AQUATIC RESOURCES MANAGEMENT, LLC

27 March 2012

United States Army Corps of Engineers
Louisville District
Newburgh Regulatory Office
6855 State Road 66
PO Box 489
Newburgh, IN 47630

Prepared on behalf of:
Oxford Mining Company-Kentucky, LLC
Sean Jones-Environmental Resource Specialist
PO Box 427
544 Chestnut St.
Coshocton, OH 43812
(270)-754-2815
SJones@oxfordresources.com

RE: Clean Water Act Section 404 Individual permit Application for Oxford Mining, KDSMRE Permit #889-0130

Dear Reviewer,

Please find enclosed one (1) original copy of the Clean Water Act Section 404 Individual permit Application for the above referenced permit. Oxford Mining is requesting a section 404 permit for the permit mentioned above for surface/auger mining in Muhlenberg County Kentucky.

Should you require any additional information or need any clarification, please feel free to contact me at 859-388-9595 or by e-mail at nbaker@aquaticresources.us.

Sincerely,

Nick Baker
Senior Environmental Scientist/Vice President

2265 Harrodsburg Road • Suite 210 • Lexington • Kentucky • 40504
Office 859.388.9595 • Fax 859.381.1005 • Web www.aquaticresources.us

United States Army Corps of Engineers
Louisville District
Individual 404 Permit Application

KDSMRE # 889-0130

Prepared for:
Oxford Mining Company-Kentucky LLC

Oxford Resource Partners
Reliability Matters

Prepared:
March 27, 2012

Prepared by:

Aquatic Resources Management
2265 Harrodsburg Rd., Suite 210
Lexington, KY 40504
(859) 388-9595

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT *(33 CFR 325)*	OMB APPROVAL NO. 0710-0003 EXPIRES: 31 August 2012

Public reporting burden for this collection of information is estimated to average 11 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters, Executive Services and Communications Directorate, Information Management Division and to the Office of Management and Budget, Paperwork Reduction Project (0710-0003). Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. Please DO NOT RETURN your form to either of those addresses. Completed applications must be submitted to the District Engineer having jurisdiction over the location of the proposed activity.

PRIVACY ACT STATEMENT

Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Programs of the Corps of Engineers; Final Rule 33 CFR 320-332. Principal Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Uses: This Information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public and may be made available as part of a public notice as required by Federal law. Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a permit be issued. One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETE

(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME:
First - Sean Middle - Last – Jones
Company – Oxford Mining Company-Kentucky LLC
E-mail Address – SJones@oxfordresources.com

8. AUTHORIZED AGENT'S NAME AND TITLE (an agent is not required)
First - Nick Middle - Last – Baker
Company – Aquatic Resources Management LLC
E-mail Address – nbaker@aquaticresources.us

6. APPLICANT'S ADDRESS.
Address - P.O. Box 427, 544 Chestnut St.
City – Coshocton State – OH Zip – 43812 Country – USA

9. AGENT'S ADDRESS
Address - 2265 Harrodsburg Road Suite 210
City – Lexington State – KY Zip – 40504 Country – USA

7. APPLICANT'S PHONE NOs. W/AREA CODE
a. Residence b. Business 270.754.2815 c. Fax

10. AGENT'S PHONE NOs. W/AREA CODE
a. Residence b. Business 859.388.9595 c. Fax 859.381.1005

STATEMENT OF AUTHORIZATION

11. I hereby authorize, Aquatic Resources Management LLC to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

APPLICANT'S SIGNATURE DATE 3/8/12

NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE (see instructions)
Geibel Property

13. NAME OF WATERBODY, IF KNOWN (if applicable)
Elk Pond Creek (stream unnamed streams enter)

14. PROJECT STREET ADDRESS (if applicable)
Address
City - State – Zip -

15. LOCATION OF PROJECT
Latitude: °N 37° 11' 50.628"
Longitude: °W -87° 13' 56.587"

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions)
State Tax Parcel ID Municipality
Section – Township – Range –

17. DIRECTIONS TO THE SITE
Entrance to site at 37° 12' 42"N & -87° 13' 44"W, off of US Highway 62, approximately 3.0 miles west of Greenville Kentucky.

18. Nature of Activity (Description of project, include all features)

The nature of activity involved in the retrieval of coal reserves, requires the assembling of sediment control structures and disposal of overburden fill materials due to surface mining methods.

19. Project Purpose (Describe the reason or purpose of the project, see instructions)

The purpose of this project is for Oxford Mining Company to assemble structures and their associated features (i.e. sediment control structures, overburden disposal, etc) to aid in the efficient extraction of coal reserves situated along the WKY #6, WKY#7, and Bancroft coal seam within the KDMRE (Kentucky Division of Mine Reclamation and Enforcement) permit # 889-0130 area.

USE BLOCKS 20-23 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. Reason(s) for Discharge

Surface mining methods and Sediment control of mined overburden material.

21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards:

Type Amount in Cubic Yards	Type Amount in Cubic Yards	Type Amount in Cubic Yards
Overburden from surface mining methods with majority being from a variety of Silt Loam complexes. Total Net Bank OB volume (CY): 30,542,745		

22. Surface Area in Acres of Wetlands or Other Waters Filled (see instructions)

Acres 8.4313 (4.0913 acres of streams, and 4.34 acres of wetlands/ponds)

Or

Liner Feet

23. Description of Avoidance, Minimization, and Compensation (see instructions)

Compensatory mitigation through reestablishment of 2.48 acres (19,399 feet) of stream channel and 4.40 acres of wetlands.
See section 8 of the attached environmental information document for the avoidance and minimization.

24. Is Any Portion of the Work Already Complete? Yes ☐ No ☑ IF YES, DESCRIBE THE COMPLETED WORK

25. Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody (If more than can be entered here, please attach a supplemental list).

Address – See supplemental list attached.

City – State – Zip –

26. List of Other Certifications or Approvals/Denials Received from other Federal, State, or Local Agencies for Work Described in This Application.

AGENCY	TYPE APPROVAL*	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED
See supplemental List attached.					

* Would include but is not restricted to zoning, building, and flood plain permits

27. Application is hereby made for a permit or permits to authorize the work described in this application. I certify that the information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

Sean Jones 3/8/12

SIGNATURE OF APPLICANT DATE SIGNATURE OF AGENT DATE

The application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than $10,000 or imprisoned not more than five years or both.

LIMITED POWER OF ATTORNEY

OXFORD MINING COMPANY – KENTUCKY, LLC TO SEAN JONES

November 29, 2011

EXPIRES: INDEFINITE

KNOW ALL MEN BY THESE PRESENTS: That Oxford Mining Company - Kentucky, LLC, organized and existing under the laws of the Commonwealth of Kentucky (the "Company"), acting on its behalf, has and does hereby appoint Sean Jones its true and lawful Attorney-in-Fact with power and authority, for and on behalf and in the name of the Company, for the express and limited purpose to file for, execute, process, and/or otherwise take necessary action pertaining to environmental applications for air, waste, and water permits and applications for surface disturbance mining permits, and renewals, amendments and/or supplements thereof, along with any certificates and/or other instruments with respect to such applications, renewals, amendments and/or supplements, which are required to be filed with any local, state or federal government or agency and which are directly related to the Company's coal mining and reclamation operations.

The Attorney herein appointed shall be authorized to act hereunder from and after the date hereof for so long and only for so long as such Attorney shall remain an employee and authorized agent of the Company, or until such earlier time as this instrument has been revoked, annulled, rescinded or set aside by an instrument executed by the Company for such purpose, whichever first occurs.

IN WITNESS WHEREOF, the Company has caused this instrument to be executed on its behalf, and notarized, in the County of Franklin, State of Ohio, on the date first written above, by the undersigned, Daniel M. Maher, Senior Vice President of Oxford Mining Company - Kentucky, LLC.

Oxford Mining Company – Kentucky, LLC

By: Daniel M. Maher

Name: Daniel M. Maher

Title: Senior Vice President

STATE OF OHIO)
) SS.
COUNTY OF FRANKLIN)

Before me, the undersigned, a Notary Public in and for said County and State, personally appeared Daniel M. Maher, to me known to be the identical person who executed the within and foregoing instrument as Senior Vice President of Oxford Mining Company – Kentucky, LLC, and acknowledged to me that he executed the same as his free and voluntary act and deed and as the free and voluntary act and deed of said limited liability company for the uses and purposes therein stated.

Given under my hand and seal of office on November 29, 2011.

Karen Van Horn

Notary Public

My Commission Expires: Oct. 12, 2016

KAREN VAN HORN NOTARY PUBLIC STATE OF OHIO

{OXF-1364.2}

Block 25

Names and addresses of adjoining property owners, lessees, etc., whose property adjoins the project site.

Name	Address	City	State	Zip Code	MRP Plot
Putman Family Trust c/o Kevin Epley	P.O. Box 502	Central City	Kentucky	42330	2003
Aehee Edwards	2560 Highland Lick Road	Elkton	Kentucky	42220	2608, 2592, 7255, 2526, 2525
Geibel Family Trust c/o James E. Tardio	118 O'Brian Street	Greenville	Kentucky	42345	2593, 2593A, 2586, 7256
Gail Geibel	501 Paradise Street	Greenville	Kentucky	42345	2593A
Gerald A. Liles & Judith Ann Liles (& Joseph P. Liles)	69 Shady Acres Lane	Greenville	Kentucky	42345	2642, 4495
Joseph P. Liles (& Gerald A. Liles & Judith Ann Liles)	3111 4th Street Apt. 320	Santa Monica	California	90405	2642, 4495
Lisa Fairchild & John Fairchild III	297 Baggett Lane	Greenville	Kentucky	42345	7257, 7257A
Tonya L. Williams & Richard T. Williams	P.O. Box 310	Powderly	Kentucky	42367	7261, 7261A
Geibel Lumber Company, Inc.	110 West Main Cross Street	Greenville	Kentucky	42345	2593, 2593A, 2586, 7256

Contents

Contents 2
List of Tables 5
List of Figures 6
Other Attachments Found in Appendix 7
Glossary of Acronyms 9
1. Executive Summary 11
2. JD Information 12
A. Approved Jurisdictional Determination Letter 12
B. Labeled Map 12
C. Aquatic Resources Delineated 12
3. External Agency Correspondence 13
4. Impact Summary 14
5. Purpose of & Need for Project 14
A. Introduction 14
B. Project Purpose 14
C. Project Need 14
D. Site Location & Description 15
E. Construction Methods & Best Management Practices (BMPs) 15
F. Affected Environments 16
G. Mining Methods & Alternatives Analysis 17
H. Environmental Consequences 20
6. Environmental Setting of Project Area 22
7. Cumulative Impacts Analysis (CIA): Site Specific 27
8. Avoidance & Minimization 27
A. Actions to Minimize Adverse Effects (Subpart H) 27
9. Evaluation of Discharge of Dredged or Fill Material in Accordance with Section 404(b)(1) Guidelines (40 CFR 230) 32
A. Disposal Site Delineation 32
B. Technical Evaluation and Testing (Subparts C-G) 33
10. Mitigation-Compensatory Mitigation Plan 59
A. Mitigation Plan 59
B. Proposed Mitigation Sites 62

C. Site Selection and Justification 62
D. Goals and Objectives of Proposed Mitigation 63
E. Mitigation Work/Implementation Plan 64
F. Construction Sequence 65
G. Performance Standards 66
H. Site Protection 67
I. Monitoring and Long Term Management 67
J. Monitoring Plan 68
K. Contingency Plan 69
11. Socioeconomic Analysis 69
A. Demographics 69
B. Income and Poverty Level 70
12. List of Preparers 73
13. List of Agencies, Organizations, & Person to Whom Copies of the Statement are sent 74
14. Bibliography 75
15. Appendix 77
Appendix A Approved Jurisdictional Determination Letter 79
Appendix B Jurisdictional Waters Location Topo Maps 80
Appendix C Aquatic Resources Delineated 81
Appendix D External Agency Correspondence 82
Appendix E Impact Resources Summary Table 83
Appendix F Mining and Reclamation Plan 84
Appendix G Aerial Maps-2006, 2008, 2010 85
Appendix H Road Map 86
Appendix I Typical Stream Restoration Plans 87
Appendix J Area Mining Method Plans A & B 88
Appendix K Soil Characterization Map 89
Appendix L Stream Characterization Data Forms 90
Appendix M Habitat Assessment Form 91
Appendix N Wetland Determination Data Forms 92
Appendix O Cross Section Profiles 93
Appendix P Photo Documents 94
Appendix Q Cumulative Impacts Analysis (CIA): Site Specific 95

Appendix R Previously Mined Area Map 96

Appendix S FEMA 100 Year Flood Plain Location Map 97

Appendix T Data from the American Coalition for Clean Coal Electricity (ACCCE) 2012 that **Figure 2** is created from 98

Appendix U Impacted Resources Vs. Mitigation Summary 99

Appendix V Current Prime Farm Soils Location Map 100

Appendix W Post-Mining Land Use Map 101

Appendix X Access Road Profiles and Sections 102

Appendix Y Stream and Wetland Avoidance and Minimization 103

List of Tables

Table 1: Underground Mining Criteria 18
Table 2: Auger/Highwall Mining Criteria 19
Table 3: Area Mining Criteria 19
Table 4: Average of data collected January-June 2011 from groundwater wells GW-01 and GW-02. GW-01 and GW-02 data is average of all data collected from this site during stated time period. Overall data is an average of all data collected at both sites. 22
Table 5: Average of data collected January-June 2011 from surface water at SW-01 23
Table 6: Soils types within proposed project area. 24
Table 7: Common trees identified in the riparian zones of streams assessed. 25
Table 8: Common plants identified in the riparian zones of streams assessed. 25
Table 9: Common trees identified in and among wetlands assessed. 25
Table 10: Common plants identified in and among wetlands assessed. 25
Table 11: List of endangered species or species of concern, recorded in Muhlenberg County Kentucky according to USFWS and KSNPC. 26
Table 12: Component drainage areas of toes for proposed backfill area and sediment ponds. 32
Table 13: Applicable, and significant effects on specific types of physical and chemical characteristics of the aquatic ecosystem 39
Table 14: Applicable, and significant effects on specific types of biological characteristics of the aquatic ecosystem. 41
Table 15: Applicable, and significant effects on specific types of special aquatic sites. 42
Table 16: Applicable, and significant effects on specific types of human use characteristics. 46
Table 17: Proposed monitoring schedule and criteria for wetland mitigation success 64
Table 18: Proposed stream monitoring assessments for mitigation determination of success. 64
Table 19: Possible Species to be planted. Species designated with * are adapted to wet conditions and would be used for mitigated wetland areas. Species not designated with * would be used in riparian areas rather than wetland areas. 67
Table 20: Historical populations for Muhlenberg County, Kentucky according to the U.S. Census Bureau every ten years. 69
Table 21: Annual median household income for the state of Kentucky and Muhlenberg County of Kentucky from 2000-2004 based on LAUS (Workforce Kentucky 2011). 70

List of Figures

Figure 1: Land use type within proposed permit area based on Kentucky Division of Geographic Information 2005. 17
Figure 2: Figure recreated from ACCCE 2012 describing energy costs as percentage of nominal after-tax income in 2001, 2005, and projected for 2012 (ACCCE 2012)..... 56
Figure 3: Average retail electricity prices (cents/kWh) of states in the U.S. based on percentage of electricity produced by coal (U.S. EIA 2012)..... 56
Figure 4: Electric utility fuel costs in nominal dollars per million BTU from 1982-2012 for coal, natural gas, and crude oil in the U.S. (U.S. EIA 1982-2012)..... 57
Figure 5: Historical populations for Muhlenberg County, Kentucky according to the U.S. Census Bureau every ten years. 69
Figure 6: Muhlenberg County's unemployment rates based on Labor Force Statistics (LAUS) (Workforce Kentucky 2011). 70
Figure 7: Annual median household income for the state of Kentucky versus Muhlenberg County of Kentucky from 2000-2004 based on LAUS (Workforce Kentucky 2011). 71

Other Attachments Found in Appendix

Appendix A	Approved Jurisdictional Determination Letter
Appendix B	Jurisdictional Waters Location Topo Maps
Appendix C	Aquatic Resources Delineated
Appendix D	External Agency Correspondence
Appendix E	Impact Resources Summary Table
Appendix F	Mining and Reclamation Plan
Appendix G	Aerial Maps-2006, 2008, 201
Appendix H	Road Map
Appendix I	Typical Stream Restoration Plans
Appendix J	Area Mining Method Plans A & B
Appendix K	Soil Characterization Map
Appendix L	Stream Characterization Data Forms
Appendix M	Habitat Assessment Form
Appendix N	Wetland Determination Data Forms
Appendix O	Cross Section Profiles
Appendix P	Photo Documents
Appendix Q	Cumulative Impacts Analysis (CIA): Site Specific
Appendix R	Previously Mined Area Map
Appendix S	FEMA 100 Year Flood Plain Location Map
Appendix T	Data from the American Coalition for Clean Coal Electricity (ACCCE) 2012 that **Figure 2** is created from
Appendix U	Impacted Resources Vs. Mitigation Summary
Appendix V	Current Prime Farm Soils Location Map

Appendix W Post-Mining Land Use Map

Appendix X Access Road Profiles and Sections

Appendix Y Stream and Wetland Avoidance and Minimization

Glossary of Acronyms

ABA	Acid/Base Accounting
ACCCE	American Coalition for Clean Coal Electricity
BMP	Best Management Practices
CFR	Code of Federal Regulations
CHIA	Cumulative Hydrologic Impact Analysis
CIA	Cumulative Impacts Analysis
CMP	Compensatory Mitigation Plan
CWA	Clean Water Act
CWD	Course Woody Debris
CFS	Cubic Feet per Second
CY	Cubic Yards
DA	Department of the Army
DOE	Department of Energy
EIA	Energy Information Administration
EID	Environmental Information Document
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FC	Fish Consumption
GIS	Geographic Information System
GPP	Groundwater Protection Plan
GPS	Global Positioning System
HUC	Hydrologic Unit Code
KDMP	Kentucky Division of Mine Permits
KDMRE	Kentucky Division of Mine Reclamation and Enforcement
KDOW	Kentucky Division of Water
KDSMRE	Kentucky Department for Surface Mining, Reclamation and Enforcement
KGS	Kentucky Geological Survey
KPDES	Kentucky Pollutant Discharge Elimination System
KSHPO	Kentucky State Historic Preservation Office
KSNPC	Kentucky State Nature Preserves Commission
KYDEP	Kentucky Energy and Environment Cabinet Department for Environmental Protection
LAUS	Labor Force Statistics
MHP	Material Handling Plan
MRP	Mining and Reclamation Plan
MSHA	Mine Safety and Health Administration
OSHA	Occupationdal Safety and Health Administration
NEPA	National Environmental Policy Act of 1969
NHPA	National Historic Preservation Act
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetland Inventory
PCR	Primary Contact Recreation
RBP	Rapid Bioassessment Protocols
SCR	Secondary Contact Recreation
SMCRA	Surface Mining Control and Reclamation Act of 1977
SWPP	Surface Water Protection Plan
TMDL	Total Maximum Daily Load

TSS	Total Suspended Solids
U.S.	United States
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
WAH	Warm Water Aquatic Habitat

1. Executive Summary

This document is an Environmental Information Document (EID) composed to fulfill requirements by the United States Army Corps of Engineers (USACE), and Department of the Army (DA) (in acknowledgement and accordance with the Endangered Species Act (ESA), National Environmental Policy Act of 1969 (NEPA), the National Historic Preservation Act (NHPA), and the United States Environmental Protection Agency (USEPA) Section 404 of the Clean Water Act (CWA)) for the purpose of removal, replacement and regrading of overburden materials and silt structures located within jurisdictional waters of the United States (U.S.) in relations with coal mining operations. Coal Mining operations are proposed to occur in Muhlenberg County Kentucky within the project area of Kentucky Department for Surface Mining, Reclamation and Enforcement (KDSMRE) permit # 889-0130.

This document presents key factors considered in the USACE decision, alternatives considered and the environmentally preferred alternatives, monitoring programs and mitigation measures, and the USACE decision relative to the proposed discharge.

Expectations described in this document with respect to the proposed project explain that the functional effects due to surface alterations are only anticipated to be temporary; however the surface alterations would be permanent. Once the project area has been reclaimed, it will eventually be established for its previous uses of forested, prime agricultural land, agricultural land, and no long-term adverse impacts should occur with regards to water quality or the surrounding environments and habitats there in.

Expected economic benefits of the project discussed in this document are anticipated to prevail over any potential deleterious environmental influences assessed within this document. Direct, indirect, and induced economic boosts to the local and state economy will not only provide profits, but also a boost in taxes to improve social services for the surrounding areas, in addition to aiding in the fulfillment of mineral requirements of the nation.

2. JD Information

A. Approved Jurisdictional Determination Letter

Reference Appendix A Approved Jurisdictional Determination Letter.

B. Labeled Map

Map depicting the linear feet of stream onsite and wetlands onsite with labels can be referenced as Streams Topo Map and Wetland Topo Map Appendix B.

C. Aquatic Resources Delineated

Reference Appendix C. All aquatic resources delineated are based on the Jurisdictional Determinations conducted by a branch of HDR, Inc. based out of Murphysboro, Illinois.

3. External Agency Correspondence

External agency correspondence can be found in Appendix D.

4. Impact Summary

An Impact Resources Summary Table can be found in Appendix E. A signed and stamped Mining and Reclamation Plan (MRP) map showing structures and jurisdictional waters limits can be found in Appendix F.

5. Purpose of & Need for Project

A. Introduction

The entirety of this document forms the USACE, Louisville District, EID toward an application by Oxford Mining Company for a DA permit in accordance with Section 404 of the CWA. The DA permit is for the purpose of removal, replacement and regrading of overburden materials and silt structures located within jurisdictional waters of the U.S. in association with the operations and reclamation of the Geibel Surface mine. The foundation of this EID is supported by the evaluation of cumulative impacts (both direct and indirect) associated with the proposed discharge. This EID summarizes the USACE regulation review in accordance with the ESA, NEPA, NHPA and the USEPA CWA Section 404(b)(1) Guidelines (40 Code of Federal Regulations (CFR) 230). This document identifies key factors considered in the USACE decision, alternatives considered and the environmentally preferred alternatives, monitoring programs and mitigation measures, and the USACE decision relative to the proposed discharge.

B. Project Purpose

The purpose of this project is for Oxford Mining Company to assemble structures and their associated and attendant features (i.e. sediment control structures, overburden disposal, etc) to aid in the efficient extraction of coal reserves situated along the WKY #6, WKY#7, and Bancroft coal seam within the KDMRE (Kentucky Division of Mine Reclamation and Enforcement) permit # 889-0130 area. The federal action to be considered is the issuance of a CWA Section 404 Individual Permit by the USACE to authorize the assemblage of structures previously mentioned. In result of this proposed project, there would be disturbances in multiple wetlands and ponds within the permitted area. In addition to disturbances in numerous unnamed tributaries of Elk Pond Creek, and Pond River; these streams are a part of a larger surface tributary system to a navigable (Section 10 of the rivers and harbors Act of 1899) waterway, the Green River.

C. Project Need

Even though other energy sources such as natural gas and renewable nonhydropower energy generation are projected to increase, coal is still typically projected to be responsible for the majority share of electricity generated through the year 2035 based on sensitivity cases analyzed (U.S. Energy Information Administration (EIA) 2011). In the same sensitivity cases coal consumption in tonnage is projected to potentially increase anywhere from 1.1-1.7% per year during the period of 2009-2035, with a starting consumption tonnage of 1,000 million short tons in 2009 (U.S. EIA 2011). The applicant is proposing to carry out the necessary activities to recover approximately 1.6 million short tons of coal reserves using surface and auger mining methods. Mining activities necessitate the construction of one permanent backfill area to organize excess overburden and two sediment control ponds, allowing sediment from streams to settle out from runoff received due to mining operations. One control pond would be

temporary the other would be permanent outside of jurisdictional waters and after mining operations would be established as open water to aid in mitigation of excavated wetlands.

Not only would this project aid in fulfilling a portion of the nation's energy needs, it would also provide thirty-two (32) direct job opportunities at the mine and approximately ninety-six (96) jobs in surrounding businesses. These jobs and the associated coal extraction benefit both the local and regional economy through increased taxes. Through coal severance tax this job has the potential to produce approximately $3,441,600 over the life of the mine. Fifty percent of the tax levied on the gross value of the coal is returned to the county it was mined in. Applying that rate Muhlenberg County would receive approximately $1,720,800. Job opportunities would help lower the unemployment percentage rates of the project's surrounding county (Muhlenberg County) which has consistently been higher than the state of Kentucky and the nation's rates for the last thirty years (Workforce Kentucky 2011). The average unemployment rate for Muhlenberg County was 10.71% from January-October 2011 (Workforce Kentucky 2011). Any alleviation to the unemployment rate would produce state income taxes and property taxes in addition to providing funding for social services, schools, public services (fire/police support), etc. of the area.

