APPENDIX A

PUBLIC SCOPING

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ATTACHMENT 1

NOTICE OF INTENT TO PREPARE DRAFT EIS

U.S. Department of Justice

Federal Bureau of Prisons

Washington, DC 20534

September 21, 2022

Office of the Federal Register
National Archives and Records Administration
800 North Capitol Street, NW, Suite 700
Washington, DC 20001

Attn: Oliver Potts, Director, Office of the Federal Register

Dear Mr. Potts:

Enclosed is a signed electronic copy of a Notice of Intent to Prepare a Draft Environmental Impact Statement (DEIS) concerning a proposal by the U.S. Department of Justice, Federal Bureau of Prisons, to develop a new Federal Correctional Institution and Federal Prison Camp in Letcher County, Kentucky. The DEIS is being prepared to fulfill the requirements of the National Environmental Policy Act of 1969, as amended.

We are requesting to have the Notice of Intent published in the Federal Register on Wednesday, September 28, 2022. If you have any questions, or the requested publication date cannot be met, please contact me at (202) 451-7046 / Email: kshudson@bop.gov. We appreciate your assistance in this matter and look forward to the publication of this important notice.

Sincerely,

Kimberly S. Hudson
Site Selection Specialist
Construction and Environmental Review Branch

Enclosure

DEPARTMENT OF JUSTICE

Federal Bureau of Prisons

Notice of Intent to Prepare a Draft Environmental Impact Statement for the Proposed Federal Correctional Institution and Federal Prison Camp in Letcher County, Kentucky

AGENCY: Federal Bureau of Prisons, U.S. Department of Justice
ACTION: Notice of Intent to Prepare a Draft Environmental Impact Statement for the Proposed Federal Correctional Institution and Federal Prison Camp in Letcher County, Kentucky

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SUMMARY: Pursuant to the National Environmental Policy Act (NEPA) of 1969, as implemented by the Council on Environmental Quality and Federal Bureau of Prisons (Bureau) regulations, the Bureau announces its intent to prepare a Draft Environmental Impact Statement (DEIS) for the ''Proposed Federal Correctional Institution and Federal Prison Camp Letcher County, Kentucky.''

Background

The Bureau's mission is to protect society by confining offenders in the controlled environments of prisons and community-based facilities that are safe, humane, cost-efficient, appropriately secure, and provide work and other self-improvement opportunities to assist offenders in becoming law-abiding citizens. A growing challenge to successfully performing that mission is the increasing number of federal correctional facilities and supporting infrastructure that were constructed over 50 years ago (the approximate design life of such facilities), resulting in a continuous need to maintain existing facilities, and when necessary, develop new facilities and infrastructure.

To address the need for modern, efficient, and cost-effective institutions, the Bureau is proposing to construct and operate a new medium-security Federal Correctional Institution (FCI) and an adjoining minimum-security Federal Prison Camp (FPC) in Letcher County, Kentucky. The FCI and FPC would be designed to house approximately 1,152 adult males and 256 adult males, respectively, and serve the needs of the Bureau's Mid-Atlantic Region.

Compliance with the National Environmental Policy Act

Development and operation of a new FCI and FPC is considered to be an action potentially significantly affecting the quality of the human environment. Therefore, the Bureau must comply with NEPA to ensure that the environmental consequences of such a federal action are adequately considered. This DEIS will be prepared to ensure that the potential environmental impacts associated with the proposed action are thoroughly documented and that compliance is achieved with NEPA as well as with other environmental statutes including but not limited to: the Coastal Zone Management Act of 1972; the Clean Air Act of 1974; the Clean Water Act and Amendments, the Endangered Species Act of 1973 (ESA); the National Historic Preservation Act (NHPA) of 1966; and the Farmland Protection Policy Act (FPPA), among other laws, regulations and Executive Orders.

Preparation of environmental documentation and its consideration by federal, state, and local officials, regulatory agencies, stakeholders, and the public will be carried out to demonstrate that the Bureau understands and fully considers the potential environmental impacts associated with the proposed action. This includes consideration to the potential impacts associated with correctional institution construction and operation and attainment of the project's objectives.

In 2006, Congress authorized and directed the Bureau to initiate various investigations for development of a new federal correctional facility in Letcher County. In accordance with Congress' directive, the Bureau conducted a wide range of technical investigations and studies and published multiple EISs in conformance with NEPA as summarized below.

Date	Title	Description
2006	Congressional authorization	Bureau directed to undertake planning for a new high-security United States Penitentiary (USP) in Letcher County, Kentucky.
July 2013	Notice of Intent to Prepare a Draft Environmental Impact Statement	Published notice of the Bureau's intent to prepare a DEIS for development of a USP and FPC on properties located in Letcher County, Kentucky. The proposed sites subjected to study consisted of non-Bureau properties located near the City of Whitesburg.

August 2013	Public Scoping Meeting Held	Held a public scoping meeting to inform the public about the proposed project and to explain NEPA and the associated environmental impact analysis.
February 2015	Draft Environmental Impact Statement	Evaluated potential impacts to the natural and man-made environments resulting from development and operation of a proposed USP and FPC at two alternative sites in Letcher County: Alternative 1 – Payne Gap Site and Alternative 2 – Roxana Site.
March 2015	DEIS Public Meeting Held	Held a public meeting to seek public input and comments concerning the proposed project and DEIS analysis.
July 2015	Final Environmental Impact Statement	Evaluated potential impacts to the natural and man-made environments resulting from development and operation of a proposed USP and FPC at two alternative sites in Letcher County: Alternative 1 – Payne Gap Site and Alternative 2 – Roxana Site. Identified the Roxana Site as the preferred alternative for development and operation of new facilities as best meeting the project goals and objectives and, on balance, would have fewer impacts to the environment. The FEIS included updated information contained in DEIS and responded to public comments received concerning the DEIS.
March 2016	Revised Final Environmental Impact Statement	Superseded the FEIS published in July 2015, which was withdrawn after consideration of comments received following its publication and to address inconsistencies in the FEIS.
November 2016	Notice of Intent to Prepare a Supplemental Revised Final Environmental Impact Statement	Provided notice of the Bureau’s intent to prepare a Supplement to the Revised FEIS for the proposed USP and FPC in Letcher County. Preparation of the Supplement was necessary to address changes in the proposed action and new circumstances or information relevant to potential environmental impacts including a reduction in available land area of the Roxana Site necessitating changes to the facilities layout evaluated for Alternative 2 – Roxana Site.

March 2017	Draft Supplemental Revised Final Environmental Impact Statement	Draft Supplemental Revised FEIS incorporated by reference and expanded upon the analyses presented in the Revised FEIS. The Draft Supplement addressed new circumstances or information relevant to potential environmental impacts. Specifically, a reduction in available land area of the Roxana Site necessitated modifying the facilities layout evaluated for Alternative 2 – Roxana Site in the Revised FEIS which identified Modified Alternative 2 – Roxana Site as the preferred alternative.
September 2017	Final Supplemental Revised Final Environmental Impact Statement	Evaluated potential impacts to the natural and man-made environments resulting from development and operation of a proposed USP and FPC at two alternative sites in Letcher County. Identified Modified Alternative 2 – Roxana Site as the preferred alternative. Incorporated by reference and built upon the analyses presented in the Revised FEIS. Addressed changes in the proposed action and assessed new circumstances or information relevant to potential environmental impacts.
March 2018	Record of Decision	Director of the Federal Bureau of Prisons selected Modified Alternative 2 – Roxana Site for land acquisition and development of a USP and FPC in Letcher County. The decision was made following consideration of potential environmental consequences, agency and public comments, Bureau operational, security, and management needs, and after being apprised of material in the DEIS, FEIS, Revised FEIS, and Draft and Final Supplemental Revised FEISs. Record of Decision (ROD) published to document the Bureau’s decision with respect to the environmental review process.
July 2019	Withdrawal of Record of Decision	Acting Director of the Federal Bureau of Prisons withdraws the ROD based on new information, which may be relevant to the environmental analysis for the proposed action, in order to evaluate the new information more fully.
September 2022	Notice of Intent to Prepare a Draft Environmental Impact Statement	Notice of the Bureau’s intent to prepare a DEIS for development of a medium-security FCI and FPC at alternative locations in Letcher County, Kentucky. The proposed sites to be examined consist of non-Bureau properties located near the City of Whitesburg.

While the Congressional directive to the Bureau to develop a new USP in Letcher County remains, the Bureau has been reevaluating the proposed project since the Record of Decision was withdrawn. During that time, the Bureau determined that the need to house medium-security inmates in a new FCI supersedes the need to house high-security inmates in a new USP. Design, construction, and operation of a high-security USP differs greatly from a medium-security FCI with the potential environmental impacts of its development and operation correspondingly different.

Consistent with the guidance provided in 40 CFR 1502.9, the DEIS will address "*substantial changes in the proposed action that are relevant to environmental concerns or if there are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts*." As a result of the change of scope in the proposed action (development of a medium-security FCI vs a high-security USP), planning for a new FCI and FPC was initiated April 2022. The Bureau will soon undertake a new evaluation and analysis in accordance with NEPA and the Bureau's NEPA implementing regulations to be documented within a new DEIS.

Publication of the Notice of Intent to Prepare a DEIS for development of a new FCI and FPC in Letcher County, Kentucky initiates a scoping period lasting for 30 days from the date of publication of this Notice of Intent in the Federal Register. A similar notice inviting federal, state, county, and local agencies, officials, organizations, and the public to participate in the scoping and DEIS study process will also published in local newspapers.

The DEIS will analyze potential environmental impacts that may result from the proposed action including, but not limited to, land use and zoning; topography, geology, and soils; air quality; noise; cultural resources; water resources; and biological resources. The DEIS analysis will also evaluate direct, indirect, and cumulative impacts. Relevant and reasonable measures that could avoid or mitigate environmental impacts will also be analyzed. Additionally, the Bureau will undertake any consultations required by applicable laws or regulations.

The Bureau will issue the DEIS for a 45-day public comment period, during which time a public meeting will be held. A notice of availability of the DEIS and a notice of public meeting will be published in the Federal Register and in area

newspapers in advance of the release of the DEIS and the public meeting. Those notices will identify further details about the public meeting, the means to view a copy of the DEIS, and the specific opportunities and methods for the public to provide comments on the proposed action and DEIS. Anyone wishing to receive notifications regarding the proposed project and DEIS are requested to contact the Bureau's Site Selection Specialist at the address shown below.

Following issuance of the DEIS and completion of the 45-day public comment period on the DEIS, the Bureau will issue a Final EIS (FEIS) that will include comments received during the public comment period on the DEIS. The FEIS will also include the Bureau's response to substantive comments received on the DEIS. Following publication of the FEIS, a 30-day review period will be provided. No action will be taken to implement any of the proposed alternatives until completion of the 30-day review period on the FEIS and issuance of a Record of Decision by the Director of the Bureau.

Contact

Questions concerning the proposed action and the DEIS may be directed to Kimberly S. Hudson, COR, Site Selection Specialist, Construction & Environmental Review Branch, U.S. Department of Justice, Federal Bureau of Prisons, 320 First Street NW, Room 901-5 West, Washington, DC 20534; email: kshudson@bop.gov or by visiting the project website at: *https://www.proposed-fci-letchercountyky.com*

Dated: September 20, 2022.

Kimberly S. Hudson, COR
Site Selection Specialist, Construction & Environmental Review Branch

Prehearing briefs must conform with the provisions of § 207.23 of the Commission's rules; the deadline for filing is December 7, 2022. Parties shall also file written testimony in connection with their presentation at the hearing, and posthearing briefs, which must conform with the provisions of section 207.25 of the Commission's rules. The deadline for filing posthearing briefs is December 22, 2022. In addition, any person who has not entered an appearance as a party to the investigations may submit a written statement of information pertinent to the subject of the investigations, including statements of support or opposition to the petitions, on or before December 22, 2022. On January 13, 2023, the Commission will make available to parties all information on which they have not had an opportunity to comment. Parties may submit final comments on this information on or before January 18, 2023, but such final comments must not contain new factual information and must otherwise comply with § 207.30 of the Commission's rules. All written submissions must conform with the provisions of § 201.8 of the Commission's rules; any submissions that contain BPI must also conform with the requirements of §§ 201.6, 207.3, and 207.7 of the Commission's rules. The Commission's *Handbook on Filing Procedures,* available on the Commission's website at *https://www.usitc.gov/documents/handbook_on_filing_procedures.pdf,* elaborates upon the Commission's procedures with respect to filings.

Additional written submissions to the Commission, including requests pursuant to § 201.12 of the Commission's rules, shall not be accepted unless good cause is shown for accepting such submissions, or unless the submission is pursuant to a specific request by a Commissioner or Commission staff.

In accordance with §§ 201.16(c) and 207.3 of the Commission's rules, each document filed by a party to the investigations must be served on all other parties to the investigations (as identified by either the public or BPI service list), and a certificate of service must be timely filed. The Secretary will not accept a document for filing without a certificate of service.

For further information concerning this proceeding see the Commission's notice cited above and the Commission's Rules of Practice and Procedure, part 201, subparts A through E (19 CFR part 201), and part 207, subparts A and C (19 CFR part 207).

Authority: These investigations are being conducted under authority of title VII of the Tariff Act of 1930; this notice is published pursuant to § 207.21 of the Commission's rules.

By order of the Commission.

Issued: September 22, 2022.

Katherine Hiner,

Acting Secretary to the Commission.

[FR Doc. 2022–20913 Filed 9–27–22; 8:45 am]

BILLING CODE 7020–02–P

DEPARTMENT OF JUSTICE

Federal Bureau of Prisons

Notice of Intent To Prepare a Draft Environmental Impact Statement for the Proposed Federal Correctional Institution and Federal Prison Camp in Letcher County, Kentucky

AGENCY: Federal Bureau of Prisons, U.S. Department of Justice.

ACTION: Notice of intent to prepare a Draft Environmental Impact Statement for the Proposed Federal Correctional Institution and Federal Prison Camp in Letcher County, Kentucky.

SUMMARY: Pursuant to the National Environmental Policy Act (NEPA) of 1969, as implemented by the Council on Environmental Quality and Federal Bureau of Prisons (Bureau) regulations, the Bureau announces its intent to prepare a Draft Environmental Impact Statement (DEIS) for the ''Proposed Federal Correctional Institution and Federal Prison Camp Letcher County, Kentucky.''

SUPPLEMENTARY INFORMATION:

Background

The Bureau's mission is to protect society by confining offenders in the controlled environments of prisons and community-based facilities that are safe, humane, cost-efficient, appropriately secure, and provide work and other self-improvement opportunities to assist offenders in becoming law-abiding citizens. A growing challenge to successfully performing that mission is the increasing number of federal correctional facilities and supporting infrastructure that were constructed over 50 years ago (the approximate design life of such facilities), resulting in a continuous need to maintain existing facilities, and when necessary, develop new facilities and infrastructure.

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Compliance With the National Environmental Policy Act

Development and operation of a new FCI and FPC is considered to be an action potentially significantly affecting the quality of the human environment. Therefore, the Bureau must comply with NEPA to ensure that the environmental consequences of such a federal action are adequately considered. This DEIS will be prepared to ensure that the potential environmental impacts associated with the proposed action are thoroughly documented and that compliance is achieved with NEPA as well as with other environmental statutes including but not limited to: the Coastal Zone Management Act of 1972; the Clean Air Act of 1974; the Clean Water Act and Amendments, the Endangered Species Act of 1973 (ESA); the National Historic Preservation Act (NHPA) of 1966; and the Farmland Protection Policy Act (FPPA), among other laws, regulations and Executive Orders.

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Consistent with the guidance provided in 40 CFR 1502.9, the DEIS will address ''*substantial changes in the proposed action that are relevant to environmental concerns or if there are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts.*'' As a result of the change of scope in the proposed action (development of a medium-security FCI vs a high-security USP), planning for a new FCI and FPC was initiated April 2022. The Bureau will soon undertake a new evaluation and analysis in accordance with NEPA and the Bureau's NEPA implementing regulations to be documented within a new DEIS.

Publication of the Notice of Intent to Prepare a DEIS for development of a new FCI and FPC in Letcher County, Kentucky initiates a scoping period lasting for 30 days from the date of publication of this Notice of Intent in the **Federal Register**. A similar notice inviting federal, state, county, and local

agencies, officials, organizations, and the public to participate in the scoping and DEIS study process will also published in local newspapers.

The DEIS will analyze potential environmental impacts that may result from the proposed action including, but not limited to, land use and zoning; topography, geology, and soils; air quality; noise; cultural resources; water resources; and biological resources. The DEIS analysis will also evaluate direct, indirect, and cumulative impacts. Relevant and reasonable measures that could avoid or mitigate environmental impacts will also be analyzed. Additionally, the Bureau will undertake any consultations required by applicable laws or regulations.

The Bureau will issue the DEIS for a 45-day public comment period, during which time a public meeting will be held. A notice of availability of the DEIS and a notice of public meeting will be published in the **Federal Register** and in area newspapers in advance of the release of the DEIS and the public meeting. Those notices will identify further details about the public meeting, the means to view a copy of the DEIS, and the specific opportunities and methods for the public to provide comments on the proposed action and DEIS. Anyone wishing to receive notifications regarding the proposed project and DEIS are requested to contact the Bureau's Site Selection Specialist at the address shown below.

Following issuance of the DEIS and completion of the 45-day public comment period on the DEIS, the Bureau will issue a Final EIS (FEIS) that will include comments received during the public comment period on the DEIS. The FEIS will also include the Bureau's response to substantive comments received on the DEIS. Following publication of the FEIS, a 30-day review period will be provided. No action will be taken to implement any of the proposed alternatives until completion of the 30-day review period on the FEIS and issuance of a Record of Decision by the Director of the Bureau.

Contact

Questions concerning the proposed action and the DEIS may be directed to Kimberly S. Hudson, COR, Site Selection Specialist, Construction & Environmental Review Branch, U.S. Department of Justice, Federal Bureau of Prisons, 320 First Street NW, Room 901–5 West, Washington, DC 20534; email: *kshudson@bop.gov* or by visiting the project website at: *https://www.proposed-fci-letchercountyky.com.*

Dated: September 28, 2022.

Kimberly S. Hudson,

Site Selection Specialist, Construction & Environmental Review Branch.

[FR Doc. 2022–20795 Filed 9–27–22; 8:45 am]

BILLING CODE P

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

[Notice: (22–075)]

Notice of Intent To Grant an Exclusive, Co-Exclusive or Partially Exclusive Patent License

AGENCY: National Aeronautics and Space Administration.

ACTION: Notice of intent to grant exclusive, co-exclusive or partially exclusive patent license.

SUMMARY: NASA hereby gives notice of its intent to grant an Exclusive, Co-Exclusive or Partially Exclusive Patent License to practice the inventions described and claimed in the patents and/or patent applications listed in **SUPPLEMENTARY INFORMATION** below.

DATES: The prospective Exclusive, Co-Exclusive or Partially Exclusive Patent License may be granted unless NASA receives written objections including evidence and argument, no later than October 13, 2022 that establish that the grant of the license would not be consistent with the requirements regarding the licensing of federally owned inventions as set forth in the Bayh-Dole Act and implementing regulations. Competing applications completed and received by NASA no later than October 13, 2022 will also be treated as objections to the grant of the contemplated Exclusive, Co-Exclusive or Partially Exclusive Patent License. Objections submitted in response to this notice will not be made available to the public for inspection and, to the extent permitted by law, will not be released under the Freedom of Information Act.

OBJECTIONS AND FURTHER INFORMATION: Written objections relating to the prospective license or requests for further information may be submitted to Agency Counsel for Intellectual Property, NASA Headquarters at Email: *hq-patentoffice@mail.nasa.gov.* Questions may be directed to Phone: (202) 358–3437.

SUPPLEMENTARY INFORMATION: NASA intends to grant an Exclusive, Co-Exclusive or Partially Exclusive Patent License in the United States to practice the inventions described and claimed in: U.S. Patent No. 6,953,129 titled ''Pressure Vessel With Impact and Fire Resistant Coating and Method of Making Same,'' U.S. Patent No. 8,561,829 titled ''Composite Pressure Vessel Including Crack Arresting Barrier,'' U.S. Patent No. 8,297,468 titled ''Fuel Tank for Liquefied Natural Gas,'' U.S. Patent No. 7,867,589 titled ''Hybrid Cryogenic Tank Construction and Method of Manufacture Therefor,'' U.S. Patent No. 7,641,949 titled ''Pressure Vessel With Improved Impact Resistance and Method of Making the Same,'' to Hanwha Cimarron, having its principal place of business in Huntsville, AL. The fields of use may be limited. NASA has not yet made a final determination to grant the requested license and may deny the requested license even if no objections are submitted within the comment period.

This notice of intent to grant an Exclusive, Co-Exclusive or Partially Exclusive Patent License is issued in accordance with 35 U.S.C. 209(e) and 37 CFR 404.7(a)(1)(i). The patent rights in these inventions have been assigned to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration. The prospective license will comply with the requirements of 35 U.S.C. 209 and 37 CFR 404.7.

Information about other NASA inventions available for licensing can be found online at *http://technology.nasa.gov.*

Helen M. Galus,

Agency Counsel for Intellectual Property.

[FR Doc. 2022–21034 Filed 9–27–22; 8:45 am]

BILLING CODE 7510–13–P

EXECUTIVE OFFICE OF THE PRESIDENT

Office of National Drug Control Policy

Paperwork Reduction Act; Proposed Collection; Comment Request; Revisions of Currently Approved Collection: Drug-Free Communities (DFC) Support Program and CARA Local Drug Crisis Program National Evaluation

AGENCY: Office of National Drug Control Policy.

ACTION: 30-Day notice and request for comments.

SUMMARY: In accordance with the Paperwork Reduction Act of 1995, the Office of National Drug Control Policy (ONDCP) announces it will submit to the Office of Management and Budget (OMB) Office of Information and Regulatory Affairs (OIRA) an information collection request (ICR). The **Federal Register** notice that solicited public comment on the

Newspaper Notice Concerning Preparation of New DEIS: September 20, 2022

U.S. DEPARTMENT OF JUSTICE, FEDERAL BUREAU OF PRISONS

Notice of Intent to Prepare a Draft Environmental Impact Statement for the Proposed Federal Correctional Institution and Federal Prison Camp in Letcher County, KY

Pursuant to the National Environmental Policy Act (NEPA) of 1969, as implemented by Council on Environmental Quality and Federal Bureau of Prisons (Bureau) regulations, the Bureau announces its intent to prepare a Draft Environmental Impact Statement (DEIS) for the proposed development of a new Federal Correctional Institution (FCI) and Federal Prison Camp (FPC) in Letcher County, Kentucky.

The Bureau's mission is to protect society by confining offenders in the controlled environments of prisons and community-based facilities that are safe, humane, cost-efficient, appropriately secure, and provide work and other self-improvement opportunities to assist offenders in becoming law-abiding citizens. A growing challenge to successfully performing that mission is the increasing number of federal correctional facilities and supporting infrastructure that were constructed over 50 years ago (the approximate design life of such facilities), resulting in a continuous need to maintain existing facilities, and when necessary, develop new facilities and infrastructure. To address this need, the Bureau proposes to construct and operate a new medium-security FCI and an adjoining minimum-security FPC in Letcher County, KY. The FCI and FPC would be designed to house approximately 1,152 adult males and 256 adult males, respectively, and serve the need of the Bureau's Mid-Atlantic Region.

Development and operation of a new FCI and FPC is considered to be an action with the potential to significantly affect the quality of the human environment. The DEIS is being prepared to ensure that the potential environmental impacts associated with the proposed action are thoroughly documented and that compliance with NEPA, the Bureau's NEPA implementing regulations, and other environmental statutes, regulations and Executive Orders is achieved. Preparation of environmental documentation, and its consideration by federal, state, and local officials, regulatory agencies, stakeholders, and the public, is being carried out to ensure that the Bureau fully considers the potential environmental impacts associated with the proposed action.

Publication of the DEIS will initiate a public comment period which will last no less than 45 days, during which time the Bureau will host a public meeting. Following the end of the DEIS public comment period, the Bureau will prepare and publish a Final EIS (FEIS) in accordance with NEPA which will incorporate additional data which may come to light into the decision-making process and respond to comments received on the DEIS. The FEIS will be subject to a public review period of not less than 30 days.

No action will be taken to implement any of the proposed alternatives until completion of the FEIS 30-day review period. A decision on whether to proceed with the proposed action would be made thereafter by the Director of the Bureau and taking into account all environmental analyses and public comments and documented by a Record of Decision as stipulated by NEPA regulations.

Publication of this notice initiates a 30-day scoping period. For additional information, or to receive future notifications regarding the proposed project, contact: Kimberly S. Hudson, Site Selection Specialist, Federal Bureau of Prisons, 320 First Street, NW, Room 901-5 West, Washington, DC 20534; email: kshudson@bop.gov or by visiting the project website at: *https://www.proposed-fci-letchercountyky.com.* Thank you for your interest.

ATTACHMENT 2

LOCAL MEDIA PRESS RELEASES FOR PUBLIC SCOPING MEETING

U.S. Department of Justice

Federal Bureau of Prisons

Washington, DC 20534

October 27, 2022

Notice of Public Scoping Meeting to Initiate the Environmental Impact Statement Process for the Proposed Federal Correctional Institution and Federal Prison Camp in Letcher County, Kentucky

Pursuant to the National Environmental Policy Act (NEPA) of 1969, as implemented by Council on Environmental Quality and Federal Bureau of Prisons (Bureau) regulations, the Bureau is initiating preparation of a Draft Environmental Impact Statement (DEIS) for the proposed development of a new Federal Correctional Institution (FCI) and Federal Prison Camp (FPC) in Letcher County, Kentucky.

A growing challenge to successfully performing the Bureau's mission to protect society is the increasing number of federal correctional facilities and supporting infrastructure that were constructed over 50 years ago (the approximate design life of such facilities), resulting in a continuous need to maintain existing facilities, and when necessary, develop new facilities and infrastructure. To address this need, the Bureau proposes to develop a new medium-security FCI and an adjoining minimum-security FPC in Letcher County, Kentucky. The FCI and FPC would be designed to house approximately 1,152 adult males and 256 adult males, respectively, and serve the need of the Bureau's Mid-Atlantic Region.

Scoping is a part of the NEPA process through which the Bureau describes a proposed action and possible alternatives. The Bureau then seeks input from other agencies, organizations, and the public on potentially affected resources, environmental issues to be considered, and the Bureau's planned approach to analysis. A scoping meeting is not intended to be a Question & Answer session, but rather is designed to solicit public and stakeholder input on the range of issues that the Bureau should consider addressing in the DEIS. This scoping meeting aims to:

- Provide an overview of the Bureau and project purpose
- Present the proposed action
- Define resources to be analyzed
- Present the proposed approach to analysis
- Provide key milestones and public involvement opportunities during DEIS process

Representatives of the Bureau will hold an in-person Public Scoping Meeting at **6:00 P.M. ET, November 17, 2022, at the Letcher County Central High School (cafeteria) located at 435 Cougar Drive in Whitesburg, Kentucky, 41858.** The Bureau reserves the right to impose a time limit for those speaking during the meeting in order to accommodate all persons interested in commenting. The meeting will be recorded and the recording posted to the project website: *https://www.proposed-fci-letchercountyky.com.*

Due to health concerns and for the convenience of the public, interested stakeholders will also be able to participate during the Public Scoping Meeting by way of a virtual meeting service that allows the public to participate safely and conveniently from remote locations using a computer, tablet or smartphone by calling-in using the toll-free telephone number (877-829-8910, Conference Code: 857288) or via the link below:

Zoom Meeting ID: 986 0557 5889 and Passcode 705186

https://wspusa.zoom.us/j/89605575889?pwd=RkZzUGhiMDdrYyt3M1IyVFJNcFZxQT09

Written statements and comments concerning the scope of the DEIS for the proposed project will also be accepted via U.S. mail or email through November 30, 2022. Submit comments to: Kimberly S. Hudson, Site Selection Specialist, Construction & Environmental Review Branch, Federal Bureau of Prisons, 320 First Street, NW, Room 901-5 West, Washington, DC 20534, Email: kshudson@bop.gov. Comments can also be submitted via the project website. For additional information and to receive future notifications, please contact: Kimberly S. Hudson. Thank you for your interest.

PUBLIC NOTICES

NOTICES

NOTICE
Commonwealth of Kentucky
Letcher District Court
Case #22-P-137
In re:
estate of:
BENSON LAWTON BLAIR
deceased

NOTICE

Pursuant to KRS 424.340, notice is hereby given that Mallie D. Combs was on the 2 day of November, 2022, appointed Administratrix of the deceased, late of Letcher County, and all persons having claims against said estate shall present same, verified, according to law, to said Administratrix at her present address, 3211 HWY 3408, Blackey, KY 41804, not later than the 2 day of May, 2023.
Mike Watts, Clerk
By: Melissa Claar
Deputy Clerk
(11-9-1p)

NOTICE
Commonwealth of Kentucky
Letcher District Court
Case #22-P-237
estate of:
DAN COMBS
deceased

NOTICE

Pursuant to KRS 424.340, notice is hereby given that David Combs was the on 2 day of November, 2022 appointed Executor of the deceased, late of Letcher County, and all persons having claims against said estate shall present same, verified, according to law, to said Executor at his present address, 4818 Bridgemont Lane, Lexington, KY 40515 not later than the 2 day of May, 2023.
Mike Watts, Clerk
By: Melissa Claar,
Deputy Clerk
(11-9-1p)

NOTICE
Commonwealth of Kentucky
Letcher District Court
Case #22-P-269
estate of:
BERNITA JOAN SLONE
deceased

NOTICE

Pursuant to KRS 424.340, notice is hereby given that Janet Faye Slone Hall and Rodney Lee Slone were on the 2nd day of November, 2022 appointed Co-Executor/trix of the estate of the deceased, late of this county, and all persons having claims against said estate shall present same, verified, according to law, to said Co-Executor/trix at their present addresses, 5136 Thornton Rd., Thornton, KY 41855 / 946 Copperhead Rd., Ermine, KY 41815 not later than the 2 day of May, 2023.
Mike Watts, Clerk
By: Melissa Claar,
Deputy Clerk
(11-9-1p)

NOTICE
Commonwealth of Kentucky
Letcher District Court
Case #22-P-271
estate of:
LEVINE FIELDS
deceased

NOTICE

Pursuant to KRS 424.340, notice is hereby given that Rachel Fields was on the 2 day of November, 2022 appointed Administratrix of the deceased, late of Letcher County, and all persons having claims against said estate shall present same, verified, according to law, to said Administratrix at her present address, 135 Bartesta Br., Whitesburg, KY 41858 not later than the 2 day of May, 2023.
Mike Watts, Clerk
By: Melissa Claar,
Deputy Clerk
(11-9-1p)

Read And Respond To Eagle Ads!

NOTICE
Commonwealth of Kentucky
Letcher District Court
Case #22-P-273
estate of:
JEAN ARTHUR BLAIR
deceased

NOTICE

Pursuant to KRS 424.340, notice is hereby given that Mallie D. Combs was on the 2 day of November, 2022 appointed Administratrix of the deceased, late of Letcher County, and all persons having claims against said estate shall present same, verified, according to law, to said Administratrix at her present address, 3211 HWY 3408, Blackey, KY 41804 not later than the 3 day of April, 2023.
Mike Watts, Clerk
By: Melissa Claar,
Deputy Clerk

NOTICE
Commonwealth of Kentucky
Letcher District Court
Case #22-P-279
estate of:
JOANN SEXTON
deceased

NOTICE

Pursuant to KRS 424.340, notice is hereby given that Shelia Sexton was on the 2 day of November, 2022 appointed Administratrix of the deceased, late of Letcher County, and all persons having claims against said estate shall present same, verified, according to law, to said Administratrix at her present address, 1820 Turkey Creek, Hallie, KY 41821 not later than the 2 day of May, 2023.
Mike Watts, Clerk
By: Melissa Claar,
Deputy Clerk

NOTICES

NOTICE
Commonwealth of Kentucky
Letcher District Court
Case #22-P-284
estate of:
PEGGY BENTLEY
deceased

NOTICE

Pursuant to KRS 424.340, notice is hereby given that Alan Bentley was on the 2 day of November, 2022 appointed Executror of the deceased, late of Letcher County, and all persons having claims against said estate shall present same, verified, according to law, to said Executor at his present address, 364 Indian Creek Rd., Whitesburg, KY 41858 not later than the 2 day of May, 2023.
Mike Watts, Clerk
By: Melissa Claar,
Deputy Clerk
(11-9-1p)

NOTICE
Commonwealth of Kentucky
Letcher District Court
Case #22-P-287
In re:
estate of:
PATRICIA CAROL THORNSBERRY
deceased

NOTICE

Pursuant to KRS 424.340, notice is hereby given that John Allen Gorecki was on November 2, 2022 appointed Executor of the estate of the deceased, late of Letcher County, and all persons having claims against said estate shall present same, verified, according to law, to Attorney Todd P. Kennedy, Agent for Service of Process at his present address, P.O. Box 1079, Pikeville, KY 41502 not later than the 2 day of May, 2023.
Mike Watts, Clerk
By: Melissa Claar,
Deputy Clerk
(11-9-1p)

NOTICES

NOTICE
Commonwealth of Kentucky
Letcher Circuit Court
Civil Action No.
22-CI-00141
Gregory Hale and Kimberly Hale,
His Wife; and James Stewart and
Elizabeth Stewart, His Wife
Plaintiffs
V.
Tanya Russell, Single
Defendant
NOTICE OF MASTER COMMISSIONER SALE

By virtue of a Default Judgment and Order of Sale entered on August 16, 2022 and Order Referring Case to Master Commissioner for Judicial Sale entered on September 19, 2022, by the Letcher Circuit Court, the undersigned Master Commissioner of the Letcher Circuit Court will offer for sale at the courthouse door of the Letcher County Courthouse in the City of Whitesburg, Kentucky on Tuesday, November 22, 2022 beginning on or about the hour of 9:45 a.m. local time and continuing until the sale is concluded to the highest bidder at public auction, the following real estate, situated in Letcher County, Kentucky:
Property Address: 17 Blacksmith Drive
Letcher, KY 41832
Tax ID No.: 037-00-00-064.00
The purchaser or successful bidder can elect to pay cash at the time of said sale or at the option of the bidder on the terms of a deposit of ten percent (10%) of the purchase price with the balance on credit for thirty (30) days. If the purchase price is not paid in full, the successful bidder shall give bond for the purchase price with good and sufficient surety, with the bond to be approved by the Master Commissioner. Said bond shall be payable to the Master Commissioner and shall bear interest at the lawful rate of twelve percent (12%) per annum from the date of sale until paid. The bond shall have the full force and effect of a Judgment in order to secure payment of the balance of the purchase price and said bond shall constitute a lien on the property until paid.
The costs involved in this action are the cost of this action and its costs herein expended, including the cost of the sale.
DATED this 25th day of October 2022.
Daniel F. Dotson
Master Commissioner
Letcher Circuit Court
(11-2-3b)

LEGAL NOTICE OF CORPORATE DISSOLUTION
C A & I, INC. of Gordon, KY is dissolving its corporation effective 12/31/22. All claims and interests against the said corporation must be received in writing by 12/01/22 at the following address: 1107 Coppinger Drive, Cumberland, KY 40823.
Dated 10/22/22
Terry Ison
President,
C A & I, INC.
(11-2-3b)

NOTICES

NOTICE OF PUBLIC HEARING

Notice is hereby given that the Kentucky Public Service Commission (the "Commission") will conduct a public hearing in Case No. 2022-00283 beginning at 9:00 a.m. Eastern Standard Time on Monday, November 28, 2022 in the Richard Raff Hearing Room (Hearing Room 1) at its offices at 211 Sower Boulevard, Frankfort, Kentucky 40601. The hearing is scheduled to continue at 9:00 a.m. Eastern Standard Time on Tuesday, November 29, 2022. The hearing will address the amortization period and recovery mechanism for the Rockport Deferral Regulatory Asset and the credit for the Rockport Fixed Costs Savings and Rockport Offset. The hearing is for the purposes of presenting and cross-examining witnesses supporting the parties' positions and rebutting the other parties' evidence. This hearing will be streamed live and may be viewed on the PSC website at psc.ky.gov. Public comments may be made at the beginning of the hearing. Those wishing to make oral comments may do so by following the instructions listed on the PSC website at psc.ky.gov.

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12 Noon On Friday
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PUBLIC NOTICE

A public hearing will be held by the Letcher County Fiscal Court at the Letcher County Courthouse, District Courtroom, 156 Main Street, Whitesburg, Letcher County, Kentucky, on Monday, November 21, 2022 at 6:30 p.m. The purpose of the public hearing is to discuss the Fiscal Court's intent to enter into a lease with Kentucky Leasing Trust. The amount of said lease is not to exceed $5,000,000 and the term is not to exceed 2 years. The funds to repay the debt will be primarily derived through the county's excess revenues and FEMA reimbursement. All interested persons in Letcher County are invited to attend the hearing.

PUBLIC (LEGAL) NOTICE ADVERTISEMENT

LETCHER COUNTY EMERGENCY PLANNING COMMITTEE

Pursuant to Section 324, Title III of the Federal Superfund Amendments and Reauthorization Act (SARA) of 1986 (PL 99-499), the following information is provided in compliance with the Community Right-to-Know requirements of the SARA Law, and the open meetings and open records provisions of Kentucky Revised Statutes. Members of the public may contact the Letcher County Emergency Planning Committee, Paul Miles, P O Box 543, Whitesburg, Ky 41858. The Letcher County Emergency Planning Committee conducts meetings at the Letcher County Courthouse, 156 Main Street, Whitesburg, Ky 41858 or at other locations, in accordance with the Kentucky Open Meetings Law. Members of the Public may request to be notified of regular or special meetings as provided in KRS 61.820 and KRS 61.825. Records of the Planning Committee, including the county emergency response plan, material safety data sheets, and inventory forms, or any follow-up emergency notices as may subsequently be issued, are open for inspection, and members of the public who wish to review these records may do so by appointment from 8 am-4 pm Eastern, 5 days a week at the Letcher County Courthouse as required by the Kentucky Open Records Law. The local 24-hour telephone number for purposes of emergency notification, as required by SARA, is 911 or (606) 633-0429. A 24 hour Fax line is available at 606-633-7105.

PUBLIC NOTICE

Letcher County Public Schools

The 2021-2022 School Report Card data is now available online. We hope you will visit Letcher County's School Report Card available at: https://www.kyschoolreportcard.com/organization/5606?year=2022.

PUBLIC NOTICE

Letcher County Sheriff
Shawn Mickey Stines —
Annual Audits — 2021 Fee Account

The Reports of the Audits of the Letcher County Sheriff's Settlement — 2021 Fee Account for the Calendar Year January 1, 2021 through December 31, 2021 has been completed and released. A copy of the complete audit reports, including financial statements and supplemental information are on file at the Sheriff's Office and available for public inspection during normal business hours. Any citizen may obtain from the Sheriff's Office a copy of the complete audit reports including financial statements and supplemental information, for his personal use. Citizens requesting a personal copy of the Sheriff's audit reports will be charged for duplication costs at a rate that shall not exceed twenty-five cents per page. Copies of the financial statements prepared in accordance with KRS 424.220 are available to the public at no cost at the Sheriff's Office or by mail at Letcher County Sheriff's Department, 6 Broadway Street, Whitesburg, KY 41858.

ADVERTISEMENT FOR BIDS

CONTRACT 519-22-01
FLOOD RECOVERY RESIDENTIAL METER AND WATER LINE REPAIRS
LETCHER COUNTY WATER AND SEWER DISTRICT
LETCHER COUNTY, KENTUCKY

Sealed proposals for the following work will be received by the Letcher County Water and Sewer District, Letcher County, Kentucky at 3443 Highway119 N, Mayking, Kentucky 41837 until 10:00 a.m., local time, Thursday, November 17, 2022, for furnishing labor and materials and performing all work as set forth by the Advertisement, General Conditions, Specifications and/or Drawings prepared by Bell Engineering. Immediately following the scheduled closing time for the reception of bids, all proposals which have been submitted in accordance with the above conditions will be publicly opened and read aloud.

The work to be bid is described as follows:

CONTRACT 519-22-01, FLOOD RECOVERY RESIDENTIAL METER AND WATER LINE REPAIRS

Repair and/or replacement of approximately 125 residential meter, replacement of approximately 2,500 linear feet of ¾-inch polyethylene service line, and installation of approximately 500 linear feet of 8-inch and 4-inch polyethylene water line via directional drill.

Drawings, Specifications and Contract Documents may be examined at the following places:

Letcher County Water and Sewer District 3443 Highway 119 N Mayking, Kentucky 41837	Bell Engineering 2480 Fortune Drive, Suite 350 Lexington, Kentucky 40509

or may be obtained from Lynn Imaging, 328 E. Vine Street, Lexington, Kentucky 40507, phone 859/255-1021, upon receipt of non-refundable deposit as follows:

CONTRACT 519-22-01--$150.00 (electronic or hard copy)

Sealed proposals for this Contract shall be clearly marked on the outside of the envelope as follows:

"Sealed Proposal for Contract 519-20-01. Not to be opened until 10:00 a.m. local time, Thursday, November 17, 2022."

If forwarded by mail, the sealed envelope containing the proposal must be enclosed in another envelope and mailed to the Letcher County Water and Sewer District office, allowing sufficient time for such mailing to reach this address prior to the scheduled closing time for receipt of proposals.

Bids shall be accompanied by a certified check or bid bond made payable to the Letcher County Water and Sewer District, Letcher County, Kentucky, in an amount not less than the percent of the base bid indicated in Specification Section 00200, Instructions to Bidders, Bid Security. No bidder may withdraw his bid for a period of 90 days after the date bids are opened. He may, however, withdraw his bid at any time prior to the time and date scheduled for opening of same or any authorized postponement thereof. Any bid received after the time and date specified shall not be considered and will be returned unopened to the bidder.

The attention of all contractors is called to the fact that any contract awarded under this Advertisement for Bids is expected to be funded in part by a grant from the Eastern Kentucky State Aid Funding for Emergency (EK-SAFE) or the Federal Emergency Management Agency (FEMA).

A wage rate determination will be made prior to advertised bid date and issued by addendum.

Both federal and state wage rate determinations will be incorporated into the Specifications by an addendum issued prior to the scheduled bidding date.

Bidders must comply with the President's Executive Order Nos. 11246 and 11375, which prohibit discrimination in employment regarding race, creed, color, sex or national origin. Where the President's Executive Order No. 11246 is shown, Executive Order No. 11375 also applies.

Bidders must make positive efforts to secure small or minority owned business enterprise participation in this Project.

Bidders must comply with Title VI of the Civil Rights Act of 1964, the Anti Kickback Act, the Contract Work Hours Standard Act, and the Davis Bacon Act.

Bidders must certify that they do not and will not maintain or provide for their employees any facilities that are segregated or based on race, color, creed, or national origin.

Bidders must show a certification of prior work under Executive Order 11246 (Equal Employment Opportunity) as amended.

All contractors and subcontractors must comply with 41 CFR 60-4, in regard to affirmative action. This is to ensure equal opportunity to females and minorities, and apply the time tables and goals set forth in 41 CFR 60-4.

Neither the United States nor any of its departments, agencies or employees is or will be a party to this Invitation for Bids or any resulting contract. This procurement is subject to the requirements outlined in the Kentucky Infrastructure Supplemental General Conditions.

The Letcher County Water and Sewer District may consider informal any bid not prepared and submitted in accordance with the provisions of this advertisement and/or the Specifications and may waive any informalities or reject any and all bids. Award of the Contract will be made to the lowest, responsive, responsible bidder.

LETCHER COUNTY WATER AND SEWER DISTRICT
Mark Lewis, Superintendent

PUBLIC NOTICE

U.S. DEPARTMENT OF JUSTICE,
FEDERAL BUREAU OF PRISONS

Notice of Public Scoping Meeting to Initiate the Environmental Impact Statement Process for the Proposed Federal Correctional Institution and Federal Prison Camp in Letcher County, Kentucky
Pursuant to the National Environmental Policy Act (NEPA) of 1969, as implemented by Council on Environmental Quality and Federal Bureau of Prisons (Bureau) regulations, the Bureau is initiating preparation of a Draft Environmental Impact Statement (DEIS) for the proposed development of a new Federal Correctional Institution (FCI) and Federal Prison Camp (FPC) in Letcher County, Kentucky. A growing challenge to successfully performing the Bureau's mission to protect society is the increasing number of federal correctional facilities and supporting infrastructure that were constructed over 50 years ago (the approximate design life of such facilities), resulting in a continuous need to maintain existing facilities, and when necessary, develop new facilities and infrastructure. To address this need, the Bureau proposes to develop a new medium-security FCI and an adjoining minimum-security FPC in Letcher County, Kentucky. The FCI and FPC would be designed to house approximately 1,152 adult males and 256 adult males, respectively, and serve the need of the Bureau's Mid-Atlantic Region.

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Representatives of the Bureau will hold an in-person Public Scoping Meeting at 6:00 P.M. ET, November 17, 2022, at the Letcher County Central High School (cafeteria) located at 435 Cougar Drive in Whitesburg, Kentucky, 41858. The Bureau reserves the right to impose a time limit for those speaking during the meeting in order to accommodate all persons interested in commenting. The meeting will be recorded and the recording posted to the project website: https://www.proposed-fci-letchercountyky.com. Due to health concerns and for the convenience of the public, interested stakeholders will also be able to participate during the Public Scoping Meeting by way of a virtual meeting service that allows the public to participate safely and conveniently from remote locations using a computer, tablet or smartphone by calling-in using the toll-free telephone number (877-829-8910, Conference Code: 857288) or via the link below:

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Submit comments concerning the scope of the DEIS for the proposed project via the Comment tab on the project website: https://www.proposed-fci-letchercountyky.com/. Written statements and comments will also be accepted via U.S. mail or email through November 30, 2022. Submit comments to: Kimberly S. Hudson, Site Selection Specialist, Construction & Environmental Review Branch, Federal Bureau of Prisons, 320 First Street, NW, Room 901-5 West, Washington, DC 20534, Email: kshudson@bop.gov. Please note that before including your name, address, phone number, e-mail address, or other personal identifying information in your comment, the entire comment, including personal identifying information, may become publicly available. For additional information and to receive future notifications, please contact: Kimberly S. Hudson. Thank you for your interest.

The Story of Demmer Richmond, Letcher County "doughboy" during World War I

EDITOR'S NOTE: In honor of Veteran's Day, we bring you this piece by our dear friends, Richard Brown and David Chaltas who researched the story of Demmer Richmond, a Letcher Countian who served during World War I. Our thanks to them for sharing their work.

By Richard G. Brown
in collaboration
with David Chaltas

The early years of the 20th century found most of the civilized countries involved in World War I, known as the "The War to end all Wars". The United States managed to avoid sending her young men off to battle in the first few years of the war. With the war going badly for France and England, the United States finally became involved when President Woodrow Wilson declared war on April 17, 1917. The United States military force was ill equipped and undermanned at the time of the Declaration of War. The number of soldiers in the United States Army was at an all-time low, with most soldiers depended upon to protect the country being in their respective state militias, now called the National Guard. Though Kentucky was not a densely populated state, the militia had no trouble filling its ranks with young men from the mountains and bluegrass areas. Private Demmer Richmond from the mountains of eastern Kentucky was one of many young American boys that would sail for Europe as a "doughboy," willing to fight for the preservation of freedom.

Demmer was born in March of 1897, near the head of Little Colley Creek in Letcher County, Kentucky. He was the son of Owen Richmond and Susan Collins Richmond. Demmer had grown up in the mountains listening to war stories told by both of his grandfathers who had fought in the Civil War. His grandfather on his father's side of the family, Jonathan Richmond, had served in the 64th Virginia Mounted Infantry of the Confederate Army while his other grandfather, Henry Collins, served in the 14th Kentucky Cavalry of the Union Army. Young Demmer no doubt heard differing viewpoints on the War Between the States from the two old soldiers that had at one time been enemies. Hoping to encounter adventures of his own, Demmer enlisted in the Kentucky Militia at Fort Thomas, Kentucky, on July 6, 1916. At that time, the young volunteer did not know that he would receive more than he had bargained for.

The young mountain boy easily adapted to military life, finding that the discipline and respect demanded there was no different than was expected in the hills of Kentucky. Also, like most country boys, he had grown up with a rifle in his hands, having done his part to keep food on the table. For almost two years Demmer and his fellow soldiers trained and enjoyed traveling the country during the uneasy peace. In the spring of 1918 his company of Kentuckians was transferred to the 166th Infantry of the 42nd Division of the newly formed American Expeditionary Force. The 42nd was known as the "Rainbow Division" and had been formed from militia units from twenty-six states. This nickname is generally credited to Douglas MacArthur's statement that the division, "Would stretch over the whole country like a rainbow." Major General C.T. Menoher commanded this newly formed division.

As a boy, he had floated up and down the Kentucky River near his home, pretending he was at sea. No longer would Demmer have to pretend as he and his fellow Letcher Countians soon found themselves sailing in a transport ship across the huge and rough Atlantic Ocean. Arriving in France, they were immediately sent to help in the defense of Champagne Marne. The Germans knew that the Americans were coming and had begun a huge offensive, hoping to win a decisive victory before their arrival. However, the Germans miscalculated the length of time that it would take for the Americans to take their positions. They anticipated that the Americans would be slow moving, much like the French but the Doughboys moved quickly into the Western Front battle line. On July 15, 1918, the last German offensive of the war began with a withering artillery barrage.

Demmer and his fellow Doughboys fought ferociously and stopped the German attack in three days of hard fighting. It was now time for the American Expeditionary Force to begin fighting on the offensive.

On July 18, the Aisne Marne offensive attack began. Several American Divisions spearheaded the attack but due to their losses in the last battle, the 42nd was held in reserve until July 25. That morning, Demmer and the 42nd crossed the Marne River and engaged the German defenders in desperate fighting. The color guard for the 42nd was Hank Gowdy, the hero of the 1914 World Series who had volunteered to fight in the 166th. Gowdy had a batting average of .545 in the series as a player for the Boston Braves. Carrying Old Glory at the front of the advancing battle line, Gowdy and the 42nd took the town of Sergy. Counter attacking with mustard gas, the Germans retook Sergy. Donning their gas mask, the 42nd again charged, retaking the town. Fighting toe to toe for almost two weeks, the German army finally withdrew on August 6, leaving the town in ruins. The Aisne Marne offensive was considered an Allied victory but had cost the 42nd more than 5,500 men. Demmer and his fellow Letcher County comrades had now been exposed to one of the brutalities of war, the use of chemical weapons.

The Doughboys spent the next two weeks digging their trenches deeper and fortifying their position, waiting for another attack from the Germans. Unknown to the Allied commanders, the German forces were too weak to mount an offense. They spent the same time fortifying the area around St. Mihiel. The overall American commander, General John Pershing, had studied the trench warfare that the Allies and the Germans had fought up to this time. He was a firm believer in an offensive attack and decided to use a new concept of warfare that he and his staff had been devising. Breaking from tradition that all attacking forces would be commanded from one command center, he would allow his front-line commanders to be independent and use their own initiative to confront problems arising in the attack. He also was impressed with his new armor commander, Colonel George S. Patton, a hard charging, and independent officer. He advised his other field commanders to emulate Patton's style.

Having prepared his officers for the St. Mihiel offensive, Pershing decided on a time and date for the attack. Unfortunately, his European counterparts did not comprehend the importance of secrecy and allowed this information to become public. Ironically, one Swiss newspaper published the date and time of the attack. Upon learning of the leak, General Pershing asked his front-line commanders their opinion of continuing with the attack. Colonel Patton and the other field officers all reported that their doughboys were eager to get out of the mud and water-soaked trenches. Hearing this, Pershing ordered the attack to continue as planned.

On the morning of September 12, 1918, Demmer and his fellow Americans

Continued to Page 8

DEMMER RICHMOND
Private First Class
Company D,
166th Infantry
42nd Division
WORLD WAR I

Letcher Countians during World War I
(Demmer Richmond is in the center)

Newspaper Notice Concerning Public Scoping Meeting – November 17, 2022

U.S. DEPARTMENT OF JUSTICE, FEDERAL BUREAU OF PRISONS

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https://wspusa.zoom.us/j/89605575889?pwd=RkZzUGhiMDdrYyt3M1IyVFJNcFZxQT09

Zoom Meeting ID: 986 0557 5889 and Passcode 705186

Submit comments concerning the scope of the DEIS for the proposed project via the Comment tab on the project website: https://www.proposed-fci-letchercountyky.com/. Written statements and comments will also be accepted via U.S. mail or email through November 30, 2022. Submit comments to: Kimberly S. Hudson, Site Selection Specialist, Construction & Environmental Review Branch, Federal Bureau of Prisons, 320 First Street, NW, Room 901-5 West, Washington, DC 20534, Email: kshudson@bop.gov. Please note that before including your name, address, phone number, e-mail address, or other personal identifying information in your comment, the entire comment, including personal identifying information, may become publicly available. For additional information and to receive future notifications, please contact: Kimberly S. Hudson. Thank you for your interest.

ATTACHMENT 3

PUBLIC SCOPING MEETING HANDOUT

We want to hear from You!

Proposed Federal Correctional Institution and Federal Prison Camp in Letcher County, Kentucky

About the Proposal

To accommodate a portion of the federal inmate population, the Bureau of Prisons (BOP) is moving forward with planning for a new Federal Correctional Institution (FCI) and prison camp (FPC) in Letcher County, Kentucky.

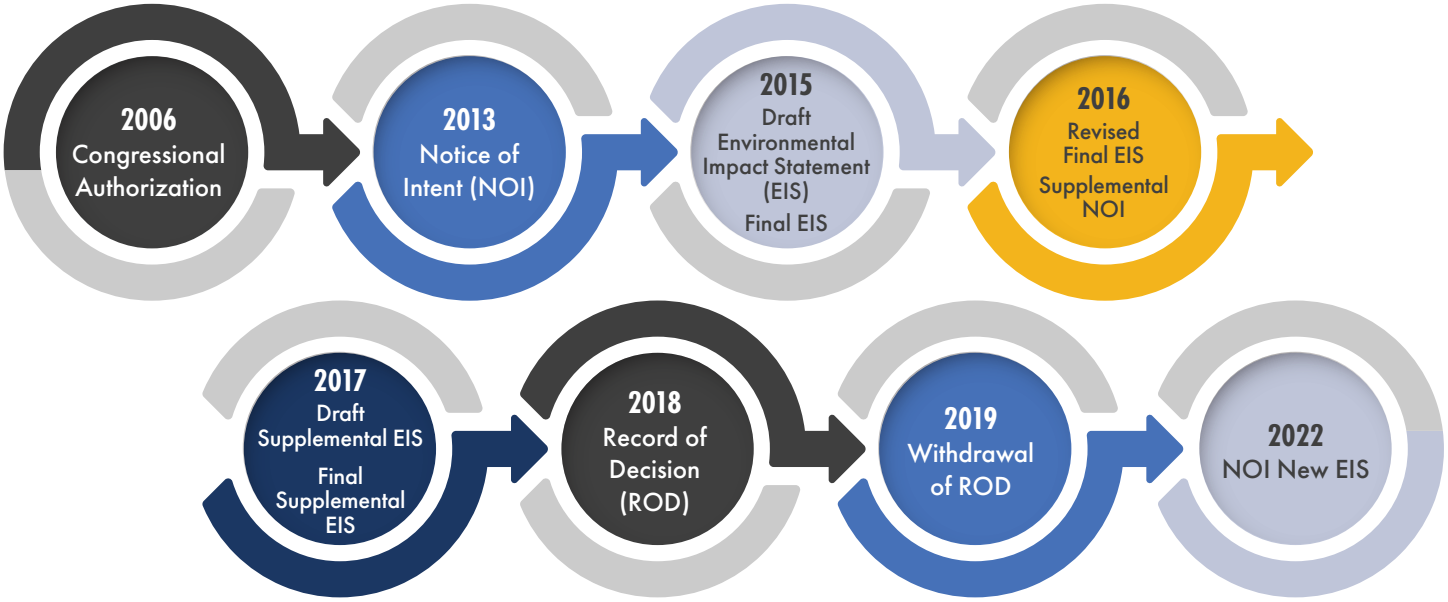
Among the objectives for developing a new FCI and prison camp is to meet the on-going need for modern federal correctional facilities and infrastructure as well as to address an identified need for a new FCI and FPC in the BOP's Mid-Atlantic Region of the country.

Why Now?

Development of a new federal correctional facility in Letcher County has its origins in 2006 when Congress directed the BOP to conduct the studies necessary to develop a new high-security facility.

Since planning for development of a new federal correctional facility in Letcher County began, the needs of the BOP have changed considerably. This has resulted in a complete re-examination of the nature and scope of the proposed action, additional investigations and evaluations of viable development sites, among other activities and necessitating preparation of this Draft Environmental Impact Statement.

Timeline:



ATTACHMENT 4

PUBLIC SCOPING MEETING SIGN-IN SHEETS

Proposed Federal Correctional Institution and Prison Camp
Letcher County, Kentucky - Scoping Meeting Sign-in Sheet

6:00 PM, November 17, 2022, Letcher County Central High School, 435 Cougar Drive, Whitesburg, Kentucky

Please PRINT your information and indicate if you would like to be called up to speak.

Name	Mailing Address	Email Address	Speaker (Y/N)
* Elwood Cornett	267 Elwood Rd Blackey, Ky	elwoodc@tuscable.com	Y
Sherry Sexton	12908 Hwy 7 North Deane Ky 41812	Katydid818@gmail.com	N
Kathy Cornett	282 Elwood Rd. Blackey, Ky. 41804-8911	elwoodc@tuscable.com	–
Anna Caudill	1014 Hwy 3408 Blackey, Ky 41804	anna-caudill1200@hotmail.com	✓
Sandra Brown	199 Hwy 3404 Partridge, Ky. 40862	sbrown0249@kctcs.edu	✓
MIMI PICKERING	14 CHURCH ST WHITESBURG KY 41858	mpickering@appalshop.org	N
Trevor Pollard	36 Right fork Mason Creek 41774	trevor@kradd.org	✓

...record subject to disclosure (NRS 239.0107)

Proposed Federal Correctional Institution and Prison Camp
Letcher County, Kentucky - Scoping Meeting Sign-in Sheet

6:00 PM, November 17, 2022, Letcher County Central High School, 435 Cougar Drive, Whitesburg, Kentucky

Please PRINT your information and indicate if you would like to be called up to speak.

Name	Mailing Address	Email Address	Speaker (Y/N)
* ROBERT N. LEWIS	54 BRIDGE LOP WHITESBURG, KY. 41858	lewisek1959@yahoo.com	YES
Freddie WATTS	310 Old Dixon Rd Blackey Ky. 41804	FWATTS@dgoc.com	✓
Senator Johnnie Turner	Box 337 Harlan Ky 40831	jTBharlan@[illegible].net Senator Johnnie Turner	✓
Phillip Hampton	PO BOX 214 Whitesburg, Ky 41858	phampton@mtncomp.org	✓
Amelia Kirby	PO Box 1394 Harlan KY 40831	kirby.amelia@gmail.com	✓

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Please PRINT your information and indicate if you would like to be called up to speak.

Name	Mailing Address	Email Address	Speaker (Y/N)
* Rebecca Holmes	2196 Bishoptown Rd Duffield VA 24244	beccamarieholmes@gmail.com	Y
Sandy Creech	P.O. Box 78 Premium, Ky 41845		N
Katie Williams	849 Spring Branch Yeremich Ky 41826		N
Marlene Walters	350 Ironwood Drive Hallie Ky 41821		N

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Letcher County, Kentucky - Scoping Meeting Sign-in Sheet

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Please PRINT your information and indicate if you would like to be called up to speak.

Name	Mailing Address	Email Address	Speaker (Y/N)
Jackie Collins	73 El Paso Drive Whitesburg, KY 41858	jackie.collins@letcher.kyschools.us	N

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Proposed Federal Correctional Institution and Prison Camp
Letcher County, Kentucky - Scoping Meeting Sign-in Sheet

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Please PRINT your information and indicate if you would like to be called up to speak.

Name	Mailing Address	Email Address	Speaker (Y/N)
Leo Shannon	260 Main St Apt B Whitesburg KY 41858	leoshannon@gmail.com	N
VAN BREEDING	PO Box 824 WHITESBURG KY 41858	vanbreedingmdegmail.com	N
Christine Bolling	~~PO~~ 6 Boardway St Whitesburg, Ky 41858	Cbolling73@me.com	N
Deborah. Young	184 Yates Branch Whitesburg	deborah.young@KCTCS.edu	N

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Please PRINT your information and indicate if you would like to be called up to speak.

Name	Mailing Address	Email Address	Speaker (Y/N)
Caitlin Myers	74 Karen Leigh Ln Whitesburg, KY	Katie@appalshop.org.	
Rowan RoudeBush	74 Karen Leigh Ln Whitesburg, KY	Rowan@appalshop.org	
* Mitch Whitaker	9063 Hwy 588 Roxana KY 41848	mitchum.whitaker@uky.edu	Y
Brianna Robinson		Brianna@mountain-top media.com	
Harry Brewer			
Kaye Outlaw			
Curtis Cox	91 Lilley Cornett Branch Hallie KY 40422	Curtis.cox@eku.edu	

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Please PRINT your information and indicate if you would like to be called up to speak.

Name	Mailing Address	Email Address	Speaker (Y/N)
Barb Causey	Suite 1 Jenkins, Ky 41541 104 Fortress Properties	barb.causey@weisandenergy llc.com	N
Kim Hudson	FBOP- 320 1st Street, NW Rm. 901.5 West Washington DC 20534	kshudson@bop.gov	Y
JENNY C. ALVAREZ	FBOP-CERB 320 FIRST ST. NW-901-5W. WASHINGTON, D.C. 20534	jsalvarez@bop.gov	N
Merle Caudill	1014 Hwy 3408 Blackey, KY 41804	merleg@tuscable.com	N
Shawn Sparkman		s.sparkman@tstel.net	✓
* Carroll Smith	smithcarrolla@hotmail.com	3240 Kingdom Come Creek Wbg Ky 41858	Yes
14. Artie Bates	artieannbates@gmail.com	1350 Elk Crk Blackey, Ky 41804	Y

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Letcher County, Kentucky - Scoping Meeting Sign-in Sheet

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Please PRINT your information and indicate if you would like to be called up to speak.

Name	Mailing Address	Email Address	Speaker (Y/N)
Roy Harlow		rharlow@gearheart.com	N
Eunice Holland		eholland@qkt.com	N
Chris Caudill		chroscaudill24@gmail.com	N
Charlie [illegible]			N
Ellen Wright		ewright@arh.org	N
Eric [illegible]		ericfields87@gmail.com	N
Todd DePriest		toddderiest@cityofjenkins.org	Y

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Letcher County, Kentucky - Scoping Meeting Sign-in Sheet

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Please PRINT your information and indicate if you would like to be called up to speak.

Name	Mailing Address	Email Address	Speaker (Y/N)
Cici Ciccarelli	320 1st St. NW Washington D.C. 20534	cciccarelli@bop.gov	N
JUDAH ORGANIC	320 1ST ST. NW RM 901-5 WASHINGTON, DC 20534	JORGANIC@BOP.GOV	N
Rob Nardi	2000 Lenox Drive ~~08858~~ Lawrenceville NJ	robert.nardi@wsp.com	N
Ricky Rose	~~Ricky.Rose@Ky.Gov~~ Ricky.Rose P.O.Box263 Cromona 41810	Ricky.Rose@Ky.Gov	N
Stephen Adams	350 Burton Hill Letcher Ky 41832	stephen adams 48@icloud.com	N
Reed CAUDILL	48 Runnels Br Road Littcarr Ky 41834	DFCMRC@TGTEL.com	N
Shawn + Randall Made	6830 Hwy 160 Whitesburg Ky 41858	606-633-7670 Land owner Roxane	N

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Proposed Federal Correctional Institution and Prison Camp
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Please PRINT your information and indicate if you would like to be called up to speak.

Name	Mailing Address	Email Address	Speaker (Y/N)
Jessica Shelton	58 Cowan St Whitesburg, KY 41858	jlshelton11@gmail.com	N
Addie Raleigh	9914 Hwy 931 S, Whitesburg, Ky	Addieraleigh@aol.com	
Linda Raleigh	9914 Hwy 931 S, Whitesburg Ky 41858	alfandralf@aol.com	
* Randy Wilson	P.O. Box 154 Whitesburg. 41858	rwilsonbanjo@gmail.com	Y
Jared Hamilton	—	jaredhamiltonphoto@gmail.com	N
Mitchum Whitaker	484 Henry Hutton Rd. Neon, KY		N

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Please PRINT your information and indicate if you would like to be called up to speak.

Name	Mailing Address	Email Address	Speaker (Y/N)
Jim Brown	199 Hwy 3404 Partridge, 40862	timbro199@gmail.com	N
Holly Caudill	1119 Hwy 1148 Isom, Ky. 41824	hollyb@tvscable.com	N
Ruby Maggard	565 Hwy 3405 Eolia KY 40824	ruby.maggard@gmail.com	N
Candice Fields	6662 Talent Branch Cornettsville, KY 41731	candice@kradd.org	N
* Terry Adams	P.O. Box 488 Isom Ky 41824	Judgeadams@letchercounty.ky.gov	Y
Sam Adams	411 N Webb Ave Whitesburg, KY 41858	sadams@themountaincagle.com	N

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Proposed Federal Correctional Institution and Prison Camp
Letcher County, Kentucky - Scoping Meeting Sign-in Sheet

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Please PRINT your information and indicate if you would like to be called up to speak.

Name	Mailing Address	Email Address	Speaker (Y/N)
Bill McIntosh Perry Co Fiscal Court	PO Drawer 210 Hazard, KY 41702	bmcintosh@perrycountyky.org	N
Sherry Cornett	276 Cornetts Br Linefork, Ky 41835	scornett01@hotmail.com	N
Belle [illegible] Retired teacher	357 Judy Rd. Blackey, Ky 41804		N
ELVENIA BLAIR	123 BLACK BOTTOM RD JEREMIA, KY 41826	ELVENIABLAIR@YAHOO.com	N
Curtis Caudill	1366 Highway 2035 Whitesburg Ky 41858	Caudillcurtis03@gmail.com	N
Jeff Hensley		Jeff.Hensley@inland energyLLC.com	N
Jordan Mazurek	—	j.e.mazurek12@gmail.com	N

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Please PRINT your information and indicate if you would like to be called up to speak.

Name	Mailing Address	Email Address	Speaker (Y/N)
Lm (mike) Caudill	Po Box 40, Whitesburg, KY 41858	lmcaudill@mtncomp.org	N
JACK BANKS	2214 Hwy 931 South Whitesburg Ky. 41858	jbanks@letcherCounty.ky.gov	N
Pauletta Breeding	POB 828, Whitesburg Ky 41858	vpuke1@yahoo.com	N
Melanie Watts	214 Old Dixon Rd. Blackey Ky 41804	wattsmel88@gmail.com	N
Linda Watts	310 Old Dixon Rd. Blackey, Ky. 41804	Linda41804@gmail.com	N
TRICIA + Wade Baker	PO Box 790 Whitesburg, Ky 41858	—	N

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Please PRINT your information and indicate if you would like to be called up to speak.

Name	Mailing Address	Email Address	Speaker (Y/N)
William Major	Po Box 977 Harlan KY 40831	Wmajor@likenknowledge.org.	
JACOB MACK-BOLL	PO Box 312 whitesburg KY 41858	jacob.mackboll@gmail.com	N
Rick Walt	235 Tom Hollow Partridge, Ky 40862	—	
William Smith	10444 Hwy 7 South Cornettsville Ky 41731		
Margaret Hammonds	122 Dow Collins St Whitesburg, Ky 41858	meghammonds@outlook.com	
Brittany Gross	154 S Abdoo St Neon, KY 41840	bgross1@arh.org	N
Vanessa Vanover	160 Allspice Dr Jenkins KY 41537	Vanessa.vanover@letcher.kyschools.us	N

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Please PRINT your information and indicate if you would like to be called up to speak.

Name	Mailing Address	Email Address	Speaker (Y/N)
Andrea Begley	48 S Hwy 15 Hazard, Ky 41701	andrea.begley@mail.house.gov	N
Colby Goss	PO Box 954 Harlan, KY 40831	Colbygoss@harlanonline.net	
Seth Long	605 Bentley Ave Whitesburg KY 41858	seth.long@homesinc.work	
John Wilder	661 Hwy 317 Neon, KY 41840	shopcellcity@gmail.com	
Will Smith	60 Fairview Dr Whitesburg.		
Brandon B. Baker	100 Tennessee Ave Whitesburg KY 41858	fdxman6t9@gmail.com	N
Jim Flynn	Box 164 Blackey, Ky 41804		

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Please PRINT your information and indicate if you would like to be called up to speak.

Name	Mailing Address	Email Address	Speaker (Y/N)
Whitney Justice		wjustice@doubledkwik.com	N
* Jeffery Justice		jeffery@pmp-ky.com	Y
Caroline Rubens	70 Cowan St. Whitesburg KY 41858	~~caroleonia~~ caroleonia@gmail.com	N
Sandy Hogg	P.O Box 365 Neon, Ky 41858	hogg.sandy@yahoo.com	N
Paul M. [illegible]	Box 365 NEON Ky		N
Steve [illegible]	Whitesburg, Ky	steved@krpky.com	N
Bernardine Frazier Miracle	99 5th street Whitesburg, Ky 41858	bernardinemiracle@yahoo.com ~~[illegible]~~	N

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6:00 PM, November 17, 2022, Letcher County Central High School, 435 Cougar Drive, Whitesburg, Kentucky

Please PRINT your information and indicate if you would like to be called up to speak.

Name	Mailing Address	Email Address	Speaker (Y/N)
B.b Shurtleff	3249 N. Mayo Pikeville, Ky	bsshurtleff@aep.com	N
Billy Stamper	1292 Smoot Creek Road Whitesburg Ky 41858	bstamper@bizzackconstruction.com	N
Jessica Johnson	278 Sunday Drive Whitesburg, Ky. 41858	jjohnson2@arh.org	N
* Ada Smith	PO Box 312 Whitesburg, KY 41858	adajulia@gmail.com	Y
Rita Pratt	861 Hwy 3400 Jenkins, Ky. 41537	pra62382@windstream.net	N
JOSEPH GORMAN	2196 BISHOPTOWN RD DUFFIELD VA 24244	joseph.andrew.gorman@gmail.com	N
Calvin R. Tackett Esq	TACKETT LAW @ Att.net		✓

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Please PRINT your information and indicate if you would like to be called up to speak.

Name	Mailing Address	Email Address	Speaker (Y/N)
Darlene Collins	562 Smoot Creek Whitesburg, KY 41858	darlene.collins@letcher.kyschools.us	N
Harry Collins	562 Smoot Creek Whitesburg KY 41858	harry.collins@letcher.kyschools.us	N
* Tarence Tarence Ray Ray	52 Broadway whitesburg, KY 41858	tarence.ray@gmail.com	Y
Tina Whitaker	73 Community Drive Cromona, Ky 41810	tina.supernorprinting@gmail.com	N
Ward Childers		dchilders@arcom	[illegible]
* Angie Hatton	20 Ohio Street Whitesburg, KY 41858	angiehatton2016@gmail.com	Y
Ken Watts	149 Beckett Loop Whitesburg Ky 41858	wattskwt@aol.com	—

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6:00 PM, November 17, 2022, Letcher County Central High School, 435 Cougar Drive, Whitesburg, Kentucky

Please PRINT your information and indicate if you would like to be called up to speak.

Name	Mailing Address	Email Address	Speaker (Y/N)
* Danielle Smoot	551 Clifty St. Somerset, Ky 42503	danielle.smoot@mail.house.gov	Yes
RYAN CREECH	P.O. BOX 956 HARLAN, KY 40831	RYANCREECH@HARLANONLINE.NET	NO
Kayla Wilder	6749 Highway 119N. Jenkins Ky, 41537	Kaylawilder@gmail.com	
Freddie Coleman	795 Kingdom come crk Whitesburg, Ky		
Mark Young	184, Vates Branch Whitesburg, Ky	myoung184v@gmail.com	
Heather Burton	146 Center Drive Whitesburg Ky 41858	heatherburton1972@gmail.com	
Sally Baker	100 Tennessee Ave. Whitesburg, Ky 41858		NO

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Please PRINT your information and indicate if you would like to be called up to speak.

Name	Mailing Address	Email Address	Speaker (Y/N)
Matt Smith	3210 Kingdom Come Creek Whitesburg, Ky 41858	fatercraw123@hotmail.com	N
Donna McClure	300 S Main St Suite 310 London Ky 40741	donna_mcclure@mcconnell.senate.gov	N
[illegible]	109 Pin Oak Dr Pikeville, Ky 41501		NO
[illegible]	P.O. Box 806 Whitesburg, KY 41858		—
Derrick Sturgill	39 Quiet Row Jenkins, Ky 41537	dsturgill24@gmail.com	N
Madeline Flannery	79 Harris Loop Whitesburg, Ky 41858	madelineflanneryc@gmail.com	—
Greg Parkman	80 Chandler Dr Hallie, KY 41821	PGSparkman@AEP.com	N

public record subject to disclosure (NRS 239.0107)

ATTACHMENT 5

WRITTEN COMMENT FORM FOR PUBLIC SCOPING MEETING

There are several ways to submit comments:

Visit our website and comment via the *Inquiries* tab:
www.proposed-fci-letchercountyky.com

Email: kshudson@bop.gov

Submit a written comment:
Kimberly S. Hudson, Site Selection Specialist
Construction and Environmental Review Branch
Federal Bureau of Prisons
320 First Street, NW, Room 901-5,
Washington, DC 20534

Comment Form

Please use this form to submit written comments concerning the Federal Bureau of Prison's proposal to develop a new Federal Correctional Institution and Federal Prison Camp in Letcher County, KY. The Bureau of Prisons is interested in your questions and comments about the proposed project as it begins preparation of the Draft Environmental Impact Statement.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Please note that before including your name, address, e-mail address, or other personal identifying information in your comment, the entire comment, including personal identifying information, may become publicly available.

Name*: _____

Title/Affiliation (if any): _____

Address: _____

City/State/Zip Code: _____

Email Address*: _____

*(*Required field)*

ATTACHMENT 6

PUBLIC SCOPING MEETING PRESENTATION

PUBLIC SCOPING MEETING PRESENTATION

Proposal to Develop a Federal Correctional Institution and Federal Prison Camp in Letcher County, Kentucky

Kimberly S. Hudson, Site Selection Specialist
Construction and Environmental Review Branch
Federal Bureau of Prisons

6:00 PM (EST), Thursday, November 17, 2022

SLIDE 1 ("PLEASE STAND BY" SLIDE)

Appears on screen for 10-15 minutes prior to meeting start.

We will begin in a few minutes to allow attendees an opportunity to be seated or to join on-line.

SLIDE 2 (PUBLIC SCOPING MEETING TITLE SLIDE)

Good evening and welcome to today's Public Scoping Meeting.

SLIDE 3 (WELCOME SLIDE)

My name is Kimberly Hudson and I am a Site Selection Specialist with the Federal Bureau of Prisons. I'm here to conduct a Public Scoping Meeting concerning a proposal to develop a new Federal Correctional Institution and Prison Camp in Letcher County and the Draft Environmental Impact Statement to be prepared in compliance with the National Environmental Policy Act. Before we start, I'd like to express our appreciation to Letcher County Schools for making available the high school for today's meeting and to the Letcher County Planning Commission for their assistance with arrangements for the meeting.

SLIDE 4 (ATTENDEES SLIDE)

I'd like to introduce several colleagues, also representing the Bureau of Prisons, who are with me tonight:

- Judah Organic, Projects Administrator with the Construction and Environmental Review Branch.
- Jenny Alverez, Senior Project Manager with the Construction and Environmental Review Branch.
- Randy Salso, Management Analyst with the Construction and Environmental Review Branch. And,
- Carl Ciccarelli, Assistant General Counsel, with the Office of General Counsel.

Representing WSP, the consulting firm assisting the Bureau, are Bob Nardi, Vice President and

Sarah Hoffman, Senior Environmental Planner.

I'd also like to acknowledge representatives of Congressman Rogers and Senator McConnell who have joined us today. Thank you for coming.

SLIDE 5 (REMOTE MEETING SERVICE)

In addition to attending in-person, individuals are able to participate remotely by using a computer, tablet, or smartphone to call-in using a toll-free number or a meeting link. For those who are joining remotely, please note that:

- We have muted everyone's microphone to eliminate any background sounds that could interfere with the meeting.
- The meeting is also being recorded. This will allow us to post the recording to the project website so those unable to attend can view the recording at a later date.

SLIDE 6 (SCOPING MEETING PURPOSE)

The purpose of today's Scoping Meeting is:

- To provide current information concerning a proposal to develop a new federal correctional institution and prison camp in Letcher County.
- To solicit public comments and input concerning the proposed action and prior to preparation of the Draft Environmental Impact Statement (also known as an EIS). And,
- To ensure compliance with the National Environmental Policy Act, commonly referred to as NEPA, and other applicable laws, regulations, and Executive Orders.

At this time, I'd like to introduce Bob Nardi to discuss the proposed project and the NEPA process.

SLIDE 7 (MISSION OF THE FEDERAL BUREAU OF PRISONS)

Thank you, Kimberly. The Federal Bureau of Prisons was established in 1930 with a mission to "*protect society by confining offenders in the controlled environments of prisons and community-based facilities that are safe, humane, cost-efficient, appropriately secure, and provide work and other self-improvement opportunities to assist offenders in becoming law-abiding citizens.*"

SLIDE 8 (CHALLENGES)

However, the Bureau faces numerous challenges each day in carrying out its mission. Among those challenges, and the reason for this meeting, involves the growing number of federal correctional facilities that were designed and constructed 50 to 100 years ago. Facilities of that age and era are costly to maintain and operate. They typically don't conform to contemporary design standards and practices and lack modern mechanical, electrical, and plumbing systems and technologies. For example, the United States Penitentiary in Leavenworth, Kansas was constructed in 1906. There is uniform agreement that it needs to be replaced and at this time, the Bureau is moving ahead to develop a new correctional institution in Leavenworth that will be

more efficient to maintain and operate, will reflect contemporary design and construction standards, and be equipped with modern mechanical, electrical and plumbing systems.

Equally important, modern facilities are designed to improve living and working conditions for inmates and staff which has been shown to have a positive effect on institution operation, safety, and security.

SLIDE 9 (PROJECT OBJECTIVES)

At this time, the Bureau is proposing to develop a new Federal Correctional Institution and Prison Camp in Letcher County. The objectives for doing so are to:

- Meet the need for modern federal correctional facilities and infrastructure.
- Accommodate a portion the federal inmate population. And
- Address the need for new facilities within the Mid-Atlantic Region of the country.

It's important to point out that the proposal to develop a new federal correctional facility has its origins in 2006. It was then that Congress directed the Bureau to undertake the investigations necessary to develop a new high-security correctional facility in Letcher County.

SLIDE 10 (NEPA REGULATIONS)

You heard Kimberly mention the National Environmental Policy Act, which became law over 50 years ago and which governs this meeting and much of the work to be done going forward. The passage of NEPA served to:

- Increase awareness about the environment,
- Encourage the public to play an active role in protecting the environment,
- Required federal agencies, including the Bureau, to consider how actions such as developing a new correctional facility would affect the environment; and
- To account for those impacts in the decision-making process.

NEPA also requires the public to be provided with opportunities to offer their input and provide comments prior to undertaking preparation of the Draft EIS and is the reason for the meeting today.

SLIDE 11 (CHRONOLOGY)

To comply with the 2006 Congressional directive, and in conformance with NEPA, the Bureau has conducted a wide range of technical studies and published multiple EISs. Included among the previous efforts were:

- A study conducted in 2008 that identified prospective sites in Letcher County that could be used for development of a new federal correctional facility.
- A Draft EIS prepared in 2015 which evaluated various alternatives for development of a high-security penitentiary and minimum security prison camp in the county.
- That same year, a Final EIS was prepared that responded to public comments received on the Draft EIS and identified the Roxana Site as the preferred location for development of the project.

- In 2016, the Bureau published a Revised Final EIS to address inconsistencies in the earlier document.
- In 2017, both Draft and Final Supplemental Revised Final EISs were prepared to address new circumstances relevant to potential environmental impacts.
- In 2018, the Bureau selected the Roxana Site for development and adopted a Record of Decision to document its decision.
- However, in 2019, the Acting Director of the Bureau withdrew the Record of Decision in order to evaluate new information.

Throughout this time, the Congressional directive of 2006 to develop a new correctional facility in Letcher County, has remained in effect.

SLIDE 12 (CURRENT STATUS)

Since 2019, the Bureau has been evaluating its current and future needs and has determined that housing medium-security inmates in the future supersedes the need to house high-security inmates. The new facilities are proposed to accommodate a combined total of 1,408 beds. However, design, construction, and operation of a medium-security institution differs from that of a high-security penitentiary with the potential environmental impacts correspondingly different. As a result, the Bureau must ensure that the environmental consequences of this new action are also adequately considered.

Fortunately, an extensive volume of information has already been compiled about Letcher County and its surroundings as well as the previously considered development sites. Although the passage of time will require us to update and verify current conditions, the information previously gathered should help expedite preparation of the new Draft EIS.

SLIDES 13, 14, 15 (TYPICAL MEDIUM SECURITY FCI AND FPC)

To provide perspective, images of a medium-security Federal Correctional Institution and minimum-security Federal Prison Camp are shown on the screen.

SLIDE 16 (PROPOSED EIS SCOPE)

The scope of our efforts in preparing the Draft EIS include:

- Explaining the purpose of the report and the regulations, including NEPA, under which the EIS process is conducted.
- Describing the purpose and need for a modern new facility to house medium-security inmates within the Mid-Atlantic Region of the country.
- Alternatives to developing the project including No Action Alternative.
- As with previous EISs, most of the document will be devoted to an account of conditions in and around the proposed project sites and Letcher County. And,
- An analysis of potential impacts of developing the proposed correctional institution based on information gathered from other federal, state, regional, and local government agencies, stakeholders, and the public.

The proposed project sites included in the previous studies will also be carried over to the new EIS. Site-specific topics and issues of local and regional concern will be addressed in the study.

This will include topography, geology, soils, water resources, cultural resources, hazardous waste, biological resources, traffic, air quality, noise conditions, impacts to local and regional land use plans, utility services, public services, and the effect on the economy and other aspects of developing such a facility.

Included among the topics to be studied will be what is known as Environmental Justice which is intended to ensure that the Bureau identifies and addresses any adverse human health or environmental impacts of the proposed project that disproportionately affect minority or low-income populations.

If the proposed project results in potentially adverse impacts, measures to mitigate such impacts will also be proposed in the document. The Draft EIS will include a list of the individuals responsible for its preparation and a list of references.

Since publication of various notices in September about the current effort, the Bureau has received input and guidance from the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, the Advisory Council on Historic Preservation, and members of the public and will seek additional input and guidance as we re-engage with local, state and federal agencies and stakeholders.

SLIDE 17 (PUBLIC SCOPING PROCESS)

As mentioned earlier, today's scoping meeting is intended to receive input and comments about the project and the Draft EIS. It is not a question and answer session nor is it an open debate or referendum about the merits of the project. As we previously mentioned, Congress has directed the Bureau to construct a new correctional facility in Letcher County. And while there's no limit to what topics you can raise, we ask that your remarks focus on the proposed action in relation to what the Bureau should consider in preparing the Draft EIS. All remarks this evening will be made part of the project record and, as Kimberly mentioned, a recording will be made of the meeting. While we look forward to the public's input, the Bureau is ultimately responsible for determining the scope of the project and the Draft EIS in accordance with Federal laws and regulations.

SLIDE 18 (PROJECT WEBSITE)

To facilitate communications between the public and the Bureau, a website has been established to provide easy access to:

- EISs and other related documents prepared since 2013; and
- Communications including notices, announcements, calendars, documents, and other project-related materials associated with this current effort including a recording of this meeting

The website also provides a means to offer comments, questions, and other input regarding the current proposal and Draft EIS.

SLIDE 19 (DRAFT AND FINAL EISs)

Once all the investigations and analyses are completed and compiled, the Bureau will publish the Draft EIS and widely circulate information about how to access the document. The public will then be invited to review the document and provide comments during a review period lasting no less than 45 days. During that time, the Bureau will host a public meeting, similar to tonight's meeting, to seek comments concerning the Draft EIS.

Once the review period has ended, the Bureau will review all written and verbal comments it received and prepare written responses that will be incorporated within a Final EIS. Publication of the Final EIS will initiate another comment period lasting no less than 30 days. A decision whether to proceed with the proposed action will then be made by the Director of the Federal Bureau of Prisons after taking into account the environmental analyses and public comments and will be documented by a Record of Decision as stipulated by NEPA regulations.

SLIDE 20 (PUBLIC PORTION OF THE MEETING)

The rest of the tonight's meeting is devoted to hearing from the public, both those in attendance and those joining remotely. For those in attendance and wishing to speak, you will be called upon in the order you signed up. We ask you to come to the microphone, state and spell your name so that it can be entered correctly into the record, and offer your comments.

For those attending remotely, you can use the "CHAT" icon on bottom of the screen to identify yourself and be called upon in the order you are identified. When you are called upon to speak, please state and spell your name so that it can be entered correctly into the record and offer your comments. For those who have already submitted written comments or questions using the CHAT icon, they will be read into the record. We ask that you keep your remarks to three to four minutes so everyone wishing to speak will have an opportunity to do so.

SLIDE 21 (COMMENT FORM)

If you have more to say than the time will allow, please consider using the Comment Form handed out tonight and available on the project website which can be completed and returned to us on or before the November 30, 2022. Simply write your comments and send them to us at the email address shown on the form and we'll consider them as we would your verbal comments this evening. If you have already prepared a written statement, please email it to us and it will be included in the record.

If you're interested in being added to the email list to receive information about the proposed project and Draft EIS, please use the Comment Form or send me an email with your name, mailing address, and email address and we'll add you to the list. Contact information is on the form and website. For those who are unsure at this time whether they wish to speak, before we conclude the meeting, we will ask if anyone else would like to offer comments. I'll now turn the meeting back to Kimberly.

(PUBLIC PORTION OF THE MEETING)

Now for the public portion of the meeting.

Of those in attendance, the first speaker is ..... Please use the microphone to state and spell your name and share your comments. Thank you.

(*After all those in attendance who wished to speak are finished*) That was the last speaker from among those in attendance.

We have a number of individuals who have joined remotely who also wish to offer comments.

The first remote speaker is ..... Please state and spell your name and share your comments. Thank you.

(*After all the remote speakers are finished*) That was the last speaker from among those who joined remotely.

We will provide a couple more minutes for anyone else wishing to address the Bureau of Prisons or to make verbal comments.

There are no more comments. The Public Comment Form is on the project website if you would like to comment at a later time With that we are concluding tonight's public scoping meeting. As a reminder, comments will be accepted by the Bureau until November 30, 2022 at which time written and verbal comments will be reviewed to identify those topics or issues to be addressed in the Draft EIS.

SLIDE 22 (THANK YOU)

Thank you.

PLEASE STAND BY

PUBLIC SCOPING MEETING WILL START MOMENTARILY

Federal Bureau of Prisons

November 17, 2022

PUBLIC SCOPING MEETING

Proposed Federal Correctional Institution
and Federal Prison Camp
Letcher County, Kentucky

Federal Bureau of Prisons

November 17, 2022

WELCOME

Kimberly S. Hudson, Site Selection Specialist

Federal Bureau of Prisons

Representing Federal Bureau of Prisons

- Judah Organic, Projects Administrator
- Jenny Alverez, Senior Project Manager
- Randy Salso, Management Analyst
- Carl Ciccarelli, Assistant General Counsel

Representing WSP USA Inc.

- Bob Nardi, Vice President
- Sarah Hoffman, Senior Environmental Planner

Remote Meeting Service

- Toll-free number: 877-829-8910, Conference Code: 857288

- Meeting link:

https://wspusa.zoom.us/j/89605575889?pwd=RkZzUGhiMDdrYyt3M1IyVFJNcFZxQT09

Zoom Meeting ID: 986 0557 5889

Passcode: 705186

Meeting Purpose

- Provide information regarding proposal to develop Federal Correctional Institution (FCI) and Federal Prison Camp (FPC) in Letcher County
- Solicit comments and input concerning proposal prior to preparation of Draft Environmental Impact Statement (EIS)
- Ensure compliance with National Environmental Policy Act (NEPA) and other laws, regulations, and Executive Orders

Mission

" Protect society by confining offenders in the controlled environments of prisons and community-based facilities that are safe, humane, cost-efficient, appropriately secure, and provide work and other self-improvement opportunities to assist offenders in becoming law-abiding citizens."

Challenges

- Growing number of federal correctional facilities designed and constructed 50 to 100 years ago
  - Costly to maintain and operate
  - Don't conform to contemporary design standards and practices
  - Lack modern mechanical, electrical, plumbing systems and technologies
- Modern facilities provide improved living and working conditions with corresponding positive effect on institution operation, safety, and security

Objectives

- Develop new correctional institution to meet need for modern facilities and infrastructure
- Accommodate portion of federal inmate population
- Address need for new facility in Mid-Atlantic Region
- Comply with Congressional directive to conduct investigations necessary to develop new high-security correctional facility in Letcher County

National Environmental Policy Act

NEPA became law 50+ years ago to:

- Increase awareness of the environment
- Encourage public to play role in protecting environment
- Require federal agencies to consider how actions affect environment
- Account for impacts in decision-making process
- Provide opportunities for public input concerning proposal and prior to preparation of Draft EIS

Chronology

2006
Congress directives Bureau to study Letcher County for prison development

2008
Initial study of development sites in Letcher County

2013
Notice of Intent to prepare EIS

2015
Draft EIS

Final EIS

2016
Revised Final EIS

2017
Draft Supplemental Revised Final EIS

Final Supplemental Revised Final EIS

2018
Record of Decision adopted

2019
Withdrawal of ROD

2022
NOI New EIS

Current Status

- Housing medium-security inmates supersedes need to house high-security inmates
- Design, construction, and operation of medium-security FCI differs from high-security penitentiary; potential environmental impacts correspondingly different
- Environmental consequences must be reconsidered
- Extensive volume of information already compiled about Letcher County and previously considered sites
- Although need to update and verify conditions, information available should expedite Draft EIS preparation

Medium-security Federal Correctional Institution

FCI Welch, West Virginia

Medium-security Federal Correctional Institution

FCI Welch, West Virginia

Minimum-security Federal Prison Camp

FPC Welch, West Virginia

Scope of Draft EIS

- Provide background and context for proposed project, NEPA, and process under which Draft EIS is prepared
- Purpose and need for new facility to house medium-security inmates within Mid-Atlantic Region
- Alternatives to developing project including No Action Alternative
- Conditions in and around project sites and Letcher County
- Analysis of potential project-related impacts
- Environmental Justice considerations
- Proposed sites from previous studies included in new EIS

Public Scoping Process

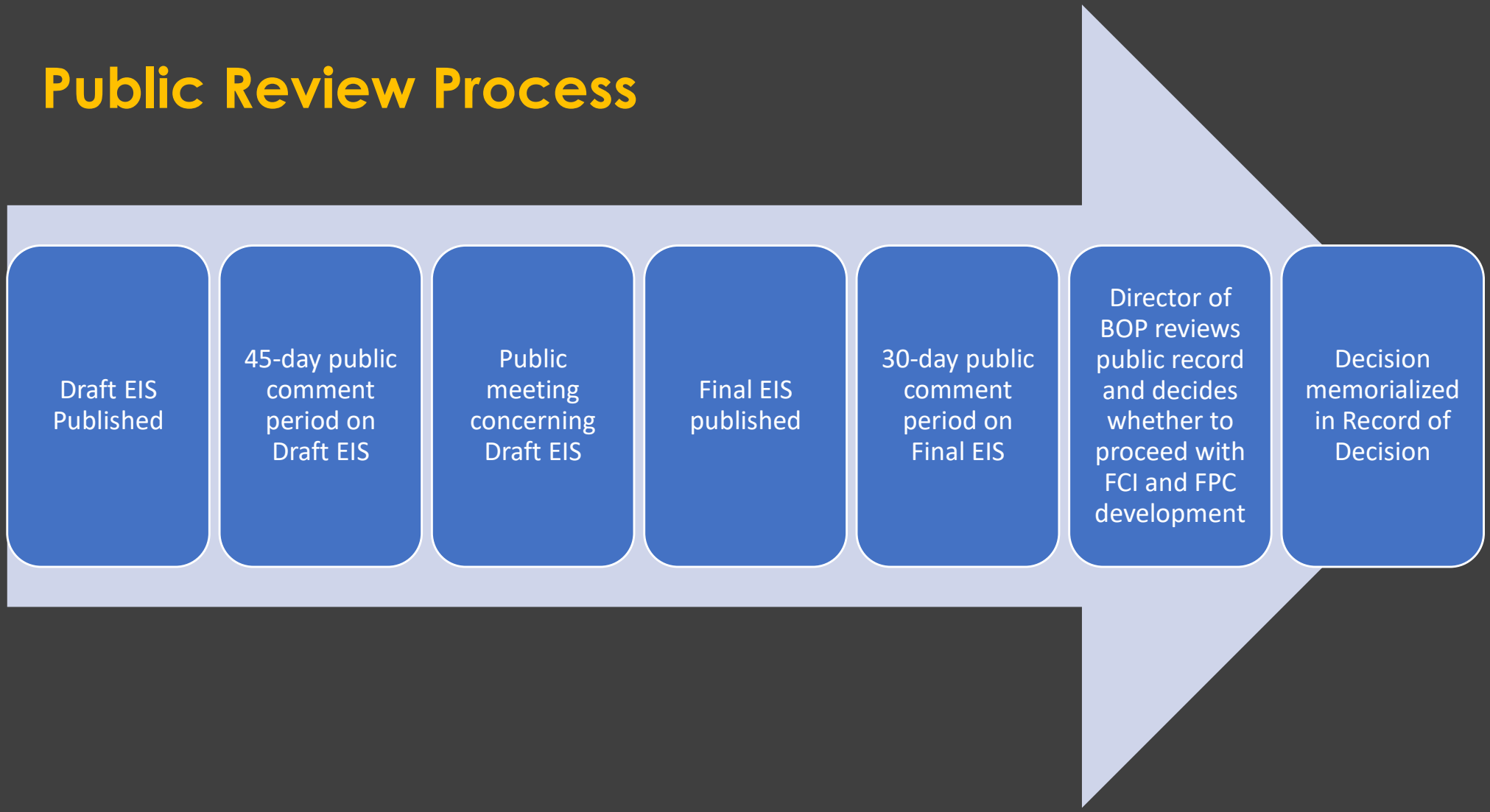
- Receive input and comments about proposed FCI and FPC and Draft EIS
- Not a Question & Answer session or referendum about project
- Focus remarks on proposed FCI and FPC, upcoming Draft EIS
- All written submissions and verbal remarks are part of public record

Project Website

- Facilitate communications about project and Draft EIS
- Provide access to:
  - Previous EISs and related documents
  - Communications including notices, announcements, calendars, meeting recordings, etc.
- Provide means to submit comments, questions, join email list, etc.

https://www.proposed-fci-letchercountyky.com/

Public Review Process



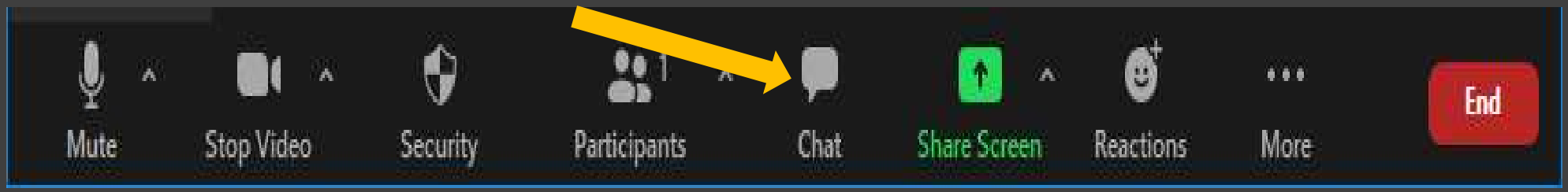
Public Portion of Scoping Meeting

In-person attendees:

- When called, come to microphone, state and spell name, offer verbal questions, comments, etc.

Remote attendees:

- Use "chat" icon to identify yourself and wait to be called upon. When called upon, state and spell your name for the record



- Keep remarks to 3-4 minutes, focus on project and Draft EIS

To Submit Comments

- Use Comment Form located on project website to submit written comments

- To join mailing list, include name, affiliation (if any), and email address on form and submit

https://www.proposed-fci-letchercountyky.com/

There are several ways to submit comments:

Visit our website and comment via the Inquiries tab
www.proposed-fci-letchercountyky.com

Email: kahudson@bop.gov

Submit a written comment:
Kimberly S. Hudson, Site Selection Specialist
Construction and Environmental Review Branch
Federal Bureau of Prisons
320 First Street, NW, Room 901-5,
Washington, DC 20534

Comment Form

Please use this form to submit written comments concerning the Federal Bureau of Prison's proposal to develop a new Federal Correctional Institution and Federal Prison Camp in Letcher County, KY. The Bureau of Prisons is interested in your questions and comments about the proposed project as it begins preparation of the Draft Environmental Impact Statement.

Please note that before including your name, address, e-mail address, or other personal identifying information in your comment, the entire comment, including personal identifying information, may become publicly available.

Name*: _____

Title/Affiliation (if any): _____

Address: _____

City/State/Zip Code: _____

Email Address*: _____

(*Required field)

THANK YOU

ATTACHMENT 7

PUBLIC SCOPING COMMENTS

There are several ways to submit comments:

Visit our website and comment via the *Inquiries* tab:
www.proposed-fci-letchercountyky.com

Email: kshudson@bop.gov

Submit a written comment:
Kimberly S. Hudson, Site Selection Specialist
Construction and Environmental Review Branch
Federal Bureau of Prisons
320 First Street, NW, Room 901-5,
Washington, DC 20534

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I think it would be an asset to the People of Letcher Co.

Please note that before including your name, address, e-mail address, or other personal identifying information in your comment, the entire comment, including personal identifying information, may become publicly available.

Name*: Ricky Rose

Title/Affiliation (if any): Letcher Co PVA

Address: P.O. Box 263

City/State/Zip Code: Cromona Ky 41810

Email Address*: Ricky.Rose@Ky.Gov

*(*Required field)*

There are several ways to submit comments:

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www.proposed-fci-letchercountyky.com

Email: kshudson@bop.gov

Submit a written comment:
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I support the project and hope the new EIS results are favorable.

Please note that before including your name, address, e-mail address, or other personal identifying information in your comment, the entire comment, including personal identifying information, may become publicly available.

Name*: Colby Goss

Title/Affiliation (if any): Deputy County Judge/Executive, Harlan County Fiscal Court

Address: P.O. Box 956

City/State/Zip Code: Harlan, KY 40831

Email Address*: colbygoss@harlanonline.net

*(*Required field)*

There are several ways to submit comments:

Visit our website and comment via the *Inquiries* tab:
www.proposed-fci-letchercountyky.com

Email: kshudson@bop.gov

Submit a written comment:
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This would be bad for our waterways. This prison represents a major danger to the North Fork River watershed and wildownstream waterways in the region. Also, all the jobs created will largely not go to residents of Letcher County due to requirements such as hiring within the BOP system, a 4 year bachelor's degree, 38 years and younger, and a clean credit + criminal history. If building on a former MTR site how do you insure infrastructure stability of the facility? We need flood relief not a prison! Lastly, old growth forest needs to be maintained and not disrupted.

Please note that before including your name, address, e-mail address, or other personal identifying information in your comment, the entire comment, including personal identifying information, may become publicly available.

Name*: William Major

Title/Affiliation (if any):

Address: PO Box 977 Harlan KY 40831

City/State/Zip Code:

Email Address*: wmajor@lkenknowledge.org

(*Required field)

There are several ways to submit comments:

Visit our website and comment via the *Inquiries* tab:
www.proposed-fci-letchercountyky.com

Email: kshudson@bop.gov

Submit a written comment:
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The need to incarcerate those people who have demonstrated their inability or unwillness to live in a free society without causing unlawful harm to law abiding citizens can not be disputed by any reasonable person.

The fact that the BoP's aging prison system to house those people, while it can be debated, is the only appropriate answer to gourntee the safety of law abiding citizens and to increase the offerings of training and rehabilitation to the inmates, is a just and compelling reason to replace these facilities with new, modern prisons.

To select Letcher County, Kentucky as the site of the new prison is the right choice. For twenty years we have shown our determination and fairly met ever hurdle or question raised. The time to act is now, build it!

Please note that before including your name, address, e-mail address, or other personal identifying information in your comment, the entire comment, including personal identifying information, may become publicly available.

Name*: L.M. (Mike) Caudill

Title/Affiliation (if any):

Address: PO Box 40

City/State/Zip Code: Whitesburg KY 41858

Email Address*: LMcaudill@mtncomp.org

(*Required field)

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We have just been in a flood that has displaced many people who need homes that are not in the flood plain. We need federal help to build homes. But instead we ~~are~~ have before us a plan to build a prison. Not houses ... a prison.

A prison is a toxic environment that leads to toxic communities. It is well documented that folks who work in a prison have more domestic violence issues in their community. Houses would be healing here - and you want to build a prison

~~Jobs created prison ar.~~ Prisons make jobs for highly trained people outside the community. Most jobs for local people are low paying. Employ people to build houses or to build ~~a~~ a prison?

Please note that before including your name, address, e-mail address, or other personal identifying information in your comment, the entire comment, including personal identifying information, may become publicly available.

Name*: Randal A. Wilson

Title/Affiliation (if any):

Address: P.O. Box 154

City/State/Zip Code: Whitesburg, Ky. 41858

Email Address*: rwilsonbanjo@gmail.com

*(*Required field)*

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Email: kshudson@bop.gov

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(8) old & outdated prisons are not our problem. Replace those where they are

(9) 70% prisons in rural areas; why? Letcher Co doesn't need this.

(1) Too much damage to the area around Roxana; too much traffic through Blackey & around the narrow road.

(2) Prisons at best are violent places & that endangers local people who might work there.

(3) Way too expensive start up & far too expensive to maintain into perpetuity; ≈ $90 million annually for upkeep. And the $500 million needed elsewhere!

(4) There are not enough black & brown people here to meet the racial diversity needs of the inmates.

(5) Our local jail in Whitesburg is over capacity by > 200% and the staff pay average is ≈ $18,000 so why not take care of local needs first.

Please note that before including your name, address, e-mail address, or other personal identifying information in your comment, the entire comment, including personal identifying information, may become publicly available.

(6) of the Federal prisons & camps in KY, 80% are east of Lexington, & now a proposal for another? None west of Lexington. Odd!

(7) Too much incarceration in US already.

Name*: Artie Ann Bates, MD

Title/Affiliation (if any): Psychiatrist

Address: 1352 Elk Crk

City/State/Zip Code: Blackey, Ky 41804

Email Address*: artieannbates@gmail.com

(*Required field)

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This will help our Community. I would like to see it happen as soon as possible.

Please note that before including your name, address, e-mail address, or other personal identifying information in your comment, the entire comment, including personal identifying information, may become publicly available.

Name*: _____

Title/Affiliation (if any): _____

Address: _____

City/State/Zip Code: _____

Email Address*: _____

*(*Required field)*

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I support the Prison on that side Kathy Cornett

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Name*: _____

Title/Affiliation (if any): _____

Address: _____

City/State/Zip Code: _____

Email Address*: _____

*(*Required field)*

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I support the Prison in Letcher County Anna Caudill

Please note that before including your name, address, e-mail address, or other personal identifying information in your comment, the entire comment, including personal identifying information, may become publicly available.

Name*: _____

Title/Affiliation (if any): _____

Address: _____

City/State/Zip Code: _____

Email Address*: _____

*(*Required field)*

Kentucky River AREA DEVELOPMENT DISTRICT

941 NORTH MAIN STREET • HAZARD, KENTUCKY 41701 • PHONE 606-436-3158

CHAIRMAN
Judge Executive
Chuck Caudill, Jr

VICE-CHAIRMAN
Fred Hall

SECRETARY
Mayor
Tom Burns

TREASURER
Judge Executive
Jeff Dobson

PARLIAMENTARIAN
Craig Lindon

BOARD OF DIRECTORS

County Judge Executives

Jeff Noble - Breathitt County
Jeff Dobson - Knott County
Chuck Caudill, Jr - Lee County
William R. Lewis - Leslie County
Terry Adams - Letcher County
Cale Turner - Owsley County
Scott Alexander - Perry County
Raymond Banks - Wolfe County

Mayors

Laura Thomas - Jackson
Tracy Neice - Hindman
Scott Cornett - Pippa Passes
Scott Jackson - Beattyville
Carol Joseph - Hyden
Susan Polis - Fleming-Neon
Tiffany Craft - Whitesburg
Todd DePriest - Jenkins
Nelson Bobrowski - Booneville
Ernest Back - Vicco
Donald "Happy" Mobelini - Hazard
Tom Burns – Buckhorn
Kathi May - Campton

Citizen Members

Susan Hartey
Gary Campbell
Ray D. Moore
Larry Parke
Larry Perkins
Harold Watley
David Lyons
Jessica Butler
Hiram Cornett
Eugenia Stewart Napier
Fred Hall
Bennie McCall
Bobby Mayes
Derrick Bowling
Lonnie Brewer
Gregory Whitson
Meriwether Wash-Hall
Pam Pilgrim
Craig Lindon

Executive Director
Michelle Allen

E-Mail
FAX NUMBER 606-436-3154
TDD NUMBER 1-800-247-2510
(Hearing Impaired)

October 29, 2022

Federal Bureau of Prisons
320 First Street, NW
Washington, DC 20534

To Whom It May Concern:

The Kentucky River Area Development District supports the location of a Federal Prison in Letcher County. This project aligns perfectly with our regional Comprehensive Economic Development Strategies.

Letcher County's economy, along with the entire Kentucky River region, has seen a drastic decline over the last decade. As a result, we have seen our population decline and poverty increase. A Federal Prison is the catalyst the region needs to improve these trends.

If you need additional information, please contact me.

Thank You,

Michelle Allen
Executive Director

From: Adelsbach, Terrence <Adelsbach.Terrence@epa.gov>
Sent: Monday, October 24, 2022 4:25 PM
To: Hudson, Kimberly (BOP) <kshudson@bop.gov>
Cc: Traci P. Buskey <Buskey.Traci@epa.gov>; Kenneth Dean <Dean.William-Kenneth@epa.gov>
Subject: [EXTERNAL] EPA Comments on the NOI to Prepare a DEIS for the Proposed FCI and FPC in Letcher County, KY

Kimberly S. Hudson, COR
Site Selection Specialist
Construction & Environmental Review Branch
U.S. Department of Justice
Federal Bureau of Prisons
320 First Street NW, Room 901–5 West
Washington, DC 20534

Re: EPA Comments on the Notice of Intent to Prepare a Draft Environmental Impact Statement for the Proposed Federal Correctional Institution and Federal Prison Camp in Letcher County, Kentucky

Dear Ms. Hudson:

The U.S. Environmental Protection Agency (EPA) Region 4 has reviewed the Notice of Intent (NOI) to prepare a Draft Environmental Impact Statement (DEIS) for the ''Proposed Federal Correctional Institution and Federal Prison Camp Letcher County, Kentucky" (Project). The Project was reviewed in accordance with Section 309 of the Clean Air Act and Section 102(2)(C) of the National Environmental Policy Act (NEPA). The Federal Bureau of Prisons (Bureau) is proposing to construct and operate a new medium-security Federal Correctional Institution (FCI) and an adjoining minimum-security Federal Prison Camp (FPC) in Letcher County, Kentucky. The FCI and FPC would be designed to house approximately 1,152 adult males and 256 adult males, respectively, and serve the needs of the Bureau's Mid-Atlantic Region. According to the NOI, development and operation of a new FCI and FPC is an action potentially significantly affecting the quality of the human environment and is therefore subject to NEPA compliance.

Based on the EPA's review of available information, the following comments are provided for your consideration in developing the DEIS.

(1) **Purpose and Need:** The Purpose and Need for the project is not clear. The EPA recommends that the DEIS include a well-defined purpose and need related to the proposed action. The DEIS should be specific and describe what facilities or portions of the facilities will be constructed, demolished, etc.

(2) **Alternatives:** NEPA requires evaluation of reasonable alternatives, including a no action alternative.

(3) **Air Quality:** The EPA Green Book (https://www3.epa.gov/airquality/greenbook/ancl.html), which summarizes counties at

the national level that are currently in non-attainment status, indicates that Letcher County is in Attainment status for all EPA air quality criteria. However, localized impacts to air quality could occur during construction due to equipment exhaust emissions and fugitive dust. The EPA recommends implementing measures to reduce diesel emissions, such as switching to cleaner fuels, retrofitting current equipment with emission reduction technologies, repowering older engines with newer cleaner engines, replacing older vehicles, and reducing idling through operator training and/or contracting policies. We also encourage controlling fugitive dust by watering or the application of other controlled materials.

(4) **Construction Stormwater Management:** Soil disturbance in support of the Proposed Action may necessitate issuance of a construction stormwater permit before construction can begin. Pursuant to the Clean Water Act, coverage under a statewide National Pollutant Discharge Elimination System (NPDES) construction stormwater general permit will be needed if the project disturbs one acre or more of contiguous land. The EPA recommends that erosion control and sediment control measures be implemented in accordance with the State's NPDES construction general permit requirements, and that the measures be addressed during the design and construction phases of the project. The Bureau should contact the Kentucky Department for Environmental Protection (KDEP) about the applicable NPDES permit(s) for this facility and project. The EPA encourages implementing best management practices during and after construction to minimize stormwater impacts on the streams. The EPA also encourages the Bureau to consider using a variety of stormwater management practices often referred to as "green infrastructure" or "low impact development" practices to comply with Section 438 of the Energy Independence and Security Act of 2007.

(5) **Waters of the United States:** Pursuant to Section 404 of the Clean Water Act (CWA), the project should avoid and minimize, to the maximum extent practicable, placement of dredged or fill material in jurisdictional waters. If fill material will be placed into waters of the United States, then the Clean Water Act Section 404(b)(1) Guidelines should be followed. Under the Section 404(b)(1) guidelines, the U.S. Army Corps of Engineers (USACE) process requires selection of the least environmentally damaging practicable alternative that would avoid or minimize the impacts to waters of the U.S., over which USACE has jurisdiction, and that meets the purpose and need for the proposed project. If the project has impacts to jurisdictional waters that cannot be avoided, the project may require a permit from the USACE. The EPA recommends that impacts to jurisdictional waters be avoided if possible, and that mitigation measures to minimize impacts be implemented if avoidance is not possible.

(6) **Biological Resources**: According to the U.S. Fish and Wildlife Services' (USFWS) IPAC database (IPaC: Explore Location resources (fws.gov) and the Kentucky Department of Fish and Wildlife (KDFW) (http://app.fw.ky.gov/speciesinfo), Letcher County is home to the gray bat (federally and state endangered), Indiana bat (federally endangered, state threatened), northern long-eared bat (federally threatened), blackside

dace (federally and state threatened), Kentucky arrow darter (federally and state threatened), and big sandy crayfish (federally and state threatened). The EPA recommends the Bureau coordinate early with the USFWS and the KDFW. The EPA further recommends that the conservation measures identified by the USFWS and the KDFW be included in the DEIS.

(7) **Environmental Justice:** Executive Order 12898 directs federal agencies to identify and address any disproportionately high and adverse human health or environmental effects of its programs, policies and activities on minority, low-income, tribal, and indigenous populations. Assessing data using EJScreen (https://www.epa.gov/ejscreen), EPA's nationally consistent environmental justice (EJ) screening and mapping tool, is a useful first step in understanding or highlighting geographic locations that may need further review or outreach. The tool provides information on environmental and socioeconomic indicators as well as pollution sources, health disparities, critical service gaps, and climate change data. The tool can help identify potential community vulnerabilities by calculating EJ Indexes and displaying other environmental and socioeconomic information in color-coded maps and standard data reports.

The EPA often considers a project to be in an area of potential EJ concern when an EJScreen analysis for the impacted area shows one or more of the twelve EJ Indexes at or above the 80th percentile in the nation and/or state. An EJScreen analysis which does not reveal the potential for EJ concerns should not be interpreted to mean that there are definitively no EJ concerns present. The tool's standard data report should not be considered a substitute for conducting a full EJ analysis. EJScreen scoping efforts using the tool should be supplemented with additional data and local knowledge when reasonably available.

(8) **Wastes:** Construction and operation in support of the proposed action should ensure that Resource Conservation and Recovery Act regulated solid wastes are disposed of in accordance with federal regulations. Details of relevant contaminated and land-use-restricted sites should be included in the DEIS.

(9) **Energy Efficiency and Recycling:** The EPA recommends the use of sustainable building practices that maximize energy and water conservation, and the use of renewable energy including solar power for supplemental electricity and lighting for infrastructure and buildings that may be constructed. The Bureau should consult the appropriate federal agencies (https://www.energy.gov/eere/femp/sustainable-federal-buildings) for energy conservation requirements. Implementation of renewable energy sources and operational efficiency measures should be included in the climate change analysis.

The EPA appreciates the opportunity to provide scoping comments on the proposed project. If you have any questions regarding the EPA's comments, please contact me by phone at 404-562-9313 or via email at Adelsbach.Terrence@epa.gov.

Terry Adelsbach

Biologist - NEPA Section
U.S. EPA Region 4,
61 Forsyth St., SW
Atlanta, GA 30303
Office: 404-562-9313
Mobile: 470-926-2763
adelsbach.terrence@epa.gov

UNITED STATES CONGRESSMAN

HAL ROGERS

SERVING KENTUCKY'S 5TH DISTRICT

Congressman Rogers' Statement Regarding the Letcher Co. Prison

WHITESBURG, Ky. (November 17, 2022) – U.S. Rep. Harold "Hal" Rogers (KY-05) released the following statement about the Bureau of Prisons' (BOP) revised plan to build a correctional facility in Letcher County. The BOP held a public meeting in Whitesburg on Thursday evening after releasing a recent notice of intent to prepare a Draft Environmental Impact Statement for the Proposed Federal Correctional Institution and Federal Prison Camp in Letcher County.

> "I am pleased that the BOP is revisiting construction options for a modernized and efficient facility in Letcher County. I have worked to secure and protect funding for this project since 2006, and with more than 300 jobs on the line, it's a battle worth fighting in a region where jobs are desperately needed.
>
> "From day one, the Letcher County Planning Commission has advocated for this project, because we have seen the positive economic impact that federal correctional institutions have had in Clay, Martin and McCreary counties, boosting the tax base and strengthening our local workforce.
>
> "The BOP has updated the scope of the project to address overcrowding and modernization, and I will continue to support their efforts through my work in Congress."

Congressman Rogers secured approximately $500 million in federal funding in the fiscal 2016 and 2017 appropriations bills for the Bureau of Prisons to construct a correctional facility in Letcher County. The funding is still available in the Bureau of Prisons' budget for construction to address modernization needs and overcrowding.

For more information about Congressman Rogers work in Washington and at home in Kentucky's Fifth Congressional District, visit halrogers.house.gov.

There are several ways to submit comments:

Visit our website and comment via the *Inquiries* tab:
www.proposed-fci-letchercountyky.com

Email: kshudson@bop.gov

Submit a written comment:
Kimberly S. Hudson, Site Selection Specialist
Construction and Environmental Review Branch
Federal Bureau of Prisons
320 First Street, NW, Room 901-5,
Washington, DC 20534

Comment Form

Please use this form to submit written comments concerning the Federal Bureau of Prison's proposal to develop a new Federal Correctional Institution and Federal Prison Camp in Letcher County, KY. The Bureau of Prisons is interested in your questions and comments about the proposed project as it begins preparation of the Draft Environmental Impact Statement.

Colby Kirk One East Kentucky 606-791-2378 colby@oneeastky.com
Josh Ball SOAR 606-626-0685 joshua@soar-ky.org
Brett Traver Southeast KY Econ. Dev. Corp. 606-875-5811 brett@skedcorp.com
Jeff Whitehead EKCEP (Workforce Program) jwhitehead@ekcep.org

Please note that before including your name, address, e-mail address, or other personal identifying information in your comment, the entire comment, including personal identifying information, may become publicly available.

Name*: _____

Title/Affiliation (if any): _____

Address: _____

City/State/Zip Code: _____

Email Address*: _____

*(*Required field)*

U.S. Department of Justice

Federal Bureau of Prisons

Washington, DC 20534

December 8, 2022

Public Scoping Meeting Held to Initiate the Environmental Impact Statement Process for the Proposed Federal Correctional Institution/Federal Prison Camp in Letcher County, Kentucky

On November 17, 2022, representatives of the Federal Bureau of Prisons (Bureau) held a Public Scoping Meeting at Letcher County Central High School in Whitesburg, Kentucky. Approximately 150 individuals attended in person with many providing written and verbal comments at that time. Additional individuals who attended remotely were able to see and hear the Bureau's presentation including many of the verbal comments provided during the meeting. The meeting was also recorded with the recording posted to the project website: *https://www.proposed-fci-letchercountyky.com/*. During the days that followed the Public Scoping Meeting, additional written comments were submitted for agency consideration.

Bureau officials wish to express their appreciation to those who attended the meeting and expressed their interest and concerns about the proposed project and the Environmental Impact Statement (EIS). We also wish to acknowledge and thank the many individuals who submitted written comments during the public scoping period which ended on November 30, 2022. Comments and questions received during the scoping period are undergoing review and will be addressed in the Draft EIS which is currently in preparation. However, during an initial review of the comments and questions received, it was apparent that many of the comments concerned a relatively small number of topics. While a comprehensive review of the comments continues, initial responses to the more frequently-cited topics are provided below.

- **Purpose and Need for a new Federal Correctional Institution must be well-defined:** Several commentors requested the Bureau to demonstrate the need for a new medium-security Federal Correctional Institution (FCI) and explain why other alternatives to new prison construction are insufficient or inadequate to meet its needs.
  Response: Among the key components of every Draft EIS are the Purpose and Need for a project or action and Alternatives to the action as proposed. The Draft EIS will document the Bureau's purpose for developing the proposed facility and how its construction will help meet its needs in the face of increasingly aged facilities and infrastructure. In addition, among the alternatives to be analyzed in the EIS will be the ability/inability to expand other existing medium-security facilities or develop an entirely new facility at other locations within the Bureau's Mid-Atlantic Region.

- **Public Safety:** Commentors noted the risk of inmate escapes from a federal correctional facility unnecessarily endangers members of the public who live nearby.
  Response: Among federal inmates, all escape attempts in recent years have occurred at minimum-security prison camps housing the lowest-risk offenders who are considered to pose minimal risk to the community. The Draft EIS will provide information to address the risk of public safety.

- **Consider no new prison construction in Letcher County or elsewhere:** Commentors expressed concerns that the U.S. has too many prisons and too many individuals confined in its prison systems. Others recommended increasing funding for addiction treatment and mental health care as an alternative to new prison construction.
  Response: Among the Draft EIS alternatives to be considered (as mandated by the National Environmental Policy Act) is the "No Action" Alternative. The analysis of the "No Action" alternative will assume no new prison construction, thereby providing a benchmark against which decision-makers and the public can compare the levels of environmental effects of each "Action" alternative. The funds appropriated by Congress can only be used for new prison construction; providing funds for addiction treatment, mental health care, and similar community needs, can only be done by Congress.

- **Economic Opportunities:** Many commentors expressed their unequivocal support or opposition to development of a new federal correctional facility in Letcher County. Backers based their support on the potential economic benefits that could be realized by Letcher County and Eastern Kentucky while opponents expressed concern that the economic and employment benefits would not be realized in addition to the potential environmental impacts.
  Response: All commentors agreed that Letcher County needs sustainable, lasting, economic development, especially in light of the floods that devasted the people and economy of Eastern Kentucky in 2022. The Draft EIS will address the potential economic and employment opportunities associated with the proposed project and the likelihood of those benefits accruing to the area in and surrounding Letcher County.

- **Redirect Prison Funds to Other Priorities:** In light of the recent storms that devasted Eastern Kentucky, many commentors recommended using the funds already allocated to prison construction (~$500 million) to rebuild homes, businesses, and infrastructure damaged or lost as a result of the flooding. Others proposed applying the funds to build and operate the prison for other area priorities such as improving education, expanding social and health care programs, and responding to the opioid crisis.
  Response: In Fiscal Year (FY) 2006 Congress appropriated funds to the Bureau to be used for site planning and development of a Federal Correctional Institution in Letcher County, KY. In FY 2015, 2016, and 2017, additional funds were appropriated for costs related to construction of new facilities. Reallocating those funds, or appropriating additional funds for other community needs, can only be done by Congress and not by the Bureau.

- **Programming, Training, and Rehabilitation:** Commentors expressed a willingness to accept a facility that will provide inmates with programs, education, and job skills to help them upon their release.
  Response: The Bureau intends to expand and enhance its traditional programming, training, and rehabilitation activities at the proposed facility to help reduce recidivism and assist inmates to become productive members of society. Plans for enhanced programming will be described in the Draft EIS.

- **Environmental Quality and Impacts:** Many commentors noted that the EIS must take into account the severity of the degradation of the site where the facility is proposed to be built. The cumulative effects of over a century of timber, coal, oil, and gas extraction has left the area ecologically devastated, affecting ground and surface water quality, the stability of the soil, and the habitat of endangered and rare species. In addition, site conditions pose a threat to the health of construction workers, Bureau employees, and inmates.

Response: Environmental baseline conditions at the proposed sites in Letcher County have been well-documented and assessed in the previous Draft EIS (2015), Final EIS (2015), Revised Final EIS (2016), Draft Supplemental Revised Final EIS (2017), and Final Supplemental Revised Final EIS (2017). Nonetheless, , the potential environmental impacts (individual and cumulative) will be reviewed, reassessed, and revised as necessary to ensure a complete and accurate assessment of all potential environmental impacts at the proposed sites in this EIS. The EIS will also determine if mitigation measures, such as site remediation, are necessary to address potential health and environmental impacts. Furthermore, a key tenet of the Bureau's mission is to provide a safe and healthy environment for all facility occupants.

- **Users of the Remote Meeting Option:** Since the Bureau was forced to end the remote meeting option early, the Bureau should hold another Scoping Meeting.
  Response: Since the pandemic in 2020, the Bureau and other federal agencies have increasingly relied upon remote meeting platforms to hold public meetings successfully and without incident. In this instance, the Scoping Meeting began at 6:00 pm EST and at time the remote meeting option was terminated (7:06 pm EST), Bureau representatives had concluded their remarks and were in the midst of hearing from members of the public who had attended the meeting in-person at the Letcher County Central High School. Those monitoring the virtual meeting (using the "Zoom" platform) witnessed several malicious parties using the virtual meeting option to disrupt the proceedings. After considerable effort to maintain control, it became necessary to disconnect all those who had joined the meeting remotely per Bureau policy. Bureau officials wish to express their disappointment and regret for having to terminate the virtual meeting before hearing from those using the remote option. However, the in-person meeting, which was being recorded, continued without incident with the recording posted to the project website shortly thereafter. The Bureau will not hold another scoping meeting as remote meeting participants were still able to submit written comments to the Bureau.

Again, thanks to all who participated during the public scoping process and expressed their interest and concerns about the proposed project. To receive future project-related information including how to access the Draft EIS once published, please send your name, affiliation (if any), mailing address, and email address to:

- Kimberly S. Hudson, Site Selection Specialist
  Construction & Environmental Review Branch
  Federal Bureau of Prisons
  320 First Street, NW, Room 901-5 West
  Washington, DC 20534
  Email: kshudson@bop.gov.

APPENDIX B

AGENCY CONSULTATION AND COORDINATION

U.S. Department of Justice

Federal Bureau of Prisons

Washington, DC 20534

January 25, 2024

Craig Potts
State Historic Preservation Officer
Kentucky Heritage Council
410 High Street
Frankfort, KY 40601
Email: craig.potts@ky.gov

Re: Section 106 Consultation Concerning Proposed Federal Correctional Institution and Federal Prison Camp – Letcher County, Kentucky

Dear Mr. Potts:

On behalf of the Federal Bureau of Prisons (FBOP), WSP USA, Inc. (WSP) completed a cultural historic survey and archaeological survey of the proposed development of a Federal Correctional Institution (FCI) and Federal Prison Camp (FPC). Pursuant to Section 106 of the National Historic Preservation Act and its implementing regulations, 36 CFR Part 800, the FBOP is providing these survey reports for your review and concurrence regarding identification of historic properties for the proposed development of the FCI and FPC in Letcher County which is located in southeastern Kentucky.

The mission of the FBOP is to protect society by confining offenders in the controlled environments of prison and community-based facilities that are safe, humane, cost-efficient, and appropriately secure, and that provide work and other self-improvement opportunities to assist the population of adults in custody in becoming law-abiding citizens. A growing challenge to performing that mission is the increasing number of federal correctional facilities and supporting infrastructure that were constructed over 50 years ago, resulting in a continuous need to maintain existing facilities, and when necessary, develop new facilities.

Congress has directed the FBOP to undertake investigations leading to development of a new FCI and FPC in Letcher County, Kentucky (Congressional authorization: P.L. 109-272), an action with the potential to significantly affect the quality of the human environment. Therefore, pursuant to the National Environmental Policy Act (NEPA) and Council on Environmental Quality regulations implementing NEPA, the FBOP is preparing a Draft Environmental Impact Statement to ensure that the environmental consequences of the proposed action are thoroughly documented, and that compliance is achieved with NEPA and the National Historic Preservation Act of 1966. Additional information about the proposed project can be found on the public website: https://www.proposed-fci-letchercountyky.com.

WSP, in the archaeological survey identified one new archaeological site (15Lr114); but no further work was recommended. WSP does recommend that a 100-foot buffer be maintained around Site 15Lr115 (Frazier Cemetery), which is adjacent to the proposed project area. WSP, in the cultural historic survey, recommended one bridge (LR-331) and two culverts (LR-327 and LR-330), as eligible for listing in the NRHP. At this time, it is uncertain whether improvements including widening of the bridge (LR-331) will be required as part of the project. For the purposes of the current undertaking, FBOP determines that the project will have an **No Adverse Effect** to historic properties with the Condition that a 100-foot buffer be maintained around Site 15Lr115. In the event the FBOP requires improvements to the historic bridge (LR-331), FBOP will initiate consultation with the Kentucky Heritage Council to determine options to minimize or eliminate the potential for adverse effect.

By this letter the FBOP requests your review and concurrence with the overall project Finding of **No Adverse Effect** as outlined above for the proposed action within 30 calendar days of the date of this letter. Please email or mail your response to:

Contact: Kimberly Hudson, Chief, Construction and Environmental Review Section
Email: kshudson@bop.gov
Phone: (202) 451-7046
Address: Federal Bureau of Prisons, 320 First Street, NW, Room 901-5 West, Washington, DC 20534

Please feel free to reach out to me using the contact information provided above if you have any questions. Thank you for your cooperation and assistance.

Sincerely,

Kimberly S. Hudson

Kimberly S. Hudson, Chief
Construction and Environmental Review Section
Federal Bureau of Prisons

Attachment

Cc:

J. Alvarez, C. Ciccarelli, FBOP
R. Nardi, S. Hoffman, C. McDonald, WSP

U.S. Department of Justice

Federal Bureau of Prisons

Washington, DC 20534

June 14, 2023

Mr. Craig A. Potts
Executive Director and State Historic Preservation Officer
State Historic Preservation Office, Kentucky Heritage Council
The Barstow House, 410 High Street, Frankfort, KY 40601
craig.potts@ky.gov

Re: Agency Consultations: Proposed Federal Correctional Institution and Federal Prison Camp - Letcher County, Kentucky

Dear Mr. Potts:

The Federal Bureau of Prisons' (Bureau) mission is to care for federal inmates in controlled environments of prisons and community-based facilities that are safe, humane, cost-efficient, and appropriately secure, while providing education, employment, and other self-improvement opportunities to assist offenders in becoming law-abiding citizens. However, a growing challenge to successfully carrying out its responsibilities is the increasing number of aging federal correctional facilities, resulting in a need to maintain existing facilities, and when necessary, develop new facilities. At the same time, current Bureau projections show a need for additional bedspace to accommodate the growing number of medium-security federal inmates, particularly in the Mid-Atlantic region of the country. To address these needs, the Bureau is proposing to develop a new federal correctional facility in Letcher County, Kentucky.

Planning for a new federal correctional facility began in 2006 when Congress directed the Bureau to undertake the various investigations needed to support such development in Letcher County. In accordance with Congress' directive and federal law, the Bureau has conducted a wide range of technical studies including multiple Environmental Impact Statements (EISs) in conformance with the National Environmental Policy Act (NEPA) of 1969, as amended. Included among those efforts were:

- Publication of a Draft EIS in 2015 which evaluated various alternatives for development of a high-security penitentiary and minimum-security prison camp in Letcher County. That same year, a Final EIS was published that responded to public comments received on the Draft EIS and identified the Roxana Site as the preferred location for development of the project.

- Publication of a Revised Final EIS in 2016 to address inconsistencies in the earlier document and in 2017, both Draft and Final Supplemental Revised Final EISs were published to address new circumstances relevant to potential environmental impacts.

- Adoption of a Record of Decision (ROD) in 2018 documenting the Bureau's decision to proceed with development at the Roxana Site, however, the ROD was withdrawn in 2019 to evaluate new information.

Although the ROD was withdrawn in 2019, Congress' 2006 directive to develop a new correctional facility in Letcher County remains in effect. As such, the Bureau has continued to evaluate its current and future inmate populations and resulting facility needs and determined that housing medium-security federal inmates supersedes the need to house high-security inmates. The design, construction, and operation of a medium-security institution differs from that of a high-security penitentiary with the potential environmental impacts correspondingly different. As a result, the Bureau must ensure that the environmental consequences of this new action are also adequately considered under NEPA.

Development of the proposed federal correctional facility has the potential to significantly affect the quality of the human environment. Therefore, the Bureau is preparing a new Draft EIS to ensure that the environmental consequences of the proposed action are thoroughly documented and complies with NEPA, the Bureau's implementing NEPA regulations, National Historic Preservation Act, Clean Water Act, Endangered Species Act, in addition to other federal statutes and Executive Orders. The process also provides interested parties, stakeholders, and the public with opportunities to offer input and comments concerning the proposed action. Fortunately, a considerable volume of information has been compiled about Letcher County as well as the previously considered alternative development sites. Although the passage of time and change of scope requires the Bureau to update, verify and validate current conditions, the information previously gathered should help with preparation of the new Draft EIS.

The Bureau wishes to again engage key regulatory agencies including the State Historic Preservation Office (Tourism, Arts and Heritage Cabinet, Kentucky Heritage Council) in a discussion about the proposed project and the interests and concerns unique to your agency. The Bureau and its consultant team (WSP USA) would like to meet with you and others from the State Historic Preservation Office to share the project history and the revised purpose and objectives of the proposed project. Most importantly, the meeting will provide the Bureau an opportunity to start a dialogue with State Historic Preservation Office officials, learn the interests and concerns of the agency regarding the proposed facility, and seek guidance to ensure compliance with all applicable regulations.

Included with this letter is an agenda which outlines the topics to be discussed at such a meeting. A representative of WSP will reach out to you shortly to identify a convenient date/time for a virtual meeting. In the meantime, feel free to reach out to me using the contact information provided below. Thank you for your cooperation and we look forward to meeting.

Sincerely,

Kimberly S. Hudson

Kimberly S. Hudson, Site Selection Specialist
Construction & Environmental Review, Federal Bureau of Prisons
320 First Street, NW, Room 901-5 West, Washington, DC 20534
202-451-7046 / kshudson@bop.gov

Attachment

Cc: J. Organic, D. Flewellyn, C. Ciccarelli, Bureau of Prisons
S. Hoffman, R. Nardi, C. McDonald, WSP
N. Konkol, KY SHPO

Proposed Federal Correctional Institution
Letcher County, Kentucky

Agenda

I. Welcome, Introductions
- a. State Historic Preservation Office, Kentucky Heritage Council
- b. Federal Bureau of Prisons
- c. WSP USA

II. Proposed Federal Correctional Institution
- a. Project History
- b. Goals and Objectives
- c. Project Description

III. Project Status
- a. Notice of Intent to Prepare a Draft EIS
- b. Agency Scoping
- c. Project Website (*https://www.proposed-fci-letchercountyky.com*)

IV. Previous EISs and Related Studies
- a. Draft EIS, February 2015
- b. Final EIS, July 2015
- c. Revised Final EIS, November 2016
- d. Draft Supplemental Revised Final EIS, March 2017
- e. Final Supplemental Revised Final EIS, September 2017

V. Anticipated Schedule
- a. Draft Environmental Impact Statement
- b. Final Environmental Impact Statement
- c. Record of Decision

VI. Next Steps/Action Items

STEVEN L. BESHEAR
GOVERNOR

TOURISM, ARTS AND HERITAGE CABINET
KENTUCKY HERITAGE COUNCIL

MARCHETA SPARROW
SECRETARY

THE STATE HISTORIC PRESERVATION OFFICE
300 WASHINGTON STREET
FRANKFORT, KENTUCKY 40601
PHONE (502) 564-7005
FAX (502) 564-5820
www.heritage.ky.gov

LINDY CASEBIER
ACTING EXECUTIVE DIRECTOR AND
STATE HISTORIC PRESERVATION OFFICER

January 24, 2012

Ms. Bridgette Lyles, Site Selection Specialist
Capacity Planning and Site Selection Branch
Federal Bureau of Prisons
320 First Street, NW
Washington, DC, 20534

Re: ***Phase I Archaeological Survey for the Federal Bureau of Prisons Feasibility Study at Three Proposed Sites in Letcher County, Kentucky***
By Kimberly M. Sebestyen and Steven W. Brann, TEC Inc.

Dear Ms. Lyles:

Thank you for your letter concerning the above referenced report. This project entailed pedestrian survey and screened shovel testing of three proposed sites totaling approximately 240 acres. No new historic or prehistoric archaeological sites were recorded as a result of this survey, and the authors recommend no further investigations of two of the three proposed sites (the Roxana/Meade Farm Site and the Payne Gap/Lawson Site). The authors identify an area of the third proposed site (the Van/Fields Site) that has not been previously surveyed and could not be accessed at the time of the fieldwork. Should this site be chosen for construction, the authors recommend that the ridgeline remnant be surveyed for archaeological resources. I concur with the authors' findings and recommendations. However, should the project plans change, or should additional information become available regarding cultural resources or citizens' concerns regarding impacts to cultural resources, please submit that information to our office as additional consultation may be warranted.

Should you have any questions, feel free to contact Nick Laracuente of my staff at 502.564.7005, extension 151.

Sincerely,

Lindy Casebier,
Acting Executive Director and
State Historic Preservation Officer

LC:nrl
cc: Jonathan P. Kerr (CRA)

STEVEN L. BESHEAR
GOVERNOR

TOURISM, ARTS AND HERITAGE CABINET
KENTUCKY HERITAGE COUNCIL

BOB STEWART
SECRETARY

THE STATE HISTORIC PRESERVATION OFFICE
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CRAIG A. POTTS
EXECUTIVE DIRECTOR AND
STATE HISTORIC PRESERVATION OFFICER

April 24, 2014

Issac Gaston
United States Department of Justice
Federal Bureau of Prisons
Capacity Planning and Site Selection Branch
320 First St. NW
Washington, DC 20534

Re: ***Historic Architectural Resources Survey for Proposed Federal Correctional Facility, Letcher County, Kentucky***

Dear Mr. Gaston:

On March 27, we received the above referenced report for review and comment. Six historic resources (LR-149 through 153 and LR-188) were evaluated. None of the sites are considered eligible for listing in the National Register of Historic Places, and the consultant recommends no further work. We concur with the results of the survey.

If you have questions regarding these comments, please contact Jill Howe of my staff at 502-564-7005, ext. 121.

Sincerely,

Craig A. Potts
Executive Director and
State Historic Preservation Officer

CP:jh

STEVEN L. BESHEAR
GOVERNOR

TOURISM, ARTS AND HERITAGE CABINET
KENTUCKY HERITAGE COUNCIL

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CRAIG A. POTTS
EXECUTIVE DIRECTOR AND
STATE HISTORIC PRESERVATION OFFICER

December 22, 2014

Mr. Issac Gaston, Site Selection Specialist
Federal Bureau of Prisons
320 First Street NW
Washington, DC 20534

Re: ***Addendum Phase I Archaeological Survey for the Federal Bureau of Prisons Proposed United States Penitentiary and Federal Prison Camp, Letcher County Kentucky,*** by Kimberly Sebestyen and Steven Brann (Cardno, Inc).

Dear Mr. Gaston:

Thank you for your correspondence regarding the above referenced report for an archaeological survey conducted in Letcher County, Kentucky for the proposed United States Penitentiary and Federal Prison Camp project. The survey found no evidence of cultural resources. Therefore, the author concluded that the project will have no adverse effect on cultural resources that are potentially eligible for listing on the National Register of Historic Places. I concur with the author's findings. Therefore, in accordance with 36CFR Part 800.4 (d) of the Advisory Council's revised regulations our finding is that there are **No Historic Properties Present** within the undertaking's area of potential impact. Therefore, we have no further comments and responsibility to consult with the Kentucky State Historic Preservation Officer under the Section 106 review process on this project is fulfilled.

Should you have any questions, feel free to contact Yvonne Sherrick of my staff at 564-7005, ext. 113.

Sincerely,

Craig A. Potts
Executive Director and
State Historic Preservation Officer

CP:43104
cc. George Crothers, Johnathan Kerr (CRA)

U.S. Department of Justice

Federal Bureau of Prisons

Washington, D.C. 20534

February 27, 2017

Mr. Craig Potts
Executive Director and State Historic Preservation Officer
Kentucky Heritage Council
300 Washington Street
Frankfort, KY 40601

Subject: OSA FY17-9088; Federal Bureau of Prisons Proposed Federal Correctional Facility, Letcher County, Kentucky – Phase I Archaeological Survey

Dear Mr. Potts,

Enclosed please find three paper copies of the *Phase I Archaeological Survey for the Federal Bureau of Prisons Federal Correctional Facility at the Proposed Roxana/Meade Farm Site in Letcher County, Kentucky; OSA Registration No. FY17-9008*, prepared by Cardno, Inc. in conjunction with Cultural Resource Analysts, Inc.

The Federal Bureau of Prisons proposes to construct and operate a federal correctional facility to include a U.S. Penitentiary, Federal Prison Camp, and ancillary facilities in Letcher County, Kentucky. A Phase I archaeological survey was conducted at three proposed sites in Letcher County in August 2011 (OSA Registration No. FY12-7001); the September 2011 report was reviewed by your office in January 2012. Additional Phase I archaeological survey was conducted at two of the three proposed sites in August 2014 (OSA Registration No. FY12-7001); your office reviewed the November 2014 addendum survey report in December 2014. Due to changes in the layout of the proposed federal correctional facility at one of the three sites, the Roxana/Meade Farm site, additional Phase I archaeological survey was conducted at the site in areas that had not been impacted by the previous site plan and had not been surveyed. Because it has been more than three years since the original survey, the project was registered with the Kentucky Office of State Archaeology again, and a new file search was completed.

An additional 50 acres was surveyed at the Roxana site for the subject project. Due to steep slopes and previous surface mining disturbance at the site, pedestrian survey was conducted and no subsurface testing was performed. No archaeological sites were identified, and no further work is recommended at the site. As the survey found no sites, an abbreviated report was prepared. The enclosed report details

the results and recommendations of the additional survey. The Federal Bureau of Prisons concurs with the report's findings and recommendations.

In addition to the archaeological surveys, two previous historic architectural surveys were conducted for the subject project (completed by TEC, Inc. in August 2011 and Cardno TEC, Inc. in February 2014), and no historic properties were identified as a result of these surveys. Therefore, in accordance with 36 CFR 800.4(d), the Federal Bureau of Prisons finding is ***No Historic Properties Affected***, as no historic properties are present within the project's area of potential effects. We respectively request your review and comment on the enclosed report and your concurrence with our finding.

Please contact me at igaston@bop.gov or (202) 514-6470 if you have any questions.

Sincerely,

Issac Gaston, Site Selection Specialist
Capacity Planning and Construction
Branch

MATTHEW G. BEVIN
GOVERNOR

DON PARKINSON
SECRETARY

TOURISM, ARTS AND HERITAGE CABINET
KENTUCKY HERITAGE COUNCIL
THE STATE HISTORIC PRESERVATION OFFICE
410 HIGH STREET
FRANKFORT, KENTUCKY 40601
PHONE (502) 564-7005
FAX (502) 564-5820
www.heritage.ky.gov

REGINA STIVERS
DEPUTY SECRETARY

CRAIG A. POTTS
EXECUTIVE DIRECTOR
& STATE HISTORIC
PRESERVATION OFFICER

April 5, 2017

Mr. Issac Gaston
Site Selection Specialist
United States Department of Justice
320 First Street, NW
Washington, DC 20534

Re: Phase I Archaeological Survey for the Federal Bureau of Prisons Federal Correctional Facility at the Proposed Roxana/Meade Farm Site in Letcher County, Kentucky prepared by Steven W. Brann of Cardno. Report dated February 2017.

Dear Mr. Gaston:

We are writing to you concerning the above referenced report, received February 28, 2017. The report describes the intensive pedestrian survey of modifications to the area of potential effect (APE) of a proposed prison facility at the Roxana/Meade Farm site in Letcher County, Kentucky. The proposed project area sits atop previous mining lands that have been heavily disturbed. The present survey effort focused on the identification of rockshelters within the unsurveyed portions of the present project APE. During the survey, the investigator did not identify any new archaeological sites. The investigator did document the Frazier Cemetery, a currently active private plot located 100 feet from the proposed access route. Based on the results of the survey, the investigator recommended no additional work for the APE.

After review of the report findings, we ***conditionally concur*** with the report's findings and recommendations. Our full concurrence is dependent on the receipt of a completed KHC Survey Form for the Frazier Cemetery. This form should incorporate the documentation provided in the present report, and should also be accompanied by a cover letter that provides an assessment of effect for this resource. The letter should also make mention of the modifications to the proposed project that accommodate a 100 foot buffer around the cemetery. We feel that this is an appropriate avoidance measure.

We look forward to receipt of the completed site form. Should the project plans change, or should additional information become available regarding cultural resources or citizens' concerns regarding impacts to cultural resources, please submit that information to our office as additional consultation may be warranted. Should you have any questions, feel free to contact Chris Gunn of my staff at (502) 564-7005, extension 4450.

Sincerely,

Craig A. Potts,
Executive Director and
State Historic Preservation Officer

CP: cmg KHC # 48622
Cc: George Crothers (OSA); Charles Niquette (CRAI)

U.S. Department of Justice

Federal Bureau of Prisons

Washington, DC 20534

April 28, 2017

Mr. Craig Potts
Executive Director and State Historic Preservation Officer
Kentucky Heritage Council
410 High Street
Frankfort, KY 40601

Subject: OSA FY17-9088; Federal Bureau of Prisons Proposed Federal Correctional Facility, Letcher County, Kentucky

Dear Mr. Potts:

Thank you for your letter of April 5, 2017 concerning your review of the Phase I Archaeological Survey report for the subject project. In your letter, you conditionally concurred with the findings and recommendations of the report, and requested submittal of a completed KHC Survey Form on the Frazier Cemetery to consider full concurrence. Enclosed please find the printed Survey Form for the Frazier Cemetery (LR-245) as well as supplemental documentation forms. The Federal Bureau of Prisons proposes to construct an access road to the federal correctional facility from KY 588. The proposed access road would be located west of the Frazier Cemetery. The conceptual design plans for the proposed federal correctional facility include a 100-foot buffer around the cemetery. The Federal Bureau of Prisons will stipulate maintaining a 100-foot buffer between access road construction activities and the Frazier Cemetery in the design-build contract. Therefore, the Federal Bureau of Prisons has determined that the proposed undertaking would have No Adverse Effect on the Frazier Cemetery (LR-245). We respectively request your concurrence with our finding.

Please contact me at igaston@bop.gov or (202) 514-6470 if you have any questions.

Sincerely,

Issac Gaston, Site Selection Specialist
Capacity Planning and Construction Branch

MATTHEW G. BEVIN
GOVERNOR

DON PARKINSON
SECRETARY

TOURISM, ARTS AND HERITAGE CABINET
KENTUCKY HERITAGE COUNCIL
THE STATE HISTORIC PRESERVATION OFFICE

410 HIGH STREET
FRANKFORT, KENTUCKY 40601
PHONE (502) 564-7005
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www.heritage.ky.gov

REGINA STIVERS
DEPUTY SECRETARY

CRAIG A. POTTS
EXECUTIVE DIRECTOR
& STATE HISTORIC
PRESERVATION OFFICER

May 4, 2017

Mr. Issac Gaston
Site Selection Specialist
United States Department of Justice
320 First Street, NW
Washington, DC 20534

Re: Federal Bureau of Prisons Proposed Letcher Correctional Facility, Letcher County, KY

Dear Mr. Gaston:

Thank you for your letter concerning the above-mentioned project, received May 1, 2017. We provided initial comment on the assessment of direct effects to the area of potential effect (APE) in a letter dated April 5, 2017. We conditionally concurred with the findings of an archaeological survey at that time, but requested that the historic cemetery documented in that work be submitted as an above-ground resource, and that recommendations of effects be made in an attached cover letter. We have received these requested items, and have reviewed them.

In sum, an historic resources assessment of the project APE identified one resource, a historic cemetery (Lr245). This resource was not recommended as eligible for nomination to the National Register of Historic Places. Additionally, this resource will be avoided by a 100 foot buffer, and we concur that the proposed project will result in **No Effect to Historic Properties**.

If the project design or boundaries change, this office should be consulted to determine the nature and extent of additional documentation that may be needed. In the event of the unanticipated discovery of an archaeological site or object of antiquity, the discovery should be reported to the Kentucky Heritage Council and to the Kentucky Office of State Archaeology in the Anthropology Department at the University of Kentucky in accordance with KRS 164.730. In the event that human remains are encountered during project activities, all work should be immediately stopped in the area and the area cordoned off, and in accordance with KRS 72.020 the county coroner and local law enforcement must be contacted immediately. Upon confirmation that the human remains are not of forensic interest, the unanticipated discovery must be reported to the Kentucky Heritage Council.

Should the project plans change, or should additional information become available regarding cultural resources or citizens' concerns regarding impacts to cultural resources, please submit that information to our office as additional consultation may be warranted. Should you have any questions, feel free to contact Chris Gunn of my staff at 502.564.7005, extension 4450 or chris.gunn@ky.gov.

Sincerely,

Craig A. Potts,
Executive Director and
State Historic Preservation Officer

CP: cmg jr KHC # 49044

ANDY BESHEAR
GOVERNOR

JACQUELINE COLEMAN
LT. GOVERNOR

TOURISM, ARTS AND HERITAGE CABINET
KENTUCKY HERITAGE COUNCIL
THE STATE HISTORIC PRESERVATION OFFICE
410 HIGH STREET
FRANKFORT, KENTUCKY 40601
(502) 564-7005
www.heritage.ky.gov

LINDY CASEBIER
SECRETARY

CRAIG A. POTTS
EXECUTIVE DIRECTOR &
STATE HISTORIC PRESERVATION OFFICER

February 21, 2024

Kimberly Hudson
Chief, Construction and
Environmental Review Section
Federal Bureau of Prisons
320 First Street NW, Room 901-5 W
Washington, DC 20534
kshudson@bop.gov

RE: FBOP, Proposed New Correctional Institute and Prison Camp
Near Roxana, Letcher County, Kentucky
Determination of Effect, Cultural Historic, and

Archaeological Survey for the Proposed Federal Correctional Facility, Roxana, Letcher County, Kentucky by Richard L. Herndon

Dear Ms. Hudson:

Thank you for your submittal of a Determination of Effect (DOE), Archaeology Report, and Cultural Historic Report for the above-referenced undertaking. We understand the Federal Bureau of Prisons (FBOP) is proposing to acquire 800 acres to construct a new Correctional Institute and Prison Camp in Letcher County, Kentucky. Proposed project activities include the construction of the buildings, auxiliary facilities and fencing on former abandoned mining land. Additionally, the project may include widening a section of KY-160 between the intersection of KY-588 and KY-160 to Rise Branch Road.

WSP Environment & Infrastructure Inc. (WSP) conducted an archaeological survey of 288 acres in November of 2023. The remainder of the 523-acre area of potential effect (APE) was previously surveyed to current standards. We understand methods included pedestrian survey and shovel testing. Two areas (totaling 3 acres) associated with the potential widening of KY-160 were not surveyed due to access issues. Two new archaeological sites, 15Lr114 and 15Lr115, were documented as a result of this survey.

WSP recommends that Site 15Lr114 is not eligible for the National Register of Historic Places (NRHP). We concur with this recommendation.

Site 15Lr115, The Frazier Cemetery, was noted during a previous survey conducted for the FBOP in 2017. It was documented to state standards and a 100-foot do-not-disturb buffer was recommended. A trinomial number was not assigned at that time. WSP revisited the cemetery during the current survey, confirmed its location, and applied for a trinomial number. WSP recommends that this site is unassessed for the NRHP. We concur with this recommendation. According to the DOE, a 100-foot do-not-disturb buffer will be maintained around Site 15Lr115.

We accept the archaeology report without revision.

The Cultural Historic Report identified and evaluated all above-ground historic-age properties within a half mile APE with a line of sight to the proposed undertaking. Three previously recorded resources and 17 newly recorded resources were identified within the APE. Our office concurs with the following eligibility recommendations:

- LR-152, 153, 320, 324, 325, and LR-328, all residential structures, are Ineligible for the NRHP.

- LR-318 and 323, both commercial structures, as well as LR-334, a bridge, LR-321, a barn, and LR-322, a church, are Ineligible for the NRHP.

- LR-245, 319, 326, 329, 332, and LR-333, all cemeteries, are Ineligible for the NRHP under Criterions A, B, and C.

- LR-327, a c. 1933 culvert, LR-330, a c. 1933 bridge, and LR-331, a c. 1933 culvert, are all Eligible for the NHRP under Criterions A and C.

We understand the proposed project is not going to directly effect either LR-327 or LR-330, although some indirect effects may occur as a result of increased traffic. The undertaking is not expected to adversely impact either resource. We also understand that current plans may involve the widening of KY-160, which is adjacent to LR-331, and would likely introduce direct effects, if pursued. These plans are not firmly established, and as such, effects are limited to the construction of the facilities. Similar to LR-327 and LR-330, the undertaking is not expected to adversely impact LR-331.

Therefore, our office concurs with the finding of **No Adverse Effect.** This concurrence is conditional upon: 1) Receipt of KHC survey forms for all above-ground resources evaluated within the Cultural Historic within three months of the date of this letter, 2) Maintenance of a 100-foot do-not-disturb boundary around Site 15Lr115/the Frazier Cemetery, and 3) Should project plans be finalized and determine that widening of KY-160 will occur, additional consultation on the effects of the widening on above and below-ground historic properties should occur. Depending on the scope of the widening, additional survey of historic age

properties may be warranted, including the two areas not surveyed due to access issues, and at minimum, further discussions regarding the effects of the widening on LR-331 should occur.

Should you have any questions, please contact Gabrielle Fernandez or Patti Hutchins of my staff at Gabrielle.Fernandez@ky.gov or Patricia.Hutchins@ky.gov.

Sincerely,

Craig A. Potts,
Executive Director and
State Historic Preservation Officer

CP: gf, peh,
KHC # 240167

Proposed Federal Correctional Institution - Letcher County, Kentucky

Meeting Summary

The agency coordination meeting was held on June 28, 2023, to discuss the history, status, and upcoming activities involving development of a proposed Federal Correctional Institution (FCI) and Federal Prison Camp (FPC) in Letcher County, Kentucky. The meeting was organized according to the attached agenda and the discussions held during the meeting are summarized below.

I. Attendees

Attendees representing the Kentucky State Historic Preservation Office (SHPO) Federal Bureau of Prisons (BOP), and WSP are listed below.

Name	Title	Telephone	Email
Kentucky SHPO			
Patricia (Patti) Hutchins	Site Protection and Archaeology, Archaeology Review Coordinator	502-892-3614	patricia.hutchins@ky.gov
Gabrielle Fernandez	Site Protection and Archaeology, Historic Preservation Review Coordinator	502-892-3623	gabrielle.fernandez@ky.gov
Federal Bureau of Prisons			
Kimberly Hudson	Site Selection Specialist	202-451-7046	kshudson@bop.gov
Jenny Alvarez, RA	Senior Project Manager	202-451-7832	J5alvarez@bop.gov
WSP USA			
Bob Nardi, PP	Senior Vice President/Program Manager	973-407-1681	robert.nardi@wsp.com
Sarah Hoffman	Assistant Vice President/Deputy Project Manager	720-482-3626	sarah.hoffman@wsp.com
Craig Hanlon	Principal Environmental Scientist	973-407-1462	craig.hanlon@wsp.com

II. Project Background

BOP and WSP provided a summary regarding the proposed action to develop a new medium-security FCI and a new minimum-security FPC for adult males in Letcher County, Kentucky. The history and timing of past studies and reports was summarized starting in 2005-2006 when Congress directed the BOP to undertake the studies necessary to build a new correctional facility in Letcher County. In 2008, site searches were conducted and the first Environmental Impact Statement (EIS) was published in 2015 with subsequent public review of the draft, public comment period, and a public hearing followed by publication of a Final EIS. Additional EISs were published in 2016 and 2017, with a Record of Decision signed by the BOP in March 2018. The project has always had strong local support but has not had the same support from a national standpoint. In response to a lawsuit challenging the project, the BOP withdrew the Record of Decision in 2019.

With the passage of time, changes to the project purpose and need have occurred including a change from development of a new high-security USP to a new medium security facility to serve the Mid-Atlantic region. At this time the thrust of the purpose of the proposed project to be included in the new draft EIS will be the need to develop modern federal correctional facilities giving the age and condition of BOP facilities and infrastructure in the region.

With that said, BOP has started a new NEPA process. The Notice of Intent to draft a new Environmental Impact Statement was published in September 2022, and a public scoping meeting was held in November 2022. We are currently working on the new draft EIS and hence engaging with key state and federal regulatory agencies. There is a project website where previous studies and documents are posted: *https://www.proposed-fci-letchercountyky.com*.

WSP explained that sites for consideration are previously mined sites, meaning they are heavily disturbed from previous coal operations. Previous surveys and studies found no sites, structures or other resources that would be eligible for the National Register. It is noted that the footprint of the medium-security facility is different (reduction in size) than the previous high-security facility, however all previous studies were thorough and the impact area is still part of the areas previously surveyed.

The Phase I Architectural Survey report was submitted to SHPO in February 2017. SHPO concurrence with the report of finings is dated April 5, 2017. And the most recent timeframe for correspondence with SHPO initiated in 2012. All of the cultural resource documentation is included in the September 2017 FSEIS, Appendix E.

SHPO stated that since more than 5 years has passed since the original work, the project would need an updated report and all accompanying documents including survey forms. This is especially required because the 50-year mark changes with the addition of time, the floods that compromised integrity of many structures, and Kentucky statutes.

SHPO described the new submittal process, which is completely digital. Currently, SHPO is using an email submittal system, which they will provide to BOP (the email is also posted on their website in Section 106 area). SHPO is currently working on a website platform for the submittal process. With emails there are attachment size restrictions and they have experience with DoD SAFE to login and download data. SHPO requested a copy of all previous documents/letters as it would be helpful for tracking. SHPO will assign this phase of the project a new tracking number.

Agenda

I. Welcome, Introductions

a. State Historic Preservation Office, Kentucky Heritage Council
b. Federal Bureau of Prisons
c. WSP USA

II. Proposed Federal Correctional Institution

a. Project History
b. Goals and Objectives
c. Project Description

III. Project Status

a. Notice of Intent to Prepare a Draft EIS
b. Agency Scoping
c. Project Website (*https://www.proposed-fci-letchercountyky.com*)

IV. Previous EISs and Related Studies

a. Draft EIS, February 2015
b. Final EIS, July 2015
c. Revised Final EIS, November 2016
d. Draft Supplemental Revised Final EIS, March 2017
e. Final Supplemental Revised Final EIS, September 2017

V. Anticipated Schedule

a. Draft Environmental Impact Statement
b. Final Environmental Impact Statement
c. Record of Decision

VI. Next Steps/Action Items

From:	Fernandez, Gabrielle (Heritage Council)
To:	Hudson, Kimberly (BOP); Hutchins, Patricia (Heritage Council)
Cc:	Nardi, Robert; Hoffman, Sarah; Alvarez, Jenny (BOP)
Subject:	Re: Agency Consultations: Proposed Federal Correctional Institution and Federal Prison Camp - Letcher County, Kentucky
Date:	Wednesday, June 28, 2023 9:26:16 AM
Attachments:	Outlook-3eorpxdh.png

Hi Kim -

Thanks again for meeting with us. Here is the link to our website that discusses the Section 106 process: Review and Compliance Overview - Kentucky Heritage Council. When you're ready to submit your documents, you can email them to khc.section106@ky.gov. When you get to that stage, let us know if you have any questions about formatting/what's required.

Have a good rest of your week,

Gabrielle Fernandez
Historic Preservation Coordinator
Kentucky Heritage Council

Important Note about Section 106 Submissions:
In order for your Section 106 submission to be accepted, distributed, and reviewed all documents must be sent via email to our dedicated address: khc.section106@ky.gov.

For additional information on how and what to submit for Section 106 review, please visit our webpage:
https://heritage.ky.gov/compliance/Pages/overview.aspx

From: Hudson, Kimberly (BOP) <kshudson@bop.gov>
Sent: Wednesday, June 28, 2023 10:22 AM
To: Hutchins, Patricia (Heritage Council) <patricia.hutchins@ky.gov>; Fernandez, Gabrielle (Heritage Council) <gabrielle.fernandez@ky.gov>
Cc: Nardi, Robert <robert.nardi@wsp.com>; Sarah Hoffman <sarah.hoffman@wsp.com>; Alvarez, Jenny (BOP) <j5alvarez@bop.gov>
Subject: Agency Consultations: Proposed Federal Correctional Institution and Federal Prison Camp - Letcher County, Kentucky

Again, thank you for taking the time to meet with us this morning to discuss the Federal Bureau of Prisons' proposal to develop a new Federal Correctional Institution and Federal Prison Camp in Letcher County, Kentucky. We look forward to working with you on the Cultural Resources aspect of the project.

At your earliest convenience please send me the link for document submissions. Please feel free to contact me if you have any questions or need additional information.

Sincerely,
Kim

Kimberly Hudson
Site Selection Specialist
Construction and Environmental Review
Federal Bureau of Prisons
320 1st Street, NW, Room 901-5 West
Main: (202) 616-2574
Cell: (202) 451-7046

From: Nardi, Robert
To: craig.potts@ky.gov
Cc: kshudson@bop.gov; Hoffman, Sarah; McDonald, Camilla; nicole.konkol@ky.gov
Subject: RE: Agency Consultations: Proposed Federal Correctional Institution/Prison Camp - Letcher County, Kentucky
Date: Wednesday, June 14, 2023 9:55:04 AM
Attachments: KY SHPO Agency Consultation Ltr Agenda V2_BOP Final 6_14_23.pdf
image001.png

Dear Mr. Potts:

As the attached letter describes, the Federal Bureau of Prisons (BOP) is proposing to develop a new federal correctional facility in Letcher County, Kentucky. In compliance with the National Environmental Policy Act and other applicable regulations, the BOP has initiated preparation of a new Draft Environmental Impact Statement. As part of that effort, we wish to engage key regulatory agencies including the Kentucky State Historic Preservation Office, Kentucky Heritage Council (SHPO/KHC) in a discussion about the proposed project and the interests and concerns unique to your agency. The BOP and its consultant team (WSP USA) would like to meet with you (virtually) and others from the SHPO/KHC to share the project history and project goals. Most importantly, the meeting will provide the BOP an opportunity to learn the interests and concerns of the agency and to seek guidance to ensure compliance with all applicable regulations. Available meeting dates/times are shown below:

- Monday, June 26, 2023, 1:00 p.m., EDT
- Tuesday, June 27, 2023, 11:30 a.m., EDT
- Wednesday, June 28, 2023, 9:00 a.m., EDT
- Wednesday, June 28, 2023, 1:00 p.m., EDT
- Thursday, June 29, 2023, 10:00 a.m., EDT
- Thursday, June 29, 2023, 1:00 p.m., EDT

Please let us know of your willingness to meet, who would be attending from SHPO/KHC, and which of the available dates/times SHPO/KHC prefers. Feel free to contact me with questions and thank you for your cooperation.

Robert J. Nardi, Senior Vice President
WSP USA
Email: robert.nardi@wsp.com
T+ 1 973.407.1681 / M + 1 973.809.7495

2000 Lenox Drive, 3rd Floor, Lawrenceville, NJ 08648 USA

wsp.com

Proposed Federal Correctional Institution - Letcher County, Kentucky

Meeting Summary

The agency coordination meeting was held on June 28, 2023, to discuss the history, status, and upcoming activities involving development of a proposed Federal Correctional Institution (FCI) and Federal Prison Camp (FPC) in Letcher County, Kentucky. The meeting was organized according to the attached agenda and the discussions held during the meeting are summarized below.

I. Attendees

Attendees representing the U.S. Army Corps of Engineers (USACE) Federal Bureau of Prisons (BOP), and WSP are listed below.

Name	Title	Telephone	Email
USACE			
David Baldridge	Chief, South Branch, Regulatory Division, Louisville District	502-315-6675	david.baldridge@usace.army.mil
Justin L. Branham	Team Leader/Regulatory Specialist, Regulatory Division Louisville District	606-642-3208	justin.l.branham@usace.army.mil
Federal Bureau of Prisons			
Kimberly Hudson	Site Selection Specialist	202-451-7046	kshudson@bop.gov
Jenny Alvarez, RA	Senior Project Manager	202-451-7832	J5alvarez@bop.gov
Carl Ciccarelli	REEL Branch, OGC	202-353-2106	ccicarelli@bop.gov
Don Flewellyn	Chief, Facilities Management Branch	202-514-6464	dflewellyn@bop.gov
WSP USA			
Bob Nardi, PP	Senior Vice President/Program Manager	973-407-1681	robert.nardi@wsp.com
Sarah Hoffman	Assistant Vice President/Deputy Project Manager	720-482-3626	sarah.hoffman@wsp.com
Craig Hanlon	Principal Environmental Scientist	973-407-1462	craig.hanlon@wsp.com

II. Project Background

BOP and WSP provided a summary regarding the proposed action to develop a new medium-security FCI and a new minimum-security FPC for adult males in Letcher County, Kentucky. The history and timing of past studies and reports was summarized starting in 2005-2006 when Congress directed the BOP to undertake the studies necessary to build a new correctional facility in Letcher County. In 2008, site searches were conducted and the first Environmental Impact Statement (EIS) was published in 2015 with subsequent public review of the draft, public comment period, and a public hearing followed by publication of a Final EIS. Additional EISs were published in 2016 and 2017, with a Record of Decision signed by the BOP in March 2018. The project has always had strong local support but has not had the same support from a national standpoint. In response to a lawsuit challenging the project, the BOP withdrew the Record of Decision in 2019.

With the passage of time, changes to the project purpose and need have occurred including a change from development of a new high-security USP to a new medium security facility to serve the Mid-

Atlantic region. At this time, the thrust of the purpose of the proposed project to be included in the new draft EIS will be the need to develop modern federal correctional facilities giving the age and condition of BOP facilities and infrastructure.

With that said, BOP has started a new NEPA process. The Notice of Intent to draft a new Environmental Impact Statement was published in September 2022, and a public scoping meeting was held in November 2022. We are currently working on the new draft EIS and hence engaging with key state and federal regulatory agencies. There is a project website where previous studies and documents are posted: *https://www.proposed-fci-letchercountyky.com*.

WSP provided a summary of previous wetland delineations performed for the Roxanna site (preferred location) in 2011 and 2014. These wetland delineations resulted in a preliminary jurisdiction determination (JD) request submitted to USACE in 2016, and a second request was made through another preliminary JD in 2017. All streams are currently considered jurisdictional. For the new draft EIS, a new wetland delineation will be conducted and submitted to USACE for review. WSP was curious, based on recent Sackett case, what the current USACE's approach is on reviewing JDs, however USACE is currently on hold with these evaluations. USCE is still issuing permits but JDs remain in limbo for potentially 3-6 months.

Because this was a previous mining location, the natural landscape has been completely altered. For the new facility layout, some boundaries may have changed slightly. WSP/BOP have not identified any other site locations for consideration based on availability of flat topography areas. The congressional funding directive dictates the facility to be constructed in Letcher County. USACE acknowledged they will need to look at range of alternatives.

USACE inquired what method of compensatory mitigation would be evaluated by the BOP to offset impacts. BOP has experience with full range of mitigation measures. Based on the previous study, the site includes small and peripheral jurisdictional water/wetlands where impacts are expected to be minimal and would therefore attempt potentially in lieu fee mitigation. There are approximately 5,600 linear feet of stream and 3.5 acres of impacted wetlands documented in the previous studies. Due to the modified layout for a medium-security footprint, this will change those impact calculations. WSP is proposing to conduct field work in the summer of 2023, with submittal of a request for a JD to USACE by late fall 2023. USACE provided a caution of copperhead snakes in the field during the summer.

For additional consultation, USACE suggested to reach out to Samantha Bogler with the Kentucky Department of Water.

USACE will discuss internally on creating a new project/identification number when the JD is submitted.

Agenda

I. Welcome, Introductions

a. U.S. Army Corps of Engineers
b. Federal Bureau of Prisons
c. WSP USA

II. Proposed Federal Correctional Institution

a. Project History
b. Goals and Objectives
c. Project Description

III. Project Status

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V. Anticipated Schedule

a. Draft Environmental Impact Statement
b. Final Environmental Impact Statement
c. Record of Decision

VI. Next Steps/Action Items

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Kentucky Ecological Services Field Office
330 West Broadway, Suite 265
Frankfort, Kentucky 40601
(502) 695-0468

October 27, 2022

Kimberly S. Hudson
U.S. Department of Justice
Federal Bureau of Prisons
320 First Street NW, Room 901-5 West
Washington, D.C. 20534

Subject: ER 2022-0416; Comments Regarding NOI to Prepare Draft EIS for the Proposed Federal Correctional Institution and Federal Prison Camp; Letcher County, Kentucky

Dear Kimberly S. Hudson:

The U.S. Fish and Wildlife Service's (Service) Kentucky Field Office has reviewed the above-referenced request for comments regarding a Notice of Intent to develop a draft Environmental Impact Statement (EIS) received by our office on September 28, 2022. The U.S. Department of Justice's (USDOJ) Federal Bureau of Prisons is proposing a Federal Correctional Institution (FCI) and Federal Prison Camp (FPC) in Letcher County, Kentucky. The Service offers the following comments in accordance with the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.).

Project History and Description
The Service concluded formal consultation and issued a Biological Opinion (BO) on the Federal Bureau of Prisons' Proposed Construction and Operation of a U.S. Penitentiary (USP) and FPC in Letcher County, Kentucky (FWS Log #: 04EK1000-2016-F-0023) on July 27, 2017. The USDOJ is proposing changes to the original project. Since the BO was issued, the USDOJ has determined that the need to house medium-security inmates in a new FCI supersedes the need to house high-security inmates in a new USP. The design, construction, and operation of a high-security USP differs greatly from a medium-security FCI with the potential environmental impacts of its development and operation correspondingly different.

Federally Listed Species
In the 2017 BO, the Service concluded that the proposed project was not likely to jeopardize the Indiana bat (*Myotis sodalis*) or northern long-eared bat (*Myotis septentrionalis*). The Service also concurred that the proposed project "may affect, but is not likely to adversely affect" the gray bat (*Myotis grisescens*). In addition, the USDOJ determined that the proposed action would have "no effect" on the Kentucky Arrow Darter (*Etheostoma spilotum*). If the proposed project

modification will result in impacts to these federally listed species not previously addressed, the Service recommends that the effects of the project on these species be re-evaluated and consultation re-initiated. Additionally, a new species has been proposed for listing since the 2017 BO was issued that may be affect by the proposed project.

Tricolored bat

On September 14, 2022, the U.S. Fish and Wildlife Service (Service) published a proposal in the Federal Register to list the tricolored bat (*Perimyotis subflavus*) as endangered under the Endangered Species Act (ESA). The Service has up to 12-months from the date the proposal published to make a final determination, either to list the tricolored bat under the Act or to withdraw the proposal. Species proposed for listing are not afforded protection under the Act; however, as soon as a listing becomes effective (typically 30 days after publication of the final rule in the Federal Register), the prohibitions against jeopardizing its continued existence and "take" will apply. Therefore, if your future or existing project has the potential to adversely affect tricolored bats after the potential new listing goes into effect, we recommend that the effects of the project on tricolored bat and their habitat be analyzed to determine whether authorization under ESA section 7 or 10 is necessary. Projects with an existing section 7 biological opinion may require re-initiation of consultation.

The tricolored bat is a small insectivorous bat that typically overwinters in caves, abandoned mines and tunnels, and road-associated culverts (southern portion of the range) and spends the rest of the year in forested habitats, typically roosting among live and dead leaf clusters. For more information on tricolored bats and the proposed rule, please see: https://www.fws.gov/species/tricolored-bat-perimyotis-subflavus and for more information on WNS, please see: https://www.whitenosesyndrome.org/.

Summary

The Service appreciates the opportunity to provide comments and recommendations for the USDOJ to consider in their development of the draft EIS. Based on the proposed project modifications and the recent proposal to list the tricolor bat, the Service recommends that the USDOJ re-initiate consultation. The Kentucky Field Office is available to assist the USDOJ as needed. If you have any questions, please contact Pamela McDill of my staff at pamela_mcdill@fws.gov.

Sincerely,

for Virgil Lee Andrews, Jr.
Field Supervisor

Proposed Federal Correctional Institution - Letcher County, Kentucky

Meeting Summary

The agency coordination meeting was held on June 29, 2023, to discuss the history, status, and upcoming activities involving development of a proposed Federal Correctional Institution (FCI) and Federal Prison Camp (FPC) in Letcher County, Kentucky. The meeting was organized according to the attached agenda and the discussions held during the meeting are summarized below.

I. Attendees

Attendees representing the U.S. Fish and Wildlife Service (USFWS) Federal Bureau of Prisons (BOP), and WSP are listed below.

Name	Title	Telephone	Email
USFWS			
Lee Andrews	Field Office Supervisor	502-695-0468 x 46108	lee_andrews@fws.gov
Seth Bishop	Section 7 Biologist	502-695-0468 x 46115	seth_bishop@fws.gov
Federal Bureau of Prisons			
Kimberly Hudson	Site Selection Specialist	202-451-7046	kshudson@bop.gov
Jenny Alvarez, RA	Senior Project Manager	202-451-7832	J5alvarez@bop.gov
Carl Ciccarelli	REEL Branch, OGC	202-353-2106	ccicarelli@bop.gov
Don Flewellyn	Chief, Facilities Management Branch	202-514-6464	dflewellyn@bop.gov
WSP USA			
Bob Nardi, PP	Senior Vice President/Program Manager	973-407-1681	robert.nardi@wsp.com
Sarah Hoffman	Assistant Vice President/Deputy Project Manager	720-482-3626	sarah.hoffman@wsp.com
Craig Hanlon	Principal Environmental Scientist	973-407-1462	craig.hanlon@wsp.com
Tara Stewart	Senior Environmental Scientist	973-407-1473	tara.stewart@wsp.com

II. Project Background

BOP and WSP provided a summary regarding the proposed action to develop a new medium-security FCI and a new minimum-security FPC for adult males in Letcher County, Kentucky. The history and timing of past studies and reports was summarized starting in 2005-2006 when Congress directed the BOP to undertake the studies necessary to build a new correctional facility in Letcher County. In 2008, site searches were conducted and the first Environmental Impact Statement (EIS) was published in 2015 with subsequent public review of the draft, public comment period, and a public hearing followed by publication of a Final EIS. Additional EISs were published in 2016 and 2017, with a Record of Decision signed by the BOP in March 2018. The project has always had strong local support but has not had the same support from a national standpoint. In response to a lawsuit challenging the project, the BOP withdrew the Record of Decision in 2019.

With the passage of time, changes to the project purpose and need have occurred including a change from development of a new high-security USP to a new medium security facility to serve the Mid-Atlantic region. At this time the thrust of the purpose of the proposed project to be included in the new draft EIS will be the need to develop modern federal correctional facilities giving the age and condition of BOP facilities and infrastructure.

With that said, BOP has started a new NEPA process. The Notice of Intent to draft a new Environmental Impact Statement was published in September 2022, and a public scoping meeting was held in November 2022. We are currently working on the new draft EIS and hence engaging with key state and federal regulatory agencies. There is a project website where previous studies and documents are posted.

WSP noted that the previous studies were coordinated with USFWS, particularly for bat species (Indiana, northern long-eared, and gray) as well as the Kentucky arrow darter. These species and habitats were evaluated during the previous field investigations. Since the sites surveyed are forested, habitat was identified and presented in a Biological Assessment submitted in 2017. Previous mitigation identified included contributions to the conservation Imperiled Bat Conservation Fund. WSP acknowledges that forested impacts would require mitigation efforts. WSP is curious on the timing of potential additional studies – specifically for the presence of bats – and consultation thresholds considering construction is a couple years out. Should mist netting or acoustic surveys be conducted now or closer to actual construction?

USFWS stated that the grass fields and scrubby areas are part of the matrix, but not preferred habitat for these bats. The preferred site in the previous Biological Assessment (BA) contains known bat habitat, including forested areas and the presence of caves. Mitigation ratios are affected by known habitat vs potential habitat therefore it might be better to just assume presence based on suitable habitat.

Formal consultation is required since the site contains known habitat. The preferred site has known swarming habitat for Indiana bat. Timing of initiation of consultation is critical as the need to resurvey is required for greater than 5 years of data. Consultation would need to be re-initiated with USFWS before they can further advise on potential impacts and required mitigation. USFWS looks at each unique site/ project and considers whether the suitable habitat is being used by the species and connectivity to off-site habitat.

The gray bat will be less of a concern at the preferred site, but potential impacts to the three tree-dwelling bat species (Indiana, northern long-eared, and tricolored bat) need to be analyzed. USFWS noted that the site also contains known swarming habitat for tricolored bat. Tri-colored bat was recently proposed for listing and was not addressed in the previous Biological Opinion; therefore, potential impacts to this species will need to be evaluated. Preliminary mitigation suggestions include seasonal tree cutting to avoids impact to juveniles. WSP will enter the project information into IPaC to obtain a current list of species and the system will assign a project number to reference during future correspondence regarding the project. Seth Bishop will be the main point-of-contact for USFWS.

Agenda

I. Welcome, Introductions

a. U.S. Fish and Wildlife Service
b. Federal Bureau of Prisons
c. WSP USA

II. Proposed Federal Correctional Institution

a. Project History
b. Goals and Objectives
c. Project Description

III. Project Status

a. Notice of Intent to Prepare a Draft EIS
b. Agency Scoping
c. Project Website (*https://www.proposed-fci-letchercountyky.com*)

IV. Previous EISs and Related Studies

a. Draft EIS, February 2015
b. Final EIS, July 2015
c. Revised Final EIS, November 2016
d. Draft Supplemental Revised Final EIS, March 2017
e. Final Supplemental Revised Final EIS, September 2017

V. Anticipated Schedule

a. Draft Environmental Impact Statement
b. Final Environmental Impact Statement
c. Record of Decision

VI. Next Steps/Action Items

From:	Nardi, Bob
To:	letcherconservation@tvscable.com
Cc:	Hoffman, Sarah; Lucia, Michael
Subject:	RE: Prime Farmland Conversion Impact Rating Form AD1006 - Proposed FCI/FPC, Letcher County, KY
Date:	Wednesday, February 14, 2024 1:53:02 PM
Attachments:	FFPA AD 1006 letter, Form Letcher County 1-19-24 signed.pdf FPPA AD1006 1-18-24.pdf image001.png

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To: Letcher County Conservation District

WSP is nearing completion of a Draft Environmental Impact Statement concerning the proposed development of a new Federal Correctional Institution and Federal Prison Camp (FCI/FPC) in Letcher County, Kentucky near the community of Roxana and known as the Roxana Site. With that I am checking on the status of the District's review of the Farmland Impact Rating Form (AD-1006) Parts II, IV and V? We appreciate your assistance and look forward to your response. Thank you.

Robert J. Nardi, Senior Vice President
WSP USA
Email: robert.nardi@wsp.com
T+ 1 973.407.1681 / M + 1 973.809.7495

2000 Lenox Drive, 3rd Floor, Lawrenceville, NJ 08648 USA

wsp.com

From: letcherconservation@tvscable.com <letcherconservation@tvscable.com>
Sent: Tuesday, January 23, 2024 10:45 AM
To: Nardi, Robert <robert.nardi@wsp.com>
Subject: RE: Prime Farmland Conversion Impact Rating Form AD1006 - Proposed FCI/FPC, Letcher County, KY

yes, we received it and I forwarded it on to my supervisor.

From: "Nardi, Robert" <robert.nardi@wsp.com>
Sent: 1/23/24 10:44 AM
To: "letcherconservation@tvscable.com" <letcherconservation@tvscable.com>
Cc: "Hoffman, Sarah" <sarah.hoffman@wsp.com>, "Lucia, Michael" <Michael.Lucia@wsp.com>
Subject: RE: Prime Farmland Conversion Impact Rating Form AD1006 - Proposed FCI/FPC, Letcher County, KY

To: Letcher County Conservation District

Please confirm receipt of email and attachments sent on Friday. Thank you.

Robert J. Nardi, Senior Vice President
WSP USA

Email: robert.nardi@wsp.com
T+ 1 973.407.1681 / M + 1 973.809.7495

2000 Lenox Drive, 3rd Floor, Lawrenceville, NJ 08648 USA

wsp.com

From: Nardi, Robert
Sent: Friday, January 19, 2024 10:39 AM
To: letcherconservation@tvscable.com
Cc: Hoffman, Sarah <sarah.hoffman@wsp.com>
Subject: Prime Farmland Conversion Impact Rating Form AD1006 - Proposed FCI/FPC, Letcher County, KY

To: Letcher County Conservation District

The Federal Bureau of Prisons, assisted by WSP USA Inc., is currently preparing a Draft Environmental Impact Statement concerning a proposed action to develop a new Federal Correctional Institution and Federal Prison Camp (FCI/FPC) in Letcher County, Kentucky. Of the alternative locations in Letcher County considered for FCI/FPC development is an approximately 700-acre property located near the community of Roxana and known as the Roxana Site. The site comprises a former surface and underground mine that has been significantly altered by mountaintop removal. The site is vacant and undeveloped and retains none of its native soils and topography. There are also no lands in the vicinity of the Roxana Site that are under cultivation or used for agricultural purposes. Find attached a Farmland Impact Rating Form (AD-1006) with Parts I and III completed. We request that your agency complete Parts II, IV and V and return the form to me for completion of Parts VI and VII. We appreciate your assistance with this matter and look forward to your response. Please contact me with questions at robert.nardi@wsp.com or by phone at 973-407-1681. Thank you.