D. Site Location & Description

The operations for the KDSMRE # 889-0130 proposal are to be located in Muhlenberg County Kentucky in the KY U.S. Geological Survey topographic Quadrangle Greenville with an entrance at 37° 12' 42"N & -87° 13' 44"W (off of US Highway 62, approximately 3.0 miles west of Greenville, Kentucky) and a central site location of 37° 11' 50.628"N & -87° 13' 56.587"W. Topographic (Appendix B), aerial (Appendix G), and road (Appendix H) mapping of the proposed project are included. Currently the proposed areas of impact are a mix between agriculture, grassland, shrubland and forest, where a section of the grassland has been mined previously and the bulk of the forest has been recently logged. The unnamed tributaries within the proposed permit area involve a water flow path that travels to Elk Pond Creek, which flows into the Pond River, which empties into the Green River. The unnamed tributaries are 3.12 river miles away from the closest named relatively permanent waterway (Elk Pond Creek) and are 37.91 river miles and 14.24 aerial miles from the nearest traditional navigable waterways (12.5 miles above the mouth of Pond River meeting the Green River). The project is within the twelve digit Watershed Hydrologic Unit Code (HUC-12) 051100060501.

E. Construction Methods & Best Management Practices (BMPs)

All construction and grading activities that could potentially result in disturbance and exposure of soil would be done under suitable field conditions. Mining operations would be attempted to be performed during low or no flow periods and would proceed in a downstream direction to avoid resuspension of sediment into restored reaches. During excessively wet or dry periods, unrepairable damage to soil porosity and structure may occur, so the applicant would attempt to avoid these conditions. In extreme circumstances, such as record wet (or dry) seasons, it may be necessary to postpone construction until the following year when field conditions are again suitable.

Well-trained personnel, knowledgeable in the operation of heavy equipment in ecologically sensitive areas, would be on site during all phases of construction to ensure that restoration goals are met with a minimum level of disturbance. Following construction/grading, soil conditioning may be necessary to reduce compaction, remove weed species, and prepare a good seed bed. Topsoil, subsoil, parent material, and coarse woody debris (CWD) may be stock piled during mining operations for later use providing that it is stored in a manner that will not create excessive runoff and erosion. All stream channel parameters, including: channel widths, side-slope ratios, meander wavelengths, and riffle/ pool spacing shall strictly follow specifications from the design drawings in Appendix I. Topsoil, subsoil, parent material, and CWD stockpiled during mining operations would be used for construction of stream channels/floodplains as long as toxic materials are not included. All toxic materials would be buried and would not be permitted in restoration surface layers. The primary stream bed materials would be coarse (non-toxic) rock derived from overburden materials during coal recovery. Bed materials would not consist of fine textured top soil or subsoil due to the high erosion potential and low aquatic habitat it provides. A minimum 50' riparian buffer of native tree species would be restored along each side of all reclaimed stream channels (Appendix I for tree species and spacing). Floodplain areas, within the 50' Riparian buffer zones, shall receive a minimum of 4 inches of top soil either from on-site stock piles or off-site sources. Surface roughening (with a disk, or similar applicable equipment) of areas that will be seeded may be performed as needed to ensure good seed to soil contact. Surface roughening would be done after all construction operations are complete. Constructed streambanks and floodplains would be revegetated as soon as practical based on seasonal weather conditions and completion of all disturbance in the area.

F. Affected Environments

Inside the HUC-12 051100060501 there are five essential land types within the existing proposed permit area environment: forest, agriculture, grassland, wetlands, and developed (industrial and/or residential). Environments in the project area are not completely segregated, but rather integrated. Of the estimated 400 acres within the proposed area roughly 74% is forested (297 acres), 18% is agricultural (71 acres), 6% is grassland (24 acres), 1% is wetlands (5 acres), 1% is developed (2 acres) and <1% is open water (0.5 acres) or scrub/shrub (0.5 acres) (Kentucky Division of Geographic Information 2005) (**Figure 1**). Of the 74% forested areas, 65.7% is deciduous Forest, 8.2% is evergreen forest, and 0.1% is mixed forest. The 17% of agricultural area is composed of 11.9% pasture or hay, and 6% cultivated crops. Within the 1% of wetland areas roughly, 0.4% is woody wetlands, and 0.7% emergent herbaceous wetlands. The final 1% of developed areas is composed of around 0.3% developed open space and 0.2% low intensity development. (Actual percentage of Grassland/Herbaceous is 6.1%, open water is 0.1%, and scrub/shrub is 0.3%.)

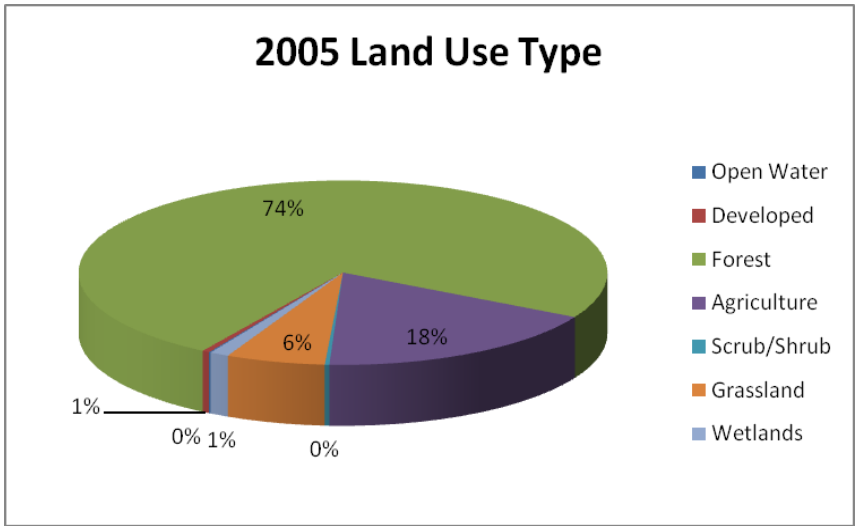

Figure 1: Land use type within proposed permit area based on Kentucky Division of Geographic Information 2005.

Every environment has previously been altered by outside factors, factors being either anthropogenic or due to changes in other environments. Historically: the proposed forested areas have been logged, agricultural areas have an increase in drainage due to highly channelized tributaries, some grassland areas have been mined, wetland acreages have - decreased due to an increase in agriculture, and developed areas have increased due to an increase in anthropogenic activities.

The actual mine site is composed of approximately 400 acres. This project can be located on the Greenville quadrangle. The proposed mining operations would impact 18,814.6' (3.56 miles) of streams and 4.34 acres of wetlands (Appendix E). All streams in the project area have a 2-4% slope. Gas wells and associated pipelines with access roads also exist within the proposed project area. The proposed mine site is located on private property with little public road access. The major roadway nearest the project is US 62, with the nearest major intersection being 1.6 miles east of the project on US HWY 62 and KY-189.

G. Mining Methods & Alternatives Analysis

Pursuant to Section 404 (b) (1) of the CWA, the USACE defines the practicable alternatives as those that are "available and capable of being done after taking into consideration cost, existing technology, and logistics in light of the overall project purpose." The 404 (b)(1) guidelines generally prohibit the permitting of projects where there "is a practicable 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" 40 CFR 230.10. When a project is not water dependent, there is a presumption that practicable alternatives are available 40 CFR 230.10. There is also a presumption that any practicable alternative will have a lesser adverse effect on the environment unless clearly demonstrated otherwise 40 CFR 230.10. A project is water dependent if it "requires access or proximity to or sitting within the special aquatic sites to fulfill its basic purpose and is considered a non-water dependent activity".

Under NEPA, all reasonable alternatives must be rigorously explored and objectively evaluated as well as those other alternatives, which are eliminated from a detailed study. What constitutes a reasonable range of alternatives depends on the nature of the proposal and the facts of the application. Reasonable alternatives include those that are practical or feasible from the technical and economic standpoint. In accordance with the requirements of NEPA and Section 404 (b)(1) guidelines, the applicant has provided the least damaging practicable alternative.

Mining methods are reviewed on the basis of geography, geology, economics and surface/mineral rights control. Those methods for Western Kentucky are underground, auger/highwall, and surface area mining, potentially with combinations of two or more methods of mining. The applicant has evaluated each method, and variations of each, and has determined that underground and auger/highwall are not practicable, leaving surface area mining as the only available method. As these methods were eliminated from consideration, the applicant did not quantify potential stream impacts associated with the underground or auger/highwall mining methods but did for the surface area method.

i. Underground Mining

To determine the feasibility of utilizing the underground mining method, the applicant analyzed the WKY6 and the Bancroft coal seams against a set of criteria established specifically for this method (**Table 1**). Adequate seam thickness, geologic conditions expected to provide safe roof conditions, and 120 feet of cover, are fundamental criteria. Based on this analysis, the WKY6 coal seam does not have adequate seam height (>30”) in order to be mined with this method; and due to the shallow depth of the block of Bancroft coal it did not meet the criteria for underground mining and underground mining was eliminated as a practical alternative for either seam.

Table 1: Underground Mining Criteria

Coal Seam	Seam Height > 30"	Cover ≥ 100 ft	Parting Thickness < 24"	50% Recovery C/Miner	Min. 40' Competent Rock to Mineable Seam Above
WKY6	No	No	Yes	Yes	N/A
Bancroft	Yes	No	Yes	Yes	N/A

ii. Auger/Highwall Mining:

To determine the feasibility of utilizing the Auger/Highwall Mining method, the applicant analyzed the WKY6 and the Bancroft coal seams against a set of criteria established specifically for this method and similar to underground mining (**Table 2**). Adequate seam thickness, geologic conditions expected to provide no subsidence, are fundamental criteria. Based on this analysis, the Bancroft coal seam meets the criteria to be mined with this method with the exception of cover; however, with specific subsidence designs the Bancroft could be highwall mined with a reduced recovery in shallow areas.

Table 2: Auger/Highwall Mining Criteria

Coal Seam	Seam Height consistently > 24"	Cover ≥100 ft	Parting Thickness < 24"	50% Recovery C/Miner	Min. 40' Competent Rock to Mineable Seam Above
WKY6	No	No	Yes	Yes	N/A
Bancroft	Yes	No	Yes	Yes	Yes

iii. Area Mining:

To determine the feasibility of utilizing the area mining method basis, the applicant analyzed the WKY6 and Bancroft seams against a set of criteria established specifically for the area mining method (**Table 3**). Under this alternative, area mining would allow full recovery (95%). While area mining is considered a practical alternative, incremental coal recovery usually can be achieved through a combination of mining methods.
For area mining to be practicable, each seam must meet the following:

Table 3: Area Mining Criteria

Coal Seam	Seam Height > 12"	Cumulative Ratio (Raw) ≤ 23.0	> 100,000 Mineable Tons	90% Pit Recovery
WKY6	Yes	Yes	Yes	Yes
Bancroft	Yes	Yes	Yes	Yes

iv. No Action Alternative:

This alternative is the future without the project. The project would not go forward, the coal reserves would not be recovered and thus would not be available for energy generation, and the environmental effects expected due to the mining activity would not occur. Additional impacts include the loss of revenue to the community from workers wages, local and state taxes, and coal severance taxes.

v. Practicable Alternative(s) – A combination of Surface Area Method of Mining and Auger/Highwall Mining:

The geology and topography of the project area indicate that it will not be possible to totally avoid the intermittent streams and still achieve a viable mining coal reserve. The area to be mined underlies intermittent streams and the area was evaluated leaving the intermittent streams essentially undisturbed.

As stated above the applicant analyzed the WKY6 and Bancroft seams against a set of criteria established specifically for the area mining method -- area mining would allow full recovery (95%). While area mining is considered a practical alternative, incremental coal recovery usually can be achieved through a combination of mining methods. The Highwall Mining Method requires an open face of coal which can be achieved utilizing the Area Method. As previously noted the applicant analyzed the WKY6 and the Bancroft coal seams against a set of criteria established specifically for the Highwall Mining method. Based on this analysis, the Bancroft coal seam meets the criteria to be

mined with this method with the exception of cover; however, with specific subsidence designs the Bancroft could be highwall mined with a reduced recovery in shallow areas.

The applicant produced two detailed studies of mining the Bancroft seam utilizing the Area Mining Method (Appendix J Area Mining Method Plans A & B) to determine if it is feasible to avoid a large portion of the streams. Of the two plans only one met the surface area mining method criteria of a raw stripping ratio $\leq$ 23.0 is Plan A, and it includes a portion of the intermittent streams.

Due to the WKY6 Seam being very sporadic it could not be analyzed in detail when mined without the Bancroft. The streams that are affected by the WKY6 when mined without the Bancroft will only be disturbed when necessary to recover the WKY6 coal that is minable based on the criteria above.

vi. Preferred Alternative:
The applicant has chosen Surface Area Mine Plan A and Highwall Mining as the "preferred" alternatives. The combination of Mine Plan A and Highwall Mining meets all the criteria. Mine operations will be developed in an orderly manner. Sediment control will be provided through sediment control structures constructed in advance of mining. The mining operation will use trucks and shovels/excavators. The mining operations will be performed in phases. The initial phase will consist of construction of the haul roads, mine management areas, sediment basins and the construction of the stream relocation (diversion ditch). Mining operations will begin on the southern portion of the proposed permit boundary. Mining will progress to the northern extent of the proposed permit boundary and will expand with mining of the WKY # 6 & 7 seams. As the surface mining progresses and while the pit is open the highwall/auger miner will mine the end walls, generally to the west and east of the Bancroft pit. The highwall miner will follow the surface mining pit progression to the north. The highwall miner holes will be plugged within 30 days after the hole is vacated by the miner. Surface mine areas, including the highwall miner plugged holes, will be progressively backfilled as mining progresses. Spoil materials will be returned to the mine bench to the extent practicable and utilized for backfilling area highwalls/pits. When backfilling is complete in an area, topsoil will be redistributed and revegetation begun. Coal obtained using these "preferred" alternatives will be transported to market via trucks or river using the Island River Terminal, a processing and barge loading complex which is being actively used by the applicant for other permits.

H. Environmental Consequences

The proposed mining operations would result in some permanent, temporary and secondary impacts to 18,814.6' (3.56 miles) of streams and 4.34 acres of wetlands. The proposed impacts on stream and wetland areas would be permanent with regards to physical surface alterations, and temporary with regards to overburden material, sediment control structures, inundation, and sediment transport activities.

Even though the wetlands in the project area would be permanently impacted by surface alterations and temporarily impacted by other mining operations, it should be noted they were

identified by National Wetland Inventory (NWI) as having been created through excavation or impoundments. Wetlands in this area are also adjacent to previous mining and continued logging practices, so they are not without current impacts already. Water quality within the aquatic systems will have increased disturbance at the beginning of operations. The disturbance in water quality at the beginning of operations is in relation to the construction of the sediment control structures being built. During beginning phases of mining operations downstream increases in sulfates, dissolved solids, specific conductance, alkalinity, potassium, calcium, iron, magnesium, hardness and manganese would be expected. Increases in water quality characteristics should be short lived though once sediment structures and proper drainage is constructed, so no significant adverse effects on water quality are expected. Low flow rates may also be exhibited downstream as water which would typically be runoff is retained in the sediment control structures, however, regular flow amounts should return after mining activities have been completed. Sediment and soil transport activities will be most affected in the beginning phases of mining operations. Sediment load and transportation functions are expected to return to pre-mining conditions or better, once mining operations have ended. After operations have ended, sediment load and transportation functions will naturally restore themselves because most sediment structures will be removed (one sediment pond will be established as open water for wetland mitigation), streams will be established, and vegetation will be returned to the area; which will minimize erosion and aid in transportation of excess sediment.

Temporary adverse impacts to food sources would be anticipated, such as organic material that enter streams and are then transported to lower reaches of stream channels until after reclamation occurs. Aquatic and associated riparian ecosystems would also be expected to be permanently physically altered and temporarily functionally disrupted during proposed mining operations. One such reason for a disruption in aquatic ecosystems is due to the temporary impoundment of water flow associated with the sediment ponds which will alter circulation and velocity. The expected lentic habitat created from the water impoundment should support a tolerant benthic macroinvertebrate community and phytoplankton/periphyton community adapted to the conditions in the sediment ponds. All impacts should persist until mining activities have ended and stream mitigation activities from reclamation are deemed successful.

Any losses in aquatic habitats would also have an impact upon other wildlife species that rely on the riparian buffers of streams within the proposed permitted area. Wildlife species may include but are not limited to the endangered species/species of concern listed in **Table 11** for Muhlenberg County Kentucky. No specific reports have listed any endangered species/species of concern for the project area, however, it is not impossible that there is not potential habitat for species to exist. Water quality, spawning and maturation areas, nesting areas, protective cover, adequate and reliable food supply, and resting areas for migratory species are the crucial elements of the aquatic habitat for threatened and endangered species in addition to non-listed species. It is expected that any population of species which may be impacted and are mobile/capable, will relocate to a more suitable area. The aquatic food webs organisms rely on, would be adversely impacted in the proposed permit area, however, it is anticipated further

impacts will be alleviated in areas downstream due to the use of sediment control structures, BMPs and compliance with Kentucky Energy and Environment Cabinet Department for Environmental Protection (KYDEP's) Kentucky Pollutant Discharge Elimination System (KPDES) requirements. Impacts in the proposed area should also not affect the physical, chemical, or biological categories in aquatic areas downstream of the mining site. A compensatory stream mitigation and enhancement plan has been provided. This plan describes an intended mitigation process for the permanently/temporarily impacted stream channels. After mining operations have ended, and a successful mitigation plan executed, it is anticipated that the adverse impacts would cease allowing for the aquatic wildlife and terrestrial wildlife dependent on stream channels, riparian buffers and wetlands to return. There will be an expected time lag, accounted for within the mitigation plan, between the end of mining operations and the return of wildlife due to the time it takes for stream and wetland mitigation to occur and time it takes for the area to reach maturation i.e. riparian buffers to fully develop. There is also anticipation that plant species from neighboring, undisturbed areas would also gradually move into the mined area to contribute to the overall diversity of species in the area.

6. Environmental Setting of Project Area

The total area for the project is roughly 400 acres where 4.09 acres of which are U.S. waters (18,814.6', 3.56 miles of ephemeral and intermittent streams) and 4.34 acres of U.S. waters (wetlands) which could be permanently impacted by surface alterations and temporarily impacted by the discharge due to mining activities. There are 20 streams (8 intermittent and 12 ephemeral) and 15 wetlands (5 shrub, 8 emergent, and 2 pond) that were delineated within the proposed project area on November 11th-15th, 2009, December 15th-16th, 2009, January 26th-27th, 2010, February 4th, 2010, and January 6th, 2011 (Cowardin et al. 1979). There are currently two groundwater wells inside or near the proposed permit area marked on the MRP (Appendix F). One well is in the northwest portion of the permit area called GW-01, and the other is just south of the permit area called GW-02. Averages of water quality data based on groundwater data collected once a month during January-June 2011 from each of the groundwater wells can be found in **Table 4** below. The current surface water sampling location is south of the proposed permit area and marked on the MRP (Appendix F). Averages of water quality data based on surface water data collected once a month during January-June 2011 can be found in **Table 5** below.

Table 4: Average of data collected January-June 2011 from groundwater wells GW-01 and GW-02. GW-01 and GW-02 data is average of all data collected from this site during stated time period. Overall data is an average of all data collected at both sites.

Average Data collected from January-June 2011										
Location of Average	Temp (C)	Conductivity (µmhos/cm)	pH (Standard Units)	Acidity as CaCO3 (mg/L)	Alkalinity as CaCO3 (mg/L)	Total Dissolved Solids(mg/L)	SO4 Dissolved (mg/L)	Fe Dissolved (mg/L)	Mn Dissolved (mg/L)	Depth to Water (ft)
GW-01	15.23	958.50	7.12	27.33	162.00	565.67	207.83	0.10	0.03	100.61
GW-02	15.08	1798.33	7.83	21.17	363.00	1175.00	55.67	0.10	0.01	26.88
Overall	15.16	1378.42	7.48	24.25	262.50	870.33	131.75	0.10	0.02	63.75

Table 5: Average of data collected January-June 2011 from surface water at SW-01

Location of Average	Discharge (cfs)	Conductivity (µmhos/cm)	pH (Standard Units)	Acidity as CaCO3 (mg/L)	Alkalinity as CaCO3 (mg/L)	Total Suspended Solids(mg/L)	SO4 Dissolved (mg/L)	Fe Dissolved (mg/L)	Mn Dissolved (mg/L)
SW-01	266.83	670.17	6.67	25.00	47.50	21.83	42.28	0.76	0.06

According to the 401 KAR 10:031 Surface Water Standards, the only water quality data that qualifies as an exceedance prior to mining operations is dissolved Fe. The Fe exceedance limitations during mining activities however would increase to 3.5-4.0 mg/L, so if mining operations commenced the current surface water Fe levels would not be considered an exceedance. It should be noted, however, that there is no primary drinking water standard for dissolved Fe, SO_4, and Mn because there are no serious health threats from their presence (Kentucky Geological Survey 2008 b, e, f). The Environmental Protection Agency (EPA) set a secondary maximum of 0.3 mg/L of Fe, 250 mg/L of SO_4, and 0.05 mg/L of Mn, because higher concentrations produce objectionable odor, taste, color, staining, corrosion, or scaling (Kentucky Geological Survey 2008 b, e, f). When compared with the rest of Kentucky the groundwater quality data within the proposed permit site is ranked as low or medium levels with respect to Kentucky Geological Survey's (KGS) groundwater quality maps last designed in 2008, where medium levels of pH are 6.51-8.5 standard units, low alkalinity is 0-500 mg/L, low conductivity is <10,000 µmhos/cm, medium sulfate level is ≤250 mg/L, medium iron level is 0.31-1.00 mg/L, and medium manganese level is 0.051-1,000 mg/L (KGS 2008 a-f). Average surface water alkalinity is 47.50 at SW-01 which falls in line with most streams at an alkalinity < 200 mg/L (Brooks et al. 2003). Average surface water conductivity is 670.17 µmhos/cm, which qualifies for potential presence of most fresh water fish species which normally require < 2,000 µmhos/cm (Brooks et al. 2003). The surface water average for Mn at 0.06 mg/L also falls in line with average streams because typically undisturbed streams rarely exceed 1.00 mg/L (Brooks et al. 2003). Surface water average SO_4 levels were 42.28 mg/L which allows for potential habitat for desirable fish fauna since levels were <90 mg/L (Brooks et al. 2003).

In general, the groundwater in Muhlenberg County is soft to moderately hard, and may contain undesired amounts of iron (KGS 2012). Approximately 8% of the county population is currently reliant upon private water supplies including groundwater wells, where 70% use wells and 30% use other sources (KGS 2012).

The waters mentioned above flow into Elk Pond Creek southwest of the proposed project area. The 305 (b) Report (Commonwealth of Kentucky 2010 Volume I) lists the designated uses (according to 401 KAR 10:026) of Elk Pond Creek as: Warm Water Aquatic Habitat (WAH), Fish Consumption (FC), Primary Contact Recreation (PCR), and Secondary Contact Recreation (SCR). Elk Pond Creek is listed as impaired for the designated use of WAH. The identified pollutant for impairment of WAH is listed as sedimentation/siltation. The identified sources of the sedimentation/siltation within Elk Pond Creek are habitat modifications other than hydromodification, otherwise the source is unknown. Elk Pond Creek is also listed as impaired for PCR due to an identified pollutant of Fecal Coliform with an unknown source. Impairments discussed caused Elk Pond Creek to be included on the 303 (d) list

(Commonwealth of Kentucky 2010 Draft Volume II) which means that it must have a Total Maximum Daily Load (TMDL) conducted within this watershed in order to limit future impacts from sedimentation and siltation on WAH, and Fecal Coliform on PCR.

The top three soils in the project area are Frondorf-Lenberg complex with 12-20% slopes (21.60% of project area), Belknap silt loam (18.80% of project area) and Zanesville silt loam with 6-12% slopes (13.70%) of project area. Further soil documentation can be found in

Table 6 below and the Soil Characterization Map in Appendix K (Natural Resources Conservation Service (NRCS) 1976(a)). The proposed project area soils are composed of 155.4 acres of non prime farmland (38.9%), 93.5 acres of prime farmland (23.4%), 75.2 acres of prime farmland if drained (18.8%), 66.1 acres of farmland of statewide importance (16.5%), and 9.3 acres of prime farmland if protected from flooding or not frequently flooded during the growing season (2.3%)(NRCS 1976 (b)).

Table 6: Soils types within proposed project area.

Soils of Proposed Project Area

Map Unit Symbol	Map Unit Name	Acres of Total Area	Percent of Total Area
Be	Belknap silt loam	75.2	18.80%
Cg	Clifty gravelly silt loam	9.3	2.30%
Co	Collins silt loam	33.2	8.30%
FlD	Frondorf-Lenberg complex, 12 to 20 percent slopes	86.2	21.60%
FlE	Frondorf-Lenberg complex, 20 to 30 percent slopes	18.6	4.70%
SaB	Sadler silt loam, 2 to 6 percent slopes	21.6	5.40%
Ud	Udorthents	26.5	6.60%
W	Water	0.7	0.20%
WlC	Wellston silt loam, 6 to 12 percent slopes	11.3	2.80%
WlC3	Wellston silt loam, 6 to 12 percent slopes, severely eroded	2.1	0.50%
WlD	Wellston silt loam, 12 to 20 percent slopes	1.2	0.30%
WlD3	Wellston silt loam, 12 to 30 percent slopes, severely eroded	19.6	4.90%
ZaB	Zanesville silt loam, 2 to 6 percent slopes	38.7	9.70%
ZaC	Zanesville silt loam, 6 to 12 percent slopes	54.8	13.70%
ZaC3	Zanesville silt loam, 6 to 12 percent slopes, severely eroded	0.5	0.10%
Totals for Area of Interest		399.6	100.00%

All field and/or data Forms such as Stream Characterization Data Forms, Habitat Assessment Forms, Wetland Determination Data Forms, Cross Section Profiles, and Photo documents can be found in Appendix L, Appendix M, Appendix N, Appendix O, and Appendix P. The common species of plants within the proposed project area can be found listed in the tables below (**Table 7, Table 8, Table 9, Table 10**).

Table 7: Common trees identified in the riparian zones of streams assessed.

Common Trees in Stream Riparian Zone	
Common Name	*Scientific Name*
American Beech	*Fagus grandifolia*
American Elm	*Ulmus americana*
American Sycamore	*Platanus occidentalis*
Black Cherry	*Prunus serotina*
Dogwood	*Cornus sp.*
Eastern Red Cedar	*Juniperus virginiana*
Green Ash	*Fraxinus pennsylvanica*
Red Maple	*Acer rubrum*
Red Oak	*Quercus sp.*
Sassafras	*Sassafras sp.*
Shagbark	*Carya sp.*
Slippery Elm	*Ulmus rubra*
Sugar Maple	*Acer saccharum*
Sweetgum	*Liquidambar styraciflua*
Tulip Poplar	*Liriodendron tulipifera*
White Oak	*Quercus alba*

Table 8: Common plants identified in the riparian zones of streams assessed.

Common Plants in Stream Riparian Zone	
Common Name	*Scientific Name*
Agricultural Fields	-
Blackberry	*Rubus sp.*
Japanese Honeysuckle	*Lonicera japonica*
Shrubs	assorted sp.

Table 9: Common trees identified in and among wetlands assessed.

Common Trees in/among Wetlands	
Common Name	*Scientific Name*
American Beech	*Fagus grandifolia*
American Sycamore	*Platanus occidentalis*
Black Cherry	*Prunus serotina*
Black Willow	*Salix nigra*
Eastern Red Cedar	*Juniperus virginiana*
Red Maple	*Acer rubrum*
Sweetgum	*Liquidambar styraciflua*
Velvet Ash	*Fraxinus velutina*

Table 10: Common plants identified in and among wetlands assessed.

Common Plants in/among Wetlands	
Common Name	*Scientifc Name*
Blackberry	*Rubus sp.*
Broadleaf Cattail	*Typha latifolia*
Broomsedge Bluestem	*Andropogon virginicus*
Canada Goldenrod	*Solidago canadensis*
Christmas Fern	*Polystichum acrostichoides*
Common Reed	*Phragmites australis*
Common Rush	*Juncus effusus*
Japanese Honeysuckle	*Lonicera japonica*
Meadow Fescue	*Festuca pratensis*
Multiflora Rose	*Rosa multiflora*
Ragweed	*Ambrosia sp.*
Reed Canarygrass	*Phalaris arundinacea*
Rice Cutgrass	*Leersia oryzoides*
Sedge (assorted)	*Carex sp.*
Wood Reed	*Cinna sp.*
Wool Grass	*Scirpus cyperinus*

The proposed project site is located in Muhlenberg County Kentucky which the U.S. Fish and Wildlife Service (USFWS) and Kentucky State Nature Preserves Commission (KSNPC) has identified as habitat to multiple species that are either endangered, threatened or listed as a species of special concern (**Table 11**). No habitat for federally endangered aquatic species occurs within the project area. No habitat for federally endangered terrestrial species has been reported within the project area. During an Indiana Bat (*Myotis sodalis*) survey (surveyed June 13-16 of 2011 by Copperhead Consulting) 4 mist net sites were constructed for a 517 acre area (392 acres forested) (Appendix D). Thirty-three bats of three species were captured, 1 Big brown bat (*Eptesicus fuscus),* 19 Red bats (*Lasiurus borealis),* and 13 Tricolor bats (*Perimyotis subflavus*). No endangered species were encountered during the survey. The USFWS's Kentucky Field Office reviewed the Indiana Bat

Summer Mist Net Survey and Winter Habitat Assessment report and concluded that no Indiana bats were captured and no potential Indiana bat winter habitat was identified onsite (Appendix D).

Table 11: List of endangered species or species of concern, recorded in Muhlenberg County Kentucky according to USFWS and KSNPC.

Agency	Taxonomic Group	*Scientific Name*	Common Name	Status (KSNPC/USFWS)
KSNPC / USFWS	Aquatic Snails	*Pleurocera alveare*	Rugged Hornsnail	Special Concern
KSNPC / USFWS	Freshwater Mussels	*Cyprogenia stegaria*	Fanshell	Endangered / Endangered
KSNPC / USFWS	Freshwater Mussels	*Epioblasma obliquata obliquata*	Catspaw	Endangered / Endangered
KSNPC	Freshwater Mussels	*Lampsilis ovata*	Pocketbook	Endangered
KSNPC / USFWS	Freshwater Mussels	*Pleurobema plenum*	Rough Pigtoe	Endangered / Endangered
KSNPC	Freshwater Mussels	*Pleurobema rubrum*	Pyramid Pigtoe	Endangered / Concern
KSNPC	Freshwater Mussels	*Toxolasma lividus*	Purple Lilliput	Endangered / Concern
KSNPC	Freshwater Mussels	*Villosa lienosa*	Little Spectaclecase	Special Concern
KSNPC	Crustaceans	*Orconectes ronaldi*	Mud River Crayfish	Threatened
KSNPC	Insects	*Poanes viator*	Broad-winged Skipper	Threatened
KSNPC / USFWS	Insects	*Stylurus notatus*	Elusive Clubtail	Endangered / Concern
KSNPC	Fishes	*Erimyzon sucetta*	Lake Chubsucker	Threatened
KSNPC	Fishes	*Ichthyomyzon castaneus*	Chestnut Lamprey	Special Concern
KSNPC	Fishes	*Lepomis miniatus*	Redspotted Sunfish	Threatened
KSNPC	Amphibians	*Cryptobranchus alleganiensis*	Hellbender	Endangered / Concern
KSNPC	Amphibians	*Hyla avivoca*	Bird-voiced Treefrog	Special Concern
KSNPC	Reptiles	*Nerodia erythrogaster neglecta*	Copperbelly Water Snake	Special Concern / Concern
KSNPC	Reptiles	*Thamnophis sauritus sauritus*	Eastern Ribbon Snake	Special Concern
KSNPC	Breeding Birds	*Ammodramus henslowii*	Henslow's Sparrow	Special Concern / Concern
KSNPC	Breeding Birds	*Ardea alba*	Great Egret	Threatened
KSNPC	Breeding Birds	*Asio flammeus*	Short-eared Owl	Endangered
KSNPC	Breeding Birds	*Asio otus*	Long-eared Owl	Endangered
KSNPC	Breeding Birds	*Botaurus lentiginosus*	American Bittern	Endangered
KSNPC	Breeding Birds	*Chondestes grammacus*	Lark Sparrow	Threatened
KSNPC	Breeding Birds	*Circus cyaneus*	Northern Harrier	Threatened
KSNPC	Breeding Birds	*Cistothorus platensis*	Sedge Wren	Special Concern
KSNPC	Breeding Birds	*Gallinula chloropus*	Common Moorhen	Threatened
KSNPC	Breeding Birds	*Haliaeetus leucocephalus*	Bald Eagle	Threatened
KSNPC	Breeding Birds	*Ixobrychus exilis*	Least Bittern	Threatened
KSNPC	Breeding Birds	*Pandion haliaetus*	Osprey	Special Concern
KSNPC	Breeding Birds	*Riparia riparia*	Bank Swallow	Special Concern
KSNPC	Breeding Birds	*Tyto alba*	Barn Owl	Special Concern
KSNPC / USFWS	Breeding Birds	*Vireo bellii*	Bell's Vireo	Special Concern / Concern
KSNPC / USFWS	Mammals	*Myotis austroriparius*	Southeastern Myotis	Endangered / Concern
KSNPC / USFWS	Mammals	*Myotis grisescens*	Gray Myotis	Threatened / Endangered
KSNPC	Mammals	*Nycticeius humeralis*	Evening Bat	Special Concern

The roads within the proposed permit area have limited access and are privately maintained. From the 2010 aerial map (Appendix G) one can view roughly 2.07 miles of old haul or logging access roads skirting in and around the western boundary of the proposed area. Roads were used for previous mining on the western side of the proposed project area during an unknown period. The logging that has occurred at 14 out of 20 streams in the proposed area have some interpretations of recent logging however no documentation has been found for this specific location; in any case, the haul roads in this area could have easily been used for logging roads as well. There also appears to be around 0.5 mile worth of road extending into the proposed area from a property south east of the project.

7. Cumulative Impacts Analysis (CIA): Site Specific

Reference Appendix Q.

8. Avoidance & Minimization

In evaluating a project area containing aquatic resources, consideration must be given to avoiding impacts on these resources. If a site cannot be avoided, impacts must be minimized. Following minimization of impacts, the unavoidable impacts must be mitigated. Permits to discharge dredged or fill material into waters of the U.S. will not be granted if it will cause or contribute to significant degradation of waters of the U.S.

Original Permit Boundary (Preliminary permit boundary) Impacts: 60,045 (25,883 Ephemeral & 34,162 Intermittent) linear feet of stream and 8.27 acres of wetlands would have been impacted.
Proposed Permit Boundary (Final permit boundary) Impacts: 18,814.60 (6,689 Ephemeral & 12,125.6 Intermittent) linear feet of stream and 4.34 acres of wetlands would be impacted.
Avoidance Impacts by changing permit boundaries: 41,230.40 (19,194 Ephemeral & 22,036.4 Intermittent) linear feet of stream and 3.93 acres of wetlands would be avoided.

The avoidance and minimization of the original permit boundary impact was made possible by decreasing the amount of area mining and optimizing the use of auger/highwall mining. Ponds/silt structures have been proposed to be temporary impacts to the waters of the U.S. and have been placed as close as possible to the mining area to eliminate further degradation of jurisdictional waters with sediment corridors. Essentially all spoil material generated through the mining process will be returned to the mining pits, thus eliminating the need for any excess spoil fills and further impacts to waters of the U.S. Because of the terrain in Western Kentucky, mining through existing streams within a project area is essential to development. However, these stream impacts are limited to the Area Mining only. Auger/Highwall mining will be utilized in conjunction with the Area Mining to minimize impacts to jurisdictional waters.

A. Actions to Minimize Adverse Effects (Subpart H)

i. Actions concerning the location of the discharge (40 CFR 230.70)
Existing substrates of stream beds in the project area consist of sedimentary particles having eroded from upper elevations, transported (by flow) and then deposited within the stream beds. Substrates of the stream beds would be excavated and then back filled with material that had been removed. Since there will be no valley fills in this project periodic water inundation patterns would not be anticipated because no

significant drainage area would be displaced. Through limiting stream impacts, and mitigation of any loss of aquatic resources, the project would minimize to the maximum extent practicable the impacts on the project area's aquatic organisms. By complying with requirements of KPDES permit conditions, an erosion and sediment control plan would be developed and implemented prior to disturbance. This would require the use of BMPs in order to minimize the increase of suspended solids and turbidity. BMPs include sediment control structures and may include some sediment ponds, silt fences, silt basins, flow diversions, in-stream controls, or other means to prevent additional sediment loading. Minimal water flow disruptions are anticipated by maintaining any diversions around backfill construction areas, natural segregation, and using techniques designed not to impound water. Monitoring of the project areas would occur on a quarterly basis and would continue until final release of permit to ensure excess water does not buttress any backstacked material.

ii. Actions concerning the material to be discharge (40 CFR 230.71)

The proposed project would involve the temporary relocation of 30.5 million cubic yards (CY) of net bank overburden volume. This material will not be located in any valley fills but will, however, be considered backfill material. Samples most representative of all strata proposed to be used as backfill have had Acid/Base Accounting (ABA) conducted (to determine buffering or neutralization capacity). There are limited amounts of overburden strata which could potentially generate acid drainage. Most of this strata is associated with the coal seams to be extracted and/or are overlying/underlying the coal seams. A Material Handling Plan (MHP) has been developed to identify material exhibiting alkaline deficient properties needing to be segregated or blended from other materials to minimize potential for formation of acid drainage. It is anticipated that the excess carbonate-rich rocks found within the overburden will aid in the minimization for potentially toxic material to produce acid water and adversely affect any revegetation to occur prior to or post mining activities. Any and all potentially toxic strata would be blended with non-acidic strata in order to neutralize the acidic material. Results of the ABA displays the neutralization potential exceeds what is actually necessary to neutralize any potential acidic strata in the overburden material. Overburden material would not be expected to degrade any soil material when exposed to water and any use of carbonaceous materials and other similar materials in the overburden will aid in the reduction of leaching potential of the final backfill. Any alkaline deficient material encountered, such as coal, would either be completely removed from the site or handled in accordance with the KYDEP approved MHP. Sediment control structures have been designed in accordance with the KPDES requirements and KDSMRE to control the anticipated runoff and any use of chemical flocculants to settle out suspended solids would not be anticipated. By using these controls, it is expected they will minimize the potential for any increases in suspended solids downstream of the project area, however, sediments structures will be cleaned as needed and chemical treatment applied at the source if necessary.

iii. Actions controlling the material after discharge (40 CFR 230.72)

Backfill locations would be designed with adequate stability in mind, in accordance with the KYDEP-approved KDSMRE. No discharge material will enter the waters of the U.S. prior to having BMPs in place. To minimize erosion processes during soil disturbance BMPs would be utilized. Any In-stream erosion control (if used) would be limited to only material that would degrade in the future and would not require removal after operations have ended. ABA of overall bedrock material indicated an overall net neutralization potential for overburden materials from the proposed mine site. Results indicated a few potentially alkaline deficient areas, the majority of which were coal seams. Material considered alkaline deficient required a net $CaCO_3$ deficiency ≥5. Potential alkaline deficient material ranges from a net $CaCO_3$ of 0-4.99. All potentially alkaline deficient and acid forming materials are to be identified, according to state law, and moved as far away from contact with water as possible. Through the timely construction and maintenance of all sediment control structures, in combination with reclamation and revegetation processes occurring as soon as mining operations have ended, further minimization of erosion and sedimentation will be achieved. All effluent discharges would be monitored at timed intervals specified in further detail later in this document, and reported to the KYDEP on a quarterly basis in accordance with KYDEP-approved KPDES permit. Any resulting effects seen below the sediment structures (ponds) would be limited in order to comply with KPDES limitations for suspended solids.

iv. Actions affecting the method of dispersion (40 CFR 230.73)

The speed at which fill materials would enter U.S. waters would be controlled by equipment used during operations and regulation of reclamation efforts. Sediment control structures (ponds) are designed with a retention period in mind to allow suspended solids to settle out of the water prior to entering any downstream areas, sufficient enough to meet all state water quality requirements. Backfill areas would be constructed from the bottom up so as to allow sediment structures to retain flowing water from these areas thus collecting loose sediment from overflow of these areas. Excavators will be used to remove overburden materials from the ground. Properly rated/sized haulage trucks (which could range anywhere from 85-200 ton trucks) would be used to support any shovels or remove any overburden material. After coal retrieval operations have been completed, underdrain materials would be installed and certified, as the critical foundation prior to final placement of overburden material. No dredged or fill material mound is proposed for this project because it is unnecessary since the sediment ponds will allow enough time for sediments to settle out of solution prior to reentering downstream areas past the pond outlets. Surface erosion and therefore slope protection will result from the usage of sediment ponds, ditches and revegetation of completed areas. All engineered aspects of the sediment structures (i.e. ponds, ditches) are designed to handle peak runoff from a 25-year 24-hour precipitation event, which means the designs would control erosion and ensure stability of the backfill areas during such a precipitation event, thus preventing excessive sediment deposition to U.S.

waters. The Cumulative Hydrologic Impact Analysis (CHIA) concluded that the addition of the proposed mining operations to current impacts of the area would not cumulate into material damage of any hydrologic regimes outside of the proposed permitted area. Any and all effluents discharging from pond outlets would be regulated through compliance with a KYDEP-approved KPDES 402 permit.

v. Actions related to technology (40 CFR 230.74)

All equipment used for backfill operations, and construction of sediment structures will be properly sized/rated. Any operators or maintenance employees to be used during mining operations would be trained to use equipment they will operate. All manufacturer recommendations or Industry standards for equipment would be used and maintained during the entirety of the mining operations. Potential equipment that may be used, include end-loaders, haul trucks, dozers, graders, backhoes, and end-dump trucks. This equipment would allow for the removal of overburden, interburden, and the preparation and loading of coal for transport to plant or load out facilities. Spill prevention and control plans will be instated for proper material handling procedures as required by EPA, Occupational Safety and Health Administration (OSHA), and Mine Safety and Health Administration (MSHA). Any training required by MSHA or other agencies would be executed. All petroleum products and its by-products would be handled in accordance with the Surface Water Protection Plan (SWPP) and Groundwater Protection Plan (GPP) set forth in the KPDES. Sequential removal of overburden and interburden materials in addition to backfilling would continue during the entirety of mining operations until mining has ended as is stipulated in the MRP. The applicant would conduct mining and reclamation operations using the best available technology and mining techniques as is required and endorsed by the KYDEP, and the federal office of MSHA. During mining operations all applicable environmental and health and safety regulations would be adhered to. The applicant would use existing roads (Road A specifically) in addition to one road to be constructed (Road B) with a planned culvert crossing one stream at the Geibel site for coal haulage (Appendix X). Road “A” is an existing road that was constructed during prior mining of the adjoining property and is constructed on the existing ridge top. Road “A” will be the primary Haul and Access Road. Road “B” is a proposed new Access Road and will be utilized for limited access primarily during the pond construction. Road “B” will be constructed during periods of dry weather when possible to minimize erosion and siltation, air and water pollution, and damage to public or private property. Any roads constructed would be necessary to complete the project and would not cross streams unless using culverts or other diversions if no other option is available. Any structures constructed in streams would be adequately sized for proper migration of remaining aquatic organisms. When the structures are constructed accurately freshwater fish and benthic Macroinvertebrates are capable of maintaining migration through these areas. All transportation routes of discharge materials will be in areas covered by a KPDES permit. Only appropriately designed transportation equipment would be used to transport materials to discharge sites.

vi. Actions affecting plant and animal population (40 CFR 230.75)

Water current would remain flowing in a down-gradient manner and would not be expected to affect movement of animals outside the project area. There are currently no reported aquatic habitats for federally listed threatened or endangered species in the boundaries of the proposed project area. There are currently no reported terrestrial habitats for federally listed threatened or endangered species and it is anticipated if a mobile federally listed threatened or endangered species is present, that it would relocate as operations occur. All plantings for establishment of mitigation zones (streams/wetlands) and revegetated areas would be monitored for five years and corrective measures would be taken if plantings do not have an 80% survival rate for streams and 50% survival rate for PFO wetlands from the initial stock. Invasive species would not be planted and would be prevented from establishing in mitigation areas. If invasive species were discovered in the mitigation zones, the company would coordinate removal efforts with the USACE to use appropriate eradication techniques. Invasive species detrimental to the survival and success of the planted woody species will be controlled/limited through the use of herbicide treatments and/or mechanical means. The specific control measures will be determined by the specific site conditions. As much as possible, the applicant would locate species-specific requirements relative to soil moisture, soil quality, etc, and species would be randomly mixed to avoid large monoculture areas. By reclaiming the mine site, it is anticipated that habitat diversity would increase allowing for a broader spectrum of uses by a wider variety of species.

None of the downstream receiving waters are considered waters of special concern. Effluent limits would be maintained from discharge of ponds through KYDEP approved KPDES 402 permit. Onsite mitigation would include the establishment of 19,399' of intermittent and ephemeral stream channels, 5.02 acres of wetlands and the surrounding riparian or forested areas which were impacted by mining operations. Existing conditions are documented for the project area to provide background data to aid in the development of channels being returned to their approximate pre-mining conditions or better to represent reference reaches with hydrogeomorphic conditions of the surrounding geographic setting. Once the channels are stable (vertically and laterally) their naturally designed shape will permit the stream to handle wide fluctuations of flow encountered through any given year.

vii. Actions affecting human use (40 CFR 230.76)

Other adverse visual effects would be associated with the mechanized land-cleaning, earth disturbing, and grubbing activities to occur in riparian zones of streams within the backfill area and sediment ponds. The proposed project is located on privately owned property with limited or no public access. No residences, businesses, or historic structures would be impacted by the proposed project. Upon completion of mining operations, one sediment pond would be removed, some open water would be established from the other sediment pond and affected channels, wetlands and riparian

zones would be restored as discussed in the Compensatory Mitigation Plan (CMP). Overburden material would be returned via backfill and regraded to an approximate original contour of original area. Reclamation and revegetation would be executed as quickly as possible after proposed mining operations have ended in order to establish at a minimum pre-mining conditions with regards to land use/land cover. Sediment control structures would be cleaned during normal operations once sediment reaches 60% clean out level and under any emergency circumstances as conditions dictate. Visual intrusions would be limited after successful reclamation of the site occurs. No public water supply intakes would be impacted in addition to any unacceptable adverse impacts on the municipal and private water supplies would be expected as a result of this project. The KYDEP approved Surface Mining Control and Reclamation Act of 1977 (SMCRA) and KPDES permits contain assurances of protection of the integrity of the waters exiting and within the proposed project.

9. Evaluation of Discharge of Dredged or Fill Material in Accordance with Section 404(b)(1) Guidelines (40 CFR 230)

A detailed evaluation of the proposed discharge of dredged or fill materials into U.S. waters can be found below, in accordance with Section 404(b) of the CWA (33 U.S.C. 1344 (b)) for compliance with the 404(b)(1) guidelines proclaimed by the Administrator of the EPA in conjunction with the Secretary of the Army acting through the Chief of Engineers. The evaluation includes a review of possible short or long term effects for the proposed discharge of dredged or fill material upon physical, chemical, biological, and human use characteristics and components of aquatic environments.

A. Disposal Site Delineation

The proposed project would result in dredged and fill material being placed into 4.34 acres of wetlands, and 18,814.6' (4.09 acres) of stream waters of the U.S. in association with the assemblage of one backfill area and two sediment ponds within ephemeral and intermittent streams that flow into Elk Pond Creek. Listed below is a table of the component drainage areas of the toes for the proposed backfill area and sediment ponds (**Table 12**).

Table 12: Component drainage areas of toes for proposed backfill area and sediment ponds.

Fill	Total Volume of Fill (CY)	Drainage Area at Fill Toe (Acres)	Surface Size of Pond (Acres)	Drainage Area At Pond Toe (Acres)	Total Land Disturbance At Pond Toe (Acres)
Dug-Out Pond 1	30,542,745	1125.91	13.40	1307.14	399.50
Dug-Out Pond 2	30,542,745	5	0.4	5.2	-

B. Technical Evaluation and Testing (Subparts C-G)

i. Physical and Chemical Characteristics of the Aquatic Ecosystem (Subpart C)

a. Substrate (40 CFR 230.20)

The substrate within the area proposed for the backfill area and sediment ponds consists of the stream bottom and banks below the normal flow elevation. This substrate is composed of organic and inorganic soil materials including water, other liquids and gases that fill spaces between the solids. Inorganic components which include but are not limited to cobble and gravel materials. The organic component includes detritus (broken down leaf material), debris (grass, lichens), and decomposed woody material.

Existing substrate is documented for each stream and wetland upon the Stream Characterization Data Forms, Habitat Assessment Forms, and Wetland Determination Data Forms of this project and can be found in Appendix L, Appendix M, and Appendix N. On average the ephemeral streams have a 10% gravel (2-64 mm), 33% sand (0.06-2 mm), and 57% Silt (0.004-0.06 mm) substrate composition. Ephemerals have approximately 9% surface covered in detritus, and 2% surface covered in muck-mud. Intermittent streams have on average a 13% gravel (2-64 mm), 35% sand (0.06-2 mm), and 52% silt (0.004-0.06 mm) substrate composition. Intermittent streams surfaces have 8% coverage of detritus and 2% coverage of muck-mud. From the Wetland Determination Data Forms for wetlands in the proposed area, 47% included silt, 40% mentioned sand, and 27% included clay in the substrate description of samples inside wet areas at a depth of approximately 0-4 inches. These same forms included 40% silt, 20% mentioned sand, and 47% included clay in the substrate descriptions of samples inside wet areas at approximately 4-12 inches in depth. Within the Wetland Determination Data Forms for wetlands in the proposed area, 80% included silt, 13% mentioned sand, and 13% included clay in the substrate description of samples outside wet areas at a depth of approximately 0-4 inches. These same forms included 80% silt, 13% mentioned sand, and 20% included clay in the substrate descriptions of samples outside wet areas at approximately 4-12 inches in depth. It should be noted some of the terms were used in a combination to describe areas, for example at a depth of 0-4 inches at wetland #28, inside the wet area it was described as being a silty clay, thus qualifying for both silt and clay in percentage ratings.