Robert J. Nardi, Senior Vice President
WSP USA

Email: robert.nardi@wsp.com
T+ 1 973.407.1681 / M + 1 973.809.7495

2000 Lenox Drive, 3rd Floor, Lawrenceville, NJ 08648 USA

wsp.com

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-LAEmHhHzdJzBlTWfa4Hgs7pbKl

From:	Hoffman, Sarah
To:	Rayos, Krystle
Subject:	FW: Prime Farmland Conversion Impact Rating Form AD1006 - Proposed FCI/FPC, Letcher County, KY
Date:	Friday, January 19, 2024 7:45:31 AM
Attachments:	FFPA AD 1006 letter, Form Letcher County 1-19-24 signed.pdf FPPA AD1006 1-18-24.pdf image001.png image002.png

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Save attachments (and email) to project file and add to administrative record.

Sarah Hoffman, CEM
Assistant Vice President - Environmental Planner
She/Her

T+ 1 720-482-3626
M+ 1 702-373-0362

From: Nardi, Robert <robert.nardi@wsp.com>
Sent: Friday, January 19, 2024 8:39 AM
To: letcherconservation@tvscable.com
Cc: Hoffman, Sarah <sarah.hoffman@wsp.com>
Subject: Prime Farmland Conversion Impact Rating Form AD1006 - Proposed FCI/FPC, Letcher County, KY

To: Letcher County Conservation District

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Email: robert.nardi@wsp.com
T+ 1 973.407.1681 / M + 1 973.809.7495

2000 Lenox Drive, 3rd Floor, Lawrenceville, NJ 08648 USA

wsp.com

From:	Hoffman, Sarah
To:	Rayos, Krystle
Subject:	FW: Prime Farmland Conversion Impact Rating Form AD1006 - Proposed FCI/FPC, Letcher County, KY
Date:	Tuesday, January 23, 2024 8:39:57 AM
Attachments:	FFPA AD 1006 letter, Form Letcher County 1-19-24 signed.pdf FPPA AD1006 1-18-24.pdf image001.png image002.png

---

Email & attachments for the record.

Sarah Hoffman, CEM
Assistant Vice President - Environmental Planner
She/Her

T+ 1 720-482-3626
M+ 1 702-373-0362

From: Nardi, Robert <robert.nardi@wsp.com>
Sent: Tuesday, January 23, 2024 8:44 AM
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Cc: Hoffman, Sarah <sarah.hoffman@wsp.com>; Lucia, Michael <Michael.Lucia@wsp.com>
Subject: RE: Prime Farmland Conversion Impact Rating Form AD1006 - Proposed FCI/FPC, Letcher County, KY

To: Letcher County Conservation District

Please confirm receipt of email and attachments sent on Friday. Thank you.

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WSP USA
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From: Nardi, Robert
Sent: Friday, January 19, 2024 10:39 AM
To: letcherconservation@tvscable.com
Cc: Hoffman, Sarah <sarah.hoffman@wsp.com>
Subject: Prime Farmland Conversion Impact Rating Form AD1006 - Proposed FCI/FPC, Letcher County, KY

To: Letcher County Conservation District

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wsp.com

U.S. Department of Justice

Federal Bureau of Prisons

Washington, DC 20534

January 18, 2024

Chuck Hoskins, Jr., Principal Chief
Cherokee Nation
P.O. Box 948
Tahlequah, Oklahoma 74465
Email: chuck-hoskin@cherokee.org

Re: Tribal Consultations Concerning Proposed Federal Correctional Institution and Federal Prison Camp – Letcher County, Kentucky

Dear Principal Chief Hoskins:

Pursuant to the National Environmental Policy Act (NEPA) of 1969, as implemented by the Council on Environmental Quality (CEQ) regulations, the Federal Bureau of Prisons (FBOP) is preparing an environmental impact statement (EIS) for the proposed development of a Federal Correctional Institution (FCI) and Federal Prison Camp (FPC) in Letcher County which is located in southeastern Kentucky as shown on the attached map.

The mission of the FBOP is to protect society by confining offenders in the controlled environments of prison and community-based facilities that are safe, humane, cost-efficient, and appropriately secure, and that provide work and other self-improvement opportunities to assist the population of adults in custody in becoming law-abiding citizens. A growing challenge to performing that mission is the increasing number of federal correctional facilities and supporting infrastructure that were constructed over 50 years ago, resulting in a continuous need to maintain existing facilities, and when necessary, develop new facilities.

Congress has directed the FBOP to undertake investigations leading to development of a new FCI and FPC in Letcher County, Kentucky (Congressional authorization: P.L. 109-272), an action with the potential to significantly affect the quality of the human environment. Therefore, pursuant to NEPA and the CEQ regulations implementing NEPA, the FBOP is preparing a Draft EIS to ensure that the environmental consequences of the proposed action are thoroughly documented and that compliance is achieved with NEPA and other environmental statutes including the Clean Air Act of 1974; the Clean Water Act and Amendments, the Endangered Species Act of 1973; the National Historic Preservation Act of 1966; and the Farmland Protection Policy Act, among others. Additional information on the proposed project can be found on the public website: https://www.proposed-fci-letchercountyky.com.

As you may know, the NEPA process provides opportunities for the public, elected and appointed officials, Tribal representatives, regulatory agencies, and others to voice their interest and provide input and comments concerning the proposed action. By this letter the FBOP requests indication of your interest in participating as a cooperating agency or an interested party for the proposed action within 30 calendar days of the date of this letter. Please email or mail your response to:

Contact: Kimberly Hudson, Chief, Construction and Environmental Review Section
Email: kshudson@bop.gov
Phone: (202) 451-7046
Address: Federal Bureau of Prisons, 320 First Street, NW, Room 901-5 West, Washington, DC 20534

Once we receive confirmation that you would like to participate as a cooperating agency, a representative of our consultant team (WSP) will contact you to identify a convenient date/time for a virtual meeting. In the meantime, please feel free to reach out to me using the contact information provided above. Thank you for your cooperation and we look forward to the possibility of working with you.

Sincerely,

Kimberly S. Hudson

Kimberly S. Hudson, Chief
Construction and Environmental Review Section
Federal Bureau of Prisons

Attachment

Cc:

E. Toombs, THPO, Cherokee Nation (elizabeth-toombs@cherokee.org)
J. Alvarez, C. Ciccarelli, FBOP
R. Nardi, S. Hoffman, C. McDonald, WSP

U.S. Department of Justice

Federal Bureau of Prisons

Washington, DC 20534

January 18, 2024

Michell Hicks, Principal Chief
Eastern Band of Cherokee Indians
Qualla Boundary, P.O. Box 1927
Cherokee, North Carolina 28719
Email: michellhicks@ebci-nsn.gov

Re: Tribal Consultations Concerning Proposed Federal Correctional Institution and Federal Prison Camp – Letcher County, Kentucky

Dear Principal Chief Hicks:

Pursuant to the National Environmental Policy Act (NEPA) of 1969, as implemented by the Council on Environmental Quality (CEQ) regulations, the Federal Bureau of Prisons (FBOP) is preparing an environmental impact statement (EIS) for the proposed development of a Federal Correctional Institution (FCI) and Federal Prison Camp (FPC) in Letcher County which is located in southeastern Kentucky as shown on the attached map.

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Kimberly S. Hudson

Kimberly S. Hudson, Chief
Construction and Environmental Review Section
Federal Bureau of Prisons

Attachment

Cc:

R. Townsend, THPO, Eastern Band of Cherokee Indians (syerka@nc-cherokee.com)
J. Alvarez, C. Ciccarelli, FBOP
R. Nardi, S. Hoffman, C. McDonald, WSP

U.S. Department of Justice

Federal Bureau of Prisons

Washington, DC 20534

January 19, 2024

Pam Straughan, Deputy Chief of Staff
Eastern Band of Cherokee Indians
Qualla Boundary, P.O. Box 1927
Cherokee, North Carolina 28719
Email: pamstraughan@ebci-nsn.gov

Re: Tribal Consultations Concerning Proposed Federal Correctional Institution and Federal Prison Camp – Letcher County, Kentucky

Dear Ms. Straughan:

Pursuant to the National Environmental Policy Act (NEPA) of 1969, as implemented by the Council on Environmental Quality (CEQ) regulations, the Federal Bureau of Prisons (FBOP) is preparing an environmental impact statement (EIS) for the proposed development of a Federal Correctional Institution (FCI) and Federal Prison Camp (FPC) in Letcher County which is located in southeastern Kentucky as shown on the attached map.

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Sincerely,

Kimberly S. Hudson

Kimberly S. Hudson, Chief
Construction and Environmental Review Section
Federal Bureau of Prisons

Attachment

Cc:

M. Hicks, Principal Chief, Eastern Band of Cherokee Indians (michellhicks@ebci-nsn.gov
R. Townsend, THPO, Eastern Band of Cherokee Indians (syerka@nc-cherokee.com)
R. Queen, Executive Assistant, Eastern Band of Cherokee Indians (raequeen1@ebci-nsn.gov)
J. Alvarez, C. Ciccarelli, FBOP
R. Nardi, S. Hoffman, C. McDonald, WSP

U.S. Department of Justice

Federal Bureau of Prisons

Washington, DC 20534

January 19, 2024

Rae Queen, Executive Assistant
Eastern Band of Cherokee Indians
Qualla Boundary, P.O. Box 1927
Cherokee, North Carolina 28719
Email: raequeen1@ebci-nsn.gov

Re: Tribal Consultations Concerning Proposed Federal Correctional Institution and Federal Prison Camp – Letcher County, Kentucky

Dear Ms. Queen:

Pursuant to the National Environmental Policy Act (NEPA) of 1969, as implemented by the Council on Environmental Quality (CEQ) regulations, the Federal Bureau of Prisons (FBOP) is preparing an environmental impact statement (EIS) for the proposed development of a Federal Correctional Institution (FCI) and Federal Prison Camp (FPC) in Letcher County which is located in southeastern Kentucky as shown on the attached map.

The mission of the FBOP is to protect society by confining offenders in the controlled environments of prison and community-based facilities that are safe, humane, cost-efficient, and appropriately secure, and that provide work and other self-improvement opportunities to assist the population of adults in custody in becoming law-abiding citizens. A growing challenge to performing that mission is the increasing number of federal correctional facilities and supporting infrastructure that were constructed over 50 years ago, resulting in a continuous need to maintain existing facilities, and when necessary, develop new facilities.

Congress has directed the FBOP to undertake investigations leading to development of a new FCI and FPC in Letcher County, Kentucky (Congressional authorization: P.L. 109-272), an action with the potential to significantly affect the quality of the human environment. Therefore, pursuant to NEPA and the CEQ regulations implementing NEPA, the FBOP is preparing a Draft EIS to ensure that the environmental consequences of the proposed action are thoroughly documented and that compliance is achieved with NEPA and other environmental statutes including the Clean Air Act of 1974; the Clean Water Act and Amendments, the Endangered Species Act of 1973; the National Historic Preservation Act of 1966; and the Farmland Protection Policy Act, among others. Additional information on the proposed project can be found on the public website: https://www.proposed-fci-letchercountyky.com.

As you may know, the NEPA process provides opportunities for the public, elected and appointed officials, Tribal representatives, regulatory agencies, and others to voice their interest and provide input and comments concerning the proposed action. By this letter the FBOP requests indication of your interest in participating as a cooperating agency or an interested party for the proposed action within 30 calendar days of the date of this letter. Please email or mail your response to:

> Contact: Kimberly Hudson, Chief, Construction and Environmental Review Section
> Email: kshudson@bop.gov
> Phone: (202) 451-7046
> Address: Federal Bureau of Prisons, 320 First Street, NW, Room 901-5 West, Washington, DC 20534

Once we receive confirmation that you would like to participate as a cooperating agency, a representative of our consultant team (WSP) will contact you to identify a convenient date/time for a virtual meeting. In the meantime, please feel free to reach out to me using the contact information provided above. Thank you for your cooperation and we look forward to the possibility of working with you.

Sincerely,

Kimberly S. Hudson

Kimberly S. Hudson, Chief
Construction and Environmental Review Section
Federal Bureau of Prisons

Attachment

Cc:

M. Hicks, Principal Chief, Eastern Band of Cherokee Indians (michellhicks@ebci-nsn.gov
R. Townsend, THPO, Eastern Band of Cherokee Indians (syerka@nc-cherokee.com)
Pam Straughan, Deputy Chief of Staff, Eastern Band of Cherokee Indians (pamstraughan@ebci-nsn.gov
J. Alvarez, C. Ciccarelli, FBOP
R. Nardi, S. Hoffman, C. McDonald, WSP

From:	Hoffman, Sarah
To:	Rayos, Krystle
Subject:	FW: Tribal Consultations - Environmental Impact Statement Process for the Proposed FCI/FPC Letcher County, KY
Date:	Thursday, January 18, 2024 9:26:49 AM
Attachments:	Tribal Consultation M Hicks 1_18_24.pdf Regional Map.pdf image001.png

Save to the project folder and add to the administrative record. (The email pdf as well)

Sarah Hoffman, CEM
Assistant Vice President - Environmental Planner
She/Her

T+ 1 720-482-3626
M+ 1 702-373-0362

From: Hudson, Kimberly (BOP) <kshudson@bop.gov>
Sent: Thursday, January 18, 2024 9:30 AM
To: michellhicks@ebci-nsn.gov
Cc: syerka@nc-cherokee.com; Alvarez, Jenny (BOP) <j5alvarez@bop.gov>; Ciccarelli, Carl (BOP) <cCiccarelli@bop.gov>; Nardi, Robert <robert.nardi@wsp.com>; Hoffman, Sarah <sarah.hoffman@wsp.com>; McDonald, Camilla <Camilla.McDonald@wsp.com>
Subject: Tribal Consultations - Environmental Impact Statement Process for the Proposed FCI/FPC Letcher County, KY

The Federal Bureau of Prisons is preparing an environmental impact statement for the proposed development of a Federal Correctional Institution and Federal Prison Camp in Letcher County, KY. Attached is a letter to request indication of your interest in participating as a cooperating agency or an interested party for the proposed action. Please review the letter and let me know if you have any questions or need additional information.

Regards,

Kimberly Hudson
Chief, Construction and Environmental Review Section
Facilities Management Branch
Federal Bureau of Prisons
320 1st Street, NW, Room 901-5 West
Washington, DC 20534
Cell: (202) 451-7046

From:	Hoffman, Sarah
To:	Rayos, Krystle
Subject:	FW: Tribal Consultations - Environmental Impact Statement Process for the Proposed FCI/FPC Letcher County, KY
Date:	Thursday, January 18, 2024 9:26:07 AM
Attachments:	Tribal Consultation C Hoskin 1_18_24.pdf Regional Map.pdf image001.png

---

Save to the project folder and add to the administrative record.

Sarah Hoffman, CEM
Assistant Vice President - Environmental Planner
She/Her

T+ 1 720-482-3626
M+ 1 702-373-0362

From: Hudson, Kimberly (BOP) <kshudson@bop.gov>
Sent: Thursday, January 18, 2024 9:30 AM
To: chuck-hoskin@cherokee.org
Cc: elizabeth-toombs@cherokee.org; Alvarez, Jenny (BOP) <j5alvarez@bop.gov>; Ciccarelli, Carl (BOP) <cCiccarelli@bop.gov>; Nardi, Robert <robert.nardi@wsp.com>; Hoffman, Sarah <sarah.hoffman@wsp.com>; McDonald, Camilla <Camilla.McDonald@wsp.com>
Subject: Tribal Consultations - Environmental Impact Statement Process for the Proposed FCI/FPC Letcher County, KY

The Federal Bureau of Prisons is preparing an environmental impact statement for the proposed development of a Federal Correctional Institution and Federal Prison Camp in Letcher County, KY. Attached is a letter to request indication of your interest in participating as a cooperating agency or an interested party for the proposed action. Please review the letter and let me know if you have any questions or need additional information.

Regards,

Kimberly Hudson
Chief, Construction and Environmental Review Section
Facilities Management Branch
Federal Bureau of Prisons
320 1st Street, NW, Room 901-5 West
Washington, DC 20534
Cell: (202) 451-7046

From:	Hoffman, Sarah
To:	Rayos, Krystle
Subject:	FW: Tribal Consultations - Environmental Impact Statement Process for the Proposed FCI/FPC Letcher County, KY
Date:	Friday, January 19, 2024 8:10:24 AM
Attachments:	Tribal Consultation R Queen 1_19_24.pdf Regional Map.pdf image001.png

Save attachments (and email) to project file and add to administrative record.

Sarah Hoffman, CEM
Assistant Vice President - Environmental Planner
She/Her

T+ 1 720-482-3626
M+ 1 702-373-0362

From: Hudson, Kimberly (BOP) <kshudson@bop.gov>
Sent: Friday, January 19, 2024 9:03 AM
To: raequeen1@ebci-nsn.gov
Cc: Alvarez, Jenny (BOP) <j5alvarez@bop.gov>; Ciccarelli, Carl (BOP) <cCiccarelli@bop.gov>; Nardi, Robert <robert.nardi@wsp.com>; Hoffman, Sarah <sarah.hoffman@wsp.com>; McDonald, Camilla <Camilla.McDonald@wsp.com>
Subject: Tribal Consultations - Environmental Impact Statement Process for the Proposed FCI/FPC Letcher County, KY

The Federal Bureau of Prisons is preparing an environmental impact statement for the proposed development of a Federal Correctional Institution and Federal Prison Camp in Letcher County, KY. Attached is a letter to request indication of your interest in participating as a cooperating agency or an interested party for the proposed action. Please review the letter and let me know if you have any questions or need additional information.

Regards,

Kimberly Hudson
Chief, Construction and Environmental Review Section
Facilities Management Branch
Federal Bureau of Prisons
320 1st Street, NW, Room 901-5 West
Washington, DC 20534
Cell: (202) 451-7046

From:	Hoffman, Sarah
To:	Rayos, Krystle
Subject:	FW: Tribal Consultations - Environmental Impact Statement Process for the Proposed FCI/FPC Letcher County, KY
Date:	Friday, January 19, 2024 7:41:47 AM
Attachments:	Tribal Consultation P Straughan 1_19_24.pdf Regional Map.pdf image001.png

Save attachments (and email) to project file and add to administrative record.

Sarah Hoffman, CEM
Assistant Vice President - Environmental Planner
She/Her

T+ 1 720-482-3626
M+ 1 702-373-0362

From: Hudson, Kimberly (BOP) <kshudson@bop.gov>
Sent: Friday, January 19, 2024 8:40 AM
To: pamstraughan@ebci-nsn.gov
Cc: Alvarez, Jenny (BOP) <j5alvarez@bop.gov>; Ciccarelli, Carl (BOP) <cCiccarelli@bop.gov>; Nardi, Robert <robert.nardi@wsp.com>; Hoffman, Sarah <sarah.hoffman@wsp.com>; McDonald, Camilla <Camilla.McDonald@wsp.com>
Subject: Tribal Consultations - Environmental Impact Statement Process for the Proposed FCI/FPC Letcher County, KY

The Federal Bureau of Prisons is preparing an environmental impact statement for the proposed development of a Federal Correctional Institution and Federal Prison Camp in Letcher County, KY. Attached is a letter to request indication of your interest in participating as a cooperating agency or an interested party for the proposed action. Please review the letter and let me know if you have any questions or need additional information.

Regards,

Kimberly Hudson
Chief, Construction and Environmental Review Section
Facilities Management Branch
Federal Bureau of Prisons
320 1st Street, NW, Room 901-5 West
Washington, DC 20534
Cell: (202) 451-7046

January 24, 2024

Department of the Army
U.S. Army Corps of Engineers
Regulatory Division, Room 183
P.O. Box 59
Louisville, KY 40202-0059
Attention: Jurisdictional Determination Review

via email: CELRL.Door.To.The.Corps@usace.army.mil

RE: Wetland Delineation Report and Jurisdictional Determination Request
Proposed Federal Correctional Institution and Federal Prison Camp
Letcher County, Kentucky

Dear Jurisdictional Determination Review:

On behalf of the U.S. Department of Justice, Federal Bureau of Prisons (BOP), WSP USA, Inc., submits herein its Wetland Delineation report and Preliminary Jurisdictional Determination Request to the U.S. Army Corps of Engineers, Louisville District. This document addresses waters of the U.S. (wetlands/open waters) within the approximately 700-acre site of the proposed Federal Correctional Institution (FCI) and Federal Prison Camp (FPC) located in Letcher County, Kentucky.

The BOP is proposing to develop a new FCI and FPC within private property that it proposes to acquire and wishes to confirm the locations of wetlands/opens waters which exist on the property. A field delineation of U.S. Army Corps of Engineers jurisdictional wetlands was performed within the site in September/October 2023 by WSP staff. The enclosed document includes the following:

- Wetland Delineation Report
- Completed Request for Department of the Army-Jurisdictional Determination application
- Completed U.S. Army Corps of Engineers Approved Jurisdictional Determination Form
- Site Photographs
- Completed Wetland Determination Data Forms
- Wetland Delineation Plan
- Threatened and Endangered Species Correspondence

Following your review of the attached document, we would appreciate an opportunity to meet (via conference call) to discuss, with BOP officials, the findings, plans for the property, potential permitting, etc. on a day/time of your convenience.

Please do not hesitate to contact me (973-407-1462, craig.hanlon@wsp.com) with questions or to arrange a day/time to meet. Thank you for your attention and consideration.

Sincerely,

WSP USA, Inc.

Craig Hanlon
Principal Environmental Scientist

Attachment
cc: K. Hudson, J. Alvarez, BOP
R. Nardi, S. Hoffman; WSP USA, Inc.

U.S. Department of Justice

Federal Bureau of Prisons

Washington, DC 20534

June 14, 2023

Mr. Justin L. Branham
Team Leader/Regulatory Specialist
U.S. Army Corps of Engineers
Eastern Kentucky Regulatory Office
845 Sassafras Creek Road, Sassafras, KY 41759
Justin.l.branham@usace.army.mil

Re: Agency Consultations: Proposed Federal Correctional Institution and Federal Prison Camp - Letcher County, Kentucky

Dear Mr. Branham:

The Federal Bureau of Prisons' (Bureau) mission is to care for federal inmates in controlled environments of prisons and community-based facilities that are safe, humane, cost-efficient, and appropriately secure, while providing education, employment, and other self-improvement opportunities to assist offenders in becoming law-abiding citizens. However, a growing challenge to successfully carrying out its responsibilities is the increasing number of aging federal correctional facilities, resulting in a need to maintain existing facilities, and when necessary, develop new facilities. At the same time, current Bureau projections show a need for additional bedspace to accommodate the growing number of medium-security federal inmates, particularly in the Mid-Atlantic region of the country. To address these needs, the Bureau is proposing to develop a new federal correctional facility in Letcher County, Kentucky.

Planning for a new federal correctional facility began in 2006 when Congress directed the Bureau to undertake the various investigations needed to support such development in Letcher County. In accordance with Congress' directive and federal law, the Bureau has conducted a wide range of technical studies including multiple Environmental Impact Statements (EISs) in conformance with the National Environmental Policy Act (NEPA) of 1969, as amended. Included among those efforts were:

- Publication of a Draft EIS in 2015 which evaluated various alternatives for development of a high-security penitentiary and minimum-security prison camp in Letcher County. That same year, a Final EIS was published that responded to public comments received on the Draft EIS and identified the Roxana Site as the preferred location for development of the project.

- Publication of a Revised Final EIS in 2016 to address inconsistencies in the earlier document and in 2017, both Draft and Final Supplemental Revised Final EISs were published to address new circumstances relevant to potential environmental impacts.

- Adoption of a Record of Decision (ROD) in 2018 documenting the Bureau's decision to proceed with development at the Roxana Site, however, the ROD was withdrawn in 2019 to evaluate new information.

Although the ROD was withdrawn in 2019, Congress' 2006 directive to develop a new correctional facility in Letcher County remains in effect. As such, the Bureau has continued to evaluate its current and future inmate populations and resulting facility needs and determined that housing medium-security federal inmates supersedes the need to house high-security inmates. The design, construction, and operation of a medium-security institution differs from that of a high-security penitentiary with the potential environmental impacts correspondingly different. As a result, the Bureau must ensure that the environmental consequences of this new action are also adequately considered under NEPA.

Development of the proposed federal correctional facility has the potential to significantly affect the quality of the human environment. Therefore, the Bureau is preparing a new Draft EIS to ensure that the environmental consequences of the proposed action are thoroughly documented and complies with NEPA, the Bureau's implementing NEPA regulations, National Historic Preservation Act, Clean Water Act, Endangered Species Act, in addition to other federal statutes and Executive Orders. The process also provides interested parties, stakeholders, and the public with opportunities to offer input and comments concerning the proposed action. Fortunately, a considerable volume of information has been compiled about Letcher County as well as the previously considered alternative development sites. Although the passage of time and change of scope requires the Bureau to update, verify and validate current conditions, the information previously gathered should help with preparation of the new Draft EIS.

The Bureau wishes to again engage key regulatory agencies including the U.S. Army Corps of Engineers (USACE) in a discussion about the proposed project and the interests and concerns unique to your agency. The Bureau and its consultant team (WSP USA) would like to meet with you and others from the USACE to share the project history and the revised purpose and objectives of the proposed project. Most importantly, the meeting will provide the Bureau an opportunity to start a dialogue with USACE officials, learn the interests and concerns of the agency regarding the proposed facility, and seek guidance to ensure compliance with all applicable regulations.

Included with this letter is an agenda which outlines the topics to be discussed at such a meeting. A representative of WSP will reach out to you shortly to identify a convenient date/time for a virtual meeting. In the meantime, feel free to reach out to me using the contact information provided below. Thank you for your cooperation and we look forward to meeting.

Sincerely,

Kimberly S. Hudson

Kimberly S. Hudson, Site Selection Specialist
Construction & Environmental Review, Federal Bureau of Prisons
320 First Street, NW, Room 901-5 West, Washington, DC 20534
202-451-7046 / kshudson@bop.gov

Attachment

Cc: J. Organic, D. Flewellyn, C. Ciccarelli, Bureau of Prisons
S. Hoffman, R. Nardi, C. Hanlon, WSP

Proposed Federal Correctional Institution
Letcher County, Kentucky

Agenda

I. Welcome, Introductions
- a. U.S. Army Corps of Engineers
- b. Federal Bureau of Prisons
- c. WSP USA

II. Proposed Federal Correctional Institution
- a. Project History
- b. Goals and Objectives
- c. Project Description

III. Project Status
- a. Notice of Intent to Prepare a Draft EIS
- b. Agency Scoping
- c. Project Website (*https://www.proposed-fci-letchercountyky.com*)

IV. Previous EISs and Related Studies
- a. Draft EIS, February 2015
- b. Final EIS, July 2015
- c. Revised Final EIS, November 2016
- d. Draft Supplemental Revised Final EIS, March 2017
- e. Final Supplemental Revised Final EIS, September 2017

V. Anticipated Schedule
- a. Draft Environmental Impact Statement
- b. Final Environmental Impact Statement
- c. Record of Decision

VI. Next Steps/Action Items

From:	Baldridge, David E CIV USARMY CELRL (USA)
To:	Hanlon, Craig
Cc:	Nardi, Robert; Hoffman, Sarah; Branham, Justin L CIV USARMY CELRL (USA)
Subject:	RE: Jurisdictional Determination Request-Proposed Federal Correctional Institution and Federal Prison Camp-Letcher County, KY
Date:	Thursday, January 25, 2024 1:35:18 PM

Craig,

Justin Branham will be managing this JD request. I copied him on this email.

Thanks.

David Baldridge
Chief, South Branch
Regulatory Division
Louisville District
U.S. Army Corps of Engineers
502-315-6675 Office
502-216-9117 Cell

Please comment on our service. Our National Customer Service Survey is located at https://regulatory.ops.usace.army.mil/customer-service-survey/

From: Hanlon, Craig <craig.hanlon@wsp.com>
Sent: Thursday, January 25, 2024 8:16 AM
To: CELRL.Door.To.The.Corps <CELRL.Door.To.The.Corps@usace.army.mil>
Cc: Nardi, Robert <robert.nardi@wsp.com>; Hoffman, Sarah <sarah.hoffman@wsp.com>
Subject: [Non-DoD Source] Jurisdictional Determination Request-Proposed Federal Correctional Institution and Federal Prison Camp-Letcher County, KY

Good Morning –

On behalf of the U.S. Department of Justice, Federal Bureau of Prisons (BOP), WSP USA, Inc., submits herein its
Wetland Delineation report and Preliminary Jurisdictional Determination Request to the U.S. Army Corps of
Engineers, Louisville District. This document addresses waters of the U.S. (wetlands/open waters) within the
approximately 700-acre site of the proposed Federal Correctional Institution (FCI) and Federal Prison Camp
(FPC) located in Letcher County, Kentucky.

The attached transmittal letter summarizes the PJD request and documents provided to support the review.
We have provided a download link below for the following items as they are too large to email.

- Wetland Delineation Report

- Appendix A – Request for Corps Jurisdictional Determination
- Appendix B – Corps Approved Jurisdictional Determination Form
- Appendix C – Photo Log
- Appendix D – USFWS Species List
- Appendix E – Wetland and Waterway Data Forms
- Appendix F – Wetland Delineation Mapping

Please let us know if you have any questions, Regards, Craig Hanlon

One or more files have been sent to you.
Visit the Workspace to retrieve files.
This link will expire on 2/25/2024 12:56:08 PM

Craig Hanlon, PWS, CE
Assistant Vice President, Environmental Scientist

T+ 1 973 407 1462
M+1 973 524 2244
WSP USA, Inc.
350 Mount Kemble Avenue
Morristown, NJ 07960
wsp.com

NOTICE: This communication and any attachments ("this message") may contain information which is privileged, confidential, proprietary or otherwise subject to restricted disclosure under applicable law. This message is for the sole use of the intended recipient(s). Any unauthorized use, disclosure, viewing, copying, alteration, dissemination or distribution of, or reliance on, this message is strictly prohibited. If you have received this message in error, or you are not an authorized or intended recipient, please notify the sender immediately by replying to this message, delete this message and all copies from your e-mail system and destroy any printed copies.

-LAEmHhHzdJzBlTWfa4Hgs7pbKl

From:	Baldridge, David E CIV USARMY CELRL (USA)
To:	Hudson, Kimberly (BOP); Branham, Justin L CIV USARMY CELRL (USA)
Cc:	Nardi, Robert; Hoffman, Sarah; Alvarez, Jenny (BOP); Hanlon, Craig
Subject:	RE: Agency Consultations: Proposed Federal Correctional Institution and Federal Prison Camp - Letcher County, Kentucky
Date:	Wednesday, June 28, 2023 1:02:01 PM

Thanks Kim, it was nice to meet everyone. Feel free to contact either Justin or I with any questions.

David Baldridge
Chief, South Branch
Regulatory Division
Louisville District
U.S. Army Corps of Engineers
502-315-6675 Office
502-216-9117 Cell

Please comment on our service. Our National Customer Service Survey is located at https://regulatory.ops.usace.army.mil/customer-service-survey/

From: Hudson, Kimberly (BOP) <kshudson@bop.gov>
Sent: Wednesday, June 28, 2023 2:28 PM
To: Branham, Justin L CIV USARMY CELRL (USA) <Justin.L.Branham@usace.army.mil>; Baldridge, David E CIV USARMY CELRL (USA) <David.E.Baldridge@usace.army.mil>
Cc: Nardi, Robert <robert.nardi@wsp.com>; Sarah Hoffman <sarah.hoffman@wsp.com>; Alvarez, Jenny (BOP) <j5alvarez@bop.gov>; Craig Hanlon <craig.hanlon@wsp.com>
Subject: [Non-DoD Source] Agency Consultations: Proposed Federal Correctional Institution and Federal Prison Camp - Letcher County, Kentucky

Good afternoon,

Thank you for taking the time to meet with us to discuss the Federal Bureau of Prisons' proposal to develop a new Federal Correctional Institution and Federal Prison Camp in Letcher County, Kentucky. We look forward to working with you on this project. Please feel free to contact me if you have further questions or need additional information.

Sincerely,
Kim

Kimberly Hudson
Site Selection Specialist
Construction and Environmental Review
Federal Bureau of Prisons
320 1st Street, NW, Room 901-5 West
Main: (202) 616-2574
Cell: (202) 451-7046

From: Nardi, Robert
To: Branham, Justin L CIV USARMY CELRL (USA)
Cc: kshudson@bop.gov; Hoffman, Sarah; Baldridge, David E CIV USARMY CELRL (USA)
Subject: RE: Agency Consultations: Proposed Federal Correctional Institution/Prison Camp - Letcher County, Kentucky
Date: Wednesday, June 14, 2023 9:50:30 AM
Attachments: USACE Agency Consultation Ltr Agenda V2 BOP Final 6_14_23.pdf
image001.png

Dear Mr. Branham:

As the attached letter describes, the Federal Bureau of Prisons (BOP) is proposing to develop a new federal correctional facility in Letcher County, Kentucky. In compliance with the National Environmental Policy Act and other applicable regulations, the BOP has initiated preparation of a new Draft Environmental Impact Statement. As part of that effort, we wish to engage key regulatory agencies including the U.S. Army Corps of Engineers in a discussion about the proposed project and the interests and concerns unique to your agency. The BOP and its consultant team (WSP USA) would like to meet with you (virtually) and others from the USACE to share the project history and project goals. Most importantly, the meeting will provide the BOP an opportunity to learn the interests and concerns of the agency and to seek guidance to ensure compliance with all applicable regulations. Available meeting dates/times are shown below:

- Monday, June 26, 2023, 1:00 p.m., EDT
- Tuesday, June 27, 2023, 11:30 a.m., EDT
- Wednesday, June 28, 2023, 9:00 a.m., EDT
- Wednesday, June 28, 2023, 1:00 p.m., EDT
- Thursday, June 29, 2023, 10:00 a.m., EDT
- Thursday, June 29, 2023, 1:00 p.m., EDT

Please let us know of your willingness to meet, who would be attending from USACE, and which of the available dates/times USACE prefers. Feel free to contact me with questions and thank you for your cooperation.

Robert J. Nardi, Senior Vice President
WSP USA
Email: robert.nardi@wsp.com
T+ 1 973.407.1681 / M + 1 973.809.7495

2000 Lenox Drive, 3rd Floor, Lawrenceville, NJ 08648 USA

wsp.com

January 19, 2024

Winford Eldridge
Letcher County Conservation District
USDA, Natural Resources Conservation Service
125 Industrial Park Road
Whitesburg, Kentucky 41858
Email: *letcherconservation@tvscable.com*

RE: **Prime Farmland Conversion Impact Rating Form AD1006 - Proposed Federal Correctional Institution and Federal Prison Camp, Letcher County, Kentucky**

Dear Mr. Eldridge:

The Federal Bureau of Prisons (FBOP), assisted by WSP USA Inc., is currently preparing a Draft Environmental Impact Statement (DEIS) concerning a proposed action to develop a new Federal Correctional Institution and Federal Prison Camp (FCI/FPC) in Letcher County, Kentucky. The DEIS, being prepared in accordance with the National Environmental Policy Act, includes consideration of prime farmland which is protected under the Farmland Protection Policy Act of 1981 (7 U.S. Code [USC] 4201 et seq.). The FBOP is required to evaluate the adverse direct and indirect effects of their activities on prime and unique farmland and farmland of statewide and local importance and is based on the outcome from preparation of the Farmland Conversion Impact Rating Form AD1006.

The mission of the FBOP is to protect society by confining offenders in the controlled environments of prison and community-based facilities that are safe, humane, cost-efficient, and appropriately secure, and that provide work and other self-improvement opportunities to assist the population of adults in custody (AIC) in becoming law-abiding citizens. However, a growing challenge to successfully performing that mission is the increasing number of aging federal correctional facilities, resulting in a need to design and construct a new facility in Letcher County, thereby ensuring that the FBOP continues to successfully accomplish its mission.

Of the alternative locations in Letcher County considered for FCI/FPC development is an approximately 700-acre property located near the community of Roxana and known as the Roxana Site. The site comprises a former surface and underground mine that has been significantly altered by mountaintop removal. The site is characterized as a wide, gently sloping to flat ridgetop plateau created by surface mine overburden removal and valley filling with elevations ranging from approximately 1,040 and 1,730 feet above mean sea level. The site is vacant and undeveloped and retains none of its native soils or topography. There are also no lands in the vicinity of the Roxana Site that are under cultivation or used for agricultural purposes.

Enclosed find a Farmland Impact Rating Form (AD-1006) with Parts I and III completed. We request that your agency complete Parts II, IV and V and return the form to me for completion of Parts VI and VII. For your reference, Attachment A depicts the regional location of Letcher County; Attachment B is an aerial view of the property and its surroundings; and Attachment C depicts topographic conditions at the project site.

We appreciate your assistance with this matter and look forward to your response. Please contact me with questions at robert.nardi@wsp.com or by phone at 973-407-1681. Thank you.

Sincerely yours,
WSP USA Inc.

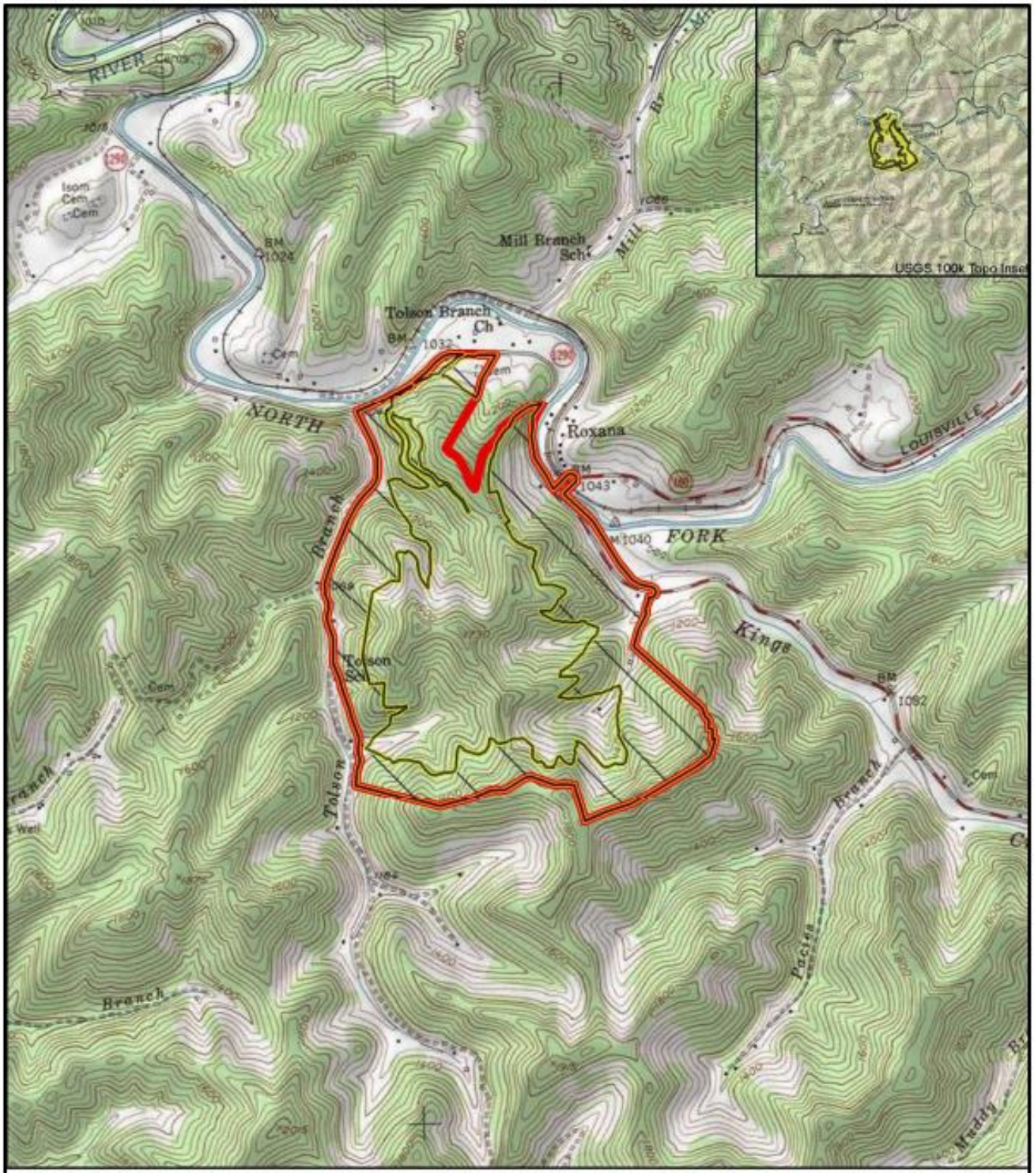
Robert J. Nardi, PP
Senior Vice President

Cc: K. Hudson, FBOP
S. Hoffman, WSP

Attachment A: Regional Location Map
Attachment B: Aerial View – Roxana Site
Attachment C: Topographic Conditions – Roxana Site
Form AD-1006 (separate attachment)

Attachment A: Letcher County Regional Location

Attachment B: Aerial View – Roxana Site



Attachment C: Topographic Conditions – Roxana Site

U.S. Department of Justice

Federal Bureau of Prisons

Washington, DC 20534

June 14, 2023

Mr. Virgil Lee Andrews, Jr.
Field Office Supervisor
U.S. Fish and Wildlife Service
Kentucky Ecological Services Field Office
330 W. Broadway, Suite 265, Frankfort, KY 40601
Lee_Andrews@fws.gov

Re: Agency Consultations: Proposed Federal Correctional Institution and Federal Prison Camp - Letcher County, Kentucky

Dear Mr. Andrews:

The Federal Bureau of Prisons' (Bureau) mission is to care for federal inmates in controlled environments of prisons and community-based facilities that are safe, humane, cost-efficient, and appropriately secure, while providing education, employment, and other self-improvement opportunities to assist offenders in becoming law-abiding citizens. However, a growing challenge to successfully carrying out its responsibilities is the increasing number of aging federal correctional facilities, resulting in a need to maintain existing facilities, and when necessary, develop new facilities. At the same time, current Bureau projections show a need for additional bedspace to accommodate the growing number of medium-security federal inmates, particularly in the Mid-Atlantic region of the country. To address these needs, the Bureau is proposing to develop a new federal correctional facility in Letcher County, Kentucky.

Planning for a new federal correctional facility began in 2006 when Congress directed the Bureau to undertake the various investigations needed to support such development in Letcher County. In accordance with Congress' directive, and federal law, the Bureau has conducted a wide range of technical studies including multiple Environmental Impact Statements (EISs) in conformance with the National Environmental Policy Act (NEPA) of 1969, as amended. Included among those efforts were:

- Publication of a Draft EIS in 2015 which evaluated various alternatives for development of a high-security penitentiary and minimum-security prison camp in Letcher County. That same year, a Final EIS was published that responded to public comments received on the Draft EIS and identified the Roxana Site as the preferred location for development of the project.

- Publication of a Revised Final EIS in 2016 to address inconsistencies in the earlier document and in 2017, both Draft and Final Supplemental Revised Final EISs were published to address new circumstances relevant to potential environmental impacts.

- Adoption of a Record of Decision (ROD) in 2018 documenting the Bureau's decision to proceed with development at the Roxana Site, however, the ROD was withdrawn in 2019 to evaluate new information.

Although the ROD was withdrawn in 2019, Congress' 2006 directive to develop a new correctional facility in Letcher County remains in effect. As such, the Bureau has continued to evaluate its current and future inmate populations and resulting facility needs and determined that housing medium-security federal inmates supersedes the need to house high-security inmates. The design, construction, and operation of a medium-security institution differs from that of a high-security penitentiary with the potential environmental impacts correspondingly different. As a result, the Bureau must ensure that the environmental consequences of this new action are also adequately considered under NEPA.

Development of the proposed federal correctional facility has the potential to significantly affect the quality of the human environment. Therefore, the Bureau is preparing a new Draft EIS to ensure that the environmental consequences of the proposed action are thoroughly documented and complies with NEPA, the Bureau's implementing NEPA regulations, National Historic Preservation Act, Clean Water Act, Endangered Species Act, in addition to other federal statutes and Executive Orders. The process also provides interested parties, stakeholders, and the public with opportunities to offer input and comments concerning the proposed action. Fortunately, a considerable volume of information has been compiled about Letcher County as well as the previously considered development sites. Although the passage of time and change of scope requires the Bureau to update, verify, and validate current conditions, the information previously gathered should help with preparation of the new Draft EIS.

The Bureau wishes to again engage key regulatory agencies including the U.S. Fish and Wildlife Service (USFWS) in a discussion about the proposed project and the interests and concerns unique to your agency. The Bureau and its consultant team (WSP USA) would like to meet with you and others from the USFWS to share the project history and the revised purpose and objectives of the proposed project. Most importantly, the meeting will provide the Bureau an opportunity to start a dialogue with USFWS officials, learn the interests and concerns of the agency regarding the proposed facility, and seek guidance to ensure compliance with all applicable regulations.

Included with this letter is an agenda which outlines the topics to be discussed at such a meeting. A representative of WSP will reach out to you shortly to identify a convenient date/time for a virtual meeting. In the meantime, feel free to reach out to me using the contact information provided below. Thank you for your cooperation and we look forward to meeting.

Sincerely,

Kimberly S. Hudson

Kimberly S. Hudson, Site Selection Specialist
Construction & Environmental Review, Federal Bureau of Prisons
320 First Street, NW, Room 901-5 West, Washington, DC 20534
202-451-7046/ kshudson@bop.gov

Attachment

Cc: J. Organic, D. Flewellyn, C. Ciccarelli, Bureau of Prisons
S. Hoffman, R. Nardi, C. Hanlon, WSP
S. Bishop, USFWS

Proposed Federal Correctional Institution
Letcher County, Kentucky

Agenda

I. Welcome, Introductions
- a. U.S. Fish and Wildlife Service
- b. Federal Bureau of Prisons
- c. WSP USA

II. Proposed Federal Correctional Institution
- a. Project History
- b. Goals and Objectives
- c. Project Description

III. Project Status
- a. Notice of Intent to Prepare a Draft EIS
- b. Agency Scoping
- c. Project Website (*https://www.proposed-fci-letchercountyky.com*)

IV. Previous EISs and Related Studies
- a. Draft EIS, February 2015
- b. Final EIS, July 2015
- c. Revised Final EIS, November 2016
- d. Draft Supplemental Revised Final EIS, March 2017
- e. Final Supplemental Revised Final EIS, September 2017

V. Anticipated Schedule
- a. Draft Environmental Impact Statement
- b. Final Environmental Impact Statement
- c. Record of Decision

VI. Next Steps/Action Items

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1	10/24/2022 12:00:00 AM	Terrence	Adelsbach	Adelsbach.Terrence@epa.gov	Dear Ms. Hudson: The U.S. Environmental Protection Agency (EPA) Region 4 has reviewed the Notice of Intent (NOI) to prepare a Draft Environmental Impact Statement (DEIS) for the ‘‘Proposed Federal Correctional Institution and Federal Prison Camp Letcher County, Kentucky” (Project). The Project was reviewed in accordance with Section 309 of the Clean Air Act and Section 102(2)(C) of the National Environmental Policy Act (NEPA). The Federal Bureau of Prisons (Bureau) is proposing to construct and operate a new medium-security Federal Correctional Institution (FCI) and an adjoining minimum-security Federal Prison Camp (FPC) in Letcher County, Kentucky. The FCI and FPC would be designed to house approximately 1,152 adult males and 256 adult males, respectively, and serve the needs of the Bureau’s Mid-Atlantic Region. According to the NOI, development and operation of a new FCI and FPC is an action potentially significantly affecting the quality of the human environment and is therefore subject to NEPA compliance.	Agency Comment		Environmental, Socioeconomic

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					Based on the EPA's review of available information, the following comments are provided for your consideration in developing the DEIS. (1) Purpose and Need: The Purpose and Need for the project is not clear. The EPA recommends that the DEIS include a well-defined purpose and need related to the proposed action. The DEIS should be specific and describe what facilities or portions of the facilities will be constructed, demolished, etc. (2) Alternatives: NEPA requires evaluation of reasonable alternatives, including a no action alternative. (3) Air Quality: The EPA Green Book (https://www3.epa.gov/airquality/greenbook/ancl.html), which summarizes counties at the national level that are currently in non-attainment status, indicates that Letcher County is in Attainment status for all EPA air quality criteria. However, localized impacts to air quality could occur during construction due to equipment exhaust emissions and fugitive dust. The EPA			

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					recommends implementing measures to reduce diesel emissions, such as switching to cleaner fuels, retrofitting current equipment with emission reduction technologies, repowering older engines with newer cleaner engines, replacing older vehicles, and reducing idling through operator training and/or contracting policies. We also encourage controlling fugitive dust by watering or the application of other controlled materials. (4) Construction Stormwater Management: Soil disturbance in support of the Proposed Action may necessitate issuance of a construction stormwater permit before construction can begin. Pursuant to the Clean Water Act, coverage under a statewide National Pollutant Discharge Elimination System (NPDES) construction stormwater general permit will be needed if the project disturbs one acre or more of contiguous land. The EPA recommends that erosion control and sediment control measures be implemented in accordance with the State's NPDES construction general permit requirements, and that the measures			

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					be addressed during the design and construction phases of the project. The Bureau should contact the Kentucky Department for Environmental Protection (KDEP) about the applicable NPDES permit(s) for this facility and project. The EPA encourages implementing best management practices during and after construction to minimize stormwater impacts on the streams. The EPA also encourages the Bureau to consider using a variety of stormwater management practices often referred to as "green infrastructure" or "low impact development" practices to comply with Section 438 of the Energy Independence and Security Act of 2007. (5) Waters of the United States: Pursuant to Section 404 of the Clean Water Act (CWA), the project should avoid and minimize, to the maximum extent practicable, placement of dredged or fill material in jurisdictional waters. If fill material will be placed into waters of the United States, then the Clean Water Act Section 404(b)(1) Guidelines should be followed. Under the Section 404(b)(1) guidelines, the			

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					U.S. Army Corps of Engineers (USACE) process requires selection of the least environmentally damaging practicable alternative that would avoid or minimize the impacts to waters of the U.S., over which USACE has jurisdiction, and that meets the purpose and need for the proposed project. If the project has impacts to jurisdictional waters that cannot be avoided, the project may require a permit from the USACE. The EPA recommends that impacts to jurisdictional waters be avoided if possible, and that mitigation measures to minimize impacts be implemented if avoidance is not possible.			
2					(6) Biological Resources: According to the U.S. Fish and Wildlife Services' (USFWS) IPAC database (IPaC: Explore Location resources (fws.gov) and the Kentucky Department of Fish and Wildlife (KDFW) (http://app.fw.ky.gov/speciesinfo), Letcher County is home to the gray bat (federally and state endangered), Indiana bat (federally endangered, state threatened), northern long-eared bat (federally threatened), blackside dace (federally and state threatened), Kentucky arrow darter (federally and state threatened), and big sandy crayfish (federally and state threatened). The EPA recommends the Bureau coordinate early with the USFWS and the	Agency Comment		

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					KDFW. The EPA further recommends that the conservation measures identified by the USFWS and the KDFW be included in the DEIS. (7) Environmental Justice: Executive Order 12898 directs federal agencies to identify and address any disproportionately high and adverse human health or environmental effects of its programs, policies and activities on minority, low-income, tribal, and indigenous populations. Assessing data using EJScreen (https://www.epa.gov/ejscreen), EPA's nationally consistent environmental justice (EJ) screening and mapping tool, is a useful first step in understanding or highlighting geographic locations that may need further review or outreach. The tool provides information on environmental and socioeconomic indicators as well as pollution sources, health disparities, critical service gaps, and climate change data. The tool can help identify potential community vulnerabilities by calculating EJ Indexes and displaying other environmental and socioeconomic information in color-coded maps and standard data reports. The EPA often considers a project to be in an area of potential EJ concern when an EJScreen analysis for the impacted area shows one or more of the twelve EJ Indexes at or above the 80th percentile in the nation and/or state. An EJScreen analysis which does not reveal the potential for EJ concerns should not			

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					be interpreted to mean that there are definitively no EJ concerns present. The tool's standard data report should not be considered a substitute for conducting a full EJ analysis. EJScreen scoping efforts using the tool should be supplemented with additional data and local knowledge when reasonably available. (8) Wastes: Construction and operation in support of the proposed action should ensure that Resource Conservation and Recovery Act regulated solid wastes are disposed of in accordance with federal regulations. Details of relevant contaminated and land-use-restricted sites should be included in the DEIS. (9) Energy Efficiency and Recycling: The EPA recommends the use of sustainable building practices that maximize energy and water conservation, and the use of renewable energy including solar power for supplemental electricity and lighting for infrastructure and buildings that may be constructed. The Bureau should consult the appropriate federal agencies (https://www.energy.gov/eere/femp/sustainable-federal-buildings) for energy conservation requirements. Implementation of renewable energy sources and operational efficiency measures should be included in the climate change analysis. The EPA appreciates the opportunity to provide scoping comments on the proposed project. If you			

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					have any questions regarding the EPA's comments, please contact me by phone at 404-562-9313 or via email at Adelsbach.Terrence@epa.gov.			
3	10/27/2022 12:00:00 AM	Pam	McDill	pamela_mcdill@fws.gov	Dear Kimberly S. Hudson:The U.S. Fish and Wildlife Service's (Service) Kentucky Field Office has reviewed the abovereferenced request for comments regarding a Notice of Intent to develop a draft Environmental Impact Statement (EIS) received by our office on September 28, 2022. The U.S. Department of Justice's (USDOJ) Federal Bureau of Prisons is proposing a Federal Correctional Institution (FCI) and Federal Prison Camp (FPC) in Letcher County, Kentucky. The Service offers the following comments in accordance with the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.).Project History and DescriptionThe Service concluded formal consultation and issued a Biological Opinion (BO) on the Federal Bureau of Prisons' Proposed Construction and Operation of a U.S. Penitentiary (USP) and FPC in Letcher County, Kentucky (FWS Log #: 04EK1000-2016-F-0023) on July 27, 2017. The USDOJ is proposing changes to the original project. Since the BO was issued, the USDOJ has determined that the need to house medium-security inmates in a new FCI supersedes the need to house high-security inmates in a new USP. The design, construction, and operation of a highsecurity USP differs greatly from a medium-security FCI with the	Agency Comment		Environmental

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					potential environmental impacts of its development and operation correspondingly different.Federally Listed SpeciesIn the 2017 BO, the Service concluded that the proposed project was not likely to jeopardize the Indiana bat (Myotis sodalis) or northern long-eared bat (Myotis septentrionalis). The Service also concurred that the proposed project "may affect, but is not likely to adversely affect" the gray bat (Myotis grisescens). In addition, the USDOJ determined that the proposed action would have "no effect" on the Kentucky Arrow Darter (Etheostoma spilotum). If the proposed project modification will result in impacts to these federally listed species not previously addressed, the Service recommends that the effects of the project on these species be re-evaluated and consultation re-initiated. Additionally, a new species has been proposed for listing since the 2017 BO was issued that may be affect by the proposed project.Tricolored batOn September 14, 2022, the U.S. Fish and Wildlife Service (Service) published a proposal in the Federal Register to list the tricolored bat (Perimyotis subflavus) as endangered under the Endangered Species Act (ESA). The Service has up to 12-months from the date the proposal published to make a final determination, either to list the tricolored bat under the Act or to withdraw the proposal. Species proposed for listing are not afforded protection under the Act; however, as soon as a listing becomes effective (typically 30 days after publication of the final rule in the Federal Register),			

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					the prohibitions against jeopardizing its continued existence and “take” will apply. Therefore, if your future or existing project has the potential to adversely affect tricolored bats after the potential new listing goes into effect, we recommend that the effects of the project on tricolored bat and their habitat be analyzed to determine whether authorization under ESA section 7 or 10 is necessary. Projects with an existing section 7 biological opinion may require re-initiation of consultation.The tricolored bat is a small insectivorous bat that typically overwinters in caves, abandoned mines and tunnels, and road-associated culverts (southern portion of the range) and spends the rest of the year in forested habitats, typically roosting among live and dead leaf clusters. For more information on tricolored bats and the proposed rule, please see: https://www.fws.gov/species/tricolored-bat-perimyotis-subflavus and for more information on WNS, please see: https://www.whitenosesyndrome.org/.SummaryThe Service appreciates the opportunity to provide comments and recommendations for the USDOJ to consider in their development of the draft EIS. Based on the proposed project modifications and the recent proposal to list the tricolor bat, the Service recommends that the USDOJ re-initiate consultation. The Kentucky Field Office is available to assist the USDOJ as needed. If you have any questions, please			

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					contact Pamela McDill of my staff at pamela_mcdill@fws.gov.			
4	10/27/2022 12:00:00 AM	Chris	Daniel	cdaniel@achp.gov	Ms. Hudson, Thank you for including the Advisory Council on Historic Preservation (ACHP) on the Federal Bureau of Prisons' (Bureau) notice for preparation of a Draft Environmental Impact Statement (DEIS) for the proposed development of a new Federal Correctional Institution and Federal Prison Camp in Letcher County, Kentucky. The ACHP has no comments at this time. However, should the Bureau, as part of its responsibilities under Section 106 of the National Historic Preservation Act (NHPA) 54 U.S.C. § 306108 and the regulations implementing Section 106 “Protection of Historic Properties” (36 CFR Part 800), reach a determination of adverse effect, in consultation with the Kentucky SHPO, Indian tribes, and other consulting parties, please invite the ACHP to participate at that time, pursuant 36 CFR §800.6(a)(1). The ACHP recommends utilizing our Electronic Section 106 Documentation Submittal System (e106) to notify us formally of an adverse effect finding. All the information can be found on our site at: https://www.achp.gov/e106-email-form Additionally, please change the Bureau's POC at the ACHP from Ms. Clark to myself using the info below.	Agency Comment		

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					Sincerely, Christopher Daniel			
5	12/12/2022 12:00:00 AM	Louanna	Aldridge	Louanna.Aldridge@ky.gov	The Energy and Environment Cabinet serves as the state clearinghouse for review of environmental documents generated pursuant to the National Environmental Policy Act (NEPA). Within the Cabinet, the Commissioner's Office in the Department for Environmental Protection (DEP) coordinates the review for Kentucky state agencies. We received your letter requesting an environmental review for this project. We have reviewed the document and provided comments below. Division of Enforcement The Division of Enforcement does not have any concerns about this project. BACKGROUND The U.S. Department of Justice's Federal Bureau of Prisons proposes to construct a penitentiary and a Federal prison camp in Letcher County, Kentucky. The terrain map below shows the approximate boundaries and the approximate locations of the proposed project. The proposed area appears to be mostly woodland, though there may be a reclaimed coal surface mine in the south/southeast portion of	Agency Comment		Environmental

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					the project area. The environmental impact statement for the project states that a lot of disturbance will be required in constructing the project, including blasting and moving of bedrock. Looking at the terrain and proposed locations of portions of the project, the environmental impact statement makes a fair assessment of the potential disturbance. The North Fork of the Kentucky River forms the northern boundary of the project. The leveling of the area during construction will greatly change the local drainage conditions of the area and in close proximity to the North Fork of the Kentucky River. I have not been able to determine the company associated with the potential reclaimed coal surface mine. It appears to pre-date the Division's TEMPO database. The Division of Enforcement does not have any current enforcement actions against the U.S. DOJ Bureau of Prisons. Please see the maps on the following pages. Division of Water Water Quality Branch Comment: 401 KAR 10:026 should be consulted to determine if any special-use waters will be impacted by the project. If so, 401 KAR 10:031 specifies surface water quality criteria that apply to special-use waters. Additionally, best management practices should be utilized to reduce runoff from project			

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					activities into nearby waters. Questions should be directed to Andrea Fredenburg, (502) 782-6950, Andrea.Fredenburg@ky.gov. Field Operations Branch Comment: No comments. Questions should be directed to Constance Coy, (502) 782-6587, Constance.Coy@ky.gov.			
6					Watershed Management Branch Water Supply Section: Comment: This proposed project is not within a designated Source Water Protection Area. Added Consumption Assuming similar water-use for household service connections theses facilities would require 0.230 - 0.288 and 0.051 - 0.064 MGD, respectively. This is likely an over-estimation but demonstrates a significant need for water considering this is an estimate of total personal needs (drinking, cooking, washing, hygiene) and cannot account for institutional needs. The selected location lies within an region known for limited surface water resources and highly variable groundwater resources both by quality and quantity. Surrounding water systems include Cumberland Municipal, Harlan Municipal, Hazard Water Department, and Knott County Water & Sewer District. Of these only Knott County would be likely capable of accommodating the additional demands due to source and system issues	Agency Comment		

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					with the other suppliers. The distribution system, Letcher County Water & Sewer District, as noted has been cited for disinfection byproducts and has a reported water loss. The construction site also lies along the North Fork of the Kentucky river on a former mine site. Care should be taken that facility impacts on drinking water suppliers are understood and do not negatively impact current users either through increased demands or water quality impacts. “ Questions should be directed to Ben Currens at (502) 782-5227, Ben.Currens@ky.gov. Groundwater Section: Comment: The proposed work is endorsed by the Groundwater Section of the Watershed Management Branch. However, it is our recommendation that site be made aware of the requirements of 401 KAR 5:037 and the need to develop a Groundwater Protection Plan (GPP) for the protection of groundwater resources within that area. Questions should be directed to Kurtis Spears at (502) 782-7119, Kurtis.Spears@ky.gov or Adam Nolte at (502) 782-1312, Adam.Nolte@ky.gov. Water Resources Branch Floodplain Management Section: Comment: Portions of the project in the regulated floodplain will require permitting from the Division			

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					of Water, Water Resources Branch. You can check https://watermaps.ky.gov/RiskPortal/ to determine if your site is located in the 1% chance floodplain (shown in Blue or Blue /Red on the map). You can use the search bar in the top right corner of the page to find your location using either a Latitude & Longitude, street address, or community name. The Floodplain General Permit (GP) covers projects that have little potential to impact regulatory base flood elevation. If the GP applies to your project, no application or public notice is required. The GP does have conditions, requirements, and exclusions listed so be sure your project can meet all these prior to the start of development. The most common activities covered by the GP include: • Underground utilities only with no ground surface elevation changes, where stream crossings, if any, are completed by directional boring; or • Installation of utility poles; or • Installation of fences that do not obstruct water flow; or • Stream obstruction removals of items such as woody debris from near bridges and culverts.			
7					The exclusions to the GP include work in or along an outstanding state resource water (OSRW) or other special use water, if an Individual 401 WQC required for the development, and development of structures or dams.	Agency Comment		

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					The Floodplain GP can be downloaded here: https://eec.ky.gov/Environmental-Protection/Water/FloodDrought/Documents/Floodplain%20General%20Permit.pdf If your site is in the floodplain and the GP doesn't apply, then an Individual Permit is required from the Division of Water for any proposed development. The application can be downloaded here: https://eec.ky.gov/Environmental-Protection/Water/FloodDrought/Documents/StreamConstructionApplicationPackage.zip. You must provide accurate latitude/longitude on the application and an aerial map (maps from the Riskmap link above or Google maps are acceptable) in lieu of a topo map. The map must show where structures or crossing will be placed, and if fill or cut/fill is being done, draw the full extents of the fill on the aerial map. For the project description, describe what you plan to do to complete the project, how much (if any) fill will be brought into the floodplain, or how much material will be moved from or redistributed within the floodplain. For structures, describe the structure, provide the size and type of foundation (slab on grade, elevated, crawl space). For culverts, describe how much material will be brought in and what type, how high above current surface elevation will the material be placed, especially in low lying areas where the roadway would impede flow. Include the number of culverts pipes used and description (length, diameter and material). For a bridge, describe how			

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					the bridge abutments will be installed, the thickness of the bridge deck and the height of the lowest point of the bridge over the ordinary high water mark (plant line on the shoreline) and height of the bottom of the bridge deck above the bottom of the creek channel. If you are replacing a bridge or culvert, describe how the new installation will compare to the old- if the new installation will have a larger opening or pipes, will have more or less fill for the installation, indicate that on the application description. Other Permits Anytime you need a state floodplain permit, and you live in a community that participates in the NFIP, a local permit is also required. Your local floodplain manager can help you with the state permit, as well as help you with the local permit and to understand the floodplain requirements. Find your local floodplain manager here: https://eec.ky.gov/Environmental-Protection/Water/FloodDrought/Documents/FloodplainCoordinatorsList.pdf. If you are working below the top of the bank, within a stream channel, or within wetlands, a 404 permit from the US Army Corps of Engineers and 401 Water Quality Certification may also be required. Our Water Quality Certification section will review the application to determine if 401/404 permitting is needed. For information on permitting procedures or for other information, visit https://eec.ky.gov/Environmental-			

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					Protection/Water/PermitCert/WQ401Cert/Pages/Apply-for-Certification.aspx Questions should be directed to Shawn Hokanson at (502) 782-6977, Shawn.Hokanson@ky.gov. Water Quality Certification Section: Comment: If the activity requires a federal permit due to activities in or near Waters of the U.S., a Clean Water Act Section 401 Water Quality Certification from the DOW may be required for this project. Questions should be directed to the Water Quality Certification Section, (502) 564-3410, 401WQC@ky.gov. Surface Water Permits Branch Permit Support Section: Comment: If the construction area disturbed is equal to or greater than 1 acre, the applicant will need to apply for a Kentucky Pollutant Discharge Elimination System (KPDES) stormwater discharge permit. Questions should be directed to the Permit Support Section, (502) 564-3410, SWPBsupport@ky.gov. If Drinking Water Systems: Drinking Water Branch Comment: No comments. Questions should be directed to Kevin Stewart, (502) 782-7081, Kevin.Stewart@ky.gov			

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8					Water Infrastructure Branch Engineering Section: Comment: Plans and specifications for waterlines related to the proposed Federal Prison at Roxana were approved by the Division of Water on May 25, 2021. The approved project did not include the 300,000 gallon water storage tank identified in the Environmental Impact Statement. Plans for this will need to be submitted for review and approval from the Division of Water if the tank is to be constructed. Questions should be directed to Terry Humphries, Engineering Section, at (502) 782-6983, Terry.Humphries@ky.gov. Municipal Capacity: Comment: Assuming they'll be using Letcher Co. Water District, the last Sanitary Survey (2022) shows that they had no deficiencies but lacked technical capacity. Their purchase contracts with the City of Whitesburg and Perry Co. appear to give them plenty of water available through purchase contracts. Water loss was estimated to be 17.5%. I don't know why they lacked technical capacity but from my end I don't see any issues. Questions should be directed to Jason Lambert at (502) 782-7001, Jason.Lambert2@ky.gov. The Kentucky Division of Water supports the goals of EPA's Sustainable Infrastructure Initiative. This Initiative seeks to promote sustainable practices that will help to reduce the potential gap between	Agency Comment		

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					funding needs and spending at the local and national level. The Sustainable Infrastructure Initiative will guide our efforts in changing how Kentucky views, values, manages, and invests in its water infrastructure. This website, www.epa.gov/waterinfrastructure/, contains information that will help you ensure your facility and operations are consistent with and can benefit from the aims of the Sustainable Infrastructure Initiative. If Wastewater Systems: Water Infrastructure Branch Engineering Section: Comment: No concerns. Questions should be directed to Michael Snyder at (502) 782-1235, Michael.Snyder@ky.gov. Municipal Planning Section: Comment: • For any possible impacts to “waters of the commonwealth” such as a stream crossing or wetland encroachment, an Individual Water Quality Certification (WQC) may be necessary. • If discharge points are required as part of this proposed project, a Kentucky Pollutant Discharge Elimination System (KPDES) Permit may be needed. • Per 401 KAR 5:005 may require construction approval for regulated additions and/or upgrades, appropriate plans and specifications required for construction permit applications must be submitted			

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					to the Division of Water for review and approval before construction may begin. Contact local water/wastewater utilities during the planning process if water or sewer line upgrades are proposed. • If construction will occur within or near a floodplain, contact the Water Resources Branch for applicable permits. • Questions should be directed to Lori Dials at (502) 782-6937, Lori.Dials@ky.gov.			
9					Division of Waste Management Based on the information provided by the applicant for this project: All solid waste generated by this project must be disposed of at a permitted facility. If asbestos, lead paint and/or other contaminants are encountered during this project contact the Division of Waste Management for proper disposal and closure. The information provided is based on those facilities or sites that KDWM currently has in its database. If you would like additional information on any of these facilities or sites, you may contact the file room custodian at (502) 782-6357. Please keep in mind additional locations of releases, potential contamination or waste facilities may be present but unknown to the agency. Therefore, it is recommended that appropriate precautions be taken during construction activities. Please report	Agency Comment		

#	Submission Date	First Name	Last Name	Email	Submission Text	Submission Method	Email/Webform Subject Title	Submission Category
					any evidence of illegal waste disposal facilities and releases of hazardous substances, pollutants, contaminants or petroleum to the 24-hour Environmental Response Team at 1-800-928-2380. Division for Air Quality As this project is presented, the owner or operator of this company should comply with any applicable Division for Air Quality permitting requirements contained in 401 KAR Chapter 52 Permits, Registrations, and Prohibitory Rules located at https://legislature.ky.gov/Pages/index.aspx and https://eec.ky.gov/Environmental-Protection/Air/Pages/Air-Permitting.aspx. For permitting information, please contact the Division for Air Quality Permit Review Branch Manager, at (502) 782-6555. 401 KAR 63:010, Fugitive Emissions, states that no person shall cause, suffer, or allow any material to be handled, processed, transported, or stored without taking reasonable precaution to prevent particulate matter from becoming airborne. Additional requirements include the covering of open bodied trucks, operating outside the work area transporting materials likely to become airborne, and that no one shall allow earth or other material being transported by truck or earth-moving equipment to be deposited onto a paved street or roadway. Please note the Fugitive Emissions Fact Sheet located at https://eec.ky.gov/Environmental-Protection/Air/Documents/Fugitive%20Dust%20Fact			

#	Submission Date	First Name	Last Name	Email	Submission Text	Submission Method	Email/Webform Subject Title	Submission Category
					%20Sheet.pdf 401 KAR 63:005 states that open burning shall be prohibited except as specifically provided. Open Burning is defined as the burning of any matter in such a manner that the products of combustion resulting from the burning are emitted directly into the outdoor atmosphere without passing through a stack or chimney. However, open burning may be utilized for the expressed purposes listed on the Open Burning Brochure located at https://eec.ky.gov/Environmental-Protection/Air/Pages/Open-Burning.aspx The Division would like to offer the following suggestions on how this project can help us stay in compliance with the National Ambient Air Quality Standards (NAAQS). These air quality control strategies are beneficial to the health of citizens of Kentucky. ▯ Utilize alternatively fueled equipment. ▯ Utilize other emission controls that are applicable to your equipment. ▯ Reduce idling time on equipment. The Division also suggests an investigation into compliance with applicable local government regulations. Kentucky Nature Preserves Your project might have the potential of impacting federally or state listed species and natural			

#	Submission Date	First Name	Last Name	Email	Submission Text	Submission Method	Email/Webform Subject Title	Submission Category
					communities. Go to the Kentucky Biological Assessment Tool (kynaturepreserves.org) to obtain a Standard Occurrence Report for information regarding listed species known within your project area. The report will also provide information on public and private conservation lands, areas of biodiversity significance, and other natural resources in your project area for which the Office of Kentucky Nature Preserves maintains data. This review is based upon the information that was provided by the applicant. An endorsement of this project does not satisfy, or imply, the acceptance or issuance of any permits, certifications or approvals that may be required from this agency under Kentucky Revised Statutes or Kentucky Administrative Regulations. Such endorsement means this agency has found no major concerns from the review of the proposed project as presented other than those stated as conditions or comments. If you should have any questions, please contact me at (502) 782-0863 or e-mail Louanna.Aldridge@ky.gov.			

APPENDIX C

CULTURAL RESOURCES SURVEY REPORTS

ATTACHMENT 1

CULTURAL HISTORIC SURVEY FOR THE PROPOSED CONSTRUCTION AND OPERATION OF A FEDERAL CORRECTIONAL FACILITY ALONG KY-588/KY-160 WITHIN ROXANA, LETCHER COUNTY, KENTUCKY

Cultural Historic Survey for the Proposed Construction and Operation of a Federal Correctional Facility along KY-588/KY-160 within Roxana, Letcher County, Kentucky

WSP Project No.: 7361231408
WSP Cultural Report of Investigations No.: 2023-044

Prepared for:
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December 2023

11003 Bluegrass Parkway, 690 Commonwealth Center
Louisville, Kentucky 40299

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Cultural Historic Survey for the Proposed Construction and Operation of a Federal Correctional Facility along KY-588/KY-160 within Roxana, Letcher County, Kentucky

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ABSTRACT

On behalf of the Federal Bureau of Prisons (BOP), WSP Environment and Infrastructure architectural historians conducted an aboveground cultural resource eligibility and effects survey for the proposed construction and operation of a federal correctional facility along KY-588/KY-160 near Roxana in Letcher County, Kentucky. The purpose of the survey was to identify aboveground historic resources over 45 years of age located within the Area of Potential Effect (APE); to evaluate these resources relative to their eligibility for listing in the National Register of Historic Places (NRHP); and to assess the potential direct and indirect effects of the proposed improvements upon these resources. The cultural historic resource APE for aboveground cultural historic resource survey was determined in consultation with the BOP and the Kentucky Heritage Council (KHC), the State Historic Preservation Office (SHPO).

The BOP proposes to acquire approximately 800 acres (324 hectares) to construct a Federal Correctional Institution (FCI) and Federal Prison Camp (FPC). Individuals housed in the FCI would be medium-security male inmates and those housed in the FPC would be minimum-security male inmates. The proposed facilities would house approximately 1,408 total inmates (approximately 1,152 within the FCI and approximately 256 within the FPC). In addition to the FCI and FPC, several ancillary facilities necessary for the operation of the FCI and FPC would be constructed including security fencing installed around the perimeter of the FCI. The proposed project is located on a former surface mine or mountaintop removal ridgetop to the south of KY-588 and to the south of the North Fork of the Kentucky River near the community of Roxana. Much of the proposed project limit consists of open level areas interspersed with groups of trees and other vegetation with few buildings or structures. In addition to the facility, the project may include widening of a section of KY-160 between the intersection of KY-588 and KY-160 to Rise Branch Road/Bluegrass Ridge Road.

The cultural historic resource survey APE consists of all historic resources in direct line-of-sight within a ½ mile buffer surrounding the proposed land tract for the project and was developed based on a review of topographic data, the density of the rural setting, as well as an understanding of the specifications of the proposed land use. The proposed project will also increase traffic in the area, which may impact the surrounding cultural historic resources. Therefore, the APE also focused on the resources along the immediate roads surrounding the proposed project site whether within or outside the direct line-of-sight, specifically the resources adjacent to the proposed section of KY-160 which may require widening. The APE encompasses a largely rural landscape and the small community of Roxana. A total of 20 resources over 45 years old, including six residential buildings, one service station and residential building, one industrial site, one religious building, one industrial/commercial building, five cemeteries, two bridges, one agricultural building, and two culverts, were identified within the APE (**Table A.1**). Three of the resources were previously surveyed. Seventeen of the twenty resources are recommended as not eligible for listing in the NRHP due to a lack of historic and architectural significance and/or loss of integrity. Based on these findings, WSP recommends that there will be **No Historic Properties Affected** by the proposed project for these 17 resources.

Three resources, LR-327, LR-330, and LR-331, are recommended as eligible for listing in the NRHP. LR-327, LR-330, and LR-331 are recommended as eligible under Criterion A and C due to their historic and architectural significance. However, the proposed project will have no direct or indirect effect on LR-327 and LR-330. Therefore, WSP recommends that there will be **No Adverse Effect** by the proposed project on LR-327 and LR-330. The proposed undertaking will have a direct and indirect effect on LR-331; therefore, WSP recommends that the proposed

project will have an **Adverse Effect** on the resource. Any widening of KY-160 is adjacent to the structure and would likely require unsympathetic alteration or replacement of the structure. Thus, mitigation will be required for LR-331.

The proposed project will result in increased traffic within the area. Due to their locations along traffic corridors adjacent to the project area, LR-327, LR-330, and LR-331 may be impacted in relation to traffic-related capacity, noise, and/or vibration. Therefore, further studies related to these concerns should be conducted to address these potential effects.

Table A.1. Historic Resources in APE and NRHP Recommendations

KHC Site Number	Address	Style/Form	NRHP Recommendation
LR-152	3947 KY-2036, Roxana, KY	Early 20th Century American Vernacular/Hipped	Not eligible due to a lack of historic and architectural significance and loss of integrity
LR-153	3967 KY-2036, Roxana, KY	Early to Mid-20th Century American Vernacular/Hipped	Not eligible due to a lack of historic and architectural significance and loss of integrity
LR-245	KY-588, Roxana, KY	Mid-20th Century Cemetery	Not eligible due to a lack of historic and architectural significance
LR-318 (AR 1)	CR-1728Q4, Roxana, KY	Mid-Late 20th Century Industrial site	Not eligible due to a lack of historic and architectural significance and loss of integrity
LR-319 (AR 3)	CR-1728Q4, Roxana, KY	Late 19th Century Cemetery	Not eligible due to a lack of historic and architectural significance
LR-320 (AR 4)	9951 KY-588, Roxana, KY	Mid-20th Century American Vernacular/Side Gable	Not eligible due to a lack of historic and architectural significance and loss of integrity
LR-321 (AR 5)	9063 KY-588, Roxana, KY	Mid-20th Century Agricultural	Not eligible due to a lack of historic and architectural significance and loss of integrity
LR-322 (AR 6)	9144 KY-588, Roxana, KY	Mid-20th Century American Vernacular/Front Gable/Center-Steeple Church	Not eligible due to a lack of historic and architectural significance and loss of integrity
LR-323 (AR 14)	6397 KY-160, Roxana, KY/6367 KY-160, Roxana, KY	Mid-20th Century Commercial/Mid-20th Century American Vernacular/Side Gable	Not eligible due to a lack of historic and architectural significance/Not eligible due to a lack of historic and architectural significance and loss of integrity
LR-324 (AR 16)	6205 KY-160, Roxana, KY	Mid-20th Century American Vernacular/Side Gable	Not eligible due to a lack of historic and architectural significance
LR-325 (AR 19)	6830 KY-160, Roxana, KY	Mid-20th Century American Vernacular/Front Gable	Not eligible due to a lack of historic and architectural significance and loss of integrity
LR-326 (AR 20)	KY-160, Roxana, KY	Early 20th Century Cemetery	Not eligible due to a lack of historic and architectural significance
LR-327 (AR 21)	KY-160, Roxana, KY	Early to Mid-20th Century Culvert	Eligible under Criterion A and C due to historic and architectural significance

KHC Site Number	Address	Style/Form	NRHP Recommendation
LR-328 (AR 22)	7642 KY-160, Roxana, KY	Early to Mid-20th Century American Vernacular/Front Gable	Not eligible due to a lack of historic and architectural significance and loss of integrity
LR-329 (AR 23)	Lilly Cornett Branch Road, Roxana, KY	Early 20th Century Family Cemetery	Not eligible due to a lack of historic and architectural significance
LR-330 (AR 24)	KY-160, Roxana, KY	Early to Mid-20th Century Concrete T-Beam Bridge	Eligible under Criterion A and C due to historic and architectural significance
LR-331 (AR 25)	KY-160, Roxana, KY	Early to Mid-20th Century Culvert	Eligible under Criterion A and C due to historic and architectural significance
LR-332 (AR-8)	KY-588, Roxana, KY	Mid-20th Century Cemetery	Not eligible due to a lack of historic and architectural significance
LR-333 (AR 26)	Big Branch-Tolson Creek Road, Roxana, KY	Early 20th Century Industrial/ Commercial	Not eligible due to a lack of historic and architectural significance and loss of integrity
LR-334 (AR 18)	KY-160, Roxana, KY	Early to Mid-20th Century Concrete Multiple Box Beam/Girder	Not eligible due to a lack of historic and architectural significance and loss of integrity

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1.0 INTRODUCTION

On behalf of the Federal Bureau of Prisons (BOP), WSP Environment and Infrastructure (WSP) conducted an aboveground cultural resources eligibility and effects survey of the proposed construction and operation of a federal correctional facility along KY-588/KY-160 within Roxana in Letcher County, Kentucky (**Figure 1.1**). This survey was conducted in order to meet the requirements of Section 106 of the National Historic Preservation Act of 1966 (36 CFR 400.4, as amended through 2000), as well as the guidelines developed by the Kentucky Heritage Council (KHC), the State Historic Preservation Office (SHPO) (KHC/SHPO 2006).

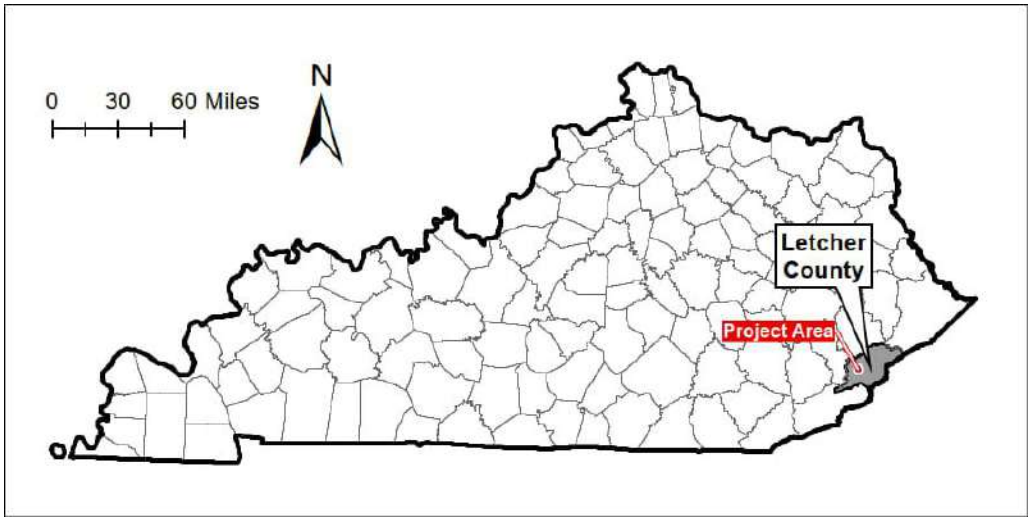

Figure 1.1. Location of Letcher County, Kentucky.

The APE, determined through consultation with the BOP and the KHC, is based upon the project's potential direct and indirect effects upon cultural historic resources. The APE was developed based on a review of topographic data, the density of the rural setting, as well as an understanding of the specifications of the proposed land use. BOP proposes to utilize a tract of land to construct a new federal correctional facility which may require widening a section of KY-160. As such, the cultural historic survey APE consisted of all historic resources in direct line-of-sight within a ½ mile buffer surrounding the proposed land tract for the project (**Figure 1.2**). The proposed project will also increase traffic in the area, which may impact the surrounding resources. Therefore, the APE also focused on the cultural historic resources along the immediate roads surrounding the proposed project whether within or outside the direct line-of-sight, as well as the resources adjacent to the section of KY-160 leading to the project site.

The survey was conducted to identify aboveground historic resources over 45 years of age located within APE; to evaluate these resources relative to their eligibility for listing in the National Register of Historic Places (NRHP); and to assess the potential direct and indirect effects of the proposed undertaking upon these resources. Due to trespassing concerns, only elevations from the right-of-way (ROW) were photographed unless permission was granted from the property owner. The proposed federal correctional facility project is located on a former surface mine or mountaintop removal ridgetop to the south of KY-588 and to the south of the North Fork of the Kentucky River near the community of Roxana, consisting mostly of open

flattened areas interspersed with groups of trees and other vegetation with few buildings or structures.

Background research was completed by Kiera Steen and Dona R. Daugherty. The architectural fieldwork was conducted on October 30, 2023 by Matthew E. Prybylski. Carolyn E. Andrews served as principal investigator for the cultural historic resource survey. A total of 20 resources over 45 years old, including six residential buildings, one service station and residential building, one industrial site, one religious building, one industrial/commercial building, five cemeteries, two bridges, one agricultural building, and two culverts, were identified within the APE (**Figure 1.3**). Three of the resources were previously surveyed. Seventeen of the twenty resources are recommended as not eligible for listing in the NRHP due to a lack of historic and architectural significance and/or loss of integrity. Based on these findings, WSP recommends that there will be **No Historic Properties Affected** by the proposed project for these 17 resources.

Three resources, LR-327, LR-330, and LR-331, are recommended as eligible for listing in the NRHP. LR-327, LR-330, and LR-331 are recommended as eligible under Criterion A and C due to their historic and architectural significance. However, the proposed BOP project will have no direct or indirect effect on LR-327 and LR-330. Therefore, WSP recommends that there will be **No Adverse Effect** by the proposed project on LR-327 and LR-330. The proposed undertaking will have a direct and indirect effect on LR-331; therefore, WSP recommends that the proposed project will have an **Adverse Effect** on the resource. Any widening of KY-160 is adjacent to the structure and would likely require unsympathetic alteration or replacement of the structure. Thus, mitigation will be required for LR-331.

The proposed project will likely result in increased traffic within the area. Due to their locations along traffic corridors adjacent to the project area, LR-327, LR-330, and LR-331 may be impacted in relation to traffic-related capacity, noise, and/or vibration. Therefore, further studies related to these concerns should be conducted to address these potential effects.

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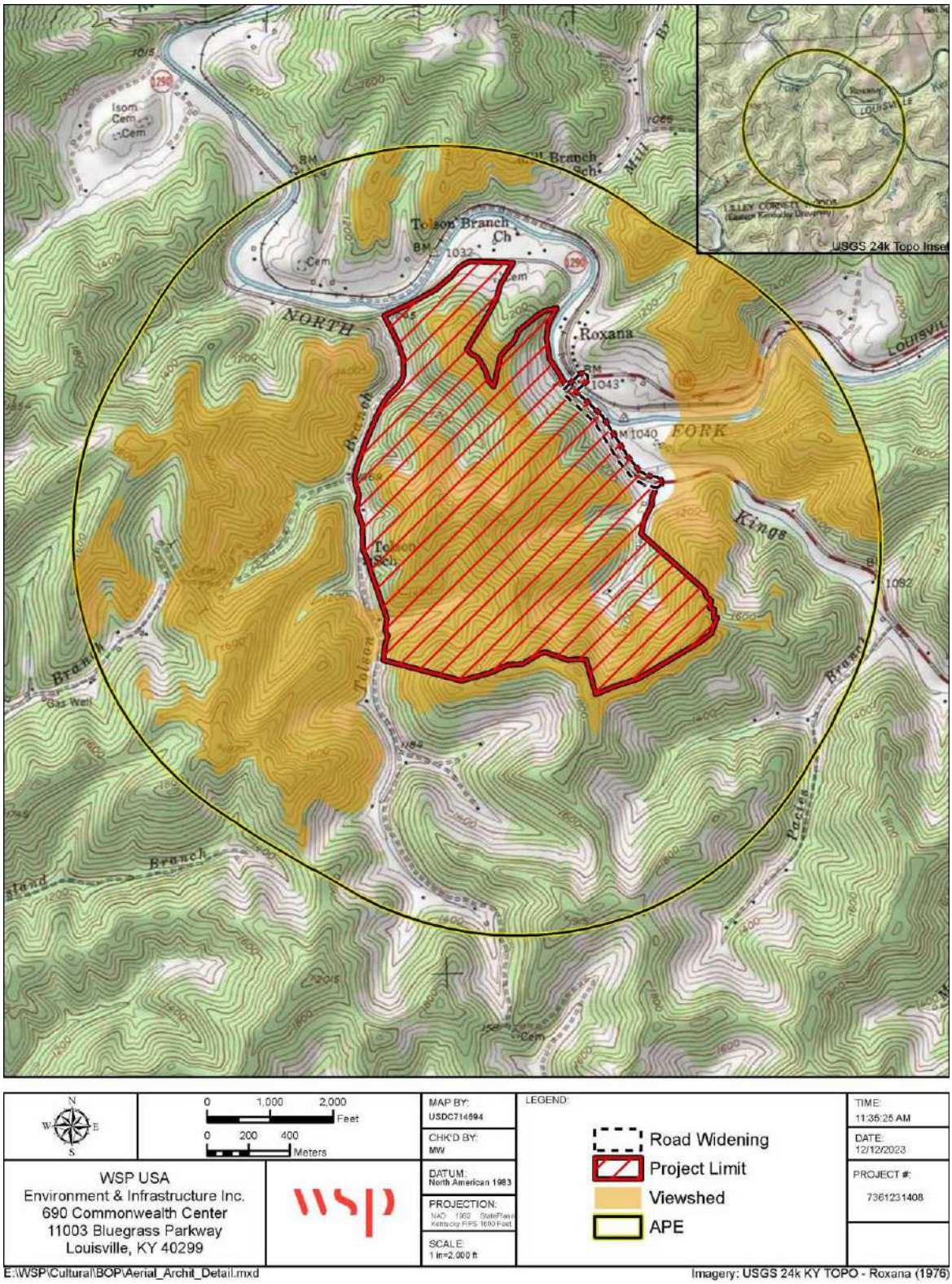

Figure 1.2. Project Area location in Letcher County, Kentucky (USGS, Roxana, KY 1976)

2.0 PROJECT AREA PHYSICAL SETTING

2.1 Physiographic Region

Letcher County lies within the Eastern Kentucky Coalfields physiographic region, also known as the Cumberland Plateau and Mountains physiographic region, and is comprised of the Pottsville (or Cumberland) Escarpment, the Cumberland Plateau, and the mountain and creek bottom (Bladen 1973; Bladen 1984; McIntosh 2004). The southern portion of the Appalachian Plateau physiographic province, which extends from New York to Alabama, also envelops the region. The Eastern Coalfields physiographic region begins in the west with the Pottsville Escarpment. It is a rock wall with a coarse-grained Rockcastle sandstone conglomerate cap (Bladen 1973; Bladen 1984). This area is deeply incised by eroding streams. The Cumberland Plateau is located between the Pottsville Escarpment to the west and the mountain and creek bottom area to the east. Deep canyons and gorges have been created by streams cutting through layers of soft decomposed shale and shales (Bladen 1973; Bladen 1984; Newell 1986). The last area, east of the Cumberland Plateau, is the mountain and creek bottom, which consists of the Cumberland and Pine Mountains. It includes the highest peak in the state, Big Black Mountain, part of the Cumberland mountain chain, in Harlan County with an elevation of 4,150 feet (Bladen 1973; Bladen 1984; Newell 1986). The Cumberland Mountains are the projecting edge of the Pottsville sandstone, known as the Lee conglomerate. Similarly, the Pine Mountain range is the projecting edge of the Lee conglomerate. Both of these mountain ranges were formed by an uplifting fault (Bladen 1973; Bladen 1984).

The landscape of Letcher County consists of long narrow ridgetops, steep and very steep hillsides, and narrow valleys (McIntosh 2004). The hillsides feed perennial streams with abrasive sediment that slowly cuts through rock-forming drainageways in a dendritic pattern of hollows and coves. Flood plains and stream terraces are narrow, with little level land (McIntosh 2004). The lowest elevation, about 675 feet, is at the mouth of Jones Fork where it joins the Right Fork of Beaver Creek. Upland elevations commonly exceed 1,400 feet. Local reliefs of 500 to 800 feet are common, generally being greater in the eastern part of the county than in the west. The highest elevations occur in the extreme southern and southeastern parts of the county where mountaintop elevations in excess of 2,000 feet are present. The highest point in the county is 3,720 feet, on a peak on Black Mountain. The lowest elevation is approximately 940 feet where the North Fork of the Kentucky River exits the county (McGrain and Currens 1978). Much of the county is drained by the North Fork of the Kentucky River, including the APE (McIntosh 2004). Located within northwestern Letcher County near the APE, a large forest, known as Lilley Cornett Woods, is owned by the state and managed by Eastern Kentucky University (Cooper 2011; EKU 2023). The property covers a total of 554 acres of mixed mesophytic forest with a total of 252 acres classified as “old-growth” forest (EKU 2023).

2.2 Area of Potential Effect (APE)

The APE for the aboveground cultural resources survey, determined through consultations with BOP and KHC, is based on the proposed federal correctional facility project along KY-588/KY-160, in which the BOP plans to acquire approximately 800 acres (324 hectares) to construct a Federal Correctional Institution (FCI) and Federal Prison Camp (FPC) near the community of Roxana, KY (**Figure 2.1**). Individuals housed in the FCI would be medium-security male inmates and those housed in the FPC would be minimum-security male inmates. The proposed facilities would house approximately 1,408 total inmates (approximately 1,152 within the FCI and approximately 256 within the FPC). In addition to the FCI and FPC, several ancillary

facilities necessary for the operation of the FCI and FPC would be constructed, and security fencing would also be installed around the perimeter of the FCI. The proposed project is located on a former surface mine or mountaintop removal ridgetop to the south of KY-588 and to the south of the North Fork of the Kentucky River (Kentucky Coal Mine Maps 2023). The proposed location has been heavily modified in relation to the mining industry via underground, auger, and most noticeably, surface mining. The Meade and Shepherd Coal Company surface mined a large area south of KY-588 between 1988 and the early 1990s, removing approximately 200 feet of rock overburden (Brann 2017). Much of the proposed project site consists of open leveled reclamation areas interspersed with groups of trees and other vegetation with few buildings or structures. In addition to the facility, the project may include widening of a section of KY-160 between the intersection of KY-588 and KY-160 to Rise Branch Road/Bluegrass Ridge Road.

The APE for cultural historic resources consists of all historic resources in direct line-of-sight within a ½ mile buffer surrounding the land tract for the proposed project and was developed based on a review of topographic data, the density of the rural setting, as well as an understanding of the specifications of the proposed land use (see **Figure 2.1**). The limitations posed by the direct line-of-sight were verified via ground truthing at the time of the survey. **Figure 2.2** - **2.4** show views from different areas in the direct line-of-sight within the ½ mile buffer towards the proposed project limit. The proposed project will also increase traffic in the area, which may impact the surrounding historic resources, such as increasing noise and vibration. Therefore, the APE also focused on the cultural historic resources along the immediate roads surrounding the proposed project whether within or outside the direct line-of-sight, as well as the resources adjacent to KY-160.

The APE encompasses a largely rural landscape, as well as the small community of Roxana. Historically, the APE also had a rural character. Archival research revealed little about Roxana, but the Roxana post office was first opened in 1891 (Elbon 2023). The community was not illustrated on the 1890 or 1892 Whitesburg topographic maps but is on the 1913 Oven Fork topographic map (USGS) (**Figure 2.5**). During this period, Roxana and the surrounding area were sparsely populated with several houses and School No. 2 along a route now known as KY-2036 and KY-160 and several houses and School No. 6 along a route that is modern-day Big Branch-Tolson Creek Road (USGS 1913, 1915). A line of the Lexington and Eastern (L&E) Railroad is shown running parallel with the North Fork of the Kentucky River through Roxana on the 1913 and 1915 topographic maps (USGS). However, the Louisville and Nashville (L&N) Railroad purchased the line in 1910, but this was not public knowledge until 1915. Immediately after the purchase, the railroad began efforts to extend the line from Jackson County to McRoberts in Letcher County, which was completed in 1912 (Cornett 1967; Kleber 1992; Mountain Eagle Staff 2015; University of Kentucky Libraries ND). KY-160, also known as the Kings Creek-Roxana Road, is first labeled as such on the 1937 highway map.

By 1954, a church, three cemeteries, and several additional houses had developed within the APE, and the two schools remained but were now known as Mill Branch (School No. 2) and Tolson School (School No. 6) (USGS) (**Figure 2.6**). The 1954 topographic map and the 1954 highway map illustrate KY-1290, the route now known as KY-588 (Letcher-Blackey Road or Blackey Road), as completed, connecting KY-160 to what would become Big Branch-Tolson Creek Road. Today, Roxana is composed of several single-family residences and associated outbuildings, agricultural buildings, a post office, a former grocery and hardware store, and a former service station (**Figures 2.7** and **2.8**). The surrounding APE contains several residential buildings consisting of both historic and non-historic construction, cemeteries, a religious building, remnants of a former coal related industrial site, agricultural buildings, remnants of a

former coal-related building or store, bridges, and two culverts (**Figures 2.9** - **2.14**). The former L&N rail line remains intact, but according to local residents, the line, most recently owned by CSX, is no longer in service.

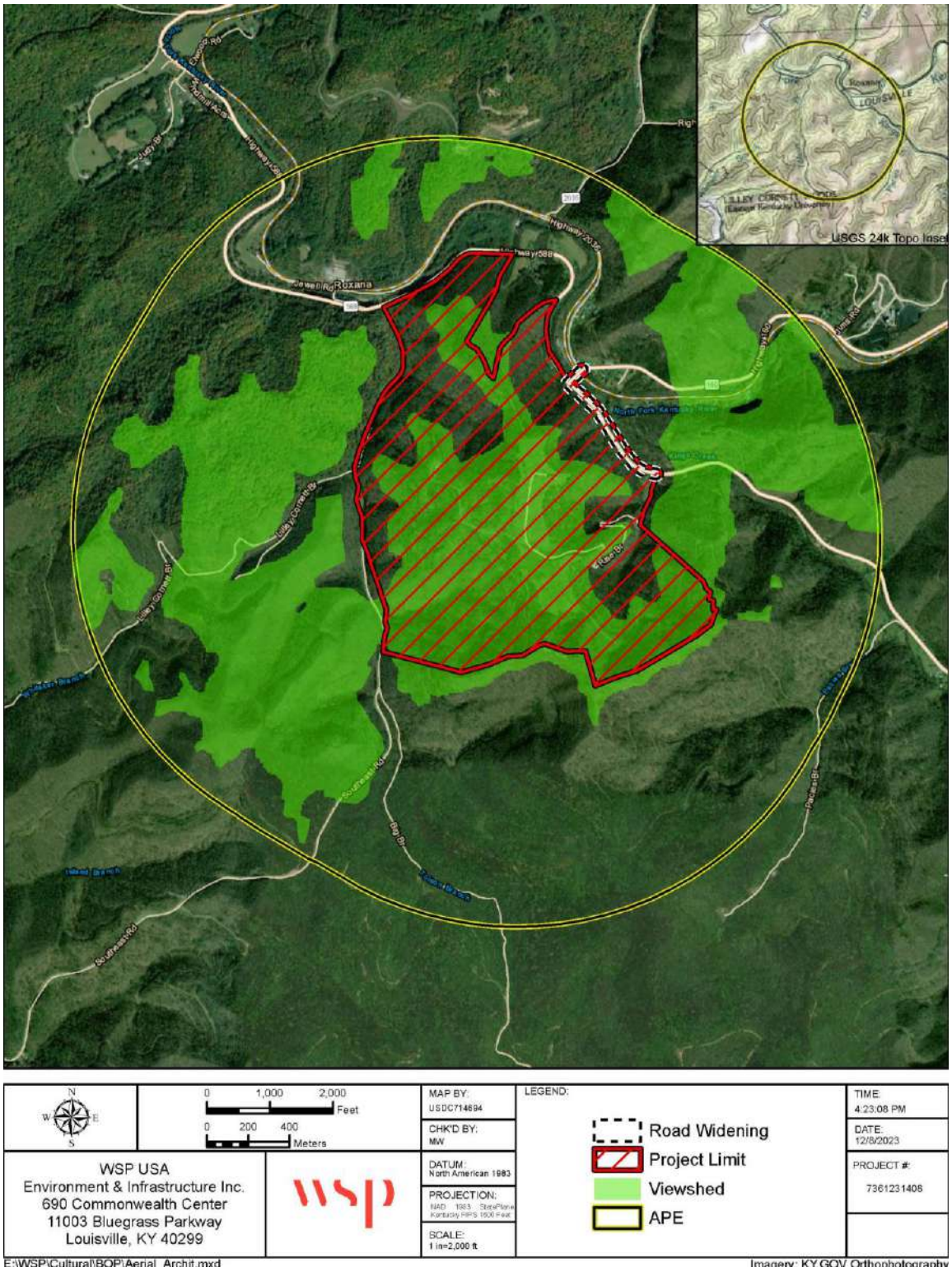

Figure 2.1. Cultural resource survey APE, the proposed project limits, and the areas with no line-of-sight.

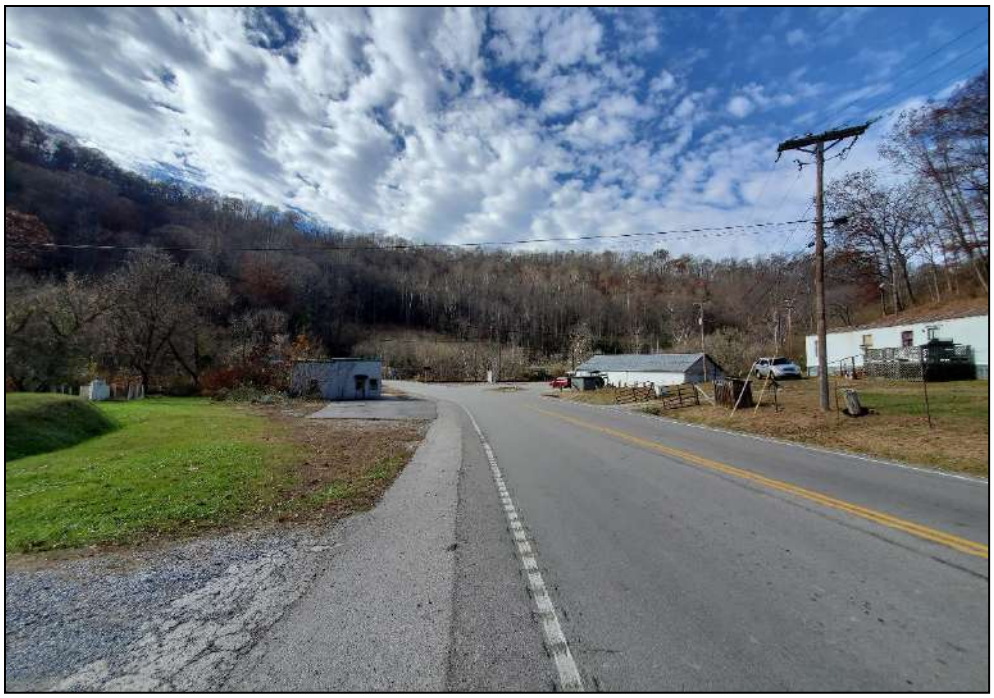

Figure 2.2. View towards the proposed project limit from within the direct line-of-sight from the northeast section of the APE along KY-160, facing southwest.

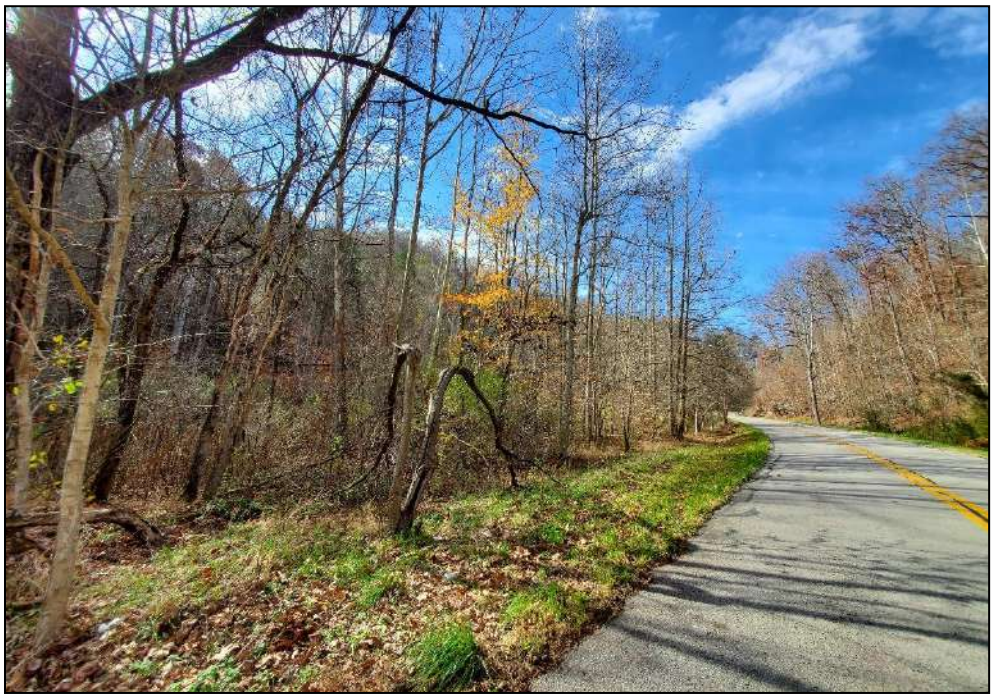

Figure 2.3. View towards the proposed project limit from outside the direct line-of-sight from the eastern section of the APE along KY-160, facing west-northwest.

Figure 2.4. View towards the proposed project limit from within the direct line-of-sight from the southern section of the APE along Big Branch-Tolson Creek Road, facing east-northeast.

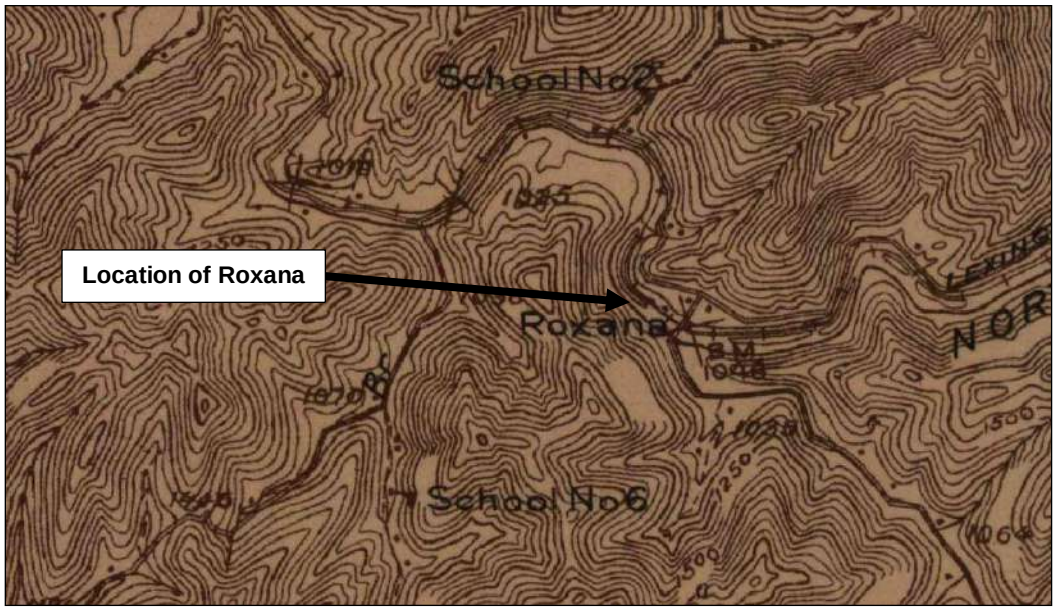

Figure 2.5. 1913 Oven Fork, KY topographic map depicting the location of Roxana along the L&E Railroad; note the location of the early roads along the same routes as KY-160, KY-2036, and Big Branch-Tolson Creek Road and the two schools (USGS).

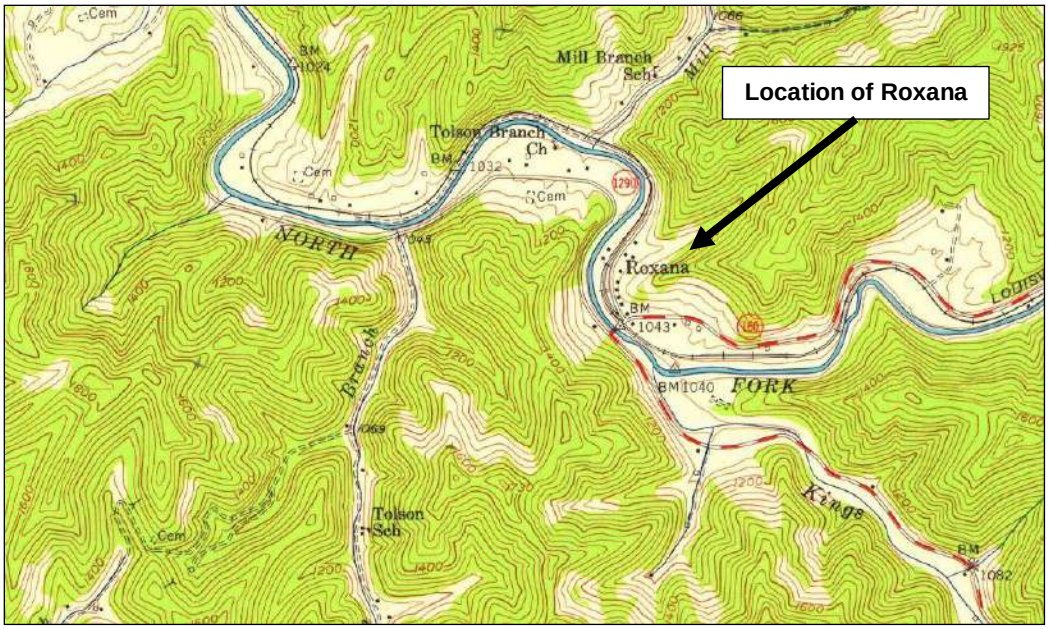

Figure 2.6. 1954 Roxana, KY topographic map depicting Roxana along the L&N Railroad; note the location of the early roads along the same routes as KY-160, KY-2036, KY-588, and Big Branch-Tolson Creek Road and the two schools (USGS).

Figure 2.7. Commercial building and post office in Roxana within the APE along KY-2036.

Figure 2.8. Residential buildings in Roxana within the APE along KY-160.

Figure 2.9. Religious building within the APE along KY-588.

Figure 2.10. Residential building within the APE along KY-588.

Figure 2.11. Agricultural building within the APE along KY-160.

Figure 2.12. Cemetery within the APE along CR-1728Q4.

Figure 2.13. Former industrial area within the APE along CR-1728Q4.

Figure 2.14. Representative location within the APE showing its rural characteristics and remnants of a historic school along Big Branch-Tolson Creek Road.

3.0 BACKGROUND RESEARCH

3.1 Previous Sites and Surveys

Prior to commencing fieldwork, WSP conducted a thorough literature review of several resources to identify what architectural resources were previously surveyed and recorded. The NRHP was checked to determine if any resources within the APE were already listed. Site file and database checks for architectural resources were searched via KHC on October 18, 2023. Based on the site file and database check, there are seven previously surveyed resources within a 1-mile buffer around the APE, and three of the seven previously surveyed resources are located within the APE (**Table 3.1** and **Figure 3.1**). All seven previously surveyed resources are undetermined for listing in the NRHP.

Table 3.1. Previously Surveyed Resources within the one-mile buffer around the APE

Site #	Historic Name	Location	NRHP Eligibility
LR-5	Old Log House	Within Lilley's Woods on Linefork Creek; approximately 37.07970, -82.98461	Undetermined
LR-8	Lilley's Woods (Lilley Cornett Woods)	37.08254, -82.99025	Undetermined
LR-152	Pearl Whitaker House	3947 KY-2036, Roxana, KY	Undetermined
LR-153	George Whitaker House	3967 KY-2036, Roxana, KY	Undetermined
LR-245	Frazier Cemetery	KY-588, Roxana, KY	Undetermined
--	Isom Cemetery	37.12080, -82.97310	Undetermined
--	Morgan Cemetery	37.08470, -82.98500	Undetermined

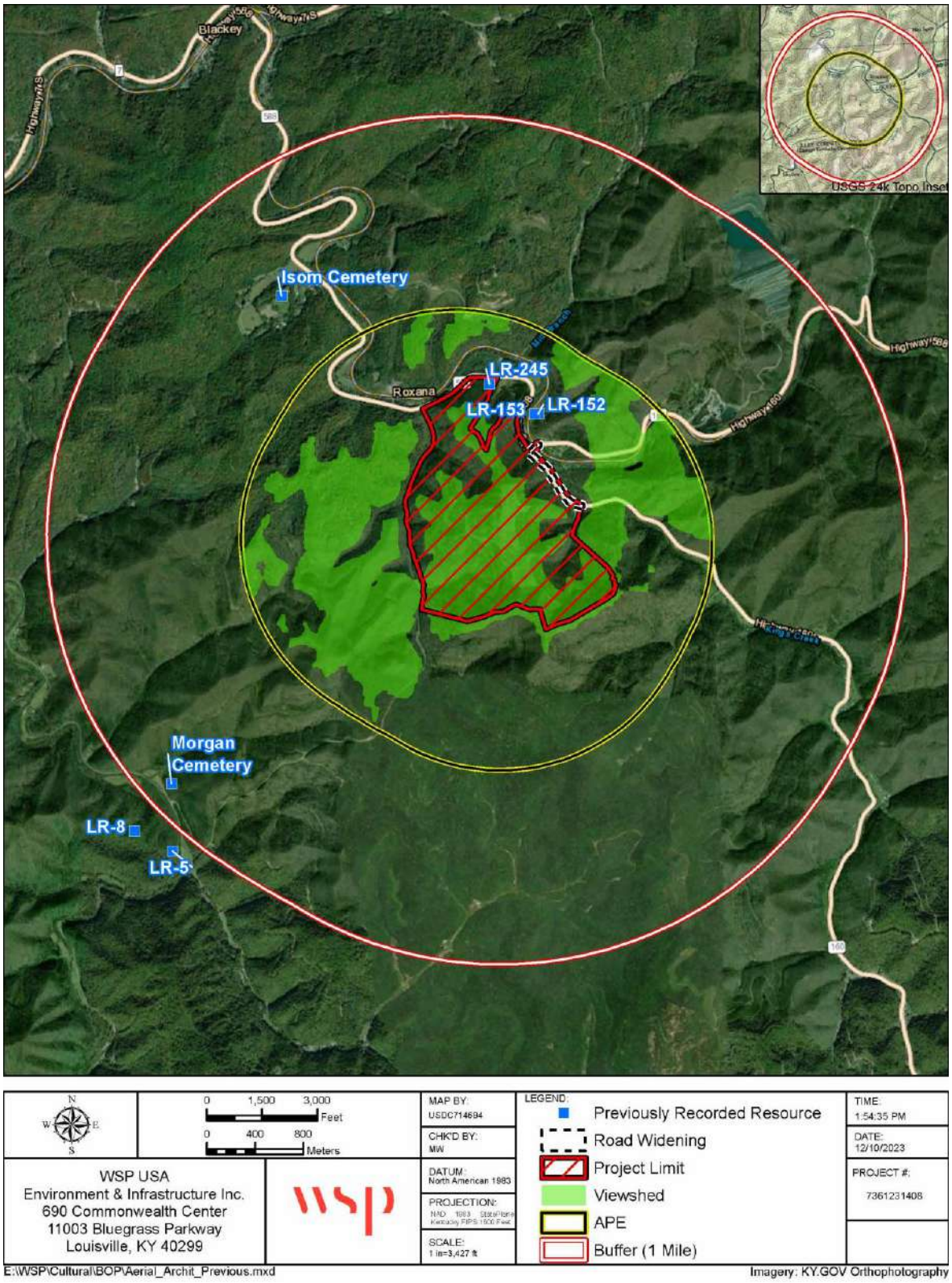

Figure 3.1. One-Mile buffer around the APE, showing previously surveyed resources within and outside of the APE.

3.2 Archival Research

In addition to the literature review, detailed archival research was also conducted. Archival research, which included local histories, historic maps, aerial photographs, the Letcher County Property Valuation Administrator (PVA) records, and other pertinent information, was conducted to identify specifications of existing buildings and to gain a better understanding of the history and development of the project area (**Table 3.2**).

Table 3.2. Archival Resources Researched for the Project

Resource	Date	Topographer/ Author	Information
Property Valuation Administrator	2023	Letcher County	Current Owners, Building Specifications and Materials, Appraisal, and Construction Dates
USGS Whitesburg, KY Topographic Maps (1:125000)	1890	U.S. Geological Survey	Development of the local area and Location of Buildings
USGS Whitesburg, KY Topographic Maps (1:125000)	1892	U.S. Geological Survey	Development of the local area and Location of Buildings
USGS Oven Fork, KY Topographic Maps (1:125000)	1913	U.S. Geological Survey	Development of the local area and Location of Buildings
USGS Oven Fork, KY Topographic Maps (1:625000)	1915	U.S. Geological Survey	Development of the local area and Location of Buildings
Highway and Transportation Map of Letcher County, KY	1937	Kentucky Department of Highway	Development of the local area and Location of Buildings
Rural Highway Series Map of Letcher County, KY	1954	Kentucky State Highway Department	Development of the local area and Location of Buildings
USGS Roxana, KY 7.5-minute Topographic Maps (1:24000)	1954	U.S. Geological Survey	Development of the local area and Location of Buildings
County Road Series Map of Letcher County, KY	1969	Kentucky Transportation Cabinet (KYTC)	Development of the local area and Location of Buildings

4.0 NRHP CRITERIA AND METHODS

WSP staff utilized NRHP Bulletin #15, *How to Apply the National Register Criteria for Evaluation* (United States Department of the Interior 2002), to assess the buildings over 45 years of age for NRHP eligibility. Moreover, the methodology for the architectural field survey follows the standards established by KHC. Fieldwork entails inspection and documentation of buildings, cemeteries, or structures over 45 years of age within the architectural survey areas. Fieldwork includes written and photographic documentation of resources with digital photographs, for the purposes of determining the architectural and historic details of each structure or building.

During the fieldwork, WSP staff attempted to contact every homeowner while on site, by knocking on doors; however, surveys are typically conducted during regular business hours, when most property owners are not at home. While each resource was individually photographed, if consent to photograph all of the house could not be fully obtained, that resource could not be fully documented due to trespassing concerns. In these instances, photographs were taken from publicly accessible points, such as roads and sidewalks, so as to ensure that the surveyor was not trespassing on private property. This limited what portions of some of the resources were accessible for documentation during the fieldwork.

4.1 NRHP Criteria for Eligibility

According to 36 CFR 60.4 (CFR 2004; United States Department of the Interior 2002), cultural resources eligible for listing in the NRHP are defined as buildings, structures, objects, sites, and districts that have “integrity,” and that meet one or more of the criteria. The evaluation criteria for extant structures and buildings, as detailed in National Register Bulletin #15, are as follows:

- Criterion A (Event): Association with one or more events that have made a significant contribution to the broad patterns of national, state, or local history.
- Criterion B (Person): Association with the lives of persons significant in the past.
- Criterion C (Design/Construction): Embodiment of distinctive characteristics of a type, period, or method of construction; or representation of the work of a master; or possession of high artistic values; or representation of a significant and distinguishable entity whose components may lack individual distinction.
- Criterion D (Information Potential): Properties that yield, or are likely to yield, information important in prehistory or history. Criterion D is most often (but not exclusively) associated with archaeological resources. To be considered eligible under Criterion D, sites must be associated with specific or general patterns in the development of the region. Therefore, sites become significant when they are seen within the larger framework of local or regional development. This criterion is typically used to assess the significance of archaeological sites.

4.2 NRHP Criteria for Integrity

In addition to identifying if a structure or archaeological site is potentially eligible for NRHP listing according to these four criteria, a structure or property’s integrity must be identified. As stated in the National Register Bulletin #15 *How to Apply the National Register Criteria for Evaluation*, “Integrity is the ability of a property to convey significance” (United States Department of the Interior 2002). Integrity of a building must be judged in accordance with the three criteria, and while it is “. . . sometimes a subjective judgment, . . . it must always be grounded in an understanding of a property's physical features and how they relate to its

significance" (United States Department of the Interior 2002). There are seven aspects of integrity as identified by NPS:

- **Location:** Location is the physical setting where a building was built or a historic event occurred. It is important in understanding the how and why of a building or property and in helping recapture the historic event. If a property is moved, it can affect the historic associations of the building.

- **Design:** Design is the form, plan, space, structure, and style of a property. It results from the decisions made during the original conception of the property or during its alteration. Design applies to function and technology as much as it applies to aesthetics. It includes the decisions that made the plan of the property, including use of space, fenestration (windows), ornamentation, and layout.

- **Setting:** Setting should not be mistaken with location. It is the physical environment of the property and involves how the character of the property was created. It includes the actual physical setting of the property - topographic features, vegetation, and manmade features. The relationship between the property and these features defines setting.

- **Materials:** Materials are the physical elements used or deposited during a specific period of time and in a particular pattern to create the building or property. Materials not only show the preference of the person who created the building but can also indicate what materials were available or popular at the time of construction or alteration. If a building has been altered, the original materials as identified within the building's period of significance, must have been saved. Materials must be original, not recreations.

- **Workmanship:** Workmanship is the evidence of the technology of a particular culture or a group of people during a particular period of time as deemed significant. It provides evidence on the craftsmanship of the age, the aesthetic styling, and the methodology of design. Workmanship in historic buildings includes carving, painting, joinery, tooling, and graining.

- **Feeling:** Feeling is defined in the bulletin as "a property's expression of the aesthetic or historic sense of a particular period of time" (United States Department of the Interior 2002). It conveys the property's historic significance through the presence of physical features.

- **Association:** Association is the direct association between a historic event or person with the building or property. To have integrity of association, the building must retain its original location and the presence of physical features that convey the historic significance of the property.

To properly assess integrity, a series of steps must be followed. First, the physical features must be defined and determined if visible enough to convey historic significance. Second, it must be determined if the property is the lone example of its kind, or if it needs to be compared with other, similar properties. Finally, the aspects of integrity must be identified and established as essential to the historic significance of a property.

5.0 HISTORIC CONTEXT

5.1 History of Letcher County, Kentucky

Letcher County, in southeastern Kentucky, was formed in 1842 by an act of the Kentucky Legislature from parts of Perry and Harlan Counties. The county name was derived from Governor Robert P. Letcher, Kentucky's governor from 1840 to 1844, and the City of Whitesburg serves as the county seat (Kleber 1992). Covering 339 square miles, the county is currently surrounded by Harlan, Perry, Knott, and Pike counties in Kentucky. Early Euromerican settlement in the county began in the late eighteenth century. Peter Whitaker built the first cabin on Whitaker's Branch in 1795, and other early settlers to the area included George Ison, II, Benjamin Webb of Maryland, James Caudill of Virginia, and William Stamper of North Carolina (Cornett 1967; Kleber 1992). Almost every main creek hosted settlers by 1806, and, by 1810, over a hundred different families were living within the county. After an initial sluggish start, the population expanded quickly between 1810 and 1850, specifically near present-day Mayking (Cornett 1967; Kleber 1992). **Figure 5.1** shows the general location of the county in 1839.

Figure 5.1. Map showing general vicinity of Letcher County in 1839 (Burr).

Despite its remote location, Letcher County was not untouched by the Civil War. Pound Gap was strategically important to both the Union and Confederate armies. On March 16, 1862, Brig. General James A. Garfield and 700 Union troops defeated General Humphrey Marshall's 500 Confederate troops at Pound Gap (Kleber 1992). The county suffered other skirmishes, including a battle near Whitesburg in 1863 and another at Pound Gap in 1864 (Cornett 1967; Kleber 1992). The Civil War ended but left behind hostility and anger, which in some cases manifested into long-term feuds in the region. Several feuds broke out but only a small section of the population engaged in the fighting (Fuson 1947). In 1886, the Wright-Jones feud began in Knott County, spilling over into Letcher County, and nearly ten years later, around 1895, a truce

was reached, only for violence to ignite again in 1897. The fighting finally ended towards the turn of the century. **Figure 5.2** shows the county in 1861.

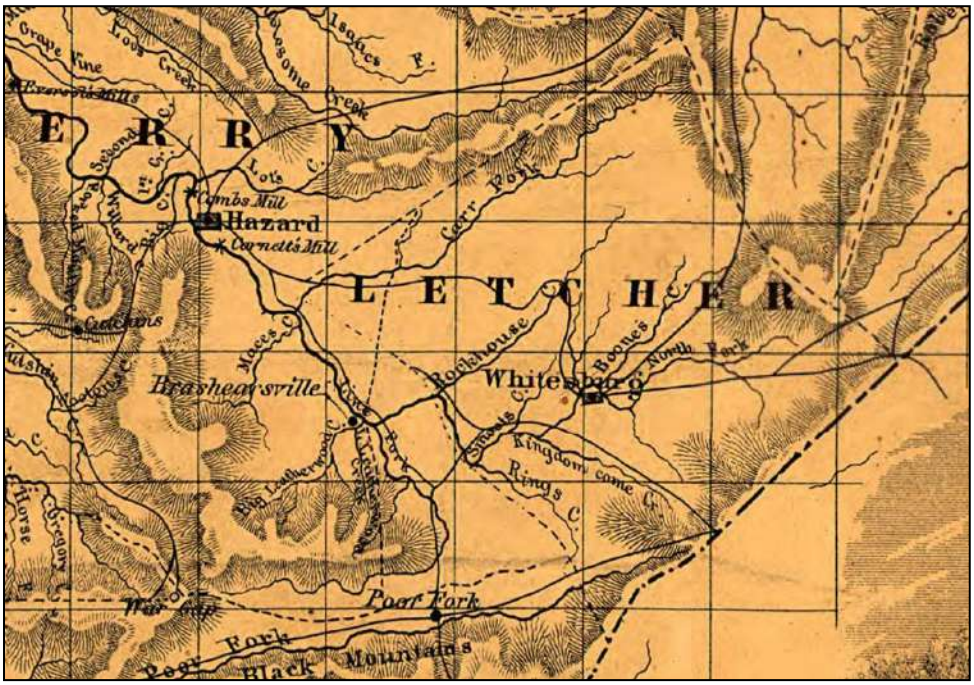

Figure 5.2. Map showing area of Letcher County in 1861 (Campbell and Barlow).

Like much of the region, the logging and mining industries played a vital role in Letcher County's economic development, with both industries emerging in importance in the 1880s. Around 1885, coal speculation began and soon companies, such as Consolidation, Elkhorn, and South-East, began purchasing mineral rights and land (Cornett 1967; Kleber 1992). By 1892, over 60% of Letcher County was owned by non-residents (Eller 1982). Within Letcher County, the companies quickly established their own towns, including Jenkins, Fleming, McRoberts, and Seco. As the coal industry expanded, the county's population swelled from 4,608 people in 1870 to over 10,000 by 1910 (U.S. Census 2023). Eastern European immigrants and African Americans from the Deep South relocated to the area, attracted by employment opportunities with the mines and the railroads (Kennedy and Johnson 2005; Richardson 1992; Powell 1998). Among the immigrants were skilled Italian stonemasons, such as Giuseppe (Joe) Romeo, Giovanni (John) Palumbo and Domenico and Francesco Mongiardo (Majority), who settled in Letcher County and are responsible for several stone bridges, culverts, foundation walls, as well as houses and churches in Whitesburg and likely additional buildings and structures in the surrounding region (ACHP ND; Kennedy and Johnson 2005; Powell 1998; Richardson 1992; Taylor 2006).

Initially, most local residents refused to work in the coal and lumber industries and remained farmers, but as the agricultural industry began to struggle in the late nineteenth and early twentieth centuries, the economic losses forced many farmers into part-time work with coal and lumber companies (McBride and McBride 1990). To facilitate the coal industry, railroads were constructed and roads improved across the county and region. The Lexington and Eastern (L&E) Railroad was purchased by the Louisville and Nashville (L&N) Railroad in 1910, although not public knowledge until 1915 (Mountain Eagle Staff 2015; University of Kentucky Libraries

ND). At the time, the L&E stretched from Lexington to Jackson, but immediately after their purchase of the company, the L&N began extending the line into Letcher County (Richardson 1992; Taylor 2006). By 1912, the L&N had completed a line extension from Jackson to McRoberts (Cornett 1967; Kleber 1992; Mountain Eagle Staff 2015; University of Kentucky Libraries ND). Early masonry bridges constructed by the L&N Railroad and/or Consolidated Coal in Letcher County are attributed to Italian immigrants (Richardson 1992; Taylor 2006). In some cases, the L&N scouted and paid the travel expenses for skilled stonemasons to relocate to the U.S., as the railroad worked directly with Consolidated Coal, building bridge abutments across West Virginia and eastern Kentucky (Cooper 2011; Richardson 1992; Taylor 2006).

Consolidated Coal had a major influence in Letcher County, operating mines in Blackey, Burdine, Dalna, Dunham, Jenkins, and McRoberts (Taylor 2006). In 1911, the company began constructing the Town of Jenkins for the sole purpose of extracting coal from the surrounding mountains. All aspects of town life were created, including housing, schools, churches, power plants, water systems, roads, and bridges, as the company sought to create a model mining community (Cooper 2011; Cornett 1967). Then, in 1912, the company built the Town of McRoberts along the upper reaches of Wrights Fork, a tributary of the North Fork of the Kentucky River. Like Jenkins, Consolidated Coal built all the resources found in a typical town for their future employees, and by 1914, 1,600 men worked in the McRoberts' mine, increasing to 2,500 by 1916. Near the existing community of Chip, the Elkhorn Coal Corporation built the coal town of Fleming in 1913. Chip was renamed Neon in 1926, and the two communities merged in 1978, known today as Fleming-Neon (Kentucky Atlas & Gazetteer 2014a; Rennick 1984). **Figure 5.3** shows an image of a Consolidated Coal Company tipple at Mine No. 241 in Jenkins, Kentucky, and **Figure 5.4** shows a historic image of the McRoberts (Kentucky Foundation 2007a, 2007b). Smaller coal companies also established camps within the county, including Elk Creek Coal, Little Blackey Coal, Rockhouse Coal, Marion Coal, Kentucky River Coal, and Smoot Creek Coal (Cornett 1967).

Figure 5.3. Consolidated Coal Company tipple at Mine No. 214 in Jenkins (Kentucky Foundation 2007a).

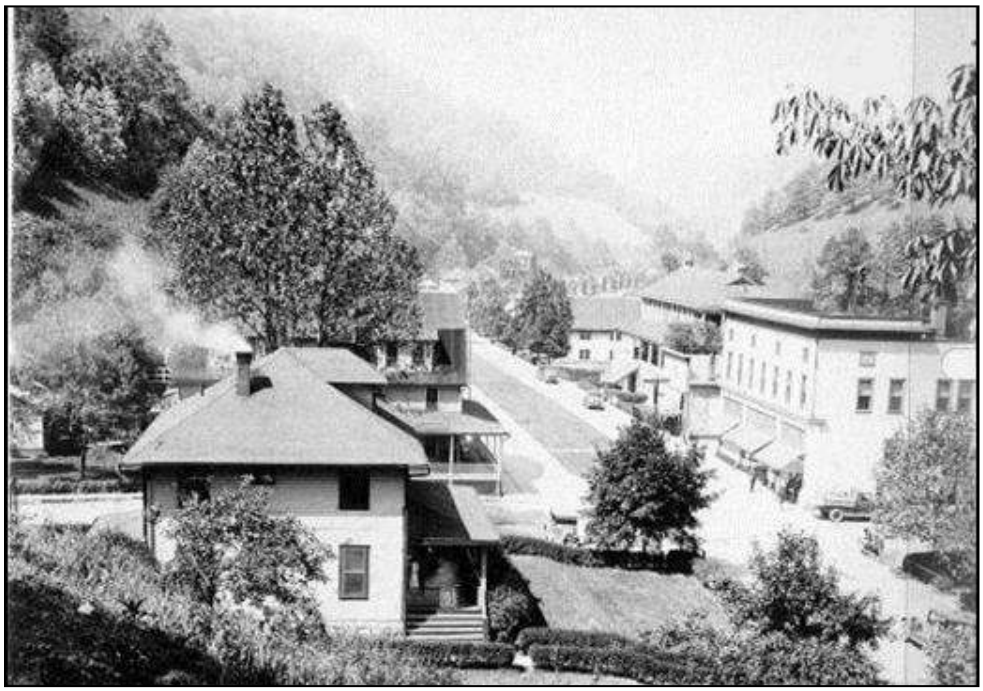

Figure 5.4. Historic view of McRoberts (Kentucky Foundation 2007b).

Coal soon dominated Letcher County's economy with most residents relying upon it for their livelihood. By 1916, Letcher County was the leading coal producer in the state, with the industry continuing to thrive into the 1920s, but the economic turmoil of the Great Depression distressed the industry (Kentucky Foundation 2007b; Kleber 1992; Rennick 1984). Then, in May of 1927, a large flood devastated the region. The Red Cross provided the region assistance after the flood, and President Franklin D. Roosevelt's New Deal programs, like Civil Works Administration, Kentucky Emergency Relief Administration, and the Works Progress Administration (WPA), alleviated some of the economic struggle by providing employment, but like for much of the country, World War II brought real relief to the region (Kennedy and Johnson 2005). During this period, the county saw major growth as the demand for coal skyrocketed. Letcher County's population peaked at over 40,000 people in 1940 (Cornett 1967; US Census 2023).

However, between 1940 and 1950, the county population greatly declined and continued to decline through the 1960s. Coal production was down due to increased mechanization and a drop in demand, and the coal companies began to sell the company towns to private owners (Eller 2008). The county's economic struggles received national attention after the publishing of Harry Caudill's *Night Comes to the Cumberlands*. As a lawyer living in Whitesburg, Caudill described his perspective on Letcher County's economic depression, which in part led to Lyndon B. Johnson's War on Poverty (Cornett 1967). In 1964, Johnson initiated a campaign to end poverty, beginning with a visit to the home of an unemployed coal miner in Inez, Kentucky. The movement endured nearly a decade and brought millions of dollars of federal aid into eastern Kentucky, while also promoting the preservation of the history and culture of Appalachian Kentucky (Glen 1992).

Letcher County's population continued to steadily decline as people left the region searching for work and more economic opportunities to the north, in cities like Cincinnati, Dayton, and

Chicago. As Middle Eastern tensions stifled the country's supply of oil in the 1970s, coal production increased by 14.4% nationwide between 1973 and 1976 (Estep and Cheves 2019). Consequently, Letcher County's population, which had sunk to around 20,000 people in 1970, shot up to over 30,000 by 1980 (U.S. Census 2023). Following this period, employment in the coal industry again began to decline and with it, the county's population. Across the country, mining jobs reached more than 34,500 in 1980 but dropped to fewer than 13,000 by 2000 (Estep and Cheves 2019). Despite this, the coal industry endured within the county but increased drilling of cheap natural gas in the twenty-first century has eroded much of the remaining coal industry across the region (Estep and Cheves 2019). Between 2015 and 2016, Letcher County lost an average of 57% of all mining jobs, and coal mine employment in the county has declined by 95% since 2000 (Kentucky Energy and Environment Cabinet 2017). Today, Letcher County is a largely rural area with an approximate population of 21,784 (U.S. Census 2023). The economy has diversified, with retail, healthcare, and education providing most of the employment, although coal extraction continues within the county (Bestplaces ND).

5.2 Roxana, Kentucky

As discussed in Section 2.2, archival research revealed little about Roxana, but the Roxana post office first opened in 1891, although the community is not illustrated on the 1890 or 1892 topographic maps (Elbon 2023; USGS). The small community is shown on historic mapping in 1913 and 1915, consisting of several buildings and a school, referred to as School No. 2 (see **Figure 2.4**). Roxana sits approximately three miles to the southeast of Blackey and seven miles to the west of Whitesburg on the east side of the North Fork of the Kentucky River. Historic mapping also indicates roads that follow a similar route as modern-day KY-2036, KY-160, and Big Branch-Tolson Creek Road were established near Roxana as early as 1913 (USGS). The L&N Railroad purchased the L&E Railroad in 1910 and soon after extended the line from Jackson, through Roxana, and into McRoberts (Cornett 1967; Kleber 1992; Mountain Eagle Staff 2015; University of Kentucky Libraries ND) (see **Figures 2.4** and **2.5**). The rail line wrapped through the community, running parallel with KY-2036 and the North Fork. L&N's motivation was related to the increasing interest in coal speculation in the region and the associated transportation needs for construction of company towns and coal extraction facilities, as well as the transport of the coal to outside markets.

The coal industry undoubtedly had an impact on Roxana's development with its location along the rail line and close proximity to Letcher County's major coal mining towns. Other than transportation improvements, not much was found regarding this influence from coal mining. Regardless, a local resident, Sam Adams, indicated there were early mining interests in the area (2023). The community's growth may have stagnated after the initial coal boom of the late nineteenth and early twentieth century, as people relocated to the company towns for employment. Nevertheless, numerous areas within and surrounding the community have been altered in relation to the coal industry via underground, auger, and surface mining techniques. Specifically, within the APE, ridgetops were leveled by the Meade and Shepherd Coal Company between 1988 and the early 1990s via surface mining activities within the proposed project limits to the south of KY-588 and the North Fork of the Kentucky River (Brann 2017; Kentucky Coal Mine Maps 2023).

During the 1930s, road improvements within and surrounding Roxana were completed, likely coinciding with the construction of the 1932 and 1933 bridge and culverts constructed along KY-160 (Kings Creek-Roxana Road). KY-160 was first referred to as such on the 1937 highway map, and also on this map, a route is first established along present-day KY-588 (Letcher-

Blackey or Blackey Road), though not yet labeled as a highway. Both roads were listed as constructed under New Deal programming at an undetermined date (Kennedy and Johnson 2005) (**Figure 5.5**). By 1954, the route along KY-588 was considered a highway, although referred to as KY-1290, but between 1954 and 1969, the route became officially known as KY-588 (USGS; Kentucky State Highway Department). Today, Roxana is composed of several single-family residences and associated outbuildings, agricultural buildings, a post office, a former grocery and hardware store, and a former service station (see **Figures 2.4** and **2.5**). The former L&N rail line remains intact through the community, but according to local residents, the line, most recently owned by CSX, is no longer active.

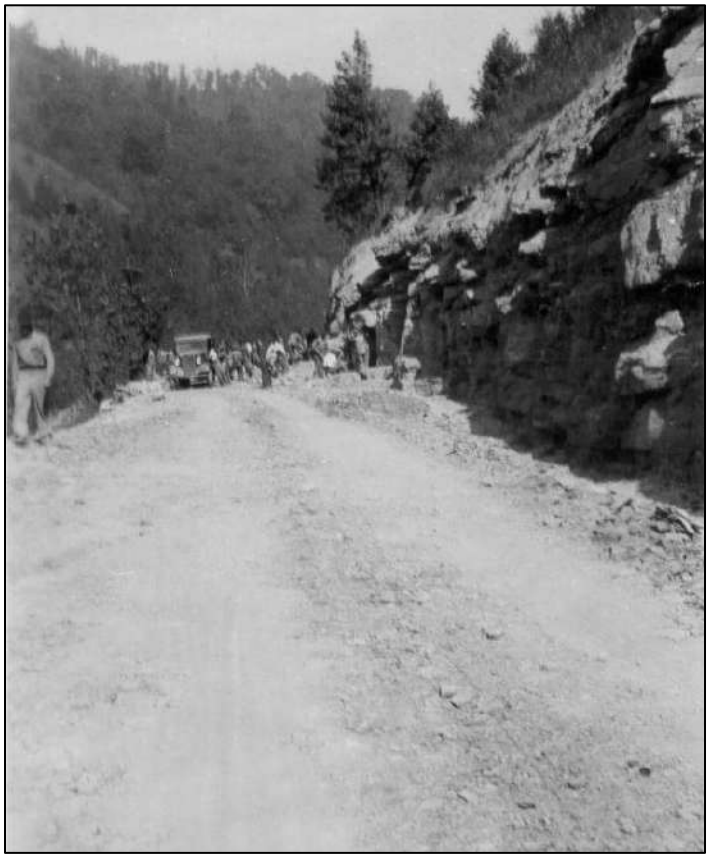

Figure 5.5. Image of Construction of Blackey Road (KY-588), undated (Explore UK 2023; Courtesy of the Goodman-Paxton Photographic Collection).

5.3 Regional Architecture

In understanding the regional architecture, several resources were consulted along with a review of the local history. Virginia McAlester's *A Field Guide to American Houses* (2018) and Gottfried and Jennings' *American Vernacular Buildings and Interiors: 1870 – 1960* were useful with their broad study of American architecture. Allen G. Noble and M. Margaret Geib's *Wood, Brick, and Stone: Houses* (1984) was also relevant to the study area. The historic bridge context developed by Karen Hudson in *Historic Highway Bridges in Kentucky, 1792 – 1950* and Amanda Abner's *A Contextual Study of Kentucky's Slab, Girder, Beam and Arch Bridges and Culverts Built Prior to 1960* were also valuable, as well as Rachel Kennedy and Cynthia Johnson's *The New Deal Builds: A Historic Context of the New Deal in East Kentucky, 1933 to*

1943. Despite the focus outside the APE's region, Rachel M. Kennedy and William Macintire's *Agricultural and Domestic Outbuildings in Central and Western Kentucky, 1800-1865* (1999) and William Macintire with Janie-Rice Brother, Rachel Kennedy, Danae Peckler, and Jennifer Ryall's *A Survey of Historic Sites in Rural Marion and Washington Counties, Kentucky* (2009) were both important sources, as well as Allen G. Nobel and Richard K. Cleek's *The Old Barn Book* (1995). In regard to cemeteries, the National Register Bulletin #41 and the Letcher County Historical and Genealogical Society's local cemeteries series, *They are Here Letcher County Cemeteries* were reviewed along with online resources.

As with much of rural Kentucky, Letcher County's architecture is composed largely of American Vernacular influences. The community of Roxana's early nineteenth century association with the L&N Railroad likely benefited from easier transport of building materials, as Folk housing shifted towards National folk housing forms, such as side-gabled and pyramidal mass-plan houses, with light framing techniques (McAlester 2018). This American Vernacular influence continued throughout the twentieth century, seen in the simple types and forms and manufactured homes found within Roxana and the surrounding area, with little to no stylistic detailing. In fact, the commercial buildings and church within the area also utilize vernacular forms. The dominant materials present on the regional historic buildings are concrete block or concrete slab for the foundation; wood, vinyl, or concrete block for the exterior wall covering; and asphalt-shingle, corrugated metal, or standing seam metal roofs. However, one building within the APE, LR-333, was constructed of cut stone walls. The building was previously identified as a former store (Brann 2017). Though, one local resident, Sam Adams, believed it was related to a former coal operation and likely constructed by Italian stonemasons, but he was uncertain of the building's original function (Adams 2023). Agricultural buildings were constructed of wood board or log with standing seam metal roofs. Cemeteries scattered throughout the APE consist of family cemeteries, common in this region, in which the immediate and extended family are interred, and in some cases, close family friends and neighbors (Potter and Boland 1992).

The bridges and culverts assessed during the survey consisted of wet stone masonry substructures and concrete superstructures. The original structures were constructed in 1932 and 1933. Following the destructive flood of 1927, the region received relief funding via the Red Cross, but according to historic newspapers, the relief effort ended in 1928 (Lexington Herald Leader, 22 July 1928:2). During the 1930s, progressive federal relief programs funded numerous infrastructure projects across the nation and throughout Kentucky, such as highways and bridge construction (Abner 2010). Beginning in December of 1930, the Emergency Federal Aid Act distributed funding to Kentucky followed by the National Industrial Recovery Act (NIRA) in 1933, which created the Public Works Administration (PWA) in June of 1933. Another agency completing highway and bridge improvements between 1933 and 1934 was the Civil Works Administration (CWA), which was begun in November of 1933.

The funding of the bridges and culverts within the APE is probably unrelated to the flood relief and likely predated both the PWA and CWA but may have been initiated under the Emergency Federal Aid Act. During this period, superior workmanship and quality materials were primary concerns for infrastructure construction, as well as the replacement of inferior and unsafe bridges (Abner 2010). Reinforced concrete was used for bridge construction by the early 1900s, with most bridges and culverts using the material by the 1930s. As concrete and steel became more accessible, stone was limited to bridge piers, abutments, and veneers (Abner 2010). Within eastern Kentucky, stone was easily accessible and therefore economical, with sandstone being the most prevalent. Quarried stone from the local Pine Mountain Quarry was utilized for many of the New Deal masonry projects in Letcher County (Kennedy and Johnson 2005) (**Figure 5.6**). These structures were likely constructed using standardized plans employed by

the state's Department of Highways (Kentucky Transportation Cabinet) at the time of construction and reconstruction. Standardization for bridge construction began in the early twentieth century and continues today.

Figure 5.6. Image of Pine Mountain Quarry in Letcher County in 1940 (Explore UK 2023) (Courtesy of the Goodman-Paxton Photographic Collection).

6.0 SITE DESCRIPTION AND EVALUATION

The architectural survey APE was developed in consultation with BOP and KHC and was based on a review of the density of the setting, the project's direct and indirect effects upon historic resources, as well as an understanding of the specifications of the proposed undertaking. The APE consists of all historic resources in direct line-of-sight within a ½ mile buffer surrounding the proposed land tract for the BOP project and was developed based on a review of topographic data, the density of the rural setting, as well as an understanding of the specifications of the proposed land use (**Figure 6.1** and **Figure 6.2**).

A total of 20 cultural historic resources were recorded during the survey. Six residential buildings, one service station and residential building, one industrial site, one religious building, one industrial/commercial building, five cemeteries, two bridges, one agricultural building, and two culverts over 45-years-old were identified within the APE (**Table 6.1**). Of these resources, three, LR-152, LR-153, and LR-245 were previously recorded and listed as undetermined in regard to eligibility for listing in the NRHP. As part of the fieldwork, all resources were documented and individually photographed. WSP staff assessed the buildings and structures individually, according to several overarching themes developed with three NRHP criteria, applicable specifically to architecture and defined by research used to develop the historic context. These themes included the development of the area (Criterion A), the association with early settlers in Letcher County and the community of Roxana (Criterion B), and the evaluation of architecture within the region (Criterion C).

Table 6.1. Historic Resources in APE and NRHP Recommendations

KHC Site Number	Address	Style/Form	NRHP Recommendation
LR-152	3947 KY-2036, Roxana, KY	Early 20th Century American Vernacular/Hipped	Not eligible due to a lack of historic and architectural significance and loss of integrity
LR-153	3967 KY-2036, Roxana, KY	Early Mid-20th Century American Vernacular/Hipped	Not eligible due to a lack of historic and architectural significance and loss of integrity
LR-245	KY-588, Roxana, KY	Mid-20th Century Cemetery	Not eligible due to a lack of historic and architectural significance
LR-318 (AR 1)	CR-1728Q4, Roxana, KY	Mid-Late 20th Century Industrial site	Not eligible due to a lack of historic and architectural significance and loss of integrity
LR-319 (AR 3)	CR-1728Q4, Roxana, KY	Late 19th Century Cemetery	Not eligible due to a lack of historic and architectural significance
LR-320 (AR 4)	9951 KY-588, Roxana, KY	Mid-20th Century American Vernacular/Side Gable	Not eligible due to a lack of historic and architectural significance and loss of integrity
LR-321 (AR 5)	9063 KY-588, Roxana, KY	Mid-20th Century Agricultural	Not eligible due to a lack of historic and architectural significance and loss of integrity

KHC Site Number	Address	Style/Form	NRHP Recommendation
LR-322 (AR 6)	9144 KY-588, Roxana, KY	Mid-20th Century American Vernacular/Front Gable/Center-Steeple Church	Not eligible due to a lack of historic and architectural significance and loss of integrity
LR-323 (AR 14)	6397 KY-160, Roxana, KY/6367 KY-160, Roxana, KY	Mid-20th Century Commercial/Mid-20th Century American Vernacular/Side Gable	Not eligible due to a lack of historic and architectural significance/Not eligible due to a lack of historic and architectural significance and loss of integrity
LR-324 (AR 16)	6205 KY-160, Roxana, KY	Mid-20th Century American Vernacular/Side Gable	Not eligible due to a lack of historic and architectural significance
LR-325 (AR 19)	6830 KY-160, Roxana, KY	Mid-20th Century American Vernacular/Front Gable	Not eligible due to a lack of historic and architectural significance and loss of integrity
LR-326 (AR 20)	KY-160, Roxana, KY	Early 20th Century Cemetery	Not eligible due to a lack of historic and architectural significance
LR-327 (AR 21)	KY-160, Roxana, KY	Early to Mid-20th Century Culvert	Eligible under Criterion A and C due to historic and architectural significance
LR-328 (AR 22)	7642 KY-160, Roxana, KY	Early to Mid-20th Century American Vernacular/Front Gable	Not eligible due to a lack of historic and architectural significance and loss of integrity
LR-329 (AR 23)	Lilly Cornett Branch Road, Roxana, KY	Early 20th Century Family Cemetery	Not eligible due to a lack of historic and architectural significance
LR-330 (AR 24)	KY-160, Roxana, KY	Early to Mid-20th Century Concrete T-Beam Bridge	Eligible under Criterion A and C due to historic and architectural significance
LR-331 (AR 25)	KY-160, Roxana, KY	Early to Mid-20th Century Culvert	Eligible under Criterion A and C due to historic and architectural significance
LR-332 (AR-8)	KY-588, Roxana, KY	Mid-20th Century Cemetery	Not eligible due to a lack of historic and architectural significance
LR-333 (AR 26)	Big Branch-Tolson Creek Road, Roxana, KY	Early 20th Century Industrial/ Commercial	Not eligible due to a lack of historic and architectural significance and loss of integrity
LR-334 (AR 18)	KY-160, Roxana, KY	Early to Mid-20th Century Concrete Multiple Box Beam/Girder	Not eligible due to a lack of historic and architectural significance and loss of integrity

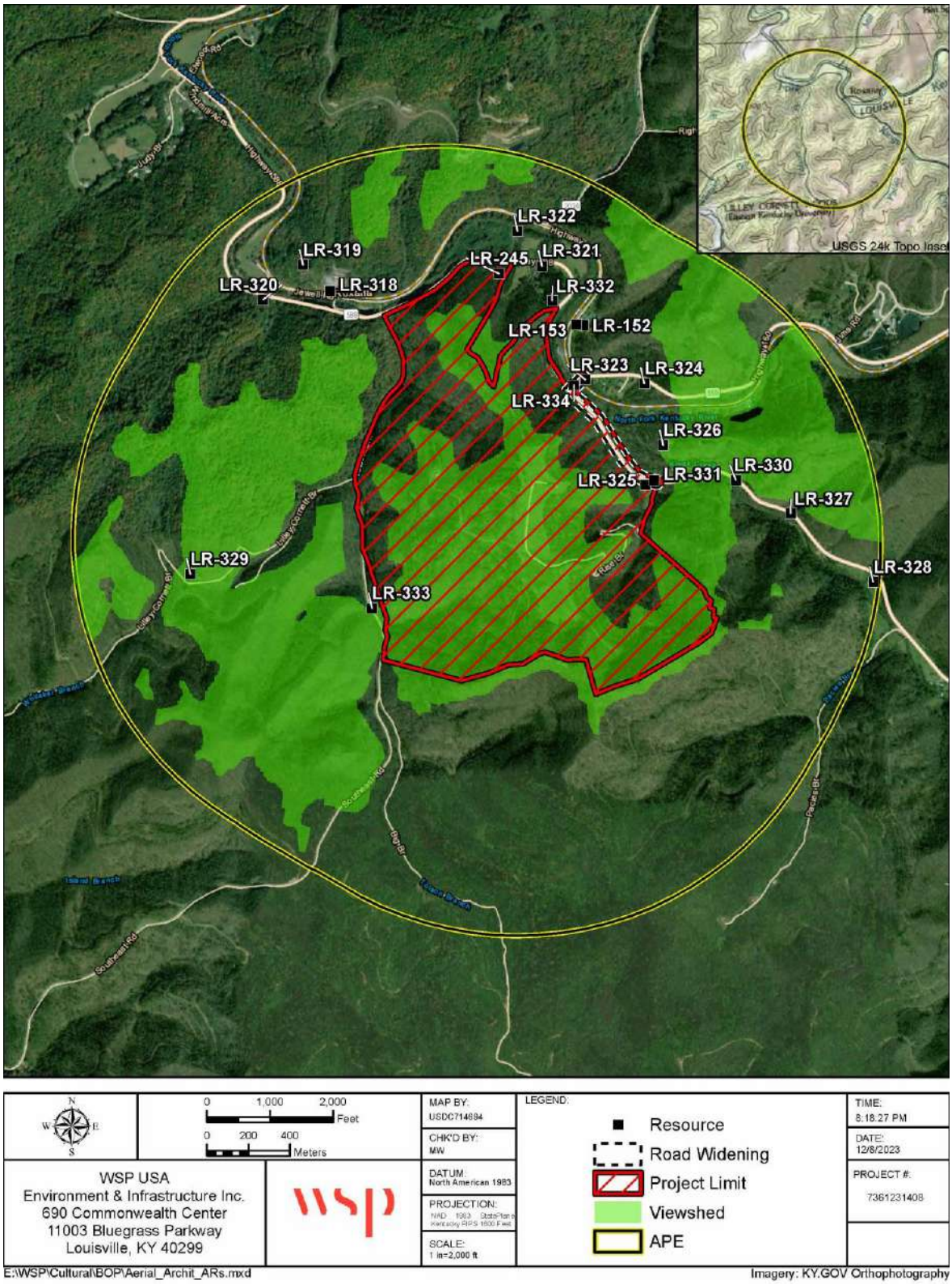

Figure 6.1. Topographic map showing the APE and the documented historic resource locations.

7.0 LR-152: 3947 KY-2036

LR-152 is an early twentieth century American Vernacular residential building located at 3947 KY-2036, Roxana, Letcher County, Kentucky (**Table 7.1**; **Figure 7.1**). The building is bound on the north and south by residential buildings, on the west by KY-2036, and the east by a wooded hillside. The property sits on a side slope covered in lawn grasses and trees on the east side of KY-2036 and is accessed via KY-2036 by a gravel drive. Aerial images indicate the house is associated with two frame sheds. According to the Letcher County, KY PVA, LR-152 is currently owned by George Whitaker and has a total living area of 2,344 sq. ft. (**Figure 7.2**). The PVA lists the original construction date of the house as 1925. A building shown in the general location of LR-152 is illustrated as early as 1913 on topographic mapping and is also shown on the 1915 and 1954 maps (**Figure 7.3** and **7.4**). A building with a similar configuration and in the same location as the house is visible on the 1952 aerial image, which is the earliest aerial found for the area. This suggests LR-152 was constructed as early as 1913. KHC lists the house as previously recorded in 2013 as the Pearl Whitaker House, but NRHP eligibility was not determined at this time; thus, the building was noted as undetermined. During the survey, the house and a shed were recorded.

Table 7.1. Summary of LR-152

Address	3947 KY-2036, Roxana, KY
County	Letcher County
Date of Construction	c. 1910
Square Footage (Living Area)	2,344 square feet
Acreage	2
Owner	George Whitaker
Architectural Style/Type	Early 20th Century American Vernacular/Hipped
Integrity	LR-152 is in good condition but has undergone moderate alteration, resulting in loss of integrity of design and materials.
NRHP Recommendation	LR-152 is not eligible for the NRHP due to a lack of architectural and historic significance and loss of integrity.

Building Description

LR-152 is a northwest facing, one-story, single-family, early twentieth century American Vernacular, hipped, residential building with a raised concrete block foundation, a standing seam metal roof, and exterior walls clad in vinyl siding (**Figure 7.5**). A wooden raised entryway deck leads up from the gravel drive to the main entrance along the façade. A carport was added along the north elevation at some point and is supported with four wood posts and topped with a low roof with a slight incline. Due to trespassing concerns, the east (rear) elevation was not assessed, but aerial images suggest there is a small entryway porch on the south end of this elevation. The windows consist of replacement vinyl sliding windows, replacement double-hung six-over-six vinyl windows, and metal two-light awning windows; some of the windows have fixed shutters. The main entrance is a replacement multi-light two-paneled wood door with metal framed storm door.

From the north to south, the west (front) elevation has a single replacement vinyl sliding window with fixed shutters, three replacement double-hung six-over-six vinyl windows, a single replacement wood paneled door with multi-lights and a metal framed storm door, three additional replacement double-hung six-over-six vinyl windows, and a second replacement vinyl sliding window with fixed shutters. One of the replacement double-hung six-over-six vinyl windows on either side of the main entrance have a single fixed shutter. The basement level has two metal two-light awning windows (see **Figure 7.5**).

The north elevation has two replacement double-hung six-over-six vinyl windows with fixed shutters. The basement level of this elevation was not viewable from the public right-of-way (ROW) (**Figure 7.6**).

The south elevation has one replacement double-hung six-over-six vinyl windows with fixed shutters. The basement level of this elevation was not viewable from the public ROW (**Figure 7.7**).

The east (rear) elevation was not viewable from the public ROW, but as described above, aerial images suggest there's an entryway porch or small addition on the south end of this elevation.

Associated Outbuildings
LR-152 is associated with two outbuildings, both small sheds, that were only partially viewable from the public ROW. The first shed sits to the northeast of the house (see **Figure 7.5**). It is topped with a gable roof covered in corrugated metal and is clad in wood board. A short overhang extends out from the east elevation. The north elevation has a double-hung window with air conditioner insert, and the west elevation has a single double-hung window. The remaining elevations were not viewable. The second shed sits to the south of the house (see **Figure 7.6**). It is topped with a standing seam metal gable roof and appears to be a small frame building. Aerial images suggest both sheds are non-historic buildings.

Current Condition
LR-152 is in good condition but has undergone some alteration, including the replacement of some of the windows, the main entrance, and the exterior wall and roofing material. An attached carport was also added along the north elevation.

NRHP Recommendation
LR-152 is not recommended as eligible for listing in the NRHP due to lack of architectural and historic significance and loss of integrity of design and materials. Under Criterion A, LR-152 is recommended as not eligible because it has no association to any historic events or pattern of events that have greatly influenced the region, state, or nation. Likewise, under Criterion B, LR-152 is recommended as not eligible, as no ties or links were found between the building and any person or persons of cultural or historic significance. Under Criterion C, LR-152 is recommended as not eligible because the building has no elements that make it a unique example of its common architectural type, and the house is not the work of a master builder or craftsperson. Furthermore, the building has undergone several unsympathetic alterations, resulting in a loss of integrity of materials and design. Criterion D is typically considered when assessing archaeological sites, but buildings may qualify if they have the potential to contribute important information to an understanding of history. However, LR-152 does not have the potential to yield additional information regarding local and regional development.

No further work is recommended.

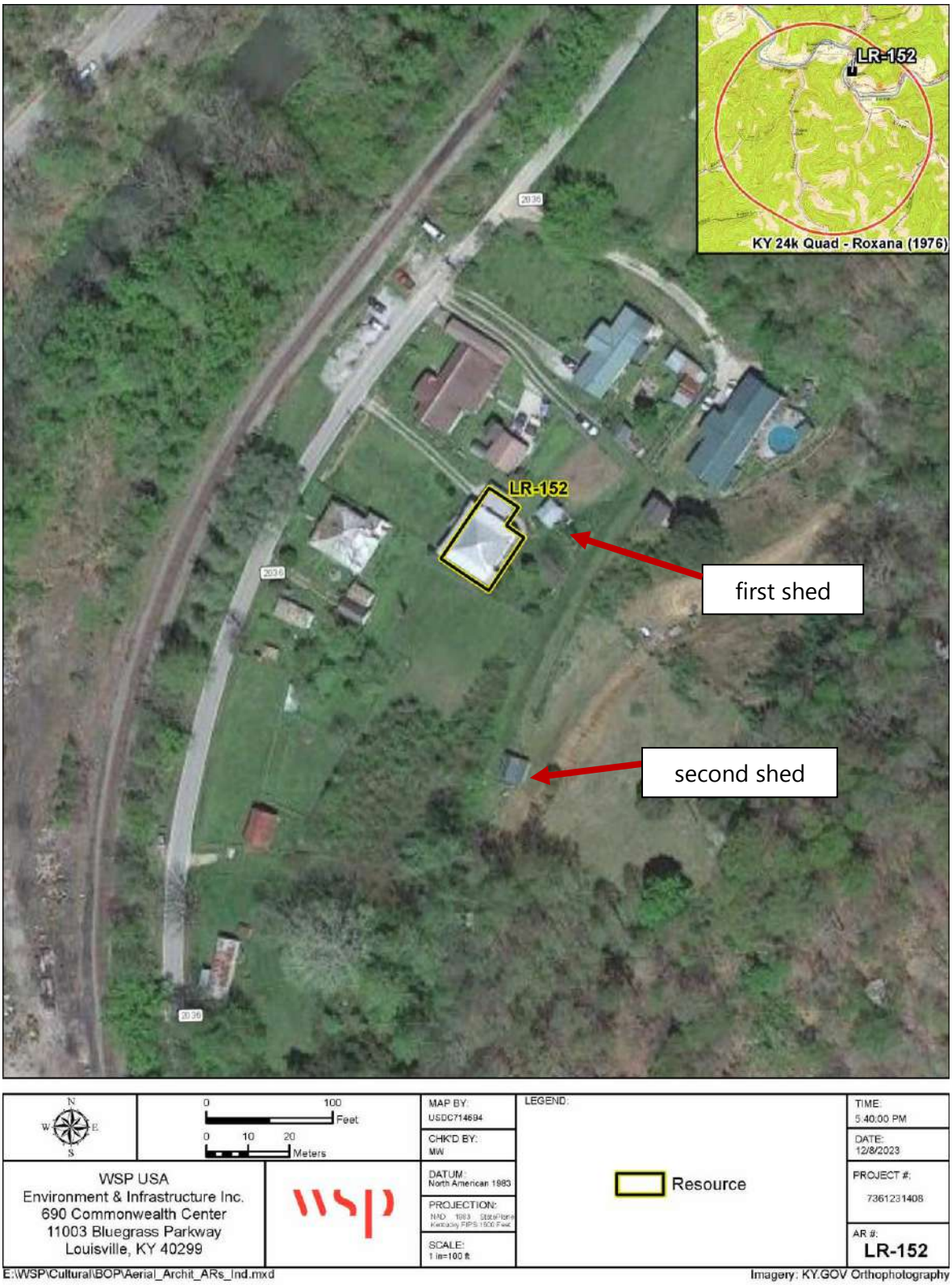

Figure 7.1. Aerial image showing the location of LR-152 and associated sheds.

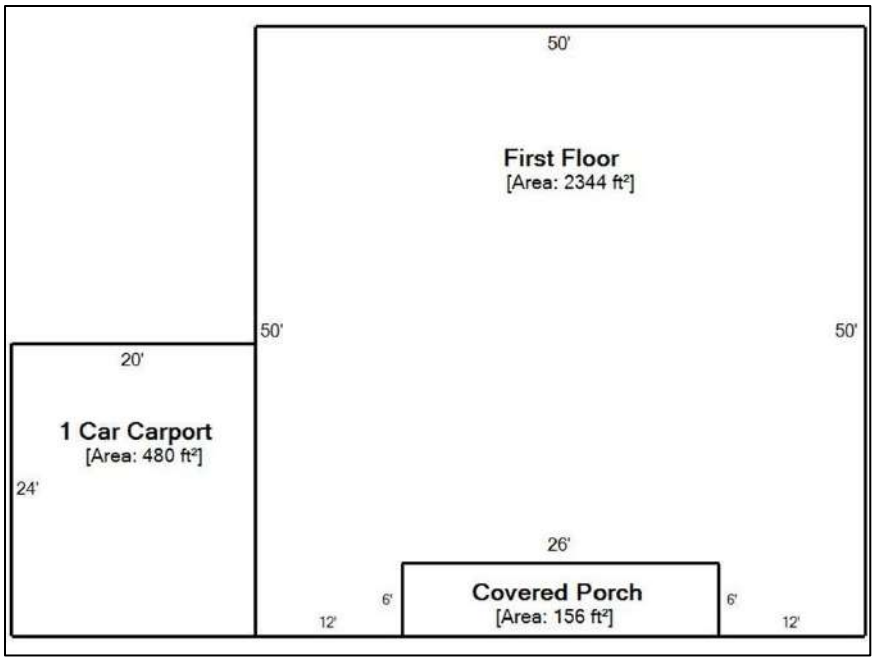

Figure 7.2. Letcher County PVA plan with square footage of LR-152.

Figure 7.3. Building in the vicinity of LR-152 on the 1913 Oven Fork, KY USGS topographic map.

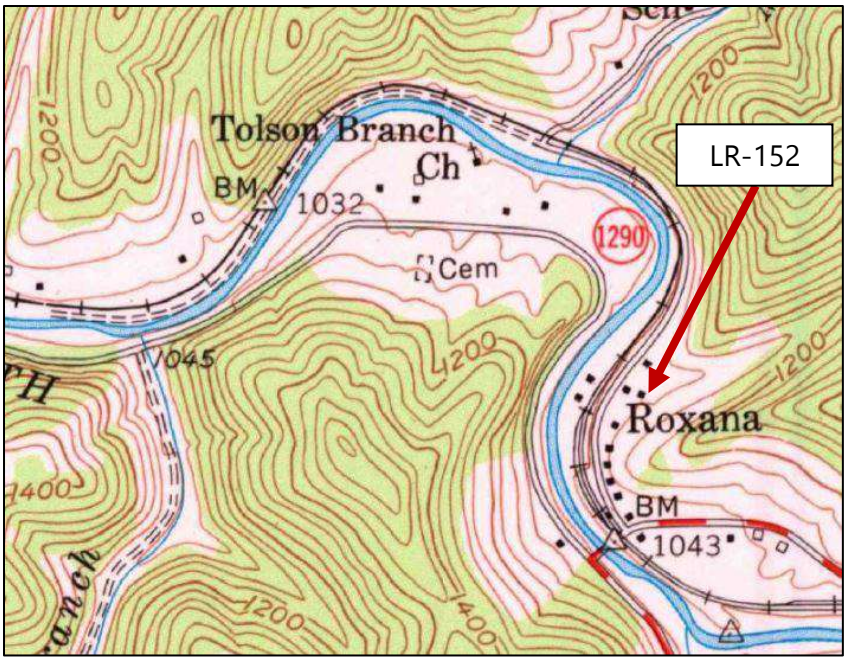

Figure 7.4. Building in the vicinity of LR-152 on the 1954 Roxana, KY USGS topographic map.

Figure 7.5. The west elevation of LR-152, facing southeast; note the roof of the first shed behind the attached carport.

Figure 7.6. The north and west elevations of LR-152, facing south-southeast; note the second shed sitting to the south of the house.

Figure 7.7. The west and south elevations of LR-152, facing east-southeast.

8.0 LR-153: 3967 KY-2036

LR-153 is an early twentieth century American Vernacular residential building located at 3967 KY-2036, Roxana, Letcher County, Kentucky (**Table 8.1**; **Figure 8.1**). The building is bound on the north and south by residential buildings, on the west by KY-2036, and the east by a wooded hillside. The property sits on a level area covered in lawn grasses on the edge of the east side of KY-2036 and is accessed via KY-2036 by a grassy gravel drive. The property is enclosed behind a metal fence with a double gate at the entrance of the gravel drive and a single gate at a short concrete sidewalk that leads up to the house's main entrance. According to the Letcher County, KY PVA, LR-153 is currently owned by Wallace Whitaker and has a total living area of 1,610 sq. ft. (**Figure 8.2**). The PVA lists the original construction date of the house as 1925. A building shown in the general location of LR-153 is illustrated as early as 1913 on topographic mapping and is also shown on the 1915 and 1954 maps (**Figures 8.3** and **8.4**). A building with a similar configuration and in the same location as the house is visible on the 1952 aerial image, which is the earliest aerial found for the area. This suggests LR-153 was constructed by as early as 1913. KHC lists the house as previously recorded in 2013 as the George Whitaker House, but NRHP eligibility was not determined at this time; thus, the building was noted as undetermined. In addition to the house, a garage, summer kitchen, three sheds, a privy, a chicken coop, a barn, and a mobile home were also recorded during this survey, indicating the residence was part of a small rural farmstead.

Table 8.1. Summary of LR-153

Address	3967 KY-2036, Roxana, KY
County	Letcher County
Date of Construction	c. 1910
Square Footage (Living Area)	1,610 square feet
Acreage	20
Owner	Wallace Whitaker
Architectural Style/Type	Early 20th Century American Vernacular/Hipped
Integrity	LR-153 is in good condition but has undergone moderate alteration, resulting in loss of integrity of design and materials.
NRHP Recommendation	LR-153 is not eligible for the NRHP due to a lack of architectural and historic significance and loss of integrity.

Building Description

LR-153 is a northwest facing, one-story, single-family, early twentieth century American Vernacular, hipped, residential building with a raised concrete block foundation, a standing seam metal roof, and exterior walls clad in weatherboard (**Figure 8.5**). A set of concrete steps lead up to the main entrance of the house on the west (front) elevation. Two short concrete pillars with concrete planters adorn each side of the steps. A tall brick chimney sits on the center of the roof slope towards the front elevation. It appears an addition was added to the rear elevation with a small section extending out from the building on the northeast corner of the house. A tall concrete block chimney sits along the roof midline of the projecting section. A porch appears to have been enclosed along the south elevation that is accessed via two single

wood doors with multi-lights and metal framed storm doors. The doors are spaced apart along this elevation and are both accessed via a set of concrete steps with wooden railings. Due to trespassing concerns, the east (rear) elevation was not assessed. The windows consist of a variety of types, including double-hung three-over-one wood windows, wood picture windows with sidelights, double-hung wood windows, and metal two-light awning windows. The main entrance is a single wood door with three-lights and a metal framed storm door. Many of the wall openings are protected by metal awnings.

From the north to south, the west (front) elevation has a pair of double-hung three-over-one wood windows, a single wood door with three-lights and a metal framed storm door, a wood picture window with sidelights, and a second pair of double-hung three-over-one wood windows. All of the wall openings along this section of the elevation have metal awnings (see **Figure 8.5**). The basement level has one single metal two-light awning window. The west elevation of the projecting section of the rear addition has a wood picture window with sidelights, and the basement level has a small wood board door.

The north elevation has three single double-hung three-over-one wood windows and the two on the west end of the elevation have metal awnings (**Figure 8.6**). The north elevation of the projecting section of the rear addition has a pair of double-hung three-over-one wood windows, and the basement level has a small wood board door.

From west to east, the south elevation has a wood picture window with sidelights, a group of three double-hung wood windows, a single wood door with multi-lights and metal framed storm door, a group of seven double-hung wood windows, and a second single wood door with multi-lights and metal framed storm door (**Figure 8.7**). The basement level has two single metal two-light awning windows.

The east (rear) elevation was not viewable from the public ROW.

Associated Buildings

LR-153 is associated with nine other buildings: storage building, garage, open shed, chicken coop, a privy, a shed, a barn, a second shed, and a manufactured home. These associated buildings suggest the property was utilized as a small farmstead at some point. The storage building sits to the south of the house at the end of the access drive. It is topped with a gable roof covered in standing seam metal and is constructed of concrete block. The west elevation has a single two-light window. The remaining elevations were not viewable from the public ROW (**Figure 8.8**). The garage sits next to the storage building and is a frame building topped with a standing seam metal front gable roof (see **Figure 8.8**). The exterior walls are wood board. The west elevation has an overhead garage door, but the remaining elevations were not viewable from the ROW. The open shed sits to the southwest of the house on the south side of the access drive (**Figures 8.9** and **8.10**). The frame building is topped with a shed roof and is supported with wood posts. The chicken coop sits to the southwest of the machine shed next to the privy (see **Figures 8.9** and **8.10; Figure 8.11**). The small frame building has a standing seam metal shed roof with wide eaves and exposed beams and exterior walls constructed of wood board. No wall openings were visible on the building from the ROW. The privy, although smaller, is of similar construction with a standing seam metal shed roof and wood board exterior walls (see **Figures 8.9** - **8.11**). To the southeast of the chicken coop is the first shed, which is also topped with a standing seam metal roof and has exterior walls of wood board (see **Figure 8.9**). The west elevation of the shed has two wood board doors, but the remaining elevations were not viewable from the public ROW.

The barn is located approximately 65 meters to the southwest of the house near the manufactured home and second shed (**Figure 8.10**). The building is topped with a front gable roof covered in standing seam metal and has exterior walls of wood board. The north elevation has a large wood board hinged door, the west elevation has no wall openings, and the east elevation was not viewable. The south elevation was partially obscured but appears to have a large wood board sliding door. The manufactured home sits about 95 meters southwest of the house (**Figure 8.11**). The building has a low-rise side gable roof covered in metal siding and exterior walls clad in corrugated metal. The foundation is concealed behind rusticated metal sheeting. A raised entryway porch sits on the south end of the west (front) elevation. The porch is topped with a shed roof covered in metal siding that is supported by three wood posts. The foundation of the porch is enclosed with the same metal sheeting that conceals the building's foundation. The porch is accessed by a set of wooden steps with a single wooden railing. A section of wooden trellis serves as a railing around the exterior of the porch deck. The west (front) elevation has two single double-hung metal windows and a single door entrance. The south elevation was partially obscured but appears to have a single double-hung metal window, and the north elevation has no wall openings. The east (rear) elevation was not viewable from the ROW. The second shed is located just to the north of the manufactured home (see **Figure 8.11**). It is topped with a standing seam metal shed roof with wide eaves and exposed beams and has exterior walls of concrete block. The west elevation has a single wood board door while the north and south elevations have no wall openings. The east (rear) elevation was not visible from the ROW.

Aerial images were inconclusive in dating the associated buildings, but the 2013 survey listed the garage, privy, first shed, chicken coop, and barn as constructed between 1925-1949. The open shed and storage building were listed as built between 1950-1974, and the second shed and manufactured home between 1975 and 2000. All of the associated buildings are shown as built by 1983 in aerials. The 1952 aerial image is not the best quality but the barn is visible on this image; thus, was constructed prior to 1952.

Current Condition

LR-153 is in fair condition. The roofing material, wall material, and windows show signs of deterioration. The building has also undergone some alteration, such as the replacement of the roofing material, the enclosure of the porch, and the rear addition. The storage building, garage, privy, chicken coop, and first shed all show signs of deterioration and damage on the exterior walls and roofing material. These buildings appear to have undergone little alteration. The open shed is also in fair condition but has likely been altered, such as the replacement and addition of roofing material and addition of wooden trellis along the west elevation. The barn is in fair condition with deterioration visible on the wall and roofing material, and a section of the roof is damaged. The roofing material and some of the wall material appears to have been replaced. The manufactured home appears to have undergone little alteration but is in fair condition with weathering and deterioration evident on the roofing, wall, and foundation materials. The second shed has also undergone little alteration but is in fair condition. Deterioration is notable on the door, roofing material, and the concrete block.

NRHP Recommendation

LR-153 is not recommended as eligible for listing in the NRHP due to lack of architectural and historic significance and loss of integrity of design and materials. Under Criterion A, LR-153 is recommended as not eligible. Although the house is associated with an early twentieth century farmstead in Roxana, the building is not exceptional in reference to this association. Under Criterion B, LR-153 is recommended as not eligible, as no ties or links were found between the building and any person or persons of cultural or historic significance. Under Criterion C, LR-153

is recommended as not eligible because the building has no elements that make it a unique example of its common architectural type, and the house is not the work of a master builder or craftsperson. Furthermore, the building has undergone several unsympathetic alterations, resulting in a loss of integrity of materials and design. Criterion D is typically considered when assessing archaeological sites, but buildings may qualify if they have the potential to contribute important information to our understanding of history. However, LR-153 does not have the potential to yield additional information regarding local and regional development.

The associated buildings are recommended as not eligible for listing in the NRHP due to a lack of historic and architectural significance and loss of material integrity. Like the residential building, the associated outbuildings are recommended as not eligible under Criterion A. The buildings are associated with an early twentieth century farmstead in Roxana, but they are not exceptional in regard to this association. The buildings are recommended as not eligible under Criterion B because they cannot be linked to any person or persons of historical significance. Under Criterion C, the buildings are not eligible because they are not associated with the work of a master builder, have no distinct architectural style, and are not unique examples of their common building types. Furthermore, the outbuildings show signs of deterioration and weathering, resulting in a loss of integrity of materials. Under Criterion D, the associated buildings do not have the potential to contribute to further understanding of local and regional development.

No further work is recommended.

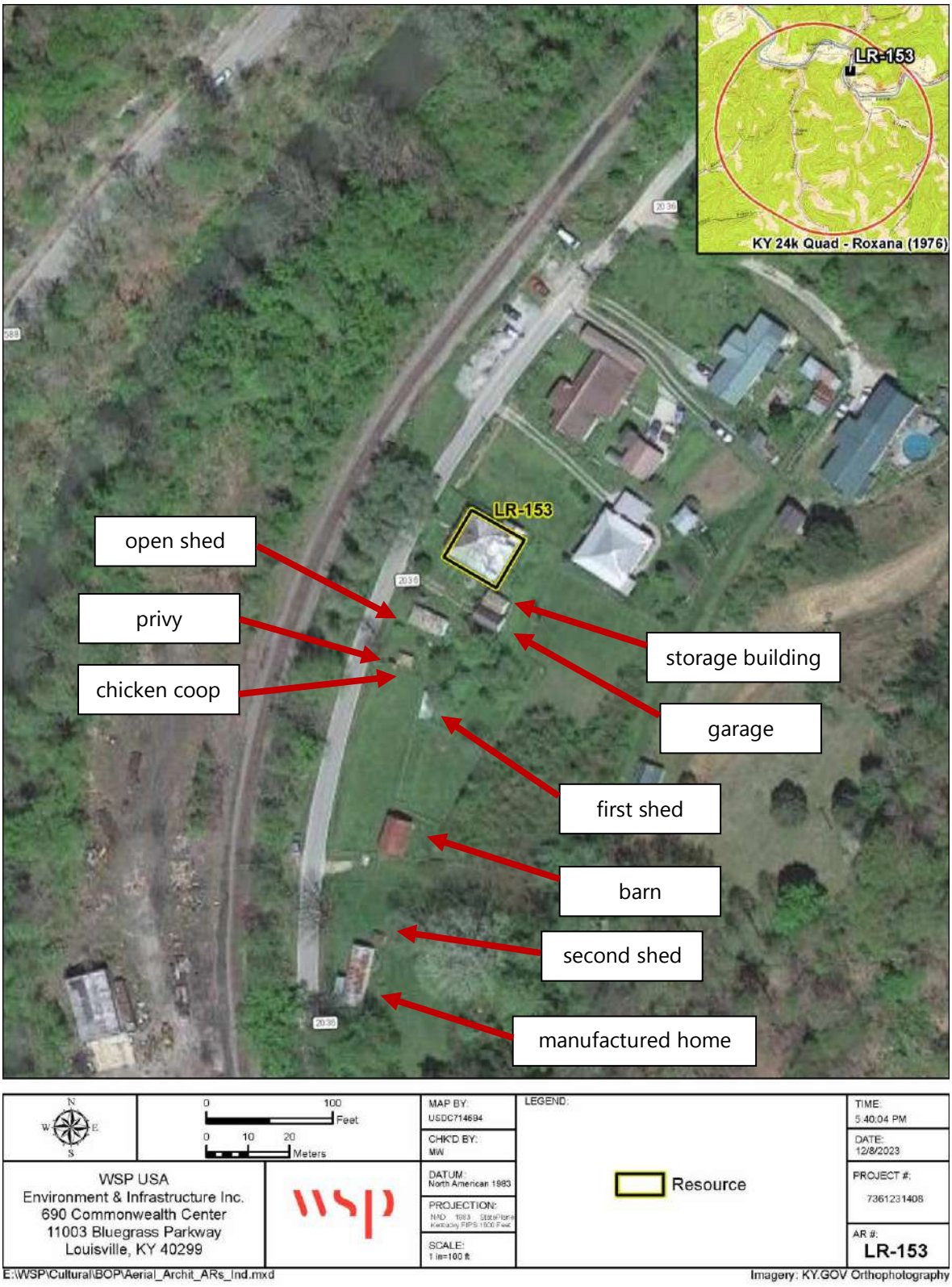

Figure 8.1. Aerial image showing the location of LR-153 and associated outbuildings.