The drainage control structures (sediment ponds) would be located at the toe of the backfill area. At the toe of the backfill area and exit channel of the ponds, deposition of sediment from fill construction would occur altering the substrates at these locations which could limit benthic habitat in the areas of the streams. Biological communities within the proposed backfill area would either be permanently eradicated or altered. If altered, the biological

communities that exist would transform from those that exist in areas of moving water to those that exist in areas of standing water. A prime example of this is if a benthic macroinvertebrate community presently exists where the sediment ponds are proposed to be constructed. The organisms in this community would then respond in one of two ways. Organisms typically adapted to lotic (flowing or running water) habitats, would be expected to migrate or drift downstream to more suitable habitats. Organisms adapted to lotic, in addition to lentic littoral habitats (standing water, shallow regions with some light penetration) would be expected to remain in the area. Potentially there would be an increase to this group of organisms due to migration of additional organisms adapted for this new habitat.

Upon the completion of mining, one pond would be removed, open water would be established from the other pond outside of jurisdictional waters and the affected jurisdictional water segments restored to stable pre-mining conditions or better in accordance with the original locations, profiles and cross-sections, by reconstructing a naturally designed stream channel. Post reclamation substrates (size and distribution) in the backfill area are expected to return to normal due to the sediment load and transportation functions returning to pre-mining conditions or better (to represent reference reaches with hydrogeomorphic conditions of the surrounding geographic setting). The sediment ponds substrates would be buried with materials from mining operations; however, once mining operations have ended they are expected to be restored to original pattern, profile and dimension. Once the habitats have returned to pre-mining conditions at a minimum, it is expected the biological communities would establish the areas. Overall effects to the jurisdictional waters downstream of the sediment ponds would be limited by compliance with the KPDES permit.

b. Suspended particulate/turbidity (40 CFR 230.21)

Suspended particulates in the aquatic ecosystems typically consist of either fine-grained mineral particles and/or organic particles. Particulates may be introduced to aquatic ecosystems at disposal sites through land runoff, flooding, vegetative and planktonic breakdown, resuspension of bottom sediments, and man's activities such as dredging and filling. Particulates may be suspended in the water column for varying amounts of time due to factors such as agitation of the water, particulate specific gravity, particle shape, and physical and chemical properties of particle surfaces.

An increase in total suspended solids (TSS) during the beginning phases of mining operations and initial excavating of backfill areas is expected due to the disturbance of the earth's surface. TSS levels are expected to return to pre-mining conditions or better once vegetation has been established on graded

areas. The correct use of BMPs allow for the expectation of TSS loads to not be extensive in their amounts below the outlet or result in violation of the effluent limitations and standards under the KPDES permit. To ensure mine discharges do not degrade downstream waters, the applicant has a proposal of a number of measures. Runoff from areas being mined would be routed through designed sediment structures. Temporary sediment control structures may include, but not be limited to ditches, ponds (one permanent), rock toe sediment structures, straw/hay bay fencing and cloth filter fences. Removal of one sediment structure and open water establishment of the other (ponds) would occur after any reclamation above the elevation of the ponds and TSS levels of waters to the ponds would return to TSS levels of pre-mining conditions or better. Sediment structures mentioned, in addition to regrading and revegetation of disturbed areas, are expected to prevent or minimize contributions of TSS.

The monitoring of all water discharge outlets from the permit area would take place according to KPDES permit requirements to assure the project would not violate Sections 401 and 402 of the CWA. Possible actions to minimize the adverse impacts with regards to sedimentation and turbidity can be found in the USACE evaluation of subpart H in this EID. Any impacts in result of TSS would be offset by the applicant's mitigation proposal. The applicant's CMP proposes to re-create stream channels and wetlands in the backfill areas to compensate for any negative impacts occurring within the streams and wetlands of this project area.

c. Water (40 CFR 230.22)

The operations proposed would result in the removal of stream channels and placement of fill material into ephemeral and intermittent jurisdictional waters and wetlands. Waters and wetlands within the project area are already adjacent to past mining and other types of land disturbances (logging, farming). Water chemistry within the aquatic systems would be temporarily impacted during mining operations through increased levels of dissolved minerals. The sediment ponds would reduce the effects to suspended or dissolved solids within the waters of the project area, however, surface water quality may have associated issues with mining operations due to potential increase in sediment transport, nutrient and pesticide loading, and acid or toxic drainage resulting in increases in iron, manganese, or total dissolved solids (TDS). Sediment, metals, and metalloids can be treated by flocculation or other chemical methods to reduce their concentration. Downstream changes in surface water chemistry (increases in sulfates, total dissolved solids, total calcium, total magnesium, hardness, total manganese, dissolved manganese, specific conductance, alkalinity and total potassium) are possible due to mining and backfill activities. Peak flow rates of water are typically reduced as precipitation (normally direct runoff), is retained and gradually released by the ponds, leading to potential

change in the physical characteristics of receiving streams by creating less erosion and resulting in more stable streambeds and banks. Groundwater is not expected to be affected. Impacts to water quality are expected to be limited to the initial construction period when surface water disturbance and deforestation would occur; however, this proposal does include a CMP and BMPs for sediment control. Proposed mitigation for impacts to jurisdictional waters would be in the form of stream reconstruction at the project area. The operation would minimize impacts to the U.S. waters downstream by executing BMPs, including placement of ponds required by KPDES Permit and other preventative erosion and sediment control structures.

Post reclamation, after regrading and successful revegetation of the project area, the water chemistry is expected to return to its approximate pre-mining conditions or better to represent reference reaches with hydrogeomorphic conditions of the surrounding geographic setting. This project would comply with the KPDES permit (pursuant to Section 402 of CWA) and Section 401 of CWA. As a monitoring program is required for both ground and surface water, the applicant is proposing a plan specifying monitoring sites, parameters that would be measured, and the frequency of measurement. In-stream monitoring of surface water will occur prior to mining, during mining, and during reclamation at site SW-01 designated south of permit area on the MRP (Appendix F). There are 6 months of initial sampling data (**Table 5**) from this location already and during mining operations surface water data will be collected quarterly beginning at the time of initial disturbance and continuing until final bond release. Parameters to be tested include: discharge, pH, acidity, alkalinity, total iron, total manganese, TSS, total sulfate, and total dissolved solids or specific conductance. Groundwater monitoring will occur prior to mining, during mining, and during reclamation at site GW-01 and GW-02 designated in the northwest portion, and the southwest portion of permit area on the MRP (Appendix F). There are 6 months of initial sampling data (**Table 4**) from these locations already and during mining operations water data will be collected quarterly beginning at the time of initial disturbance and continuing until final bond release. Parameters to be tested include: water level, pH, temperature, acidity, alkalinity, dissolved manganese, dissolved iron, sulfate, total dissolved solids or specific conductance. Hydrologic data collected during operations would be submitted to the KYDEP. If during the course of mining operations, the monitoring reports indicate that a water quality parameter has exceeded the acceptable level, the operator must contact the regulatory authority and initiate action to correct the problem (30 CFR 816.451).

Petroleum and petroleum by-products would be handled in accordance with the SWPP and GPP set forth in the KPDES. The use of MHPs for handling any

identified toxic materials prevents the placement of such material in any discharge material to be placed in the proposed backfill.

d. Current patterns and water circulation (40 CFR 230.23)
The proposed action would not impact any jurisdictional waters in which water current and circulation is important for animal movement. At the end of the project, the impacted area would be restored at a minimum to an equivalent level of current productivity.

The physical movements of water are composed of current patterns and water circulation which respond to natural forces modified by basin shape and cover, physical and chemical characteristics of water strata and masses, and energy dissipating factors. The circulation and drainage patterns of this project site would be altered by the excavation, relocation, and filling of approximately 18,814.6' of ephemeral and intermittent streams in addition to 4.34 acres of wetlands. Flow patterns of the streams and wetlands would be altered as mining progresses.

As stated in the previous section, overland runoff (and surface water availability) may increase. This increase would be diminished through mitigation by engineering sediment structures that provide storm runoff retention and stable sediment ponds to receive discharge. No elimination of flow is anticipated. Runoff from surface areas on backfills would be routed through temporary diversions designed to carry and withstand the peak discharges from specified storm events. Sediment channels would be able to withstand a 10-year frequency 24-hour duration storm event, while diversion ditches would withstand a 2-year frequency 24 hour duration storm event. Surface runoff rates would be expected to stabilize after revegetation has occurred in the project area and stream/wetland areas are established. Streams and wetlands would be established within the reclaimed mined area, however, the gradients would not be identical to the previously existing channel conditions, but would be within the naturally occurring range of stream gradients to the area and its hydrogeomorphic setting. The sections of the streams impacted by sediment transport and storage would only be temporary and are expected to return to pre-mining conditions or better after the completion of reclamation operations. Following the closing of the mine, approximately 19,399' of intermittent and ephemeral stream channels, and 5.02 acres of wetlands (1.04 acres of which would be open water) would be established to incorporate stream bed material similar in substrate to the pre-existing channel. No unacceptable adverse impacts to current patterns or water circulation would be anticipated to occur downstream of the proposed sediment ponds. Potential minimizing actions of adverse impacts with regards to water patterns and circulation can be found in the USACE evaluation subpart

H in this EID. The successful implementation of the applicant's CMP is expected to offset the impacts to water patterns and circulation.

e. Normal water fluctuations (40 CFR 230.24)
Normal water fluctuations in natural aquatic systems consist of daily, seasonal and annual tidal and flood fluctuations in water level. Biological and physical components of such a system are either attuned to or characterized by periodic water fluctuations. During the 6 months of pre-mining surface water quality data collected at SW-01 (designated on MRP, Appendix F), the minimum discharge was < 1 cubic feet per second (cfs), the maximum discharge was 750 cfs, and the average discharge is 266.83 cfs. Results of this proposed project are not expected to induce an outcome of considerable material damage to the physical, chemical, and biological characteristics of the jurisdictional waters of the U.S. Runoff water flow in the proposed project area is anticipated to increase due to surface disturbance. This increase is only temporary as the runoff would eventually be routed to properly sized and engineered sediment control structures (designed to meet effluent limitations in the KPDES permit) to ease the flow increase to receiving streams. The sediment ponds constructed would produce a lentic environment, however, water flow would not be stagnant and biological communities would still be able to utilize the environments. After revegetation of the project area has occurred sediment structures would be removed (with the exception of one sediment pond which would be established as open water to mitigate wetland loss) and water fluctuation levels would be expected to stabilize.

Once reclamation is completed, evapotranspiration demands upon groundwater would be expected to be reduced in comparison with pre-mining conditions as vegetation becomes established. Possible action to minimize adverse impacts on normal water fluctuations can be found in the USACE evaluation of subpart H in this EID. Impacts on normal water fluctuations would be expected to be offset by the successful implementation of the applicant's CMP.

f. Salinity gradients (40 CFR 230.25)
This project would only involve discharges of dredged or fill material in non-tidal waters of the U.S.; therefore, this project would have no effect on salinity gradients.

Table 13: Applicable, and significant effects on specific types of physical and chemical characteristics of the aquatic ecosystem

Type	Section	Not applicable	Not Significant	Significant
Substrate	40 CFR 230.20		x	
Suspended particulates/turbidity	40 CFR 230.21		x	
Water	40CFR 230.22		x	
Current patterns and water circulation	40 CFR 230.23		x	
Normal water fluctuations	40 CFR 230.24		x	
Salinity Gradients	40 CFR 230.25	x		

ii. Biological Characteristics of the Aquatic Ecosystem (Subpart D)

a. Threatened and endangered species and their habitat (40 CFR 230.30)

There are currently no reported federally listed threatened or endangered species in the boundaries of the proposed project area. A list of threatened and endangered species found in Muhlenberg County Kentucky, the county the proposed project is located in, and what could potentially be in the proposed project area can be found in **Table 11.** During an Indiana Bat (*Myotis sodalis*) survey (surveyed June 13-16 of 2011 by Copperhead Consulting) 4 mist net sites were constructed for a 517 acre area (392 acres forested) (Appendix D). Thirty-three bats of three species were captured, 1 Big brown bat (*Eptesicus fuscus),* 19 Red bats (*Lasiurus borealis),* and 13 Tricolor bats (*Perimyotis subflavus*). No endangered species were encountered during the survey. The USFWS's Kentucky Field Office reviewed the Indiana Bat Summer Mist Net Survey and Winter Habitat Assessment report and concluded that no Indiana bats were captured and no potential Indiana bat winter habitat was identified onsite (Appendix D). Elements of the aquatic habitat that are particularly crucial to the continued survival of some threatened and endangered species include adequate water quality, spawning and maturation areas, nesting areas, protective cover, adequate and reliable food supply, and resting areas for migratory species.

b. Fish, crustaceans, mollusks and other aquatic organisms in the food web (40 CFR 230.31)

Aquatic organisms in the food web include, but are not limited to, fish, crustaceans, mollusks, insects, annelids, planktonic organisms, and the plants and animals on which they feed and depend upon for their needs. Aquatic organisms are normally impacted by the release of any contaminant, which adversely impact the establishment and proliferation of these species. Keeping this in mind the project would comply with the KPDES permit and Section 401 of CWA. For this project, trained and experienced environmental biologists would conduct surveys strictly following the guidelines set forth by Kentucky Division

of Water (KDOW) for all data collection, processing and metric calculation and the U.S. EPA's *Rapid Bioassessment Protocols For Use in Wadeable Streams and Rivers: Periphyton, Macroinvertebrates, and Fish*, to determine what organisms would potentially be impacted by the mining operations.

Any aquatic biota currently existing in the aquatic environments (ephemeral/intermittent streams, wetlands) would be impacted by the proposed discharge. Increased sediment during initial mining operations would result in temporary effects on the macroinvertebrate communities immediately downstream of disturbance areas. When filling stream channels, the aquatic and aquatic-dependant interactions (spawning and maturation, nesting, protective cover, food supply, and resting areas for migratory species) are eliminated until fill is removed and a stream environment returns. Even so, below the fills there would still be potential for diverse aquatic communities to exist inside sediment ponds creating lentic habitat. There are aquatic species that prefer lentic habitats supporting less flowing water, with lower light and temperature control. Colonization of lentic sediment ponds would continue the utilization of the aquatic habitat.

During mining operations through the execution of effective drainage designs (implementing ponds and erosion control measures) it is anticipated that the impact (contamination) resulting from sediment increases on macroinvertebrates and fish communities would be minor; thus potential impacts on the aquatic food web as a whole would be minimal. The potential short term effects on macroinvertebrates are not anticipated to affect their role as a food source for fish because most impacts for aquatic environments are expected to be temporary. The impacted stream will be restored to pre-mining conditions or better as best is capable to still support a stable hydrogeomorphic setting. Surrounding the channel a 50' vegetative riparian buffer zone, on both sides, would be assembled using native vegetation of the area. This organic buffer zone will create the foundation of organic matter necessary as a food source for macroinvertebrates in lower order streams. Organic matter is vital in creating habitat for shredder and collector/gatherer (macroinvertebrates feeding on Coarse Particulate Organic Matter and Fine Particulate Organic Matter) functional feeding groups that an aquatic food web can be based on. The mitigation of the stream, organic matter, and macroinvertebrate communities establishes the necessary habitats and food sources for larger organisms, such as predator macroinvertebrates, fish, crustacean and mollusks. Possible actions to minimize adverse impacts regarding characteristics of biological components of the aquatic ecosystem can be found in the USACE subpart H evaluation in this EID. Impacts to benthic organisms would be offset by successful implementation of the applicant's CMP.

c. Other wildlife (40 CFR 230.32)

Other wildlife such as resident and transient mammals, birds, reptiles, and amphibians would not be permanently adversely impacted by this project. Riparian zones surrounding the streams in the project area provide the wildlife of this area with prime habitat. There may be temporary impacts to wildlife, following the conclusion of mining operations; however, impacts would be mitigated. Discharge of fill material may also result in the loss or change of breeding and nesting areas, escape cover, travel corridors, and preferred food sources.

After the conclusion of mining operations, riparian zones would be established to at minimum pre-mining conditions, as best is capable to support a stable hydrogeomorphic setting. Fallen and dead woody debris, (providing habitat for amphibians, reptiles, and small mammals), and annual deciduous leaf (fall needed for forest leaf litter that terrestrial insects use for habitat and some instances food), will have a temporal lag in returning to prior to mining conditions. The temporarily lost ground cover, shrub and tree species would be addressed by a successful mitigation of stream areas providing essential elements of habitat, food, water and shelter in order to meet wildlife needs.

Table 14: Applicable, and significant effects on specific types of biological characteristics of the aquatic ecosystem.

Type	Section	Not applicable	Not Significant	Significant
Threatened and endangered species and their habitat	40 CFR 230.30		x	
Fish, crustaceans, mollusks and other aquatic organisms in the food web	40 CFR 230.31		x	
Other wildlife	40 CFR 230.32		x	

iii. Special Aquatic Sites (Subpart E)

a. Sanctuaries and refuges (40 CFR 230.40)

There would be no impact to known sanctuaries and refuges designated under State and Federal laws or local ordinances that are managed principally for the preservation and use of fish and wildlife resources (Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972).

b. Wetlands (40 CFR 230.41)

Wetland determinations were conducted in accordance with 1987 USACE Wetland Delineation Manual and the Eastern Mountain and Piedmont Regional Supplement to the 1987 Manual. Detailed information on each wetland can be found on the Wetland Determination Data Forms in Appendix N. There are currently 4.34 acres identified as 15 different Palustrine Open Water Wetlands (according to the USFWS NWI 2012) in the project boundaries. The average size

wetland overall is 0.29 acres. Eight of the identified wetlands have a Cowardin Classification of Emergent, two are classified as Pond, and five are classified as Shrub (Cowardin et al. 1979). The Emergent wetlands have an average size of 0.33 acres, with a total of 2.62 acres. Pond wetlands have an average size of 0.52 acres, with a total of 1.04 acres. Shrub wetlands have an average size of 0.14 acres, with a total of 0.68 acres. Adjacent to wetland areas are previous land disturbances of mining, logging, and agricultural fields. The NWI identified the wetlands as having been created through excavation or impoundments. Operations proposed would result in the complete excavation then establishment of the jurisdictional wetlands leaving them physically permanently impacted, however functionally temporarily impacted.

c. Mudflats (40 CFR 230.42)
There are no mudflats identified within the project boundaries.

d. Vegetated shallows (40 CFR 230.43)
There are no vegetated shallows identified within the project boundaries.

e. Coral reefs (40 CFR 230.44)
There are no coral reefs identified within the project boundaries

f. Riffle and pool complexes (40 CFR 230.45)
There are no riffle pool complexes identified within the project boundaries.

Table 15: Applicable, and significant effects on specific types of special aquatic sites.

Type	Section	Not applicable	Not Significant	Significant
Sanctuaries and refuges	40 CFR 230.40	x		
Wetlands	40 CFR 230.41			x
Mudflats	40 CFR 230.42	x		
Vegetated shallows	40 CFR 230.43	x		
Coral reefs	40 CFR 230.44	x		
Riffle and pool complexes	40 CFR 230.45	x		

iv. Human Use Characteristics (Subpart F)

a. Municipal and private water supplies (40 CFR 230.50)
The nearest downstream water treatment plant is in Evansville Indiana, approximately 117 river miles north of the proposed project site off of the Ohio River. Water discharge standards imposed by the KYDEP on discharges from the mine should ensure that mining activities will have minimal impacts on the surface water intake at the water treatment plant.

On the MRP (Appendix F) two ponds considered private waters, are located within or surrounded by the proposed permit site. On property ID# 2586 on CR 1310, there is a pond (surrounded by permit site) designated as not being currently used, and is not anticipated to be affected by proposed operations. The pond in the permit site did not get designated for use by the owner according to the surface water survey. Property for this pond exists on property ID# 7256 on the western central portion of the permit area. There are six additional ponds adjacent to the proposed permit area and are considered private waters. Two of the ponds are used for recreational purposes and are described in the next section (40 CFR 230.51). Two of the remaining four ponds to be described, are designated as used for livestock, with an unknown withdrawal rate for said livestock; one is on property ID# 2544 south of the permit on KY 189, the other is on property ID# 3487, north of the permit site on U.S. 62. Both livestock designated ponds are upstream of the proposed permit area, and therefore are not anticipated to be affected by proposed operations. The final two ponds to be described are either not in use or according to the surface water survey did not have a use designated. The pond not in use is on property ID# 1898 northwest of permit site on CR 1301. The pond without a designated use is on property ID# 7257 northeast of the permit site. Pond on property ID#1898 is located upstream of the permit area, and the pond on property ID#7257 was not designated upstream or downstream, however, neither of the properties should be adversely affected.

One ground water monitoring well exists within the proposed permit area on the northwestern side. Another ground water monitoring well is immediately southwest of the permit boundary and a surface water monitoring location is approximately 1000 feet downstream of the permit area. There are no domestic wells within the proposed permit area, however, there is a domestic well within 300 feet south east of the permit area at -87°13’35”W and 37°11’46”N. The mining operations should have no impact on this water supply. In the unlikely event the current groundwater users would be affected, the applicant would be responsible for replacement of the users groundwater source in the event adverse impacts did occur as required by the KYDEP. Possible actions to minimize negative impacts with regards to characteristics of human use components can be found in the Crops Subpart H evaluation in this EID.

b. Recreational and commercial fisheries (40 CFR 230.51)
Recreational and commercial fisheries is composed of harvestable fish, crustaceans, shellfish, and other aquatic organisms used by man. Proposed activities are not predicted to impact habitats providing viable populations of economically important fish and shellfish species. There is no national, state, or local park, forest or recreation areas/facilities present in the vicinity of the

proposed project. There are two ponds adjacent to the proposed permitted area used for recreational fishing. One pond is north of the permit site on U.S. 62 noted on the MRP (Appendix F) property ID# 2530, and the other is east of the permit site on CR 1310 noted on the MRP property ID# 7254; both sites are upstream of permit areas and are not anticipated to be adversely affected. The proposed operations would not limit the residents of the surrounding area in recreation activities.

c. Water related recreation (40 CFR 230.52)
Water-related recreational activities include both amusement and relaxation. Activities include two broad categories of use: consumptive (harvesting resources through hunting/fishing) and non consumptive (canoeing and sight-seeing.) The proposed project area is all on private land and thus public access activities conducted would not be adversely affected in U.S. waters designated for water-related recreation. There are no public water-related recreation opportunities (boat access, hiking trails, etc,) available within the project area. In addition, the aquatic areas to be affected, are limited in size and flow, and therefore do not typically support swimmable areas.

d. Aesthetics (40 CFR 230.53)
Occasionally discharge of fill material can have adverse aesthetic impacts. Aesthetics in aquatic ecosystems can consist of the perception of beauty by one or a combination of senses such as sight, hearing, touch, and smell in addition to the quality of life enjoyed by general public and property owners. The natural beauty of aquatic ecosystems could be adversely affected by degrading water quality, distracting disposal sites, inducing inappropriate development, encouraging unplanned and incompatible human access, or by destroying vital elements that contribute to unity, visual distinctiveness, or diversity of an area. Negative impacts on aesthetics may also involve the degradation of particular features, traits, or characteristics of an aquatic area which make it valuable to property owners. Further adverse impacts include the denying of access to visibility of the resource, or result in changes in odor, air quality, or noise levels surrounding the aquatic ecosystem.

The project site will include some adverse effects on aesthetics, however, once the mining area has conducted the reclamation activities it will be returned to a natural state/configuration, so the aesthetic impacts would be temporary. It is located in a remote area not easily visible to any existing residences or buildings accessible to the general public, which decreases the probability of impact on senses such as sight, hearing, touch and smell. The fact that the site is far removed from the public also eliminates the probability of increase in human access. It is anticipated compliance with the mining and reclamation plan would be expected to result in acceptable water quality and a land configuration that

conforms to the surrounding area for Post Mine Land Use of forestland and fish and wildlife habitat and recreational use.

Following the closing of the mine, approximately 19,399' of intermittent and ephemeral stream channels, and 5.02 acres of wetlands would be established to incorporate stream bed material similar in substrate to the pre-existing channel. Riparian zones, where practicable, would be established and restored to better represent reference reaches with hydrogeomorphic conditions of the surrounding geographic setting (geometry and structure). The mitigation of the areas would help mitigate the temporary adverse effects of mining operations by improving shading of streams, erosion prevention, and contribution of vegetation to the stream. Streamside vegetation (riparian zone) could filter pollutants prior to them reaching the streams or wetlands (keeps stream and groundwater clean), and the sediments and nutrients filtered out in the riparian zone will aid in quick colonization by new vegetation stabilizing the sediment. After a time lag, accounted for in the mitigation plan, large woody debris would return to the forest floor providing habitat for a variety of species (insects, amphibians, reptiles and small mammals and birds) as well as providing a surface for seedling to become established. Improvements discussed above are anticipated to result in diverse and productive habitats for plants and animals. This is because the improvements will increase availability of water, rich moist soils, and a variety of plants for an attractive area for wildlife and people alike. Possible actions to minimize adverse impacts regarding aesthetic components can be found in the USACE evaluation of Subpart H in this EID. The proposed CMP and approved mine reclamation plan would compensate for disturbances to aesthetic features.

e. Parks, national and historical monuments, national seashores, wilderness area, research sites, and similar preserves (40 CFR 230.54)
Parks, national and historical monuments, national seashore, wilderness areas, research sites or similar preserves are designated under Federal and State laws or local ordinances to be managed for their aesthetic, education, historical, recreation, or scientific value. Areas such as these would not be impacted. During a preliminary reconnaissance archaeological survey of the proposed project area, a few sites were evaluated as being potentially eligible for listing in the National Register. These sites will be protected from mining related impacts by marked 200 foot radius buffer zones indicated on the MRP (Appendix F) as "No Disturbance Zones". No aspect of construction, operation or reclamation of the proposed project will affect a listing of the NRHP. The Kentucky State Historic Preservation Office (KSHPO) does not have any known historical, architectural or archaeological sites listed in or eligible for inclusion in the NRHP near the proposed project besides those previously mentioned. Further documentation of the various phases in archaeological surveys for the project

area can be found in the External Agency Correspondence section in Appendix D.