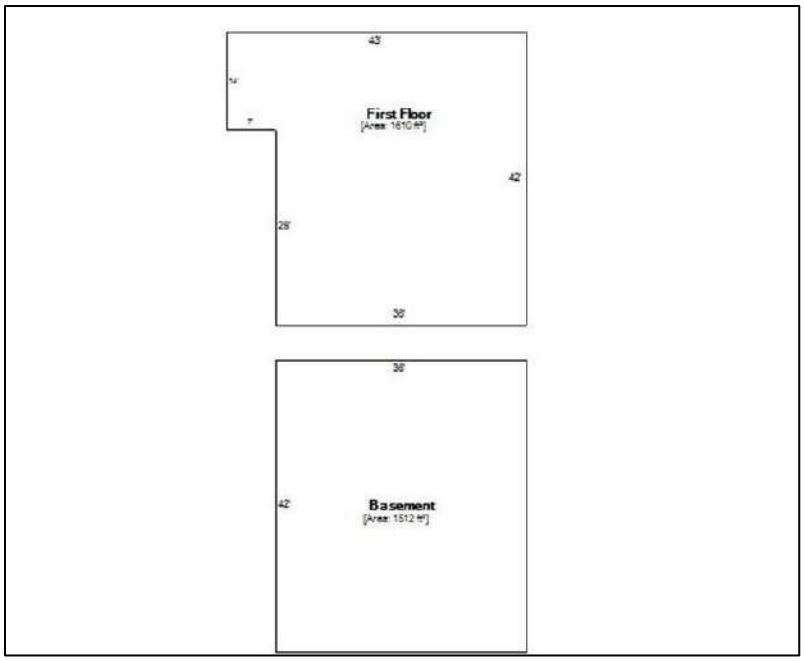

Figure 8.2. Letcher County PVA plan with square footage of LR-153.

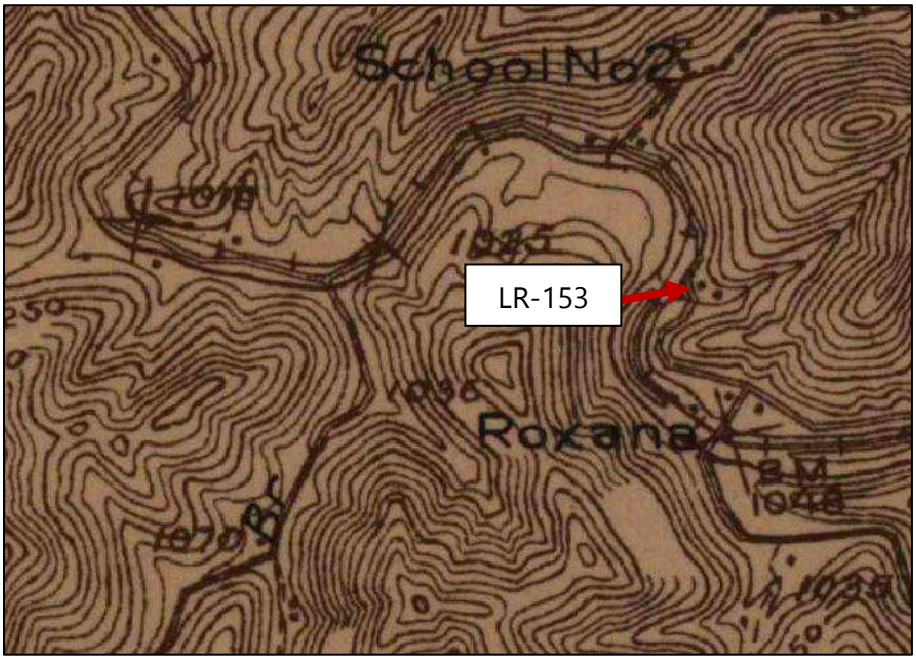

Figure 8.3. Building in the vicinity of LR-153 on the 1913 Oven Fork, KY USGS topographic map.

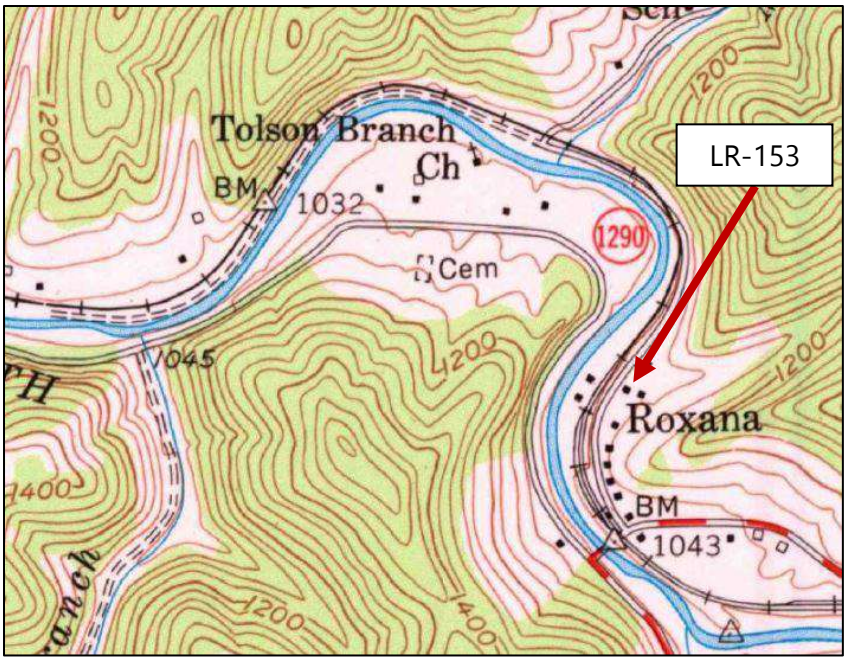

Figure 8.4. Building in the vicinity of LR-153 on the 1954 Roxana, KY USGS topographic map.

Figure 8.5. The west elevation of LR-153, facing southeast.

Figure 8.6. The north and west elevations of LR-153, facing south-southeast.

Figure 8.7. The west and south elevations of LR-153, facing northeast.

Figure 8.8. The west elevations of the storage building and garage associated with LR-153, facing southeast.

Figure 8.9. The north and west elevations of the open shed, the first shed, the chicken house, and the privy, facing southeast.

Figure 8.10. The west elevations of the open shed, the chicken house, and the privy, facing southeast.

Figure 8.11. The north and west elevations of the chicken house and the privy, facing southeast.

Figure 8.12. The north and west elevations of the barn, facing south-southeast.

Figure 8.13. The west elevation of the manufactured home and second shed, facing east.

9.0 LR-245: KY-588

LR-245 is a small family cemetery along KY-245 in Roxana, Letcher County, Kentucky (**Table 9.1**; **Figure 9.1**). The property is bound on the north by KY-588, and on the east, west, and south by a wooded area. The cemetery sits in an open area on a ridgetop along a side slope covered in lawn grasses and surrounded by trees on the south side of KY-588 and is accessed via KY-588 by a gravel and grassy drive. According to the Letcher County, KY PVA, LR-245 is currently owned by Bernadine Miracle. The cemetery is first illustrated on topographic mapping in 1954 (USGS) (**Figure 9.2**). The cemetery is not visible on the 1952 aerial, which is the earliest aerial image available, but this may be due to poor clarity. The cemetery was previously recorded by Cardno in 2017 and referred to as the Frazier Cemetery (Brann 2017). The earliest internment identified dates to 1949, which corresponds with the 2017 survey.

Table 9.1. Summary of LR-245

Address	KY-588 (37.113776, -82.954281)
County	Letcher County
Date of Construction	c. 1949 (earliest marked internment)
Number of Interments	Approximately 12 headstones (possible more unmarked)
Owner	Bernadine Miracle
Architectural Type	Mid-20th Century Family Cemetery
Integrity	LR-245 is in good condition.
NRHP Recommendation	LR-245 is not eligible for the NRHP due to lack of architectural and historic significance.

Cemetery Description

LR-245 is a small family cemetery in an open area along a ridgetop on a side slope (**Figure 9.3**). The cemetery's boundaries are marked with chain link fencing and covers an approximate area of 1,900 square feet (0.04 acres). The headstones are laid out within uniform rows although there appears to be gaps which may indicate unmarked graves or reserved spots for future internments (**Figure 9.4**). Like LR-245, family cemeteries were most often established on high, well-drained property (Potter and Boland 1992). This type of cemetery became popular as settlement patterns became more dispersed while transportation remained difficult (Potter and Boland 1992). During the time of the survey, approximately 12 marked graves were recorded, with the earliest noted being from 1949 and the most recent from 2015. Additional unmarked internments may exist but no obvious depressions were observed. The headstones consisted of upright and flat types constructed of marble or granite (**Figures 9.5** - **9.7**). The surnames recorded included Frazier, Messer, Everidge, and Cook. The earliest two internments located were from the Frazier family. According to online research, the cemetery is known as Ira Frazier Cemetery whose home once stood in the vicinity (Findagrave 2023; Letcher County Cemetery Records ND). Frazier is the most abundant surname recorded within the cemetery. Eight headstones were previously documented with the earliest dating to 1949, but this list appears to not include late twentieth century and twenty-first century internments (Letcher County Cemetery Records ND). The website Find a Grave lists nine internments within the cemetery with a date range from 1949 to 1984 (Findagrave 2023). Like the current survey, Cardno recorded 12 marked internments in 2017, dating from 1949 to 2015 (Brann 2017).

Current Condition
At the time of the survey, LR-245 was in good condition and appeared well maintained. Many of the headstones do exhibit signs of weathering from exposure, but overall, the markers are in good condition (see **Figures 9.5** - **9.7**). The cemetery appears to be active.

NRHP Recommendation
LR-245 is recommended as not eligible for NRHP listing due to a lack of historic or architectural significance based on the four NRHP criteria and themes identified during research. As *National Register Bulletin #41* states, "cemeteries and graves are among those properties that ordinarily are not considered eligible for inclusion in the National Register of Historic Places unless they meet special requirements. To qualify for listing under Criteria A, B, C, or D a cemetery or grave must meet not only the basic criteria, but also the special requirements of Criteria Considerations C or D, relating to graves and cemeteries" (Potter and Boland 1992).

Under Criterion A, the cemetery is not associated with any known significant event, nor does it provide information on the role of any local industry or agricultural development. The cemetery does not have any historically significant connections, therefore it is not considered significant under Criterion B. Under Criterion C, the resource does not contain monuments that are of architectural significance nor does it appear to be a special built historic landscape. Under Criterion D, the cemetery does not yield information pertaining to any previously mentioned criteria or themes. Given these factors, it is recommended that LR-245 is not eligible for listing on the NRHP.

No further work is recommended.

Figure 9.1. Aerial image showing the location of LR-245.

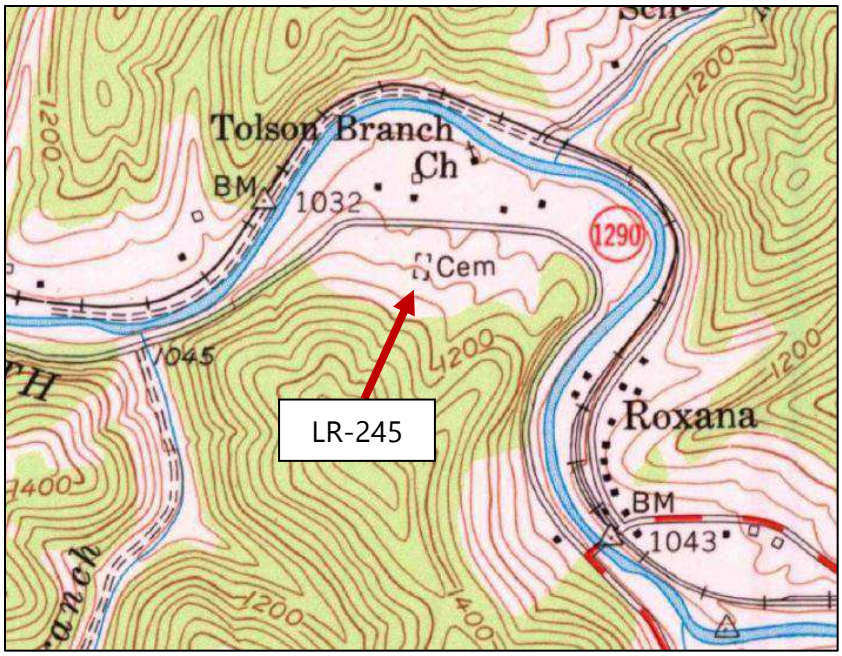

Figure 9.2. LR-245 on the 1954 Roxana, KY USGS topographic map.

Figure 9.3. View of LR-245, facing south.

Figure 9.4. View of LR-245, facing south.

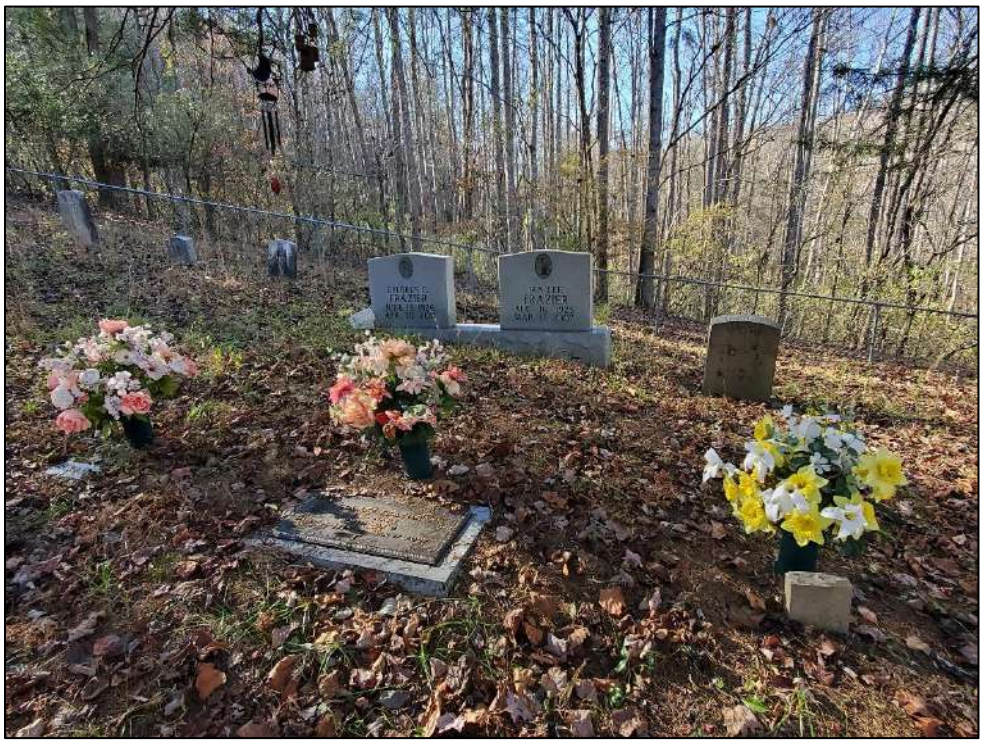

Figure 9.5. Example of headstones found within LR-245.

10.0 LR-318 : CR-1728

LR-318 is a mid to late twentieth century industrial building located along CR-1728, Roxana, Letcher County, Kentucky (**Table 10.1; Figure 10.1**). The property is bound on the north by a paved area, on the south by CR-1728 and railroad tracks, east by a wooded area, and on the west by railroad tracks and CR-1728. The building sits on a concrete parking area on level ground that was mechanically cut into the hillside, and the building is accessed via a concrete drive that extends between the parking area and CR-1728. The building is associated with the parking area, concrete remnants of a former conveyor belt for transporting coal, and a large non-historic warehouse. According to the Letcher County, KY PVA, LR-318 is currently owned by Kentucky River Properties LLC. The PVA does not list the original construction date of LR-318. The deed history indicates the industrial site was related to coal mining. Enterprise Mining Co LLC and Kentucky Processing Corporation are both listed as previous owners. Aerial images also show a conveyor belt and large quantities of coal at the location in 1983 and 1995; the coal is not present after 2004. A building with a similar configuration and in the location of LR-318 is illustrated as early as 1983 on historical aerial images but not on the 1952 aerial, which is the earliest image available for the area. A building is also illustrated on the 1913 and 1915 Oven Fork and Whitesburg topographic maps and a building and barn on the 1954 Roxana topographic map. The early building is likely a former residential building in the general vicinity of LR-318, and the 1954 building is also likely a former residential building and barn. The 1952 aerial image shows buildings that resemble houses and barns in the vicinity. Thus, LR-318 was constructed at some point between 1954 and 1983. Surface or strip mining expanded in eastern Kentucky with the development of large-scale excavation and transportation equipment in the 1950s, and the mining industry in the region experienced an uptick in demand during the 1970s. The drastic modification of the landscape surrounding LR-318 suggests surface mining was utilized at the location.

Table 10.1. Summary of LR-318

Address	CR-1728 (37.113281, -82.963472)
County	Letcher County
Date of Construction	c. 1965
Square Footage (Living Area)	--
Acreage	350.16
Owner	Kentucky River Properties LLC
Architectural Style/Type	Mid-Late 20th Century Industrial
Integrity	LR-318 is in fair condition and has undergone little alteration, but its neglected state has negatively impacted its integrity of materials.
NRHP Recommendation	LR-318 is not eligible for the NRHP due to loss of integrity and lack of architectural and historical significance.

Building Description

LR-318 is a north-northeast facing, one-story, mid to late twentieth century coal-related industrial building (**Figure 10.2**). The small concrete block building has a concrete cap roof. From east to west, the north (front) elevation has a single metal door, a small metal vent, a single double-hung window, a second small metal vent, and a second metal door (see **Figure**

10.2; **Figure 10.3**). The east elevation has a single small metal vent, and the west elevation has no wall openings (see **Figure 10.3; Figure 10.4**). The south (rear) elevation has two small metal vents (**Figure 10.5**). The interior has exposed concrete block walls and concrete flooring. The floor was covered in debris and trash. Fluorescent lighting fixtures hang from the ceiling with one light fixture broken and hanging (**Figure 10.6**).

Associated Outbuilding
LR-318 is associated with the concrete remnants of a former conveyor belt for transporting coal and a large non-historic warehouse. The concrete remnants sit to the east and northeast of the building (**Figure 10.7**). The conveyor belt and LR-318 were likely built at the same time. Much of the belt structure was removed between 2006 and 2008. The large warehouse sits to the east of LR-318. The building is rectangular in plan, topped with a low-rise side gable roof covered in metal siding, sits on a raised poured concrete foundation, and has exterior walls clad in corrugated metal. The north (front) elevation has a large overhead garage door of corrugated metal, a large metal sliding door, and a large, enclosed wall opening (**Figure 10.8**). The large metal sliding door extends to the ground and the enclosed opening did also, but the overhead garage door sits even with the raised concrete foundation. The east elevation has a small metal door on the north end along the foundation (see **Figure 10.8**). A small concrete block section with a concrete cap extends off the foundation on the south end of this elevation. The main level of this elevation has no wall openings. The west elevation has only a single metal door along the north end of the foundation (**Figure 10.9**). The south (rear) elevation has no wall openings. According to aerial images, the building was constructed between 1983 and 1995.

Current Condition
LR-318 is in fair condition. Structurally the building appears in good condition but has been neglected. One window is damaged with glass broken, and a vent along the rear elevation is damaged but has been boarded up with plywood from the interior (see **Figure 10.6**). The doors are open and the interior is strewn with debris; moisture can easily seep inside the building, causing further damage.

The coal conveyor belt is in ruinous condition with only remnants of the structure remaining (see **Figure 10.7**).

NRHP Recommendation
LR-318 was evaluated for National Register eligibility using the three NRHP criteria identified in this research. LR-318 is recommended as not eligible for listing in the NRHP due to a lack of architectural and historical significance and loss of integrity. Although the building is related to the coal industry in Letcher County, LR-318 does not embody an important aspect of this history. Therefore, LR-318 is not eligible under Criterion A. LR-318 is recommended as not eligible under Criterion B because it cannot be linked to any person or persons who are historically significant to the region, state, or nation. Under Criterion C, the resource is not eligible because the building is not the work of a master builder or craftsperson and is not an exemplary example of a coal-related industrial building. Furthermore, the building shows signs of neglect, which has negatively impacted the building's integrity of materials.

The associated coal conveyor belt is recommended as not eligible for listing in the NRHP due to a lack of historic and architectural significance and loss of integrity. Although the structure is related to the coal industry in Letcher County, only remnants of the coal conveyer belt remain. In addition, the location is no longer utilized for coal-related industrial purposes. These combined factors result in a loss of integrity of design, materials, setting, feeling, and association. Therefore, the conveyor belt no longer embodies this history, and as a result, is not eligible

under Criterion A. The conveyor belt is recommended as not eligible under Criterion B because it cannot be linked to any person or persons of historical significance. Under Criterion C, the structure is not eligible because it is not associated with the work of a master builder, has no distinct architectural style, and is only remnants of the former structure. Criterion D is typically considered when assessing archaeological sites, but buildings may qualify if they have the potential to contribute important information to our understanding of history. However, LR-318 does not have the potential to yield additional information regarding local and regional development.

No further work is recommended.

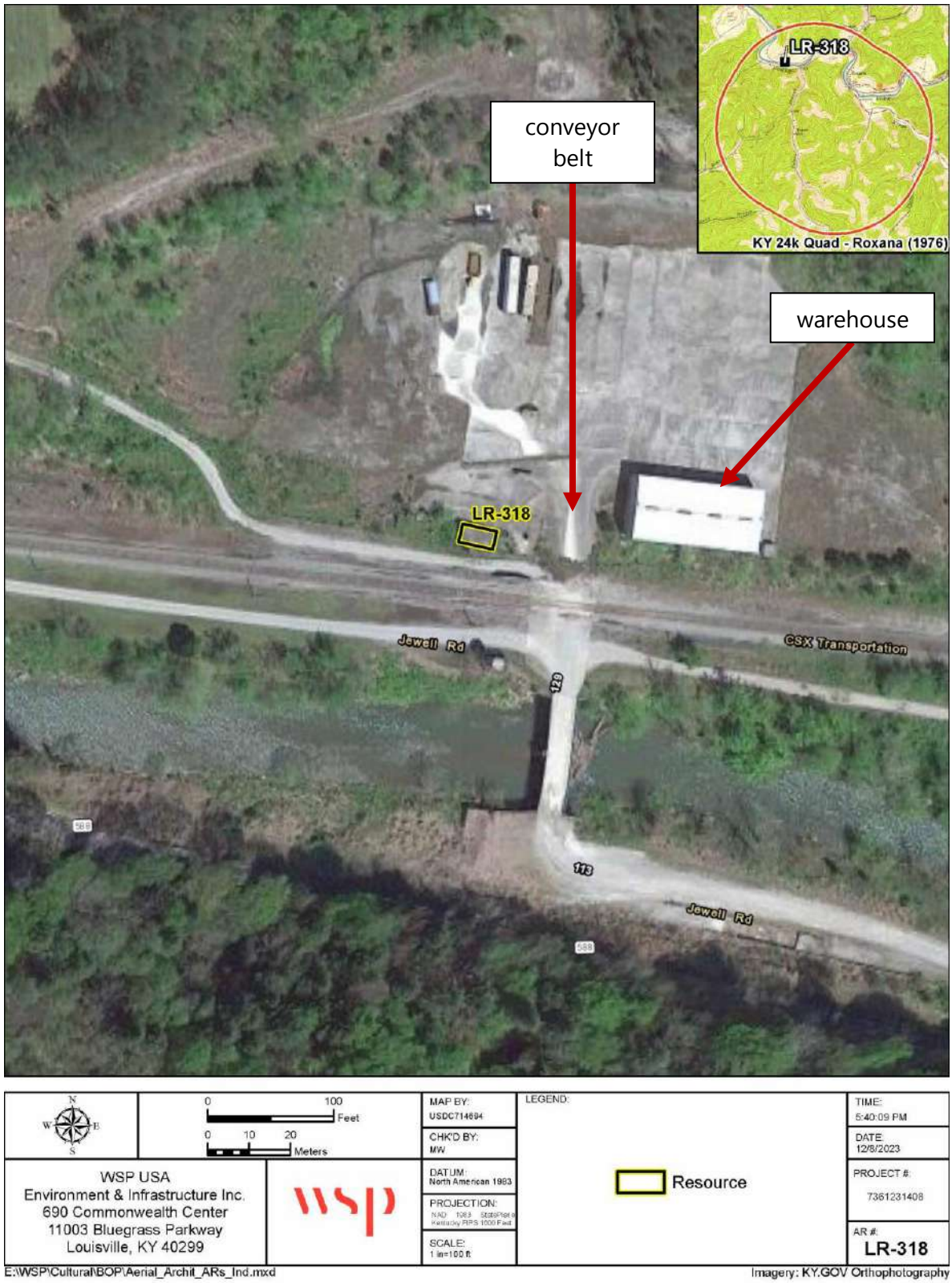

Figure 10.1. Aerial image showing the location of LR-318 and associated warehouse and conveyor belt remnants.

Figure 10.2. The north elevation of LR-318, facing south.

Figure 10.3. The east and north elevations of LR-318, facing southwest.

Figure 10.4. The north and west elevations of LR-318, facing southeast.

Figure 10.5. The south and east elevations of LR-318, facing northwest.

Figure 10.6. The interior of LR-318.

Figure 10.7. View of industrial property surrounding LR-318, facing southwest; note the remnants of the conveyor belt.

Figure 10.8. The north and east elevations of the warehouse associated with LR-318, facing southwest.

Figure 10.9. The west elevation of the warehouse associated with LR-318, facing east.

11.0 LR-319: CR-1728

LR-319 is a small community or large family cemetery along CR-1728 in Roxana, Letcher County, Kentucky (**Table 11.1**; **Figure 11.1**). The property is bound on the north, east, and west by a wooded area and the south by a former industrial area. The cemetery sits in an open area on a ridgetop along a side slope covered in lawn grasses and surrounded by trees on the north side of CR-1728 and is accessed via CR-1728 by a long winding gravel and grassy drive. According to the Letcher County, KY PVA, LR-319 is currently owned by Cemetery Hampton. The cemetery is first illustrated on topographic mapping in 1954 (USGS) (**Figure 11.2**). Aerial images show the cemetery expanded to about its current size by 1983. The next available image is from 1952 in which the cemetery appears smaller. This suggests the cemetery was established prior to 1952 and has remained active throughout the twentieth and into the twenty-first centuries.

Table 11.1. Summary of LR-319

Address	CR-1728 (37.11453, -82.96479)
County	Letcher County
Date of Construction	c. 1893 (earliest marked internment)
Number of Interments	Approximately 90 headstones (possible more unmarked)
Owner	Cemetery Hampton
Architectural Type	Late 19th Century Cemetery
Integrity	LR-319 is in good condition.
NRHP Recommendation	LR-319 is not eligible for the NRHP due to lack of architectural and historic significance.

Cemetery Description

LR-319 is a cemetery in an open area along a ridgetop on a side slope (**Figure 11.3**). The cemetery's boundaries are unmarked with fencing or other markers but covers an approximate area of 18,847.35 square feet (0.43 acres). The headstones are laid out within uniform rows although there appears to be gaps and sections of surnames lumped together (**Figure 11.4**). The gaps may indicate unmarked graves or reserved spots for future internments. The cemetery likely began as a family cemetery, which often were established on high, well-drained property (Potter and Boland 1992). This type of cemetery became popular as settlement patterns became more dispersed while transportation remained difficult (Potter and Boland 1992). However, the cemetery was likely later expanded to include other families from the surrounding community. During the time of the survey, approximately 90 marked graves were recorded, with the earliest noted being from 1893 and the most recent from 2016. Additional unmarked internments may exist but no obvious depressions were observed. The headstones consisted of upright and flat types constructed of marble or granite (**Figures 11.5** - **11.7**). The surnames recorded included Fields, Cornet, Frazier, Stamper, Caudill, Whitaker, Amburgey, Wright, Millican, Stewart, Brown, Ison, Sparks, and Woods. The earliest two internments located were from the Whitaker family. According to online research, the cemetery is known as Mose Whitaker Cemetery whose homestead once stood in the vicinity. William Caudill's homestead also once stood in the general area (Findagrave 2023; Letcher County Cemetery Records ND). Whitaker and Caudill are two of the more abundant surnames recorded within the cemetery during the survey. Eighty-six headstones were previously documented with the earliest dating to

1893, but this list appears to not include late twentieth century and twenty-first century internments (Letcher County Cemetery Records ND). The website Find a Grave lists 102 internments within the cemetery with a date range from 1893 to 2012 (Findagrave 2023).

Current Condition
At the time of the survey, LR-319 was in good condition and appeared well maintained. Many of the headstones do exhibit signs of weathering from exposure and a few are broken, but overall, the markers are in good condition (see **Figures 11.5** - **11.7**). The cemetery appears to be active.

NRHP Recommendation
LR-319 is recommended as not eligible for NRHP listing due to a lack of historic or architectural significance based on the four NRHP criteria and themes identified during research. As *National Register Bulletin #41* states, “cemeteries and graves are among those properties that ordinarily are not considered eligible for inclusion in the National Register of Historic Places unless they meet special requirements. To qualify for listing under Criteria A, B, C, or D a cemetery or grave must meet not only the basic criteria, but also the special requirements of Criteria Considerations C or D, relating to graves and cemeteries” (Potter and Boland 1992).

Under Criterion A, the cemetery is not associated with any known significant event, nor does it provide information on the role of any local industry or agricultural development. The cemetery does not have any historically significant connections, therefore it is not considered significant under Criterion B. Under Criterion C, the resource does not contain monuments that are of architectural significance nor does it appear to be a special built historic landscape. Under Criterion D, the cemetery does not yield information pertaining to any previously mentioned criteria or themes. Given these factors, it is recommended that LR-319 is not eligible for listing on the NRHP.

No further work is recommended.

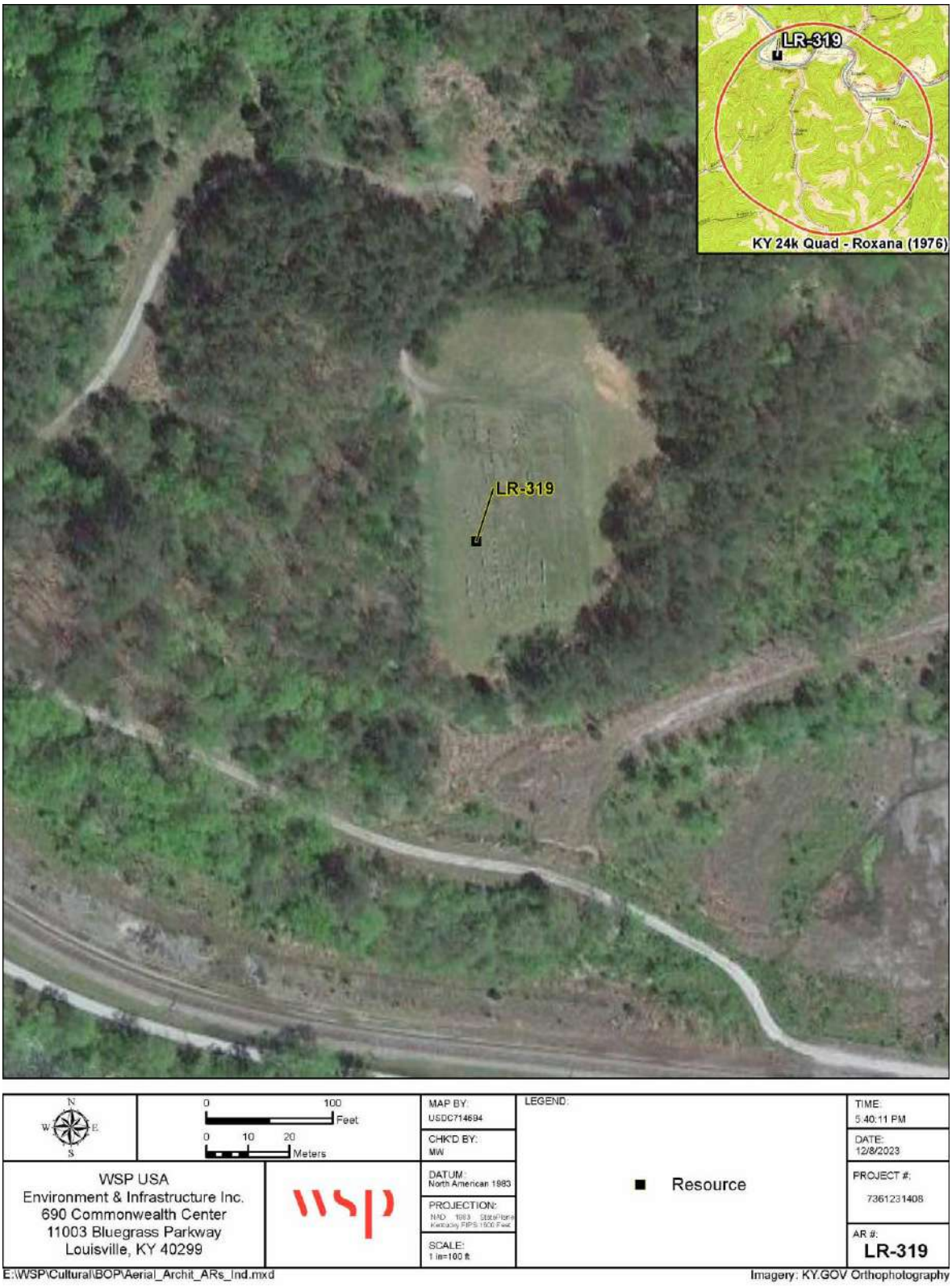

Figure 11.1. Aerial image showing the location of LR-319.

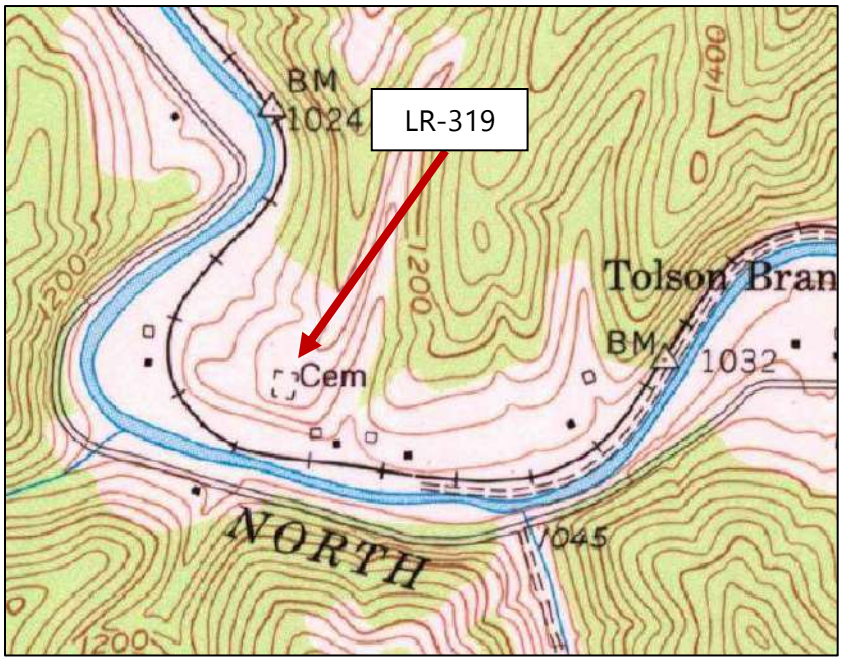

Figure 11.2. LR-319 on the 1954 Roxana, KY USGS topographic map.

Figure 11.3. View of LR-319, facing southeast.

Figure 11.4. View of LR-319, facing south.

Figure 11.5. Example of headstones found within LR-319.

Figure 11.6. Example of headstones found within LR-319.

Figure 11.7. Example of headstones found within LR-319; note the center broken headstone.

12.0 LR-320: 9951 KY-588

LR-320 is a mid-twentieth century American Vernacular residential building located at 9951 KY-588, Roxana, Letcher County, Kentucky (**Table 12.1**; **Figure 12.1**). The building is bound on the north by KY-588, and to the south, east, and west by wooded areas. The property sits on a ledge along a side slope covered in lawn grasses on the south side of KY-588 and is accessed via KY-588 by a gravel drive. The building is associated with a shop and/or storage building, a small shed, and an above ground pool. According to the Letcher County, KY PVA, LR-320 is currently owned by Whita Annabelle, Andy, & Billy Wayne Wright has a total living area of 1,440 sq. ft. (**Figure 12.2**). The PVA lists the original construction date of the house as 1950. A building shown in the general location of LR-320 is illustrated as early as 1913 on topographic mapping and is also shown on the 1915 and 1954 maps (**Figures 12.3** and **12.4**). A building with a similar configuration and in the same location as the house is visible on the 1983 aerial image but not on the 1952 image, which is the earliest aerial found for the area. This suggests LR-320 was constructed by as early as 1913 but the PVA's construction date of 1950 indicates LR-320 replaced a previous building.

Table 12.1. Summary of LR-320

Address	9951 KY-588, Roxana, KY
County	Letcher County
Date of Construction	c. 1950
Square Footage (Living Area)	1,440 square feet
Acreage	4
Owner	Annabelle, Andy, & Billy Wayne Wright
Architectural Style/Type	Mid-20th Century American Vernacular/Side Gable
Integrity	LR-320 is in good condition but has undergone some alteration.
NRHP Recommendation	LR-320 is not eligible for the NRHP due to a lack of architectural and historic significance and loss of integrity.

Building Description

LR-320 is a northeast facing, one-story, single-family, mid-twentieth century American Vernacular, side gable, residential building with a raised concrete block foundation, a replacement standing seam metal roof, and exterior walls clad in wood siding (**Figure 12.5**). A raised concrete block full width porch extends along the north (front) elevation. The porch is protected by a standing seam metal overhang that extends out from the roofline and is supported with several wood posts. A wooden balustrade wraps around the exterior of the wood board deck. The porch is accessed via a set of concrete steps with metal railings, and a wooden picket gate intersects the access steps and porch deck. A side entryway porch adorns the south end of the east elevation. The porch was only partially viewable from the public ROW but has a standing seam metal overhang supported with wood posts with a wooden balustrade around the porch deck. Due to trespassing concerns, the east (rear) elevation was not assessed. The windows consist of replacement vinyl sliding windows, replacement double-hung vinyl windows, replacement vinyl picture window, and metal sliding and awning windows. The entrances appear to be wood doors with multi-lights and exterior metal framed storm doors.

From the east to west, the north (front) elevation has a single replacement vinyl double-hung window, a single wood door with metal framed storm door, a single replacement vinyl double-hung window, a second single wood door with metal framed storm door, and a third single replacement vinyl double-hung window (see **Figure 12.5**). Along the basement level, the elevation has a single metal awning window, a single wood door with multi-lights and a metal framed storm door, a single metal awning window, a second single wood door with multi-lights and a metal framed storm door, and a third single metal awning window.

From north to south, the west elevation has a single replacement vinyl double-hung window, a replacement vinyl sliding window, a second replacement vinyl double-hung window, and a single replacement paneled wood door inset with multi-lights (**Figure 12.6**). The basement level has three metal awning windows.

The east elevation has a single door, a replacement vinyl sliding window, a replacement vinyl picture window with fixed center window flanked on either side by single double-hung window (**Figure 12.7**). The basement level of the east elevation was partially obscured by the entryway porch and vegetation but three metal awning windows were observed.

The south (rear) elevation was not viewable from the public ROW.

Associated Outbuildings
LR-320 is associated with a frame storage or workshop building, a small frame shed, and an aboveground pool. The storage or workshop building sits to the west of the house (**Figure 12.8**). It is topped with a low-rise gable, corrugated metal roof with wide eaves and exposed beams and sits on a continuous concrete block foundation. The exterior walls are clad in prefabricated wood panels. A small non-historic addition was added on the west side of the building that sits on wood piers, is topped with the main roof, and clad in matching prefabricated wood panels. The windows consist of single double-hung wood types on the original section and single two-over-two vinyl types on the addition. A full width porch extends along the original section of the façade. The porch has a wood board deck with a wooden balustrade along the outer edge, rests on wood posts, and is accessed via a set of wood steps with wooden railings from the east end. An overhang extends out from the main roof to cover the porch, which is supported with three wood posts. From east to west, the north (front) elevation of the original section has a single double-hung wood window, a single wood paneled door inset with three-lights, and a single double-hung wood window (**Figure 12.9**). The north (front) elevation of the addition has a single two-over-two vinyl double-hung window. The east elevation has a pair of two metal sliding doors and a single rectangular metal vent near the peak of the roof (see **Figure 12.8**). The west elevation has a single two-over-two double-hung vinyl window and above the window is a single rectangular metal vent (**Figure 12.10**). A building with a similar plan and in the general location as the storage/workshop building is shown as early as 1983 on aerial images. The next available aerial image of 1952 does not show the building, suggesting the storage/workshop was built between 1952 and 1983. The Letcher County PVA lists the building as constructed in 1970.

The frame shed sits across the road from LR-320 (**Figure 12.11**). The small building is topped with a standing seam metal gable roof and the walls are constructed of horizontal-laid wood board. The construction date of the shed is uncertain, but construction materials suggest a historic building.

The above ground pool is not historic and sits to the west of the house between the house and the storage/workshop building (see **Figure 12.5**).

Current Condition
LR-320 is in good condition but has undergone moderate alteration, including the replacement of most of the windows and the roofing material.

The storage/workshop building is in good condition but was unsympathetically altered with the addition on the west elevation. The shed is in fair condition. The wall material is damaged in places and some boards are missing. Also, the roofing material shows signs of weathering. The non-historic above ground pool appears to be in good condition.

NRHP Recommendation
LR-320 is recommended as not eligible for listing in the NRHP due to lack of architectural and historic significance and loss of integrity of materials. Under Criterion A, LR-320 is recommended as not eligible because it has no association to any historic events or pattern of events that have greatly influenced the region, state, or nation. Likewise, under Criterion B, LR-320 is recommended as not eligible, as no ties or links were found between the building and any person or persons of cultural or historic significance. Under Criterion C, LR-320 is recommended as not eligible because the building has no elements that make it a unique example of its common architectural type, and the house is not the work of a master builder or craftsperson. Furthermore, the building has undergone unsympathetic alterations, resulting in a loss of integrity of materials. Criterion D is typically considered when assessing archaeological sites, but buildings may qualify if they have the potential to contribute important information to our understanding of history. However, LR-320 does not have the potential to yield additional information regarding local and regional development.

The storage/workshop building is recommended as not eligible for listing in the NRHP due to lack of architectural and historic significance and loss of integrity of design. Under Criterion A, building is recommended as not eligible because it has no association to any important historic events or pattern of events. Under Criterion B, the building is recommended as not eligible, as no ties or links were found between the building and any person or persons of cultural or historic significance. Under Criterion C, the building is recommended as not eligible because the building has no elements that make it a unique example of its architectural type and is not the work of a master builder or craftsperson. Furthermore, the building has undergone unsympathetic alterations, resulting in a loss of integrity of design. Under Criterion D, the building does not have the potential to contribute additional information about local and regional development.

The associated shed is recommended as not eligible for listing in the NRHP due to lack of architectural and historic significance and loss of integrity of materials. Under Criterion A, building is recommended as not eligible because it has no association to any important historic events or pattern of events. Under Criterion B, the building is recommended as not eligible, as no ties or links were found between the building and any person or persons of cultural or historic significance. Under Criterion C, the building is recommended as not eligible because it has no elements that make it a unique example of its architectural type, which is a common vernacular type found throughout the region. Furthermore, the building has undergone unsympathetic alterations, resulting in a loss of integrity of materials. The building is also not eligible under Criterion D, as it has no potential to contribute to further understanding of local and regional development.

No further work is recommended.

Figure 12.1. Aerial image showing the location of LR-320 and associated buildings and above-ground pool.

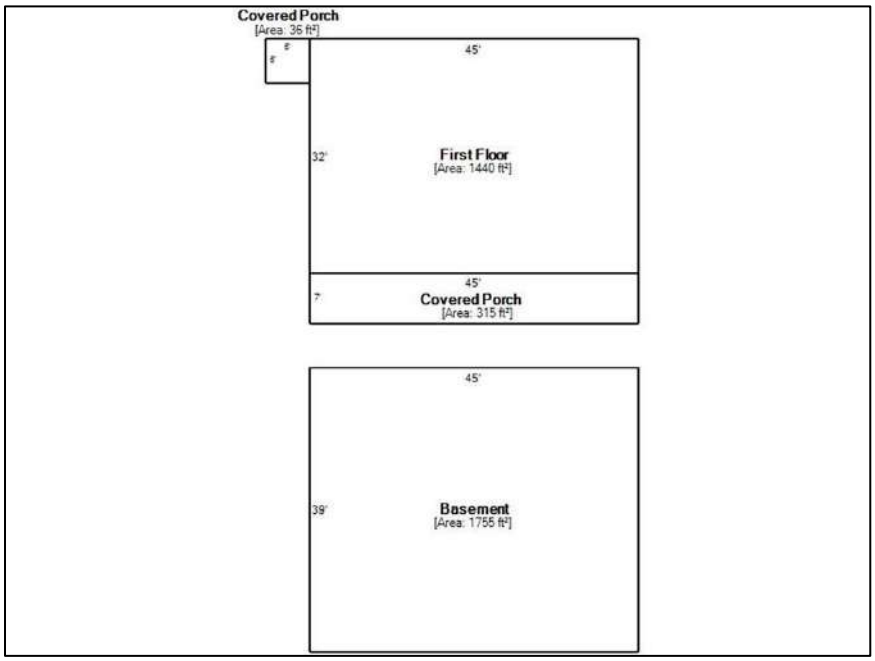

Figure 12.2. Letcher County PVA plan with square footage of LR-320.

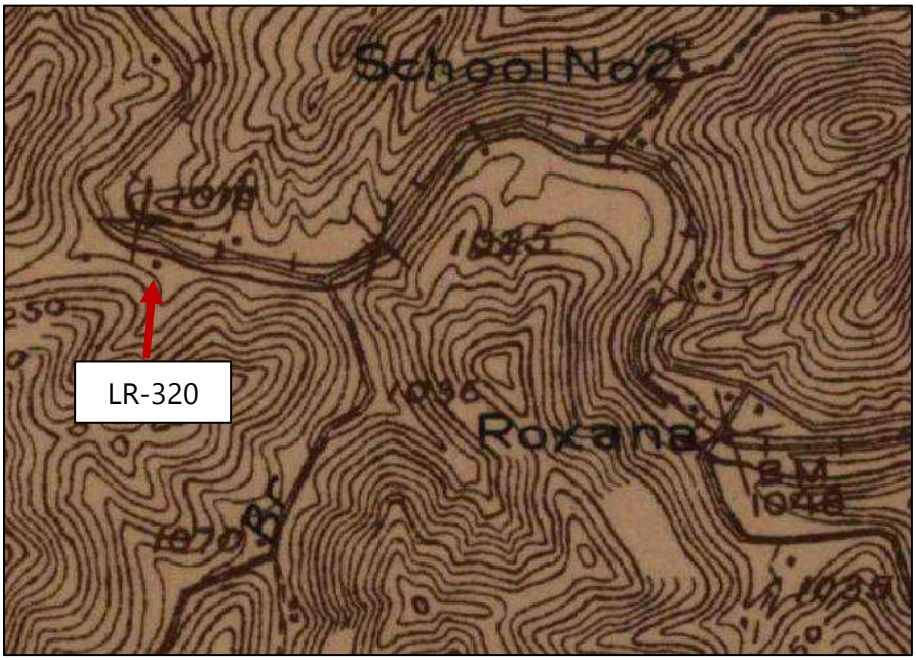

Figure 12.3. Building in the vicinity of LR-320 on the 1913 Oven Fork, KY USGS topographic map.

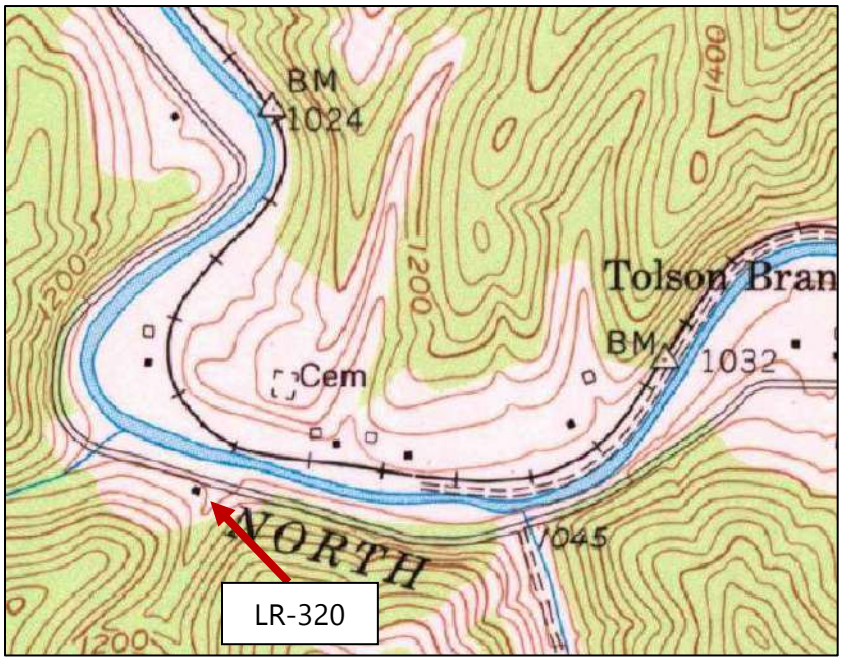

Figure 12.4. Building in the vicinity of LR-320 on the 1954 Roxana, KY USGS topographic map.

Figure 12.5. The north (front) elevation of LR-320, facing southwest; note the aboveground pool located to the west of the building.

Figure 12.6. The north and west elevations of LR-320, facing east-southeast.

Figure 12.7. The east and north elevations of LR-320, facing west-southwest.

Figure 12.8. The east and north elevations of storage/workshop building, facing west-southwest.

Figure 12.9. The north elevation of the storage/workshop building, facing southwest.

Figure 12.10. The north and west elevations of the storage/workshop building, facing east-southeast.

Figure 12.11. The south and east elevations of the shed, facing northwest.

13.0 LR-321: 9063 KY-588

LR-321 is a mid-twentieth century barn located at 9063 KY-588, Roxana, Letcher County, Kentucky (**Table 13.1**; **Figure 13.1**). The building is bound on the north by KY-588, on the east by a wooded area, on the west and south by residential properties. The barn sits on a level area covered in lawn grasses on the edge of the south side of KY-588 and is associated with a non-historic residential building. According to the Letcher County, KY PVA, LR-321 is currently owned by Mitchum & Gwen Whitaker but does not list a construction date for the building. A building is not illustrated in the general location of LR-321 on topographic mapping. A building with a similar configuration and in the same location as the barn is visible on the 1952 aerial image, which is the earliest aerial found for the area. This suggests LR-321 was built prior to 1952.

Table 13.1. Summary of LR-321

Address	9063 KY-588, Roxana, KY (37.114102, -82.951945)
County	Letcher County
Date of Construction	c. 1945
Square Footage (Living Area)	--
Acreage	15
Owner	Mitchum & Gwen Whitaker
Architectural Style/Type	Mid-20th Century Agricultural
Integrity	LR-321 is in fair condition but has undergone alteration, resulting in loss of integrity of design and materials.
NRHP Recommendation	LR-321 is not eligible for the NRHP due to a lack of architectural and historic significance and loss of integrity.

Building Description

LR-321 is a mid-twentieth century barn with a non-historic standing seam metal roof, exterior walls constructed of vertical wood board, and a shed addition (**Figure 13.2**). A small one-story addition protrudes out from the south elevation that has exterior walls of thin wood boards with gaps for ventilation. The barn is small in size with a rectangular plan. The north elevation has a large opening along the shed addition and a second large opening with a large, hinged door constructed of wood board (see **Figure 13.2**). The opening along the shed addition is partially enclosed with a hinged gate. The upper section of this elevation is obscured by thick vegetation. The west elevation has a single window opening with wooden vents and a hinged wood board door (**Figure 13.3**). The south elevation has a single hinged wood board door (**Figure 13.4**). The east elevation has large openings between wood boards, likely for ventilation (**Figure 13.5**). The exterior appears to have been modified for this purpose and likely had walls of vertical wood board originally.

Current Condition

LR-321 is in fair condition. The building exhibits several signs of cosmetic and structural damage, such as the deterioration of the wall and roofing material and the broken wood boards. Vegetation has also begun to overtake the upper section of the north elevation. The barn has

undergone some alteration, including the replacement of roofing material, modification of wall material, and the small addition along the south elevation.

NRHP Recommendation

LR-321 is not recommended as eligible for listing in the NRHP due to lack of architectural and historic significance and loss of integrity of design and materials. Under Criterion A, LR-321 is recommended as not eligible because it has no association to any historic events or pattern of events that have greatly influenced the region, state, or nation. Likewise, under Criterion B, LR-321 is recommended as not eligible, as no ties or links were found between the building and any person or persons of cultural or historic significance. Under Criterion C, LR-321 is recommended as not eligible because the building has no elements that make it a unique example of its architectural type, which is a common type found throughout the region. In addition, the barn is not the work of a master builder or craftsperson. Furthermore, the building has undergone unsympathetic alterations, resulting in a loss of integrity of materials and design. Criterion D is typically considered when assessing archaeological sites, but buildings may qualify if they have the potential to contribute important information to our understanding of history. However, LR-321 does not have the potential to yield additional information regarding local and regional development.

No further work is recommended.

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Figure 13.1. Aerial image showing the location of LR-321.

Figure 13.2. The north elevation of LR-321, facing south.

Figure 13.3. The west and south elevations of LR-321, facing northeast.

Figure 13.4. The south elevation of LR-321, facing north.

Figure 13.5. The east and north elevations of LR-321, facing southwest.

14.0 LR-322: 9144 KY-588

LR-322 is a mid-twentieth century American Vernacular religious building known as the Tolson Creek Old Regular Baptist Church. The church is located on the north side of KY-588 in Roxana, Letcher County, Kentucky (**Table 14.1; Figure 14.1).** The property is bound on the north by the North Fork of the Kentucky River, the former L&N/CSX railroad line, and KY-2036, on the south by KY-588, and on the east and west by open fields and wooded areas. The house sits on level terrain covered by a manicured lawn and is accessed via a long asphalt drive that extends from the church to KY-588. According to the Letcher County, KY PVA, LR-322 is currently owned by Church Tolson Creek Regular. The PVA does not list the original construction date for the church. A building shown in the general location of LR-322 and marked as the Tolson Branch Church is illustrated as early as 1954 on topographic mapping but is not shown on the 1913 or 1915 maps (**Figure 14.2**). A building is also illustrated in the vicinity on the 1937 highway map, but this building is not marked as a religious building (Kentucky Department of Highways). A building with a similar configuration and in the same location as the church is visible on the 1983 aerial image but not on the 1952 image, which is the earliest aerial found for the area. This suggests LR-322 was constructed between 1952 and 1954. A plaque above the main entrance states the church's establishment date is May 23, 1942, which may indicate that this building replaced an earlier building, or the church was established before a building was constructed.

Table 14.1. Summary of LR-322

Address	9144 KY-588
County	Letcher County
Date of Construction	c. 1950
Square Footage (Living Area)	15,628 square feet
Acreage	0.359
Architectural Style/Type	Mid-20th Century American Vernacular/Front Gable/ Center-Steeple
Owner	Church Tolson Creek Old Regular Baptist
Integrity	LR-322 is in good condition but has undergone several alterations, resulting in loss of integrity of design and materials.
NRHP Recommendation	LR-322 is not eligible for the NRHP due to loss of integrity and lack of architectural and historic significance.

Building Description

LR-322 is a southeast facing, one-story, mid-twentieth century American Vernacular center-steeple church constructed of concrete block (**Figure 14.3).** The building is topped with a replacement standing seam metal, front gable roof. A large addition was added on the north elevation, that is also topped with a standing seam metal gable roof and has exterior walls of wood panels. The addition rests on a continuous concrete block foundation. An entryway porch appears to have been previously enclosed and has walls of prefabricated wood panels. A new entryway porch was added to the enclosed porch that has a wooden deck supported by wooden posts and is accessed via wooden steps and short ramp. The access steps and ramp have wooden railings that connect to a wooden balustrade along the porch. The enclosed porch and

new entryway porch are protected by a gable overhang. A second overhang extends off the center of the gable overhang to protect the ramp access. A concrete sidewalk extends from the main entrance to a second entrance along the east (front) elevation of the rear addition. A set of three wood steps with wooden railings leads up to this entrance. A crawl space access is located on the south end of the west elevation that is covered with metal siding. The windows consist of vinyl double-hung replacements, and the doors are six-paneled wood replacements.

The east (front) elevation has a single replacement double-hung vinyl window with a concrete sill and lintel, a single replacement six-paneled door, a second single replacement double-hung vinyl window with a concrete sill and lintel, and a second single replacement six-paneled door (see **Figure 14.3**). The basement level has two metal vents.

The north (back) elevation has a single replacement six-paneled door along the enclosed entryway porch and two single double-hung vinyl windows along the rear addition (**Figure 14.4**). The basement level on the rear addition has three metal vents.

The south elevation has two metal vents along the basement level of the rear addition (**Figure 14.5**). This elevation along the original block has a single metal vent along the basement level and a square sealed opening beneath the apex of the gable roof. A small gable overhang supported by two braces extends out over this wall opening. The cellar entrance is also located on the east end of this elevation.

From east to west, the south elevation has three replacement double-hung vinyl windows with concrete sills and lintels (**Figure 14.6**). The basement level has three metal vents.

Outbuilding
LR-322 is associated with a non-historic picnic area that sits on the east side of the building adjacent to the northeast end of the rear addition (see **Figure 14.3**). The picnic area consists of a long open shed with a corrugated metal gable roof that shelters three picnic tables. The shed is supported by six tall wood posts. Aerial images indicate the building was added to the property between 2004 and 2006.

Current Condition
LR-322 is in good condition but has undergone several alterations, such as the enclosure of the entryway porch, the addition of a new entryway porch, the large rear addition, and the replacement of windows, doors, and roofing material. According to aerial images, the large addition was added between 1983 and 1995, and the entryway porch was enclosed and a second entryway porch constructed between 2004 and 2006.

NRHP Recommendation
LR-322 was recommended as not eligible for listing in the NRHP due to a lack of historic and architectural significance and loss of integrity. LR-322 is recommended as not eligible under Criterion A. Although the church building has served the surrounding community of Roxana since the mid-twentieth century, this association with the community's development is weakened by the building's loss of materials and design integrity. Under Criterion B, LR-322 is recommended as not eligible because no links were found between the building and person or persons with cultural or historic significance. Under Criterion C, the church is recommended as not eligible because it is not the work of a master builder or craftsperson and exhibits no elements that make it exemplary of a mid-twentieth century vernacular religious building. The center-steeple church is one of the most common types found in the region and across the nation (Gottfried and Jennings 2009). In addition, the building has undergone unsympathetic

alterations since first constructed, resulting in loss of integrity of design and materials. Criterion D is typically considered when assessing archaeological sites, but buildings may qualify if they have the potential to contribute important information to our understanding of history. However, LR-322 does not have the potential to yield additional information regarding local and regional development.

No further work is recommended.

Figure 14.1. Aerial image showing the location of LR-322 and associated picnic shelter.

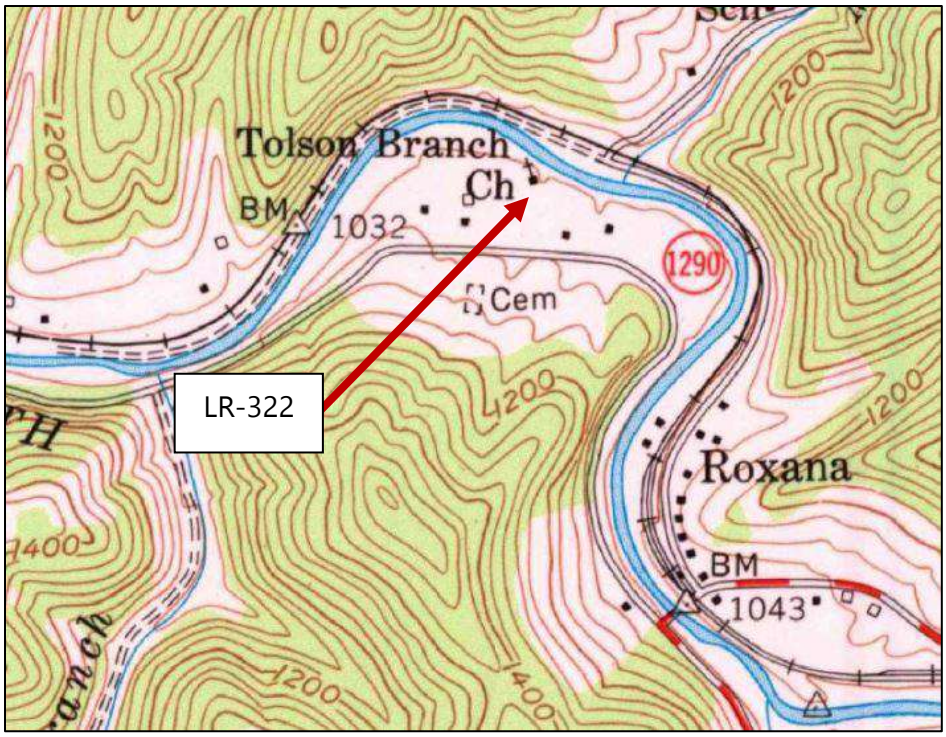

Figure 14.2. Location of LR-322 on the 1954 Roxana, KY USGS topographic map.

Figure 14.3. The east (front) elevation of LR-322, facing northwest; note the picnic shelter.

Figure 14.4. The north and west elevations of LR-322, facing southeast.

Figure 14.5. The west and south elevations of LR-322, facing east-northeast.

Figure 14.6. The south elevation of LR-322, facing northeast.

15.0 LR-323: 6397 KY-160

LR-323 is a mid-twentieth century commercial building formerly used as a service station. The building is located on the south side of the intersection of KY-160 and KY-2036 in Roxana, Letcher County, Kentucky (**Table 15.1; Figure 15.1).** The property is bound on the north by KY-160 and KY-2036, on the east by a residential building, on the west and south by the North Fork of the Kentucky River and the former L&N/CSX railroad line. The building sits on level terrain covered by a gravel drive, manicured lawn, and tall grasses and vegetation, and is accessed via an asphalt drive and parking area adjacent to KY-160. According to the Letcher County, KY PVA, LR-323 is currently owned by Steve Bates and Laverna Akers, has a construction date of 1940, and has a living area of 1,120 sq. ft. (**Figure 15.2**). A building in the general location of LR-323 is not illustrated in 1913 or 1915 on topographic mapping but is shown on the 1954 map (**Figure 15.3**). A building is also illustrated in the vicinity on the 1937 highway map (Kentucky Department of Highways). A building with a similar configuration and in the same location as the church is visible on the 1952 image, which is the earliest aerial found for the area. This suggests LR-323 was constructed between 1937 and 1952.

Table 15.1. Summary of LR-323

Address	6397 KY-160
County	Letcher County
Date of Construction	c. 1935
Square Footage (Living Area)	1,120 square feet
Acreage	1.5
Architectural Style/Type	Mid-20th Century Commercial
Owner	Steve Bates and Laverna Akers
Integrity	LR-323 is in fair condition but has undergone little alteration.
NRHP Recommendation	LR-323 is not eligible for the NRHP due to lack of architectural and historic significance.

Building Description

LR-323 is a southwest facing, one-story, mid-twentieth century former service station building constructed of concrete block with painted exterior walls (**Figure 15.4).** The building is topped with a flat roof. The windows consist of metal picture, multi-light metal awning, and two-over-two double-hung metal types. Other wall openings consisted of overhead paneled wood doors with three-lights and a single paneled wood door inset with multi-lights.

The north (front) elevation has a single metal picture window and two overhead paneled wood doors with three-lights (see **Figure 15.4**). The bottom section of the overhead doors was replaced with plywood that was in poor condition, and vegetation had overgrown sections of all three wall openings.

The east elevation has a single two-over-two double-hung metal window, a single paneled wood door inset with multi-lights, and a single window with four stacked metal awning windows (**Figure 15.5**). A small overhang covered in corrugated metal protects the entryway.

The west and south (rear) elevations were only partially viewable due to thick vegetation and no wall openings were discernable (**Figure 15.6**).

Associated Residential Building
LR-323 is associated with a historic residential building that sits to the east of the commercial building on the south side of KY-160 and is accessed via a gravel drive. The gravel drive also extends to a residential building on a separate parcel. The house sits on level terrain covered by a manicured lawn. The Letcher County, KY PVA lists the house as constructed in 1950 and with a living space of 1,170 sq. ft. (**Figure 15.7**). Although a building is illustrated in the vicinity on the 1937 highway map, a building is not shown in the general location of the house on the 1954 topographic map (Kentucky Department of Highways) (**Figure 15.8**). A building with a similar configuration and in the same location as the house is visible on the 1983 aerial image, but not on the 1952 image, which is the earliest aerial found for the area. This suggests the house was built between 1954 and 1983.

Table 15.2. Summary of house associated with LR-323

Address	6367 KY-160
County	Letcher County
Date of Construction	c. 1960
Square Footage (Living Area)	1,170 square feet
Acreage	1.5
Architectural Style/Type	Mid-20th Century American Vernacular/Side Gable
Owner	Steve Bates and Laverna Akers
Integrity	The house is in good condition but has undergone several alterations, resulting in loss of integrity of design and materials.
NRHP Recommendation	The house is not eligible for the NRHP due to loss of integrity and lack of architectural and historic significance.

Residential Building Description
The house is a southwest facing, one-story, mid-twentieth century American Vernacular residential building topped with a side gable roof covered in corrugated metal (**Figure 15.9**). The building has exterior walls clad in vinyl siding and sits on a continuous concrete block foundation. An entryway porch adorns the main entrance along the north (front) elevation that is topped with a front gable corrugated metal overhang. The overhang is supported with two wood posts, and the deck is constructed of wood board. The porch is accessed via a set of wood board steps. The building has a large, attached garage with a gable roof along the east elevation, a small rear addition with a shed roof, a covered porch and wood deck along the rear elevation, and a second addition with a cross gable roof along the west elevation. The windows consist of three-over-one double-hung wood windows with exterior metal storm windows on the original section and the side and rear additions and double-hung vinyl windows on the attached garage. Other wall openings consist of a single paneled wood door, a large multi-paneled overhead garage door and metal hexagonal-shaped vents.

From northeast to southwest, the north (front) elevation has two single double-hung vinyl windows with fixed shutters along the attached garage and a pair of three-over-one double-hung

wood windows with fixed shutters, a single paneled wood door with metal framed storm door, and a second pair of three-over-one double-hung wood windows with fixed shutters along the original section (see **Figure 15.9**). A single three-over-one double-hung wood window with a single fixed shutter sits along this elevation of the side addition. A small metal hexagonal-shaped vent sits along the front gable overhang of the entryway porch. The basement level of the original section also has two rectangular metal vents.

The west elevation has a single three-over-one double-hung wood window with a single fixed shutter and single metal hexagonal-shaped vent on the original section and two single three-over-one double-hung wood windows and single metal hexagonal-shaped vent on the side addition (**Figure 15.10**). One of the windows has fixed shutters.

The east elevation of the original section has a single metal hexagonal-shaped vent and two single three-over-one double-hung wood windows, one with a single fixed shutter and the other with fixed shutters (**Figure 15.11**). The east elevation of the attached garage has a multi-paneled overhead garage door and centered above the garage door is a single metal hexagonal-shaped vent.

The rear elevation was not viewable from the public ROW.

Current Condition
LR-323 is in fair condition but has undergone little alteration. The building does show signs of weathering and damage, such as the plywood covering sections of the garage doors, and vegetation has begun to overtake sections of the exterior walls.

The house associated with LR-323 is in excellent condition but has undergone several unsympathetic alterations, like the replacement of the siding, roofing material, and shutters. In addition to the replacement of materials, an attached garage and two additions were added to the building, altering the building's original plan and design. The PVA information indicates a porch and deck were also added to along the rear elevation after the additions were constructed.

NRHP Recommendation
LR-323 was recommended as not eligible for listing in the NRHP due to a lack of historic and architectural significance. LR-323 is recommended as not eligible under Criterion A. The building is not associated with any historic event or pattern of events related to the region, state, or nation. Under Criterion B, the former service station is recommended as not eligible, as no ties or links were found between the building and any person or persons of cultural or historic significance. LR-323 is recommended as not eligible under Criterion C because the building is not the work of a master builder or craftsperson and exhibits no elements exemplary of a mid-twentieth century commercial building. The building is a common commercial type found throughout the region and across the country. Criterion D is typically considered when assessing archaeological sites, but buildings may qualify if they have the potential to contribute important information to our understanding of history. However, LR-323 does not have the potential to yield additional information regarding local and regional development.

The house associated with LR-323 was recommended as not eligible for listing in the NRHP due to a lack of historic and architectural significance and loss of integrity. The building is recommended as not eligible under Criterion A because it has no association to any historic events or pattern of events that have greatly influenced the region, state, or nation. Likewise, under Criterion B, the house is recommended as not eligible, as no ties or links were found

between the building and any person or persons of cultural or historic significance. Under Criterion C, the residential building is recommended as not eligible because the building has no elements that make it a unique example of its common architectural type, which is found throughout the region. The house is not the work of a master builder or craftsperson, and has drastically been altered since first constructed, resulting in a loss of integrity of materials and design. Under Criterion D, the house does not have the potential to contribute important information to our understanding of local and regional history.

No further work is recommended.

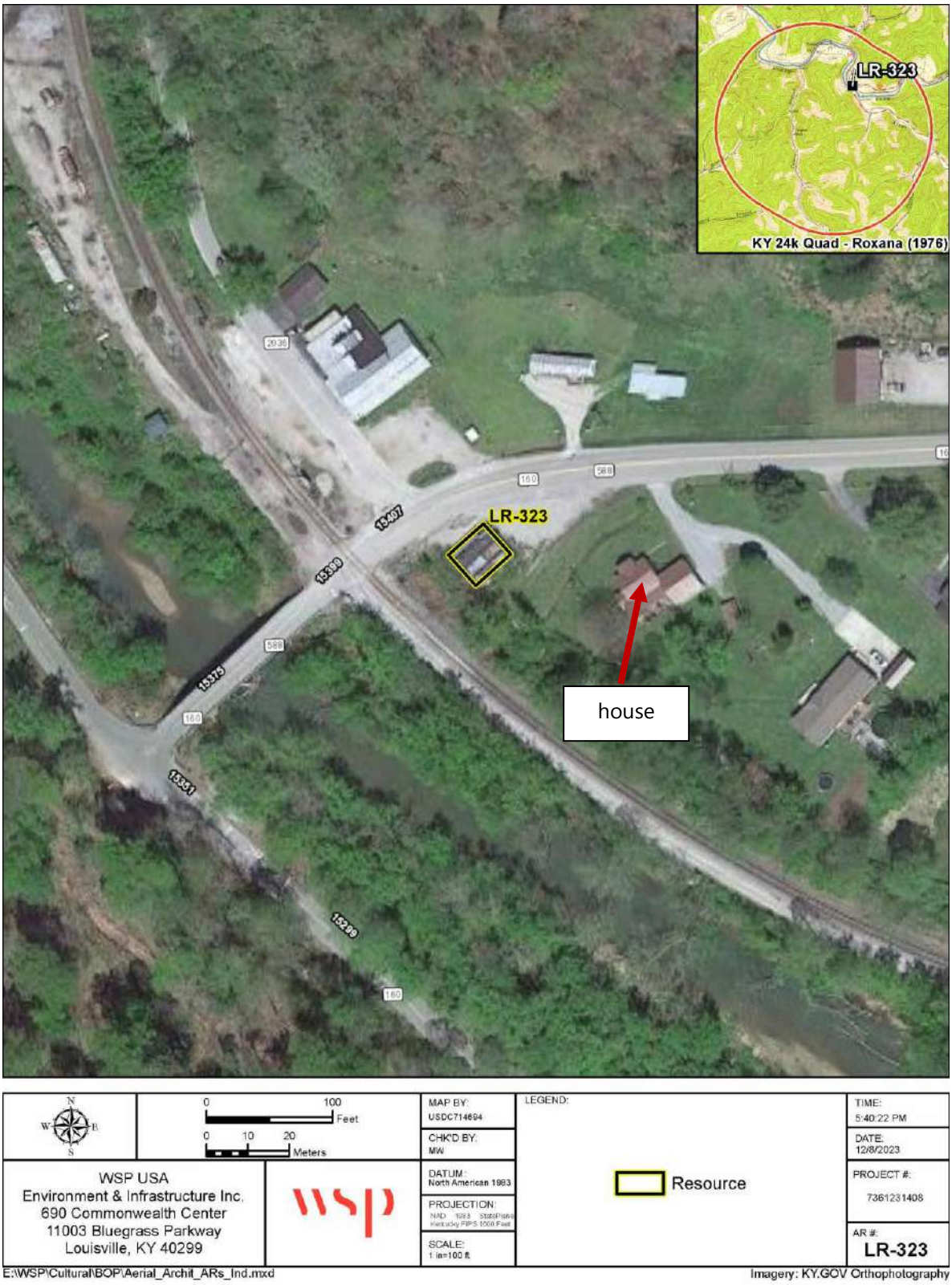

Figure 15.1. Aerial image showing the location of LR-323 and associated house.

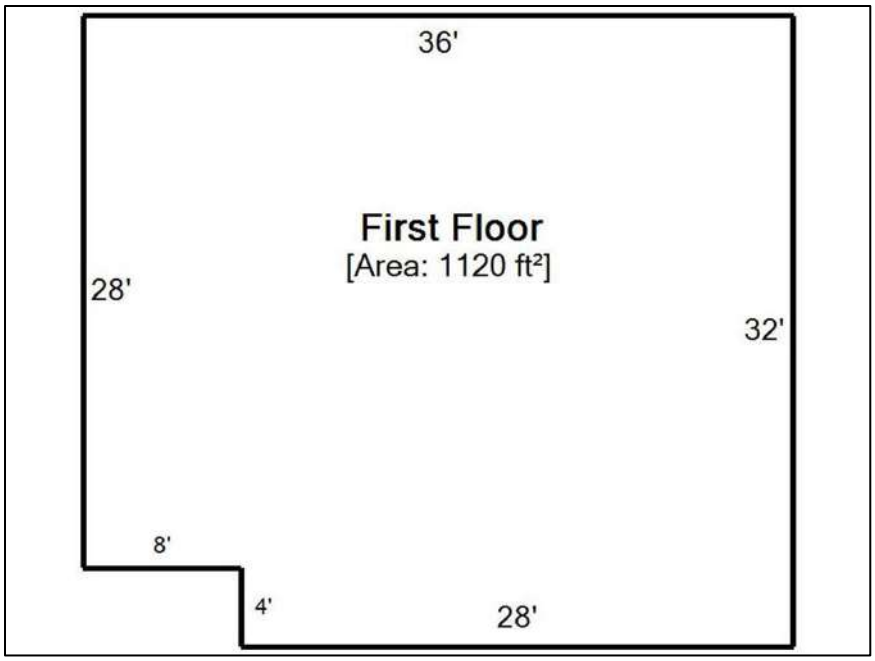

Figure 15.2. Letcher County PVA plan with square footage of LR-323.

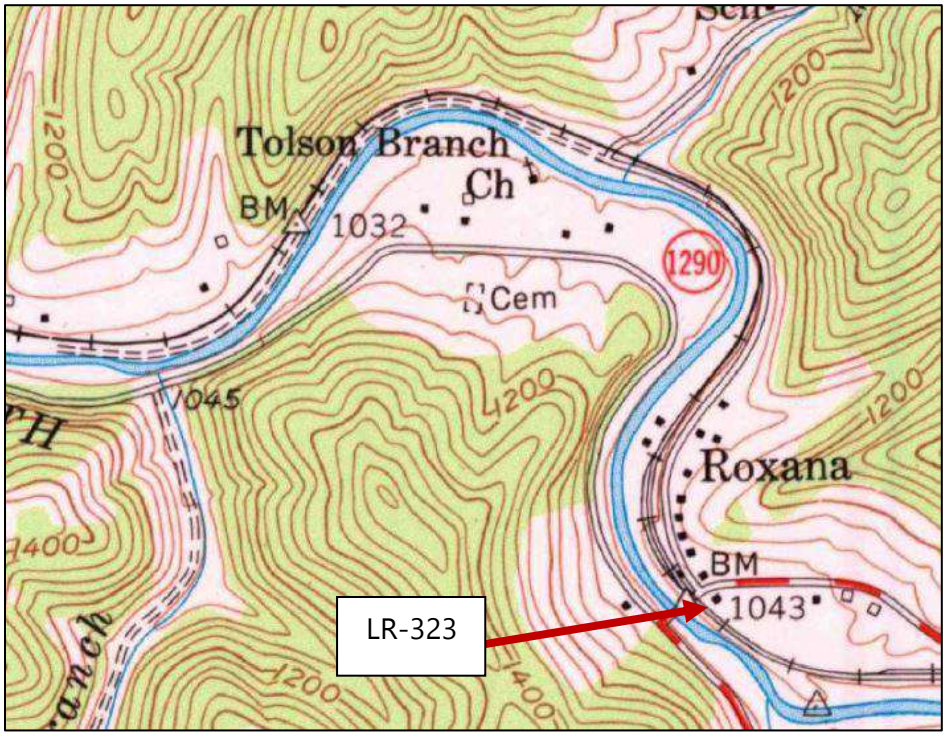

Figure 15.3. Location of LR-323 on the 1954 Roxana, KY USGS topographic map.

Figure 15.4. The north (front) elevation of LR-323, facing southeast.

Figure 15.5. The east elevation of LR-323, facing southwest.

Figure 15.6. The north and west elevations of LR-323, facing east.

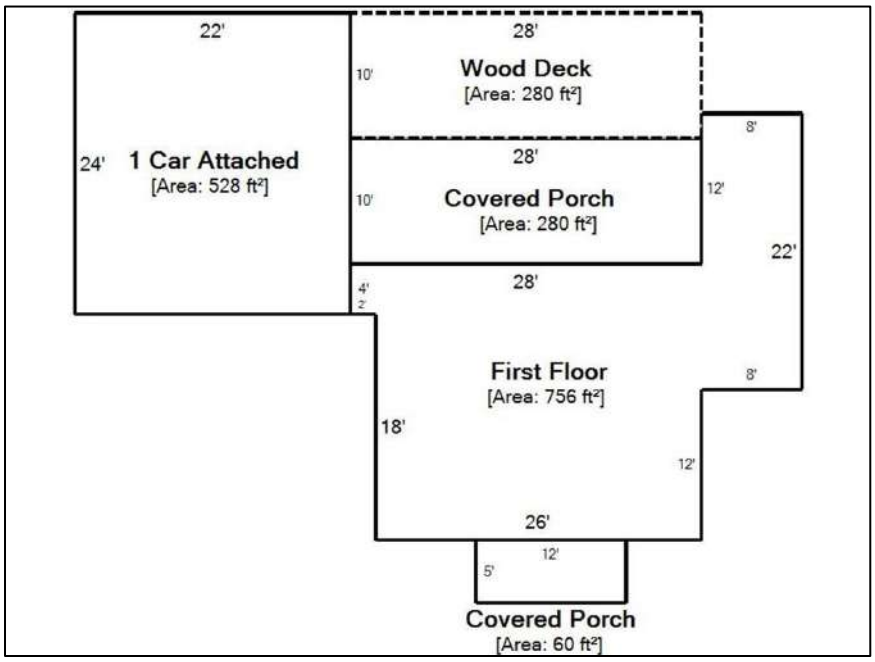

Figure 15.7. Letcher County PVA plan with square footage of LR-323.

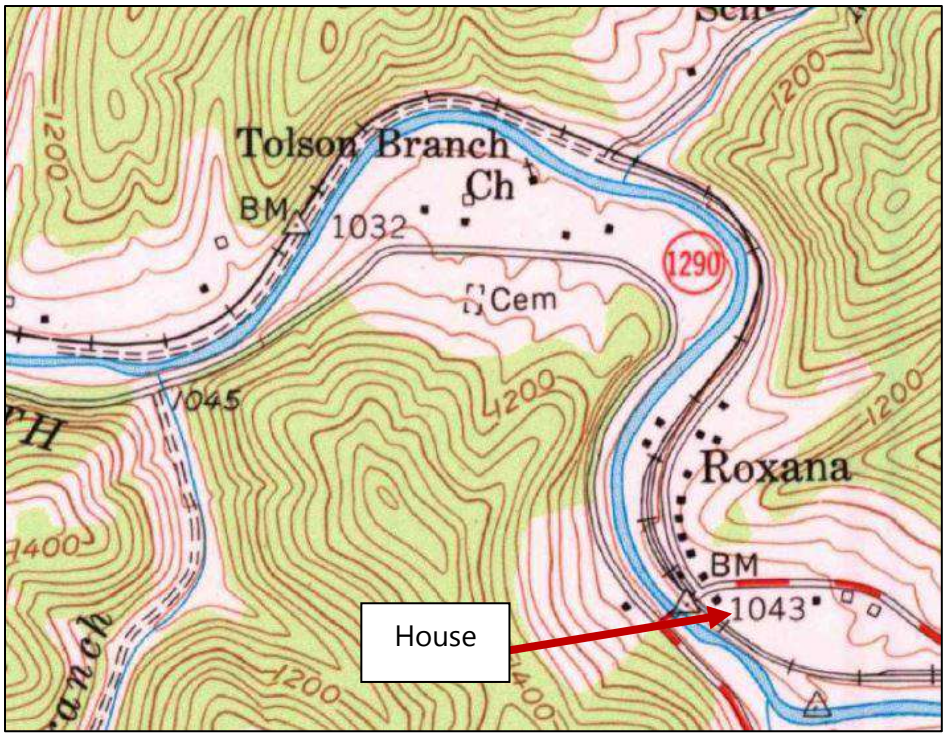

Figure 15.8. Location of house associated with LR-323 on the 1954 Roxana, KY USGS topographic map; note the building is not illustrated.

Figure 15.9. The north (front) elevation of the house associated with LR-323, facing southeast.

Figure 15.10. The north (front) and west elevations of the house associated with LR-323, facing east.

Figure 15.11. The west and north (front) elevations of the house associated with LR-323, facing southwest.

16.0 LR-324: 6205 KY-160

LR-324 is a mid-twentieth century American Vernacular residential building located at 6205 KY-160, Roxana, Letcher County, Kentucky (**Table 16.1**; **Figure 16.1**). The building is bound on the north by KY-160, to the east and west by residential buildings, and on the south by a wooded area, railroad tracks, and the North Fork of the Kentucky River. The property sits on a leveled area along a side slope covered in tall lawn grasses, weeds, and secondary growth on the south side of KY-160 and is accessed via KY-160 by a grassy and gravel drive. According to the Letcher County, KY PVA, LR-324 is currently owned by Frank and Geraldine Perry, and the building has a total living area of 672 sq. ft. (**Figure 16.2**)). The construction date and acreage are not listed. A building shown in the general location of LR-324 is not illustrated on the 1913, 1915, or 1954 topographic maps. A building with a similar configuration and in the same location as the house is visible on the 1983 aerial image but not on the 1952 image, which is the earliest aerial found for the area. This suggests LR-324 was constructed between 1954 and 1983, and the building materials indicate a mid-twentieth century construction date. The house appears to be associated with a non-historic manufactured home that was constructed between 1983 and 1995 and two small sheds, but despite the close proximity of the buildings, LR-324 and the non-historic manufactured home and two sheds are listed on separate parcels in the PVA. The non-historic manufactured home is recorded as owned by Genevieve H. Banks' life estate.

Table 16.1. Summary of LR-324

Address	6205 KY-160, Roxana, KY
County	Letcher County
Date of Construction	c. 1965
Square Footage (Living Area)	672 square feet
Acreage	Unknown
Owner	Frank & Geraldine Perry
Architectural Style/Type	Mid-20th Century American Vernacular/Side Gable
Integrity	LR-324 is in fair condition but has undergone little alteration.
NRHP Recommendation	LR-324 is not eligible for the NRHP due to a lack of architectural and historic significance.

Building Description

LR-324 is a northeast facing, one-story, single-family, mid-twentieth century American Vernacular, side gable, residential building with an asphalt shingle roof and weatherboard exterior walls (**Figure 16.3**). The building was partially obscured by vegetation and the foundation only partly viewable but appeared to be poured concrete. A partial width front porch sits along the west half of the north (front) elevation. The porch has a wood board deck and is covered with an asphalt shingle overhang supported by three posts. A second entryway porch is found along the east elevation. This porch has a concrete deck and is covered with an extension of the main roof that is supported by four slender posts. The windows consist of a large wood picture window with a central fixed window surrounded by nine-lights, two-over-two double-hung wood windows, and double-hung wood windows. The entrances are wood doors with metal framed storm doors.

The east elevation has a single two-over-two double-hung wood window and a single wood door with metal framed storm door (see **Figure 16.3**). A single rectangular metal vent sits beneath the roof gable on the end of the porch overhang.

The south (rear) elevation was overgrown with vegetation but a pair of double-hung windows, a single double-hung window, and a third window were observed (**Figure 16.4**).

Beginning on the east end, the north (front) elevation has a large wood picture window with a central fixed window surrounded by three-lights on each side and above the fixed window, totaling nine-lights (**Figure 16.5**). To the west of the picture window, there is a single wood door with metal framed storm door and single two-over-two double-hung wood window.

The west elevation has two two-over-two double-hung wood windows and a rectangular metal vent centered beneath the gable of the roof (see **Figure 16.5**).

Current Condition
LR-324 is in fair condition but has undergone little alteration. The exterior wall material does show signs of deterioration and weathering, and vegetation has begun to overtake sections of the west half of the building (see **Figures 16.3** and **16.4**).

NRHP Recommendation
LR-324 is recommended as not eligible for listing in the NRHP due to lack of architectural and historic significance. Under Criterion A, LR-324 is recommended as not eligible because it has no association to any historic events or pattern of events that have greatly influenced the region, state, or nation. Likewise, under Criterion B, LR-324 is recommended as not eligible because no ties or links were found between the building and any person or persons of cultural or historic significance. Under Criterion C, LR-324 is recommended as not eligible because the building has no elements that make it a unique example of its architectural type, which is a common vernacular type, and the house is not the work of a master builder or craftsperson. Criterion D is typically considered when assessing archaeological sites, but buildings may qualify if they have the potential to contribute important information to our understanding of history. However, LR-324 does not have the potential to yield additional information regarding local and regional development.

No further work is recommended.

Figure 16.1. Aerial image showing the location of LR-324.

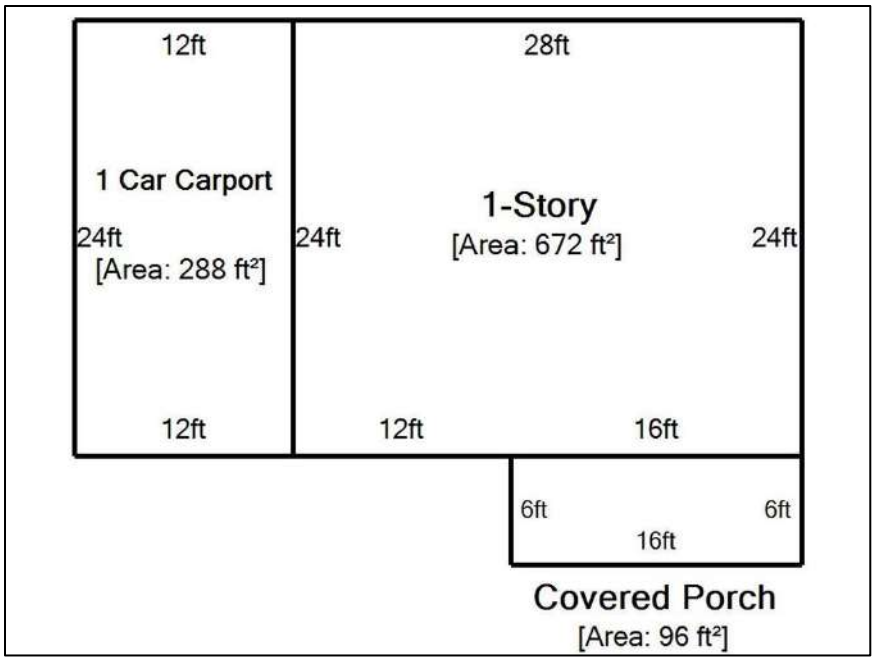

Figure 16.2. Letcher County PVA plan with square footage of LR-324.

Figure 16.3. The east elevation of LR-324, facing northwest; note the vegetation growth on the west end of the north elevation.

Figure 16.4. The south and east elevations of LR-324, facing northwest; note the vegetation growth on the west end of the south elevation.

Figure 16.5. Image of the north and west elevations of LR-324, facing southeast (Courtesy of Google).

17.0 LR-325: 6830 KY-160

LR-325 is a mid-twentieth century American Vernacular residential building located at 6830 KY-2036, Roxana, Letcher County, Kentucky (**Table 17.1**; **Figure 17.1**). The building is bound on the north by KY-160, on the east and south by Bluegrass Ridge Road, and on the west by a wooded area. The property sits on a level area covered in lawn grasses on the south side of KY-160 and is accessed via KY-160 by a gravel drive that extends to the north (front) elevation of an associated outbuilding to the east of the house. The outbuilding is a large warehouse. The immediate property surrounding the house is enclosed behind a chain link fence. A set of concrete steps lead up to the gate of the fence and a concrete sidewalk extends from the steps to the east elevation of the house. The house is also associated with a small, covered patio area that sits behind the house. According to the Letcher County, KY PVA, LR-325 is currently owned by Rondall and Sharon Meade and has a total living area of 1,135 sq. ft. (**Figure 17.2**). The PVA lists the original construction date of the house as 1955. A building shown in the general location of LR-325 is illustrated as early as 1954 on topographic mapping but not on the 1913 or 1915 maps (**Figure 17.3**). A building in the same location as the house is visible on the 1952 aerial image, which is the earliest aerial found for the area. This suggests LR-325 was constructed between 1915 and 1952.

Table 17.1. Summary of LR-325

Address	6830 KY-160, Roxana, KY
County	Letcher County
Date of Construction	1950
Square Footage (Living Area)	1,135 square feet
Acreage	168.64
Owner	Rondall & Sharon Meade
Architectural Style/Type	Mid-20th Century American Vernacular/Front Gable
Integrity	LR-325 is in good condition but has undergone several alterations, resulting in loss of integrity of design and materials.
NRHP Recommendation	LR-325 is not eligible for the NRHP due to a lack of architectural and historic significance and loss of integrity.

Building Description

LR-325 is a north facing, one-story, single-family, mid-twentieth century American Vernacular, front gable, residential building with a raised concrete block foundation, a corrugated metal roof, and exterior walls clad in vinyl siding (**Figure 17.4**). A wraparound porch on the northeast corner of the house was enclosed behind walls of continuous windows with stone veneer piers with concrete caps and concrete columns that support the porch overhang still visible. The porch overhang consists of a side gable roof covered in matching corrugated metal. A set of concrete steps lead up to the porch on the north end of the east elevation, and short stone veneer posts with concrete caps sit on either side of the steps. The concrete sidewalk extends from the chain link fence gate to the porch steps and then continues to wraparound the east elevation to the rear entrance. A second concrete sidewalk extends south from the rear entrance to a covered patio area with concrete slab. An external concrete block chimney sits towards the northwest

corner along the west elevation of the house. Two small additions are located along the south (rear) elevation. The first addition extends along half of the rear elevation, is clad in vinyl siding, and is topped with a corrugated metal shed roof. The second addition is slightly shorter than the first addition and is much smaller. This addition is attached to the first addition on the west elevation, is also clad in vinyl siding, and has a corrugated metal shed roof. The windows consist of replacement vinyl double-hung windows, a large protruding replacement vinyl or metal bay window, a vinyl sliding window, and metal sliding windows. The main entrance is a replacement wood door with a metal framed storm door and inset with an oval-shaped light.

Beginning west to east, the north (front) elevation has a single replacement double-hung vinyl window with fixed shutters and then along the recessed porch, a single door with metal framed storm door and long oval-shaped light, and a pair of replacement double-hung vinyl windows with fixed shutters (see **Figure 17.4**; **Figure 17.5**). The basement level has three metal sliding windows, and beneath the gable of the roof is a large rectangular metal vent.

The north end of the east elevation was largely obscured by the blinds covering a section of the enclosed porch but there is a pair of large windows, and along the gable end of the porch roof is a hexagonal-shaped metal vent (**Figure 17.6**). To the south of the enclosed porch, there is a replacement protruding vinyl or metal bay window, a pair of replacement double-hung vinyl windows, and then a vinyl sliding window along the rear addition. Much of the basement level along this elevation was covered by shrubbery but a pair of wood double doors inset with decorative multi-lights sits beneath the enclosed porch to the south of the porch steps.

From the west to the east along the original section of the house, the south (rear) elevation has a single replacement double-hung vinyl window, a multi-light window largely covered up by the rear additions, a window that was enclosed and covered with vinyl siding, and a rectangular metal vent centered beneath the roof gable (**Figure 17.7**). The south elevation of the first rear addition has a single wood door with metal frame storm door and multi-lights and a vinyl sliding window.

The west elevation has three replacement double-hung vinyl windows (**Figure 17.8**). The basement level was only partially viewable from the public ROW but a single metal sliding window was observed on the north end. The west elevation of the second rear addition has a single fixed window with a pipe extending out of it.

Associated Outbuildings

LR-325 is associated with two outbuildings, a large barn and a covered patio. The large barn sits to the southeast of the house, and according to the PVA, was constructed in 1978 and has an area of 4,000 sq. ft. (**Figure 17.9**). The barn has walls clad in metal siding on the north and east elevations and a wall constructed of concrete block on the west elevation (**Figure 17.10**). The building is topped with a low-rise gable roof covered in corrugated metal with a shed addition along the west elevation. The north elevation has two large metal sliding doors, a single metal door cut into one of the large metal sliding doors, and a large rectangular metal vent beneath the roof gable. The east and west elevations have no wall openings, and the rear elevation was not viewable from the public ROW. The covered patio sits to the south of the house (see **Figures 17.5** and **17.10**). The patio has a concrete deck covered by a corrugated metal gable overhang that is supported by six wood posts.

Current Condition

LR-325 is in good condition but has undergone several unsympathetic alterations, including the replacement of windows, exterior wall material, and roofing material. In addition, the wraparound

porch was enclosed and two additions were added to the south (rear) elevation. The barn is in good condition although the exterior wall and roofing material does show signs of weathering. Aerial images indicate the shed addition was added between 1983 and 1995. The covered patio is in good condition and is likely non-historic.

NRHP Recommendation
LR-325 is recommended as not eligible for listing in the NRHP due to lack of architectural and historic significance and loss of integrity of design and materials. Under Criterion A, LR-325 is recommended as not eligible because it has no association to any historic events or pattern of events that have greatly influenced the region, state, or nation. Likewise, under Criterion B, LR-325 is recommended as not eligible as no ties or links were found between the building and any person or persons of cultural or historic significance. Under Criterion C, LR-325 is recommended as not eligible because the building has no elements that make it a unique example of its common architectural type, and the house is not the work of a master builder or craftsperson. Furthermore, the building has undergone several unsympathetic alterations, such as the enclosure of the porch, replacement of windows, and the rear additions, resulting in a loss of integrity of materials and design.

The barn is recommended as not eligible for listing in the NRHP due to lack architectural and historic significance and loss of integrity of design and materials. The barn is recommended as not eligible under Criterion A because it has no association with any influential historic events or pattern of events. Under Criterion B, the barn is recommended as not eligible as no ties or links were found between the building and any person or persons of cultural or historic significance. Under Criterion C, the barn is recommended as not eligible because the building is not the work of a master builder and exhibits no elements unique or exemplary of its architectural type. The barn is a common architectural form found throughout the region. The building has also been altered. The replacement of exterior wall and roofing materials and the shed addition along the west elevation have modified the building's original design and materials. Criterion D is typically considered when assessing archaeological sites, but buildings may qualify if they have the potential to contribute important information to our understanding of history. However, LR-325 does not have the potential to yield additional information regarding local and regional development.

No further work is recommended.

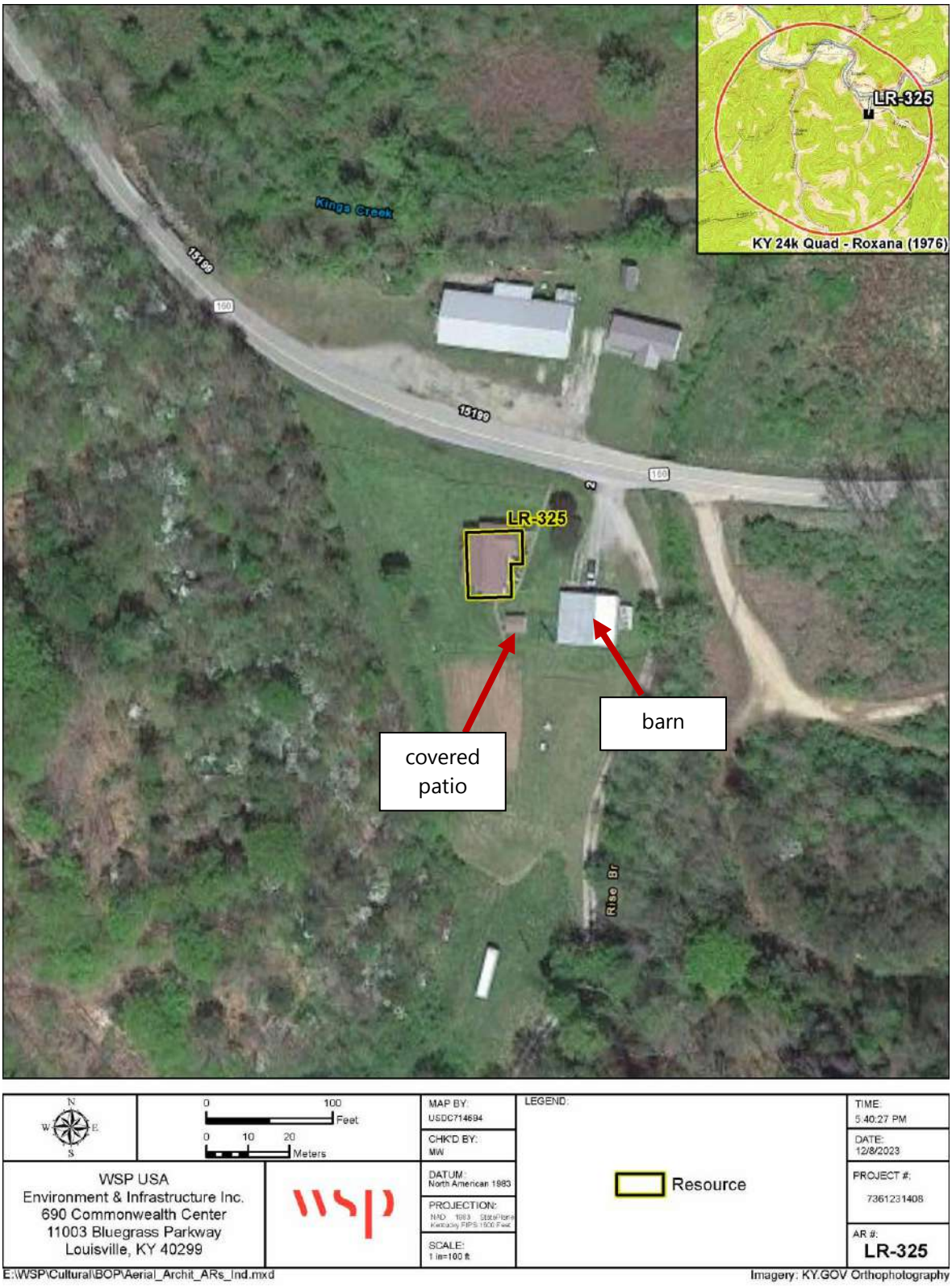

Figure 17.1. Aerial image showing the location of LR-325 and associated barn and covered patio.

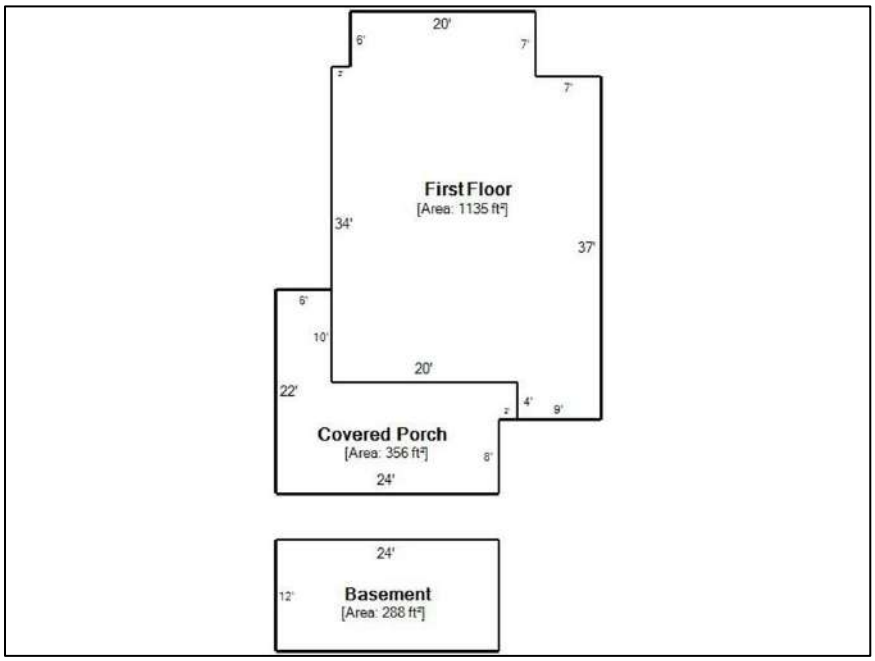

Figure 17.2. Letcher County PVA plan with square footage of LR-325.

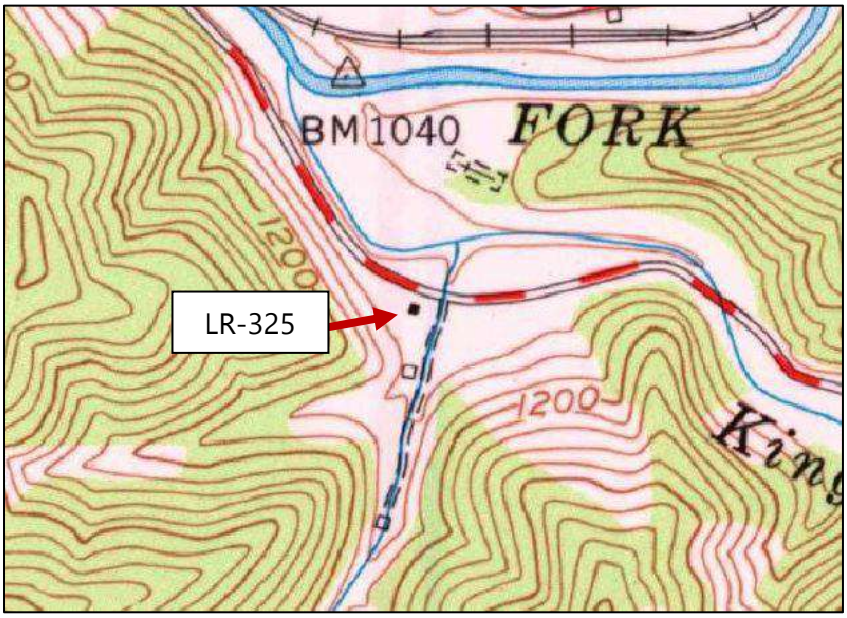

Figure 17.3. Building in the vicinity of LR-325 on the 1954 Roxana, KY USGS topographic map.

Figure 17.4. The north (front) elevation of LR-325, facing south; note the enclosed porch.

Figure 17.5. The east and north (front) elevations of LR-325, facing southwest; note the enclosed porch and the covered patio behind the house.

Figure 17.6. The east elevation of LR-325, facing west.

Figure 17.7. The west and south (rear) elevations of LR-325, facing northeast.

Figure 17.8. The west elevation of LR-325, facing east.

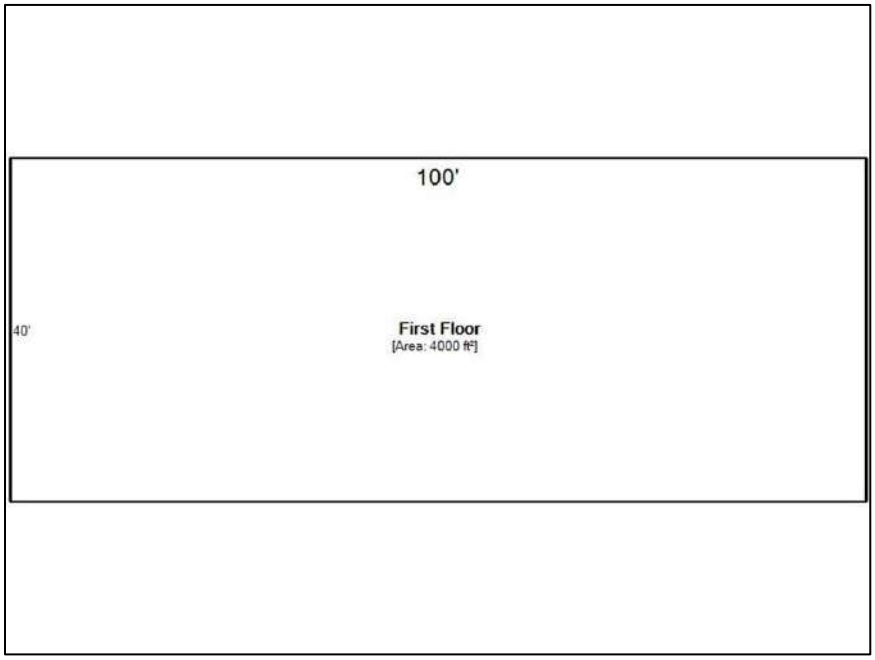

Figure 17.9. Letcher County PVA plan with square footage of the large barn associated with LR-325.

Figure 17.10. The north and east elevations of the barn associated with LR-325, facing southwest; note the covered patio between the barn and the house.

18.0 LR-326: KY-160

LR-326 is a small family cemetery along KY-160 in Roxana, Letcher County, Kentucky (**Table 18.1**; **Figure 18.1**). The cemetery is bound on all cardinal directions by wooded areas. LR-326 sits in an open area on a side slope covered in lawn grasses on the north side of KY-160 and is accessed via KY-160 by a long winding gravel drive. According to the Letcher County, KY PVA, LR-326 is currently owned by Rondall and Sharon Meade. The cemetery is first illustrated on topographic mapping in 1954 (USGS) (**Figure 18.2**). The area is obscured by vegetation on most of the aerial images except the 1952 image where the cemetery area appears to be established, but the image clarity is not sharp enough to be certain.

Table 18.1. Summary of LR-326

Address	KY-160 (37.106156, -82.945334)
County	Letcher County
Date of Construction	c. 1900 (earliest internment)
Number of Interments	Approximately 30 headstones (possible more unmarked)
Owner	Rondall & Sharon Meade
Architectural Type	Early 20th Century Family Cemetery
Integrity	LR-326 is in good condition.
NRHP Recommendation	LR-326 is not eligible for the NRHP due to lack of architectural and historic significance.

Cemetery Description

LR-326 is an early twentieth century cemetery located in an open area along a side slope surrounded by a wooded area. The cemetery consists of two sections. The first section sits to the west of the access drive and consists of several internments, and the second section sits to the east of the drive, consisting of five non-historic internments of the Frazier family (**Figures 18.3** - **18.5**). LR-326 is a small family cemetery. This type of cemetery became popular as settlement patterns became more dispersed while transportation remained difficult and often were established on high, well-drained property (Potter and Boland 1992). During the time of the survey, approximately 30 marked graves were recorded, with the earliest noted being from 1900 and the most recent from 2022. Additional unmarked internments may exist but no obvious depressions were observed. The headstones consisted of upright and flat types constructed of granite, marble, and wood (see **Figures 18.5** - **18.8**). Sections of the cemetery were enclosed with short metal fencing, signifying them as immediate family plots (see **Figure 18.7**). The surnames recorded included Frazier, Webb, Fields, Cornett, Ison, Caudill, Hall, Hogg, Mitchell, and Raleigh. The earliest internment located was from the Caudill family. According to online research, the cemetery is known as Hiram Frazier Cemetery (Findagrave 2023; Letcher County Cemetery Records ND). Thirty-seven headstones were previously documented with the earliest dating to 1900, but this list appears to not include late twentieth century and twenty-first century internments (Letcher County Cemetery Records ND). The website Find a Grave lists 29 internments within the cemetery with a date range from 1900 to 1994 (Findagrave 2023).

Current Condition
At the time of the survey, LR-326 is an active cemetery in good condition but sections of the cemetery are becoming overgrown with vegetation (see **Figures 18.5** - **18.8**).

NRHP Recommendation
LR-326 is recommended as not eligible for NRHP listing due to a lack of historic or architectural significance based on the four NRHP criteria and themes identified during research. As *National Register Bulletin #41* states, "cemeteries and graves are among those properties that ordinarily are not considered eligible for inclusion in the National Register of Historic Places unless they meet special requirements. To qualify for listing under Criteria A, B, C, or D a cemetery or grave must meet not only the basic criteria, but also the special requirements of Criteria Considerations C or D, relating to graves and cemeteries" (Potter and Boland 1992).

Under Criterion A, the cemetery is not associated with any known significant event, nor does it provide information on the role of any local industry or agricultural development. The cemetery does not have any historically significant connections, therefore it is not considered significant under Criterion B. Under Criterion C, the resource does not contain monuments that are of architectural significance nor does it appear to be a special built historic landscape. Under Criterion D, the cemetery does not yield information pertaining to any previously mentioned criteria or themes. Given these factors, it is recommended that LR-326 is not eligible for listing on the NRHP.

No further work is recommended.

Figure 18.1. Aerial image showing the location of LR-326.

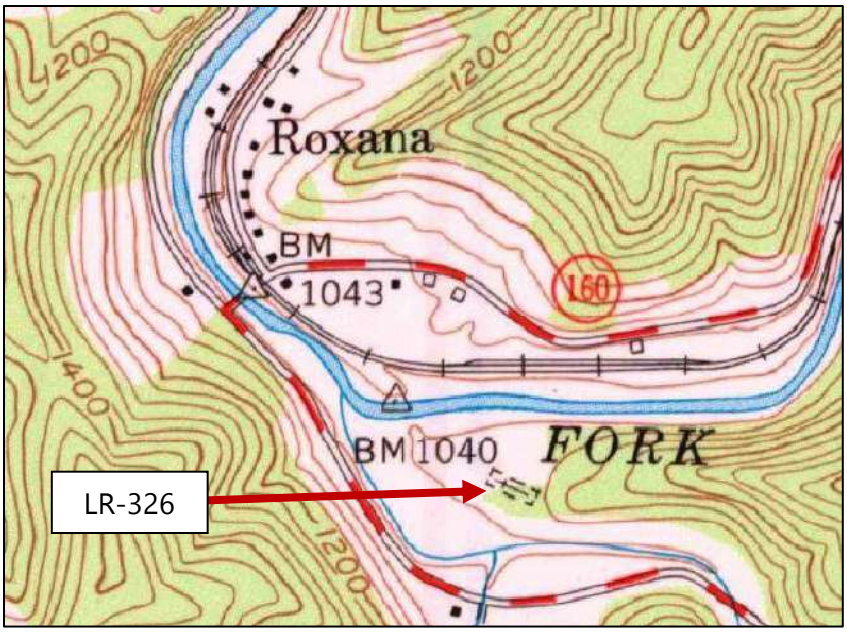

Figure 18.2. LR-326 on the 1954 Roxana, KY USGS topographic map.

Figure 18.3. View of the first earlier section of LR-326, facing west.

Figure 18.4. View of the second section of LR-326, facing east.

Figure 18.5. Headstones within the second section of LR-326, facing east.

Figure 18.6. Headstones found within the first earlier section of LR-326; note this section is becoming overgrown.

Figure 18.7. Headstones found within the first earlier section of LR-326; note the group of fenced-in headstones.

Figure 18.8. Headstone examples found within the first earlier section of LR-326.

19.0 LR-327: KY-160

LR-327 is a box culvert located along KY-160, approximately 1.29-kilometer (0.8 mile) southeast of the intersection of KY-160 and KY-588 in Letcher County, Kentucky (**Table 19.1**; **Figure 19.1**). The culvert carries two lanes of KY-160 over an unnamed drainage. LR-327 is an early to mid-twentieth century culvert constructed in 1933. Like bridges, culverts were often constructed using standardized plans employed by the Kentucky State Highway Department during this period. According to historic mapping, a road was first constructed that intersected the unnamed drainage between 1915 and 1933 (USGS). Although a route traveled through the vicinity as early as 1913, it appears the road was modified and moved further to the northeast of Kings Creek, now intersecting the drainage. With the Good Roads Movement and the increased accessibility of the automobile, road improvements became a national initiative, that led to new legislation and the establishment of the state highway systems. The route was first referred to as KY-160 on historic mapping in 1937, suggesting the route was improved into a highway between 1915 and 1937. The highway improvements and the construction of the culvert in 1933 likely coincided. During the 1930s, progressive federal relief programs funded numerous infrastructure projects across the nation, such as highway and bridge construction (Abner 2010). Beginning in December of 1930, the Emergency Federal Aid Act distributed funding to Kentucky followed by the National Industrial Recovery Act (NIRA) in 1933, which created the Public Works Administration (PWA). In Kentucky, the PWA constructed nearly 600 projects by December of 1933 (Abner 2010). Another agency completing highway and bridge improvements between 1933 and 1934 was the Civil Works Administration (CWA). Unlike the PWA, the CWA operated directly with local governments. LR-327 was likely constructed in association with one of these programs. Standardization for bridge and culvert construction began in the early twentieth century and continues today.

Table 19.1. Summary of LR-327

Address	KY-160 (37.102974, -82.938827)
County	Letcher County
Date of Construction	1933 (inscribed on structure)
Owner	KYTC
Architectural Type	Box Culvert
Integrity	LR-327 is in good condition and has undergone little to no alteration.
NRHP Recommendation	LR-327 is recommended as eligible for the NRHP under Criterion A & C due to architectural and historic significance.

Structure Description

LR-327 is a box culvert with a single barrel or span, walls of wet stone masonry, and a low concrete guardrail (**Figures 19.2** - **19.5**). The concrete guardrail is inscribed with “1933” and “15 TONS” along the south side (see **Figure 19.3**). The culvert is approximately 15.33 feet in length with a deck width of 26.27 feet. The structure has a wearing surface of bituminous. Two stone masonry arches and/or culverts were recorded in Letcher County’s district in 2010, but single-barrel box culverts shorter than 20 feet were not recorded in the state’s bridge database (Abner 2010).

Current Condition
At the time of the current survey, LR-327 was in good condition but the masonry walls, concrete deck, and concrete guardrail did show some minors signs of erosion and weathering. The structure has undergone little to no alteration.

NRHP Recommendation
LR-327 was evaluated for National Register eligibility using the four NRHP criteria identified in this research. The bridge is recommended as eligible for listing in the NRHP under Criterion A and C due to the structure's historic and architectural significance. Under Criterion A, LR-327 is recommended as eligible because of its association with early Highway Department practices and standardization, as well as the bridge's association with federal aid programs during the early to mid-twentieth century. Under Criterion B, LR-327 is recommended as not eligible, as no ties or links were found between the structure and anyone with cultural or historic significance. Under Criterion C, the culvert is recommended as eligible because the structure is an excellent example of an early to mid-twentieth century culvert, retaining original features like its inscribed railing and masonry substructure. The culvert is in good condition and has undergone little to no alteration, whereas many similar culverts have been widened, undergone substantial repairs, or replacement of features. Criterion D is typically considered when assessing archaeological sites, but structures may qualify if they have the potential to contribute important information to our understanding of history. However, LR-327 does not have the potential to yield additional information regarding local and regional development.

LR-327 is located outside the proposed project limit; therefore, the proposed undertaking will not have a direct effect on the bridge. Due to the steep topography situated between the proposed project and the bridge, the proposed undertaking is not visible from the LR-327, resulting in no indirect effect (**Figure 19.6**). Based on these factors, WSP recommends that the proposed undertaking will have **No Adverse Effect** on LR-327. However, the proposed project will likely result in increased traffic within the area, and this may impact the bridge in relation to traffic capacity, noise, and/or vibration. Therefore, further studies related to these concerns should be conducted to assess these potential effects.

Figure 19.1. Aerial image showing the location of LR-327.

Figure 19.2. View of KY-160 carried by LR-327, facing southeast.

Figure 19.3. View of LR-327, facing northeast; note date and tonnage inscribed along the concrete rail and damage on the concrete deck.

Figure 19.4. View of LR-327, facing northwest.

Figure 19.5. View of inside of barrel of LR-327, facing northeast.

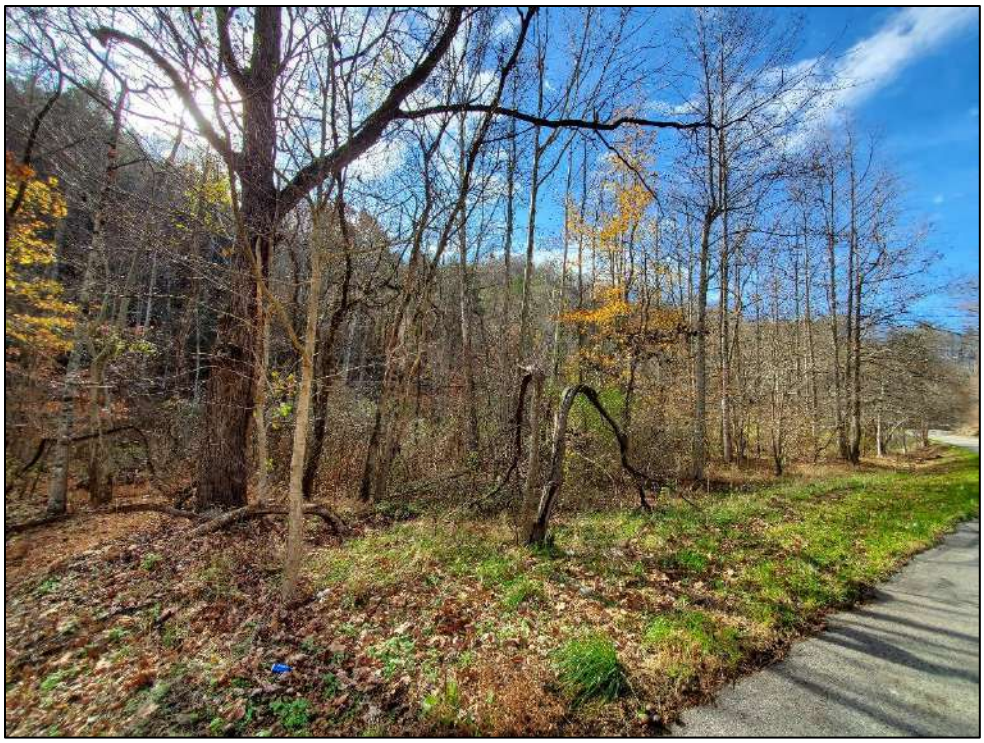

Figure 19.6. View from LR-327 towards the proposed project limit, facing west-northwest.

20.0 LR-328: 7642 KY-160

LR-328 is an early to mid-twentieth century American Vernacular residential building located at 7642 KY-160, Roxana, Letcher County, Kentucky (**Table 20.1**; **Figure 20.1**). The building is bound on the north and east by KY-160 and on the south and west by a wooded area. The property sits on a level area in a valley beneath a side slope covered in lawn grasses and trees on the west side of KY-160 and is accessed via KY-160 by a short gravel drive along the eastern boundary of the property and the road. The immediate property surrounding the house is enclosed within a chain link fence with a small gate centered in front of the house. A long concrete walkway extends from the gate to the main entrance and front porch of the house. Sections of a concrete block wall run between the chain link fence and the gravel drive in front of the house. The building is associated with a shed and a barn. According to the Letcher County, KY PVA, LR-328 is currently owned by Isaac Mitchell, Jr. and has a total living area of 1,546 sq. ft. (**Figure 20.2**). The PVA lists the original construction date of the house as 1933. A building shown in the general location of LR-328 and the associated barn are not illustrated on the 1913 or 1915 topographic mapping but are on the 1954 map (**Figure 20.3**). A building with a similar configuration and in the same location as the house is visible on the 1952 aerial image, which is the earliest aerial found for the area. Despite this, the clarity of the 1952 aerial is not clear enough to determine if the barn was yet constructed. This suggests LR-328 was constructed between 1915 and 1952, which corroborates the PVA's construction date, and that the barn was constructed before 1954.

Table 20.1. Summary of LR-328

Address	7642 KY-160, Roxana, KY
County	Letcher County
Date of Construction	1933 (PVA)
Square Footage (Living Area)	1,546 square feet
Acreage	150
Owner	Isaac Mitchell, Jr.
Architectural Style/Type	Early to mid-20th Century American Vernacular/Front Gable
Integrity	LR-328 is in good condition but has undergone multiple alterations, resulting in loss of integrity of design and materials.
NRHP Recommendation	LR-328 is not eligible for the NRHP due to a lack of architectural and historic significance and loss of integrity.

Building Description

LR-328 is a northeast facing, one-story, single-family, early to mid-twentieth century American Vernacular, front gable, residential building with a raised concrete block foundation, a standing seam metal roof, and exterior walls clad in aluminum siding (**Figure 20.4**). Due to trespassing concerns, the west (rear) elevation was not assessed. A full width porch adorns the main block of the east (front) elevation. The porch is topped with an extension of the main front gable roof that is supported by four rusticated wood posts. The porch has a concrete deck, a concrete block foundation, and is accessed via a short wood ramp with single wood railing. A side porch has been enclosed along the north elevation. The enclosure is topped with a standing seam

metal shed roof, clad in walls of aluminum siding, and sits on a raised concrete block foundation. The entrance to the side porch is accessed via a set of concrete steps. An addition was added on the south elevation that is topped with a standing seam metal shed roof, clad in matching aluminum siding, and rests on a raised concrete block foundation. The building has two internal chimneys, one brick chimney that sits along the south slope of the main roof and one concrete block chimney that sits on the north slope of the main roof near the enclosed side porch. The windows consist of wood double-hung types, and the doors appear to be wood doors with single light and metal framed storm doors.

From the north to south, the east (front) elevation has a single wood door with single light and metal framed storm door along the enclosed porch, a single double-hung wood window, a single wood door with single light and metal framed storm door, a second double-hung wood window along the main block of the house, and a single double-hung wood window along the addition (see **Figures 20.4** - **20.6**).

Beginning on the east end, the north elevation has a single double-hung wood window on the main block and a group of three screened-in wall openings (see **Figure 20.5**).

The south elevation has a single double-hung wood window and a pair of single double-hung wood windows along the side addition and a single double-hung wood window on the east end of the main block (see **Figure 20.6**).

Associated Outbuildings
LR-328 is associated with two outbuildings, a small shed and barn, that were only partially viewable from the public ROW. The shed sits to the northwest of the house (**Figure 20.7**). It is topped with a standing seam metal shed roof and has walls constructed of wood board. The south elevation has a single hinged, wood board door. The north elevation has a single window opening. The east elevation has no wall openings, and the west elevation was not viewable.

The barn sits to the northeast of the house on the opposite side of KY-160. The barn is topped with a standing seam metal gable roof with wide eaves and exposed beams and has exterior walls of vertical wood board on the lower portion and the front gable section (**Figure 20.8**). The interior and the upper portion of the barn utilize log construction. A one story shed addition sits along the north elevation that is covered with a standing seam metal shed roof and has walls of vertical wood board (**Figure 20.9**). The north elevation of the shed addition has no wall openings but within the open section of the shed addition is a hinged wood board door along the north elevation of the main block of the barn. The west elevation has a single rectangular section cut out of the wood board. The upper log portion of this elevation has large gaps for ventilation. The west half of the south elevation is open, and the upper log portion also has large gaps for ventilation. The east elevation was not viewable from the public ROW. Historic mapping indicates the barn was constructed prior to 1954 (see **Figure 20.3**).

Current Condition
LR-328 is in good condition but has undergone multiple unsympathetic alterations, including the side addition, the enclosure of the side porch, and the replacement of the exterior wall material.

The shed is in fair condition with little to no alteration. The barn is in fair condition with signs of weathering and some damage on the exterior walls and roofing material. The building has also been altered, such as the shed addition and the replacement of roofing and some wall material.

NRHP Recommendation

LR-328 is not recommended as eligible for listing in the NRHP due to lack of architectural and historic significance and loss of integrity of design and materials. Under Criterion A, LR-328 is recommended as not eligible because it has no association to any historic events or pattern of events that have greatly influenced the region, state, or nation. Likewise, under Criterion B, LR-328 is recommended as not eligible, as no ties or links were found between the building and any person or persons of cultural or historic significance. Under Criterion C, LR-328 is recommended as not eligible because the building has no elements that make it a unique example of its common architectural type, and the house is not the work of a master builder or craftsperson. Furthermore, the building has undergone several unsympathetic alterations, resulting in a loss of integrity of materials and design. Criterion D is typically considered when assessing archaeological sites, but buildings may qualify if they have the potential to contribute important information to our understanding of history. However, LR-328 does not have the potential to yield additional information regarding local and regional development.

The barn is not recommended as eligible for listing in the NRHP due to lack of architectural and historic significance and loss of integrity of design and materials. Under Criterion A, the barn is recommended as not eligible because it has no association to any historic events or pattern of events that have greatly influenced the region, state, or nation. Under Criterion B, the barn is recommended as not eligible, as no ties or links were found between the building and any person or persons of cultural or historic significance. Under Criterion C, the barn is recommended as not eligible because it is not the work of a master builder or craftsperson and has undergone unsympathetic alterations, such as the shed addition and replacement of building materials, resulting in a loss of integrity of materials and design. Under Criterion D, the barn does not have the potential to yield additional information regarding local and regional development.

The shed is recommended as not eligible for listing in the NRHP due to a lack of historic and architectural significance. Under Criterion A, the shed is not associated with any historically significant events or patterns that have affected the region, state, or nation. The building is recommended as not eligible under Criterion B because it cannot be linked to any person or persons of historical significance. Under Criterion C, the shed is not eligible because it is not associated with the work of a master builder, has no distinct architectural style, and is not a unique example of its common building type. Under Criterion D, the shed does not have the potential to contribute to further understanding of local and regional development.

No further work is recommended.

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Figure 20.1. Aerial image showing the location of LR-328 and associated outbuildings.

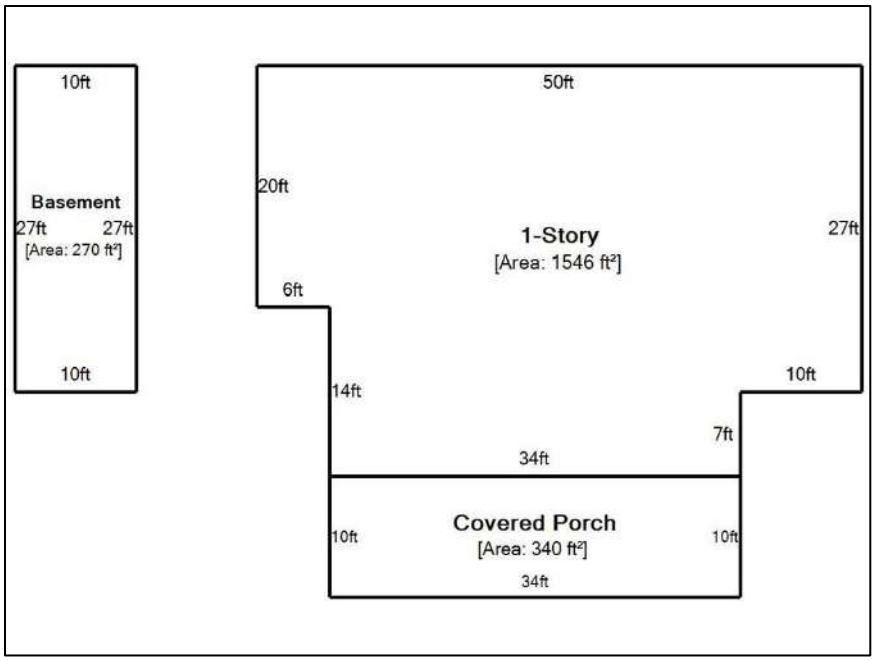

Figure 20.2. Letcher County PVA plan with square footage of LR-328.

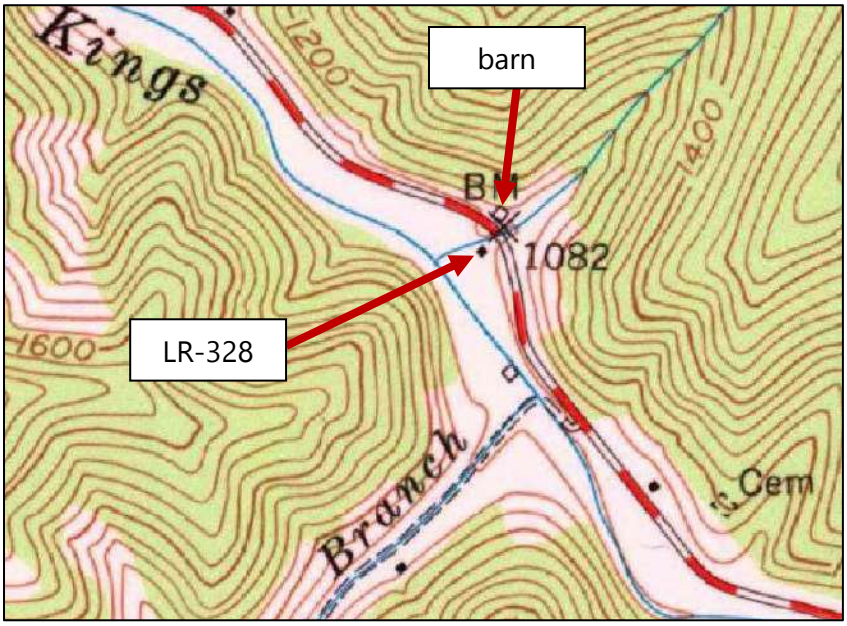

Figure 20.3. Building in the vicinity of LR-328 and the associated barn on the 1954 Roxana, KY USGS topographic map.

Figure 20.4. The east elevation of LR-328, facing west-southwest; note the associated shed to the northwest of the house.

Figure 20.5. The east and north elevations of LR-328, facing south.

Figure 20.6. The south and east elevations of LR-328, facing northwest.

Figure 20.7. The associated shed and the north and west elevations of LR-328, facing south.

Figure 20.8. The south and east elevations of the barn associated with LR-328, facing north.

Figure 20.9. The west and south elevations of the barn associated with LR-328, facing northeast.

21.0 LR-329: Lilly Cornett Branch Road

LR-329 is a small family cemetery along Lilly Cornett Branch Road in Roxana, Letcher County, Kentucky (**Table 21.1**; **Figure 21.1**). The cemetery is bound on the north, east, and west by wooded areas and on the south by Lilly Cornett Branch Road. LR-329 sits in a small open area on a side slope surrounded by trees on the north side of Lilly Cornett Branch Road and is accessed via Lilly Cornett Branch Road and an unnamed gravel road by a short grassy trail. According to the Letcher County, KY PVA, LR-329 is currently owned by Annabelle, Andy, & Billy Wayne Wright. The cemetery is first illustrated on topographic mapping in 1954 (USGS) (**Figure 21.2**). The area is obscured by vegetation all available aerial images.

Table 21.1. Summary of LR-329

Address	Lilly Cornett Branch Road (37.101029, -82.971602)
County	Letcher County
Date of Construction	c. 1901 (earliest internment)
Number of Interments	Approximately 14 headstones (possible more unmarked)
Owner	Annabelle, Andy, & Billy Wayne Wright
Architectural Type	Early 20th Century Family Cemetery
Integrity	LR-329 is in good condition.
NRHP Recommendation	LR-329 is not eligible for the NRHP due to lack of architectural and historic significance.

Cemetery Description

LR-329 is an early twentieth century cemetery located in an open area along a side slope surrounded by a wooded area (**Figures 21.3** and **21.4**). LR-329 is a small family cemetery. This type of cemetery became popular as settlement patterns became more dispersed while transportation remained difficult and often were established on high, well-drained property (Potter and Boland 1992). During the time of the survey, approximately 14 marked graves were recorded, with the earliest noted being from 1901 and the most recent from 1998. The headstones consisted of upright types constructed of granite, marble, concrete, and field rock (**Figures 21.4** - **21.6**). A few of the headstones were recently replaced while several others are difficult to read. Additional unmarked internments may exist but no obvious depressions were observed. The surnames recorded included Watts, Ison, and Bailey. The earliest internment located was from the Ison family. According to online research, the cemetery is known as Isaac Ison Cemetery (Findagrave 2023). The website Find a Grave lists 11 internments within the cemetery with a date range from 1904 to 2018 (Findagrave 2023).

Current Condition

At the time of the survey, LR-329 is an active cemetery in good condition and well maintained.

NRHP Recommendation

LR-329 is recommended as not eligible for NRHP listing due to a lack of historic or architectural significance based on the four NRHP criteria and themes identified during research. As *National Register Bulletin #41* states, “cemeteries and graves are among those properties that ordinarily are not considered eligible for inclusion in the National Register of Historic Places unless they meet special requirements. To qualify for listing under Criteria A, B, C, or D a cemetery or grave

must meet not only the basic criteria, but also the special requirements of Criteria Considerations C or D, relating to graves and cemeteries" (Potter and Boland 1992).

Under Criterion A, the cemetery is not associated with any known significant event, nor does it provide information on the role of any local industry or agricultural development. The cemetery does not have any historically significant connections, therefore it is not considered significant under Criterion B. Under Criterion C, the resource does not contain monuments that are of architectural significance nor does it appear to be a special built historic landscape. Under Criterion D, the cemetery does not yield information pertaining to any previously mentioned criteria or themes. Given these factors, it is recommended that LR-329 is not eligible for listing on the NRHP.

No further work is recommended.

Figure 21.1. Aerial image showing the location of LR-329.

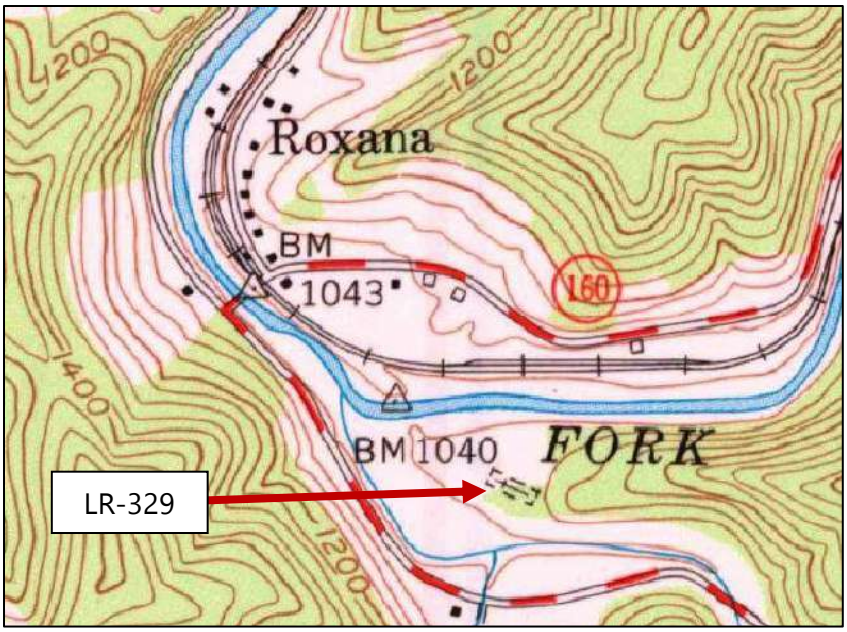

Figure 21.2. LR-329 on the 1954 Roxana, KY USGS topographic map.

Figure 21.3. View of LR-329, facing north.

Figure 21.4. View of LR-329, facing north.

Figure 21.5. Headstone examples within LR-329.

Figure 21.6. Headstone examples within LR-329.

22.0 LR-330: KY-160

LR-330 (Bridge No. 067B00031N) is located along KY-160, approximately 0.48-kilometer (0.3 mile) southeast of the intersection of KY-160 and Bluegrass Ridge Road in Letcher County, Kentucky (**Table 22.1**; **Figure 22.1**). The bridge carries two lanes of KY-160 over Kings Creek. LR-330 is an early to mid-twentieth century concrete T-Beam bridge constructed in 1933. A T-Beam is a bridge type with a superstructure system where a slab has vertical reinforced concrete beams along the underside, resulting in a cross section of the superstructure that resembles the letter T (Abner 2010). According to historic mapping, a road crossed Kings Creek in the vicinity of LR-330 as early as 1913, suggesting LR-330 replaced an earlier bridge (USGS). With the Good Roads Movement and the increased accessibility of the automobile, road improvements became a national initiative, that led to new legislation and the establishment of the state highway systems. The route was first referred to as KY-160 on historic mapping in 1937, suggesting the route was improved into a highway between 1915 and 1937. The highway improvements and the construction of the bridge in 1933 likely coincided. During the 1930s, progressive federal relief programs funded numerous infrastructure projects across the nation, such as highways and bridge construction (Abner 2010). Beginning in December of 1930, the Emergency Federal Aid Act distributed funding to Kentucky followed by the National Industrial Recovery Act (NIRA) in 1933, which created the Public Works Administration (PWA). Another agency completing highway and bridge improvements between 1933 and 1934 was the Civil Works Administration (CWA). LR-330 was likely constructed in association with the Emergency Federal Aid Act or one of these early programs. The bridge was constructed using standardized plans employed by the Department of Highways (KYTC) at the time of construction. Standardization for bridge construction began in the early twentieth century and continues today. Superior workmanship and quality materials were primary concerns for infrastructure construction in the 1930s, as well as the replacement of inferior and unsafe bridges (Abner 2010). As of 2010, ninety-seven concrete T-Beam bridges were recorded as built before 1960 within Letcher County's district (Abner 2010).

Table 22.1. Summary of LR-330

Address	KY-160 (37.104531, -82.941818)
County	Letcher County
Date of Construction	1933 (NBI Data and inscribed with date)
Owner	KYTC
Architectural Type	Concrete T-Beam
Integrity	LR-330 is in good condition and has undergone little to no alteration, retaining integrity of design, workmanship, materials, location, association, feeling, and setting.
NRHP Recommendation	LR-330 is recommended as eligible for the NRHP under Criterion A & C due to architectural and historic significance.

Bridge Description

LR-330 is a reinforced concrete Tee or T-Beam type bridge with three spans and a concrete cast-in-place deck that crosses over Kings Creek along KY-160 (**Figure 22.2**). The bridge is 116.1 ft. in length, with a deck width of 20.3 ft., a maximum span of 36.1 ft., and a 45-degree skew (Bridge Data Miner 2023; FHWA 2023; National Bridge Inventory 2023) (**Figure 22.3**).

The structure has a wearing surface of bituminous, stepped wet stone masonry abutments and rounded piers, and retains its original concrete Standardized Handrail Type A or fence type railings in good condition (**Figures 22.4** - **22.7)**. Thirteen bridges with this type of railing were recorded in the Letcher County district in 2010. Often found on rural roads, the railing type was commonly used in Kentucky from the 1910s to the early 1930s. However, the railing type is susceptible to damage from impacts and has often been replaced with standard steel guard rails. The abutments and piers consist of rectangular cut stone blocks with protruding mortar joints, which were typical of structures in the 1920s and 1930s (Abner 2010). The concrete superstructure is inscribed with “1933” and “15 TONS” on the underside of the west abutment (**Figure 22.8**).

Current Condition
According to the 2022 inspection, LR-330 is in fair condition but the deck geometry was listed as intolerable and a high priority for replacement (Bridge Data Miner 2023; FHWA 2023; National Bridge Inventory 2023). At the time of the current survey, the bridge appeared to be in good condition with little to no alteration, although some minor deterioration was observed on the concrete superstructure and railing (**Figures 22.9** and **22.10**).

NRHP Recommendation
LR-330 was evaluated for National Register eligibility using the four NRHP criteria identified in this research. The bridge is recommended as eligible for listing in the NRHP under Criterion A and C due to the structure’s historic and architectural significance. Under Criterion A, LR-330 is recommended as eligible because of its association with early Highway Department practices and standardization, as well as the bridge’s association with federal aid programs during the early to mid-twentieth century. Under Criterion B, LR-330 is recommended as not eligible, as no ties or links were found between the structure and anyone with cultural or historic significance. Under Criterion C, the bridge is recommended as eligible because the structure is an excellent example of an early reinforced concrete T-Beam, retaining original features like its handrails and stone substructure. The bridge is in good condition and has undergone little to no alteration, whereas many similar bridges have been widened, undergone substantial repairs, or replacement of features. Criterion D is typically considered when assessing archaeological sites, but structures may qualify if they have the potential to contribute important information to our understanding of history. However, LR-330 does not have the potential to yield additional information regarding local and regional development.

LR-330 is located outside the proposed project limit; therefore, the proposed undertaking will not have a direct effect on the bridge. Due to the steep topography situated between the proposed project and the bridge, the proposed undertaking is not visible from the LR-330, resulting in no indirect effect (**Figure 22.11**). Based on these factors, WSP recommends that the proposed undertaking will have **No Adverse Effect** on LR-330. However, the proposed project will likely result in increased traffic within the area, and this may impact the bridge in relation to traffic capacity, noise, and/or vibration. Therefore, further studies related to these concerns should be conducted to assess these potential effects.

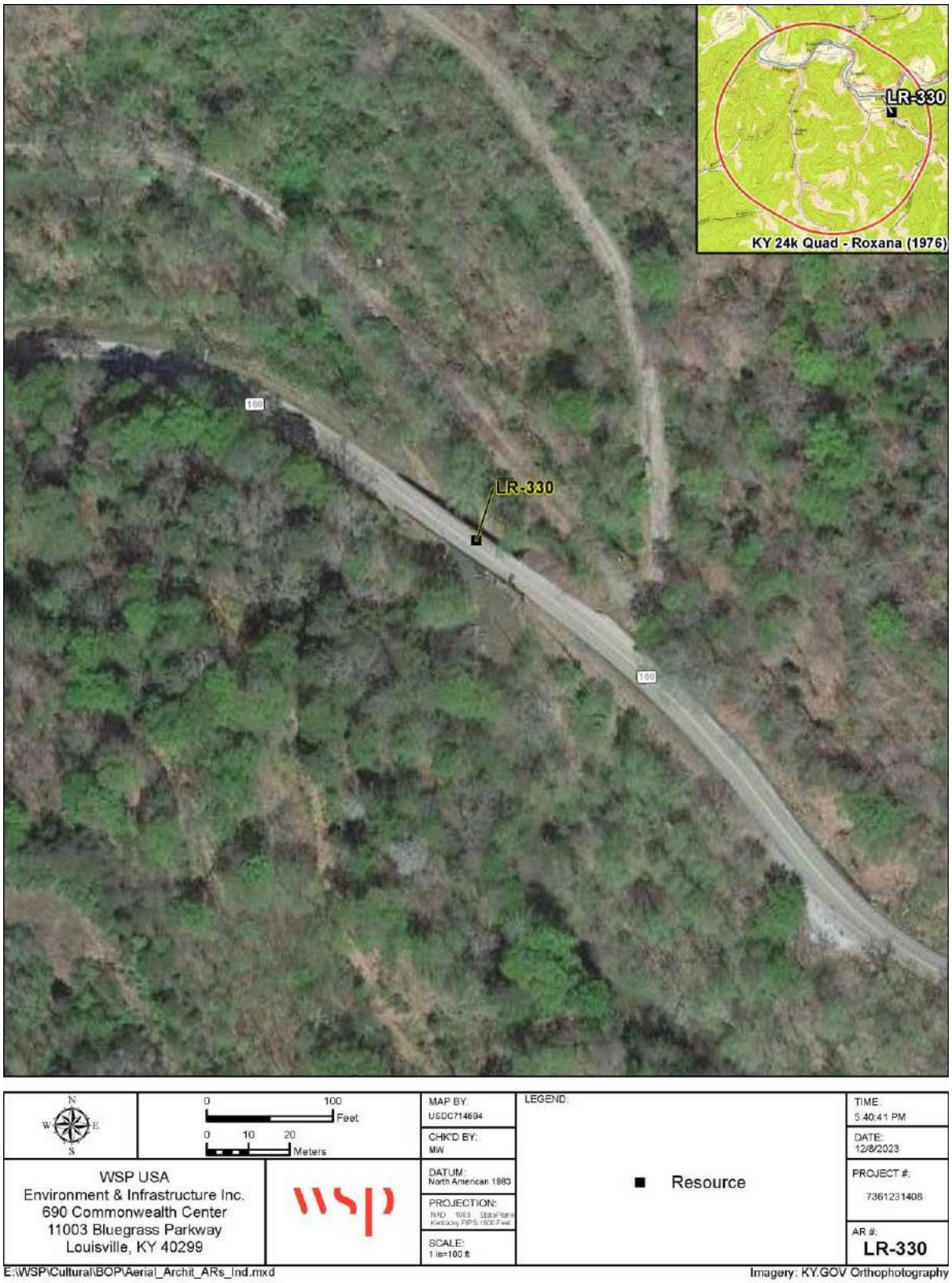

Figure 22.1. Aerial image showing the location of LR-330.

Figure 22.2. View of LR-330, facing northwest.

Figure 22.3. View of LR-330, facing north-northwest; note the railing and rounded wet stone piers.

Figure 22.4. View of LR-330, facing north-northwest; note the railing.

Figure 22.5. View of LR-330, facing north; note the stepped wet masonry abutment.

Figure 22.6. View of LR-330, facing east-southeast; note the wet masonry rounded piers and railing.

Figure 22.7. View of the underside of the superstructure and one of the rounded masonry piers of LR-330, facing northwest.

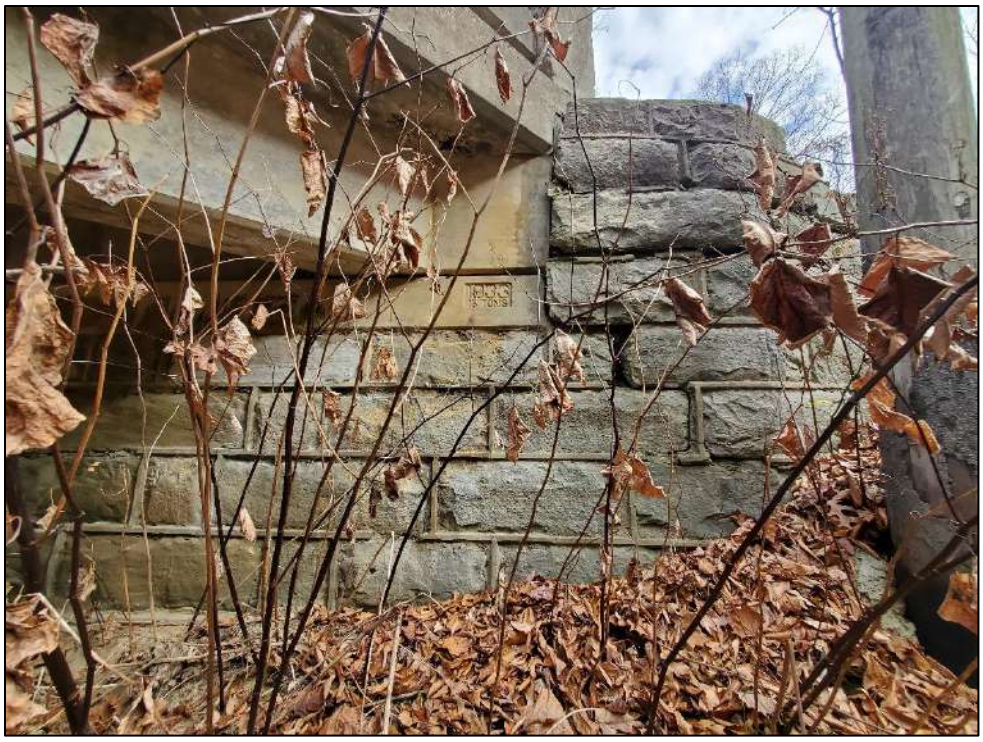

Figure 22.8. View of the construction date and tonnage inscribed on the underside of the superstructure on the west end of LR-330.

Figure 22.9. View of damage to the concrete superstructure of LR-330.

Figure 22.10. View of damage to the concrete railing of LR-330.

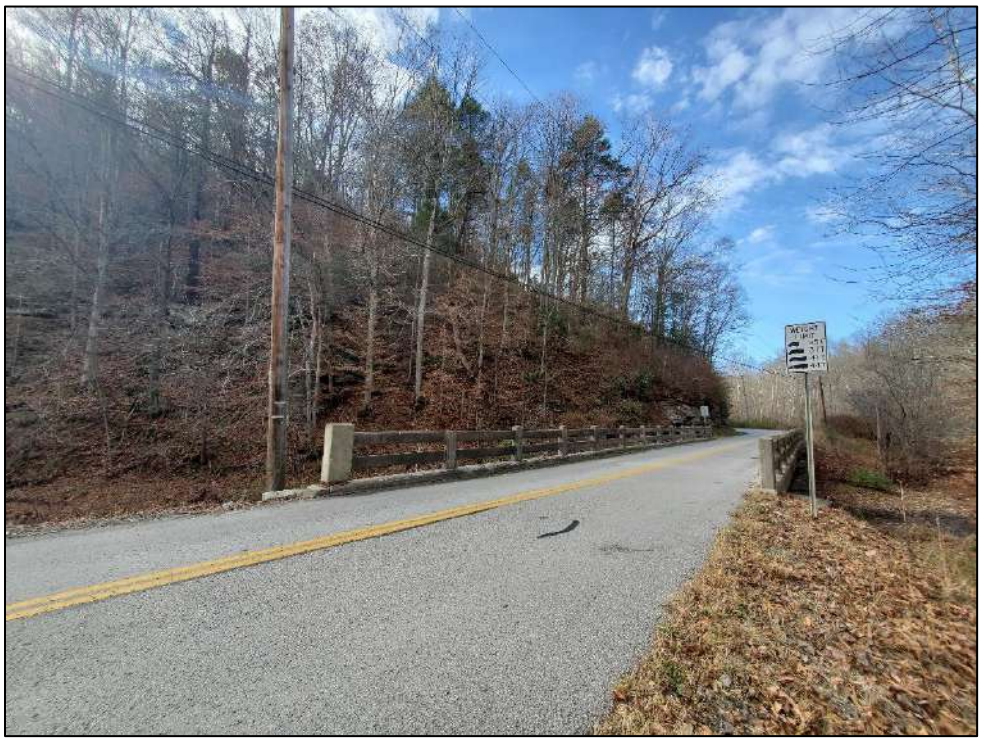

Figure 22.11. View from LR-330 towards the proposed project limit, facing west-northwest.

23.0 LR-331: KY-160

LR-331 is a box culvert located along KY-160, approximately seven meters (23 ft.) east of the intersection of KY-160 and Bluegrass Ridge Road in Letcher County, Kentucky (**Table 23.1**; **Figure 23.1**). The culvert carries two lanes of KY-160 over an unnamed drainage. LR-331 is an early to mid-twentieth century culvert constructed in 1933. According to historic mapping, a road was first constructed that intersected the unnamed drainage between 1913 and 1933 (USGS). With the Good Roads Movement and the increased accessibility of the automobile, road improvements became a national initiative, that led to new legislation and the establishment of the state highway systems. The route was first referred to as KY-160 on historic mapping in 1937, suggesting the route was improved into a highway between 1913 and 1937. The highway improvements and the construction of the culvert in 1933 likely coincided. During the 1930s, progressive federal relief programs funded numerous infrastructure projects across the nation and throughout Kentucky, such as highway and bridge construction (Abner 2010). Beginning in December of 1930, the Emergency Federal Aid Act distributed funding to Kentucky followed by the National Industrial Recovery Act (NIRA) in 1933, which created the Public Works Administration (PWA). Another agency completing highway and bridge improvements between 1933 and 1934 was the Civil Works Administration (CWA). ULR-331 was likely constructed in association with Emergency Federal Aid Act or one of these early programs. Like bridges, culverts were often constructed using standardized plans employed by the Kentucky State Highway Department. Standardization began in the early twentieth century and continues today.

Table 23.1. Summary of LR-331

Address	KY-160 (37.104564, -82.946144)
County	Letcher County
Date of Construction	1933 (inscribed on structure)
Owner	KYTC
Architectural Type	Box Culvert
Integrity	LR-331 is in good condition and has undergone little to no alteration, retaining its integrity of design, materials, workmanship, location, feeling, association, and setting.
NRHP Recommendation	LR-331 is recommended as eligible for the NRHP under Criterion A & C due to architectural and historic significance.

Structure Description

LR-331 is a box culvert with a double barrel or span, abutments and pier of wet stone masonry, and concrete deck and superstructure (**Figures 23.2** - **23.4**). The concrete deck is inscribed with “1933” and “15 TONS” along the south side (see **Figure 23.3**). The culvert is approximately 25 ft. in length with a deck width of 24 ft. The structure has a wearing surface of bituminous. Over 1,300 double-barrel culverts were still extant across Kentucky in 2018, but only two stone masonry arches and/or culverts were recorded in Letcher County’s district in 2010 (Abner 2010). However, culverts that utilize concrete with stone substructures were often classified as concrete box culverts instead of stone, and 108 concrete culverts were recorded in the district. Despite this, culverts with stone masonry substructures are less common than all concrete examples, and double-barrel culverts are also less common than single barrel.

Current Condition
At the time of the current survey, LR-331 was in good condition but the masonry walls and concrete deck and superstructure do show some signs of erosion and weathering, and the barrel on the west side of the culvert is largely blocked by vegetation (see **Figures 23.2 - 23.3**). The structure appears to have undergone little to no alteration.

NRHP Recommendation
LR-331 was evaluated for National Register eligibility using the four NRHP criteria identified in this research. The culvert is recommended as eligible for listing in the NRHP under Criterion A and C due to the structure's historic and architectural significance. Under Criterion A, LR-331 is recommended as eligible because of its association with early Highway Department practices and standardization, as well as the culvert's association with federal aid programs during the early to mid-twentieth century (Abner 2010; Kennedy and Johnson 2005). Under Criterion B, LR-331 is recommended as not eligible, as no ties or links were found between the structure and anyone with cultural or historic significance. Under Criterion C, the culvert is recommended as eligible because the structure is an excellent example of an early two-barrel culvert with a stone masonry substructure. Culverts with stone masonry substructures are less common within the region and the state than all-concrete examples (Abner 2010; Kennedy and Johnson 2005). The culvert is in good condition and has undergone little to no alteration whereas similar culverts have undergone substantial repairs and alterations. Criterion D is typically considered when assessing archaeological sites, but structures may qualify if they have the potential to contribute important information to our understanding of history. However, LR-331 does not have the potential to yield additional information regarding local and regional development.

LR-331 is located adjacent to the possible widening of KY-160, which will likely require unsympathetic alteration or replacement of the structure. **Figure 23.5** shows the proximity of LR-331 to the proposed KY-160 widening. The structure sits only approximately 10 feet from the current intersection of KY-160 and Bluegrass Ridge Road/Rise Branch Road, which is the eastern terminus of the proposed widening of KY-160. Given these factors, the proposed project will have a direct and indirect effect on LR-331. As a result, WSP recommends that the proposed undertaking will have an **Adverse Effect** on the structure, and further mitigation will be required.

In addition, the proposed project will likely result in increased traffic within the area, and this may negatively impact the bridge in relation to traffic capacity, noise, and/or vibration. Therefore, further studies related to these concerns will need to be addressed if deemed necessary.

Figure 23.1. Aerial image showing the location of LR-331.

Figure 23.2. View of the south side of LR-331, facing northeast; note date and tonnage stamped along the concrete deck and vegetation overtaking the west barrel.

Figure 23.3. Close-up view of construction date and tonnage on LR-331; note signs of weathering and deterioration.

Figure 23.4. View of the north side of LR-331, facing southwest.

Figure 23.5. View from LR-331 towards the proposed project limit, facing west; note the proximity of the culvert to the proposed widening of KY-160.

24.0 LR-332: KY-588

LR-332 is a small family cemetery along KY-588 in Roxana, Letcher County, Kentucky (**Table 24.1**; **Figure 24.1**). The cemetery is bound on the south and north by a wooded area, on the west by a residential property, and on the east by KY-588. The cemetery sits in an open area on a ridge along a side slope covered in lawn grasses on the south and west side of KY-588 and is accessed via KY-588 by a long winding gravel drive that wraps around a residential property owned by Bernadine Miracle to the cemetery. The residential property is at 9063 KY-588. According to the Letcher County, KY PVA, LR-332 is currently owned by Bernadine Miracle. The cemetery is not illustrated on topographic mapping, and is not shown on the 1952 aerial image, which is the earliest image available (**Figure 24.2**). The cemetery is visible on the 1983 image. The earliest internment recorded dates to 1965.

Table 24.1. Summary of LR-332

Address	KY-588 (37.112593, -82.951419)
County	Letcher County
Date of Construction	c. 1965 (earliest internment recorded)
Number of Interments	Approximately 13 headstones (possible more unmarked)
Owner	Bernardine Miracle
Architectural Type	Mid-20th Century Family Cemetery
Integrity	LR-332 is in good condition.
NRHP Recommendation	LR-332 is not eligible for the NRHP due to lack of architectural and historic significance.

Cemetery Description

LR-332 is a cemetery in an open area along a ridge and is enclosed within metal chain link fencing and surrounded by a wooded area (**Figure 24.3**). The headstones are laid out within uniform rows (**Figure 24.4**). LR-332 is a small family cemetery. This type of cemetery became popular as settlement patterns became more dispersed while transportation remained difficult and often were established on high, well-drained property (Potter and Boland 1992). During the time of the survey, approximately 13 marked graves were recorded, with the earliest noted being from 1965 and the most recent from 2010. Additional unmarked internments may exist but no obvious depressions were observed. The headstones consisted of upright and flat types constructed of granite, and one internment was marked with a metal name plate (**Figures 24.5** and **24.6**). The surnames recorded included Boggs, Childers, Maggard, Raleigh, Whitaker, Cable, and Gibson. The earliest internments located were from the Bogg family. According to online research, the cemetery is known as Jeff Whitaker Cemetery (Findagrave 2023; Letcher County Cemetery Records ND). Ten headstones were previously documented with the earliest dating to 1965, but this list appears to not include late twentieth century and twenty-first century internments (Letcher County Cemetery Records ND). The website Find a Grave lists 22 internments within the cemetery with a date range from 1965 to 2006 (Findagrave 2023). The Letcher County Historical and Genealogical Society also compiled a list of cemeteries in the county, referring to this cemetery as Jeff & Hessie Whitaker Cemetery and documenting a total of 19 internments with a date range of 1965 to 2005 (2006).

Current Condition
At the time of the survey, LR-332 is a well maintained and active cemetery in good condition.

NRHP Recommendation
LR-332 is recommended as not eligible for NRHP listing due to a lack of historic or architectural significance based on the four NRHP criteria and themes identified during research. As *National Register Bulletin #41* states, “cemeteries and graves are among those properties that ordinarily are not considered eligible for inclusion in the National Register of Historic Places unless they meet special requirements. To qualify for listing under Criteria A, B, C, or D a cemetery or grave must meet not only the basic criteria, but also the special requirements of Criteria Considerations C or D, relating to graves and cemeteries” (Potter and Boland 1992).

Under Criterion A, the cemetery is not associated with any known significant event, nor does it provide information on the role of any local industry or agricultural development. The cemetery does not have any historically significant connections, therefore it is not considered significant under Criterion B. Under Criterion C, the resource does not contain monuments that are of architectural significance, nor does it appear to be a special built historic landscape. Under Criterion D, the cemetery does not yield information pertaining to any previously mentioned criteria or themes. Given these factors, it is recommended that LR-332 is not eligible for listing on the NRHP.

No further work is recommended.

Figure 24.1. Aerial image showing the location of LR-332.

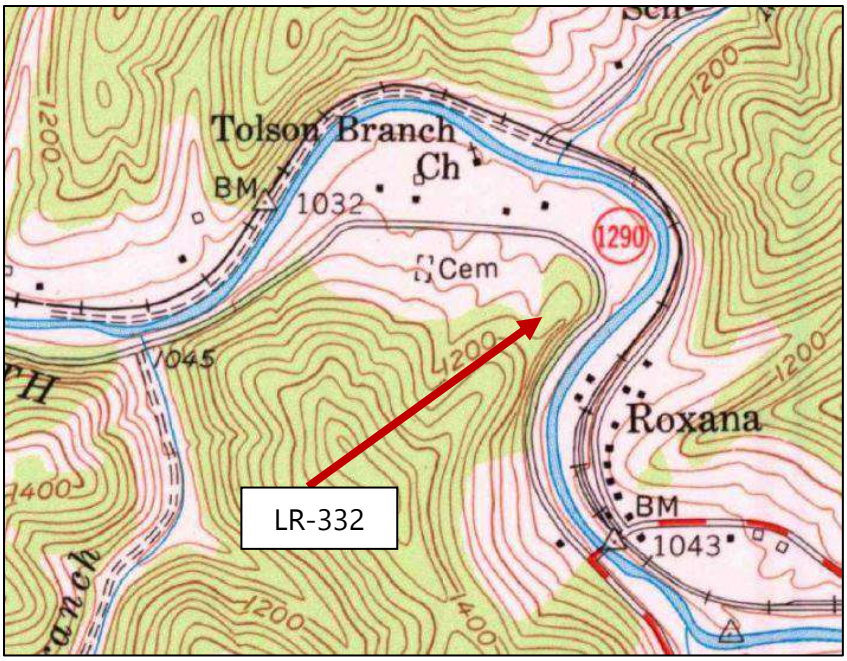

Figure 24.2. Vicinity of LR-332 on the 1954 Roxana, KY USGS topographic map; note that no cemetery is labeled.

Figure 24.3. View of LR-332, facing south-southwest.

Figure 24.4. View of LR-332, facing south.

Figure 24.5. Example of headstones found within LR-332.

Figure 24.6. Example of headstones found within LR-332.

25.0 LR-333: Big Branch-Tolson Creek Road

LR-333 is an early twentieth century building located at Big Branch-Tolson Creek Road, Roxana, Letcher County, Kentucky (**Table 25.1**; **Figure 25.1**). The building is bound on the west and south by Big Branch-Tolson Creek Road, and on the north and east by wooded areas. The property sits on the east edge of Big Branch-Tolson Creek Road. The building is associated with the remnants of a low stone wall that runs along a section of LR-333 between the building and Big Branch-Tolson Creek Road. According to a property owners composite map from 2016, LR-333 is owned by Kentucky River Properties and is identified as a former store (**Figure 25.2**). The Letcher County, KY PVA does not list a landowner for the parcel nor an original construction date for the building. A building shown in the general location of LR-333 is illustrated as early as 1913 on topographic mapping and is also shown on the 1915 and 1954 maps (**Figures 25.3** and **25.4**). A building with a similar configuration and in the same location as the building is visible on the 1952 aerial image, which is the earliest aerial found for the area. This suggests LR-333 was constructed before 1913. Research did not verify that this building is a former store. A local informant, Sam Adams, claimed the building was originally associated with an early coal operation but he was uncertain of the building's original function (2023). The coal industry emerged in the region in the late nineteenth and early twentieth centuries and with it came the expansion of the railroads. Employment opportunity with both industries attracted numerous Eastern European immigrants, including skilled Italian stonemasons (Kennedy and Johnson 2005; Richardson 1992; Powell 1998). Soon after, stone construction became common throughout the region. The building's location, period of construction, and probable association with the coal industry suggests the structure was constructed by local Italian stonemasons around the turn of the century, but this was not verified.

Table 25.1. Summary of LR-333

Address	Big Branch-Tolson Creek Road, Roxana, KY (37.099416, -82.961700)
County	Letcher County
Date of Construction	c. 1900
Square Footage (Living Area)	--
Acreage	Unknown
Owner	Kentucky River Properties
Architectural Style/Type	Early 20th Century Industrial/Commercial
Integrity	LR-333 is in ruinous condition, resulting in loss of integrity of design, workmanship, and materials.
NRHP Recommendation	LR-333 is not eligible for the NRHP due to lack of architectural and historic significance and loss of integrity.

Building Description

LR-333 is a west-southwest facing, one-story, early twentieth century industrial/commercial building constructed of wet masonry with large cut stones (**Figure 25.5**). The building no longer has a roof, the wall openings are vacant, and vegetation has overtaken the interior of the building. The rear wall is only partially standing. From north to south, the west (front) elevation has a window opening, a door opening, and a second window opening (see **Figures 25.5 - 25.6**). The north elevation has a single door opening and a small circular hole (see **Figure**

25.5). The south elevation has no wall openings, and the east (rear) elevation was only partially viewable from the public ROW but a single window opening was observed (**Figure 25.7**).

Associated Structure
LR-333 is associated with the remnants of a section of wet masonry fence that runs between the building and Big Branch-Tolson Creek Road (see **Figures 25.5** and **25.6**).

Current Condition
LR-333 is in ruinous condition, with only three walls and part of a fourth wall still standing. The masonry shows signs of deterioration, erosion, cracking, and patching with concrete. Vegetation has overtaken the interior of the building, and the walls have been vandalized with spray paint.

The associated fence consists of only a remnant of the original structure, which is in poor condition. The structure is largely overgrown with vegetation and the masonry shows signs of deterioration, erosion, and shifting of stones.

NRHP Recommendation
LR-333 is recommended as not eligible for NRHP listing due to a lack of historic or architectural significance and loss of integrity based on the four NRHP criteria and themes identified during research. Under Criterion A, LR-333 is recommended as not eligible because it has no defined association to any historic events or pattern of events that have greatly influenced the region, state, or nation. The building is likely associated with the early coal industry in the region but this association was not verified. Furthermore, the building is in ruinous condition, resulting in a loss of integrity of materials, design, and workmanship. Under Criterion B, LR-333 is recommended as not eligible, as no ties or links were found between the building and any person or persons of cultural or historic significance. The building may have been constructed by local Italian stonemasons but this was not verified. Under Criterion C, LR-333 is recommended as not eligible because the building no longer retains integrity of materials, workmanship, and design due to its ruinous state. Criterion D is typically considered when assessing archaeological sites, but buildings may qualify if they have the potential to contribute important information to our understanding of history. However, an association between LR-333 and previously mentioned criteria or themes was not established; thus, the building does not have potential to yield information regarding local and regional development. Therefore, LR-333 is recommended as not eligible under Criterion D.

No further work is recommended.

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Figure 25.1. Aerial image showing the location of LR-333.

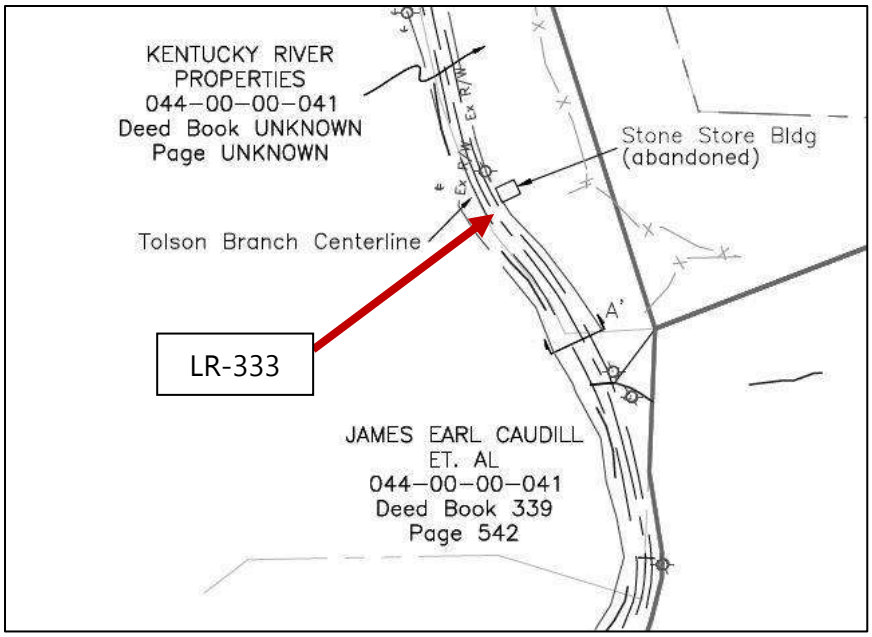

Figure 25.2. LR-333 on a 2016 property owners composite map and labeled as a "Stone Store Bldg (abandoned)."

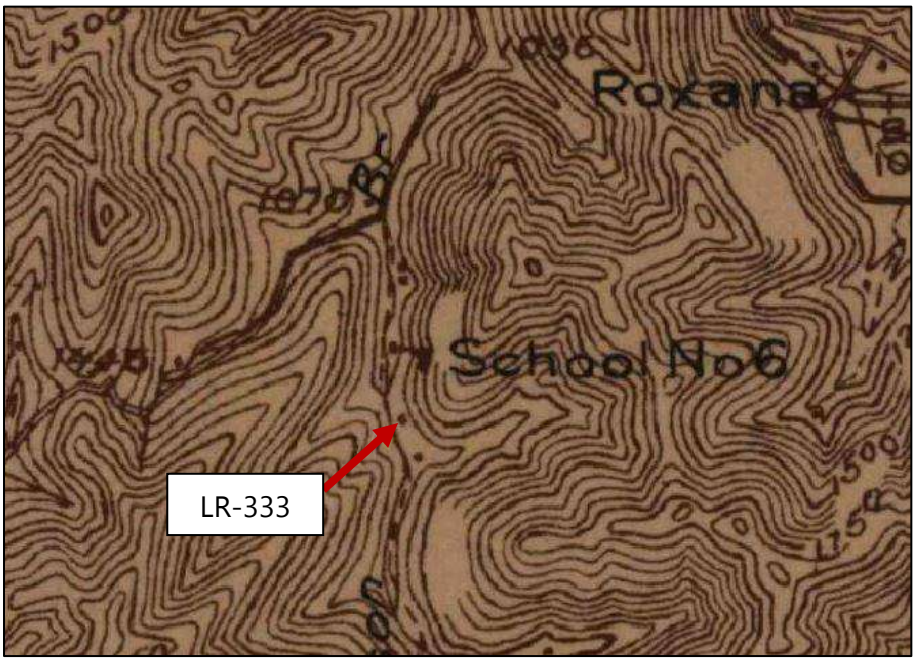

Figure 25.3. Building in the vicinity of LR-333 on the 1913 Oven Fork, KY USGS topographic map.

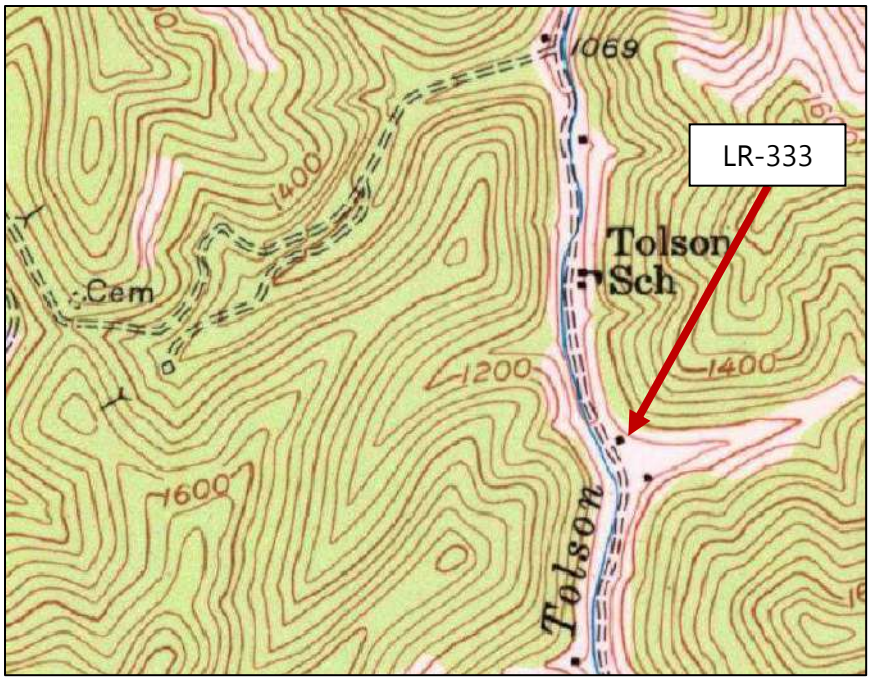

Figure 25.4. Building in the vicinity of LR-333 on the 1954 Roxana, KY USGS topographic map.

Figure 25.5. The north and west (front) elevations of LR-333, facing east-southeast; note the low stone wall or fence.

Figure 25.6. The west (front) elevation of LR-333, facing east-northeast; note the low stone wall or fence.

Figure 25.7. The west (front) and south elevations of LR-333, facing northeast.

26.0 LR-334: KY-160

LR-334 (Bridge No. 067B00101N) is located along KY-160 in Roxana within Letcher County, Kentucky (**Table 26.1**; **Figure 26.1**). The bridge carries two lanes of KY-160 over the North Fork of the Kentucky River at the intersection of KY-160 and KY-588. LR-334 is an early to mid-twentieth century prestressed concrete multiple box beam/girder bridge with wet stone masonry abutments and pier that was originally constructed in 1932. The superstructure was reconstructed in 1980. The bridge was likely constructed using standardized plans employed by the Kentucky Transportation Department at the time of construction and reconstruction. Standardization for bridge construction began in the early twentieth century and continues today. During the 1930s, progressive federal relief programs funded numerous infrastructure projects across the nation, such as highways and bridge construction (Abner 2010). The original bridge was possibly funded with Emergency Federal Aid Act, which began in December of 1930. Even though construction images of the bridge were included in the Goodman-Paxton Photographic Collection, which consists of Works Progress Administration (WPA) projects between 1934 and 1942, the WPA was established in May of 1935. **Figures 26.2** and **26.3** are photographs of the bridge while under construction (Explore UK 2023). Superior workmanship and quality materials were primary concerns for infrastructure construction in the 1930s, as well as the replacement of inferior and unsafe bridges (Abner 2010). According to historic mapping, a road crossed the North Fork of the Kentucky River in the vicinity of LR-334 as early as 1913, suggesting LR-334 replaced an earlier bridge (USGS). With the Good Roads Movement and the increased accessibility of the automobile, road improvements became a national initiative, that led to new legislation and the establishment of the state highway systems. The route was first referred to as KY-160 on historic mapping in 1937, suggesting the route was improved into a highway between 1915 and 1937. The highway improvements and the original construction of the bridge in 1932 likely coincided. KY-588 (Letcher-Blackey Road or Blackey Road), and KY-160 (Kings Creek-Roxana Road) are both listed as constructed with New Deal/Federal Aid Programs (Kennedy and Johnson 2005). When the superstructure was reconstructed in 1980, prestressed concrete was used, which had become more prevalent in the 1950s and 1960s (Abner 2010).

Table 26.1. Summary of LR-334

Address	KY-160 (37.108810, -82.950418)
County	Letcher County
Date of Construction	1980 (NBI Data) superstructure/1932 (stamped) substructure
Owner	KYTC
Architectural Type	Prestressed Concrete Multiple Box Beam/Girder
Integrity	LR-334 is in good condition but has undergone alteration, resulting in loss of integrity of design, workmanship, and materials.
NRHP Recommendation	LR-334 is not eligible for the NRHP due to lack of architectural and historical significance and loss of integrity.

Bridge Description

LR-334 is a prestressed concrete Multiple Box Beam/Girder type bridge with two spans and a concrete precast panel deck that crosses over the North Fork of the Kentucky River along KY-

160 (**Figure 26.4**). The bridge is 173.9 ft. in length, with a deck width of 21 ft., and a maximum span of 86.9 ft. (Bridge Data Miner 2023; FHWA 2023; National Bridge Inventory 2023) (**Figures 26.5** and **26.6**). The structure has a wearing surface of bituminous, stepped wet stone masonry abutments and a wet stone masonry rounded pier, and replacement metal guardrails (**Figures 26.7** - **26.10)**. The abutments and piers consist of rectangular cut stone blocks with protruding mortar joints, which were typical of structures in the 1920s and 1930s (Abner 2010) (**Figures 26.11**). A block on the east side of the north abutment is inscribed with “1932” and “15 TONS” (**Figure 26.12**).

Current Condition
According to the 2022 inspection, LR-334 is in fair condition (Bridge Data Miner 2023; FHWA 2023; National Bridge Inventory 2023). At the time of the current survey, the bridge appeared to be in good condition, although some deterioration and damage was observed on the concrete superstructure, the railings, and the substructure (see **Figures 26.6**, **26.7**, and **26.12**). Moreover, the bridge has undergone unsympathetic alterations with replacement of the superstructure and the railings, resulting in a loss of integrity of materials, design, and workmanship.

NRHP Recommendation
LR-334 is not recommended as eligible for listing in the NRHP due to lack of architectural and historic significance and loss of integrity of design, materials, and workmanship. Under Criterion A, LR-334 is recommended as not eligible. Although the bridge is related to New Deal programming and transportation standardization, LR-334 has undergone unsympathetic alterations. As a result, the structure no longer embodies the significance of these historic associations. Under Criterion B, LR-334 is recommended as not eligible, as no ties or links were found between the structure and any person or persons of cultural or historic significance. Under Criterion C, LR-334 is recommended as not eligible because the structure has no elements that make it a unique example of its architectural type and is not the work of a master builder or craftsperson. Furthermore, the bridge has undergone several unsympathetic alterations, resulting in a loss of integrity of materials, design, and workmanship. Criterion D is typically considered when assessing archaeological sites, but structures may qualify if they have the potential to contribute important information to our understanding of history. However, LR-334 does not have the potential to yield additional information regarding local and regional development.

No further work is recommended.

Figure 26.1. Aerial image showing the location of LR-334.

Figure 26.2. Image of LR-334's masonry abutments during construction, undated (Explore UK 2023) (Courtesy of the Goodman-Paxton Photographic Collection).

Figure 26.3. Image of LR-334's during construction, undated (Explore UK 2023) (Courtesy of the Goodman-Paxton Photographic Collection).

Figure 26.4. View of LR-334, facing northeast; note the replacement railing.

Figure 26.5. View of LR-334, facing west; note the replacement railing, rounded masonry pier, and masonry abutment.

Figure 26.6. View of LR-334, facing west-southwest; note the replacement railing and damage to railing and superstructure.

Figure 26.7. View of north abutment of LR-334, facing northwest; note alterations to the abutment due to the reconstruction of the superstructure and deterioration of the concrete and mortar.

Figure 26.8. View of rounded masonry pier and underside of superstructure of LR-334, facing southwest; note alterations to the pier due to the reconstruction of the superstructure.

Figure 26.9. View of north abutment and superstructure of LR-334, facing east-northeast; note alterations to the abutment due to the reconstruction of the superstructure.

Figure 26.10. View of north abutment and underside of superstructure of LR-334, facing northeast; note alterations to the abutment due to the reconstruction of the superstructure.

Figure 26.11. Closeup view of the stone masonry of the north abutment of LR-334, facing northeast.

Figure 26.12. View of north abutment and construction date of LR-334; note alterations to the abutment due to the reconstruction of the superstructure and deterioration of the concrete and mortar.

27.0 CONCLUSIONS AND RECOMMENDATIONS

At the request of the BOP, WSP conducted an aboveground cultural resource eligibility and effects survey for the proposed construction and operation of a federal correctional facility along KY-588/KY-160 near Roxana in Letcher County, Kentucky. The purpose of the survey was to identify aboveground historic resources over 45 years of age located within the APE; to evaluate these resources relative to their eligibility for listing in the NRHP; and to assess the potential direct and indirect effects of the proposed undertaking upon these resources.

The APE for aboveground cultural historic resource survey was determined in consultation with BOP and the KHC, the SHPO. The APE is based on the proposed project located on a former surface mine or mountaintop removal ridgetop to the south of KY-588 and to the south of the North Fork of the Kentucky River adjacent to the community of Roxana. The BOP proposes to acquire approximately 800 acres (324 hectares) to construct the FCI and FPC. In addition to the FCI and FPC, several ancillary facilities necessary for the operation of the FCI and FPC would be constructed, and security fencing would also be installed around the perimeter of the FCI. The project may require widening of a section of KY-160 between the intersection of KY-588 and KY-160 to Rise Branch Road/Bluegrass Ridge Road.

The APE for the cultural resource survey consists of all historic resources in direct line-of-sight within a ½ mile buffer surrounding the proposed land tract for the project and was developed based on a review of topographic data, the density of the rural setting, as well as an understanding of the specifications of the proposed land use. The proposed project will also increase traffic in the area, which may impact the surrounding cultural historic resources. Therefore, the APE also focused on the resources along the immediate roads surrounding the proposed project whether within or outside the direct line-of-sight, as well as the resources adjacent to the section of KY-160 under consideration for widening.

A total of 20 resources over 45 years old, including six residential buildings, one service station and residential building, one industrial site, one religious building, one industrial/commercial building, five cemeteries, two bridges, one agricultural building, and two culverts, were identified within the APE (**Table 27.1**). Three of the resources, LR-152, LR-153, and LR-245, were previously surveyed. Seventeen of the twenty resources are recommended as not eligible for listing in the NRHP due to a lack of historic and architectural significance and/or loss of integrity. Based on these findings, WSP recommends that there will be **No Historic Properties Affected** by the proposed project for these 17 resources.

Three resources, LR-327, LR-330, and LR-331, are recommended as eligible for listing in the NRHP. LR-327, LR-330, and LR-331 are recommended as eligible under Criterion A and C due to their historic and architectural significance. However, the proposed project will have no direct or indirect effect on LR-327 and LR-330. Therefore, WSP recommends that there will be **No Adverse Effect** by the proposed project on LR-327 and LR-330. The proposed undertaking does have a direct and indirect effect on LR-331; therefore, WSP recommends that the proposed project will have an **Adverse Effect** on the resource. Widening of KY-160 is adjacent to the structure and would likely require unsympathetic alteration or replacement of the structure. Thus, mitigation will be required for LR-331.

The proposed project will likely result in increased traffic within the area. Due to their locations along traffic corridors adjacent to the project area, LR-327, LR-330, and LR-331 may be impacted in relation to traffic-related capacity, noise, and/or vibration. Therefore, further studies related to these concerns should be conducted to address these potential effects.

Table 27.1. NRHP Recommendations and Determinations of Effect

KHC Site Number	Style/Form	NRHP Recommendation	Determination of Effect
LR-152	Early 20th Century American Vernacular/Hipped	Not Eligible	No Historic Properties Affected
LR-153	Early-Mid-20th Century American Vernacular/Hipped	Not Eligible	No Historic Properties Affected
LR-245	Mid-20th Century Cemetery	Not Eligible	No Historic Properties Affected
LR-318	Mid-Late 20th Century Industrial site	Not Eligible	No Historic Properties Affected
LR-319	Late 19th Century Cemetery	Not Eligible	No Historic Properties Affected
LR-320	Mid-20th Century American Vernacular/Side Gable	Not Eligible	No Historic Properties Affected
LR-321	Mid-20th Century Agricultural	Not Eligible	No Historic Properties Affected
LR-322	Mid-20th Century American Vernacular/Front Gable/Center-Steeple Church	Not Eligible	No Historic Properties Affected
LR-323	Mid-20th Century Commercial/Mid-20th Century American Vernacular/Side Gable	Not Eligible	No Historic Properties Affected
LR-324	Mid-20th Century American Vernacular/Side Gable	Not Eligible	No Historic Properties Affected
LR-325	Mid-20th Century American Vernacular/Front Gable	Not Eligible	No Historic Properties Affected
LR-326	Early 20th Century Cemetery	Not Eligible	No Historic Properties Affected
LR-327	Early to Mid-20th Century Culvert	**Eligible**	**No Adverse Effect**
LR-328	Mid-20th Century American Vernacular/Front Gable	Not Eligible	No Historic Properties Affected
LR-329	Early 20th Century Family Cemetery	Not Eligible	No Historic Properties Affected
LR-330	Early to Mid-20th Century Concrete T-Beam Bridge	**Eligible**	**No Adverse Effect**
LR-331	Early to Mid-20th Century Culvert	**Eligible**	**Adverse Effect**
LR-332	Mid-20th Century Cemetery	Not Eligible	No Historic Properties Affected
LR-333	Early 20th Century Industrial/ Commercial	Not Eligible	No Historic Properties Affected
LR-334	Early to Mid-20th Century Concrete Multiple Box Beam/Girder	Not Eligible	No Historic Properties Affected

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ATTACHMENT 2

ARCHAEOLOGICAL SURVEY FOR THE PROPOSED FEDERAL CORRECTIONAL FACILITY, ROXANA, LETCHER COUNTY, KENTUCKY

Archaeological Survey for the Proposed Federal Correctional Facility, Roxana, Letcher County, Kentucky

KY OSA Registration No.: FY24-12500
WSP Project No.: 7361231408
WSP Report No: 2023-046

Prepared for:

Kimberly Hudson, Chief
Construction and Environmental Review Section
Facilities Management Branch
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Federal Bureau of Prisons
320 First Street, NW, Room 901-5
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10 January 2024

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10 January 2024

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ABSTRACT

On behalf of the Federal Bureau of Prisons (BOP), WSP conducted an archaeological survey during the first week of November 2023 for the proposed construction and operation of a federal correctional facility at a site located along KY-588/KY-160 near Roxana in Letcher County, Kentucky. The BOP proposes to construct a Federal Correctional Institution (FCI) and Federal Prison Camp (FPC). Individuals housed in the FCI would be medium-security male inmates and those housed in the FPC would be minimum-security male inmates. The proposed facilities would house approximately 1,408 total inmates (approximately 1,152 within the FCI and approximately 256 within the FPC). In addition to the FCI and FPC, several ancillary facilities necessary for the operation of the FCI and FPC would be constructed including a warehouse, central utility plant, along with security fencing installed around the perimeter of the FCI. The proposed project site is a former surface mine or mountaintop removal ridgetop to the south of KY-588 and to the south of the North Fork of the Kentucky River near the community of Roxana. Much of the proposed project limit consists of open level areas interspersed with groups of trees and other vegetation with few buildings or structures. In addition to the facility, the project may include widening of a section of KY-160 between the intersection of KY-588 and KY-160 to Rise Branch Road/ Bluegrass Ridge Road.

The archaeological area of potential effect for the proposed project encompassed approximately 520 acres (210 ha). Prior to the survey, a records review was requested from the Office of State Archaeology (OSA) which showed that most of the 520 acres was previously surveyed by Sebestyen and Brann (2011) and that no previously recorded archaeological sites were in or immediately adjacent to the proposed project area (FY24-12500). Later survey reports for the same project by Sebestyen and Brann (2014) and Brann (2017), however, indicates that these three surveys collectively only covered approximately 235 acres (95 ha) of the current 520-acre area.

Although no archaeological sites were documented during the previous three surveys, one active modern cemetery (Frazier) was noted just south of Highway 588 during the 2017 investigation. An archaeological site number was not assigned to the cemetery, but per SHPO request (see KHC No. 48622) all the tombstone information and photos were included on a KHC Survey Form and incorporated into their revised report. A cover letter included with the report noted the proposed project would accommodate a 100-foot buffer around the cemetery and be avoided. Since the cemetery was recently recorded, the current survey only confirmed its location and, per OSA request, a site number was applied for and given (15Lr115).

Since 235 acres was previously surveyed, the current investigation covered the remaining 285 acres (115 ha) of the project area. In addition to the 285 acres associated with the facility, another three acres (50-foot buffer) were surveyed on the east side of Highway 160 between the intersection of Highways 160 and 588 and Rise Branch Road for possible road widening associated with the proposed facility. The area associated with both the facility and the road widening were steeply sloped and forested. Most of the leaves, however, had fallen prior to fieldwork, so terrain visibility was excellent. Fieldwork, which consisted mostly of pedestrian survey, required approximately 24 person hours to complete and was conducted by Richard Herndon. Prior to fieldwork, two areas along the west side of Highway 160 were excluded from the survey at this time as the landowners were still residing at each location. These two areas combined totaled approximately three acres and will be surveyed later if and when those parcels have been acquired by the BOP. Disturbances observed within the project area consisted mostly

of buried utility lines along Highway 160, old mining roads and several slopes that were filled with rock waste from the past coal operation (approximately 30 acres).

As a result of this survey one new archaeological site (15Lr114) was identified. The site was an early to late twentieth century occupation on the east side of Tolson Creek Road. Only one artifact was recovered. Also present was a modern outhouse, a covered well, and the remains of a small collapsed wooden shed. Site area was disturbed by previous road construction and by a small transmission line. Two possible sites were noted outside the project area along Tolson Creek Road. One was the foundation of a possible school and the other was the standing remains of a store. If the project area should change to include the location of the school and/or store, then an additional archaeological investigation may be needed.

Given the disturbed condition of Site 15Lr114 and the nondiagnostic nature of the artifact assemblage, WSP recommends the site as not eligible for the NRHP and that there will be **No Adverse Effect** by the proposed project with the condition that the 100-foot buffer around Site 15Lr115 (Frazier Cemetery) is maintained.

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1.0 INTRODUCTION

On behalf of the Federal Bureau of Prisons (BOP), WSP conducted an archaeological survey during the first week of November 2023 for a proposed federal correctional facility to be built near Roxana in Letcher County, Kentucky (**Figure 1.1**). The project was completed to facilitate compliance with Section 106 of the National Historic Preservation Act (Public Law 89-665; 54 U.S.C. 300101 et seg.). Investigations were completed in compliance with established specifications for field investigations and National Register of Historic Places (NRHP) assessment according to the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation (Federal Register, Vol. 48, No. 190, 1983) and with the current revision of *Standards and Specifications for Conducting Fieldwork and Preparing Cultural Resource Assessment Reports* prepared by the Kentucky State Historic Preservation Office/Heritage Council (Sanders 2017).

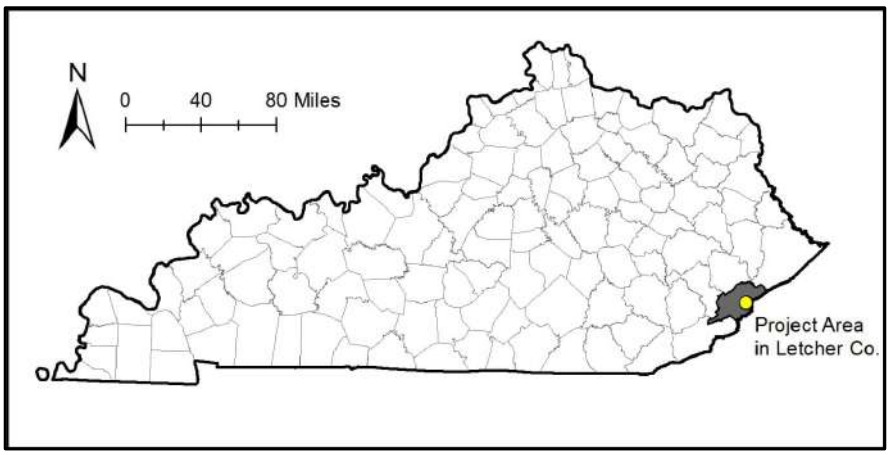

Figure 1.1. Survey location in Letcher County, Kentucky.

1.1 Area of Potential Effect, Project Description, and Project Need

The archaeological Area of Potential Effect (APE), which encompasses approximately 520 acres (210 ha), is located just west of Roxana, KY (**Figures 1.2 and 1.3**). The proposed project involves development of a Federal Correctional Institution (FCI) and Federal Prison Camp (FPC) to be partially placed over a former coal mining operation that has been reclaimed. Individuals housed in the FCI would be medium-security male inmates and those housed in the FPC would be minimum-security male inmates. The proposed facilities would house approximately 1,408 total inmates (approximately 1,152 within the FCI and approximately 256 within the FPC). Ancillary facilities include a central utility plant, firing range, outside warehouse, staff training building, garage, access road, and parking area. Security fencing will also be installed around the perimeter of the FCI. Buffer areas around the facilities are also incorporated into the 520-acre area. In addition to the correctional facility, approximately three acres or a 50-foot buffer on the east side of Highway 160 between the intersection of Highways 160 and 588 and Rise Branch Road is needed for possible road widening associated with the proposed facility.

Prior to the survey, a records review was requested from the Office of State Archaeology (OSA) which showed that most of the 520 acres was previously surveyed by Sebestyen and Brann (2011) for an earlier version of the same proposed project and that no previously recorded archaeological sites were in or immediately adjacent to the proposed project area (FY24-12500).

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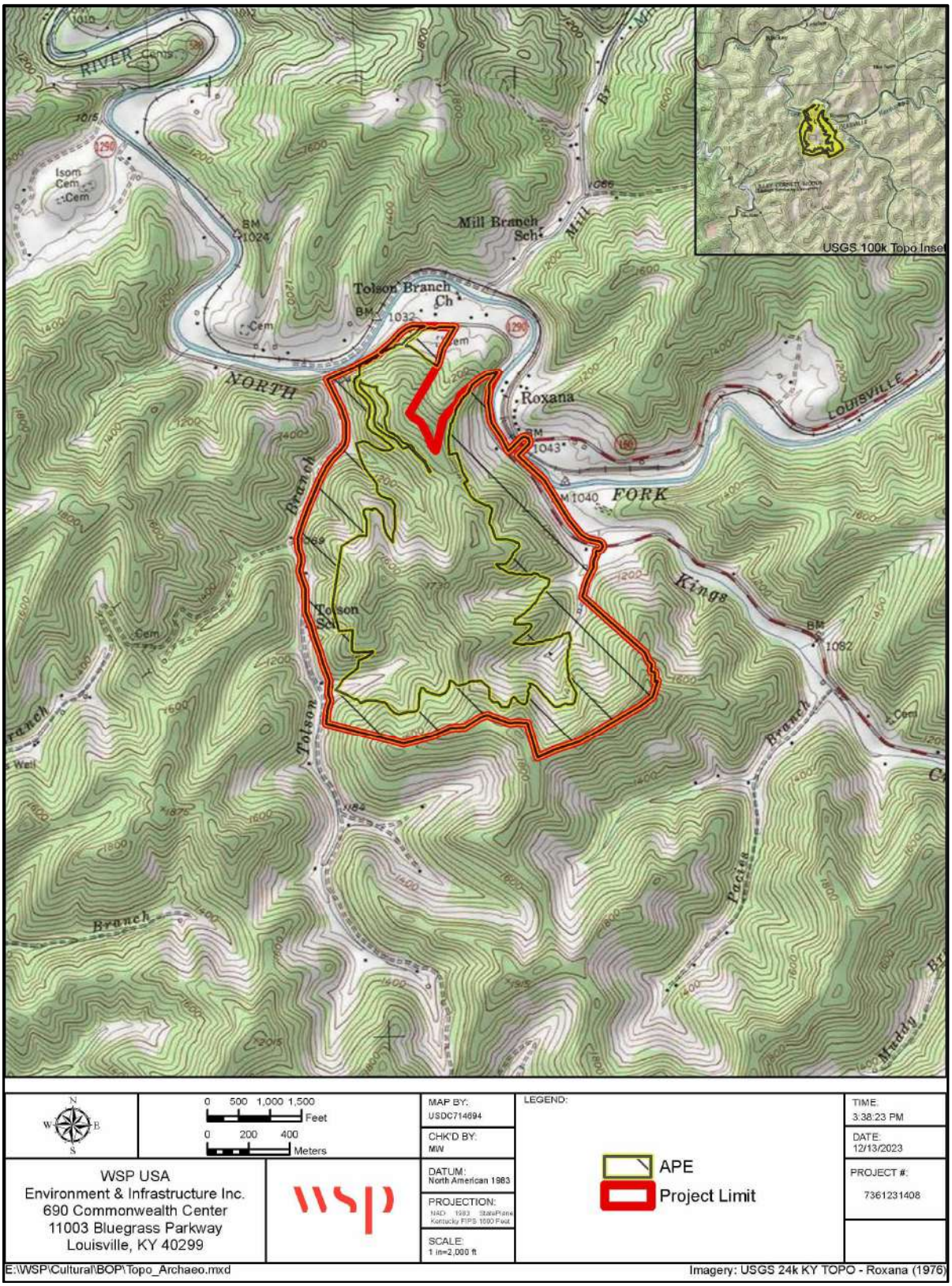

Figure 1.2. Location of the project area on the Roxana topographic quadrangle (USGS 1954).

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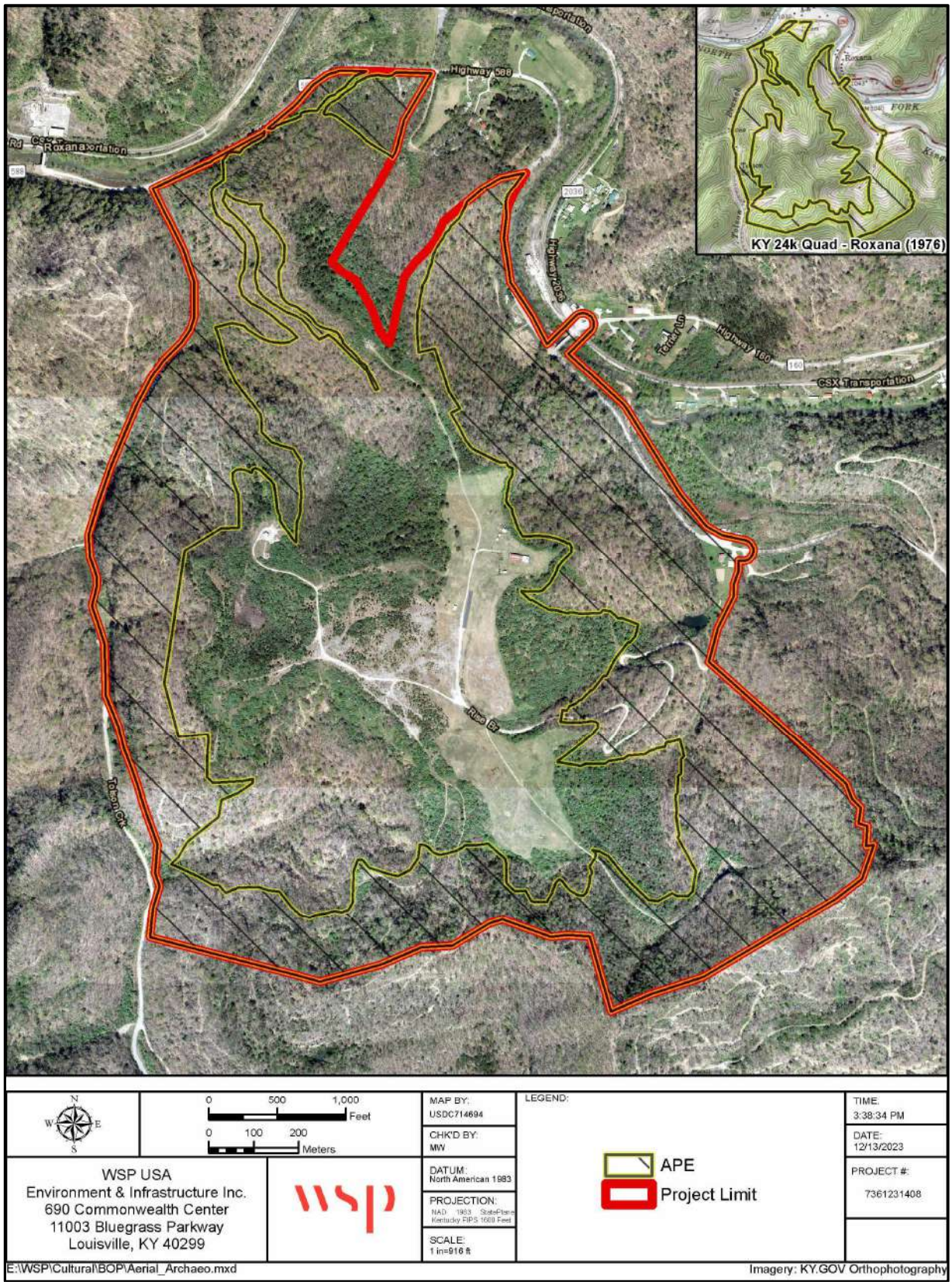

Figure 1.3. Modern aerial showing project area.

Later survey reports for the same project by Sebestyen and Brann (2014) and Brann (2017), however, indicates that these three surveys collectively only covered approximately 235 acres (95 ha) of the current 520-acre area with the latter investigation also identifying a modern active cemetery to be buffered from the proposed work (**Figure 1.4**; also see **Section 3.4** below for further details). These investigations mainly included the disturbed coal mining areas (including fill zones) and its immediate surrounding undisturbed slope (**Figure 1.5**).

Since 235 acres was previously surveyed, the current investigation covered the remaining 285 acres (115 ha) of the project area plus the above-mentioned three acres for the 50-foot buffer on the east side of Highway 160 between the intersection of Highways 160 and 588 and Rise Branch Road. Prior to fieldwork, two areas along the west side of Highway 160 were excluded from the survey as the landowners were still residing at each location. These two areas combined totaled approximately three acres and will be surveyed later if and when those parcels have been acquired by the BOP. Taking everything into account, this survey covered approximately 285 acres. The area associated with both the facility and the road widening were heavily sloped and forested (**Figures 1.6–1.7**). Most of the leaves, however, had fallen prior to fieldwork, so terrain visibility was excellent for identifying the location of possible cemeteries and rockshelters along the slopes. Disturbances observed within the project area consisted mostly of old coal roads, a few buried utility lines along Highway 160, and several slopes that were filled with rock waste from the past coal operation (approximately 30 acres).

Figure 1.4. Overview of previously documented Frazier Cemetery.

Figure 1.5. Overview of previously surveyed areas of project footprint showing reclaimed land and modern buildings, looking west.

Figure 1.6. View of slope on west wide of project area along Tolson Creek Roads, looking north.

Figure 1.7. Overview of slope in southeastern portion of project area, looking southeast.

1.2 Summary of Findings

During the first week of November 2023, WSP conducted an archaeological survey for a proposed Federal Correctional Institution and a Federal Prison Camp to be built on a former coal mining operation near Roxana in Letcher County, Kentucky. The archaeological area of potential effect for the proposed project encompassed approximately 520 acres; however, approximately 235 acres was previously surveyed by Sebestyen and Brann (2011), Sebestyen and Brann (2014), and Brann (2017). Although no archaeological sites were documented during these three surveys, one active modern cemetery (Frazier) was noted just south of Highway 588 during the 2017 investigation. An archaeological site number was not assigned to the cemetery, but per SHPO request (see KHC No. 48622) all the tombstone information and photos were included on a KHC Survey Form and incorporated into their revised report. A cover letter included with the report noted the proposed project would accommodate a 100-foot buffer around the cemetery and be avoided. Since the cemetery was recently recorded, the current survey only confirmed its location and, per OSA request, a site number was applied for and given (15Lr115).

Since 235 acres was previously surveyed, the current investigation covered the remaining 285 acres of the project area. Approximately 30 acres of that total was significantly disturbed by rock waste deposited on slopes by the previous coal operation, coal roads, and by underground utilities along Highway 160. In addition to the 285 acres associated with the proposed facility, another

three acres (50-foot buffer) were surveyed on the east side of Highway 160 between the intersection of Highways 160 and 588 and Rise Branch Road for possible road widening associated with the proposed facility. The area associated with both the facility and the road widening were heavily sloped and forested. Prior to fieldwork, two areas along the west side of Highway 160 were excluded from the surveyed as the landowners were still living at each location. These two areas combined totaled approximately three acres and will be surveyed later once those parcels have been acquired by the BOP.

As a result of the survey one new archaeological site (15Lr114) was identified. The site was an early to late twentieth century occupation on the east side of Tolson Creek Road. Only one artifact was recovered. Also present was a modern outhouse, a covered well, and the remains of a small collapsed wooden shed. Site area was disturbed by previous road construction and by a small transmission line. Two possible sites were noted outside the project area along Tolson Creek Road. One was the foundation of a possible school and the other was the standing remains of a store. If the project area should change to include the location of the school and/or store, then additional archaeological investigation may be needed.

Given the disturbed condition of Site 15Lr114 and the nondiagnostic nature of the artifact assemblage, WSP recommends the site as not eligible for the NRHP and that there will be **No Adverse Effect** by the proposed project with the condition that the 100-foot buffer around Site 15Lr115 (Frazier Cemetery) is maintained.

2.0 ENVIRONMENT

This chapter reviews the environmental context of the project area. Included in the discussions are physiography and geology of the county and the immediate region, soils located within the project area, and the prehistoric and historic climate of the area.

2.1 Physiography and Geology

Letcher County lies within the Eastern Kentucky Coalfields physiographic region, also known as the Cumberland Plateau and Mountains physiographic region and is comprised of the Pottsville (or Cumberland) Escarpment, the Cumberland Plateau, and the mountain and creek bottom (Bladen 1973,1984; McIntosh 2004). The southern portion of the Appalachian Plateau physiographic province, which extends from New York to Alabama, also envelops the region. The Eastern Coalfields physiographic region begins in the west with the Pottsville Escarpment. It is a rock wall with a coarse-grained Rockcastle sandstone conglomerate cap (Bladen 1973; Bladen 1984). This area is deeply incised by eroding streams. The Cumberland Plateau is located between the Pottsville Escarpment to the west and the mountain and creek bottom area to the east. Deep canyons and gorges have been created by streams cutting through layers of soft decomposed shale and shales (Bladen 1973,1984; Newell 1986). The last area, east of the Cumberland Plateau, is the mountain and creek bottom, which consists of the Cumberland and Pine Mountains. It includes the highest peak in the state, Big Black Mountain, part of the Cumberland mountain chain, in Harlan County with an elevation of 4,150 feet (Bladen 1973, 1984; Newell 1986). The Cumberland Mountains are the projecting edge of the Pottsville sandstone, known as the Lee conglomerate. Similarly, the Pine Mountain range is the projecting edge of the Lee conglomerate. The mountain ranges were formed by an uplifting fault (Bladen 1973, 1984).

The landscape of Letcher County consists of long narrow ridgetops, steep and very steep hillsides, and narrow valleys (McIntosh 2004). The hillsides feed perennial streams with abrasive sediment that slowly cuts through rock-forming drainageways in a dendritic pattern of hollows and coves. Flood plains and stream terraces are narrow, with little level land (McIntosh 2004). The lowest elevation, about 675 feet, is at the mouth of Jones Fork where it joins the Right Fork of Beaver Creek. Upland elevations commonly exceed 1,400 feet. Local reliefs of 500 to 800 feet are common, generally being greater in the eastern part of the county than in the west. The highest elevations occur in the extreme southern and southeastern parts of the county where mountaintop elevations in excess of 2,000 feet are present. The highest point in the county is 3,720 feet, on a peak on Black Mountain. The lowest elevation is approximately 940 feet where the North Fork of the Kentucky River exits the county (McGrain and Currens 1978). Much of the county is drained by the North Fork of the Kentucky River, including the APE (McIntosh 2004). Located within northwestern Letcher County near the APE, a large forest, known as Lilley Cornett Woods, is owned by the state and managed by Eastern Kentucky University (Cooper 2011; EKU 2023). The property covers a total of 554 acres of mixed mesophytic forest with a total of 252 acres classified as “old-growth” forest (EKU 2023).

2.2 Soils

Four soil complexes were mapped within the project area: Cloverlick-Kimper-Highsplint, Dekalb-Gilphin-Rayne, Shelocta-Highsplint-Gilphin, and Udorthents-Urban (**Table 2.1**). The first three complexes cover most of the project area and ranged in slope between 20 and 70 percent. The

remaining complex, Udorthents-Urban, was located along Highway 160 on the east side of the road. These soils have been severely disturbed by modern road construction and underground utilities. No soils within the project have the potential to contain deeply buried archaeological deposits. Information in Table 2.1 was collected from the United States Department of Agriculture Natural Resource Conservation Service Web Soil Survey (USDA/NRCS 2023).

Table 2.1. Soil Types and Slope in Project Area.

Soil Type	Slope	Landform
Cloverlick-Kimper-Highsplint	*30–65 percent*	Uplands
Dekalb-Gilpin-Rayne	25–65 percent	Uplands
Shelocta-Highsplint-Gilphin	20–70 percent	Uplands
Udorthents-Urban Land	0–6 percent	Unstable Urban Fill

2.3 Prehistoric and Historic Environment

Since the end of the Pleistocene Epoch, both the vegetation and climate of Kentucky have remained relatively stable. Starting at about 10,000 years ago, the entire state of Kentucky was dominated by Maritime Tropical and Pacific air masses. While the glaciers to the north would have made the climate somewhat cooler than today's average temperatures, the weather patterns during this period would have been similar to those of modern times (Delcourt and Delcourt 1984). The area known today as Kentucky was covered by mixed hardwood forests at this time (Delcourt and Delcourt 1981). This type of forest would contain a wide variety of forest communities. Oak-hickory forests would have been found in warm exposed areas, beech-maple forests would occur in cool, moist shaded areas, and along streams and river valleys, northern riverine forests would have been present (Kricher 1988:72).

As the glaciers retreated further north, average temperatures increased, and the mixed hardwood forests of Kentucky were gradually replaced by oak-hickory forests. By 5,000 years ago, the transition was complete (Delcourt and Delcourt 1981). Oak-hickory forests commonly contain a wide variety of flora. The trees that may have been present prehistorically include different species of oaks and hickories, American chestnut, dogwood, sassafras, hophornbeam, and hackberry. Tuliptrees, elm, sweetgum, shagbark hickory, and red maple also may have been present, especially in moist areas. The understory may have contained mountain laurel, a variety of blueberries, and deer berry. Herbs may have included wintergreen, wild sarsaparilla, wood-sorrel, mayapple, rue-anemone, jack-in-the-pulpit, and trout lilies (Kricher 1988:57).

Today, most of Kentucky falls within the Western Mesophytic Forest Association (Braun 1950). The forest canopy in upland areas is dominated by oak (white, post, blackjack, black, chestnut, and southern red) and hickories (shagbark, pignut, and mockernut) but also includes beech, sugar maple, butternut, tulip tree, red oak, white ash, mountain laurel and, before the early nineteenth century, chestnut. Sweetgum, sycamore, and butternut are found in the valley floors. In wetter areas tree species include various species of oak, and ash, along with sweet gum, red maple, black tupelo, and beech. In the dryer areas, dogwood, redbud, mulberry, and wild cherry occur as understory species (Braun 1950).

A wide variety of fauna would also have been present from the early Holocene to early historic times. Mammals that thrived in oak-hickory forests include the gray squirrel, fox squirrel, whitetail deer, raccoon, beaver, woodchuck, a variety of mice, striped skunks, mink, otter, fox, black bear, and bobcats. Bird species would likely have included red-tailed hawks, ruffed grouse, great horned and eastern screech owl, pileated woodpecker, wild turkeys, and blue jay (Kricher 1988:12). A variety of ducks and geese also could have been present during the fall and spring migrations.

The floral and faunal species present in Kentucky remained relatively constant until post-contact times, when Europeans began to severely modify the regional ecology (Delcourt and Delcourt 1981). The American chestnut, common during prehistoric times as a canopy tree, has been reduced to an understory tree by a blight introduced into North America in historic times (Kricher 1988:58). The populations of mink, fox, and most other animals have been reduced due to loss of habitat and hunting.

The pollen record shows that relatively mild temperature fluctuations have occurred since the end of the Pleistocene. After about 10,000 BP, a gradual warming trend resulted in generally higher temperatures than are known today. The highest temperatures appear to have occurred around 5000 BP. This warming trend continued until the beginning of the Little Ice Age (AD 1450-1850), when there was a significant drop in temperature. After the Little Ice Age, temperatures became more moderate (Davis 1983:176).

Today, Kentucky's climate is reflective of its inland location, as well as its position north of the Gulf of Mexico (Kentucky Climate Center 2017). This position can produce highly variable weather conditions and large seasonal temperature ranges. Summers are typically warm, sunny, and humid, with highs of 90° Fahrenheit (F). Occasionally temperatures will exceed 100° F during the summer months. Winters are rarely harsh, with an average of 39° to 45° F seen across the state. Occasionally, polar air masses affect Kentucky weather and, even more rarely, temperatures can dip below 0° F.

3.0 CULTURAL CONTEXT

This chapter reviews the cultural context of the project and the immediate region. Both a prehistoric and historic overview of the general region is provided as well as a more detailed synopsis of the history of Letcher County. This chapter also summarizes the previously recorded sites and surveys within a two km buffer of the project area and the results of the historic map research.

3.1 Prehistoric Cultural/Historical Context

The history of human activity in Powell County and the surrounding region of Kentucky spans thousands of years. The earliest groups to leave a definitive material record of their presence were early Paleoindians who entered the region during the Late Pleistocene glacial epoch more than 10,000 years ago. Their descendants, and the descendants of other Native American groups who migrated to the region, lived along the Ohio River for the next ten millennia. This long prehistoric era lasted until the arrival of the first European explorers and settlers in the seventeenth and eighteenth centuries, which marks the beginning of the Historic period.

While cultural change is a slow and continual process, archaeologists and other researchers divide the human history of a region into distinct cultural periods. Archaeologists and historians recognize four broadly defined prehistoric periods for the Ohio River Valley. These include the Paleoindian period (ca 9500–8000 BC), the Archaic period (8000–1000 BC), the Woodland period, (1000 BC–AD 1000) and the Late Prehistoric period (AD 900–ca.1700). The Historic period began with the arrival of the first European explorers and colonists.

This summary is a brief outline of Kentucky archaeological history and draws heavily from the *Archaeology of Kentucky* (Pollack 2008), as well as *Kentucky Archaeology* (Lewis 1996a).

3.1.1 Paleoindian Period, ca. 9500–8000 B.C.

Tankersley (1996) defines the Early Paleoindian period (9500–9000 B.C..) as the period when Clovis groups first entered the region. These early colonizing groups were small, consisting of one or two family groups. They were highly mobile hunter-gatherers who subsisted primarily by hunting Late Pleistocene fauna, such as bison, musk ox, caribou, and the now extinct megafauna, such as ground sloth, moose-elk, mammoth, and mastodon (Tankersley 1996). Most Early Paleoindian sites are identified as simple isolated finds with single Clovis points, characterized by fluting, or point fragments.

According to Tankersley (1996), the Middle Paleoindian period (900–-8500 B.C.) is marked by increased diversity in fluted point styles, as well as a more diverse lithic tool kit that included spurred endscrapers and sidescrapers, and an increased use of lower quality local cherts. Tankersley (1996) suggests these changes reflect an increased reliance on smaller game and even plant resources. A distinctive regional fluted point style, the Cumberland point, is found in Kentucky (Rolingson 1964).

By the Late Paleoindian period (8500–8000 B.C.), fluted projectile points had disappeared and were replaced by points of the non-fluted Dalton Cluster (Justice 1987; Tankersley 1996). The Dalton Cluster points display a much greater stylistic variety, reflecting greater regional diversity.

There was also a wider range of tools associated with the Dalton tool kit, as opposed to the earlier Paleoindian groups (Tankersley 1996). The regional diversity in point styles may indicate more restricted settlement systems on the part of these later Paleoindian groups, while the more diverse tool kit composition may indicate more intensive exploitation of a wider range of food resources.

3.1.2 Archaic Period, ca 8000–1000 B.C.

The Archaic period (ca. 8000–1000 B.C.) encompasses the 7,000-year time span when early Native Americans in the eastern U.S. adapted to the changing post-Pleistocene Early Holocene climate. The Archaic includes Early Archaic, Middle Archaic, and Late Archaic sub-periods, which are described below.

In many respects, Native American adaptive strategies during the Early Archaic period (8000–6000 B.C.) more closely resembled those of their Paleoindian predecessors than those of the later Middle and Late Archaic periods. Like their Paleoindian counterparts, the Native American groups of the Early Archaic were hunter-gatherers who incorporated a great deal of mobility into their subsistence/settlement systems. However, the Early Archaic is generally seen as a transitional period, when regional populations more fully adapted to the changing environmental conditions that were taking shape during the Early Holocene (Jefferies 1996).

Such modern game species as white-tailed deer and turkey, and important subsistence plant species like the nut-bearing oak, hickory, and chestnut trees of the spreading deciduous forest, replaced the Late Pleistocene fauna and flora (Jefferies 1996). The lithic tool kits of the Early Archaic were similar to those utilized during the Paleoindian period. However, there is evidence for increased regionalization during the Early Archaic, an intensification of trends first observed during the Late Paleoindian period. While these early groups continued to be highly mobile, their seasonal settlement systems were more regionalized, with different bands and macro-bands restricting the seasonal mobility to specific drainages (Anderson et al. 1996). Artifact type markers for the early portion of the Early Archaic include Kirk Corner-notched points and Thebes Side-notched points (Jefferies 1996; Justice 1987). Later Early Archaic point types include Kirk Stemmed points and bifurcate-based LeCroy and Kanawha points (Jefferies 1996; Justice 1987).

By the onset of the Middle Archaic period (6000–3000 B.C.), early Native American populations had begun to settle down into increasingly regionalized settlement ranges. Middle Archaic sites along the Ohio River drainage and elsewhere include large base camps, used as long-term, perhaps even year-round, residential sites (Jefferies 1996). These changes in settlement strategy coincided with the long warm, dry spell which climatologists call the Hypsithermal Climatic Interval. Much of Kentucky became arid grasslands, and the distribution of subsistence game and plant resources were more restricted than in previous periods. Though the Middle Archaic period is poorly understood in Kentucky, it is generally recognized as a period of intensive regionalization when groups began to exploit a wider range of local subsistence resources. Middle Archaic artifact assemblages include the appearance of groundstone tools and pecking stones generally attributed to plant food processing. Middle Archaic groups were able to access a variety of subsistence resources and were able to limit their residential mobility. A plethora of stylistically distinct projectile point types with limited distribution ranges appeared during this time, including Morrow Mountain, Matanzas, and Big Sandy II points (Jefferies 1996; Justice 1987).

During the Late Archaic period (3000–1000 B.C.), the number and diversity of prehistoric occupations and other sites scattered across the Kentucky landscape increased dramatically.

Late Archaic subsistence/settlement strategies emphasized generalized hunter/gatherer strategies, and these groups intensively exploited a range of subsistence resources in a variety of environmental settings (Collins and Driskell 1979; Jefferies 1996). There is also clear evidence for increased sedentism at the numerous sites where human and dog burials occur with large trash pits and hearths (Anslinger 1988). By the end of the Archaic, there is evidence for incipient horticulture, basket weaving, and a variety of tools for woodworking and food processing (Watson 1974). Late Archaic site types included large base camp sites on floodplains and in the interior lowlands along the Ohio River's major tributaries. Along the Ohio River drainage, large shell mounds appeared during the Late Archaic, either built intentionally by Late Archaic groups, or built up over time through repeated utilization of the same location. These sites also yielded diverse artifact assemblages indicative of long-term residential activities. Smaller resource extraction sites are scattered throughout the full range of geographic settings in the region. Projectile points indicative of Late Archaic occupation includes McWhinney Stemmed, Merom-Trimble Cluster, and Brewerton points (Jefferies 1996).

3.1.3 Woodland Period, ca. 1000 B.C.–A.D. 1000

The division of the Early Woodland period (1000–200 B.C.) from the preceding Late Archaic period is marked by the appearance of ceramic pottery around 1000 BC. Many Early Woodland projectile point types are indicative of transitional Late Archaic/Early Woodland occupations, including Kramer, Wade, Savanna River, Saratoga Stemmed, Buck Creek Barbed, and various other stemmed points (Justice 1987; Railey 1996). Early Woodland sites are similar in type and distribution to those during the Late Archaic. Large midden sites are located in the alluvial valleys and smaller resource procurement sites are found scattered throughout the landscape. However, the Early Woodland also has the first appearance of distinct ceremonial sites. There is also evidence for widespread horticulture of such domesticated plants as gourds and sunflowers.

Complex ceremonials continued through the middle part of the Woodland period (200 B.C.–A.D. 500). Sophisticated mortuary practices suggest the appearance of hierarchical social organization and long-range trade (Railey 1996). Though hunting and gathering continued to be the major source of subsistence food, the use of horticulture intensified, and permanent settlements were firmly established along river bottoms (Prufer and McKenzie 1967). A number of plants were domesticated, including squash, gourds, sunflower, maygrass, knotweed, little barley, and goosefoot. In the Late Woodland period, maize also arrived in the region (Railey 1996).

By the beginning of the Late Woodland period (A.D. 500–1000), a major technological change was the introduction of the bow and arrow (Railey 1996). This was indicated in the archaeological record by the appearance and proliferation of small triangular points. Other chipped stone tools diagnostic of the Late Woodland includes Jacks Reef Corner-notched, commissary knives, and small triangular Madison points believed to be arrowheads (Railey 1996). Increasing regional variability of stylistic motifs on ceramic pottery became increased throughout the Late Woodland. Subsistence/settlement strategies continued the trend toward increased sedentism. Small, nucleated circular villages with circular central plazas appeared in some locations of the state by the Late Woodland (Railey 1996). The appearance of aggregated settlements may, in part, have resulted from increased population density and shrinking settlement ranges. Along with aggregating into central village locations, Late Woodland populations adopted intensive horticulture of maize and domesticated plant seed plants.

3.1.4 Late Prehistoric Period, ca. A.D. 1000–1540

By the Late Prehistoric period, central Kentucky was the interface of two cultural groups, Fort Ancient and Mississippian. Each culture is discussed below.

Mississippian Culture

The period from A.D. 900-1700 saw the development of a variety of regional cultural expressions that have been included under the name *Mississippian*. During this time, regional populations increased. Agriculture was a means of intensifying production, with maize, beans, and gourds comprising the agricultural base (Lewis 1996b). Hunting and gathering supplemented agriculture.

A distinguishing feature of the Mississippian Period is a settlement system that included a hierarchy of sites. At the highest tier of this hierarchy are large-palisaded towns believed to be ceremonial and political centers, comprising pyramidal platform mounds aligned around central plazas. The political organization of the period correlates to that of a chiefdom level society. Other Mississippian sites include smaller nucleated villages and dispersed farmsteads. Defense and cooperation were likely responsible for the nucleation of settlements (Muller 1986). Settlement was generally favored in areas of highest soil fertility, commonly in bottomlands along rivers. Houses were mostly rectangular, with wall trenches, log foundations, and thatched roofs. Exchange of goods occurred between groups as evidenced from the recovery of exotic items. However, local exchange was probably more important than long-distance trade (Muller 1986).

Fort Ancient Culture

Fort Ancient culture was overwhelmingly dependent on bean and maize agriculture, and its social structure was fundamentally based around the organization of agricultural activities. Fort Ancient phases and traditions are generally thought to have been chiefdom level societies but lacked the social hierarchy of the Mississippian cultures to the west (Sharp 1996).

Fort Ancient populations lived in towns with a central plaza surrounded by houses, palisaded walls, and defensive ditches (Sharp 1996). The central plaza was the site of social and ceremonial activities, but unlike the Mississippians to the west, central plaza platform mounds were absent. Instead, the mounds present at Fort Ancient sites were part of complex mortuary practices and were located on the edges of the central plazas. The material culture of the Fort Ancient Period includes shell-tempered pottery and a variety of ceramic vessel forms, including jars, bowls, and pans (Sharp 1996). Lithic artifact assemblages were typically limited to simple tools, such as small triangular points (Justice 1987). The presence of marine shell and Catlinite disk pipes at Fort Ancient sites points to participation in long-distance exchange networks (Sharp 1996).

3.1.5 Contact Period, ca. A.D. 1540–1795

The term “protohistoric” frequently refers to the Native culture of North America during the span of time following the first influence of European cultures (principally through trade goods or disease), and later, when the Native cultures were recorded and described by the encroaching Euro-American cultures. During this period, the Native cultures underwent acculturation, a breakdown of their former way of life occurred by replacement of cultural norms by the dominant culture. Henderson et al. (1986) refers to the Protohistoric period as beginning when the first indirect effects of the European presence were felt by Native cultures, roughly A.D. 1540. The

beginning date was selected based on descriptions by members of the De Soto expedition in the early 1540s that European trade goods and disease were there before them. The signing of the Greenville treaty in 1795 marks the end of this period. In that document, the Indians relinquished all claims to the land in the region to the new government of the United States. Several tribes were removed to small reservations to the north and west (Henderson et al. 1986).

The Protohistoric period spans nearly two centuries, ending around A.D. 1795. The inhabitants of the region during this period probably consisted of diverse groups speaking Algonquian or Iroquoian languages and based their economies on a combination of horticulture, fishing, hunting, and gathering. Small encampments at scattered locations sometimes coalesced into larger villages on floodplains in the spring for the cultivation of corn, beans, squash, and a few other selected plants, like tobacco. During this period in what is now Kentucky, contact between Native Americans and Europeans may have been indirect, with European trade goods and information about Europeans spread through the existing Native American exchange systems. The earliest European exploration of what was to become Kentucky has not been established, but Marquette and Joliet passed the mouth of the Ohio in 1673 during their exploration of the Mississippi River (Alvord 1965). Other French, English, and Spanish traders and explorers may have passed through the territory between the late seventeenth and mid-eighteenth centuries, as well (McBride and McBride 1990). Disease increasingly reduced populations all over the central and eastern parts of the continent during this period. Epidemics are documented from the late 1500s into the mid-1600s.

3.2 Historic Overview of Letcher County

Letcher County, in southeastern Kentucky, was formed in 1842 by an act of the Kentucky Legislature from parts of Perry and Harlan counties. The county name was derived from Governor Robert P. Letcher, Kentucky's governor from 1840 to 1844, and the City of Whitesburg serves as the county seat (Kleber 1992). Covering 339 square miles, the county is currently surrounded by Harlan, Perry, Knott, and Pike counties. Early Euro-American settlement in the county began in the late eighteenth century. Peter Whitaker built the first cabin on Whitaker's Branch in 1795, and other early settlers to the area included George Ison, Benjamin Webb of Maryland, James Caudill of Virginia, and William Stamper of North Carolina (Cornett 1967; Kleber 1992). Almost every main creek hosted settlers by 1806, and, by 1810, over a hundred different families were living within the county. After an initial sluggish start, the population expanded quickly between 1810 and 1850, specifically near present-day Mayking (Cornett 1967; Kleber 1992). **Figure 3.1** shows the general location of the county in 1839.

Despite its remote location, Letcher County was not untouched by the Civil War. Pound Gap was strategically important to both the Union and Confederate armies. On March 16, 1862, Brig. General James A. Garfield and 700 Union troops defeated General Humphrey Marshall's 500 Confederate troops at Pound Gap (Kleber 1992). The county suffered other skirmishes, including a battle near Whitesburg in 1863 and another at Pound Gap in 1864 (Cornett 1967; Kleber 1992). The Civil War ended but left behind hostility and anger, which in some cases manifested into long-term feuds in the region. Several feuds broke out but only a small section of the population engaged in the fighting (Fuson 1947). In 1886, the Wright-Jones feud began in Knott County, spilling over into Letcher County, and nearly ten years later, around 1895, a truce was reached, only for violence to ignite again in 1897. The fighting finally ended towards the turn of the century. **Figure 3.2** shows the county in 1861.

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Figure 3.1. Map showing general vicinity of Letcher County in 1839 (adapted from Burr 1839).

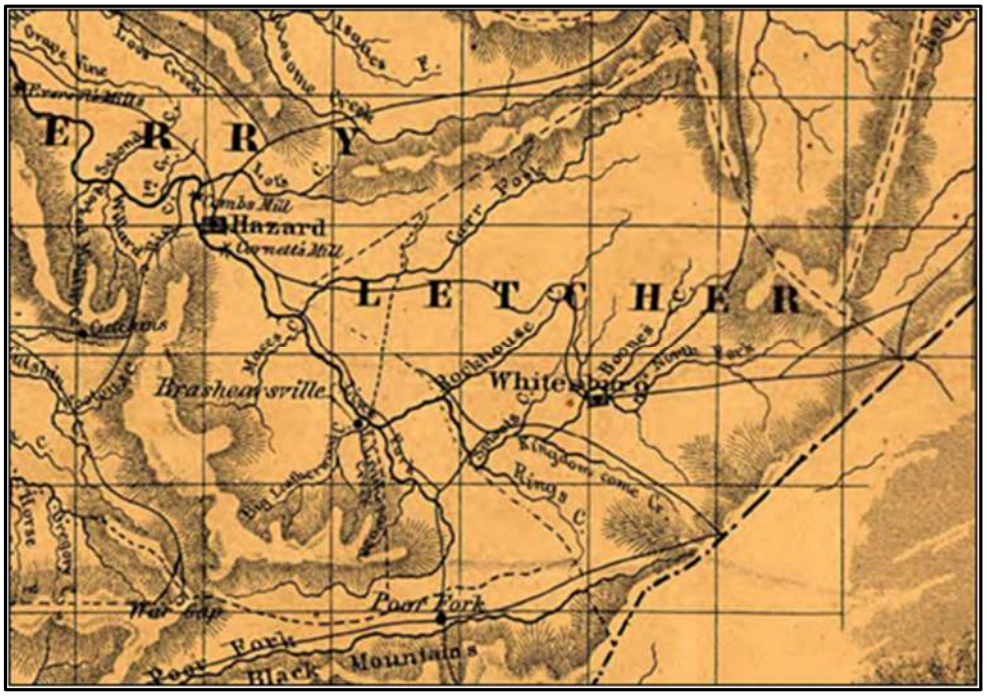

Figure 3.2. Map showing area of Letcher County in 1861 (adapted from Campbell and Barlow 1861).

Like much of the region, the logging and mining industries played a vital role in Letcher County's economic development, with both industries emerging in importance in the 1880s. Around 1885, coal speculation began and soon companies, such as Consolidation, Elkhorn, and South-East, began purchasing mineral rights and land (Cornett 1967; Kleber 1992). By 1892, over 60% of Letcher County was owned by non-residents (Eller 1982). Within Letcher County, the companies quickly established their own towns, including Jenkins, Fleming, McRoberts, and Seco. As the coal industry expanded, the county's population swelled from 4,608 people in 1870 to over 10,000 by 1910 (U.S. Census 2023). Eastern European immigrants and African Americans from the Deep South relocated to the area, attracted by employment opportunities with the mines and the railroads (Kennedy and Johnson 2005; Powell 1998; Richardson 1992). Among the immigrants were skilled Italian stonemasons, such as Giuseppe (Joe) Romeo, Giovanni (John) Palumbo and Domenico and Francesco Mongiardo (Majority), who settled in Letcher County and are responsible for several stone bridges, culverts, foundation walls, as well as houses and churches in Whitesburg and likely additional buildings and structures in the surrounding region (ACHP ND; Kennedy and Johnson 2005; Powell 1998; Richardson 1992; Taylor 2006).

Initially, most local residents refused to work in the coal and lumber industries and remained farmers, but as the agricultural industry began to struggle in the late nineteenth and early twentieth centuries, the economic losses forced many farmers into part-time work with coal and lumber companies (McBride and McBride 1990). To facilitate the coal industry, railroads were constructed, and roads improved across the county and region. The Lexington and Eastern (L&E) Railroad was purchased by the Louisville and Nashville (L&N) Railroad in 1910, although not public knowledge until 1915 (Mountain Eagle Staff 2015; University of Kentucky Libraries ND). At the time, the L&E stretched from Lexington to Jackson, but immediately after their purchase of the company, the L&N began extending the line into Letcher County (Richardson 1992; Taylor 2006). By 1912, the L&N had completed a line extension from Jackson to McRoberts (Cornett 1967; Kleber 1992; Mountain Eagle Staff 2015; University of Kentucky Libraries ND). Early masonry bridges constructed by the L&N Railroad and/or Consolidated Coal in Letcher County are attributed to Italian immigrants (Richardson 1992; Taylor 2006). In some cases, the L&N scouted and paid the travel expenses for skilled stonemasons to relocate to the U.S., as the railroad worked directly with Consolidated Coal, building bridge abutments across West Virginia and eastern Kentucky (Cooper 2011; Richardson 1992; Taylor 2006).

Consolidated Coal had a major influence in Letcher County, operating mines in Blackey, Burdine, Dalna, Dunham, Jenkins, and McRoberts (Taylor 2006). In 1911, the company began constructing the Town of Jenkins for the sole purpose of extracting coal from the surrounding mountains. All aspects of town life were created, including housing, schools, churches, power plants, water systems, roads, and bridges, as the company sought to create a model mining community (Cooper 2011; Cornett 1967). Then, in 1912, the company built the Town of McRoberts along the upper reaches of Wrights Fork, a tributary of the North Fork of the Kentucky River. Like Jenkins, Consolidated Coal built all the resources found in a typical town for their future employees, and by 1914, 1,600 men worked in the McRoberts' mine, increasing to 2,500 by 1916. Near the existing community of Chip, the Elkhorn Coal Corporation built the coal town of Fleming in 1913. Chip was renamed Neon in 1926, and the two communities merged in 1978, known today as Fleming-Neon (Kentucky Atlas & Gazetteer 2014a; Rennick 1984).

Coal soon dominated Letcher County's economy with most residents relying upon it for their livelihood. By 1916, Letcher County was the leading coal producer in the state, with the industry continuing to thrive into the 1920s, but the economic turmoil of the Great Depression distressed the industry (Kentucky Foundation 2007b; Kleber 1992; Rennick 1984). Then, in May of 1927, a

large flood devastated the region. The Red Cross provided the region with assistance after the flood, and President Franklin D. Roosevelt's New Deal programs, like Civil Works Administration, Kentucky Emergency Relief Administration, and the Works Progress Administration (WPA), alleviated some of the economic struggle by providing employment, but like for much of the country, World War II brought real relief to the region (Kennedy and Johnson 2005). During this period, the county saw major growth as the demand for coal skyrocketed. Letcher County's population peaked at over 40,000 people in 1940 (Cornett 1967; U.S. Census 2023).

However, between 1940 and 1950, the county population greatly declined and continued to decline through the 1960s. Coal production was down due to increased mechanization and drop in demand, and the coal companies began to sell the company towns to private owners (Eller 2008). The county's economic struggles received national attention after the publishing of Harry Caudill's *Night Comes to the Cumberlands*. As a lawyer living in Whitesburg, Caudill described his perspective on Letcher County's economic depression, which in part led to Lyndon B. Johnson's War on Poverty (Cornett 1967). In 1964, Johnson initiated a campaign to end poverty, beginning with a visit to the home of an unemployed coal miner in Inez, Kentucky. The movement endured nearly a decade and brought millions of dollars of federal aid into eastern Kentucky, while also promoting the preservation of the history and culture of Appalachian Kentucky (Glen 1992).

Letcher County's population continued to steadily decline as people left the region searching for work and more economic opportunities to the north, in cities like Cincinnati, Dayton, and Chicago. As Middle Eastern tensions stifled the country's supply of oil in the 1970s, coal production increased by 14.4% nationwide between 1973 and 1976 (Estep and Cheves 2019). Consequently, Letcher County's population, which had sunk to around 20,000 people in 1970, shot up to over 30,000 by 1980 (U.S. Census 2023). Following this period, employment in the coal industry again began to decline and with it, the county's population. Across the county, mining jobs reached more than 34,500 in 1980 but dropped to fewer than 13,000 by 2000 (Estep and Cheves 2019). Despite this, the coal industry endured within the county but increased drilling of cheap natural gas in the twenty-first century has eroded much of the remaining coal industry across the region (Estep and Cheves 2019). Between 2015 and 2016, Letcher County lost an average of 57% of all mining jobs, and coal mine employment in the county has declined by 95% since 2000 (Kentucky Energy and Environment Cabinet 2017). Today, Letcher County is a largely rural area with an approximate population of 21,784 (U.S. Census 2023). The economy has diversified, with retail, healthcare, and education providing most of the employment, although coal extraction continues within the county (Bestplaces ND).

3.3 Roxana, Kentucky

Archival research revealed little information about the history of Roxana. The Roxana post office first opened in 1891, although the community is not illustrated on the 1890 or 1892 topographic maps (Elbon 2023; USGS 1890, 1892). The small community is shown on historic mapping in 1913 and 1915, consisting of several buildings and a school, referred to as School No. 2. Roxana sits approximately three miles to the southeast of Blackey and 7 miles to the west of Whitesburg on the east side of the North Fork of the Kentucky River. Historic mapping also indicates roads that follow a similar route as modern-day KY-2036, KY-160, and Big Branch-Tolson Creek Rd. were established near Roxana as early as 1913 (USGS 1913). The L&N Railroad purchased the L&E in 1910 and soon after extended the line from Jackson, through Roxana, and into McRoberts (Cornett 1967; Kleber 1992; Mountain Eagle Staff 2015; University of Kentucky Libraries ND). The rail line wrapped through the community, running parallel with KY-2036 and the North Fork. L&N's motivation was related to the increasing interest in coal speculation in the region and the

associated transportation needs for construction of company towns and coal extraction facilities, as well as the transport of the coal to outside markets.

The coal industry undoubtedly had an impact on Roxana's development with its location along the rail line and close proximity to Letcher County's major coal mining towns but not much was found regarding this influence other than transportation improvements, although a local resident, Sam Adams, indicated there were early mining interests in the area (Adams 2023). The community's growth may have stagnated after the initial coal boom of the late nineteenth and early twentieth century, as people relocated to the company towns for employment. Nevertheless, numerous areas within and surrounding the community have been altered in relation to the coal industry via underground, auger, and surface mining techniques. Specifically, within the APE, ridgetops were leveled by the Meade and Shepherd Coal Company between 1988 and the early 1990s via surface mining activities within the proposed project limits to the south of KY-588 and the North Fork of the Kentucky River (Brann 2017; Kentucky Coal Mine Maps 2023).

Road improvements within and surrounding Roxana were completed during the 1930s, likely coinciding with the construction of the 1932 and 1933 bridge and culverts constructed along the routes. KY-160 (Kings Creek-Roxana Rd.), was first referred to as such on the 1937 highway map, and a route is first seen completed along present-day KY-588 (Letcher-Blackey or Blackey Rd.) on this map, although not labeled as a highway. Both roads were listed as constructed under New Deal programming at an undetermined date (Kennedy and Johnson 2005). By 1954, the route along KY-588 was considered a highway although, referred to as KY-1290, but between 1954 and 1969, the route became known as KY-588 (USGS 1954, 1969; Kentucky State Highway Department). Today, Roxana is composed of several single-family residences and associated outbuildings, agricultural buildings, a post office, a former grocery and hardware store, and a former service station. The former L&N rail line remains intact, but according to local residents, the line, most recently owned by CSX, is no longer active.

3.4 Previous Sites and Surveys

Prior to fieldwork, an extensive background research was conducted that included information provided by the OSA (FY24-12500). This review included a 2-km (1.24-mi) buffer around the current survey area. The research aimed to identify previously recorded archaeological sites within and near the project area as well as archaeological surveys and other relevant investigations that have been conducted. Previous cultural resource reports were also consulted as part of the literature search to better understand the archaeological research potential of the project area.

Background research revealed that seven previously completed archaeological surveys occurred within a 2-km radius (**Figure 3.3 and Table 3.1**). Three surveys occurred outside the current project area: Arnold (2002), Hand (2000), and Webb (2016). Arnold (2002) resulted in the documentation of a historic cemetery (Site 15Lr73) whereas the other two surveys were no-finds (**Table 3.2**). The other four surveys overlapped the current project area. The earliest project was Fryman et al. (1967). This project, which overlapped a portion of the project area along Tolson Creek Road, was for the proposed Ulvah Reservoir, but it did not result in any sites being recorded in or near the proposed project area. Since this investigation pre-dated current SHPO guidelines for field methodologies, it was resurveyed during the current project.

Table 3.1. OSA Data for Previously Surveyed Areas within a 2-km Radius.

Consolidated Title	Year	Author
A Preliminary Survey of the Arch. And Historical Resources of the Proposed Ulvah Reservoir	1967	Fryman et al.
An Arch. Survey of a Proposed Coal mine Operation on Whitaker Branch	2000	Hand
An Arch. Survey of a Proposed Coal Mining Operation on North Fork of the Kentucky River	2002	Arnold
Arch. Survey for the Fed. Bureau of Prisons Feasibility Study at Three Proposed Sites	2011	Sebestyen & Brann
Arch. Survey for the Fed. Bureau of Prisons Feasibility Study: Three Proposed Sites	2014	Sebestyen & Brann
Arch. Survey of the Proposed Roxana Telecommunications Tower	2016	Webb
Arch. Survey for the Fed. Bureau of Prisons at the Proposed Roxana/Meade Farm Site	2017	Brann

The remaining three surveys were for earlier versions of the current project. Sebestyen and Brann (2011) surveyed approximately 80 acres on top of the old coal mine operation and verified that the entire 80-acre (32 ha) area was disturbed by previous mining activities. Sebestyen and Brann (2014) returned to the project area and surveyed an additional 94 acres (38 ha) and identified additional disturbed areas due to previous mining activities. No sites were recorded during these surveys. Brann (2017) returned to the project area and surveyed approximately 60 additional acres (24 ha). No sites were documented, but one modern, active cemetery (Frazier) was located. This cemetery was documented by photographing all the tombstones but was not given a site number at the time of the survey. Brann (2017) recommended that a 100-foot buffer be placed around the cemetery and be avoided by the proposed project. This cemetery was relocated during the current survey and recorded as a site (15Lr115). Altogether, these three surveys covered approximately 235 acres of the current 520-acre project area. Given their recent investigation, these areas were not resurveyed during the current fieldwork.

The OSA data also showed that two previously recorded prehistoric sites (15Lr14 and 15Lr15) were located within a 2-km radius of the project area as was the already mentioned historic cemetery (15Lr73). None of the sites were in or immediately adjacent to the current project (**Table 3.2**).

Table 3.2. OSA Data for Previously Recorded Sites within a 2-km Radius.

Site	Site Type	Cultural/Temporal Affiliation	NRHP Status
15Lr14	Open Habitation without Mounds	Late Prehistoric/Fort Ancient	Not Recorded
15Lr15	Open Habitation without Mounds	Late Prehistoric/Fort Ancient	Not Recorded
15Lr73	Cemetery	Historic	National Register status not assessed

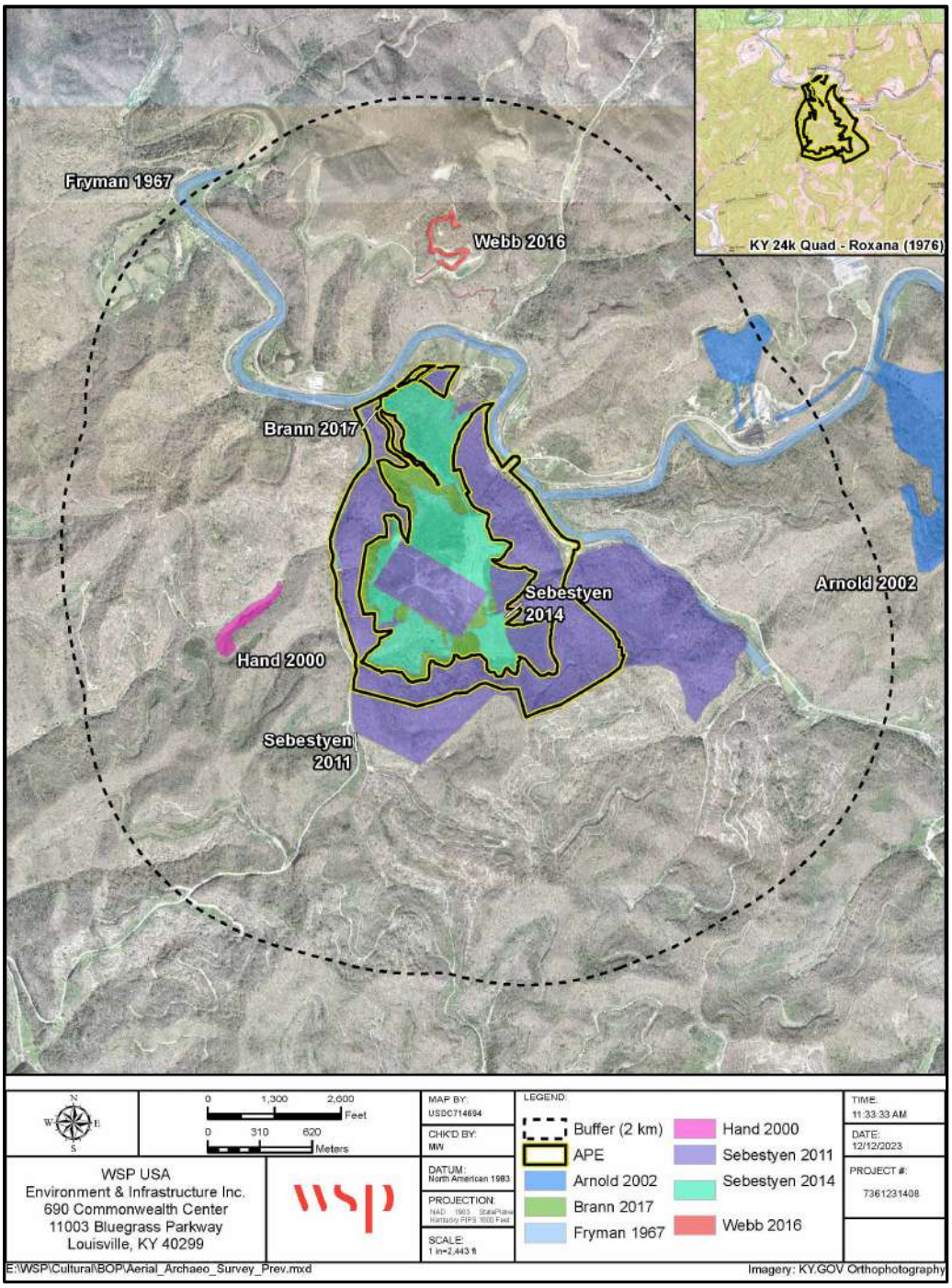

Figure 3.3. OSA data on previous surveys located within a 2-km radius of the project area.

3.5 Historic Map and Aerial Review

Prior to fieldwork, a review of available historic maps was carried out to identify possible locations for historic archaeological sites within the project area. No maps dating prior to 1890 could be located for the project area. Those that could be located and reviewed are as follows:

1890 Whitesburg, Kentucky, 30-minute series topographic quadrangle. United States Department of the Interior, Washington, D.C. (USGS)
1892 Whitesburg, Kentucky, 30-minute series topographic quadrangle. United States Department of the Interior, Washington, D.C. (USGS)
1913 Oven Fork, Kentucky, 30-minute series topographic quadrangle. United States Department of the Interior, Washington, D.C. (USGS)
1915 Whitesburg, Kentucky, 30-minute series topographic quadrangle. United States Department of the Interior, Washington, D.C. (USGS)
1937 Highway and Transportation Map, Letcher County, Kentucky (KDOH)
1954 Roxana, Kentucky, 7.5-minute series topographic quadrangles. United States Department of the Interior, Washington, D.C. (USGS)
1969 Roxana, Kentucky, 7.5-minute series topographic quadrangles. United States Department of the Interior, Washington, D.C. (USGS)

This review revealed no map structures in or immediately adjacent to the project area in 1890 or 1892. In 1913 and 1915, multiple map structures were depicted in the general location of Site 15Lr114 (MS 1 and 2) as were map structures for the school (MS 3) and store (MS 4) that were located just outside the project area along the east side of Tolson Creek Road (**Figure 3.4**). Another map structure (MS 5) was depicted slightly south of the store along the edge of the project area, but no evidence of the building was noted during the survey. A sixth and seventh building were depicted on the east side of the project area along what is now known as Highway 160 (MS 6 and MS 7). These buildings are in the project area in the general vicinity of an existing house and barn, but this area was not surveyed during the current investigation as the landowners were still living there (per the request of the client). As noted elsewhere in the report, the area will be surveyed later if and when the property has been purchased.

All the same map structures are depicted on the 1954 topographic quadrangle with the addition of one more. On the east side of the project area along Highway 160 is a map structure (MS 8) in the general location of an existing building situated within the project area (**Figure 3.5**). This area was not surveyed during the current investigation as the landowners were still living there (at the request of the client). As with the above property, this area will be surveyed later once the property has been purchased. In addition to the building, the Frazier Cemetery (15Lr115) was depicted on this map.

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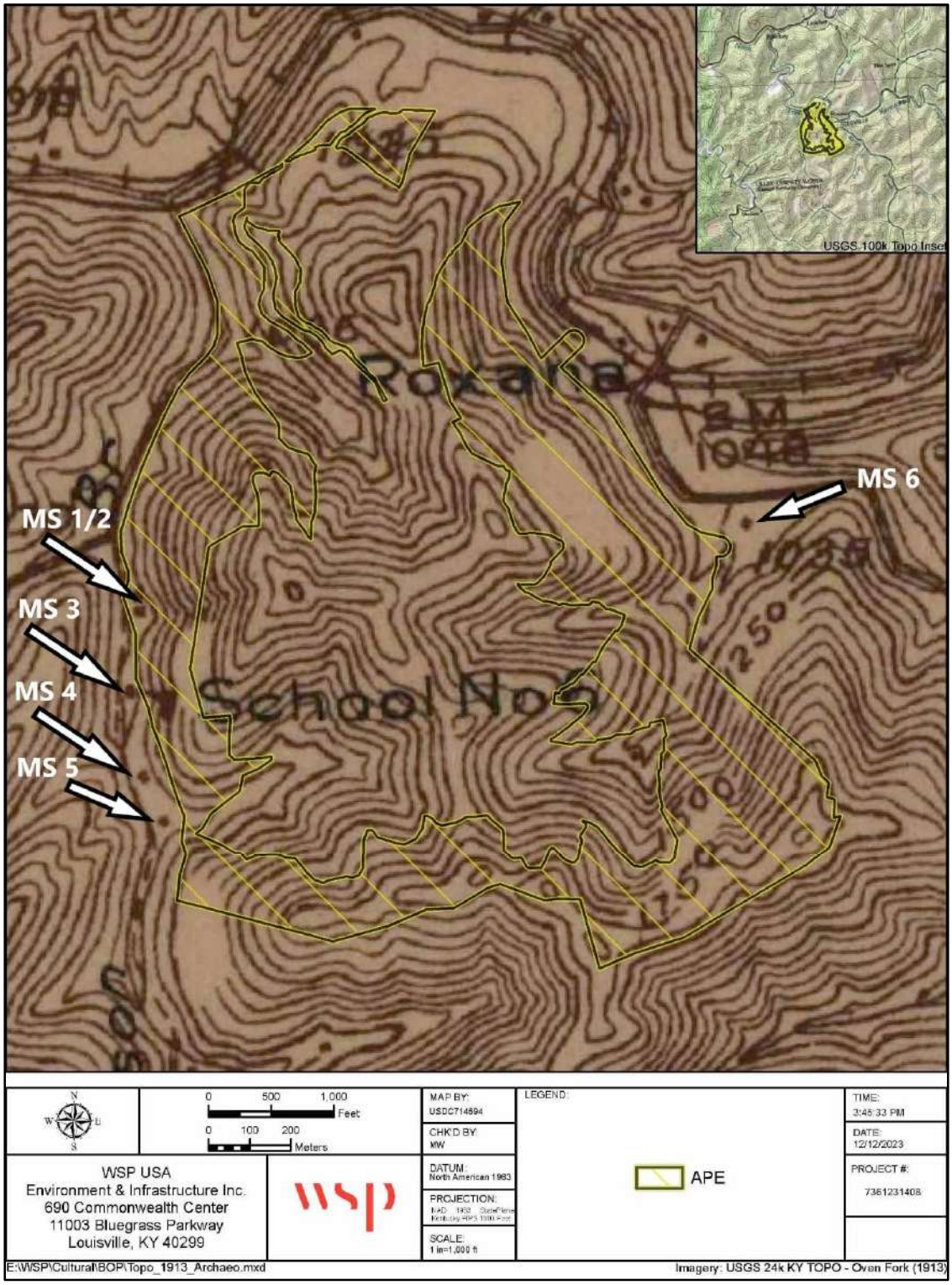

Figure 3.4. The project area depicted on the Oven Fork topographic quadrangle (USGS 1913).

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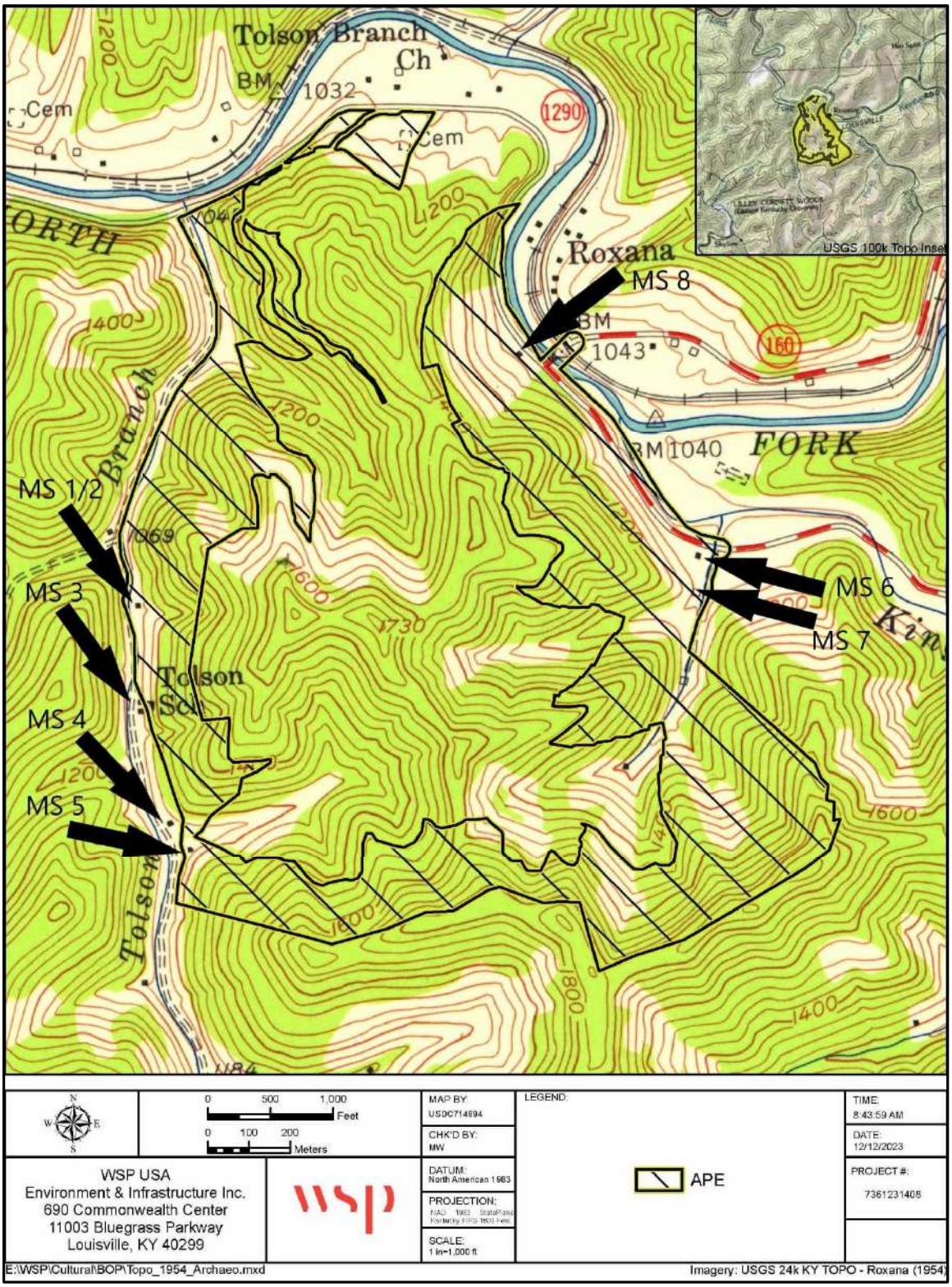

Figure 3.5. The project area depicted on the Roxana topographic quadrangle (USGS 1954).

4.0 FIELD METHODS

The purpose of the archaeological survey was to determine if sites that are listed on, or eligible for, the National Register of Historic Places (NRHP) are located within the project area. Resources were assessed using NRHP criteria for determining their eligibility. These criteria require that the quality of significance in American history, architecture, culture, and archaeology should be present in buildings, structures, objects, sites, or districts that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and that the buildings, structures, objects, sites or districts (NPS 2002):

A. Are associated with events that have made a significant contribution to the broad patterns of our history; or,
B. Are associated with the lives of persons significant in our past; or,
C. Embody the distinctive characteristics of a type, period, or method of construction or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or,
D. Have yielded, or may be likely to yield, information important in prehistory or history.

Prehistoric and historic archaeological sites typically consist of below-ground artifact concentrations, though they may be associated with above-ground features, such as Native American burial mounds or historic houses, barns, and other structures. The significance of archaeological sites is often assessed under Criterion D. In general, archaeological sites that lack sub-plow zone artifact-bearing deposits, have low-density artifact distributions, contain evidence of deep plowing, lack spatial integrity, lack artifact concentrations, or exhibit signs of earth disturbing activities do not appear to be good candidates for inclusion on the NRHP. Sites that contain concentrations of artifacts, intact surface and/or subsurface features, or intact subsurface remains may be recommended for additional evaluation to determine if they are eligible for inclusion in the NRHP. Further investigations of these intact archaeological contexts can yield important data on various aspects of the lives of the prehistoric and historic peoples who left them.

4.1 Archaeological Field Methodology

Field methods employed during the survey were commensurate with field conditions at the time of the survey. During the survey, the APE was visually inspected for wells, cisterns, foundations, grave markers, topographic irregularities, vegetation patterns, and other evidence of potential archaeological sites. Areas with steep slope (greater 15 percent) or that were obviously disturbed were visually examined for archaeological resources by walking pedestrian survey transects spaced at distances that provided line-of-site inspection by field personnel. These transect were spaced no greater than 20 m (65 feet) apart. Most of the project area was pedestrian surveyed since slope was generally greater than 15 percent. The only exception to that pattern was a small area located on the east side of Tolson Creek Road where Site 15Lr114 was documented. This latter area, which exhibited less than 10 percent ground surface visibility, was shovel tested on a 10 m interval. A total of 10 shovel tests were excavated at the site. All shovel tests were excavated at least 10 cm into sterile subsoil. All the STP's had a diameter of at least 30 cm (11.8 inches). Most shovel tests were excavated to approximately 25–30 cm bgs. The soil was screened through 6.35 mm (0.25 in) hardware cloth. Critical information, including STP number, depth, Munsell color, and texture of the strata, artifact content, and other data, was recorded on standardized forms. No shovel tests were excavated outside the APE.

Photographs were taken to document conditions within the overall project area and examples of soil profiles exposed in the STP excavations. Mapping for the project was done with a hand-held Geographic Positioning System (GPS) device capable of sub-meter (3.28 feet) accuracy. Detailed notes, field methods and environmental conditions within the APE were maintained on a daily basis.

5.0 MATERIALS RECOVERED

One historic artifact, a knife fragment, was recovered during shovel testing at Site 15Lr114. Per South (1977), the knife belongs to the Kitchen Group which generally consist of artifacts used in the preparation, consumption, and/or storage of foods and beverages and the processing of animals. The knife fragment was recovered from STP 6 (**Figure 5.1**). This artifact yields little information about the age or function of the site.

Figure 5.1. Artifact recovered from Site 15Lr114.
Knife, white metal, STP 6.

6.0 RESULT OF FIELDWORK

This chapter summarizes the results of the fieldwork, including the documentation of two sites located within the project area. A newly recorded historic site (15Lr114) with an early to late twentieth century occupation was identified along the east side of Tolson Creek Road. Documentation of this site consists of a general site description, summary of field methods employed during recording, artifacts recovered, and a review of archival information. The other site is a modern cemetery (Frazier) that has been in use since 1949. It was previously documented by Brann (2017) while surveying for an earlier design version of the same BOP project as being reported herein. That report included a KHC Survey Form of the cemetery along with all the supporting tombstone photographs and associated headstone information (KHC No. 48622); however, an OSA site number was not assigned at the time. At the request of the OSA, a site form was submitted for the Frazier cemetery as part of the current project (Site 15Lr115).

6.1 Archaeological Survey

The archaeological area of potential effect for the proposed project encompassed approximately 520 acres (**Figure 6.1**). As noted earlier in the report, approximately 235 acres of that was previously surveyed by Sebestyen and Brann (2011), Sebestyen and Brann (2014) and Brann (2017). No sites were documented as a result of these surveys, although as noted above one modern cemetery (Frazier) was identified in the 2017 survey and received a site number during the current reporting (15Lr115). The remaining 285 acres that were not recently surveyed were investigated as part of the current project, except for approximately three acres that were associated with two houses along the west side of Highway 160. These houses were still being occupied by the landowners at the time of the current investigation and for that reason the client requested those areas not be surveyed until after the property is purchased. In addition to the 285 acres, another three acres (50-foot buffer) were surveyed on the east side of Highway 160 between the intersection of Highways 160 and 588 and Rise Branch Road for possible road widening associated with the proposed facility.

The area associated with both the facility and the road widening were heavily sloped (greater than 20 percent) and forested (see **Figures 1.6–1.7**). Most of the leaves, however, had fallen prior to fieldwork, so terrain visibility was excellent for identifying the location of possible cemeteries and rockshelters. Approximately 30 acres of the 285 acres needing a survey was significantly disturbed by rock waste deposited on slopes by the previous coal operation, coal roads, and by underground utilities along Highway 160. Given that most of the project area was heavily sloped (see **Table 2.1)**, pedestrian walkover was the main investigative method employed during the survey (see **Chapter 4.0**).

No rockshelters or additional cemeteries were identified during the pedestrian survey of the sloped area. One new historic site (15Lr114), however, was documented in the project area along the east side of Tolson Creek Road. Also, Frazier cemetery was revisited to confirm its location. Lastly, two possible sites were noted outside the project area along Tolson Creek Road. One was the foundation of a possible school and the other was the standing remains of a store, both of which are depicted on the 1913 topographic quadrangle (see **Section 3.5, Figure 3.4**). Neither of these sites were investigated since they were located outside the project footprint. The architectural component of the existing store was documented and evaluated as part of the associated cultural historic report to this project (Daugherty 2023).

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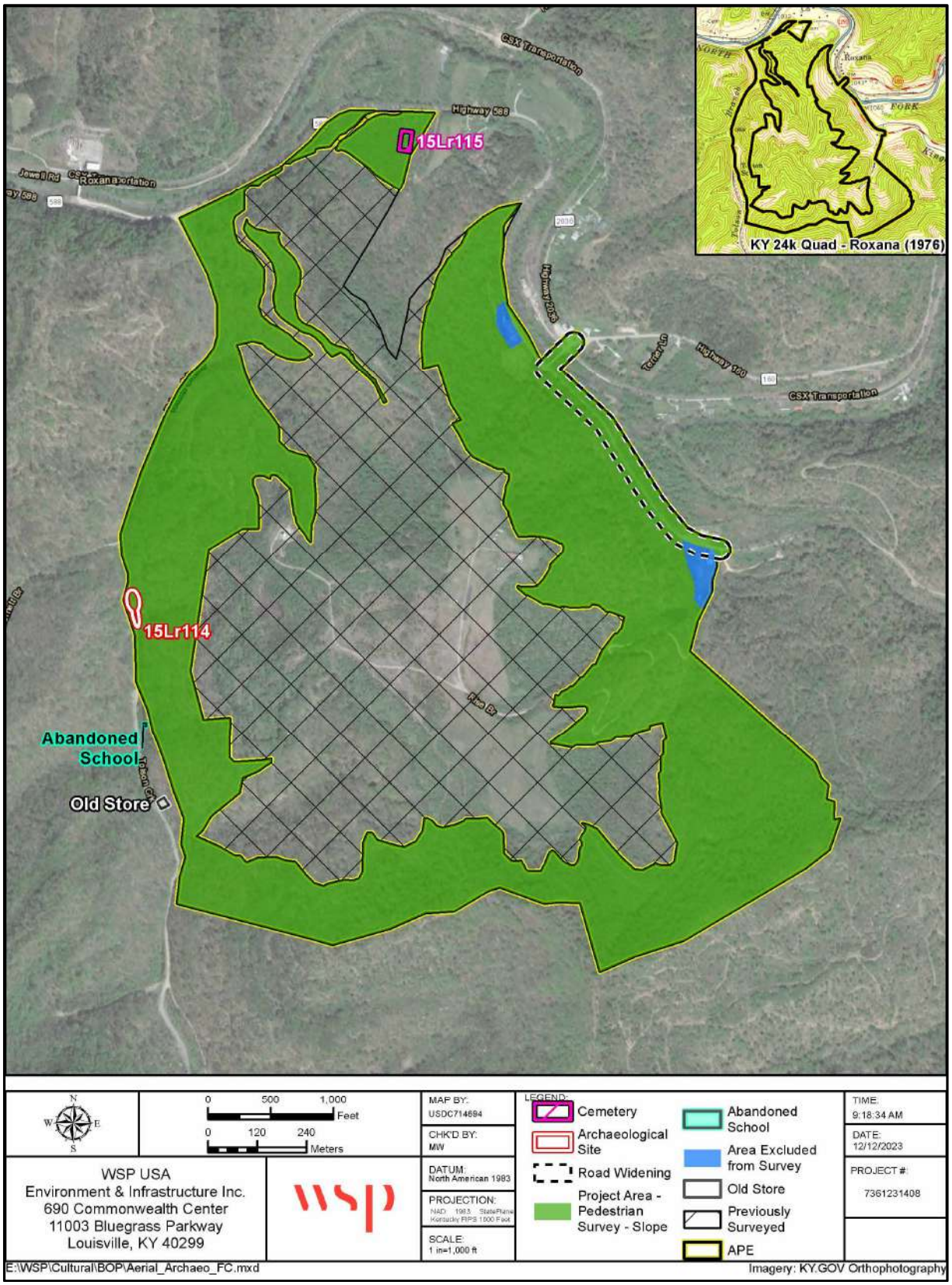

Figure 6.1. Modern aerial showing location of project area and survey results.

6.2 Site 15Lr114

***Site Type**:* historic farmstead/residence
Cultural/Temporal Affiliation: early to late-twentieth century
***Elevation**: 1,160* ft (353 m) AMSL
Topography/Landform: Hillside
Soil Type/Slope: *Cloverlick-Kimper-Highsplint* silt loam/6–10 percent
***Ground Cover (Visibility)**:* grass and secondary growth; less than 10 percent visibility
Site Size: *2,157* sq m
***Recommended NRHP Eligibility**:* not eligible

Site Description

The site is located on the east side of Tolson Creek Road near its intersection with Lilly Cornett Branch Road (see **Figure 6.1**). It is situated on a hillside that is currently in tall grass and secondary growth (**Figure 6.2**). The western edge of the site in defined by Tolson Creek Road and the eastern edge by steep slope and Tolson Creek. Both the northern and southern boundaries were defined by negative shovel tests and the lack of cultural material on the ground surface such as cinder blocks and brick fragments. Other components present at the site included a modern outhouse (**Figure 6.3**), concrete covered well, and the collapsed remains of a small wooden building or shed (**Figure 6.4**). The site, which is approximately 2,157 sq m in area, has been disturbed by recent development, including the existing road right-of-way and a small transmission line that crossed the site. The entire site appears to be in the proposed project area.

Figure 6.2. Site 15Lr114 overview on east side of Tolson Creek road, looking east.

Investigative Methods and Artifact Assemblage

Since the site was covered by tall grass and secondary undergrowth at the time of the survey, ground surface visibility was less than 10 percent. Given this, the entire site was shovel tested on a 10 m interval and when possible, the ground surface was examined for possible artifacts. A total of ten shovel tests were used to define site boundaries (**Figure 6.5**); however, only one was

positive (STP 6). In addition to the positive shovel test, several cinder blocks and brick fragments were noted on the ground surface in various parts of the site. These latter artifacts were not collected as part of the current investigation.

Figure 6.3. Site 15Lr114 showing modern outhouse, looking east.

Figure 6.4. Site 15Lr114 showing remains of a small collapsed wooden building, looking east.

Most of the shovel tests exhibited a similar soil profile consisting of two zones (**Figure 6.6**). Zone I was generally a dark brown (10YR 4/3) silt loam that ranged in depth from ground surface to 12 cm bgs. The underlying Zone II subsoil was the typical yellowish brown (10YR 5/6) silt loam. It

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extended from approximately 12 cm bgs to at least 25 cm bgs. The only artifact recovered during shovel testing was a knife blade from Zone I of STP 6. Per South (1977), the knife belongs to the Kitchen Group which generally consist of artifacts used in the preparation, consumption, and/or storage of foods and beverages and faunal remains.

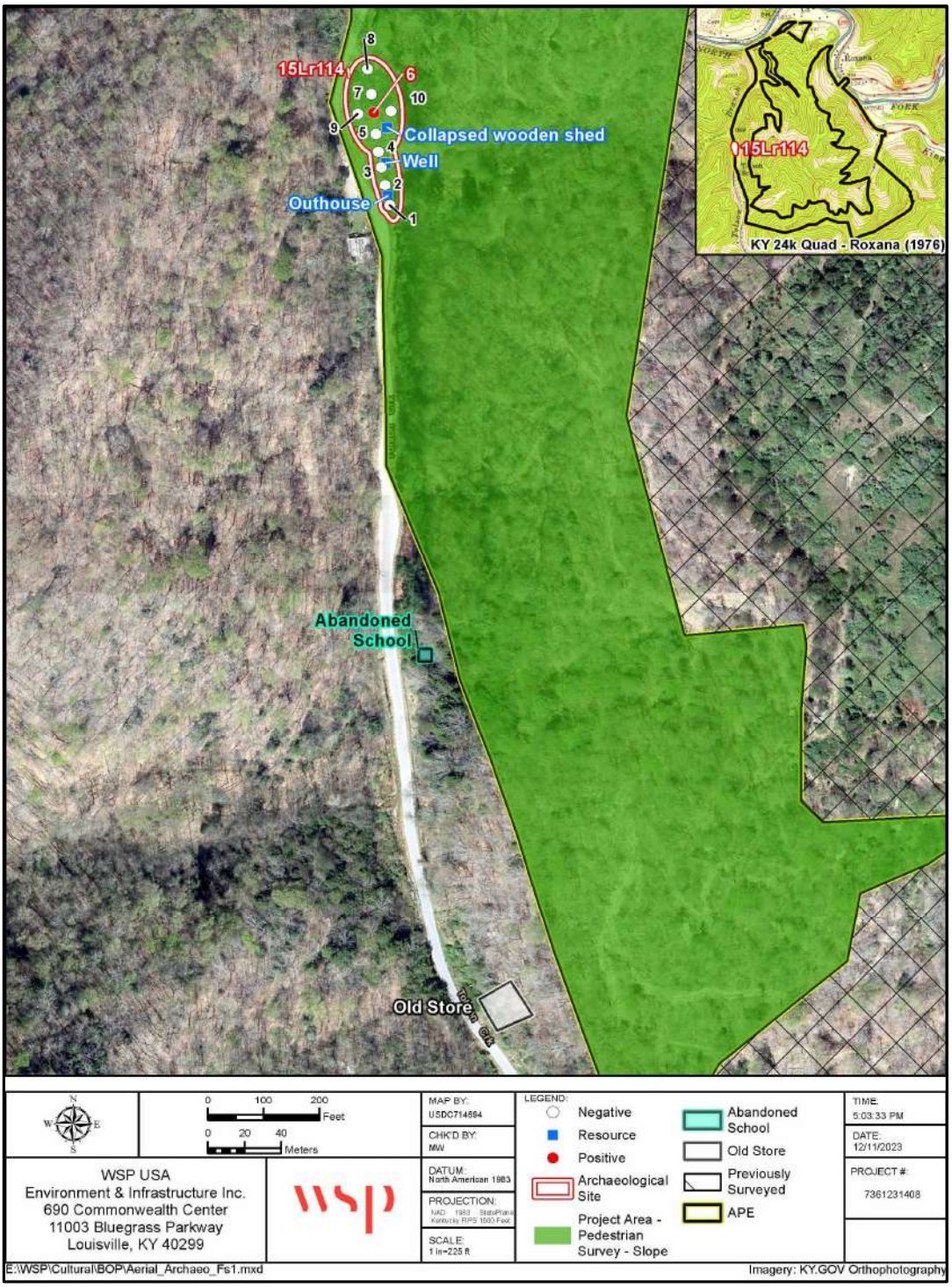

Figure 6.5. Modern aerial showing location of site and survey results.

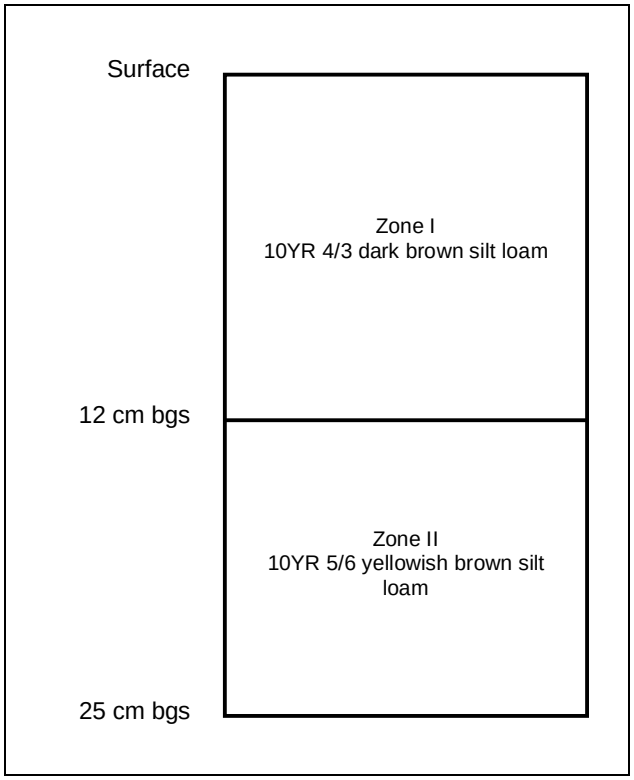

Figure 6.6. Representative shovel test profile (STP 6) from the site.

Archival Research

Archival research consisted of a review of historic topographic maps dating from 1890 to present (KDOH 1937; USGS 1890, 1892, 1913, 1915, 1954). This review revealed either one or two buildings located in or immediately adjacent to the site starting in 1913 (see **Figures 3.4 and 3.5**). It remains unknown what type of buildings were present, but those buildings or more recent replacements were still standing at the site until recently. The recent occupation is represented by the modern outhouse shown in **Figure 6.3**.

Summary and Recommendation

Based on historic maps and the limited artifact assemblage, the site is an early to late twentieth century occupation located on the east side of Tolson Creek Road. The area has been disturbed by the existing road right-of-way and by the construction of a small transmission line that crossed the site. Given the disturbed condition of the site, nondiagnostic character of the artifact assemblage, and very light density of artifacts, WSP does not recommend the site as eligible for the NRHP.

6.3 Site 15Lr115

***Site Type**:* historic cemetery
Cultural/Temporal Affiliation: mid-twentieth to early twenty-first century
***Elevation**:* 1,030 ft (314 m) AMSL
Topography/Landform: slope

Soil Type/Slope: Gilphin-Shelcota Complex/11–25 percent
Ground Cover (Visibility)*:* grass
Site Size: *125* sq m
Recommended NRHP Eligibility*:* not assessed

Site Description and Archival Research

This active cemetery is in the northern portion of the project area approximately 58 m due south of Highway 588 (**Figures 6.7 and 6.8**). It is located on a hillside and has a chain-linked fence surrounding it. Site area within the fence is approximately 125 sq m. A total of 23 tombstones are present, although additional unmarked graves may be present. It was originally recorded by Brann (2017) for an earlier design of the same proposed prison project as being reported herein. As a result of that survey, all 23 tombstones were photographed, and at the request of SHPO a KHC Survey Form was filled out and submitted with the report (KHC No. 48622). At least eight of the graves are older than 50 years in age with death dates in the 1940s, 1950, and 1960s. The most recent grave was 2015. Brann (2017) recommended and SHPO agreed that the cemetery be avoided during construction and that a 100-ft buffer around it should be maintained. An OSA site number, however, was not assigned at the time of their investigation. Given that some graves are older than 50 years in age, OSA requested that a site form be completed as part of the current survey. To this end, WSP applied for and received site number 15Lr115.

Figure 6.7. Overview of previously documented Frazier Cemetery (15Lr115).

During the current survey, the cemetery was revisited to confirm its location but since all the tombstones had already been recorded, no further documentation was conducted. It did not appear, however, that any new graves had been added since the 2017 investigation. Although isolated on a forested hillside, the cemetery appears to be well maintained. A review of historic maps of the area do not depict a cemetery at this location until 1954 which closely matches the earliest known death date of 1949 in the cemetery. This latter grave was for Ira Frazier, who

according to his tombstone was born 22 February 1879 and died 15 August 1949. He was a veteran. Slightly later death dates were recorded for Mattie Lee Frazier (1953), Rufus Darrel Messer (1953), George Frazier (1954), Ronnie Fuller Frazier (1957), and Hubert Frazier (1963).

Summary and Recommendation

The site is a mid-twentieth to early twenty-first century cemetery located just south of Highway 588 in the northern portion of the proposed project area. Eight of the 23 known graves are older than 50 years in age with the latest grave dating to 2015. When it was originally documented by Brann (2017), it was recommended that the cemetery be avoided with a 100-foot buffer placed around it and SHPO concurred with that recommendation. As a result of the revisit, WSP maintains the original recommendation that the cemetery should be avoid by the proposed project and that a 100-foot buffer should be put in place to help protect it from potential disturbances.

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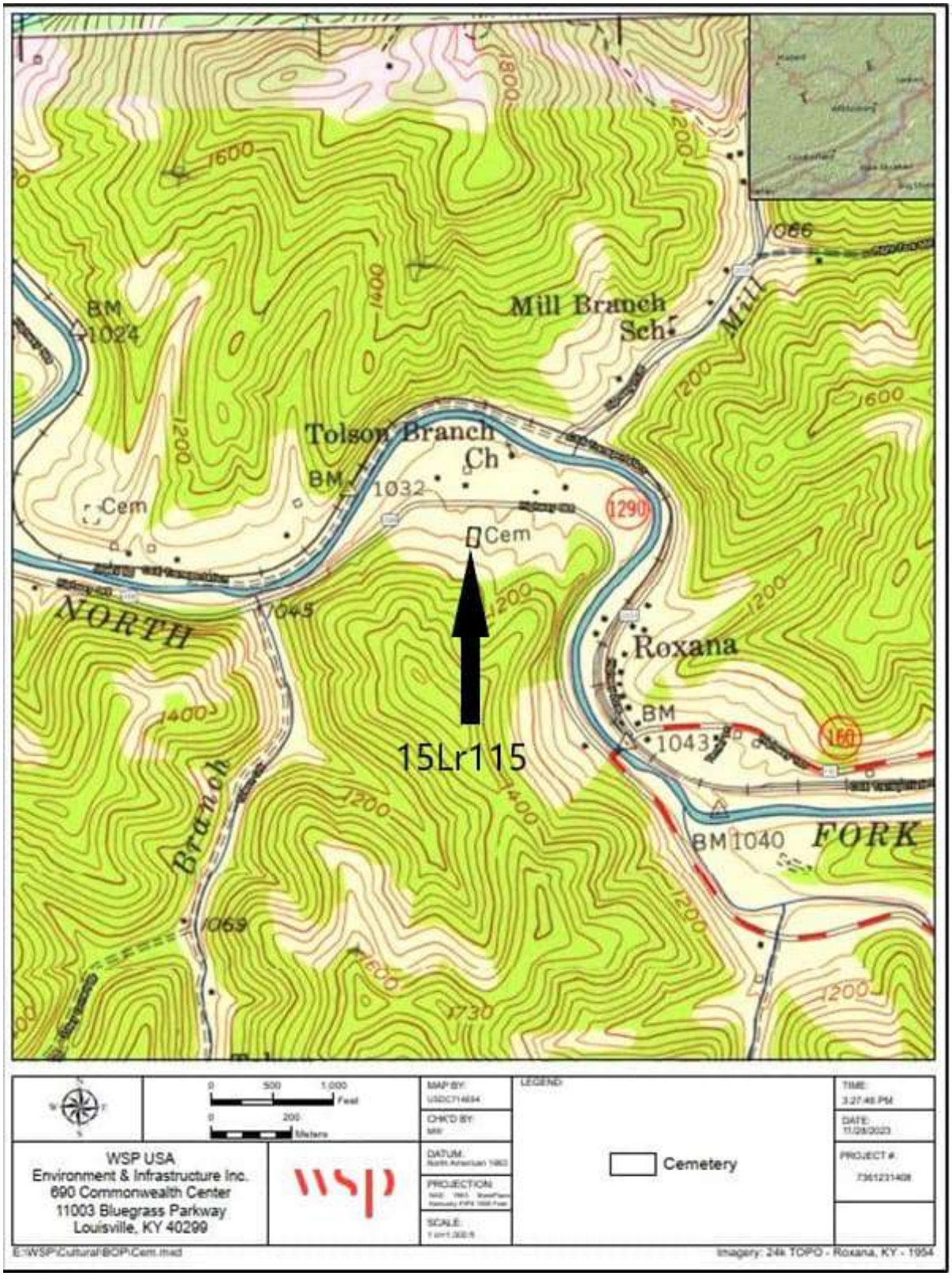

Figure 6.8. Location of Frazier Cemetery on the Roxana, KY topographic quadrangle (USGS 1954).

7.0 SUMMARY AND CONCLUSION

On behalf of the Federal Bureau of Prisons (BOP), WSP conducted an archaeological survey in the first week of November 2023 for the proposed construction and operation of a federal correctional facility along KY-588/KY-160 near Roxana in Letcher County, Kentucky. The archaeological area of potential effect for the proposed project encompassed approximately 520 acres; however, approximately 235 acres was recently surveyed by Sebestyen and Brann (2011), Sebestyen and Brann (2014), and Brann (2017). Although no archaeological sites were documented during these three surveys, one active modern cemetery (Frazier) was noted just south of Highway 588 during the 2017 investigation. An archaeological site number was not assigned to the cemetery, but per SHPO request (see KHC No. 48622) all the tombstone information and photos were included on a KHC Survey Form and incorporated into the revised report. A cover letter included with the report noted the proposed project would accommodate a 100-foot buffer around the cemetery and be avoided. Since the cemetery was recently recorded, the current survey only confirmed its location and, per OSA request, a site number was applied for and given (15Lr115).

Since 235 acres was previously surveyed, the current investigation covered the remaining 285 acres of the project footprint. Approximately 30 acres of that total was significantly disturbed by rock waste deposited on slopes by the previous coal operation, coal roads, and by underground utilities along Highway 160. In addition to the 285 acres associated tied to facility, another three acres (50-foot buffer) were surveyed on the east side of Highway 160 between the intersection of Highways 160 and 588 and Rise Branch Road for possible road widening associated with the proposed facility. The area associated with both the facility and the road widening were heavily sloped and forested. Prior to fieldwork, the client requested that two areas along the west side of Highway 160 not be surveyed as the landowners were still living at each location. These two areas combined totaled approximately three acres and will be surveyed later if and when those parcels have been acquired.

As a result of the survey one new archaeological site (15Lr114) was identified. The site was an early to late twentieth century occupation on the east side of Tolson Creek Road. Only one artifact was recovered. Also present was a modern outhouse, a covered well, and the remains of a small collapsed wooden shed. Site area was disturbed by previous road construction and by a small transmission line. Two possible sites were noted outside the project area along Tolson Creek Road. One was the foundation of a possible school and the other was the standing remains of a store. If the project area should change to include the location of the school and/or store, then additional archaeological investigation may be needed.

Given the disturbed condition of Site 15Lr114 and the nondiagnostic nature of the artifact assemblage, WSP recommends the site as not eligible for the NRHP and that there will be **No Adverse Effect** by the proposed project with the condition that the 100-foot buffer around Site 15Lr115 (Frazier Cemetery) is maintained.

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APPENDIX D

WETLAND DELINEATION REPORT

January 24, 2024

Department of the Army
U.S. Army Corps of Engineers
Regulatory Division, Room 183
P.O. Box 59
Louisville, KY 40202-0059
Attention: Jurisdictional Determination Review

via email: CELRL.Door.To.The.Corps@usace.army.mil

RE: Wetland Delineation Report and Jurisdictional Determination Request
Proposed Federal Correctional Institution and Federal Prison Camp
Letcher County, Kentucky

Dear Jurisdictional Determination Review:

On behalf of the U.S. Department of Justice, Federal Bureau of Prisons (BOP), WSP USA, Inc., submits herein its Wetland Delineation report and Preliminary Jurisdictional Determination Request to the U.S. Army Corps of Engineers, Louisville District. This document addresses waters of the U.S. (wetlands/open waters) within the approximately 700-acre site of the proposed Federal Correctional Institution (FCI) and Federal Prison Camp (FPC) located in Letcher County, Kentucky.

The BOP is proposing to develop a new FCI and FPC within private property that it proposes to acquire and wishes to confirm the locations of wetlands/opens waters which exist on the property. A field delineation of U.S. Army Corps of Engineers jurisdictional wetlands was performed within the site in September/October 2023 by WSP staff. The enclosed document includes the following:

- Wetland Delineation Report
- Completed Request for Department of the Army-Jurisdictional Determination application
- Completed U.S. Army Corps of Engineers Approved Jurisdictional Determination Form
- Site Photographs
- Completed Wetland Determination Data Forms
- Wetland Delineation Plan
- Threatened and Endangered Species Correspondence

Following your review of the attached document, we would appreciate an opportunity to meet (via conference call) to discuss, with BOP officials, the findings, plans for the property, potential permitting, etc. on a day/time of your convenience.

Please do not hesitate to contact me (973-407-1462, craig.hanlon@wsp.com) with questions or to arrange a day/time to meet. Thank you for your attention and consideration.

Sincerely,

WSP USA, Inc.

Craig Hanlon
Principal Environmental Scientist

Attachment
cc: K. Hudson, J. Alvarez, BOP
R. Nardi, S. Hoffman; WSP USA, Inc.

WETLAND DELINEATION REPORT AND JURISDICTIONAL DETERMINATION REQUEST

Proposed Development of a New Federal Correctional Institution and Prison Camp Letcher County, Kentucky

Prepared by:
Federal Bureau of Prisons
Washington, D.C.

December 2023

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1.0 SUMMARY

The U.S. Department of Justice, Federal Bureau of Prisons (BOP) is proposing to develop a new Federal Correctional Institution (FCI) and Federal Prison Camp (FPC) within the Roxana site located in the community of Roxana in Letcher County, Kentucky.

On behalf of the BOP, WSP USA, Inc. (WSP) conducted an investigation of the property to determine the presence or absence of wetlands and other waters of the United States (WUS). A wetland delineation was performed following guidance outlined in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual, Eastern Mountains and Piedmont Region, Version 2.0* (August 2010). A desktop review of resource maps, soil interpretation, site photography, National Wetlands Inventory (NWI) data, and general observation of topographic and hydrologic conditions was conducted. Field investigations were conducted by WSP wetland scientists from September 11 to October 13, 2023.

This report documents the findings of the wetland delineation conducted of the Roxana property proposed for FCI/FPC development (Study Area) and requests a Preliminary Jurisdictional Determination from the U.S. Army Corps of Engineers (Corps). Based on the desktop analysis and field determination, approximately 2.73 acres (118,362 square feet) of palustrine wetland under federal jurisdiction were identified within the Study Area along with 25,338 linear feet of stream under federal jurisdiction.

2.0 INTRODUCTION

2.1 SITE DESCRIPTION

The Study Area for the proposed Federal Correctional Institution (FCI) and Federal Prison Camp (FPC) is located within the southeastern portion of Letcher County in the unincorporated community of Roxana, Kentucky (Exhibit 1). The northern portion of the property is bordered by Kentucky Route 588 (KY 588) through its intersection with Kentucky Route 160 (KY 160) on the North Fork of the Kentucky River near its confluence with Kings Creek. The western portion of the property is bordered by Big Tolson Creek Road and Tolson Branch. While the entire property totals over 700 acres, the more developable portion of the Study Area comprises approximately 545 acres of forested, reclaimed mining and residential land use.

2.2 REGULATORY AUTHORITY

The Corps administers and enforces Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act. The procedure for identifying and locating jurisdictional waters that are regulated by the Corps under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act is commonly referred to as a “jurisdictional determination." Regulated areas include wetlands, stream channels, rivers, lakes, ponds, and coastal and offshore waters. Wetlands and WUS are considered jurisdictional by the Corps if they are relatively permanent waters (RPW); are intermittent, perennial streams; or are adjacent to RPWs.

EXHIBIT 1: VICINITY MAP

2.3 JURISDICTIONAL DETERMINATION REQUEST

A Request for Corps Jurisdictional Determination Form is included as Appendix A. The Corps' Preliminary Jurisdictional Determination Form is provided as Appendix B and was used to ensure all required information was provided with this request. The checklist of information to include with a Request for Jurisdictional Determination includes the name, address, telephone number, and email address of the property owner's representative, the applicant, and the wetland delineator are as follows:

Roxana Property Address:	6830 KY-160, Roxana, Kentucky 41804
Current Property Owner:	Sandra Creech
Attention:	Sandra Creech
Address:	P.O. Box 78, Premium, Kentucky 41845
Telephone:	606-633-4036
Email:	Not available
Applicant:	Federal Bureau of Prisons
Attention:	Kimberly S. Hudson, Chief, Construction and Environmental Review Section, Facilities Management Branch
Address:	320 First Street, NW, Room 901-5, Washington, D.C. 20534
Telephone:	202-616-2574
Email:	kshudson@bop.gov
Wetland Delineator:	WSP USA, Inc.
Attention:	Craig Hanlon, Principal Environmental Scientist
Address:	350 Mount Kemble Avenue, Morristown, New Jersey 07962
Telephone:	973-407-1462
Email:	craig.hanlon@wsp.com

3.0 METHODS

The wetland delineation was performed following guidance outlined in the Regional Supplement to the Corps of Engineers Wetland Delineation Manual, Eastern Mountains and Piedmont Regions (August 2010). Prior to field investigations, a desktop review of resource maps, soil interpretation, site photography, NWI data, and general observations of topographic and hydrologic conditions was conducted. Field investigations were conducted by WSP wetland scientists from September 11 to October 13, 2023, searching for wetland indicator parameters (vegetation, soils, or hydrology) of wetlands or OWUS. Water courses are categorized as either Traditional Navigable Waters (TNW), RPW, or non-RPW (U.S. Environmental Protection Agency, 2006).

TNWs are all tidal waters and waters that have been, could be, or are used in interstate or foreign commerce. TNWs are jurisdictional by the Corps, and any tributary that continually flows directly or indirectly, at least seasonally, into a TNW is also jurisdictional. RPWs are tributaries that flow year-round or have continuous flow at least seasonally, and that flow directly or indirectly into a TNW. Non-RPWs are tributaries that have less than seasonal flow, and that flow directly or indirectly into a TNW.

Wetlands can also be classified as abutting a tributary, adjacent to a tributary, or isolated (U.S. Environmental Protection Agency, 2006). A wetland that abuts a tributary has no distinction between the immediate edge of the tributary and the wetland itself. An adjacent wetland has a barrier between itself and the tributary but is connected by surface flow. Abutting and adjacent wetlands are jurisdictional waters of the U.S. Isolated wetlands are those that satisfy the three criteria but have no direct surface connection to navigable waters or their tributaries that are not jurisdictional waters of the U.S. (EPA/CORPS April 21, 2020).

If evidence was observed that suggested at least one positive wetland indicator parameter (vegetation, soils, or hydrology) is present, then further investigation, as detailed below, was performed to make a positive wetland determination. An area would not be considered a regulatory wetland if indicators for any one of these three parameters are not observed under normal environmental conditions.

3.1 DETERMINING HYDRIC VEGETATION

A plant community is hydrophytic (wetland) if the vegetation displays indicators of hydrophytic vegetation, as defined in the delineation methodology (Corps, 2008). A sample plot is evaluated at each possible wetland area and meets the dominance test for hydrophytic vegetation if more than 50 percent of the dominant species from all strata have obligate wetland, facultative wetland, and/or facultative indicator status. Indicator status is provided by the Corps' National Wetland Plant List (Corps, 2020). Dominant species are identified as the most abundant species that individually or collectively account for more than 50 percent of the total coverage of vegetation in the stratum (absolute percent cover), plus any other species that, by itself, accounts for at least 20 percent of the total. The wetland indicator status for each dominant species is then used to determine whether the plant community is dominated by hydrophytic vegetation. The "Prevalence Index" may also be used as the indicator of hydrophytic vegetation. The Prevalence Index is a weighted average of all plant species in the sample plot.

3.2 DETERMINING HYDRIC SOIL

Soil test pits are hand dug with a spade to approximately 18 inches deep to examine soils for hydric indicators. These soil test pits are labeled with a data point number and located on a site map. Colors of the soil, including concentrations, depletions, or gleying, if present, are identified using a Munsell color chart (Munsell, 2000). Field Indicators of Hydric Soils in the United States (USDA-NRCS, 2017) are used to determine the presence or absence of hydric soils, and soil pits helped reveal where the approximate wetland boundaries occur.

3.3 DETERMINING HYDROLOGY

The hydrology of an area is evaluated by recording the depth to shallow groundwater and/or soil saturation in each soil test pit. Other indicators of hydrology are observed, including but not limited to, water marks, water-stained leaves, sediment deposits, crayfish burrows, and drainage patterns. This data provided information on timing and duration of ponding and/or saturation in the site.

Ephemeral streams and drainage features, which include swales, erosional features, or small washes, were documented and it is up to the Corps to decide if these waterways are jurisdictional. Ditches (including roadside ditches) draining only uplands and without a relatively permanent flow of water, and uplands transporting overland flow generated from precipitation were also documented.

4.0 FINDINGS

Investigations included a desktop/office review of resource maps, on-site vegetation identification, soil interpretation, site photography, and general field observations of hydrologic and other environmental conditions. Findings are described below with site photographs taken during the September 11 to October 13, 2023, field investigations included as Appendix C. Results of desktop review of potential Threatened and Endangered Species at the property are included in Appendix D.

4.1 TOPOGRAPHY

The USGS 7.5-minute Topographic Quadrangle Map for Roxana, Kentucky (ESRI 2023) shows the overall Roxana Study Area at between 1,000 to 1,730 feet above mean sea level (msl) (Exhibit 2). The property is located in the Kentucky River Basin in the Kings Creek-North Fork Kentucky River Watershed (051002010105). The topography consists of steep mountain slopes and valleys in the majority of the Study Area with a gently rolling terrain in the centralized portion. Runoff from the eastern portion of the site flows into Tolson Branch and eventually into the North Fork of the Kentucky River. Runoff from the contributing watershed flows into the North Fork of the Kentucky River which borders the northern portion of the Study Area. An aerial view of the Roxana Study Area is shown on Exhibit 3.

4.2 GEOLOGY AND SOILS

The U.S. Department of Agriculture, Natural Resources Conservation Service (USDA-NRCS) Custom Soil Resource Report for Letcher County, Kentucky, indicates there are nine soil units comprising the Study Area (Exhibit 4). Descriptions of each soil, the extent of coverage, and the hydric soil and prime farmland status of each mapping unit are identified in Table 1. A hydric soil is one that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part. No on-site soil map units have minor hydric components.

USDA defines prime farmland as land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor, and without intolerable soil erosion. Approximately 0.1 percent of soils at the Study Area are considered prime farmland if protected from flooding or not frequently flooded during the growing season (Table 1). Land that does not meet the criteria for prime or unique farmland but included areas of soils that nearly meet the requirements for prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods, as determined by the appropriate State agencies, is considered farmland of statewide importance. The Alleghany loam, 2 to 15 percent slopes component comprises approximately 0.1 percent of the Study Area and is considered farmland of statewide importance (Table 1).

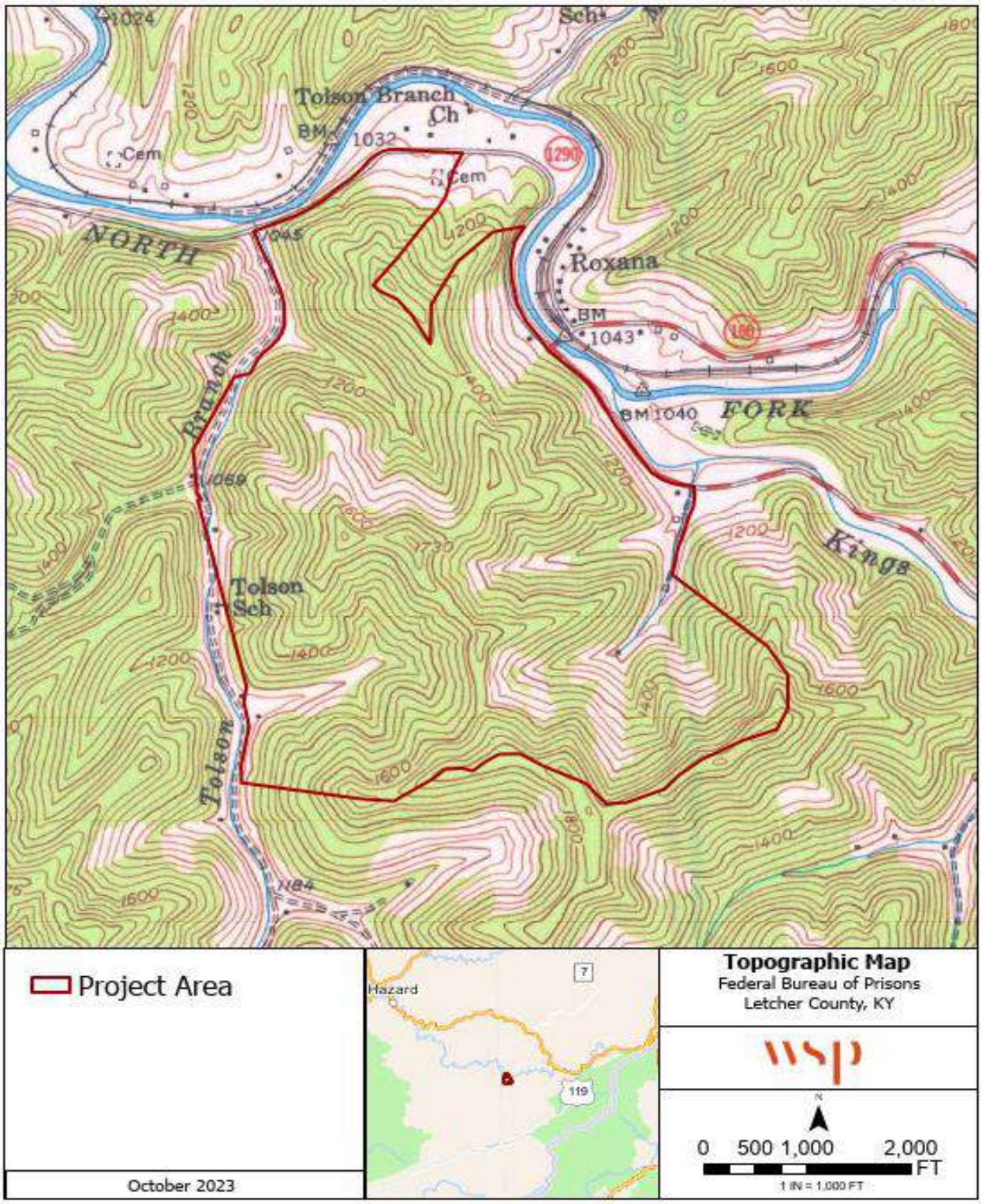

EXHIBIT 2: TOPOGRAPHIC MAP

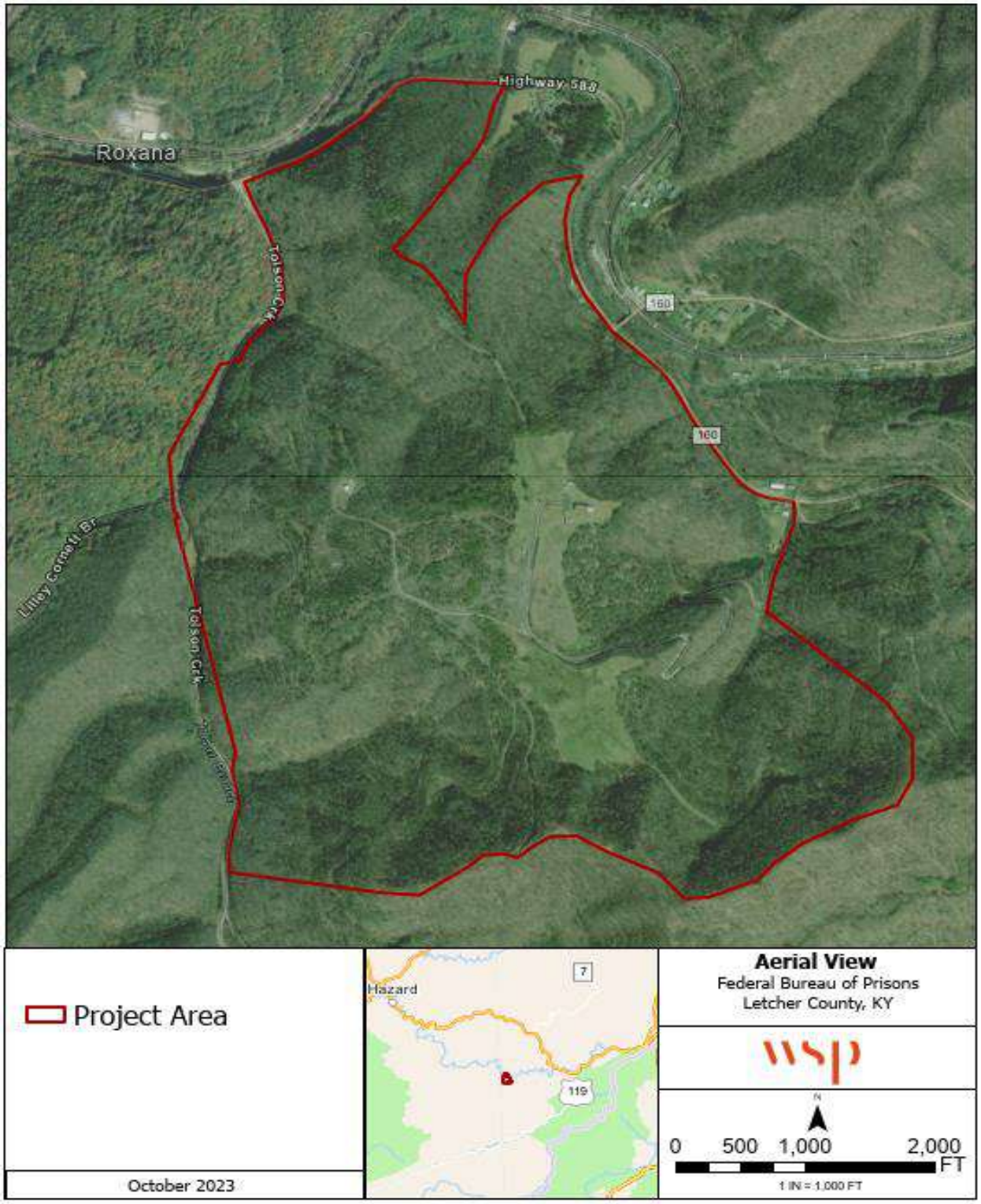

EXHIBIT 3: AERIAL VIEW

TABLE 1: SOIL TYPES AND CHARACTERISTICS

Soil Unit Symbol	Soil Unit Name	Percentage of Site	Hydric Soil	Prime Farmland
AlC	Allegheny loam, 2 to 15% slopes	0.1%	No	Farmland of statewide importance
CkF	Cloverlick-Kimper-Highsplint complex, 30 to 65% slopes, very stony	35.4%	No	Not prime farmland
DrF	Dekalb-Gilpin-Rayne complex, 25 to 65% slopes, very rocky	9.7%	No	Not prime farmland
FkE	Fiveblock and Kaymine soils, 0 to 30% slopes, stony	9.6%	No	Not prime farmland
GlD	Gilpin-Shelocta complex, 12 to 25% slopes	0.8%	No	Not prime farmland
KfF	Kaymine, Fairpoint, and Fiveblock soils, benched, 2 to 70% slopes, very stony	23.0%	No	Not prime farmland
uGrig	Grigsby fine sandy loam, 0 to 3% slopes, frequently flooded	0.1%	No	Prime farmland if protected from flooding or not frequently flooded during the growing season
uShgF	Shelocta-Highsplint-Gilpin complex, 20 to 70% slopes, very stony	19.8%	No	Not prime farmland
uUdrB	Udorthents-Urban land-Grigsby complex, 0 to 6% slopes, occasionally flooded	1.5%	No	Not prime farmland

Source: USDA-NRCCS, Web Soil Survey, Letcher County, Kentucky, 2023.

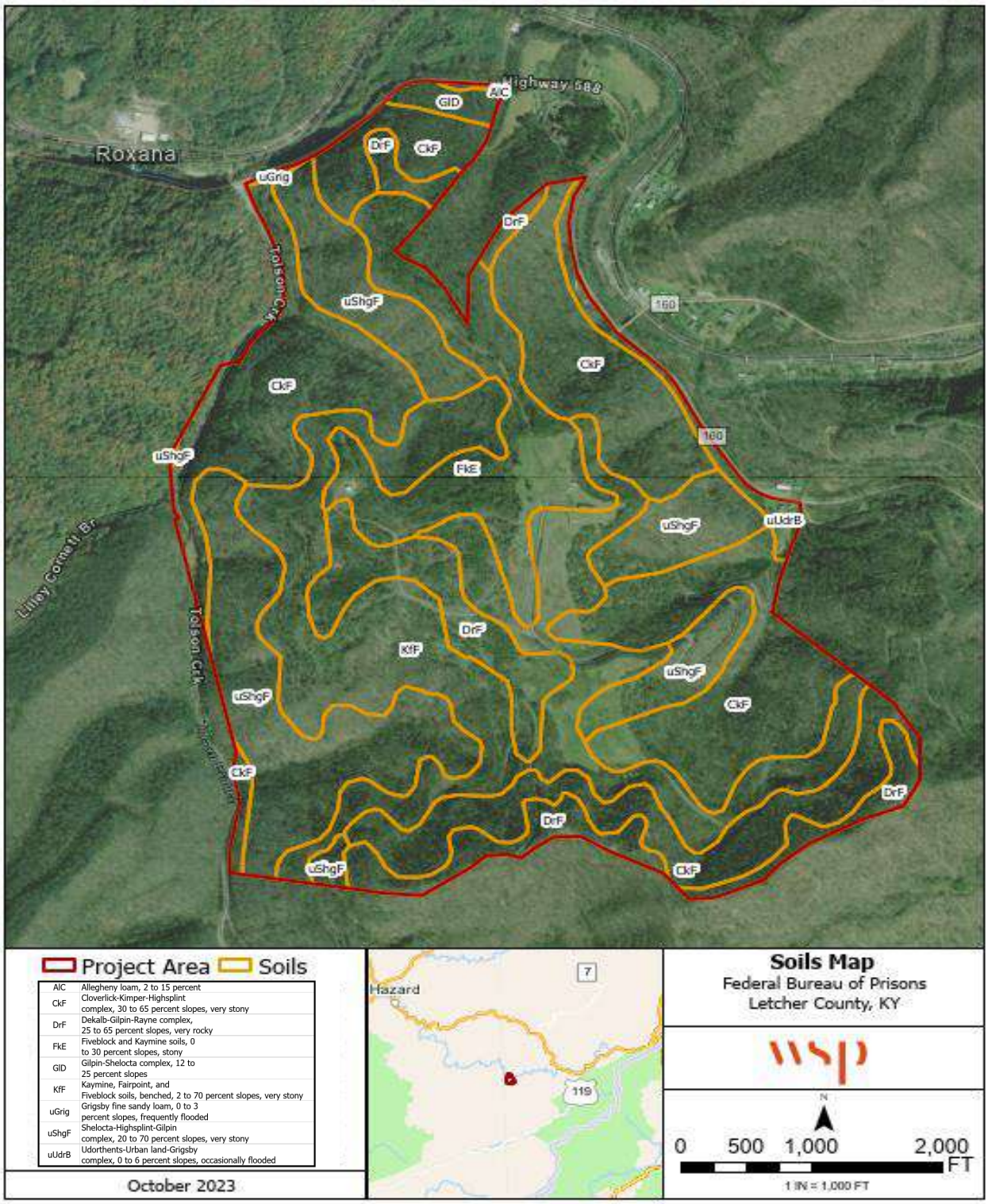

EXHIBIT 4: SOILS MAP

4.3 HYDROLOGY

The Study Area is located within the Kentucky River Basin and the Kings Creek-North Fork Kentucky River Watershed. The surface waters that drain the area consist of drainage ditches, ephemeral streams, intermittent streams, and perennial streams. According to the Federal Emergency Management Agency flood maps, no portion of the Study Area is located within the 100-year for 500-year flood zones.

A total of fifteen ephemeral tributaries were identified within the Study Area. Within the eastern portion of the Study Area, several ephemeral tributaries flow west to the confluence with Tolson Branch which runs along the western boundary of the Roxana property. The remaining ephemeral tributaries drain into other water resources such as an intermittent tributary.

Seventeen intermittent tributaries and four perennial tributaries were also identified within the Study Area. All tributaries are dispersed along the outer edges of the Study Area with the western tributaries draining into Tolson Branch (WUS004) and the eastern tributaries draining into the North Fork Kentucky River. At the time of the site visit in October 2023, most of the intermittent tributaries had standing water with no visible flow.

4.4 VEGETATION

Vegetation observed within the Study Area is listed in Table 2 along with the species' wetland indicator status. This not a complete list of all vegetation present within the Study Area, but rather the dominant species observed.

TABLE 2: DOMINANT VEGETATION OBSERVED WITHIN THE JURISDICTONAL DETERMINATION AREA

Scientific Name	Common Name	Wetland Indicator Status
Acer negundo	Boxelder maple	FAC
Acer rubrum	Red maple	FAC
Asimina triloba	American pawpaw	FAC
Betula nigra	River birch	FACW
Bidens frondosa	Common Beggar-Ticks	FACW
Boehmeria cylindrica	False nettle	FACW
Carex frankii	Frank's sedge	OBL
Cyperus eragrostis	Tall flatsedge	FACW
Cyperus strigosus	Straw-colored sedge	FACW
Elaeagnus umbellata	Autumn olive	UPL
Fagus grandifolia	American beech	FACU
Fraxinus americana	White ash	FACU
Fraxinus nigra	Black ash	FACW
Fraxinus pennsylvanica	Green ash	FACW
Impatiens capensis	Common jewelweed	FACW
Impatiens pallida	Yellow jewelweed	FACW
Juncus effusus	Soft rush	OBL
Kyllinga brevifolia	Shortleaf spikesedge	FACW
Lindera benzoin	Northern spicebush	FAC
Liriodendron tulipifera	Tulip poplar	FACU

Scientific Name	Common Name	Wetland Indicator Status
Lonicera japonica	Japanese honeysuckle	FACU
Microstegium vimineum	Japanese stiltgrass	FAC
Nyssa sylvatica	Black gum	FAC
Oplismenus hirtellus	Wavyleaf basketgrass	FACU
Parthenocissus quinquefolia	Virginia creeper	FACU
Persicaria longiseta	Oriental Lady's-thumb	FAC
Persicaria virginiana	Jumpseed	FAC
Pilea pumila	Canadian clearweed	OBL
Pinus virginiana	Virginia pine	UPL
Platanus occidentalis	American sycamore	FACW
Polystichum acrostichoides	Christmas fern	FACU
Rosa multiflora	Rambler rose	FACU
Salix nigra	Black willow	OBL
Scirpus atrovirens	Dark green bulrush	OBL
Scirpus cyperinus	Woolgrass	FACW
Scirpus microcarpus	Panicled bulrush	OBL
Toxicodendron radicans	Poison ivy	FAC
Urtica dioica	Stinging nettle	OBL
Vitis vinifera	Common grape vine	FACU

Key to indicator categories:

OBL: Obligate, almost always occur in wetlands.

FACW: Facultative Wetland, usually occur in wetlands, but may occur in non-wetlands.

FAC: Facultative, occur in wetlands and non-wetlands.

FACU Facultative Upland, usually occur in non-wetlands, but may occur in wetlands.

UPL: Upland, almost never occur in wetlands.

NI: Not found on national listings of plants occurring in wetlands.

Source: Corps, 2020.

4.5 WETLANDS AND WATERWAYS

Relevant USGS 7.5-minute topographic quadrangle maps, U.S. Fish and Wildlife Service (USFWS) NWI maps, the “Web Soil Survey of Letcher County, Kentucky,” and aerial photographs were gathered and reviewed to determine the likelihood that jurisdictional areas would exist on site. These data sources were used to assess the Study Area for the possible presence of hydric soils, wetland areas, and streams and other watercourses that may provide an indication of jurisdictional areas. NWI maps depict freshwater ponds and riverine wetlands within the Study Area as listed below and shown on Exhibit 5.

- Riverine wetlands classified as Riverine, Low Gradient Perennial, Unconsolidated Bottom, Permanently Flooded (R2UBH)
- Riverine wetlands classified as Riverine, Intermittent Streambed, Seasonally Flooded (R4SBC)
- Riverine wetlands classified as Riverine, High Gradient Perennial, Unconsolidated Bottom, Permanently Flooded (R3UBH)
- Freshwater wetlands classified as Ponds, Unconsolidated Bottom, Permanently Flooded,

Diked/Impounded (PUBHh)

- Freshwater wetlands classified as Ponds, Unconsolidated Bottom, Permanently Flooded (PUBH)

A field wetland delineation of aquatic resources within the Study Area was conducted in September - October 2023, to determine precise extent and boundaries of wetlands. As part of this effort, vegetative community types were recorded, dominant plant species were inventoried, descriptions of wetlands and open waters delineated were noted, and extensive photo-documentation was recorded. Also, soil profiles and hydrologic indicators were documented. Wetland determination data forms documenting the vegetative, soil, and hydrologic characteristics of each wetland are included as Appendix E.

Aquatic resource boundaries were demarcated in the field using sequentially numbered surveyor flags and boundaries were identified on the Wetland Delineation Map (Exhibit 5). Flags were located to sub-foot accuracy using a GNSS Arrow+ global positioning system. Wetlands were classified in accordance with the USFWS Manual FWS/OBS-79/31 Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et al., 1979). Table 3 lists each NWI aquatic resource identified within the site along with the Cowardin classification, flow regime, acreage, linear footage, and location. Table 4 lists each WUS identified within the site during the field investigations along with the Cowardin classification, flow direction, waterway type, linear footage and location.

TABLE 3: NWI AQUATIC RESOURCE IDENTIFIED ADJACENT AND WITHIN THE JURISDICTIONAL DETERMINATION AREA

Aquatic Resource	Cowardin Classification	Flow Regime	Area (Acres)	Length (Linear Feet)	Location (Latitude/Longitude)
A	R2UBH	Permanently Flooded	309.2	255,114.80	37.243/-82.737
B	R4SBC	Seasonally Flooded	4.9	6,727.10	37.112/-82.960
C	R3UBH	Permanently Flooded	18.7	18,912.90	37.107/-82.948
D	R4SBC	Seasonally Flooded	0.8	1,103.44	37.105/-82.945
E	PUBHh	Permanently Flooded	0.2	112.05	37.107/-82.955
F	PUBHh	Permanently Flooded	0.3	130.91	37.102/-82.949
G	PUBHh	Permanently Flooded	0.2	103.11	37.099/-82.948
H	PUBH	Permanently Flooded	0.2	120.22	37.094/-82.957
I	PUBHh	Permanently Flooded	0.2	94.9	37.101/-82.940

Source: USFWS NWI Wetlands, 2023

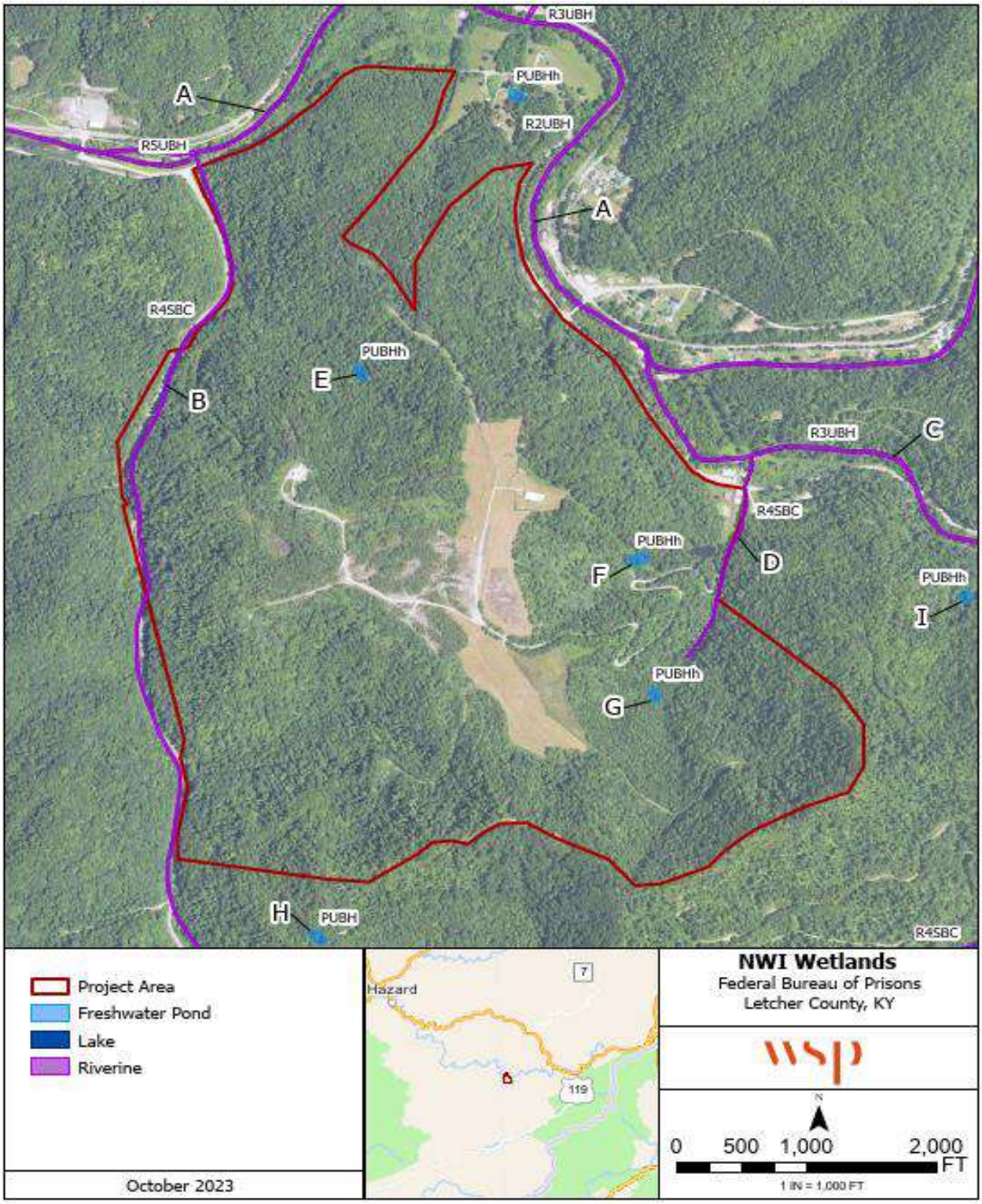

EXHIBIT 4: NATIONAL WETLAND INVENTORY MAP

TABLE 4: WATERS OF THE U.S. IDENTIFIED WITHIN THE JURISDICTIONAL DETERMINATION AREA

Aquatic Resource	Cowardin Classification	Flow Direction	Waters Type	Length (Linear Feet)	Location (Latitude/Longitude)
WUS001	R5UB	West	Ephemeral	454.7	37.107/-82.954
WUS002	R5UB	West	Ephemeral	559.1	37.107/-82.954
WUS002	R4SB1	Northwest	Intermittent	121.5	37.107/-82.955
WUS002	R2UB1	West	Perennial	1,316.5	37.107/-82.956
WUS003	R4SB1	Northeast	Intermittent	372.4	37.107/-82.956
WUS004	R3SB3	Northeast	Perennial	8,145.9	37.109/-82.959
WUS005	R4SB1	West	Intermittent	2,152.4	37.100/-82.954
WUS006	R5UB	North	Ephemeral	258.4	37.106/-82.953
WUS007	R5UB	Southwest	Ephemeral	468.7	37.100/-82.955
WUS008	R4SB1	North	Intermittent	456.8	37.099/-82.955
WUS009	R4SB1	North	Intermittent	106.5	37.099/-82.955
WUS010	R5UB	South	Ephemeral	729.3	37.100/-82.956
WUS011	R5UB	Southeast	Ephemeral	127.6	37.100/-82.957
WUS012	R4SB1	North	Intermittent	659.9	37.098/-82.957
WUS013	R5UB	Northeast	Ephemeral	129.3	37.098/-82.957
WUS014	R3UB1	Northwest	Perennial	774.6	37.097/-82.958
WUS015	R4SB1	North	Intermittent	296.3	37.097/-82.959
WUS016	R4SB1	North	Intermittent	187.6	37.097/-82.959
WUS017	R5UB	Northwest	Intermittent	53.8	37.098/-82.958
WUS018	R4SB1	South	Intermittent	287.1	37.099/-82.958
WUS020	R5UB	West	Ephemeral	379.6	37.101/-82.960
WUS021	R5UB	West	Ephemeral	263.9	37.102/-82.961
WUS021	R4SB1	West	Intermittent	90.9	37.102/-82.962
WUS022	R4SB1	North	Intermittent	802.5	37.103/-82.960
WUS023A	R4SB1	North	Intermittent	120.5	37.103/-82.960
WUS023B	R4SB1	North	Intermittent	49.6	37.103/-82.960
WUS024	R5UB	Northwest	Ephemeral	420.9	37.112/-82.957
WUS100	R5UB	Northeast	Ephemeral	1,003.0	37.107/-82.952
WUS101A	R5UB	Northeast	Ephemeral	865.9	37.106/-82.950
WUS101B	R5UB	Northeast	Ephemeral	117.5	37.105/-82.950
WUS102	R2SB3	North	Perennial	1,894.0	37.102/-82.946
WUS102A	R5UB	East	Ephemeral	38.0	37.103/-82.948
WUS102B	R5UB	Northeast	Ephemeral	381.6	37.102/-82.948
WUS102B	R4SB1	Northeast	Intermittent	118.7	37.102/-82.948
WUS103	R3UB1	Northwest	Intermittent	1,033.4	37.106/-82.960
WUS103A	R4SB1	Northeast	Intermittent	99.7	37.105/-82.959

Cowardin Classifications:

R2SB3: Riverine, Lower Perennial, Streambed, Cobble-Gravel

R2UB1: Riverine, Lower Perennial, Unconsolidated Bottom, Cobble-Gravel

R3UB1: Riverine, Upper Perennial, Unconsolidated Bottom, Cobble-Gravel
R3SB1: Riverine, Upper Perennial, Streambed, Bedrock
R3SB3: Riverine, Upper Perennial, Streambed, Cobble-Gravel
R4SB1: Riverine, Intermittent, Streambed, Cobble-Gravel
R5UB: Riverine, Unknown, Ephemeral, Unconsolidated Bottom

WUS001 is an ephemeral WUS of approximately 454.7 linear feet that flows west into WUS002. WUS001 is fed by precipitation and overland flow. WUS001 has a substrate that consists of cobble, gravel and sand. WUS001 has an Ordinary High Water Mark (OHWM) that is characterized by a clear, natural line impressed on the bank, vegetation matted down, bent or absent, sediment deposition and the destruction of terrestrial vegetation.

WUS002 starts as an ephemeral waterway for approximately 559.1 linear feet that flows west through the confluence with WUS001. WUS002 becomes a clear intermittent channel and begins to turn northwest as it intersects more groundwater for approximately 121.5 linear feet. WUS002 then becomes a visibly flowing perennial stream for the remainder of 1,316.5 linear feet before it reaches the confluence with WUS004 named tributary Tolson Branch. WUS002 has a substrate that consists of cobble, gravel and sand. WUS002 has an OHWM that is characterized by a clear natural line impressed on the bank, shelving, leaf litter disturbed or washed away, sediment deposition, presence of leaf litter and debris, presence of wrack lines, sediment sorting and scour, and predicted flow events.

WUS003 is an intermittent WUS of approximately 372.4 linear feet that flows northeast into the perennial section of WUS002. WUS003 is fed by groundwater and precipitation and has an OHWM that is characterized by a clear, natural line impressed on the bank, sediment sorting and multiple observed flow events. WUS003 has a substrate that consists of cobble, gravel and bedrock.

WUS004 is a perennial waterway and the named tributary Tolson Branch. Approximately 8,145.9 linear feet of Tolson Branch was mapped as it borders the west side of the Study Area flowing out from a culvert that carries flow underneath the road named Tolson Creek. WUS004 flows northeast into the South Fork Kentucky River. WUS004 receives flow from groundwater and several other mapped WUS within the Study Area. WUS004 has a substrate that consists of cobble, gravel, sand and silt. WUS004 has an OHWM that is characterized by a clear natural line impressed on the bank, vegetation matted down, bent or absent, sediment deposition, the destruction of terrestrial vegetation, observed flow events and scour.

WUS005 is an intermittent WUS of approximately 2,152.4 linear feet that flows west into WUS004. WUS005 is fed by mostly precipitation and groundwater. WUS005 can be classified as having fair bank stability in some areas but is eroding heavily in some locations downstream. WUS005 flows through multiple mapped non-tidal wetlands and begins to headcut as it flows through WET012 and WET013. WUS005 has a substrate that consists of cobble, gravel, sand, silt and bedrock. WUS005 has an OHWM that is characterized by a clear, natural line impressed on the bank, washed away and disturbed leaf

litter, sediment deposition, wrack lines, sediment sorting, scour and multiple observed flow events.

WUS006 is an ephemeral waterway of approximately 258.4 linear feet that flows north to northwest down the mountain side. WUS006 is fed by precipitation that collects and concentrates in the mapped drainage ditch D002 until it becomes an ephemeral channel that flows downhill into a terrace and dissipates over the steep slope. WUS006 has a substrate that consists of cobble, gravel, sand and vegetation. WUS006 has an OHWM that is characterized by a clear, natural line impressed on the bank, changes in the character of the soil, matted vegetation, sediment deposition and sorting and observed flow events.

WUS007 is an ephemeral waterway of approximately 468.7 linear feet that flows southwest into WUS005. WUS007 is fed by precipitation and has good bank stability but loses most of its hydrology downstream. WUS007 has a substrate that consists of cobble, gravel, sand, silt and bedrock. WUS007 has an OHWM that is characterized by a clear, natural line impressed on the bank, changes in the character of the soil, disturbed leaf litter, sediment deposition and sorting and the presence of debris.

WUS008 is an intermittent WUS of approximately 456.8 linear feet that flows north into WUS005. WUS008 is fed by groundwater and has an OHWM that is characterized by disturbed and washed away leaf litter, sediment sorting and deposition and scour. WUS008 has a substrate that consists of cobble, gravel, sand, silt and bedrock.

WUS009 is an intermittent WUS of approximately 106.5 linear feet that flows north into WUS008. WUS009 is fed by groundwater and has a substrate that consists of mostly bedrock with some scattered silt and cobble. WUS009 has an OHWM that is characterized by sediment deposition, scour, disturbed leaf litter and the presence of debris. WUS009 has a substrate that consists of cobble, silt and bedrock.

WUS010 is an ephemeral waterway of approximately 729.3 linear feet that flows south into WUS005. WUS010 is fed by groundwater. Near the upstream portion of WUS010 there is another small ephemeral waterway, **WUS011**, that flows southeast into WUS010 and is approximately 127.6 linear feet. WUS010 and WUS011 are very similar waterways except WUS011 has a steeper gradient. Both WUS010 and WUS011 have an OHWM that is characterized by disturbed leaf litter, sediment deposition and sorting, and scour. WUS010 and WUS011 have a substrate that consists of cobble, gravel, sand, silt and bedrock.

WUS012 is an intermittent waterway of approximately 659.9 linear feet that flows north into WUS005. WUS012 is a very steep watercourse and drains an dirt roadway that appears to be abandoned of use. WUS012 has a substrate that consists of mostly bedrock and cobble with traces of gravel and silt. WUS012 is fed by groundwater and has an OHWM that is characterized by shelving, matted vegetation, disturbed leaf litter, sediment deposition and sorting, scour and debris.

WUS013 is an ephemeral waterway of approximately 129.3 linear feet that flows northeast into WUS012. WUS013 is fed by precipitation and appears to be the result of a culvert failure and the presence of an adjacent berm that resulted in water channelization. WUS013 has a fair bank stability and an OHWM that is characterized by a clear, natural line impressed on the bank, disturbed leaf litter, sediment deposition and sorting, and scour. WUS013 has a substrate that consists of cobble, gravel, sand, silt and bedrock.

WUS014 is a perennial WUS of approximately 774.6 linear feet that flows northwest into WUS005. WUS014 is fed by groundwater and various seeps and receives and drains flow from WET010. WUS014 has an OHWM that is characterized by a clear, natural line impressed on the bank, matted down vegetation, disturbed leaf litter, sediment deposition and sorting, destruction of terrestrial vegetation, scour and multiple observed flow events. WUS014 has a substrate that consists of cobble, gravel, sand and silt.

WUS015 is an intermittent WUS of approximately 296.3 linear feet that flows north into WUS014. WUS015 is fed by groundwater and drains WET010. WUS015 has a mesohabitat of 100 percent riffle and has an OHWM that is characterized by a clear, natural line impressed on the bank, matted down vegetation, disturbed leaf litter, sediment deposition and sorting, destruction of terrestrial vegetation and scour. WUS015 has a substrate that consists of cobble, gravel, sand and silt.

WUS016 is an intermittent WUS of approximately 187.6 linear feet that flows north into WUS015. WUS016 is fed by groundwater and drains WET010. WUS016 has an OHWM that is characterized by a clear, natural line impressed on the bank, matted down vegetation, disturbed leaf litter, sediment deposition and sorting, destruction of terrestrial vegetation and scour. WUS016 has a substrate that consists of cobble, gravel, sand and silt.

WUS017 is an ephemeral WUS of approximately 53.83 linear feet that flows northwest into WUS005. WUS017 is fed by groundwater and seeps and precipitation flow from mapped drainage ditch, D004. WUS017 has an OHWM that is characterized by a clear, natural line impressed on the bank, matted down vegetation, disturbed leaf litter, sediment deposition and sorting, and scour. WUS017 has a substrate that consists of cobble, gravel, sand and silt.

WUS018 is an intermittent WUS of approximately 287.1 linear feet that flows south in WUS005. WUS018 is fed by groundwater and is very steep with the presence of saturated rocks and good bank stability. WUS018 has a substrate that consists of cobble, gravel, sand, silt and bedrock. WUS018 has an OHWM that is characterized by a clear, natural line impressed on the bank, disturbed and washed away leaf litter, sediment sorting and deposition, with scouring.

WUS020 is an ephemeral waterway of approximately 379.2 linear feet that flows west until it dissipates, most likely draining into WUS004. WUS020 receives its flow from precipitation and overland sheet flow.

WUS020 has a substrate that consists of primarily bedrock with vegetation scattered throughout the channel. WUS020 has a OHWM that is characterized by a clear, natural line impressed on the bank, matted down and bent vegetation, water-stained leaves and the presence of debris.

WUS021 starts as an ephemeral waterway for approximately 263.9 linear feet before becoming a clear intermittent WUS for a remaining 90.9 linear feet when it starts to intercept groundwater flow before its confluence with WUS004. WUS021 is fed by precipitation and overland sheet flow along the mapped ephemeral portion of the watercourse. WUS021 has an OHWM that is characterized by a clear, natural line impressed on the bank, matted down vegetation, disturbed leaf litter, water staining and the presence of litter and debris. WUS021 has a substrate that consists of cobble, gravel, sand, vegetation and bedrock.

WUS022 is an intermittent WUS of approximately 802.5 linear feet that flows west into WUS004. WUS022 is fed by precipitation, overland sheet flow, WUS023 and multiple seeps. WUS022 has an OHWM that is characterized by a clear, natural line impressed on the bank, matted down vegetation, disturbed leaf litter, water staining and the presence of litter and debris. WUS022 has a substrate that consists of cobble, gravel, silt, vegetation and bedrock.

WUS023A is an intermittent WUS of approximately 120.5 linear feet that flows north into WUS022. WUS023 is comprised of two branches, **WUS023B** is the smaller of the two intermittent channels and is approximately 49.6 linear feet and flows north into WUS023A. WUS023 is fed by seeps and has an OHWM that is characterized by a clear, natural line impressed on the bank, changes in soil characteristics, matted down vegetation, disturbed leaf litter, water staining and the presence of litter and debris. WUS023 has a substrate that consists of cobble, gravel, silt, vegetation and bedrock.

WUS024 is an ephemeral waterway of approximately 420.9 linear feet that flows northwest over the Highway and into the N. Fork Kentucky River. WUS024 is fed by precipitation and overland flow and has an OHWM that is characterized by a clear, natural line impressed on the bank, changes in soil characteristics, matted down vegetation, disturbed leaf litter, water staining and the presence of litter and debris. WUS024 has a substrate that consists of cobble, gravel, silt and vegetation.

WUS100 is an intermittent WUS of approximately 1,003 linear feet that flows northeast into named tributary King's Creek. WUS100 is fed by stormwater and has stable banks and a OHWM that is characterized by matted down vegetation, disturbed leaf litter, water staining and the presence of litter and debris. WUS100 has a substrate that consists of cobble and gravel.

WUS101A is an intermittent WUS of approximately 865.9 linear feet with another small intermittent branch, **WUS101B**, of approximately 117.5 linear feet. WUS101 flows northeast and is fed by stormwater and groundwater. WUS101 has an OHWM that is characterized by matted down vegetation, disturbed leaf litter, and scour. WUS101 drains into a culvert beneath State Highway 160 and eventually

flows into the N. Fork Kentucky River. WUS101A and WUS101B have a substrate that consists of cobble, gravel and vegetation.

WUS102 is a perennial WUS of approximately 1,893.9 linear feet that flows north into King's Creek. WUS102 is fed by adjacent wetlands, stormwater and groundwater. WUS102A and WUS102B connect into WUS102 after draining into WET100. WUS102A and WUS102B are ephemeral channels fed by stormwater. WUS102B appears to become intermittent when draining WET100. WUS102 has an OHWM that is characterized by matted down vegetation, disturbed leaf litter and sediment deposition. WUS102, WUS102A and WUS102B have a substrate that consists of cobble, gravel and sand.

WUS103 is an intermittent WUS of approximately 1,033.4 linear feet that flows northwest into WUS004. **WUS103A** is a small intermittent watercourse of approximately 99.7 linear feet that flows into WUS103 and drains WET105. WUS103 is fed by groundwater and stormwater and has an OHWM that is characterized by matted down vegetation and disturbed leaf litter. WUS103 and WUS103A have a substrate that consists of cobble, gravel and sand.

Table 5 lists each non-tidal wetland identified within the Study Area during the field investigations along with Cowardin classification, Hydrogeomorphic (HGM) code, area and location. For detailed wetland delineation mapping see Appendix F.

TABLE 5: WETLANDS IDENTIFIED WITHIN THE JURISDICTIONAL DETERMINATION AREA

Aquatic Resource	Cowardin Classification	HGM Code	Area (Square Feet)	Area (Acres)	Location (Latitude/Longitude)
WET001	PEM1A	Depressional	238.6	0.005	37.104/-82.952
WET003	PEM1A	Slope	538.7	0.012	37.107/-82.956
WET004	PEM1A	Slope	254.0	0.006	37.108/-82.957
WET005	PEM1A	Slope	4,805.3	0.110	37.109/-82.959
WET006	POW1H	Depressional	127.1	0.003	37.100/-82.954
WET007	PFO1A	Depressional	4,051.1	0.093	37.099/-82.956
WET008	PFO1A	Depressional	511.6	0.012	37.099/-82.957
WET009	PEM1A	Depressional	353.2	0.008	37.097/-82.956
WET010	PFO1A	Depressional	18,502.8	0.425	37.096/-82.959
WET011	PEM1A	Depressional	1,076.0	0.025	37.099/-82.958
WET012	PEM1A	Slope	9,383.7	0.215	37.098/-82.959
WET013	PEM1A	Depressional	2,247.0	0.052	37.098/-82.959
WET020	PEM1A	Depressional	2,096.0	0.048	37.101/-82.953
WET021	PEM1A	Slope	2,027.6	0.047	37.100/-82.953
WET022	PEM1A	Depressional	316.6	0.007	37.100/-82.954
WET023	PEM1A	Depressional	4,807.2	0.110	37.099/-82.951
WET024	PEM1A	Depressional	410.0	0.009	37.099/-82.950
WET025	PEM1A	Depressional	2,959.4	0.068	37.099/-82.951

Aquatic Resource	Cowardin Classification	HGM Code	Area (Square Feet)	Area (Acres)	Location (Latitude/Longitude)
WET026	PEM1A	Depressional	1,909.9	0.044	37.100/-82.951
WET027	PEM1A	Depressional	8,076.8	0.185	37.100/-82.952
WET028	PEM1A	Depressional	1,565.0	0.036	37.100/-82.951
WET029	PEM1A	Depressional	3,206.7	0.074	37.100/-82.952
WET030	PEM1A	Depressional	975.7	0.022	37.104/-82.952
WET031	PEM1A	Depressional	334.9	0.008	37.102/-82.953
WET032	PFO1A	Depressional	798.5	0.018	37.103/-82.960
WET033	PFO1A	Depressional	688.0	0.016	37.113/-82.955
WET034	PFO1A	Depressional	826.3	0.019	37.110/-82.957
WET100	POW1H	Depressional	22,034.4	0.506	37.103/-82.947
WET101	PEM1A	Depressional	950.3	0.022	37.101/-82.947
WET102	PEM1A	Depressional	4,753.3	0.109	37.101/-82.947
WET103	PEM1A	Depressional	34,778.6	0.798	37.103/-82.958
WET104	PEM1A	Slope	3,311.3	0.076	37.104/-82.959
WET105	PEM1A	Depressional	667.0	0.015	37.105/-82.959

Cowardin Classifications:

PEM1A: Palustrine, Emergent, Persistent, Temporarily Flooded

POW1H: Palustrine, Open Water, Cobble-Gravel, Permanently Flooded

PFO1A: Palustrine, Forested, Broad-Leaved Deciduous, Temporarily Flooded

WET001 is classified as a palustrine emergent (PEM) wetland of approximately 238.6 square feet (0.005 acres) in size. WET001 is situated in the center of the Study Area in a depressional area near the highest elevation. WET001 receives hydrology from groundwater, precipitation and overland flow. WET001 is characterized hydrologically by the presence of oxidized rhizospheres on living roots, visible inundation on aerial imagery and the Facultative-Neutral (FAC-Neutral) test. Dominant hydrophytic vegetation includes straw-colored flatsedge (*Cyperus strigosus*) and shortleaf spikesedge (*Kyllinga brevifolia*). Vegetation was disturbed during the time of the field investigation due to mowing. The soil is hydric and meets the indicator of a depleted matrix.

WET003 is classified as a PEM wetland of approximately 538.7 square feet (0.12 acres) in size. WET003 is situated on a terrace on a steep slope and receives hydrology from groundwater, precipitation, and overland flow. WUS003 is an intermittent WUS that flows right through WET003, dispersing flow into the wetland adding to its hydrology. WET003 is characterized hydrologically by the presence of surface water, a high water table, saturation, water-stained leaves, a sparsely vegetated concave surface and moss trim lines. Dominant hydrophytic vegetation includes spotted jewelweed (*Impatiens capensis*) and panicled bulrush (*Scirpus microcarpus*). The soil is hydric and meets the indicator of a thick dark surface.

WET004 is classified as a PEM wetland of approximately 254 square feet (0.006 acres) in size. WET004 is situated on a terrace on a steep slope and receives hydrology from groundwater, precipitation, and overland flow. WET004 is drained by mapped drainage ditch, D001. WET004 is characterized hydrologically by the presence of surface water, a high water table, saturation, water-stained leaves, a

sparsely vegetated concave surface and moss trim lines. Dominant hydrophytic vegetation includes spotted jewelweed (*Impatiens capensis*) and Canadian clearweed (*Pilea pumila*). The soil is hydric and meets the indicator of a thick dark surface.

WET005 is classified as a PEM wetland of approximately 4,805.3 square feet (0.11 acres) in size. WET005 is situated on a hillslope adjacent to the confluence of WUS002 and WUS004. WET005 receives its hydrology from groundwater, precipitation and overland flow and is characterized hydrologically by the presence of surface water, high water table, and saturation. Dominant hydrophytic vegetation includes spotted jewelweed (*Impatiens capensis*) and yellow jewelweed (*Impatiens pallida*). The soil is hydric and meets the indicator of a depleted matrix.

WET006 is classified as a palustrine open-water (POW) wetland of approximately 127.1 square feet (0.003 acres) in size. WET006 is situated along a ridge with 7 inches of standing water above the surface with wetland fringe plants dispersed throughout. WET006 receives its hydrology from groundwater, precipitation and overland flow and is characterized hydrologically by the presence of surface water and a hydrogen sulfide odor. Dominant hydrophytic vegetation includes soft rush (*Juncus effusus*) and common beggarticks (*Bidens frondosa*). The soil is hydric and meets the indicator of a loamy gleyed matrix.

WET007 is classified as a palustrine forested (PFO) wetland of approximately 4,051.1 square feet (0.093 acres) in size. WET007 is situated on a hillslope in a depressional area adjacent to the confluence of WUS005 and WUS008. WUS007 and WUS005 flow through portions of this PFO wetland and contribute to its hydrology. WET007 also receives its hydrology from groundwater, precipitation and overland flow and is characterized hydrologically by surface water, drainage patterns, moss trim lines and its geomorphic position. Dominant hydrophytic vegetation includes green ash *(Fraxinus pennsylvatica*) and Northern spice bush (*Lindera benzoin*). The soil is hydric and meets the indicator of a depleted dark surface.

WET008 is classified as a PFO wetland of approximately 511.6 square feet (0.012 acres) in size. WET008 is situated on a terrace adjacent to WUS012. WET008 receives its hydrology from groundwater, precipitation and overland flow. WET008 is characterized hydrologically by surface water, water-stained leaves, a sparsely vegetated concave surface, stressed plants, geomorphic position and the FAC-Neutral test. Dominant hydrophytic vegetation includes American sycamore (*Platanus occidentalis*) and green ash (*Fraxinus pennsylvatica*). The soil is hydric and meets the indicator of a depleted matrix.

WET009 is classified as a PEM wetland of approximately 353.2 square feet (0.008 acres) in size. WET009 is situated on a hillslope and terrace and receives its hydrology from groundwater, precipitation and overland flow. WET009 is characterized hydrologically by the presence of surface water and drainage patterns. Dominant hydrophytic vegetation includes Canadian clearweed (*Pilea pumila*) and tall flatsedge (*Cyperus eragrostis*). The soil is hydric and meets the indicator of a depleted matrix.

WET010 is classified as a PEM wetland of approximately 18,502.8 square feet (0.425 acres) in size. WET010 is situated on a terrace toward the top of a very steep mountainous slope. WET010 receives its hydrology from groundwater, precipitation and overland flow and is the primary source of flow generation for WUS014, WUS015 and WUS016. WET009 is characterized hydrologically by surface water, a high water table, saturation, water-stained leaves, sparsely vegetated concaves surfaces, drainage patterns, moss trim lines, crayfish burrows, stunted or stressed plants, geomorphic position and the FAC-Neutral test. Dominant hydrophytic vegetation includes American sycamore (*Platanus occidentalis*) and river birch (*Betulla nigra*). The soil is hydric and meets the indicator of a depleted matrix.

WET011 is classified as a PEM wetland of approximately 1076 square feet (0.025 acres) in size. WET011 is situated in the floodplain of WUS005 in a flat area. WET011 receives its hydrology from WUS005, groundwater, precipitation and overland flow. WET011 is characterized hydrologically by surface water, a high water table, saturation, water-stained leaves, drainage patterns, crayfish burrows, stunted or stressed plants, geomorphic position, and the FAC-Neutral test. Dominant hydrophytic vegetation includes spotted jewelweed (*Impatiens capensis*) and American sycamore (*Platanus occidentalis*). The soil is hydric and meets the indicator of a depleted matrix.

WET012 is classified as a PEM wetland of approximately 9,383.7 square feet (0.215 acres) in size. WET012 is situated in the floodplain of WUS005 in a flat area. WET012 receives its hydrology from WUS005, groundwater, precipitation and overland flow. WET012 is characterized hydrologically by surface water, a high water table, saturation, water-stained leaves, drainage patterns, crayfish burrows, stunted or stressed plants, geomorphic position, and the FAC-Neutral test. Dominant hydrophytic vegetation includes spotted jewelweed (*Impatiens capensis*) and American sycamore (Platanus occidentalis). The soil is hydric and meets the indicator of a depleted matrix.

WET013 is classified as a PEM wetland of approximately 2,247 square feet (0.052 acres) in size. WET012 is situated in the floodplain of WUS005 in a flat area. WET013 receives its hydrology from WUS005, groundwater, precipitation and overland flow. WET013 is characterized hydrologically by surface water, a high water table, saturation, water-stained leaves, drainage patterns, crayfish burrows, stunted or stressed plants, geomorphic position, and the FAC-Neutral test. Dominant hydrophytic vegetation includes spotted jewelweed (*Impatiens capensis*) and American sycamore (Platanus occidentalis). The soil is hydric and meets the indicator of a depleted matrix.

WET020 is classified as a PEM wetland of approximately 2,096 square feet (0.048 acres) in size. WET020 is situated in a plateau in the center of the Study Area and receives its hydrology from groundwater, precipitation and overland flow. WET020 contains soil that is significantly disturbed due to historical mining practices on this land. WET020 is characterized hydrologically by drainage patterns, visible saturation on aerial imagery and the FAC-Neutral test. Dominant hydrophytic vegetation includes soft

rush (*Juncus effusus*), straw-colored flatsedge (*Cyperus strigosus*) and marsh bristlegrass (*Setaria parviflora*). The soil is hydric and meets the indicator of a depleted matrix.

WET021 is classified as a PEM wetland of approximately 2,027.6 square feet (0.047 acres) in size. WET021 is situated in a plateau in the center of the Study Area and receives its hydrology from groundwater, precipitation and overland flow. WET021 contains soil that is significantly disturbed due to historical mining practices on this land. WET021 is characterized hydrologically by the presence of oxidized rhizospheres on living roots, visible saturation on aerial imagery and the FAC-Neutral test. Dominant hydrophytic vegetation includes American elm (Ulmus americana) and marshpepper knotweed (*Persicaria hydropiper*). The soil is hydric and meets the indicator of a depleted matrix.

WET022 is classified as a PEM wetland of approximately 316.6 square feet (0.007 acres) in size. WET022 is situated in a plateau in the center of the Study Area and receives its hydrology from groundwater, precipitation and overland flow. WET022 contains soil that is significantly disturbed due to historical mining practices on this land. WET022 is characterized hydrologically by drainage patterns, visible saturation on aerial imagery and the FAC-Neutral test. Dominant hydrophytic vegetation includes soft rush (*Juncus effusus*), straw-colored flatsedge (*Cyperus strigosus*) and marsh bristlegrass (*Setaria parviflora*). The soil is hydric and meets the indicator of a depleted matrix.

WET023 is classified as a PEM wetland of approximately 4,807.2 square feet (0.11 acres) in size. WET023 is situated in a plateau in the center of the Study Area and receives its hydrology from groundwater, precipitation and overland flow. WET023 contains soil that is significantly disturbed due to historical mining practices on this land. WET023 is characterized hydrologically by drainage patterns, visible saturation on aerial imagery and the FAC-Neutral test. Dominant hydrophytic vegetation includes soft rush (*Juncus effusus*), straw-colored flatsedge (*Cyperus strigosus*) and marsh bristlegrass (*Setaria parviflora*). The soil is hydric and meets the indicator of a depleted matrix.

WET024 is classified as a PEM wetland of approximately 410 square feet (0.009 acres) in size. WET024 is situated in a plateau in the center of the Study Area and receives its hydrology from groundwater, precipitation and overland flow. WET024 contains soil that is significantly disturbed due to historical mining practices on this land. WET024 is characterized hydrologically by drainage patterns, visible saturation on aerial imagery and the FAC-Neutral test. Dominant hydrophytic vegetation includes soft rush (*Juncus effusus*), straw-colored flatsedge (*Cyperus strigosus*) and marsh bristlegrass (*Setaria parviflora*). The soil is hydric and meets the indicator of a depleted matrix.

WET025 is classified as a PEM wetland of approximately 2,959.4 square feet (0.068 acres) in size. WET025 is situated in a plateau in the center of the Study Area and receives its hydrology from groundwater, precipitation and overland flow. WET025 contains soil that is significantly disturbed due to historical mining practices on this land. WET025 is characterized hydrologically by drainage patterns, visible saturation on aerial imagery and the FAC-Neutral test. Dominant hydrophytic vegetation includes

soft rush (*Juncus effusus*), straw-colored flatsedge (*Cyperus strigosus*) and marsh bristlegrass (*Setaria parviflora*). The soil is hydric and meets the indicator of a depleted matrix.

WET026 is classified as a PEM wetland of approximately 1,909.9 square feet (0.044 acres) in size. WET026 is situated in a plateau in the center of the Study Area and receives its hydrology from groundwater, precipitation and overland flow. WET026 contains soil that is significantly disturbed due to historical mining practices on this land. WET026 is characterized hydrologically by drainage patterns, visible saturation on aerial imagery and the FAC-Neutral test. Dominant hydrophytic vegetation includes soft rush (*Juncus effusus*), straw-colored flatsedge (*Cyperus strigosus*) and marsh bristlegrass (*Setaria parviflora*). The soil is hydric and meets the indicator of a depleted matrix.

WET027 is classified as a PEM wetland of approximately 8,076.8 square feet (0.185 acres) in size. WET027 is situated in a plateau in the center of the Study Area and receives its hydrology from groundwater, precipitation and overland flow. WET027 contains soil that is significantly disturbed due to historical mining practices on this land. WET027 is characterized hydrologically by drainage patterns, visible saturation on aerial imagery and the FAC-Neutral test. Dominant hydrophytic vegetation includes soft rush (*Juncus effusus*), straw-colored flatsedge (*Cyperus strigosus*) and marsh bristlegrass (*Setaria parviflora*). The soil is hydric and meets the indicator of a depleted matrix.

WET028 is classified as a PEM wetland of approximately 1,565 square feet (0.036 acres) in size. WET028 is situated in a plateau in the center of the Study Area and receives its hydrology from groundwater, precipitation and overland flow. WET028 contains soil that is significantly disturbed due to historical mining practices on this land. WET028 is characterized hydrologically by drainage patterns, visible saturation on aerial imagery and the FAC-Neutral test. Dominant hydrophytic vegetation includes soft rush (*Juncus effusus*), straw-colored flatsedge (*Cyperus strigosus*) and marsh bristlegrass (*Setaria parviflora*). The soil is hydric and meets the indicator of a depleted matrix.

WET029 is classified as a PEM wetland of approximately 3,206.7 square feet (0.074 acres) in size. WET029 is situated in a plateau in the center of the Study Area and receives its hydrology from groundwater, precipitation and overland flow. WET029 contains soil that is significantly disturbed due to historical mining practices on this land. WET029 is characterized hydrologically by drainage patterns, visible saturation on aerial imagery and the FAC-Neutral test. Dominant hydrophytic vegetation includes soft rush (*Juncus effusus*), straw-colored flatsedge (*Cyperus strigosus*) and marsh bristlegrass (*Setaria parviflora*). The soil is hydric and meets the indicator of a depleted matrix.

WET030 is classified as a PEM wetland of approximately 975.7 square feet (0.022 acres) in size. WET030 is situated on a terrace in the center of the Study Area and receives its hydrology from groundwater, precipitation and overland flow. WET030 contains vegetation that is significantly disturbed due to mowing. WET030 is characterized hydrologically by oxidized rhizospheres on living roots, saturation visible on aerial imagery and the FAC-Neutral test. Dominant hydrophytic vegetation includes straw-

colored flatsedge (*Cyperus strigosus*) and shortleaf spikesedge (*Kyllinga brevifolia*). The soil is hydric and meets the indicator of a depleted matrix.

WET031 is classified as a PEM wetland of approximately 334.9 square feet (0.008 acres) in size. WET031 is situated on a terrace in the center of the Study Area and receives its hydrology from groundwater, precipitation and overland flow. WET031 contains vegetation that is significantly disturbed due to mowing. WET031 is characterized hydrologically by oxidized rhizospheres on living roots, saturation visible on aerial imagery and the FAC-Neutral test. Dominant hydrophytic vegetation includes water pepper (*Persicaria hydropiper*) and toad rush (*Juncus bufonius*). The soil is hydric and meets the indicator of a depleted matrix.

WET032 is classified as a PEM wetland of approximately 798.5 square feet (0.018 acres) in size. WET032 is situated on a terrace adjacent to WUS022 and WUS023. WET032 receives its hydrology from groundwater, precipitation and overland flow. WET032 is classified as a mountainside wetland seep and is characterized hydrologically by surface water, a high water table and saturation. Dominant hydrophytic vegetation includes slippery elm (*Ulmus rubra*) and Northern spicebush (*Lindera benzoin*). The soil is hydric and meets the indicator of a depleted matrix.

WET033 is classified as a PEM wetland of approximately 688 square feet (0.016 acres) in size. WET033 is situated in a depressional area in the northern most part of the Study Area. WET033 receives it hydrology from groundwater and precipitation and is characterized hydrologically by a sparsely vegetated concave surface, moss trim lines, geomorphic position and the FAC-Neutral test. Dominant hydrophytic vegetation includes American sycamore (*Platanus occidentalis*) and Canadian clearweed (*Pilea pumila*). The soil is hydric and meets the indicator of a depleted matrix.

WET034 is classified as a PEM wetland of approximately 826.3 square feet (0.019 acres) in size. WET034 is situated on a terrace and receives its hydrology from groundwater, precipitation and overland flow. WET034 is classified as a mountainside wetland seep and is characterized hydrologically by surface water, a high water table and saturation. Dominant hydrophytic vegetation includes slippery elm (*Ulmus rubra*) and soft rush (*Juncus effusus*). The soil is hydric and meets the indicator of a depleted matrix.

WET100 is classified as a POW wetland of approximately 22,034.4 square feet (0.506 acres) in size. WET100 is a freshwater pond situated in a depressional area that receives flow from WUS102A and WUS102B and drains into WUS102. WET100 receives its hydrology from groundwater, precipitation and overland flow. WET100 is characterized hydrologically by a high water table, saturation and geomorphic position. Dominant hydrophytic vegetation includes boxelder maple (*Acer negundo*) and Northern spicebush (*Lindera benzoin*). The soil is hydric and meets the indicator of dark surface.

WET101 is classified as a PEM wetland of approximately 950.3 square feet (0.022 acres) in size. WET101 is situated on a terrace along a steep slope and receives most of its hydrology from overland flow and

precipitation. WET101 is characterized hydrologically by saturation and geomorphic position. Dominant hydrophytic vegetation include tulip poplar (*Liriodendron tulipifera*) and spotted jewelweed (*Imaptiens capensis*). The soil is hydric and meets the indicator of depleted matrix.

WET102 is classified as a PEM wetland of approximately 4,753.3 square feet (0.109 acres) in size. WET102 is situated adjacent to WUS102 and sits within the valley of the mapped WUS. WET102 receives its hydrology from WUS102, groundwater, precipitation and overland flow. WET102 is characterized hydrologically by saturation and geomorphic position. Dominant hydrophytic vegetation include American sycamore (*Platanus occidentalis*) and green bulrush (*Sirpus atrvirens*). The soil is hydric and meets the indicator of histosol.

WET103 is classified as a PEM wetland of approximately 34,778.6 square feet (0.798 acres) in size. WET103 receives its hydrology from groundwater, precipitation and overland flow. WET103 is characterized hydrologically by saturation and water-stained leaves. Dominant hydrophytic vegetation include black willow (*Salix nigra*) and narrow-leaf cattail (*Typha angustifolia*). The soil is hydric and meets the indicator of a depleted matrix.

WET104 is classified as a PEM wetland of approximately 3,311.3 square feet (0.798 acres) in size. WET104 receives its hydrology from groundwater, precipitation and overland flow and is characterized hydrologically by saturation and geomorphic position. Dominant hydrophytic vegetation include American sycamore *(Platanus occidentalis*) and common beggarticks (*Bidens frondosa*). The soil is hydric and meets the indictor of a depleted matrix.

WET105 is classified as a PEM wetland of approximately 667 square feet (0.015 acres) in size. WET105 is situated on a sloped terrace and drains into intermittent waterway WUS103A. WET105 receives its hydrology through groundwater, precipitation and overland flow. WET105 is characterized hydrologically by saturation and geomorphic position. Dominant hydrophytic vegetation include spotted jewelweed (*Imaptiens capensis*) and common beggarticks (*Bidens frondose*). The soil is hydric and meets the indicator of a depleted matrix.

4.6 THREATENED AND ENDANGERED SPECIES

The USFWS IPaC system was accessed to assess the potential presence of species under the jurisdiction of the USFWS within the Study Area. According to the IPaC, five species listed under the Endangered Species Act may occur in the area: the federally listed as endangered northern long-eared bat (*Myotis septentrionalis*); the federally listed as endangered gray bat (*Myotis grisescens*); the federally listed as endangered Indiana bat (*Myotis sodalis*); the federally listed as threatened Kentucky arrow darter (*Etheostoma spilotum*); and the federally listed as a candidate species monarch butterfly (Danaus plexippus) (USFWS, 2023a). There is no USFWS designated critical habitat for these or any other listed species within the Study Area. The USFWS federally threatened and endangered species list and correspondence can be found in Appendix D. None of these species were observed during field investigations, although species-specific surveys were not conducted.