Table 16: Applicable, and significant effects on specific types of human use characteristics.

Type	Section	Not applicable	Not Significant	Significant
Municipal and private water supplies	40 CFR 230.50		x	
Recreational and commercial fisheries	40 CFR 230.51	x		
Water related recreation	40 CFR 230.52		x	
Aesthetics	40 CFR 230.53		x	
Parks, national and historical monuments, national seashores, wilderness area, research sites, and similar preserves	40 CFR 230.54	x		

v. Evaluation and Testing (Subpart G)

a. General Evaluation of Dredged or Fill Material (40 CFR 230.60)

The proposed extraction operations would generate approximately 31.6 million CY of material. Of the 31.6 million CY of material, approximately 1.1 million CY (1.6 million short tons) will be coal from the WKY #6, WKY#7, and Bancroft coal seam, leaving a total overburden volume of an estimated 30.5 million CY. Add in a 25% swell rate and the overburden would result in an estimated 38.2 million CY. The resulting overburden would be used to construct drainage control structures until the mining operations are completed and reclamation begins. During reclamation, the overburden will be used to establish approximately 19,399' of intermittent and ephemeral stream channels, and 5.02 acres of wetlands to incorporate stream bed material similar in substrate to the pre-existing channel. Mitigation zones, where practicable, would be established and restored to approximate reference reaches with hydrogeomorphic conditions of the surrounding geographic setting (geometry and structure).

According to The Toxic Materials handling Plan (Subpart H), any potentially toxic/acidic strata that necessitates special handling, (if any), will be disposed of in a backfill or excess overburden storage area within 30 days of exposal. The toxic strata would then be segregated and placed in a fill area or backfilled area in a controlled manner as mining progresses. Finally the toxic strata would be covered with a minimum of four feet of non-acidic and non-combustible material. Any potential acid forming strata would not be placed in proximity to a drainage course. The previous measures should be adequate in preventing any contamination to ground or surface water. In the event ground or surface water were adversely affected it would be discovered through ground water and surface water monitoring the effectiveness of the toxic material handling plan.

Petroleum and the respective byproducts would be handled in accordance with the SWPP and GPP found in the KPDES permit. SWPP and GPP identifies materials to be used in operations, the handling/storage/inspection of contaminants and reporting procedures, and personnel training requirements in addition to a spill response plan to be used in the event of an accidental release of materials that are part of the SWPP and GPP. Diesel fuel, hydraulic fluids, lubricants, and similar vital materials to the mining industry are potential contaminants covered by the SWPP and GPP.

Currently there are no known significant sources or public records of persistent pesticides from land runoff/percolation, or contaminants from industries, municipalities, or other sources inside the proposed permit area. There is also no known existence of substantial material deposits which could be released in harmful quantities to the aquatic environment by man-induced discharge activities. The proposed area is, however, adjacent to agricultural activities where persistent pesticides may have been possible without previous records.

vi. Factual Determinations (40 CFR 230.11)

After reviewing the appropriate information given in sections above (230.20-230.77) it is concluded that there is minimal potential for short or long-term environmental effects of the proposed discharge as related to the physical substrate at the disposal site, water circulation/fluctuation, suspended particulates/turbidity, contaminant availability, or aquatic ecosystem structure and function and disposal site. Cumulative and secondary effects on the aquatic ecosystem are discussed below:

a. Determination of Cumulative Effects on the Aquatic Ecosystem

When determining cumulative effects on an aquatic ecosystem, careful consideration must be given to known past, present, and reasonably foreseeable future impacts to the aquatic area within a reasonably defined geographic space. Boundaries for cumulative effects within the geographic space, limits the evaluation to all jurisdictional waters of the U.S. according to USACE of Watershed HUC-12 051100060501. It should be noted the information regarding length of stream channels and size of wetland areas was obtained from the Jurisdictional Report for Wetland and Stream Characterization of the Geibel Property conducted by an HDR, Inc. branch out of Murphysboro, Illinois. The permit boundary of this project falls within the upstream section of the Elk Pond Creek (05110006-030-020) 14-digit HUC in Muhlenberg County, Kentucky. The actual mine site is composed of approximately 400 acres. A 4,575 acre portion of the upstream HUC watershed containing the proposed mine is designated as the Boundary Area (Appendix R). This Boundary Area can be located on the Greenville and Graham quadrangles. All Geographic Information System (GIS) analysis was performed on the designated Boundary Area. The total stream length within the Boundary Area is

approximately 374,153' (71 miles) of which approximately 114,025' (21.6 miles or 30% of streams in Boundary Area) are ephemeral streams, 198,007' (37.5 miles or 53% of streams in Boundary Area) are intermittent streams, and 62,121' (11.8 miles or 17% of streams in Boundary Area) are perennial. In the same Boundary Area there are a total of 41.48 acres of wetlands (0.91% of Boundary Area Acreage) of which 2.63 acres are freshwater emergent, 0.84 acres are freshwater forested/shrub, and 38.01 acres (Cowardin et al. 1979). The proposed mining operations would result in some permanent, temporary and secondary impacts to 18,814.6' (3.56 miles) of streams and 4.34 acres of wetlands. The proposed impact areas would be impacted permanently by physical surface alterations and temporarily impacted by overburden material, sediment control structures, inundation, and sediment transport activities. Within the Boundary Area 5.04% of streams would be impacted, 10.46% of wetlands would be impacted.

All streams in the project area have a slope of 2-4%. Land use associated in the proposed project area is dominated by logged forest (74% of project area), agricultural land (18% of project area), and grassland (6% of project area). Areas adjacent to the project area within the Boundary Area resemble evidence of previous mining and logging activities. Gas wells and associated pipelines with access roads also exist within the proposed project area. The proposed mine site is located on private property with little public road access. The major roadway nearest the proposed project is US 62, with the nearest major intersection 1.6 miles east of the proposed project on US HWY 62 and KY-189.

There would be two phases involved in the mining operations of the proposed project area. The initial phase will consist of construction of the haul roads, mine management areas, sediment basins and the construction of the stream relocation (diversion ditch). Mining operations will begin on the southern portion of the proposed permit boundary. The initial diversions and spillway for Pond 1 - Phase 1 will be constructed and certified. Pond 1 – Phase 1 will then be completed and final certification submitted. Pond 1 – Phase 2 will entail the expansion of Pond 1 (as noted in the MRP) as mining increases in the upper watershed area. Activities necessary for mining operations would be coordinated so as to minimize total land and stream disturbance. Keeping present impacts in mind, a calculation of a worse case scenario for the phases of operations was conducted, concluding that Phase 2 of mining operations would create the most disturbances during the life of the mine. During Phase 2, approximately 304 acres would be impacted amounting to 6.6% of the Boundary Area.

KPDES and Section 401 of the CWA have set Water Quality Based Effluent Limits and Water Quality Certifications (as required by KYDEP) for any currently

operating and proposed surface mine sites within this watershed. There are surface and groundwater monitoring plans designed and implemented for all operating/proposed mines within the watershed to identify any unacceptable changes in water quality resulting from mining operations. For the SMCRA permitting process, the KYDEP conducts a CHIA for surface mine operations. These studies assess combined impacts from adjacent and anticipated mining in the watershed to determine whether or not the proposed mining operations are designed to prevent damage to the hydrologic regime outside of the permit area. The CHIA has concluded the addition of this mine should not cause material damage to the hydrological balance outside of the permit area nor any adverse cumulative impacts to the hydrologic balance. This conclusion is based on the ABA indicating the discharges from the site should not violate effluent limitations and post-SMCRA mining in the area has not significantly degraded water quality within the watershed.

b. Identification of Relevant Past and Present Activities

As previously stated, proposed mining operations would result in some permanent, temporary and secondary impacts to 18,814.6' (3.56 miles) of streams and 4.34 acres of wetlands. Appendix R contains a map displaying 1,241 acres of previously mined areas within the Boundary Area. This means approximately 27% of the Boundary Area has been impacted by mining activities. Some of the impacts such as sedimentation/siltation, may have contributed to Elk Pond Creek becoming a TMDL stream by KYDEP. Water quality at the proposed impacted site shows low conductivity levels, and average metal levels (Fe & Mn). The SW-01 stream exhibits average alkalinity, which provides some buffering capacity for pollution sources. Aquatic and riparian habitat values show good potential. Due to location, amount of draining and water control necessary, the site is not suited for industry, farming, commercial or residential use. As is, the land is best utilized as proposed. Of the approximate 400 acres within the proposed permit area there are only 93.5 acres of prime farmland (23.4%) that would not require any hydrogeomorphic adjustment to obtain or continue use and 66.1 acres of farmland of statewide importance (16.5%) (NRCS 1976 (b)). The information provided in this EID indicates that within the 400 acre area for the proposed project, 4.34 acres are wetlands, while no threatened or endangered species, critical habitat, state or national park, other areas of conservation, wild or scenic rivers, historic or archaeological sites or areas of Native American concern have been identified.

c. Identification of Future Activities and Their Potential Impacts

It is anticipated that mining would continue within the Boundary Area. Commercial timbering, as well as oil and natural gas drilling, can also be expected to occur within the affected Boundary Area and surrounding areas. It

is not anticipated that other types of development would likely occur due to the Boundary Area being relatively isolated.

As stated previously, if the proposed mining operations are approved and implemented in accordance with all applicable regulations, an estimated 5.04% of streams within the Boundary Area would have some permanent surface alterations and temporary functional impacts, while 10.46% of wetlands would have permanent surface alterations and be temporarily (functionally) impacted by mining operations. It is anticipated to have short-term impacts to both aquatic and terrestrial environments as a result of the proposal due to planned mitigation; no adverse cumulative environmental impacts within the Boundary Area are expected.

To conclude, no major changes to the aquatic environment within the Boundary Area are expected in the reasonably foreseeable future. This is because the existing physical, chemical and biological characteristics of the existing area are not likely to change, nor are existing fish and wildlife values. Aspects which have already been degraded are most likely to remain degraded, and ones that are higher quality are also expected to maintain their current status. Even though continued population and wildlife growth in general will exert certain demands over water quality and fish and wildlife values, regulatory requirements are designed to protect the resources. All avoidance, minimization and compensation measures are expected to be evaluated as part of the regulatory process. In addition, government programs evaluating non-point sources, soil and water conservation and ecosystem mitigation are likely to return some streams and wetlands to a more natural condition. The evaluated processes would aid in improving water quality conditions in comparison to their current state. By implementing various programs directed toward restoring aquatic habitats and ecosystem should improve fish and wildlife values in the regions resulting in a continued sustainable water quality and fish and wildlife values through the area.

d. Determination of Secondary Effects on the Aquatic Ecosystem
Examples of secondary effects on an aquatic ecosystem are: fluctuating water levels in an impoundment and downstream areas associated with the operation of a dam; septic tank leaching and surface runoff from residential or commercial developments on fill; leachate and runoff from a sanitary landfill located in waters of the U.S. These are secondary effects that could be associated with the discharge of fill material, but are not directly caused by actual placement of fill material. In the case of the proposed mining operations, secondary impacts would include impoundment of water and sediment transport activities between the toe of backfill areas and sediment pond embankments. To minimize impacts, measures would be employed to minimize the increases in

suspended solids and turbidity. Effects below the sediment ponds would be limited by complying with KPDES effluent limits. Both KPDES and KYDEP would require monitoring of the water quality to gauge the effectiveness of the sediment control system. In-stream monitoring will occur, prior to mining, during mining, and during reclamation at site SW-01 designated south of permit area on the MRP (Appendix F). There are 6 months of initial sampling data from this location already (**Table 5**) and during mining operations surface water data will be collected quarterly beginning at the time of initial disturbance and continuing until final bond release. Parameters to be tested include: discharge, pH, acidity, alkalinity, total iron, total manganese, TSS, total sulfate, and total dissolved solids or specific conductance. This monitoring would be required to be conducted at specific times during the life of the mine to ensure compliance with state water quality standards according to KYDEP. After mining operations have been conducted the secondarily impacted areas would be restored to pre-mining conditions or better, this is after sediment structures (with the exception of one sediment pond to be established as open water for wetland mitigation) have been removed as is described in the CMP. A successful implementation of the compensatory stream mitigation and reclamation activities should ensure the establishment of the previous aquatic ecosystem.

e. Evaluation of Public Interest Review Factors

The probable impact, including cumulative impacts of a proposed activity on the public interest must be evaluated prior to the issuance of a permit. Taking the impacts in to consideration reflects a concern for the protection and utilization of important resources to people and their environment. In accordance with both 40 CFR 1501.3 of the NEPA and 33 CFR Part 325.3, the probable environmental effects associated with the proposed discharge of fill material into waters of the U.S. is discussed below.

Conservation: This proposal would result in impacts to both intermittent and ephemeral stream channels, and wetlands in addition to their associated riparian buffers. Each of the resources would be temporarily removed from the landscape. After mining operations are completed the stream channel and wetlands would be reconstructed and restored. Cumulative adverse impacts on conservation practices within the state of Kentucky are not anticipated complying with all applicable state and federal regulation addressing natural resources conservation.

Economics: Proposed mining operations would provide economic benefits to both the mine operator and the local economy. By placing fill material into U.S. waters, the operator will be able to remove approximately 1.1 million CY of coal, translating to 1.6 million short tons of coal with a market value in excess of $76,480,000. Market prices for coal from Oxford Coal Company's financial

statement as of 2010, had been estimated at $47.80 per short ton. Current severance tax rate for coal in Kentucky is 4.5% of the gross market value. The proposed project will produce approximately $3,441,600 in tax dollars at market prices over the life of the mine (short tons*cost per short ton*0.045). Fifty percent of the tax levied on the gross value of the coal is returned to the county it was mined in. Applying that rate Muhlenberg County would receive approximately $1,720,800. Tax dollars will benefit the local economy as well as the State of Kentucky. Additional job opportunities, both at the mine itself, and secondary services for the mine or mine employees, would help benefit the local and regional economy. Jobs would produce state income taxes and property taxes as well as give an influx of money to the local economy from the purchase of goods and services.

Aesthetics: The proposal involves the conversion of ephemeral and intermittent streams to temporary backfilled areas. It is located in a remote area not easily visible to any existing residences or buildings accessible to the general public. The aesthetics is mainly temporary since after mining operations are completed the intermittent and ephemeral channels, riparian zones and wetlands will be established.

Wetlands: There are currently 4.34 acres of wetlands within the proposed project site. The NWI identified the wetlands as having been created through excavation or impoundments. Operations proposed would result in the complete excavation and then establishment (with an additional 0.68 acres) of the jurisdictional wetlands leaving them permanently impacted.

Historic Properties: During a preliminary reconnaissance archaeological survey of the proposed project area, a few sites were evaluated as being potentially eligible for listing in the National Register. These sites will be protected from mining related impacts by marked 200 foot radius buffer zones indicated on the MRP (Appendix F) as “No Disturbance Zones”. No aspect of construction, operation or reclamation of the proposed project will affect a listing of the NRHP. The Kentucky State Historic Preservation Office (KSHPO) does not have any known historical, architectural or archaeological sites listed in or eligible for inclusion in the NRHP near the proposed project besides those previously mentioned. Further documentation of the various phases in archaeological surveys for the project area can be found in the External Agency Correspondence section in Appendix D.

Flood Hazards:
No adverse impacts or increases in downstream flooding are anticipated in result or relationship to the proposed project.

Floodplain Values: The majority of stream channels involved in the proposed project do not fall within the 100-year floodplain, but rather are determined to be outside the 500-year flood plain as designated by the Federal Emergency Management Agency (FEMA) (Appendix S). A southwest portion of the proposed permitted area would impact an 1896.5' section of the 100-year flood zone where no base flood elevations have been determined (Appendix S). An application for permit to construct across or along a stream and/or water quality certification has been submitted with KDOW for the proposed project (Appendix D).

Land Use: Approximately 18,814.6' of intermittent and ephemeral streams and their respected riparian buffer zones, and 4.34 acres of wetlands would be converted to a backfill area at some point during the proposed operations. The proposed impact areas would be temporarily impacted by overburden material. Upon completion of mining activities 19,399' of stream channels (13,225' intermittent and 6,174' ephemeral) and 5.02 acres of wetlands (permanently and temporarily impacted areas) would be restored utilizing natural stream channel design techniques and replanted riparian zones. Through mitigation of the stream channel, wetlands and the riparian buffers, it is anticipated diversity and productivity would be promoted within the stream channels. This would result in the mitigation of 19,399' of stream channels and 5.02 acres of wetlands within a 400 acre project area.

Navigation: The proposed project is not expected to have any net effect related to navigation. Currently, in order to fulfill existing contracts coal is being purchased from another company and shipped via navigable waters. When coal production commences in relation to this application, purchases from other companies will cease and this production will replace the previous shipment amounts on the same navigable waterway.

Safety: The applicant would be mandated to comply with all state and federal safety regulations. The SMCRA permit includes various provisions and regulations to be implemented to ensure the safety of all backfill areas and sediment control structures and allow for the inspection and certification of the structures.

Recreation: There are no anticipated adverse impacts to recreational values as a result of the proposal because the streams and wetlands proposed are not utilized for public recreational purposes.

Energy and Mineral Needs: Coal is projected to be responsible for the majority share of electricity generated through the year 2035 based on sensitivity cases analyzed (U.S. EIA 2011). The placement of fill material into waters of the U.S. would allow the applicant to carry out the necessary activities to recover approximately 1.1 million CY of coal reserves (1.6 million short tons). This coal would be used for energy production and is expected to contribute benefits toward the local, regional and national energy and mineral needs.

Water Quality: From placing fill material into over 18,814.6' of ephemeral and intermittent streams, short-term impacts to water quality values are expected. The most current water quality within streams at the site, range from low to medium levels in comparison with the rest of Kentucky water quality. There is low to moderate conductivity, and alkalinity which may provide only slight buffering capacity against potential pollution sources. The pH values are on average 6.67 standard units (slightly acidic), which is in line with the typical 6-9 standard units seen in streams. None of the receiving streams are considered waters of special concern. Only Elk Pond Creek is listed on the 2010 303 (d) list as impaired for Fecal Coliform and sedimentation/siltation. Increased turbidity and erosion onsite and downstream of the site are expecting during mining operations. Impacts would be minimized by sediment control structures, and BMPs executed during mining activities. The proposal will have minimal effects on stream quality with respect to pH and should not increase levels of dissolved metals, or suspended solids according to the CIA conclusions. Sediment control structures, and timely revegetation should reduce turbidity, sedimentation levels, and reduce the risk of flooding/stream flow alternations. The monitoring of all water discharge outlets from the permit area would take place according to KPDES permit to assure the project would not violate Sections 401 and 402 of the CWA. Any acid or toxic bearing strata encountered would be dealt with in accordance with the MHP. The proposed permit would comply with Section 402 of the CWA KPDES, and the Section 401 of the CWA Water Quality Certification. Considering the information detailed above, the water quality impact is expected to be minimal through the reconstruction and reclamation period.

Fish and Wildlife Values: Temporary adverse impacts to fish and wildlife are expected as a result of losses in aquatic habitats. Some aquatic species especially benthic species will be eliminated during the stream filling activities. It is expected that any population of species which may be impacted and are mobile/capable, will relocate to a more suitable area. The aquatic food webs the organisms rely on, would be adversely impacted in the proposed permit area, however, it is anticipated further impacts will be alleviated in areas downstream due to the use of sediment control structures, BMPs and compliance with KYDEP's KPDES requirements. A compensatory stream mitigation and enhancement plan has been provided by the applicant. After mining operations have ended, and a successful mitigation plan executed, it is anticipated that the adverse impacts would cease allowing for the aquatic wildlife and terrestrial wildlife dependent on stream channels, wetlands and riparian buffers to return.

Shore Erosion and Accretion: The proposal should have no appreciable effects on shore erosion and accretion.

Water Supply and Conservation: No adverse impacts on water supply and/or water conservation values are anticipated to result from placing fill material into waters of the U.S. associated with this project. There should be no diminution/interruption of any ground or surface water sources currently being used for domestic, agricultural, or industrial purposes in the adjacent area.

Food and Fiber Production: The proposal should have no appreciable effects on food and fiber production.

Property Ownership: The list of property owners can be found attached to the Application for DA Permit (33 CFR 325).

General Environmental Concerns: The proposal should not result in any long-term or adverse impacts to the general environment. All applicable environmental and health and safety regulations will be abided by as construction of the fills and sediment control structures are built. Impacts to the aquatic environments have been minimized within the project area to the maximum extent practicable. Air emissions are also a factor to be considered underneath general environmental concerns. Operations associated with mining such as blasting, earth and rock removal, transport related dust etc. are qualified as "fugitive emissions" under the Clean Air Act. The facility will limit fugitive emissions by limiting the speed of coal haulage trucks, applying water to running surfaces, putting chemical bonding agents on the road surface when warranted, and paving where warranted in or near high traffic areas. By limiting fugitive emissions, the operations would not meet criteria for major source air quality permits, defined as sources that emit at least 250 tons/year of a regulated pollutant.

Needs and Welfare of the People: Coal is the predominant source of energy at 45% of all electricity provided in the U.S. (U.S. EIA 2012). There are currently 272 billion tons of coal reserves within the U.S. and from the recoverable coal there is enough energy content to be equivalent roughly to all of the world's known oil reserves making it a longer lasting option for energy in the U.S. (National Energy Technology Laboratory 2012). Since 2001 the amount of income dedicated to energy per household in the U.S. has increased substantially to the point that in 2012 it is projected to account for an average of 21% of after-tax income for roughly 60 million American Families in an income category of gross annual income less than $50,000 (American Coalition for Clean Coal Electricity (ACCCE) 2012). **Figure 2**, is recreated from a study conducted by the ACCCE, which used data collected from the U.S. Census Bureau, U.S. Department of Energy (DOE)/EIA, U.S. Department of Transportation, and the Congressional Budget Office Effective Federal Tax Rates

under current law (data can be seen in Appendix T)(ACCCE) 2012). **Figure 2** is a visual representation of how energy costs place an increased burden on families with lesser household incomes.

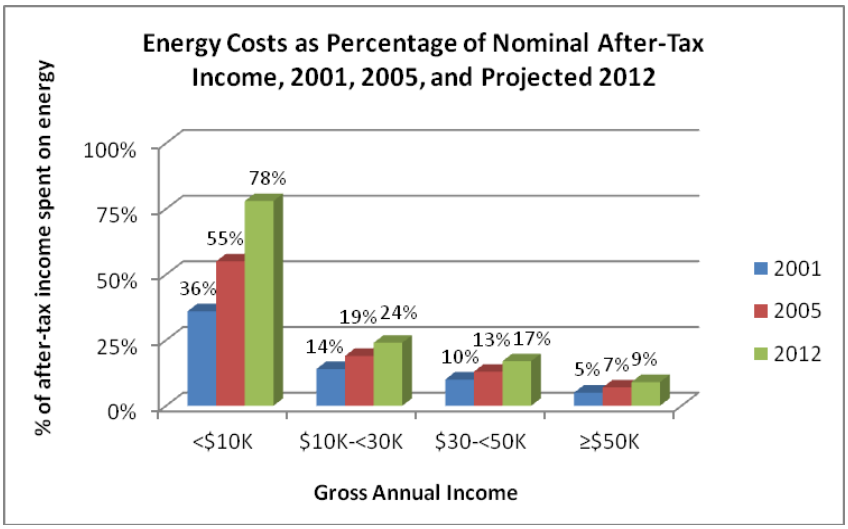

Figure 2: Figure recreated from ACCCE 2012 describing energy costs as percentage of nominal after-tax income in 2001, 2005, and projected for 2012 (ACCCE 2012)

The affordability of coal has helped and can continue to help keep costs of energy low, because as it can be seen in **Figure 3**, states with higher percentages of their energy resulting from coal typically have a lower average retail price of energy (U.S. EIA 2012).