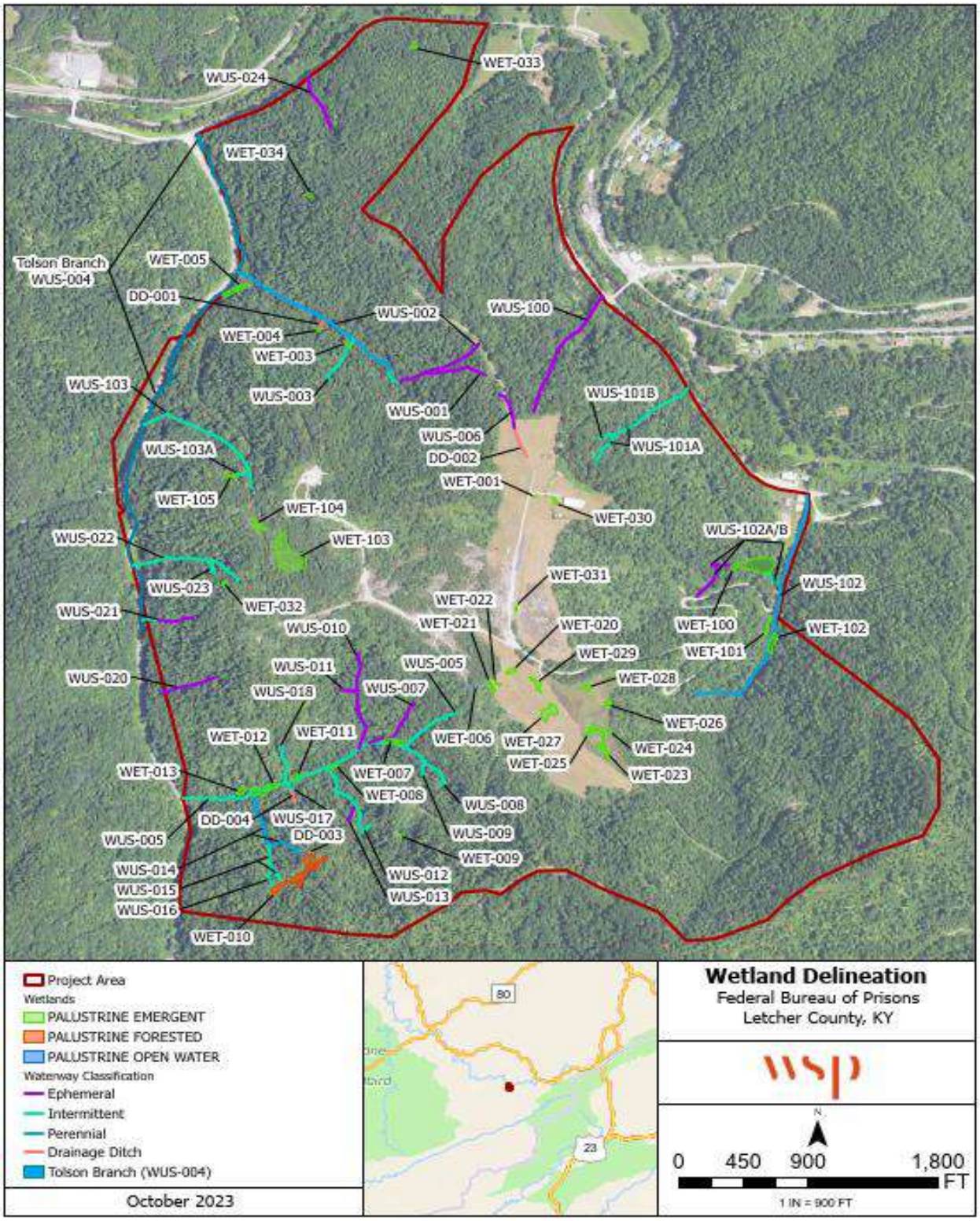

EXHIBIT 5: WETLAND DELINEATION MAP

5.0 CONCLUSION

Based on the desktop analysis and field determination, regulated wetlands and waters of the United States are present within the Study Area. Approximately 2.73 acres (118,362 square feet) of palustrine wetland under federal jurisdiction were identified within the Study Area boundary along with approximately 25,338 linear feet of stream under federal jurisdiction. According to the Sackett v. Environmental Protection Agency (EPA) Supreme Court decision, a final ruling was determined on September 8th, 2023 that ephemeral waterways are to be regarded as non-jurisdictional waterways. Therefore, approximately 6,198 linear feet of ephemeral stream were identified within the Study Area that may not be subject to federal regulatory jurisdiction. The delineated wetlands are dominated by hydrophytic vegetation and contain hydric soils and/or presence of wetland hydrology and are subject to a Jurisdictional Determination by the Corps. This wetland delineation report and preliminary jurisdictional determination request is hereby submitted to the Corps for concurrence and approval of jurisdictional limits under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act.

6.0 REFERENCES

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APPENDIX

A REQUEST FOR CORPS JURISDICTIONAL DETERMINATION

Appendix A - REQUEST FOR CORPS JURISDICTIONAL DETERMINATION (JD)

To: U.S. Army Corps of Engineers, Nashville District, Regulatory Division

- I am requesting a JD on property located at: 6830 KY-160, Roxana, Kentucky 41804
  (Street Address)
  City/Township/Parish: Roxana County: Letcher State: Kentucky
  Acreage of Parcel/Review Area for JD: 545 acres
  Section: 0 Township: 0 Range: RO
  Latitude (decimal degrees): 37.1033251°N Longitude (decimal degrees): 82.9541923°W
  (For linear projects, please include the center point of the proposed alignment.)

- Please attach a survey/plat map and vicinity map identifying location and review area for the JD.
  ☐ I currently own this property. ☐ I plan to purchase this property.
  ☑ I am an agent/consultant acting on behalf of the requestor.
  ☐ Other (please explain): _____

- Reason for request: (check as many as applicable)
  ☐ I intend to construct/develop a project or perform activities on this parcel which would be designed to avoid all aquatic resources.
  ☐ I intend to construct/develop a project or perform activities on this parcel which would be designed to avoid all jurisdictional aquatic resources under Corps authority.
  ☑ I intend to construct/develop a project or perform activities on this parcel which may require authorization from the Corps, and the JD would be used to avoid and minimize impacts to jurisdictional aquatic resources and as an initial step in a future permitting process.
  ☐ I intend to construct/develop a project or perform activities on this parcel which may require authorization from the Corps; this request is accompanied by my permit application and the JD is to be used in the permitting process.
  ☐ I intend to construct/develop a project or perform activities in a navigable water of the U.S. which is included on the district Section 10 list and/or is subject to the ebb and flow of the tide.
  ☐ A Corps JD is required in order to obtain my local/state authorization.
  ☐ I intend to contest jurisdiction over a particular aquatic resource and request the Corps confirm that jurisdiction does/does not exist over the aquatic resource on the parcel.
  ☐ I believe that the site may be comprised entirely of dry land.
  ☐ Other:): _____

- Type of determination being requested:
  ☐ I am requesting an approved JD.
  ☑ I am requesting a preliminary JD.
  ☐ I am requesting a "no permit required" letter as I believe my proposed activity is not regulated.
  ☐ I am unclear as to which JD I would like to request and require additional information to inform my decision.

By signing below, you are indicating that you have the authority, or are acting as the duly authorized agent of a person or entity with such authority, to and do hereby grant Corps personnel right of entry to legally access the site if needed to perform the JD. Your signature shall be an affirmation that you possess the requisite property rights to request a JD on the subject property.

*Signature: _____ Date: _____

- Typed or printed name: Craig Hanlon

  Company name: WSP USA

  Address: _____

  _____

  Daytime phone no.: _____

  Email address: Craig.Hanlon@wsp.com

***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 Program of the U.S. Army Corps of Engineers; Final Rule for 33 CFR Parts 320-332.
Principal Purpose: The information that you provide will be used in evaluating your request to determine whether there are any aquatic resources within the project area subject to federal jurisdiction under the regulatory authorities referenced above.
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. Your name and property location where federal jurisdiction is to be determined will be included in the approved jurisdictional determination (AJD), which will be made available to the public on the District's website and on the Headquarters USAGE website.
Disclosure: Submission of requested information is voluntary; however, if information is not provided, the request for an AJD cannot be evaluated nor can an AJD be issued.

APPENDIX

B CORPS APPROVED JURISDICTIONAL DETERMINATION FORM

Appendix 2 - PRELIMINARY JURISDICTIONAL DETERMINATION (PJD) FORM

BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR PJD:

B. NAME AND ADDRESS OF PERSON REQUESTING PJD:

Craig Hanlon, 412 Mt Kemble Ave, Morristown NJ 07960

C. DISTRICT OFFICE, FILE NAME, AND NUMBER:

D. PROJECT LOCATION(S) AND BACKGROUND INFORMATION:

(USE THE TABLE BELOW TO DOCUMENT MULTIPLE AQUATIC RESOURCES AND/OR AQUATIC RESOURCES AT DIFFERENT SITES)

State: Kentucky County/parish/borough: Letcher City: Roxana

Center coordinates of site (lat/long in degree decimal format): 82.9531367°W 37.1023893°N

Lat.: xx.xxx° Long.: yy.yyy° 82.9541923°W 37.1033251°N

Universal Transverse Mercator:

Name of nearest waterbody: North Fork Kentucky River

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

[X] Office (Desk) Determination. Date: September 1- Speptember 10

[X] Field Determination. Date(s): September 11th - October 13

TABLE OF AQUATIC RESOURCES IN REVIEW AREA WHICH "MAY BE" SUBJECT TO REGULATORY JURISDICTION.

Site number	Latitude (decimal degrees)	Longitude (decimal degrees)	Estimated amount of aquatic resource in review area (acreage and linear feet, if applicable)	Type of aquatic resource (i.e., wetland vs. non-wetland waters)	Geographic authority to which the aquatic resource "may be" subject (i.e., Section 404 or Section 10/404)

1) The Corps of Engineers believes that there may be jurisdictional aquatic resources in the review area, and the requestor of this PJD is hereby advised of his or her option to request and obtain an approved JD (AJD) for that review area based on an informed decision after having discussed the various types of JDs and their characteristics and circumstances when they may be appropriate.
2) In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "pre-construction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an AJD for the activity, the permit applicant is hereby made aware that: (1) the permit applicant has elected to seek a permit authorization based on a PJD, which does not make an official determination of jurisdictional aquatic resources; (2) the applicant has the option to request an AJD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an AJD could possibly result in less compensatory mitigation being required or different special conditions; (3) the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) undertaking any activity in reliance upon the subject permit authorization without requesting an AJD constitutes the applicant's acceptance of the use of the PJD; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a PJD constitutes agreement that all aquatic resources in the review area affected in any way by that activity will be treated as jurisdictional, and waives any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an AJD or a PJD, the JD will be processed as soon as practicable. Further, an AJD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331. If, during an administrative appeal, it becomes appropriate to make an official determination whether geographic jurisdiction exists over aquatic resources in the review area, or to provide an official delineation of jurisdictional aquatic resources in the review area, the Corps will provide an AJD to accomplish that result, as soon as is practicable. This PJD finds that there *"may be"* waters of the U.S. and/or that there *"may be"* navigable waters of the U.S. on the subject review area, and identifies all aquatic features in the review area that could be affected by the proposed activity, based on the following information:

SUPPORTING DATA. Data reviewed for PJD (check all that apply)

Checked items should be included in subject file. Appropriately reference sources below where indicated for all checked items:

[X] Maps, plans, plots or plat submitted by or on behalf of the PJD requestor:
Map: See References.

[X] Data sheets prepared/submitted by or on behalf of the PJD requestor.
[ ] Office concurs with data sheets/delineation report.
[ ] Office does not concur with data sheets/delineation report. Rationale: _____.

[X] Data sheets prepared by the Corps: See References

[ ] Corps navigable waters' study: _____.

[ ] U.S. Geological Survey Hydrologic Atlas: _____.
[ ] USGS NHD data.
[ ] USGS 8 and 12 digit HUC maps.

[ ] U.S. Geological Survey map(s). Cite scale & quad name: _____.

[X] Natural Resources Conservation Service Soil Survey. Citation: See References

[X] National wetlands inventory map(s). Cite name: See References

[ ] State/local wetland inventory map(s): _____.

[ ] FEMA/FIRM maps: _____.

[ ] 100-year Floodplain Elevation is: ____. (National Geodetic Vertical Datum of 1929)

[X] Photographs: [ ] Aerial (Name & Date): _____.
or [ ] Other (Name & Date): _____.

[ ] Previous determination(s). File no. and date of response letter: _____.

[ ] Other information (please specify): _____.

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

_____	_____
Signature and date of Regulatory staff member completing PJD	Signature and date of person requesting PJD (REQUIRED, unless obtaining the signature is impracticable)[1]

[1] Districts may establish timeframes for requestor to return signed PJD forms. If the requestor does not respond within the established time frame, the district may presume concurrence and no additional follow up is necessary prior to finalizing an action.

APPENDIX

C PHOTO LOG

Federal Bureau of Prisons, Letcher County, Kentucky

Wetland Delineation Photo Log

October 2023

WETLANDS

WET001, Overview

WET001, Soil Pit

WET003, Overview

WET003, Soil Pit

WET004, Overview

WET004, Soil Pit

WET005, Overview

WET005, Soil Pit

WET006, Overview

WET006, Soil Pit

WET007, Overview

WET007, Soil Pit

WET008, Overview

WET008, Soils Pit

WET-009, Overview

WET-009, Soil Pit

WET010, Overview

WET010, Soil Pit

WET011, Overview

WET012, Overview

WET013, Overview

WET013, Soils Pit

WET100, Overview

WET100, Soil Pit

WET101, Overview

WET101, Overview

WET102, Overview

WET102, Soil Pit

WET103, Overview

WET103, Soil Pit

WET104, Overview

WET105, Overview

WET105, Overview

WET021, Overview

WET021, Soil Pit

WET022, Overview

WET023, Overview

WET023, Soils Pit

WET024, Overview

WET025, Overview

WET026, Overview

WET027, Overview

WET028, Overview

WET029, Overview

WET030, Overview

WET031, Overview

WET032, Overview

WET032, Soils Pit

WET033, Overview

WET033, Soils Pit

WET034, Overview

UPLANDS

UPL002, Overview

UPL002, Soil Pit

UPL003, Overview

UPL003, Soil Pit

UPL007, Overview

UPL007, Soil Pit

UPL008, Overview

UPL008, Soil Pit

UPL009, Overview

UPL009, Soil Pit

UPL010, Overview

UPL010, Soil Pit

UPL021, Overview

UPL021,Overview

WATERWAYS

WUS001, Upstream

WUS001, Downstream

WUS002 (Ephemeral), Upstream

WUS002 (Ephemeral), Downstream

WUS002 (Intermittent), Upstream

WUS002 (Intermittent), Downstream

WUS002 (Perennial), Downstream

WUS002 (Perennial), Upstream

WUS003, Upstream

WUS003, Downstream

WUS004, Upstream

WUS004, Downstream

WUS005, Upstream

WUS005, Downstream

WUS006, Upstream

WUS006, Downstream

WUS007, Upstream

WUS007, Downstream

WUS008, Upstream

WUS008, Downstream

WUS009, Upstream

WUS009, Downstream

WUS010, Upstream

WUS010, Downstream

WUS011, Upstream

WUS011, Downstream

WUS012, Upstream

WUS012, Downstream

WUS013, Upstream

WUS013, Downstream

WUS014, Upstream

WUS014, Downstream

WUS015, Upstream

WUS015, Downstream

WUS016, Upstream

WUS016, Downstream

WUS017, Upstream

WUS017, Downstream

WUS018, Upstream

WUS018, Downstream

WUS100, Upstream

WUS100, Downstream

WUS101, Upstream

WUS101, Downstream

WUS102, Upstream

WUS102, Downstream

WUS103, Upstream

WUS103, Downstream

WUS020, Upstream

WUS020, Downstream

WUS021, Upstream

WUS021, Downstream

WUS022, Upstream

WUS022, Downstream

WUS023, Upstream

WUS023, Downstream

WUS024, Upstream

WUS024, Downstream

DRAINAGE DITCHES

D001, Downstream

D002, Upstream

D002, Downstream

D003, Downstream

D004, Upstream

D004, Downstream

APPENDIX

D USFWS SPECIES LIST

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Kentucky Ecological Services Field Office
J C Watts Federal Building, Room 265
330 West Broadway
Frankfort, KY 40601-8670
Phone: (502) 695-0468 Fax: (502) 695-1024
Email Address: kentuckyes@fws.gov

In Reply Refer To: September 22, 2023
Project Code: 2023-0132243
Project Name: Federal Correction Institute & Federal Prison Camp, Letcher County, Kentucky

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the

human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts, see https://www.fws.gov/program/migratory-bird-permit/what-we-do..

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures, see https://www.fws.gov/library/collections/threats-birds.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/partner/council-conservation-migratory-birds.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of

this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Kentucky Ecological Services Field Office
J C Watts Federal Building, Room 265
330 West Broadway
Frankfort, KY 40601-8670
(502) 695-0468

PROJECT SUMMARY

Project Code: 2023-0132243

Project Name: United States Penitentiary and Federal Prison Camp, Letcher County, Kentucky

Project Type: Government / Municipal (Non-Military) Construction

Project Description: The purpose of the proposed federal correctional facility in Letcher County, Kentucky is to develop additional high-security facilities to increase capacity for current inmate populations in the Mid-Atlantic Region based on an identified need for additional bed space. The Bureau has determined that there is a need for additional high-security facilities within this region to reduce the demonstrated overcrowding that compromises the mission of the Bureau.

Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@37.10529305,-82.95516678976745,14z

Counties: Letcher County, Kentucky

ENDANGERED SPECIES ACT SPECIES

There is a total of 5 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Note that 2 of these species should be considered only under certain conditions.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Gray Bat *Myotis grisescens*	Endangered

No critical habitat has been designated for this species.
This species only needs to be considered under the following conditions:
- The project area includes potential gray bat habitat.

Species profile: https://ecos.fws.gov/ecp/species/6329
General project design guidelines:
https://ipac.ecosphere.fws.gov/project/NVWWZUGV7JBURBHVVGHANBKRCQ/documents/generated/6422.pdf

Indiana Bat *Myotis sodalis*	Endangered

There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
This species only needs to be considered under the following conditions:
- The project area includes known 'swarming 1' habitat.

Species profile: https://ecos.fws.gov/ecp/species/5949
General project design guidelines:
https://ipac.ecosphere.fws.gov/project/NVWWZUGV7JBURBHVVGHANBKRCQ/documents/generated/6422.pdf

Northern Long-eared Bat *Myotis septentrionalis*	Endangered

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/9045
General project design guidelines:
https://ipac.ecosphere.fws.gov/project/NVWWZUGV7JBURBHVVGHANBKRCQ/documents/generated/6422.pdf

FISHES

NAME	STATUS
Kentucky Arrow Darter *Etheostoma spilotum*	Threatened

There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/9063
General project design guidelines:
https://ipac.ecosphere.fws.gov/project/NVWWZUGV7JBURBHVVGHANBKRCQ/documents/generated/5224.pdf

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus*	Candidate

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/9743

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

IPAC USER CONTACT INFORMATION

Agency:	WSP USA inc.
Name:	Ante Rosales
Address:	1 East Pratt Street
Address Line 2:	Suite 300
City:	Baltimore
State:	MD
Zip:	21202
Email	ante.rosales@wsp.com
Phone:	4106223616

APPENDIX

E

WETLAND AND WATERWAY DATA FORMS

Stream Datasheet

Project: BOP Kentucky Date: 09/12/2023 Stream ID: WUS-001

Staff: MD/SH Flow Type: Perennial ☐ Intermittent ☐ Ephemeral ☑

Site ID: _____ Rainfall w/in 48 hrs? Y Current Weather: cloudy/rain

Flow Direction: W Drains into: WUS-002

Fed By: precipitation

Bank Height: 3-3.5 Water Depth: 1" Width: 1.5-2.5'

Channel Gradient (%): 50 Bank Stability: stable

Avg. Bank Slope: Vertical ☑ 2:1 ☐ 3:1 ☐ 4:1 or greater ☐

Mesohabitat: % Run: 100 % Riffle: 0 % Pool: 0

Substrate:

Cobble	☑	Gravel	☑	Sand	☑	Silt	☐
Veg	☐	Riprap	☐	Concrete	☐	Muck	☐

Channel Characteristics: Natural ☑ Artificial ☐ Man-altered ☐

OHWM:

Clear, natural line impressed on the bank	☑	Presence of litter and debris	☑
Changes in character of soil	☐	Destruction of terrestrial veg.	☑
Shelving	☐	Presence of wrack line	☑
Vegetation matted down, bent, or absent	☑	Sediment sorting	☑
Leaf litter disturbed or washed away	☑	Scour	☑
Sediment deposition	☑	Multiple observed/predicted flow events	☑
Water staining	☐	Abrupt change in plant community	☐

Photos? Upstream ☑ Downstream ☑

Connection to Traditional Navigable Waterway:

WUS-001 flows into right fork of Kentucky River

Other Comments: Rain event within the last 30 minutes with flow on and off within the channel

Stream Datasheet

Project: BOP Kentucky Date: 09/12/2023 Stream ID: WUS-002

Staff: MD/SH Flow Type: Perennial ☑ Intermittent ☑ Ephemeral ☑

Site ID: _____ Rainfall w/in 48 hrs? Y Current Weather: cloudy/rain

Flow Direction: NW Drains into: WUS-004

Fed By: precipitation at the start of the channel and then intersects groundwater at the intermittent portion of the watercourse

Bank Height: 3.5' Water Depth: 2-4" Width: 4'

Channel Gradient (%): 45 Bank Stability: fair

Avg. Bank Slope: Vertical ☑ 2:1 ☐ 3:1 ☐ 4:1 or greater ☐

Mesohabitat: % Run: 50 % Riffle: 30 % Pool: 20

Substrate:

Cobble	☑	Gravel	☑	Sand	☑	Silt	☐
Veg	☐	Riprap	☐	Concrete	☐	Muck	☐

Channel Characteristics: Natural ☑ Artificial ☐ Man-altered ☐

OHWM:

Clear, natural line impressed on the bank	☑	Presence of litter and debris	☑
Changes in character of soil	☐	Destruction of terrestrial veg.	☐
Shelving	☑	Presence of wrack line	☑
Vegetation matted down, bent, or absent	☐	Sediment sorting	☑
Leaf litter disturbed or washed away	☑	Scour	☑
Sediment deposition	☑	Multiple observed/predicted flow events	☑
Water staining	☐	Abrupt change in plant community	☐

Photos? Upstream ☑ Downstream ☑

Connection to Traditional Navigable Waterway:

WUS-002 flows into WUS-004

Other Comments: Starts ephemeral and the turns intermittent and then perennial. we have datapoints and photos at each phase change. Towards the bottom of the channel near WUS-004 the channel intersects with bedrock.

Stream Datasheet

Project: BOP Kentucky Date: 09/12/2023 Stream ID: WUS-003

Staff: MD/SH Flow Type: Perennial ☐ Intermittent ☑ Ephemeral ☐

Site ID: _____ Rainfall w/in 48 hrs? Y Current Weather: cloudy/rain

Flow Direction: NE Drains into: WUS-002

Fed By: precipitation and groundwater

Bank Height: 0.5' Water Depth: 2" Width: 3-4'

Channel Gradient (%): 70 Bank Stability: good

Avg. Bank Slope: Vertical ☑ 2:1 ☐ 3:1 ☐ 4:1 or greater ☐

Mesohabitat: % Run: 20 % Riffle: 80 % Pool: 0

Substrate: Cobble ☑ Gravel ☑ Sand ☐ Silt ☐
Veg ☐ Riprap ☐ Concrete ☐ Muck ☐ x Bedrock

Channel Characteristics: Natural ☑ Artificial ☐ Man-altered ☐

OHWM:

Clear, natural line impressed on the bank	☑	Presence of litter and debris	☐
Changes in character of soil	☐	Destruction of terrestrial veg.	☐
Shelving	☐	Presence of wrack line	☐
Vegetation matted down, bent, or absent	☐	Sediment sorting	☑
Leaf litter disturbed or washed away	☐	Scour	☐
Sediment deposition	☐	Multiple observed/predicted flow events	☑
Water staining	☐	Abrupt change in plant community	☐

Photos? Upstream ☑ Downstream ☑

Connection to Traditional Navigable Waterway:
WUS-002 to WUS-004 to southern Fork of Kentucky River

Other Comments: Mountainside type of river.

Stream Datasheet

Project: BOP Kentucky Date: 09/13-09/14/2023 Stream ID: WUS-004

Staff: MD/SH Flow Type: Perennial ☑ Intermittent ☐ Ephemeral ☐

Site ID: _____ Rainfall w/in 48 hrs? Y/N Current Weather: cloudy/rain

Flow Direction: N Drains into: S. Fork of KY River

Fed By: groundwater

Bank Height: 2-3' Water Depth: 6" Width: 3-4'

Channel Gradient (%): 30 Bank Stability: fair

Avg. Bank Slope: Vertical ☐ 2:1 ☑ 3:1 ☐ 4:1 or greater ☐

Mesohabitat: % Run: 60 % Riffle: 20 % Pool: 20

Substrate:

Cobble	☑	Gravel	☑	Sand	☑	Silt	☑
Veg	☐	Riprap	☐	Concrete	☐	Muck	☐

Channel Characteristics: Natural ☑ Artificial ☐ Man-altered ☐

OHWM:

Clear, natural line impressed on the bank	☑	Presence of litter and debris	☐
Changes in character of soil	☐	Destruction of terrestrial veg.	☑
Shelving	☑	Presence of wrack line	☐
Vegetation matted down, bent, or absent	☑	Sediment sorting	☐
Leaf litter disturbed or washed away	☐	Scour	☑
Sediment deposition	☑	Multiple observed/predicted flow events	☑
Water staining	☐	Abrupt change in plant community	☐

Photos? Upstream ☑ Downstream ☑

Connection to Traditional Navigable Waterway:

S.Fork of Kentucky River

Other Comments: Observed multiple days

Stream Datasheet

Project: BOP Kentucky Date: 09/13/2023 Stream ID: WUS-005

Staff: MD/SH Flow Type: Perennial ☐ Intermittent ☑ Ephemeral ☐

Site ID: _____ Rainfall w/in 48 hrs? Y Current Weather: partly cloudy/clear

Flow Direction: W Drains into: WUS-004

Fed By: groundwater and precipitation

Bank Height: 1-13' Water Depth: 3-4" Width: 1-6'

Channel Gradient (%): 20-45 Bank Stability: fair - stable in some areas but eroding in other areas

Avg. Bank Slope: Vertical ☑ 2:1 ☑ 3:1 ☐ 4:1 or greater ☐

Mesohabitat: % Run: 70 % Riffle: 10 % Pool: 20

Substrate: Cobble ☑ Gravel ☑ Sand ☑ Silt ☑ x Bedrock
Veg ☐ Riprap ☐ Concrete ☐ Muck ☐

Channel Characteristics: Natural ☑ Artificial ☐ Man-altered ☐

OHWM:

Clear, natural line impressed on the bank	☑	Presence of litter and debris	☑
Changes in character of soil	☐	Destruction of terrestrial veg.	☐
Shelving	☐	Presence of wrack line	☑
Vegetation matted down, bent, or absent	☐	Sediment sorting	☑
Leaf litter disturbed or washed away	☑	Scour	☑
Sediment deposition	☑	Multiple observed/predicted flow events	☑
Water staining	☐	Abrupt change in plant community	☐

Photos? Upstream ☑ Downstream ☑

Connection to Traditional Navigable Waterway:
S.Fork of Kentucky River

Other Comments: At the bottom of the waterway it is sufficiently headcutting around wetlands 12 and 13

Stream Datasheet

Project: BOP Kentucky Date: 09/13/2023 Stream ID: WUS-006

Staff: MD/SH Flow Type: Perennial ☐ Intermittent ☐ Ephemeral ☑

Site ID: _____ Rainfall w/in 48 hrs? Y Current Weather: partly cloudy

Flow Direction: N to NW Drains into: Unknown. See comments.

Fed By: precipitation

Bank Height: 0.5-2' Water Depth: 0-0.5" Width: 0.5-1.5'

Channel Gradient (%): 20-45 Bank Stability: good

Avg. Bank Slope: Vertical ☐ 2:1 ☑ 3:1 ☑ 4:1 or greater ☐

Mesohabitat: % Run: 90 % Riffle: 10 % Pool: 0

Substrate: Cobble ☑ Gravel ☑ Sand ☑ Silt ☐
Veg ☑ Riprap ☐ Concrete ☐ Muck ☐

Channel Characteristics: Natural ☑ Artificial ☐ Man-altered ☑

OHWM:

Clear, natural line impressed on the bank	☑	Presence of litter and debris	☐
Changes in character of soil	☑	Destruction of terrestrial veg.	☐
Shelving	☐	Presence of wrack line	☐
Vegetation matted down, bent, or absent	☑	Sediment sorting	☑
Leaf litter disturbed or washed away	☐	Scour	☐
Sediment deposition	☑	Multiple observed/predicted flow events	☑
Water staining	☐	Abrupt change in plant community	☐

Photos? Upstream ☑ Downstream ☑

Connection to Traditional Navigable Waterway: _____

Other Comments: The waterway started at an off road vehicle trail and turns from vegetative to rocky and crosses the trail into the woods. Where it becomes very steep and flows down hill to a terrace and fizzles out.No wetland at the bottom of the waterway.

Stream Datasheet

Project: BOP Kentucky Date: 09/13/2023 Stream ID: WUS-007

Staff: MD/SH Flow Type: Perennial ☐ Intermittent ☐ Ephemeral ☑

Site ID: _____ Rainfall w/in 48 hrs? Y Current Weather: partly cloudy

Flow Direction: SW Drains into: WUS-005

Fed By: precipitation

Bank Height: 0.5-3' Water Depth: 1" Width: 1-4'

Channel Gradient (%): 45 Bank Stability: good

Avg. Bank Slope: Vertical ☑ 2:1 ☐ 3:1 ☐ 4:1 or greater ☐

Mesohabitat: % Run: _____ % Riffle: _____ % Pool: 0

Substrate: Cobble ☑ Gravel ☑ Sand ☑ Silt ☑ x Bedrock
Veg ☐ Riprap ☐ Concrete ☐ Muck ☐

Channel Characteristics: Natural ☑ Artificial ☐ Man-altered ☐

OHWM:

Clear, natural line impressed on the bank	☑	Presence of litter and debris	☑
Changes in character of soil	☑	Destruction of terrestrial veg.	☐
Shelving	☐	Presence of wrack line	☐
Vegetation matted down, bent, or absent	☐	Sediment sorting	☑
Leaf litter disturbed or washed away	☑	Scour	☐
Sediment deposition	☑	Multiple observed/predicted flow events	☐
Water staining	☐	Abrupt change in plant community	☐

Photos? Upstream ☑ Downstream ☑

Connection to Traditional Navigable Waterway:
S. Fork of the KY River

Other Comments: Flowing but lost hydrology at the bottom.

Stream Datasheet

Project: BOP Kentucky Date: 09/13/2023 Stream ID: WUS-008

Staff: MD/SH Flow Type: Perennial ☐ Intermittent ☑ Ephemeral ☐

Site ID: _____ Rainfall w/in 48 hrs? Y Current Weather: partly cloudy

Flow Direction: N Drains into: WUS-005

Fed By: groundwater

Bank Height: 1-1.5' Water Depth: 2" Width: 3'

Channel Gradient (%): 45-50 Bank Stability: fair

Avg. Bank Slope: Vertical ☑ 2:1 ☐ 3:1 ☐ 4:1 or greater ☐

Mesohabitat: % Run: 20 % Riffle: 80 % Pool: 0

Substrate: Cobble ☑ Gravel ☑ Sand ☑ Silt ☑ x Bedrock
Veg ☐ Riprap ☐ Concrete ☐ Muck ☐

Channel Characteristics: Natural ☑ Artificial ☐ Man-altered ☐

OHWM:

Clear, natural line impressed on the bank	☐	Presence of litter and debris	☑
Changes in character of soil	☐	Destruction of terrestrial veg.	☐
Shelving	☐	Presence of wrack line	☐
Vegetation matted down, bent, or absent	☐	Sediment sorting	☑
Leaf litter disturbed or washed away	☑	Scour	☑
Sediment deposition	☑	Multiple observed/predicted flow events	☐
Water staining	☐	Abrupt change in plant community	☐

Photos? Upstream ☑ Downstream ☑

Connection to Traditional Navigable Waterway:
S. Fork of the KY River

Other Comments: .

Stream Datasheet

Project: BOP Kentucky Date: 09/13/2023 Stream ID: WUS-009

Staff: MD/SH Flow Type: Perennial ☐ Intermittent ☑ Ephemeral ☐

Site ID: _____ Rainfall w/in 48 hrs? Y Current Weather: partly cloudy

Flow Direction: N Drains into: WUS-008

Fed By: groundwater

Bank Height: 0.5' Water Depth: 0.5" Width: 4'

Channel Gradient (%): 70 Bank Stability: good

Avg. Bank Slope: Vertical ☑ 2:1 ☐ 3:1 ☐ 4:1 or greater ☐

Mesohabitat: % Run: 0 % Riffle: 100 % Pool: 0

Substrate: Cobble ☑ Gravel ☐ Sand ☐ Silt ☑ x Bedrock
Veg ☐ Riprap ☐ Concrete ☐ Muck ☐

Channel Characteristics: Natural ☑ Artificial ☐ Man-altered ☐

OHWM:

Clear, natural line impressed on the bank	☐	Presence of litter and debris	☑
Changes in character of soil	☐	Destruction of terrestrial veg.	☐
Shelving	☐	Presence of wrack line	☐
Vegetation matted down, bent, or absent	☐	Sediment sorting	☑
Leaf litter disturbed or washed away	☑	Scour	☑
Sediment deposition	☑	Multiple observed/predicted flow events	☐
Water staining	☐	Abrupt change in plant community	☐

Photos? Upstream ☑ Downstream ☑

Connection to Traditional Navigable Waterway:
S. Fork of the KY River

Other Comments: .

Stream Datasheet

Project: BOP Kentucky Date: 09/13/2023 Stream ID: WUS-010/011

Staff: MD/SH Flow Type: Perennial ☐ Intermittent ☐ Ephemeral ☑

Site ID: _____ Rainfall w/in 48 hrs? Y Current Weather: partly cloudy

Flow Direction: N Drains into: WUS-005 / WUS-010

Fed By: precipitation

Bank Height: 2' / 2' Water Depth: 0.5" / 0.5" Width: 3.5' / 3.5'

Channel Gradient (%): 45 / 55 Bank Stability: fair / fair

Avg. Bank Slope: Vertical ☑ 2:1 ☐ 3:1 ☐ 4:1 or greater ☐

Mesohabitat: % Run: 30 / 30 % Riffle: 60 / 60 % Pool: 10 / 10

Substrate: Cobble ☑ Gravel ☑ Sand ☑ Silt ☑ x Bedrock
Veg ☐ Riprap ☐ Concrete ☐ Muck ☐

Channel Characteristics: Natural ☑ Artificial ☐ Man-altered ☐

OHWM:

Clear, natural line impressed on the bank	☐	Presence of litter and debris	☑
Changes in character of soil	☐	Destruction of terrestrial veg.	☐
Shelving	☐	Presence of wrack line	☐
Vegetation matted down, bent, or absent	☐	Sediment sorting	☑
Leaf litter disturbed or washed away	☑	Scour	☑
Sediment deposition	☑	Multiple observed/predicted flow events	☐
Water staining	☐	Abrupt change in plant community	☐

Photos? Upstream ☑ Downstream ☑

Connection to Traditional Navigable Waterway:
S. Fork of the KY River

Other Comments: . WUS-010 and WUS-011 are very similar. WUS-011 has a steeper gradient

Stream Datasheet

Project: BOP Kentucky Date: 09/13/2023 Stream ID: WUS-012

Staff: MD/SH Flow Type: Perennial ☐ Intermittent ☑ Ephemeral ☐

Site ID: _____ Rainfall w/in 48 hrs? Y Current Weather: partly cloudy

Flow Direction: N Drains into: WUS-005

Fed By: groundwater

Bank Height: 1-6' Water Depth: 2" Width: 1-4'

Channel Gradient (%): 30-55 Bank Stability: fair

Avg. Bank Slope: Vertical ☑ 2:1 ☑ 3:1 ☐ 4:1 or greater ☐

Mesohabitat: % Run: 30 % Riffle: 60 % Pool: 10

Substrate: Cobble ☑ Gravel ☑ Sand ☑ Silt ☐ x Bedrock
Veg ☐ Riprap ☐ Concrete ☐ Muck ☐

Channel Characteristics: Natural ☑ Artificial ☐ Man-altered ☐

OHWM:

Clear, natural line impressed on the bank	☐	Presence of litter and debris	☑
Changes in character of soil	☐	Destruction of terrestrial veg.	☑
Shelving	☑	Presence of wrack line	☐
Vegetation matted down, bent, or absent	☑	Sediment sorting	☑
Leaf litter disturbed or washed away	☑	Scour	☑
Sediment deposition	☑	Multiple observed/predicted flow events	☐
Water staining	☐	Abrupt change in plant community	☐

Photos? Upstream ☑ Downstream ☑

Connection to Traditional Navigable Waterway:
S. Fork of the KY River

Other Comments: Super steep then at the top drains a dirt roadway that is not used much now

Stream Datasheet

Project: BOP Kentucky Date: 09/13/2023 Stream ID: WUS-013

Staff: MD/SH Flow Type: Perennial ☐ Intermittent ☐ Ephemeral ☑

Site ID: _____ Rainfall w/in 48 hrs? Y Current Weather: partly cloudy

Flow Direction: NE Drains into: WUS-012

Fed By: precipitation

Bank Height: 2-3' Water Depth: 0" Width: 1-3'

Channel Gradient (%): 70 Bank Stability: fair

Avg. Bank Slope: Vertical ☑ 2:1 ☐ 3:1 ☐ 4:1 or greater ☐

Mesohabitat: % Run: 0 % Riffle: 100 % Pool: 0

Substrate: Cobble ☑ Gravel ☑ Sand ☑ Silt ☑ x Bedrock
Veg ☐ Riprap ☐ Concrete ☐ Muck ☐

Channel Characteristics: Natural ☑ Artificial ☐ Man-altered ☐

OHWM:

Clear, natural line impressed on the bank	☑	Presence of litter and debris	☐
Changes in character of soil	☐	Destruction of terrestrial veg.	☐
Shelving	☐	Presence of wrack line	☐
Vegetation matted down, bent, or absent	☐	Sediment sorting	☑
Leaf litter disturbed or washed away	☑	Scour	☑
Sediment deposition	☑	Multiple observed/predicted flow events	☐
Water staining	☐	Abrupt change in plant community	☐

Photos? Upstream ☑ Downstream ☑

Connection to Traditional Navigable Waterway:
S. Fork of the KY River

Other Comments: Culvert failure / waterway channelized to this location due to culvert and berm

Stream Datasheet

Project: BOP Kentucky Date: 09/14/2023 Stream ID: WUS-014

Staff: MD/SH Flow Type: Perennial ☑ Intermittent ☐ Ephemeral ☐

Site ID: _____ Rainfall w/in 48 hrs? N Current Weather: clear

Flow Direction: NW Drains into: WUS-005

Fed By: groundwater/seeps

Bank Height: 1.5-2' Water Depth: 1-2" Width: 2'

Channel Gradient (%): 70 Bank Stability: fair

Avg. Bank Slope: Vertical ☑ 2:1 ☐ 3:1 ☐ 4:1 or greater ☐

Mesohabitat: % Run: 20 % Riffle: 80 % Pool: 0

Substrate:

Cobble	☑	Gravel	☑	Sand	☑	Silt	☑
Veg	☐	Riprap	☐	Concrete	☐	Muck	☐

Channel Characteristics: Natural ☑ Artificial ☐ Man-altered ☐

OHWM:

Clear, natural line impressed on the bank	☑	Presence of litter and debris	☑
Changes in character of soil	☐	Destruction of terrestrial veg.	☑
Shelving	☐	Presence of wrack line	☐
Vegetation matted down, bent, or absent	☑	Sediment sorting	☑
Leaf litter disturbed or washed away	☑	Scour	☑
Sediment deposition	☑	Multiple observed/predicted flow events	☑
Water staining	☐	Abrupt change in plant community	☐

Photos? Upstream ☑ Downstream ☑

Connection to Traditional Navigable Waterway:

S. Fork of the KY River

Other Comments: Drains WET-010

Stream Datasheet

Project: BOP Kentucky Date: 09/14/2023 Stream ID: WUS-015

Staff: MD/SH Flow Type: Perennial ☐ Intermittent ☑ Ephemeral ☐

Site ID: _____ Rainfall w/in 48 hrs? N Current Weather: clear

Flow Direction: N Drains into: WUS-014

Fed By: groundwater

Bank Height: 2' Water Depth: 0.25" Width: 3'

Channel Gradient (%): 70 Bank Stability: fair

Avg. Bank Slope: Vertical ☑ 2:1 ☐ 3:1 ☐ 4:1 or greater ☐

Mesohabitat: % Run: 0 % Riffle: 100 % Pool: 0

Substrate: Cobble ☑ Gravel ☑ Sand ☑ Silt ☑
Veg ☐ Riprap ☐ Concrete ☐ Muck ☐

Channel Characteristics: Natural ☑ Artificial ☐ Man-altered ☐

OHWM:

Clear, natural line impressed on the bank	☑	Presence of litter and debris	☑
Changes in character of soil	☐	Destruction of terrestrial veg.	☐
Shelving	☐	Presence of wrack line	☐
Vegetation matted down, bent, or absent	☑	Sediment sorting	☑
Leaf litter disturbed or washed away	☑	Scour	☑
Sediment deposition	☑	Multiple observed/predicted flow events	☐
Water staining	☐	Abrupt change in plant community	☐

Photos? Upstream ☑ Downstream ☑

Connection to Traditional Navigable Waterway:
S. Fork of the KY River

Other Comments: Drains WET-010

Stream Datasheet

Project: BOP Kentucky Date: 09/14/2023 Stream ID: WUS-016

Staff: MD/SH Flow Type: Perennial ☐ Intermittent ☑ Ephemeral ☐

Site ID: _____ Rainfall w/in 48 hrs? N Current Weather: clear

Flow Direction: N Drains into: WUS-015

Fed By: groundwater

Bank Height: 1.5' Water Depth: 0.25" Width: 1.5'

Channel Gradient (%): 70 Bank Stability: fair

Avg. Bank Slope: Vertical ☑ 2:1 ☐ 3:1 ☐ 4:1 or greater ☐

Mesohabitat: % Run: 0 % Riffle: 100 % Pool: 0

Substrate:

Cobble	☑	Gravel	☑	Sand	☑	Silt	☑
Veg	☐	Riprap	☐	Concrete	☐	Muck	☐

Channel Characteristics: Natural ☑ Artificial ☐ Man-altered ☐

OHWM:

Clear, natural line impressed on the bank	☑	Presence of litter and debris	☑
Changes in character of soil	☐	Destruction of terrestrial veg.	☐
Shelving	☐	Presence of wrack line	☐
Vegetation matted down, bent, or absent	☑	Sediment sorting	☑
Leaf litter disturbed or washed away	☑	Scour	☑
Sediment deposition	☑	Multiple observed/predicted flow events	☐
Water staining	☐	Abrupt change in plant community	☐

Photos? Upstream ☑ Downstream ☑

Connection to Traditional Navigable Waterway:

S. Fork of the KY River

Other Comments: Drains WET-010

Stream Datasheet

Project: BOP Kentucky Date: 09/14/2023 Stream ID: WUS-017

Staff: MD/SH Flow Type: Perennial ☐ Intermittent ☑ Ephemeral ☐

Site ID: _____ Rainfall w/in 48 hrs? N Current Weather: clear

Flow Direction: NW Drains into: WUS-005

Fed By: groundwater/seep

Bank Height: 1.5' Water Depth: 0.25" Width: 1.5'

Channel Gradient (%): 35 Bank Stability: fair

Avg. Bank Slope: Vertical ☐ 2:1 ☑ 3:1 ☐ 4:1 or greater ☐

Mesohabitat: % Run: 100 % Riffle: 0 % Pool: 0

Substrate: Cobble ☑ Gravel ☑ Sand ☑ Silt ☑
Veg ☐ Riprap ☐ Concrete ☐ Muck ☐

Channel Characteristics: Natural ☑ Artificial ☐ Man-altered ☐

OHWM:

Clear, natural line impressed on the bank	☑	Presence of litter and debris	☑
Changes in character of soil	☐	Destruction of terrestrial veg.	☐
Shelving	☐	Presence of wrack line	☐
Vegetation matted down, bent, or absent	☐	Sediment sorting	☑
Leaf litter disturbed or washed away	☑	Scour	☑
Sediment deposition	☑	Multiple observed/predicted flow events	☐
Water staining	☐	Abrupt change in plant community	☐

Photos? Upstream ☑ Downstream ☑

Connection to Traditional Navigable Waterway:
S. Fork of the KY River

Other Comments:

Stream Datasheet

Project: BOP Kentucky Date: 09/14/2023 Stream ID: WUS-018

Staff: MD/SH Flow Type: Perennial ☐ Intermittent ☑ Ephemeral ☐

Site ID: _____ Rainfall w/in 48 hrs? N Current Weather: clear

Flow Direction: S Drains into: WUS-005

Fed By: groundwater

Bank Height: 0.5-2' Water Depth: 0.25" Width: 1'

Channel Gradient (%): 45 Bank Stability: good

Avg. Bank Slope: Vertical ☑ 2:1 ☐ 3:1 ☐ 4:1 or greater ☐

Mesohabitat: % Run: _____ % Riffle: 100 % Pool: 0

Substrate: Cobble ☑ Gravel ☑ Sand ☑ Silt ☑ x Bedrock
Veg ☐ Riprap ☐ Concrete ☐ Muck ☐

Channel Characteristics: Natural ☑ Artificial ☐ Man-altered ☐

OHWM:

Clear, natural line impressed on the bank	☑	Presence of litter and debris	☑
Changes in character of soil	☐	Destruction of terrestrial veg.	☐
Shelving	☐	Presence of wrack line	☐
Vegetation matted down, bent, or absent	☐	Sediment sorting	☑
Leaf litter disturbed or washed away	☑	Scour	☑
Sediment deposition	☑	Multiple observed/predicted flow events	☐
Water staining	☐	Abrupt change in plant community	☐

Photos? Upstream ☑ Downstream ☑

Connection to Traditional Navigable Waterway:
S. Fork of the KY River

Other Comments: Very steep - saturated rocks, no observed rainfall

Stream Datasheet

Project: BOP Kentucky Date: 10/11/2023 Stream ID: WUS-020

Staff: MD/CH Flow Type: Perennial ☐ Intermittent ☐ Ephemeral ☑

Site ID: _____ Rainfall w/in 48 hrs? N Current Weather: clear

Flow Direction: W Drains into: WUS-004

Fed By: precipitation, overland sheet flow

Bank Height: 5-25' Water Depth: 0" Width: 3-8'

Channel Gradient (%): 35 Bank Stability: moderate

Avg. Bank Slope: Vertical ☐ 2:1 ☑ 3:1 ☐ 4:1 or greater ☐

Mesohabitat: % Run: 60 % Riffle: 30 % Pool: 10

Substrate: Cobble ☑ Gravel ☑ Sand ☑ Silt ☐ X Bedrock
Veg ☑ Riprap ☐ Concrete ☐ Muck ☐

Channel Characteristics: Natural ☑ Artificial ☐ Man-altered ☐

OHWM:

Clear, natural line impressed on the bank	☑	Presence of litter and debris	☑
Changes in character of soil	☐	Destruction of terrestrial veg.	☐
Shelving	☐	Presence of wrack line	☐
Vegetation matted down, bent, or absent	☑	Sediment sorting	☐
Leaf litter disturbed or washed away	☑	Scour	☐
Sediment deposition	☐	Multiple observed/predicted flow events	☐
Water staining	☑	Abrupt change in plant community	☐

Photos? Upstream ☑ Downstream ☑

Connection to Traditional Navigable Waterway:
Tolson Branch to N Fork Kentucky River

Other Comments:

Stream Datasheet

Project: BOP Kentucky Date: 10/11/2023 Stream ID: WUS-021

Staff: MD/CH Flow Type: Perennial ☐ Intermittent ☑ Ephemeral ☑

Site ID: _____ Rainfall w/in 48 hrs? N Current Weather: clear

Flow Direction: W Drains into: WUS-004

Fed By: precipitation, overland sheet flow, see comments

Bank Height: 3-15' Water Depth: 0" Width: 2-6'

Channel Gradient (%): 25 Bank Stability: moderate

Avg. Bank Slope: Vertical ☐ 2:1 ☑ 3:1 ☐ 4:1 or greater ☐

Mesohabitat: % Run: 80 % Riffle: 10 % Pool: 10

Substrate: Cobble ☑ Gravel ☑ Sand ☑ Silt ☐ X Bedrock
Veg ☑ Riprap ☐ Concrete ☐ Muck ☐

Channel Characteristics: Natural ☑ Artificial ☐ Man-altered ☐

OHWM:

Clear, natural line impressed on the bank	☑	Presence of litter and debris	☑
Changes in character of soil	☐	Destruction of terrestrial veg.	☐
Shelving	☐	Presence of wrack line	☐
Vegetation matted down, bent, or absent	☑	Sediment sorting	☐
Leaf litter disturbed or washed away	☑	Scour	☐
Sediment deposition	☐	Multiple observed/predicted flow events	☐
Water staining	☑	Abrupt change in plant community	☐

Photos? Upstream ☑ Downstream ☑

Connection to Traditional Navigable Waterway:
Tolson Branch to N Fork Kentucky River

Other Comments: WUS picks up groundwater at flag 003 and turns intermittent until its confluence with WUS004

Stream Datasheet

Project: BOP Kentucky Date: 10/11/2023 Stream ID: WUS-022

Staff: MD/CH Flow Type: Perennial ☐ Intermittent ☑ Ephemeral ☐

Site ID: _____ Rainfall w/in 48 hrs? N Current Weather: clear

Flow Direction: NW Drains into: WUS-004

Fed By: precipitation, overland sheet flow, WUS023, seeps

Bank Height: _____ Water Depth: _____ Width: _____

Channel Gradient (%): 10-20 Bank Stability: moderate

Avg. Bank Slope: Vertical ☐ 2:1 ☑ 3:1 ☐ 4:1 or greater ☐

Mesohabitat: % Run: 90 % Riffle: 10 % Pool: 0

Substrate: Cobble ☑ Gravel ☑ Sand ☐ Silt ☑ X Bedrock
Veg ☑ Riprap ☐ Concrete ☐ Muck ☐

Channel Characteristics: Natural ☑ Artificial ☐ Man-altered ☐

OHWM:

Clear, natural line impressed on the bank	☑	Presence of litter and debris	☑
Changes in character of soil	☐	Destruction of terrestrial veg.	☐
Shelving	☐	Presence of wrack line	☐
Vegetation matted down, bent, or absent	☑	Sediment sorting	☐
Leaf litter disturbed or washed away	☑	Scour	☐
Sediment deposition	☐	Multiple observed/predicted flow events	☐
Water staining	☑	Abrupt change in plant community	☐

Photos? Upstream ☑ Downstream ☑

Connection to Traditional Navigable Waterway:
Tolson Branch to N Fork Kentucky River

Other Comments: _____

Stream Datasheet

Project: BOP Kentucky Date: 10/11/2023 Stream ID: WUS-023

Staff: MD/CH Flow Type: Perennial ☐ Intermittent ☑ Ephemeral ☐

Site ID: _____ Rainfall w/in 48 hrs? N Current Weather: clear

Flow Direction: N Drains into: WUS-022

Fed By: seeps

Bank Height: 6" Water Depth: 0.2" Width: 1-5'

Channel Gradient (%): 5-30 Bank Stability: moderate

Avg. Bank Slope: Vertical ☐ 2:1 ☑ 3:1 ☐ 4:1 or greater ☑

Mesohabitat: % Run: 70 % Riffle: 30 % Pool: 0

Substrate:

Cobble	☑	Gravel	☑	Sand	☐	Silt	☑
Veg	☑	Riprap	☐	Concrete	☐	Muck	☐

Channel Characteristics: Natural ☑ Artificial ☐ Man-altered ☐

OHWM:

Clear, natural line impressed on the bank	☑	Presence of litter and debris	☑
Changes in character of soil	☑	Destruction of terrestrial veg.	☐
Shelving	☐	Presence of wrack line	☐
Vegetation matted down, bent, or absent	☑	Sediment sorting	☐
Leaf litter disturbed or washed away	☑	Scour	☐
Sediment deposition	☐	Multiple observed/predicted flow events	☐
Water staining	☑	Abrupt change in plant community	☐

Photos? Upstream ☑ Downstream ☑

Connection to Traditional Navigable Waterway:

WUS022 to Tolson Branch to N Fork Kentucky River

Other Comments:

Stream Datasheet

Project: BOP Kentucky Date: 10/11/2023 Stream ID: WUS-024

Staff: MD/CH Flow Type: Perennial ☐ Intermittent ☐ Ephemeral ☑

Site ID: _____ Rainfall w/in 48 hrs? N Current Weather: clear

Flow Direction: NW Drains into: N Fork Kentucky River

Fed By: precipitation, overland flow

Bank Height: 4-5' Water Depth: 0 Width: 1-5'

Channel Gradient (%): 5-30 Bank Stability: moderate

Avg. Bank Slope: Vertical ☐ 2:1 ☑ 3:1 ☐ 4:1 or greater ☑

Mesohabitat: % Run: 90 % Riffle: 10 % Pool: 0

Substrate:

Cobble	☑	Gravel	☑	Sand	☐	Silt	☑
Veg	☑	Riprap	☐	Concrete	☐	Muck	☐

Channel Characteristics: Natural ☑ Artificial ☐ Man-altered ☐

OHWM:

Clear, natural line impressed on the bank	☑	Presence of litter and debris	☑
Changes in character of soil	☑	Destruction of terrestrial veg.	☐
Shelving	☐	Presence of wrack line	☐
Vegetation matted down, bent, or absent	☑	Sediment sorting	☐
Leaf litter disturbed or washed away	☑	Scour	☐
Sediment deposition	☐	Multiple observed/predicted flow events	☐
Water staining	☑	Abrupt change in plant community	☐

Photos? Upstream ☑ Downstream ☑

Connection to Traditional Navigable Waterway:

N Fork Kentucky River

Other Comments:

Stream Datasheet

Project: Roxana (Letcher Co.) **Date:** 9/12/23 **Stream ID:** WUS100

Staff: Phil Perhamus, Lisa Thompson **Flow Type:** Perennial ☐ Intermittent ☑ Ephemeral ☐

Site ID: _____ **Rainfall w/in 48 hrs?** Yes **Current Weather:** Moderate to heavy showers

Flow Direction: NE to NNE **Drains into:** ~~S. Branch Kentucky River~~ Kings Creek

Fed By: Stormwater

Bank Height: ~1' **Water Depth:** <1" **Width:** ~3'

Channel Gradient (%): _____ **Bank Stability:** Stable

Avg. Bank Slope: Vertical ☐ 2:1 ☐ 3:1 ☑ 4:1 or greater ☐

Mesohabitat: % Run: 90 % Riffle: 10 % Pool: Ø

Substrate: Cobble ☑ Gravel ☑ Sand ☐ Silt ☐ Veg ☐ Riprap ☐ Concrete ☐ Muck ☐

Channel Characteristics: Natural ☑ Artificial ☐ Man-altered ☐

OHWM:

Clear, natural line impressed on the bank	☐	Presence of litter and debris	☑
Changes in character of soil	☐	Destruction of terrestrial veg.	☐
Shelving	☐	Presence of wrack line	☐
Vegetation matted down, bent, or absent	☑	Sediment sorting	☐
Leaf litter disturbed or washed away	☑	Scour	☐
Sediment deposition	☐	Multiple observed/predicted flow events	☐
Water staining	☑	Abrupt change in plant community	☐

Photos? Upstream ☐ Downstream ☐

Connection to Traditional Navigable Waterway: Drains to culvert beneath Rt. 160 into Kings Creek which flows into North ~~Branch~~ Fork Kentucky River

Other Comments: _____

Stream Datasheet

Project: Roxana (Letcher Co) **Date:** 9/12/23 **Stream ID:** WVS101

Staff: Phil Pethamus, Lisa Thompson **Flow Type:** Perennial ☐ Intermittent ☑ Ephemeral ☐

Site ID: _____ **Rainfall w/in 48 hrs?** Yes **Current Weather:** Cloudy

Flow Direction: NE to ENE **Drains into:** Kings Creek

Fed By: Stormwater and possibly groundwater

Bank Height: ~10' **Water Depth:** <1" **Width:** ~5'

Channel Gradient (%): _____ **Bank Stability:** Stable

Avg. Bank Slope: Vertical ☐ 2:1 ☐ 3:1 ☐ 4:1 or greater ☑

Mesohabitat: % Run: 90 % Riffle: ~9 % Pool: <1

Substrate: Cobble ☑ Gravel ☑ Sand ☐ Silt ☐ Veg ☑ Riprap ☐ Concrete ☐ Muck ☐

Channel Characteristics: Natural ☑ Artificial ☐ Man-altered ☐

OHWM:

Clear, natural line impressed on the bank	☐	Presence of litter and debris	☐
Changes in character of soil	☐	Destruction of terrestrial veg.	☐
Shelving	☐	Presence of wrack line	☐
Vegetation matted down, bent, or absent	☑	Sediment sorting	☐
Leaf litter disturbed or washed away	☑	Scour	☑
Sediment deposition	☐	Multiple observed/predicted flow events	☐
Water staining	☐	Abrupt change in plant community	☐

Photos? Upstream ☐ Downstream ☐

Connection to Traditional Navigable Waterway: Drains to culvert beneath Rt. 160 into Kings Creek which flows into North Fork Kentucky River.

Other Comments: _____

Stream Datasheet

Project: Roxana (Letcher Co.) **Date:** 9/13/23 **Stream ID:** WUS102

Staff: Phil Pothamus, Lisa Thompson **Flow Type:** Perennial ☐ Intermittent ☑ Ephemeral ☐

Site ID: _____ **Rainfall w/in 48 hrs?** Yes **Current Weather:** Drizzly

Flow Direction: N **Drains into:** Kings Creek

Fed By: Stormwater and possibly groundwater

Bank Height: ~6' **Water Depth:** 1-2" **Width:** ~8'

Channel Gradient (%): _____ **Bank Stability:** Stable

Avg. Bank Slope: Vertical ☐ 2:1 ☐ 3:1 ☑ 4:1 or greater ☐

Mesohabitat: % Run: 90 % Riffle: 10 % Pool: Ø

Substrate:

Cobble	☑	Gravel	☑	Sand	☑	Silt	☐
Veg	☑	Riprap	☐	Concrete	☐	Muck	☐

Channel Characteristics: Natural ☑ Artificial ☐ Man-altered ☐

OHWM:

Clear, natural line impressed on the bank	☐	Presence of litter and debris	☑
Changes in character of soil	☐	Destruction of terrestrial veg.	☐
Shelving	☐	Presence of wrack line	☐
Vegetation matted down, bent, or absent	☑	Sediment sorting	☐
Leaf litter disturbed or washed away	☑	Scour	☐
Sediment deposition	☑	Multiple observed/predicted flow events	☐
Water staining	☐	Abrupt change in plant community	☐

Photos? Upstream ☐ Downstream ☐

Connection to Traditional Navigable Waterway: ~~Drains to WETLAND which drains to~~ ~~WUS~~ Drains to Kings Creek.

Other Comments: _____

Stream Datasheet

Project: Roxana (Letzhor Co.) **Date:** 9/13/23 **Stream ID:** WUS 102 & b

Staff: Phil Perhamus, Lisa Thompson **Flow Type:** Perennial ☐ Intermittent ☐ Ephemeral ☑

Site ID: _____ **Rainfall w/in 48 hrs?** Yes **Current Weather:** Drizzly

Flow Direction: ☒ NE to E **Drains into:** Wetland 100 (WET100)

Fed By: Stormwater

Bank Height: ~5' **Water Depth:** Ø **Width:** ~4'

Channel Gradient (%): _____ **Bank Stability:** Stable

Avg. Bank Slope: Vertical ☐ 2:1 ☐ 3:1 ☑ 4:1 or greater ☐

Mesohabitat: % Run: 90 % Riffle: 10 % Pool: Ø

Substrate: Cobble ☑ Gravel ☑ Sand ☐ Silt ☐
Veg ☑ Riprap ☐ Concrete ☐ Muck ☐

Channel Characteristics: Natural ☑ Artificial ☐ Man-altered ☐

OHWM:

Clear, natural line impressed on the bank	☐	Presence of litter and debris	☑
Changes in character of soil	☐	Destruction of terrestrial veg.	☐
Shelving	☐	Presence of wrack line	☐
Vegetation matted down, bent, or absent	☑	Sediment sorting	☐
Leaf litter disturbed or washed away	☑	Scour	☐
Sediment deposition	☐	Multiple observed/predicted flow events	☐
Water staining	☑	Abrupt change in plant community	☐

Photos? Upstream ☐ Downstream ☐

Connection to Traditional Navigable Waterway: Drains into WUS102 which drains into Kings Creek.

Other Comments: _____

Stream Datasheet

Project: Roxana (Letcher Co.) **Date:** 9/14/23 **Stream ID:** WUS 103

Staff: Phil Pethamus, Lisa Thompson **Flow Type:** Perennial ☐ Intermittent ☑ Ephemeral ☐

Site ID: _____ **Rainfall w/in 48 hrs?** No **Current Weather:** Sunny

Flow Direction: _____ **Drains into:** Roadside ditch

Fed By: Stormwater and possibly groundwater

Bank Height: ~10' **Water Depth:** <1" **Width:** ~9'

Channel Gradient (%): _____ **Bank Stability:** Stable

Avg. Bank Slope: Vertical ☐ 2:1 ☐ 3:1 ☐ 4:1 or greater ☑

Mesohabitat: % Run: 90 % Riffle: 8 % Pool: 2

Substrate:

Cobble	☑	Gravel	☑	Sand	☑	Silt	☐
Veg	☐	Riprap	☐	Concrete	☐	Muck	☐

Channel Characteristics: Natural ☑ Artificial ☐ Man-altered ☐

OHWM:

Clear, natural line impressed on the bank	☐	Presence of litter and debris	☐
Changes in character of soil	☐	Destruction of terrestrial veg.	☐
Shelving	☐	Presence of wrack line	☐
Vegetation matted down, bent, or absent	☑	Sediment sorting	☐
Leaf litter disturbed or washed away	☑	Scour	☐
Sediment deposition	☐	Multiple observed/predicted flow events	☐
Water staining	☐	Abrupt change in plant community	☐

Photos? Upstream ☐ Downstream ☐

Connection to Traditional Navigable Waterway: Drains to roadside ditch which eventually drains to Kings Creek.

Other Comments: _____

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Roxana BOP City/County: Letcher Sampling Date: 09/12/2023

Applicant/Owner: Federal Bureau of Prisons (BOP) State: KY Sampling Point: WET001

Investigator(s): MD/SH Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): 2-3

Subregion (LRR or MLRA): LRR N Lat: 37.104661 Long: 82.952616 Datum: NAD83

Soil Map Unit Name: Fiveblock and Kaymine soils, 0-30 percent slopes, stony (FkE) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation ✔, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No _____	**Is the Sampled Area within a Wetland?** **Yes** ✔ **No** _____
Hydric Soil Present?	Yes ✔	No _____	
Wetland Hydrology Present?	Yes ✔	No _____	

Remarks:

Recently mowed. All herbaceous stratum vegetation producing flowers. PEM.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ✔ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ✔ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ✔ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No ✔	Depth (inches): _____
Water Table Present?	Yes _____	No ✔	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✔	Depth (inches): _____

Wetland Hydrology Present? **Yes** ✔ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No water table in the pit. Recently rained within the last few hours.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WET001

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: _____)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
	0 = Total Cover		

Herb Stratum (Plot size: 12' x 8')			
1. Kyllinga brevifolia	60	YES	FACW
2. Cyperus strigosus	25	YES	FACW
3. Trifolium pratense	10	NO	FACU
4. Setaria parviflora	5	NO	FAC
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	100 = Total Cover		

Woody Vine Stratum (Plot size: _____)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	0 (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✔ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✔ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

All vegetation recently mowed but all vegetation has flowers.

SOIL

Sampling Point: WET001

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	2.5YR 4/1	95	7.5YR 5/6	5	C	PL	SiCL	silty clay loam
4-6	2.5YR 4/1	80	10YR 5/6	20	C	PL	SiCL	
6-18+	2.5YR 6/2	70	10YR 6/6	25	C	PL	CL	clay loam
			7.5YR 5/8	5	C	PL		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✔ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)** Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Roxana BOP City/County: Letcher Sampling Date: 09/12/2023

Applicant/Owner: Federal Bureau of Prisons (BOP) State: KY Sampling Point: WET003

Investigator(s): MD/SH Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): 0

Subregion (LRR or MLRA): LRR N Lat: 37.1078308 Long: 82.9569648 Datum: NAD83

Soil Map Unit Name: Cloverlick-Kimper-Highsplint complex, 30 to 65 percent slopes, very stony (CkF) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No _____	**Is the Sampled Area within a Wetland?** **Yes** ✔ **No** _____
Hydric Soil Present?	Yes ✔	No _____	
Wetland Hydrology Present?	Yes ✔	No _____	

Remarks:

PEM with no trees, but is underneath tree canopy.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✔ Surface Water (A1)
- ✔ High Water Table (A2)
- ✔ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ✔ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ✔ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ✔ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ✔	No _____	Depth (inches): 1
Water Table Present?	Yes ✔	No _____	Depth (inches): 12
Saturation Present? (includes capillary fringe)	Yes ✔	No _____	Depth (inches): 0

Wetland Hydrology Present? **Yes** ✔ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WET003

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 12' X 18')			
1. Lindera benzoin	5	YES	FAC
2. Fraxinus nigra	5	YES	FACW
3. Elaeagnus umbellata	1	YES	UPL
4. Fagus grandifolia	1	YES	FACU
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
	12 = Total Cover		

Herb Stratum (Plot size: 20' x 10')			
1. Impatiens capensis	15	YES	FACW
2. Scirpus microcarpus	15	YES	OBL
3. Pilea pumila	15	YES	OBL
4. Bidens frondosa	10	YES	FACW
5. Persicaria longiseta	10	YES	FAC
6. Microstegium vimineum	10	YES	FAC
7. Urtica dioica	5	NO	FACU
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	80 = Total Cover		

Woody Vine Stratum (Plot size: _____)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 8 (A)

Total Number of Dominant Species Across All Strata: 10 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	0 (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✔ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✔ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WET003

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 2/1	100					LS	some organic matter
2-18+	10YR 3/1	100					LS	loamy sand

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ✔ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Roxana BOP City/County: Letcher Sampling Date: 09/12/2023

Applicant/Owner: Federal Bureau of Prisons (BOP) State: KY Sampling Point: WET004

Investigator(s): MD/SH Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): 0

Subregion (LRR or MLRA): LRR N Lat: 37.108157 Long: 82.9576298 Datum: NAD83

Soil Map Unit Name: Cloverlick-Kimper-Highsplint complex, 30 to 65 percent slopes, very stony (CkF) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No _____	**Is the Sampled Area within a Wetland?** **Yes** ✔ **No** _____
Hydric Soil Present?	Yes ✔	No _____	
Wetland Hydrology Present?	Yes ✔	No _____	

Remarks:

PEM with no trees, but is underneath tree canopy.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✔ Surface Water (A1)
- ✔ High Water Table (A2)
- ✔ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ✔ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ✔ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ✔ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ✔	No _____	Depth (inches): 1
Water Table Present?	Yes ✔	No _____	Depth (inches): 12
Saturation Present? (includes capillary fringe)	Yes ✔	No _____	Depth (inches): 0

Wetland Hydrology Present? **Yes** ✔ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WET004

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 12' X 18')			
1. Lindera benzoin	5	YES	FAC
2. Fraxinus nigra	5	YES	FACW
3. Elaeagnus umbellata	1	YES	UPL
4. Fagus grandifolia	1	YES	FACU
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
	12 = Total Cover		

Herb Stratum (Plot size: 20' x 10')			
1. Impatiens capensis	15	YES	FACW
2. Scirpus microcarpus	15	YES	OBL
3. Pilea pumila	15	YES	OBL
4. Bidens frondosa	10	YES	FACW
5. Persicaria longiseta	10	YES	FAC
6. Microstegium vimineum	10	YES	FAC
7. Urtica dioica	5	NO	FACU
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	80 = Total Cover		

Woody Vine Stratum (Plot size: _____)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 8 (A)

Total Number of Dominant Species Across All Strata: 11 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 81 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	0 (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✔ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✔ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WET004

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 2/1	100					LS	some organic matter
2-18+	10YR 3/1	100					LS	loamy sand

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
  2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ✔ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
  Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Roxana BOP City/County: Letcher Sampling Date: 09/12/2023

Applicant/Owner: Federal Bureau of Prisons (BOP) State: KY Sampling Point: WET005

Investigator(s): MD/SH Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 0

Subregion (LRR or MLRA): LRR N Lat: 37.1091220 Long: 82.9593035 Datum: NAD83

Soil Map Unit Name: Cloverlick-Kimper-Highsplint complex, 30 to 65 percent slopes, very stony (CkF) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No _____	**Is the Sampled Area within a Wetland?** **Yes** ✔ **No** _____
Hydric Soil Present?	Yes ✔	No _____	
Wetland Hydrology Present?	Yes ✔	No _____	

Remarks:

PEM within a forest canopy.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✔ Surface Water (A1)
- ✔ High Water Table (A2)
- ✔ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ✔	No _____	Depth (inches): 4
Water Table Present?	Yes ✔	No _____	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes ✔	No _____	Depth (inches): 0

Wetland Hydrology Present? **Yes** ✔ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WET005

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Platanus occidentalis	2	NO	FACW
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	2	= Total Cover	

Sapling/Shrub Stratum (Plot size: 30')			
1. Platanus occidentalis	15	YES	FACW
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
	15	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Impatiens capensis	40	YES	FACW
2. Impatiens pallida	30	YES	FACW
3. Boehmeria cylindrica	15	NO	FACW
4. Desmodium paniculatum	15	NO	FACU
5. Mimulus ringens	15	NO	OBL
6. Adiantum pedatum	10	NO	FAC
7. Persicaria longiseta	5	NO	FAC
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	130	= Total Cover	

Woody Vine Stratum (Plot size:)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✔ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✔ No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WET005

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-18	2.5YR 4/2	97	10YR 5/8	3	C	M	SaL	sandy loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✔ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)** Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Roxana BOP City/County: Letcher Sampling Date: 09/12/2023

Applicant/Owner: Federal Bureau of Prisons (BOP) State: KY Sampling Point: WET006

Investigator(s): MD/SH Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Ridge Local relief (concave, convex, none): Concave Slope (%): 2-3

Subregion (LRR or MLRA): LRR N Lat: 37.1007825 Long: 82.9542076 Datum: NAD83

Soil Map Unit Name: Dekalb-Gilpin-Rayne complex, 25 to 65 percent slopes, very rocky (DrF) and KfF NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No _____	**Is the Sampled Area within a Wetland?** **Yes** ✔ **No** _____
Hydric Soil Present?	Yes ✔	No _____	
Wetland Hydrology Present?	Yes ✔	No _____	

Remarks:

POW with wetland fringe plants and autumn olive canopy.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✔ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ✔ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ✔	No _____	Depth (inches): _____
Water Table Present?	Yes _____	No ✔	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✔	Depth (inches): _____

Wetland Hydrology Present? **Yes** ✔ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

7 inches of water with numerous frogs in the wetland.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WET006

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: _____)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
	0 = Total Cover		

Herb Stratum (Plot size: 20' x 15')			
1. Bidens frondosa	15	YES	FACW
2. Scirpus cyperinus	15	YES	FACW
3. Juncus effusus	10	YES	FACW
4. Pilea pumila	10	YES	FACW
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	50 = Total Cover		

Woody Vine Stratum (Plot size: _____)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	0 (B)

Prevalence Index = B/A = 2

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✔ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✔ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Vegetation noted around the fringe of the wetland.

SOIL

Sampling Point: WET006

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-1	7.5YR 3/1	100					SiC	
1-17+	GLEY1 4/10Y	99	7.5YR 4/6	1	C	PL	SiC	silty clay

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
  2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ✔ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
  Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: rock outcrop

Depth (inches): 17"

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Roxana BOP City/County: Letcher Sampling Date: 09/12/2023

Applicant/Owner: Federal Bureau of Prisons (BOP) State: KY Sampling Point: WET007

Investigator(s): MD/SH Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 2-3

Subregion (LRR or MLRA): LRR N Lat: 37.0997583 Long: 82.9561898 Datum: NAD83

Soil Map Unit Name: Shelocta-Highsplint-Gilpin complex, 20 to 70 percent slopes, very stony (uShgF) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No _____	**Is the Sampled Area within a Wetland?** **Yes** ✔ **No** _____
Hydric Soil Present?	Yes ✔	No _____	
Wetland Hydrology Present?	Yes ✔	No _____	

Remarks:

Hillslope with a berm and a lot of downed logs retaining water. PFO.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✔ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ✔ Drainage Patterns (B10)
- ✔ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✔ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ✔	No _____	Depth (inches): 0.5
Water Table Present?	Yes _____	No ✔	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✔	Depth (inches): _____

Wetland Hydrology Present? **Yes** ✔ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WET007

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Fagus grandifolia	60	YES	FACU
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	60	= Total Cover	

Sapling/Shrub Stratum (Plot size: 20' x 20')			
1. Lindera benzoin	35	YES	FAC
2. Asimina triloba	15	YES	FAC
3. Fagus grandifolia	10	NO	FACU
4. Fraxinus pennsylvanica	10	NO	FACW
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
	70	= Total Cover	

Herb Stratum (Plot size: 20' x 20')			
1. Urtica dioica	30	YES	FACU
2. Microstegium vimineum	20	NO	FAC
3. Impatiens capensis	30	YES	FACW
4. Osmundastrum cinnamomeum	10	NO	FACW
5. Dioscorea villosa	5	NO	FAC
6. Persicaria virginiana	5	NO	FAC
7. Pilea Pumila	30	YES	FACW
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	130	= Total Cover	

Woody Vine Stratum (Plot size: 10' x 10')			
1. Parthenocissus quinquefolia	10	YES	FACU
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
	10	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 57 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	0 (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✔ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✔ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WET007

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 2/1	100					CL	organic layer
2-4	10YR 3/1	80	10YR 5/3	20	D	M	CL	clay loam
4-18+	10YR 5/4	85	10YR 3/1	10	D	M	CL	
			10YR 5/6	5	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ✔ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Roxana BOP City/County: Letcher Sampling Date: 09/13/2023

Applicant/Owner: Federal Bureau of Prisons (BOP) State: KY Sampling Point: WET008

Investigator(s): MD/SH Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): _____

Subregion (LRR or MLRA): LRR N Lat: 37.0992414 Long: 82.9575816 Datum: NAD83

Soil Map Unit Name: Shelocta-Highsplint-Gilpin complex, 20 to 70 percent slopes, very stony (uShgF) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No _____	**Is the Sampled Area within a Wetland?** **Yes** ✔ **No** _____
Hydric Soil Present?	Yes ✔	No _____	
Wetland Hydrology Present?	Yes ✔	No _____	

Remarks:

PFO/PSS

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✔ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ✔ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ✔ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✔ Stunted or Stressed Plants (D1)
- ✔ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ✔ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ✔	No _____	Depth (inches): 0.5
Water Table Present?	Yes _____	No ✔	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✔	Depth (inches): _____

Wetland Hydrology Present? **Yes** ✔ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wet from yesterday rain and soil is mucky.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WET008

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Fagus grandifolia	20	YES	FACU
2. Liriodendron tulipifera	20	YES	FACU
3. Platanus occidentalis	20	YES	FACW
4. Fraxinus pennsylvanica	20	YES	FACW
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	80	= Total Cover	

Sapling/Shrub Stratum (Plot size: 30')			
1. Lindera benzoin	40	YES	FAC
2. Fagus grandifolia	30	YES	FAC
3. Elaeagnus umbellata	15	NO	UPL
4. Acer rubrum	15	NO	FAC
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
	100	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Microstegium vimineum	20	YES	FAC
2. Persicaria virginiana	10	YES	FAC
3. Polystichum acrostichoides	10	YES	FACU
4. Urtica dioica	10	YES	FACU
5. Polystichum acrostichoides	8	NO	FACU
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	58	= Total Cover	

Woody Vine Stratum (Plot size: 10')			
1. Parthenocissus quinquefolia	20	YES	FACU
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
	20	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 11 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 54 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	0 (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✔ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✔ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WET008

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 4/2	97	10YR 5/6	3	C	PL	SiC	organic matter until 0.5" depth
16-19+	10YR 4/2	80	7.5YR 5/8	10	C	M	CL	clay loam w/ black coal masses
			7.5YR 4/4	10	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✔ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Roxana BOP City/County: Letcher Sampling Date: 09/14/2023

Applicant/Owner: Federal Bureau of Prisons (BOP) State: KY Sampling Point: WET009

Investigator(s): MD/SH Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 20

Subregion (LRR or MLRA): LRR N Lat: 37.0977893 Long: 82.9560552 Datum: NAD83

Soil Map Unit Name: Kaymine, Fairpoint, and Fiveblock soils, benched, 2 to 70 percent (KfF) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No _____	**Is the Sampled Area within a Wetland?** **Yes** ✔ **No** _____
Hydric Soil Present?	Yes ✔	No _____	
Wetland Hydrology Present?	Yes ✔	No _____	

Remarks:

PEM

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✔ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ✔ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ✔	No _____	Depth (inches): 0.25
Water Table Present?	Yes _____	No ✔	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✔	Depth (inches): _____

Wetland Hydrology Present? **Yes** ✔ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WET009

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Liriodendron tulipifera	10	YES	FACU
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	10	= Total Cover	

Sapling/Shrub Stratum (Plot size: 30')			
1. Elaeagnus umbellata	40	YES	UPL
2. Platanus occidentalis	10	YES	FACW
3. Salix nigra	1	NO	OBL
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
	51	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Pilea pumila	20	YES	FACW
2. Microstegium vimineum	20	YES	FAC
3. Oplismenus hirtellus	10	YES	FACU
4. Cyperus eragrostis	10	YES	FACW
5. Carex frankii	10	YES	OBL
6. Solidago canadensis	5	NO	FACU
7. Dichanthelium clandestinum	5	NO	FAC
8. Ludwigia alternifolia	5	NO	FACW
9. Ambrosia artemisiifolia	5	NO	FACW
10. Juncus effusus	5	NO	FACW
11. Bidens frondosa	5	NO	FACW
12. Lycopus uniflorus	5	NO	OBL
	105	= Total Cover	

Woody Vine Stratum (Plot size: Herb Cont.)			
1. Persicaria longiseta	5	NO	FAC
2. Epilobium coloratum	5	NO	FACW
3. Scirpus cyperinus	5	NO	FACW
4. Typha angustifolia	5	NO	OBL
5. Ilex opaca	2	NO	FACU
6.		-	-
	22	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 63 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✔ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✔ No ___

Remarks: (Include photo numbers here or on a separate sheet.)

No vines. Herbaceous continued on Vine Stratum.

SOIL

Sampling Point: WET009

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-12	10Y/R 4/1	95	10YR 5/8	5	C	PL	SiCL	silty clay loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
  2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✔ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
  Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: rock outcrop or old road path

Depth (inches): 12

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Roxana BOP City/County: Letcher Sampling Date: 09/14/2023

Applicant/Owner: Federal Bureau of Prisons (BOP) State: KY Sampling Point: WET010

Investigator(s): MD/SH Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): 5

Subregion (LRR or MLRA): LRR N Lat: 37.0967487 Long: 82.9591185 Datum: NAD83

Soil Map Unit Name: Shelocta-Highsplint-Gilpin complex, 20 to 70 percent slopes, very stony (uShgF) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No _____	**Is the Sampled Area within a Wetland?** **Yes** ✔ **No** _____
Hydric Soil Present?	Yes ✔	No _____	
Wetland Hydrology Present?	Yes ✔	No _____	

Remarks:

Beautiful wetland seep. PFO

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✔ Surface Water (A1)
- ✔ High Water Table (A2)
- ✔ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ✔ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ✔ Drainage Patterns (B10)
- ✔ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ✔ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✔ Stunted or Stressed Plants (D1)
- ✔ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ✔ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ✔	No _____	Depth (inches): 1-3"
Water Table Present?	Yes ✔	No _____	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes ✔	No _____	Depth (inches): 0

Wetland Hydrology Present? **Yes** ✔ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Mountain side seep

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WET010

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Platanus occidentalis	20	YES	FACW
2. Pinus virginiana	20	YES	UPL
3. Liriodendron tulipifera	20	YES	FACU
4. Betula nigra	20	YES	FACW
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	80	= Total Cover	

Sapling/Shrub Stratum (Plot size: 30')			
1. Acer rubrum	30	YES	FAC
2. Nyssa sylvatica	20	YES	FAC
3. Rosa multiflora	10	NO	FACU
4. Platanus occidentalis	10	NO	FACW
5. Fraxinus pennsylvanica	5	NO	FACW
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
	75	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Microstegium vimineum	50	YES	FAC
2. Pilea pumila	20	YES	FACW
3. Solidago rugosa	10	NO	FAC
4. Persicaria longiseta	5	NO	FAC
5. Solidago gigantea	5	NO	FACW
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	90	= Total Cover	

Woody Vine Stratum (Plot size: 10')			
1. Parthenocissus quinquefolia	10	YES	FACU
2. Toxicodendron radicans	5	YES	FAC
3.		-	-
4.		-	-
5.		-	-
6.		-	-
	15	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 10 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 70 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	0 (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✔ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✔ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WET010

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 3/1	100						organic fiberous
1-2	10YR 5/1	90	10YR 5/8	10	C	M	SiCL	distinct
2-18+	10YR 5/1	80	5YR 4/6	20	C	M	SiCL	silty clay loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✔ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)** Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Roxana BOP City/County: Letcher Sampling Date: 09/14/2023

Applicant/Owner: Federal Bureau of Prisons (BOP) State: KY Sampling Point: WET011

Investigator(s): MD/SH Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Flat Slope (%): 0

Subregion (LRR or MLRA): LRR N Lat: 37.0990288 Long: 82.9585503 Datum: NAD83

Soil Map Unit Name: Shelocta-Highsplint-Gilpin complex, 20 to 70 percent slopes, very stony (uShgF) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No _____	**Is the Sampled Area within a Wetland?** **Yes** ✔ **No** _____
Hydric Soil Present?	Yes ✔	No _____	
Wetland Hydrology Present?	Yes ✔	No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✔ Surface Water (A1)
- ✔ High Water Table (A2)
- ✔ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ✔ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ✔ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ✔ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✔ Stunted or Stressed Plants (D1)
- ✔ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ✔ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ✔	No _____	Depth (inches): 1
Water Table Present?	Yes ✔	No _____	Depth (inches): 1
Saturation Present? (includes capillary fringe)	Yes ✔	No _____	Depth (inches): 1

Wetland Hydrology Present? **Yes** ✔ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WET011

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Platanus occidentalis	10	YES	FACW
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	10	= Total Cover	

Sapling/Shrub Stratum (Plot size: 30')			
1. Elaeagnus umbellata	20	YES	UPL
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
	20	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Impatiens capensis	100	YES	FACW
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	100	= Total Cover	

Woody Vine Stratum (Plot size:)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✔ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✔ No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WET011

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2	95	7.5YR 4/6	5	C	M	SiCL	
4-20	10YR 5/1	85	7.5YR 3/4	5	C	M	Clay	distinct black masses
			7.5YR 4/6	10	C	M	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✔ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)** Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Roxana BOP City/County: Letcher Sampling Date: 09/14/2023

Applicant/Owner: Federal Bureau of Prisons (BOP) State: KY Sampling Point: WET012

Investigator(s): MD/SH Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Flat Slope (%): 0

Subregion (LRR or MLRA): LRR N Lat: 37.0990288 Long: 82.9585503 Datum: NAD83

Soil Map Unit Name: Shelocta-Highsplint-Gilpin complex, 20 to 70 percent slopes, very stony (uShgF) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No _____	**Is the Sampled Area within a Wetland?** **Yes** ✔ **No** _____
Hydric Soil Present?	Yes ✔	No _____	
Wetland Hydrology Present?	Yes ✔	No _____	

Remarks:

Waterway starting to headcut and wetland is beginning to lose hydrology

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✔ Surface Water (A1)
- ✔ High Water Table (A2)
- ✔ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ✔ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ✔ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ✔ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✔ Stunted or Stressed Plants (D1)
- ✔ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ✔ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ✔	No _____	Depth (inches): 1
Water Table Present?	Yes ✔	No _____	Depth (inches): 1
Saturation Present? (includes capillary fringe)	Yes ✔	No _____	Depth (inches): 1

Wetland Hydrology Present? **Yes** ✔ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WET012

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Platanus occidentalis	10	YES	FACW
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	10	= Total Cover	

Sapling/Shrub Stratum (Plot size: 30')			
1. Elaeagnus umbellata	20	YES	UPL
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
	20	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Impatiens capensis	80	YES	FACW
2. Microstegium vimineum	20	YES	FAC
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	100	= Total Cover	

Woody Vine Stratum (Plot size:)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✔ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✔ No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WET012

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2	95	7.5YR 4/6	5	C	M	SiCL	
4-20	10YR 5/1	85	7.5YR 3/4	5	C	M	Clay	distinct black masses
			7.5YR 4/6	10	C	M	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✔ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)** Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Roxana BOP City/County: Letcher Sampling Date: 09/14/2023

Applicant/Owner: Federal Bureau of Prisons (BOP) State: KY Sampling Point: WET013

Investigator(s): MD/SH Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Flat Slope (%): 0

Subregion (LRR or MLRA): LRR N Lat: 37.0988212 Long: 82.9597794 Datum: NAD83

Soil Map Unit Name: Shelocta-Highsplint-Gilpin complex, 20 to 70 percent slopes, very stony (uShgF) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No _____	**Is the Sampled Area within a Wetland?** **Yes** ✔ **No** _____
Hydric Soil Present?	Yes ✔	No _____	
Wetland Hydrology Present?	Yes ✔	No _____	

Remarks:

PEM

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✔ Surface Water (A1)
- ✔ High Water Table (A2)
- ✔ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ✔ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ✔ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ✔ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✔ Stunted or Stressed Plants (D1)
- ✔ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ✔ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ✔	No _____	Depth (inches): 1
Water Table Present?	Yes ✔	No _____	Depth (inches): 1
Saturation Present? (includes capillary fringe)	Yes ✔	No _____	Depth (inches): 1

Wetland Hydrology Present? **Yes** ✔ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WET013

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Platanus occidentalis	10	YES	FACW
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	10	= Total Cover	

Sapling/Shrub Stratum (Plot size: 30')			
1. Elaeagnus umbellata	10	YES	UPL
2. Rosa multiflora	10	YES	FACU
3. Asimina triloba	10	YES	FAC
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
	30	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Impatiens capensis	60	YES	FACW
2. Microstegium vimineum	40	YES	FAC
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	100	= Total Cover	

Woody Vine Stratum (Plot size:)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✔ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✔ No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WET013

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2	95	7.5YR 4/6	5	C	M	SiCL	
4-20	10YR 5/1	85	7.5YR 3/4	5	C	M	Clay	distinct black masses
			7.5YR 4/6	10	C	M	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✔ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)** Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Roxana BOP City/County: Letcher Sampling Date: 10/11/2023

Applicant/Owner: Federal Bureau of Prisons (BOP) State: KY Sampling Point: WET020

Investigator(s): MD/CH Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Plateau Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR or MLRA): LRR N Lat: 37.1010902 Long: 82.9532621 Datum: NAD83

Soil Map Unit Name: Dekalb-Gilpin-Rayne complex, 25 to 65 percent slopes, very rocky (DrF) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil ✔, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No _____	**Is the Sampled Area within a Wetland?** **Yes** ✔ **No** _____
Hydric Soil Present?	Yes ✔	No _____	
Wetland Hydrology Present?	Yes ✔	No _____	

Remarks:

Soil is significantly compacted from mining. PEM.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ✔ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ✔ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ✔ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No ✔	Depth (inches): _____
Water Table Present?	Yes _____	No ✔	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✔	Depth (inches): _____

Wetland Hydrology Present? **Yes** ✔ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WET020

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: _____)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Cyperus strigosus	40	YES	FACW
2. Juncus effusus	25	YES	FACW
3. Setaria parviflora	20	YES	FAC
4. Persicaria hydropiper	10	NO	OBL
5. Scirpus cyperinus	5	NO	FACW
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	100 = Total Cover		

Woody Vine Stratum (Plot size: _____)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	0 (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✔ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✔ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WET020

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 5/2	97	10YR 5/4	3	C	M	SiCL	organic matter
1-3	10YR 6/1	85	7.5YR 5/8	15	C	M	SiCL	
3-6	10YR 5/1	95	7.5YR 5/8	5	C	M	SiCL	silty clay loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✔ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)** Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: compaction

Depth (inches): 6"

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Roxana BOP City/County: Letcher Sampling Date: 09/12/2023

Applicant/Owner: Federal Bureau of Prisons (BOP) State: KY Sampling Point: WET021

Investigator(s): MD/CH Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Plateau Local relief (concave, convex, none): Concave Slope (%): 5

Subregion (LRR or MLRA): LRR N Lat: 37.1007603 Long: 82.9537774 Datum: NAD83

Soil Map Unit Name: Dekalb-Gilpin-Rayne complex, 25 to 65 percent slopes, very rocky (DrF) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil ✔, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No _____	**Is the Sampled Area within a Wetland?** **Yes** ✔ **No** _____
Hydric Soil Present?	Yes ✔	No _____	
Wetland Hydrology Present?	Yes ✔	No _____	

Remarks:

Soil disturbed compacted from mining. PEM.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ✔ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ✔ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ✔ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No ✔	Depth (inches): _____
Water Table Present?	Yes _____	No ✔	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✔	Depth (inches): _____

Wetland Hydrology Present? **Yes** ✔ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WET021

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 30')			
1. Ulmus americana	20	YES	FACW
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
	20 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Persicaria hydropiper	30	YES	OBL
2. Scirpus cyperinus	20	YES	FACW
3. Solidago rugosa	20	YES	FAC
4. Solidago altissima	5	NO	FACU
5. Symphyotrichum pilosum	5	NO	FAC
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	80 = Total Cover		

Woody Vine Stratum (Plot size: 10')			
1. Toxicodendron radicans	10	YES	FAC
2. Clematis virginiana	5	YES	FAC
3.		-	-
4.		-	-
5.		-	-
6.		-	-
	15 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	0 (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✔ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✔ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WET021

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-1								organic matter
1-3	10YR 4/2	93	7.5YR 5/8	7	C	PL	SiCL	silty clay loam
3-7	10YR 5/1	80	7.5YR 5/8	20	C	M	SiCL	coal

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✔ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)** Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: rock

Depth (inches): 7"

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Roxana BOP City/County: Letcher Sampling Date: 10/11/2023

Applicant/Owner: Federal Bureau of Prisons (BOP) State: KY Sampling Point: WET022

Investigator(s): MD/CH Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Plateau Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR or MLRA): LRR N Lat: 37.1008198 Long: 82.9536050 Datum: NAD83

Soil Map Unit Name: Dekalb-Gilpin-Rayne complex, 25 to 65 percent slopes, very rocky (DrF) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil ✔, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No _____	**Is the Sampled Area within a Wetland?** **Yes** ✔ **No** _____
Hydric Soil Present?	Yes ✔	No _____	
Wetland Hydrology Present?	Yes ✔	No _____	

Remarks:

Soil is significantly compacted from mining. PEM.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ✔ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ✔ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ✔ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No ✔	Depth (inches): _____
Water Table Present?	Yes _____	No ✔	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✔	Depth (inches): _____

Wetland Hydrology Present? **Yes** ✔ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WET022

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: _____)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Cyperus strigosus	40	YES	FACW
2. Juncus effusus	25	YES	FACW
3. Setaria parviflora	20	YES	FAC
4. Persicaria hydropiper	10	NO	OBL
5. Scirpus cyperinus	5	NO	FACW
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	100 = Total Cover		

Woody Vine Stratum (Plot size: _____)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	0 (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✔ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✔ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WET022

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 5/2	97	10YR 5/4	3	C	M	SiCL	organic matter
1-3	10YR 6/1	85	7.5YR 5/8	15	C	M	SiCL	
3-6	10YR 5/1	95	7.5YR 5/8	5	C	M	SiCL	silty clay loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✔ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)** Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: compaction

Depth (inches): 6"

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Roxana BOP City/County: Letcher Sampling Date: 10/11/2023

Applicant/Owner: Federal Bureau of Prisons (BOP) State: KY Sampling Point: WET023

Investigator(s): MD/CH Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Plateau Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR or MLRA): LRR N Lat: 37.0993665 Long: 82.9511288 Datum: NAD83

Soil Map Unit Name: Cloverlick-Kimper-Highsplint complex, 30 to 65 percent slopes, very stony (CkF) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil ✔, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No _____	**Is the Sampled Area within a Wetland?** **Yes** ✔ **No** _____
Hydric Soil Present?	Yes ✔	No _____	
Wetland Hydrology Present?	Yes ✔	No _____	

Remarks:

Soil is significantly compacted from mining. PEM

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ✔ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ✔ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ✔ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No ✔	Depth (inches): _____
Water Table Present?	Yes _____	No ✔	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✔	Depth (inches): _____

Wetland Hydrology Present? **Yes** ✔ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WET023

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: _____)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Cyperus strigosus	40	YES	FACW
2. Juncus effusus	25	YES	FACW
3. Setaria parviflora	20	YES	FAC
4. Persicaria hydropiper	10	NO	OBL
5. Scirpus cyperinus	5	NO	FACW
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	100 = Total Cover		

Woody Vine Stratum (Plot size: _____)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	0 (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✔ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✔ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WET023

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 5/2	97	10YR 5/4	3	C	M	SiCL	organic matter
1-3	10YR 6/1	85	7.5YR 5/8	15	C	M	SiCL	
3-6	10YR 5/1	95	7.5YR 5/8	5	C	M	SiCL	silty clay loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
  2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✔ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
  Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: compaction

Depth (inches): 6"

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Roxana BOP City/County: Letcher Sampling Date: 10/11/2023

Applicant/Owner: Federal Bureau of Prisons (BOP) State: KY Sampling Point: WET024

Investigator(s): MD/CH Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Plateau Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR or MLRA): LRR N Lat: 37.0998212 Long: 82.9509868 Datum: NAD83

Soil Map Unit Name: Shelocta-Highsplint-Gilpin complex, 20 to 70 percent slopes, very stony (uShgf) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil ✔, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No _____	**Is the Sampled Area within a Wetland?** **Yes** ✔ **No** _____
Hydric Soil Present?	Yes ✔	No _____	
Wetland Hydrology Present?	Yes ✔	No _____	

Remarks:

Soil is significantly compacted from mining. PEM.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ✔ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ✔ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ✔ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No ✔	Depth (inches): _____
Water Table Present?	Yes _____	No ✔	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✔	Depth (inches): _____

Wetland Hydrology Present? **Yes** ✔ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WET024

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: _____)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Cyperus strigosus	40	YES	FACW
2. Juncus effusus	25	YES	FACW
3. Setaria parviflora	20	YES	FAC
4. Persicaria hydropiper	10	NO	OBL
5. Scirpus cyperinus	5	NO	FACW
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	100 = Total Cover		

Woody Vine Stratum (Plot size: _____)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	0 (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✔ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✔ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WET024

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 5/2	97	10YR 5/4	3	C	M	SiCL	organic matter
1-3	10YR 6/1	85	7.5YR 5/8	15	C	M	SiCL	
3-6	10YR 5/1	95	7.5YR 5/8	5	C	M	SiCL	silty clay loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✔ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)** Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: compaction

Depth (inches): 6"

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Roxana BOP City/County: Letcher Sampling Date: 10/11/2023

Applicant/Owner: Federal Bureau of Prisons (BOP) State: KY Sampling Point: WET025

Investigator(s): MD/CH Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Plateau Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR or MLRA): LRR N Lat: 37.0998541 Long: 82.9513074 Datum: NAD83

Soil Map Unit Name: Shelocta-Highsplint-Gilpin complex, 20 to 70 percent slopes, very stony (uShgf) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil ✔, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No _____	**Is the Sampled Area within a Wetland?** **Yes** ✔ **No** _____
Hydric Soil Present?	Yes ✔	No _____	
Wetland Hydrology Present?	Yes ✔	No _____	

Remarks:

Soil is significantly compacted from mining. PEM.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ✔ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ✔ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ✔ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No ✔	Depth (inches): _____
Water Table Present?	Yes _____	No ✔	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✔	Depth (inches): _____

Wetland Hydrology Present? **Yes** ✔ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WET025

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: _____)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Cyperus strigosus	40	YES	FACW
2. Juncus effusus	25	YES	FACW
3. Setaria parviflora	20	YES	FAC
4. Persicaria hydropiper	10	NO	OBL
5. Scirpus cyperinus	5	NO	FACW
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	100 = Total Cover		

Woody Vine Stratum (Plot size: _____)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	0 (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✔ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✔ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WET025

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 5/2	97	10YR 5/4	3	C	M	SiCL	organic matter
1-3	10YR 6/1	85	7.5YR 5/8	15	C	M	SiCL	
3-6	10YR 5/1	95	7.5YR 5/8	5	C	M	SiCL	silty clay loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✔ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)** Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: compaction

Depth (inches): 6"

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Roxana BOP City/County: Letcher Sampling Date: 10/11/2023

Applicant/Owner: Federal Bureau of Prisons (BOP) State: KY Sampling Point: WET026

Investigator(s): MD/CH Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Plateau Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR or MLRA): LRR N Lat: 37.1003534 Long: 82.9510504 Datum: NAD83

Soil Map Unit Name: Shelocta-Highsplint-Gilpin complex, 20 to 70 percent slopes, very stony (uShgf) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil ✔, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No _____	**Is the Sampled Area within a Wetland?** **Yes** ✔ **No** _____
Hydric Soil Present?	Yes ✔	No _____	
Wetland Hydrology Present?	Yes ✔	No _____	

Remarks:

Soil is significantly compacted from mining. PEM

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ✔ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ✔ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ✔ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No ✔	Depth (inches): _____
Water Table Present?	Yes _____	No ✔	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✔	Depth (inches): _____

Wetland Hydrology Present? **Yes** ✔ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WET026

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: _____)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Cyperus strigosus	40	YES	FACW
2. Juncus effusus	25	YES	FACW
3. Setaria parviflora	20	YES	FAC
4. Persicaria hydropiper	10	NO	OBL
5. Scirpus cyperinus	5	NO	FACW
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	100 = Total Cover		

Woody Vine Stratum (Plot size: _____)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	0 (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✔ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✔ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WET026

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 5/2	97	10YR 5/4	3	C	M	SiCL	organic matter
1-3	10YR 6/1	85	7.5YR 5/8	15	C	M	SiCL	
3-6	10YR 5/1	95	7.5YR 5/8	5	C	M	SiCL	silty clay loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
  2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✔ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
  Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: compaction

Depth (inches): 6"

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Roxana BOP City/County: Letcher Sampling Date: 10/11/2023

Applicant/Owner: Federal Bureau of Prisons (BOP) State: KY Sampling Point: WET027

Investigator(s): MD/CH Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Plateau Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR or MLRA): LRR N Lat: 37.1002310 Long: 82.9523961 Datum: NAD83

Soil Map Unit Name: Kaymine, Fairpoint, and Fiveblock soils, benched, 2 to 70 percent slopes, very stony (KfF) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil ✔, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No _____	**Is the Sampled Area within a Wetland?** **Yes** ✔ **No** _____
Hydric Soil Present?	Yes ✔	No _____	
Wetland Hydrology Present?	Yes ✔	No _____	

Remarks:

Soil is significantly compacted from mining. PEM

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ✔ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ✔ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ✔ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No ✔	Depth (inches): _____
Water Table Present?	Yes _____	No ✔	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✔	Depth (inches): _____

Wetland Hydrology Present? **Yes** ✔ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WET027

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: _____)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Cyperus strigosus	40	YES	FACW
2. Juncus effusus	25	YES	FACW
3. Setaria parviflora	20	YES	FAC
4. Persicaria hydropiper	10	NO	OBL
5. Scirpus cyperinus	5	NO	FACW
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	100 = Total Cover		

Woody Vine Stratum (Plot size: _____)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	0 (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✔ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✔ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WET027

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 5/2	97	10YR 5/4	3	C	M	SiCL	organic matter
1-3	10YR 6/1	85	7.5YR 5/8	15	C	M	SiCL	
3-6	10YR 5/1	95	7.5YR 5/8	5	C	M	SiCL	silty clay loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
  2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✔ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
  Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: compaction

Depth (inches): 6"

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Roxana BOP City/County: Letcher Sampling Date: 10/11/2023

Applicant/Owner: Federal Bureau of Prisons (BOP) State: KY Sampling Point: WET028

Investigator(s): MD/CH Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Plateau Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR or MLRA): LRR N Lat: 37.1006801 Long: 82.9514826 Datum: NAD83

Soil Map Unit Name: Kaymine, Fairpoint, and Fiveblock soils, benched, 2 to 70 percent slopes, very stony (KfF) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil ✔, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No _____	**Is the Sampled Area within a Wetland?** **Yes** ✔ **No** _____
Hydric Soil Present?	Yes ✔	No _____	
Wetland Hydrology Present?	Yes ✔	No _____	

Remarks:

Soil is significantly compacted from mining. PEM

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ✔ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ✔ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ✔ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No ✔	Depth (inches): _____
Water Table Present?	Yes _____	No ✔	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✔	Depth (inches): _____

Wetland Hydrology Present? **Yes** ✔ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WET028

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: _____)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Cyperus strigosus	40	YES	FACW
2. Juncus effusus	25	YES	FACW
3. Setaria parviflora	20	YES	FAC
4. Persicaria hydropiper	10	NO	OBL
5. Scirpus cyperinus	5	NO	FACW
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	100 = Total Cover		

Woody Vine Stratum (Plot size: _____)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	0 (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✔ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✔ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WET028

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 5/2	97	10YR 5/4	3	C	M	SiCL	organic matter
1-3	10YR 6/1	85	7.5YR 5/8	15	C	M	SiCL	
3-6	10YR 5/1	95	7.5YR 5/8	5	C	M	SiCL	silty clay loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✔ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)** Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: compaction

Depth (inches): 6"

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Roxana BOP City/County: Letcher Sampling Date: 10/11/2023

Applicant/Owner: Federal Bureau of Prisons (BOP) State: KY Sampling Point: WET029

Investigator(s): MD/CH Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Plateau Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR or MLRA): LRR N Lat: 37.1008073 Long: 82.9527046 Datum: NAD83

Soil Map Unit Name: Dekalb-Gilpin-Rayne complex, 25 to 65 percent slopes, very rocky (DrF) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil ✔, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No _____	**Is the Sampled Area within a Wetland?** **Yes** ✔ **No** _____
Hydric Soil Present?	Yes ✔	No _____	
Wetland Hydrology Present?	Yes ✔	No _____	

Remarks:

Soil is significantly compacted from mining. PEM

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ✔ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ✔ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ✔ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No ✔	Depth (inches): _____
Water Table Present?	Yes _____	No ✔	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✔	Depth (inches): _____

Wetland Hydrology Present? **Yes** ✔ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WET029

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: _____)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Cyperus strigosus	40	YES	FACW
2. Juncus effusus	25	YES	FACW
3. Setaria parviflora	20	YES	FAC
4. Persicaria hydropiper	10	NO	OBL
5. Scirpus cyperinus	5	NO	FACW
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	100 = Total Cover		

Woody Vine Stratum (Plot size: _____)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	0 (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✔ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✔ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WET029

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 5/2	97	10YR 5/4	3	C	M	SiCL	organic matter
1-3	10YR 6/1	85	7.5YR 5/8	15	C	M	SiCL	
3-6	10YR 5/1	95	7.5YR 5/8	5	C	M	SiCL	silty clay loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✔ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)** Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: compaction

Depth (inches): 6"

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Roxana BOP City/County: Letcher Sampling Date: 09/12/2023

Applicant/Owner: Federal Bureau of Prisons (BOP) State: KY Sampling Point: WET030

Investigator(s): MD/SH Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): 2-3

Subregion (LRR or MLRA): LRR N Lat: 37.104661 Long: 82.952616 Datum: NAD83

Soil Map Unit Name: Fiveblock and Kaymine soils, 0-30 percent slopes, stony (FkE) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation ✔, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No _____	**Is the Sampled Area within a Wetland?** **Yes** ✔ **No** _____
Hydric Soil Present?	Yes ✔	No _____	
Wetland Hydrology Present?	Yes ✔	No _____	

Remarks:

Recently mowed. All herbaceous stratum vegetation producing flowers. PEM.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ✔ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ✔ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ✔ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No ✔	Depth (inches): _____
Water Table Present?	Yes _____	No ✔	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✔	Depth (inches): _____

Wetland Hydrology Present? **Yes** ✔ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No water table in the pit. Recently rained within the last few hours.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WET030

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: _____)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
	0 = Total Cover		

Herb Stratum (Plot size: 12' x 8')			
1. Kyllinga brevifolia	60	YES	FACW
2. Cyperus strigosus	25	YES	FACW
3. Trifolium pratense	10	NO	FACU
4. Setaria parviflora	5	NO	FAC
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	100 = Total Cover		

Woody Vine Stratum (Plot size: _____)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	0 (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✔ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✔ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

All vegetation recently mowed but all vegetation has flowers.

SOIL

Sampling Point: WET030

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	2.5YR 4/1	95	7.5YR 5/6	5	C	PL	SiCL	silty clay loam
4-6	2.5YR 4/1	80	10YR 5/6	20	C	PL	SiCL	
6-18+	2.5YR 6/2	70	10YR 6/6	25	C	PL	CL	clay loam
			7.5YR 5/8	5	C	PL		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
  2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✔ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
  Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Roxana BOP City/County: Letcher Sampling Date: 09/12/2023

Applicant/Owner: Federal Bureau of Prisons (BOP) State: KY Sampling Point: WET031

Investigator(s): MD/SH Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): 2-3

Subregion (LRR or MLRA): LRR N Lat: 37.1065469 Long: 82.9548003 Datum: NAD83

Soil Map Unit Name: Fiveblock and Kaymine soils, 0-30 percent slopes, stony (FkE) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation ✔, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No _____	**Is the Sampled Area within a Wetland?** **Yes** ✔ **No** _____
Hydric Soil Present?	Yes ✔	No _____	
Wetland Hydrology Present?	Yes ✔	No _____	

Remarks:

Recently mowed. All herbaceous stratum vegetation producing flowers. PEM.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ✔ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ✔ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ✔ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No ✔	Depth (inches): _____
Water Table Present?	Yes _____	No ✔	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✔	Depth (inches): _____

Wetland Hydrology Present? **Yes** ✔ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No water table in the pit. Recently rained within the last few hours.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WET031

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: _____)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
	0 = Total Cover		

Herb Stratum (Plot size: 12' x 8')			
1. Persicaria hydropiper	45	YES	OBL
2. Juncus bufonius	30	YES	FACW
3. Cyperus strigosus	15	NO	FACW
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	90 = Total Cover		

Woody Vine Stratum (Plot size: _____)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	0 (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✔ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✔ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

All vegetation recently mowed but all vegetation has flowers.

SOIL

Sampling Point: WET031

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	2.5YR 4/1	95	7.5YR 5/6	5	C	PL	SiCL	silty clay loam
4-6	2.5YR 4/1	80	10YR 5/6	20	C	PL	SiCL	
6-18+	2.5YR 6/2	70	10YR 6/6	25	C	PL	CL	clay loam
			7.5YR 5/8	5	C	PL		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
  2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✔ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
  Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Roxana BOP City/County: Letcher Sampling Date: 10/11/2023

Applicant/Owner: Federal Bureau of Prisons (BOP) State: KY Sampling Point: WET032

Investigator(s): MD/CH Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): 10

Subregion (LRR or MLRA): LRR N Lat: 37.1030562 Long: 82.9600401 Datum: NAD83

Soil Map Unit Name: Shelocta-Highsplint-Gilpin complex, 20 to 70 percent slopes, very stony (uShgF) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No _____	**Is the Sampled Area within a Wetland?** **Yes** ✔ **No** _____
Hydric Soil Present?	Yes ✔	No _____	
Wetland Hydrology Present?	Yes ✔	No _____	

Remarks:

Mountainside wetland forested seep. PFO

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✔ Surface Water (A1)
- ✔ High Water Table (A2)
- ✔ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ✔	No _____	Depth (inches): 1
Water Table Present?	Yes ✔	No _____	Depth (inches): 4
Saturation Present? (includes capillary fringe)	Yes ✔	No _____	Depth (inches): 0

Wetland Hydrology Present? **Yes** ✔ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WET032

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Ulmus rubra	40	YES	FAC
2. Magnolia tripetala	10	YES	FACU
3. Fagus grandifolia	5	NO	FACU
4. Liriodendron tulipifera	5	NO	FACU
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	60	= Total Cover	

Sapling/Shrub Stratum (Plot size: 30')			
1. Lindera benzoin	20	YES	FAC
2. Elaeagnus angustifolia	5	YES	FACU
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
	25	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Microstegium vimineum	10	YES	FAC
2. Adiantum L.	10	YES	FAC
3. Juncus effusus	5	YES	FACW
4. Polystichum acrostichoides	2	NO	FACU
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	27	= Total Cover	

Woody Vine Stratum (Plot size:)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 57 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✔ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✔ No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WET032

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 4/2	100					CL	clay loam
2-6	2.5YR 5/1	98	10YR 4/6	2	C	M	CL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✔ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)** Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: bedrock/rock

Depth (inches): 6"

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Roxana BOP City/County: Letcher Sampling Date: 10/11/2023

Applicant/Owner: Federal Bureau of Prisons (BOP) State: KY Sampling Point: WET033

Investigator(s): MD/CH Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Depressional Local relief (concave, convex, none): Concave Slope (%): 10

Subregion (LRR or MLRA): LRR N Lat: 37.1030562 Long: 82.9600401 Datum: NAD83

Soil Map Unit Name: Gilpin-Shelocta complex, 12 to 25 percent slopes (GID) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No _____	**Is the Sampled Area within a Wetland?** **Yes** ✔ **No** _____
Hydric Soil Present?	Yes ✔	No _____	
Wetland Hydrology Present?	Yes ✔	No _____	

Remarks:

PFO

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ✔ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✔ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ✔ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No ✔	Depth (inches): _____
Water Table Present?	Yes _____	No ✔	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✔	Depth (inches): _____

Wetland Hydrology Present? **Yes** ✔ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WET033

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Ulmus rubra	30	YES	FAC
2. Platanus occidentalis	30	YES	FACW
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	60	= Total Cover	

Sapling/Shrub Stratum (Plot size: 30')			
1. Lindera benzoin	40	YES	FAC
2. Ulmus rubra	20	YES	FAC
3. Rosa multiflora	20	YES	FACU
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
	80	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Microstegium vimineum	30	YES	FAC
2. Pilea pumila	20	YES	FACW
3. Persicaria virginiana	10	NO	FAC
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	60	= Total Cover	

Woody Vine Stratum (Plot size:)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 86 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✔ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✔ No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WET033

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 5/1	80	10YR 5/8	20	C	M	SiCL	
3-10	10YR 5/1	70	10YR 5/8	30	C	M	SiCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✔ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)** Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: bedrock/rock

Depth (inches): 10"

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Roxana BOP City/County: Letcher Sampling Date: 10/11/2023

Applicant/Owner: Federal Bureau of Prisons (BOP) State: KY Sampling Point: WET034

Investigator(s): MD/CH Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): 10

Subregion (LRR or MLRA): LRR N Lat: 37.1108885 Long: 82.9577092 Datum: NAD83

Soil Map Unit Name: Shelocta-Highsplint-Gilpin complex, 20 to 70 percent slopes, very stony (uShgF) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No _____	**Is the Sampled Area within a Wetland?** **Yes** ✔ **No** _____
Hydric Soil Present?	Yes ✔	No _____	
Wetland Hydrology Present?	Yes ✔	No _____	

Remarks:

Mountainside wetland forested seep. PFO

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✔ Surface Water (A1)
- ✔ High Water Table (A2)
- ✔ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ✔	No _____	Depth (inches): 1
Water Table Present?	Yes ✔	No _____	Depth (inches): 4
Saturation Present? (includes capillary fringe)	Yes ✔	No _____	Depth (inches): 0

Wetland Hydrology Present? **Yes** ✔ **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WET034

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Ulmus rubra	40	YES	FAC
2. Magnolia tripetala	10	YES	FACU
3. Fagus grandifolia	5	NO	FACU
4. Liriodendron tulipifera	5	NO	FACU
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	60	= Total Cover	

Sapling/Shrub Stratum (Plot size: 30')			
1. Lindera benzoin	20	YES	FAC
2. Elaeagnus angustifolia	5	YES	FACU
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
	25	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Microstegium vimineum	10	YES	FAC
2. Adiantum pedatum	10	YES	FAC
3. Juncus effusus	5	YES	FACW
4. Polystichum acrostichoides	2	NO	FACU
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	27	= Total Cover	

Woody Vine Stratum (Plot size:)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 57 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✔ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✔ No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WET034

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 4/2	100					CL	clay loam
2-6	2.5YR 5/1	98	10YR 4/6	2	C	M	CL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ✔ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)** Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: bedrock/rock

Depth (inches): 6"

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Roxana City/County: Letcher Co. Sampling Date: 9/13/23
Applicant/Owner: EBOP State: KY Sampling Point: WET 100
Investigator(s): Phil Perhamus, Lisa Thompson Section, Township, Range: _____
Landform (hillslope, terrace, etc.): Pond Local relief (concave, convex, none): Concave Slope (%): _____
Subregion (LRR or MLRA): LRR N Lat: 37.10332 Long: -82.94795 Datum: NAD83
Soil Map Unit Name: _____ NWI classification: _____
Are climatic / hydrologic conditions on the site typical for this time of year? Yes [✓] No [ ] (If no, explain in Remarks.)
Are Vegetation [ ] Soil [ ], or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes [✓] No [ ]
Are Vegetation [ ] Soil [ ], or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes [✓]	No [ ]	**Is the Sampled Area within a Wetland?** Yes [✓] No [ ]
Hydric Soil Present?	Yes [✓]	No [ ]	
Wetland Hydrology Present?	Yes [✓]	No [ ]	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- [ ] Surface Water (A1)
- [✓] High Water Table (A2)
- [✓] Saturation (A3)
- [ ] Water Marks (B1)
- [ ] Sediment Deposits (B2)
- [ ] Drift Deposits (B3)
- [ ] Algal Mat or Crust (B4)
- [ ] Iron Deposits (B5)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Water-Stained Leaves (B9)
- [ ] Aquatic Fauna (B13)
- [ ] True Aquatic Plants (B14)
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres on Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Tilled Soils (C6)
- [ ] Thin Muck Surface (C7)
- [ ] Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- [ ] Surface Soil Cracks (B6)
- [ ] Sparsely Vegetated Concave Surface (B8)
- [ ] Drainage Patterns (B10)
- [ ] Moss Trim Lines (B16)
- [ ] Dry-Season Water Table (C2)
- [ ] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [ ] Stunted or Stressed Plants (D1)
- [✓] Geomorphic Position (D2)
- [ ] Shallow Aquitard (D3)
- [ ] Microtopographic Relief (D4)
- [ ] FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes [✓]	No [ ]	Depth (inches): Pond
Water Table Present?	Yes [✓]	No [ ]	Depth (inches): 3
Saturation Present? (includes capillary fringe)	Yes [✓]	No [ ]	Depth (inches): 0

Wetland Hydrology Present? Yes [✓] No [ ]

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: WET 100

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. NA			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Sapling Stratum (Plot size: 15')			
1. NA Acer negundo	15	Y	FAC
2.			
3.			
4.			
5.			
6.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Shrub Stratum (Plot size: 15')			
1. Elaeagnus umbellata	25	Y	UPL
2. Lindera benzoin	20	Y	FAC
3. ~~Acer negun~~			
4.			
5.			
6.			
	45 = Total Cover		

50% of total cover: 22.5 20% of total cover: 9

Herb Stratum (Plot size: 10')			
1. Microstegium vimineum	90	Y	FAC
2. Impatiens capensis	20	N	FACW
3. Persicaria longiseta	10	N	FAC
4. Pilea pumila	8	N	FACW
5. Bidens frondosa	2	N	FACW
6. Tiarella cordifolia	1	N	FAC
7.			
8.			
9.			
10.			
11.			
	130 = Total Cover		

50% of total cover: 65 20% of total cover: 26

Woody Vine Stratum (Plot size: 30')			
1. NA			
2.			
3.			
4.			
5.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- [ ] 1 - Rapid Test for Hydrophytic Vegetation
- [x] 2 - Dominance Test is >50%
- [ ] 3 - Prevalence Index is ≤3.0[1]
- [ ] 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes [x] No [ ]

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WETI00

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-1	2.5Y 2.5/1	100					Mucky silt	Saturated
1-12	2.5Y 3/1	100					Loamy med sand	Saturated
12-22	2.5Y 4/1	100					Loamy med sand	5% angular gravel Saturated

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10) **(LRR N)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☑ Dark Surface (S7)
- ☐ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ☐ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ☐ Umbric Surface (F13) **(MLRA 136, 122)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ☐ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) **(MLRA 147)**
- ☐ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☑ No ☐

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Roxma City/County: Letcher Co. Sampling Date: 9/13/23
Applicant/Owner: FBOP State: KY Sampling Point: WETI01
Investigator(s): Phil Perhamus, Lisa Thompson Section, Township, Range: _____
Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope (%): _____
Subregion (LRR or MLRA): LRR N Lat: No GPS signal Long: No GPS signal Datum: _____
Soil Map Unit Name: _____ NWI classification: _____
Are climatic / hydrologic conditions on the site typical for this time of year? Yes [✓] No [ ] (If no, explain in Remarks.)
Are Vegetation [ ], Soil [ ], or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes [✓] No [ ]
Are Vegetation [ ], Soil [ ], or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes [✓]	No [ ]	**Is the Sampled Area within a Wetland?** Yes [✓] No [ ]
Hydric Soil Present?	Yes [✓]	No [ ]	
Wetland Hydrology Present?	Yes [✓]	No [ ]	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- [ ] Surface Water (A1)
- [ ] High Water Table (A2)
- [✓] Saturation (A3)
- [ ] Water Marks (B1)
- [ ] Sediment Deposits (B2)
- [ ] Drift Deposits (B3)
- [ ] Algal Mat or Crust (B4)
- [ ] Iron Deposits (B5)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Water-Stained Leaves (B9)
- [ ] Aquatic Fauna (B13)
- [ ] True Aquatic Plants (B14)
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres on Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Tilled Soils (C6)
- [ ] Thin Muck Surface (C7)
- [ ] Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- [ ] Surface Soil Cracks (B6)
- [ ] Sparsely Vegetated Concave Surface (B8)
- [ ] Drainage Patterns (B10)
- [ ] Moss Trim Lines (B16)
- [ ] Dry-Season Water Table (C2)
- [ ] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [ ] Stunted or Stressed Plants (D1)
- [✓] Geomorphic Position (D2)
- [ ] Shallow Aquitard (D3)
- [ ] Microtopographic Relief (D4)
- [ ] FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes [ ]	No [✓]	Depth (inches): _____
Water Table Present?	Yes [ ]	No [✓]	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes [✓]	No [ ]	Depth (inches): 0

Wetland Hydrology Present? Yes [✓] No [ ]

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: WET101

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. NA			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Sapling Stratum (Plot size: 15')			
1. Liriodendron tulipifera	30	Y	FACU
2.			
3.			
4.			
5.			
6.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Shrub Stratum (Plot size: 15')			
1. NA			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: 10')			
1. Impatiens capensis	80	Y	FACW
2. Microstegium vimineum	25	N	FAC
3. Juncus effusus	20	N	FACW
4. Boehmeria cylindrica	10	N	FACW
5. Tussilago farfara	3	N	FACU
6.			
7.			
8.			
9.			
10.			
11.			
	138 = Total Cover		

50% of total cover: 69 20% of total cover: 27.6

Woody Vine Stratum (Plot size: 30')			
1. NA			
2.			
3.			
4.			
5.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks: (Include photo numbers here or on a separate sheet.)

Although dominance test is 50% exactly, professional judgment exercised to indicate hydrophytic vegetation.

SOIL

Sampling Point: WET101

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 4/2	97	7.5YR 4/6	3	C	M	Silty clay loam	Saturated
4-6	10YR 4/3	95	7.5YR 4/6	5	C	M	Silt loam	Saturated

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10) **(LRR N)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7)
- ☐ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ☐ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ☐ Umbric Surface (F13) **(MLRA 136, 122)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ☐ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) **(MLRA 147)**
- ☐ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rock

Depth (inches): 6

Hydric Soil Present? Yes ☑ No ☐

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Roxana City/County: Letcher Co. Sampling Date: 9/13/23
Applicant/Owner: FBOP State: KY Sampling Point: WET102
Investigator(s): Phil Pechamus, Lisa Thompson Section, Township, Range: _____
Landform (hillslope, terrace, etc.): Valley Local relief (concave, convex, none): Concave Slope (%): _____
Subregion (LRR or MLRA): LRR N Lat: 37.10147 Long: -82.94705 Datum: NAD 83
Soil Map Unit Name: _____ NWI classification: _____
Are climatic / hydrologic conditions on the site typical for this time of year? Yes [✓] No [ ] (If no, explain in Remarks.)
Are Vegetation [ ] Soil [ ], or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes [✓] No [ ]
Are Vegetation [ ] Soil [ ], or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes [ ]	No [ ]	**Is the Sampled Area within a Wetland?** Yes [ ] No [ ]
Hydric Soil Present?	Yes [ ]	No [ ]	
Wetland Hydrology Present?	Yes [ ]	No [ ]	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- [ ] Surface Water (A1)
- [ ] High Water Table (A2)
- [✓] Saturation (A3)
- [ ] Water Marks (B1)
- [ ] Sediment Deposits (B2)
- [ ] Drift Deposits (B3)
- [ ] Algal Mat or Crust (B4)
- [ ] Iron Deposits (B5)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Water-Stained Leaves (B9)
- [ ] Aquatic Fauna (B13)
- [ ] True Aquatic Plants (B14)
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres on Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Tilled Soils (C6)
- [ ] Thin Muck Surface (C7)
- [ ] Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- [ ] Surface Soil Cracks (B6)
- [ ] Sparsely Vegetated Concave Surface (B8)
- [ ] Drainage Patterns (B10)
- [ ] Moss Trim Lines (B16)
- [ ] Dry-Season Water Table (C2)
- [ ] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [ ] Stunted or Stressed Plants (D1)
- [✓] Geomorphic Position (D2)
- [ ] Shallow Aquitard (D3)
- [ ] Microtopographic Relief (D4)
- [ ] FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes [ ]	No [✓]	Depth (inches): _____
Water Table Present?	Yes [ ]	No [✓]	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes [✓]	No [ ]	Depth (inches): 0

Wetland Hydrology Present? Yes [✓] No [ ]

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: WET102

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. NA			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Sapling Stratum (Plot size: 15')			
1. Platanus occidentalis	5	Y	FACW
2. Fraxinus americana	2	Y	FACU
3.			
4.			
5.			
6.			
	7 = Total Cover		

50% of total cover: 3.5 20% of total cover: 1.4

Shrub Stratum (Plot size: 15')			
1. NA			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: 10')			
1. Impatiens capensis	90	Y	FACW
2. Scirpus atrovirens	75	Y	OBL
3. Rumex obtusifolius	35	N	FACU
4. Solidago canadensis	10	N	FACU
5. Lycopus sp.	8	N	OBL
6. Pilea pumila	5	N	FACW
7. Microstegium vimineum	2	N	FAC
8. Persicaria longiseta	1	N	FAC
9.			
10.			
11.			
	226 = Total Cover		

50% of total cover: 113 20% of total cover: 45.2

Woody Vine Stratum (Plot size: ~~15~~ 30')			
1. NA			
2.			
3.			
4.			
5.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	_____	x 1 = _____
FACW species	_____	x 2 = _____
FAC species	_____	x 3 = _____
FACU species	_____	x 4 = _____
UPL species	_____	x 5 = _____
Column Totals:	_____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- [ ] 1 - Rapid Test for Hydrophytic Vegetation
- [x] 2 - Dominance Test is >50%
- [ ] 3 - Prevalence Index is ≤3.0[1]
- [ ] 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes [✓] No [ ]

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WET102

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-35	5Y 3/1	100					Silty muck	Saturated

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- [x] Histosol (A1)
- [ ] Histic Epipedon (A2)
- [ ] Black Histic (A3)
- [ ] Hydrogen Sulfide (A4)
- [ ] Stratified Layers (A5)
- [ ] 2 cm Muck (A10) **(LRR N)**
- [ ] Depleted Below Dark Surface (A11)
- [ ] Thick Dark Surface (A12)
- [ ] Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- [ ] Sandy Gleyed Matrix (S4)
- [ ] Sandy Redox (S5)
- [ ] Stripped Matrix (S6)
- [ ] Dark Surface (S7)
- [ ] Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- [ ] Thin Dark Surface (S9) **(MLRA 147, 148)**
- [ ] Loamy Gleyed Matrix (F2)
- [ ] Depleted Matrix (F3)
- [ ] Redox Dark Surface (F6)
- [ ] Depleted Dark Surface (F7)
- [ ] Redox Depressions (F8)
- [ ] Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- [ ] Umbric Surface (F13) **(MLRA 136, 122)**
- [ ] Piedmont Floodplain Soils (F19) **(MLRA 148)**
- [ ] Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- [ ] 2 cm Muck (A10) **(MLRA 147)**
- [ ] Coast Prairie Redox (A16) **(MLRA 147, 148)**
- [ ] Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- [ ] Very Shallow Dark Surface (TF12)
- [ ] Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes [x] No [ ]

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Roxana City/County: Letcher Co. Sampling Date: 9/14/23
Applicant/Owner: FBOP State: KY Sampling Point: WET 103
Investigator(s): Phil Perhamus, Lisa Thompson Section, Township, Range: _____
Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____
Subregion (LRR or MLRA): LRR N Lat: _____ Long: _____ Datum: _____
Soil Map Unit Name: _____ NWI classification: _____
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐ Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐
Are Vegetation ☐ Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☑	No ☐	**Is the Sampled Area within a Wetland?** Yes ☑ No ☐
Hydric Soil Present?	Yes ☑	No ☐	
Wetland Hydrology Present?	Yes ☑	No ☐	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☑ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☑	No ☐	Depth (inches): 1
Water Table Present?	Yes ☐	No ☑	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes ☑	No ☐	Depth (inches): 0

Wetland Hydrology Present? Yes ☑ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: WET103

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. NA			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Sapling Stratum (Plot size: 15')			
1. Salix nigra	10	Y	OBL
2.			
3.			
4.			
5.			
6.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Shrub Stratum (Plot size: 15')			
1. NA			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: 10')			
1. Typha angustifolia	100	Y	OBL
2. Persicaria punctata	40	Y	OBL
3. Salix nigra	8	N	OBL
4. Boehmeria cylindrica	3	N	FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	151 = Total Cover		

50% of total cover: 75.5 20% of total cover: 30.2

Woody Vine Stratum (Plot size: 30')			
1. NA			
2.			
3.			
4.			
5.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	_____	x 1 = _____
FACW species	_____	x 2 = _____
FAC species	_____	x 3 = _____
FACU species	_____	x 4 = _____
UPL species	_____	x 5 = _____
Column Totals:	_____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: WET103

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-8	5Y 5/1	90	7.5YR 4/6	10	C	M	Clay	saturated
8-14	5Y 5/2	80	7.5YR 4/6	20	C	M	Loamy clay	saturated

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10) **(LRR N)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7)
- ☐ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ☐ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ☐ Umbric Surface (F13) **(MLRA 136, 122)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ☐ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) **(MLRA 147)**
- ☐ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☑ No ☐

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Roxana City/County: Letcher Co. Sampling Date: 9/14/23
Applicant/Owner: FBOP State: KY Sampling Point: WET104
Investigator(s): Phil Pothamus, Lisa Thompson Section, Township, Range: _____
Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): _____
Subregion (LRR or MLRA): LRR N Lat: 37.10419 Long: -82.95924 Datum: NAD83
Soil Map Unit Name: _____ NWI classification: _____
Are climatic / hydrologic conditions on the site typical for this time of year? Yes [✓] No [ ] (If no, explain in Remarks.)
Are Vegetation [ ] Soil [ ], or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes [✓] No [ ]
Are Vegetation [ ] Soil [ ], or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes [✓]	No [ ]	**Is the Sampled Area within a Wetland?** Yes [✓] No [ ]
Hydric Soil Present?	Yes [✓]	No [ ]	
Wetland Hydrology Present?	Yes [✓]	No [ ]	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- [ ] Surface Water (A1)
- [ ] High Water Table (A2)
- [✓] Saturation (A3)
- [ ] Water Marks (B1)
- [ ] Sediment Deposits (B2)
- [ ] Drift Deposits (B3)
- [ ] Algal Mat or Crust (B4)
- [ ] Iron Deposits (B5)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Water-Stained Leaves (B9)
- [ ] Aquatic Fauna (B13)
- [ ] True Aquatic Plants (B14)
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres on Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Tilled Soils (C6)
- [ ] Thin Muck Surface (C7)
- [ ] Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- [ ] Surface Soil Cracks (B6)
- [ ] Sparsely Vegetated Concave Surface (B8)
- [ ] Drainage Patterns (B10)
- [ ] Moss Trim Lines (B16)
- [ ] Dry-Season Water Table (C2)
- [ ] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [ ] Stunted or Stressed Plants (D1)
- [✓] Geomorphic Position (D2)
- [ ] Shallow Aquitard (D3)
- [ ] Microtopographic Relief (D4)
- [ ] FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes [ ]	No [✓]	Depth (inches): _____
Water Table Present?	Yes [ ]	No [✓]	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes [✓]	No [ ]	Depth (inches): 0

Wetland Hydrology Present? Yes [✓] No [ ]

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: WET 104

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. NA			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Sapling Stratum (Plot size: 15')			
1. Liriodendron tulipifera	8	Y	FACW
2. Platanus occidentalis	5	Y	FACW
3.			
4.			
5.			
6.			
	13 = Total Cover		

50% of total cover: 6.5 20% of total cover: 2.6

Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: 10')			
1. Bidens frondosa	85	Y	FACW
2. Scirpus cyperinus	80	Y	FACW
3. Juncus effusus	10	N	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	175 = Total Cover		

50% of total cover: 87.5 20% of total cover: 35

Woody Vine Stratum (Plot size: 30')			
1. NA			
2.			
3.			
4.			
5.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- [ ] 1 - Rapid Test for Hydrophytic Vegetation
- [x] 2 - Dominance Test is >50%
- [ ] 3 - Prevalence Index is ≤3.0[1]
- [ ] 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes [x] No [ ]

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WET104

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-12	2.5Y 5/1	95	2.5Y 5/3	5	C	M	Silty clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10) **(LRR N)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7)
- ☐ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ☐ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ☐ Umbric Surface (F13) **(MLRA 136, 122)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ☐ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) **(MLRA 147)**
- ☐ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rock

Depth (inches): 12

Hydric Soil Present? Yes ☑ No ☐

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Roxana City/County: Letcher Co. Sampling Date: 9/14/23
Applicant/Owner: FBOP State: KY Sampling Point: WETL05
Investigator(s): Phil Perhamus, Lisa Thompson Section, Township, Range: _____
Landform (hillslope, terrace, etc.): Terrace sloped Local relief (concave, convex, none): sloped Slope (%): _____
Subregion (LRR or MLRA): LRR N Lat: _____ Long: _____ Datum: _____
Soil Map Unit Name: _____ NWI classification: _____
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐ Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐
Are Vegetation ☐ Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☑	No ☐	**Is the Sampled Area within a Wetland?** Yes ☑ No ☐
Hydric Soil Present?	Yes ☑	No ☐	
Wetland Hydrology Present?	Yes ☑	No ☐	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☐	No ☑	Depth (inches): _____
Water Table Present?	Yes ☐	No ☑	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes ☑	No ☐	Depth (inches): 0

Wetland Hydrology Present? Yes ☑ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: WET105

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. NA			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Sapling Stratum (Plot size: 15')			
1. NA			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Shrub Stratum (Plot size: 15')			
1. NA			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: 10')			
1. Impatiens capensis	50	Y	FACW
2. Bidens frondosa	50	Y	FACW
3. Microstegium vimineum	30	N	FAC
4. Tussilago farfara	20	N	FACU
5. Onoclea sensibilis	20	N	FACW
6. Persicaria longiseta	15	N	FAC
7. Unknown sedge	10	N	NA
8.			
9.			
10.			
11.			
	195 = Total Cover		

50% of total cover: 97.5 20% of total cover: 39

Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	_____	x 1 = _____
FACW species	_____	x 2 = _____
FAC species	_____	x 3 = _____
FACU species	_____	x 4 = _____
UPL species	_____	x 5 = _____
Column Totals:	_____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WETL05

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-12	2.5Y 4/1	70	7.5YR 4/6	30	C	M	clay	Saturated
12-16	2.5Y 5/1	60	7.5YR 4/6	40	C	M	Silty clay loam	Saturated

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10) **(LRR N)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7)
- ☐ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ☐ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ☐ Umbric Surface (F13) **(MLRA 136, 122)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ☐ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) **(MLRA 147)**
- ☐ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☑ No ☐

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Roxana BOP City/County: Letcher Sampling Date: 09/12/2023

Applicant/Owner: Federal Bureau of Prisons (BOP) State: KY Sampling Point: UPL002

Investigator(s): MD/SH Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 0-2

Subregion (LRR or MLRA): LRR N Lat: 37.104661 Long: 82.952616 Datum: NAD83

Soil Map Unit Name: Cloverlick-Kimper-Highsplint complex, 30 to 65 percent slopes, very stony (CkF) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No _____	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** ✔
Hydric Soil Present?	Yes ✔	No _____	
Wetland Hydrology Present?	Yes _____	No ✔	

Remarks:

No WET002. Only UPL002. UPL

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ✔ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No ✔	Depth (inches): _____
Water Table Present?	Yes _____	No ✔	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✔	Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Hillslope with vegetation in the valley but no standing water.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: UPL002

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Platanus occidentalis	70	YES	FACW
2. Fagus grandifolia	30	YES	FACU
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	100 = Total Cover		

Sapling/Shrub Stratum (Plot size: 30')			
1. Platanus occidentalis	14	YES	FACW
2. Acer negundo	10	YES	FAC
3. Fagus grandifolia	6	YES	FACU
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
	30 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Impatiens capensis	50	YES	FACW
2. Microstegium vimineum	30	YES	FAC
3. Boehmeria cylindrica	20	YES	FACW
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	100 = Total Cover		

Woody Vine Stratum (Plot size:)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	0 (B)

Prevalence Index = B/A = 2.75

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✔ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✔ No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: UPL002

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/1	97	10YR 5/8	3	C	PL	SCL	Faint concentrations
6-18+	2.5YR 5/1	75	10YR 5/8	25	C	PL	SCL	sandy clay loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✔ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✔ **No** ___

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Roxana BOP City/County: Letcher Sampling Date: 09/12/2023

Applicant/Owner: Federal Bureau of Prisons (BOP) State: KY Sampling Point: UPL003/004

Investigator(s): MD/SH Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): 0

Subregion (LRR or MLRA): LRR N Lat: 37.1079611 Long: 82.9571770 Datum: NAD83

Soil Map Unit Name: Cloverlick-Kimper-Highsplint complex, 30 to 65 percent slopes, very stony (CkF) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No _____	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** ✔
Hydric Soil Present?	Yes _____	No ✔	
Wetland Hydrology Present?	Yes _____	No ✔	

Remarks:

UPL

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No _____	Depth (inches): _____
Water Table Present?	Yes _____	No _____	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No _____	Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: UPL003/004

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 10' x 20')			
1. Fagus grandifolia	15	YES	FACU
2. Fraxinus nigra	10	YES	FACW
3. Lindera benzoin	5	YES	FAC
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
	30 = Total Cover		

Herb Stratum (Plot size: 10' x 20')			
1. Microstegium vimineum	80	YES	FAC
2. Pilea pumila	10	NO	OBL
3. Polystichum acrostichoides	5	NO	FACU
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	95 = Total Cover		

Woody Vine Stratum (Plot size: _____)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	0 (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✔ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No ✔

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: UPL003/004

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 3/2	100					CL	clay loam
3-24+	2.5YR 5/2	80	10YR 5/8	20	C	PL	CL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
2 cm Muck (A10) **(LRR N)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)

___ Dark Surface (S7)
___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
___ Thin Dark Surface (S9) **(MLRA 147, 148)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
___ Umbric Surface (F13) **(MLRA 136, 122)**
___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(MLRA 147)**
___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✔

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Roxana BOP City/County: Letcher Sampling Date: 09/13/2023

Applicant/Owner: Federal Bureau of Prisons (BOP) State: KY Sampling Point: UPL007

Investigator(s): MD/SH Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 2-3

Subregion (LRR or MLRA): LRR N Lat: 37.0997459 Long: 82.9564613 Datum: NAD83

Soil Map Unit Name: Shelocta-Highsplint-Gilpin complex, 20 to 70 percent slopes, very stony (uShgF) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✔	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** ✔
Hydric Soil Present?	Yes _____	No ✔	
Wetland Hydrology Present?	Yes _____	No ✔	

Remarks:

UPL

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No _____	Depth (inches): _____
Water Table Present?	Yes _____	No _____	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No _____	Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: UPL007

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Liriodendron tulipifera	15	YES	FACU
2. Betula nigra	15	YES	FACW
3. Fagus grandifolia	15	YES	FACU
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	45	= Total Cover	

Sapling/Shrub Stratum (Plot size: 30')			
1. Fagus grandifolia	70	YES	FACU
2. Lindera benzoin	23	YES	FAC
3. Cercis canadensis	5	NO	FACU
4. Acer rubrum	1	NO	FAC
5. Elaeagnus umbellata	1	NO	UPL
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
	100	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Urtica dioica	25	YES	FACU
2. Impatiens capensis	23	YES	FACW
3. Polystichum acrostichoides	2	NO	FACU
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	50	= Total Cover	

Woody Vine Stratum (Plot size:)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 43 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** _____ **No** _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: UPL007

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-13	10YR 3/2	98	5YR 3/4	2	C	M	SiC	silty clay
13-17	10YR 3/2	80	10YR 4/4	20	C	M	SCL	sandy clay loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: rock layer

Depth (inches): 17+

Hydric Soil Present? **Yes** _____ **No** ✔

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Roxana BOP City/County: Letcher Sampling Date: 09/13/2023

Applicant/Owner: Federal Bureau of Prisons (BOP) State: KY Sampling Point: UPL008

Investigator(s): MD/SH Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 5

Subregion (LRR or MLRA): LRR N Lat: 37.0992247 Long: 82.9575842 Datum: NAD83

Soil Map Unit Name: Shelocta-Highsplint-Gilpin complex, 20 to 70 percent slopes, very stony (uShgF) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✔	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** ✔
Hydric Soil Present?	Yes _____	No ✔	
Wetland Hydrology Present?	Yes _____	No ✔	

Remarks:

Hillslope to steep to hold hydrology. UPL

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No ✔	Depth (inches): _____
Water Table Present?	Yes _____	No ✔	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✔	Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: UPL008

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Platanus occidentalis	40	YES	FACW
2. Liriodendron tulipifera	30	YES	FACU
3. Fagus grandifolia	10	NO	FACU
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	80	= Total Cover	

Sapling/Shrub Stratum (Plot size: 30')			
1. Elaeagnus umbellata	40	YES	UPL
2. Fagus grandifolia	25	YES	FACU
3. Lindera benzoin	15	NO	FAC
4. Fraxinus pennsylvannica	5	NO	FACW
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
	85	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Microstegium vimineum	50	YES	FAC
2. Osmundastrum cinnamomeum	15	NO	FACW
3. Pilea pumila	10	NO	FACW
4. Persicaria virginiana	5	NO	FAC
5. Polystichum acrostichoides	5	NO	FACU
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	85	= Total Cover	

Woody Vine Stratum (Plot size: 10')			
1. Parthenocissus quinquefolia	5	YES	FACU
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
	5	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	0 (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** _____ **No** ✔

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: UPL008

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/3	95	10YR 4/6	5	C	M	SCL	sandy clay loam
4-18+	10YR 4/2	98	7.5YR 4/6	2	C	M	SCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✔

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Roxana BOP City/County: Letcher Sampling Date: 09/14/2023

Applicant/Owner: Federal Bureau of Prisons (BOP) State: KY Sampling Point: UPL009

Investigator(s): MD/SH Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 1-2

Subregion (LRR or MLRA): LRR N Lat: 37.0979473 Long: 82.9559614 Datum: NAD83

Soil Map Unit Name: Kaymine, Fairpoint, and Fiveblock soils, benched, 2 to 70 percent (KfF) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No _____	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** ✔
Hydric Soil Present?	Yes _____	No ✔	
Wetland Hydrology Present?	Yes _____	No ✔	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No ✔	Depth (inches): _____
Water Table Present?	Yes _____	No ✔	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✔	Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No surface flow or puddles like we have seen in other areas

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: UPL009

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Elaeagnus umbellata	10	YES	UPL
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	10	= Total Cover	

Sapling/Shrub Stratum (Plot size: 30')			
1. Elaeagnus umbellata	30	YES	UPL
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
	30	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Pilea pumila	30	YES	FACW
2. Microstegium vimineum	10	YES	FAC
3. Persicaria longiseta	5	YES	FAC
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	45	= Total Cover	

Woody Vine Stratum (Plot size:)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✔ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✔ No ___

Remarks: (Include photo numbers here or on a separate sheet.)

Sparsely vegetated herbaceous layer

SOIL

Sampling Point: UPL009

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR 4/1	98	7.5YR 4/6	2	C	M	CL	clay loam
14-15								coal/restrictive layer

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: coal

Depth (inches): 14

Hydric Soil Present? **Yes** _____ **No** ✔

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Roxana BOP City/County: Letcher Sampling Date: 09/14/2023

Applicant/Owner: Federal Bureau of Prisons (BOP) State: KY Sampling Point: UPL010

Investigator(s): MD/SH Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): 5

Subregion (LRR or MLRA): LRR N Lat: 37.0967045 Long: 82.9592531 Datum: NAD83

Soil Map Unit Name: Shelocta-Highsplint-Gilpin complex, 20 to 70 percent slopes, very stony (uShgF) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✔	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** ✔
Hydric Soil Present?	Yes _____	No ✔	
Wetland Hydrology Present?	Yes _____	No ✔	

Remarks:

UPL

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No ✔	Depth (inches): _____
Water Table Present?	Yes _____	No ✔	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✔	Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: UPL010

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum	50	YES	FAC
2. Platanus occidentalis	10	NO	FACW
3. Salix nigra	5	NO	OBL
4. Nyssa sylvatica	5	NO	FAC
5. Cercis canadensis	5	NO	FACU
6.		-	-
7.		-	-
8.		-	-
	75	= Total Cover	

Sapling/Shrub Stratum (Plot size: 30')			
1. Elaeagnus umbellata	54	YES	UPL
2. Lindera benzoin	5	NO	FAC
3. Platanus occidentalis	1	NO	FACW
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
	60	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Microstegium vimineum	60	YES	FAC
2. Lonicera japonica	20	YES	FACU
3. Pilea pumila	5	NO	FACW
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	85	= Total Cover	

Woody Vine Stratum (Plot size: 10')			
1. Vitis vinifera	5	YES	FACU
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
	5	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 40 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	0 (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** _____ **No** ✔

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: UPL010

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 4/3	98	10YR 2/6	2	C	M	L	loam
2-18+	7.5YR 7/1	70	10YR 5/6	30	C	M	L	loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
  2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
  Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✔

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Roxana BOP City/County: Letcher Sampling Date: 10/11/2023

Applicant/Owner: Federal Bureau of Prisons (BOP) State: KY Sampling Point: UPL021

Investigator(s): MD/CH Section, Township, Range: _____

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): Concave Slope (%): 5

Subregion (LRR or MLRA): LRR N Lat: 37.1008335 Long: 82.9539766 Datum: NAD83

Soil Map Unit Name: Dekalb-Gilpin-Rayne complex, 25 to 65 percent slopes, very rocky (DrF) NWI classification: UPL

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil ✔, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✔	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** ✔
Hydric Soil Present?	Yes _____	No ✔	
Wetland Hydrology Present?	Yes _____	No ✔	

Remarks:

Soil disturbed compacted from mining.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No ✔	Depth (inches): _____
Water Table Present?	Yes _____	No ✔	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✔	Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: UPL021

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Elaeagnus umbellata	45	YES	UPL
2. Ulmus americana	15	YES	FACW
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	60	= Total Cover	

Sapling/Shrub Stratum (Plot size: 30')			
1. Acer negundo	5	YES	FAC
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
	5	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Clematis virginiana	15	YES	FAC
2. Solidago gigantea	8	YES	FACW
3. Cirsium discolor	7	YES	UPL
4. Microstegium vimineum	7	YES	FAC
5. Geum canadense	5	YES	FACU
6. Acalypha rhomboidea	3	YES	FACU
7. Oxalis dillenii	2	NO	FACU
8. Miscanthus sinensis	2	NO	FACU
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	49	= Total Cover	

Woody Vine Stratum (Plot size:)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 11 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 27 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No ✔

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: UPL021

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-1								organic matter
1-2	10YR 3/2	100					SiCL	silty clay loam
2-5	10YR 5/3	97	10YR 5/8	3	C	M	SiCL	silty clay loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: rock

Depth (inches): 5"

Hydric Soil Present? **Yes** _____ **No** ✔

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Roxana BOP City/County: Letcher Sampling Date: 10/11/2023

Applicant/Owner: Federal Bureau of Prisons (BOP) State: KY Sampling Point: UPL023/24/25

Investigator(s): MD/CH Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 4

Subregion (LRR or MLRA): LRR N Lat: 37.0986231 Long: 82.9510764 Datum: NAD83

Soil Map Unit Name: Cloverlick-Kimper-Highsplint complex, 30 to 65 percent slopes, very stony (CkF) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil ✔, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✔	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** ✔
Hydric Soil Present?	Yes _____	No ✔	
Wetland Hydrology Present?	Yes _____	No ✔	

Remarks:

Soil disturbed compacted from mining. UPL

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ True Aquatic Plants (B14)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No ✔	Depth (inches): _____
Water Table Present?	Yes _____	No ✔	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✔	Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: UPL023/24/25

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Elaeagnus umbellata	20	YES	UPL
2. Salix nigra	15	YES	OBL
3. Ailanthus altissima	5	YES	FACU
4. Ulmus americana	1	NO	FACW
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	41	= Total Cover	

Sapling/Shrub Stratum (Plot size: 30')			
1. Salix nigra	5	YES	OBL
2. Acer saccharum	5	YES	FACU
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
	10	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Lespedeza virginica	25	YES	UPL
2. Plantago lanceolata	10	YES	UPL
3. Solidago altissima	10	YES	FACU
4. Solidago rugosa	8	YES	FAC
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	53	= Total Cover	

Woody Vine Stratum (Plot size: 10')			
1. Lonicera japonica	45	YES	FACU
2. Rubus idaeus	30	YES	FAC
3. Toxicodendron radicans	15	NO	FAC
4.		-	-
5.		-	-
6.		-	-
	90	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 11 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 36 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No ✔

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: UPL023/24/25

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 5/3	100					SiL	
2-4	10YR 6/4	100					SiL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: rock

Depth (inches): 4"

Hydric Soil Present? **Yes** _____ **No** ✔

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Roxana BOP City/County: Letcher Sampling Date: 10/11/2023

Applicant/Owner: Federal Bureau of Prisons (BOP) State: KY Sampling Point: UPL027

Investigator(s): MD/CH Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 2-3

Subregion (LRR or MLRA): LRR N Lat: 37.1006351 Long: 82.9523680 Datum: NAD83

Soil Map Unit Name: Dekalb-Gilpin-Rayne complex, 25 to 65 percent slopes, very rocky (DrF) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil ✔, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✔	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** ✔
Hydric Soil Present?	Yes _____	No ✔	
Wetland Hydrology Present?	Yes _____	No ✔	

Remarks:

Soil disturbed compacted from mining. UPL

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✔ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No ✔	Depth (inches): _____
Water Table Present?	Yes _____	No ✔	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✔	Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: UPL027

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: _____)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Setaria parviflora	25	YES	FAC
2. Andropogon virginicus	20	YES	FACU
3. Lespedeza virginica	15	YES	UPL
4. Plantago virginica	10	NO	UPL
5. Oxalis dillenii	5	NO	FACU
6. Cyperus strigosus	2	NO	FACW
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	77 = Total Cover		

Woody Vine Stratum (Plot size: _____)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	0 (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** _____ **No** ✔

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: UPL027

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 5/4	100					SiL	silty loam
1-3	10YR 5/3	90	7.5YR 5/6	10	C	M	SiL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
  2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
  Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: rock

Depth (inches): 3"

Hydric Soil Present? **Yes** _____ **No** ✔

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Roxana BOP City/County: Letcher Sampling Date: 10/11/2023

Applicant/Owner: Federal Bureau of Prisons (BOP) State: KY Sampling Point: UPL032

Investigator(s): MD/CH Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR or MLRA): LRR N Lat: 37.1030911 Long: 82.9598740 Datum: NAD83

Soil Map Unit Name: Shelocta-Highsplint-Gilpin complex, 20 to 70 percent slopes, very stony (uShgF) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil ✔, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✔	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** ✔
Hydric Soil Present?	Yes _____	No ✔	
Wetland Hydrology Present?	Yes _____	No ✔	

Remarks:

UPL

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ✔ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✔ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No ✔	Depth (inches): _____
Water Table Present?	Yes _____	No ✔	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✔	Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: UPL032

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Fagus grandifolia	35	YES	FACU
2. Liriodendron tulipifera	25	YES	FACU
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	60	= Total Cover	

Sapling/Shrub Stratum (Plot size: 30')			
1. Fagus grandifolia	10	YES	FACU
2. Acer rubrum	5	YES	FAC
3. Fraxinus pennsylvatica	5	YES	FACW
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
	20	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Polystichum acrostichoides	10	YES	FACU
2. Microstegium vimineum	10	YES	FAC
3. Acer rubrum	5	YES	FAC
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	25	= Total Cover	

Woody Vine Stratum (Plot size:)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** _____ **No** ✔

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: UPL032

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 3/1	100						Fibrous organic layer
1-6	10YR 5/3	85	10YR 5/6	15	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: rock

Depth (inches): 6"

Hydric Soil Present? **Yes** _____ **No** ✔

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Roxana BOP City/County: Letcher Sampling Date: 10/11/2023

Applicant/Owner: Federal Bureau of Prisons (BOP) State: KY Sampling Point: UPL033

Investigator(s): MD/CH Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR or MLRA): LRR N Lat: 37.1032332 Long: 82.9598468 Datum: NAD83

Soil Map Unit Name: Shelocta-Highsplint-Gilpin complex, 20 to 70 percent slopes, very stony (uShgF) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil ✔, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✔	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** ✔
Hydric Soil Present?	Yes _____	No ✔	
Wetland Hydrology Present?	Yes _____	No ✔	

Remarks:

UPL

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ✔ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✔ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No ✔	Depth (inches): _____
Water Table Present?	Yes _____	No ✔	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✔	Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: UPL033

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Fagus grandifolia	35	YES	FACU
2. Liriodendron tulipifera	25	YES	FACU
3.		-	-
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
	60	= Total Cover	

Sapling/Shrub Stratum (Plot size: 30')			
1. Fagus grandifolia	10	YES	FACU
2. Acer rubrum	5	YES	FAC
3. Fraxinus pennsylvatica	5	YES	FACW
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
	20	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Polystichum acrostichoides	10	YES	FACU
2. Microstegium vimineum	10	YES	FAC
3. Acer rubrum	5	YES	FAC
4.		-	-
5.		-	-
6.		-	-
7.		-	-
8.		-	-
9.		-	-
10.		-	-
11.		-	-
12.		-	-
	25	= Total Cover	

Woody Vine Stratum (Plot size:)			
1.		-	-
2.		-	-
3.		-	-
4.		-	-
5.		-	-
6.		-	-
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	0 (A)	0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No ✔

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: UPL033

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 3/1	100						Fibrous organic layer
1-6	10YR 5/3	85	10YR 5/6	15	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: rock

Depth (inches): 6"

Hydric Soil Present? **Yes** _____ **No** ✔

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Roxana City/County: Letcher Co. Sampling Date: 9/14/23
Applicant/Owner: FBOP State: KY Sampling Point: UPL 100
Investigator(s): Phil Perhamus, Lisa Thompson Section, Township, Range: _____
Landform (hillslope, terrace, etc.): Suspect area on sideslope Local relief (concave, convex, none): Concave Slope (%): _____
Subregion (LRR or MLRA): LRR N Lat: _____ Long: _____ Datum: _____
Soil Map Unit Name: _____ NWI classification: _____
Are climatic / hydrologic conditions on the site typical for this time of year? Yes [✓] No [ ] (If no, explain in Remarks.)
Are Vegetation [ ] Soil [ ] or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes [✓] No [ ]
Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes [✓]	No [ ]	**Is the Sampled Area within a Wetland?** Yes [ ] No [✓]
Hydric Soil Present?	Yes [ ]	No [✓]	
Wetland Hydrology Present?	Yes [ ]	No [✓]	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- [ ] Surface Water (A1)
- [ ] High Water Table (A2)
- [ ] Saturation (A3)
- [ ] Water Marks (B1)
- [ ] Sediment Deposits (B2)
- [ ] Drift Deposits (B3)
- [ ] Algal Mat or Crust (B4)
- [ ] Iron Deposits (B5)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Water-Stained Leaves (B9)
- [ ] Aquatic Fauna (B13)
- [ ] True Aquatic Plants (B14)
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres on Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Tilled Soils (C6)
- [ ] Thin Muck Surface (C7)
- [ ] Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- [ ] Surface Soil Cracks (B6)
- [ ] Sparsely Vegetated Concave Surface (B8)
- [ ] Drainage Patterns (B10)
- [ ] Moss Trim Lines (B16)
- [ ] Dry-Season Water Table (C2)
- [ ] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [ ] Stunted or Stressed Plants (D1)
- [ ] Geomorphic Position (D2)
- [ ] Shallow Aquitard (D3)
- [ ] Microtopographic Relief (D4)
- [ ] FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes [ ]	No [✓]	Depth (inches): _____
Water Table Present?	Yes [ ]	No [✓]	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes [ ]	No [✓]	Depth (inches): _____

Wetland Hydrology Present? Yes [ ] No [✓]

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

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VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: UPL100

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. NA			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Sapling Stratum (Plot size: 15')			
1. NA			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Shrub Stratum (Plot size: 15')			
1. NA			
2.			
3.			
4.			
5.			
6.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: 10')			
1. Microstegium vimineum	60	Y	FAC
2. Persicaria longiseta	30	Y	FAC
3. Impatiens capensis	15	N	FACW
4. Tussilago farfara	5	N	FACU
5.			
6.			
7.			
8.			
9. ~~50%~~ = (88)			
10.			
11.			
	110 = Total Cover		

50% of total cover: 55 20% of total cover: 22

Woody Vine Stratum (Plot size: 15')			
1. NA			
2.			
3.			
4.			
5.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- [ ] 1 - Rapid Test for Hydrophytic Vegetation
- [x] 2 - Dominance Test is >50%
- [ ] 3 - Prevalence Index is ≤3.0[1]
- [ ] 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes [x] No [ ]

Remarks: (Include photo numbers here or on a separate sheet.)

CamScanner

SOIL

Sampling Point: UPL 100

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 4/3	100					Sandy loam	Moist but friable
8-12	10YR 4/3	95	7.5YR 4/6	5			Sandy loam	Moist

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10) **(LRR N)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7)
- ☐ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ☐ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ☐ Umbric Surface (F13) **(MLRA 136, 122)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ☐ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) **(MLRA 147)**
- ☐ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: 12

Depth (inches): Rock

Hydric Soil Present? Yes ☐ No ☑

Remarks:

CamScanner

APPENDIX

F

WETLAND DELINEATION MAPPING

Wetlands

- Project Area
- PALUSTRINE EMERGENT
- PALUSTRINE FORESTED
- PALUSTRINE OPEN WATER

Waterway Classification

- Ephemeral
- Intermittent
- Perennial
- Tolson Branch (WUS-004)

- Wetland Data Points
- Upland Data Points
- Waterway Data Points
- Drain Data Point

1	
2	3
4	5
6	7

Federal Bureau of Prisons

Proposed Federal Correctional Institution and Prison Camp

Letcher County, Kentucky

Wetland Delineation: Sheet 1 of 7

wsp

0 200 400 600 Feet

Scale: 1" = 200'

N

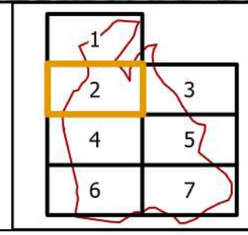
Wetlands

- Project Area
- PALUSTRINE EMERGENT
- PALUSTRINE FORESTED
- PALUSTRINE OPEN WATER

Waterway Classification

- Ephemeral
- Intermittent
- Perennial
- Tolson Branch (WUS-004)

- Wetland Data Points
- Upland Data Points
- Waterway Data Points
- Drain Data Point



Federal Bureau of Prisons

Proposed Federal Correctional Institution and Prison Camp

Letcher County, Kentucky

Wetland Delineation: Sheet 2 of 7

wsp

0 200 400 600 Feet

Scale: 1" = 200'

N

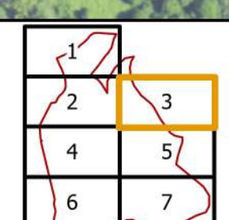
Wetlands

- Project Area
- PALUSTRINE EMERGENT
- PALUSTRINE FORESTED
- PALUSTRINE OPEN WATER

Waterway Classification

- Ephemeral
- Intermittent
- Perennial
- Tolson Branch (WUS-004)

- Wetland Data Points
- Upland Data Points
- Waterway Data Points
- Drain Data Point



Federal Bureau of Prisons

Proposed Federal Correctional Institution and Prison Camp

Letcher County, Kentucky

Wetland Delineation: Sheet 3 of 7

wsp

0 200 400 600 Feet

Scale: 1" = 200'

N

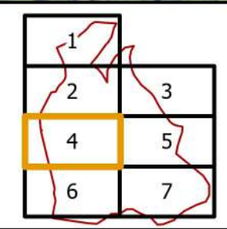
Wetlands

- Project Area
- PALUSTRINE EMERGENT
- PALUSTRINE FORESTED
- PALUSTRINE OPEN WATER

Waterway Classification

- Ephemeral
- Intermittent
- Perennial
- Tolson Branch (WUS-004)

- Wetland Data Points
- Upland Data Points
- Waterway Data Points
- Drain Data Point



Federal Bureau of Prisons

Proposed Federal Correctional Institution and Prison Camp

Letcher County, Kentucky

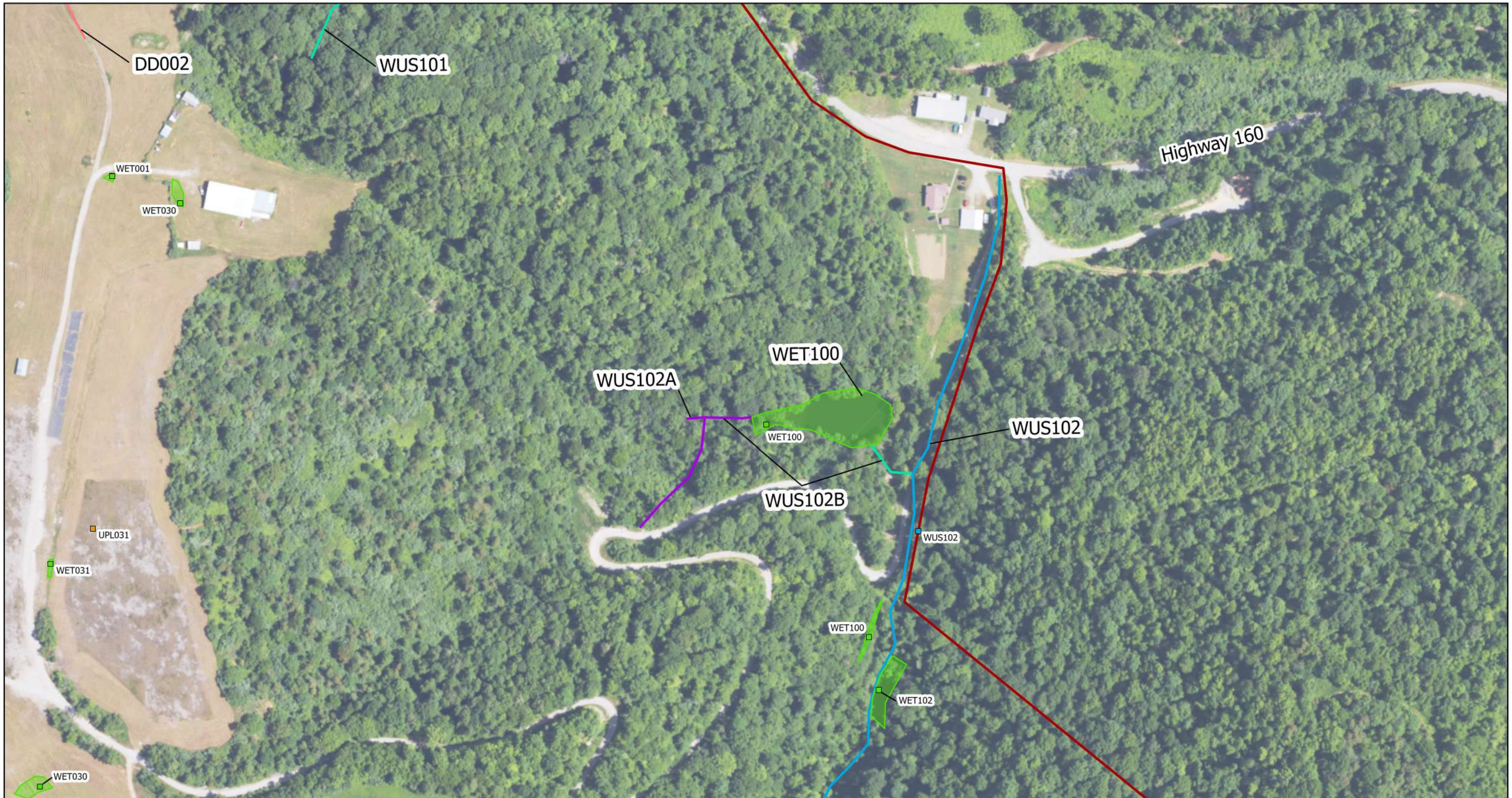
Wetland Delineation: Sheet 4 of 7

wsp

0 200 400 600 Feet

Scale: 1" = 200'

N



Wetlands

- Project Area
- PALUSTRINE EMERGENT
- PALUSTRINE FORESTED
- PALUSTRINE OPEN WATER

Waterway Classification

- Ephemeral
- Intermittent
- Perennial
- Tolson Branch (WUS-004)

- Wetland Data Points
- Upland Data Points
- Waterway Data Points
- Drain Data Point

1	
2	3
4	5
6	7

Federal Bureau of Prisons

Proposed Federal Correctional Institution and Prison Camp

Letcher County, Kentucky

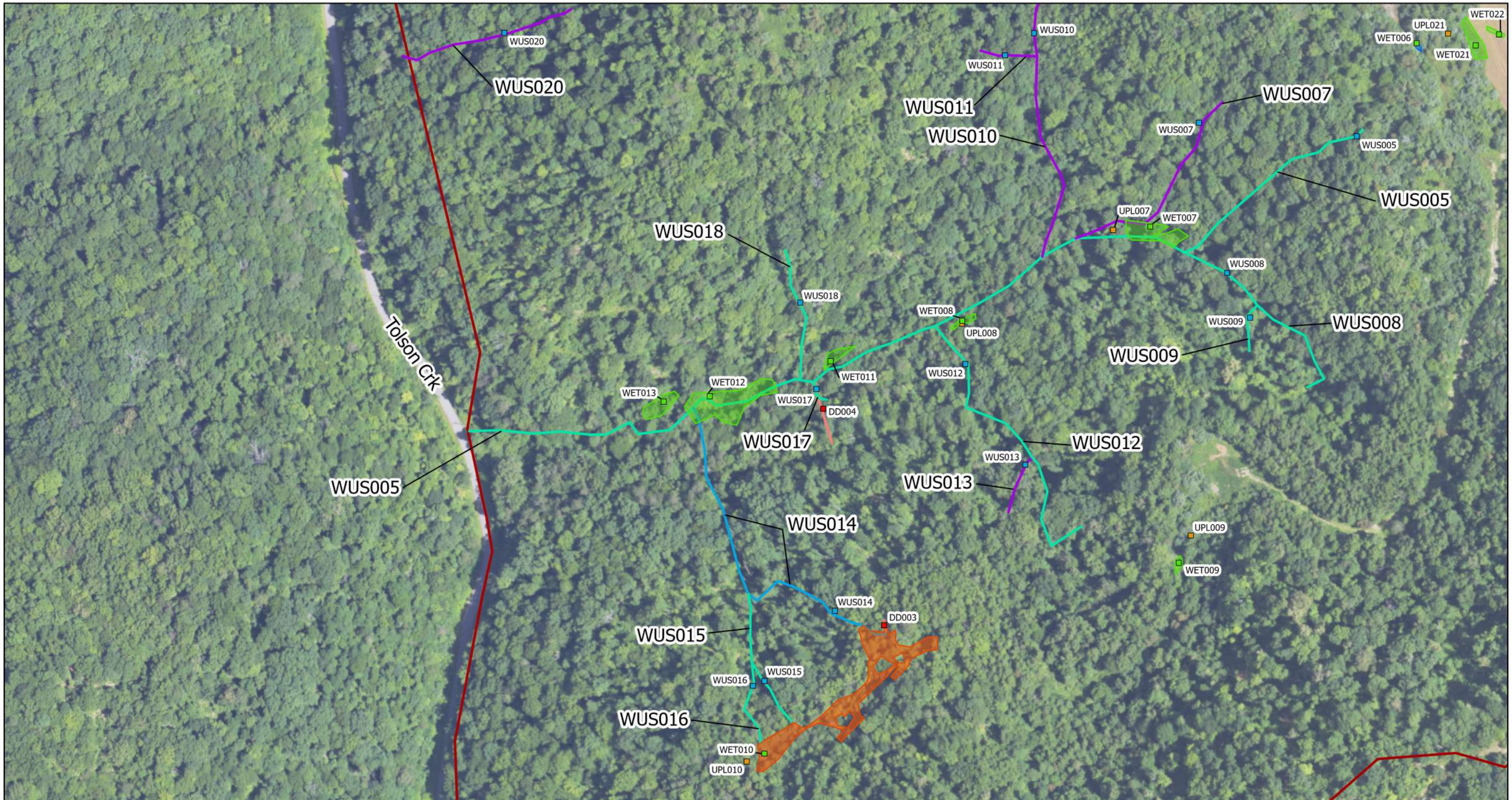
Wetland Delineation: Sheet 5 of 7

wsp

0 200 400 600 Feet

Scale: 1" = 200'

N



Wetlands

- Project Area
- PALUSTRINE EMERGENT
- PALUSTRINE FORESTED
- PALUSTRINE OPEN WATER

Waterway Classification

- Ephemeral
- Intermittent
- Perennial
- Tolson Branch (WUS-004)

- Wetland Data Points
- Upland Data Points
- Waterway Data Points
- Drain Data Point

1	
2	3
4	5
6	7

Federal Bureau of Prisons

Proposed Federal Correctional Institution and Prison Camp

Letcher County, Kentucky

Wetland Delineation: Sheet 6 of 7

wsp

0 200 400 600 Feet

Scale: 1" = 200'

N

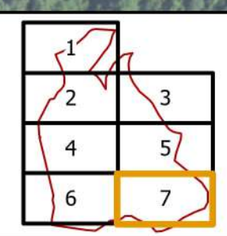
Wetlands

- Project Area
- PALUSTRINE EMERGENT
- PALUSTRINE FORESTED
- PALUSTRINE OPEN WATER

Waterway Classification

- Ephemeral
- Intermittent
- Perennial
- Tolson Branch (WUS-004)

- Wetland Data Points
- Upland Data Points
- Waterway Data Points
- Drain Data Point



Federal Bureau of Prisons

Proposed Federal Correctional Institution and Prison Camp

Letcher County, Kentucky

Wetland Delineation: Sheet 7 of 7

wsp

0 200 400 600 Feet

Scale: 1" = 200'

N

APPENDIX E

PHASE I

ENVIRONMENTAL SITE ASSESSMENT

FEDERAL BUREAU OF PRISONS

PHASE I ENVIRONMENTAL SITE ASSESSMENT

ROXANA SITE, WHITESBURG, LETCHER COUNTY, KENTUCKY

FEBRUARY 06, 2024

CONFIDENTIAL

PHASE I ENVIRONMENTAL SITE ASSESSMENT

ROXANA SITE, WHITESBURG, LETCHER COUNTY, KENTUCKY

FEDERAL BUREAU OF PRISONS

CONFIDENTIAL

PROJECT NO.: 31800209.001
DATE: FEBRUARY 2024

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EXECUTIVE SUMMARY

The Federal Bureau of Prisons (FBOP, the User) retained WSP USA Inc. (WSP) to perform a Phase I Environmental Site Assessment (ESA) of the Roxana Site located in Whitesburg, Letcher County, Kentucky (the subject property). The purpose of the Phase I ESA was to identify recognized environmental conditions (RECs) in connection with the subject property, to the extent feasible, pursuant to the processes prescribed in the ASTM Practice E 1527-21 entitled "Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process" (ASTM Standard); U.S. Environmental Protection Agency (EPA) Rule entitled "Standards and Practices for All Appropriate Inquiries, Final Rule" (AAI Rule), 40 CFR Part 312; the WSP proposal dated February 15, 2022 (the Proposal); and WSP's professional judgment. WSP representatives performed the Phase I ESA in conformance with these criteria.

This summary is to be used only in conjunction with the attached Phase I ESA (the Report), dated February 6, 2024, for the Roxana Site located in Letcher County, Kentucky. All definitions used in this summary have the same meanings as in the Report, and the use of this summary is subject to the limitations and conditions contained in the Report. The Report shall govern in the event of any inconsistency between this summary and the Report.

PROPERTY DESCRIPTION

The subject property is located within the unincorporated community of Roxana in Whitesburg, Letcher County, Kentucky. The city center of Whitesburg is approximately 7.5 miles from the Roxana Site. The subject property consists of approximately 570+/- acres of land within parcels: 044-00-00-049.00, 044-00-00-036.00, 044-00-00-037.00, 044-00-00-039.00, 044-00-00-040.00, 044-00-00-041.00, 044-00-00-042.00, 044-00-00-073.00, 044-00-00-076.00, 044-00-00-077.00, 044-00-00-078.00, and 044-00-00-079.00. Uses within the subject property consist of farming and residential. The subject property is covered by secondary growth forests which have occurred since surface mining ended. Mining permit applications indicate surface and underground mining operations dating to the 1960s have occurred within the Roxana Site. Ponds are present within the western and northeastern portions of the subject property. The North Fork Kentucky River and Kings Creek are located approximately 100 feet to the north of the subject property, flowing generally west to east.

SIGNIFICANT DATA GAPS

WSP encountered the following significant data gaps:

- WSP was unable to inspect building interiors. This data gap affected WSPs ability to identify whether a REC may exist in connection with the buildings located on the subject property.
- WSP was unable to determine whether remedial action was taken at the REC locations identified in the previous environmental reports. This data gap affected WSPs ability to assess whether this previous release was addressed to the satisfaction of applicable regulators.

RECOGNIZED ENVIRONMENTAL CONDITIONS

WSP identified the following REC in connection with the subject property:

- A previous Phase II Environmental Site Assessment sampled the subject property and confirmed that impacted soils by petroleum products are located at the compressor station, the damaged aboveground storage tank (AST), and the AST open drain valve. It was recommended that the identified contaminated soils should be excavated and disposed of at a permitted disposal facility. It is unknown if these impacted soils have been excavated and therefore WSP considers this release to be a REC.
- Mining permit applications indicate surface and underground mining operations dating to the 1960s have occurred within the site. As indicated in the search conducted by EDR, several mines listed in

the US MINES and Abandoned Mines databases occur within the subject property. These mines include Meade & Shepherd Coal Company Inc., Lance Coal Corp, C&C Coal Company, Marie Enterprises Inc., Big Oak Coal Company, Roxana #2, and NO 1 Mine. These mines are indicated to have either been permanently closed or sealed and abandoned. No violations were found in connection with these mines. Due to the historical use of hazardous substances in mining and the potential for contamination from past mining operations, WSP considers this a REC.

CONTROLLED RECOGNIZED ENVIRONMENTAL CONDITIONS

WSP did not identify any CRECs in connection with the subject property.

HISTORICAL RECOGNIZED ENVIRONMENTAL CONDITION

WSP did not identify any HRECs in connection with the subject property:

DE MINIMIS CONDITIONS

WSP did not identify de minimis conditions in connection with the subject property.

BUSINESS ENVIRONMENTAL RISKS

WSP did not identify any Business Environmental Risks in connection with the subject property.

1 INTRODUCTION

1.1 SUBJECT PROPERTY DESCRIPTION

1.1.1 *LOCATION*

The subject property is located within the unincorporated community of Roxana in Whitesburg, Letcher County, Kentucky. The city center of Whitesburg is approximately 7.5 miles from the Roxana Site which can be accessed from the north using KY Route 588. Uses within the subject property consist of farming and residential. Mining permit applications indicate surface and underground mining operations dating to the 1960s have occurred within the Roxana Site. The Roxana Site is covered by secondary growth forests which have occurred since surface mining ended. The subject property consists of approximately 570+/- acres of land. Ponds are present within the western and northeastern portions of the subject property. The North Fork Kentucky River and Kings Creek are located approximately 100 feet to the north of the subject property, flowing generally west to east. The subject property is located on the United States Geological Survey (USGS) 7.5-minute, Roxana and Blackey, Kentucky 2022 topographic quadrangle maps, as shown on Figure 1.

1.1.2 *LEGAL DESCRIPTION*

The subject property encompasses 24 parcels. The Assessor Parcel Numbers and owners are listed in the following table.

Assessor Parcel Number	Owner	Assessor Parcel Number	Owner
044-00-00-049.00	Bernardine Miracle	044-00-00-080.00	Janice Hogg
044-00-00-036.00	The Richard Family	044-00-00-080.01	John C. Hogg
044-00-00-037.00	Sandra Creech	044-00-00-080.02	Vera Lentz
044-00-00-039.00	Carlos Sherwood Ison	044-00-00-080.03	John Wiley Cain, Ronald William, and Bruce Robert
044-00-00-040.00	JC Burke	044-80-00-002.00	Lee Gentry Jr.
044-00-00-041.00	Wayne Whitaker	044-80-00-003.00	Lee Gentry Jr.
044-00-00-042.00	Thomas Stahl	044-80-00-004.00	Lee Gentry Jr.
044-00-00-073.00	Mitchum Whitaker	044-80-00-006.00	Richard Ison
044-00-00-076.00	Delana K Simpson	044-80-00-006.01	Lee Gentry Jr.
044-00-00-077.00	Randall Meade	044-80-00-007.00	Not reported
044-00-00-078.00	Billy Stamper	060-00-00-011.00	Janice Hogg
044-00-00-079.00	Lee Gentry Jr.	060-00-00-011.01	John C. Hogg

1.2 PURPOSE

The Federal Bureau of Prisons (FBOP, the User) retained WSP USA Inc. (WSP) to perform a Phase I Environmental Site Assessment (ESA) of the Roxana Site located in Whitesburg, Letcher County, Kentucky (the subject property). The purpose of the Phase I ESA is to identify recognized environmental conditions (RECs) in connection with the subject property, to the extent feasible, pursuant to the processes prescribed in the ASTM Practice E1527-21 entitled "Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process" (ASTM Standard); EPA Rule entitled "Standards and Practices for All Appropriate Inquiries, Final Rule" (AAI Rule), 40 CFR Part 312; the WSP proposal dated February 15, 2022 (the Proposal); and WSP's professional judgment. WSP representatives performed the Phase I ESA in conformance with these criteria.

Key definitions from ASTM Practice E1527-21, including REC, Controlled REC (CREC), Historical REC (HREC), and de minimis condition are included in Appendix A. The AAI Rule states that the ASTM Practice may be used to comply with the requirements of the AAI Rule, so, whenever reference is made to the ASTM Standard, it shall include the AAI Rule.

1.3 SCOPE OF WORK

The scope of services for this Phase I ESA consisted of the following tasks:

RECORDS REVIEW

- Reviewing environmental record sources, including federal and state regulatory databases, to identify facilities with past or current regulatory enforcement actions within applicable distances of the subject property as defined in the ASTM Standard. The regulatory database search report is presented in Appendix D.
- Reviewing physical setting information sources to identify information about the geologic, hydrogeologic, hydrologic, and topographic conditions in the area of the subject property. The USGS 7.5-minute topographic map of the area of the subject property is shown in Figure 1.
- Reviewing historical record sources to identify past land use activities at the subject property and surrounding properties. Selected historical information obtained during performance of the Phase I ESA is included in Appendix E.

SITE RECONNAISSANCE

- Performing a visual inspection of the subject property and surrounding properties to identify potential sources of chemical and petroleum contamination such as aboveground storage tanks (ASTs), underground storage tanks (USTs), potential sources of polychlorinated biphenyls (PCBs), chemicals, and hazardous materials. Surficial evidence of potential RECs such as distressed vegetation, stained soils, and/or stained paving was also evaluated. Site reconnaissance was performed by WSP scientists during September and October 2023. Photographs recorded during these visits are included in Appendix C.

INTERVIEWS

- Interviewing available individuals with knowledge of current or historical use, storage, or disposal of potentially hazardous materials or other environmentally related activities on or adjoining the subject property. User-provided information is included in Appendix F. Interview notes are incorporated into applicable sections of this report.

REPORT PREPARATION

- This report has been prepared to document the findings, opinions, and conclusions of the Phase I ESA investigation conducted at the subject property and it provides the supporting documentation and references for those findings, opinions, and conclusions (the Report). Resumes for the environmental professionals (EPs) that performed the assessment and prepared this Phase I ESA Report are included in Appendix B.

1.3.1 *LIMITING CONDITIONS/DEVIATIONS*

There were no limiting conditions encountered during this assessment.

1.3.2 *SIGNIFICANT ASSUMPTIONS*

This Phase I ESA was conducted in accordance with ASTM E1527-21. In preparing this report, WSP relied upon certain verbal information and representations provided by government employees and others, documents provided by the subject property owner(s) and/or operator(s), and a computer search of government databases by a firm whose business is to provide that service. Except as discussed, WSP has relied upon that information and did not attempt to independently verify its accuracy or completeness but did not detect any inconsistency or omission of a nature that might call into question its validity. To the extent that the conclusions in this report are based in whole or in part on such information, they are contingent on its validity and WSP assumes no responsibility for any consequence arising from any information or condition that was concealed, withheld, misrepresented, or otherwise not fully disclosed or available to WSP.

In the absence of site-specific hydrogeologic information, WSP has relied on the assumption that groundwater flow generally follows surface topography. There are limits to this interpretation and WSP has exercised professional judgment in applying this assumption to the evaluation of off-site properties with the potential to impact the subject property.

1.4 GENERAL LIMITATIONS

WSP performed our services in accordance with the following principles, which are an integral part of the ASTM Standard:

- No ESA can wholly eliminate uncertainty regarding the potential for RECs in connection with a property. Performance of this Phase I ESA is intended to reduce, but not eliminate, uncertainty regarding the potential for RECs in connection with the subject property, and the ASTM Standard recognizes reasonable limits of time and cost.
- “All appropriate inquiry” does not mean an exhaustive assessment of a property. WSP performed this ESA in conformance with the ASTM Standard’s principle of identifying a balance between the competing goals of limiting the costs and time demands inherent in performing an ESA and the reduction of uncertainty about unknown conditions resulting from additional information.
- Not every property warrants the same level of assessment - the type of property subject to the assessment, the expertise and risk tolerance of the user, and the information developed in the course of the inquiry guided the appropriate level of assessment for this ESA.
- ESAs must be evaluated based on the reasonableness of judgments made at the time and under the circumstances in which they were made. Subsequent ESAs should not be considered valid standards to judge the appropriateness of any prior assessment based on hindsight, new information, use of developing technology or analytical techniques, or other factors.

The conclusions presented in this report represent WSP’s professional judgement based upon the information available and conditions existing as of the date of this report. As such, the conclusions in this report are valid only to the extent that the information provided was complete and accurate. This

assessment is not intended as legal advice or as an exhaustive review of site conditions. WSP makes no representations or warranties, expressed or implied, related to the presence or absence of pollutants or that all pollutants have been identified.

1.5 RELIANCE

The FBOP (Client) acknowledges and agrees that this report was prepared solely on its behalf and functions solely as a Phase I ESA. By accepting this report, Client acknowledges and agrees that it may in part rely upon sources, either written or oral, that WSP considers reliable, but which are not guaranteed or independently verified by WSP.

Where Client is required to disseminate this report, either by law or in connection with Client's business activities, to any other party to whom this report is not addressed (the "Third Party"), Client agrees to notify the Third Party of the terms of this disclaimer who in turn shall be bound by such terms. WSP is not responsible for independent conclusions, opinions, or recommendations made by others or otherwise based on the findings presented in this Report. Any Third Party wishing to rely on the information and opinions contained herein does so at its own risk.

1.6 TERM OF REPORT VIABILITY

In accordance with ASTM E 1527-21, this report is presumed to be viable when it is conducted within 180 days prior to the date of acquisition of the subject property (or, for transactions not involving an acquisition such as a lease or refinance, the date of the intended transaction). This Phase I ESA is viable for one year provided key components are updated within 180 days prior to the date of acquisition of the subject property. Note that the date of the report generally does not represent the date of the acquisition of key components and should not be used when evaluating compliance with the 180-day or one-year all appropriate inquiries requirements.

2 USER PROVIDED INFORMATION

The ASTM Standard defines a User as the party seeking to use Practice E1527 to complete an ESA of the subject property. The ASTM Standard describes certain tasks to be performed by or on behalf of a party seeking to qualify for a landowner liability protection (LLPs) to CERCLA. WSP requested that the User provide information that may be material to identifying RECs, and WSP provided a User Questionnaire to facilitate the transfer of this information to WSP. The following table summarizes the source and affiliation of the person providing information and the date it was provided.

Name of Person completing User Questionnaire or providing information	Kimberly S. Hudson, Chief, Construction and Environmental Review Section, Facilities Management Branch
Company/Organization	FBOP
Date	January 23, 2024

The following table summarizes the information provided by the User.

Topic	Question	Response
Purpose of the Phase I ESA	What is the User's purpose for conducting the Phase I ESA? (If the User does not identify the purpose of the Phase I ESA, the environmental professional shall assume the purpose is to qualify for an LLP to CERCLA liability, and this will be stated in the report.)	User did not identify the purpose of the Phase I ESA; therefore, it is assumed the purpose is to qualify for an LLP to CERCLA liability.
Environmental liens that are filed or recorded against the property (40 CFR 312.25)	Did a search of recorded land title records (or judicial records where appropriate[1]) identify any environmental liens filed or recorded against the property under federal, tribal, state or local law?	User indicated that they had no knowledge of the results of a search of recorded land title records, or of any environmental liens filed or recorded against the property under federal, tribal, state or local law.
Activity and land use limitations (AULs) that are in place on the property or have that been filed or recorded against the property (40 CFR 312.26(a)(1)(v) and (vi))	Did a search of recorded land title records (or judicial records where appropriate[1]) identify any AULs, such as engineering controls, land use restrictions or institutional controls that are in place at the property and/or have been filed or recorded against the property under federal, tribal, state or local law?	User indicated that they had no knowledge of the results of a search of recorded land title records, or of any AULs filed or recorded against the property under federal, tribal, state or local law.

[1] In certain jurisdictions, federal, tribal, state, or local statutes, or regulations specify that environmental liens and AULs be filed in judicial records rather than in land title records. In such cases, judicial records must be searched for environmental liens and AULs.

Topic	Question	Response
Specialized knowledge or experience of the person seeking to qualify for the LLP (user) (40 CFR 312.28)	Do you have any specialized knowledge or experience related to the property or nearby properties? For example, are you involved in the same line of business as the current or former occupants of the property or an adjoining property so that you would have specialized knowledge of the chemicals and processes used by this type of business?	User indicated that they had no specialized knowledge or experience related to the subject property or nearby properties.
Relationship of the purchase price to the fair market value of the property if it were not contaminated (40 CFR 312.29)	If the Phase I ESA is being completed for a property sale or transaction: Does the purchase price being paid for this property reasonably reflect the fair market value of the property? If you conclude that there is a difference, have you considered whether the lower purchase price is because contamination is known or believed to be present at the property?	User indicated that they were not aware of the purchase price.
Commonly known or reasonably ascertainable information about the property (40 CFR 312.30)	Are you aware of commonly known or reasonably ascertainable information about the property that would help the environmental professional to identify conditions indicative of releases or threatened releases?	User indicated to refer to the previously completed Environmental Impact Statements for historical uses of the property.
	Do you know the past uses of the property?	User indicated to refer to the previously completed Environmental Impact Statements for historical uses of the property.
	Do you know of specific chemicals that are present or once were present at the property?	User indicated to refer to the previously completed Environmental Impact Statements for historical uses of the property.
	Do you know of spills or other chemical releases that have taken place at the property?	User indicated to refer to the previously completed Environmental Impact Statements for historical uses of the property.
	Do you know of any environmental cleanups that have taken place at the property?	User indicated to refer to the previously completed Environmental Impact Statements for historical uses of the property.
The degree of obviousness or the presence or likely presence of contamination at the property, and the ability to detect the contamination by appropriate investigation (40 CFR 312.31)	Based on your knowledge and experience related to the property are there any obvious indicators that point to the presence or likely presence of releases at the property?	User indicated that the site was previously mined and oil/gas operations are occurring at the site.

3 SITE RECONNAISSANCE

Site reconnaissance was performed by WSP scientists during September and October 2023.

3.1 GENERAL SITE SETTING

The Roxana Site is located in Letcher County, Kentucky (Figure 1). The subject property, located approximately 7.5 miles west of Whitesburg, Kentucky, is found south of KY Route 588 and west of KY Route 160. During the investigations, it was observed that the majority of the subject property consisted of steep mountain slopes and valleys with gently rolling terrain found in the central portion. It was determined that the surface waters that drain the area consist of drainage ditches, ephemeral streams, intermittent streams, and perennial streams. Portions of the subject property were observed to have been disturbed by rock waste deposited on slopes by previous coal operation, coal roads, and by underground utilities along KY Route 160.

3.2 CURRENT USES OF THE SUBJECT PROPERTY

The Roxana Site includes undeveloped areas that are predominantly forested and are primarily used for recreational activities. The subject property also provides a venue for family gatherings and celebrations. Land use surrounding the subject property is also primarily forested, with small single-family residences in the area. The site layout is shown on Figure 2.

3.3 PAST USES OF THE SUBJECT PROPERTY

Mining permit applications indicate surface and underground mining operations dating to the 1960s have occurred within the Roxana Site. However, mining activities no longer occur at the subject property.

3.4 SUBJECT PROPERTY IMPROVEMENTS

The following table summarizes improvements observed at the subject property.

Improvement	Description
Structures	A RC model airplane landing strip is located near the center of the subject property. A small structure is located to the west of the landing strip. To the north of the landing strip is a large building with a metal roof and several small structures in its vicinity. To the west of the landing strip is another structure, presumedly used for residential purposes but is not abandoned.
Roads	The subject property is located south of the intersection of KY Route 160 and KY Route 588. Bluegrass Ridge Road traverses the subject property. A network of unimproved roads provide access to the subject property.
Potable Water Supply/ Source	The subject property receives potable water from the Letcher County water supply.
Sewage Disposal System	The subject property is under the jurisdiction of the Letcher County Water & Sewer District.

3.5 ADJOINING PROPERTIES

Based on desktop review, the current uses of properties adjoining the subject property are summarized below:

Direction	Address	Occupant	Property Use
North	KY Route 588	N/A	Residential
South	Big Br-Tolson Cr Road	N/A	Undeveloped
East	4115 Highway 2036	United States Postal Service	Post Office
West	SE Road	N/A	Undeveloped

Conditions indicative of likely migration of petroleum products and/or hazardous substances from adjoining properties to the Roxana Site were not observed.

4 RECORDS REVIEW

4.1 PHYSICAL SETTING

The table below provides an overview of the physical setting for the subject property.

Feature	Description
Topographic Gradient	During the site reconnaissance, it was observed that the majority of the subject property consisted of steep mountain slopes and valleys with gently rolling terrain found in the central portion. The highest elevation at the subject property is approximately 1,850 feet above mean sea level, and the lowest elevation at the subject property is approximately 1,035 feet above mean sea level. Regional topography slopes gently downward to the northwest. *Source: USGS Topographic Map*
Geologic and Hydro-geologic Conditions	The Roxana Site is underlain by the Breathitt Group, which comprises the Pikeville Formation and the Hyden Formation. The geology underlying the Roxana Site is primarily the Hyden Formation. The geological rock of the Hyden and Pikeville Formations consists of sandstone, siltstone, claystone, and coal. The Roxana Site is also underlain by the Four Corners Formation, which is composed of sandstone, siltstone, claystone, coal, and limestone. The surface mining had been conducted in the Fireclay and Fireclay Rider coal seams. Based on topography, groundwater likely flows in a northerly direction. *Source: Kentucky Geological Survey 2020*
Surface Water Runoff	The surface waters that drain the area consist of drainage ditches, ephemeral streams, intermittent streams, and perennial streams. *Source: WSP 2023*
Nearest Surface Water Body to the Subject property and Groundwater Flow	Several tributaries were delineated within the subject property. The North Fork Kentucky River flows east to west approximately 1 mile north of the subject property. Shallow groundwater is presumed to flow to the northwest. *Source: U.S. Geological Survey topographic map; WSP 2023*
Flood Plain	The subject property is not mapped as being located within a 100-year flood plain. *Source: Federal Emergency Management Agency Flood Insurance Rate Map*
Wetlands	A 0.21-acre Freshwater Pond habitat classified as a PUBHh (Palustrine, Unconsolidated Bottom, Permanently Flooded, and Diked/Impounded) is present in the northeast portion of the subject property. A 0.20-acre Freshwater Pond habitat classified as a PUBHh is present in the southwestern portion of the subject property. *Source: U.S. Fish and Wildlife Service (USFWS) online National Wetlands Inventory*
Soils	The three most common soils on the Roxana Site are the Cloverlick-Kimper-Highsplint complex, (30 to 65 percent slopes), the Kaymine, Fairpoint and Fiveblock soils map unit (2 to 70 percent slopes), and the Shelocta-Highsplint (20 to 70 percent slopes). *Source: U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) 2023*

According to the USFWS National Wetlands Inventory, two Freshwater Pond habitats are present within the subject property and are classified as PUBHh. A summary of the classification code is as follows:

- ***System Palustrine (P):*** The Palustrine System includes all nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5 ppt. It also includes wetlands lacking such vegetation, but with all of the following four characteristics: (1) area less than 8 ha (20 acres);

(2) active wave-formed or bedrock shoreline features lacking; (3) water depth in the deepest part of basin less than 2.5 m (8.2 feet) at low water; and (4) salinity due to ocean-derived salts less than 0.5 ppt.

- ***Class Unconsolidated Bottom (UB):*** Includes all wetlands and deepwater habitats with at least 25% cover of particles smaller than stones (less than 6-7 cm), and a vegetative cover less than 30%.
- ***Water Regime Permanently Flooded (H):*** Water covers the substrate throughout the year in all years.
- ***Special Modifier Diked/Impounded (h):*** These wetlands have been created or modified by a man-made barrier or dam that obstructs the inflow or outflow of water.

4.2 HISTORICAL USE REVIEW

The following table summarizes the historical use record sources reviewed for this Phase I ESA and includes whether the source reviewed was applicable to the subject property and/or the adjoining properties. The table also includes relevant comments and reasons for excluding a particular resource, if applicable.

Historical Resource Summary				
Historical Resource Type	Source(s) / Dates	Applicability		Comments / Reasons for Excluding
		Subject Property	Adjoining Property	
Aerial Photographs	EDR / 1952, 1960, 1977, 1983, 1988, 1991, 1995, 2008, 2012, 2016, and 2020	☒	☒	None
Fire Insurance Maps	EDR	☒	☒	EDR certified that fire insurance maps covering the target property were not available.
Local Street Directories	EDR / 1992, 1995, 2000, 2005, 2010, 2014, 2017, and 2020	☒	☒	The subject property was not listed in the City Directories
USGS Topographic Maps	EDR / 1890, 1892, 1913, 1915, 1954, 1976, 2013, 2016, 2019, and 2022	☐	☒	None
Building Department Records	EDR	☒	☒	EDR indicated that they do not have access to building permits within Whitesburg, Kentucky
Interviews	Not reviewed	☐	☐	Historical uses were determined from other sources
Property Tax Files	EDR	☒	☒	EDR indicated that there was no coverage within the subject property
Zoning/Land Use Records	Not reviewed	☐	☐	Historical uses were determined from other sources
Other Historical Sources	Not reviewed	☐	☐	Historical uses were determined from other sources

4.2.1 *HISTORICAL USES OF THE SUBJECT PROPERTY*

A history of previous uses of the subject property since its first developed use was compiled from information obtained from standard historical sources to identify past uses that could have led to RECs in connection with the subject property. The following table summarizes the historical uses of the subject property.

Historical Use Summary for the Subject Property		
Time Period	**General Use**	**Findings / Discussion**
1890 to 1892	Undeveloped	The subject property is undeveloped. A stream flowing generally northwest to southeast traverses the property.
1913 to 1977	Undeveloped, residential, and school	Most of the Property continued to be undeveloped. Surface mining is depicted in the center portion of the subject property in the 1952 aerial photograph. The 1954 topographic map depicts a clearing and a pit/mine within the western portion of the subject property. Some residential structures are depicted at the western and eastern edges of the subject property. Tolson School is present in the southwestern portion of the subject property.
1983 to 1995	Undeveloped, surface mining, and residential	The residential structures continued to exist in the western and eastern portions of the subject property, and most of the subject property remained undeveloped. The school is no longer depicted. Surface mining is depicted in the center portion of the subject property in aerial photographs dated 1983 to 1995. Unimproved roads leading to the surface mining area from the northern and southeastern boundaries of the subject property are present. A large structure is depicted in the eastern portion of the surface mining area. A pond is depicted in the eastern portion of the subject property from 1983 onward. A pond is depicted in the western portion of the subject property from 1988 onward.
2008 to 2020	Undeveloped and residential	The residential structures continued to exist, and most of the property remained undeveloped. The cessation of surface mining at the subject property is portrayed by the regrowth of vegetation in the center area. The large structure continued to exist. There is a structure present in the central-western portion of the subject property and a small structure located near the northern portion of the subject property. The network of unimproved roads continued to exist.

Based on a review of historical uses of the subject property and due to the historical use of hazardous substances in mining processes and the potential for contamination from past mining operations, the previous mining occurring at the subject property is considered a REC.

4.2.2 *DATA FAILURE*

WSP did not identify data failure during preparation of the Phase I ESA.

4.2.3 *HISTORICAL USE SUMMARY – ADJOINING PROPERTIES*

The following table summarizes historical uses of adjoining properties.

Historical Use Summary – Adjoining Properties		
Direction	**Name / Address**	**Summary**
North	9063-9095 KY Route 588	The northern area was historically unimproved dating back to at least 1890. Residential homes are depicted to the north of the subject property on the 1954 topographic map.
East	8617 to 8665 KY Route 588	The eastern area was historically unimproved dating back to at least 1890. A single structure is depicted to the southeast in the 1915 topographic map.
South	N/A	The area to the south is unimproved dating back to at least 1890.
West	N/A	The Tolson Branch stream bounds the western portion of the subject property, flowing generally north to south.

WSP did not identify obvious historical uses of adjoining properties that are considered to be likely sources of impact to the subject property.

4.2.4 *USES OF PROPERTIES IN SURROUNDING AREA*

A cursory review of historical uses of properties in the area surrounding the subject property was conducted using aerial photographs and topographic maps. WSP did not identify evidence of industrial complexes or other obvious uses or conditions indicating a REC may exist in connection with the subject property.

4.3 PRIOR ENVIRONMENTAL REPORTS

The *Phase I Environmental Site Assessment* conducted by Cardno, Inc. and dated October 2015 (Cardno, 2015) was reviewed by WSP. The report identified the following Recognized Environmental Concerns (RECs) and other environmental concerns associated with the subject property:

- A large, red, steel barrel with a hand pump was observed in the Meade family compound and determined to be an environmental concern. The barrel contained liquid with a strong petroleum odor; however, no evidence of leaks or spills was observed on or around the barrel. It was recommended that the contents of the barrel be characterized, removed, and disposed of in accordance with applicable regulations.
- A storage tank to the north of the Meade compound was identified as a REC due to the fact that the open drainage valve presents a material threat of release. The tank was associated with an active oil extraction operation and was assumed to contain petroleum crude oil.
- A natural gas compressor station was observed to the west of the Meade compound and was indicated to have experienced a release, and cleanup methods to address the leak were observed to be insufficient. The compressor station and surrounding soils were considered to be a REC.
- A larger steel fuel AST was observed to power the compressor station and was considered an environmental concern due to lack of secondary containment and direct ground placement.
- An open topped, 50-gallon, plastic barrel and a 5-gallon bucket were observed on the north side of the compressor and were indicated to present a material threat of release of petroleum products and considered to be RECs.
- A small, stained area was observed beneath a valve at the large steel oil tank located approximately 50 yards south of the compressor station. The storage tank was contained within an earthen berm and no liner was observed beneath the tank. Therefore, the site was determined to present an environmental concern.
- A large plastic oil storage tank observed approximately 1,000 feet east of the compressor station was observed to be damaged and to have released a portion of its contents. This AST is within a lined and

bermed area; however, the condition of the liner was not known. This site was considered to be a REC.

- Two transformers observed near the Meade family compounded were assumed to contain PCBs and considered to be RECs.
- Several small receptacles containing solid waste and a fire pit where solid waste appears to be burned were observed on the property. These were considered to be environmental concerns.

Cardno recommended that a Phase II ESA be conducted in order to confirm the absence/presence of hazardous materials or petroleum products at the compressor station and at the leaking AST observed to the east of the compressor station. The two transformers located on the property were also recommended to be investigated for PCBs.

Cardno stated that two buildings within the Meade family compound were not accessible at the time of the inspection. Since the contents of the buildings could not be determined, this was considered a data gap.

The *Phase II Environmental Site Assessment* conducted by Cardno, Inc. and dated February 2016 (Cardno, 2016) was reviewed by WSP. The areas sampled during the Phase II ESA included the following:

- The compressor station and surrounding soils and open containers of petroleum products
- The damaged plastic aboveground storage tank (AST) located approximately 1,000 feet east of the compressor station
- The open drain at the large AST located to the north of the Meade compound
- Two transformers located near the Meade compound

Soil sampling confirmed that petroleum hydrocarbons are located at three locations, the compressor station, the damaged AST, and the AST open drain valve, at concentrations above the regulatory criteria but are not considered to be hazardous or require special handling. Soil impacts were generally limited to the top 2 feet of soil. In addition, the report identified concentrations of arsenic across the subject property at concentrations well above the USEPA Regional Screening Level (RSL), but they were found to be consistent with background conditions for the area; therefore, arsenic was not considered to be a contaminant of concern.

The following recommendations were given:

- Upon decommissioning of the petroleum extraction operation, the identified contaminated soils should be excavated and disposed of at a permitted disposal facility.
- The walls and floor of all excavated areas should be sampled to demonstrate compliance with Kentucky cleanup standards for petroleum hydrocarbons in residential areas per Kentucky DEP 7079C (September 2011), Table B. All associated documents should be properly submitted to the Kentucky DEP for the closure of the petroleum releases.
- As the owner/operator of the compressor station, Vineland Energy is a responsible party for the documented petroleum releases and, as such, is responsible for the cleanup of the site. Prior to the purchase of the property, it is recommended that Vineland Energy remove the compressor station and all tanks, piping, and appurtenances from the site. Once removed, it is recommended that a licensed contractor remove and dispose of all contaminated soils on the property in accordance with applicable regulations and in coordination with Kentucky DEP Division of Waste Management, Superfund Branch-Petroleum Cleanup Section.

WSP requested additional information for the subject property from the Kentucky Energy and Environment Cabinet (EEC). Relevant information obtained is summarized below in Section 4.5, Regulatory Agency File and Records Review.

4.4 REGULATORY RECORDS REVIEW

WSP contracted EDR to conduct a search of publicly available information from federal, state, and tribal environmental regulatory agency databases that include information related to regulated facilities and facilities that have reported releases of hazardous substances and/or petroleum products. The standard government environmental records searched, and minimum search distances were consistent with criteria included in ASTM E1527-21 Section 8.2.2. The EDR report also included supplemental environmental record sources that are generally related to environmental compliance and may indicate a business environmental risk, but are not necessary indicative of a REC. The supplemental record sources were reviewed and discussed to the extent the record was pertinent within the scope of this assessment.

EDR gathers the regulatory search data into a cohesive report utilizing geocoded location information that is provided by the respective database sources. Resources with inadequate information are identified as “orphan” or “unmappable sites.” The listed sites are identified within the minimum search radii identified within the ASTM Standard E1527-21. The regulatory database report is included in Appendix D.

WSP generally considers the following criteria to determine if a listed database site is a potential environmental concern for the subject property: 1) the site’s distance from and/or position in relation to topography and groundwater gradient from the subject property; 2) indication of a spill or release; and 3) status of associated regulatory agency environmental cases.

The sites that have the greatest potential to have caused environmental contamination are those that have had releases or spills of hazardous substances or petroleum products located upgradient or in close proximity to the facility. The direction of localized groundwater flow at the Roxana Site is presumed to be to the northwest. Therefore, the sites that are of the greatest potential concern are those that have had releases or spills of hazardous substances or petroleum products and are southeast (upgradient) or in close proximity to the subject property.

Regulatory database listings associated with the subject property, adjacent site(s), and surrounding properties of concern that WSP determined warrant additional discussion based on the criteria above are identified in the summary table below.

Environmental Records Review Summary			
Facility Name / Address	**Distance / Direction / Gradient**	**Federal & State Database Listing(s)**	**Discussion / Finding**
Subject Property Roxana Site, Letcher County, KY	Property	UST, US MINES, and Abandoned Mines	The Lee Gentry Property is located in the northeastern portion of the subject property and is listed in the UST database. The 560-gallon tank reportedly held diesel and was installed in 1982, closed in place in 1997, and removed in 1998. No violations in relation to the tank were found. The Meade & Shepherd Coal Company Inc. located in the central area of the subject property is listed in the US MINES database, and its status indicates that it is permanently closed as of 1991. Lance Coal Corp. located in the central area of the subject property is listed in the US MINES database, and its status indicates it is permanently closed as of 1980. The C&C Coal Company located in the southwestern portion of the property is listed in the US MINES database and is indicated to be permanently closed as of 1987. Marie Enterprises Inc within the southwestern portion of the subject property is listed in the US MINES database and is indicated to be permanently closed as of 1989. The Big Oak Coal Company within the southwestern portion of the subject property is listed in the US MINES database, and its status indicates it is permanently closed as of 1989. NO 2 is an abandoned underground coal mine operated by Big Oak Coal Company within the southwestern portion of the subject property, and its status indicates that it was sealed and abandoned in 1989. Roxana #2 is an abandoned surface coal mine operated by Meade & Shepherd Coal Company Inc within the central portion of the subject property, and its status indicates it was abandoned in 1991. NO 1 Site is an abandoned surface coal mine operated by C & C Coal Company in the southwestern portion of the subject property, and its status indicates it was abandoned in 1987. The NO 1 Mine is an abandoned underground coal mine operated by Marie Enterprises Inc in the southwestern portion of the subject property, and its status indicated it was sealed and abandoned as of 1989.

Environmental Records Review Summary			
Facility Name / Address	**Distance / Direction / Gradient**	**Federal & State Database Listing(s)**	**Discussion / Finding**
Roxanne BP KY Route 160 S	Adjacent / Northeast / Downgradient	SB193	The facility is listed in the SB 193 database, indicating that it has performed permanent closure activities at a regulated UST facility. The report indicates that there was soil and groundwater contamination.
Multiple Facilities Letcher County, KY	Adjacent / Northwest / Downgradient	US MINES	This location contains multiple facilities. Mill Branch Processing Inc is listed in the US MINES database and is indicated to have been permanently closed as of 2019. Fleenor Inc is listed in the US MINES database and is indicated to have been permanently closed as of 2012. W&F Contract Augering Inc. is listed in the US MINES database and is indicated to have been permanently closed as of 2015. Auger NO 1 SN #11 is an abandoned surface coal mine, and its status indicates it was abandoned as of 2019. # 2, Mill Branch is a surface coal mine listed in the US MINES and Abandoned Mines databases and has reportedly received multiple citations in 2007. The mine status indicates its abandonment as of 2007. Mill Branch Operation Mine No 1 is an abandoned surface coal mine listed in the US MINES and Abandoned Mines databases and has reportedly received multiple citations in 2007, 2008, and 2009. The assessment status indicates these violations are closed. The mine status indicates its abandonment as of 2007.

Based on the regulatory records review discussed above, the previous mines located within the Roxana Site are considered a potential source of impact. Additionally, the Roxanne BP facility and mines adjacent to the subject property found to have received multiple citations are considered a potential source of impact to the subject property. Additional information is included in Section 4.5.

4.5 REGULATORY AGENCY FILE AND RECORDS REVIEW

WSP requested additional information for properties that were identified as a potential source of impact to the site from the Kentucky EEC. Relevant information obtained is summarized in the following table.

Facility Name / Address / Description	Information Source(s)	Discussion / Finding
Roxana BP (Gulf) KY Route 160	Kentucky EEC	Two 1,000-gallon and one 2,000-gallon steel gasoline USTs were recorded at the property, with the tanks estimated to have been installed in 1970. A Notice of Intent (NOI) to permanently close these tanks was issued in 2001. Records indicate that a release into the environment from a petroleum storage tank occurred on the property. Hinkle Meyer Environmental Services, Inc. was responsible for the removal of the three USTs located on the property, occurring in 2001. Soil samples were collected and tested for benzene, toluene, ethylbenzene, and total xylenes (BTEX). Results revealed the presence of contamination above allowable levels. Reports of this contamination were sent to the Kentucky Department of Environmental Protection (DEP) for evaluation, who requested additional evaluation in 2002. Following this request, Hinkle installed and sampled monitoring wells on the property in 2003. Kentucky DEP requested the over-excavation of contaminated soils in 2006, which was completed by Hinkle in 2007. Continued sampling and over-excavation subsequently occurred. As of 2020, it was indicated that soil and groundwater constituent concentrations of BTEX are below Allowable Levels. Copies of these reports with this information are available in Appendix F. Registration of hazardous waste activity dated 2003 was found in connection with the property, indicating it to be a one-time, small quantity generator. This waste was reported to have been generated during UST removal. Approximately 542.10 pounds of waste was generated and shipped off-site to Midwest Environmental Services, Inc. Violations in connection with the property were found to be issued for failure to remit Annual Registration payment for USTs at the property.

Files concerning the mines adjacent to the northwest of the subject property were not received. The Roxana B facility is located on KY Route 160, adjacent to the northeast of and downgradient from the subject property. Due to the subject property's location on a plateau with steep slopes approximately 400 feet above the adjacent properties, it is WSP's opinion that adjacent properties do not pose any concern as being a potential source of impact to the subject property, as the possibility of contaminant migration to the subject property is not likely.

It is WSP's opinion that the information reviewed was sufficient to evaluate whether the subject property has been impacted from on-site releases or migration from releases at off-site properties. Pertinent information from the Kentucky EEC is included in Appendix F.

4.6 ENVIRONMENTAL LIENS/ACTIVITY AND USE LIMITATIONS

An environmental lien/activity and use limitations search is a User responsibility and was not conducted as part of this Phase I ESA per the agreed upon scope of work; however, a search of engineering and institutional controls on the use of the property, including deed restrictions, was included in the regulatory database search conducted by EDR. The results of the search indicated that no current engineering or institutional controls exist for the subject property.

5 EVALUATION

5.1 FINDINGS AND OPINIONS

The following is a summary of findings relevant to releases or suspected releases of hazardous substances and/or petroleum products and WSP's opinion regarding whether the finding is a REC, HREC, CREC, or de minimis condition:

- A previous Phase II Environmental Site Assessment sampled the subject property and confirmed that impacted soils by petroleum products are located at the compressor station, the damaged aboveground storage tank (AST), and the AST open drain valve. It was recommended that the identified contaminated soils should be excavated and disposed of at a permitted disposal facility. It is unknown if these impacted soils have been excavated and therefore WSP considers this release to be a REC.
- A previous Phase II Environmental Site Assessment sampled the subject property and confirmed that impacted soils by petroleum products are located at the damaged aboveground storage tank (AST). It was recommended that the identified contaminated soils should be excavated and disposed of at a permitted disposal facility. It is unknown if these impacted soils have been excavated and therefore WSP considers this release to be a REC.
- A previous Phase II Environmental Site Assessment sampled the subject property and confirmed that impacted soils by petroleum products are located at the AST open drain valve. It was recommended that the identified contaminated soils should be excavated and disposed of at a permitted disposal facility. It is unknown if these impacted soils have been excavated and therefore WSP considers this release to be a REC.
- Mining permit applications indicate surface and underground mining operations dating to the 1960s have occurred within the site. As indicated in the search conducted by EDR, several mines listed in the US MINES and Abandoned Mines databases occur within the subject property. These mines include Meade & Shepherd Coal Company Inc., Lance Coal Corp, C&C Coal Company, Marie Enterprises Inc., and Big Oak Coal Company. These mines are indicated to have either been permanently closed or sealed and abandoned. No violations were found in connection with these mines. Due to the historical use of hazardous substances in mining and the potential for contamination from past mining operations, WSP considers this a REC.

5.2 DATA GAPS

WSP identified data gaps during the completion of this Phase I ESA:

- WSP was unable to determine whether remedial action was taken at the REC locations identified in the previous environmental reports. This data gap affected WSPs ability to assess whether this previous release was addressed to the satisfaction of applicable regulators.

5.3 BUSINESS ENVIRONMENTAL RISKS

WSP did not identify business environmental risks in association with the subject property.

6 CONCLUSIONS

WSP has performed a Phase I Environmental Site Assessment in conformance with the scope and limitations of ASTM Practice E1527-21 of the Roxana Site, the subject property. Any exceptions to, or deletions from, this practice are described in Section 1.3.1 of this report. This assessment has revealed the following RECs, CRECs and/or significant data gaps in connection with the subject property:

- A previous Phase II Environmental Site Assessment sampled the subject property and confirmed that impacted soils by petroleum products are located at the compressor station, the damaged aboveground storage tank (AST), and the AST open drain valve. It was recommended that the identified contaminated soils should be excavated and disposed of at a permitted disposal facility. It is unknown if these impacted soils have been excavated and therefore WSP considers this release to be a REC.
- Mining permit applications indicate surface and underground mining operations dating to the 1960s have occurred within the site. As indicated in the search conducted by EDR, several mines listed in the US MINES and Abandoned Mines databases occur within the subject property. These mines include Meade & Shepherd Coal Company Inc., Lance Coal Corp, C&C Coal Company, Marie Enterprises Inc., Big Oak Coal Company, Roxana #2, and NO 1 Mine. These mines are indicated to have either been permanently closed or sealed and abandoned. No violations were found in connection with these mines. Due to the historical use of hazardous substances in mining and the potential for contamination from past mining operations, WSP considers this a REC.
- WSP was unable to inspect building interiors. This data gap affected WSPs ability to identify whether a REC may exist in connection with the buildings located on the subject property.
- WSP was unable to determine whether remedial action was taken at the REC locations identified in the previous environmental reports. This data gap affected WSPs ability to assess whether this previous release was addressed to the satisfaction of applicable regulators.

7 ENVIRONMENTAL PROFESSIONAL DECLARATION

This report was prepared by Sarah Hoffman, CEM of WSP. Ms. Hoffman's resume is included in Appendix B.

I declare that, to the best of my professional knowledge and belief, I meet the definition of Environmental Professional as defined in Section 312.10 of 40 CFR Part 312. I have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject property. I have developed and performed all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

Sarah Hoffman

Sarah Hoffman, CEM

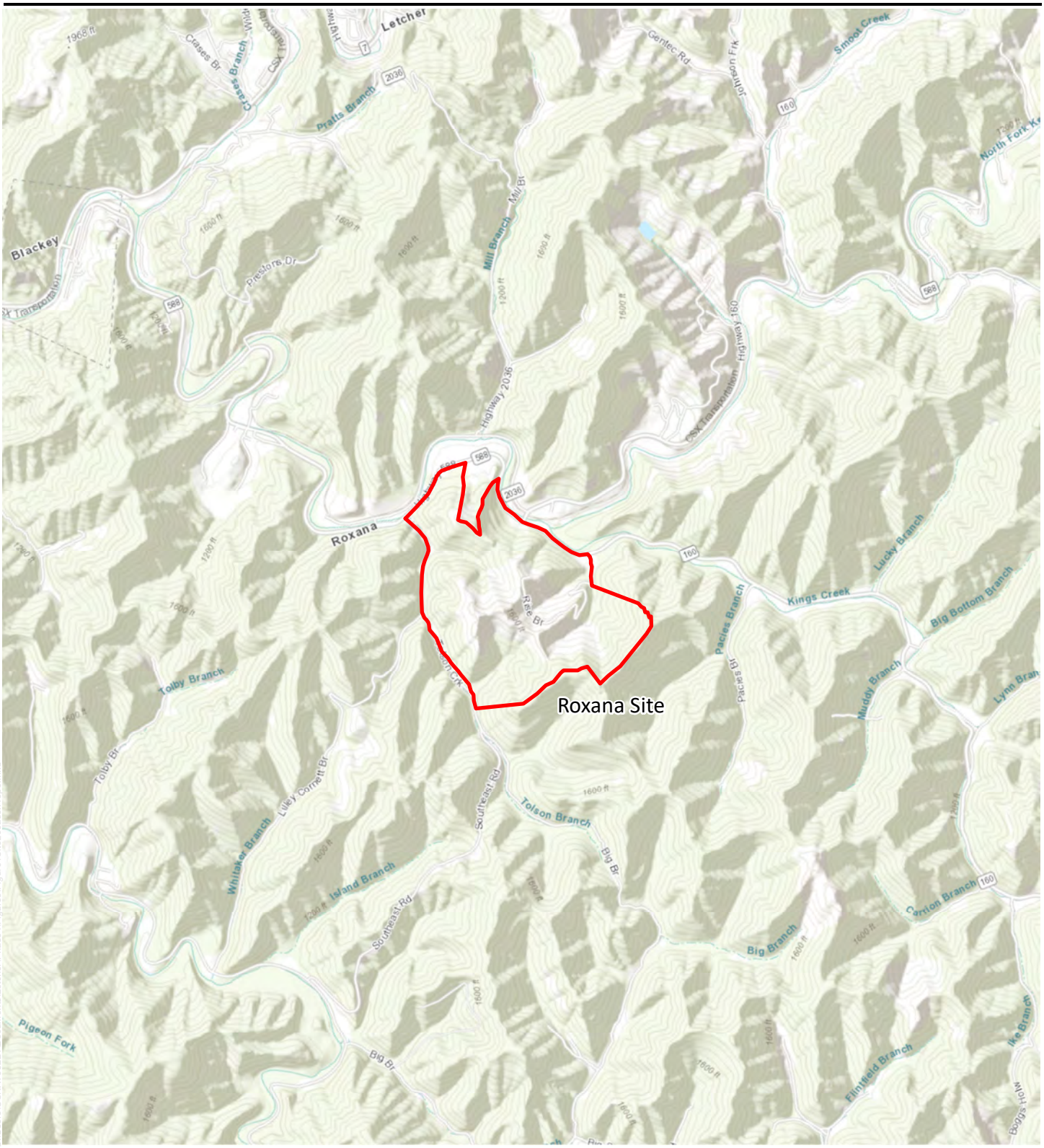
REFERENCES

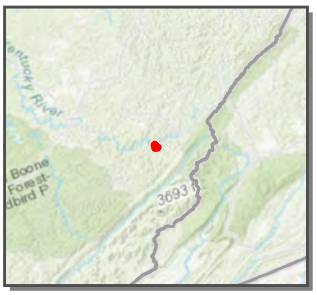
- Cardno. 2015. Phase I Environmental Site Assessment for Proposed United States Penitentiary and Federal Prison Camp. Roxana, Letcher County, Kentucky.
- Cardno. 2016. Phase II Environmental Site Assessment for Proposed United States Penitentiary and Federal Prison Camp. Roxana, Letcher County, Kentucky.
- Environmental Data Resources, Inc. 2023. The EDR Aerial Photo Decade Package. Inquiry Number: 721379.11. December 18.
- Environmental Data Resources, Inc. 2023. The EDR City Directory Abstract. Inquiry Number: 7521379.5. December 19.
- Environmental Data Resources, Inc. 2023. The EDR Historical Topographic Map Report. Inquiry Number: 7521379.4. December 14.
- Environmental Data Resources, Inc. 2023. The EDR Environmental Lien and AUL Search. Inquiry Number: 7521379.7. December 15.
- Environmental Data Resources, Inc. 2023. The EDR Radius Map with GeoCheck. Inquiry Number: 7521379.2s. December 14.
- Environmental Data Resources, Inc. 2023. Sanborn® Map Report. Inquiry Number: 7521379.3. December 14.
- Federal Emergency Management Agency (FEMA). 2015. FIRM Flood Rate Insurance Map, Letcher County, Kentucky. Map Number 21133C0225D.
- United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS). 2023. Custom Soil Resource Report for Knott and Letcher Counties, Kentucky.
- WSP. 2023. Wetland Delineation Report and Jurisdictional Determination Request.

ACRONYMS

AAI	All appropriate inquiries
ACM	Asbestos-containing material
AST	Aboveground Storage Tank
BTEX	Benzene, toluene, ethylbenzene, and xylenes
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
DEP	Kentucky Department of Environmental Protection
EDR	Environmental Data Resources, Inc.
EEC	Kentucky Energy and Environment Cabinet
EP	Environmental professionals
EPA	U.S. Environmental Protection Agency
ESA	Environmental Site Assessment
FBOP	Federal Bureau of Prisons
LLP	Liability protection
LUST	Leaking underground storage tank database
NOI	Notice of Intent
NRCS	Natural Resources Conservation Service
OSHA	Occupational Safety and Health Administration
RSL	Regional Screening Level
PCBs	Polychlorinated biphenyls
REC	Recognized Environmental Condition
UCL	Upper Confidence Limit
USDA	United States Department of Agriculture
USGS	United States Geological Survey
UST	Underground Storage Tank

FIGURES





Legend

Subject Property

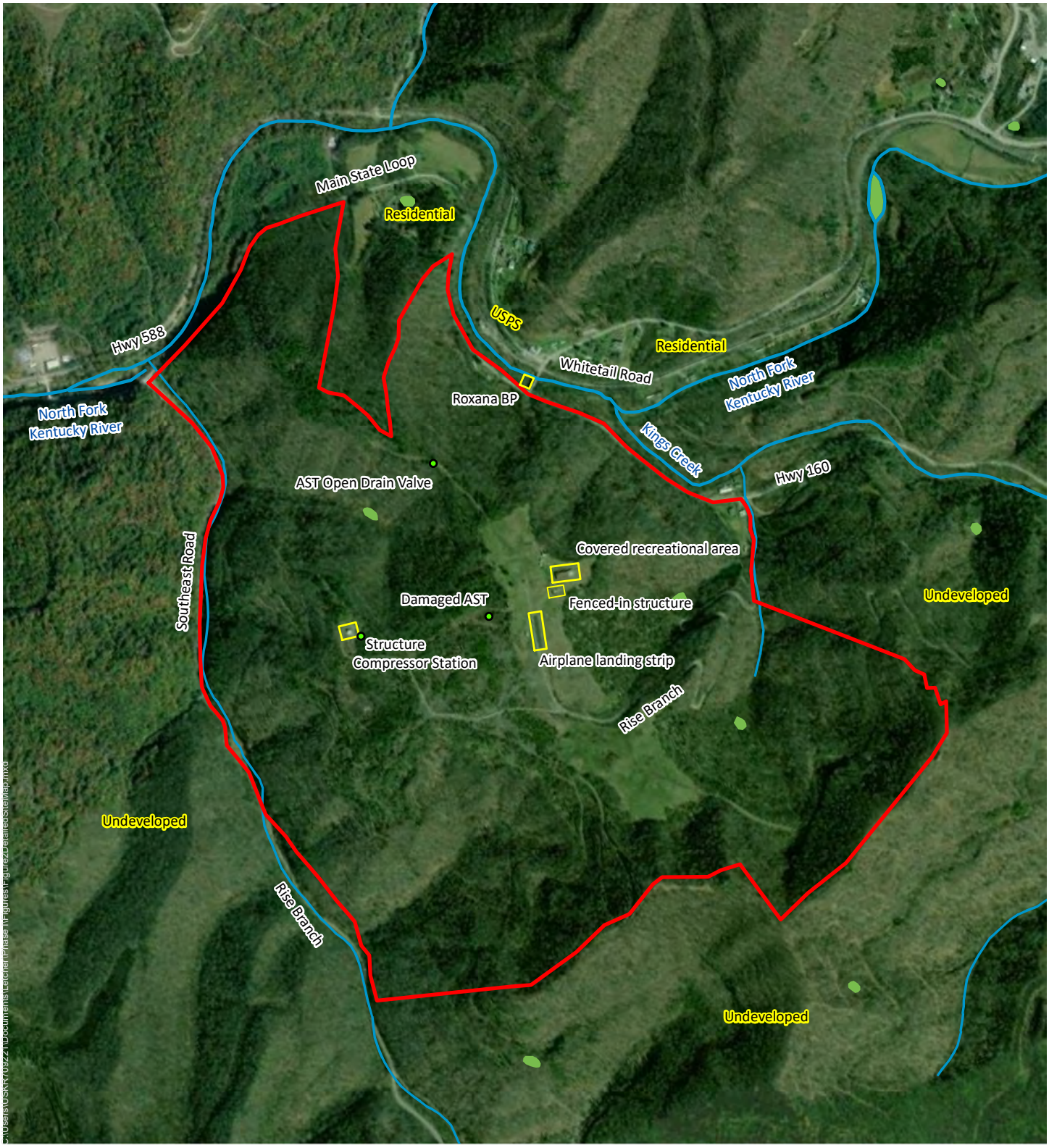
N

Sources: ESRI 2022; WSP 2022.

Proposed Federal Correctional Institution and Federal Prison Camp
Figure 1 Subject Property Location

Letcher County, Kentucky
January 2024

0 1 2 Miles



Legend

- Marsh, Swamp, Bog, Prairie
- River
- Subject Property Location

Proposed Federal Correctional Institution and Prison Camp
Figure 2 Aerial View

Letcher County, Kentucky
February 2024

0 500 1,000 Feet

Sources: ESRI 2022; WSP 2022.

APPENDIX

A KEY DEFINITIONS FROM ASTM E1527-21

KEY DEFINITIONS FROM ASTM E 1527-21, STANDARD PRACTICE FOR ENVIRONMENTAL SITE ASSESSMENTS: PHASE I ENVIRONMENTAL SITE ASSESSMENT PROCESS, SECTION 3.2

Recognized Environmental Condition (REC) - (1) The presence of hazardous substances or petroleum products in, on, or ad the subject property due to a release to the environment; (2) the likely presence of hazardous substances or petroleum products in, on, or at the subject property due to a release or likely release to the environment; or (3) the presence of hazardous substances or petroleum products in, on, or at the subject property under conditions that pose a material threat of a future release to the environment.

Controlled Recognized Environmental Condition (CREC) - A REC affecting the subject property that has been addressed to the satisfaction of the applicable regulatory authority or authorities with hazardous substances or petroleum products allowed to remain in place subject to implementation of required controls (for example, activity and use limitations or other property use limitations). The identification of a CREC does not imply that WSP has evaluated or confirmed the adequacy, implementation, or continued effectiveness of the required control(s).

Historical Recognized Environmental Condition (HREC) - A previous release of hazardous substances or petroleum products affecting the subject property that has been addressed to the satisfaction of the applicable regulatory authority or authorities and meeting unrestricted use criteria established by the applicable regulatory authority or authorities without subjecting the subject property to any controls (for example, activity and use limitations or other property use limitations). An HREC is not a REC. WSP's rationale for identifying a condition as an HREC is based solely on the information stated herein.

De minimis condition - A condition related to a release that generally does not present a threat to human health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. A condition determined to be a de minimis condition is not a REC or a CREC.

Data Gap – A lack or inability to obtain information required by this practice despite good faith efforts by the environmental professional to gather such information. Data gaps may result from incompleteness in any of the activities required by this practice, including, but not limited to, site reconnaissance (for example, an inability to conduct the site visit), and interviews (for example, an inability to interview the key site manager, regulatory officials, etc.).

Significant Data Gap – A data gap that affects the ability of the environmental professional to identify a REC.

APPENDIX

B STATEMENT OF QUALIFICATIONS

SARAH HOFFMAN, CEM

Senior Environmental Planner

Years with the firm

7

Years total

19

Professional qualifications

Certified Environmental Manager, 2437, Expires 3/23/25

Areas of practice

NEPA, Phase I Due Diligence, SWPPP/SPCC, Environmental Monitoring, Permitting and Compliance

Languages

English

CAREER SUMMARY

Ms. Hoffman has 19 years of professional experience managing a variety of environmental engineering and geology projects for the Transportation, Water, and Environment sectors. Ms. Hoffman's work experience includes National Environmental Policy Act (NEPA), Phase I Environmental Site Assessments (ESA) due diligence, environmental scoping, permitting and compliance, Stormwater Pollution Prevention Plans (SWPPP), Spill Prevention Control and Countermeasure (SPCC) Plans, and soil and groundwater sampling, monitoring, and remediation.

Ms. Hoffman also participated on the 2019 Bridges to Prosperity Karambi, Rwanda project team. Ms. Hoffman was the Logistics Coordinator for the 50m suspension pedestrian footbridge construction project.

EDUCATION

BS, Environmental Geology, University of Nevada Las Vegas 2004

ADDITIONAL TRAINING

OSHA 40-Hour Hazardous Waste Operations Training with current 8 -hr refresher
CPR/First Aid/AED Certification
Wetland Training Institute – Basic Wetland Delineation
CCRFCD – Environmental Permitting Workshop
NDOT RE Training
OSHA Construction 30-hour
OSHA Asbestos Consultant, License No. I-1879
Qualified Industrial Stormwater Practitioner, California Stormwater Quality Association
NEPA Writing, NWETC
Advanced NEPA, NWETC
NDEP/NDOT Las Vegas Valley Construction Site Stormwater Training
EPA Method 9, Visible Emissions Training
TRI Training Basic Concepts Section 313 Reporting
AGC/NDOT Water Pollution Control Manager Training
Clark County DAQ Dust Monitor
Wind Erosion Control Prediction Systems, IECA
Environmental Site Assessments for Commercial Real Estate, ASTM
FEMA Badged

PROFESSIONAL MEMBERSHIPS

Society of Military Engineers (SAME), Pikes Peak and Denver Metro Posts, Member, 2019-Present, SAME Southern Nevada Post, Member 2015-2019
National Association of Environmental Professionals (NAEP), Member 2021-Present
Nevada Section, Air & Waste Management Association (AWMA), Board of Directors 2008-2018
American Public Works Association (APWA), Member 2016-2018; Committee Member 2016-2017
Nevada Virtual Academy, Board of Directors 2016-2017
Women in Transportation (WTS), Volunteer 2016-2019

PROFESSIONAL EXPERIENCE

Environmental Assessments/NEPA

- Bureau of Federal Prisons, Supplemental Final Environmental Impact Statement - Federal Correctional Institution and Federal Prison Camp, Leavenworth, Kansas. Ms. Hoffman was the Deputy Project Manager, assisting with data collection and analysis of 277-acre site proposed for development as a new FCI and FPC in Leavenworth, KS. Studies involve analysis of access routes and transport requirements, wetland delineation and permit application preparation; water, sewer, gas, and power supply requirements and availability, geotechnical considerations; archaeological and historic resources, and hazardous waste contamination. Assisting with for preparation of Draft Supplemental FEIS, public hearing preparations, response to public comments, preparation of Final Supplemental, draft record of decision, and Administrative Record.
- Bureau of Federal Prisons, Environmental Impact Statement - Federal Correctional Institution and Federal Prison Camp, Letcher County, Kentucky. Ms. Hoffman was the Deputy Project Manager, assisting with data collection, analysis, and site selection process for a proposed new FCI and FPC in Letcher County, Kentucky. Ms. Hoffman coordinated the public scoping meeting and generation of the draft EIS.
- City of Las Vegas, Rancho Drive Complete Street, Las Vegas, Nevada. Ms. Hoffman is the Environmental Lead for this project. The proposed project would improve approximately 6.6 miles of Rancho Drive from Rainbow Boulevard to Mesquite Avenue to incorporate qualities of a Complete Street. The EA is being prepared in accordance with the City of Las Vegas and in cooperation with the Nevada Department of Transportation (NDOT) and Federal Highway Administration (FHWA) regulations. This project has a significant public outreach component because the easements needed for additional right-of-way for roadway improvements would require acquisition of privately owned parcels. The proposed action is located in an Environmental Justice (EJ) community.
- City of Las Vegas, I-15 Frontage Roads, Las Vegas, Nevada. Ms. Hoffman assisted the Project Manager with the preparation of the Environmental Assessment (EA). The proposed project would provide a frontage road for approximately one mile along Interstate 15 (I-15) North Freeway from Lake Mead Boulevard to Washington Avenue to improve access and encourage economic development in the Historic Westside Neighborhood. The EA was prepared in accordance with the City of Las Vegas and in cooperation with the NDOT and FHWA regulations. A detailed assessment of the effect of the Proposed Action for critical elements of the human environment specified by statue, regulation, or Executive Order (EO) were described and analyzed. For each resource category, the Proposed Action is compared to the No Action Alternative.
- City of North Las Vegas, Range Wash – Ann Branch, North Las Vegas, Nevada. Ms. Hoffman was the Environmental Lead for the development of a Section 8 Environmental Analysis, and Phase I ESA for the Range Wash – Ann Branch project. The proposed project will provide flood control facilities to collect and convey runoff along Mt Hood Street and Ann Road for the Range Wash Watershed. The proposed project will construct flood control facilities (RWAN 0000 through RWAN 0050) as a lateral reinforced concrete box (RCB) stormdrain to carry a 100-year runoff event to reduce flood flows. The environmental documents were prepared in accordance with the ASTM, Clark County Regional Flood Control District, and Bureau of Land Management regulations.

- City of North Las Vegas, Range Wash – Hollywood Branch, North Las Vegas, Nevada. Ms. Hoffman was the Environmental Lead for the preparation of the Description of the Proposed Action and Alternative (DOPAA), USAF Form 813, Environmental Baseline Survey (EBS) and Supplemental EBS, Section 8 Environmental Analysis, Phase I ESA and EA for multiple phases of this project. The proposed project will provide flood control facilities to collect and convey runoff along Hollywood Boulevard for the Range Wash Watershed from Centennial Parkway to Las Vegas Boulevard to the Confluence Detention basin on Nellis Air Force Base (AFB) property. The proposed project will construct a lateral along Azure Avenue to intersect with the flood control facilities (RWHW 0173 through RWHW 0277) from Centennial Parkway to Las Vegas Boulevard along Hollywood Boulevard as a lateral reinforced concrete box (RCB) stormdrain to carry a 100-year runoff event to reduce flood flows overtop of Las Vegas Boulevard and across Nellis AFB lands. The environmental documents prepared in accordance with the USAF, ASTM, Clark County Regional Flood Control District, and Bureau of Land Management regulations.
- City of North Las Vegas, Detention Basin, North Las Vegas, Nevada. Ms. Hoffman was the Environmental Lead for the development of a Section 8 Environmental Analysis, and Phase I ESA for the Detention Basin project. The City of North Las Vegas is planning to improve the North Las Vegas Detention Basin to address the 100-year, 6-hour storm hydrologic and hydraulic design for the expansion of the North Las Vegas Detention Basin (NLVDB) located north of the CC-215 Beltway between North 5th Street and Losee Road. The environmental documents were prepared in accordance with the ASTM, Clark County Regional Flood Control District, and Bureau of Land Management regulations.
- Clark County Department of Public Works, Carey Avenue, Las Vegas, Nevada. Ms. Hoffman assisted the Project Manager during the generation of an EA for the Carey Avenue Project, in cooperation with Nellis AFB personnel. The Clark County Department of Public Works has requested of Nellis AFB a grant of easement for the purpose of constructing improvements to a portion of Carey Avenue, an east-west collector street serving the community of Sunrise Manor. The easement would comprise approximately seven acres of underutilized non-excess real property along the installation's southern boundary, south of Sloan Channel. The proposed action involves the improvement and expansion of Carey Avenue between Nellis Boulevard and Toiyabe Street, by building a new collector roadway connection. Ms. Hoffman reviewed the EBS and assisted with the DOPAA, USAF Form 813, and EA development. Ms. Hoffman also prepared two additional EBSs for land swap consideration and granting of easements.
- Clark County Department of Public Works, Hollywood Boulevard Extension, Las Vegas, Nevada. Ms. Hoffman was the Environmental Lead during the generation of an EA for the Hollywood Boulevard Extension Project, in cooperation with the Bureau of Reclamation. The Clark County Department of Public Works proposes to extend Hollywood Boulevard southward across the park to connect to Wiesner Way in the City of Henderson. The project will include upgrading approximately 3.8 miles of Hollywood Boulevard and Wiesner Way and constructing approximately 2.0 miles of new roadway through the park to connect the Sunrise Manor Planning Area of Clark County to the City of Henderson. Ms. Hoffman prepared the Hazardous Waste Screening Study Report, oversaw agency coordination, and developed the EA.
- Clark County Department of Public Works, Orchard Detention Basin, Las Vegas, Nevada. Ms. Hoffman assisted the Design Project Manager by providing

environmental services including the environmental scoping and the SF-299, Plan of Development, and Environmental Assessment for the continuation of a flood control channel that required additional right-of-way from the BLM.

- Clark County Department of Public Works, Flamingo Wash, Las Vegas, Nevada. Ms. Hoffman assisted the Design Project Manager by providing environmental services including the the Section 8 Environmental Analysis, and Phase I ESA for the Flamingo Wash project. The proposed project will provide improved flood control facilities between Palos Verdes Street and Maryland Parkway. The environmental documents were prepared in accordance with the ASTM, Clark County Regional Flood Control District, and Bureau of Land Management regulations.
- Clark County Department of Public Works, Flamingo Wash – Hotel Rio, Las Vegas, Nevada. Ms. Hoffman assisted the Design Project Manager by providing environmental services including the the Section 8 Environmental Analysis, and Phase I ESA for the Flamingo Wash project. The proposed project will provide improved flood control facilities between Hotel Rio and the UPRR. The environmental documents were prepared in accordance with the ASTM, Clark County Regional Flood Control District, and Bureau of Land Management regulations.
- Clark County Department of Public Works, Sahara Avenue Interchange at I-515 PEL, Las Vegas, Nevada. Ms. Hoffman was the Environmental Lead during the generation of a Planning and Linkages (PEL) Study for the new interchange of Sahara Avenue at I-515 Project, in cooperation with the NDOT. The Clark County Department of Public Works proposes to add this interchange to alleviate congestion and provide additional access of the I-515 freeway.
- Clark County Department of Public Works, Vegas Drive, Las Vegas, Nevada. Ms. Hoffman assisted the Design Project Manager by providing environmental services including the the Section 8 Environmental Analysis, and Phase I ESA for the Vegas Drive project. The proposed project will provide improved flood control facilities. The environmental documents were prepared in accordance with the ASTM, Clark County Regional Flood Control District, and Bureau of Land Management regulations.
- Metropolitan Transportation Authority (MTA) Central Business District (CBD) Tolling Program EA, New York City. Senior Environmental Planning assisting with the following chapters of the EA: Economic Benefit Analysis/Social Equity, Environmental Justice, and Indirect and Cumulative Effects. On March 31, 2019 the New York State (NYS) Legislature enacted the MTA Reform and Traffic Mobility Act ("Traffic Mobility Act") that authorized the MTA to establish a CBD tolling program to institute a toll for vehicles entering or remaining in the CBD, south of 60th Street in Manhattan. Louis Berger prepared an EA to conform to all governmental regulations, standards, and guidelines applicable to the performance of an environmental review under NEPA, and to conform to FHWA regulations and guidance. Louis Berger analyzed the potential impacts of the proposed Tolling Program.
- Orange & Rockland Utilities' Woodbury to Highlands Falls and United States Arm Garrison West Point Transmission Line Upgrade, Article VII Application and Environmental Condition of Property Assessment, Orange County, New York. Senior Environmental Planner in charge of generating a Environmental Condition of Property Assessment (ECP) for the approximately 12-mile transmission line project as well as drafting the hazardous materials exhibit for the Article VII Application.

— U.S. Coast Guard, Hurricane Execution Plan at Sector Key West, Senior Environmental Planner. The U.S. Coast Guard (USCG) is proposing to repair/replace facilities at Sector and Station Key West in Florida that were damaged by Hurricane Irma in September 2017. The purpose of the project is to provide facilities and infrastructure at Sector Key West and Station Key West that meet the operational, space, and maintenance requirements so that they can fully execute their strategic missions. This includes increasing the resiliency of Sector and Station facilities so that they can remain operational during future weather events and return to full operation after an event is over. Ms. Hoffman was responsible for assessing the potential impacts to hazardous materials and human health and safety for the project.

Due Diligence

— BTC III Acquisitions LLC, Salt Lake City, UT (2019). Project Manager in charge of a Phase I ESA for a 67-acre vacant property in Salt Lake City, Utah. The Phase I ESAs were performed in general accordance with the scope and limitations of the ASTM International Standard E 1527-13, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process and the "due diligence" regulations of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Section 9601 (35)(b) of the Superfund Amendments and Reauthorization Act (SARA).

— City of Las Vegas, Las Vegas Boulevard North Widening Stewart Avenue to Washington Avenue, Las Vegas, Nevada. Ms. Hoffman was the environmental coordinator for assessing existing conditions, researching Nevada Division of Environmental Protection (NDEP) Bureau of Corrective Action case files for past releases and evaluating parcels of environmental interest for the widening project.

— CoreCivic, Lansing Correction Facility, Lansing, Kansas. Project Manager in charge of a Phase I ESA for the approximately 40-acre medium-security portion of the Lansing Correction Facility. The Phase I ESA was performed in general accordance with the scope and limitations of the ASTM International Standard E 1527-13, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process and the "due diligence" regulations of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Section 9601 (35)(b) of the Superfund Amendments and Reauthorization Act.

— CoreCivic, Midwest Regional Reception Center, Leavenworth, Kansas. Project Manager in charge of an Environmental Assessment as well as a Phase I ESA for the construction of the ICE facility. The Phase I ESA was performed in general accordance with the scope and limitations of the ASTM International Standard E 1527-13, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process and the "due diligence" regulations of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Section 9601 (35)(b) of the Superfund Amendments and Reauthorization Act.

— CoreCivic, CAR19, Burlington, Colorado and Natchez, Mississippi. Project Manager in charge of a Phase I ESA for the medium-security Kit Carson Correctional Center and Adams County Correctional Center. The Phase I ESAs were performed in general accordance with the scope and limitations of the ASTM standards and Federal regulations.

— CoreCivic, ICE Procurement, Otay Mesa, California. Helped with preparation of an Environmental Screening Report as described in the Immigration and Customs

Enforcement (ICE) solicitation for Contract Detention Facility and Transportation Services. With only seven (7) days to complete an Environmental Assessment and the Environmental Screening Report, a team was assembled to evaluate the potential environmental impacts of operating a detention facility to house approximately 2,100 adult male and female detainees. The facility would support ICE administration, processing, and courtrooms on lands located approximately 24 miles southeast of downtown San Diego, California in the community of Otay Mesa. In addition, Ms. Hoffman conducted the site reconnaissance and prepared the Phase I ESA report in general accordance with the scope and limitations of the ASTM standards and Federal regulations.

— CoreCivic, ICE Procurement, Plymouth, Illinois and Prairie, Minnesota. Helped with preparation of an Environmental Assessment as described in the ICE solicitation for Contract Detention Facility and Transportation Services for both facilities. Subject matters included geology and soils and water resources. In addition, prepared a Phase I ESA for each location which was performed in general accordance with the scope and limitations of the ASTM standards and Federal regulations.

— CoreCivic, Tallassee and Atmore, Alabama. Helped with preparation of Phase I ESA for both facilities in general accordance with the scope and limitations of the ASTM standards and Federal regulations. Both properties are currently used as agricultural property but are being proposed for development for correction facilities.

— Emerson Automation Solutions, Phase I ESA, Ferndale Washington, Denver (Commerce City), Colorado, and Oklahoma City, Oklahoma. Project Manager in charge of a Phase I ESA for valve repair shops in the Copac Grandview Industrial Center (Ferndale), Park Industrial Center (Commerce City), and Oklahoma City. The Phase I ESAs were performed in general accordance with the scope and limitations of the ASTM standards and Federal regulations.

— Farmer Brothers Coffee, Desktop Reviews MN, MO and OR. Ms. Hoffman assisted with desktop reviews for five Farmer Brothers Coffee warehouse and distribution locations in MN, MO, and OR. A phone interview was conducted with each warehouse manager, a review of available databases and historical information, and then a summary of findings was prepared for each facility.

— Maryland Department of Transportation, Hazardous Materials Evaluations, MD. Hazardous Materials Evaluations were conducted at each of the compensatory Stormwater Management Limit of Disturbances (LODs) and larger stream restoration sites. Seven hundred and forty-five (745) LODs and fifteen (15) stream restoration sites were reviewed. The goal of each evaluation was to identify potential soil, groundwater, soil vapor, or debris-impacted potential sites of concern (PSOCs) or Recognized Environmental Conditions (RECs) such as a chemical/petroleum storage tank on or in close proximity to the LOD that could create an unsafe or hazardous situation during any intrusive groundwork. The evaluations were conducted in modified/limited accordance with Environmental Protection Agency (EPA) Standards and Practices for All Appropriate Inquiries as required under Section 101(35)(B) of the federal Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or Superfund Law as specified in Title 40 Code of Federal Regulations (CFR) Part 312; and the ASTM International (ASTM) Standard for Environmental Site Assessments: Phase I Environmental Site Assessment Process (ASTM E 1527-13). Ms. Hoffman assisted the Project Manager with hundreds of desktop reviews for proposed LODs.

- New York City Department of Design and Construction (DDC); Phase I Corridor Assessment, New York. The Corridor Assessment included review of environmental database reports, historical Sanborn Fire Insurance Maps, and historical information provided by the DDC for the 11 Segment Priority Grid Corridors. Ms. Hoffman assisted with review of the database reports and the Sanborn Maps and the findings which were incorporated into an individual Phase I Corridor Assessment Report (Phase I CAR) for each Corridor.
- New York City Economic Development Corporation (EDC), Phase I ESA, New York. Ms. Hoffman assisted the Project Manager with a quick turn Phase I ESA for a property located in the Long Island City area of Queens, New York.
- South Dakota Army National Guard (SDARNG), Phase I ESAs, De Smet South Dakota. Project Manager for conducting two Phase I ESAs: one was a parcel of land owned by the City of De Smet and leased by the SDARNG for a Motor Vehicle Storage Compound (MVSC), and the other was the DeSmet Armory located in the DeSmet High School. The two ESAs were required to comply with the Environmental Condition of Property (ECOP) determined to be appropriate for a termination of lease by the SDARNG. Ms. Hoffman oversaw site reconnaissance and performed the data collection, file reviews, interviews, and prepared the reports. The Phase I ESA reports were conducted in general accordance with ASTM standards.
- Spirt Truck Lines, Phase I ESAs, San Juan/San Antonio, TX. Project Manager in charge of a Phase I ESA for the approximately 59-acre and 9-acre parcels, respectively used for administrate offices, freight sorting/distribution, truck maintenance/repair, truck washing, and parking. The Phase I ESAs were performed in general accordance with the scope and limitations of the ASTM International Standard E 1527-13, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process and the "due diligence" regulations of the CERCLA and Section 9601 (35)(b) of the SARA.
- United States Postal Service, Phase I ESAs, Nationwide (2017-present). Project Manager for Phase I ESAs of proposed USPS lease locations in multiple states including but not limited to: New York, New Jersey, Massachusetts, Washington DC, Illinois, Montana, Wisconsin, North Carolina, Georgia, California, Colorado, Puerto Rico, and Guam. Ms. Hoffman oversaw site reconnaissance and performed the data collection, file reviews, interviews, and prepared the reports. The Phase I ESA reports were conducted in general accordance with ASTM standards.
- United States Postal Service, Facility Post-Cleanup, Arlington, Virginia. Responsibilities included coordinating and oversight of hazardous material disposal and report preparation specific to properly classifying, labeling, transporting, and disposal of various waste materials that were remaining at the former Vehicle Maintenance Facility (VMF).
- Various: Project Manager for Phase I ESAs of facilities located in multiple states including Arkansas, Colorado, New Mexico, New Jersey, Washington, Indiana, Oregon, California, and Nevada . Ms. Hoffman conducted the site reconnaissance, performed the data collection, file reviews, interviews, and prepared the reports. The Phase I ESA reports were conducted in general accordance with ASTM standards.

Environmental Permitting

- Clark County Department of Public Works, Whipple – Fairgrounds Detention Basin, Logandale, Nevada. Ms. Hoffman assisted the Project Manager with the

environmental permitting, assessment, and Emergency Action Plan per Department of Homeland Security. The project includes a 130 acre-foot detention basin, earthen dam with emergency spillway and stilling basin, inflow spillway, paved access road, gravel maintenance roads, sediment basin and outlet structure with a 1.5 mile 48" RCP outfall system with an energy dissipator at the Muddy River. The outfall system includes sediment basins, confluence structures, and drop inlets. Louis Berger is responsible for the final drainage report, utility research, cost estimates, hydrologic and hydraulic analysis, town meetings, and coordination of subcontractors for the BLM Environmental Assessment, USCOE Section 404 Jurisdictional Determination, survey, right-of-way, and geotechnical investigations.

— Clark County Department of Public Works, Laughlin-Bullhead City Bridge, Laughlin, Nevada. Environmental Planner tasked in assisting with the generation of the US DOT, FHWA, and NDOT Re-Evaluation Report of the EA for Laughlin-Bullhead City Bridge Project as well as environmental permitting acquisition. The proposed project will construct a new bridge between Laughlin, NV and Bullhead City, AZ, to supplement the existing Laughlin and Veterans Memorial Bridges. The original Laughlin-Bullhead City Bridge Project EA was approved by FHWA on October 21, 2010 and the FONSI was signed on July 13, 2011. The proposed realignment reduces the skew of the bridge over the Colorado River and subsequent impacts to Waters of the United States (WOUS).

— Clark County Department of Public Works, Airport Connector, Las Vegas, Nevada. Environmental Planner tasked in assisting with the generation of the US DOT, FHWA, and NDOT Re-Evaluation Report for Phase 3 of the Airport Connector. The re-evaluation was conducted in accordance with 23 CFR 771.117 for the Categorical Exclusion (CE) that was previously approved on March 31, 2005 and a Re-evaluation that was previously approved on August 31, 2010. The proposed Phase 3 improvements will not increase the capacity of the I-215 Freeway and are planned as operational and safety improvements.

— National Park Service, Glen Canyon National Recreation Area, Utah. Ms. Hoffman was the Project Manager for the natural resources survey and reports for the Bullfrog NEPA phase. The NPS is extending the boat launch ramp due to emergency conditions from lowering lake elevations.

— National Park Service, Glen Canyon National Recreation Area, Arizona. Ms. Hoffman was the Project Manager for the pre-NEPA effort to address lower lake levels. Ms. Hoffman hosted a pre-NEPA workshop to identify an initial plan list and prioritize the list to address impacts to park resources and visitor use pending these emergency conditions from lowering lake elevations.

— National Park Service, Lake Mead, Relocated Callville Bay Water Intake Barge, Henderson, Nevada. Ms. Hoffman was the Project Manager through the pre-design and schematic design services to relocate the water intake barge at Callville Bay in anticipation of continued decreasing lake elevation. Ms. Hoffman hosted the Value Analysis workshop as well as provided permitting scoping services including the Permitting Assessment Form, permit list, and permit applications, as well as an alternatives assessment to address infestation by Quagga Mussels. Ms. Hoffman was the Project Manager for the RFP task, generating the RFP package for a Design-Build contractor.

— National Park Service, Lake Mead, Katherine Landing Water Treatment Plant, Bullhead City, Arizona. Ms. Hoffman oversaw the test well installation and aquifer testing activities at Katherine Landing. The National Park Service (NPS) was

considering the transfer of the Katherine Landing water supply from Lake Mohave surface water to groundwater. Ms. Hoffman reviewed the analytical report and assisted with the Value Analysis workshop that was conducted to evaluate alternatives for providing water treatment modifications to address infestation by Quagga Mussels. Ms. Hoffman assisted with the compilation of the Draft Schematic Design Report (SD) package as well as the Design Development/Construction Documents (DD/CD) package including the Permitting Assessment Form. Ms. Hoffman is currently managing the Class III construction services task for Submittals and RFIs.

— National Park Service, Lincoln Memorial Reflecting Pool, NAMA. The NPS is upgrading the water pipeline for the pool. Ms. Hoffman provided permitting scoping services including the Permitting Assessment Form, permit list, and permit applications.

— National Park Service, Hawaii. The NPS is proposing to replace old and deteriorating fencing at three parks: HAVO, HALE, and KALA. Ms. Hoffman provided permitting scoping services including the Permitting Assessment Form, permit list, and permit applications for this proposed action for all three parks.

— National Park Service, Zion, Tuzigoot, Canyon de Chelly, and Glen Canyon, Arizona and Utah. The NPS is renovating bridges at four different properties including Zion National Park, Tuzigoot National Monument, Canyon de Chelly National Monument, and Glen Canyon National Recreation Area. Ms. Hoffman provided permitting scoping services including the Permitting Assessment Form, permit list, and permit applications.

— Windhub Solar, Stormwater Pollution Prevention Plan, Mojave, California. Ms. Hoffman assisted with the Stormwater Pollution Prevention Plan (SWPPP) preparation for construction activities at the 160-acre property located in Mojave, Kern County, California. The SWPPP was prepared in compliance with California's General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities (General Permit) Order No. 2009 0009 DWQ as amended by Order No. 2010 0014 DWQ (NPDES No. CAS000002) issued by the State Water Resources Control Board (SWRCB).

— 174 Power Global, Stormwater Pollution Prevention Plan, Silver Peak Solar Project, Boulder City, Nevada. Ms. Hoffman prepared the Stormwater Pollution Prevention Plan (SWPPP) for construction activities at the 10-acre property located in Eldorado Valley near Boulder City, Nevada. The SWPPP was prepared in compliance with Nevada's General Permit for Stormwater Discharges Associated with Construction Activities (General Permit) Order No. 2009 0009 DWQ as amended by Order No. 2010 0014 DWQ (NPDES No. CAS000002) issued by the State Water Resources Control Board (SWRCB).

Transportation

— National Cooperative Highway Research Program, Nationwide. This study was conducted for the AASHTO Committee on Environment and Sustainability, with funding provided through the National Cooperative Highway Research Program (NCHRP) Project 25-25, Task 109, Successful Practices for Environmental Commitments in Public/Private Partnerships (P-3) and Design-Build (D-B) Contracts. Ms. Hoffman participated in literature reviews and State DOT interviews. The literature review conducted identified potentially replicable, successful practices with a focus on communicating post-NEPA and permitting environmental commitments and facilitation of compliance with those

commitments. These initially identified successful practices were the basis of the interview questions, and the state DOT interviews conducted yielded a more refined list of existing, potentially replicable successful practices. Ms. Hoffman assisted in preparing the Interim Report that synthesizes successful practices gleaned from the literature review and State DOT interview summaries.

— Nevada Department of Transportation, Craig Road. Environmental Lead assisting Nevada Department of Transportation (NDOT) NEPA process with evaluating environmental resources and specialty areas that must be analyzed, coordinated with respective resource agencies, documented, and, in some cases, mitigated for the proposed improvements to Craig Road. Reports were prepared for hazardous materials, cultural resources, and natural resource impacts based on the proposed action.

— Nevada Department of Transportation Truck Climbing Lane #3 MP 82.0 to 82.9. Environmental Lead assisting Nevada Department of Transportation (NDOT) NEPA process with evaluating environmental resources and specialty areas that must be analyzed, coordinated with respective resource agencies, documented, and, in some cases, mitigated for the proposed approximately 1-mile long truck climbing lane on Interstate-15. Permitting and compliance tasks for natural resources included desert tortoise fence inspections and tribal consultation, as well as USACE 404 and EPA 401 permit applications.

— New Jersey Department of Transportation, Route 80 Riverview Drive (CR 640) to Polify Road (CR 55), New Jersey. Responsible for the characterization of existing community characteristics and assessment of community impacts for NJDOT's reconstruction of Route 80 WB from MP 56.4 to MP 65.4 in Passaic and Bergen Counties to support no disproportionately high and adverse impacts on minority/low-income populations. The characterization of existing community characteristics and assessment of community impacts during the field survey followed the New Jersey Department of Transportation's (NJDOT's) Socioeconomic Guidance Manual. The study area includes the neighborhoods that may experience temporary impacts related to traffic, air quality, noise, and quality of life during the construction period in addition to areas that will have permanent impacts from the project.

— New York State Department of Transportation, Route 363, New York. Responsible for environmental justice anlsysis of the study area impacted by the proposed improvements to Route 363 in Binghamton, Broome County, New Jersey. Environmental justice communities were identified using race, ethnicity and poverty status data from 2010 U.S. Census of Population and Housing and the U.S. Census Bureau, American Community Survey (ACS) 5-Year Estimates for 2013-2017 for each block group in the study area.

— Regional Transportation Commission of Southern Nevada, Resort Corridor Feasibility Study, Las Vegas, Nevada. Ms. Hoffman assisted the Project Manager with outreach and stakeholder coordination and assisted with facilitating a stated preference survey for high capacity transit modal transportation options in the resort corridor. The Feasibility Study included a 3-day workshop to identify alternatives, scenarios, and technologies.

Emergency Response

— Federal Emergency Management Agency (FEMA), Hurricanes Harvey, Irma, and Maria Disaster Response, Labor Operations and Finance. In the wake of the 2017 Atlantic Ocean hurricane season, Ms. Hoffman was mobilized by FEMA to evaluate

expense reports for thousands of inspectors in Texas, Florida, Puerto Rico, and the U.S. Virgin Islands.

— USACE Hurricane Dorian, Emergency Response. In the wake of the 2019 Atlantic Ocean hurricane season, Ms. Hoffman was mobilized by USACE to provide emergency generator services in Georgia.

Construction Management

— Clark County Department of Public Works, Las Vegas Boulevard Pedestrian Protection Program. Ms. Hoffman assisted the Construction Manager as the Construction Coordinator for the Pedestrian Protection construction project of bollards along the Las Vegas Strip. Ms. Hoffman managed submittals, meetings, project files, and provided construction quality control services.

PUBLICATIONS AND PRESENTATIONS

Presentations

— Hoffman, Sarah. "Planning for Lowering Lake Levels." American Public Works Association (APWA) Nevada Section Spring Conference, April 27, 2023, Mesquite, Nevada.

— Hoffman, Sarah. "Planning for Lowering Lake Levels." National Association of Environmental Professionals (NAEP) annual conference, May 17, 2022, Fort Lauderdale, Florida.

— Hoffman, Sarah. "GHS Labeling and Safe Transportation." 2017 Three Day INDO-US Course on Hazardous Materials Management, Manipal Institute of Technology, Manipal, India.

— Hoffman, Sarah. "Hazardous Materials Safe Handling and Emergency Preparedness." 2017 Three Day INDO-US Course on Hazardous Materials Management, Manipal Institute of Technology, Manipal, India.

— Hoffman, Sarah. "Introduction to Hazardous Materials." 2017 Three Day INDO-US Course on Hazardous Materials Management, Manipal Institute of Technology, Manipal, India.

Experience Prior to LB/WSP

NEPA

Ms. Hoffman has conducted Environmental Impact Statements (EIS) and Environmental Assessments (EA) since 2006 in Nevada. Ms. Hoffman has the following experience related to conducting National Environmental Policy Act of 1969 (NEPA) studies:

Blackburn Federal #22 Oil Well, Pine Valley, NV. Ms. Hoffman was the Senior Environmental Geologist in charge of preparing the EA for Grant Canyon. The Blackburn Unit project was included in a Federal lease, designated NVN – 11348, that consists of approximately 480 acres, of which approximately 2.7 acres were included in this phase. Ms. Hoffman coordinated with the Bureau of Land Management (BLM) Elko District, Tuscarora Field Office during the EA generation. A detailed assessment of the effect of the Proposed Action for critical elements of the human environment specified by statue, regulation, or Executive Order (EO) were described and analyzed. For each resource category, the Proposed Action is compared to the No Action Alternative. Ms. Hoffman generated the EA for Grant Canyon in a very short time constraint.

Northern Nevada Veterans Home, Sparks, NV. Ms. Hoffman was the Project Manager during the generation of an EA for the State of Nevada Public Works proposed project to build a 96-bed Community Living Center for Veterans. Ms. Hoffman prepared the EA in an extremely short time constraint, while in accordance with the NEPA, the Council on Environmental Quality (CEQ) Regulations for Implementing NEPA, and in accordance with the VA NEPA Interim Guidance for Projects.

American Vanadium, Gibellini Mine Environmental Impact Statement, Battle Mountain, NV. Environmental Scientist assisting to prepare the EIS for the Gibellini mine project, which was a proposed vanadium heap leach facility located in Eureka County, Nevada. To date, this project is the only active vanadium mine in the United States. The mine will develop a solar field to power a series of vanadium batteries that will eventually provide 80 percent of the mine's electrical needs. Duties included reviewing the technical information that has been prepared to synthesize the data into a readable and defensible EIS.

Pacific Solar Investments (PSI), Amargosa Valley Solar EIS, NV. Environmental Scientist/Planner for the preparation of a third party BLM EIS for the Amargosa North Solar Project that will be sited exclusively on land administered by the Bureau of Land Management. Ultimately, PSI intends to construct 150-MW Photovoltaic (PV) technology, proposed to be built in 3 phases, each on 380 acres, within approximately 1,700 acres of public lands in Nye County. Final facility size and site layout will depend on environmental considerations and market conditions.

Regional Transportation Commission, Laughlin-Bullhead City Bridge Project on the Lower Colorado River, NV and AZ, Laughlin, NV. Environmental Scientist/Planner tasked in providing transportation planning, siting and feasibility review, NEPA documentation development and support, right-of-way setting, conceptual engineering, and public involvement services for the Regional Transportation Commission of Southern Nevada (RTCSN). The project supports RTCSN's desired transportation improvements including a bridge across the Colorado River (connecting Laughlin, NV and Bullhead City, AZ) and supporting facilities.

SolarReserve, Crescent Dunes Solar EIS, NV. Environmental Scientist/Planner assisting with technical edits of a third-party EIS, Public Involvement Plan (PIP), Scoping Summary, and Visual Report for a proposed 100 Megawatt (MW) concentrated solar power (CSP) plant, utilizing a liquid salt storage. The project is located on approximately 2,800 acres of land managed by the Bureau of Land Management, Tonopah Field Office and includes a large field of heliostats reflecting sunlight to a central tower, approximately 630 feet high, and associated linear facilities (transmission line and access road).

Sithe Global Power LLC, Flat Top Mesa Transmission Line. Environmental Scientist/Planner during the preparation of the Ely District Scoping Preparation Document for a 138 kV, 7.5-mile transmission line to connect a 150 MW photovoltaic power project, located on private lands, to an existing transmission line on BLM managed lands.

University of Nevada Las Vegas Solar Technology Center, Boulder City, NV. Air Quality Specialist assisting in an Air Quality study which was completed as part of an EA for the proposed Solar Technology Center that was proposed to include research, development, educational training, and outreach for renewable energy conservation. Duties included assessing air quality attainment status of the National Ambient Air Quality Standards (NAAQS), performing a climate assessment, regulatory authority review, emission calculations for existing conditions and each proposed action, analysis of potential impacts of each proposed action, and providing conclusions and recommendations for mitigating measures.

Air Quality Permitting and Compliance

Ms. Hoffman has performed Air Quality Permitting and Compliance for major and non-major sources in Colorado, Texas, New Mexico, Arizona, and Nevada since the year 2004. Ms. Hoffman has extensive experience with permit applications, renewals, modifications, and administrative amendments. Ms. Hoffman has also performed Best Available Control Technology (BACT) analysis, Potential-to-Emit (PTE) calculations, opacity testing, dust control plans, permit audits, annual reports, and air quality modeling. Below are specific projects showcasing Ms. Hoffman's Air Quality experience:

- New Generation Supplements, Silver Springs, NV. Senior Environmental Geologist providing Air Quality Permitting services to a manufacturer of feed supplements to obtain a Class II Air Quality Operating Permit from the Nevada Division of Environmental Projection (NDEP) Bureau of Air Pollution Control (BAPC). Ms. Hoffman was the assistant to the Project Manager during generation of a new Class II permit application for the facility's expansion. Duties included an on-site assessment, PTE calculations, and preparing the permit application packet.
- Las Vegas Recycling, North Las Vegas, NV. Project Manager providing Air Quality Permitting services to a recyclable material merchant wholesaler. Ms. Hoffman was the Project Manager during generation of an amendment to the site's existing Air Operating Permit to incorporate additional generators at the site. Duties included client liaison, data compilation, coordinating with Clark County Department of Air Quality (DAQ), PTE calculations, and preparing the permit application.
- El Dorado Energy Plant, Boulder City, NV. Project Manager providing Air Quality Permitting, Compliance Audit, and Annual Emissions services for a 500-megawatt natural gas generating plant. Duties for the facility's Title V renewal application included data compilation, PTE calculations, administrative amendments, and review of startup conditions. Duties for the Compliance Audit ranged from site inspection, data collection, and review of data collected to the requirements stated within the facility's Operating Permit to verify compliance with 40 CFR Title IV and V and applicable sections of the Clark County Air Quality Regulations. Duties for the Emissions Inventory included reviewing records and quarterly reports submitted to the DAQ, reviewing the facility's Electronic Data Reporting files, and calculating emissions in accordance with Section G-4 (b) of the facility's Operating Permit.
- El Paso Electric Company, NM and TX. Staff Environmental Geologist providing Air Quality Compliance for all El Paso Electric Company facilities. Duties include air quality compliance, National Pollutant Discharge Elimination System (NPDES), Resource Conservation and Recovery Act (RCRA), Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and Clean Water Act (CWA) regulatory affairs.
- LaFarge, Denver, CO. Senior Staff Environmental Geologist assisting a mining company with air quality compliance at several of its Denver-area aggregate facilities. Duties included on-site opacity inspections and drafting of flow diagrams.
- Las Vegas Paving, NV. Staff Scientist for assisting a mining company with air quality compliance at several of its Clark County, NV aggregate facilities. Projects included on-site opacity inspections, drafting of flow diagrams, and report generation.

- LSG Sky Chefs, Las Vegas, NV. Project Manager overseeing the generation of an Authority to Construct/Air Operating Permit (ATC/OP) application for development of two natural gas fired boilers. Duties included client liaison services, data compilation, coordinating with DAQ, reviewing PTE calculations, and preparing the permit application.
- Opportunity Village, Las Vegas, NV. Project Manager and Air Quality Specialist overseeing an ATC/OP application and the air quality section of an Environmental Assessment (EA) for a new 10.9-acre Opportunity Village campus consisting of an Art Enrichment Center, Employment Resource Center, open-air amphitheater with state of the art handicap accessibility, and a 2.5-acre park. Duties included data compilation, coordinating with DAQ, PTE calculations, preparing the permit application, assessing air quality attainment status of the National Ambient Air Quality Standards (NAAQS), performing a climate assessment, regulatory authority review, emission calculations for existing conditions as well as each proposed action, analysis of potential impacts of each proposed action, and providing conclusions and recommendations for mitigating measures.
- P.I. Land Las Vegas, North Las Vegas, NV. Project Manager during generation of an ATC/OP application and permit compliance for a tire shredding facility. Duties included client liaison, data compilation, coordinating with DAQ, PTE calculations, preparing the permit application, and preparing permit compliance letters.
- Pinnacle Las Vegas, Las Vegas, NV. Air Quality Specialist overseeing the generation of an ATC/OP application for development of two 36-story residential towers. Duties included data compilation, coordination with DAQ, performing PTE calculations, and preparing the permit application.
- Cemex (formerly Rinker), Las Vegas NV. Staff Scientist for assisting the mining company with air quality compliance of their local aggregate facilities. Projects included on-site opacity inspections, drafting of flow diagrams, and preparation of Class II ATC/OP application. Duties included field reconnaissance and inspection, conducting visible emissions testing, generation of testing report, drafting flow diagrams and site maps, and preparation of a permit application.
- Silverton Hotel and Casino, Las Vegas, NV. Project Manager Air Quality Specialist overseeing the modification of an existing Operating Permit for an expansion of the Silverton Hotel and Casino. Duties associated with the air permit modification included data compilation, coordination with DAQ, calculating the facility's PTE, and preparing the permit modification application.
- Windset Greenhouses, North Las Vegas, Nevada. Project Manager overseeing the generation of an ATC/OP application and permit compliance for two natural gas fired boilers proposed to produce hot water to keep the facility humid for plant growth. Duties included client liaison, data compilation, coordinating with DAQ, PTE calculations, preparing the permit application, emission inventory, and preparation of an annual compliance report.

Indoor Air Quality

Ms. Hoffman obtained a State of Nevada OSHA certified asbestos inspector license. The following projects provided pertain to Ms. Hoffman's Indoor Air Quality experience.

- Ely Grade School, Ely, NV. Ms. Hoffman was an Asbestos Consultant assisting the Project Manager by performing an asbestos survey prior to historical renovation activities, and preparing a comprehensive report. Ms. Hoffman followed AHERA and Housing and Urban Development (HUD) guidelines for the collection of asbestos bulk samples. Additional tasks included the performance of a visual assessment of homogenous materials prior to sample collection, submitting samples to an accredited laboratory for analysis, data interpretation, and preparation of a comprehensive written report with abatement recommendations.

- Atla Daycare, Las Vegas, NV. Ms. Hoffman was a Project Manager for an asbestos survey providing pre-renovation asbestos survey for the City of Las Vegas. Ms. Hoffman performed a visual assessment of suspect building materials, collected bulk asbestos samples throughout the property while not disturbing active property operations for pre-renovation activities, and prepared a detailed report documenting the findings of the survey.
- PCC Structurals – Emergency Response, Carson City, NV. Ms. Hoffman was an Asbestos Consultant who performed an emergency response pre-demolition asbestos survey following a chemical fire and prepared a comprehensive report. Prior to the collection of bulk samples for asbestos analysis, a visual assessment of building materials was performed at the property by Ms. Hoffman. Due to the damaged nature of the building materials, Ms. Hoffman utilized specialized safety precautions prior to sample collection. Asbestos bulk samples were collected and submitted to an accredited laboratory for analysis. Upon completion of sample collection activities, a comprehensive report was prepared,
- 702 The Range, Las Vegas, NV. Ms. Hoffman was an Asbestos Consultant that performed a limited pre-demolition asbestos survey at the facility.
- St. Rose Dominican – Rose de Lima Campus, Henderson, NV. Ms. Hoffman was an Asbestos Consultant that performed a visual assessment of suspect building materials, collected bulk asbestos samples throughout the property while not disturbing active property operations for pre-renovation activities, and prepared a detailed report documenting the findings of the survey.
- Express Scripts, Las Vegas, NV. Ms. Hoffman performed a post-decontamination indoor environmental quality assessment and clearance report for a facility that use to process, sort, package, and distribute pharmaceuticals. Ms. Hoffman provided oversight during a specialized cleanup of equipment at the facility, conducted surface wipe sampling of decontaminated surfaces, submitted the samples to a certified laboratory, and prepared a comprehensive report.

Water/Stormwater

Since 2004, Ms. Hoffman has prepared numerous Stormwater Pollution Prevention Plans (SWPPP), conducted SWPPP site inspections, developed Erosion Control Plans, prepared Spill Prevention and Countermeasure Plans (SPCC), procurement of Section 404 Permits, and procurement of water rights conveyance documents in Nevada. Ms. Hoffman is also a Certified Qualified Industrial Stormwater Practitioner (QISP) in California. The following project descriptions showcase Ms. Hoffman's experience in those areas.

- Traylor Shea Precast, Littlerock & Stockton, CA. Senior Environmental Geologist and responsible for SWPPP generation/revision, training and implementation as Traylor Shea Precast's QISP. Ms. Hoffman generated a SWPPP in accordance with the CASQA.
- CEMEX, Wadsworth, NV. Senior Environmental Geologist responsible for generating a SWPPP in accordance with US. Environmental Protection Agency (EPA) Region 9, Multi-Sector General Permit for compliance with stormwater regulations under NVR05001.
- City of Henderson Landfill, Henderson, NV. Senior Environmental Geologist responsible for SWPPP revision and implementation at the City of Henderson Landfill. Ms. Hoffman generated a SWPPP in accordance with the Nevada Construction Stormwater General Permit NVR100000 recommending best management practices (BMPs) to be implemented and provided daily oversight during maintenance and repair activities.
- Hunt & Sons, Various, NV & CA. Ms. Hoffman conducted site visits at multiple Hunt & Sons facilities for SPCC Plans for the company's bulk oil storage facilities as well as generation of SWPPPs. Responsibilities included site visits, SPCC generation, spill containment calculations and/or SWPPPs.

- Nevada Cement, Various, NV. Ms. Hoffman conducted site visits at multiple Nevada Cement properties for SWPPPs. Duties included site reconnaissance, data compilation, preparing the SWPPP, and recommending BMPs to be implemented on site to control and limit erosion and runoff potential for each the company's quarries.
- City of Sparks, North Truckee Drain Realignment, Sparks, NV. Environmental Scientist/Planner assisting with a 404 Letter of Permission Application. The North Truckee Drain is a component of the larger Corps of Engineer's Truckee Meadows Flood Control project, but the City of Sparks has opted to accelerate the North Truckee portion to meet the City's flood control goals. The North Truckee Drain's outfall will be relocated into the Truckee River further downstream from its present location. Moving the discharge location will take advantage of a lower water surface in the Truckee River at the new outfall location, which will reduce the ultimate flood stage to the nearby industrial development in Sparks.
- Commerce Construction, Commercial Building, Decatur Boulevard and Badura Avenue, Las Vegas, NV. Project Manager overseeing SWPPP preparation concerning the relocation of an existing detention basin on a commercial property approximately 56-acres in size. Duties included performing a site reconnaissance, data compilation, preparing the SWPPP, and recommending BMPs to be implemented on site to control and limit erosion and runoff potential.
- Interwest Capital, La Paz/Oeste, Pecos Avenue and Lake Mead Boulevard. Project Manager overseeing SWPPP preparation during construction of a residential property. Duties included performing a site reconnaissance, data compilation, preparing the SWPPP, and recommending BMPs to be implemented on site to control and limit erosion and runoff potential. Weekly site inspections were also conducted in accordance with Permit requirements.
- KB Home, NV. Staff Scientist for assisting Residential Developer with SWPPP preparation for their Las Vegas communities. Duties included performing a site reconnaissance, data compilation, and preparing the SWPPP detailed site map depicting BMPs to be implemented on site to control and limit erosion and runoff potential. Dust control inspections were also conducted for the building development activity.
- Pabco Gypsum, Las Vegas, NV. Project Manager overseeing the preparation of an Industrial SWPPP for the gypsum mining facility. Duties included project management, site reconnaissance, data compilation, preparing the SWPPP, and recommending BMPs to be implemented on site to control and limit erosion and runoff potential.
- NPDES, CCRFCD, Las Vegas, NV. Engineering Intern - Storm Water Sampling. Responsibilities included equipment maintenance at six valley locations, stormwater sampling during rain events, and preparing an annual report.
- Wetlands Park Nature Center, Wetlands Park Lane, Las Vegas, NV. Project Manager overseeing SWPPP preparation for the Wetlands Park Nature Center and parking lot expansion. Duties included performing a site reconnaissance, data compilation, preparing the SWPPP, and recommending BMPs to be implemented on site to control and limit erosion and runoff potential.
- Reliant Energy, Primm, NV. Planner that prepared an Effluent Management Plan for a power plant in Primm, NV.
- Silverton Hotel and Casino, Las Vegas, NV. Project Manager overseeing SWPPP preparation. Duties included site reconnaissance, data compilation, preparing the SWPPP, and recommending BMPs to be implemented on site to control and limit erosion and runoff potential.
- Summerlin Hospital Medical Center, Las Vegas, NV. Independent Consultant for developing a Salinity Control Plan to accompany the hospital's Class I Wastewater Contribution Permit.
- Valley Electric, NV. Project Manager overseeing the preparation of SPCC plans for the utility company's thirteen facilities in Nye County, NV.

- Water Rights, Private Client, Las Vegas, NV. Worked on multiple water rights projects including drafting of water rights maps and completing applications for water rights and reports of conveyance.

Environmental Monitoring

Ms. Hoffman has conducted Environmental Monitoring in Nevada and California since the year of 2004. Ms. Hoffman has the following experience related to her participation in Environmental Monitoring projects:

- HDR/e2M, One Nevada 500KV Transmission Line (ONLINE) Project. Ms. Hoffman served as the Logistics Coordinator for the Southwest Intertie Project (former SWIP) - Southern Portion. The project traversed from the Harry Allen Substation, located in Dry Lake, NV (approximately 20 miles northeast of Las Vegas) approximately 230 miles north through parts of Clark, Lincoln, Nye, and White Pine counties in Nevada, to the proposed Thirty-mile Substation located approximately 18 miles northwest of Ely, NV. The transmission line interconnected with the Sierra Pacific Power Company's existing Falcon-to-Gonder 345kV transmission line at this location. In general, this phase corresponded to Right-of-Way Grant NVN-85210. The transmission line facilities consist of tubular steel guyed-V, steel lattice guyed-V, self-supporting steel-lattice, and steel-pole H-frame structures placed approximately 1,200 to 1,500 feet apart. Ms. Hoffman managed the environmental team conducting the environmental monitoring.
- Nevada DOT Headquarters, NDOT Habitat Conservation Plan (HCP) and EA, Las Vegas, NV. The purpose of this project was to develop a HCP and receive an Incidental Take Permit (ITP) that allows NDOT to continue to fulfill both their highway system maintenance obligations as well as their obligation of protecting sensitive, threatened, and endangered species that may be within their transportation corridors.
- NV Energy, Northern and Southern Brownfields Siting Study. Assessment of nine existing brownfields power generation sites for potential development and expansion of the capacity of natural gas fired power generation. Evaluated existing fuel, water, land, and electrical transmission infrastructure as well as air quality, environmental, and permitting considerations in support of Integrated Resource Plan filings. Activities included generation technology assessments and the development of a project design basis document for the most feasible generation sites.
- Nevada DOT Headquarters, Tortoise Fence Monitoring. Ms. Hoffman was the Project Manager on NDOT's Desert Tortoise Fence monitoring and inspection project to monitor and maintain the desert tortoise exclusion fencing along NDOT's right-of-ways.
- Rhodes Home, James Hardie Gypsum Mine, Blue Diamond, NV. Field Scientist who oversaw the excavation and disposal of approximately 28,000 tons of petroleum hydrocarbon-impacted soil associated with leaks, surface spills, and improper disposal at the former James Hardie Gypsum Mine, in Blue Diamond, NV. Responsibilities included on-site soil sample testing with a total petroleum hydrocarbon (TPH) RemediAid field test kit, drafting site maps, and closure report generation.

Transportation

Ms. Hoffman has assisted and coordinated several transportation engineering projects in Nevada. Ms. Hoffman has the following experience related to Transportation projects.

- City of North Las Vegas, Losee and Lone Mountain Pedestrian Bridge, North Las Vegas, NV. Ms. Hoffman was the Construction Coordinator for the project that consisted of erecting a prefabricated, steel-truss pedestrian bridge crossing on top of concrete columns spanning

Losee Road. The project included the associated concrete approach ramps and approximately 1,000 linear feet of ADA-compliant, multi-use trail with native landscaping, lighting, rest stops, and other necessary appurtenances between Losee Road and Lone Mountain Road. Ms. Hoffman managed submittals, meetings, and provided construction quality control services.

- Clark County, Tropicana Wash. Ms. Hoffman was the Construction Coordinator responsible for Contract Management, submittal logs in Oracle/Primavera, daily logs, monthly reports and weekly, field meeting notes, quality control, punch list tracking and project-close out.
- Clark County Regional Transportation Commission (RTC), Clark County Pedestrian Survey. Ms. Hoffman assisted with evaluating high pedestrian accident intersections and corridors in Las Vegas.
- RTC, Pyramid-McCarran Intersection Improvement Project. Ms. Hoffman was responsible for procurement and bid-documents for home abatement/demolition phase of project in Washoe County.
- Nevada DOT Headquarters, West Mesquite Interchange Design-Build, Procurement Management, Mesquite, NV. HDR provided Procurement Management services to NDOT for the West Mesquite Interchange Design-Build Project and Ms. Hoffman was the Technical Editor for these extensive documents. This project included all aspects of assisting NDOT in procuring a design-build contractor/design team for the reconstruction of Exit 120. Ms. Hoffman facilitated all revisions for each industry review.
- Nevada DOT Headquarters, NDOT Scoping Assignments, Carson City, NV. Ms. Hoffman was the Environmental Lead that prepared and provided eight Project-specific Scoping Reports (PSRs) for the NDOT concerning approximately 78 miles of state highways throughout Nevada. The assignments included data collection, data analyses, data review, site visit and road safety review, development of design and construction schedules, development of construction cost estimates utilizing the NDOT Cost Estimating Wizard, and a project-specific risk assessment. Environmental, right-of-way, constructability, maintenance, drainage, roadway geometry, structure conditions and safety evaluations were considered. The purpose of the road safety review was to identify potential road safety issues and opportunities for improvements in safety for all road users. The FHWA Nine Proven Crash Countermeasures were considered and the scoping team utilized the NDOT's Post-construction Phase RSA for Existing Roads Prompt List. The project was fast-tracked to complete the PSR with recommendations in a two-week time frame.

Phase I Environmental Site Assessments

Ms. Hoffman has conducted Phase I ESAs in the western portion of the United States since the year 2004. Ms. Hoffman has the following experience related to conducting Phase I ESAs:
Nevada – Conducted numerous Phase I ESAs in Clark County (southern Nevada). Client types included, but are not excluded to, financial institutions, industrial manufacturers, and commercial businesses.
California – Ms. Hoffman has experience conducting Phase I ESAs in San Bernardino County and Riverside County located in southern California.

APPENDIX

C PHOTOGRAPHS

	PHOTOGRAPHIC LOG	
Roxana Site	**Whitesburg, Letcher County, Kentucky**	**31800209.001**

Photo No. 1	**Date** 9/12/2023	
Fenced-in structure found in the central portion of the Subject Property.		

Photo No. 2	**Date** 9/12/2023	
Covered recreational area found in the central portion of the Subject Property, containing benches, chairs, children's toys, and appliances.		

Photo No.	Date	
3	10/26/2023	
Structure found along Rise Branch Road within the southeastern portion of the Subject Property, view facing west.		

Photo No.	Date	
4	10/26/2023	
Pong found along Rise Branch Road within the southeastern portion of the Subject Property, view facing north.		

Photo No.	Date	
5	10/26/2023	
Filled area within center portion of Subject Property, grown over with vegetation.		

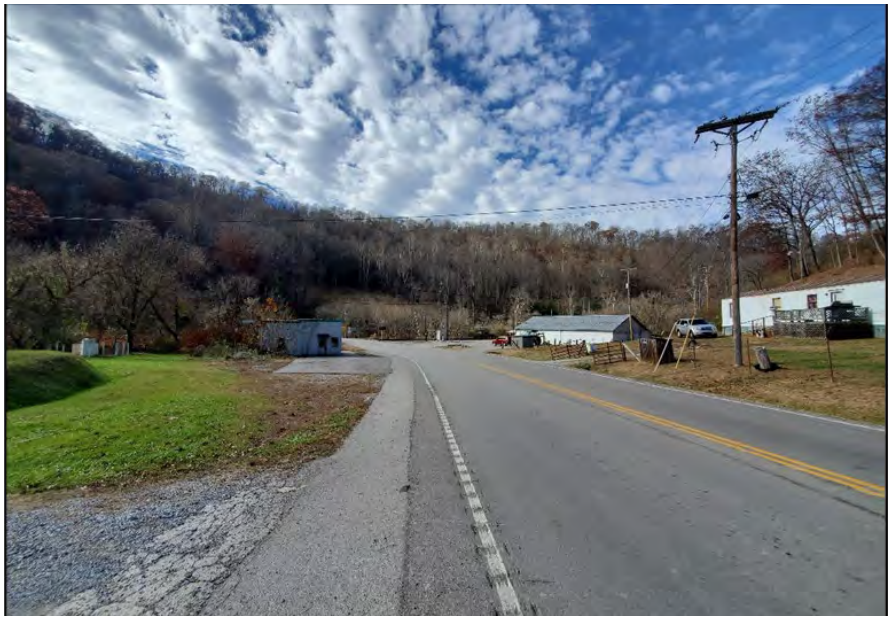
Photo No.	Date	
6	10/30/2023	
Vegetation, paved road, residential units, and wooden telephone pole adjacent to the northeast of the Subject Property along U.S. Hwy 160. View towards the Subject Property, facing southwest.		

Photo No.	Date
7	10/30/2023

Vegetation and paved road adjacent to the east of the Subject Property along U.S. Hwy 160. View towards the Subject Property, facing west-northwest.

Photo No.	Date
8	10/30/2023

Vegetation, transmission line, and general overview of slope along Tolson Creek Road. View towards the Subject Property, facing east-northeast

Photo No.	Date	
9	10/13/2023	
Wetland and vegetation found in the center of the Subject Property.		

Photo No.	Date	
10	10/13/2023	
Wetland found within the central southern portion of the Subject Property with standing water and vegetation throughout.		

Photo No.	Date
11	10/30/2023

Residential area adjacent to the east of the Subject Property, with U.S. Hwy 160 to the right. View facing west toward the Subject Property.

Photo No.	Date
12	10/30/2023

Commercial building and post office adjacent to the north of the Subject Property.

APPENDIX

D ENVIRONMENTAL DATABASE REPORT

Roxana Site - Letcher County, KY
Bluegrass Ridge Road/Kentucky 160
Whitesburg, KY 41848

Inquiry Number: 7521379.2s
December 14, 2023

The EDR Radius Map™ Report with GeoCheck®

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

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Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E1527 - 21), the ASTM Standard Practice for Environmental Site Assessments for Forestland or Rural Property (E2247 - 16), the ASTM Standard Practice for Limited Environmental Due Diligence: Transaction Screen Process (E1528 - 22) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

BLUEGRASS RIDGE ROAD/KENTUCKY 160
WHITESBURG, KY 41848

COORDINATES

Latitude (North):	37.1041270 - 37˚ 6' 14.85''
Longitude (West):	82.9542330 - 82˚ 57' 15.23''
Universal Tranverse Mercator:	Zone 17
UTM X (Meters):	326343.9
UTM Y (Meters):	4108007.2
Elevation:	1465 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	50022972 ROXANA, KY
Version Date:	2022
North Map:	50022942 BLACKEY, KY
Version Date:	2022

AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from:	20200601
Source:	USDA

MAPPED SITES SUMMARY

Target Property Address:
BLUEGRASS RIDGE ROAD/KENTUCKY 160
WHITESBURG, KY 41821

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
A1	MEADE & SHEPHERD COA		US MINES	Higher	1 ft.
B2	NO 2		ABANDONED MINES	Lower	1 ft.
A3	ROXANA #2		ABANDONED MINES	Higher	1 ft.
4	LEE GENTRY PROPERTY	HWY 588 W	UST	Lower	1 ft.
5	LANCE COAL CORP		US MINES	Higher	1 ft.
C6	NO 1 SITE		ABANDONED MINES	Higher	1 ft.
C7	C & C COAL COMPANY		US MINES	Higher	1 ft.
B8	MARIE ENTERPRISES IN		US MINES	Lower	1 ft.
B9	NO 1 MINE		ABANDONED MINES	Lower	1 ft.
B10	BIG OAK COAL COMPANY		US MINES	Lower	1 ft.
11	ROXANNE BP	US HWY 160 S	SB193	Lower	30, 0.006, NNE
D12	MILL BRANCH PROCESSI		US MINES	Lower	68, 0.013, NNW
D13	FLEENOR INC		US MINES	Lower	68, 0.013, NNW
D14	W & F CONTRACT AUGER		US MINES	Lower	104, 0.020, NNW
D15	# 2	MILL BRANCH	US MINES, ABANDONED MINES	Lower	194, 0.037, NNW
D16	AUGER NO 1 SN #11	STATE ROUTE 1373 BEA	ABANDONED MINES	Lower	194, 0.037, NNW
D17	MILL BRANCH OPERATIO	MILL BRANCH ROAD	US MINES, ABANDONED MINES	Lower	194, 0.037, NNW
18	JESSE ISON LEASE KF-	BULL CREEK RD	SHWS	Higher	5173, 0.980, SSW

EXECUTIVE SUMMARY

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Lists of Federal NPL (Superfund) sites

NPL ..... National Priority List
Proposed NPL ..... Proposed National Priority List Sites
NPL LIENS ..... Federal Superfund Liens

Lists of Federal Delisted NPL sites

Delisted NPL ..... National Priority List Deletions

Lists of Federal sites subject to CERCLA removals and CERCLA orders

FEDERAL FACILITY ..... Federal Facility Site Information listing
SEMS ..... Superfund Enterprise Management System

Lists of Federal CERCLA sites with NFRAP

SEMS-ARCHIVE ..... Superfund Enterprise Management System Archive

Lists of Federal RCRA facilities undergoing Corrective Action

CORRACTS ..... Corrective Action Report

Lists of Federal RCRA TSD facilities

RCRA-TSDF ..... RCRA - Treatment, Storage and Disposal

Lists of Federal RCRA generators

RCRA-LQG ..... RCRA - Large Quantity Generators
RCRA-SQG ..... RCRA - Small Quantity Generators
RCRA-VSQG ..... RCRA - Very Small Quantity Generators (Formerly Conditionally Exempt Small Quantity Generators)

Federal institutional controls / engineering controls registries

LUCIS ..... Land Use Control Information System

EXECUTIVE SUMMARY

US ENG CONTROLS..... Engineering Controls Sites List
US INST CONTROLS..... Institutional Controls Sites List

Federal ERNS list

ERNS..... Emergency Response Notification System

Lists of state and tribal landfills and solid waste disposal facilities

SWF/LF..... Solid Waste Facilities List

Lists of state and tribal leaking storage tanks

PSTEAF..... Facility Ranking List
INDIAN LUST..... Leaking Underground Storage Tanks on Indian Land

Lists of state and tribal registered storage tanks

FEMA UST..... Underground Storage Tank Listing
AST..... Above Ground Storage Tanks
INDIAN UST..... Underground Storage Tanks on Indian Land

State and tribal institutional control / engineering control registries

ENG CONTROLS..... Engineering Controls Site Listing
INST CONTROL..... State Superfund Database

Lists of state and tribal voluntary cleanup sites

INDIAN VCP..... Voluntary Cleanup Priority Listing
VCP..... Voluntary Cleanup Program Sites

Lists of state and tribal brownfield sites

BROWNFIELDS..... Kentucky Brownfield Inventory

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS..... A Listing of Brownfields Sites

Local Lists of Landfill / Solid Waste Disposal Sites

SWRCY..... Recycling Facilities
HIST LF..... Historical Landfills
INDIAN ODI..... Report on the Status of Open Dumps on Indian Lands
ODI..... Open Dump Inventory
DEBRIS REGION 9..... Torres Martinez Reservation Illegal Dump Site Locations
IHS OPEN DUMPS..... Open Dumps on Indian Land

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL..... Delisted National Clandestine Laboratory Register

EXECUTIVE SUMMARY

CDL	Clandestine Drub Lab Location Listing
US CDL	National Clandestine Laboratory Register

Local Land Records

LIENS 2	CERCLA Lien Information

Records of Emergency Release Reports

HMIRS	Hazardous Materials Information Reporting System
SPILLS	State spills

Other Ascertainable Records

RCRA NonGen / NLR	RCRA - Non Generators / No Longer Regulated
FUDS	Formerly Used Defense Sites
DOD	Department of Defense Sites
SCRD DRYCLEANERS	State Coalition for Remediation of Drycleaners Listing
US FIN ASSUR	Financial Assurance Information
EPA WATCH LIST	EPA WATCH LIST
2020 COR ACTION	2020 Corrective Action Program List
TSCA	Toxic Substances Control Act
TRIS	Toxic Chemical Release Inventory System
SSTS	Section 7 Tracking Systems
ROD	Records Of Decision
RMP	Risk Management Plans
RAATS	RCRA Administrative Action Tracking System
PRP	Potentially Responsible Parties
PADS	PCB Activity Database System
ICIS	Integrated Compliance Information System
FTTS	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
MLTS	Material Licensing Tracking System
COAL ASH DOE	Steam-Electric Plant Operation Data
COAL ASH EPA	Coal Combustion Residues Surface Impoundments List
PCB TRANSFORMER	PCB Transformer Registration Database
RADINFO	Radiation Information Database
HIST FTTS	FIFRA/TSCA Tracking System Administrative Case Listing
DOT OPS	Incident and Accident Data
CONSENT	Superfund (CERCLA) Consent Decrees
INDIAN RESERV	Indian Reservations
FUSRAP	Formerly Utilized Sites Remedial Action Program
UMTRA	Uranium Mill Tailings Sites
LEAD SMELTERS	Lead Smelter Sites
US AIRS	Aerometric Information Retrieval System Facility Subsystem
MINES MRDS	Mineral Resources Data System
FINDS	Facility Index System/Facility Registry System
DOCKET HWC	Hazardous Waste Compliance Docket Listing
UXO	Unexploded Ordnance Sites
ECHO	Enforcement & Compliance History Information
FUELS PROGRAM	EPA Fuels Program Registered Listing
PFAS NPL	Superfund Sites with PFAS Detections Information
PFAS FEDERAL SITES	Federal Sites PFAS Information
PFAS TSCA	PFAS Manufacture and Imports Information
PFAS TRIS	List of PFAS Added to the TRI

EXECUTIVE SUMMARY

PFAS RCRA MANIFEST..... PFAS Transfers Identified In the RCRA Database Listing
PFAS ATSDR..... PFAS Contamination Site Location Listing
PFAS WQP..... Ambient Environmental Sampling for PFAS
PFAS NPDES..... Clean Water Act Discharge Monitoring Information
PFAS ECHO..... Facilities in Industries that May Be Handling PFAS Listing
PFAS ECHO FIRE TRAINING Facilities in Industries that May Be Handling PFAS Listing
PFAS PART 139 AIRPORT... All Certified Part 139 Airports PFAS Information Listing
AQUEOUS FOAM NRC..... Aqueous Foam Related Incidents Listing
BIOSOLIDS..... ICIS-NPDES Biosolids Facility Data
PFAS..... PFAS Detections Site Listing
AIRS..... Permitted Airs Facility Listing
ASBESTOS..... Asbestos Notification Listing
COAL ASH..... Coal Ash Disposal Sites
DRYCLEANERS..... Drycleaner Listing
Financial Assurance..... Financial Assurance Information Listing
LEAD..... Environmental Lead Program Report Tracking Database
NPDES..... Permitted Facility Listing
UIC..... UIC Information

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP..... EDR Proprietary Manufactured Gas Plants
EDR Hist Auto..... EDR Exclusive Historical Auto Stations
EDR Hist Cleaner..... EDR Exclusive Historical Cleaners

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA HWS..... Recovered Government Archive State Hazardous Waste Facilities List
RGA LF..... Recovered Government Archive Solid Waste Facilities List

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

STANDARD ENVIRONMENTAL RECORDS

Lists of state- and tribal hazardous waste facilities

EXECUTIVE SUMMARY

SHWS: The State Hazardous Waste Sites records are the states' equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. The data come from the Department of Environmental Protection's Uncontrolled Site Branch List.

A review of the SHWS list, as provided by EDR, and dated 11/27/2023 has revealed that there is 1 SHWS site within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
JESSE ISON LEASE KF- Facility Id: 91997 Facility Status: Closed	BULL CREEK RD	SSW 1/2 - 1 (0.980 mi.)	18	29

Lists of state and tribal leaking storage tanks

SB193: The inventory indicates facilities that have performed permanent closure activities at a regulated underground storage tank facility and have known soil and/or groundwater contamination.

A review of the SB193 list, as provided by EDR, and dated 09/05/2006 has revealed that there is 1 SB193 site within approximately 0.5 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
ROXANNE BP Facility Id: 6892067	US HWY 160 S	NNE 0 - 1/8 (0.006 mi.)	11	15

Lists of state and tribal registered storage tanks

UST: The Underground Storage Tank database contains registered USTs. USTs are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA). The data come from the Department of Environmental Protection's Owner/Facility Report of All Tanks Regardless of Status list.

A review of the UST list, as provided by EDR, and dated 08/11/2023 has revealed that there is 1 UST site within approximately 0.25 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
LEE GENTRY PROPERTY Tank Status: TRM Facility Id: 59894 Closed In Place Date: 03/19/1997	HWY 588 W	0 - 1/8 (0.000 mi.)	4	9

ADDITIONAL ENVIRONMENTAL RECORDS

Other Ascertainable Records

EXECUTIVE SUMMARY

US MINES: Mines Master Index File. The source of this database is the Dept. of Labor, Mine Safety and Health Administration.

A review of the US MINES list, as provided by EDR, has revealed that there are 10 US MINES sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
MEADE & SHEPHERD COA Database: US MINES, Date of Government Version: 08/01/2023 Mine ID:: 1516361		0 - 1/8 (0.000 mi.)	A1	8
LANCE COAL CORP Database: US MINES, Date of Government Version: 08/01/2023 Mine ID:: 1503494		0 - 1/8 (0.000 mi.)	5	11
C & C COAL COMPANY Database: US MINES, Date of Government Version: 08/01/2023 Mine ID:: 1515830		0 - 1/8 (0.000 mi.)	C7	13

Lower Elevation	Address	Direction / Distance	Map ID	Page
MARIE ENTERPRISES IN Database: US MINES, Date of Government Version: 08/01/2023 Mine ID:: 1516000		0 - 1/8 (0.000 mi.)	B8	13
BIG OAK COAL COMPANY Database: US MINES, Date of Government Version: 08/01/2023 Mine ID:: 1516077		0 - 1/8 (0.000 mi.)	B10	14
MILL BRANCH PROCESSI Database: US MINES, Date of Government Version: 08/01/2023 Mine ID:: 1519140		NNW 0 - 1/8 (0.013 mi.)	D12	15
FLEENOR INC Database: US MINES, Date of Government Version: 08/01/2023 Mine ID:: 1519050		NNW 0 - 1/8 (0.013 mi.)	D13	16
W & F CONTRACT AUGER Database: US MINES, Date of Government Version: 08/01/2023 Mine ID:: 1519060		NNW 0 - 1/8 (0.020 mi.)	D14	16
# 2 Database: MINES VIOLATIONS, Date of Government Version: 07/05/2023	***MILL BRANCH***	***NNW 0 - 1/8 (0.037 mi.)***	***D15***	***17***
MILL BRANCH OPERATIO Database: MINES VIOLATIONS, Date of Government Version: 07/05/2023	***MILL BRANCH ROAD***	***NNW 0 - 1/8 (0.037 mi.)***	***D17***	***22***

ABANDONED MINES: An inventory of land and water impacted by past mining (primarily coal mining) is maintained by OSMRE to provide information needed to implement the Surface Mining Control and Reclamation Act of 1977 (SMCRA). The inventory contains information on the location, type, and extent of AML impacts, as well as, information on the cost associated with the reclamation of those problems. The inventory is based upon field surveys by State, Tribal, and OSMRE program officials. It is dynamic to the extent that it is modified as new problems are identified and existing problems are reclaimed.

A review of the ABANDONED MINES list, as provided by EDR, and dated 11/28/2023 has revealed that there are 7 ABANDONED MINES sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
ROXANA #2		0 - 1/8 (0.000 mi.)	A3	9
NO 1 SITE		0 - 1/8 (0.000 mi.)	C6	12

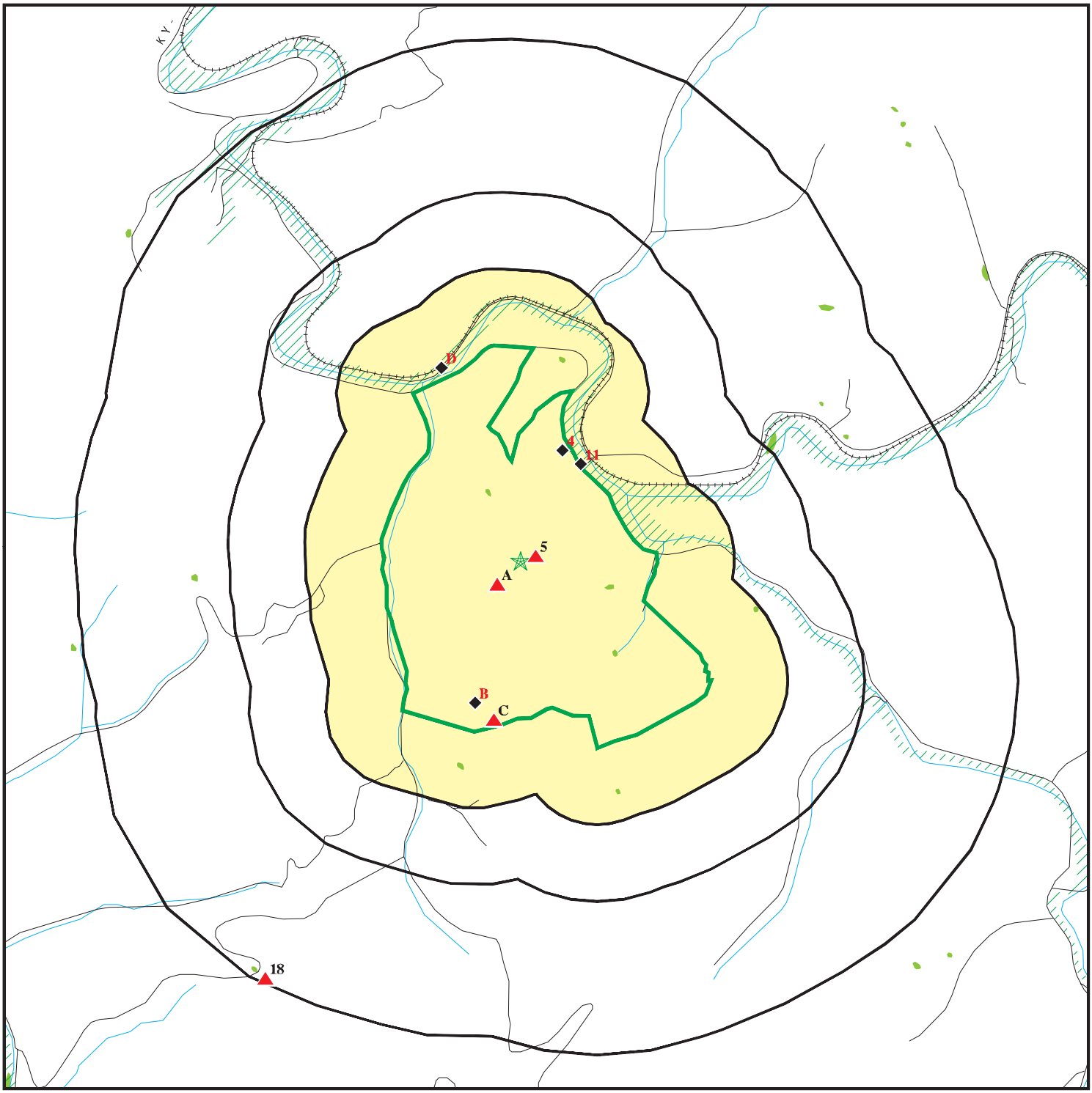
EXECUTIVE SUMMARY

Lower Elevation	Address	Direction / Distance	Map ID	Page
NO 2		0 - 1/8 (0.000 mi.)	B2	8
NO 1 MINE		0 - 1/8 (0.000 mi.)	B9	14
# 2	***MILL BRANCH***	***NNW 0 - 1/8 (0.037 mi.)***	***D15***	***17***
AUGER NO 1 SN #11	STATE ROUTE 1373 BEA	NNW 0 - 1/8 (0.037 mi.)	D16	21
MILL BRANCH OPERATIO	***MILL BRANCH ROAD***	***NNW 0 - 1/8 (0.037 mi.)***	***D17***	***22***

EXECUTIVE SUMMARY

There were no unmapped sites in this report.

OVERVIEW MAP - 7521379.2S



Target Property

Sites at elevations higher than or equal to the target property

Sites at elevations lower than the target property

Manufactured Gas Plants

National Priority List Sites

Dept. Defense Sites

0 1/4 1/2 1 Miles

Indian Reservations BIA

Special Flood Hazard Area (1%)

0.2% Annual Chance Flood Hazard

National Wetland Inventory

State Wetlands

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Roxana Site - Letcher County, KY ADDRESS: Bluegrass Ridge Road/Kentucky 160 Whitesburg KY 41848 LAT/LONG: 37.104127 / 82.954233	CLIENT: WSP USA, Inc CONTACT: Krystle Rayos INQUIRY #: 7521379.2s DATE: December 14, 2023 9:02 pm

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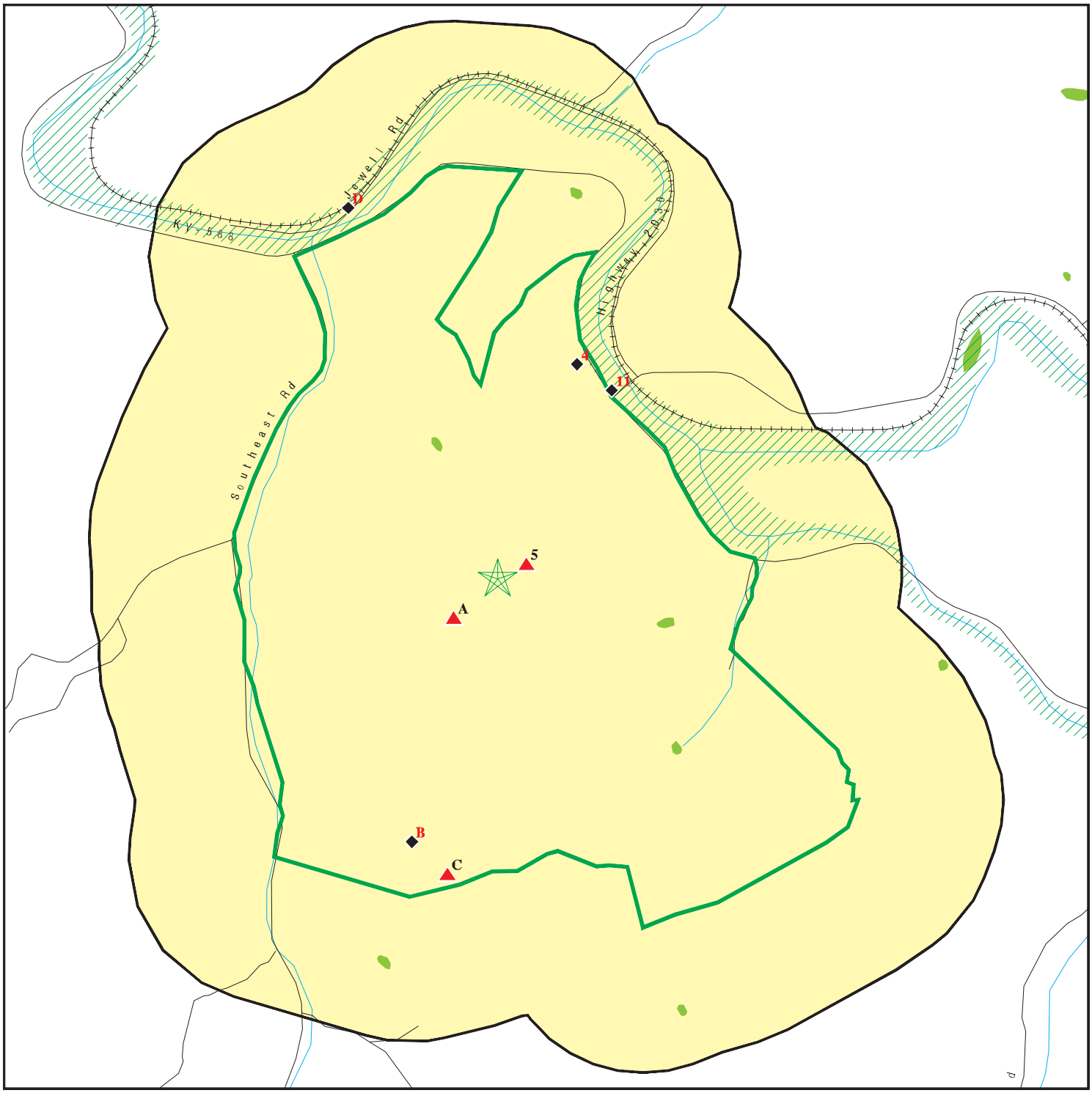
DETAIL MAP - 7521379.2S



Target Property

Sites at elevations higher than or equal to the target property

Sites at elevations lower than the target property

Manufactured Gas Plants

Sensitive Receptors

National Priority List Sites

Dept. Defense Sites

0 1/8 1/4 1/2 Miles

Indian Reservations BIA

Special Flood Hazard Area (1%)

0.2% Annual Chance Flood Hazard

National Wetland Inventory

State Wetlands

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Roxana Site - Letcher County, KY	CLIENT: WSP USA, Inc
ADDRESS: Bluegrass Ridge Road/Kentucky 160 Whitesburg KY 41848	CONTACT: Krystle Rayos INQUIRY #: 7521379.2s
LAT/LONG: 37.104127 / 82.954233	DATE: December 14, 2023 9:03 pm

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MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Lists of Federal NPL (Superfund) sites								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	1.000		0	0	0	0	NR	0
Lists of Federal Delisted NPL sites								
Delisted NPL	1.000		0	0	0	0	NR	0
Lists of Federal sites subject to CERCLA removals and CERCLA orders								
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
SEMS	0.500		0	0	0	NR	NR	0
Lists of Federal CERCLA sites with NFRAP								
SEMS-ARCHIVE	0.500		0	0	0	NR	NR	0
Lists of Federal RCRA facilities undergoing Corrective Action								
CORRACTS	1.000		0	0	0	0	NR	0
Lists of Federal RCRA TSD facilities								
RCRA-TSDF	0.500		0	0	0	NR	NR	0
Lists of Federal RCRA generators								
RCRA-LQG	0.250		0	0	NR	NR	NR	0
RCRA-SQG	0.250		0	0	NR	NR	NR	0
RCRA-VSQG	0.250		0	0	NR	NR	NR	0
Federal institutional controls / engineering controls registries								
LUCIS	0.500		0	0	0	NR	NR	0
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROLS	0.500		0	0	0	NR	NR	0
Federal ERNS list								
ERNS	TP		NR	NR	NR	NR	NR	0
Lists of state- and tribal hazardous waste facilities								
SHWS	1.000		0	0	0	1	NR	1
Lists of state and tribal landfills and solid waste disposal facilities								
SWF/LF	0.500		0	0	0	NR	NR	0
Lists of state and tribal leaking storage tanks								
PSTEAF	0.500		0	0	0	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
INDIAN LUST	0.500		0	0	0	NR	NR	0
SB193	0.500		1	0	0	NR	NR	1
Lists of state and tribal registered storage tanks								
FEMA UST	0.250		0	0	NR	NR	NR	0
UST	0.250		1	0	NR	NR	NR	1
AST	0.250		0	0	NR	NR	NR	0
INDIAN UST	0.250		0	0	NR	NR	NR	0
State and tribal institutional control / engineering control registries								
ENG CONTROLS	0.500		0	0	0	NR	NR	0
INST CONTROL	0.500		0	0	0	NR	NR	0
Lists of state and tribal voluntary cleanup sites								
INDIAN VCP	0.500		0	0	0	NR	NR	0
VCP	0.500		0	0	0	NR	NR	0
Lists of state and tribal brownfield sites								
BROWNFIELDS	0.500		0	0	0	NR	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
SWRCY	0.500		0	0	0	NR	NR	0
HIST LF	0.500		0	0	0	NR	NR	0
INDIAN ODI	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
IHS OPEN DUMPS	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US HIST CDL	TP		NR	NR	NR	NR	NR	0
CDL	TP		NR	NR	NR	NR	NR	0
US CDL	TP		NR	NR	NR	NR	NR	0
Local Land Records								
LIENS 2	TP		NR	NR	NR	NR	NR	0
Records of Emergency Release Reports								
HMIRS	TP		NR	NR	NR	NR	NR	0
SPILLS	TP		NR	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	0.250		0	0	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
FUDS	1.000		0	0	0	0	NR	0
DOD	1.000		0	0	0	0	NR	0
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
US FIN ASSUR	TP		NR	NR	NR	NR	NR	0
EPA WATCH LIST	TP		NR	NR	NR	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
TSCA	TP		NR	NR	NR	NR	NR	0
TRIS	TP		NR	NR	NR	NR	NR	0
SSTS	TP		NR	NR	NR	NR	NR	0
ROD	1.000		0	0	0	0	NR	0
RMP	TP		NR	NR	NR	NR	NR	0
RAATS	TP		NR	NR	NR	NR	NR	0
PRP	TP		NR	NR	NR	NR	NR	0
PADS	TP		NR	NR	NR	NR	NR	0
ICIS	TP		NR	NR	NR	NR	NR	0
FTTS	TP		NR	NR	NR	NR	NR	0
MLTS	TP		NR	NR	NR	NR	NR	0
COAL ASH DOE	TP		NR	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
PCB TRANSFORMER	TP		NR	NR	NR	NR	NR	0
RADINFO	TP		NR	NR	NR	NR	NR	0
HIST FTTS	TP		NR	NR	NR	NR	NR	0
DOT OPS	TP		NR	NR	NR	NR	NR	0
CONSENT	1.000		0	0	0	0	NR	0
INDIAN RESERV	1.000		0	0	0	0	NR	0
FUSRAP	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
LEAD SMELTERS	TP		NR	NR	NR	NR	NR	0
US AIRS	TP		NR	NR	NR	NR	NR	0
US MINES	0.250		10	0	NR	NR	NR	10
ABANDONED MINES	0.250		7	0	NR	NR	NR	7
MINES MRDS	0.250		0	0	NR	NR	NR	0
FINDS	TP		NR	NR	NR	NR	NR	0
DOCKET HWC	TP		NR	NR	NR	NR	NR	0
UXO	1.000		0	0	0	0	NR	0
ECHO	TP		NR	NR	NR	NR	NR	0
FUELS PROGRAM	0.250		0	0	NR	NR	NR	0
PFAS NPL	0.250		0	0	NR	NR	NR	0
PFAS FEDERAL SITES	0.250		0	0	NR	NR	NR	0
PFAS TSCA	0.250		0	0	NR	NR	NR	0
PFAS TRIS	0.250		0	0	NR	NR	NR	0
PFAS RCRA MANIFEST	0.250		0	0	NR	NR	NR	0
PFAS ATSDR	0.250		0	0	NR	NR	NR	0
PFAS WQP	0.250		0	0	NR	NR	NR	0
PFAS NPDES	0.250		0	0	NR	NR	NR	0
PFAS ECHO	0.250		0	0	NR	NR	NR	0
PFAS ECHO FIRE TRAINING	0.250		0	0	NR	NR	NR	0
PFAS PART 139 AIRPORT	0.250		0	0	NR	NR	NR	0
AQUEOUS FOAM NRC	0.250		0	0	NR	NR	NR	0
BIOSOLIDS	TP		NR	NR	NR	NR	NR	0
PFAS	0.250		0	0	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
AIRS	TP		NR	NR	NR	NR	NR	0
ASBESTOS	TP		NR	NR	NR	NR	NR	0
COAL ASH	0.500		0	0	0	NR	NR	0
DRYCLEANERS	0.250		0	0	NR	NR	NR	0
Financial Assurance	TP		NR	NR	NR	NR	NR	0
LEAD	TP		NR	NR	NR	NR	NR	0
NPDES	TP		NR	NR	NR	NR	NR	0
UIC	TP		NR	NR	NR	NR	NR	0
EDR HIGH RISK HISTORICAL RECORDS								
EDR Exclusive Records								
EDR MGP	1.000		0	0	0	0	NR	0
EDR Hist Auto	0.125		0	NR	NR	NR	NR	0
EDR Hist Cleaner	0.125		0	NR	NR	NR	NR	0
EDR RECOVERED GOVERNMENT ARCHIVES								
Exclusive Recovered Govt. Archives								
RGA HWS	TP		NR	NR	NR	NR	NR	0
RGA LF	TP		NR	NR	NR	NR	NR	0
- Totals --		0	19	0	0	1	0	20

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

A1 **MEADE & SHEPHERD COAL COMPANY INC** **US MINES** **1016483514**
N/A

< 1/8
1 ft.

LETCHER (County), KY

Site 1 of 2 in cluster A

Relative:
Higher

Actual:
1714 ft.

US MINES:

Sic Code(s):	122200
Sic Code(s):	000000
Sic Code(s):	000000
Sic Code(s):	000000
Sic Code(s):	000000
Sic Code(s):	000000
Mine ID:	1516361
Entity Name:	ROXANA #2
Company:	MEADE & SHEPHERD COAL COMPANY INC
Status:	Permanently Closed
Status Date:	19910123
Operation Class:	1
Number of Shops:	0
Number of Plants:	0
Latitude Degree:	37
Longitude Degree:	082
Latitude Minute:	06
Latitude Seconds:	11
Longitude Minutes:	57
Longitude Seconds:	20
Number of Pits:	001

B2 **NO 2** **ABANDONED MINES** **1022855660**
N/A

< 1/8
1 ft.

, KY 37815

Site 1 of 4 in cluster B

Relative:
Lower

Actual:
1423 ft.

ABANDONED MINES:

Mine ID:	1516077
Mine Name:	NO 2
Mine Address:	Not reported
City,State,Zip:	KY 37815
Primary SIC Code:	Coal (Bituminous)
Mine Type:	Underground
Mine Status Description:	AbandonedSealed
Mine Status Date:	2/22/1989
Coal (C) or Metal (M) Mine:	C
Controller ID:	C12769
Controller Name:	Johnson Robert
Operator ID:	P18730
Operator name:	Big Oak Coal Company
Address of Record Street:	Not reported
Address of Record PO Box:	472
Address of Record City:	MORRISTOWN
Address of Record State:	KY
Address of Record Zip Code:	37815
Assessment Address Street:	Not reported
Assessment Address PO Box:	472
Assessment Address City:	MORRISTOWN
Assessment Address State:	KY
Assessment Address Zip Code:	37815
Mine Health and Safety Address Street:	Not reported

NO 2 (Continued) **1022855660**

Mine Health and Safety Address PO Box: Not reported
Mine Health and Safety Address City: Not reported
Mine Health and Safety Address State: Not reported
Mine Health and Safety Address Zip Code: Not reported
Latitude: 37.0975
Longitude: -82.9569

A3 **ROXANA #2** **ABANDONED MINES** **1022855930**
N/A

< 1/8
1 ft.

, KY 41858

Site 2 of 2 in cluster A

Relative:
Higher

Actual:
1716 ft.

ABANDONED MINES:

Mine ID:	1516361
Mine Name:	ROXANA #2
Mine Address:	Not reported
City,State,Zip:	KY 41858
Primary SIC Code:	Coal (Bituminous)
Mine Type:	Surface
Mine Status Description:	Abandoned
Mine Status Date:	1/23/1991
Coal (C) or Metal (M) Mine:	C
Controller ID:	C03753
Controller Name:	Talmage D Meade
Operator ID:	P06670
Operator name:	Meade & Shepherd Coal Company Inc
Address of Record Street:	Hc-84 Box 1404
Address of Record PO Box:	Not reported
Address of Record City:	WHITESBURG
Address of Record State:	KY
Address of Record Zip Code:	41858
Assessment Address Street:	Hc-84 Box 1404
Assessment Address PO Box:	Not reported
Assessment Address City:	WHITESBURG
Assessment Address State:	KY
Assessment Address Zip Code:	41858
Mine Health and Safety Address Street:	Not reported
Mine Health and Safety Address PO Box:	Not reported
Mine Health and Safety Address City:	Not reported
Mine Health and Safety Address State:	Not reported
Mine Health and Safety Address Zip Code:	Not reported
Latitude:	37.1031
Longitude:	-82.9556

---

4 **LEE GENTRY PROPERTY** **UST** **U003201172**
HWY 588 W **N/A**
< 1/8 **ROXANA, KY 41848**
1 ft.

Relative:
Lower

Actual:
1067 ft.

UST:

Name:	LEE GENTRY PROPERTY
Address:	HWY 588 W
City,State,Zip:	ROXANA, KY 41848
Sequence Id:	7630067
Facility ID:	59894

LEE GENTRY PROPERTY (Continued) **U003201172**

Owner Name:	Lee Gentry
Owner Address:	1052 Carpenters Trc
Owner Address2:	Not reported
Owner Address3:	Not reported
Owner City,St,Zip:	Villa Hills, KY 410174412
Internal Document ID:	0
Latitude:	-82.951762
Longitude:	37.109427
Inert Material Code:	Not reported
Removed Date:	03/31/1998
Change in Service Date:	Not reported
Tank Pit Num:	Not reported
Tank Mfg Code:	Not reported
Tank Overfill Protection:	UNK
Last Tank Test Date:	Not reported
Relined Date:	Not reported
Lining Insp Date:	Not reported
Pipe Release Detection:	NON
Pipe Rel Detect Suc Code:	NON
Pipe Leak Detect Code:	Not reported
Last Contained Date:	Not reported
Pipe Mfg Code:	Not reported
Last Pipe Test Date:	Not reported
Last CP Test Date:	Not reported
Added To Flex Date:	Not reported
Added To Piping Date:	Not reported
Decode For Tstatus:	Removed Tank Verified
Decode For Inertmatcd:	Not reported
Decode For Tmatcode:	Single Wall Steel
Decode For Textcrprcd:	None
Decode For Treldetcod:	None
Decode For Tintprotcd:	Unknown
Decode For Tsplprevcd:	Unknown
Decode For Tovflprvcd:	Unknown
Decode For Pmatcode:	Single Wall Steel
Decode For Pextcoprcd:	None
Decode For Ptypecode:	Suction
Decode For Preldetcod:	None
Decode For Preldetsuc:	None
Decode For Plekdetcod:	Not reported
Decode For Tsubcd:	Diesel
Decode For Tmancd:	Not reported
Decode For Pmancd:	Not reported
Subject Item ID:	1
Tank Status:	TRM
Installation Date:	01/01/1982
Closed In Place Date:	03/19/1997
Capacity in Gallons:	560
Compartment Number:	1
Piping Installation Date:	Not reported
Added To Tank Date:	Not reported
Inert Material Code:	Not reported
Removed Date:	03/31/1998
Change in Service Date:	Not reported
Tank Pit Num:	Not reported

LEE GENTRY PROPERTY (Continued) **U003201172**

Tank Mfg Code:	Not reported
Tank Overfill Protection:	UNK
Last Tank Test Date:	Not reported
Relined Date:	Not reported
Lining Insp Date:	Not reported
Pipe Release Detection:	NON
Pipe Rel Detect Suc Code:	NON
Pipe Leak Detect Code:	Not reported
Last Contained Date:	Not reported
Pipe Mfg Code:	Not reported
Last Pipe Test Date:	Not reported
Last CP Test Date:	Not reported
Added To Flex Date:	Not reported
Added To Piping Date:	Not reported
Decode For Tstatus:	Removed Tank Verified
Decode For Inertmatcd:	Not reported
Decode For Tmatcode:	Single Wall Steel
Decode For Textcrprcd:	None
Decode For Treldetcod:	None
Decode For Tintprotcd:	Unknown
Decode For Tsplprevcd:	Unknown
Decode For Tovflprvcd:	Unknown
Decode For Pmatcode:	Single Wall Steel
Decode For Pextcoprcd:	Unknown
Decode For Ptypecode:	Suction
Decode For Preldetcod:	None
Decode For Preldetsuc:	None
Decode For Plekdetcod:	Not reported
Decode For Tsubcd:	Gasoline
Decode For Tmancd:	Not reported
Decode For Pmancd:	Not reported
Subject Item ID:	2
Tank Status:	TRM
Installation Date:	01/01/1982
Closed In Place Date:	03/19/1997
Capacity in Gallons:	1000
Compartment Number:	1
Piping Installation Date:	Not reported
Added To Tank Date:	Not reported

---

5 **LANCE COAL CORP** **US MINES** **1016478219**
N/A

< 1/8
1 ft.

LETCHER (County), KY

Relative:
Higher

Actual:
1561 ft.

US MINES:

Sic Code(s):	122200
Sic Code(s):	000000
Sic Code(s):	000000
Sic Code(s):	000000
Sic Code(s):	000000
Sic Code(s):	000000
Mine ID:	1503494
Entity Name:	NO 1 STRIP MINE
Company:	LANCE COAL CORP
Status:	Permanently Closed
Status Date:	19800425
Operation Class:	1

LANCE COAL CORP (Continued) **1016478219**

Number of Shops:	0
Number of Plants:	0
Latitude Degree:	00
Longitude Degree:	000
Latitude Minute:	00
Latitude Seconds:	00
Longitude Minutes:	00
Longitude Seconds:	00
Number of Pits:	000

C6 **NO 1 SITE** **ABANDONED MINES** **1022855428**
N/A

< 1/8
1 ft.

, KY 40935

Site 1 of 2 in cluster C

Relative:
Higher

Actual:
1632 ft.

ABANDONED MINES:

Mine ID:	1515830
Mine Name:	NO 1 SITE
Mine Address:	Not reported
City,State,Zip:	KY 40935
Primary SIC Code:	Coal (Bituminous)
Mine Type:	Surface
Mine Status Description:	Abandoned
Mine Status Date:	6/1/1987
Coal (C) or Metal (M) Mine:	C
Controller ID:	C12646
Controller Name:	Carter Byron
Operator ID:	P18101
Operator name:	C & C Coal Company
Address of Record Street:	Not reported
Address of Record PO Box:	425
Address of Record City:	FLATLICK
Address of Record State:	KY
Address of Record Zip Code:	40935
Assessment Address Street:	Not reported
Assessment Address PO Box:	425
Assessment Address City:	FLATLICK
Assessment Address State:	KY
Assessment Address Zip Code:	40935
Mine Health and Safety Address Street:	Not reported
Mine Health and Safety Address PO Box:	Not reported
Mine Health and Safety Address City:	Not reported
Mine Health and Safety Address State:	Not reported
Mine Health and Safety Address Zip Code:	Not reported
Latitude:	37.0967
Longitude:	-82.9558

C7 **C & C COAL COMPANY** **US MINES** **1011166500**
N/A

< 1/8
1 ft.

LETCHER (County), KY

Site 2 of 2 in cluster C

Relative:
Higher

Actual:
1673 ft.

US MINES:

Sic Code(s):	122200
Sic Code(s):	000000
Sic Code(s):	000000
Sic Code(s):	000000
Sic Code(s):	000000
Sic Code(s):	000000
Mine ID:	1515830
Entity Name:	NO 1 SITE
Company:	C & C COAL COMPANY
Status:	Permanently Closed
Status Date:	19870601
Operation Class:	1
Number of Shops:	0
Number of Plants:	0
Latitude Degree:	37
Longitude Degree:	082
Latitude Minute:	05
Latitude Seconds:	48
Longitude Minutes:	57
Longitude Seconds:	20
Number of Pits:	001

B8 **MARIE ENTERPRISES INC** **US MINES** **1011166662**
N/A

< 1/8
1 ft.

LETCHER (County), KY

Site 2 of 4 in cluster B

Relative:
Lower

Actual:
1431 ft.

US MINES:

Sic Code(s):	122200
Sic Code(s):	000000
Sic Code(s):	000000
Sic Code(s):	000000
Sic Code(s):	000000
Sic Code(s):	000000
Mine ID:	1516000
Entity Name:	NO 1 MINE
Company:	MARIE ENTERPRISES INC
Status:	Permanently Closed
Status Date:	19890202
Operation Class:	1
Number of Shops:	0
Number of Plants:	0
Latitude Degree:	37
Longitude Degree:	082
Latitude Minute:	05
Latitude Seconds:	51
Longitude Minutes:	57
Longitude Seconds:	24
Number of Pits:	000

B9 **NO 1 MINE** **ABANDONED MINES** **1022855587**
N/A

< 1/8
1 ft.

, KY 25801

Site 3 of 4 in cluster B

Relative:
Lower

Actual:
1423 ft.

ABANDONED MINES:

Mine ID:	1516000
Mine Name:	NO 1 MINE
Mine Address:	Not reported
City,State,Zip:	KY 25801
Primary SIC Code:	Coal (Bituminous)
Mine Type:	Underground
Mine Status Description:	AbandonedSealed
Mine Status Date:	2/2/1989
Coal (C) or Metal (M) Mine:	C
Controller ID:	C08614
Controller Name:	Simpson Herbert Gaston
Operator ID:	P17431
Operator name:	Marie Enterprises Inc
Address of Record Street:	Not reported
Address of Record PO Box:	909
Address of Record City:	BECKLEY
Address of Record State:	KY
Address of Record Zip Code:	25801
Assessment Address Street:	Not reported
Assessment Address PO Box:	909
Assessment Address City:	BECKLEY
Assessment Address State:	KY
Assessment Address Zip Code:	25801
Mine Health and Safety Address Street:	Not reported
Mine Health and Safety Address PO Box:	Not reported
Mine Health and Safety Address City:	Not reported
Mine Health and Safety Address State:	Not reported
Mine Health and Safety Address Zip Code:	Not reported
Latitude:	37.0975
Longitude:	-82.9569

B10 **BIG OAK COAL COMPANY** **US MINES** **1011166739**
N/A

< 1/8
1 ft.

LETCHER (County), KY

Site 4 of 4 in cluster B

Relative:
Lower

Actual:
1431 ft.

US MINES:

Sic Code(s):	122200
Sic Code(s):	000000
Sic Code(s):	000000
Sic Code(s):	000000
Sic Code(s):	000000
Sic Code(s):	000000
Mine ID:	1516077
Entity Name:	NO 2
Company:	BIG OAK COAL COMPANY
Status:	Permanently Closed
Status Date:	19890222
Operation Class:	1
Number of Shops:	0
Number of Plants:	0
Latitude Degree:	37

BIG OAK COAL COMPANY (Continued) **1011166739**

Longitude Degree:	082
Latitude Minute:	05
Latitude Seconds:	51
Longitude Minutes:	57
Longitude Seconds:	24
Number of Pits:	000

11
NNE
< 1/8
0.006 mi.
30 ft.

ROXANNE BP **SB193** **U003132084**
US HWY 160 S **N/A**
ROXANA, KY

Relative:
Lower

Actual:
1034 ft.

KY SENATE BILL 193 INVENTORY:

KY SENATE BILL 193 INVENTORY:	SIW
Facility ID:	6892067
Soil / Groundwater:	Soil and Groundwater
Agency Interest Number:	59860

D12
NNW
< 1/8
0.013 mi.
68 ft.

MILL BRANCH PROCESSING INC **US MINES** **1011169733**
N/A

PIKE (County), KY

Site 1 of 6 in cluster D

Relative:
Lower

Actual:
1028 ft.

US MINES:

Sic Code(s):	122200
Sic Code(s):	000000
Sic Code(s):	000000
Sic Code(s):	000000
Sic Code(s):	000000
Sic Code(s):	000000
Mine ID:	1519140
Entity Name:	AUGER NO 1 SN #11
Company:	MILL BRANCH PROCESSING INC
Status:	Permanently Closed
Status Date:	20190923
Operation Class:	1
Number of Shops:	0
Number of Plants:	0
Latitude Degree:	37
Longitude Degree:	082
Latitude Minute:	06
Latitude Seconds:	47
Longitude Minutes:	57
Longitude Seconds:	32
Number of Pits:	000

D13 NNW < 1/8 0.013 mi. 68 ft. | **FLEENOR INC** | **US MINES** | **1010015878** **N/A**

LETCHER (County), KY

Site 2 of 6 in cluster D

Relative: Lower

Actual: 1028 ft.

US MINES:

Sic Code(s):	122200
Sic Code(s):	000000
Sic Code(s):	000000
Sic Code(s):	000000
Sic Code(s):	000000
Sic Code(s):	000000
Mine ID:	1519050
Entity Name:	MILL BRANCH OPERATION MINE NO 1
Company:	FLEENOR INC
Status:	Permanently Closed
Status Date:	20121127
Operation Class:	1
Number of Shops:	0
Number of Plants:	0
Latitude Degree:	37
Longitude Degree:	082
Latitude Minute:	06
Latitude Seconds:	47
Longitude Minutes:	57
Longitude Seconds:	31
Number of Pits:	000

D14 NNW < 1/8 0.020 mi. 104 ft. | **W & F CONTRACT AUGERING INC.** | **US MINES** | **1011169521** **N/A**

LETCHER (County), KY

Site 3 of 6 in cluster D

Relative: Lower

Actual: 1027 ft.

US MINES:

Sic Code(s):	122200
Sic Code(s):	000000
Sic Code(s):	000000
Sic Code(s):	000000
Sic Code(s):	000000
Sic Code(s):	000000
Mine ID:	1519060
Entity Name:	# 2
Company:	W & F CONTRACT AUGERING INC.
Status:	Permanently Closed
Status Date:	20150113
Operation Class:	1
Number of Shops:	0
Number of Plants:	0
Latitude Degree:	37
Longitude Degree:	082
Latitude Minute:	06
Latitude Seconds:	47
Longitude Minutes:	57
Longitude Seconds:	32
Number of Pits:	000

D15 **# 2** **US MINES** **1024911665**
NNW **MILL BRANCH** **ABANDONED MINES** **N/A**
< 1/8 **ROXANA, KY 41858**
0.037 mi.
194 ft. **Site 4 of 6 in cluster D**

Relative:
Lower

Actual:
1028 ft.

MINES VIOLATIONS:

Name:	# 2
Address:	MILL BRANCH
City,State,Zip:	ROXANA, KY 41858
Facility ID:	Not reported

MINES VIOLATIONS:

Violation Number:	7436917
Mine ID:	1519060
Contractor ID:	Not reported
Date Issued:	01/04/2007
Action Type:	104(a)
Type of Issue:	Citation
S and S:	N
Term Date:	01/05/2007
Title 30 Code of Federal Regulations:	77.1104
Proposed Penalty:	60.00
Assessment Amount:	60.00
Paid Penalty Amount:	0.00
Assessment Case Status:	Proposed
Assessment Status:	Received
Year:	2007
Address Type:	MineLocation
PO Box:	Not reported
Address:	MILL BRANCH
City:	ROXANA
State:	KY
Operator:	W & F Contract Augering Inc.
Zip:	41858
Mine Controller Name:	Christina J Whittaker
Name:	# 2
Ownership Date:	11/16/2006
Mine Status:	Abandoned
Status Date:	01/13/2015
Primary Site Description:	Coal (Bituminous)
Mine Type:	Surface
State 2:	KY
County:	LETCHER

Violation Number:	7436918
Mine ID:	1519060
Contractor ID:	Not reported
Date Issued:	01/04/2007
Action Type:	104(a)
Type of Issue:	Citation
S and S:	N
Term Date:	01/05/2007
Title 30 Code of Federal Regulations:	77.1109(c)(1)
Proposed Penalty:	60.00
Assessment Amount:	60.00
Paid Penalty Amount:	0.00
Assessment Case Status:	Proposed
Assessment Status:	Received
Year:	2007

 # 2 (Continued) **1024911665**

Address Type:	MineLocation
PO Box:	Not reported
Address:	MILL BRANCH
City:	ROXANA
State:	KY
Operator:	W & F Contract Augering Inc.
Zip:	41858
Mine Controller Name:	Christina J Whittaker
Name:	# 2
Ownership Date:	11/16/2006
Mine Status:	Abandoned
Status Date:	01/13/2015
Primary Site Description:	Coal (Bituminous)
Mine Type:	Surface
State 2:	KY
County:	LETCHER

Violation Number:	7436919
Mine ID:	1519060
Contractor ID:	Not reported
Date Issued:	01/04/2007
Action Type:	104(a)
Type of Issue:	Citation
S and S:	N
Term Date:	01/08/2007
Title 30 Code of Federal Regulations:	77.1000
Proposed Penalty:	60.00
Assessment Amount:	60.00
Paid Penalty Amount:	0.00
Assessment Case Status:	Proposed
Assessment Status:	Received
Year:	2007
Address Type:	MineLocation
PO Box:	Not reported
Address:	MILL BRANCH
City:	ROXANA
State:	KY
Operator:	W & F Contract Augering Inc.
Zip:	41858
Mine Controller Name:	Christina J Whittaker
Name:	# 2
Ownership Date:	11/16/2006
Mine Status:	Abandoned
Status Date:	01/13/2015
Primary Site Description:	Coal (Bituminous)
Mine Type:	Surface
State 2:	KY
County:	LETCHER

Violation Number:	7436921
Mine ID:	1519060
Contractor ID:	Not reported
Date Issued:	01/08/2007
Action Type:	104(a)
Type of Issue:	Citation
S and S:	N
Term Date:	01/11/2007

 # 2 (Continued) **1024911665**

Title 30 Code of Federal Regulations:	77.1706(b)
Proposed Penalty:	60.00
Assessment Amount:	60.00
Paid Penalty Amount:	0.00
Assessment Case Status:	Proposed
Assessment Status:	Received
Year:	2007
Address Type:	MineLocation
PO Box:	Not reported
Address:	MILL BRANCH
City:	ROXANA
State:	KY
Operator:	W & F Contract Augering Inc.
Zip:	41858
Mine Controller Name:	Christina J Whittaker
Name:	# 2
Ownership Date:	11/16/2006
Mine Status:	Abandoned
Status Date:	01/13/2015
Primary Site Description:	Coal (Bituminous)
Mine Type:	Surface
State 2:	KY
County:	LETCHER
Violation Number:	7436922
Mine ID:	1519060
Contractor ID:	Not reported
Date Issued:	01/09/2007
Action Type:	104(a)
Type of Issue:	Citation
S and S:	N
Term Date:	06/06/2007
Title 30 Code of Federal Regulations:	62.130(a)
Proposed Penalty:	60.00
Assessment Amount:	60.00
Paid Penalty Amount:	0.00
Assessment Case Status:	Proposed
Assessment Status:	Received
Year:	2007
Address Type:	MineLocation
PO Box:	Not reported
Address:	MILL BRANCH
City:	ROXANA
State:	KY
Operator:	W & F Contract Augering Inc.
Zip:	41858
Mine Controller Name:	Christina J Whittaker
Name:	# 2
Ownership Date:	11/16/2006
Mine Status:	Abandoned
Status Date:	01/13/2015
Primary Site Description:	Coal (Bituminous)
Mine Type:	Surface
State 2:	KY
County:	LETCHER
Violation Number:	7436923

 # 2 (Continued) **1024911665**

Mine ID:	1519060
Contractor ID:	Not reported
Date Issued:	01/09/2007
Action Type:	104(a)
Type of Issue:	Citation
S and S:	N
Term Date:	01/11/2007
Title 30 Code of Federal Regulations:	62.120
Proposed Penalty:	60.00
Assessment Amount:	60.00
Paid Penalty Amount:	0.00
Assessment Case Status:	Proposed
Assessment Status:	Received
Year:	2007
Address Type:	MineLocation
PO Box:	Not reported
Address:	MILL BRANCH
City:	ROXANA
State:	KY
Operator:	W & F Contract Augering Inc.
Zip:	41858
Mine Controller Name:	Christina J Whittaker
Name:	# 2
Ownership Date:	11/16/2006
Mine Status:	Abandoned
Status Date:	01/13/2015
Primary Site Description:	Coal (Bituminous)
Mine Type:	Surface
State 2:	KY
County:	LETCHER

Violation Number:	6645624
Mine ID:	1519060
Contractor ID:	Not reported
Date Issued:	02/08/2007
Action Type:	104(a)
Type of Issue:	Citation
S and S:	N
Term Date:	02/14/2007
Title 30 Code of Federal Regulations:	50.30(a)
Proposed Penalty:	60.00
Assessment Amount:	60.00
Paid Penalty Amount:	0.00
Assessment Case Status:	Proposed
Assessment Status:	Received
Year:	2007
Address Type:	MineLocation
PO Box:	Not reported
Address:	MILL BRANCH
City:	ROXANA
State:	KY
Operator:	W & F Contract Augering Inc.
Zip:	41858
Mine Controller Name:	Christina J Whittaker
Name:	# 2
Ownership Date:	11/16/2006
Mine Status:	Abandoned

 # 2 (Continued) **1024911665**

Status Date:	01/13/2015
Primary Site Description:	Coal (Bituminous)
Mine Type:	Surface
State 2:	KY
County:	LETCHER

ABANDONED MINES:

Mine ID:	1519060
Mine Name:	# 2
Mine Address:	MILL BRANCH
City,State,Zip:	ROXANA, KY 41858
Primary SIC Code:	Coal (Bituminous)
Mine Type:	Surface
Mine Status Description:	Abandoned
Mine Status Date:	1/13/2015
Coal (C) or Metal (M) Mine:	C
Controller ID:	0096533
Controller Name:	Christina J Whittaker
Operator ID:	P23994
Operator name:	W & F Contract Augering Inc.
Address of Record Street:	51 Elm Drive
Address of Record PO Box:	Not reported
Address of Record City:	Pinetop
Address of Record State:	KY
Address of Record Zip Code:	41858
Assessment Address Street:	51 Elm Drive
Assessment Address PO Box:	Not reported
Assessment Address City:	PINETOP
Assessment Address State:	KY
Assessment Address Zip Code:	41858
Mine Health and Safety Address Street:	51 Elm Drive
Mine Health and Safety Address PO Box:	Not reported
Mine Health and Safety Address City:	Pinetop
Mine Health and Safety Address State:	KY
Mine Health and Safety Address Zip Code:	Not reported
Latitude:	37.113333
Longitude:	-82.958889

D16 **AUGER NO 1 SN #11** **ABANDONED MINES** **1025500876**
NNW **STATE ROUTE 1373 BEAVER CREEK ROAD** **N/A**
< 1/8 **ELKHORN CITY, KY 41522**
0.037 mi.
194 ft. **Site 5 of 6 in cluster D**

Relative:
Lower

Actual:
1028 ft.

ABANDONED MINES:

Mine ID:	1519140
Mine Name:	AUGER NO 1 SN #11
Mine Address:	STATE ROUTE 1373 BEAVER CREEK ROAD
City,State,Zip:	ELKHORN CITY, KY 41522
Primary SIC Code:	Coal (Bituminous)
Mine Type:	Surface
Mine Status Description:	Abandoned
Mine Status Date:	9/23/2019
Coal (C) or Metal (M) Mine:	C
Controller ID:	0063233
Controller Name:	Greg Fleenor

AUGER NO 1 SN #11 (Continued) **1025500876**

Operator ID:	0082765
Operator name:	Mill Branch Processing Inc
Address of Record Street:	21 Silver Spur Lane Elkhorn Creek Road
Address of Record PO Box:	Not reported
Address of Record City:	Ashcamp
Address of Record State:	KY
Address of Record Zip Code:	41522
Assessment Address Street:	Not reported
Assessment Address PO Box:	100
Assessment Address City:	ASHCAMP
Assessment Address State:	KY
Assessment Address Zip Code:	41522
Mine Health and Safety Address Street:	Not reported
Mine Health and Safety Address PO Box:	100
Mine Health and Safety Address City:	Ashcamp
Mine Health and Safety Address State:	KY
Mine Health and Safety Address Zip Code:	Not reported
Latitude:	37.113333
Longitude:	-82.958889

D17 **MILL BRANCH OPERATION MINE NO 1** **US MINES** **1024911655**
NNW **MILL BRANCH ROAD** **ABANDONED MINES** **N/A**
< 1/8 **WHITESBURG, KY 41858**
0.037 mi.
194 ft. **Site 6 of 6 in cluster D**

Relative:
Lower

Actual:
1028 ft.

MINES VIOLATIONS:

Name:	MILL BRANCH OPERATION MINE NO 1
Address:	MILL BRANCH ROAD
City,State,Zip:	WHITESBURG, KY 41858
Facility ID:	Not reported

MINES VIOLATIONS:

Violation Number:	7436920
Mine ID:	1519050
Contractor ID:	Not reported
Date Issued:	01/05/2007
Action Type:	104(a)
Type of Issue:	Citation
S and S:	N
Term Date:	01/05/2007
Title 30 Code of Federal Regulations:	77.1605(b)
Proposed Penalty:	60.00
Assessment Amount:	60.00
Paid Penalty Amount:	60.00
Assessment Case Status:	Proposed
Assessment Status:	Closed
Year:	2007
Address Type:	MineLocation
PO Box:	Not reported
Address:	MILL BRANCH ROAD
City:	WHITESBURG
State:	KY
Operator:	Fleenor Inc
Zip:	41858
Mine Controller Name:	Greg Fleenor
Name:	MILL BRANCH OPERATION MINE NO 1
Ownership Date:	09/26/2006

MILL BRANCH OPERATION MINE NO 1 (Continued) **1024911655**

Mine Status:	Abandoned
Status Date:	11/27/2012
Primary Site Description:	Coal (Bituminous)
Mine Type:	Surface
State 2:	KY
County:	LETCHER

Violation Number:	7436930
Mine ID:	1519050
Contractor ID:	Not reported
Date Issued:	01/22/2007
Action Type:	104(a)
Type of Issue:	Citation
S and S:	N
Term Date:	01/25/2007
Title 30 Code of Federal Regulations:	77.404(a)
Proposed Penalty:	60.00
Assessment Amount:	60.00
Paid Penalty Amount:	60.00
Assessment Case Status:	Proposed
Assessment Status:	Closed
Year:	2007
Address Type:	MineLocation
PO Box:	Not reported
Address:	MILL BRANCH ROAD
City:	WHITESBURG
State:	KY
Operator:	Fleenor Inc
Zip:	41858
Mine Controller Name:	Greg Fleenor
Name:	MILL BRANCH OPERATION MINE NO 1
Ownership Date:	09/26/2006
Mine Status:	Abandoned
Status Date:	11/27/2012
Primary Site Description:	Coal (Bituminous)
Mine Type:	Surface
State 2:	KY
County:	LETCHER

Violation Number:	7436931
Mine ID:	1519050
Contractor ID:	Not reported
Date Issued:	01/22/2007
Action Type:	104(a)
Type of Issue:	Citation
S and S:	N
Term Date:	01/24/2007
Title 30 Code of Federal Regulations:	50.30(a)
Proposed Penalty:	60.00
Assessment Amount:	60.00
Paid Penalty Amount:	60.00
Assessment Case Status:	Proposed
Assessment Status:	Closed
Year:	2007
Address Type:	MineLocation
PO Box:	Not reported
Address:	MILL BRANCH ROAD

MILL BRANCH OPERATION MINE NO 1 (Continued) **1024911655**

City:	WHITESBURG
State:	KY
Operator:	Fleenor Inc
Zip:	41858
Mine Controller Name:	Greg Fleenor
Name:	MILL BRANCH OPERATION MINE NO 1
Ownership Date:	09/26/2006
Mine Status:	Abandoned
Status Date:	11/27/2012
Primary Site Description:	Coal (Bituminous)
Mine Type:	Surface
State 2:	KY
County:	LETCHER
Violation Number:	7436932
Mine ID:	1519050
Contractor ID:	Not reported
Date Issued:	01/22/2007
Action Type:	104(a)
Type of Issue:	Citation
S and S:	N
Term Date:	01/24/2007
Title 30 Code of Federal Regulations:	47.51
Proposed Penalty:	60.00
Assessment Amount:	60.00
Paid Penalty Amount:	60.00
Assessment Case Status:	Proposed
Assessment Status:	Closed
Year:	2007
Address Type:	MineLocation
PO Box:	Not reported
Address:	MILL BRANCH ROAD
City:	WHITESBURG
State:	KY
Operator:	Fleenor Inc
Zip:	41858
Mine Controller Name:	Greg Fleenor
Name:	MILL BRANCH OPERATION MINE NO 1
Ownership Date:	09/26/2006
Mine Status:	Abandoned
Status Date:	11/27/2012
Primary Site Description:	Coal (Bituminous)
Mine Type:	Surface
State 2:	KY
County:	LETCHER
Violation Number:	7436933
Mine ID:	1519050
Contractor ID:	Not reported
Date Issued:	01/24/2007
Action Type:	104(a)
Type of Issue:	Citation
S and S:	N
Term Date:	01/25/2007
Title 30 Code of Federal Regulations:	77.404(a)
Proposed Penalty:	60.00
Assessment Amount:	60.00

MILL BRANCH OPERATION MINE NO 1 (Continued) **1024911655**

Paid Penalty Amount:	60.00
Assessment Case Status:	Proposed
Assessment Status:	Closed
Year:	2007
Address Type:	MineLocation
PO Box:	Not reported
Address:	MILL BRANCH ROAD
City:	WHITESBURG
State:	KY
Operator:	Fleenor Inc
Zip:	41858
Mine Controller Name:	Greg Fleenor
Name:	MILL BRANCH OPERATION MINE NO 1
Ownership Date:	09/26/2006
Mine Status:	Abandoned
Status Date:	11/27/2012
Primary Site Description:	Coal (Bituminous)
Mine Type:	Surface
State 2:	KY
County:	LETCHER

Violation Number:	8229573
Mine ID:	1519050
Contractor ID:	Not reported
Date Issued:	11/03/2009
Action Type:	104(a)
Type of Issue:	Citation
S and S:	N
Term Date:	11/04/2009
Title 30 Code of Federal Regulations:	77.1104
Proposed Penalty:	100.00
Assessment Amount:	100.00
Paid Penalty Amount:	100.00
Assessment Case Status:	Proposed
Assessment Status:	Closed
Year:	2009
Address Type:	MineLocation
PO Box:	Not reported
Address:	MILL BRANCH ROAD
City:	WHITESBURG
State:	KY
Operator:	Fleenor Inc
Zip:	41858
Mine Controller Name:	Greg Fleenor
Name:	MILL BRANCH OPERATION MINE NO 1
Ownership Date:	09/26/2006
Mine Status:	Abandoned
Status Date:	11/27/2012
Primary Site Description:	Coal (Bituminous)
Mine Type:	Surface
State 2:	KY
County:	LETCHER

Violation Number:	8229574
Mine ID:	1519050
Contractor ID:	Not reported
Date Issued:	11/04/2009

MILL BRANCH OPERATION MINE NO 1 (Continued) **1024911655**

Action Type:	104(a)
Type of Issue:	Citation
S and S:	N
Term Date:	11/04/2009
Title 30 Code of Federal Regulations:	77.404(a)
Proposed Penalty:	100.00
Assessment Amount:	100.00
Paid Penalty Amount:	100.00
Assessment Case Status:	Proposed
Assessment Status:	Closed
Year:	2009
Address Type:	MineLocation
PO Box:	Not reported
Address:	MILL BRANCH ROAD
City:	WHITESBURG
State:	KY
Operator:	Fleenor Inc
Zip:	41858
Mine Controller Name:	Greg Fleenor
Name:	MILL BRANCH OPERATION MINE NO 1
Ownership Date:	09/26/2006
Mine Status:	Abandoned
Status Date:	11/27/2012
Primary Site Description:	Coal (Bituminous)
Mine Type:	Surface
State 2:	KY
County:	LETCHER

Violation Number:	8229583
Mine ID:	1519050
Contractor ID:	Not reported
Date Issued:	12/10/2009
Action Type:	104(a)
Type of Issue:	Citation
S and S:	N
Term Date:	12/11/2009
Title 30 Code of Federal Regulations:	77.404(a)
Proposed Penalty:	100.00
Assessment Amount:	100.00
Paid Penalty Amount:	100.00
Assessment Case Status:	Proposed
Assessment Status:	Closed
Year:	2009
Address Type:	MineLocation
PO Box:	Not reported
Address:	MILL BRANCH ROAD
City:	WHITESBURG
State:	KY
Operator:	Fleenor Inc
Zip:	41858
Mine Controller Name:	Greg Fleenor
Name:	MILL BRANCH OPERATION MINE NO 1
Ownership Date:	09/26/2006
Mine Status:	Abandoned
Status Date:	11/27/2012
Primary Site Description:	Coal (Bituminous)
Mine Type:	Surface

MILL BRANCH OPERATION MINE NO 1 (Continued) **1024911655**

State 2:	KY
County:	LETCHER
Violation Number:	8229584
Mine ID:	1519050
Contractor ID:	Not reported
Date Issued:	12/10/2009
Action Type:	104(a)
Type of Issue:	Citation
S and S:	N
Term Date:	12/11/2009
Title 30 Code of Federal Regulations:	77.1104
Proposed Penalty:	100.00
Assessment Amount:	100.00
Paid Penalty Amount:	100.00
Assessment Case Status:	Proposed
Assessment Status:	Closed
Year:	2009
Address Type:	MineLocation
PO Box:	Not reported
Address:	MILL BRANCH ROAD
City:	WHITESBURG
State:	KY
Operator:	Fleenor Inc
Zip:	41858
Mine Controller Name:	Greg Fleenor
Name:	MILL BRANCH OPERATION MINE NO 1
Ownership Date:	09/26/2006
Mine Status:	Abandoned
Status Date:	11/27/2012
Primary Site Description:	Coal (Bituminous)
Mine Type:	Surface
State 2:	KY
County:	LETCHER
Violation Number:	8229586
Mine ID:	1519050
Contractor ID:	Not reported
Date Issued:	12/15/2009
Action Type:	104(a)
Type of Issue:	Citation
S and S:	N
Term Date:	12/15/2009
Title 30 Code of Federal Regulations:	71.208
Proposed Penalty:	100.00
Assessment Amount:	100.00
Paid Penalty Amount:	100.00
Assessment Case Status:	Proposed
Assessment Status:	Closed
Year:	2009
Address Type:	MineLocation
PO Box:	Not reported
Address:	MILL BRANCH ROAD
City:	WHITESBURG
State:	KY
Operator:	Fleenor Inc
Zip:	41858

MILL BRANCH OPERATION MINE NO 1 (Continued) **1024911655**

Mine Controller Name:	Greg Fleenor
Name:	MILL BRANCH OPERATION MINE NO 1
Ownership Date:	09/26/2006
Mine Status:	Abandoned
Status Date:	11/27/2012
Primary Site Description:	Coal (Bituminous)
Mine Type:	Surface
State 2:	KY
County:	LETCHER

Violation Number:	8219190
Mine ID:	1519050
Contractor ID:	Not reported
Date Issued:	09/05/2008
Action Type:	104(a)
Type of Issue:	Citation
S and S:	N
Term Date:	09/08/2008
Title 30 Code of Federal Regulations:	77.205(a)
Proposed Penalty:	100.00
Assessment Amount:	100.00
Paid Penalty Amount:	100.00
Assessment Case Status:	Proposed
Assessment Status:	Closed
Year:	2008
Address Type:	MineLocation
PO Box:	Not reported
Address:	MILL BRANCH ROAD
City:	WHITESBURG
State:	KY
Operator:	Fleenor Inc
Zip:	41858
Mine Controller Name:	Greg Fleenor
Name:	MILL BRANCH OPERATION MINE NO 1
Ownership Date:	09/26/2006
Mine Status:	Abandoned
Status Date:	11/27/2012
Primary Site Description:	Coal (Bituminous)
Mine Type:	Surface
State 2:	KY
County:	LETCHER

Click this hyperlink while viewing on your computer to access
33 additional US_MINES_VIOLATIONS: record(s) in the EDR Site Report.

ABANDONED MINES:

Mine ID:	1519050
Mine Name:	MILL BRANCH OPERATION MINE NO 1
Mine Address:	MILL BRANCH ROAD
City,State,Zip:	WHITESBURG, KY 41858
Primary SIC Code:	Coal (Bituminous)
Mine Type:	Surface
Mine Status Description:	Abandoned
Mine Status Date:	11/27/2012
Coal (C) or Metal (M) Mine:	C
Controller ID:	0063233

MILL BRANCH OPERATION MINE NO 1 (Continued) **1024911655**

Controller Name:	Greg Fleenor
Operator ID:	0075325
Operator name:	Fleenor Inc
Address of Record Street:	11027 Silver Spur Lane
Address of Record PO Box:	Not reported
Address of Record City:	Ashcamp
Address of Record State:	KY
Address of Record Zip Code:	41858
Assessment Address Street:	11027 Silver Spur Lane
Assessment Address PO Box:	Not reported
Assessment Address City:	ASHCAMP
Assessment Address State:	KY
Assessment Address Zip Code:	41858
Mine Health and Safety Address Street:	Not reported
Mine Health and Safety Address PO Box:	100
Mine Health and Safety Address City:	Ashcamp
Mine Health and Safety Address State:	KY
Mine Health and Safety Address Zip Code:	Not reported
Latitude:	37.113333
Longitude:	-82.958888

18
SSW
1/2-1
0.980 mi.
5173 ft.

JESSE ISON LEASE KF-611 **SHWS** **S118672442**
BULL CREEK RD **N/A**
ROXANA, KY 41773

Relative:
Higher

Actual:
1513 ft.

SHWS:

Name:	JESSE ISON LEASE KF-611
Address:	BULL CREEK RD
City,State,Zip:	ROXANA, KY 41773
Facility Id:	91997
Status:	**Closed**
Description:	KY West Virginia Gas Oil Drum Spill (Closed: Restored 3-25-96)
Closure Date:	03/25/1996
Longitude:	-82.969278
Latitude:	37.084472
Subject Item County:	Letcher
Sub Item Longitude:	-82.969117
Sub Item Latitude:	37.084420
Subject Item Address:	Bull Creek Rd
Subject Item Address2:	Not reported
Subject Item City,St,Zip:	Roxana, KY 41773
Regulatory Desc:	Petroleum Cleanup
Closure Option:	Option C Restored
Side SG:	Oil Spill
Acreage:	Not reported

Count: 0 records.

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
		NO SITES FOUND			

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

STANDARD ENVIRONMENTAL RECORDS

Lists of Federal NPL (Superfund) sites

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 09/19/2023
Date Data Arrived at EDR: 10/03/2023
Date Made Active in Reports: 10/19/2023
Number of Days to Update: 16

Source: EPA
Telephone: N/A
Last EDR Contact: 12/04/2023
Next Scheduled EDR Contact: 01/08/2024
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 7
Telephone: 913-551-7247

EPA Region 4
Telephone 404-562-8033

EPA Region 8
Telephone: 303-312-6774

EPA Region 5
Telephone 312-886-6686

EPA Region 9
Telephone: 415-947-4246

EPA Region 10
Telephone 206-553-8665

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 09/19/2023
Date Data Arrived at EDR: 10/03/2023
Date Made Active in Reports: 10/19/2023
Number of Days to Update: 16

Source: EPA
Telephone: N/A
Last EDR Contact: 12/04/2023
Next Scheduled EDR Contact: 01/08/2024
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

Lists of Federal Delisted NPL sites

Delisted NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 09/19/2023
Date Data Arrived at EDR: 10/03/2023
Date Made Active in Reports: 10/19/2023
Number of Days to Update: 16

Source: EPA
Telephone: N/A
Last EDR Contact: 12/04/2023
Next Scheduled EDR Contact: 01/08/2024
Data Release Frequency: Quarterly

Lists of Federal sites subject to CERCLA removals and CERCLA orders

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 09/25/2023
Date Data Arrived at EDR: 09/26/2023
Date Made Active in Reports: 12/12/2023
Number of Days to Update: 77

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 09/26/2023
Next Scheduled EDR Contact: 01/08/2024
Data Release Frequency: Varies

SEMS: Superfund Enterprise Management System

SEMS (Superfund Enterprise Management System) tracks hazardous waste sites, potentially hazardous waste sites, and remedial activities performed in support of EPA's Superfund Program across the United States. The list was formerly know as CERCLIS, renamed to SEMS by the EPA in 2015. The list contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This dataset also contains sites which are either proposed to or on the National Priorities List (NPL) and the sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 09/19/2023
Date Data Arrived at EDR: 10/03/2023
Date Made Active in Reports: 10/19/2023
Number of Days to Update: 16

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 12/04/2023
Next Scheduled EDR Contact: 01/22/2024
Data Release Frequency: Quarterly

Lists of Federal CERCLA sites with NFRAP

SEMS-ARCHIVE: Superfund Enterprise Management System Archive

SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list the site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. The decision does not necessarily mean that there is no hazard associated with a given site; it only means that. based upon available information, the location is not judged to be potential NPL site.

Date of Government Version: 09/19/2023
Date Data Arrived at EDR: 10/03/2023
Date Made Active in Reports: 10/19/2023
Number of Days to Update: 16

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 12/04/2023
Next Scheduled EDR Contact: 01/22/2024
Data Release Frequency: Quarterly

Lists of Federal RCRA facilities undergoing Corrective Action

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 12/04/2023
Date Data Arrived at EDR: 12/06/2023
Date Made Active in Reports: 12/12/2023
Number of Days to Update: 6

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 12/06/2023
Next Scheduled EDR Contact: 01/01/2024
Data Release Frequency: Quarterly

Lists of Federal RCRA TSD facilities

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 12/04/2023
Date Data Arrived at EDR: 12/06/2023
Date Made Active in Reports: 12/12/2023
Number of Days to Update: 6

Source: Environmental Protection Agency
Telephone: (404) 562-8651
Last EDR Contact: 12/06/2023
Next Scheduled EDR Contact: 01/01/2024
Data Release Frequency: Quarterly

Lists of Federal RCRA generators

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 12/04/2023
Date Data Arrived at EDR: 12/06/2023
Date Made Active in Reports: 12/12/2023
Number of Days to Update: 6

Source: Environmental Protection Agency
Telephone: (404) 562-8651
Last EDR Contact: 12/06/2023
Next Scheduled EDR Contact: 01/01/2024
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 12/04/2023
Date Data Arrived at EDR: 12/06/2023
Date Made Active in Reports: 12/12/2023
Number of Days to Update: 6

Source: Environmental Protection Agency
Telephone: (404) 562-8651
Last EDR Contact: 12/06/2023
Next Scheduled EDR Contact: 01/01/2024
Data Release Frequency: Quarterly

RCRA-VSQG: RCRA - Very Small Quantity Generators (Formerly Conditionally Exempt Small Quantity Generators)

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Very small quantity generators (VSQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 12/04/2023
Date Data Arrived at EDR: 12/06/2023
Date Made Active in Reports: 12/12/2023
Number of Days to Update: 6

Source: Environmental Protection Agency
Telephone: (404) 562-8651
Last EDR Contact: 12/06/2023
Next Scheduled EDR Contact: 01/01/2024
Data Release Frequency: Quarterly

Federal institutional controls / engineering controls registries

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 08/03/2023
Date Data Arrived at EDR: 08/07/2023
Date Made Active in Reports: 10/10/2023
Number of Days to Update: 64

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 11/02/2023
Next Scheduled EDR Contact: 02/19/2024
Data Release Frequency: Varies

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 08/21/2023
Date Data Arrived at EDR: 08/21/2023
Date Made Active in Reports: 11/07/2023
Number of Days to Update: 78

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 11/17/2023
Next Scheduled EDR Contact: 03/04/2024
Data Release Frequency: Varies

US INST CONTROLS: Institutional Controls Sites List

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 08/21/2023
Date Data Arrived at EDR: 08/21/2023
Date Made Active in Reports: 11/07/2023
Number of Days to Update: 78

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 11/17/2023
Next Scheduled EDR Contact: 03/04/2024
Data Release Frequency: Varies

Federal ERNS list

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 09/18/2023
Date Data Arrived at EDR: 09/20/2023
Date Made Active in Reports: 12/11/2023
Number of Days to Update: 82

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 12/13/2023
Next Scheduled EDR Contact: 04/01/2024
Data Release Frequency: Quarterly

Lists of state- and tribal hazardous waste facilities

SHWS: State Leads List

State Hazardous Waste Sites. State hazardous waste site records are the states' equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. Available information varies by state.