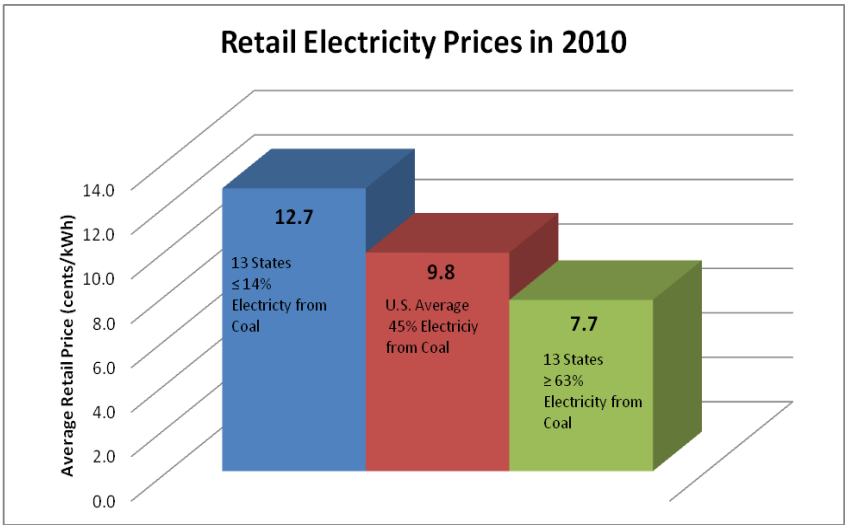

Figure 3: Average retail electricity prices (cents/kWh) of states in the U.S. based on percentage of electricity produced by coal (U.S. EIA 2012).

Not only does coal energy keep energy affordable for millions of American families, it is also more consistent with its fuel costs. Coal has been more consistent since 1982 compared to both natural gas and crude oil nominal dollar per million BTU cost (**Figure 4**) (U.S. EIA 1982-2012).

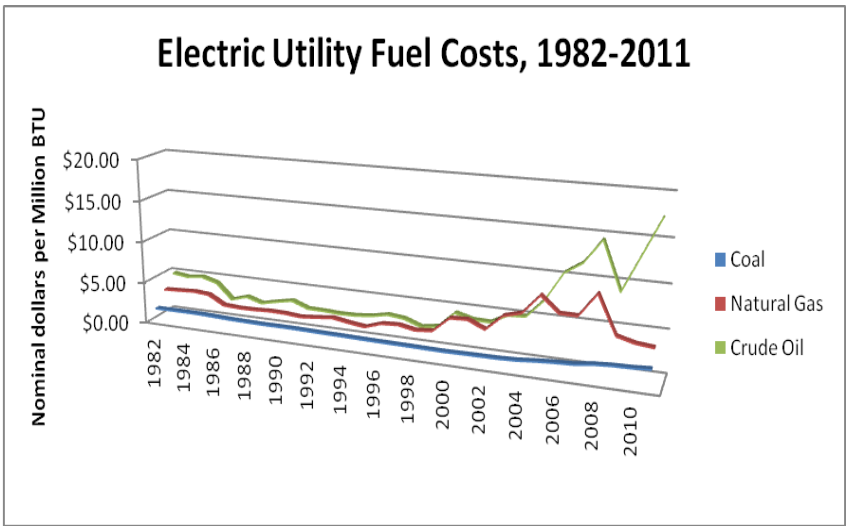

Figure 4: Electric utility fuel costs in nominal dollars per million BTU from 1982-2012 for coal, natural gas, and crude oil in the U.S. (U.S. EIA 1982-2012).

The proposed project will allow access to retrieve coal resources toward the purpose of electricity, thus benefiting people on a local, regional and national level. The retrieved coal will help families spend less from its household income on energy, which means more money the family will have to spend on other necessities such as child care, food, or health care.

In addition to the increased job opportunities by this proposal there will also be service oriented businesses, both of which will provide a boost to the local tax bases which provides social services, schools, fire/police support, etc. Human use characteristics such as municipal and private water supplies, recreation and commercial fisheries, water related recreation, aesthetics, local, state, or national parks should have no adverse impacts from the proposal. No human health effects are anticipated as a result of this proposed project.

The proposal would not result in disproportionately high impacts to low-income population, which puts the proposal in accordance with the Executive Order 12898 of February 11, 1994 (Environmental Justice). While the surrounding communities do have a low-income population, the proposed site is isolated away from residences, businesses, and other structures within the watershed area. No adverse impacts to residents in this region are anticipated and no

adverse impacts to minority populations are anticipated as less than 8% of the population in this county are a minority (U.S. Census Bureau 2011). Based on population demographics there are also no significant direct effects on any one or more Indian tribes within the project area, which also puts the proposal in accordance with the Presidential Executive Order 13175.

Cumulative Effects Evaluation: The USACE is required to consider cumulative effects of any proposed project on aquatic environments in order to evaluate the project under the NEPA and the 404(b)(1) Guidelines. Cumulative effects must include not only the present impacts but also past and future foreseeable future impacts (within reason) to the aquatic environment in a reasonably defined geographic area. Based on the cumulative effects analysis (Section B. Technical Evaluation and Testing, vii. Factual Determinations (40 CFR 230.11) a-d) in this document, it has been determined the existing physical, chemical, and biological characteristics of the existing watershed are not likely to be adversely impacted by implementation of the proposal.

vii. Findings of Compliance (40 CFR 230.12)

a. Practicable Alternatives:
The alternative selected would require fill material being placed in 18,814.6' of jurisdictional streams and 4.34 acres of wetlands. The proposed discharge represents the least environmentally damaging and practicable alternative (demonstrated by this document). There is no other practicable alternative to the proposed discharge that would have less adverse impacts on aquatic ecosystems that would not have alternative significant adverse environmental consequences. What adverse impacts result from this proposal would be compensated by the applicant's proposed CMP and stream mitigation plan.

b. Compliance with other Agencies:
The KYDEP required 401 water quality certification will be applied for pending public and agency notice of this 404 application. This would certify the proposed discharged material into jurisdictional waters would not violate any applicable state water quality standards. The KYDEP application for the SMCRA is in process. The applicant has also applied for a KDPES permit. Evaluation of this information indicates proposed discharge material will abide by acceptable constraints implemented to reduce contamination down to acceptable levels within proposed sites and prevent contaminants from being transported beyond boundary sites.

c. Degradation of Water:
Discharge occurring from this proposed project will not cause nor will it contribute to significant degradation of jurisdictional waters including but not limited to adverse effects on human health or welfare, life stages of aquatic life

and wildlife, diversity, productivity and stability of the aquatic life and other wildlife or wildlife habitat, recreational, aesthetic and economic values, in consideration of part 230.10 through 230.61 of 40 CFR.

d. Steps to Minimize Potential Impacts:
All appropriate and practicable steps have been taken to minimize potential adverse impacts of the discharge on the aquatic ecosystem in consideration of parts 230.70 through 230.77 of 40 CFR under Section E of the 404 (b) (1) Evaluation of this EID. Additionally, the applicant has submitted a CMP to offset the unavoidable impacts to the jurisdictional waters of the permit area.

e. Compliance with the Guidelines:
This preferred alternative represents the least environmentally damaging practicable alternatives. The applicant will comply with agencies listed previously in order to follow all applicable water quality and environmental standards. Fill material would not be expected to harm any endangered species or their critical habitat, nor violate any requirements for federally designated sanctuaries. The applicant's mitigation and monitoring plans were also considered by the USACE. Activities proposed will not cause or contribute to significant degradation of waters of the U.S. including adverse effects on human health, life stage of organisms, dependent on the aquatic ecosystem, ecosystem diversity, productivity and stability, and recreational, aesthetic, and economic values. The appropriate steps to minimize potential adverse impacts of the discharged material on aquatic ecosystems will be taken such as the KYDEP approved state certification, KPDES permit and SMCRA permit.

In evaluating the proposed project, it can be concluded that the proposed discharge with standard conditions put in place by the USACE permits and compliance of EPA pursuant to Section 404(b) of the CWA will minimize pollution or adverse effects to the aquatic ecosystems. There is no basis for denial of the project under the guidelines promulgated by the Administrator, EPA, under authority of Section 404(b) of CWA.

10. Mitigation-Compensatory Mitigation Plan

A. Mitigation Plan

Establishment and improvement of stream and wetland qualities onsite was considered the best option to mitigate the mining operations in the project area because of the likelihood of success and the greater impacts to the ecologically important uplands and potential gains in terms of aquatic resource functions. Establishment of the streams and wetlands in the project area would provide mitigation within the same watershed as the impact site, and would thus replace lost functions and services within the excavated areas such as aquatic habitat diversity, habitat

connectivity, hydrologic relationships, trends in land use, ecological benefits, and compatibility with adjacent land uses. All establishment efforts would be conducted at the maximum extent practicable, as quickly as possible after mining operations causing the impacts have ended. All mitigation activities would comply with all applicable federal, state and local laws.

During the proposed mining operations there would be an excavation and subsequent fill of 18,815' (12,125.6' intermittent and 6,689' ephemeral) stream channels, and 4.34 (0.68 acres of which are scrub/shrub, 2.62 acres are emergent, and 1.04 acres of which are open water) acres of wetlands. The Oxford Mining Company proposes to compensate for stream excavation using a mitigation ratio of one-to-one (in-kind) by establishing onsite 19,399' (13,225' intermittent and 6,174' ephemeral) of stream channels (approximately 1:1 for ephemeral streams; approximately 1:1 for intermittent streams). The Oxford Mining Company also proposes to compensate for wetland excavation by using varying mitigation ratios (2:1 for scrub/shrub wetlands with a functional lift to forested wetlands; 1:1 for emergent wetlands with a functional lift to forested wetlands; 1:1 for open water wetlands) in-kind by establishing onsite 5.02 acres of wetlands after mining operations have ceased, and the areas have been backfilled and revegitated. This would mean after mitigation there would be an excess of 584.4' mitigated for streams and an excess of 0.68 acres mitigated for wetlands. The excess 3% stream establishment and excess 16% wetland establishment is proposed as compensation for the delay in construction of streams and wetlands since mining operations must be completed prior to any aquatic establishment. The applicant proposes to submit mitigation designs for approval prior to the issuance of the permit. Submitted designs will be typical drawings and final designs will be dependent upon the backfill configuration and slope since stream designs specifically depend on exact numbers to be successful. Impacted Resources Vs. Mitigation Summary Information can be found in Appendix U. Of the current approximate 400 acres in the project area roughly 71 acres have a land use classification of agriculture, while the remaining 329 acres are a combination of forested, grassland, wetlands, or developed areas (for further detail reference Environmental Setting of Project Area Section 6 of this document). The applicant proposes to establish 42.29 acres as cropland (prime farmland area) including 10.19 acres of enhancement and 357.21 acres will be established as pasture/hayland, including 30.8 acres of enhancement. A current Prime Farm Soils Location Map in addition to the anticipated Post-Mining Land Use Map can be found in Appendix V and Appendix W. Documentation to aid in stream and wetland establishment (Topographic maps, Aerials, Stream Characterization Data Forms, Habitat Assessment Forms, Wetland Determination Data Forms, and Photo documents) can be found in Appendix B, Appendix G, Appendix L, Appendix M, Appendix N, and Appendix P. The current common species of plants within the proposed project area can be found listed in **Table 7, Table 8, Table 9,** and **Table 10.** The current state of streams and wetlands within the project area will be used for reference during mitigation of impacted areas. In addition, existing stream cross-sections for the primary tributaries will aid in the establishment of the stream channels, and can be found in Appendix O. No work on mitigation will commence within waters of the U.S. until the district engineer approves the final mitigation plan, unless the district engineer determines that such a special condition is not practicable and not necessary to ensure timely completion of the required compensatory mitigation.

During the development of the wetland and stream mitigation plan, hydrogeomorphic and ecological landscapes and climates will be considered. A dynamic landscape perspective would be adopted to aid in development of naturally variable hydrological conditions. When possible wetland/stream establishment will be selected over the creation of a new wetland/stream and over-engineered structures will be avoided. Appropriate planting elevation, depth, soil type, seasonal timing, subsurface conditions including soil and sediment geochemistry and physics, groundwater quantity and quality and infaunal communities will be considered during the re-vegetation and general development of the mitigation plan. Appropriate heterogeneous topography would be used and adapted to best fit each aquatic location. Potential complications of aquatic creation or establishment in seriously degraded or disturbed sites would be taken in to serious consideration throughout the entire mitigation process. Monitoring would occur early and often as a part of adaptive management for these temperamental habitats. Regarding aquatic impacts, primary efforts will focus on avoidance or minimization. For unavoidable impacts, onsite and within-watershed mitigation will be performed strictly following guidance such as *Stream Restoration: A Natural Channel Design Handbook* and those detailed in the *Wetlands Compensatory Mitigation Rule* administered through the U.S. EPA and USACE. By following mitigation guidance, the replacement and potential improvement of wetland/stream mitigation function will be insured within the project area. For the potential mitigation project(s), aquatic areas will be monitored biannually for 5-years (or until release from monitoring from the USACE) to determine the successful design and functional replacement by assessing measurable milestones associated with hydrologic and biogeochemical function along with habitat and food supply. Results from monitoring will be compiled in to a yearly monitoring report. These reports would be delivered to the Louisville District of USACE and the 401 review section at the KDMP. Particular emphasis will be placed on percent tree survival (80% survival rate for streams and 50% survival rate for PFO wetlands from the initial stock), establishment of hydrology, documentation/control of invasive species, soil stability, and documentation of soil chroma/value.

To determine tree survival in wetlands, one dedicated plot/photo station per acre (5 total) will be established for yearly plant surveys. Each plot will have a 30' radius for an approximate total of 2,800 ft^2. Fence posts with plot number flagging will be driven into the center of the plot to mark the location along with a recording of the latitude and longitude with GPS. Photos will be taken in each cardinal direction. To determine vegetative survival in riparian areas, all stream lengths will have the entire riparian zone assessed. Adequate hydrology will be determined either through repeated visits within the early growing season (during the spring rains) or through the placement of a pressure transducer within wetlands. During the plant and hydrology visits all sites will be surveyed entirely for the establishment of invasive species. Pending potential colonization, invasives will be controlled through manual removal or herbicide application based on USACE recommendations. Soil stability will also be estimated during site visits and documented with photographs. A yearly report will be generated for the USACE to document the findings of the field survey. Current stream qualities within the project area are ranked as poor. As post restoration mitigation streams are establishing stability and habitat during years 1-3 of monitoring, Rapid Bioassessment Protocol (RBP) scores are projected to range in the marginal category or higher. Expected minimum RBP scores of eighty (80) for

ephemeral streams, and eighty-five (85) for intermittent stream will be achieved in the first three years post construction. During year four (4), scores are expected to transition from the marginal category to sub-optimal or higher (RBP score of 95 or higher for ephemeral streams; RBP score of 100 or higher for intermittent streams). Both ephemeral and intermittent streams would then have an average RBP score around 115 within year 5. Each stream would have a 50' buffer zone (riparian zone) on each side of the channel, to ensure a more productive stream by means of shading and providing a food source. In-stream habitat structures such as boulders, logs, cross-vanes, j-hooks, and rock weirs could be added to give support to more species diversity within the stream channel. Structures and the riparian zone of stream channels and wetlands would work jointly to create stable prolific aquatic areas, by providing a reliable food source along with areas for retreating, predation, collecting, and gathering of food sources, in addition to increasing stability of the stream and creating various habitat niches. By establishing riparian corridors with trees, shrubs, and grasses many functions would be served including but not limited to directly and indirectly reducing sedimentation, leading to increases in epifaunal substrate and reducing embeddedness, thus leading to increased benthic habitat. Plants within the mitigated areas would provide shading of the streams aiding in maintenance of optimal temperatures for aquatic habitats.

The compensatory mitigation plan would utilize both quantitative and qualitative measurements to provide background data for impacted stream channels to be restored and utilizes an ecological mitigation approach by attempting to restore hydrologic and geomorphic functions of impacted channels. Chemical functions of mitigated sites would be to remain constant and supportive of benthic communities. All of the physical mitigations discussed would allow for important aspects such as trees, grade control structures, and correct channel configurations to support healthy aquatic systems and communities. The stated goal of the mitigation plan is to utilize an ecological mitigation approach for the impacted stream and wetlands in order to replace lost structure and functions as a result of mining operations. It is anticipated that through mitigation, aquatic habitats and water quality values would benefit, enabling structural aquatic communities to recover and be sustainable. It is anticipated that after proper maturation time of the enhanced established stream channels and wetlands, treatment of non-point source pollutants, temperature control, maintenance of genetic diversity, bank stability, water and sediment transport, water and organic matter retention would be established. All mitigation construction and monitoring tasks will be performed by or under the supervision of personnel familiar with natural channel design principles.

B. Proposed Mitigation Sites

Oxford Mining Company will conduct mitigation by establishing intermittent and ephemeral streams and wetlands onsite. The applicant would be removing one sediment structure upon the release of the bond, however the other pond would be used to establish permanent open water outside of jurisdictional waters to aid in mitigation of excavated wetlands.

C. Site Selection and Justification

Onsite selection was chosen because establishing and improving stream and wetland qualities in the directly impacted watershed would provide the greatest likelihood of success and

improvement to the ecologically important areas and potential gains in terms of aquatic resource functions impacted as a result of the preferred alternative. Stream channels and wetlands would be constructed based on natural channel designs from reference background material within this document and reference reach data in the area. In-stream habitat structures such as boulders, logs, cross-vanes, j-hooks, and rock weirs could be added to give support to more species diversity within the stream channel as well as increased stream stability. A 100' riparian buffer, 50' on each side of the streams and wetlands would be established along restored areas to provide a riparian buffer zone needed to ensure productivity through shading and food sources. Established structures and riparian buffers would work jointly to create the stable prolific habitat necessary to improve RBP scores. The new structures and riparian habitat enable the restored areas to provide reliable food sources in addition to areas for retreating, predation, collecting and gathering of food sources which will aid in the increasing of stability of the stream/wetland and development of varying habitat niches. By establishing riparian corridors with trees, shrubs, and grasses many functions would be served including but not limited to directly and indirectly reducing sedimentation, leading to increases in epifaunal substrate and reducing embeddedness, thus leading to increased benthic habitat. The shade provided by the new riparian plants would aid in regulating the aquatic areas toward optimal temperatures for aquatic habitats.

D. Goals and Objectives of Proposed Mitigation

The goal of the mitigation in this project is to utilize an ecological mitigation approach for all impacted streams and wetlands in order to replace the lost structural and aquatic functions as a result of biological integrity lost in relation to mining impacts. During establishment, proper width/depth ratios and enhancement structures will be utilized to increase sediment transport and support to grade control of the areas. It is anticipated that by establishing basic aquatic functions, both aquatic habitat and other water quality values will benefit, thus enabling structural aquatic communities to recover and become self sustaining. Upon maturation it is expected that enhanced, created and restored areas that treat pollutants, nutrient cycling, temperature control, maintenance of genetic diversity, bank stability, water and sediment transport, water and organic matter retention would be established. Proposed monitoring schedules for wetland and stream mitigation success are in **Table 17** and **Table 18**.

Table 17: Proposed monitoring schedule and criteria for wetland mitigation success

Type/Category	Criteria	Year 1	Year 2	Year 3	Year 4	Year 5
Hydrology	Saturated soil within the top 12" for at least 14 days of growing season	Measured saturation for allotted time	Measured saturation for allotted time	Measured saturation for allotted time	Measured saturation for allotted time	Measured saturation for allotted time
Vegetation	Planted container trees/herb cover, % survival by plot, max % 1 species	~70% tree survival, absence of bare soil, <20% dominance of 1 species	~70% tree survival, absence of bare soil, <20% dominance of 1 species	~70% tree survival, absence of bare soil, <20% dominance of 1 species	~70% tree survival, absence of bare soil, <20% dominance of 1 species	~70% tree survival, absence of bare soil, <20% dominance of 1 species
	Native trees min % by plot	80%	80%	80%	80%	80%
	Species list	Yes	Yes	Yes	Yes	Yes
Soil	Documentation of Munsel soil chroma/value in each pit (upper 12")	Yes	Yes	Yes	Yes	Yes
	Documentation of stability	Yes	Yes	Yes	Yes	Yes

Table 18: Proposed stream monitoring assessments for mitigation determination of success.

Type of Assessment	Year 1	Year 2	Year 3	Year 4	Year 5
As Built Survey	x				x
RBP Scores ≥ 80 (Ephemeral), ≥ 85 (Intermittent)	x	x	x		
RBP Scores ≥ 95 (Ephemeral), ≥ 100 (Intermittent)				x	
RBP Scores ≥ 115 (Ephemeral), ≥ 115 (Intermittent)					x
Macroinvertebrate Sampling		x		x	
Riparian Tree Surivival >80% stream >50% PFO wetlands	x	x	x	x	x
Riparian Tree Survival ≥ 300 stems per acre	x	x	x	x	x
Riparian Tree Survival ≥ 6 species	x	x	x	x	x

E. Mitigation Work/Implementation Plan

Both the USACE and Kentucky Division of Mine Permits (KDMP) 401 section will be notified at the beginning and completion of mitigation construction. BMPs would be followed during all construction and implementation of the mitigation plan so as to minimize/prevent increases in sedimentation or erosion. Minimizing and preventing further sediment loads or erosion would be attained through: the installation of basin and/or filter strips, land grading and shaping, mulching of planting areas, placement of rip rap, rapid re-vegetation, rock check dams, silt

fences, straw bale barriers, bank stabilization techniques, limiting the amount of time of heavy equipment is directly in the stream/wetland channel, and conducting work in a downstream direction so as not to disturb previously constructed reaches/areas. By implementing these measures, there will be potential for an increase in successful mitigation. Sedimentation structures such as ponds would be dewatered by pumping or siphoning the water prior to any earth relocation activities.

Following the completion of the mining project, SMCRA-required BMPs combined with the specifics of wetland and associated stream design will ensure the establishment of the necessary slope and drainage area required to replace necessary hydrologic conditions. Establishment/mitigation activities would be conducted in a manner to achieve and exceed the natural pre-mining conditions of the streams and wetlands if applicable. Substrates would be strategically located to achieve appropriate "step/pool" or "riffle/run" sequences necessary to ensure successful sediment transportation through the restored aquatic areas. Substrates of varying sizes, such as rocks (boulder-pebble) would be used to attain a natural substrate design. Any nondurable toxic or acidic materials would be removed from the aquatic areas and buried, in upland areas away from the restored reaches, with a minimum of six inches of non toxic material so as to prevent water contamination.

Riparian zones would begin at ordinary high water marks and span a distance of 50' along both sides of stream and wetland areas. Zones would be re-vegetated with native species that would function to stabilize newly formed stream banks and the reduction of soil erosion. Wetland mitigation will focus on replacement of the unavoidably impacted wetlands through conversion of the scrub/shrub vegetation to a dominance of tree species. This process will establish a high-quality forested wetland. With the establishment of higher quality wetlands than the proposed impact, Oxford is proposing mitigation ratios of 2:1 (mitigation area:impact area) for scrub/shrub wetlands; 1:1 for emergent wetlands; 1:1 for open water wetlands in-kind due to this increase in wetland quality (functional lift from scrub/shrub and emergent to forested). Per requirements for wetland hydrology based on the 1987 USACE Wetland Delineation Manual, the upland drainage area will be designed to promote saturation in the upper 12 inches of wetland soil for at least 14 days (1% of the average 145-day growing season). Efforts to prevent oversaturation will be made to prevent killing of immature tree saplings. During the design process it will be determined whether the wetland will receive its water through overland flow, stream flooding or a combination of the two.

F. Construction Sequence

Construction of aquatic areas would be attempted to be conducted during low/no flow periods. Timing of machinery usage directly in the areas to be established would be limited. Stream/wetland crossing by equipment would either be conducted at fords sloped to 5:1 ratio or flatter, or will occur at temporary culvert locations. Geotextile sediment fences would be used to trap sediments from areas with limited runoff. Sediment fences would also be installed along contours of the entire downstream perimeter of mitigation reaches that are disturbed during construction processes. Fences used would be trenched into the ground and properly anchored. Disking or hand scarifying would be performed to loosen any compacted soils if soil

in construction areas is compacted; this would aid in increased seed growth success. Soil testing would commence to determine fertility and whether or not fertilization and proper amount of fertilization necessary for seeding areas. Once determined, fertilizer and lime would be uniformly mixed into the top three inches of soil. If soil is either gravelly or cobbled, fertilization will be deemed unnecessary. *Stream Restoration: A Natural Channel Design Handbook* recommends a 10-10-10 fertilizer be spread at a rate of 435 lbs/acre, and lime spread at 2,200 lbs/acre. Seeding of the areas would be dependent upon the growing season on which the seeding takes place. If seeding occurs in the fall, winter, or spring, a rye grain winter wheat mix would be used and spread at a rate of 130 lbs/acre. If seeding is to take place in the summer, brown top millet would be used and spread at a rate of 45 lbs/acre.

G. Performance Standards

The applicant would use its own equipment operators or subcontractors to implement mitigation efforts and ensure BMPs. All mitigation and monitoring tasks would be performed or supervised by personnel familiar with natural channel design principles. Stream channel and wetland morphology would be determined a success once the proposed structures that would be used for mitigation projects are constructed in approximate location proposed within the mitigation plan. During establishment, stream and wetland stability would be examined and monitored for successful erosion control. Successful erosion control would be considered when the stream/wetlands, along with constructed erosion control structures are laterally and vertically stable. All boundaries of stream mitigation sites would be delineated and flagged via surveyor's stakes to easily identify restored areas.

Specific tree species to be planted in the project area ultimately will be limited to nursery supply but riparian areas will include at least 6 local species, and wetland areas will include at least six local species adapted to wet conditions with a particular emphasis on oak variants. Efforts will ensure that no species dominates the community (>20%). Potential species to be planted can be found in **Table 19**. If available, container-grown saplings (due to increased survivability) will be obtained from the closest available nursery and species/numbers will be planted based on the resulting site hydrology at an estimated 681 saplings per wetland acre, and an estimate 300 trees/shrubs per riparian acre. Trees will be planted with eight foot spacings. Vegetation for mitigated areas would have a minimum of 50% success rate of initial stock for PFO mitigation areas and 80% success rate of initial stock for riparian areas after 5 years for native species. It is anticipated that natural succession of native species would occur. Currently, in the vicinity of the existing areas there is a dominance of slightly lower quality tree species including red maple (*Acer rubrum*), sycamore (*Platanus occidentalis*), sweetgum (*Liquidambar styraciflua*), and black willow (*Salix nigra*). It is expected that colonization of several of these species will occur in conjunction with the planted species thereby increasing the initial tree density and ultimately the canopy diversity. In order to stabilize the bare soil an additional seeding of annual rye or other native herbaceous seed mixture will be spread immediately following construction. This mixture will be covered with straw. Within established areas, nonnative species would be kept at less than 20% to ensure the successful propagation of native vegetation to be planted. Once the mitigation standards have been achieved for all areas encompassing the mitigation project, the applicant and/or consultant would be responsible for conducting annual monitoring reports.

These reports would be delivered to the Louisville District of USACE and the 401 review section at the KDMP. The applicant would be obligated to maintain the project area following requirements set forth by the KDSMRE and USACE. Monitoring and maintenance of the mitigation site would continue until final approval of the mitigation is achieved.

Table 19: Possible Species to be planted. Species designated with * are adapted to wet conditions and would be used for mitigated wetland areas. Species **not** designated with * would be used in riparian areas rather than wetland areas.

Possible Species to Be Planted	
Common Name	*Scientific Name*
American Basswood	*Tilia americana*
American Beech	*Fagus grandifolia*
American Elm	*Ulmus americana*
Bitternut Hickory	*Carya cordiformis*
Black Oak	*Quercus velutina*
Black Walnut	*Juglans nigra*
Blackberry	*Rubus spp.*
Bur Oak*	*Quercus macrocarpa*
Cherrybark Oak*	*Quercus pagoda*
Chinkapin Oak	*Quercus muehlenbergii*
Kentucky Coffeetree	*Gymnocladus dioicus*
Northern Red Oak	*Quercus rubra*
Overcup Oak*	*Quercus lyrata*
Pignut Hickory	*Carya glabra*
Pin Oak*	*Quercus palustris*
Rock Elm	*Ulmus thomasii*
Shagbark Hickory	*Carya ovata*
Sugar Maple	*Acer saccharum*
Swamp Chestnut Oak*	*Quercus michauxii*
Swamp White Oak*	*Quercus bicolor*
White Oak	*Quercus alba*
Willow Oak*	*Quercus phellos*

H. Site Protection

The landowner would be responsible for the protection of the restored mitigation site through a perpetual deed. The applicant would maintain mitigation efforts up until KDSMRE bond release and subsequent USACE release from monitoring. Riparian areas and subsequent aquatic resources would be protected. If deemed necessary by the Louisville District USACE, a third party would be implemented to ensure the protection of the mitigation reaches.

I. Monitoring and Long Term Management

Long-term monitoring applicable to the project would be conducted by either Oxford Mining Company and/or a selected qualified individual. Monitoring plans would be submitted to the Louisville District USACE using a yearly reporting frequency which should be sufficient for an inspector to determine compliance with performance standards and any identifiable remedial actions. Monitoring on the established areas would be conducted for a period of five years or until release from monitoring from the USACE to ensure the success of the project meets performance standards.

J. Monitoring Plan

Defined in 33 CFR 332.2, performance standards will be consistent with the objective of the compensatory mitigation. During the monitoring phase, photo points and representative biological monitoring points will be at fixed locations. For wetland surveys there will be one dedicated station per wetland acre (5 total). For stream surveys one RBP assessment will be conducted for each ephemeral and intermittent stream based on data accumulated over the entirety of the reach. Additionally, representative intermittent stream cross sections will have a permanently monitored location. A map will be developed post construction to establish locations for fixed photo points, and monitored cross sections. Monitoring of each mitigation site would be conducted for a period of 5 years (unless KDSMRE releases the bond and subsequent USACE release from monitoring earlier). Mitigation site monitoring (biannually) and reporting (annually) would be conducted during the 5 year period. Monitoring reports would contain sufficient information and detail to assess progress towards meeting stated performance standards. Monitoring reports submitted will not exceed 10 pages in length. The first page would consists of ten specific items of information as follows: 1) Corps permit number; 2) name and contact information of permittee and consultant; 3) name and party responsible for conducting monitoring and date the inspection was conducted; 4) a summary paragraph defining the purpose of the approved project, acreage and type of aquatic resources impacted, and mitigation acreage and type of aquatic resources authorized to compensate for the aquatic impacts; 5) written description on the location and any identifiable landmarks of the compensatory mitigation project including information to locate the site perimeter; 6) directions to the mitigation sites; 7) dates that compensatory mitigation commenced and/or was complete; 8) short statement on whether the performance standards are being met; 9) dates of any recent corrective or maintenance activities conducted since the previous report submission; and 10) specific recommendations for any additional corrective or remedial actions. Page one will also include a list of the monitoring requirements and performance standards, as specified in the approved mitigation plan and special conditions of the permit, and evaluate whether the compensatory mitigation project site is successfully achieving the approved performance standards. Summary data would comprise of a maximum of four pages of the monitoring report. Summary data would be used to substantiate the success or the potential challenges that would be associated with the compensatory mitigation project. Photo documentation may be submitted to support findings and recommendations that are referenced within the monitoring report. Photos must fit on a standard 8.5” X 11” piece of paper as well as be dated and clearly labeled with directions to the location from which the photo was taken. Photos must also be submitted with a corresponding map showing the site’s location. A maximum of three pages of maps would be provided to show location of compensatory mitigation site relative to other landscape features, habitat types, location of photographic reference points, transect, sampling data points, and/or other features pertinent to the mitigation plan. Submitted maps must clearly delineate mitigation site perimeters. Each map or diagram must fit on a standard 8.5” x 11” piece of paper and include a legend and location of any photos submitted. Conclusions of reports must not exceed a one page maximum. The conclusion would include a general statement describing the condition of the compensatory mitigation project. If performance standards are not being met, a brief

explanation of the difficulties and potential remedial actions proposed by the permittee, including a timetable of the corrective action that will be performed would be provided.

K. Contingency Plan

It is anticipated that all proposed mitigation would be successful and the applicant is obligated to meet KDSMRE standards and the USACE standards with all mitigation efforts proposed in this application. The applicant will act, in a timely manner, on any un-anticipated difficulties that may arise with the mitigation plan. The project(s) would be considered successful when stated so by the USACE. Although it is highly anticipated that the planned onsite mitigation would be successful, should it fail, other stream reaches or wetlands may be substituted for or added to the mitigation plan. In this event a revised mitigation plan would be composed. As a last resort, the use of In-Lieu fee payment would be implemented.

11. Socioeconomic Analysis

A. Demographics

The social setting of the proposed project is in Muhlenberg County west of Greenville Kentucky. The following **Table 20** contains historical population data starting from 1900 up to the most recent populations of Muhlenberg County, Kentucky according to the U.S. Census Bureau that is conducted every ten years; for a more visual demonstration of this data reference **Figure 5**.

Table 20: Historical populations for Muhlenberg County, Kentucky according to the U.S. Census Bureau every ten years.

Geographic Area	1900 Census	1910 Census	1920 Census	1930 Census	1940 Census	1950 Census	1960 Census	1970 Census	1980 Census	1990 Census	2000 Census	2010 Census
Muhlenberg County Kentucky	20,741	28,598	33,353	37,784	37,554	32,501	27,791	27,537	32,238	31,318	31,839	31,499

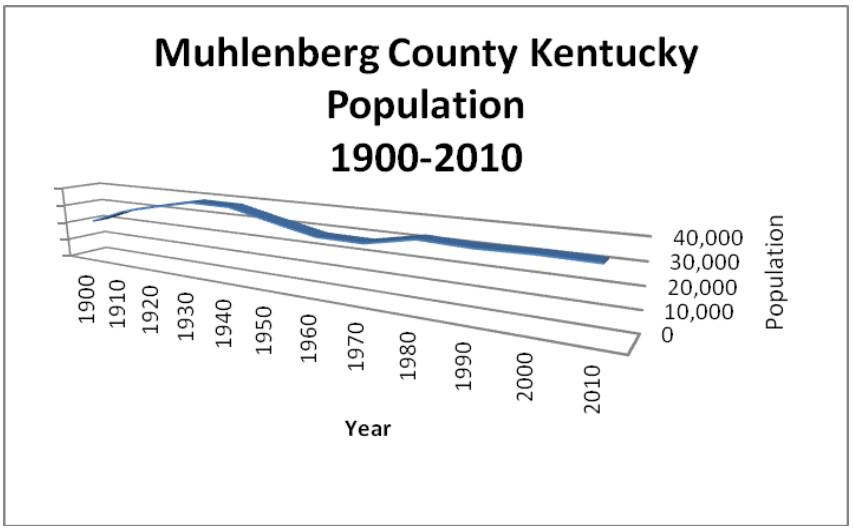

Figure 5: Historical populations for Muhlenberg County, Kentucky according to the U.S. Census Bureau every ten years.

B. Income and Poverty Level

The current labor force in Muhlenberg County is 13,451, with 12,240 employed and 1,211 unemployed as of November 2011 (9% unemployment rate) (Workforce Kentucky 2011). The average unemployment rate for Muhlenberg County from January 2011-November 2011 is 10.71% (**Figure 6**).

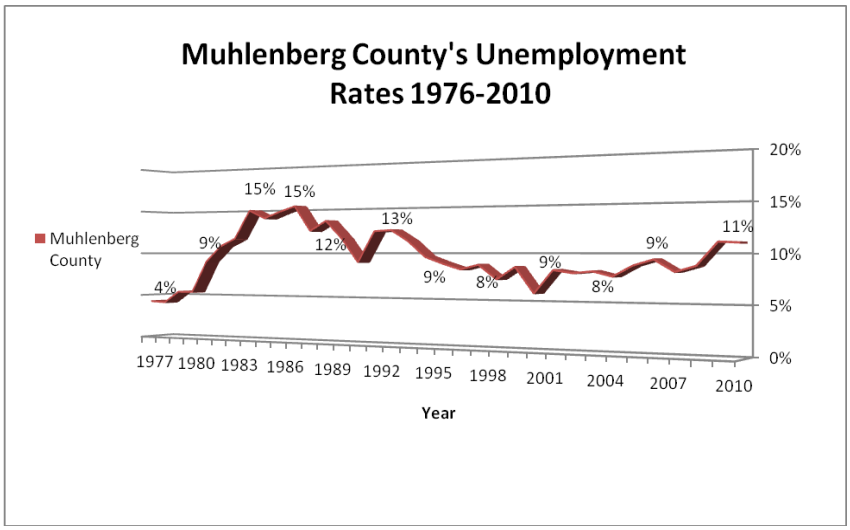

Figure 6: Muhlenberg County's unemployment rates based on Labor Force Statistics (LAUS) (Workforce Kentucky 2011).

Median household income in Muhlenberg County, KY has increased from $29,787 in 2000 to $31,141 in 2004 (4.5% increase) in comparison with the state of Kentucky which has increased from $41,990 to $44,334 (5.6%) (Workforce Kentucky 2011) (**Table 21**) (**Figure 7**).

Table 21: Annual median household income for the state of Kentucky and Muhlenberg County of Kentucky from 2000-2004 based on LAUS (Workforce Kentucky 2011).

Year	Period	Area	Source	Income Type	Income
2000	Annual	Kentucky	Census	Median household income	$35,150
2001	Annual	Kentucky	Census	Median household income	$35,977
2002	Annual	Kentucky	Census	Median household income	$35,875
2003	Annual	Kentucky	Census	Median household income	$36,663
2004	Annual	Kentucky	Census	Median household income	$37,046

Year	Period	Area	Income Source	Income Type	Income
2000	Annual	Muhlenberg County	Census	Median household income	$29,787
2001	Annual	Muhlenberg County	Census	Median household income	$29,241
2002	Annual	Muhlenberg County	Census	Median household income	$29,568
2003	Annual	Muhlenberg County	Census	Median household income	$30,458
2004	Annual	Muhlenberg County	Census	Median household income	$31,141

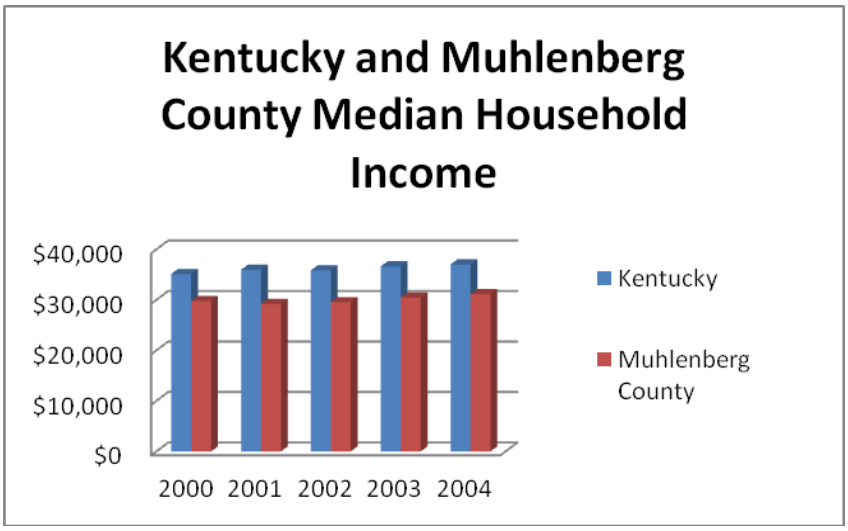

Figure 7: Annual median household income for the state of Kentucky versus Muhlenberg County of Kentucky from 2000-2004 based on LAUS (Workforce Kentucky 2011).

According to the 2010 U.S. Census, for Muhlenberg County Kentucky, 21% of the population was below the poverty line. This percentage was higher than the rate found for the state of Kentucky, which was 18.9% below the poverty line (U.S. Census Bureau 2011).

It is estimated that this proposed project would facilitate in the employment of as many as 82 employees at the peak of operation. Thirty-two of 82 employees are anticipated to start out from existing operations, and the remaining 50 employees would be new hires. The 50 new hires would drop the unemployment rate of November 2011 at 9% down to 8.6%. A study by the Kentucky Cabinet for Economic Development quantified the overall economic impact of certain jobs in the state (Kentucky Cabinet for Economic Development 2011). The study determined that the overall impact of gaining or losing jobs consists of direct, indirect, and induced effects. Direct effects represent *"the impacts (e.g., change in employment), for the expenditures and/or production values specified* as *direct final demand changes."* Indirect effects are defined as *"the impacts (e.g., change in employment) caused by the iteration* of *industries purchasing from industries resulting from direct final demand changes."* These represent *"impacts (e.g., change in employment) on all local industries caused by the expenditures* of *new household income generated by the direct and indirect effects resulting from direct final demand changes."* Induced direct economic effects may also reflect government or investment gains. The study concluded that the direct economic impact for each mining job is $146,490 per year. According to the study the indirect and induced economic effects are $45,480 and $37,080 per year respectively. Total economic effect of each mining job gained or lost is, therefore $229,050 annually. On this basis, the economic effect of the 82 jobs at proposed project is approximately $19 million annually (Kentucky Cabinet for Economic Development 2011). Not only would these jobs create a boost in the economy of the area they would also increase estimated jobs and state and local taxes as well. This study concluded that

for every one mining job created, 0.47 indirect jobs and 0.57 induced jobs were created. Therefore in addition to the 82 jobs created for the proposed project another 84 jobs would result in the surrounding area thus giving an additional boost to the economy of Muhlenberg County, Kentucky.

12. List of Preparers

Preparers	Company
Mr. Josh Howard	Aquatic Resources Management LLC
Mr. Nick Baker	Aquatic Resources Management LLC
Mr. Tony Miller	Aquatic Resources Management LLC
Mrs. Rebecca Ramsey	Aquatic Resources Management LLC
Mr. Jason Butler	Aquatic Resources Management LLC
Mrs. Robin Bernal	Aquatic Resources Management LLC
Ms. Courtney Rockafellow	Aquatic Resources Management LLC
Mr. Dale Davis	Environmental Resources Management Consulting Company

13. List of Agencies, Organizations, & Person to Whom Copies of the Statement are sent

Dr. John Gassett
Ky. Dept. of Fish and Wildlife Resources
#1 Game Farm Road
Frankfort, KY 40601

Mr. Virgil Lee Andrew
U.S. Fish and Wildlife Service (KY)
3761 Georgetown Road
Frankfort, KY 40601

Mr. Eric Somerville
Wetlands Regulatory Section
USEPA, Region IV
Atlanta Federal Center
61 Forsyth Street, SW
Atlanta, GA 30303

Mr. Allen Luttrell
KDNR/Division of Permits
#2 Hudson Hollow, US 127 South
Frankfort, Kentucky 40601

Ms. Danita Lasage
Division of Mine Permits
#2 Hudson Hollow
Frankfort, Kentucky 40601

Mr. Mark Dennen
Kentucky Heritage Council
300 Washington Street
Frankfort KY, 40601

Mr. Joseph Blackburn
OSM
2675 Regency Road
Lexington, Kentucky 40503

14. Bibliography

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15. Appendix

Appendix A Approved Jurisdictional Determination Letter

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, LOUISVILLE
CORPS OF ENGINEERS
NEWBURGH REGULATORY OFFICE
P.O. Box 489
NEWBURGH, INDIANA 47629-0489
FAX: (812) 858-2678
http://www.lrl.usace.army.mil

January 3, 2012

Operations Division
Regulatory Branch (West)
ID No. LRL-2011-348-dah

Sean Jones
Oxford Mining Company-Kentucky, LLC
3060 Cleaton Road
Central City, KY 42330

Dear Mr. Jones:

This is in regard to the report you submitted for the Oxford Mining property located west of Greenville in Muhlenberg County, Kentucky. Representatives from this office inspected the site on June 16, 2011 and September 28, 2011. Based on a review of the submitted information, the report: Wetland and Stream Characterization Geibel Property, Muhlenberg County, Kentucky November 2011, and the field visits, we have determined Wetland 3 and Pond 6 are isolated resources and would not be considered jurisdictional and under the Corps' authority. The remaining twenty-three (23) wetlands, seven (7) ponds and sixty-three (63) streams are considered to be "waters of the United States." This determination is based on the presence of (1) a navigable waterway; (2) wetlands adjacent to navigable or interstate waters, or that eventually drain or flow into navigable or interstate waters through a tributary system that may include man-made conveyances such as ditches or channelized streams; and (3) one or more tributaries (stream channels, man-made conveyances, lakes, ponds, rivers) that eventually drain or flow into navigable or interstate waters. This jurisdictional determination is valid for a period of five (5) years from the date of this letter unless new information warrants revision of the determination before the expiration date.

This letter contains an approved jurisdictional determination for your subject site. If you object to this determination, you may request an administrative appeal under Corps regulations at 33 CFR Part 331. Enclosed you will find a Notification of Appeal Process (NAP) fact sheet and Request for Appeal (RFA) form. If you request to appeal this determination you must submit a completed RFA form to the Lakes and Rivers Division Office at the following address:

U.S. Army Engineer Division,
Great Lakes and Ohio River
550 Main Street - Room 10032
Cincinnati, Ohio 45202-3222
(513) 684-6212

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 CFR Part 331.5, and that it has been received by the Division Office within 60 days of the date of the NAP. Should you decide to submit an RFA form, it must be received at the above address by March 3, 2012.

It is not necessary to submit an RFA form to the Division office if you do not object to the

determination in this letter.

If you have any questions concerning this matter, please contact this office at the above address, ATTN: CELRL-OP-FW, or by calling Devetta Hill at 812.842.0250. Any correspondence should reference the assigned ID Number LRL-2011-348-dah.

Sincerely,

ORIGINAL SIGNED

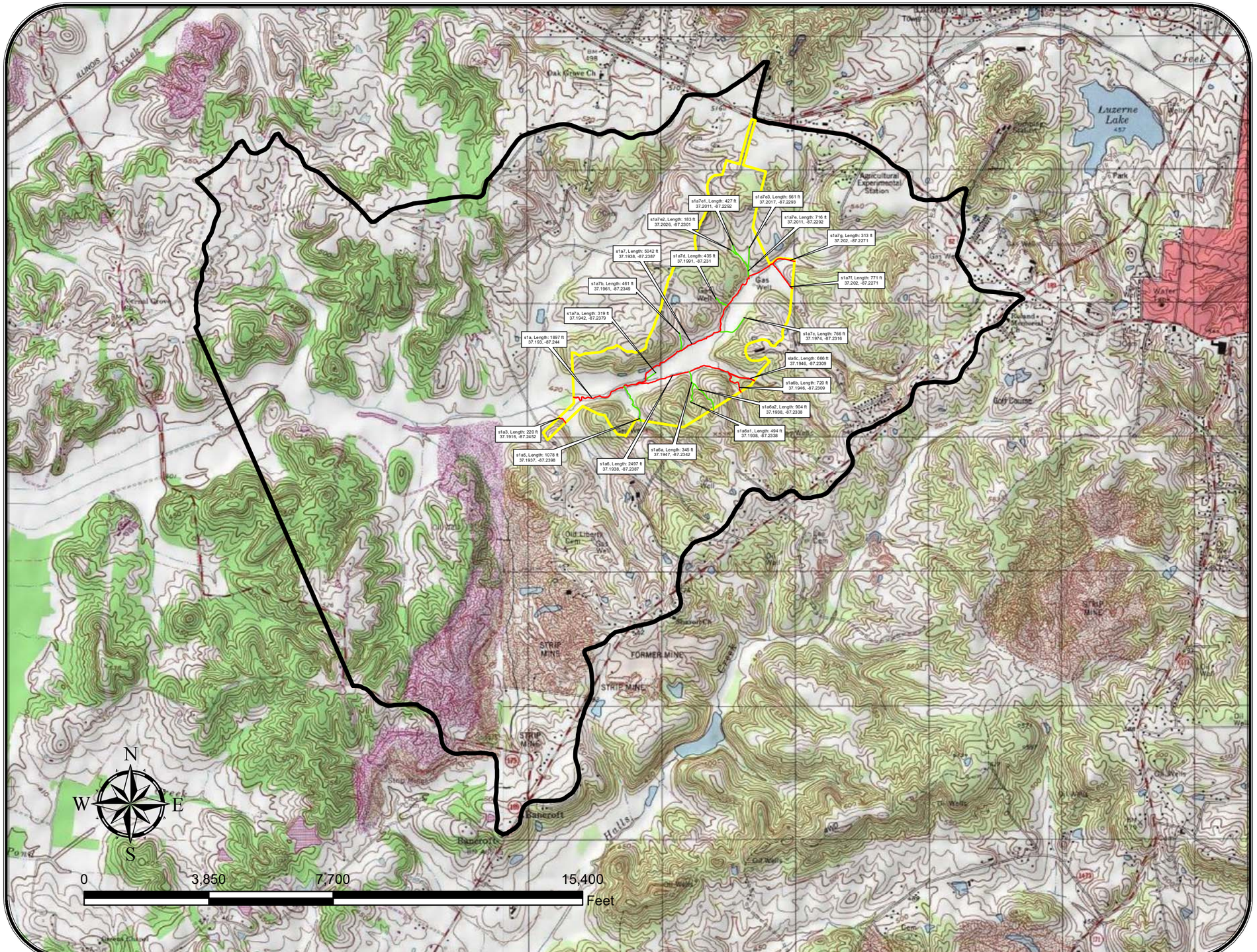
Devetta Hill
Project Manager
Newburgh

Enclosure

dah/fw/concurrence.doc

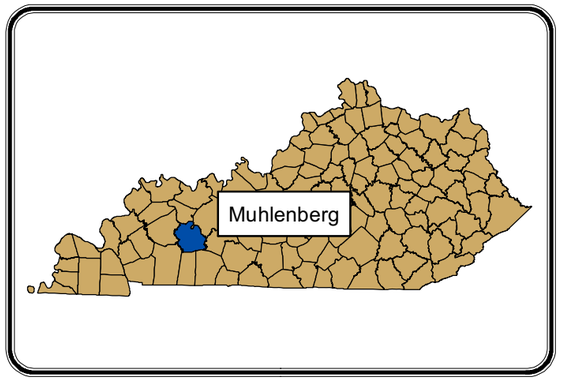
Appendix B Jurisdictional Waters Location Topo Maps