Date of Government Version: 11/27/2023
Date Data Arrived at EDR: 11/29/2023
Date Made Active in Reports: 12/05/2023
Number of Days to Update: 6

Source: Department of Environmental Protection
Telephone: 502-564-6716
Last EDR Contact: 11/15/2023
Next Scheduled EDR Contact: 03/04/2024
Data Release Frequency: Quarterly

Lists of state and tribal landfills and solid waste disposal facilities

SWF/LF: Solid Waste Facilities List

Solid Waste Facilities/Landfill Sites. SWF/LF type records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. Depending on the state, these may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 08/22/2023
Date Data Arrived at EDR: 08/24/2023
Date Made Active in Reports: 11/03/2023
Number of Days to Update: 71

Source: Department of Environmental Protection
Telephone: 502-564-6716
Last EDR Contact: 10/28/2023
Next Scheduled EDR Contact: 02/05/2024
Data Release Frequency: Semi-Annually

Lists of state and tribal leaking storage tanks

PSTEAF: Facility Ranking List

The Underground Storage Tank Branch (USTB) has ranked all PSTEAF reimbursable facilities requiring corrective action, in accordance with 401 KAR 42:290. Directive letters will be issued on the basis of facility ranking and available PSTEAF funding in sequential order as ranked. For example, Rank 2 facilities will be issued directives before Rank 3 facilities.

Date of Government Version: 06/01/2023
Date Data Arrived at EDR: 06/29/2023
Date Made Active in Reports: 09/22/2023
Number of Days to Update: 85

Source: Department of Environmental Protection
Telephone: 502-564-5981
Last EDR Contact: 10/04/2023
Next Scheduled EDR Contact: 01/15/2024
Data Release Frequency: Quarterly

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 04/20/2023
Date Data Arrived at EDR: 05/09/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 66

Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 10/11/2023
Next Scheduled EDR Contact: 01/29/2024
Data Release Frequency: Varies

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 04/19/2023
Date Data Arrived at EDR: 05/09/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 66

Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 10/11/2023
Next Scheduled EDR Contact: 01/29/2024
Data Release Frequency: Varies

INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land
Leaking underground storage tanks located on Indian Land in Michigan, Minnesota and Wisconsin.

Date of Government Version: 04/14/2023
Date Data Arrived at EDR: 05/09/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 66

Source: EPA, Region 5
Telephone: 312-886-7439
Last EDR Contact: 10/11/2023
Next Scheduled EDR Contact: 01/29/2024
Data Release Frequency: Varies

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 04/26/2023
Date Data Arrived at EDR: 05/09/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 66

Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 10/11/2023
Next Scheduled EDR Contact: 01/29/2024
Data Release Frequency: Varies

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 04/20/2023
Date Data Arrived at EDR: 05/09/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 66

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 10/11/2023
Next Scheduled EDR Contact: 01/29/2024
Data Release Frequency: Varies

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 04/25/2023
Date Data Arrived at EDR: 05/09/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 66

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 10/11/2023
Next Scheduled EDR Contact: 01/29/2024
Data Release Frequency: Varies

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 04/20/2023
Date Data Arrived at EDR: 05/09/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 66

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 10/11/2023
Next Scheduled EDR Contact: 01/29/2024
Data Release Frequency: Varies

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 04/19/2023
Date Data Arrived at EDR: 05/09/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 66

Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 10/11/2023
Next Scheduled EDR Contact: 01/29/2024
Data Release Frequency: Varies

SB193: SB193 Branch Site Inventory List
The inventory indicates facilities that have performed permanent closure activities at a regulated underground storage tank facility and have known soil and/or groundwater contamination.

Date of Government Version: 09/05/2006
Date Data Arrived at EDR: 09/13/2006
Date Made Active in Reports: 10/18/2006
Number of Days to Update: 35

Source: Department of Environmental Protection
Telephone: 502-564-5981
Last EDR Contact: 04/08/2016
Next Scheduled EDR Contact: 07/25/2016
Data Release Frequency: No Update Planned

Lists of state and tribal registered storage tanks

FEMA UST: Underground Storage Tank Listing
A listing of all FEMA owned underground storage tanks.

Date of Government Version: 03/08/2023
Date Data Arrived at EDR: 03/09/2023
Date Made Active in Reports: 05/30/2023
Number of Days to Update: 82

Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 10/10/2023
Next Scheduled EDR Contact: 01/15/2024
Data Release Frequency: Varies

UST: Underground Storage Tank Database
Registered Underground Storage Tanks. UST's are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with the state department responsible for administering the UST program. Available information varies by state program.

Date of Government Version: 08/11/2023
Date Data Arrived at EDR: 08/22/2023
Date Made Active in Reports: 11/06/2023
Number of Days to Update: 76

Source: Department of Environmental Protection
Telephone: 502-564-5981
Last EDR Contact: 11/17/2023
Next Scheduled EDR Contact: 03/04/2024
Data Release Frequency: Quarterly

AST: Above Ground Storage Tanks
A listing of aboveground storage tank site locations.

Date of Government Version: 11/06/2023
Date Data Arrived at EDR: 11/09/2023
Date Made Active in Reports: 11/20/2023
Number of Days to Update: 11

Source: Office of State Fire Marshal
Telephone: 502-564-4010
Last EDR Contact: 11/01/2023
Next Scheduled EDR Contact: 03/04/2024
Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 04/20/2023
Date Data Arrived at EDR: 05/09/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 66

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 10/11/2023
Next Scheduled EDR Contact: 01/29/2024
Data Release Frequency: Varies

INDIAN UST R9: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 04/19/2023
Date Data Arrived at EDR: 05/09/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 66

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 10/11/2023
Next Scheduled EDR Contact: 01/29/2024
Data Release Frequency: Varies

INDIAN UST R7: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 04/25/2023
Date Data Arrived at EDR: 05/09/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 66

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 10/11/2023
Next Scheduled EDR Contact: 01/29/2024
Data Release Frequency: Varies

INDIAN UST R1: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 04/20/2023
Date Data Arrived at EDR: 05/09/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 66

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 10/11/2023
Next Scheduled EDR Contact: 01/29/2024
Data Release Frequency: Varies

INDIAN UST R5: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 04/14/2023
Date Data Arrived at EDR: 05/09/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 66

Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 10/11/2023
Next Scheduled EDR Contact: 01/29/2024
Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 04/26/2023
Date Data Arrived at EDR: 05/09/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 66

Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 10/11/2023
Next Scheduled EDR Contact: 01/29/2024
Data Release Frequency: Varies

INDIAN UST R10: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 04/20/2023
Date Data Arrived at EDR: 05/09/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 66

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 10/11/2023
Next Scheduled EDR Contact: 01/29/2024
Data Release Frequency: Varies

INDIAN UST R8: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 04/20/2023
Date Data Arrived at EDR: 05/09/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 66

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 10/11/2023
Next Scheduled EDR Contact: 01/29/2024
Data Release Frequency: Varies

State and tribal institutional control / engineering control registries

ENG CONTROLS: Engineering Controls Site Listing
A listing of sites that use engineering controls.

Date of Government Version: 11/28/2023
Date Data Arrived at EDR: 11/29/2023
Date Made Active in Reports: 12/05/2023
Number of Days to Update: 6

Source: Department of Environmental Protection
Telephone: 502-564-6716
Last EDR Contact: 11/15/2023
Next Scheduled EDR Contact: 03/04/2024
Data Release Frequency: Varies

INST CONTROL: State Superfund Database
A list of closed sites in the State Superfund Database. Institutional controls would be in place at any site that uses Contained or Managed as a Closure Option.

Date of Government Version: 11/28/2023
Date Data Arrived at EDR: 11/29/2023
Date Made Active in Reports: 12/05/2023
Number of Days to Update: 6

Source: Department of Environmental Protection
Telephone: 502-564-6716
Last EDR Contact: 11/15/2023
Next Scheduled EDR Contact: 03/04/2024
Data Release Frequency: Varies

Lists of state and tribal voluntary cleanup sites

VCP: Voluntary Cleanup Program Sites
Sites that have been accepted into the Voluntary Cleanup Program or have submitted an application.

Date of Government Version: 07/31/2023
Date Data Arrived at EDR: 08/02/2023
Date Made Active in Reports: 10/19/2023
Number of Days to Update: 78

Source: Department of Environmental Protection
Telephone: 502-564-6716
Last EDR Contact: 09/21/2023
Next Scheduled EDR Contact: 01/08/2024
Data Release Frequency: Varies

INDIAN VCP R1: Voluntary Cleanup Priority Listing
A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 07/27/2015
Date Data Arrived at EDR: 09/29/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 142

Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 12/12/2023
Next Scheduled EDR Contact: 04/01/2024
Data Release Frequency: Varies

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng
A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27

Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 07/08/2021
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

Lists of state and tribal brownfield sites

BROWNFIELDS: Kentucky Brownfield Inventory
The Kentucky Brownfield Program has created an inventory of brownfield sites in order to market the properties to those interested in brownfield redevelopment. The Kentucky Brownfield Program is working to promote the redevelopment of these sites by helping to remove barriers that prevent reuse, providing useful information to communities, developers and the public and encouraging a climate that fosters redevelopment of contaminated sites.

Date of Government Version: 07/07/2023
Date Data Arrived at EDR: 08/03/2023
Date Made Active in Reports: 10/19/2023
Number of Days to Update: 77

Source: Division of Compliance Assistance
Telephone: 502-564-0323
Last EDR Contact: 10/04/2023
Next Scheduled EDR Contact: 01/22/2024
Data Release Frequency: Varies

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites

Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 08/15/2023	Source: Environmental Protection Agency
Date Data Arrived at EDR: 08/30/2023	Telephone: 202-566-2777
Date Made Active in Reports: 12/01/2023	Last EDR Contact: 08/30/2023
Number of Days to Update: 93	Next Scheduled EDR Contact: 12/25/2023
	Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

HIST LF: Historical Landfills

This solid waste facility listing contains detail information that is not included in the landfill listing. A listing with detail information is no longer available by the Department of Environmental Protection.

Date of Government Version: 05/01/2003	Source: Department of Environmental Protection
Date Data Arrived at EDR: 03/30/2006	Telephone: 502-564-6716
Date Made Active in Reports: 05/01/2006	Last EDR Contact: 02/23/2009
Number of Days to Update: 32	Next Scheduled EDR Contact: 05/25/2009
	Data Release Frequency: No Update Planned

SWRCY: Recycling Facilities

A listing of recycling facilities located in the state of Kentucky.

Date of Government Version: 09/04/2020	Source: Department of Environmental Protection
Date Data Arrived at EDR: 10/14/2020	Telephone: 502-564-6716
Date Made Active in Reports: 01/04/2021	Last EDR Contact: 10/10/2023
Number of Days to Update: 82	Next Scheduled EDR Contact: 01/22/2024
	Data Release Frequency: Varies

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands

Location of open dumps on Indian land.

Date of Government Version: 12/31/1998	Source: Environmental Protection Agency
Date Data Arrived at EDR: 12/03/2007	Telephone: 703-308-8245
Date Made Active in Reports: 01/24/2008	Last EDR Contact: 10/23/2023
Number of Days to Update: 52	Next Scheduled EDR Contact: 02/05/2024
	Data Release Frequency: Varies

ODI: Open Dump Inventory

An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985	Source: Environmental Protection Agency
Date Data Arrived at EDR: 08/09/2004	Telephone: 800-424-9346
Date Made Active in Reports: 09/17/2004	Last EDR Contact: 06/09/2004
Number of Days to Update: 39	Next Scheduled EDR Contact: N/A
	Data Release Frequency: No Update Planned

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations
A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137

Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 10/10/2023
Next Scheduled EDR Contact: 01/29/2024
Data Release Frequency: No Update Planned

IHS OPEN DUMPS: Open Dumps on Indian Land
A listing of all open dumps located on Indian Land in the United States.

Date of Government Version: 04/01/2014
Date Data Arrived at EDR: 08/06/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 176

Source: Department of Health & Human Serivces, Indian Health Service
Telephone: 301-443-1452
Last EDR Contact: 10/28/2023
Next Scheduled EDR Contact: 02/05/2024
Data Release Frequency: Varies

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL: National Clandestine Laboratory Register
A listing of clandestine drug lab locations that have been removed from the DEAs National Clandestine Laboratory Register.

Date of Government Version: 08/21/2023
Date Data Arrived at EDR: 08/21/2023
Date Made Active in Reports: 11/07/2023
Number of Days to Update: 78

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 11/17/2023
Next Scheduled EDR Contact: 03/04/2024
Data Release Frequency: No Update Planned

CDL: Clandestine Drub Lab Location Listing
Clandestine drug lab site locations.

Date of Government Version: 11/21/2023
Date Data Arrived at EDR: 11/29/2023
Date Made Active in Reports: 12/05/2023
Number of Days to Update: 6

Source: Department of Environmental Protection
Telephone: 502-564-6716
Last EDR Contact: 11/15/2023
Next Scheduled EDR Contact: 03/04/2024
Data Release Frequency: Varies

US CDL: Clandestine Drug Labs
A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 08/21/2023
Date Data Arrived at EDR: 08/21/2023
Date Made Active in Reports: 11/07/2023
Number of Days to Update: 78

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 11/17/2023
Next Scheduled EDR Contact: 03/04/2024
Data Release Frequency: Quarterly

Local Land Records

LIENS 2: CERCLA Lien Information
A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 09/19/2023
Date Data Arrived at EDR: 10/03/2023
Date Made Active in Reports: 10/19/2023
Number of Days to Update: 16

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 11/01/2023
Next Scheduled EDR Contact: 01/08/2024
Data Release Frequency: Semi-Annually

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System
Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 09/18/2023
Date Data Arrived at EDR: 09/20/2023
Date Made Active in Reports: 11/14/2023
Number of Days to Update: 55

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 12/13/2023
Next Scheduled EDR Contact: 04/01/2024
Data Release Frequency: Quarterly

SPILLS: State spills
A listing of spill and/or release related incidents.

Date of Government Version: 08/02/2023
Date Data Arrived at EDR: 08/03/2023
Date Made Active in Reports: 08/21/2023
Number of Days to Update: 18

Source: DEP, Emergency Response
Telephone: 502-564-2380
Last EDR Contact: 10/04/2023
Next Scheduled EDR Contact: 01/22/2024
Data Release Frequency: Varies

Other Ascertainable Records

RCRA NonGen / NLR: RCRA - Non Generators / No Longer Regulated
RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 12/04/2023
Date Data Arrived at EDR: 12/06/2023
Date Made Active in Reports: 12/12/2023
Number of Days to Update: 6

Source: Environmental Protection Agency
Telephone: (404) 562-8651
Last EDR Contact: 12/06/2023
Next Scheduled EDR Contact: 01/01/2024
Data Release Frequency: Quarterly

FUDS: Formerly Used Defense Sites
The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 08/07/2023
Date Data Arrived at EDR: 08/15/2023
Date Made Active in Reports: 10/10/2023
Number of Days to Update: 56

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 11/10/2023
Next Scheduled EDR Contact: 02/26/2024
Data Release Frequency: Varies

DOD: Department of Defense Sites
This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 06/07/2021
Date Data Arrived at EDR: 07/13/2021
Date Made Active in Reports: 03/09/2022
Number of Days to Update: 239

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 10/09/2023
Next Scheduled EDR Contact: 01/22/2024
Data Release Frequency: Varies

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 04/02/2018
Date Data Arrived at EDR: 04/11/2018
Date Made Active in Reports: 11/06/2019
Number of Days to Update: 574

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 10/04/2023
Next Scheduled EDR Contact: 01/15/2024
Data Release Frequency: N/A

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 07/30/2021
Date Data Arrived at EDR: 02/03/2023
Date Made Active in Reports: 02/10/2023
Number of Days to Update: 7

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 11/08/2023
Next Scheduled EDR Contact: 02/19/2024
Data Release Frequency: Varies

US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 09/18/2023
Date Data Arrived at EDR: 09/20/2023
Date Made Active in Reports: 12/12/2023
Number of Days to Update: 83

Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 12/13/2023
Next Scheduled EDR Contact: 04/01/2024
Data Release Frequency: Quarterly

EPA WATCH LIST: EPA WATCH LIST

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 08/30/2013
Date Data Arrived at EDR: 03/21/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 88

Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 10/31/2023
Next Scheduled EDR Contact: 02/12/2024
Data Release Frequency: Quarterly

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 09/30/2017
Date Data Arrived at EDR: 05/08/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 73

Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 11/03/2023
Next Scheduled EDR Contact: 02/12/2024
Data Release Frequency: Varies

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2020
Date Data Arrived at EDR: 06/14/2022
Date Made Active in Reports: 03/24/2023
Number of Days to Update: 283

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 09/15/2023
Next Scheduled EDR Contact: 12/25/2023
Data Release Frequency: Every 4 Years

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2021
Date Data Arrived at EDR: 08/18/2023
Date Made Active in Reports: 11/07/2023
Number of Days to Update: 81

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 11/13/2023
Next Scheduled EDR Contact: 02/26/2024
Data Release Frequency: Annually

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 07/17/2023
Date Data Arrived at EDR: 07/18/2023
Date Made Active in Reports: 10/10/2023
Number of Days to Update: 84

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 10/20/2023
Next Scheduled EDR Contact: 01/29/2024
Data Release Frequency: Annually

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 09/19/2023
Date Data Arrived at EDR: 10/03/2023
Date Made Active in Reports: 10/19/2023
Number of Days to Update: 16

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 12/04/2023
Next Scheduled EDR Contact: 03/11/2024
Data Release Frequency: Annually

RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 05/09/2023
Date Data Arrived at EDR: 06/29/2023
Date Made Active in Reports: 09/25/2023
Number of Days to Update: 88

Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 09/26/2023
Next Scheduled EDR Contact: 01/29/2024
Data Release Frequency: Varies

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

PRP: Potentially Responsible Parties

A listing of verified Potentially Responsible Parties

Date of Government Version: 09/19/2023
Date Data Arrived at EDR: 10/03/2023
Date Made Active in Reports: 10/19/2023
Number of Days to Update: 16

Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 12/04/2023
Next Scheduled EDR Contact: 02/12/2024
Data Release Frequency: Quarterly

PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 03/20/2023
Date Data Arrived at EDR: 04/04/2023
Date Made Active in Reports: 06/09/2023
Number of Days to Update: 66

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 10/06/2023
Next Scheduled EDR Contact: 01/15/2024
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 11/18/2016
Date Data Arrived at EDR: 11/23/2016
Date Made Active in Reports: 02/10/2017
Number of Days to Update: 79

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 09/27/2023
Next Scheduled EDR Contact: 01/15/2024
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: No Update Planned

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: No Update Planned

MLTS: Material Licensing Tracking System
MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 07/20/2023
Date Data Arrived at EDR: 09/01/2023
Date Made Active in Reports: 09/20/2023
Number of Days to Update: 19

Source: Nuclear Regulatory Commission
Telephone: 301-415-0717
Last EDR Contact: 10/10/2023
Next Scheduled EDR Contact: 01/29/2024
Data Release Frequency: Quarterly

COAL ASH DOE: Steam-Electric Plant Operation Data
A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2021
Date Data Arrived at EDR: 04/14/2023
Date Made Active in Reports: 07/10/2023
Number of Days to Update: 87

Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 11/27/2023
Next Scheduled EDR Contact: 03/11/2024
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List
A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 01/12/2017
Date Data Arrived at EDR: 03/05/2019
Date Made Active in Reports: 11/11/2019
Number of Days to Update: 251

Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 11/27/2023
Next Scheduled EDR Contact: 03/11/2024
Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database
The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 09/13/2019
Date Data Arrived at EDR: 11/06/2019
Date Made Active in Reports: 02/10/2020
Number of Days to Update: 96

Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 11/03/2023
Next Scheduled EDR Contact: 02/12/2024
Data Release Frequency: Varies

RADINFO: Radiation Information Database
The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 07/01/2019
Date Data Arrived at EDR: 07/01/2019
Date Made Active in Reports: 09/23/2019
Number of Days to Update: 84

Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 09/22/2023
Next Scheduled EDR Contact: 01/08/2024
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing

A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing

A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

DOT OPS: Incident and Accident Data

Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 01/02/2020
Date Data Arrived at EDR: 01/28/2020
Date Made Active in Reports: 04/17/2020
Number of Days to Update: 80

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 10/04/2023
Next Scheduled EDR Contact: 02/05/2024
Data Release Frequency: Quarterly

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 06/30/2023
Date Data Arrived at EDR: 07/19/2023
Date Made Active in Reports: 10/10/2023
Number of Days to Update: 83

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 10/03/2023
Next Scheduled EDR Contact: 01/15/2024
Data Release Frequency: Varies

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2021
Date Data Arrived at EDR: 03/09/2023
Date Made Active in Reports: 03/20/2023
Number of Days to Update: 11

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 12/06/2023
Next Scheduled EDR Contact: 01/01/2024
Data Release Frequency: Biennially

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 07/14/2015
Date Made Active in Reports: 01/10/2017
Number of Days to Update: 546

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 10/02/2023
Next Scheduled EDR Contact: 01/15/2024
Data Release Frequency: Semi-Annually

FUSRAP: Formerly Utilized Sites Remedial Action Program

DOE established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations.

Date of Government Version: 03/03/2023
Date Data Arrived at EDR: 03/03/2023
Date Made Active in Reports: 06/09/2023
Number of Days to Update: 98

Source: Department of Energy
Telephone: 202-586-3559
Last EDR Contact: 10/25/2023
Next Scheduled EDR Contact: 02/12/2024
Data Release Frequency: Varies

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 08/30/2019
Date Data Arrived at EDR: 11/15/2019
Date Made Active in Reports: 01/28/2020
Number of Days to Update: 74

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 11/09/2023
Next Scheduled EDR Contact: 02/26/2024
Data Release Frequency: Varies

LEAD SMELTER 1: Lead Smelter Sites

A listing of former lead smelter site locations.

Date of Government Version: 09/19/2023
Date Data Arrived at EDR: 10/03/2023
Date Made Active in Reports: 10/19/2023
Number of Days to Update: 16

Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 12/04/2023
Next Scheduled EDR Contact: 01/08/2024
Data Release Frequency: Varies

LEAD SMELTER 2: Lead Smelter Sites

A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001
Date Data Arrived at EDR: 10/27/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 36

Source: American Journal of Public Health
Telephone: 703-305-6451
Last EDR Contact: 12/02/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)

The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US AIRS MINOR: Air Facility System Data
A listing of minor source facilities.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

MINES VIOLATIONS: MSHA Violation Assessment Data
Mines violation and assessment information. Department of Labor, Mine Safety & Health Administration.

Date of Government Version: 07/05/2023
Date Data Arrived at EDR: 07/05/2023
Date Made Active in Reports: 09/25/2023
Number of Days to Update: 82

Source: DOL, Mine Safety & Health Admi
Telephone: 202-693-9424
Last EDR Contact: 10/04/2023
Next Scheduled EDR Contact: 02/19/2024
Data Release Frequency: Quarterly

US MINES: Mines Master Index File
Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 08/01/2023
Date Data Arrived at EDR: 08/22/2023
Date Made Active in Reports: 11/07/2023
Number of Days to Update: 77

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 11/17/2023
Next Scheduled EDR Contact: 03/04/2024
Data Release Frequency: Semi-Annually

US MINES 2: Ferrous and Nonferrous Metal Mines Database Listing
This map layer includes ferrous (ferrous metal mines are facilities that extract ferrous metals, such as iron ore or molybdenum) and nonferrous (Nonferrous metal mines are facilities that extract nonferrous metals, such as gold, silver, copper, zinc, and lead) metal mines in the United States.

Date of Government Version: 01/07/2022
Date Data Arrived at EDR: 02/24/2023
Date Made Active in Reports: 05/17/2023
Number of Days to Update: 82

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 11/20/2023
Next Scheduled EDR Contact: 03/04/2024
Data Release Frequency: Varies

US MINES 3: Active Mines & Mineral Plants Database Listing
Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011
Date Data Arrived at EDR: 06/08/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 97

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 11/20/2023
Next Scheduled EDR Contact: 03/04/2024
Data Release Frequency: Varies

ABANDONED MINES: Abandoned Mines
An inventory of land and water impacted by past mining (primarily coal mining) is maintained by OSMRE to provide information needed to implement the Surface Mining Control and Reclamation Act of 1977 (SMCRA). The inventory contains information on the location, type, and extent of AML impacts, as well as, information on the cost associated with the reclamation of those problems. The inventory is based upon field surveys by State, Tribal, and OSMRE program officials. It is dynamic to the extent that it is modified as new problems are identified and existing problems are reclaimed.

Date of Government Version: 11/28/2023
Date Data Arrived at EDR: 11/29/2023
Date Made Active in Reports: 12/11/2023
Number of Days to Update: 12

Source: Department of Interior
Telephone: 202-208-2609
Last EDR Contact: 11/28/2023
Next Scheduled EDR Contact: 03/18/2024
Data Release Frequency: Quarterly

MINES MRDS: Mineral Resources Data System
Mineral Resources Data System

Date of Government Version: 08/23/2022
Date Data Arrived at EDR: 11/22/2022
Date Made Active in Reports: 02/28/2023
Number of Days to Update: 98

Source: USGS
Telephone: 703-648-6533
Last EDR Contact: 11/20/2023
Next Scheduled EDR Contact: 03/04/2024
Data Release Frequency: Varies

FINDS: Facility Index System/Facility Registry System
Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 11/03/2023
Date Data Arrived at EDR: 11/08/2023
Date Made Active in Reports: 11/20/2023
Number of Days to Update: 12

Source: EPA
Telephone: (404) 562-9900
Last EDR Contact: 11/08/2023
Next Scheduled EDR Contact: 03/11/2024
Data Release Frequency: Quarterly

UXO: Unexploded Ordnance Sites
A listing of unexploded ordnance site locations

Date of Government Version: 09/06/2023
Date Data Arrived at EDR: 09/13/2023
Date Made Active in Reports: 12/11/2023
Number of Days to Update: 89

Source: Department of Defense
Telephone: 703-704-1564
Last EDR Contact: 09/13/2023
Next Scheduled EDR Contact: 01/22/2024
Data Release Frequency: Varies

DOCKET HWC: Hazardous Waste Compliance Docket Listing
A complete list of the Federal Agency Hazardous Waste Compliance Docket Facilities.

Date of Government Version: 05/06/2021
Date Data Arrived at EDR: 05/21/2021
Date Made Active in Reports: 08/11/2021
Number of Days to Update: 82

Source: Environmental Protection Agency
Telephone: 202-564-0527
Last EDR Contact: 11/15/2023
Next Scheduled EDR Contact: 03/04/2024
Data Release Frequency: Varies

ECHO: Enforcement & Compliance History Information
ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

Date of Government Version: 06/24/2023
Date Data Arrived at EDR: 06/29/2023
Date Made Active in Reports: 09/25/2023
Number of Days to Update: 88

Source: Environmental Protection Agency
Telephone: 202-564-2280
Last EDR Contact: 10/03/2023
Next Scheduled EDR Contact: 01/15/2024
Data Release Frequency: Quarterly

FUELS PROGRAM: EPA Fuels Program Registered Listing
This listing includes facilities that are registered under the Part 80 (Code of Federal Regulations) EPA Fuels Programs. All companies now are required to submit new and updated registrations.

Date of Government Version: 08/14/2023
Date Data Arrived at EDR: 08/15/2023
Date Made Active in Reports: 10/19/2023
Number of Days to Update: 65

Source: EPA
Telephone: 800-385-6164
Last EDR Contact: 11/10/2023
Next Scheduled EDR Contact: 02/26/2024
Data Release Frequency: Quarterly

PFAS NPL: Superfund Sites with PFAS Detections Information

EPA's Office of Land and Emergency Management and EPA Regional Offices maintain data describing what is known about site investigations, contamination, and remedial actions under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) where PFAS is present in the environment.

Date of Government Version: 07/05/2023
Date Data Arrived at EDR: 07/05/2023
Date Made Active in Reports: 10/02/2023
Number of Days to Update: 89

Source: Environmental Protection Agency
Telephone: 703-603-8895
Last EDR Contact: 10/03/2023
Next Scheduled EDR Contact: 01/15/2024
Data Release Frequency: Varies

PFAS FEDERAL SITES: Federal Sites PFAS Information

Several federal entities, such as the federal Superfund program, Department of Defense, National Aeronautics and Space Administration, Department of Transportation, and Department of Energy provided information for sites with known or suspected detections at federal facilities.

Date of Government Version: 07/05/2023
Date Data Arrived at EDR: 07/05/2023
Date Made Active in Reports: 10/02/2023
Number of Days to Update: 89

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 10/03/2023
Next Scheduled EDR Contact: 01/15/2024
Data Release Frequency: Varies

PFAS TRIS: List of PFAS Added to the TRI

Section 7321 of the National Defense Authorization Act for Fiscal Year 2020 (NDAA) immediately added certain per- and polyfluoroalkyl substances (PFAS) to the list of chemicals covered by the Toxics Release Inventory (TRI) under Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA) and provided a framework for additional PFAS to be added to TRI on an annual basis.

Date of Government Version: 07/05/2023
Date Data Arrived at EDR: 07/05/2023
Date Made Active in Reports: 10/02/2023
Number of Days to Update: 89

Source: Environmental Protection Agency
Telephone: 202-566-0250
Last EDR Contact: 10/03/2023
Next Scheduled EDR Contact: 01/15/2024
Data Release Frequency: Varies

PFAS TSCA: PFAS Manufacture and Imports Information

EPA issued the Chemical Data Reporting (CDR) Rule under the Toxic Substances Control Act (TSCA) and requires chemical manufacturers and facilities that manufacture or import chemical substances to report data to EPA. EPA publishes non-confidential business information (non-CBI) and includes descriptive information about each site, corporate parent, production volume, other manufacturing information, and processing and use information.

Date of Government Version: 07/05/2023
Date Data Arrived at EDR: 07/05/2023
Date Made Active in Reports: 10/02/2023
Number of Days to Update: 89

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 10/03/2023
Next Scheduled EDR Contact: 01/15/2024
Data Release Frequency: Varies

PFAS RCRA MANIFEST: PFAS Transfers Identified In the RCRA Database Listing

To work around the lack of PFAS waste codes in the RCRA database, EPA developed the PFAS Transfers dataset by mining e-Manifest records containing at least one of these common PFAS keywords: PFAS, PFOA, PFOS, PERFL, AFFF, GENX, GEN-X (plus the VT waste codes). These keywords were searched for in the following text fields: Manifest handling instructions (MANIFEST_HANDLING_INSTR), Non-hazardous waste description (NON_HAZ_WASTE_DESCRIPTION), DOT printed information (DOT_PRINTED_INFORMATION), Waste line handling instructions (WASTE_LINE_HANDLING_INSTR), Waste residue comments (WASTE_RESIDUE_COMMENTS).

Date of Government Version: 07/05/2023
Date Data Arrived at EDR: 07/05/2023
Date Made Active in Reports: 10/02/2023
Number of Days to Update: 89

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 10/03/2023
Next Scheduled EDR Contact: 01/15/2024
Data Release Frequency: Varies

PFAS ATSDR: PFAS Contamination Site Location Listing

PFAS contamination site locations from the Department of Health & Human Services, Center for Disease Control & Prevention. ATSDR is involved at a number of PFAS-related sites, either directly or through assisting state and federal partners. As of now, most sites are related to drinking water contamination connected with PFAS production facilities or fire training areas where aqueous film-forming firefighting foam (AFFF) was regularly used.

Date of Government Version: 06/24/2020
Date Data Arrived at EDR: 03/17/2021
Date Made Active in Reports: 11/08/2022
Number of Days to Update: 601

Source: Department of Health & Human Services
Telephone: 202-741-5770
Last EDR Contact: 10/23/2023
Next Scheduled EDR Contact: 02/05/2024
Data Release Frequency: Varies

PFAS WQP: Ambient Environmental Sampling for PFAS

The Water Quality Portal (WQP) is a part of a modernized repository storing ambient sampling data for all environmental media and tissue samples. A wide range of federal, state, tribal and local governments, academic and non-governmental organizations and individuals submit project details and sampling results to this public repository. The information is commonly used for research and assessments of environmental quality.

Date of Government Version: 09/23/2023
Date Data Arrived at EDR: 10/03/2023
Date Made Active in Reports: 10/10/2023
Number of Days to Update: 7

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 10/03/2023
Next Scheduled EDR Contact: 01/15/2024
Data Release Frequency: Varies

PFAS NPDES: Clean Water Act Discharge Monitoring Information

Any discharger of pollutants to waters of the United States from a point source must have a National Pollutant Discharge Elimination System (NPDES) permit. The process for obtaining limits involves the regulated entity (permittee) disclosing releases in a NPDES permit application and the permitting authority (typically the state but sometimes EPA) deciding whether to require monitoring or monitoring with limits. Caveats and Limitations: Less than half of states have required PFAS monitoring for at least one of their permittees and fewer states have established PFAS effluent limits for permittees. New rulemakings have been initiated that may increase the number of facilities monitoring for PFAS in the future.

Date of Government Version: 07/05/2023
Date Data Arrived at EDR: 07/05/2023
Date Made Active in Reports: 10/02/2023
Number of Days to Update: 89

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 10/03/2023
Next Scheduled EDR Contact: 01/15/2024
Data Release Frequency: Varies

PFAS ECHO: Facilities in Industries that May Be Handling PFAS Listing

Regulators and the public have expressed interest in knowing which regulated entities may be using PFAS. EPA has developed a dataset from various sources that show which industries may be handling PFAS. Approximately 120,000 facilities subject to federal environmental programs have operated or currently operate in industry sectors with processes that may involve handling and/or release of PFAS.

Date of Government Version: 07/05/2023
Date Data Arrived at EDR: 07/05/2023
Date Made Active in Reports: 09/25/2023
Number of Days to Update: 82

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 10/03/2023
Next Scheduled EDR Contact: 01/15/2024
Data Release Frequency: Varies

PFAS ECHO FIRE TRAINING: Facilities in Industries that May Be Handling PFAS Listing

A list of fire training sites was added to the Industry Sectors dataset using a keyword search on the permitted facilitys name to identify sites where fire-fighting foam may have been used in training exercises. Additionally, you may view an example spreadsheet of the subset of fire training facility data, as well as the keywords used in selecting or deselecting a facility for the subset. as well as the keywords used in selecting or deselecting a facility for the subset. These keywords were tested to maximize accuracy in selecting facilities that may use fire-fighting foam in training exercises, however, due to the lack of a required reporting field in the data systems for designating fire training sites, this methodology may not identify all fire training sites or may potentially misidentify them.

Date of Government Version: 07/05/2023
Date Data Arrived at EDR: 07/05/2023
Date Made Active in Reports: 09/25/2023
Number of Days to Update: 82

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 10/03/2023
Next Scheduled EDR Contact: 01/15/2024
Data Release Frequency: Varies

PFAS PART 139 AIRPORT: All Certified Part 139 Airports PFAS Information Listing

Since July 1, 2006, all certified part 139 airports are required to have fire-fighting foam onsite that meet military specifications (MIL-F-24385) (14 CFR 139.317). To date, these military specification fire-fighting foams are fluorinated and have been historically used for training and extinguishing. The 2018 FAA Reauthorization Act has a provision stating that no later than October 2021, FAA shall not require the use of fluorinated AFFF. This provision does not prohibit the use of fluorinated AFFF at Part 139 civilian airports; it only prohibits FAA from mandating its use. The Federal Aviation Administration?s document AC 150/5210-6D - Aircraft Fire Extinguishing Agents provides guidance on Aircraft Fire Extinguishing Agents, which includes Aqueous Film Forming Foam (AFFF).

Date of Government Version: 07/05/2023
Date Data Arrived at EDR: 07/05/2023
Date Made Active in Reports: 09/25/2023
Number of Days to Update: 82

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 10/03/2023
Next Scheduled EDR Contact: 01/15/2024
Data Release Frequency: Varies

AQUEOUS FOAM NRC: Aqueous Foam Related Incidents Listing

The National Response Center (NRC) serves as an emergency call center that fields initial reports for pollution and railroad incidents and forwards that information to appropriate federal/state agencies for response. The spreadsheets posted to the NRC website contain initial incident data that has not been validated or investigated by a federal/state response agency. Response center calls from 1990 to the most recent complete calendar year where there was indication of Aqueous Film Forming Foam (AFFF) usage are included in this dataset. NRC calls may reference AFFF usage in the ?Material Involved? or ?Incident Description? fields.

Date of Government Version: 07/05/2023
Date Data Arrived at EDR: 07/06/2023
Date Made Active in Reports: 09/25/2023
Number of Days to Update: 81

Source: Environmental Protection Agency
Telephone: 202-267-2675
Last EDR Contact: 10/03/2023
Next Scheduled EDR Contact: 01/15/2024
Data Release Frequency: Varies

PCS: Permit Compliance System

PCS is a computerized management information system that contains data on National Pollutant Discharge Elimination System (NPDES) permit holding facilities. PCS tracks the permit, compliance, and enforcement status of NPDES facilities.

Date of Government Version: 07/14/2011
Date Data Arrived at EDR: 08/05/2011
Date Made Active in Reports: 09/29/2011
Number of Days to Update: 55

Source: EPA, Office of Water
Telephone: 202-564-2496
Last EDR Contact: 09/28/2023
Next Scheduled EDR Contact: 01/15/2024
Data Release Frequency: No Update Planned

PCS ENF: Enforcement data

No description is available for this data

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 02/05/2015
Date Made Active in Reports: 03/06/2015
Number of Days to Update: 29

Source: EPA
Telephone: 202-564-2497
Last EDR Contact: 09/28/2023
Next Scheduled EDR Contact: 01/15/2024
Data Release Frequency: Varies

BIOSOLIDS: ICIS-NPDES Biosolids Facility Data

The data reflects compliance information about facilities in the biosolids program.

Date of Government Version: 07/16/2023
Date Data Arrived at EDR: 07/18/2023
Date Made Active in Reports: 08/28/2023
Number of Days to Update: 41

Source: Environmental Protection Agency
Telephone: 202-564-4700
Last EDR Contact: 10/03/2023
Next Scheduled EDR Contact: 01/29/2024
Data Release Frequency: Varies

PFAS: PFAS Detections Site Listing
The presence of PFAS contamination at locations, including water treatment plants.

Date of Government Version: 03/06/2023
Date Data Arrived at EDR: 03/09/2023
Date Made Active in Reports: 05/26/2023
Number of Days to Update: 78

Source: Department of Environmental Protection
Telephone: 502-564-3410
Last EDR Contact: 11/28/2023
Next Scheduled EDR Contact: 03/18/2024
Data Release Frequency: Varies

AIRS: Permitted Airs Facility Listing
A listing of permitted Airs facilities.

Date of Government Version: 07/05/2023
Date Data Arrived at EDR: 07/20/2023
Date Made Active in Reports: 08/29/2023
Number of Days to Update: 40

Source: Department of Environmental Protection
Telephone: 502-573-3382
Last EDR Contact: 10/23/2023
Next Scheduled EDR Contact: 02/05/2024
Data Release Frequency: Semi-Annually

ASBESTOS: Asbestos Notification Listing
Asbestos sites

Date of Government Version: 09/21/2023
Date Data Arrived at EDR: 09/22/2023
Date Made Active in Reports: 12/12/2023
Number of Days to Update: 81

Source: Department of Environmental Protection
Telephone: 502-782-6780
Last EDR Contact: 11/21/2023
Next Scheduled EDR Contact: 03/11/2024
Data Release Frequency: Varies

COAL ASH: Coal Ash Disposal Sites
A listing of coal ash pond site locations.

Date of Government Version: 07/18/2023
Date Data Arrived at EDR: 07/25/2023
Date Made Active in Reports: 10/12/2023
Number of Days to Update: 79

Source: Department of Environmental Protection
Telephone: 502-564-6716
Last EDR Contact: 10/27/2023
Next Scheduled EDR Contact: 02/05/2024
Data Release Frequency: No Update Planned

DRYCLEANERS: Drycleaner Listing
A listing of drycleaner facility locations.

Date of Government Version: 07/05/2023
Date Data Arrived at EDR: 07/20/2023
Date Made Active in Reports: 08/29/2023
Number of Days to Update: 40

Source: Department of Environmental Protection
Telephone: 502-573-3382
Last EDR Contact: 10/23/2023
Next Scheduled EDR Contact: 02/05/2024
Data Release Frequency: Semi-Annually

Financial Assurance 1: Financial Assurance Information Listing
A listing of financial assurance information.

Date of Government Version: 08/22/2023
Date Data Arrived at EDR: 08/24/2023
Date Made Active in Reports: 08/29/2023
Number of Days to Update: 5

Source: Department of Environmental Protection
Telephone: 502-564-6716
Last EDR Contact: 10/23/2023
Next Scheduled EDR Contact: 02/05/2024
Data Release Frequency: Varies

Financial Assurance 2: Financial Assurance Information Listing
Financial Assurance information for underground storage tank facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 05/14/2014
Date Data Arrived at EDR: 06/06/2014
Date Made Active in Reports: 06/24/2014
Number of Days to Update: 18

Source: Department of Environmental Protection
Telephone: 502-564-5981
Last EDR Contact: 10/20/2023
Next Scheduled EDR Contact: 02/05/2024
Data Release Frequency: Varies

Financial Assurance 3: Financial Assurance Information Listing
A listing of financial assurance information for solid waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 11/09/2023
Date Data Arrived at EDR: 11/09/2023
Date Made Active in Reports: 11/13/2023
Number of Days to Update: 4

Source: Department of Environmental Protection
Telephone: 502-564-6716
Last EDR Contact: 10/23/2023
Next Scheduled EDR Contact: 02/05/2024
Data Release Frequency: Varies

LEAD: Environmental Lead Program Report Tracking Database
Lead Report Tracking Database

Date of Government Version: 01/27/2017
Date Data Arrived at EDR: 02/02/2017
Date Made Active in Reports: 08/21/2017
Number of Days to Update: 200

Source: Department of Public Health
Telephone: 502-564-4537
Last EDR Contact: 10/26/2023
Next Scheduled EDR Contact: 02/12/2024
Data Release Frequency: Varies

NPDES: Permitted Facility Listing
A listing of permitted wastewater facilities.

Date of Government Version: 08/14/2023
Date Data Arrived at EDR: 08/15/2023
Date Made Active in Reports: 11/01/2023
Number of Days to Update: 78

Source: Department of Environmental Protection
Telephone: 502-564-3410
Last EDR Contact: 10/26/2023
Next Scheduled EDR Contact: 02/12/2024
Data Release Frequency: Semi-Annually

UIC: UIC Information
A listing of wells identified as underground injection wells, in the Kentucky Oil & Gas Wells data base.

Date of Government Version: 06/28/2023
Date Data Arrived at EDR: 07/10/2023
Date Made Active in Reports: 09/28/2023
Number of Days to Update: 80

Source: Kentucky Geological Survey
Telephone: 859-323-0544
Last EDR Contact: 10/10/2023
Next Scheduled EDR Contact: 01/22/2024
Data Release Frequency: Quarterly

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP: EDR Proprietary Manufactured Gas Plants
The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR Hist Auto: EDR Exclusive Historical Auto Stations
EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR Hist Cleaner: EDR Exclusive Historical Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA HWS: Recovered Government Archive State Hazardous Waste Facilities List

The EDR Recovered Government Archive State Hazardous Waste database provides a list of SHWS incidents derived from historical databases and includes many records that no longer appear in current government lists.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/03/2014
Number of Days to Update: 186

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LF: Recovered Government Archive Solid Waste Facilities List

The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/15/2014
Number of Days to Update: 198

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data

Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 08/07/2023
Date Data Arrived at EDR: 08/08/2023
Date Made Active in Reports: 10/24/2023
Number of Days to Update: 77

Source: Department of Energy & Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 11/07/2023
Next Scheduled EDR Contact: 02/19/2024
Data Release Frequency: No Update Planned

NJ MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 04/10/2019
Date Made Active in Reports: 05/16/2019
Number of Days to Update: 36

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 09/28/2023
Next Scheduled EDR Contact: 01/15/2024
Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data
Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 12/31/2019
Date Data Arrived at EDR: 11/30/2023
Date Made Active in Reports: 12/01/2023
Number of Days to Update: 1

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 11/30/2023
Next Scheduled EDR Contact: 02/05/2024
Data Release Frequency: Quarterly

PA MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 06/30/2018
Date Data Arrived at EDR: 07/19/2019
Date Made Active in Reports: 09/10/2019
Number of Days to Update: 53

Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 10/05/2023
Next Scheduled EDR Contact: 01/22/2024
Data Release Frequency: Annually

RI MANIFEST: Manifest information
Hazardous waste manifest information

Date of Government Version: 12/31/2020
Date Data Arrived at EDR: 11/30/2021
Date Made Active in Reports: 02/18/2022
Number of Days to Update: 80

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 11/09/2022
Next Scheduled EDR Contact: 02/26/2024
Data Release Frequency: Annually

WI MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 05/31/2018
Date Data Arrived at EDR: 06/19/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 76

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 11/29/2023
Next Scheduled EDR Contact: 03/18/2024
Data Release Frequency: Annually

Oil/Gas Pipelines
Source: Endeavor Business Media
Petroleum Bundle (Crude Oil, Refined Products, Petrochemicals, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)) N = Natural Gas Bundle (Natural Gas, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)). This map includes information copyrighted by Endeavor Business Media. This information is provided on a best effort basis and Endeavor Business Media does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of Endeavor Business Media.

Electric Power Transmission Line Data
Source: Endeavor Business Media
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Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Certified Child Care Homes
Source: Cabinet for Families & Children
Telephone: 502-564-7130

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005, 2010 and 2015 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Environmental & Public Protection Cabinet
Telephone: 502-564-6736

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

STREET AND ADDRESS INFORMATION

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GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

ROXANA SITE - LETCHER COUNTY, KY
BLUEGRASS RIDGE ROAD/KENTUCKY 160
WHITESBURG, KY 41848

TARGET PROPERTY COORDINATES

Latitude (North):	37.104127 - 37˚ 6’ 14.86’’
Longitude (West):	82.954233 - 82˚ 57’ 15.24’’
Universal Tranverse Mercator:	Zone 17
UTM X (Meters):	326343.9
UTM Y (Meters):	4108007.2
Elevation:	1465 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	50022972 ROXANA, KY
Version Date:	2022
North Map:	50022942 BLACKEY, KY
Version Date:	2022

EDR’s GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principle investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

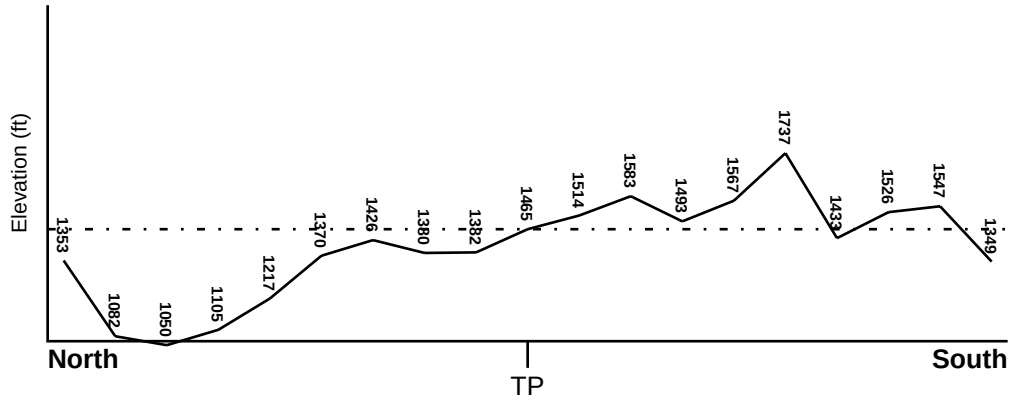
TOPOGRAPHIC INFORMATION

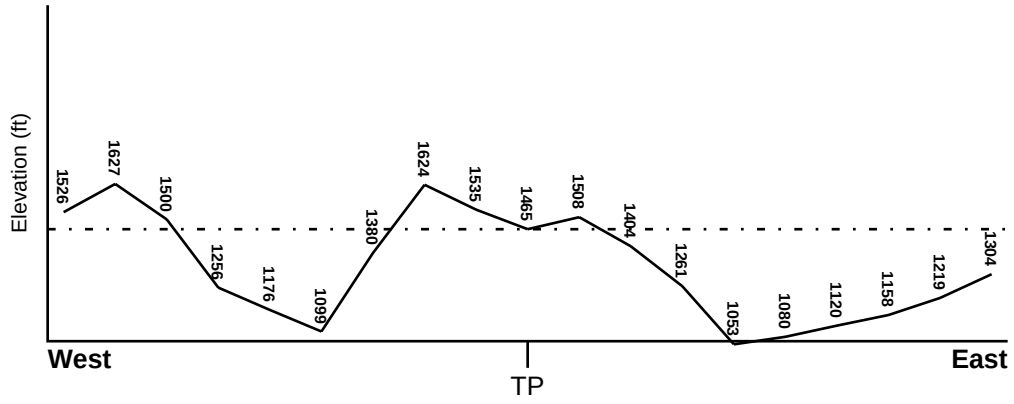
Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

General Topographic Gradient: General NE

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES





Target Property Elevation: 1465 ft.

0 1/2 1 Miles

Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Flood Plain Panel at Target Property	FEMA Source Type
21095C0075E	FEMA FIRM Flood data

Additional Panels in search area:	FEMA Source Type
Not Reported	

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
ROXANA	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

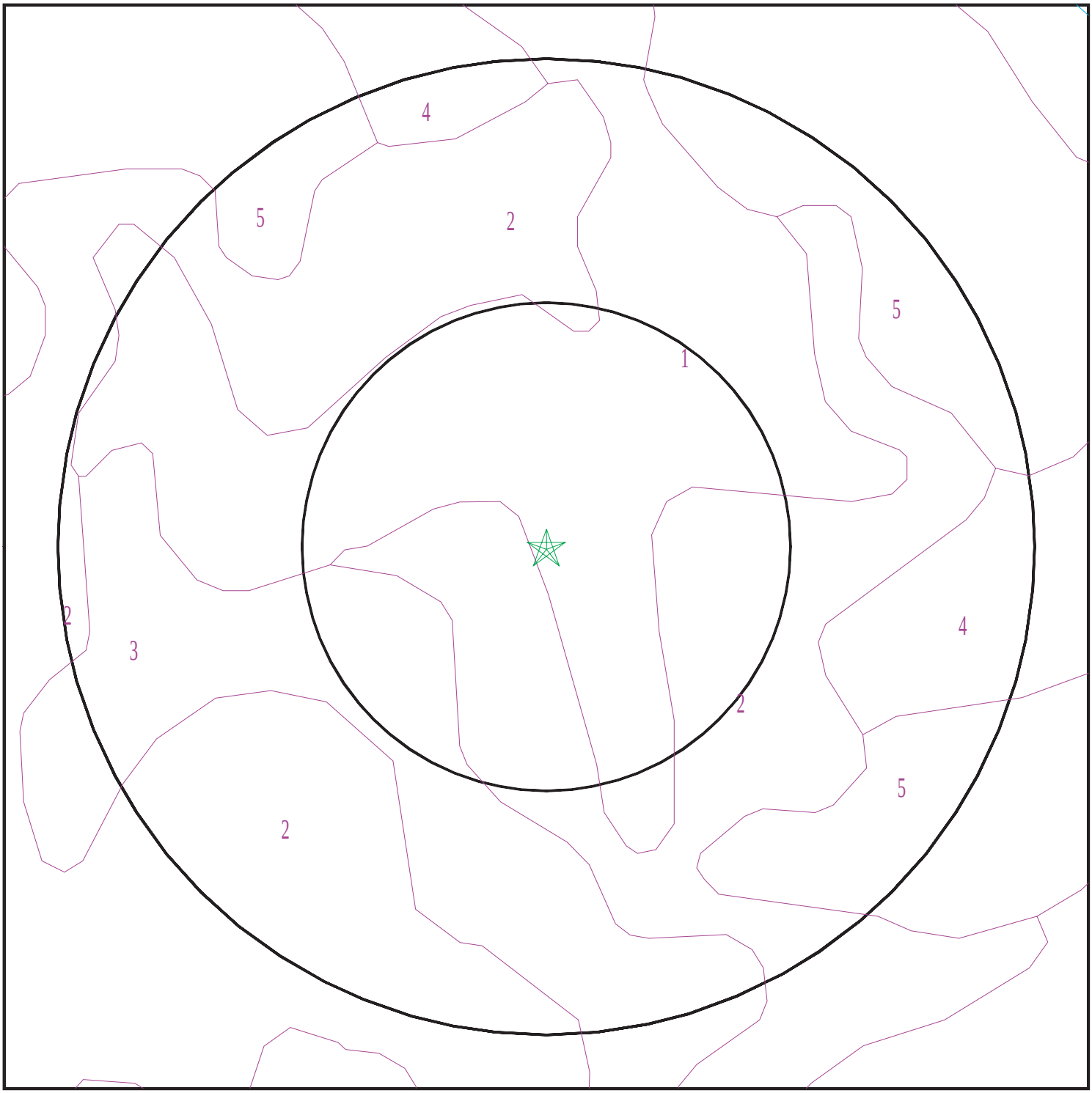
Era:	Paleozoic
System:	Pennsylvanian
Series:	Atokan and Morrowan Series
Code:	PP1 *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Stratifed Sequence

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

SSURGO SOIL MAP - 7521379.2s



Target Property
SSURGO Soil
Water

0 1/16 1/8 1/4 Miles

N

SITE NAME:	Roxana Site - Letcher County, KY	CLIENT:	WSP USA, Inc
ADDRESS:	Bluegrass Ridge Road/Kentucky 160 Whitesburg KY 41848	CONTACT:	Krystle Rayos
		INQUIRY #:	7521379.2s
LAT/LONG:	37.104127 / 82.954233	DATE:	December 14, 2023 9:04 pm

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GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

Soil Map ID: 1

Soil Component Name: Fiveblock

Soil Surface Texture: channery sandy loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	14 inches	channery sandy loam	Granular materials (35 pct. or less passing No. 200), Stone Fragments, Gravel and Sand.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Silty Gravel	Max: 141 Min: 42	Max: 7.8 Min: 5.6
2	14 inches	64 inches	very channery sandy loam	Granular materials (35 pct. or less passing No. 200), Stone Fragments, Gravel and Sand.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Silty Gravel	Max: 141 Min: 42	Max: 7.8 Min: 5.6

Soil Map ID: 2

Soil Component Name: Kaymine

Soil Surface Texture: channery silt loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	14 inches	channery silt loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Clayey Gravel	Max: 42 Min: 4	Max: 7.8 Min: 5.6
2	14 inches	79 inches	very channery silt loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Clayey Gravel	Max: 42 Min: 4	Max: 7.8 Min: 5.6

Soil Map ID: 3

Soil Component Name: Dekalb

Soil Surface Texture: channery sandy loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 64 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	1 inches	channery sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: Min:	Max: Min:
2	1 inches	25 inches	very channery sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: Min:	Max: Min:
3	25 inches	29 inches	unweathered bedrock	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: Min:	Max: Min:

Soil Map ID: 4

Soil Component Name: Shelocta

Soil Surface Texture: silt loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	3 inches	silt loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: Min:	Max: Min:
2	3 inches	27 inches	silt loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: Min:	Max: Min:
3	27 inches	55 inches	very channery silt loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: Min:	Max: Min:
4	55 inches	66 inches	weathered bedrock	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: Min:	Max: Min:

Soil Map ID: 5

Soil Component Name: Kimper

Soil Surface Texture: silt loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	5 inches	silt loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Clayey Gravel	Max: 14 Min: 4	Max: 6 Min: 4.5
2	5 inches	61 inches	silt loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Clayey Gravel	Max: 14 Min: 4	Max: 6 Min: 4.5
3	61 inches	79 inches	very channery loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Clayey Gravel	Max: 14 Min: 4	Max: 6 Min: 4.5

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
B13	USGS40000379988	1/4 - 1/2 Mile NNE

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

MAP ID	WELL ID	LOCATION FROM TP

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No PWS System Found		

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
A1	KY7000000100495	1/4 - 1/2 Mile NNE
A2	KY7000000096350	1/4 - 1/2 Mile NNE
A3	KY7000000100498	1/4 - 1/2 Mile NNE
A4	KY7000000096351	1/4 - 1/2 Mile NNE
A5	KY7000000096349	1/4 - 1/2 Mile NNE
A6	KY7000000100497	1/4 - 1/2 Mile NNE
A7	KY7000000100499	1/4 - 1/2 Mile NNE
A8	KY7000000100500	1/4 - 1/2 Mile NNE
A9	KY7000000100496	1/4 - 1/2 Mile NNE
B10	KY7000000097759	1/4 - 1/2 Mile NE
B11	KY7000000097760	1/4 - 1/2 Mile NE
B12	KY7000000048477	1/4 - 1/2 Mile NNE
14	KY7000000020308	1/4 - 1/2 Mile East
C15	KY7000000009516	1/4 - 1/2 Mile NE
C16	KY7000000007264	1/2 - 1 Mile NE
17	KY7000000040534	1/2 - 1 Mile ENE
18	KY7000000017629	1/2 - 1 Mile North
D19	KY7000000024645	1/2 - 1 Mile NNE
D20	KY7000000003913	1/2 - 1 Mile NNE
21	KY7000000045404	1/2 - 1 Mile ENE
22	KY7000000007610	1/2 - 1 Mile NE
23	KY7000000012389	1/2 - 1 Mile North
24	KY7000000008116	1/2 - 1 Mile ENE
25	KY7000000024632	1/2 - 1 Mile NNW
26	KY7000000023468	1/2 - 1 Mile NW
27	KY7000000046169	1/2 - 1 Mile WNW

OTHER STATE DATABASE INFORMATION

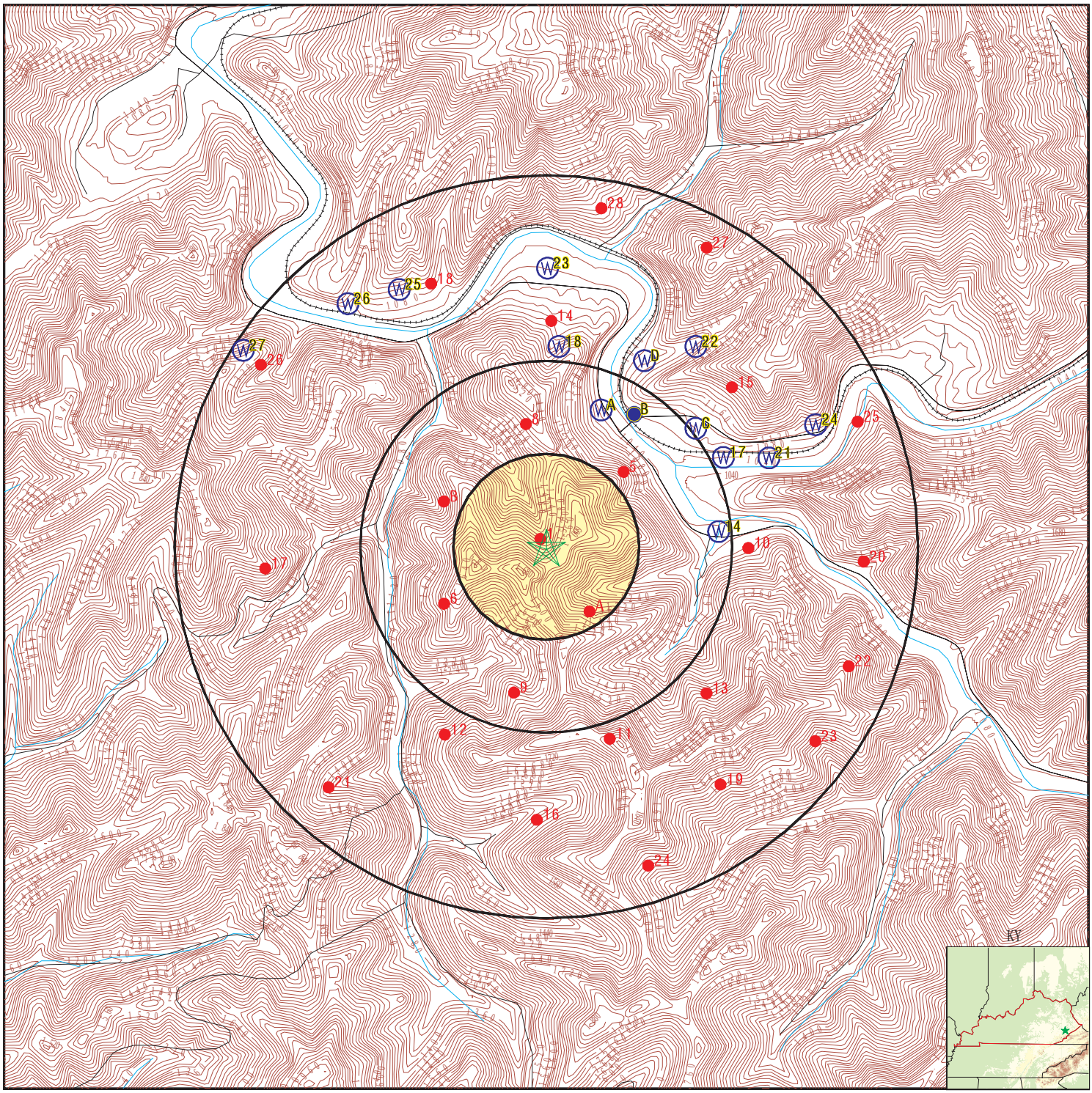
STATE OIL/GAS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
1	KYOG14000118269	0 - 1/8 Mile NW
A2	KYOG14000107286	1/8 - 1/4 Mile SSE
A3	KYOG14000107024	1/8 - 1/4 Mile SE
B4	KYOG14000012096	1/4 - 1/2 Mile WNW
5	KYOG14000107025	1/4 - 1/2 Mile NE
6	KYOG14000111935	1/4 - 1/2 Mile WSW
B7	KYOG14000030096	1/4 - 1/2 Mile WNW
8	KYOG14000111292	1/4 - 1/2 Mile North
9	KYOG14000111475	1/4 - 1/2 Mile SSW
10	KYOG14000108368	1/2 - 1 Mile East
11	KYOG14000112162	1/2 - 1 Mile SSE
12	KYOG14000060583	1/2 - 1 Mile SSW

STATE OIL/GAS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
13	KYOG14000107021	1/2 - 1 Mile SE
14	KYOG14000105044	1/2 - 1 Mile North
15	KYOG14000105366	1/2 - 1 Mile NE
16	KYOG14000117493	1/2 - 1 Mile South
17	KYOG14000030091	1/2 - 1 Mile West
18	KYOG14000107422	1/2 - 1 Mile NNW
19	KYOG14000106700	1/2 - 1 Mile SE
20	KYOG14000111293	1/2 - 1 Mile East
21	KYOG14000022354	1/2 - 1 Mile SW
22	KYOG14000108370	1/2 - 1 Mile ESE
23	KYOG14000106703	1/2 - 1 Mile SE
24	KYOG14000106704	1/2 - 1 Mile SSE
25	KYOG14000108724	1/2 - 1 Mile ENE
26	KYOG14000110080	1/2 - 1 Mile WNW
27	KYOG14000030097	1/2 - 1 Mile NNE
28	KYOG14000114761	1/2 - 1 Mile North

PHYSICAL SETTING SOURCE MAP - 7521379.2s



County Boundary
Major Roads
Contour Lines
Earthquake epicenter, Richter 5 or greater
Water Wells
Public Water Supply Wells
Cluster of Multiple Icons

0 1/4 1/2 1 Miles

Groundwater Flow Direction
Indeterminate Groundwater Flow at Location
Groundwater Flow Varies at Location
Oil, gas or related wells

SITE NAME:	Roxana Site - Letcher County, KY	CLIENT:	WSP USA, Inc
ADDRESS:	Bluegrass Ridge Road/Kentucky 160 Whitesburg KY 41848	CONTACT:	Krystle Rayos
		INQUIRY #:	7521379.2s
LAT/LONG:	37.104127 / 82.954233	DATE:	December 14, 2023 9:04 pm

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GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID Direction Distance Elevation	Database	EDR ID Number
A1 **NNE** **1/4 - 1/2 Mile** **Lower**	**KY WELLS**	**KY7000000100495**

AKGWA ID:	80065295	Well Type:	Monitoring Well
Well Status:	Plugged	Alt ID:	MW-04H-14
PWS ID:	Not Reported	Well Name:	Lee Gentry Property
Surface Elevation:	1059	Usage:	Monitoring Well - Ambient Monitoring
Total Depth:	11.5	Depth to Bedrock:	11.5
End Date:	27-MAR-13		

A2 **NNE** **1/4 - 1/2 Mile** **Lower**	**KY WELLS**	**KY7000000096350**

AKGWA ID:	80058598	Well Type:	Monitoring Well
Well Status:	Plugged	Alt ID:	MW-02
PWS ID:	Not Reported	Well Name:	Lee Gentry Property
Surface Elevation:	1062.099976	Usage:	Monitoring Well - Ambient Monitoring
Total Depth:	12.5	Depth to Bedrock:	12.5
End Date:	02-FEB-10		

A3 **NNE** **1/4 - 1/2 Mile** **Lower**	**KY WELLS**	**KY7000000100498**

AKGWA ID:	80065298	Well Type:	Monitoring Well
Well Status:	Plugged	Alt ID:	MW-07J-15
PWS ID:	Not Reported	Well Name:	Lee Gentry Property
Surface Elevation:	1053	Usage:	Monitoring Well - Ambient Monitoring
Total Depth:	7	Depth to Bedrock:	7
End Date:	27-MAR-13		

A4 **NNE** **1/4 - 1/2 Mile** **Lower**	**KY WELLS**	**KY7000000096351**

AKGWA ID:	80058599	Well Type:	Monitoring Well
Well Status:	Plugged	Alt ID:	MW-03
PWS ID:	Not Reported	Well Name:	Lee Gentry Property
Surface Elevation:	1051.900024	Usage:	Monitoring Well - Ambient Monitoring
Total Depth:	10	Depth to Bedrock:	10
End Date:	02-FEB-10		

Map ID Direction Distance Elevation	Database	EDR ID Number
A5 **NNE** **1/4 - 1/2 Mile** **Lower**	**KY WELLS**	**KY7000000096349**

AKGWA ID:	80058597	Well Type:	Monitoring Well
Well Status:	Plugged	Alt ID:	MW-01
PWS ID:	Not Reported	Well Name:	Lee Gentry Property
Surface Elevation:	1063.900024	Usage:	Monitoring Well - Ambient Monitoring
Total Depth:	12	Depth to Bedrock:	12
End Date:	02-FEB-10		

A6 **NNE** **1/4 - 1/2 Mile** **Lower**	**KY WELLS**	**KY7000000100497**

AKGWA ID:	80065297	Well Type:	Monitoring Well
Well Status:	Plugged	Alt ID:	MW-06G-09
PWS ID:	Not Reported	Well Name:	Lee Gentry Property
Surface Elevation:	1064	Usage:	Monitoring Well - Ambient Monitoring
Total Depth:	13	Depth to Bedrock:	13
End Date:	27-MAR-13		

A7 **NNE** **1/4 - 1/2 Mile** **Lower**	**KY WELLS**	**KY7000000100499**

AKGWA ID:	80065299	Well Type:	Monitoring Well
Well Status:	Plugged	Alt ID:	MW-08L-13
PWS ID:	Not Reported	Well Name:	Lee Gentry Property
Surface Elevation:	1037	Usage:	Monitoring Well - Ambient Monitoring
Total Depth:	7	Depth to Bedrock:	7
End Date:	27-MAR-13		

A8 **NNE** **1/4 - 1/2 Mile** **Lower**	**KY WELLS**	**KY7000000100500**

AKGWA ID:	80065300	Well Type:	Monitoring Well
Well Status:	Plugged	Alt ID:	MW-09K-09
PWS ID:	Not Reported	Well Name:	Lee Gentry Property
Surface Elevation:	1059	Usage:	Monitoring Well - Ambient Monitoring
Total Depth:	7	Depth to Bedrock:	7
End Date:	27-MAR-13		

Map ID Direction Distance Elevation	Database	EDR ID Number
A9 **NNE** **1/4 - 1/2 Mile** **Lower**	**KY WELLS**	**KY7000000100496**

AKGWA ID:	80065296	Well Type:	Monitoring Well
Well Status:	Plugged	Alt ID:	MW-05H-07
PWS ID:	Not Reported	Well Name:	Lee Gentry Property
Surface Elevation:	1059	Usage:	Monitoring Well - Ambient Monitoring
Total Depth:	16.5	Depth to Bedrock:	16.5
End Date:	27-MAR-13		

B10 **NE** **1/4 - 1/2 Mile** **Lower**	**KY WELLS**	**KY7000000097759**

AKGWA ID:	80060268	Well Type:	Monitoring Well
Well Status:	Active	Alt ID:	MW-07
PWS ID:	Not Reported	Well Name:	Roxana BP (Gulf)
Surface Elevation:	1048.599976	Usage:	Remediation
Total Depth:	20	Depth to Bedrock:	0
End Date:	14-SEP-10		

B11 **NE** **1/4 - 1/2 Mile** **Lower**	**KY WELLS**	**KY7000000097760**

AKGWA ID:	80060269	Well Type:	Monitoring Well
Well Status:	Active	Alt ID:	MW-08
PWS ID:	Not Reported	Well Name:	Roxana BP (Gulf)
Surface Elevation:	1053	Usage:	Remediation
Total Depth:	5	Depth to Bedrock:	5
End Date:	14-SEP-10		

B12 **NNE** **1/4 - 1/2 Mile** **Lower**	**KY WELLS**	**KY7000000048477**

AKGWA ID:	40001826	Well Type:	Water Well
Well Status:	Not Reported	Alt ID:	370634082570101
PWS ID:	Not Reported	Well Name:	Not Reported
Surface Elevation:	1050	Usage:	UNKNOWN
Total Depth:	0	Depth to Bedrock:	0
End Date:	Not Reported		

Map ID Direction Distance Elevation	Database	EDR ID Number
B13 **NNE** **1/4 - 1/2 Mile** **Lower**	**FED USGS**	**USGS40000379988**

Organization ID:	USGS-KY	Organization Name:	USGS Kentucky Water Science Center
Monitor Location:	I28C0003	Type:	Well
Description:	Not Reported	HUC:	05100201
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	Not Reported	Formation Type:	Breathitt Formation
Aquifer Type:	Not Reported	Construction Date:	19540901
Well Depth:	43	Well Depth Units:	ft
Well Hole Depth:	Not Reported	Well Hole Depth Units:	Not Reported

---

14 **East** **1/4 - 1/2 Mile** **Lower**	**KY WELLS**	**KY7000000020308**

AKGWA ID:	00033250	Well Type:	Water Well
Well Status:	Active	Alt ID:	Not Reported
PWS ID:	Not Reported	Well Name:	Residence - Randell Meade
Surface Elevation:	1040	Usage:	Industrial - General
Total Depth:	50	Depth to Bedrock:	18
End Date:	02-SEP-93		

C15 **NE** **1/4 - 1/2 Mile** **Lower**	**KY WELLS**	**KY7000000009516**

AKGWA ID:	00012966	Well Type:	Water Well
Well Status:	Active	Alt ID:	Not Reported
PWS ID:	Not Reported	Well Name:	Residence - George Hogg
Surface Elevation:	1050	Usage:	Domestic - Single Household
Total Depth:	100	Depth to Bedrock:	18
End Date:	17-OCT-88		

C16 **NE** **1/2 - 1 Mile** **Lower**	**KY WELLS**	**KY7000000007264**

AKGWA ID:	00009194	Well Type:	Water Well
Well Status:	Active	Alt ID:	Not Reported
PWS ID:	Not Reported	Well Name:	Residence - Raymond A Banks
Surface Elevation:	1080	Usage:	Domestic - Single Household
Total Depth:	150	Depth to Bedrock:	3
End Date:	03-MAR-88		

Map ID Direction Distance Elevation	Database	EDR ID Number
17 **ENE** **1/2 - 1 Mile** **Lower**	**KY WELLS**	**KY7000000040534**

AKGWA ID:	00067720	Well Type:	Water Well
Well Status:	Active	Alt ID:	Not Reported
PWS ID:	Not Reported	Well Name:	Jason Kincer Property
Surface Elevation:	1035.900024	Usage:	Domestic - Multiple Domestic Households
Total Depth:	1035.900024	Depth to Bedrock:	82
End Date:	02-NOV-11		

---

18 **North** **1/2 - 1 Mile** **Lower**	**KY WELLS**	**KY7000000017629**

AKGWA ID:	00028726	Well Type:	Water Well
Well Status:	Active	Alt ID:	Not Reported
PWS ID:	Not Reported	Well Name:	Residence - Mitch Whitaker
Surface Elevation:	1200	Usage:	Domestic - Single Household
Total Depth:	140	Depth to Bedrock:	8
End Date:	06-APR-92		

D19 **NNE** **1/2 - 1 Mile** **Lower**	**KY WELLS**	**KY7000000024645**

AKGWA ID:	00043670	Well Type:	Water Well
Well Status:	Active	Alt ID:	Not Reported
PWS ID:	Not Reported	Well Name:	Residence - Randy Maggard
Surface Elevation:	1080	Usage:	Domestic - Single Household
Total Depth:	0	Depth to Bedrock:	0
End Date:	28-SEP-95		

D20 **NNE** **1/2 - 1 Mile** **Lower**	**KY WELLS**	**KY7000000003913**

AKGWA ID:	00003867	Well Type:	Water Well
Well Status:	Active	Alt ID:	Not Reported
PWS ID:	Not Reported	Well Name:	Residence - Paul Shepherd
Surface Elevation:	1060	Usage:	Domestic - Single Household
Total Depth:	61	Depth to Bedrock:	8
End Date:	01-JUN-87		

Map ID Direction Distance Elevation	Database	EDR ID Number
21 **ENE** **1/2 - 1 Mile** **Lower**	**KY WELLS**	**KY7000000045404**

AKGWA ID:	30006637	Well Type:	Water Well
Well Status:	Not Reported	Alt ID:	Not Reported
PWS ID:	Not Reported	Well Name:	Not Reported
Surface Elevation:	0	Usage:	Domestic - Single Household
Total Depth:	18	Depth to Bedrock:	0
End Date:	Not Reported		

---

22 **NE** **1/2 - 1 Mile** **Lower**	**KY WELLS**	**KY7000000007610**

AKGWA ID:	00009934	Well Type:	Water Well
Well Status:	Active	Alt ID:	Not Reported
PWS ID:	Not Reported	Well Name:	Residence - Paul Shepherd
Surface Elevation:	1080	Usage:	Domestic - Single Household
Total Depth:	61	Depth to Bedrock:	8
End Date:	17-DEC-87		

---

23 **North** **1/2 - 1 Mile** **Lower**	**KY WELLS**	**KY7000000012389**

AKGWA ID:	00017812	Well Type:	Water Well
Well Status:	Active	Alt ID:	Not Reported
PWS ID:	Not Reported	Well Name:	Tolson Creek Baptist Church
Surface Elevation:	1050	Usage:	Public - Non-transient, Non-community
Total Depth:	70	Depth to Bedrock:	5
End Date:	29-JUN-90		

---

24 **ENE** **1/2 - 1 Mile** **Lower**	**KY WELLS**	**KY7000000008116**

AKGWA ID:	00010733	Well Type:	Water Well
Well Status:	Active	Alt ID:	Not Reported
PWS ID:	Not Reported	Well Name:	Residence - Oliver Little
Surface Elevation:	1050	Usage:	Domestic - Single Household
Total Depth:	100	Depth to Bedrock:	20
End Date:	27-APR-88		

Map ID Direction Distance Elevation	Database	EDR ID Number
25 **NNW** **1/2 - 1 Mile** **Lower**	**KY WELLS**	**KY7000000024632**

AKGWA ID:	00043658	Well Type:	Water Well
Well Status:	Active	Alt ID:	Not Reported
PWS ID:	Not Reported	Well Name:	Residence - Joe Baker
Surface Elevation:	1150	Usage:	Domestic - Single Household
Total Depth:	80	Depth to Bedrock:	7
End Date:	11-OCT-95		

---

26 **NW** **1/2 - 1 Mile** **Lower**	**KY WELLS**	**KY7000000023468**

AKGWA ID:	00041301	Well Type:	Water Well
Well Status:	Active	Alt ID:	Not Reported
PWS ID:	Not Reported	Well Name:	Fox Processing
Surface Elevation:	1040	Usage:	Domestic - Single Household
Total Depth:	130	Depth to Bedrock:	1
End Date:	18-JUL-95		

---

27 **WNW** **1/2 - 1 Mile** **Lower**	**KY WELLS**	**KY7000000046169**

AKGWA ID:	30008394	Well Type:	Water Well
Well Status:	Not Reported	Alt ID:	Not Reported
PWS ID:	Not Reported	Well Name:	Not Reported
Surface Elevation:	0	Usage:	Domestic - Single Household
Total Depth:	100	Depth to Bedrock:	0
End Date:	Not Reported		

Map ID Direction Distance	Database	EDR ID Number

1
NW
0 - 1/8 Mile

OIL_GAS **KYOG14000118269**

OIL_GAS:

API #:	16133015500000	KGS #:	137064
Well Elevation:	1532		
Original Farm/Lease Name:	EQUITABLE PRODUCTION COMPANY ET AL		
Original Operator:	CLEAN GAS, INC	Original Well #:	301
Permit #:	104837	Formation:	341OHIO
Deepest Formation:	341OHIO	Init Open or Potential Flow:	Not Reported
description in result_desc field:	GAS	Original API Classification:	Development Well
How Completed:	Gas producer		
Bore Type:	Conventional vertical well bore		
Completion Date:	24-MAR-09	Plug Date:	Not Reported
Documentation on Plug:	Not Reported	Core Call #:	Not Reported
Cutting Call #:	Not Reported	Log on File:	ELOG
URL:	https://kgs.uky.edu/kygeode/services/oilgas/wellReport.asp?id=137064		

A2
SSE
1/8 - 1/4 Mile

OIL_GAS **KYOG14000107286**

OIL_GAS:

API #:	16133007740000	KGS #:	125686
Well Elevation:	1531	Original Farm/Lease Name:	MEADE, RONDAL & SHARON
Original Operator:	CLEAN GAS, INC	Original Well #:	SB-32
Permit #:	94550	Formation:	341OHIO
Deepest Formation:	341OHIO	Init Open or Potential Flow:	Not Reported
description in result_desc field:	GAS	Original API Classification:	Development Well
How Completed:	Gas producer		
Bore Type:	Conventional vertical well bore		
Completion Date:	29-APR-04	Plug Date:	Not Reported
Documentation on Plug:	Not Reported	Core Call #:	Not Reported
Cutting Call #:	Not Reported	Log on File:	ELOG
URL:	https://kgs.uky.edu/kygeode/services/oilgas/wellReport.asp?id=125686		

A3
SE
1/8 - 1/4 Mile

OIL_GAS **KYOG14000107024**

OIL_GAS:

API #:	16133007520000	KGS #:	125086
Well Elevation:	1530	Original Farm/Lease Name:	MEADE, RONDAL & SHARON
Original Operator:	CLEAN GAS, INC	Original Well #:	SB-32
Permit #:	94305	Formation:	000
Deepest Formation:	000	Init Open or Potential Flow:	Not Reported
description in result_desc field:	TRM	Original API Classification:	Unclassified
How Completed:	Terminated (permit expired or cancelled)		
Bore Type:	Conventional vertical well bore		
Completion Date:	Not Reported	Plug Date:	Not Reported
Documentation on Plug:	Not Reported	Core Call #:	Not Reported
Cutting Call #:	Not Reported	Log on File:	Not Reported

URL: https://kgs.uky.edu/kygeode/services/oilgas/wellReport.asp?id=125086

B4
WNW **OIL_GAS** **KYOG14000012096**
1/4 - 1/2 Mile

OIL_GAS:

API #:	16133008230000	KGS #:	12407
Well Elevation:	1315	Original Farm/Lease Name:	HOGG, GEORGE
Original Operator:	KENTUCKY WEST VIRGINIA GAS CO		
Original Well #:	7178	Permit #:	26332
Formation:	000	Deepest Formation:	000
Init Open or Potential Flow:	Not Reported	description in result_desc field:	TRM
Original API Classification:	Unclassified		
How Completed:	Terminated (permit expired or cancelled)		
Bore Type:	Conventional vertical well bore		
Completion Date:	Not Reported	Plug Date:	Not Reported
Documentation on Plug:	Not Reported	Core Call #:	Not Reported
Cutting Call #:	Not Reported	Log on File:	Not Reported
URL:	https://kgs.uky.edu/kygeode/services/oilgas/wellReport.asp?id=12407		

5
NE **OIL_GAS** **KYOG14000107025**
1/4 - 1/2 Mile

OIL_GAS:

API #:	16133007530000	KGS #:	125087
Well Elevation:	1319	Original Farm/Lease Name:	MEADE, RONDAL & SHARON
Original Operator:	CLEAN GAS, INC	Original Well #:	SB-31
Permit #:	94306	Formation:	341OHIO
Deepest Formation:	341OHIO	Init Open or Potential Flow:	Not Reported
description in result_desc field:	GAS	Original API Classification:	Development Well
How Completed:	Gas producer		
Bore Type:	Conventional vertical well bore		
Completion Date:	27-MAY-04	Plug Date:	Not Reported
Documentation on Plug:	Not Reported	Core Call #:	Not Reported
Cutting Call #:	Not Reported	Log on File:	ELOG
URL:	https://kgs.uky.edu/kygeode/services/oilgas/wellReport.asp?id=125087		

6
WSW **OIL_GAS** **KYOG14000111935**
1/4 - 1/2 Mile

OIL_GAS:

API #:	16133011360000	KGS #:	130597
Well Elevation:	1510		
Original Farm/Lease Name:	EQUITABLE PRODUCTION COMPANY		
Original Operator:	CLEAN GAS, INC	Original Well #:	154
Permit #:	99070	Formation:	341OHIO
Deepest Formation:	341OHIO	Init Open or Potential Flow:	Not Reported
description in result_desc field:	GAS	Original API Classification:	Development Well
How Completed:	Gas producer		
Bore Type:	Conventional vertical well bore		

Completion Date:	01-JUN-06	Plug Date:	Not Reported
Documentation on Plug:	Not Reported	Core Call #:	Not Reported
Cutting Call #:	Not Reported	Log on File:	ELOG
URL:	https://kgs.uky.edu/kygeode/services/oilgas/wellReport.asp?id=130597		

B7
WNW **OIL_GAS** **KYOG14000030096**
1/4 - 1/2 Mile

OIL_GAS:

API #:	16133001110000	KGS #:	31561
Well Elevation:	1332	Original Farm/Lease Name:	HOGG, GEORGE
Original Operator:	KENTUCKY WEST VIRGINIA GAS CO		
Original Well #:	7192	Permit #:	26638
Formation:	341OHIO	Deepest Formation:	341OHIO
Init Open or Potential Flow:	133 MCFGPD	description in result_desc field:	GAS
Original API Classification:	Development Well		
How Completed:	Gas producer		
Bore Type:	Conventional vertical well bore		
Completion Date:	22-JUN-73	Plug Date:	Not Reported
Documentation on Plug:	Not Reported	Core Call #:	Not Reported
Cutting Call #:	Not Reported	Log on File:	Not Reported
URL:	https://kgs.uky.edu/kygeode/services/oilgas/wellReport.asp?id=31561		

8
North **OIL_GAS** **KYOG14000111292**
1/4 - 1/2 Mile

OIL_GAS:

API #:	16133011110000	KGS #:	129852
Well Elevation:	1436	Original Farm/Lease Name:	ISON, RICHARD ESTATE
Original Operator:	CLEAN GAS, INC	Original Well #:	150
Permit #:	98511	Formation:	341OHIO
Deepest Formation:	341OHIO	Init Open or Potential Flow:	Not Reported
description in result_desc field:	GAS	Original API Classification:	Development Well
How Completed:	Gas producer		
Bore Type:	Conventional vertical well bore		
Completion Date:	03-FEB-06	Plug Date:	Not Reported
Documentation on Plug:	Not Reported	Core Call #:	Not Reported
Cutting Call #:	Not Reported	Log on File:	ELOG
URL:	https://kgs.uky.edu/kygeode/services/oilgas/wellReport.asp?id=129852		

9
SSW **OIL_GAS** **KYOG14000111475**
1/4 - 1/2 Mile

OIL_GAS:

API #:	16133011150000	KGS #:	130035
Well Elevation:	1497	Original Farm/Lease Name:	STAHL, THOMAS
Original Operator:	CLEAN GAS, INC	Original Well #:	153
Permit #:	98693	Formation:	341OHIO
Deepest Formation:	341OHIO	Init Open or Potential Flow:	Not Reported
description in result_desc field:	GAS	Original API Classification:	Development Well

How Completed:	Gas producer		
Bore Type:	Conventional vertical well bore		
Completion Date:	23-FEB-06	Plug Date:	Not Reported
Documentation on Plug:	Not Reported	Core Call #:	Not Reported
Cutting Call #:	2399	Log on File:	ELOG
URL:	https://kgs.uky.edu/kygeode/services/oilgas/wellReport.asp?id=130035		

10
East
1/2 - 1 Mile

OIL_GAS **KYOG14000108368**

OIL_GAS:

API #:	16133009490000	KGS #:	126926
Well Elevation:	1101	Original Farm/Lease Name:	HOGG, IRA JR (HEIRS)
Original Operator:	CLEAN GAS, INC	Original Well #:	SB-54
Permit #:	95610	Formation:	341OHIO
Deepest Formation:	341BBSI	Init Open or Potential Flow:	237 MCFGPD
description in result_desc field:	GAS	Original API Classification:	Development Well
How Completed:	Gas producer		
Bore Type:	Conventional vertical well bore		
Completion Date:	04-JUN-04	Plug Date:	Not Reported
Documentation on Plug:	Not Reported	Core Call #:	Not Reported
Cutting Call #:	Not Reported	Log on File:	ELOG
URL:	https://kgs.uky.edu/kygeode/services/oilgas/wellReport.asp?id=126926		

11
SSE
1/2 - 1 Mile

OIL_GAS **KYOG14000112162**

OIL_GAS:

API #:	16133011500000	KGS #:	130824
Well Elevation:	1846	Original Farm/Lease Name:	GENTRY, LEE
Original Operator:	CLEAN GAS, INC	Original Well #:	155
Permit #:	99287	Formation:	341OHIO
Deepest Formation:	341OHIO	Init Open or Potential Flow:	Not Reported
description in result_desc field:	GAS	Original API Classification:	Development Well
How Completed:	Gas producer		
Bore Type:	Conventional vertical well bore		
Completion Date:	08-JUN-06	Plug Date:	Not Reported
Documentation on Plug:	Not Reported	Core Call #:	Not Reported
Cutting Call #:	Not Reported	Log on File:	ELOG
URL:	https://kgs.uky.edu/kygeode/services/oilgas/wellReport.asp?id=130824		

12
SSW
1/2 - 1 Mile

OIL_GAS **KYOG14000060583**

OIL_GAS:

API #:	16133002140000	KGS #:	63892
Well Elevation:	1489	Original Farm/Lease Name:	GENTRY, DOUGLAS
Original Operator:	MAXON EXP & DEV CO		
Original Well #:	1	Permit #:	70676
Formation:	341OHIO	Deepest Formation:	341BBSI

Init Open or Potential Flow:	328 MCFGPD	description in result_desc field:	GAS
Original API Classification:	Development Well		
How Completed:	Gas producer		
Bore Type:	Conventional vertical well bore		
Completion Date:	06-FEB-86	Plug Date:	Not Reported
Documentation on Plug:	Not Reported	Core Call #:	Not Reported
Cutting Call #:	Not Reported	Log on File:	ELOG
URL:	https://kgs.uky.edu/kygeode/services/oilgas/wellReport.asp?id=63892		

13
SE
1/2 - 1 Mile

OIL_GAS **KYOG14000107021**

OIL_GAS:

API #:	16133009300000	KGS #:	125083
Well Elevation:	1540	Original Farm/Lease Name:	MEADE, RONDAL & SHARON
Original Operator:	CLEAN GAS, INC	Original Well #:	SB-33
Permit #:	94272	Formation:	341OLNG
Deepest Formation:	341OHIO	Init Open or Potential Flow:	0 MCFGPD
description in result_desc field:	GAS	Original API Classification:	Development Well
How Completed:	Gas producer		
Bore Type:	Conventional vertical well bore		
Completion Date:	06-MAY-04	Plug Date:	Not Reported
Documentation on Plug:	Not Reported	Core Call #:	Not Reported
Cutting Call #:	Not Reported	Log on File:	ELOG
URL:	https://kgs.uky.edu/kygeode/services/oilgas/wellReport.asp?id=125083		

14
North
1/2 - 1 Mile

OIL_GAS **KYOG14000105044**

OIL_GAS:

API #:	16133006170000	KGS #:	123040
Well Elevation:	1158	Original Farm/Lease Name:	KRCC/EPC
Original Operator:	CLEAN GAS, INC	Original Well #:	SB-18
Permit #:	92487	Formation:	341OHIO
Deepest Formation:	341OHIO	Init Open or Potential Flow:	Not Reported
description in result_desc field:	GAS	Original API Classification:	Development Well
How Completed:	Gas producer		
Bore Type:	Conventional vertical well bore		
Completion Date:	03-JUL-01	Plug Date:	Not Reported
Documentation on Plug:	Not Reported	Core Call #:	Not Reported
Cutting Call #:	Not Reported	Log on File:	ELOG
URL:	https://kgs.uky.edu/kygeode/services/oilgas/wellReport.asp?id=123040		

15
NE
1/2 - 1 Mile

OIL_GAS **KYOG14000105366**

OIL_GAS:

API #:	16133006270000	KGS #:	123361
Well Elevation:	1268	Original Farm/Lease Name:	HOGG, RUTH
Original Operator:	CLEAN GAS, INC	Original Well #:	SB-17

Permit #:	92586	Formation:	341OHIO
Deepest Formation:	341OHIO	Init Open or Potential Flow:	Not Reported
description in result_desc field:	GAS	Original API Classification:	Development Well
How Completed:	Gas producer		
Bore Type:	Conventional vertical well bore		
Completion Date:	12-OCT-01	Plug Date:	Not Reported
Documentation on Plug:	Not Reported	Core Call #:	Not Reported
Cutting Call #:	1798	Log on File:	ELOG
URL:	https://kgs.uky.edu/kygeode/services/oilgas/wellReport.asp?id=123361		

16
South **OIL_GAS** **KYOG14000117493**
1/2 - 1 Mile

OIL_GAS:

API #:	16133014860000	KGS #:	136277
Well Elevation:	1383		
Original Farm/Lease Name:	EQUITABLE PRODUCTION COMPANY, LLC		
Original Operator:	CLEAN GAS, INC	Original Well #:	300
Permit #:	104085	Formation:	341OHIO
Deepest Formation:	341OHIO	Init Open or Potential Flow:	Not Reported
description in result_desc field:	GAS	Original API Classification:	Development Well
How Completed:	Gas producer		
Bore Type:	Conventional vertical well bore		
Completion Date:	11-SEP-08	Plug Date:	Not Reported
Documentation on Plug:	Not Reported	Core Call #:	Not Reported
Cutting Call #:	Not Reported	Log on File:	ELOG
URL:	https://kgs.uky.edu/kygeode/services/oilgas/wellReport.asp?id=136277		

17
West **OIL_GAS** **KYOG14000030091**
1/2 - 1 Mile

OIL_GAS:

API #:	16133001090000	KGS #:	31556
Well Elevation:	1463	Original Farm/Lease Name:	ISON, ISAAC
Original Operator:	KENTUCKY WEST VIRGINIA GAS CO		
Original Well #:	7167	Permit #:	25952
Formation:	355LCKP	Deepest Formation:	341OHIO
Init Open or Potential Flow:	146 MCFGPD	description in result_desc field:	GAS
Original API Classification:	Development Well		
How Completed:	Gas producer		
Bore Type:	Conventional vertical well bore		
Completion Date:	20-OCT-72	Plug Date:	Not Reported
Documentation on Plug:	Not Reported	Core Call #:	Not Reported
Cutting Call #:	Not Reported	Log on File:	ELOG
URL:	https://kgs.uky.edu/kygeode/services/oilgas/wellReport.asp?id=31556		

18
NNW **OIL_GAS** **KYOG14000107422**
1/2 - 1 Mile

OIL_GAS:

API #:	16133007800000	KGS #:	125822
Well Elevation:	1090	Original Farm/Lease Name:	HAMPTON, JAMES
Original Operator:	CLEAN GAS, INC	Original Well #:	SB-38
Permit #:	94598	Formation:	341OHIO
Deepest Formation:	341OHIO	Init Open or Potential Flow:	350 MCFGPD
description in result_desc field:	GAS	Original API Classification:	Development Well
How Completed:	Gas producer		
Bore Type:	Conventional vertical well bore		
Completion Date:	19-MAY-03	Plug Date:	Not Reported
Documentation on Plug:	Not Reported	Core Call #:	Not Reported
Cutting Call #:	2013	Log on File:	ELOG
URL:	https://kgs.uky.edu/kygeode/services/oilgas/wellReport.asp?id=125822		

19
SE
1/2 - 1 Mile **OIL_GAS** **KYOG14000106700**

OIL_GAS:

API #:	16133007270000	KGS #:	124695
Well Elevation:	1552	Original Farm/Lease Name:	THE LEWIS COMPANY
Original Operator:	KINZER, J W	Original Well #:	1220
Permit #:	93982	Formation:	341OHIO
Deepest Formation:	341OHIO	Init Open or Potential Flow:	Not Reported
description in result_desc field:	GAS	Original API Classification:	Development Well
How Completed:	Gas producer		
Bore Type:	Conventional vertical well bore		
Completion Date:	21-MAY-04	Plug Date:	Not Reported
Documentation on Plug:	Not Reported	Core Call #:	Not Reported
Cutting Call #:	Not Reported	Log on File:	ELOG
URL:	https://kgs.uky.edu/kygeode/services/oilgas/wellReport.asp?id=124695		

20
East
1/2 - 1 Mile **OIL_GAS** **KYOG14000111293**

OIL_GAS:

API #:	16133011120000	KGS #:	129853
Well Elevation:	1110	Original Farm/Lease Name:	HOGG, IRA JR HEIRS
Original Operator:	CLEAN GAS, INC	Original Well #:	151
Permit #:	98512	Formation:	341OHIO
Deepest Formation:	341OHIO	Init Open or Potential Flow:	Not Reported
description in result_desc field:	GAS	Original API Classification:	Development Well
How Completed:	Gas producer		
Bore Type:	Conventional vertical well bore		
Completion Date:	12-JAN-06	Plug Date:	Not Reported
Documentation on Plug:	Not Reported	Core Call #:	Not Reported
Cutting Call #:	Not Reported	Log on File:	ELOG
URL:	https://kgs.uky.edu/kygeode/services/oilgas/wellReport.asp?id=129853		

Map ID Direction Distance	Database	EDR ID Number

21
SW
1/2 - 1 Mile

OIL_GAS **KYOG14000022354**

OIL_GAS:

API #:	16133001740000	KGS #:	23460
Well Elevation:	1351	Original Farm/Lease Name:	WRIGHT, JESSIE
Original Operator:	KEPCO, INC	Original Well #:	KL498
Permit #:	53671	Formation:	344CORN
Deepest Formation:	341OHIO	Init Open or Potential Flow:	239 MCFGPD
description in result_desc field:	GAS	Original API Classification:	Development Well
How Completed:	Gas producer		
Bore Type:	Conventional vertical well bore		
Completion Date:	06-APR-83	Plug Date:	Not Reported
Documentation on Plug:	Not Reported	Core Call #:	Not Reported
Cutting Call #:	14614	Log on File:	ELOG
URL:	https://kgs.uky.edu/kygeode/services/oilgas/wellReport.asp?id=23460		

22
ESE
1/2 - 1 Mile

OIL_GAS **KYOG14000108370**

OIL_GAS:

API #:	16133009480000	KGS #:	126928
Well Elevation:	1549	Original Farm/Lease Name:	HOGG, IRA JR (HEIRS)
Original Operator:	CLEAN GAS, INC	Original Well #:	SB-52
Permit #:	95572	Formation:	341OHIO
Deepest Formation:	341OHIO	Init Open or Potential Flow:	Not Reported
description in result_desc field:	GAS	Original API Classification:	Development Well
How Completed:	Gas producer		
Bore Type:	Conventional vertical well bore		
Completion Date:	13-MAY-04	Plug Date:	Not Reported
Documentation on Plug:	Not Reported	Core Call #:	Not Reported
Cutting Call #:	Not Reported	Log on File:	ELOG
URL:	https://kgs.uky.edu/kygeode/services/oilgas/wellReport.asp?id=126928		

23
SE
1/2 - 1 Mile

OIL_GAS **KYOG14000106703**

OIL_GAS:

API #:	16133007300000	KGS #:	124698
Well Elevation:	1474	Original Farm/Lease Name:	THE LEWIS COMPANY
Original Operator:	KINZER, J W	Original Well #:	1219
Permit #:	93981	Formation:	341OHIO
Deepest Formation:	341OHIO	Init Open or Potential Flow:	420 MCFGPD
description in result_desc field:	GAS	Original API Classification:	Development Well
How Completed:	Gas producer		
Bore Type:	Conventional vertical well bore		
Completion Date:	25-MAY-04	Plug Date:	Not Reported
Documentation on Plug:	Not Reported	Core Call #:	Not Reported
Cutting Call #:	Not Reported	Log on File:	ELOG
URL:	https://kgs.uky.edu/kygeode/services/oilgas/wellReport.asp?id=124698		

Map ID Direction Distance	Database	EDR ID Number

24
SSE
1/2 - 1 Mile

OIL_GAS **KYOG14000106704**

OIL_GAS:

API #:	16133007310000	KGS #:	124699
Well Elevation:	1552	Original Farm/Lease Name:	THE LEWIS COMPANY
Original Operator:	KINZER, J W	Original Well #:	1221
Permit #:	93983	Formation:	341OHIO
Deepest Formation:	341OHIO	Init Open or Potential Flow:	Not Reported
description in result_desc field:	GAS	Original API Classification:	Development Well
How Completed:	Gas producer		
Bore Type:	Conventional vertical well bore		
Completion Date:	19-MAY-04	Plug Date:	Not Reported
Documentation on Plug:	Not Reported	Core Call #:	Not Reported
Cutting Call #:	Not Reported	Log on File:	ELOG
URL:	https://kgs.uky.edu/kygeode/services/oilgas/wellReport.asp?id=124699		

25
ENE
1/2 - 1 Mile

OIL_GAS **KYOG14000108724**

OIL_GAS:

API #:	16133009710000	KGS #:	127282
Well Elevation:	1049		
Original Farm/Lease Name:	KENTUCKY RIVER PROPERTIES LLC		
Original Operator:	CLEAN GAS, INC	Original Well #:	SB-57
Permit #:	95957	Formation:	341OHIO
Deepest Formation:	341OHIO	Init Open or Potential Flow:	Not Reported
description in result_desc field:	GAS	Original API Classification:	Development Well
How Completed:	Gas producer		
Bore Type:	Conventional vertical well bore		
Completion Date:	22-DEC-05	Plug Date:	Not Reported
Documentation on Plug:	Not Reported	Core Call #:	Not Reported
Cutting Call #:	Not Reported	Log on File:	ELOG
URL:	https://kgs.uky.edu/kygeode/services/oilgas/wellReport.asp?id=127282		

26
WNW
1/2 - 1 Mile

OIL_GAS **KYOG14000110080**

OIL_GAS:

API #:	16133010440000	KGS #:	128638
Well Elevation:	1216	Original Farm/Lease Name:	BEGLEY PROPERTIES, LLC
Original Operator:	CLEAN GAS, INC	Original Well #:	114
Permit #:	97294	Formation:	341OHIO
Deepest Formation:	341OHIO	Init Open or Potential Flow:	Not Reported
description in result_desc field:	GAS	Original API Classification:	Development Well
How Completed:	Gas producer		
Bore Type:	Conventional vertical well bore		
Completion Date:	07-JUL-05	Plug Date:	Not Reported
Documentation on Plug:	Not Reported	Core Call #:	Not Reported
Cutting Call #:	Not Reported	Log on File:	ELOG

URL: https://kgs.uky.edu/kygeode/services/oilgas/wellReport.asp?id=128638

27
NNE **OIL_GAS** **KYOG14000030097**
1/2 - 1 Mile

OIL_GAS:

API #:	16133000770000	KGS #:	31562
Well Elevation:	1469	Original Farm/Lease Name:	LEWIS, JOHN J
Original Operator:	KENTUCKY WEST VIRGINIA GAS CO		
Original Well #:	7101	Permit #:	23786
Formation:	341OHIO	Deepest Formation:	341OHIO
Init Open or Potential Flow:	61 MCFGPD	description in result_desc field:	GAS
Original API Classification:	Development Well		
How Completed:	Gas producer		
Bore Type:	Conventional vertical well bore		
Completion Date:	17-DEC-70	Plug Date:	Not Reported
Documentation on Plug:	Not Reported	Core Call #:	Not Reported
Cutting Call #:	11883	Log on File:	Not Reported
URL:	https://kgs.uky.edu/kygeode/services/oilgas/wellReport.asp?id=31562		

28
North **OIL_GAS** **KYOG14000114761**
1/2 - 1 Mile

OIL_GAS:

API #:	16133013190000	KGS #:	133432
Well Elevation:	1198		
Original Farm/Lease Name:	EQUITABLE PRODUCTION COMPANY		
Original Operator:	CLEAN GAS, INC	Original Well #:	144
Permit #:	101494	Formation:	341OHIO
Deepest Formation:	341OHIO	Init Open or Potential Flow:	Not Reported
description in result_desc field:	GAS	Original API Classification:	Development Well
How Completed:	Gas producer		
Bore Type:	Conventional vertical well bore		
Completion Date:	21-JUN-07	Plug Date:	Not Reported
Documentation on Plug:	Not Reported	Core Call #:	Not Reported
Cutting Call #:	Not Reported	Log on File:	ELOG
URL:	https://kgs.uky.edu/kygeode/services/oilgas/wellReport.asp?id=133432		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

Federal EPA Radon Zone for LETCHER County: 2

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for LETCHER COUNTY, KY

Number of sites tested: 2

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	0.900 pCi/L	100%	0%	0%
Living Area - 2nd Floor	Not Reported	Not Reported	Not Reported	Not Reported
Basement	2.400 pCi/L	100%	0%	0%

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

HYDROLOGIC INFORMATION

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005, 2010 and 2015 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Environmental & Public Protection Cabinet
Telephone: 502-564-6736

HYDROGEOLOGIC INFORMATION

AQUIFLOW[R] Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Service, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

STATE RECORDS

Kentucky Water Well Records Database
Source: Kentucky Geological Survey
Telephone: 859-257-5500
Water Wells in Kentucky. Data from the Kentucky Ground Water Data Repository.

OTHER STATE DATABASE INFORMATION

Oil and Gas Well Locations
Source: Kentucky Geological Survey
Telephone: 859-257-5500
Oil and gas well locations in the state of Kentucky

RADON

State Database: KY Radon
Source: Department of Public Health
Telephone: 502-564-4856
Radon Test Results

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary faultlines, prepared in 1975 by the United State Geological Survey

PHYSICAL SETTING SOURCE RECORDS SEARCHED

STREET AND ADDRESS INFORMATION

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APPENDIX

E HISTORICAL RECORDS

Roxana Site - Letcher County, KY

Bluegrass Ridge Road/Kentucky 160

Whitesburg, KY 41848

Inquiry Number: 7521379.4

December 14, 2023

EDR Historical Topo Map Report

with QuadMatch™

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Historical Topo Map Report

12/14/23

Site Name:	Client Name:
Roxana Site - Letcher County,	WSP USA, Inc
Bluegrass Ridge Road/Kentuck	412 Mt. Kemble Ave
Whitesburg, KY 41848	Morristown, NJ 07962
EDR Inquiry # 7521379.4	Contact: Krystle Rayos

EDR Topographic Map Library has been searched by EDR and maps covering the target property location as provided by WSP USA, Inc were identified for the years listed below. EDR's Historical Topo Map Report is designed to assist professionals in evaluating potential liability on a target property resulting from past activities. EDRs Historical Topo Map Report includes a search of a collection of public and private color historical topographic maps, dating back to the late 1800s.

Search Results:		*Coordinates:*	
P.O.#	31800209.001	**Latitude:**	37.104127 37° 6' 15" North
Project:	Proposed FCI/FPC Letcher C,	**Longitude:**	-82.954233 -82° 57' 15" West
		UTM Zone:	Zone 17 North
		UTM X Meters:	326348.18
		UTM Y Meters:	4108210.55
		Elevation:	1458.16' above sea level

Maps Provided:

2022	1892
2019	1890
2016	
2013	
1976	
1954	
1915	
1913	

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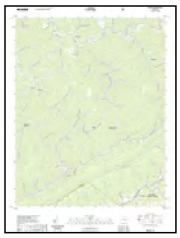
Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

2022 Source Sheets



Roxana
2022
7.5-minute, 24000

Blackey
2022
7.5-minute, 24000

2019 Source Sheets

Roxana
2019
7.5-minute, 24000

Blackey
2019
7.5-minute, 24000

2016 Source Sheets

Roxana
2016
7.5-minute, 24000

Blackey
2016
7.5-minute, 24000

2013 Source Sheets

Roxana
2013
7.5-minute, 24000

Blackey
2013
7.5-minute, 24000

Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

1976 Source Sheets

Roxana
1976
7.5-minute, 24000
Aerial Photo Revised 1952

1954 Source Sheets

Blackey
1954
7.5-minute, 24000
Aerial Photo Revised 1952

Roxana
1954
7.5-minute, 24000
Aerial Photo Revised 1952

1915 Source Sheets

Whitesburg
1915
15-minute, 62500

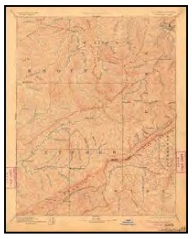
1913 Source Sheets

Oven Fork
1913
15-minute, 48000

Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

1892 Source Sheets



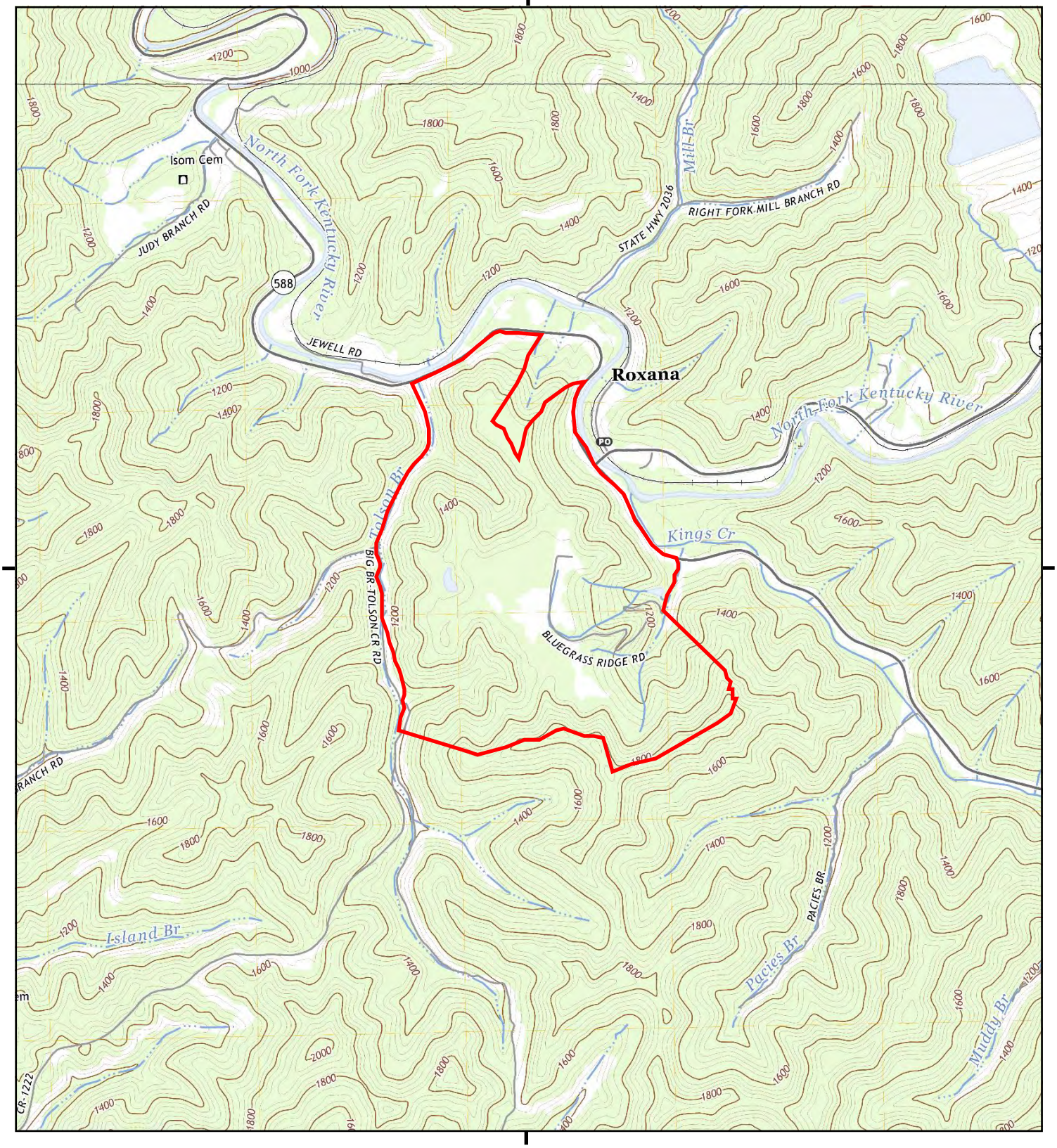
Whitesburg
1892
30-minute, 125000

1890 Source Sheets

Whitesburg
1890
30-minute, 125000

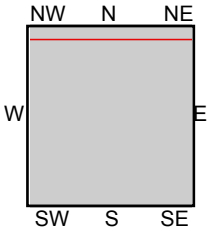
Historical Topo Map

2022



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5



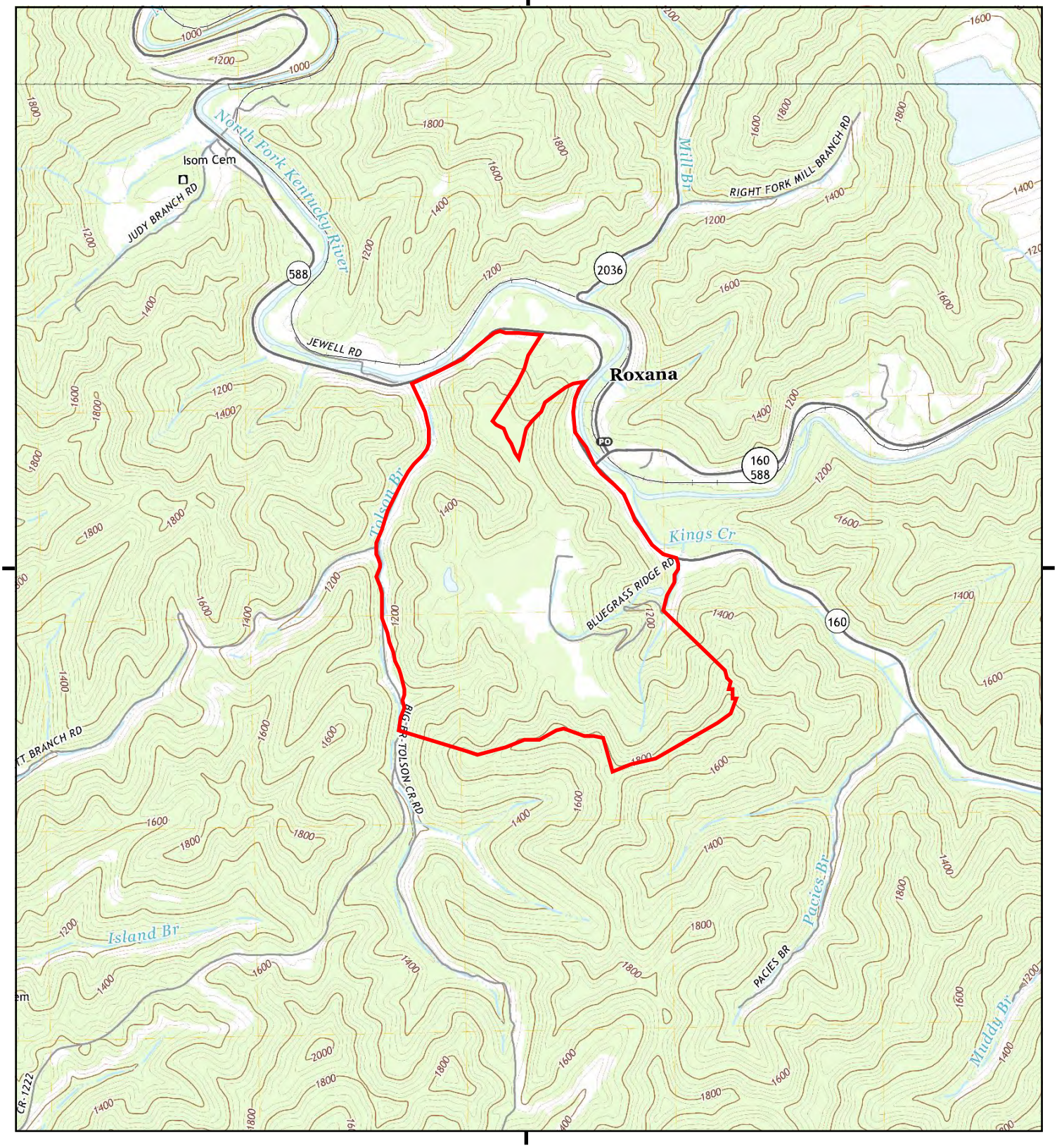
TP, Roxana, 2022, 7.5-minute
N, Blackey, 2022, 7.5-minute

SITE NAME: Roxana Site - Letcher County, KY
ADDRESS: Bluegrass Ridge Road/Kentucky 160
Whitesburg, KY 41848
CLIENT: WSP USA, Inc

N

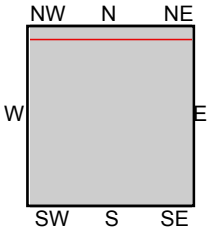
Historical Topo Map

2019



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5



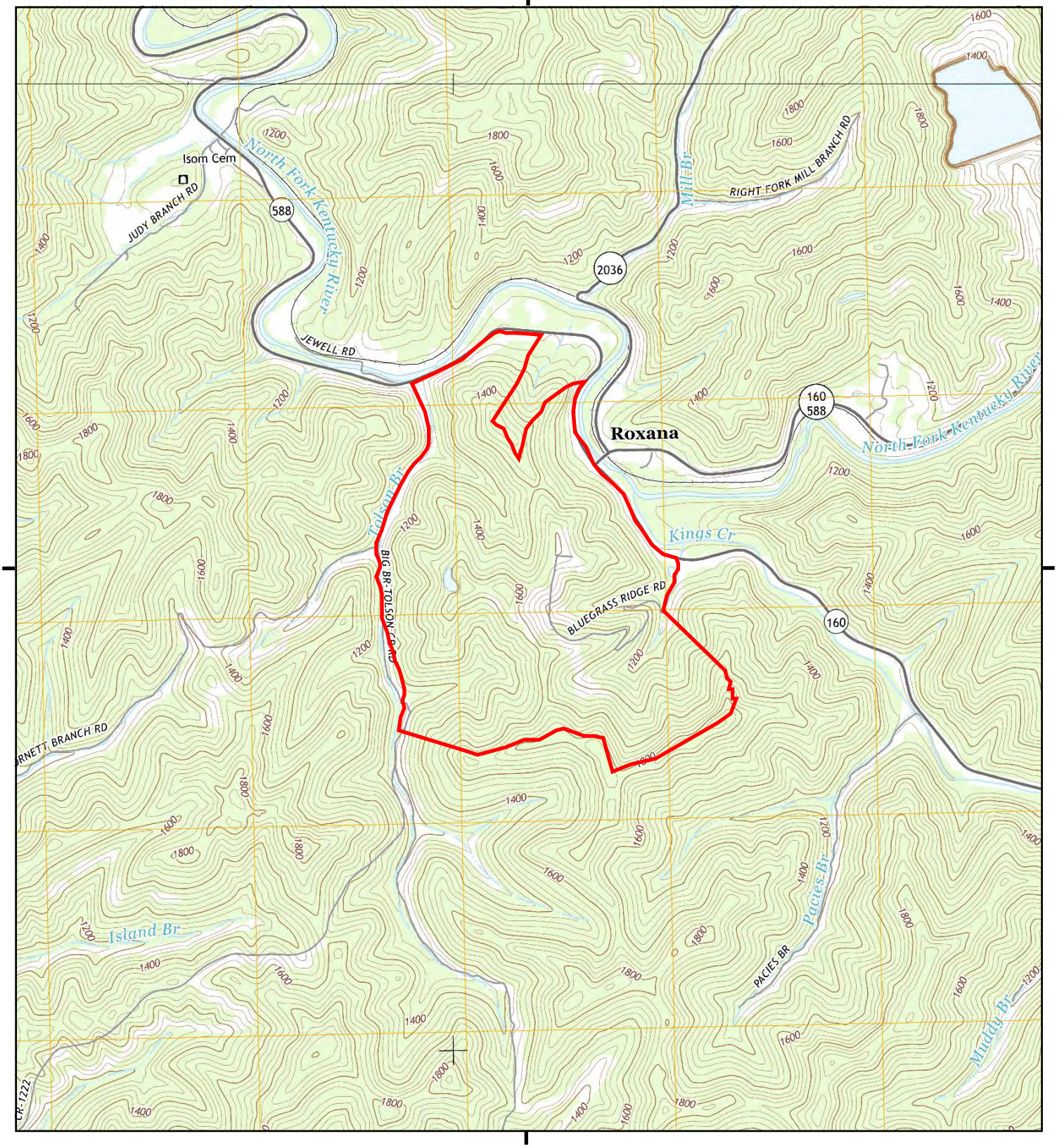
TP, Roxana, 2019, 7.5-minute
N, Blackey, 2019, 7.5-minute

SITE NAME: Roxana Site - Letcher County, KY
ADDRESS: Bluegrass Ridge Road/Kentucky 160
Whitesburg, KY 41848
CLIENT: WSP USA, Inc

N

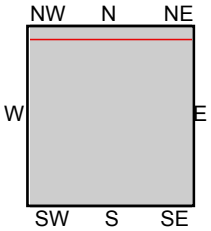
Historical Topo Map

2016



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5



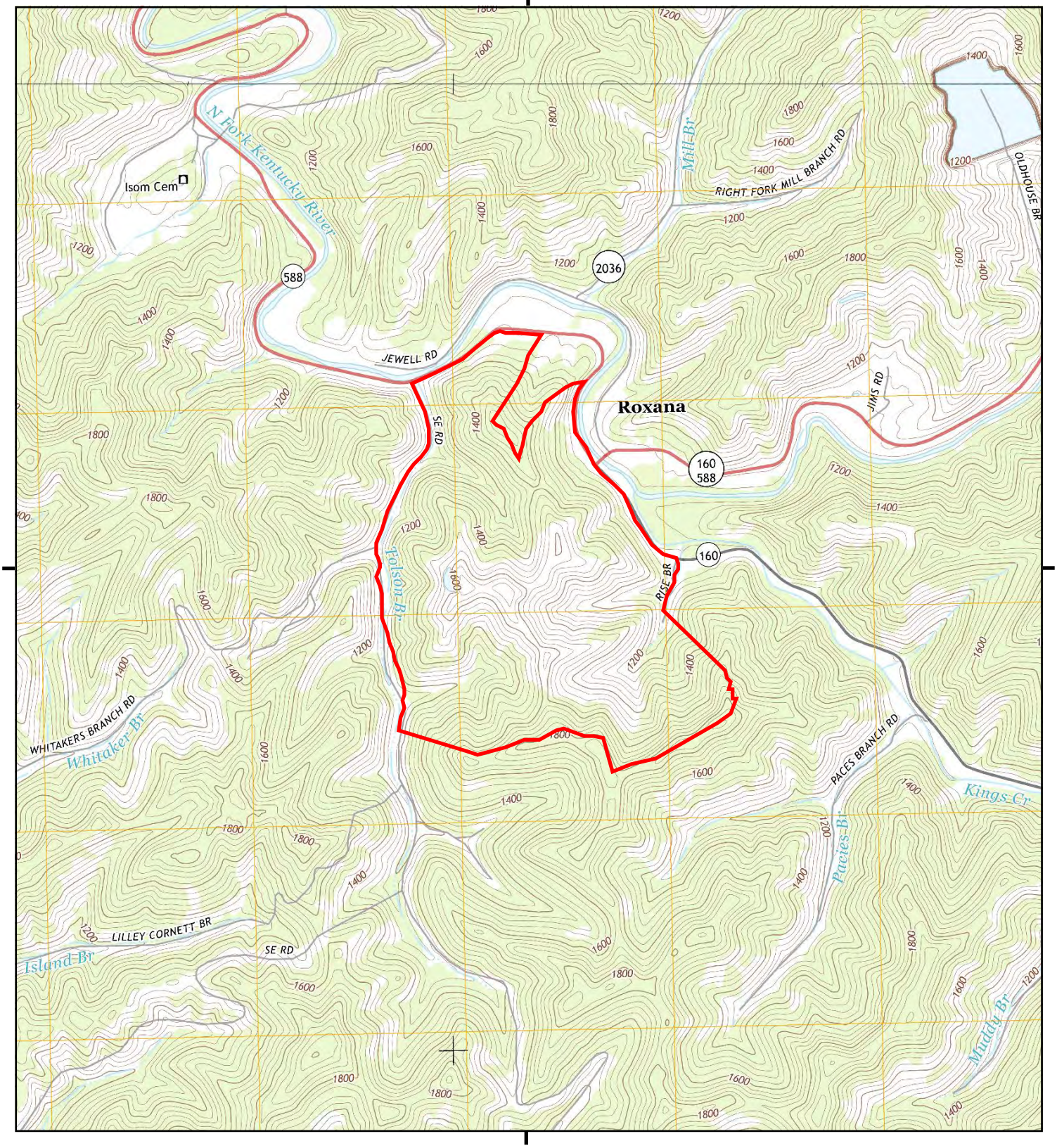
TP, Roxana, 2016, 7.5-minute
N, Blackey, 2016, 7.5-minute

SITE NAME: Roxana Site - Letcher County, KY
ADDRESS: Bluegrass Ridge Road/Kentucky 160
Whitesburg, KY 41848
CLIENT: WSP USA, Inc

N

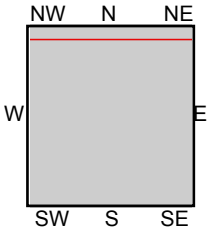
Historical Topo Map

2013



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5



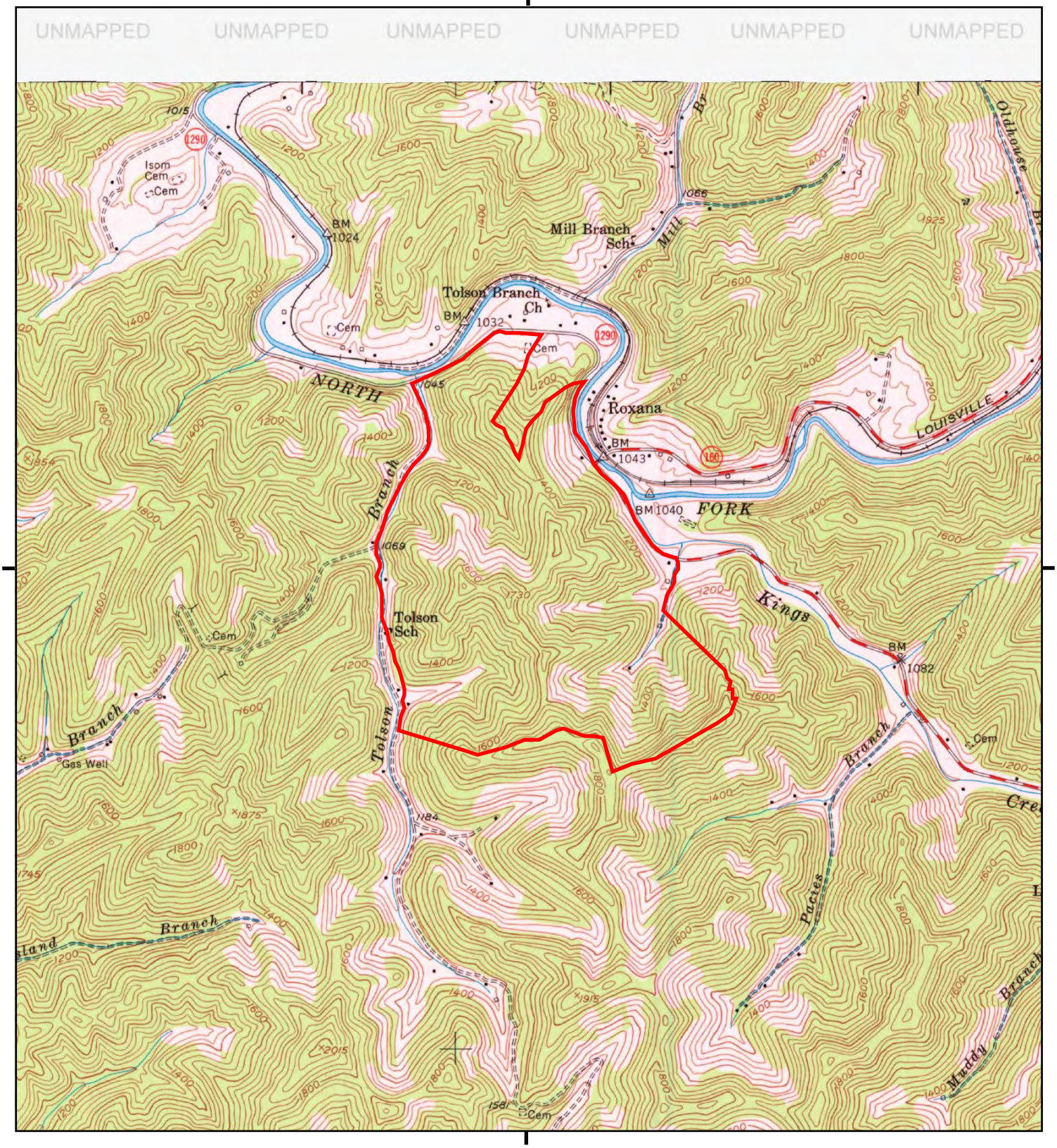
TP, Roxana, 2013, 7.5-minute
N, Blackey, 2013, 7.5-minute

SITE NAME: Roxana Site - Letcher County, KY
ADDRESS: Bluegrass Ridge Road/Kentucky 160
Whitesburg, KY 41848
CLIENT: WSP USA, Inc

N

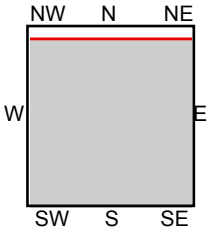
Historical Topo Map

1976



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5



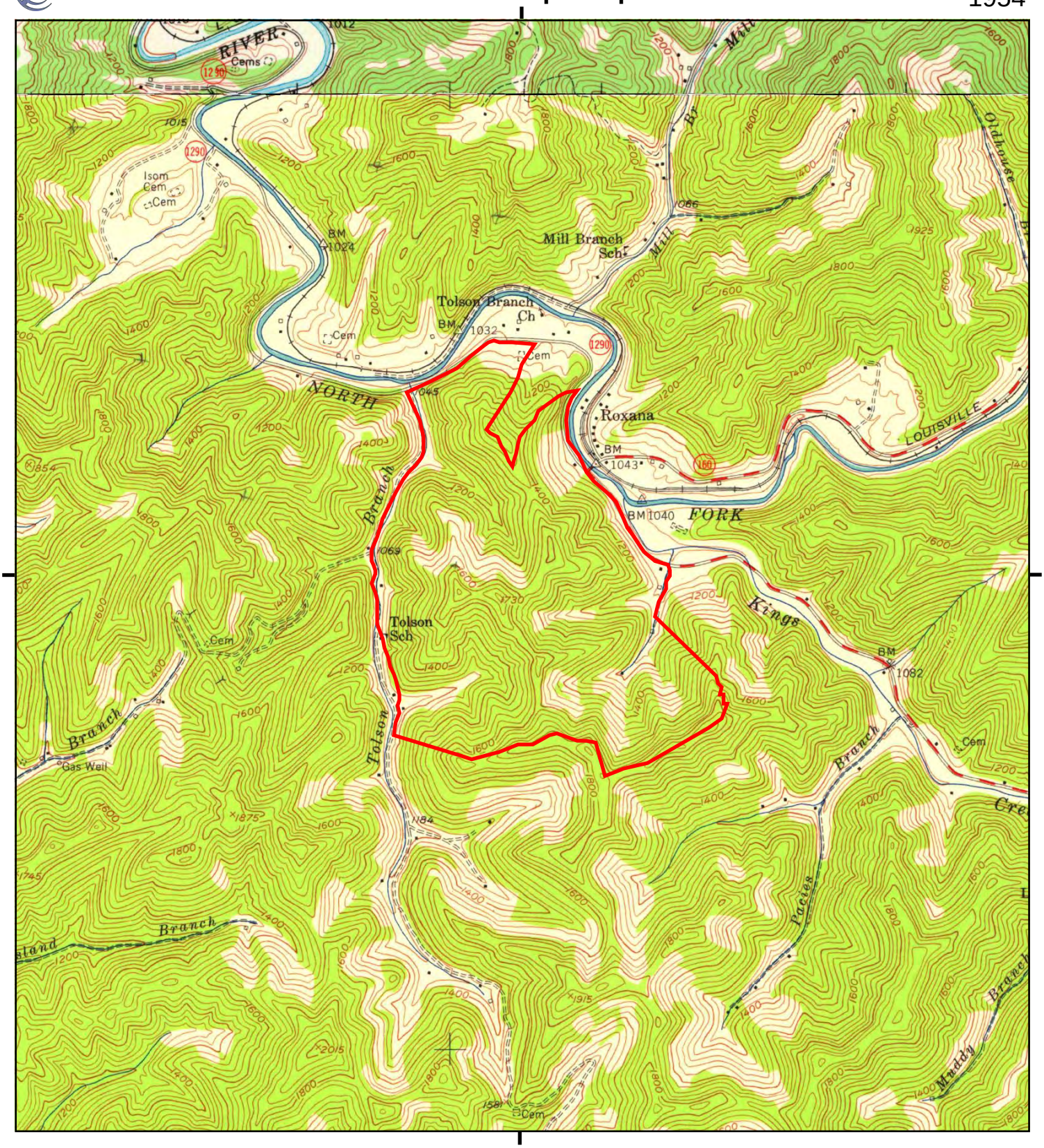
TP, Roxana, 1976, 7.5-minute

SITE NAME: Roxana Site - Letcher County, KY
ADDRESS: Bluegrass Ridge Road/Kentucky 160
Whitesburg, KY 41848
CLIENT: WSP USA, Inc

N

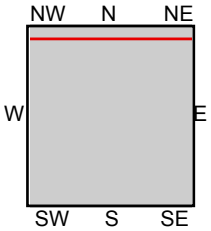
Historical Topo Map

1954



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5



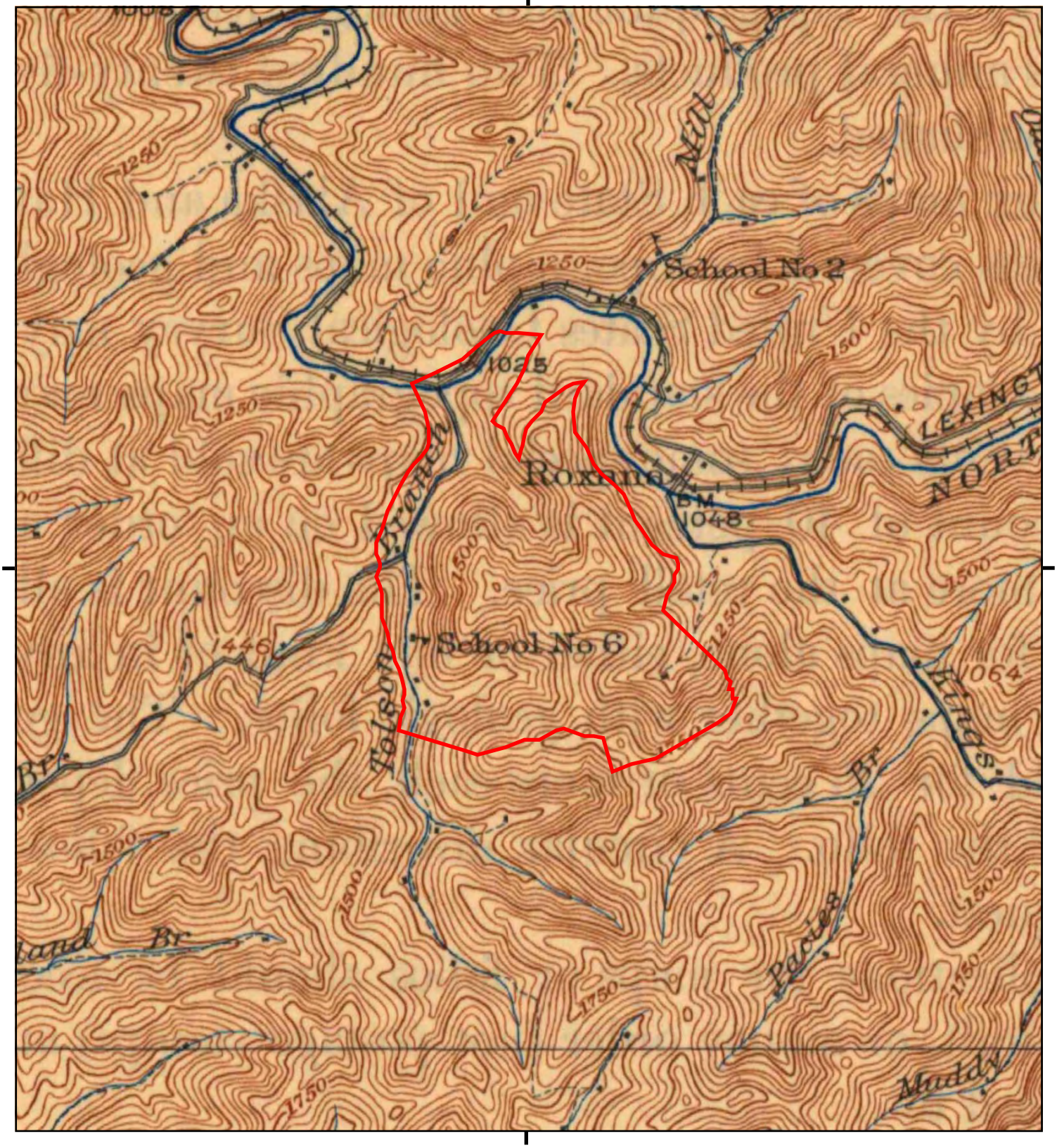
TP, Roxana, 1954, 7.5-minute
N, Blackey, 1954, 7.5-minute

SITE NAME: Roxana Site - Letcher County, KY
ADDRESS: Bluegrass Ridge Road/Kentucky 160
Whitesburg, KY 41848
CLIENT: WSP USA, Inc

N

Historical Topo Map

1915



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

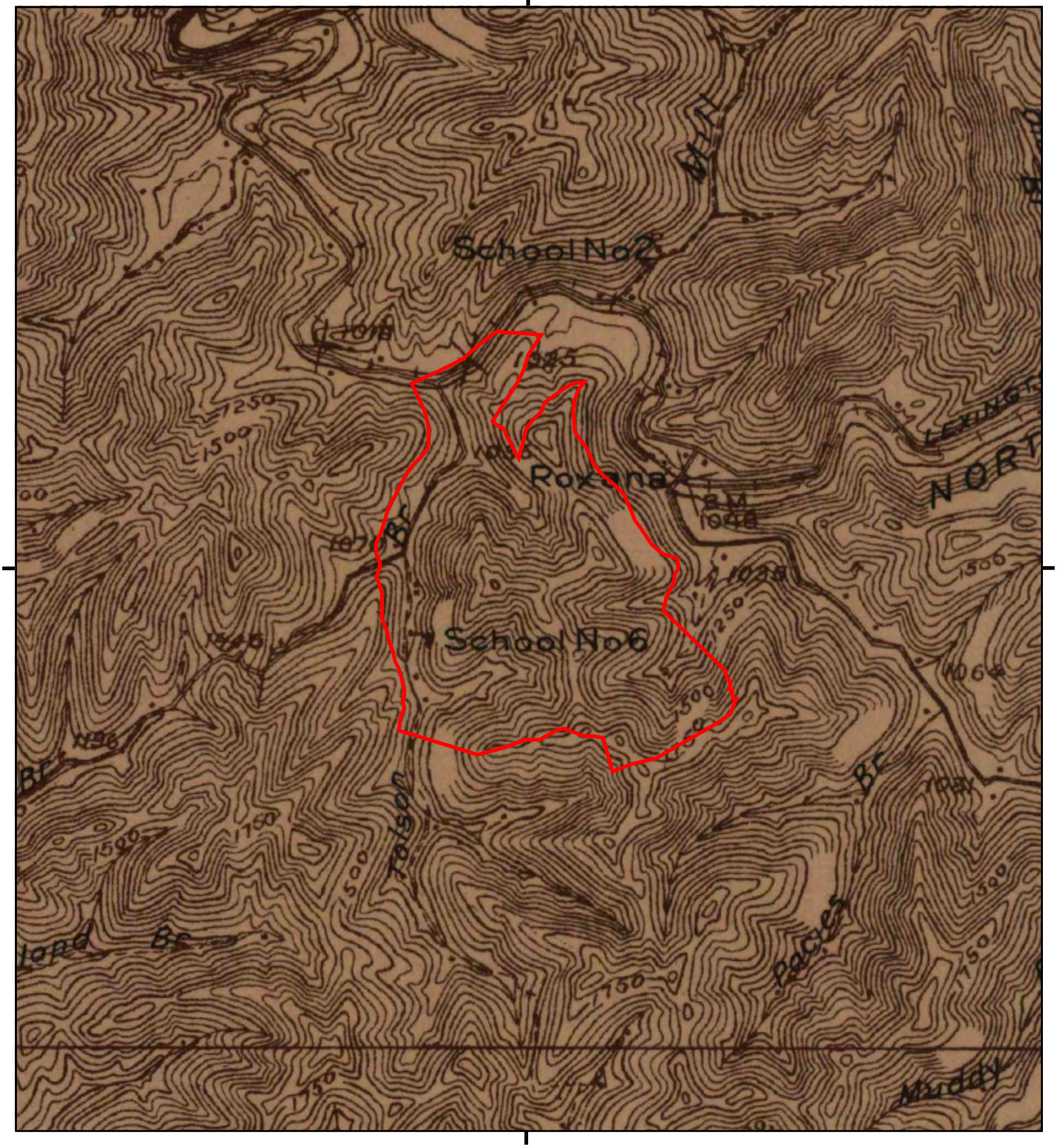
TP, Whitesburg, 1915, 15-minute

SITE NAME: Roxana Site - Letcher County, KY
ADDRESS: Bluegrass Ridge Road/Kentucky 160
Whitesburg, KY 41848
CLIENT: WSP USA, Inc

N

Historical Topo Map

1913



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

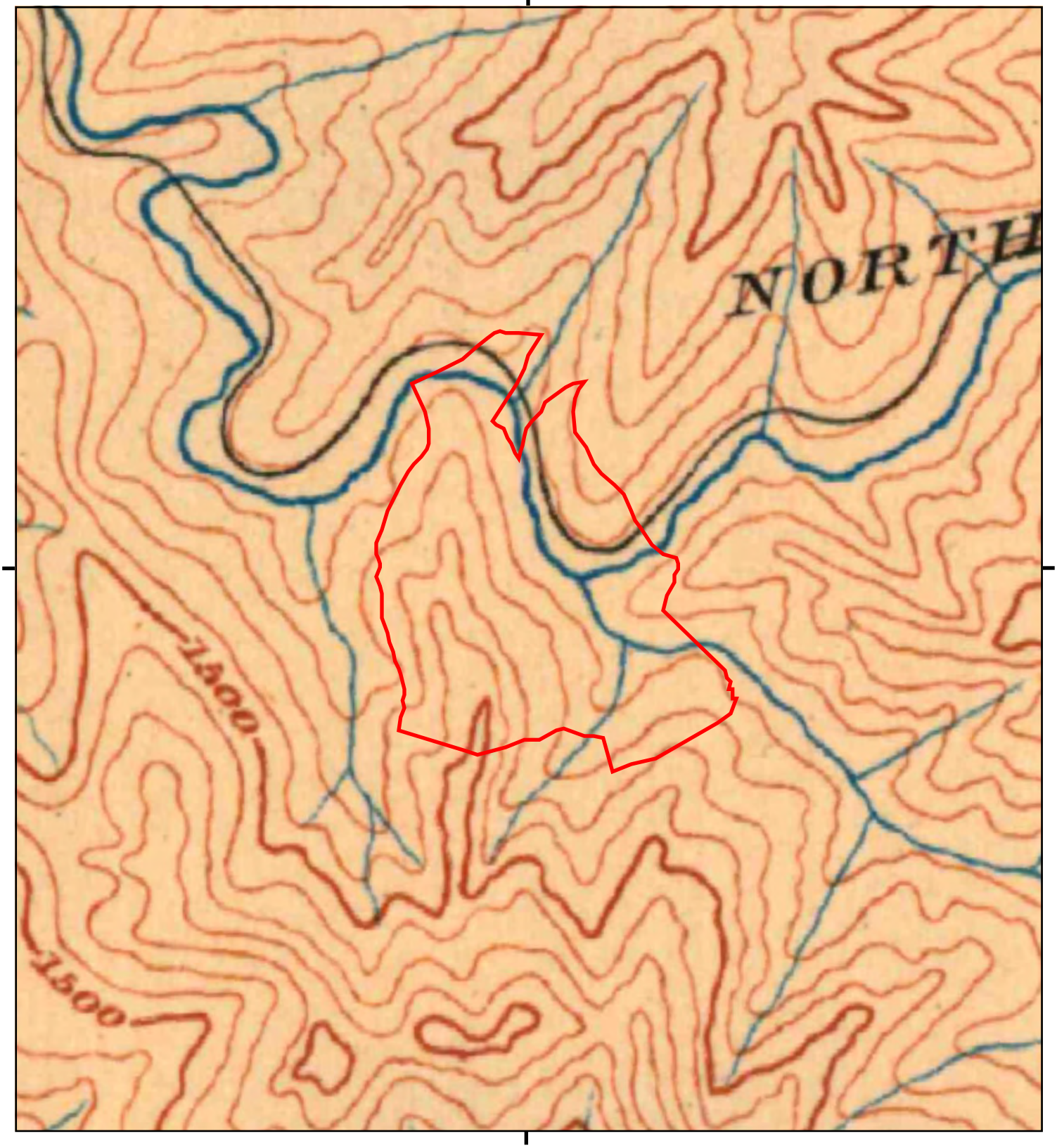
TP, Oven Fork, 1913, 15-minute

SITE NAME: Roxana Site - Letcher County, KY
ADDRESS: Bluegrass Ridge Road/Kentucky 160
Whitesburg, KY 41848
CLIENT: WSP USA, Inc

N

Historical Topo Map

1892



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0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

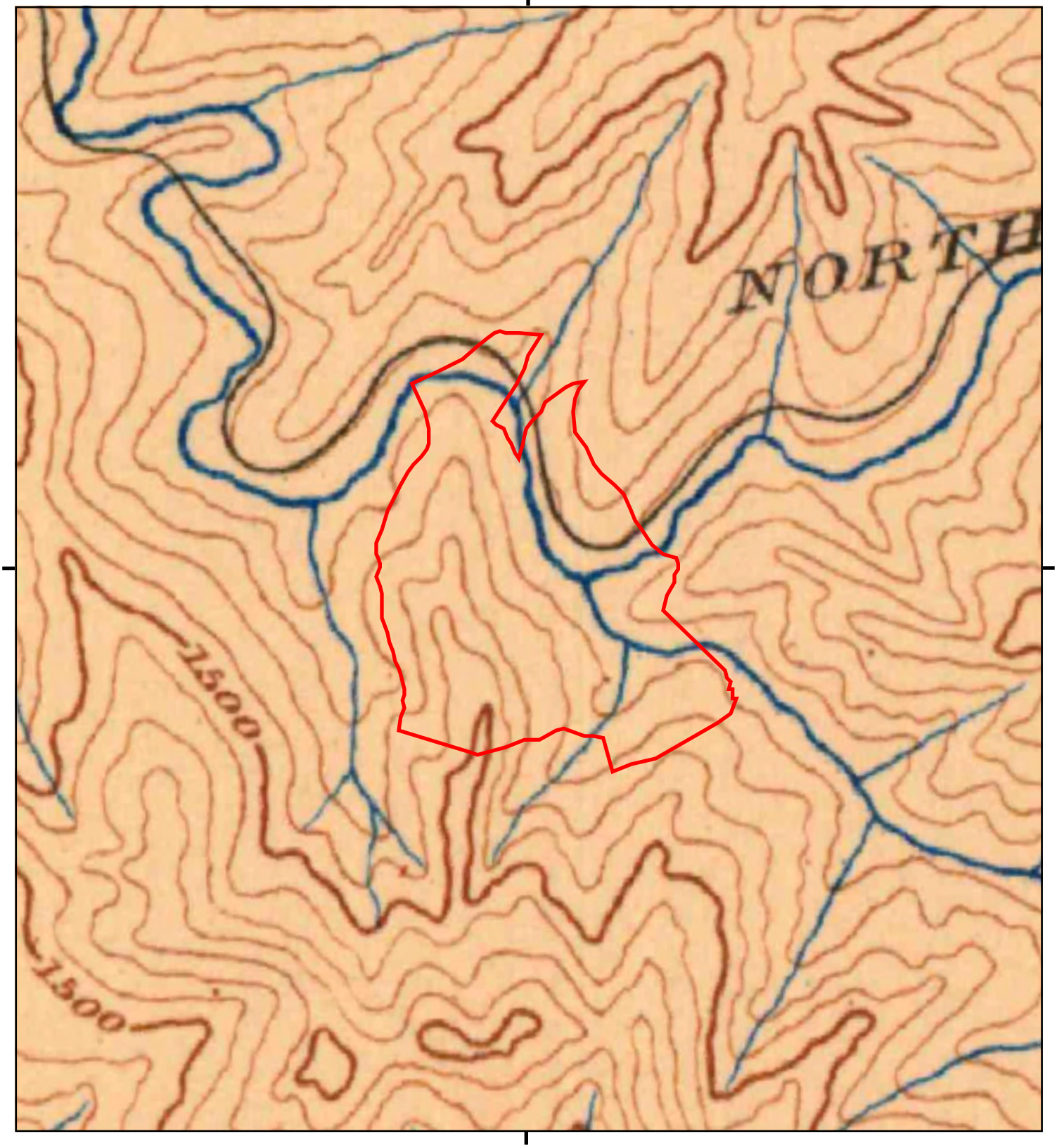
TP, Whitesburg, 1892, 30-minute

SITE NAME: Roxana Site - Letcher County, KY
ADDRESS: Bluegrass Ridge Road/Kentucky 160
Whitesburg, KY 41848
CLIENT: WSP USA, Inc

N

Historical Topo Map

1890



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Whitesburg, 1890, 30-minute

SITE NAME: Roxana Site - Letcher County, KY
ADDRESS: Bluegrass Ridge Road/Kentucky 160
Whitesburg, KY 41848
CLIENT: WSP USA, Inc

N

Roxana Site - Letcher County, KY

Bluegrass Ridge Road/Kentucky 160

Whitesburg, KY 41848

Inquiry Number: 7521379.11

December 18, 2023

The EDR Aerial Photo Decade Package

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Aerial Photo Decade Package

12/18/23

Site Name:

Roxana Site - Letcher County,
Bluegrass Ridge Road/Kentuck
Whitesburg, KY 41848
EDR Inquiry # 7521379.11

Client Name:

WSP USA, Inc
412 Mt. Kemble Ave
Morristown, NJ 07962
Contact: Krystle Rayos

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Search Results:

Year	*Scale*	*Details*	*Source*
2020	1"=1000'	Flight Year: 2020	USDA/NAIP
2016	1"=1000'	Flight Year: 2016	USDA/NAIP
2012	1"=1000'	Flight Year: 2012	USDA/NAIP
2008	1"=1000'	Flight Year: 2008	USDA/NAIP
1995	1"=1000'	Acquisition Date: March 24, 1995	USGS/DOQQ
1991	1"=1000'	Flight Date: March 28, 1991	USGS
1988	1"=1000'	Flight Date: March 27, 1988	USGS
1983	1"=1000'	Flight Date: April 26, 1983	USDA
1977	1"=1000'	Flight Date: March 04, 1977	USGS
1960	1"=1000'	Flight Date: April 19, 1960	USGS
1952	1"=1000'	Flight Date: April 08, 1952	USGS

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INQUIRY #: 7521379.11
YEAR: 2020
= 1000'
N
EDR

INQUIRY #: 7521379.11
YEAR: 2016
= 1000'
N
EDR

INQUIRY #: 7521379.11
YEAR: 2012
= 1000'
N
EDR

INQUIRY #: 7521379.11
YEAR: 2008
= 1000'
N
EDR

INQUIRY #: 7521379.11
YEAR: 1995
= 1000'
N
EDR

INQUIRY #: 7521379.11
YEAR: 1991
= 1000'
N
EDR
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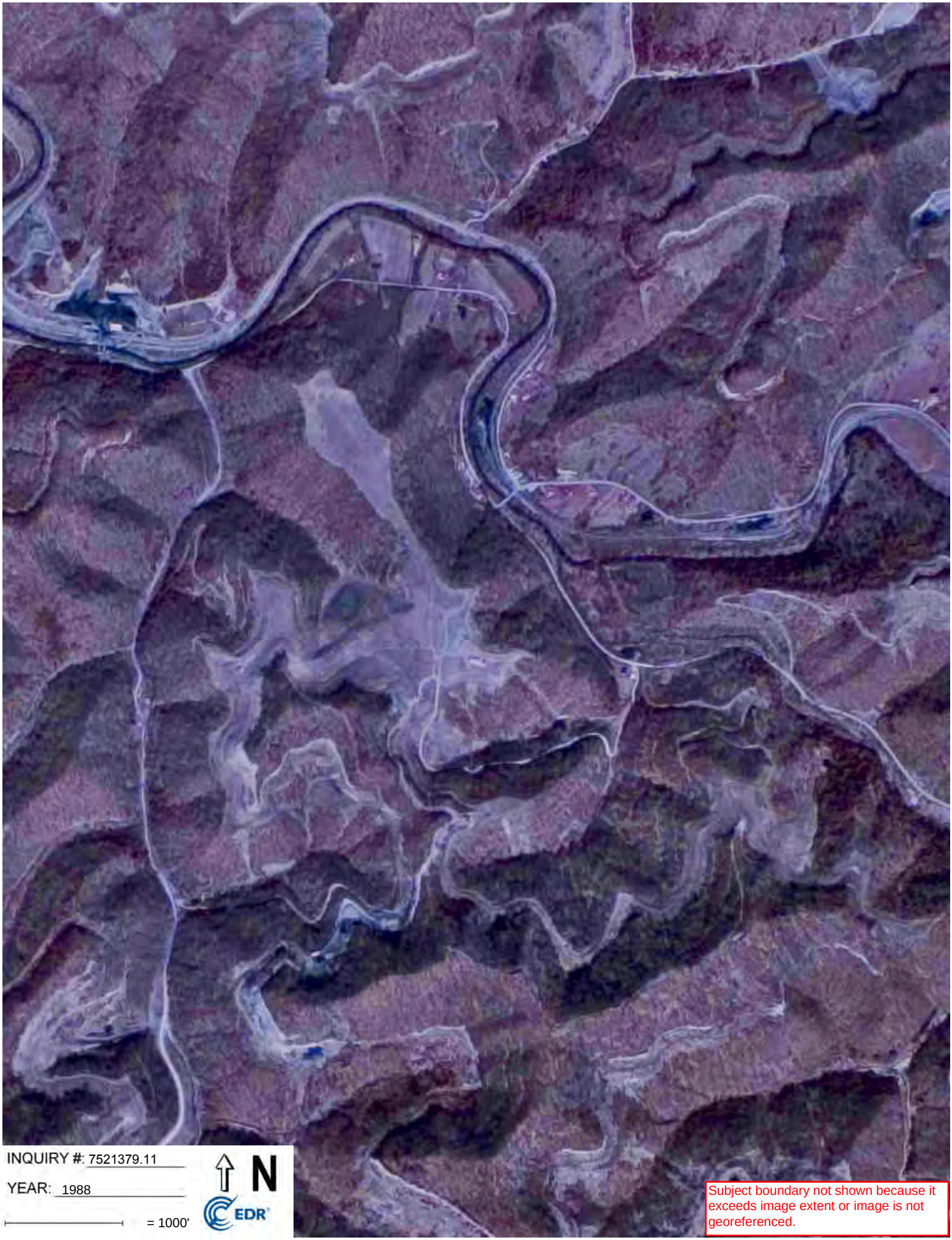
INQUIRY #: 7521379.11
YEAR: 1988
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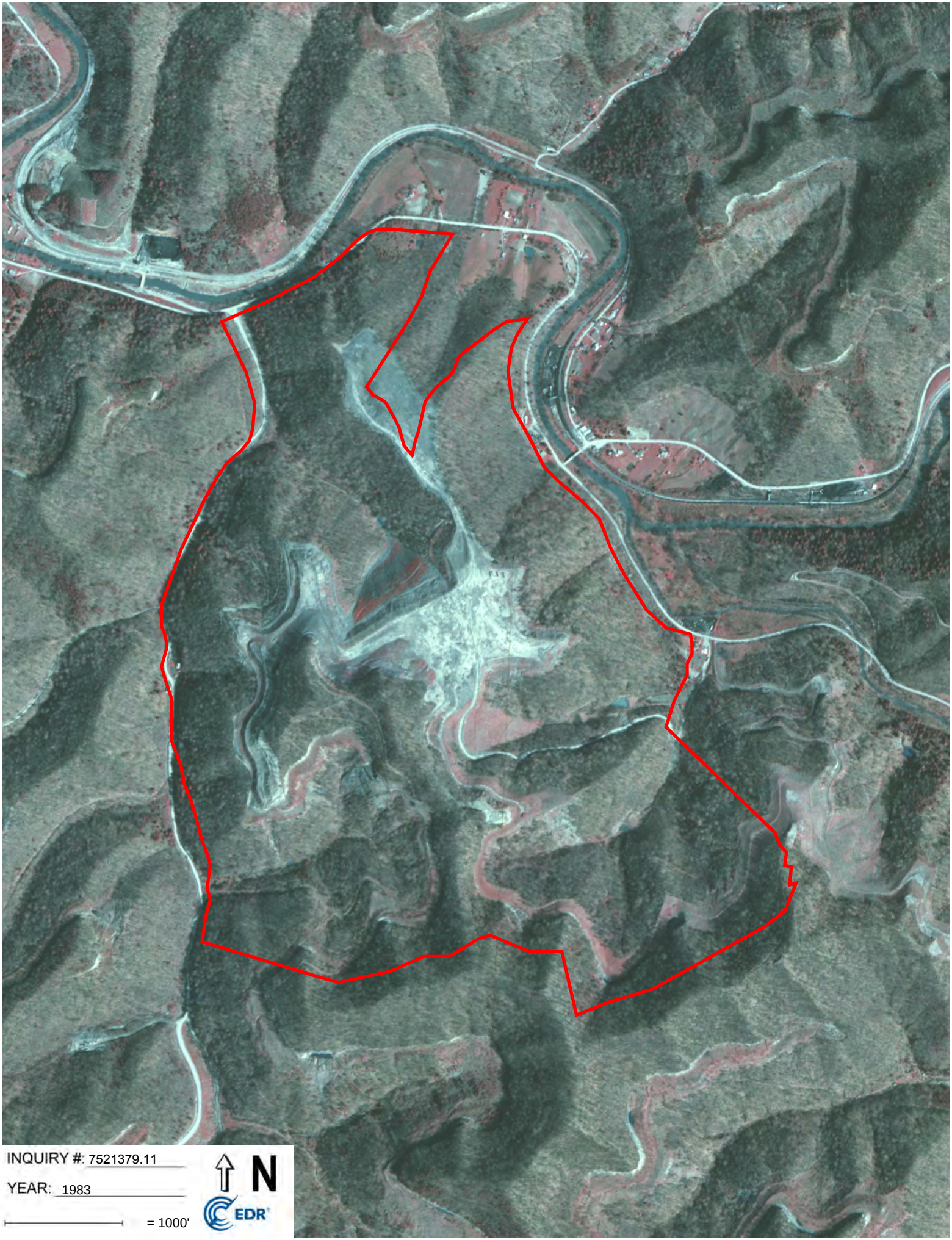
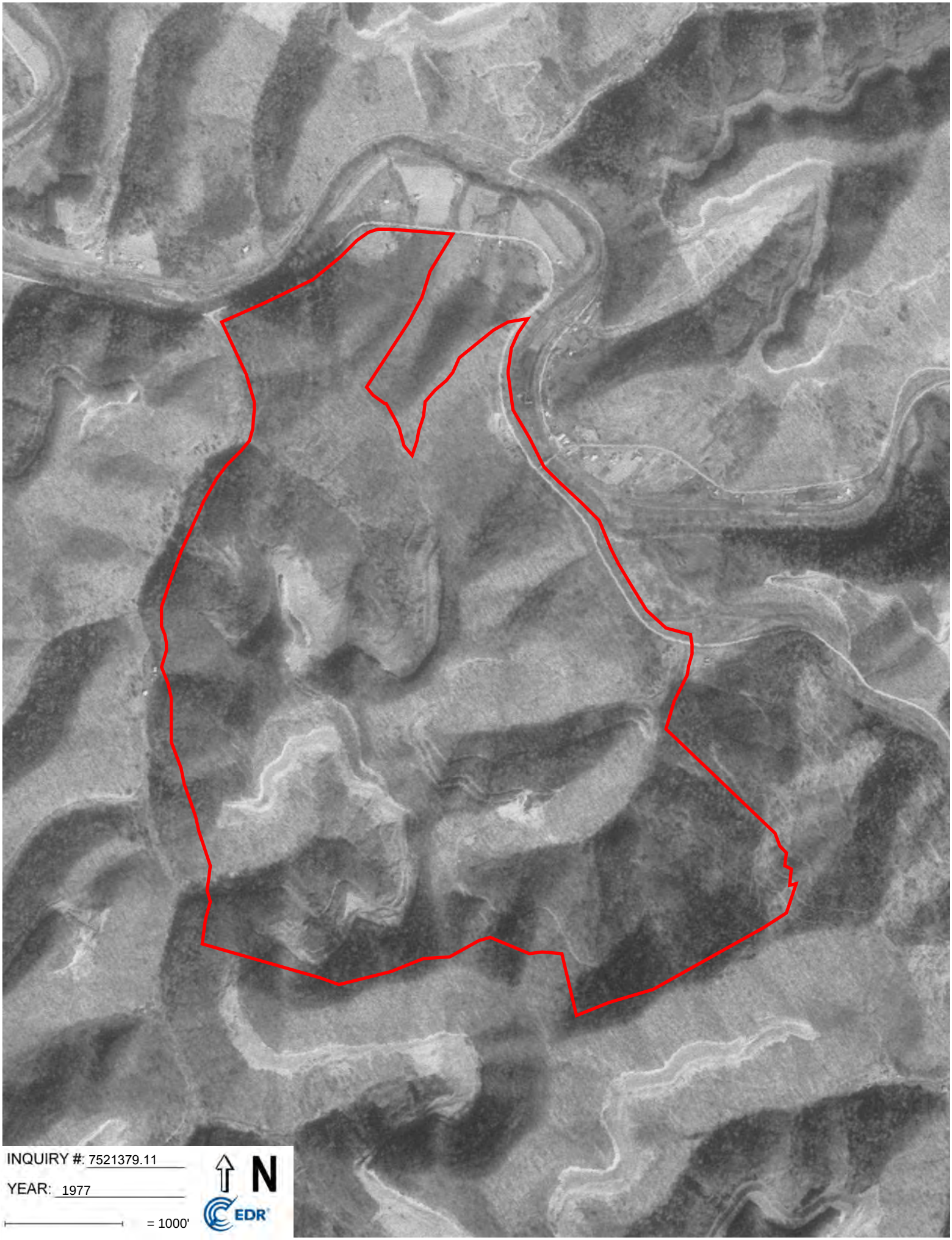
EDR
Subject boundary not shown because it exceeds image extent or image is not georeferenced.


INQUIRY #: 7521379.11
YEAR: 1983
= 1000'
N
EDR


INQUIRY #: 7521379.11
YEAR: 1977
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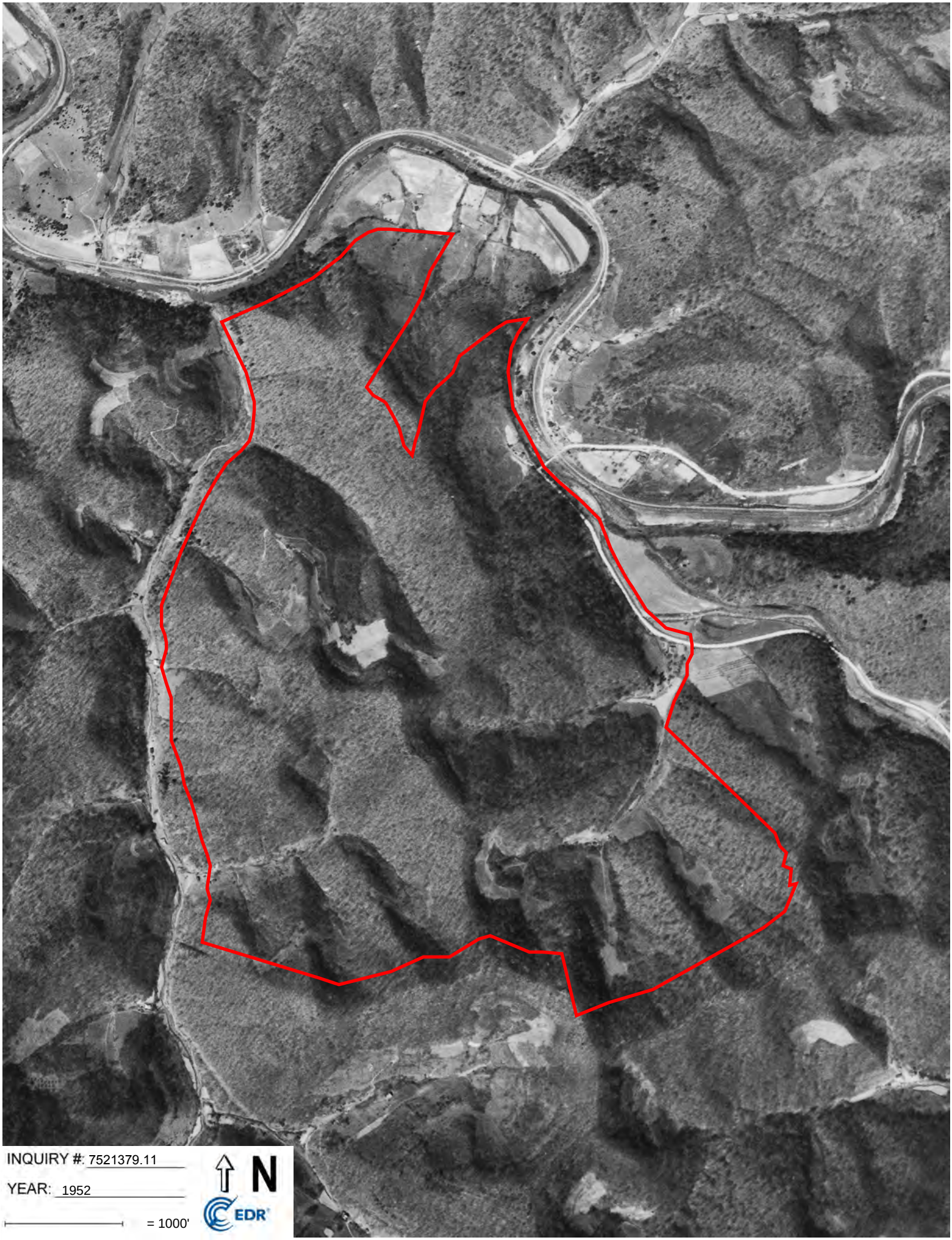
N
EDR

INQUIRY #: 7521379.11
YEAR: 1960
= 1000'
N
EDR


INQUIRY #: 7521379.11
YEAR: 1952
= 1000'
N
EDR

APPENDIX

F REGULATORY AGENCY RECORDS

PROFESSIONAL ENGINEERS, INC
3 HMB Circle
US 460
Frankfort, KY 40601
Office: (502) 695-9800
Fax: (502) 695-9810

May 19, 2020

Emmanuel Onejeme
UST Branch
300 Sower Boulevard
Frankfort, KY 40601

RE: Site Investigation Report
Roxana BP
U.S. 160 South
Roxana, KY 41848
Letcher County
AI NO.: 59860
HMB File: 9216_010

Dear Mr. Onejeme:

On behalf of the above referenced UST facility, HMB is pleased to offer you this response to your directive dated July 16, 2019 (Attachment A). Please find responses to your numbered items below.

Item 1: The UST Branch Reviewer was notified.

Item 2: This report with attachments is the Site Investigation report. The site history and elements of the investigation report requirements are included below.

1.1 The chronology of the site is listed below. Tables summarizing the soil and groundwater BTEX analytical results and groundwater elevation and well information data are attached. A site map is attached.

On August 1, 2001, Hinkle Contracting Corporation (HCC) closed two (2) 1,000-gallon and one (1) 2,000-gallon steel, gasoline UST's and associated steel piping by removal from this site. The two (2) 1,000-gallon UST's were located in Pit 1 and the 2,000-gallon tank was located in Pit 2. On October 17, 2001, a release was reported by HCC based on analytical results from the closure samples and the release was issued incident number 63197. Pit water was observed in Pit 1 during removal and groundwater was observed during the 1-meter assessment. The UST pit material was placed back into the basin. No domestic-use wells (DUW's) were identified by the KGS Groundwater Database within 300 meters of the site. No sensitive features were reported within 50 meters

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of the site. The site was classified as Class III, Table I for soil and Groundwater Table 1 in the Closure Assessment Report. Soil and a pit water samples were collected during closure on August 1, 2001. Analytical results from the soil samples collected as a part of closure indicated BTEX constituent concentrations above the Allowable Levels in the Pit 1 pipe trench sample and in the Pit 2 south wall, west wall, pipe trench, and soil pile samples. The analytical results from the pit water sample indicated BTEX constituent concentrations below the Allowable Levels. HCC submitted a Closure Assessment Report to the UST Branch on December 5, 2001.

Hinkle-Meyer Environmental Services LLC (HMES) obtained the site and assigned project management to HMB Professional Engineers Inc (HMB). Hinkle Environmental Services LLC (HES), formerly HCC, was retained to perform drilling and remediation services. The UST Branch issued a deficiency letter dated January 28, 2002 in response to the Closure Assessment Report. HMB submitted the responses to the deficiencies in a letter dated July 25, 2002.

The UST Branch issued an Additional Evaluation (AE) I request directive dated September 11, 2002. HMB with HES advanced borings at SB-1 through SB-14 and MW-1 through MW-4 on December 30 and 31, 2002 at the locations shown on the site map and collected soil samples for BTEX analyses. Laboratory analytical results indicated BTEX constituent concentrations above the Allowable Levels in the soil samples collected from several locations. HMB with HES installed monitoring wells at the MW-1, MW-2, and MW-4 locations shown on the site map on January 2, 2003. A large gravel pile obstructed the proposed MW-3 location, so it was not installed. On January 9, 2003, HMB personnel gauged, purged/developed and sampled the new monitoring wells MW-1, MW-2, and MW-4 for BTEX analyses. The analytical results indicated BTEX constituent concentrations below the Allowable Levels in the groundwater samples collected. The AE I Report dated March 10, 2003 was submitted by HMB to the UST Branch.

The UST Branch issued a deficiency letter dated April 2, 2003 in response to the AE I Report. HMB submitted the responses to the deficiencies in a letter dated June 19, 2003.

The UST Branch issued an AE II request directive dated February 13, 2004. HMB with HES advanced borings at the directed grid locations and named the locations SB15, SB16, MW-5 and MW-6 at the locations shown on the site map on March 23, 2004 and collected soil samples for BTEX analyses. Laboratory analytical results indicated a benzene and an ethylbenzene concentrations above the Allowable Levels in the MW-5 (3-8') soil sample. HMB with HES installed monitoring wells at the

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MW-5 and MW-6 locations shown on the site map on March 24, 2004. On April 5, 2004, HMB personnel gauged, developed/purged, and sampled wells MW-1, MW-2, MW-4, MW-5, and MW-6 for BTEX analyses. The analytical results indicated BTEX constituent concentrations above the Allowable Levels in groundwater samples collected from MW-4 and MW-5. The AE II Report dated May 10, 2004 was submitted to the UST Branch.

The UST Branch issued an over-excavation (OE) Request Letter (up to 500 cubic yards) dated July 24, 2006. On April 18 through 20, 2007, HMB with HES removed and disposed 371.21 tons of petroleum-impacted soil from the area shown on the site map. Prior to backfilling, soil samples for BTEX analyses were collected from the walls and floor of the OE basin. The OE basin was backfilled with 390.18 tons of gravel. The analytical results indicated BTEX constituent concentrations were above the Class III, Table 1 Allowable Levels in the SW2 sample. To address the area represented by sample SW2, HMB with HES OE'ed an additional 294.60 tons of petroleum-impacted soil from the area shown on the site map on August 29 and 30, 2007. Prior to backfilling soil samples for BTEX analyses were collected from the walls and floor of the OE. The OE basin was backfilled with 258.84 tons of gravel. The analytical results indicated BTEX constituent concentrations were below the Class III, Table 1 Allowable Levels in all samples. Also, on August 29, 2007, HMB gauged purged and collected groundwater samples from wells MW-1, MW-2, MW-4, and MW-5. Well MW-6 was missing. The groundwater sample analytical results indicated BTEX constituent concentrations above the Allowable Levels at the MW-4 and MW-5 locations. A report summarizing the OE and groundwater monitoring activities and results dated October 3, 2007 was submitted to the UST Branch.

The UST Branch issued a Resample Request Letter dated October 16, 2007. On December 5, 2007, HMB personnel gauged, purged, and sampled wells MW-1, MW-4, and MW-5 for BTEX analyses. Well MW-2 was damaged and well MW-6 was still missing. The analytical results indicated BTEX constituent concentrations above the Allowable Levels in the groundwater samples collected from wells MW-4 and MW-5. HMB attempted to obtain an off-site access agreement (OSA) with the owner of the Amburgey property. The off-site property owner denied the request. A report summarizing the investigation activities and results dated March 10, 2009 was submitted to the UST Branch.

The UST Branch issued a Directive Letter dated May 11, 2009. On July 15, 2009, HMB personnel gauged, purged, and sampled wells MW-1, MW-4, and MW-5 for BTEX analyses. The analytical results indicated BTEX constituent concentrations above the Allowable Levels in the

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groundwater samples collected from wells MW-4 and MW-5. A report summarizing the investigation activities and results dated March 30, 2010 was submitted to the UST Branch.

The UST Branch issued an Intermediate Site Investigation Report Request Letter dated July 19, 2010. HMB with HES installed wells at the MW-7 and MW-8 locations shown on the site map on September 14, 2010. On July 15, 2009, HMB personnel gauged, purged/developed, and sampled wells MW-1, MW-5, and MW-7 for BTEX analyses. Well MW-2, previously reported damaged, could not be located, MW-8 was dry, and the well cover and cap on MW-4 were unsecured. The analytical results indicated BTEX constituent concentrations below the Allowable Levels in the groundwater samples collected. A report summarizing the investigation activities and results dated June 1, 2011 was submitted to the UST Branch.

HMB conducted a re-classification assessment at the site in response to a UST Branch directive dated November 4, 2011. The site Allowable Levels were determined to be Class B, Matrix Table II soil concentrations and Groundwater Table 1 groundwater concentrations on-site and off-site due to three (3) DUW's within 300 meters of the site. The re-classification assessment was submitted to the UST Branch in a report dated June 5, 2012.

The UST Branch issued an Intermediate Site Investigation Report Request Letter dated September 4, 2012. HMB with HES installed wells at the MW-9, MW-10, MW-11, and MW-12 locations shown on the site map on March 25, 2013. HMB with HES also properly abandoned well MW-4 on March 25, 2013. On June 17, 2013, HMB personnel gauged, purged/developed, and sampled wells MW-5, MW-7, MW-8, MW-9, MW-10, MW-11, and MW-12 for BTEX analyses. Well MW-1 could not be located. The analytical results indicated benzene concentrations above the Allowable Levels in the groundwater samples collected from MW-5 and MW-9. A report summarizing the investigation activities and results dated July 9, 2013 was submitted to the UST Branch.

The UST Branch issued an Intermediate Site Investigation Report Request Letter dated December 17, 2013. On May 20, 2014, HMB with HES advanced borings adjacent to the directed SB6, SB11, SB14, MW-4, MW-5, MW-9, X1, and X2 locations shown on the site map and collected soil samples for BTEX analyses. Laboratory analytical results indicated BTEX constituent concentrations above the Allowable Levels Allowable Levels in the SB11A (3-5'), SB14A (3-5'), MW4A (0-2'), MW5A (4-6'), MW9A (4-6'), and X1A (0-2'), (2-4'), (8') soil samples. On February 17, 2014, HMB personnel gauged wells MW-5, MW-7, MW-8, MW-10, MW-11, and MW-12 and purged and collected a

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groundwater sample from MW-5 for BTEX analyses. Well MW-9 could not be located. Also, a groundwater sample for BTEX analyses was collected from the Amburgey DUW. The analytical results indicated BTEX constituent concentrations below the Allowable Levels in the groundwater samples collected. A report summarizing the investigation activities and results dated July 15, 2014 was submitted to the UST Branch.

The UST Branch issued an Intermediate Site Investigation Report Request Letter dated February 6, 2015. On October 28, 2015, HMB with HES advanced borings adjacent to the directed X1, SB11, SB14, MW4A, MW5, and MW9A locations shown on the site map and collected soil samples for BTEX analyses. Laboratory analytical results indicated BTEX constituent concentrations above the Allowable Levels in the SB11A (3-5'), SB14A (3-5'), and MW9A (10-12') soil samples. HMB with HES installed replacement wells at the MW-9A and MW-4A and well MW-13 locations shown on the site map on October 28, 2015. On December 3, 2015, HMB personnel gauged, wells MW-6, MW-7, and MW-8 and gauged, purged/developed, and sampled wells MW-4A, MW-5, MW-9A, MW-10, MW-11, MW-12, and MW-13 for BTEX analyses. The analytical results indicated BTEX constituent concentrations above the Allowable Levels in the groundwater samples collected from MW-4A, MW-5, and MW-9A. A report summarizing the investigation activities and results, as well as an OE plan, dated April 4, 2016 was submitted to the UST Branch.

The UST Branch issued an over-excavation (OE) Request Letter dated July 18, 2016. On September 19 and 20, 2016, HMB with HES removed and disposed 487.52 tons of petroleum-impacted soil from the areas shown on the site map. Wells MW-4A, MW-5, and MW-9A were abandoned by OE on September 19, 2016. Prior to backfilling, soil samples for BTEX analyses were collected from the walls and floor of the OE basin. The OE basin was backfilled with 512.88 tons of gravel. The analytical results indicated BTEX constituent concentrations were above the Allowable Levels in the OE1-1, OE1-2, OE1-3, OE1-4, OE2-1, OE2-2, OE2-3, OE2-4, and OE2-5 samples collected at the approximate locations shown on the site map. A report summarizing the OE activities and results dated January 10, 2017 was submitted to the UST Branch.

The UST Branch issued an Intermediate Site Investigation Report Request Letter dated June 8, 2017. On December 5, 2017, HMB with HES advanced borings adjacent to the directed OE1-3 and at the directed PSB-1 through PSB-5 locations shown on the site map and collected soil samples for BTEX analyses. Laboratory analytical results indicated BTEX constituent concentrations above the Allowable Levels Allowable

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Levels in the PSB-1 (2-4'), PSB-3 (2-4'), and PSB-5 (4-6') soil samples. The field technician attempted to find the DUW's reported to be in the area but, could only find the Amburgey wellhouse located across Highway 160 from the site. It was determined that all other well locations would be up-gradient from the site even if located. A report summarizing the investigation activities and results dated January 24, 2018 was submitted to the UST Branch.

1.2 The site is located in Roxana, Lethcher County, Kentucky. The surrounding properties are commercial, residential, and undeveloped woodland. There are no other former UST sites within 100 meters of the site. A site map and vicinity map are attached. On August 1, 2001, HCC closed two (2) 1,000-gallon and one (1) 2,000-gallon steel, gasoline UST's and associated steel piping by removal from this site. The two (2) 1,000-gallon UST's were located in Pit 1 and the 2,000-gallon tank was located in Pit 2. On October 17, 2001 a release was reported by HCC based on analytical results from the closure samples and the release was issued incident number 63197. Pit water was observed in Pit 1 during removal and groundwater was observed during the 1-meter assessment. The UST pit material was placed back into the basin. The current 2019 applicable on-site and off-site soil Allowable Levels are the Class B, Matrix Table II concentrations. The current 2019 applicable on-site and off-site groundwater Allowable Levels are the Table 1 concentrations. Photographs of the site are included in Attachment B.