Topo Location Map



Legend

- Ephemeral
- Intermittent
- Permit Boundary
- Boundary Area



Oxford Mining Company

889-0130

Oxford Resource Partners

Reliability Matters

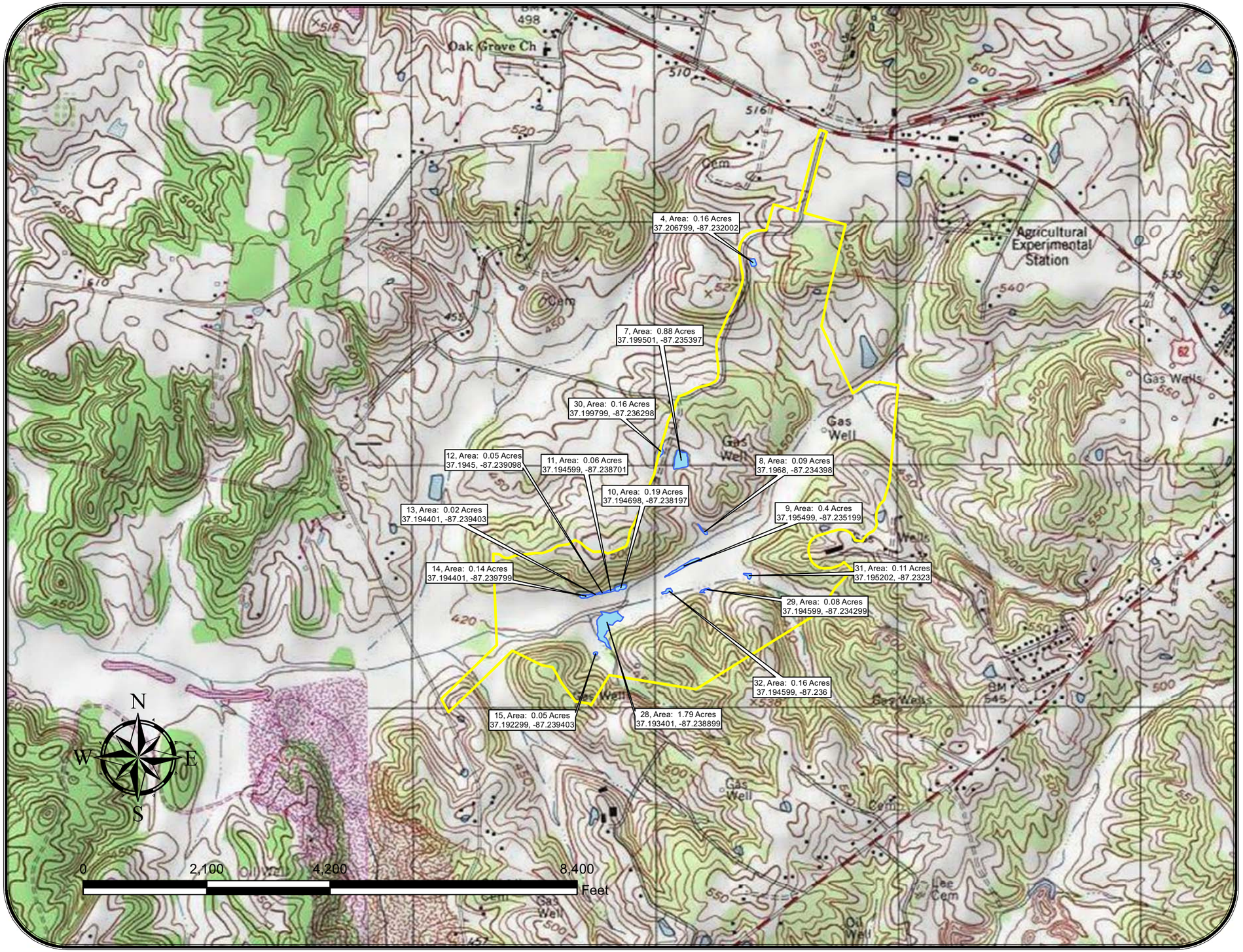
P.O. Box 427, 544 Chestnut Street, Coshoctin, OH 43812

Date: 3/23/2012 Drawn By: CJR

ARM Project #: 080-502

Aquatic Resources Management
2265 Harrodsburg Rd., Suite 210
Lexington, KY 40504
(859) 388-9595

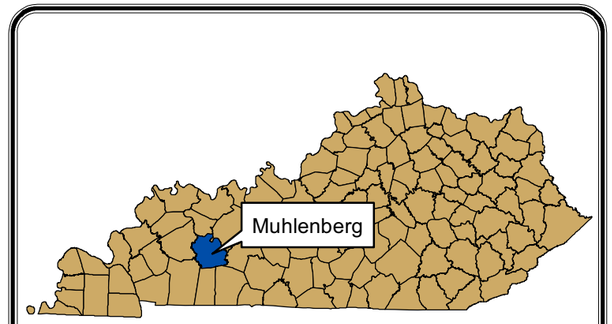
Topo Location Map



Legend

Wetland

Permit Boundary



Oxford Mining Company

889-0130

Oxford Resource Partners

Reliability Matters

P.O. Box 427, 544 Chestnut Street, Coshoctin, OH 43812

Date: 2/7/2012 Drawn By: CJR

ARM Project #: 080-502

Aquatic Resources Management
2265 Harrodsburg Rd., Suite 210
Lexington, KY 40504
(859) 388-9595

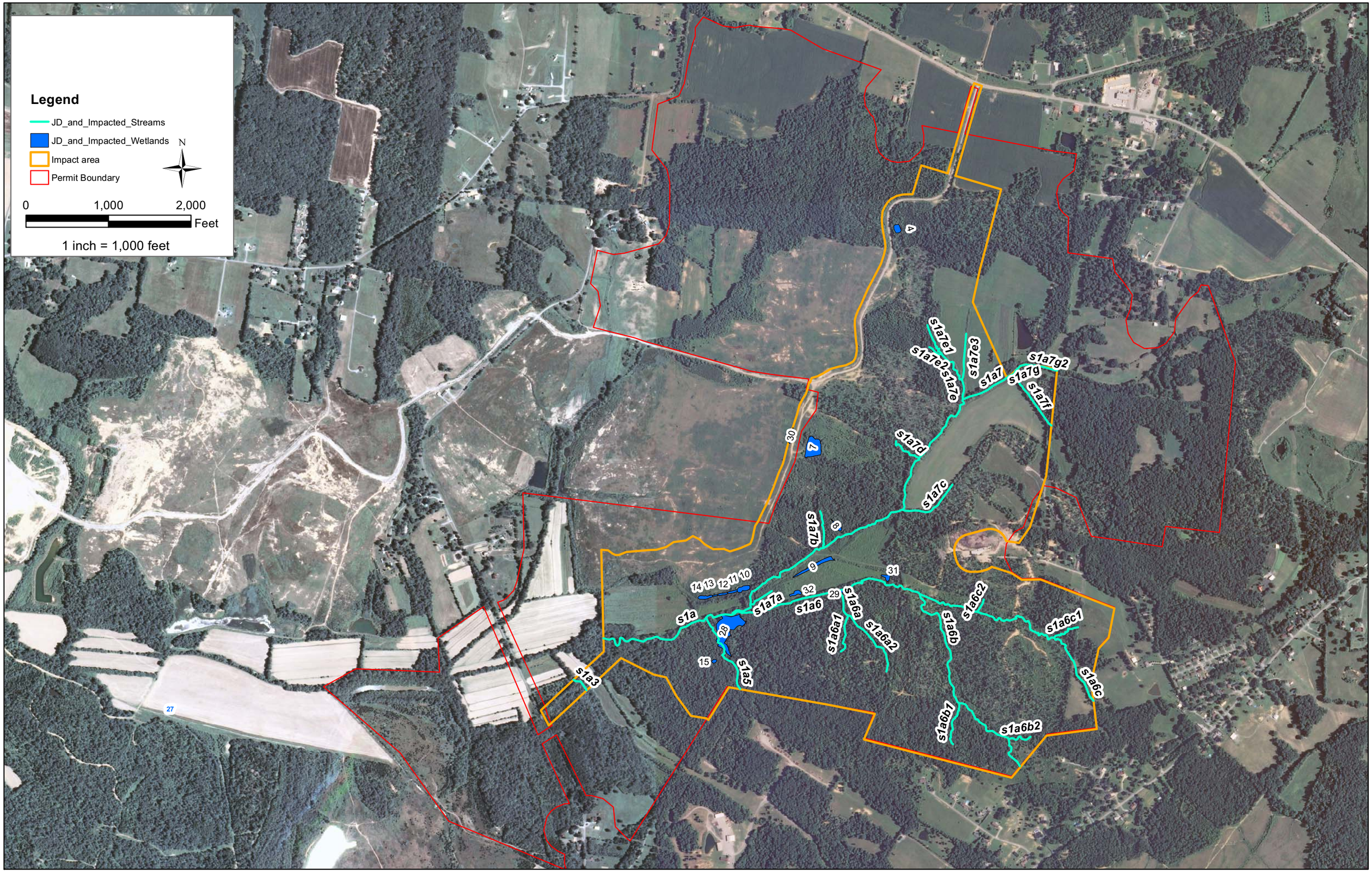
Table 3. Summary of delineated wetlands and deepwater habitats, Giebel Area, Muhlenberg County, KY

*ID #	Cowardin Classification	Acres	Impacted	Jurisdictional	Final Impact Acres
1	PSS	0.14	No	Yes	0
2	PFO	0.01	No	Yes	0
3	PEM	0.22	Yes	No	NA
4	Pond	0.16	Yes	Yes	0.16
5	Pond	1.24	No	Yes	0
6	Pond	0.00	Yes	No	NA
7	Pond	0.88	Yes	Yes	0.88
8	PSS	0.09	Yes	Yes	0.09
9	PSS	0.40	Yes	Yes	0.4
10	PEM	0.19	Yes	Yes	0.19
11	PSS	0.06	Yes	Yes	0.06
12	PEM	0.05	Yes	Yes	0.05
13	PSS	0.02	Yes	Yes	0.02
14	PEM	0.14	Yes	Yes	0.14
15	PEM	0.05	Yes	Yes	0.05
16	Pond	0.14	No	Yes	0
17	PEM	0.18	No	Yes	0
18	PSS	0.02	No	Yes	0
19	PEM	0.04	No	Yes	0
20	Pond	0.14	No	Yes	0
21	Pond	0.03	No	Yes	0
22	PSS	0.01	No	Yes	0
23	PSS	0.01	No	Yes	0
24	PFO	0.08	No	Yes	0
25	PEM	0.09	No	Yes	0
26	Pond	1.41	No	Yes	0
27	PEM	0.15	No	Yes	0
28	PEM	1.80	Yes	Yes	1.79
29	PEM	0.08	Yes	Yes	0.08
30	PEM	0.16	Yes	Yes	0.16
31	PSS	0.11	Yes	Yes	0.11
32	PEM	0.16	Yes	Yes	0.16
TOTAL		**8.27**			**4.34**
Pond		4.01			1.09
Total PEM		3.31			2.57
Total PSS		0.86			0.68
Total PFO		0.09			0.00

[redacted]le 4. [redacted]mary [redacted]eam [redacted]el [redacted] Area [redacted]enbe [redacted]unty [redacted]

Stream ID	Rosgen Classification (Level II)	Bed materials	Strahler Stream Order	Flow Regime	Bankfull Width (ft)	Bankfull Depth (ft)	Width Depth Ratio	Floodprone Area Width	Entrench Ratio	Terrace Width (ft)	Terrace Depth (ft)	Sinuosity	Watershed Size (Acres)	Staight length	Linear Feet	Final Impact Feet
s1	G4	gravel	5	Intermittent	22.4	1.9	11.8	26.5	1.2	30.8	7.7	1.1	3061	1469	1566	0
s1a	G4	gravel	4	Intermittent	18.6	1.7	10.7	21.2	1.1	27.5	6.2	1.1	1655	3348	3835	1896.5
s1a1	B6	silt	2	Ephemeral	5.0	0.9	5.5	9.7	2.0	15.7	3.1	1.0	36	1685	1761	0
s1a1a	B6	silt	1	Ephemeral	3.1	0.7	4.4	4.5	1.5	11.5	3.3	1.1	4	108	114	0
s1a1b	B6	silt	1	Ephemeral	3.8	0.6	6.3	7.0	1.8	16.8	3.4	1.1	17	552	613	0
s1a2	B6	silt	1	Ephemeral	2.1	0.9	2.3	4.6	2.2	11.7	2.4	1.0	6	217	218	0
s1a3	G4	gravel	3	Intermittent	14.7	1.5	10.1	17.9	1.2	22.4	5.1	1.1	262	1504	1645	220
s1a3a	B6	silt	1	Ephemeral	2.8	0.5	5.6	4.4	1.6	10.0	2.2	1.3	5	115	151	0
s1a3b	G4	gravel	1	Ephemeral	10.9	1.4	7.6	13.5	1.2	16.3	5.1	1.0	112	689	712	0
s1a3c	G4	gravel	1	Ephemeral	5.4	0.8	6.5	7.3	1.3	9.1	3.3	1.0	115	589	606	0
s1a4	B6	silt	1	Ephemeral	2.0	0.3	6.7	3.1	1.6	8.7	2.0	1.0	10	187	188	0
s1a5	B5	sand	2	Ephemeral	4.5	0.7	6.9	6.2	1.4	11.8	1.9	1.2	91	914	1078	1077.9
s1a6	G4	gravel	3	Intermittent	7.3	0.8	8.8	11.3	1.5	17.4	4.1	1.1	267	2310	2497	2497
s1a6a	B5	sand	2	Ephemeral	2.8	0.6	4.7	5.5	2.0	9.5	3.5	1.1	26	325	345	345
s1a6a1	B6	silt	1	Ephemeral	3.5	0.5	7.0	6.0	1.7	10.0	4.0	1.1	11	445	494	494
s1a6a2	B6	silt	1	Ephemeral	3.3	0.6	6.0	5.8	1.8	13.5	2.3	1.1	11	829	904	904
s1a6b	B5	sand	2	Intermittent	8.1	0.9	8.8	11.9	1.5	15.8	3.4	1.2	116	2456	2879	2879
s1a6b1	B4	gravel	1	Ephemeral	3.9	0.8	4.9	6.1	1.6	8.7	2.8	1.1	17	498	549	549
s1a6b2	B4	gravel	1	Ephemeral	1.6	0.6	2.7	2.8	1.8	6.0	1.6	1.2	20	258	322	322
s1a6c	B6	silt	2	Intermittent	10.1	1.3	7.7	14.1	1.4	20.5	3.9	1.1	94	2627	2998	2998
s1a6c1	B6	silt	1	Ephemeral	1.6	0.4	4.0	2.3	1.4	4.8	1.4	1.2	7	320	371	370
s1a6c2	B6	silt	1	Ephemeral	1.5	0.3	5.0	3.2	2.1	3.2	0.6	1.0	9	170	169	168.9
s1a7	G4	gravel	3	Intermittent	14.4	1.7	8.3	18.1	1.3	24.7	5.6	1.1	929	4650	5042	5042.3
s1a7a	E4	gravel	1	Ephemeral	3.8	1.1	3.5	10.4	2.7	22.0	6.2	1.1	4	287	319	319
s1a7b	B5	sand	1	Ephemeral	4.6	1.4	3.3	8.8	1.9	14.8	5.7	1.0	25	445	461	461.3
s1a7c	G6	silt	1	Ephemeral	4.6	0.8	5.8	5.6	1.2	10.9	3.2	1.0	39	732	766	766.4
s1a7d	B6	silt	1	Ephemeral	2.9	0.7	4.1	4.3	1.5	13.0	5.3	1.3	27	343	435	435.1
s1a7e	B6	silt	2	Ephemeral	5.5	1.0	5.5	8.1	1.5	10.2	4.2	1.2	87	604	716	715.8
s1a7e1	B6	silt	1	Ephemeral	3.0	0.5	6.2	5.5	1.8	8.4	2.0	1.1	37	390	427	426.6
s1a7e2	B6	silt	1	Ephemeral	2.4	0.4	6.0	5.0	2.1	7.6	1.5	1.1	14	160	183	183.1
s1a7e3	B6	silt	1	Ephemeral	2.0	0.3	6.7	5.5	2.8	5.5	0.6	1.0	25	559	561	560.8
s1a7f	G4	gravel	2	Intermittent	8.8	1.1	8.0	11.9	1.4	18.1	3.8	1.1	290	2429	2590	770.8
s1a7f1	B6	silt	1	Ephemeral	4.0	0.6	6.7	6.0	1.5	12.3	2.3	1.1	24	924	1057	0
s1a7f2	B6	silt	1	Ephemeral	3.1	0.5	6.2	4.9	1.6	8.0	2.9	1.0	13	111	111	0
s1a7g	G4	gravel	3	Intermittent	13.1	0.9	14.5	16.2	1.2	23.8	4.2	1.1	374	284	313	313
s1a7g1	G4	gravel	3	Intermittent	8.7	1.2	7.1	10.5	1.2	12.8	3.8	1.0	187	1144	1175	0
s1a7g1a	B4	gravel	2	Ephemeral	5.3	0.7	7.9	8.5	1.6	12.1	3.0	1.1	46	1390	1544	0
s1a7g1a1	B4	gravel	1	Ephemeral	4.0	0.6	6.7	6.1	1.5	9.6	3.6	1.2	6	229	273	0
s1a7g1a2	B4	gravel	1	Ephemeral	2.3	0.7	3.3	6.4	2.8	8.8	2.0	1.1	17	230	248	0
s1a7g1a3	B4	gravel	1	Ephemeral	2.2	0.2	11.0	3.7	1.7	8.6	1.5	1.1	5	138	145	0
s1a7g1b	B4	gravel	2	Intermittent	6.7	1.0	7.1	9.0	1.3	15.7	3.3	1.1	101	347	372	0
s1a7g1c	B6	silt	1	Ephemeral	3.1	0.8	3.9	4.3	1.4	8.2	2.5	1.2	15	387	451	0
s1a7g2	B4	gravel	2	Intermittent	9.1	1.1	8.2	12.7	1.4	17.0	4.3	1.1	185	2511	2654	269
s1a7g2a	G6	silt	1	Ephemeral	3.0	0.5	5.9	3.6	1.2	6.0	1.7	1.0	32	806	838	0

Stream ID	Rosgen Classification (Level II)	Bed materials	Strahler Stream Order	Flow Regime	Bankfull Width (ft)	Bankfull Depth (ft)	Width Depth Ratio	Floodprone Area Width	Entrench Ratio	Terrace Width (ft)	Terrace Depth (ft)	Sinuosity	Watershed Size (Acres)	Staight length	Linear Feet	Final Impact Feet
s1a7g2b	G4	gravel	1	Ephemeral	3.8	0.4	9.5	5.4	1.4	9.9	2.5	1.2	9	164	189	0
s1b	G4	gravel	4	Intermittent	12.4	2.1	5.9	15.7	1.3	18.8	7.1	1.0	783	2422	2523	0
s1b1	B6	silt	1	Ephemeral	3.6	1.2	3.0	6.9	1.9	12.1	5.5	1.0	41	368	370	0
s1b2	G6	silt	1	Ephemeral	4.6	0.8	5.8	5.0	1.1	7.0	3.4	1.0	66	151	155	0
s1b3	G4	gravel	3	Intermittent	7.9	0.8	9.9	9.7	1.2	13.7	2.9	1.1	272	3002	3429	0
s1b3a	B6	silt	1	Ephemeral	3.7	0.6	6.2	5.9	1.6	9.8	1.8	1.1	19	520	565	0
s1b3b	B6	silt	2	Ephemeral	2.4	0.7	3.5	3.6	1.5	7.1	2.0	1.1	33	1301	1416	0
s1b3b1	B6	silt	1	Ephemeral	2.1	0.6	3.5	3.6	1.7	3.6	1.2	1.0	19	794	824	0
s1b3b2	B4	gravel	1	Ephemeral	5.5	0.6	9.2	8.3	1.5	28.0	3.6	1.2	11.5	362	451	0
s1b3c	B4	gravel	1	Ephemeral	3.0	0.5	6.0	5.3	1.8	6.8	1.2	1.2	15	689	794	0
s1b3d	B6	silt	2	Ephemeral	3.7	0.7	5.3	7.2	2.0	15.0	3.5	1.4	36	833	1133	0
s1b3d1	B6	silt	1	Ephemeral	2.5	0.5	5.0	4.9	2.0	8.7	2.0	1.0	5	61	64	0
s1b3d2	B6	silt	1	Ephemeral	2.9	0.6	4.8	4.9	1.7	5.2	1.6	1.2	15	430	495	0
s1b3e	B4	gravel	2	Ephemeral	6.4	0.9	7.1	9.6	1.5	13.8	3.0	1.2	56	1212	1406	0
s1b3e1	B6	silt	1	Ephemeral	3.2	0.6	5.3	6.7	2.1	12.0	2.0	1.4	3	183	260	0
s1b3e2	B6	silt	1	Ephemeral	2.4	0.7	3.4	4.0	1.7	9.8	1.8	1.0	8	95	98	0
s1b4	B6	silt	3	Intermittent	3.0	3.0	1.0	4.0	1.3	13.0	5.0	1.0	106	639	644	0
s1b4a	B6	silt	2	Ephemeral	1.5	1.0	1.5	2.0	1.3	5.0	3.0	1.0	52	306	312	0
s1b4b	B6	silt	2	Ephemeral	1.5	1.0	1.5	2.0	1.3	5.0	3.0	1.3	39	174	221	0
Totals															**60045**	**24985**
Total Ephemeral				**48**											**25883**	**8099**
Total Intermittent				**15**											**34162**	**16886**


Legend
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s1a6b
s1a6c2
s1a6c1
s1a6c
s1a6b1
s1a6b2
s1a5
s1a3
4
7
8
9
10
11
12
13
14
15
27
28
29
30
31
32

Appendix D External Agency Correspondence

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Table of Contents

I. Bat Survey Conducted by Copperhead Environmental Consulting, INC
II. USFWS Bat Survey Concurrence Letter (June 21 2011)
III. SHPO Letter regarding Phase I Cultural Resource Investigation (July 19 2011)
IV. DMP Letter regarding Phase I Cultural Resource Investigation (July 28 2011)
V. SHPO Letter regarding Phase II Testing (October 28 2011)
VI. DMP Letter regarding Phase II Testing (November 8 2011)
VII. SHPO Letter regarding Phase III Data Recovery (October 28 2011)
VIII. Final Report Phase II Testing (September 11 2011)
IX. Application for Permit to Construct Across or Along a Stream and/or Water Quality Certification
X. KDSMRE Technically Acceptable or Issuance Letter

COPPERHEAD
ENVIRONMENTAL CONSULTING

27 June 2011

Sean Jones
3060 Cleaton Road
Central City, KY 42330

Subject: **Bat Survey on Geibel permit #889-0130 for Oxford Resource Partners, Muhlenberg County, Kentucky**

Dear Mr. Jones,

Copperhead Environmental Consulting, Inc. (dba: Copperhead Consulting) is pleased to submit this final report package for completion of a mist netting bat survey for a proposed mining operation at the Geibel property. Included in the report is the concurrence letter from USFWS Frankfort Field Office accepting our survey and concurring that mining activities will not likely affect Indiana bats. It is our desire to provide a quality product resulting from hard work and dedication. We trust that the survey was sufficient to meet your needs.

We hope that this package provides the detailed information that you require for your review. If you have any questions regarding this submittal or need additional information, please do not hesitate to contact us.

Sincerely,

Piper Roby
Biologist / Project Manager

COPPERHEAD ENVIRONMENTAL CONSULTING, INC.
P.O. BOX 73 ■ 11641 RICHMOND RD. ■ PAINT LICK, KENTUCKY, 40461
(859) 925-9012 OFFICE (859) 925-9816 FAX

www.copperheadconsulting.com

BAT SURVEY ON GEIBEL PERMIT #889-0130 FOR OXFORD RESOURCE PARTNERS

Muhlenberg County, Kentucky | 2011

Project Number 194.03

COPPERHEAD
ENVIRONMENTAL CONSULTING

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Bat Survey on Geibel Permit #889-0130 for Oxford Resource Partners, Muhlenberg County, Kentucky, June 2011

Prepared for:

Sean Jones
3060 Cleaton Road
Central City, KY 42330

Prepared by:

Piper Roby
P.O. Box 73
Paint Lick, KY 40461

June 27, 2011

Table of Contents

Abstract……i

Introduction……1

Materials and Methods……1

Mist Net Locations……1

Acoustical Sampling……..3

White-Nose Syndrome Protocol……..3

Results……4

Bat Capture……4

Acoustic Analysis……4

Discussion……6

List of Tables

Table 1. Location of mist net sites surveyed for bats on the Geibel permit #889-0130 Oxford Resources Partners, Muhlenberg County, KY, 2011……1

Table 2. Acoustic sites surveyed using Anabat II detectors on Geibel permit #889-0130 for Oxford Resources Partners, Muhlenberg County, KY, 2011. Filters used included Noise and ID1. GUI analysis determined probability of Indiana bat call detection……3

Table 3. Bat capture summary during a survey on the Geibel permit #889-0130 Oxford Resources Partners, Muhlenberg County, KY, 2011……4

Table 4. Bat species documented at each site during a survey on the Geibel permit #889-0130 Oxford Resources Partners, Muhlenberg County, KY, 2011……5

Table 5. Results of acoustic data collected in conjunction with mist netting on the Geibel permit #889-0130 for Oxford Resources Partners, Muhlenberg County, KY, 2011……5