1.3 The site is located within the Eastern Coalfields physiographic region. The mapped geology at the site is Quaternary aged Alluvium. The topography surrounding the site is steep hills with a dendritic drainage pattern. The surface water flow at the site is generally to the southwest toward the North Fork of the Kentucky River. A section of the USGS Roxana Quadrangle topographic map showing the location of the site is attached. The bedrock underlying the site is alluvium. A section of the USGS Roxana Quadrangle geologic map showing the location of the site is attached. According to the Kentucky Geologic Survey (KGS) Groundwater Atlas for Letcher County, the Sandlick area currently has problems with a lack of water in private wells. Most other areas of the county have high levels of iron or sulfur. More than three-quarters of the wells drilled in valley bottoms and on mountainsides are adequate for a domestic supply. Some wells on ridges and mountaintops are adequate for domestic supply. Drilled wells more than 200 feet deep in valleys may yield enough water for small municipal or industrial supplies. North of Pine Mountain, ground water from most drilled wells is moderately hard and contains noticeable amounts of iron. Salty water in drilled wells probably will not be found less than 200 feet below the principal valley bottoms. Along and south of Pine Mountain the water quality is slightly better, and few wells less than 300 feet below the principal valley bottoms

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will yield salty water. The ground water is soft but contains noticeable amounts of iron. This area also contains limestone beds that, when faulted and below drainage, may yield several hundred gallons per minute. Springs in this area will yield 50 gal/min, but generally yield less than 10 gal/min. Bedrock refusal at the site is generally encountered around 8 to 12 feet bgs. The drilling logs from borings indicate soil is primarily gray or brown silty sandy clay with gravel. The measured depths to groundwater on December 3, 2015 ranged from 0.90 feet below the top of the well casing (btoc) in MW-12 to 5.57 feet btoc in MW-7. A copy of the groundwater potentiometric surface map based on the December 2015 data is attached. The groundwater flow direction based on the December 2015 gauging data is generally to the west. No karst features were evident in the area of the site on the topographic map or immediately proximate to the site.

Updated Site Classification: Three (3) DUW's were located within 300 meters of the site during the 2011 reclassification. In December 2017, the HMB field technician attempted to find the DUW's reported to be in the area but, could only find the Amburgey wellhouse located across Highway 160 from the site. It was determined that all other well locations would be up-gradient from the site even if located. The site classification was reevaluated based on updated information gathered during site investigation activities at the site. The KGS groundwater database indicates there are four (4) active and one (1) unknown status DUW's or springs within 300 meters of the site. A copy of the KGS groundwater database radius search map and information available for all wells within 300 meters of the site are included in Attachment C. The HMB technician verified the Amburgey DUW is still present. The wellhouse is locked. The location of the Amburgey DUW in relation to the site is shown on the site map. A copy of the updated facility classification guide is included in Attachment D. The site is underlain by alluvium. The applicable on-site and off-site soil Allowable Levels are the Class B Matrix Table II concentrations. The applicable on-site and off-site groundwater Allowable Levels are the Table 1 concentrations. Photographs of the site and Amburgey DUW are included in Attachment B.

Item 3: An updated site map is attached. Other required figures and maps are attached.

Item 4: HMB was at the site with Hinkle Environmental Services on March 10, 2020 to advance soil borings adjacent to the EW2, SW2, OE2WW2, OE2NW2, HSB1, HSB2, HSB6, HSB7, HSB9, MW11, OE1NW, OE1FL1, SB25, SB26, SB-27, SB28, and SB-29 locations. The soil boring locations are shown on the site map attached. The borings were advanced to the directed sampling depths or direct-push refusal.

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The borings were sampled continuously using direct-push and each 2-foot interval was screened using a properly calibrated PID. Drilling logs with PID responses are included in Attachment E. Soil samples for laboratory analyses were collected from the directed intervals or the interval within the directed intervals exhibiting the highest PID responses at most locations. At some locations the sample intervals were altered due to shallower refusal or poor recovery in the directed intervals. Notes are included on the drilling logs for these locations explaining the reason for the altered sample interval. The samples were collected in glass containers with a Teflon-lined lid with as little headspace as possible. The samples were placed in a cooler with ice and shipped overnight via FedEx to Pace Analytical in Mt. Juliet, Tennessee, where they were analyzed for BTEX constituents using EPA Method 8260B. The laboratory analytical report with COC for the March 2020 soil samples is included in Attachment F. The current soil analytical results indicate BTEX constituent concentrations below the currently applicable Allowable Levels in all samples. The current and historic soil BTEX analytical results and sample statuses are summarized in the table attached.

Item 5: Recommendations/Conclusions: The most current December 2015 analytical results indicated BTEX constituent concentrations above the Allowable Levels in groundwater samples collected from MW-4A, MW-5, and MW-9A. The area where wells MW-4A, MW-5, and MW-9A were located was OE'ed and the wells were abandoned in September 2016. The current and historic soil analytical results indicate BTEX constituent concentrations previously above Allowable Levels have either been OE'ed or attenuated to concentrations below the Allowable Levels. Based on the observed attenuation in soil and removal of impacted soil from the area where impacted monitoring wells were previously located, additional more current groundwater monitoring does not appear to be necessary. The groundwater sample collected from the Amburgey DUW in February 2014, even before more current corrective action and attenuation, did not indicate concentrations above the Federal maximum Contaminant Levels or the laboratory detection limits. HMB recommends no further action for this site. Site restoration will need to include repair of a washed-out area of the lot adjacent to Highway 160 shown in photographs included in Attachment B.

Item 6: Soil samples were collected using direct-push with disposable liners. There is one (1) drum of investigation-derived waste pending disposal. This report with attachments is the requested Site Investigation Report. A completed Site Investigation Report Checklist (DWM 4269) is included in Attachment G.

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If you have any questions or require any additional information I can be reached via phone at 502-695-9800 or email at djoslyn@hmbpe.com. Please direct all written correspondence to my attention c/o:

Hinkle-Meyer Environmental Services, LLC
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Frankfort, KY 40601

Sincerely,

David Joslyn
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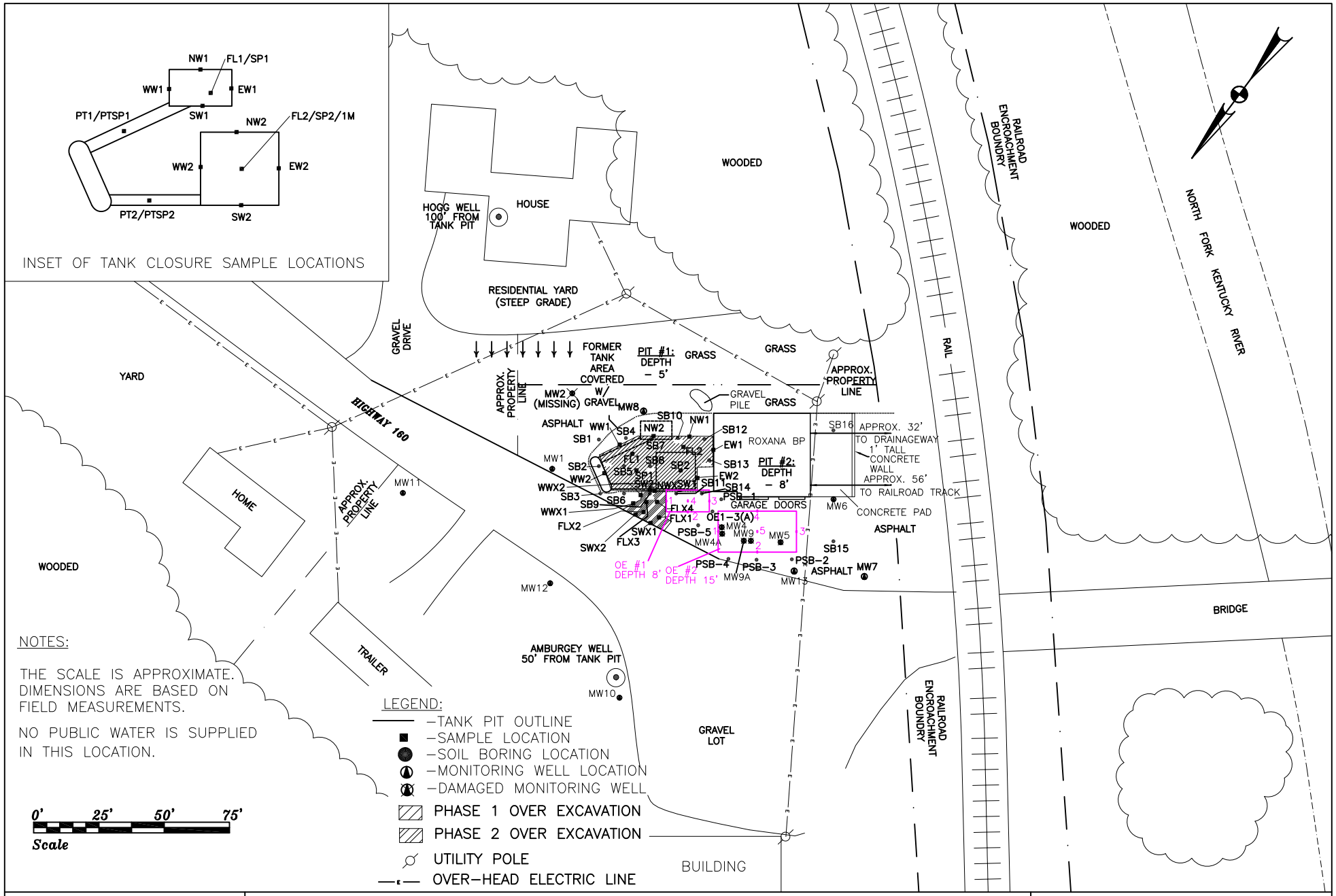
David E. Joslyn, P.G.
Project Manager

Cc: HMB file, 9216

FIGURES/MAPS



MAY 2020

PROJECT No. 9216
DRAWN BY: TB
EDITED BY: DEJ

SITE MAP
ROXANA BP
HIGHWAY 160 SOUTH
ROXANA, KENTUCKY (LETCHER COUNTY)

AI# 59860

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MAY 2020

PROJECT No. 9216
DRAWN BY: DEJ
EDITED BY: DEJ

AERIAL PHOTOGRAPH SITE MAP
ROXANA BP
HIGHWAY 160 SOUTH
ROXANA, KENTUCKY (LETCHER COUNTY)

AI# 59860

HMB
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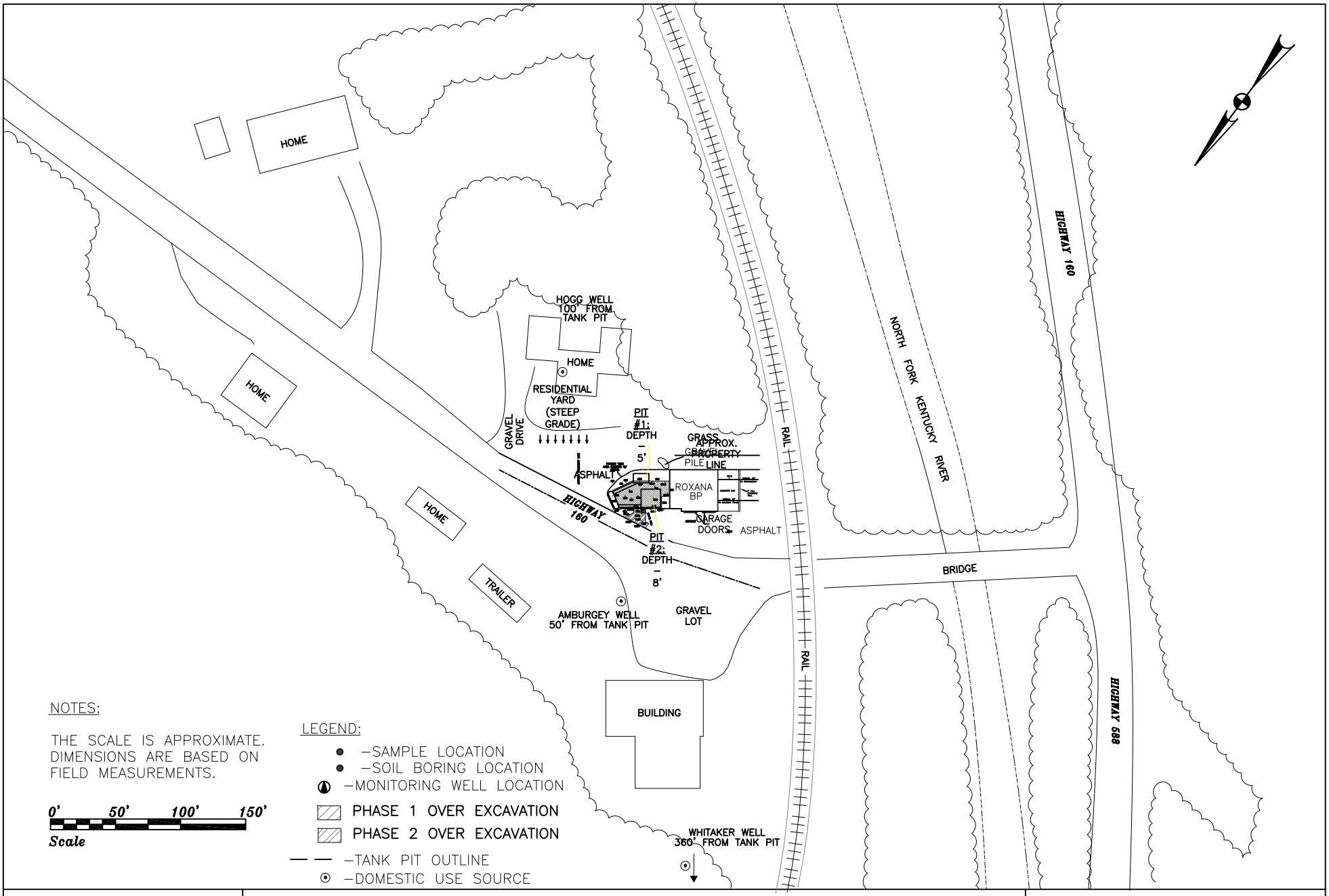
FRANKFORT, KY 40601



NOTES:

THE SCALE IS APPROXIMATE. DIMENSIONS ARE BASED ON FIELD MEASUREMENTS.

0' 50' 100' 150'
Scale

LEGEND:

- –SAMPLE LOCATION
- –SOIL BORING LOCATION
- –MONITORING WELL LOCATION
- PHASE 1 OVER EXCAVATION
- PHASE 2 OVER EXCAVATION
- –TANK PIT OUTLINE
- –DOMESTIC USE SOURCE

DECEMBER 2015

PROJECT No. 9216
DRAWN BY: RDJ
CHECKED BY: SC

VICINITY MAP
ROXANA BP
HIGHWAY 160 SOUTH
ROXANA, KENTUCKY (LETCHER COUNTY)
AI# 59860

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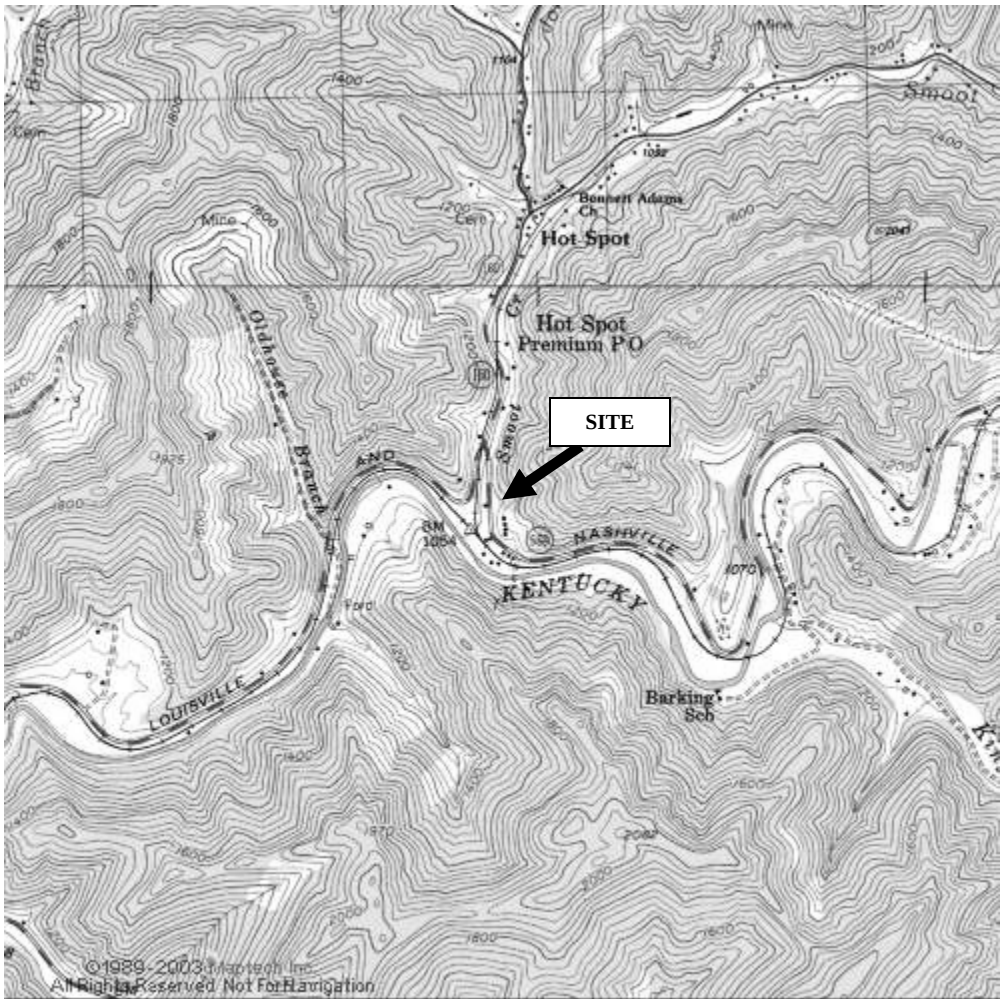
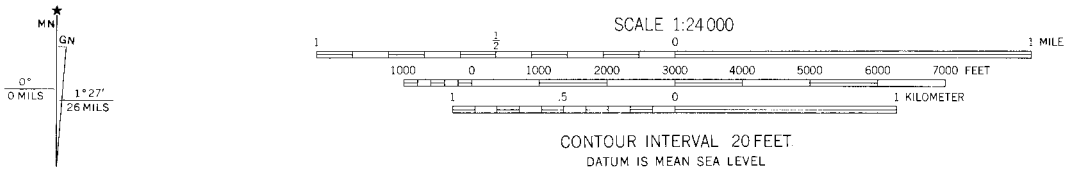
FRANKFORT, KY 40601

HAWORTH, MEYER & BOLEYN, INC.

ENGINEERS•ARCHITECTS•PLANNERS





ROXANA BP, PROJECT # 9216

HIGHWAY 160 S.
ROXANA, KY (LETCHER COUNTY)
UST ID # 6892-067

FIGURE 1

ROXANA QUADRANGLE KENTUCKY 7.5-MINUTE SERIES (TOPOGRAPHIC)

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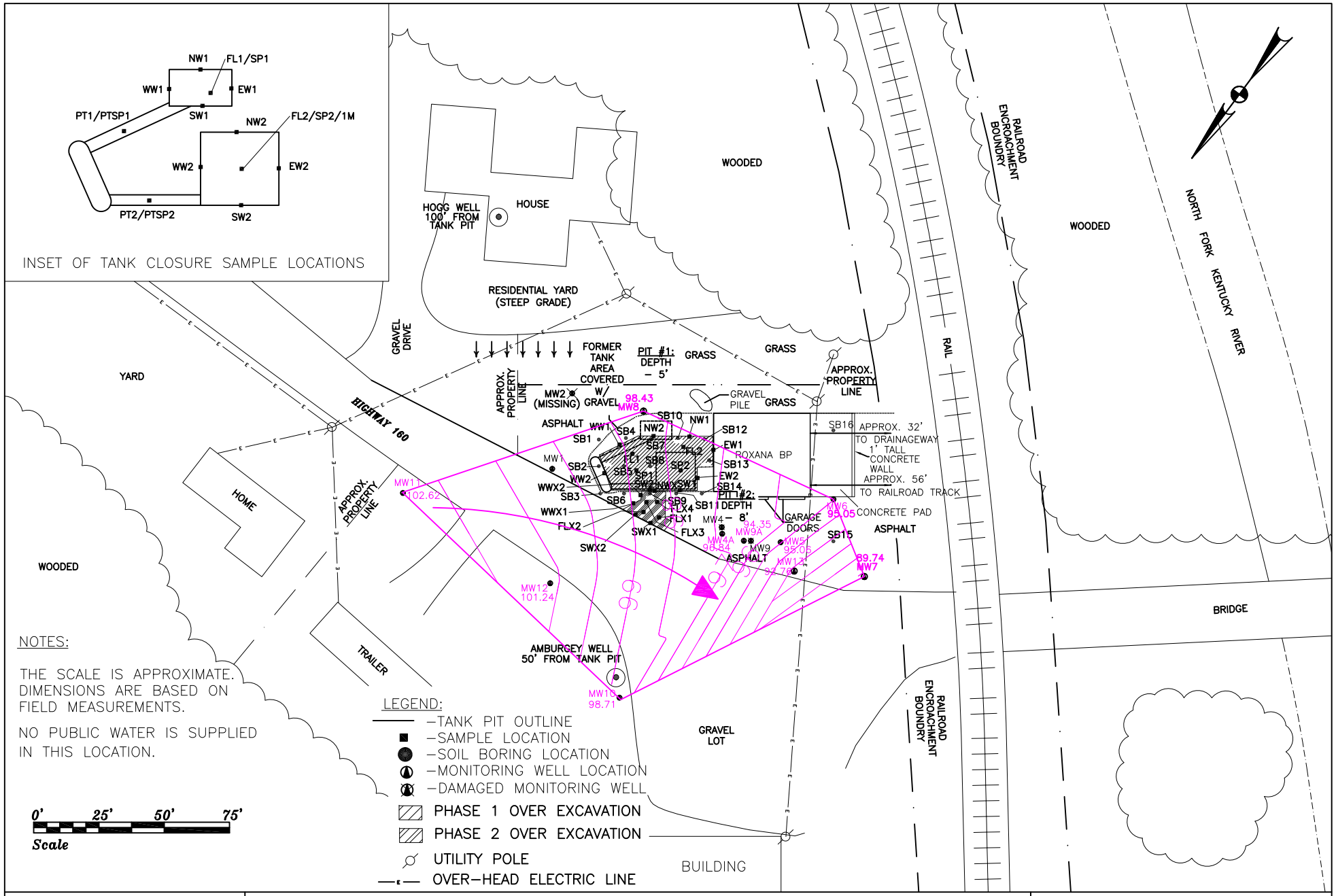
Qal	**Alluvium** (Quaternary - Quaternary)
Pbmi	**Middle part of Breathitt Group** (Lower Pennsylvanian - Middle Pennsylvanian)
Pfc	**Four Corners Formation** (Lower Pennsylvanian - Middle Pennsylvanian)
Ph	**Hyden Formation** (Lower Pennsylvanian - Middle Pennsylvanian)
Ppk	**Pikeville Formation** (Lower Pennsylvanian - Middle Pennsylvanian)
Pg	**Grundy Formation** (Lower Pennsylvanian - Middle Pennsylvanian)
Pbl	**Lower part of Breathitt Group** (Lower Pennsylvanian - Middle Pennsylvanian)
Pah	**Hensley Member of Alvy Creek Formation** (Lower Pennsylvanian - Middle Pennsylvanian)
Mpg	**Pennington Formation (or Group)** (Upper Mississippian - Upper Mississippian)
Mnu	**Newman Limestone, Upper Member** (Upper Mississippian - Upper Mississippian)
Mnl	**Newman Limestone, Lower Member** (Upper Mississippian - Upper Mississippian)
Mgr	**Grainger Formation** (Lower Mississippian - Lower Mississippian)
MDsbb	**Sunbury Shale, Berea Sandstone, and Bedford Shale** (Upper Devonian - Lower Mississippian)
Do	**Ohio Shale** (Middle Devonian - Upper Devonian)

ROXANA BP, PROJECT 9216

KY 160 S

ROXANA, KY (LETCHER COUNTY) 41339 AI# 59860

ROXANA QUADRANGLE KENTUCKY 7.5-MINUTE SERIES (GEOLOGIC)



DECEMBER 2015

PROJECT No. 9216
DRAWN BY: RDJ
CHECKED BY: SC

POTENTIOMETRIC MAP
ROXANA BP
HIGHWAY 160 SOUTH
ROXANA, KENTUCKY (LETCHER COUNTY)

AI# 59860

HMB PROFESSIONAL ENGINEERS, INC

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TABLES

SUMMARY OF SOIL BTEX ANALYTICAL RESULTS
ROXANA BP
AI NO. 59860
HIGHWAY 160 SOUTH, ROXANA, LETCHER COUNTY, KY
PROJECT NO. 9216

			BTEX RESULTS (milligrams per kilogram)				
SAMPLE ID	**LOCATION**	**DATE COLLECTED**	**BENZENE**	**TOLUENE**	**ETHYL-BENZENE**	**XYLENE**	**SAMPLE STATUS**
CLASS B SOIL TABLE II SCREENING LEVELS			0.01	0.5	0.4	3	
P1 NW1	North Wall	08/01/01	<0.01	<0.5	<0.4	<3.0	Below Allowable Levels
P1 SW1	South Wall	08/01/01	<0.01	<0.5	<0.4	<3.0	Below Allowable Levels
P1 EW1	East Wall	08/01/01	**0.036**	<0.5	<0.4	<3.0	Over-Excavated
P1 WW1	West Wall	08/01/01	<0.01	<0.5	<0.4	<3.0	Below Allowable Levels
P1 FL1	Floor	08/01/01	<0.01	<0.5	<0.4	<3.0	Below Allowable Levels
P1 SP1	Stockpile	08/01/01	<0.01	<0.5	<0.4	<3.0	Below Allowable Levels
P1 PT1	Pipe Trench	08/01/01	**1.7**	**9.8**	**6.6**	**49**	Over-Excavated
P1 PTSP1	Pipe Trench Stockpile	08/01/01	**5.6**	<0.5	**23**	**41**	Over-Excavated
P2 NW2	North Wall	08/01/01	**1.6**	**0.95**	**4.5**	**9.3**	Over-Excavated
P2 SW2	South Wall	08/01/01	**7.3**	**22**	**52**	**170**	Over-Excavated
P2 EW2	East Wall	08/01/01	**0.24**	<0.5	<0.4	<3.0	Over-Excavated
P2 WW2	West Wall	08/01/01	**2.3**	**1.2**	**4.3**	**5.9**	Over-Excavated
P2 FL2	Floor	08/01/01	**0.28**	<0.5	<0.4	<3.0	Over-Excavated
P2 SP2	Stockpile	08/01/01	**4.2**	**13**	**7.8**	**52**	Over-Excavated
P2 PT2	Pipe Trench	08/01/01	**2.3**	**1.5**	**8.9**	**25**	Over-Excavated
P2 PTSP2	Pipe Trench Stockpile	08/01/01	**2.5**	**1.2**	**12**	**50**	Over-Excavated
P2 1M	1 Meter Assessment	08/01/01	**0.075**	<0.5	<0.4	<3.0	Over-Excavated
SB1	0-3'	12/31/02	0.0037	<0.025	0.017	0.045	Below Allowable Levels
SB1	3-6'	12/31/02	0.0025	<0.025	0.0037	0.014	Below Allowable Levels
SB1	6'	12/31/02	<0.0025	<0.025	<0.0025	0.01	Below Allowable Levels
SB2	0-3'	12/30/02	0.004	<0.025	0.0056	0.02	Below Allowable Levels
SB2	3-6'	12/30/02	<0.0025	<0.025	0.0056	0.019	Below Allowable Levels
SB3	0-3'	12/30/02	0.0071	<0.025	0.016	0.055	Below Allowable Levels
SB3	3-6'	12/30/02	<0.0025	<0.025	0.01	0.03	Below Allowable Levels
SB4	0-3'	12/31/02	0.0026	<0.025	0.0076	0.033	Below Allowable Levels
SB4	3-6'	12/31/02	<0.0026	<0.025	<0.0025	<0.0075	Below Allowable Levels
SB4	6'	12/31/02	<0.0025	<0.025	0.0077	0.026	Below Allowable Levels
SB5	0-4'	12/30/02	**0.038**	<0.25	**4.7**	1.3	Over-Excavated
SB6	0-3'	12/30/02	**0.24**	<0.025	**1.3**	0.2	Over-Excavated
SB6	3-6'	12/30/02	**0.29**	<0.5	**5.2**	1.7	Over-Excavated
SB7	3-7.3'	12/31/02	**0.66**	**1.8**	**4.6**	**12**	Over-Excavated
SB7	7.3'	12/31/02	<0.0025	<0.025	<0.0025	<0.0075	Below Allowable Levels

NOTES:

*Indicates detection limit set higher than screening levels

Results in **BOLD** indicate values above Allowable Levels

SUMMARY OF SOIL BTEX ANALYTICAL RESULTS
ROXANA BP
AI NO. 59860
HIGHWAY 160 SOUTH, ROXANA, LETCHER COUNTY, KY
PROJECT NO. 9216

			BTEX RESULTS (milligrams per kilogram)				
SAMPLE ID	**LOCATION**	**DATE COLLECTED**	**BENZENE**	**TOLUENE**	**ETHYL-BENZENE**	**XYLENE**	**SAMPLE STATUS**
CLASS B SOIL TABLE II SCREENING LEVELS			0.01	0.5	0.4	3	
SB8	3-7'	12/30/02	**0.35**	**0.51**	**1.2**	1.2	Over-Excavated
SB8	7'	12/30/02	<0.0025	<0.025	0.011	0.032	Below Allowable Levels
SB9	3-8.3'	12/30/02	<0.05*	**6**	**6.3**	2	Over-Excavated
SB10	3-8'	12/31/02	**0.56**	<1.2*	**5.5**	**12**	Over-Excavated
SB10	8'	12/31/02	<0.0025	<0.025	0.0032	0.028	Below Allowable Levels
SB11	3-8'	12/30/02	**0.055**	0.065	0.028	0.071	Over-Excavated
SB11	8-9.5'	12/30/02	**0.19**	**0.99**	**0.73**	2.3	Over-Excavated
SB12	3-8'	12/31/02	**0.49**	<0.25	**1.5**	**4.6**	Over-Excavated
SB12	8-9.7'	12/31/02	**0.018**	<0.025	0.032	0.16	Over-Excavated
SB12	9.7'	12/31/02	<0.0025	<0.025	0.0037	0.017	Below Allowable Levels
SB13	3-8'	12/31/02	**2.5**	**4**	**16**	**54**	Over-Excavated
SB13	8-11'	12/31/02	**2.1**	<1.2*	**19**	**64**	Over-Excavated
SB13	11'	12/31/02	<0.0025	<0.025	0.0052	0.018	Below Allowable Levels
SB14	3-8'	12/30/02	**0.42**	**1.2**	0.18	0.9	Over-Excavated
SB14	8-10'	12/30/02	**0.053**	**0.8**	**0.88**	2.5	Over-Excavated
SB14	10'	12/30/02	**0.017**	0.27	0.15	0.72	Over-Excavated
MW-1	3-8'	12/30/02	<0.0025	<0.025	<0.0025	0.024	Below Allowable Levels
MW-1	8'	12/30/02	<0.0025	<0.025	0.0063	0.024	Below Allowable Levels
MW-2	3-4.2'	12/31/02	<0.0025	<0.025	0.011	0.039	Below Allowable Levels
MW-2	4.2'	12/31/02	<0.0025	<0.025	<0.0025	0.01	Below Allowable Levels
MW-4	3-8'	12/31/02	**0.03**	<0.025	0.071	0.2	Over-Excavated
MW-4	8-11'	12/30/02	**0.037**	<0.025	0.012	0.036	Over-Excavated
MW-4	11'	12/30/02	<0.0025	<0.025	<0.0025	<0.0075	Below Allowable Levels
SB15	3-8'	03/23/04	0.0014	<0.005	0.0012	0.012	Below Allowable Levels
SB15	8-13'	03/23/04	<0.0025	0.025	<0.0025	<0.0075	Below Allowable Levels
MW-5	3-8'	03/23/04	**0.4**	<0.25	**0.81**	1.6	Over-Excavated
MW-5	8-13'	03/23/04	0.0065	<0.025	0.11	0.077	Below Allowable Levels
MW-6	3-8'	03/23/04	0.0091	<0.025	0.0026	<0.0075	Below Allowable Levels
MW-6	8-13';	03/23/04	0.0045	<0.025	<0.0025	<0.0075	Below Allowable Levels
SB16	3-8'	03/23/04	<0.0025	<0.025	<0.0025	<0.00075	Below Allowable Levels
SB16	8-13'	03/23/04	<0.0025	<0.025	<0.0025	<0.00075	Below Allowable Levels

NOTES:

*Indicates detection limit set higher than screening levels

Results in **BOLD** indicate values above Allowable Levels

SUMMARY OF SOIL BTEX ANALYTICAL RESULTS
ROXANA BP
AI NO. 59860
HIGHWAY 160 SOUTH, ROXANA, LETCHER COUNTY, KY
PROJECT NO. 9216

			BTEX RESULTS (milligrams per kilogram)				
SAMPLE ID	**LOCATION**	**DATE COLLECTED**	**BENZENE**	**TOLUENE**	**ETHYL-BENZENE**	**XYLENE**	**SAMPLE STATUS**
CLASS B SOIL TABLE II SCREENING LEVELS			0.01	0.5	0.4	3	
SP1	Stockpile	04/18/07	**0.45**	<2.5*	**8.2**	**19**	Over-Excavated
SP2	Stockpile	04/18/07	**0.45**	<1.2*	**7.1**	**4.6**	Over-Excavated
NW1	North Wall	04/19/07	<0.0025	<0.025	<0.0025	<0.0075	Below Allowable Levels
NW2	North Wall	04/19/07	<0.0025	<0.025	0.0033	<0.0075	Below Allowable Levels
SW1	South Wall	04/19/07	**0.054**	0.26	0.29	1.6	Over-Excavated
SW2	South Wall	04/19/07	**3.5**	**14**	**16**	**81**	Over-Excavated
EW1	East Wall	04/19/07	**1.2**	**3.1**	**9.4**	**32**	Re-Sampled by EW-1 (20)
EW2	East Wall	04/19/07	**1.3**	**4.4**	**13**	**27**	Re-Sampled by EW-2 (20)
WW1	West Wall	04/19/07	0.005	<0.025	0.0038	0.014	Below Allowable Levels
WW2	West Wall	04/19/07	0.0093	<0.025	0.049	<0.0075	Below Allowable Levels
FL1	Floor	04/19/07	**0.012**	0.046	0.13	0.69	Re-Sampled by FL-1 (20)
FL2	Floor	04/19/07	**0.14**	**0.57**	**1.1**	**5**	Re-Sampled by FL-2 (20)
FLX1	Floor	08/29/07	<0.0025	<0.025	<0.0025	<0.0075	Below Allowable Levels
FLX2	Floor	08/29/07	<0.0025	<0.025	<0.0025	<0.0075	Below Allowable Levels
SWX1	South Wall	08/29/07	<0.0025	<0.025	<0.0025	<0.0075	Below Allowable Levels
SWX2	South Wall	08/29/07	<0.0025	<0.025	<0.0025	<0.0075	Below Allowable Levels
WWX1	West Wall	08/29/07	<0.0025	<0.025	<0.0025	<0.0075	Below Allowable Levels
NWX	North Wall	08/30/07	<0.0025	<0.025	<0.0025	<0.0075	Below Allowable Levels
WWX2	West Wall	08/30/07	<0.0025	<0.025	<0.0025	<0.0075	Below Allowable Levels
FLX3	Floor	08/30/07	<0.0025	<0.025	<0.0025	<0.0075	Below Allowable Levels
FLX4	Floor	08/30/07	<0.0025	<0.025	<0.0025	<0.0075	Below Allowable Levels
SB6A	4-6'	05/20/14	<0.0025	<0.025	<0.0025	<0.0075	Below Allowable Levels
SB11A	3-5'	05/20/14	**1.1**	<0.025	**3.6**	**15**	Over-Excavated
SB14A	3-5'	05/20/14	**1.5**	<0.025	**6.5**	**32**	Over-Excavated
MW4A	0-2'	05/20/14	**1.7**	<0.025	**4.2**	2.4	Over-Excavated
MW4A	2-4'	05/20/14	**1.8**	<0.025	**22**	**44**	Over-Excavated
MW4A	4-6'	05/20/14	0.0063	<0.025	0.0039	0.059	Below Allowable Levels
MW4A	6-8'	05/20/14	0.0068	<0.025	0.0096	0.094	Below Allowable Levels
MW4A	8-10'	05/20/14	0.0047	<0.025	0.039	0.078	Below Allowable Levels
MW4A	10'	05/20/14	<0.0025	<0.025	<0.0025	<0.0075	Below Allowable Levels

NOTES:

*Indicates detection limit set higher than screening levels

Results in **BOLD** indicate values above Allowable Levels

SUMMARY OF SOIL BTEX ANALYTICAL RESULTS
ROXANA BP
AI NO. 59860
HIGHWAY 160 SOUTH, ROXANA, LETCHER COUNTY, KY
PROJECT NO. 9216

			BTEX RESULTS (milligrams per kilogram)				
SAMPLE ID	**LOCATION**	**DATE COLLECTED**	**BENZENE**	**TOLUENE**	**ETHYL-BENZENE**	**XYLENE**	**SAMPLE STATUS**
CLASS B SOIL TABLE II SCREENING LEVELS			0.01	0.5	0.4	3	
MW5A	0-2'	05/20/14	<0.0025	<0.025	0.014	0.04	Below Allowable Levels
MW5A	2-4'	05/20/14	<0.0025	<0.025	<0.0025	<0.0075	Below Allowable Levels
MW5A	4-6'	05/20/14	**0.032**	<0.025	0.017	0.038	Over-Excavated
MW5A	6-8'	05/20/14	<0.0025	<0.025	<0.0025	0.014	Below Allowable Levels
MW5A	8-10'	05/20/14	<0.0025	<0.025	<0.0025	<0.0075	Below Allowable Levels
MW5A	10-12'	05/20/14	<0.0025	<0.025	0.0093	0.016	Below Allowable Levels
MW9A	0-2'	05/20/14	<0.0025	<0.025	<0.0025	<0.0075	Below Allowable Levels
MW9A	2-4'	05/20/14	0.0099	<0.025	<0.0025	<0.0075	Below Allowable Levels
MW9A	4-6'	05/20/14	**0.042**	<0.025	0.0031	0.047	Over-Excavated
MW9A	6-8'	05/20/14	<0.0025	<0.025	<0.0025	0.0078	Below Allowable Levels
MW9A	8-10'	05/20/14	<0.0025	<0.025	<0.0025	<0.0075	Below Allowable Levels
MW9A	10-12'	05/20/14	<0.0025	<0.025	<0.0025	<0.0075	Below Allowable Levels
X1A	0-2'	05/20/14	**0.083**	<0.025	2.4	1.5	Re-Sampled by X1 (15)
X1A	2-4'	05/20/14	**0.43**	<0.025	2.2	1.4	Re-Sampled by X1 (15)
X1A	4-6'	05/20/14	0.0052	<0.025	0.016	0.022	Below Allowable Levels
X1A	6-8'	05/20/14	<0.0025	<0.025	0.0036	<0.0075	Below Allowable Levels
X1A	8'	05/20/14	**0.029**	<0.025	0.093	0.14	Re-Sampled by X1 (15)
X2A	0-2'	05/20/14	0.0026	<0.025	<0.0025	<0.0075	Below Allowable Levels
X2A	2-4'	05/20/14	<0.0025	<0.025	<0.0025	<0.0075	Below Allowable Levels
X2A	4-6'	05/20/14	<0.0025	<0.025	<0.0025	<0.0075	Below Allowable Levels
X2A	6-8'	05/20/14	<0.0025	<0.025	<0.0025	<0.0075	Below Allowable Levels
X2A	8-10'	05/20/14	<0.0025	<0.025	<0.0025	<0.0075	Below Allowable Levels
X2A	10-12'	05/20/14	<0.0025	<0.025	<0.0025	<0.0075	Below Allowable Levels
X1	2-4'	10/28/15	<0.0025	<0.025	<0.0025	<0.0075	Below Allowable Levels
X1	5-7'	10/28/15	<0.0025	<0.025	<0.0025	<0.0075	Below Allowable Levels
SB11	3-5'	10/28/15	**0.896**	<0.025	**5.17**	**24.2**	Over-Excavated
SB14	3-5'	10/28/15	**0.631**	**1.43**	**1.84**	**3.02**	Over-Excavated
MW5	4-6'	10/28/15	**0.181**	**0.578**	**0.889**	1.2	Over-Excavated
MW4A	2-4'	10/28/15	<0.0025	<0.025	<0.0025	<0.0075	Below Allowable Levels
MW4A	10-12'	10/28/15	0.00453	<0.025	<0.0025	0.0114	Below Allowable Levels
MW9A	2-4'	10/28/15	**0.0137**	<0.025	0.017	0.0566	Over-Excavated
MW9A	10-12'	10/28/15	**0.152**	0.248	0.133	0.176	Over-Excavated

NOTES:

*Indicates detection limit set higher than screening levels

Results in **BOLD** indicate values above Allowable Levels

SUMMARY OF SOIL BTEX ANALYTICAL RESULTS
ROXANA BP
AI NO. 59860
HIGHWAY 160 SOUTH, ROXANA, LETCHER COUNTY, KY
PROJECT NO. 9216

			BTEX RESULTS (milligrams per kilogram)				
SAMPLE ID	**LOCATION**	**DATE COLLECTED**	**BENZENE**	**TOLUENE**	**ETHYL-BENZENE**	**XYLENE**	**SAMPLE STATUS**
CLASS B SOIL TABLE II SCREENING LEVELS			0.01	0.5	0.4	3	
OE1-1	N/A	09/19/16	**0.597**	<0.480	**3.03**	**3.21**	Re-Sampled by OE1-1(20)
OE1-2	N/A	09/19/16	**0.758**	**0.747**	**1.98**	1.24	Re-Sampled by PSB-5
OE1-3	N/A	09/19/16	**10.7**	**6.01**	**36.1**	**81.3**	Re-Sampled by OE1-3(A)
OE1-4	N/A	09/19/16	**0.0856**	0.0703	0.177	0.351	Re-Sampled by OE1-4(20)
OE2-1	N/A	09/19/16	**0.0183**	0.0132	0.0135	0.0222	Re-Sampled by PSB-5
OE2-2	N/A	09/19/16	**0.0619**	<0.005	0.0559	0.0709	Re-Sampled by PSB-3
OE-2-3	N/A	09/19/16	0.00203	<0.005	0.00128	0.00193	Below Allowable Levels
OE2-4	N/A	09/19/16	0.00457	<0.005	0.00273	0.00585	Below Allowable Levels
OE2-5	N/A	09/19/16	**0.0135**	0.0142	0.0117	0.0264	Re-Sampled by OE2-5(20)
OE1-3(A)	4-8'	12/05/17	0.00191	<0.0050	0.00371	0.0108	Below Allowable Levels
PSB-1	2-4'	12/05/17	**0.0263**	0.0302	0.112	0.166	Re-Sampled by PSB-1(20)
PSB-1	4-6'	12/05/17	0.00423	<0.0050	0.00384	0.0107	Below Allowable Levels
PSB-1	6-8'	12/05/17	0.00185	<0.0050	0.000941	0.00341	Below Allowable Levels
PSB-2	2-4'	12/05/17	0.00147	<0.0050	0.00116	0.00367	Below Allowable Levels
PSB-2	4-6'	12/05/17	0.00752	0.0106	0.0383	0.0684	Below Allowable Levels
PSB-2	6-8'	12/05/17	<0.00050	<0.0050	<0.00050	<0.0015	Below Allowable Levels
PSB-2	8-10'	12/05/17	<0.00050	<0.0050	<0.00050	<0.0015	Below Allowable Levels
PSB-3	2-4'	12/05/17	**0.0146**	0.0142	0.0506	0.0861	Re-Sampled by PSB-3(20)
PSB-3	4-6'	12/05/17	0.00202	<0.0050	0.0174	0.0179	Below Allowable Levels
PSB-3	6-8'	12/05/17	<0.00050	<0.0050	0.000636	0.00225	Below Allowable Levels
PSB-3	8-10'	12/05/17	<0.00050	<0.0050	<0.00050	<0.0015	Below Allowable Levels
PSB-4	2-4'	12/05/17	0.00687	0.00632	0.00248	0.00899	Below Allowable Levels
PSB-4	4-6'	12/05/17	0.00176	<0.0050	0.0052	0.0077	Below Allowable Levels
PSB-4	6-8'	12/05/17	<0.00050	<0.0050	<0.00050	<0.0015	Below Allowable Levels
PSB-4	8-10'	12/05/17	<0.00050	<0.0050	<0.00050	<0.0015	Below Allowable Levels
PSB-5	2-4'	12/05/17	0.00589	0.00618	0.00225	0.00552	Below Allowable Levels
PSB-5	4-6'	12/05/17	**0.0142**	0.00721	0.00581	0.0177	Re-Sampled by PSB-5(20)
PSB-5	6-8'	12/05/17	0.000761	<0.0050	0.0012	0.00345	Below Allowable Levels
PSB-5	7-9'	12/05/17	0.00124	<0.0050	0.00128	0.0033	Below Allowable Levels

NOTES:

*Indicates detection limit set higher than screening levels

Results in **BOLD** indicate values above Allowable Levels

SUMMARY OF SOIL BTEX ANALYTICAL RESULTS
ROXANA BP
AI NO. 59860
HIGHWAY 160 SOUTH, ROXANA, LETCHER COUNTY, KY
PROJECT NO. 9216

			BTEX RESULTS (milligrams per kilogram)				
SAMPLE ID	**LOCATION**	**DATE COLLECTED**	**BENZENE**	**TOLUENE**	**ETHYL-BENZENE**	**XYLENE**	**SAMPLE STATUS**
CLASS B SOIL TABLE II SCREENING LEVELS			0.01	0.5	0.4	3	
FL-2	6-8'	03/12/20	<0.0010	<0.0050	<0.00250	<0.00650	Below Allowable Levels
FL-1	6-7.3'	03/12/20	<0.0010	<0.0050	<0.00250	<0.00650	Below Allowable Levels
EW-1	4-6'	03/12/20	<0.0010	<0.0050	<0.00250	<0.00650	Below Allowable Levels
EW-2	2-4'	03/12/20	<0.0010	<0.0050	<0.00250	<0.00650	Below Allowable Levels
OE1-1	4-6'	03/12/20	<0.0010	<0.0050	<0.00250	<0.00650	Below Allowable Levels
OE1-4	4-6'	03/12/20	<0.0010	<0.0050	<0.00250	0.00736	Below Allowable Levels
PSB-5	4-6'	03/12/20	<0.0010	<0.0050	0.00570	<0.00650	Below Allowable Levels
PSB-1	2-4'	03/12/20	<0.0010	<0.0050	<0.00250	<0.00650	Below Allowable Levels
OE2-5	2-4'	03/12/20	<0.0010	<0.0050	<0.00250	<0.00650	Below Allowable Levels
PSB-3	2-4'	03/12/20	0.00105	<0.0050	0.00128	0.00670	Below Allowable Levels

NOTES:

*Indicates detection limit set higher than screening levels

Results in **BOLD** indicate values above Allowable Levels

SUMMARY OF GROUNDWATER BTEX ANALYTICAL RESULTS

ROXANA BP

AI NO. 59860

HIGHWAY 160 SOUTH, ROXANA, LETCHER COUNTY, KY

PROJECT NO. 9216

		BTEX RESULTS (milligrams per liter)			
SAMPLE ID	DATE COLLECTED	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE
GROUNDWATER TABLE I SCREENING LEVELS		**0.007**	**0.94**	**0.47**	**5.89**
PIT-1 GW	08/01/01	**0.72**	**3.2**	<0.70*	<10*
MW1	01/09/03	<0.00050	<0.0050	<0.00050	<0.0015
	04/05/04	<0.00050	<0.0050	<0.00050	<0.0015
	08/29/07	<0.00050	<0.0050	<0.00050	<0.0015
	12/05/07	<0.00050	<0.0050	<0.00050	<0.0015
	07/15/09	<0.00050	<0.0050	<0.00050	<0.0015
	10/28/10	<0.0005	<0.005	<0.0005	<0.0015
MW2	01/09/03	<0.00050	<0.0050	<0.00050	<0.0015
	04/05/04	<0.00050	<0.0050	<0.00050	<0.0015
	08/29/07	<0.00050	<0.0050	<0.00050	<0.0015
MW4	01/09/03	**0.18**	0.0081	0.25	0.0044
	04/05/04	**0.26**	<0.050	**0.81**	0.57
	08/29/07	**0.31**	0.057	**0.94**	0.3
	12/05/07	**0.2**	<0.050	**0.49**	0.12
	07/15/09	**0.16**	0.026	0.46	0.092
MW4A	12/03/15	**0.357**	0.0144	**0.542**	0.105
	09/19/16	Well Abandoned			
MW5	04/05/04	**0.14**	0.011	0.18	0.29
	08/29/07	**0.026**	0.0088	0.015	0.014
	12/05/07	**0.14**	<0.050	0.041	0.058
	07/15/09	**0.025**	0.0062	0.0062	0.011
	10/28/10	<0.0005	<0.005	0.0005	0.0062
	06/17/13	**0.033**	<0.0050	0.0078	0.016
	02/17/14	0.0048	<0.005	0.0018	0.0036
	12/03/15	**0.0483**	0.0139	0.00885	0.0247
	09/19/16	Well Abandoned			

NOTES:

Results in **BOLD** indicate values above Allowable Levels

*Indicates detection limit set higher than screening levels

SUMMARY OF GROUNDWATER BTEX ANALYTICAL RESULTS

ROXANA BP

AI NO. 59860

HIGHWAY 160 SOUTH, ROXANA, LETCHER COUNTY, KY

PROJECT NO. 9216

		BTEX RESULTS (milligrams per liter)			
SAMPLE ID	DATE COLLECTED	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE
GROUNDWATER TABLE I SCREENING LEVELS		**0.007**	**0.94**	**0.47**	**5.89**
MW6	04/05/04	<0.00050	<0.0050	<0.00050	<0.0015
MW7	10/28/10	<0.0005	<0.005	<0.0005	<0.0015
	06/17/13	<0.0005	<0.005	<0.0005	<0.0015
MW8	06/17/13	<0.0005	<0.005	<0.0005	<0.0015
MW9	06/17/13	**0.1**	0.008	0.0098	0.075
MW9A	12/03/15	**0.0836**	<0.005	0.121	0.0542
	09/19/16	Well Abandoned			
MW10	06/17/13	<0.0005	<0.005	<0.0005	<0.0015
	12/03/15	<0.0005	<0.005	<0.0005	<0.0015
MW11	06/17/13	<0.0005	<0.005	<0.0005	<0.0015
	12/03/15	<0.0005	<0.005	<0.0005	<0.0015
MW12	06/17/13	<0.0005	<0.005	<0.0005	<0.0015
	12/03/15	<0.0005	<0.005	<0.0005	<0.0015
MW13	12/03/15	<0.0005	<0.005	<0.0005	<0.0015
Amburgey DUW	02/17/14	<0.0005	<0.005	<0.0005	<0.0015

NOTES:

Results in **BOLD** indicate values above Allowable Levels

*Indicates detection limit set higher than screening levels

GROUNDWATER ELEVATION AND MONITORING WELL DATA TABLE

ROXANA BP

AI NO. 59860

HIGHWAY 160 SOUTH, ROXANA, LETCHER COUNTY, KENTUCKY

PROJECT NO. 9216

Monitoring Well #	Date Sampled	AKGWA #	Depth of Well (ft.)	Depth to Water (ft.)	Top of Casing Elevation (relative ft.)	Groundwater Elevation (relative ft.)	Screened Interval (ft.)	Description/Notes
MW-1	1/9/2003	8004-6485	7.00	0.74	101.16	100.42	4.5-7	N/A
MW-2	1/9/2003	8004-6486	5.00	1.29	101.16	99.87	4-5	N/A
MW-4	1/9/2003	8004-6487	12.00	1.00	98.35	97.35	4.5-12	N/A
MW-1	4/5/2004	8004-6485	7.00	1.68	96.98	95.30	4.5-7	N/A
MW-2	4/5/2004	8004-6486	5.00	1.20	96.98	95.78	4-5	N/A
MW-4	4/5/2004	8004-6487	12.00	1.45	94.17	92.72	4.5-12	N/A
MW-5	4/5/2004	8005-0365	13.00	3.00	98.24	95.24	5-13	N/A
MW-6	4/5/2004	8005-0366	13	3.82	99.07	95.25	5-13	N/A
MW-1	8/29/2007	8004-6485	7.00	2.61	96.98	94.37	4.5-7	Murky; no odor
MW-2	8/29/2007	8004-6486	5.00	2.89	96.98	94.09	4-5	Murky; no odor
MW-4	8/29/2007	8004-6487	12.00	3.40	94.17	90.77	4.5-12	Clear; no odor
MW-5	8/29/2007	8005-0365	13.00	5.65	98.24	92.59	5-13	Clear; no odor
MW-1	12/5/2007	8004-6485	7	3.24	96.98	93.74	4.5-7'	Muddy; slight odor
MW-4	12/5/2007	8004-6487	12	2.72	94.17	91.45	4.5-12'	Turbid; slight odor
MW-5	12/5/2007	8005-0365	13	5.3	98.24	92.94	5-13'	Turbid; slight odor
MW-1	7/15/2009	8004-6485	7	3.3	96.98	93.68	4.5-7	Cloudy; no odor
MW-4	7/15/2009	8004-6487	12	2.75	94.17	91.42	4.5-12	Cloudy; slight odor
MW-5	7/15/2009	8005-0365	13	4.65	98.24	93.59	5-13	Cloudy; slight odor
MW-1	10/28/2010	8004-6485	7	4.34	96.98	92.64	4.5-7'	Very Murky / Slight Odor
MW-4	10/28/2010	8004-6487	12	-	-	-	4.5-12'	Damaged
MW-5	10/28/2010	8005-0365	13	6.68	98.24	91.56	5-13'	Cloudy / Slight Odor
MW-7	10/28/2010	8006-0268	20	9.55	95.31	85.76	10-20'	Clear / No Odor
MW-8	10/28/2010	8006-0269	5	-	100.44	-	3-5'	Dry

GROUNDWATER ELEVATION AND MONITORING WELL DATA TABLE

ROXANA BP

AI NO. 59860

HIGHWAY 160 SOUTH, ROXANA, LETCHER COUNTY, KENTUCKY

PROJECT NO. 9216

Monitoring Well #	Date Sampled	AKGWA #	Depth of Well (ft.)	Depth to Water (ft.)	Top of Casing Elevation (relative ft.)	Groundwater Elevation (relative ft.)	Screened Interval (ft.)	Description/Notes
MW-5	6/17/2013	8005-0365	13	3.51	98.24	94.73	5-13'	Clear; odor
MW-7	6/17/2013	8006-0268	20	5.10	95.31	90.21	10-20'	Muddy; no odor
MW-8	6/17/2013	8006-0269	5	3.63	100.44	96.81	3-5'	Murky, no odor
MW-9	6/17/2013	8006-4805	10	2.08	98.79	96.71	5-10'	Clear; no odor
MW-10	6/17/2013	8006-4806	7	3.06	101.21	98.15	5-7'	Cloudy; no odor
MW-11	6/17/2013	8006-4807	4	2.86	104.02	101.16	3-4'	Turbid; no odor
MW-12	6/17/2013	8006-4808	5	2.64	102.14	99.50	4-5'	Clear; no odor
MW-5	2/17/2014	8005-0365	13	1.28	98.24	96.96	5-13'	Cloudy, Slight Odor
MW-7	2/17/2014	8006-0268	20	4.86	95.31	90.45	10-20'	Not Sampled
MW-8	2/17/2014	8006-0269	5	1.72	100.44	98.72	3-5'	Not Sampled
MW-9	2/17/2014	8006-4805	10	Not	98.79	Located	5-10'	Not Located
MW-10	2/17/2014	8006-4806	7	2.72	101.21	98.49	5-7'	Not Sampled
MW-11	2/17/2014	8006-4807	4	2.46	104.02	101.56	3-4'	Not Sampled
MW-12	2/17/2014	8006-4808	5	1.27	102.14	100.87	4-5'	Not Sampled
MW5	12/3/2015	8005-0365	13	3.18	98.24	95.06	5-13'	Cloudy; odor
MW6	12/3/2015	8005-0366	13	4.02	99.07	95.05	5-13	Clear; no odor
MW7	12/3/2015	8006-0268	20	5.57	95.31	89.74	10-20'	Clear; no odor
MW8	12/3/2015	8006-0269	5	2.01	100.44	98.43	3-5'	Clear; no odor
MW9A	12/3/2015	8007-0818	12	3.64	97.99	94.35	5-12'	Cloudy; odor
MW10	12/3/2015	8006-4806	7	2.50	101.21	98.71	5-7'	Cloudy; no odor
MW11	12/3/2015	8006-4807	4	1.40	104.02	102.62	3-4'	Clear; no odor
MW12	12/3/2015	8006-4808	5	0.90	102.14	101.24	4-5'	Turbid/coudy; slight odor
MW13	12/3/2015	8007-0819	12	5.01	97.77	92.76	5-12'	Cloudy; no odor

ATTACHMENT A
UST Branch Letter

MATTHEW G. BEVIN
GOVERNOR

CHARLES G. SNAVELY
SECRETARY

ANTHONY R. HATTON
COMMISSIONER

ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION

300 SOWER BOULEVARD
FRANKFORT, KENTUCKY 40601

July 16, 2019

HMB
9216 - 010

STEVEN BATES
PO BOX 27
ROXANA KY 41848

Re: Site Investigation Report Request
Agency Interest Number (AI #): 59860 UST ID #: 6892067
ROXANA BP
US 160 S
Roxana, Letcher County
Incident #: 63197 PSTEAF Application #: 104333

Dear Mr. Bates:

A review of the information submitted on January 24, 2018 by HMB has been performed by the Underground Storage Tank (UST) Branch personnel. The applicable regulation has been verified as 2019 Regulation and the site classification screening levels are Class B, Matrix Table II for on-site soils and Groundwater Table 1 for on-site groundwater. The analyses indicate the presence of BTEX constituents above screening levels within the point of compliance. To further characterize the site, in accordance with KRS 224.60-105, KRS 224.60-135, and 401 KAR 42:060, the UST Branch directs the activities listed below.

This request does not identify all required information necessary for a technical complete determination. Failure to address all items required in the UST Corrective Action Manual, may result in delayed reimbursement.

Technical Requirements:

1. **Notification:** At least two (2) weeks prior to the initiation of fieldwork associated with this directive, notify Emmanuel Onejeme at Emmanuel.Onejeme@ky.gov so that a representative may have the opportunity to visit the site during field activities.
2. **Site Information and History:** Submit the items in accordance with Section 5.1 of UST Corrective Action Manual.
3. **Maps:** In accordance with Section 5.2 of the UST Corrective Action Manual, submit an:
   - Updated site map and other required maps
4. **Soil Data:** Advance soil borings in accordance with Section 5.3 of the UST Corrective Action Manual.
   - Soil borings shall be advanced as described in the following table and at the locations indicated on the enclosed soil boring location map.
   - Soil samples shall be collected in accordance with Section 5.4 of the Corrective Action Manual.
   - Drilling shall cease if bedrock is encountered prior to reaching the maximum termination depth.

Soil Location ID	Resample	Sample Interval (feet)	Max Termination Depth (feet)	Constituent
EW-1	☒	4-6	6	BTEX
EW-2	☒	4-6	6	BTEX
FL-1	☒	8-9	9	BTEX
FL-2	☒	15-16	16	BTEX
OE-1-1	☒	4-6	6	BTEX
OE1-4	☒	4-6	6	BTEX

Soil Location ID	Resample	Sample Interval (feet)	Max Termination Depth (feet)	Constituent
OE2-5	☒	4-6	6	BTEX
PSB-1	☒	2-4	4	BTEX
PSB-3	☒	2-4	4	BTEX
PSB-5	☒	4-6	6	BTEX
10 TOTAL Number of Soil Borings			**10 BTEX constituent samples**	

5. **Conclusions and Recommendations:** Provide conclusions and recommendations in accordance with Sections 5.8 and 5.9 of the UST Corrective Action Manual.
6. **Reporting Requirements:**
   - At a minimum, the Site Investigation Report shall include a descriptive narrative of the all applicable items listed on the UST Site Investigation Checklist (DWM 4269).
   - In accordance with Section 5.0 of the UST Corrective Action Manual, include a completed Site Investigation Checklist (DWM 4269) certified by a P.E. or P.G.
   - In accordance with Section 3.15 of the UST PSTEAF Reimbursement Rates, provide Site Investigation Reporting, as follows:
     - Site Investigation Base Reporting
     - Supplemental Site Investigation Reporting

In accordance with Section 1.0 of the UST Corrective Action Manual, the cabinet reserves the right to require additional data or information. If the submitted information is not technically sufficient to comply with the request of this directive, the owner/operator will be contacted, in writing, by the cabinet if more information is required or if modification to this and/or future reports or plan(s) is needed. The UST Branch shall have final authority to determine all reimbursable actions.

The owner/operator/contractor/consultant bears the responsibility of exploring, identifying and addressing all potential safety hazards during field activities.

Submit the requested item(s) by **October 16, 2019**. All documents may be submitted electronically (preferred) using our website or by mail at the address below. Always refer to the appropriate site AI # when contacting the UST Branch, and include the AI # on all documents submitted.

Division of Waste Management
Underground Storage Tank Branch
300 Sower Boulevard, Second Floor
Frankfort KY 40601
www.eec.ky.gov/Environmental-Protection/Waste/underground-storage-tank

PSTEAF Provisions:

Refer to 401 KAR 42:250 for forms and other requirements necessary for reimbursement.

The actions required by this written directive letter have a reimbursable amount of **$11,177.60**, as calculated on the attached itemization **(dated July 10, 2019)** and indicated on the attached UST Claim Request for Directed Actions (DWM 4286). Payment of this reimbursable amount is contingent upon a determination by the UST Branch that the submitted information is technically complete and addresses all requirements of this written directive. Final reimbursement may be subject to deduction of the entry level established in KRS 224.60-120. The established reimbursable amount will be adjusted for corrective actions as identified in 401 KAR 42:250, Section 7(6) if applicable.

If the contract with the eligible company or partnership designated on a written directive is terminated prior to the commencement of reimbursable activities in response to the written directive, the obligation and guarantee of payment of the reimbursable amount, made in accordance with KRS 224.60-140(5), will be null and void.

All eligible tank owners and operators seeking reimbursement from the PSTEAF must follow the eligible company or partnership and laboratory certification requirements outlined in 401 KAR 42:250.

More information including UST regulations, outlines, forms and updates can be found on our website. If you have any questions regarding this letter, please contact me at 502-782-6429 or Emmanuel.Onejeme@ky.gov.

Sincerely,

Emmanuel Onejeme

Emmanuel Onejeme,
UST Branch, Corrective Action 1 Section

Enclosure: UST Claim Request for Directed Actions (DWM 4286)
Itemization of the Reimbursable Amount

Cc:

HINKLE-MEYER ENVIRONMENTAL SERVICES LLC
3 HMB CIRCLE US 460
FRANKFORT KY 40601

ATTACHMENT B
Photographs

Roxanna BP
Highway 160 South, Roxana, Letcher County, KY 41848
AI No. 59860
Project No. 9216_010

Area Southeast of the Site

ASite Looking Northwest. Note washout Area (Center Right)

Roxanna BP
Highway 160 South, Roxana, Letcher County, KY 41848
AI No. 59860
Project No. 9216_010

Area Behind the Site Looking West

Area Southwest of Site

Roxanna BP
Highway 160 South, Roxana, Letcher County, KY 41848
AI No. 59860
Project No. 9216_010

Area North of Site and Amburgey Domestic-Use Well Across Highway 160 from the Site

Amburgey Domestic-Use Well

Roxanna BP
Highway 160 South, Roxana, Letcher County, KY 41848
AI No. 59860
Project No. 9216_010

Amburgey Domestic-Use Wellhouse Locked

Site Looking North

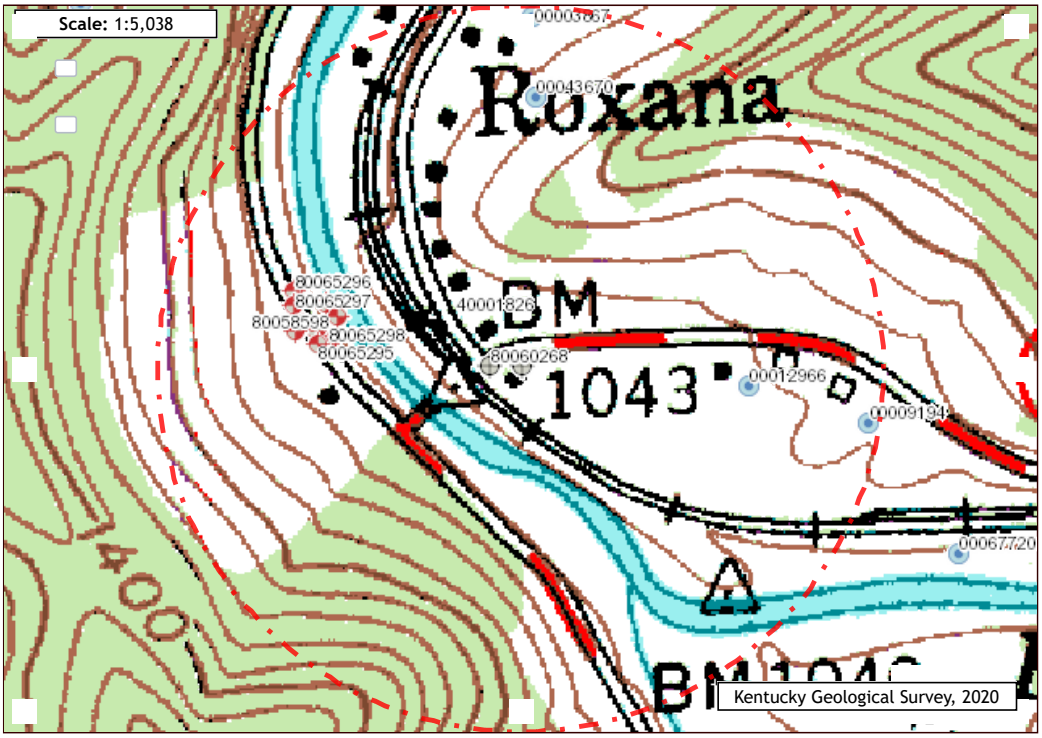
Roxanna BP
Highway 160 South, Roxana, Letcher County, KY 41848
AI No. 59860
Project No. 9216_010

Washed Out Area Along the Highway

Area East of the Site

ATTACHMENT C
KGS Groundwater Database Map and DUW Information

Kentucky Groundwater Data Repository
Water Well and Spring Location Map



Map Info | Configuration | Tools

Search Criteria
search radius: **300 meters**
coords (lat,lon): **37.109082, -82.949620**
county: **Letcher**
7.5' quadrangle: **Roxana**

Map Configuration
Base Layer: Topographic Map
Basemap (roads, rivers, etc) Transparency
Index Maps (quadrangle grids)
Water Layers:
Water Wells
transparency
label: AKGWA Number
Other
Domestic
Industrial
Agriculture
Monitoring
Public
Mining

Map Functionality:
- For best results, use the latest version of Internet Explorer, Firefox, or Google Chrome browsers.
- Click on a well or spring to identify feature.
- Double-click on a map location to identify coordinates.

Map Printing:
- For best results, use the latest version of Internet Explorer, Firefox, or Google Chrome browsers.
- Use the map printing tools (**under the "Tools" menu on the right**) to print the map to a printer or a pdf.
- This page is formatted to fit the map and the tables below on one page - use your browser functionality (or click the "Print This Page" button below) to print this page and the tables below.
  NOTE: In older versions of Internet Explorer (8.0 and below), the topography or imagery may not print. You will need to either upgrade your browser, use a different browser (Firefox or Chrome), use the "print to pdf" tool, or use your computer's screen capture functionality.

Print This Page

Information about wells labeled on map above:
- Tabular data of WATER WELLS in this view
- Tabular data of SPRINGS in this view

For information about the KY Groundwater Data Repository:
Sarah Arpin (Kentucky Geological Survey)
Sarah.Arpin@uky.edu

Water wells and springs in the current view:
Well Table:
note: wells may overlap on the map. Some wells listed below may not be visible unless highly zoomed in.
**click AKGWA number for more info about a well
depths and elevations are given in **FEET
**shaded AKGWA numbers indicate wells that fall outside the specified radius

minimize table below to show records in pages

Symbol	AKGWA #	Status	Primary Use	Elevation	Depth	Bedrock Depth	H_2O Depth	Distance from Circle Center	Zoom
	00003867	Active	Domestic - Single Household	1060	61	8	23	943 ft | 287 m	zoom to well
	00009194	Active	Domestic - Single Household	1080	150	3	30	958 ft | 292 m	zoom to well
	00012966	Active	Domestic - Single Household	1050	100	18	16	622 ft | 190 m	zoom to well
	00043670	Active	Domestic - Single Household	1080	n/a	0	0	741 ft | 226 m	zoom to well
	00067720	Active	Domestic - Multiple Domestic Households	1035.9	1035.9	82	11	1288 ft | 393 m	zoom to well

Page 1/4

Symbol	AKGWA #	Status	Primary Use	Elevation	Depth	Bedrock Depth	H_2O Depth	Distance from Circle Center	Zoom
	40001826	n/a	UNKNOWN	1050	n/a	n/a	n/a	229 ft | 70 m	zoom to well
	80058597	Plugged	Monitoring Well - Ambient Monitoring	1063.9	12	12	n/a	625 ft | 191 m	zoom to well
	80058598	Plugged	Monitoring Well - Ambient Monitoring	1062.1	12.5	12.5	n/a	602 ft | 183 m	zoom to well
	80058599	Plugged	Monitoring Well - Ambient Monitoring	1051.9	10	10	n/a	566 ft | 172 m	zoom to well
	80060268	Active	Remediation	1048.6	20	n/a	n/a	82 ft | 25 m	zoom to well

Page 2/4

Symbol	AKGWA #	Status	Primary Use	Elevation	Depth	Bedrock Depth	H_2O Depth	Distance from Circle Center	Zoom
	80060269	Active	Remediation	1053	5	5	n/a	18 ft | 5 m	zoom to well
	80065295	Plugged	Monitoring Well - Ambient Monitoring	1059	11.5	11.5	n/a	556 ft | 169 m	zoom to well
	80065296	Plugged	Monitoring Well - Ambient Monitoring	1059	16.5	16.5	n/a	654 ft | 199 m	zoom to well

	80065297	Plugged	Monitoring Well - Ambient Monitoring	1064	13	13	n/a	645 ft | 197 m	zoom to well
	80065298	Plugged	Monitoring Well - Ambient Monitoring	1053	7	7	n/a	522 ft | 159 m	zoom to well

Symbol	AKGWA #	Status	Primary Use	Elevation	Depth	Bedrock Depth	H_20 Depth	Distance from Circle Center	Zoom
	80065299	Plugged	Monitoring Well - Ambient Monitoring	1037	7	7	n/a	521 ft | 159 m	zoom to well
	80065300	Plugged	Monitoring Well - Ambient Monitoring	1059	7	7	n/a	559 ft | 170 m	zoom to well

Spring Table:
note: springs may overlap on the map. Some springs listed below may not be visible unless highly zoomed in.
****no springs found in map area**

KENTUCKY WATER WELL RECORD

Please read all instructions prior to completing this form. Do not write in shaded areas. Completed copies of this form are to be submitted within ***30 days*** of well completion to the property owner and to the KY Natural Resources and Environmental Protection Cabinet, Division of Water - Groundwater Branch, 18 Reilly Road, Frankfort Office Park, Frankfort, Kentucky 40601. Telephone (502) 564-3410.

(TYPE OR PRINT CLEARLY)

1

0000-3867-01

(2) GENERAL INFORMATION:

Well Owner's Name: Shepherd (Last) Paul (First) (MI)

Owner's Phone: ( ) ( ) None

Date Received: JAN 28 1988

Mailing Address

Well Address ( ) Same as owner's address

(3) AKGWA NUMBER: JAN 28 1988 [redacted]

City: Roxana State: Ky. Zip Code: 41848

City State Zip Code

(4) VARIANCE WELL: ( ) Yes ( ) No

(5) WELL LOCATION: USGS Quadrangle Name: ROXANA County: LETCHER Latitude: 37°06' 42" N Longitude: 82°56' 58" W

(6) GENERAL WELL CONSTRUCTION:

Start Date: 12 17 87

Finish Date:

Drilling Method: ( ) Air Rotary ( ) Mud Rotary ( ) Cable ( ) Auger ( ) Other

Type of Work: ( ) New Well ( ) Rework ( ) Deepen (✓) Plug ( ) Other

Surface El.: 1060 ft.

Total Depth: 61 ft.

Depth to Bedrock: 8 ft.

Static Water Level: 23 ft.

(7) WELL TEST:

Date:

Testing Method: ( ) Pump ( ) Blowing ( ) Bailer ( ) Other

Well Yield: ( ) gpm ( ) gph

Drawdown: ft. after ( ) hrs ( ) min of pumping at ( ) gpm ( ) gph

ft. after ( ) hrs ( ) min of pumping at ( ) gpm ( ) gph

Flowing Artesian Well:

Shut-in Pressure: (psi)

Discharge: ( ) gpm ( ) gph

(10) PHYSIOGRAPHIC OR HYDROLOGIC REGION: ( ) Blue Grass ( ) Ohio River Alluvium (✓) E. Coal Field ( ) W. Coal Field ( ) Miss. Plateau ( ) Jackson Purchase

(11) WELL SERVICE: Number of people served: Number of service connections:

(12) WELL USE: ( ) Domestic ( ) Industrial ( ) Dry Hole ( ) Public ( ) Livestock ( ) Heat Pump ( ) Irrigation ( ) Monitoring ( ) Other

(13) SKETCH MAP:

Show well location and distances from permanent structures, septic drain fields, major roads (include name or number) and intersections. ***INDICATE NORTH WITH AN ARROW.*** Provide a photocopy of a topographic map with the well location clearly marked with an "X", the AKGWA number, and the well owner's name.

(8) WATER QUALITY:

Well was ( ) pumped ( ) bailed ( ) blown ( ) not purged, for ( ) hrs. ( ) min., at per ( ) min. ( ) hr. before sampling.

Appearance: ( ) Clear ( ) Cloudy ( ) Muddy ( ) Other

Odor: ( ) None ( ) Musty ( ) Sulfur ( ) Other

Well Disinfectant: Type

Amount

Results of ( ) fecal ( ) total coliform analysis:

( ) < 1.0 ( ) TNTC ( ) Confl. # colonies/100 ml

Other

Sampling Date:

Analysis Date:

Lab Performing Test:

(14) PUMP DATA: Was a pump set?: ( ) yes ( ) no

Date set:

Installed by: ( ) Driller ( ) Pump Installer ( ) Home Owner or Other

Pump Type: ( ) Jet ( ) Submersible ( ) Turbine ( ) Hand ( ) Bailer/Bucket ( ) Other

Horsepower

Rating (gpm)

Pump intake set at feet below ground surface

(9) WELL COMPLETION:

Feet Below Surface From	To	Hole Diameter (in.)	Casing Inside Diameter (in.)	Casing Type

Casing joint: ( ) Glued Coupler ( ) Threaded Coupler ( ) Flush Thread ( ) Welded ( ) No joint ( ) Other

Well Head (Casing Top) Seal: ( ) Well Cap ( ) Sanitary Seal ( ) Other

Was a pitless adapter installed?: ( ) yes ( ) no

Screen or Casing Perforation:

I.D. (in.) From To ft. Type Slot Size

I.D. (in.) From To ft. Type Slot Size

Annulus Fill and Seal:

Feet Below Surface

From 0 To 61 Material 12 Bags Cement = 2 Shovels Cement 1 Shovel Sand Installed with a Hand-Bailer.

(15) LITHOLOGIC LOG:

Feet Below Surface From	To	Description	Water Quality and GPM

(16) COMMENTS:

(17) AFFIRMATION: The work described above was done under my supervision, and this report is true and correct to the best of my knowledge.

NOTE: The water well driller is not responsible for natural groundwater quality or quantity encountered while drilling or completing this well.

Well Driller's or Rig Operator's Name *(Print or Type)*

State Certification Number or Rig Operator's Permit No. 0126

Signature of Responsible Certified Driller

Company Mailing Address B-424

City Lit Carr State Ky. Zip Code 41834 Date 1 28 88

Number of Attached sheets

White Copy to Division of Water, Yellow Copy to Owner, Pink Copy to Driller's Files

DEP-4045

Printed with State Funds 9/15/87

KENTUCKY WATER WELL RECORD

Please read all instructions prior to completing this form. Do not write in shaded areas. Completed copies of this form are to be submitted within ***30 days*** of well completion to the property owner and to the KY Natural Resources and Environmental Protection Cabinet, Division of Water - Groundwater Branch, 18 Reilly Road, Frankfort Office Park, Frankfort, Kentucky 40601. Telephone (502) 564-3410.

(TYPE OR PRINT CLEARLY)

0000-9194

(2) GENERAL INFORMATION: JUN 13 1988

Well Owner's Name	Owner's Phone	Date Received:
Banks (Last) Raymond (First) A. (MI)	(606) 633-8760 ( ) None	

Mailing Address	Well Address ( ) Same as owner's address	(3) AKGWA NUMBER:
Box 41		0000—9194

City	State	Zip Code	City	State	Zip Code	(4) VARIANCE WELL:
Roxana	Ky.	41848				( ) Yes (X) No

(5) WELL LOCATION:	USGS Quadrangle Name	County	Latitude	Longitude
	Roxana	Letcher	37°06'31" N	82°56'47" W

(6) GENERAL WELL CONSTRUCTION:

Start Date: 2-25-83
Finish Date: 3-3-88

Drilling Method: ( ) Air Rotary ( ) Mud Rotary (X) Cable ( ) Auger ( ) Other

Type of Work: (X) New Well ( ) Rework ( ) Deepen ( ) Plug ( ) Other

Surface El.: 1043 ft.
Total Depth: 150 ft.
Depth to Bedrock: 3 ft.
Static Water Level: 30 ft.

(7) WELL TEST:
Date: 3-3-88
Testing Method: ( ) Pump ( ) Blowing (X) Bailer ( ) Other
Well Yield: 3 (X) gpm ( ) gph
Drawdown: 130 ft. after 1 (✓) hrs ( ) min of pumping at 10 (X) gpm ( ) gph
ft. after ( ) hrs ( ) min of pumping at ( ) gpm ( ) gph

Flowing Artesian Well:
Shut-in Pressure: (psi)
Discharge: ( ) gpm ( ) gph

(10) PHYSIOGRAPHIC OR HYDROLOGIC REGION:
( ) Blue Grass ( ) Ohio River Alluvium
(X) E. Coal Field ( ) W. Coal Field
( ) Miss. Plateau ( ) Jackson Purchase

(11) WELL SERVICE:
Number of people served: 2
Number of service connections: 1

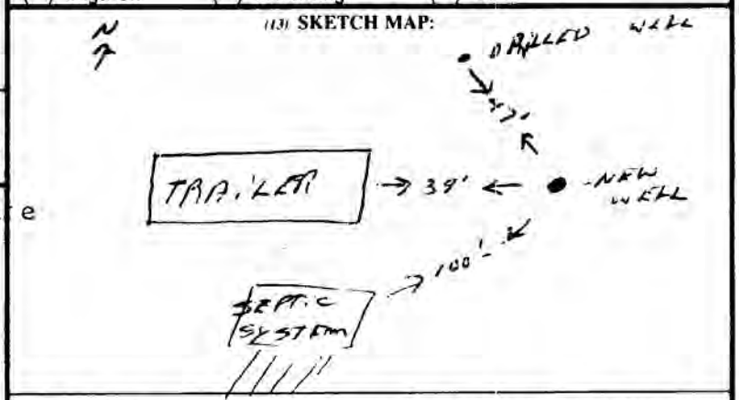
(12) WELL USE:
(X) Domestic ( ) Industrial ( ) Dry Hole
( ) Public ( ) Livestock ( ) Heat Pump
( ) Irrigation ( ) Monitoring ( ) Other

(8) WATER QUALITY:
Well was ( ) pumped (X) bailed ( ) blown ( ) not purged, for (1) hrs. ( ) min., at 3 per (X) min. ( ) hr. before sampling.

Appearance: (X) Clear ( ) Cloudy ( ) Muddy ( ) Other
Odor: (X) None ( ) Musty ( ) Sulfur ( ) Other

Well Disinfectant: Type Chlorine
Amount 2 cups
Results of ( ) fecal (X) total coliform analysis:
( ) <1.0 ( ) TNTC ( ) Confl. 0 ~~nil~~ # colonies/100 ml
Other
Sampling Date: 5-5-88
Analysis Date: 5-5-88
Lab Performing Test: Standard Lab.

(13) SKETCH MAP:



Show well location and distances from permanent structures, septic drain fields, major roads (include name or number) and intersections. ***INDICATE NORTH WITH AN ARROW.*** Provide a photocopy of a topographic map with the well location clearly marked with an "X", the AKGWA number, and the well owner's name

(14) PUMP DATA: Was a pump set?: ( ) yes (X) no
Date set:
Installed by: ( ) Driller ( ) Pump Installer ( ) Home Owner or Other
Pump Type: ( ) Jet ( ) Submersible ( ) Turbine ( ) Hand ( ) Bailer/Bucket ( ) Other
Horsepower
Rating (gpm)
Pump intake set at feet below ground surface

(9) WELL COMPLETION:

Feet Below Surface From	To	Hole Diameter (in.)	Casing Inside Diameter (in.)	Casing Type
0	20	8"	6"	Plastic
20	150	6"	open hole	

Casing joint: ( ) Glued Coupler ( ) Threaded Coupler ( ) Flush Thread ( ) Welded (X) No joint ( ) Other
Well Head (Casing Top) Seal: ( ) Well Cap (X) Sanitary Seal ( ) Other
Was a pitless adapter installed?: ( ) yes (X) no
Screen or Casing Perforation:
I.D. (in.) From To ft. Type Slot Size
I.D. (in.) From To ft. Type Slot Size
Annulus Fill and Seal:

Feet Below Surface From	To	Material
0	18	drill cuttings
18	20	bentonite

(15) LITHOLOGIC LOG:

Feet Below Surface From	To	Description	Water Quality and GPM
0	3	dirt	
3	65	hard white sandstone	
65	75	gray shale	
75	115	white sandstone	
115	116	coal	
116	145	gray shale	130'- 3 GPM
145	150	gray sandstone	good water

(16) COMMENTS:

(17) AFFIRMATION: The work described above was done under my supervision, and this report is true and correct to the best of my knowledge.
NOTE: The water well driller is not responsible for natural groundwater quality or quantity encountered while drilling or completing this well.

Well Driller's or Rig Operator's Name (Print or Type)	State Certification Number or Rig Operator's Permit No.	Signature of Responsible Certified Driller
Johnnie P. Ramsey	0092	[signature]

Company Mailing Address	City	State	Zip Code	Date
HC 84 Box 726	Whitesburg	Ky.	41858	5-14-88

Number of Attached sheets 2

White Copy to Division of Water, Yellow Copy to Owner, Pink Copy to Driller's Files

DEP-4045 Printed with State Funds 9/15/87

KENTUCKY WATER WELL RECORD

Please read all instructions prior to completing this form. Do not write in shaded areas. Completed copies of this form are to be submitted within ***30 days*** of well completion to the property owner and to the KY Natural Resources and Environmental Protection Cabinet, Division of Water - Groundwater Branch, 18 Reilly Road, Frankfort Office Park, Frankfort, Kentucky 40601. Telephone (502) 564-3410.

(TYPE OR PRINT CLEARLY)

0001-2966

(2) GENERAL INFORMATION:

Well Owner's Name: Hagy (Last) George (First) (MI)

Owner's Phone: ( ) (✓) None

Date Received: JAN 26 1989

Mailing Address: Del Del

Well Address: (✓) Same as owner's address

(3) AKGWA NUMBER: 0001 — 2966

City: Royana | State: KY | Zip Code:

City: | State: | Zip Code:

(4) VARIANCE WELL: ( ) Yes (X) No

(5) WELL LOCATION: USGS Quadrangle Name: Royana | County: Letcher | Latitude: 37° 06' 32" N | Longitude: 83° 56' 51" W

83°57' 51"

(6) GENERAL WELL CONSTRUCTION:

Start Date: 10-17-88

Finish Date: 10-17-88

Drilling Method: (✓) Air Rotary ( ) Mud Rotary ( ) Cable ( ) Auger ( ) Other

Type of Work: (✓) New Well ( ) Rework ( ) Deepen ( ) Plug ( ) Other

Surface El.: 1050 ft.

Total Depth: 100 ft.

Depth to Bedrock: 18 ft.

Static Water Level: 16 ft.

(7) WELL TEST:

Date: 10-17-88

Testing Method: ( ) Pump (✓) Blowing ( ) Bailer ( ) Other

Well Yield: 3 (✓) gpm ( ) gph

Drawdown: ft. after ( ) hrs ( ) min of pumping at ( ) gpm ( ) gph

ft. after ( ) hrs ( ) min of pumping at ( ) gpm ( ) gph

Flowing Artesian Well:

Shut-in Pressure: N/A (psi)

Discharge: ( ) gpm ( ) gph

(8) WATER QUALITY:

Well was ( ) pumped ( ) bailed (✓) blown ( ) not purged, for ( ) hrs. 30 min., at per ( ) min. ( ) hr. before sampling.

Appearance: (✓) Clear ( ) Cloudy ( ) Muddy ( ) Other

Odor: (✓) None ( ) Musty ( ) Sulfur ( ) Other

Well Disinfectant: Type Clorox

Amount ½ gal

Results of ( ) fecal ( ) total coliform analysis:

( ) < 1.0 ( ) TNTC ( ) Confl. 0 # colonies/100 ml

Other

Sampling Date: 11-16-88

Analysis Date: 11-16-88

Lab Performing Test: Standard Lab

(9) WELL COMPLETION:

Feet Below Surface From	To	Hole Diameter (in.)	Casing Inside Diameter (in.)	Casing Type
0	30	8 3/4	6	PVC
30	100	6	OPEN	Hole

Casing joint: (✓) Glued Coupler ( ) Threaded Coupler ( ) Flush Thread ( ) Welded ( ) No joint ( ) Other

Well Head (Casing Top) Seal: (✓) Well Cap ( ) Sanitary Seal ( ) Other

Was a pitless adapter installed?: ( ) yes ( ) no

Screen or Casing Perforation:

I.D. (in.) From To ft. Type Slot Size

I.D. (in.) From To ft. Type Slot Size

Annulus Fill and Seal:

Feet Below Surface From	To	Material
0	30	Cuttings

(10) PHYSIOGRAPHIC OR HYDROLOGIC REGION:

( ) Blue Grass ( ) Ohio River Alluvium

(✓) E. Coal Field ( ) W. Coal Field

( ) Miss. Plateau ( ) Jackson Purchase

(11) WELL SERVICE:

Number of people served: 2

Number of service connections: 1

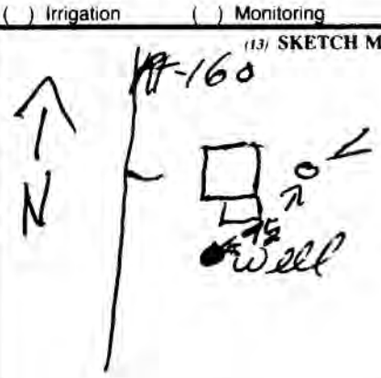
(12) WELL USE:

(✓) Domestic ( ) Industrial ( ) Dry Hole

( ) Public ( ) Livestock ( ) Heat Pump

( ) Irrigation ( ) Monitoring ( ) Other

(13) SKETCH MAP:



Show well location and distances from permanent structures, septic drain fields, major roads (include name or number) and intersections. ***INDICATE NORTH WITH AN ARROW.*** Provide a photocopy of a topographic map with the well location clearly marked with an "X", the AKGWA number, and the well owner's name.

(14) PUMP DATA: Was a pump set?: ( ) yes (✓) no

Date set:

Installed by: ( ) Driller ( ) Pump Installer ( ) Home Owner or Other

Pump Type: ( ) Jet ( ) Submersible ( ) Turbine ( ) Hand ( ) Bailer/Bucket ( ) Other

Horsepower

Rating (gpm)

Pump intake set at feet below ground surface

(15) LITHOLOGIC LOG:

Feet Below Surface From	To	Description	Water Quality and GPM
0	18	Dirt	
18	30	slate Casing	
30	35	slate	
35	36	Coal.	
36	58	sandstone	
58		water	3 gal
58	100	sandstone	

(16) COMMENTS:

(17) AFFIRMATION: The work described above was done under my supervision, and this report is true and correct to the best of my knowledge.

NOTE: The water well driller is not responsible for natural groundwater quality or quantity encountered while drilling or completing this well.

Well Driller's or Rig Operator's Name (Print or Type): Clarence Gibson

State Certification Number or Rig Operator's Permit No.: 0069

Signature of Responsible Certified Driller: Clarence Gibson

Company Mailing Address: Box 92 | City: Red Fox | State: KY | Zip Code: 41847 | Date: 10-17-88

Number of Attached sheets: 2

White Copy to Division of Water, Yellow Copy to Owner, Pink Copy to Driller's Files

DEP-4045 Printed with State Funds 9-15-87

KENTUCKY WATER WELL RECORD

Please read all instructions prior to completing this form. Do not write in shaded areas. Completed copies of this form are to be submitted within ***30 days*** of well completion to the property owner and to the KY Natural Resources and Environmental Protection Cabinet, Division of Water - Groundwater Branch, 18 Reilly Road, Frankfort Office Park, Frankfort, Kentucky 4060. Telephone (502) 564-3410.

(TYPE OR PRINT CLEARLY)

0004-3670

(If Applicable)

(2) GENERAL INFORMATION:

Well Owner's Name (Last, First)	Owner's Phone ( ) None	Date Received:
Maggard Randy	(606) 633 8015	JUN 2 1996

Mailing Address	Well Address (✓) Same as owner's address	(3) AKGWA NUMBER:
HC 67 Box 1741	Royalton	0004-3670

City	State	Zip Code	City	State	Zip Code	(4) VARIANCE WELL:
Colin	KY	41847		KY	41848	( ) Yes (X) No

(5) WELL LOCATION:	USGS Quadrangle Name	County	Latitude	Longitude
	Royalton	Letcher	37 06 40 N	82 56 58 W

(6) GENERAL WELL CONSTRUCTION:

Start Date: 8-28-95
Finish Date: 8-28-95

Drilling Method: (✓) Air Rotary ( ) Mud Rotary ( ) Cable ( ) Auger ( ) Other

Type of Work: (✓) New Well ( ) Rework ( ) Deepen ( ) Plug ( ) Other

Surface El.: ~~[illegible]~~ 1080 ft.
Total Depth: 140 ft.
Depth to Bedrock: 10 ft.
Static Water Level: 30 ft.

(7) WELL TEST:

Date: 8-28-95
Testing Method: ( ) Pump (✓) Blowing ( ) Bailer ( ) Other
Well Yield: 1½ ( ) gpm ( ) gph
Drawdown:
ft. after ( ) hrs ( ) min
of pumping at ( ) gpm ( ) gph
ft. after ( ) hrs ( ) min
of pumping at ( ) gpm ( ) gph

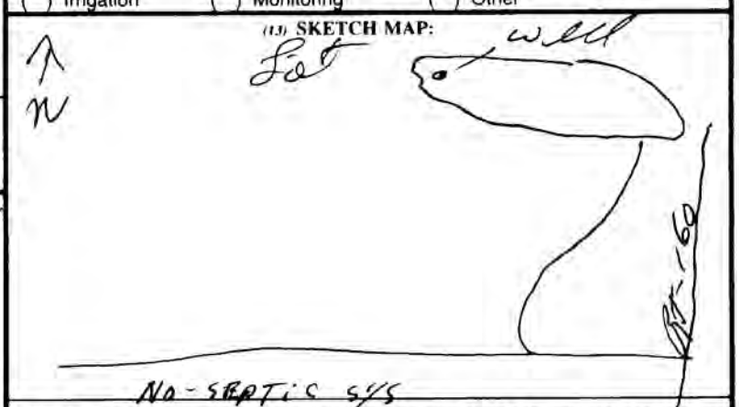
Flowing Artesian Well:
Shut-in Pressure: NA (psi)
Discharge: ( ) gpm ( ) gph

(10) PHYSIOGRAPHIC OR HYDROLOGIC REGION:
( ) Blue Grass ( ) Ohio River Alluvium
(✓) E. Coal Field ( ) W. Coal Field
( ) Miss. Plateau ( ) Jackson Purchase

(11) WELL SERVICE:
Number of people served: 2
Number of service connections: 1

(12) WELL USE:
(✓) Domestic ( ) Industrial ( ) Dry Hole
( ) Public ( ) Livestock ( ) Heat Pump
( ) Irrigation ( ) Monitoring ( ) Other

(13) SKETCH MAP:



Show well location and distances from permanent structures, septic drain fields, major roads (include name or number) and intersections. ***INDICATE NORTH WITH AN ARROW.*** Provide a photocopy of a topographic map with the well location clearly marked with an "X", the AKGWA number, and the well owner's name

(8) WATER QUALITY:
Well was ( ) pumped ( ) bailed (✓) blown ( ) not purged, for ( ) hrs. (✓) min., at per ( ) min. ( ) hr. before sampling.

Appearance: (✓) Clear ( ) Cloudy ( ) Muddy ( ) Other
Odor: (✓) None ( ) Musty ( ) Sulfur ( ) Other

Well Disinfectant: Type Clorox
Amount 2 qt
Results of (✓) fecal ( ) total coliform analysis:
(✓) <1.0 ( ) TNTC ( ) Confl. # colonies/100 ml
Other
Sampling Date: 9 6 95
Analysis Date: 9 6 95
Lab Performing Test: Standard Lab

(14) PUMP DATA: Was a pump set?: ( ) yes (X) no
Date set:
Installed by: ( ) Driller ( ) Pump Installer ( ) Home Owner or Other
Pump Type: ( ) Jet ( ) Submersible ( ) Turbine ( ) Hand ( ) Bailer/Bucket ( ) Other
Horsepower
Rating (gpm)
Pump intake set at feet below ground surface

(9) WELL COMPLETION:

Feet Below Surface From	To	Hole Diameter (in.)	Casing Inside Diameter (in.)	Casing Type
0	80½	8¾	6¼	PVC
80½	140	6¼	OPEN	

Casing joint: (✓) Glued Coupler ( ) Threaded Coupler ( ) Flush Thread ( ) Welded ( ) No joint ( ) Other
Well Head (Casing Top) Seal: (✓) Well Cap ( ) Sanitary Seal ( ) Other
Was a pitless adapter installed?: ( ) yes ( ) no
Screen or Casing Perforation:
I.D. (in.) From To ft. Type Slot Size
I.D. (in.) From To ft. Type Slot Size
Annulus Fill and Seal:

Feet Below Surface From	To	Material
0	80½	Cutting

(15) LITHOLOGIC LOG:

Feet Below Surface From	To	Description	Water Quality and GPM
0	10	Soil	
10	25	Shale	
25	55	Sandstone	
55	57	Coal	
57	80½	Shale	
80½	100	Shale	
100	108	Sandstone	
108	112	Sandstone	1½ gal
112	114	Coal	
114	120	Shale	
120	140	Sandstone	

(16) COMMENTS:

(17) AFFIRMATION: The work described above was done under my supervision, and this report is true and correct to the best of my knowledge.
NOTE: The water well driller is not responsible for natural groundwater quality or quantity encountered while drilling or completing this well.

Well Driller's or Rig Operator's Name (Print or Type)	State Certification Number or Rig Operator's Permit No	Signature of Responsible Certified Driller
CLARENCE Gibson	0069	Clarence Gibson

Company Mailing Address	City	State	Zip Code	Date
Box 92	Red Fox	KY	41847	8-28-95

Number of Attached sheets	White Copy to Division of Water, Yellow Copy to Owner, Pink Copy to Driller's Files	DEP-4045 Printed with State Funds 9/15/87
2		

Detailed Info About This Well (Casing & Lithologic)
Kentucky Groundwater Data Repository

AKGWA #: 40001826
PWSID (public well ID):
AI Number #:
Quadrangle: Roxana
County: Letcher
Latitude, Longitude (dms): 37° 6' 34.34'', -82° 57' 0.576''
Latitude, Longitude (dec degree): 37.109539, -82.95016
Regulatory Program:
Surface Elev (ft): 1050
Total Depth (ft):
Depth To Bedrock (ft):
Static Water Level (ft):
Status:
Primary Use: UNKNOWN
Owner Information: N/A

Scanned Document (pdf): none available

Do... OAD THIS REPORT INTO A SEMICOLON-DELIMITED TEXT FILE

Lithology report, casing report, and water quality data availability:

****No Water Well Lithology Report For This Well****

****No Water Well Casing Report For This Well****

Water Quality Analyses
(click each analyte name for detailed data on the analyses for this well)

Analyte Name (click name for full report)	Analyte Group	Number of Analyses	First Date	Last Date	Max. Result
Chloride	Inorganics	1	11/9/1954	11/9/1954	14 mg/L
Field Temperature	Field	1	11/9/1954	11/9/1954	11.66 C

Print Close Window

ATTACHMENT D
Updated Facility Classification Guide

ATTACHMENT E
Drilling Logs

DRILLING LOG

HMB Professional Engineers, Inc
Remediation Division
3 HMB Circle
Frankfort, KY 40601
(502) 695-9800

JOB NUMBER	JOB NAME	COUNTY	DATE DRILLED	DRILLED BY	SAMPLING METHOD
9216	Roxana BP	LETCHER	03/12/20	Hinkle Env. Svs.	GRAB

BORING #	CORRESPONDING MW	SURFACE ELEV	WATER LEVEL	LOGGED BY	DRILLING METHOD
OE1-1	NA	NA	NA	DUSTIN BURRIS	DIRECT PUSH

DEPTH	FIELD PID READING	VISUAL SOIL/ROCK DESCRIPTION
0-2’	12.1	SILTY CLAY, Some Sand and Gravel, Gray and Brown, Damp, Slight Odor
2-4’	147.8	SILTY CLAY, Some Sand and Gravel, Gray and Brown, Damp, Odor
*4-6’	9.8	SILTY CLAY, Some Sand, Dark Gray, Wet, Slight Odor (Poor Recovery)
		TERMINATED AT 6’
		* DENOTES INTERVAL SAMPLED

DRILLING LOG

HMB Professional Engineers, Inc
Remediation Division
3 HMB Circle
Frankfort, KY 40601
(502) 695-9800

JOB NUMBER	JOB NAME	COUNTY	DATE DRILLED	DRILLED BY	SAMPLING METHOD
9216	Roxana BP	LETCHER	03/12/20	Hinkle Env. Svs.	GRAB

BORING #	CORRESPONDING MW	SURFACE ELEV	WATER LEVEL	LOGGED BY	DRILLING METHOD
OE1-4	NA	NA	NA	DUSTIN BURRIS	DIRECT PUSH

DEPTH	FIELD PID READING	VISUAL SOIL/ROCK DESCRIPTION
0-2’	138.2	SILTY CLAY, Some Sand and Gravel, Gray and Tan, Dry, Odor
2-4’	808.3	SILTY CLAY, Some Sand and Gravel, Dark Gray, Damp, Odor
*4-6’	8.8	SILTY CLAY, Some Sand, Gray, Wet, Slight Odor (Poor Recovery)
		TERMINATED AT 6’
		* DENOTES INTERVAL SAMPLED

DRILLING LOG

HMB Professional Engineers, Inc
Remediation Division
3 HMB Circle
Frankfort, KY 40601
(502) 695-9800

JOB NUMBER	JOB NAME	COUNTY	DATE DRILLED	DRILLED BY	SAMPLING METHOD
9216	Roxana BP	LETCHER	03/12/20	Hinkle Env. Svs.	GRAB

BORING #	CORRESPONDING MW	SURFACE ELEV	WATER LEVEL	LOGGED BY	DRILLING METHOD
PSB-1	NA	NA	NA	DUSTIN BURRIS	DIRECT PUSH

DEPTH	FIELD PID READING	VISUAL SOIL/ROCK DESCRIPTION
0-2’	11.8	SILTY CLAY, Some Sand and Gravel, Gray, Slight Odor
*2-4’	6.2	SILTY CLAY, Some Sand and Gravel, Dark Brown, Wet, No Odor
		TERMINATED AT 4’
		* DENOTES INTERVAL SAMPLED

DRILLING LOG

HMB Professional Engineers, Inc
Remediation Division
3 HMB Circle
Frankfort, KY 40601
(502) 695-9800

JOB NUMBER	JOB NAME	COUNTY	DATE DRILLED	DRILLED BY	SAMPLING METHOD
9216	Roxana BP	LETCHER	03/12/20	Hinkle Env. Svs.	GRAB

BORING #	CORRESPONDING MW	SURFACE ELEV	WATER LEVEL	LOGGED BY	DRILLING METHOD
PSB-3	NA	NA	NA	DUSTIN BURRIS	DIRECT PUSH

DEPTH	FIELD PID READING	VISUAL SOIL/ROCK DESCRIPTION
0-2’	0.0	SILTY CLAY, Some Sand and Gravel, Light Gray, No Odor
*2-4’	0.0	SILTY CLAY, Some Sand and Gravel, Slight Plasticity, Brown, Wet, No Odor
		TERMINATED AT 4’
		* DENOTES INTERVAL SAMPLED

DRILLING LOG

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Remediation Division
3 HMB Circle
Frankfort, KY 40601
(502) 695-9800

JOB NUMBER	JOB NAME	COUNTY	DATE DRILLED	DRILLED BY	SAMPLING METHOD
9216	Roxana BP	LETCHER	03/12/20	Hinkle Env. Svs.	GRAB

BORING #	CORRESPONDING MW	SURFACE ELEV	WATER LEVEL	LOGGED BY	DRILLING METHOD
PSB-5	NA	NA	NA	DUSTIN BURRIS	DIRECT PUSH

DEPTH	FIELD PID READING	VISUAL SOIL/ROCK DESCRIPTION
0-2’	233.8	SILTY CLAY, Some Sand and Gravel, Gray, Odor
2-4’	158.6	SILTY CLAY, Some Sand and Gravel, Dark Brown, Odor
*4-6’	135.6	SILTY CLAY, Some Sand, Soft, Dark Brown, Wet, Odor
		TERMINATED AT 6’
		* DENOTES INTERVAL SAMPLED

DRILLING LOG

HMB Professional Engineers, Inc
Remediation Division
3 HMB Circle
Frankfort, KY 40601
(502) 695-9800

JOB NUMBER	JOB NAME	COUNTY	DATE DRILLED	DRILLED BY	SAMPLING METHOD
9216	Roxana BP	LETCHER	03/12/20	Hinkle Env. Svs.	GRAB

BORING #	CORRESPONDING MW	SURFACE ELEV	WATER LEVEL	LOGGED BY	DRILLING METHOD
EW-1	NA	NA	NA	DUSTIN BURRIS	DIRECT PUSH

DEPTH	FIELD PID READING	VISUAL SOIL/ROCK DESCRIPTION
0-2’	0.0	GRAVELLY SILT, Some Sand, Gray, Damp, No Odor
2-4’	0.0	GRAVELLY SILT, Some Sand, Gray, Damp, No Odor
*4-6’	0.2	SILTY CLAY, Some Gravel and Sand, Dark Gray, Saturated, No Odor
		TERMINATED AT 6’
		* DENOTES INTERVAL SAMPLED

DRILLING LOG

HMB Professional Engineers, Inc
Remediation Division
3 HMB Circle
Frankfort, KY 40601
(502) 695-9800

JOB NUMBER	JOB NAME	COUNTY	DATE DRILLED	DRILLED BY	SAMPLING METHOD
9216	Roxana BP	LETCHER	03/12/20	Hinkle Env. Svs.	GRAB
BORING #	CORRESPONDING MW	SURFACE ELEV	WATER LEVEL	LOGGED BY	DRILLING METHOD
EW-2	NA	NA	NA	DUSTIN BURRIS	DIRECT PUSH

DEPTH	FIELD PID READING	VISUAL SOIL/ROCK DESCRIPTION
0-2’	0.0	GRAVELLY SILT, Some Sand, Gray, Damp, No Odor
*2-4’	0.0	GRAVELLY SILT, Some Sand, Gray, Damp, No Odor
4-6’		NO RECOVERY
		TERMINATED AT 6’
		* DENOTES INTERVAL SAMPLED

DRILLING LOG

HMB Professional Engineers, Inc
Remediation Division
3 HMB Circle
Frankfort, KY 40601
(502) 695-9800

JOB NUMBER	JOB NAME	COUNTY	DATE DRILLED	DRILLED BY	SAMPLING METHOD
9216	Roxana BP	LETCHER	03/12/20	Hinkle Env. Svs.	GRAB

BORING #	CORRESPONDING MW	SURFACE ELEV	WATER LEVEL	LOGGED BY	DRILLING METHOD
FL-1	NA	NA	NA	DUSTIN BURRIS	DIRECT PUSH

DEPTH	FIELD PID READING	VISUAL SOIL/ROCK DESCRIPTION
0-2’	6.3	GRAVEL, Some Sand, Gray, Wet, No Odor
2-4’	0.5	GRAVEL, Some Sand, Gray, Wet, No Odor
4-6’	0.0	GRAVEL, Some Sand, Gray, Wet, No Odor
*6-7.3’	0.0	SILTY CLAY, Some Gravel and Fine Sand, Medium Hard, Brown, Wet, No Odor
		REFUSED AT 7.3’ (Made 3 Attempts)
		* DENOTES INTERVAL SAMPLED

DRILLING LOG

HMB Professional Engineers, Inc
Remediation Division
3 HMB Circle
Frankfort, KY 40601
(502) 695-9800

JOB NUMBER	JOB NAME	COUNTY	DATE DRILLED	DRILLED BY	SAMPLING METHOD
9216	Roxana BP	LETCHER	03/12/20	Hinkle Env. Svs.	GRAB

BORING #	CORRESPONDING MW	SURFACE ELEV	WATER LEVEL	LOGGED BY	DRILLING METHOD
FL-2	NA	NA	NA	DUSTIN BURRIS	DIRECT PUSH

DEPTH	FIELD PID READING	VISUAL SOIL/ROCK DESCRIPTION
0-2’	15.0	GRAVEL, Some Sand, Gray, Wet, Slight Odor
2-4’	4.6	GRAVEL, Some Sand, Gray, Wet, No Odor
4-6’	1.1	GRAVEL, Some Sand, Gray, Wet, No Odor
*6-8’	40.8	SILTY CLAY, Some Fine Sand, Medium Soft, Brown, Damp, Odor
		REFUSED AT 8’ (Made 3 Attempts)
		* DENOTES INTERVAL SAMPLED

DRILLING LOG

HMB Professional Engineers, Inc
Remediation Division
3 HMB Circle
Frankfort, KY 40601
(502) 695-9800

JOB NUMBER	JOB NAME	COUNTY	DATE DRILLED	DRILLED BY	SAMPLING METHOD
9216	Roxana BP	LETCHER	03/12/20	Hinkle Env. Svs.	GRAB

BORING #	CORRESPONDING MW	SURFACE ELEV	WATER LEVEL	LOGGED BY	DRILLING METHOD
OE2-5	NA	NA	NA	DUSTIN BURRIS	DIRECT PUSH

DEPTH	FIELD PID READING	VISUAL SOIL/ROCK DESCRIPTION
0-2’	0.0	GRAVELLY SILT, Some Sand, Gray, Damp, No Odor
*2-4’	0.0	GRAVELLY SILT, Some Sand, Gray, Damp, No Odor
4-6’		NO RECOVERY
		TERMINATED AT 6’
		* DENOTES INTERVAL SAMPLED

ATTACHMENT F
Laboratory Analytical Report with COC

ANALYTICAL REPORT

March 24, 2020

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

HMB Professional Engineers, Inc.

Sample Delivery Group:	L1199868
Samples Received:	03/17/2020
Project Number:	9216
Description:	Roxana BP
Report To:	Mr. David Joslyn 3 HMB Circle Frankfort, KY 40601

Entire Report Reviewed By:

T. Alan Harvill
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

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FL-2 L1199868-01 Solid

Collected by: Dustin Burris | Collected date/time: 03/12/20 10:30 | Received date/time: 03/17/20 08:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1447092	1	03/18/20 09:37	03/20/20 11:53	DWR	Mt. Juliet, TN

FL-1 L1199868-02 Solid

Collected by: Dustin Burris | Collected date/time: 03/12/20 10:55 | Received date/time: 03/17/20 08:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1447092	1	03/18/20 09:37	03/20/20 12:13	DWR	Mt. Juliet, TN

EW-1 L1199868-03 Solid

Collected by: Dustin Burris | Collected date/time: 03/12/20 11:15 | Received date/time: 03/17/20 08:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1447751	1	03/18/20 09:37	03/20/20 21:46	ACG	Mt. Juliet, TN

EW-2 L1199868-04 Solid

Collected by: Dustin Burris | Collected date/time: 03/12/20 11:30 | Received date/time: 03/17/20 08:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1447751	1	03/18/20 09:37	03/20/20 22:05	ACG	Mt. Juliet, TN

OE-1-1 L1199868-05 Solid

Collected by: Dustin Burris | Collected date/time: 03/12/20 11:55 | Received date/time: 03/17/20 08:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1447751	1	03/18/20 09:37	03/20/20 22:24	ACG	Mt. Juliet, TN

OE-1-4 L1199868-06 Solid

Collected by: Dustin Burris | Collected date/time: 03/12/20 12:25 | Received date/time: 03/17/20 08:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1447751	1	03/18/20 09:37	03/20/20 22:43	ACG	Mt. Juliet, TN

PSB-5 L1199868-07 Solid

Collected by: Dustin Burris | Collected date/time: 03/12/20 12:40 | Received date/time: 03/17/20 08:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1447751	1	03/18/20 09:37	03/20/20 23:01	ACG	Mt. Juliet, TN

PSB-1 L1199868-08 Solid

Collected by: Dustin Burris | Collected date/time: 03/12/20 12:55 | Received date/time: 03/17/20 08:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1447751	1	03/18/20 09:37	03/20/20 23:20	ACG	Mt. Juliet, TN

OE-5 L1199868-09 Solid

Collected by	Collected date/time	Received date/time
Dustin Burris	03/12/20 13:20	03/17/20 08:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1447751	1	03/18/20 09:37	03/20/20 23:39	ACG	Mt. Juliet, TN

PSB-3 L1199868-10 Solid

Collected by	Collected date/time	Received date/time
Dustin Burris	03/12/20 13:45	03/17/20 08:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1447751	1	03/18/20 09:37	03/20/20 23:58	ACG	Mt. Juliet, TN

1 Cp
2 Tc
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All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

T. Alan Harvill
Project Manager

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	03/20/2020 11:53	WG1447092
Toluene	ND		0.00500	1	03/20/2020 11:53	WG1447092
Ethylbenzene	ND		0.00250	1	03/20/2020 11:53	WG1447092
Total Xylenes	ND		0.00650	1	03/20/2020 11:53	WG1447092
(S) Toluene-d8	*107*		*75.0-131*		*03/20/2020 11:53*	WG1447092
(S) 4-Bromofluorobenzene	*109*		*67.0-138*		*03/20/2020 11:53*	WG1447092
(S) 1,2-Dichloroethane-d4	*99.4*		*70.0-130*		*03/20/2020 11:53*	WG1447092

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	03/20/2020 12:13	WG1447092
Toluene	ND		0.00500	1	03/20/2020 12:13	WG1447092
Ethylbenzene	ND		0.00250	1	03/20/2020 12:13	WG1447092
Total Xylenes	ND		0.00650	1	03/20/2020 12:13	WG1447092
(S) Toluene-d8	*109*		*75.0-131*		*03/20/2020 12:13*	WG1447092
(S) 4-Bromofluorobenzene	*110*		*67.0-138*		*03/20/2020 12:13*	WG1447092
(S) 1,2-Dichloroethane-d4	*95.0*		*70.0-130*		*03/20/2020 12:13*	WG1447092

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	03/20/2020 21:46	WG1447751
Toluene	ND		0.00500	1	03/20/2020 21:46	WG1447751
Ethylbenzene	ND		0.00250	1	03/20/2020 21:46	WG1447751
Total Xylenes	ND		0.00650	1	03/20/2020 21:46	WG1447751
(S) Toluene-d8	*96.6*		*75.0-131*		*03/20/2020 21:46*	WG1447751
(S) 4-Bromofluorobenzene	*98.3*		*67.0-138*		*03/20/2020 21:46*	WG1447751
(S) 1,2-Dichloroethane-d4	*105*		*70.0-130*		*03/20/2020 21:46*	WG1447751

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	03/20/2020 22:05	WG1447751
Toluene	ND		0.00500	1	03/20/2020 22:05	WG1447751
Ethylbenzene	ND		0.00250	1	03/20/2020 22:05	WG1447751
Total Xylenes	ND		0.00650	1	03/20/2020 22:05	WG1447751
(S) Toluene-d8	*95.9*		*75.0-131*		*03/20/2020 22:05*	WG1447751
(S) 4-Bromofluorobenzene	*98.6*		*67.0-138*		*03/20/2020 22:05*	WG1447751
(S) 1,2-Dichloroethane-d4	*112*		*70.0-130*		*03/20/2020 22:05*	WG1447751

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	03/20/2020 22:24	WG1447751
Toluene	ND		0.00500	1	03/20/2020 22:24	WG1447751
Ethylbenzene	ND		0.00250	1	03/20/2020 22:24	WG1447751
Total Xylenes	ND		0.00650	1	03/20/2020 22:24	WG1447751
(S) Toluene-d8	*95.4*		*75.0-131*		*03/20/2020 22:24*	WG1447751
(S) 4-Bromofluorobenzene	*97.5*		*67.0-138*		*03/20/2020 22:24*	WG1447751
(S) 1,2-Dichloroethane-d4	*113*		*70.0-130*		*03/20/2020 22:24*	WG1447751

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	03/20/2020 22:43	WG1447751
Toluene	ND		0.00500	1	03/20/2020 22:43	WG1447751
Ethylbenzene	ND		0.00250	1	03/20/2020 22:43	WG1447751
Total Xylenes	0.00736		0.00650	1	03/20/2020 22:43	WG1447751
(S) Toluene-d8	*97.2*		*75.0-131*		*03/20/2020 22:43*	WG1447751
(S) 4-Bromofluorobenzene	*100*		*67.0-138*		*03/20/2020 22:43*	WG1447751
(S) 1,2-Dichloroethane-d4	*109*		*70.0-130*		*03/20/2020 22:43*	WG1447751

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	03/20/2020 23:01	WG1447751
Toluene	ND		0.00500	1	03/20/2020 23:01	WG1447751
Ethylbenzene	0.00570		0.00250	1	03/20/2020 23:01	WG1447751
Total Xylenes	ND		0.00650	1	03/20/2020 23:01	WG1447751
(S) Toluene-d8	*95.3*		*75.0-131*		*03/20/2020 23:01*	WG1447751
(S) 4-Bromofluorobenzene	*96.8*		*67.0-138*		*03/20/2020 23:01*	WG1447751
(S) 1,2-Dichloroethane-d4	*110*		*70.0-130*		*03/20/2020 23:01*	WG1447751

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	03/20/2020 23:20	WG1447751
Toluene	ND		0.00500	1	03/20/2020 23:20	WG1447751
Ethylbenzene	ND		0.00250	1	03/20/2020 23:20	WG1447751
Total Xylenes	ND		0.00650	1	03/20/2020 23:20	WG1447751
(S) Toluene-d8	*95.9*		*75.0-131*		*03/20/2020 23:20*	WG1447751
(S) 4-Bromofluorobenzene	*98.4*		*67.0-138*		*03/20/2020 23:20*	WG1447751
(S) 1,2-Dichloroethane-d4	*111*		*70.0-130*		*03/20/2020 23:20*	WG1447751

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	03/20/2020 23:39	WG1447751
Toluene	ND		0.00500	1	03/20/2020 23:39	WG1447751
Ethylbenzene	ND		0.00250	1	03/20/2020 23:39	WG1447751
Total Xylenes	ND		0.00650	1	03/20/2020 23:39	WG1447751
(S) Toluene-d8	*96.8*		*75.0-131*		*03/20/2020 23:39*	WG1447751
(S) 4-Bromofluorobenzene	*98.6*		*67.0-138*		*03/20/2020 23:39*	WG1447751
(S) 1,2-Dichloroethane-d4	*109*		*70.0-130*		*03/20/2020 23:39*	WG1447751

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
Benzene	0.00105		0.00100	1	03/20/2020 23:58	WG1447751
Toluene	ND		0.00500	1	03/20/2020 23:58	WG1447751
Ethylbenzene	ND		0.00250	1	03/20/2020 23:58	WG1447751
Total Xylenes	0.00670		0.00650	1	03/20/2020 23:58	WG1447751
(S) Toluene-d8	*94.0*		*75.0-131*		*03/20/2020 23:58*	WG1447751
(S) 4-Bromofluorobenzene	*97.3*		*67.0-138*		*03/20/2020 23:58*	WG1447751
(S) 1,2-Dichloroethane-d4	*114*		*70.0-130*		*03/20/2020 23:58*	WG1447751

Method Blank (MB)

(MB) R3511066-2 03/20/20 11:33

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	U		0.000400	0.00100
Ethylbenzene	U		0.000530	0.00250
Toluene	U		0.00125	0.00500
Xylenes, Total	U		0.00478	0.00650
(S) Toluene-d8	*107*			*75.0-131*
(S) 4-Bromofluorobenzene	*110*			*67.0-138*
(S) 1,2-Dichloroethane-d4	*100*			*70.0-130*

Laboratory Control Sample (LCS)

(LCS) R3511066-1 03/20/20 10:32

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Benzene	0.125	0.107	85.6	70.0-123	
Ethylbenzene	0.125	0.138	110	74.0-126	
Toluene	0.125	0.114	91.2	75.0-121	
Xylenes, Total	0.375	0.380	101	72.0-127	
(S) Toluene-d8			*109*	*75.0-131*	
(S) 4-Bromofluorobenzene			*106*	*67.0-138*	
(S) 1,2-Dichloroethane-d4			*100*	*70.0-130*	

L1200341-12 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1200341-12 03/20/20 16:19 • (MS) R3511066-3 03/20/20 17:39 • (MSD) R3511066-4 03/20/20 18:00

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Benzene	0.705	0.149	0.780	0.747	89.5	84.7	8	10.0-149			4.38	37
Ethylbenzene	0.705	1.67	2.69	2.43	144	107	8	10.0-160			10.3	38
Toluene	0.705	ND	0.725	0.687	103	97.5	8	10.0-156			5.41	38
Xylenes, Total	2.12	0.0909	2.53	2.37	115	108	8	10.0-160			6.83	38
(S) Toluene-d8					*109*	*108*		*75.0-131*				
(S) 4-Bromofluorobenzene					*108*	*109*		*67.0-138*				
(S) 1,2-Dichloroethane-d4					*101*	*103*		*70.0-130*				

Method Blank (MB)

(MB) R3511764-2 03/20/20 20:37

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Benzene	U		0.000400	0.00100
Ethylbenzene	U		0.000530	0.00250
Toluene	U		0.00125	0.00500
Xylenes, Total	U		0.00478	0.00650
(S) Toluene-d8	*97.2*			*75.0-131*
(S) 4-Bromofluorobenzene	*97.0*			*67.0-138*
(S) 1,2-Dichloroethane-d4	*109*			*70.0-130*

Laboratory Control Sample (LCS)

(LCS) R3511764-1 03/20/20 19:29

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Benzene	0.125	0.140	112	70.0-123	
Ethylbenzene	0.125	0.118	94.4	74.0-126	
Toluene	0.125	0.112	89.6	75.0-121	
Xylenes, Total	0.375	0.361	96.3	72.0-127	
(S) Toluene-d8			*95.5*	*75.0-131*	
(S) 4-Bromofluorobenzene			*103*	*67.0-138*	
(S) 1,2-Dichloroethane-d4			*122*	*70.0-130*	

L1199851-17 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1199851-17 03/21/20 02:29 • (MS) R3511764-3 03/21/20 03:25 • (MSD) R3511764-4 03/21/20 03:44

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Benzene	1.00	0.0136	0.936	0.999	92.2	98.5	8	10.0-149			6.51	37
Ethylbenzene	1.00	0.334	1.57	1.63	124	130	8	10.0-160			3.75	38
Toluene	1.00	ND	0.717	0.792	71.7	79.2	8	10.0-156			9.94	38
Xylenes, Total	3.00	1.05	4.93	5.23	129	139	8	10.0-160			5.91	38
(S) Toluene-d8					*90.6*	*93.6*		*75.0-131*				
(S) 4-Bromofluorobenzene					*106*	*109*		*67.0-138*				
(S) 1,2-Dichloroethane-d4					*120*	*120*		*70.0-130*				

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Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
	The remainder of this page intentionally left blank, there are no qualifiers applied to this SDG.

ACCREDITATIONS & LOCATIONS

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

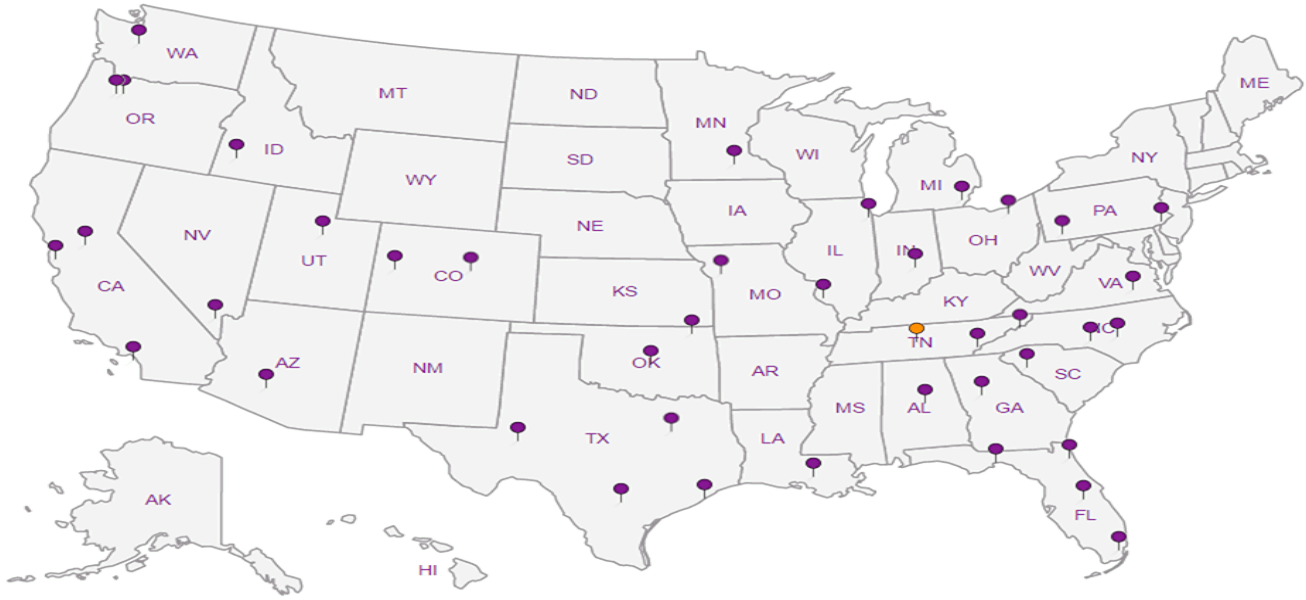
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



HMB Professional Engineers, Inc.

3 HMB Circle
Frankfort, KY 40601

Billing Information:
Ms. Jenna Daniels
3 HMB Circle
Frankfort, KY 40601

Pres Chk

Report to: DAVE JOSLYN
Email To: djoslyn@hmbpe.com

Project Description: ROXANA BP
City/State Collected: ROXANA, KY
Please Circle: PT MT CT ET

Phone: 502-695-9800
Fax:
Client Project # 9216
Lab Project #

Collected by (print): DUSTIN BURRIS
Site/Facility ID #
P.O. #

Collected by (signature):
Immediately Packed on Ice N ___ Y ✓
Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day
Quote #
Date Results Needed: ASAP

Analysis / Container / Preservative: BTEX METHOD 8260 / 202 / ICE

Chain of Custody Page 1 of 1

Pace Analytical® National Center for Testing & Innovation
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

SDG # L1199868
E220
Acctnum: HMBFKY
Template:
Prelogin:
PM: 364 - T. Alan Harvill
PB:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	BTEX METHOD 8260 / 202 / ICE	Remarks	Sample # (lab only)
FL-2	GRAB	S.S.	6'-8'	3/12/20	10:30	1	✓		-01
FL-1			6'-7.4"		10:55	1	✓		-02
EW-1			4'-6'		11:15	1	✓		-03
EW-2			2'-4'		11:30	1	✓		-04
OE-1-1			4'-6'		11:55	1	✓		-05
OE-1-4			4'-6'		12:25	1	✓		-06
PSB-5			4'-6'		12:40	1	✓		-07
PSB-1			2'-4'		12:55	1	✓		-08
OE 2-5			2'-4'		1:20	1	✓		-09
PSB-3			2'-4'		1:45	1	✓		-10

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks: * RUN BTEX METHOD 8260

pH _____ Temp _____
Flow _____ Other _____

Samples returned via: __ UPS __ FedEx __ Courier _____
Tracking # 1382 6821 6950

Sample Receipt Checklist
COC Seal Present/Intact: NP __Y __N
COC Signed/Accurate: __Y __N
Bottles arrive intact: __Y __N
Correct bottles used: __Y __N
Sufficient volume sent: __Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: __Y __N
RAD Screen <0.5 mR/hr: __Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	If preservation required by Login: Date/Time
	3/16/20	4:00			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 4.7 °C Bottles Received: 10 (1.0-.2=.8)	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 17 Mar Time: 0830	Hold: / Condition: NCF / OK

ATTACHMENT G
Site Investigation Report Checklist

Kentucky Department for Environmental Protection
Division of Waste Management
Underground Storage Tank Branch
300 Sower Boulevard, Second Floor – Frankfort KY 40601
(502) 564-5981

FOR OFFICIAL USE ONLY – DO NOT WRITE IN THIS SPACE

UST Site Investigation Checklist

1. UST Facility Information

Agency Interest Number (AI)	59860		
UST Facility Name	Roxana BP		
UST Facility Physical Address	Street Address: US Highway 160 South		
	City: Roxana	County: Letcher	Zip Code: 41848-
UST Facility Location *(Coordinates)*	Latitude: N37.109082	Longitude: W-82.94962	

2. UST System Owner Information

UST System Owner Name	Steven Bates		
UST System Owner Mailing Address	Street Address: P.O. Box 27		
	City: Roxana	State: KY	Zip Code: 41848-
UST System Owner Contact Information	Phone: (606)633-1633	Alternate Phone: ( ) -	
	Email:		

3. Site-Specific Details

Release/Incident Numbers and Dates	1. 63197	2.
Applicable Regulation	☒ 2019 Regulation	☐ Backlog Regulation *(effective prior to 4/18/94)*
Re-Evaluation of Classification	☐ Classified correctly *(no change)*	☒ Amended Classification Guide, DWM 4261 *(included with report)*

Soil Screening Levels *(per Classification Guide)*		**Groundwater Screening Levels** *(per Classification Guide)*	
On-Site	**Off-Site**	**On-Site**	**Off-Site**
☐ Class A	☐ Class B Soil Matrix Table 1	☒ Groundwater Table 1	☒ Groundwater Table 1
☐ Class A Adjusted	☒ Class B Soil Matrix Table 2	☐ Groundwater Table 2	☐ Backlog Levels
☐ Class B Soil Matrix Table 1	☐ Class B Soil Matrix Table 3	☐ Groundwater Table 3	☐ Other – Variance Approved
☒ Class B Soil Matrix Table 2	☐ Backlog Levels	☐ Backlog Levels	
☐ Class B Soil Matrix Table 3	☐ Other – Variance Approved	☐ Other – Variance Approved	
☐ Backlog Levels			
☐ Other – Variance Approved			

4. Current Site Details

Soil Contamination	Nature and extent (vertical and horizontal) defined?		☒ Yes	☐ No	☐ N/A
	Confirmed above applicable screening levels?	On-Site:	☐ Yes	☒ No	
		Off-Site:	☐ Yes	☒ No	
Groundwater Contamination	Nature and extent (vertical and horizontal) defined?		☒ Yes	☐ No	☐ N/A
	Confirmed above applicable screening levels?	On-Site:	☐ Yes	☒ No	
		Off-Site:	☐ Yes	☒ No	

Free product encountered? *(provide photographs)*	☐ Yes	Thickness *(in)*:	☒ No
Impacted receptors?	☐ Yes	☒ No	
Active or temporarily closed USTs on property?	☐ Yes	☒ No	
Aboveground storage tanks on property?	☐ Yes	☒ No	Substance(s) stored:

AI 59860

5. Site Information and History	
Site supplied by public water?	☒ Yes ☐ No
Other non-UST cleanup activities ongoing?	☐ Yes ☒ No List Applicable Program(s):
UST facilities identified w/in 100-meters *(both current and historical)*?	☐ Yes ☒ No List AI Numbers:
Description of past and present use of property and adjacent/nearby properties?	☒ Yes ☐ No
Updated chronology of events provided?	☒ Yes ☐ No
Provide site photographs of UST facility	☒ Yes ☐ No

6. Site Geology, Hydrogeology, and Stratigraphy			
Narrative description on geology, hydrogeology, and surface water hydrology provided?	☒ Yes		
Narrative description of trends in groundwater flow provided?	☒ Yes		
Geologic Cross Section provided	☐ Yes	☒ No	☐ N/A
Karst evaluation provided?	☒ Yes	☐ No	☐ N/A
Is this site within a Well head protection Area	☐ Yes	☒ No	☐ N/A
Discussion on water bearing zones associated with local domestic use?	☒ Yes	☐ No	☐ N/A

7. Maps			
Instructions: Provide the following maps as required by the UST Corrective Action Manual.			
Site Survey Map	☐ Yes	Topographic Map	☒ Yes
Vicinity Map	☒ Yes	Geologic Quadrangle Map	☒ Yes
Aerial *(photograph)* Map	☒ Yes		

Instructions: Provide the following maps if applicable to the data collected to date.					
Contaminant Isocontour Maps	*Soil:*	☐ Yes	☒ N/A	Groundwater Potentiometric Surface Map	☒ Yes ☐ N/A
	Groundwater:	☐ Yes	☒ N/A	Bedrock Contour Map	☐ Yes ☒ N/A
	Vapor:	☐ Yes	☒ N/A		

8. Field Investigations			
Soil	Narrative describing soil sampling and handling procedures	☒ Yes *(required)*	☐ N/A
	Field instrument calibration documentation	☒ Yes *(required)*	☐ N/A
	Soil analytical table	☒ Yes *(required)*	☐ N/A
	Soil boring logs	☒ Yes *(required)*	☐ N/A
Groundwater	Narrative describing groundwater sampling and handling procedures	☐ Yes *(required)*	☒ N/A
	Groundwater analytical table	☐ Yes *(required)*	☒ N/A
	Groundwater gauging data table	☐ Yes *(required)*	☒ N/A
	Concentration and Groundwater Elevation Graphs	☐ Yes *(required)*	☒ N/A
	Monitoring well construction and/or plugging records	☐ Yes *(required)*	☒ N/A
	Monitoring well schematic drawings *(installation/repair)*	☐ Yes *(required)*	☒ N/A
	Photographs of monitoring well installation/repair/abandonment	☐ Yes *(required)*	☒ N/A
	Bedrock wells recommended	☐ Yes	☒ No
Vapor	Narrative describing vapor sampling and handling procedures	☐ Yes *(required)*	☒ N/A
	Vapor analytical table	☐ Yes *(required)*	☒ N/A
	Schematic of soil vapor probe	☐ Yes *(required)*	☒ N/A

AI 59860

9. Analytical Requirements and Results		
Analytical data sheets	☒ Yes *(required)*	
Chains of custody	☒ Yes *(required)*	
Trip blank analysis *(BTEX water samples only)*	☐ Yes *(required)*	☒ N/A
Narrative description of any flagged, qualified, or anomalous data	☒ Yes *(required)*	

10. Decontamination and Material Management	
Summary of decontamination procedures?	☒ Yes *(required)*
Summary of handling and storage of investigation derived waste?	☒ Yes *(required)*

11. Off-Site Access and Encroachment Permits		
Is off-site access necessary?	☐ Yes	☒ No
If yes, have the requirements of Section 5.7 of the UST Corrective Action Manual been completed?	☐ Yes *(required)*	

12. Conclusions	
Instructions: Provide a written discussion for the following as part of the conclusions.	
Status of defining the horizontal and vertical extent of soil and groundwater contamination	☒ Yes *(required)*
Groundwater encountered may be a potential source for domestic-use	☒ Yes *(required)*
Potential contaminant migration between water bearing units	☒ Yes *(required)*
Contaminant mobility, migration pathways, and potential receptors	☒ Yes (required)
Dissolved phase groundwater plume *(i.e., expanding, decreasing, stable)*	☒ Yes (required)
Potential impacts to buried utility conduits	☒ Yes (required)
Data trends of all gauging and contaminant concentration data	☒ Yes (required)
Implementation of abatement measures for vapors and free product	☐ Yes ☒ N/A

13. Recommendations					
Continued Site Investigation	☐ Yes *(required)*	☐ No	Interim Corrective Action	☐ Yes *(required)*	☐ No
No Further Action	☒ Yes *(required)*	☐ No	Corrective Action	☐ Yes *(required)*	☐ No

14. Report Certification

Under the requirements of KRS Chapter 322 and 322A, this checklist and attached report shall be completed and signed by a P.E. licensed with the Kentucky Board of Licensure for Professional Engineers and Land Surveyors or a P.G. registered with the Kentucky Board of Registration for Professional Geologists.

I, the undersigned, state, under penalty of law, that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals responsible for obtaining the information, I certify the submitted information is true, accurate and complete.

Printed	David E. Joslyn	**Title**	Project Manager
Signature	David Joslyn PROFESSIONAL GEOLOGY 3 HMB Circle Frankfort, KY 40601 (502) 695-3600 www.hmbpe.com	**Date**	05/ 19 / 2020
☐ Professional Engineer		☒ Professional Geologist	
License Number		Registration Number	113080
License Date	/ /	Registration Date	6 / 11 / 98

DAVID E JOSLYN
Kentucky Board of Registration for Professional Geologists
SEAL
PG-113080
Registered Professional Geologist

If you have questions on how to fill out this form please contact the cabinet at (502) 564-5981 or visit our web site at http://waste.ky.gov/ust. For copies of UST facility records please visit http://eec.ky.gov/pages/openrecords.aspx or email EEC.KORA@ky.gov.

APPENDIX

G USER-PROVIDED INFORMATION

PHASE I ENVIRONMENTAL SITE ASSESSMENT

USER QUESTIONNAIRE

ASTM STANDARD PRACTICE E1527-21

PLEASE RETURN TO: Robert J. Nardi Email to: robert.nardi@wsp.com

In order to qualify for one of the Landowner Liability Protections offered by the Small Business Liability Relief and Brownfields Revitalization Act of 2001, the User (as defined in E1527-13) should provide the information requested below, to the extent available, to ensure the completion of "all appropriate inquiry" with respect to the subject Property. The environmental professional preparing the Phase I Environmental Site Assessment (ESA) needs this information to complete the report.

Property Identification: Roxana Site, Roxana, Letcher County, Kentucky

User: Federal Bureau of Prisons (FBOP)

Reason for ESA: The FBOP is proposing to build a Federal Correctional Insitution and Federal Prison Camp in Letcher County, KY.

Questionnaire Respondent (Printed Name, Title, Affiliation): Kimberly S. Hudson, Chief, Construction and Environmental Review Section, Facilities Management Branch

Questionnaire Respondent Signature: _____

Date: **January 23, 2024**

1. Environmental clean-up liens that are filed or recorded against the Property (40 CFR 312.25).

Are you aware of any environmental cleanup liens against the Property that are filed or recorded under federal, tribal, state or local law? **No**

2. Activity and land use limitations that are in place on the Property or that have been filed or recorded in a registry (40 CFR 312.26).

Are you aware of any activity and use limitations, such as engineering controls, land use restrictions or institutional controls that are in place at the Property and/or have been filed or recorded in a registry under federal, tribal, state or local law? **No**

3. Specialized knowledge or experience of the person seeking to qualify for the Landowner Liability Protections (40 CFR 312.28).

As the User of this ESA, do you have any specialized knowledge or experience related to the Property or nearby properties? For example, are you involved in the same line of business as the current or former occupants of the Property or an adjoining property so that you would have specialized knowledge of the chemicals and processes used by this type of business? **No**

4. Relationship of the purchase price to the fair market value of the Property if it were not contaminated (40 CFR 312.29).

Does the purchase price being paid for this Property reasonably reflect the fair market value of the Property? If you conclude that there is a difference, have you considered whether the lower purchase price is because contamination is known or believed to be present at the Property?
Unknown

5. Commonly known or reasonably ascertainable information about the Property (40 CFR 312.30).

Are you aware of commonly known or reasonably ascertainable information about the Property that would help the environmental professional to identify conditions indicative of releases or threatened releases of hazardous substances or petroleum to the environment? For example, as user,

(a) Do you know the past uses of the Property? **For questions 5(a) through 5(d) please refer to the previous completed Environmental Impact Statements for historical uses of the property.**

(b) Do you know of specific chemicals that are present or once were present at the Property?

(c) Do you know of spills or other chemical releases that have taken place at the Property?

(d) Do you know of any environmental cleanups that have taken place at the Property?

6. The degree of obviousness of the presence or likely presence of contamination at the Property, and the ability to detect the contamination by appropriate investigation (40 CFR 312.31).

As the User of this ESA, based on your knowledge and experience related to the Property, are there any obvious indicators that point to the presence or likely presence of contamination at the Property?

The site was previously mined and oil/gas operations are occurring at the site.

APPENDIX F

ADDITIONAL GEOTECHNICAL STUDY

ROXANA SITE (2016)

Additional Geotechnical Study
Proposed Federal Correctional Facility
Roxana Site
Letcher County, Kentucky

October 2016

Prepared for:
United States Department of Justice
Federal Bureau of Prisons
320 First Street NW
Washington, DC 20534

Prepared by:
Cardno, Inc.
5480 Swanton Drive
Lexington, Kentucky 40509
www.cardno.com

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RX-7 - Facility Location Map
RX-8 - Existing Topography and Boring Location Map
RX-9 – Clearing and Grubbing Map
RX-10 – Cut and Fill Limits Map

Appendices

Appendix A: Boring Logs
Appendix B: Laboratory Test Results

1 Introduction and Purpose of Investigation

The Roxana, Kentucky, site has been selected for proposed construction of a federal correctional facility by the **United States Department of Justice *(USDOJ)*, Federal Bureau of Prisons (*BOP*)**. Cardno has previously conducted studies and submitted reports relative to those studies for this site that include a "*Geotechnical Feasibility Report*" dated June 2012, and prepared by **Marshall Miller & Associates, Inc**. now doing business as
Cardno, Inc. *(Cardno)*; a "*Revised Earthwork Quantities and Construction Costs Report*" dated October 24, 2014, and issued by **Cardno MM&A** now doing business as Cardno; and a "*Title Reports and ALTA Survey Results Report*" dated May 2016, and prepared by Cardno. All previous reports are included by reference.

The proposed facility includes several structures as shown on the attached **Exhibit RX-7** "*Facility Location Map*." The proposed primary footprint of the **United States Penitentiary *(USP)*** is approximately 20 hectares (50 acres). Several other facilities including a prison camp, staff training center and a utility plant are proposed for the site. The BOP has relocated the prison camp and the access road to avoid a certain property at the site. Based upon these relocations and other studies, Cardno was requested to perform the following tasks:

Task 1 – Locate Access Road and Federal Prison Camp

> Cardno located the access road and **Federal Prison Camp *(FPC)*** such that they will fit the topography of the site near the location indicated by the BOP on June 3, 2016. These locations were determined from a plausible "cut and fill" perspective, and a preliminary location was submitted to the BOP for approval. The access road was designed at or less than a 10-percent grade.

Task 2 - Revise Earthwork Quantities and Construction Costs

> Cardno determined and balanced the quantities of cut and fill for the new access road and the FPC locations relative to the previously determined facility locations. The quantities are based on a subgrade pad elevation of 445 meters for the main building, a subgrade pad elevation of 421 meters for the FPC and finished pad elevation of 447 meters for the utility plant area and training facility. The cut and fill quantities were balanced and an estimate of current construction costs was computed based upon those quantities. Buildings are located in areas near bedrock, where possible.

Task 3 - Drilling and Sampling Borings at the New FPC Site and Select Areas

> Due to the relocating of the FPC and findings of the June 2012, Feasibility Study, four (4) borings were drilled at the site by **Horn & Associates, Inc. *(Horn & Associates)*** to determine engineering parameters relative to the site construction.

> Cardno drilled and sampled two (2) borings at the locations shown on the proposed FPC site on a map provided by BOP on July 27, 2016. The borings were advanced to auger refusal and samples collected at 2.5-foot intervals for the first 10 feet and 5-foot intervals thereafter. The encountered refusal material was core drilled to determine if the refusal material is bedrock.

> Cardno drilled and sampled two (2) additional borings on July 25, 2016, through July 28, 2016, at locations identified in the October 24, 2014, report as requiring further information. Those borings are located in hollow fills remaining from the surface mining activities that previously occurred on-site. Based upon the information collected from the borings, Cardno was requested to relocate the USP area to avoid founding a building on mine spoil in hollow fill areas.

Task 4 - Laboratory Testing

> Cardno provided the soil samples to **S&ME, Inc.** laboratory to classify the soil and to determine the soil strength parameters.

Task 5 - Reporting

> Cardno has summarized the subsurface conditions based upon the additional and prior drilling, sampling and testing. A summary of the earthwork cut and fill balancing and construction costs are provided. The report includes portions of the "*Geotechnical Feasibility Report*" issued for this site on June 1, 2012, by Cardno.

The above tasks comprised Cardno's additional geotechnical study (i.e., "study") for the selected site. Cardno did not perform environmental investigations or assessments.

The purpose of the study was to document additional baseline site conditions to provide a basis for developing feasible (albeit preliminary) geotechnical and earthwork plans for the site. Cardno's investigation scope was limited to consideration of gross earthwork quantities to achieve rough subgrade elevations, and foundation types judged feasible for the observed site-specific conditions. **An additional detailed study will be required to evaluate and recommend foundations for the final proposed structures, and their specific locations on the selected site and applicable loading conditions.**

Cardno is pleased to present our additional geotechnical study for the proposed federal correctional facility at the **Roxana Site** (***Roxana***) near Roxana, Kentucky. Our report for the Roxana site follows, and presents:

1. background information, including a description of the existing site conditions, summary of past mining on, below, and/or proximate to the site, and Cardno's assumptions and concept with regard to preparatory site development (i.e., gross earthwork and grading);
2. scope of geotechnical subsurface exploration;
3. inferred, generalized subsurface conditions, and laboratory soils testing results; and
4. preliminary foundation and site grading recommendations.

2 Background Information

2.1 Existing Conditions

Information pertaining to the Roxana site was provided by **TEC, Inc**., now doing business as **Cardno Government Services Divisions (*Cardno GS*)** and from persons (including property owners and personnel from the **Letcher County Economic Development Authority**) who were available on-site. Additional information was also obtained by Cardno during research of public information, and through site visits and drilling and sampling of the exploratory borings.

The proposed location for the correctional facilities are presented on **Exhibit RX-7** "*Existing Topography and Boring Location Map*." The Roxana site has been surface mined by the mountaintop removal *(MTR)* mining method. The site is characterized as a wide, gently sloping to flat ridge created by surface mine overburden removal and valley filling. Ridge side slopes are moderate to steep into the valleys. Surface cover consists of grasses with sparse shrubs and immature trees on the surface-mined area, with the remaining area being mature forest and roads. A natural gas compressor station is located on the surface-mined portion of the site. Also, an agricultural structure and storage sheds are located on-site. The subject site is located in the 0.2 to 0.3g Peak Ground Acceleration (*PGA*) range presented on the *2014 National Seismic Hazard Map for Probabilistic Ground Motion* (2-percent in 50-year return period event) as developed by the **United States Geological Survey (*USGS*)**.[1]

The limited stormwater management structures currently in-place will not properly manage flow from the proposed development. **Additional evaluation and design relative to stormwater management will be required after a final site plan is developed.**

[1] *Geotechnical Feasibility Report*" dated June 2012, and prepared by **Marshall Miller & Associates, Inc**. now doing business as **Cardno, Inc.**

2.2 Review of Past Mining[2]

Cardno researched publicly available records related to surface and underground mining in the general vicinity of the site. Cardno also conducted a field reconnaissance for surficial evidence of past mining and mining impacts in the area. Additionally, we reviewed a report by **Summit Engineering, Inc. (*Summit*)** on previous mining in the vicinity of the site. Refer to *Map RX-3* from the June 2012, report for known and documented mine workings.

Cardno's efforts attempted to identify mine workings on, adjacent to, and underlying the site and, if underground workings were identified, to assess the potential impact of mine subsidence (if any) on the earthwork and foundation designs. Potential subsidence associated with underground mine workings can significantly impact site development costs to provide mine stabilization measures and/or special foundations over higher risk subsidence zones and for more sensitive (less movement-tolerant) structures. No documented underground mining has been conducted in the immediate vicinity of the Roxana site, based on Cardno's review of publicly available documents.

Surface mining has been conducted in the Fireclay and Fireclay Rider coal seams at or above elevation 445 meters prior to 1995. During mining of the site, mine spoil (un-controlled/un-compacted fill material consisting primarily of shot rock) was placed over most of the site to the present existing grade. Surface mine spoil averages 21 meters (69 feet) in depth. In certain areas of the site, primarily where excess mine spoil was placed in valley fills, the mine spoil thickness is as much as 58.2 meters (191 feet).

2.3 Proposed Site Development

BOP provided Cardno with the proposed facilities to be built upon the property along with a generalized site development plan. The development will consist of an access road, FPC area, USP area, utility plant area and staff training center area including a firing range and a warehouse.

3 Subsurface Exploration

3.1 Subsurface Exploration (Drilling) and Drill Rig Supervision

Cardno retained the services of Horn & Associates, a geotechnical drilling contractor, to perform the subsurface exploration program. Cardno was responsible for supervision of the drilling activities, and logging the materials encountered. Cardno provided experienced field engineering personnel to monitor the drilling program, classify materials encountered in the borings, and prepare field boring logs. A summary of the borings drilled at the site is presented in *Table 3-1*, their respective locations are shown on **Exhibit RX-8** *"Existing Topography and Boring Location Map"* and the logs of the borings are contained in ***Appendix A***.

Standard hollow-stem augers with rock auger cutting bits were utilized to advance the borings through unconsolidated overburden, although earlier exploration stopped when encountering the practical limits of the tooling, this additional exploration extended the borings to refusal and into bedrock. Disturbed split-spoon sampling and Standard Penetration Tests (*SPT*) were performed to *ASTM D1586* standards (ahead of augering) on 0.75-meter (2.5-feet) intervals in the upper 3 meters (10 feet) below the ground surface and at 1.5 meter (5 feet) intervals thereafter, until reaching SPT or auger refusal. Undisturbed sampling (e.g., Shelby-tube sampling) was not attempted due to the variable nature of the mine spoil and common difficulties obtaining viable samples in such material. Below the depth of refusal, rock coring was undertaken to confirm the presence and location of bedrock.

For each 46-centimeter (18-inch) sampling interval, SPT blow counts on the 5-centimeter (2-inch) diameter split-spoon sampler were recorded for every 15-centimeter (6-inch) increment and SPT "N-values" were recorded as the sum of the blow counts for the final two 15-centimeter (6-inch) increments. Samples were visually logged in

[2] *Geotechnical Feasibility Report*" dated June 2012, and prepared by **Marshall Miller & Associates, Inc**. now doing business as **Cardno, Inc.**

accordance with *ASTM D2488* standards. Water levels in the boreholes were measured at the completion of drilling and, when practical, approximately 24 hours after drilling completion, and are noted on the boring logs.

Auger cuttings from the borings were collected, tested and remolded for additional testing purposes. The completed boreholes were filled and leveled with auger cuttings. The location and surface elevation at each boring was determined using survey-grade, global positioning system (*GPS*) techniques.

The four (4) borings summarized in *Table 3-1* were advanced at the respective locations shown on **Exhibit RX-8** *"Existing Topography and Boring Location Map*." All borings were advanced into the bedrock.

Table 3-1 Depth and Elevation of Fill and Boring Termination

Boring No.	Surface Elevation meters (feet)	Approximate Depth of Fill meters (feet)	Approximate Elevation of Base of Fill meters (feet)	Total Boring Depth meters (feet)	Boring Bottom Elevation meters (feet)
RX-12	443.6 (1,455.5)	2.8 (9.2)	440.8 (1,446.3)	9.8 (32.0)	433.9 (1,423.5)
RX-13	445.9 (1,463.0)	4.5 (14.8)	441.4 (1,448.3)	11.4 (37.5)	434.5 (1,425.5)
RX-14	466.3 (1,530.0)	46.4 (152.2)	419.9 (1,377.7)	50.9 (167.0)	415.4 (1,363.0)
RX-15	466.2 (1,529.4)	58.2 (190.9)	408.0 (1,338.4)	63.9 (209.5)	402.3 (1,319.9)

4 Subsurface Conditions

The subsurface conditions discussed in this report were inferred from the test borings summarized in *Table 3-1*, and the borings drilled in an earlier study. These borings are the basis for our preliminary geotechnical evaluations. Subsurface conditions between test borings will vary. Accordingly, project designers and others utilizing this information should not rely solely upon the subsurface information in this report, but should perform their own research and site observations, and further augment the available subsurface information as they deem necessary for their independent evaluations and design purposes.

The subject site is overlain with mine spoil (unconsolidated overburden) from previous surface coal mining activities. The surface mining activities were completed in the early-1990s. The mine spoil appears to have been randomly placed with little to no compaction (i.e., "uncontrolled" fill), and is highly variable in gradation and consistency with depth among the borings.

All borings are located in previously surface mined areas within the USP proposed footprint and the proposed FPC area. The unconsolidated overburden is comprised of varying proportions of dry to moist, brown and gray clayey silt and gray sandstone and dark gray shale fragments. Trace organics were observed in some borings at random depths. Material consistency was estimated from SPT blow counts. The penetration resistance (N-value) is used to describe the relative density and consistency of the soil being tested. The N-value can also be used to correlate the in-situ strength and compressibility of the soil. SPT N-values ranged from 4 to 79+. Higher N-values were observed in zones containing a substantial fraction of coarser particle sizes (i.e., rock fragments and boulders).

The zones where cohesive soil predominated ranged in consistency from soft to very stiff, with no consistent trend with depth. Those zones containing a substantial or predominant fraction of rock fragments exhibited a loose to dense consistency, with no apparent trend with depth. The cohesive soils exhibited varying degrees of plasticity from non-plastic to low plasticity. The bedrock encountered immediately below mine spoil consisted of gray sandstone of good to excellent quality based on Rock Quality Designation (*RQD*).

The proposed FPC will be located in a gap in the topography between the previous FPC location and the USP. Borings RX-12 and RX-13 were drilled where the proposed FPC was to be located with surface elevations slightly below and above the 445 meter elevation thought to be the approximate coal mine bench level in holes drilled previously to the south. Mine spoil was encountered in both holes at elevations 448.0 and 441.4 meters

respectively. The mine spoil consisted of moist to wet, clayey silts with many sandstone and shale fragments and layers. SPT N-Values ranged from 11 to 39 indicating a consistency from stiff to very stiff. The bedrock encountered was shaley sandstone with shale layers into sandstone conglomerate into massive sandstone. The auger cuttings were collected from each boring.

Borings RX-14 and RX-15 are located in areas identified as requiring additional investigation in the Cardno MM&A report dated October 24, 2014. Those borings are located in existing valley fills where the total depth to bedrock was previously undetermined.

4.1 Boring Hole RX-14

Soils encountered in RX-14 were generally dry to moist, stiff to hard, brown clayey silt containing some sandstone and shale fragments. SPT N-Values ranged from 9 to 68+ indicating a consistency from medium stiff to hard. A bag sample of the auger cuttings was collected. Rock was encountered in the borehole and rock coring was initiated at elevation 437.77 meters only to discover that the rock was a boulder. Several additional attempts to core in the unconsolidated material resulted in very poor recovery until competent bedrock was encountered at elevation 419.94 meters. The competent bedrock was gray sandstone with coal streaks present at elevation 417.99 meters and soft shale seams beginning at elevation 417.47 meters.

4.2 Boring Hole RX-15

Soils encountered in RX-15 were generally dry to moist, soft to hard, brown and grey, clayey silts with sandstone and shale fragments and layers. A bag sample of the auger cuttings was collected. The bedrock encountered at elevation 408.0 meters immediately below the unconsolidated overburden was massive gray sandstone.

4.3 Soils Laboratory Testing

Cardno delivered all soil samples to the subcontracted geotechnical testing laboratory, **S&ME**, **Inc.** and requisitioned desired testing. The natural moisture content (*ASTM-2216*) test was performed on several of the SPT samples. In addition, the following testing was performed on bulk samples obtained from the auger cuttings at the test boring locations:

> Atterberg Limits [*ASTM D4318*]

> Grain-size analyses [*ASTM D422*]

> Standard Proctor (*ASTM D-698*),

> Unconfined compression, remolded (*ASTM D-2166*), and

> Consolidated undrained triaxial (*ASTM D-4767*) on remolded samples.

Split spoon samples were collected from each SPT and placed in a jar for identification and possible laboratory testing. A total of four bag samples were collected, one from each of the borings. The two smaller samples from borings RX-12 and Rx-13 were composited in the laboratory. A total of three bag samples were tested, designated as RX-12/RX-13, RX-14 and RX-15.

The moisture contents of several of the split spoon samples were determined and the results ranged from 5.5-percent to 19.9-percent. The test results from the bag samples indicated soil classifications of clayey sand with gravel, sandy lean clay and clayey sand with gravel, respectively. The maximum dry density *(MDD)* of the three samples was 120.7 pounds per cubic foot *(pcf)*, 126.8 pcf and 132.6 pcf. The optimum moisture corresponding to the maximum dry densities was 9.3-percent, 9.8-percent and 6.5-percent, respectively. The maximum compressive strength for the remolded samples was 5.129 tons per square foot *(tsf)*, 5.121 tsf and 4.68 tsf, respectively. The total stress parameters of the remolded samples were $\Phi = 12.6^0$ and c=3.3 pounds per square inch *(psi)*; $\Phi = 18.4^0$ and c= 1.7 psi and $\Phi = 13.8^0$ and c= 3.2 psi. The effective stress parameters of the remolded samples were $\Phi = 21.6^0$ and c = 2.5 psi; $\Phi = 30.7^0$ and c = 0 psi and $\Phi = 28.6^0$ and c= 1.1 psi. Soil testing results are presented in the following Tables 4-1, 4-2 and 4-3 and in ***Appendix B***.

Table 4-1 Laboratory Results – Soil Moisture Content

Sample Id #	Material Description	Moisture (%)
RX-12 • SS-1	n/a	10.8
RX-12 • SS-3	n/a	9.6
RX-13 • SS-2	n/a	5.5
RX-13 • SS-4	n/a	19.9
RX-12 & RX-13 • Bags	Clayey sand with gravel	6.2
RX-14 • SS-6	n/a	8.7
RX-14 • SS-14	n/a	10.1
RX-14 • Bag	Sandy lean clay	6.6
RX-15 • SS-7	n/a	11.6
RX-15 • SS-17	n/a	9.8
RX-15 • Bag	Clayey sand with gravel	4.9

Table 4-2 Laboratory Results – Atterburg Limits and Compaction Tests

		Liquid & Plastic Limits Test Report						Lab Compaction Test Report			
								Rock Corrected Test Results		Uncorrected	
Sample Id #	Material Description	LL	PL	PI	%<# 40	%<# 200	USCS	Maximum dry density (pcf)	Optimum moisture (%)	Maximum dry density (pcf)	Optimum moisture (%)
RX-12/RX-13	Clayey sand with gravel	29	20	9	50.8	40.8	SC	120.7	9.3%	118.7	9.8%
RX-14	Sandy lean clay	29	20	9	63.1	55.6	CL	126.8	9.8%	125.4	10.2%
RX-15	Clayey sand with gravel	28	18	10	42.3	33.8	SC	132.6	6.5%	128.8	7.3%

Table 4-3 Laboratory Results – Soil Strength Parameters

Sample Id #	Material Description	Moisture (%)	Wet Density (pcf)	Dry Density (pcf)	Max Comp. Strength (tsf)	Strain @ Max Comp. Strength (%)	Friction Angle (Degrees), Effective Stress	Cohesion (psi), Effective Stress
RX-12/RX-13	Clayey sand with gravel	12	126.3	112.8	5.129	1.4	21.6	2.5
RX-14	Sandy lean clay	12	134.6	120.2	5.121	1.5	30.7	0
RX-15	Clayey sand with gravel	10.7	134.1	121.1	4.68	1.3	28.6	1.1

The *soil moisture content* test indicates the in-situ moisture of the soil for comparison to the optimum moisture content determined in the compaction test. The maximum density and the optimum moisture can be determined from the *compaction test*. These values are used when the soil is excavated, transported and placed in structural fill to determine the percent compaction.

A *grain-size analysis* and *Atterberg Limits* tests are used to determine the classification of the soil. The *maximum compressive strength* of the soil is generally twice the undrained shear strength of the soil. The *total*

stress and *effective stress parameters* are used to determine the bearing capacity of the soil and can be used in slope stability analysis.

5 Foundation and Site Grading Recommendations

5.1 General

The data obtained from the subsurface exploration and laboratory testing programs were relied on for our preliminary geotechnical evaluations and formulation of foundation and site grading recommendations. The test borings indicate that the subsurface conditions within the primary facility footprint consist of surface mine spoil of highly variable consistency, roughly averaging 21 meters (69 feet) in thickness. Accordingly, Cardno has assumed that the primary facility footprint (approximately 50 acres) at the Roxana site would be graded to an approximate subgrade elevation of 445 meters (1,460 feet), which Cardno estimates would locate building foundations on or in rock.

Cardno considered the possibility that portions of the site may contain expansive shale, which could impact foundation behavior if such materials existed near foundation level or were incorporated within fills beneath structures or around piping. The *U.S. Army Technical Manual (TM5-818-7)* for Foundations in Expansive Soils indicates that Letcher County, Kentucky is located in a “non-expansive” region of the Appalachian Plateau physiographic province. Non-expansive is defined in the aforementioned-reference as the extremely limited occurrence of expansive materials. Cardno attempted to visually identify evidence of expansive materials, such as the existence of pyrite and gypsum materials within shale in the mine spoil and bedrock. Given the findings of our desktop research and lack of visual evidence of expansive shale during the exploration program, laboratory testing for expansive constituents (e.g., sulfur species) was not performed.

5.2 Area Base Elevations

Cardno determined base elevations relative to the site topography and the geotechnical studies for each area. Based upon the amount of mine spoil present on the site, the buildings should be founded on bedrock or other competent material such as structural fill.

The USP area is proposed to be graded to a subgrade elevation of 445 meters (1,460 feet), which Cardno estimates will locate building foundations on or in rock across the majority of the area. Earthwork to reach the subgrade elevation is primarily excavation and relocation of mine spoil (unconsolidated overburden). Valley fills that extend deeper than the 445 elevation are located along the north and east sides. The building footprint has been rotated to avoid the valley fill areas. The roadway on the east side of the USP and the parking area on the north side of the USP will be located on as much as 38 meters (125 feet) of mine spoil fill in the original valleys. The fenced perimeter of the USP area will also cross the deep mine spoil on the east side and structural fill on the south side.

The training center is proposed to be graded to an approximate subgrade elevation of 447 meters (1,467 feet). The training center will be founded on structural fill that has been placed in a controlled manner from the excavated mine spoil.

The utility plant area will be graded to an approximate elevation of 447 meters (1,467 feet). The utility plant area will be founded on bedrock.

The FPC will be graded to approximate elevation of 421 meters (1,381 feet). The prison camp buildings will be founded on bedrock and the other facilities will be founded on structural fill.

5.3 Foundation Design Recommendations

As noted in the preceding section, structures could be reliably supported on shallow foundations on or in bedrock (sandstone) or structural fill. This would require that the USP area be graded to approximate elevation 445

meters. The FPC should be graded to approximate elevation 421 meters and the utility plant and training center areas should be graded to elevation 447 meters. This foundation configuration would afford an allowable bearing capacity of 4,000 pounds per square foot *(psf)* in bedrock and 2,000 psf in structural fill. This will limit potential total and differential settlements to less than 1-inch, if all recommendations can be followed. All perimeter foundations should bear below the frost line for the area.

The mine spoil that will be removed from the USP building footprint has surcharged the fill remaining in the valleys below elevation 445 meters. Therefore, the fill in the valleys has likely consolidated since the mine spoil was placed in the 1990s. However, Cardno discourages building foundations bearing on or within untreated/unimproved mine spoil which could lead to at least six (6) inches of total settlement and 2.5 inches of differential settlement over a 50-foot distance per 100 feet thickness of mine spoil. The unknown of the presence of large boulders or deleterious materials in the fill could likely result in future settlement and could likely cause damage to any facilities bearing on this medium. Therefore, Cardno recommends geosynthetic reinforcement or grout compaction in critical areas which support the roadway, parking lot, perimeter fences and/or walls.

Control of surface water drainage in the valley fill areas is paramount to reduce the risk of settlement in these areas.

Mine spoil transported to the valleys to be compacted as structural fill will have a bearing capacity of 2,000 psf if placed according to the recommendations herein.

In all cases, Cardno recommends that the foundation subgrades be examined by a licensed Geotechnical Engineer prior to placement of concrete. Any subgrades that are found unsuitable should be over-excavated to suitable subgrade and the bottom level of the foundation lowered in elevation or brought up with properly compacted structural fill or flowable fill. All structural fill materials should be examined for potentially expansive constituents, and approved by the Geotechnical Engineer. As previously mentioned, a reinforced structural fill (incorporating geosynthetic reinforcement [i.e., geotextile or geogrid or grout compaction]) could be designed and installed beneath the roadway, the parking lot, the fence and/or walls, if necessary or desirable, to increase bearing capacity and help mitigate the impacts of potential total and differential settlements.

Depending on the final facility layout (horizontal and vertical configurations) on the site, additional subsurface exploration might be required to evaluate and design a ground improvement program, finalize recommendations for geotechnical aspects of the project, and complete detailed foundation designs.

5.4 Slab-On-Grade Design Recommendations[3]

Cardno recommends that the floor slabs be designed to be structurally independent of the foundations, and that all control and expansion joints be filled with appropriate joint filler materials. We further recommend that the floor slabs be designed and constructed in accordance with *American Concrete Institute (ACI) 302.1R, ACI 330R*, and *ACI 360R* standards.

5.5 Asphalt Pavement Recommendations[4]

A California Bearing Ratio (*CBR*) of 2 may be used for design of asphalt pavements that bear upon mine spoil. A typical pavement section based on the 2007 *Pavement Design Guide* from the **Division of Highway Design of the Kentucky Transportation Cabinet** is presented in the following table along with the assumed design criteria.

[3] *Geotechnical Feasibility Report*" dated June 2012, and prepared by **Marshall Miller & Associates, Inc**. now doing business as **Cardno, Inc.**
[4] *Ibid.*

Table 5-1 Typical Pavement Section

Parameter	Value	Comments
CBR	2	
ESAL*	500,000	
Structural Number	4.97	Based on 50% asphalt curves

* *Equivalent Single Axle Load*

Typical Asphalt Pavement Sections		
	Structural Layer Coefficient	Thickness (in.)
Surface Layer	0.44	2
Binder Layer	0.42	2
Base Layer	0.40	4
Aggregate Base	0.14	12

5.6 Earthwork and Excavations

Cardno anticipates that the preparatory mass earthwork can be performed using conventional heavy construction equipment and techniques. Vegetation and shallow soils containing roots and other unsuitable components should be removed (cleared) from structure (foundation and slab), pavement, other new construction areas, and areas of fill construction or material stockpiling/disposal. The "*Clearing and Grubbing Map*" as shown in **Exhibit RX-9** depicts the limits of the areas to be cleared. Upon removal of these unsuitable materials, the exposed subgrades in areas requiring fill placement or near finished grade for foundation, slab or pavement construction should be examined by a licensed Geotechnical Engineer, while the areas are heavily compacted and thoroughly proof-rolled. For the heavy compaction process, Cardno recommends use of a sheepsfoot roller compactor with a minimum static weight of 10 tons, and having a leading blade for filling compaction indentations in advance of successive passes. For proof-rolling, we recommend use of a smooth drum roller with a minimum static weight of 10 tons. Cardno recommends a minimum of three overlapping passes in each of two orthogonal directions with the sheepsfoot compactor for heavy compaction, followed by two overlapping passes in each of two orthogonal directions with the smooth drum roller for proof-rolling purposes. The intent is to compact areas of relatively soft/loose shallow soils and re-compact areas disturbed during subgrade excavation or other activities, and identify unacceptable subgrade areas that require correction/restoration. Areas which remain unsuitable in the professional opinion of the Geotechnical Engineer or deviate from the contract specification requirements, after the heavy compaction and proof-rolling process, should be over-excavated to a suitable bearing stratum and replaced with compacted structural fill or acceptable on-site soils.

Excavations must be performed in accordance with the current **Occupational Safety and Health Administration (*OSHA*)** Standards for Excavations (*29 CFR 1926, Subpart P*). The majority of the silty clay materials encountered at the site is Type "B" or Type "C" soils, as classified in the above-referenced OSHA standard. The Contractor must evaluate soil and water conditions during excavations, since variations in the soil can occur across the site. The Contractor is ultimately responsible for all excavation safety.

5.7 Structural Fill and Backfill Criteria

All material placed as fill beneath foundations, slabs, and pavements, and as backfill against foundations and in utility trenches should be a well-graded, durable, chemically inert, granular fill, free of organic matter, debris, and other deleterious material.

All structural fill and backfill should be placed in horizontal lifts not to exceed 10 inches loose lift thickness (i.e., pre-compaction thickness) and shall be compacted to at least 95-percent of the MDD as determined by the Standard Proctor Test (*ASTM D-698*) using a minimum 10-ton static roller. In confined areas, such as over-

excavated spread footing areas, the structural fill should be placed in horizontal lifts not to exceed 6 inches loose lift thickness and compacted to at least 95-percent of the MDD (per *ASTM D-698*) using a manually-operated compactor. For **both** of the compaction operations, the placement moisture content shall be controlled within ±3-percent of the optimum moisture content (per *ASTM D-698*), or within an alternate moisture range determined by the Geotechnical Engineer based on the makeup and moisture sensitivity of the specific fill material. Granular structural fill/backfill should be compacted with equipment operating in vibratory mode if the nature and moisture condition of the underlying subgrade and trench walls (if applicable) would not be deteriorated by the vibratory action.

Excavated/borrowed mine spoil might constitute acceptable structural fill in larger areas (*not small or confined areas*), if supported by an appropriate scope of prequalification index and moisture-density testing, and durability testing if predominantly comprised of rocky material. The mine spoil may require screening to comply with structural fill grain size and placement specifications, noting that the maximum predominant particle size within the fill material should not exceed $^1/_3$ to $^1/_4$ the recommended lift thickness, depending on the application and the durability of the larger particles.

The excavated rock used for structural fill should be isolated from the mine spoil structural fill. The excavated rock fill should be placed at the bottom of each of the hollow fills to promote free drainage of subsurface water. The excavated rock fill should be separated from the mine spoil fill with a geosynthetic fabric to prevent piping of the spoil fines. The excavated rock should have a maximum size of 15 inches and should be well-graded. Cardno recommends placing the excavated rock fill in lifts no greater than 24 inches and the rock fill should be bladed in with a dozer. The rock fill should be compacted with a 10- to 20-ton smooth vibratory roller.

5.8 Control of Groundwater and Surface Water

The Contractor should be required to conduct all excavation and backfill operations “in-the-dry”. Provisions should be made to remove infiltrating groundwater and perched water, divert surface runoff away from work areas, and seal working surfaces from water penetration throughout construction. Design, construction, and maintenance of water control methods should be the responsibility of the Contractor. We anticipate that proper grading of the prevailing ground surface to direct surface runoff away from active and completed work areas, and from excavations, combined with pumping from properly filtered sumps will be adequate to control groundwater and normal surface runoff. The mass excavation of existing mine spoil and construction of drainage controls through remaining spoil could alter surface and subsurface drainage patterns and interaction within the spoils. Should the mine spoil include rocky zones with significant void space and/or rock that degrades rapidly, the introduction/reintroduction of water and additional oxygen into such spoil zones could prompt subsurface erosion and/or accelerated weathering/deterioration in otherwise inert zones. The institution of construction-period and permanent surface drainage controls, maintenance of well-sealed earthwork surfaces, and precautions to ensure that installed subsurface drains, rain gutter outlets, water lines, and other plumbing are absent leaks should largely mitigate these potential adverse consequences.

6 Earthwork Quantities and Costs

Preliminary earthwork quantities are presented in *Table 6-1*. Limits of cut and fill are presented on **Exhibit RX-10**. **Additional (i.e., fine) grading to achieve site drainage and landscaping will be required. Site drainage should be designed to avoid any mine spoil areas left in-place.**[5]

The earthwork quantities have been estimated from the three-dimensional modeling of the site using **Carlson®** Software.[6] The earthwork quantities for each area were determined and balanced such that the amount of material excavated was equal to the amount of material placed and compacted.

[5] *Geotechnical Feasibility Report*" *dated June 2012, and prepared by* ***Marshall Miller & Associates, Inc****. now doing business as* ***Cardno, Inc.***
[6] *www.**carlsons**w.com*

Cardno estimated that the spoil material will be denser in the structural fill and shrink in volume by 10-percent; Cardno further estimated that the rock excavated will be 25-percent greater in the structural fill. The soil or spoil fill are sloped at 2 horizontal to 1 vertical (2:1). The rock cuts are sloped 1/4:1. Some areas containing softer rock such as shale may have to be sloped flatter. The following *Table 6-1* represents the amount of cut and fill for each area. The cut and fill balancing is shown on **Exhibit RX-8**.

Table 6-1 Roxana Site – Volumes by Area

Item (Cubic Meters)	USP Area	Access Road Area	Training Center Area	Utility Plant Area	Prison Camp Area	Total
Spoil Excavation	5,915,065	0	0	661,469	8,551	6,585,085
Rock Excavation	0	104,737	0	237,146	216,025	557,908
Structural Fill	47,382	1,216	3,956,737	6	2,678,634	6,683,976
Spoil Fill	0	0	0	0	0	0
Base Elevation	445	Varies	447	447	421	

The unit costs for the construction quantities were based on "RSMeans Cost Data"[7] and updated to reflect 2016 costs. The updated lower excavation costs reflect large excavations (more than 200,000 bank cubic yards) typical of surface mines in the area, and because of the depressed coal market, heavy equipment generally used in that industry is available. The estimated costs are presented in *Table 6-2*.

Table 6-2 Roxana Site • 2016 Revised Earthwork Quantities and Construction Costs

Item	Unit Cost ($/Cubic Meters)	Unit Cost ($/Cubic Yards)	Units (Cubic Meters)	Units (Cubic Yards)	Cost ($)
Spoil Excavation	$4.88	$3.73	6,585,085	8,612,966	$32,135,215
Rock Excavation	$22.54	$17.23	557,908	729,716	$12,575,246
Structural Fill	$5.00	$3.82	6,683,976	8,742,310	$33,419,878
	($/Hectare)	($/Acres)	(Hectare)	(Acres)	$
Clear Mined Area	$850	$342	24.1	60	$20,485
Clear Forest Area	$21,930	$8,876	49.9	123	$1,094,307
				Total	**$79,245,131**

7 Engineers' Statement

Cardno requests and recommends that we be provided the opportunity to review the details of development within the primary facility footprint, and the associated site development drawings, foundation designs and details, and contract specifications for consistency with our recommendations. Cardno's recommendations are contingent upon continuous monitoring by the licensed Geotechnical Engineer or his representative of geotechnical aspects of the construction. At a minimum, Cardno recommends that the monitoring include observation of preparatory site earthwork, including structural fill placement and compaction; foundation, slab, and pavement subgrade preparation; and foundation construction.

Slope stability calculations were not included in this scope of services. **Slope stability evaluations for existing mine spoil valley fills, and proposed cut and fill slopes are recommended.** Slope stability evaluations should encompass, but not necessarily be limited to, slopes constructed of, or in, mine spoil and surface water and groundwater influences on stability. Also, subsidence prediction associated with previous coal mining or

[7] Hale, Derrick, PE, Senior Editor, RSMeans Heavy Construction Cost Data 2016, 30th Annual Edition, From the Gordian Group®, Construction Publishers & Consultants, 2015.

recommendations to mitigate subsidence were not included in this scope of services. Only identification of the potential for subsidence at the site was assessed, which is judged acceptable for this site selection process.

Additional geotechnical investigation should be performed if construction over mine spoil and ground improvement of the spoil will be pursued as a site development approach. Additionally, the feasibility-level earthwork quantities and estimates of select construction costs will require refinement as additional geotechnical information is obtained and details of the planned development are finalized for the selected site.

Cardno prepared this report in support of the proposed federal correctional facility to be located in Letcher County, Kentucky. Cardno's conclusions and recommendations are based on information obtained from the subsurface investigation and Cardno's understanding of the proposed development as expressed in this report. As noted previously in this report, changes to our recommendations might be warranted if the actual subsurface conditions vary from those anticipated, or as details of the proposed development become known.

Generally-accepted geotechnical engineering practices were used to develop Cardno's recommendations. The services provided for this project were performed with the care and skill ordinarily exercised by reputable members of the profession practicing under similar conditions at the same time and in the same or similar locality. No warranty, expressed or implied, is made or intended by rendition of these consulting services or by furnishing oral or written reports of the findings made. Cardno reserves the right to revise or amend our opinions in this report in the event new information, documentation or evidence becomes available.

Résumés of Writers

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W. Dale Nicholson

Current Position
Senior Forensic Engineer

Profession
Civil Engineer

Years' Experience
35+

Joined Cardno
1990

Education
BS – Civil Engineering, University of Kentucky

AS – Civil Engineering Technology, Lexington Technical Institute

Professional Registrations
PE – KY, WV, VA, TN, AR, OK, NY

LS – KY

PI – KY, WV, TN

Fire Investigator – CFI-IAAI, CFEI-NAFI

MSHA 8 Hour Annual Refresher

Summary of Experience

Mr. Nicholson investigates and provides expert opinions as to the causation of property damage claims to residential and commercial structures, equipment, vehicles and land-related to construction errors, water, wind, hail, vibration, fire, explosion, mine subsidence, landslides, settlement, accidents and other causes. He investigates and provides expert opinions relative to regulations and codes for the above referenced cases as well as personal injuries or fatalities. He also performs environmental site assessments on commercial and mining properties. Mr. Nicholson provides professional land surveying services including boundary surveys, stockpile surveys and topographic surveys.

Significant Projects

> **Various Insurance Adjusters:** Analysed structural damage due to blasting, fire, and weather-related causes; investigated automobile accidents; analysed ground water infiltration and associated damage to residential and commercial properties; conducted landslide investigations.

> **Various Attorneys:** Provided expert witness testimony regarding damages to residential and commercial property and relative to personal injury and fatalities.

> **Commercial Real Estate:** Performed Phase I Environmental Site Assessments.

> **Surveying:** Performed boundary surveys of commercial and personal properties; conducted stockpile surveys to determine volume of materials including coal, limestone, lead concentrate, zinc concentrate, copper concentrate, soil contamination and vermiculite.

Specific Projects

> Investigated the causation of landslides on or near properties owned or leased by oil and gas companies and coal companies.

> Investigated the causation of structural damage to residential and commercial properties for insurance companies in Kentucky, West Virginia, Tennessee and Louisiana (Hurricane Katrina).

> Investigated the origin and cause of natural gas explosions for insurance companies in Kentucky.

> Investigated the origin and cause of fires for insurance companies in Kentucky, West Virginia and Tennessee.

> Performed Phase I Site Assessments of coal mining properties in Kentucky, West Virginia, Virginia and Pennsylvania.

> Performed Phase I Site Assessments at various motels in Kentucky.

> **US Army Corps of Engineers:** Coordinated development of proposal that included health and safety plan, and access plan for geotechnical drilling project; managed drilling project.

John E. Feddock

Current Position
Senior Principal, Practice Leader - Engineering

Profession
Mining Engineer

Years' Experience
44+

Joined Cardno
1996

Education
MS - Mining Engineering (Mineral Economics, Rock Mechanics), Columbia University, Henry Krumb School of Mines, New York, New York

Professional Registrations
PE - IL, KY, OH, PA, UT, VA, WV

Land Surveyor - WV

SME - Founding Registered Member, Competent Person for Mineral Reporting

MSHA Certified Trainer

MSHA 8 Hour Annual Refresher

Summary of Experience

Mr. Feddock serves as the principal investigator in mineral economic and mining geotechnical projects to meet standards as developed by the U.S. Securities and Exchange Commission (SEC), the Canadian National Instrument (NI) 43-101, and the Australian Joint Ore Reserves Committee (JORC) code. Previously, he served as Vice President/Manager of Engineering for two major coal companies. In addition, he serves as an expert witness and manages all administrative aspects of the Lexington, KY, office.

Significant Projects

> Served as consultant for projects at surface and underground mines for the mineral industry including coal; stone metal and non-metal mining *(underground mine projects included mine planning and entry layout, longwall applications, subsidence prediction and control, productivity analysis and prediction, continuous miner and longwall equipment applications, roof support analysis, and coal pillar sizing)*

> Characterization of all types of mineral resources for effective layout and design for surface and underground mines

> Coordinated mineral economics projects that included discounted cash flow and rate of return analysis; equipment and facility investment requirements (Capex); the valuation of property, plant, equipment, and reserves; mine operating cost (Opex) forecasting and analysis; mine feasibility studies, and company valuations

> Provided expert witness testimony, attorney technical support, insurance claim analysis for cases that involved: longwall mining, blasting, subsidence, groundwater impacts, slope stability, lost coal claims, personal injury, production capability, sales contracting, and other mining and geotechnical engineering issues in both State and Federal courts

Specific Projects

> **Overseas Assignments**: Australia, Chile, China, Colombia, United Kingdom

> **Valuation of Reserves, Mines and/or Facilities:** Colorado, Indiana, Illinois, Kentucky, Utah, Virginia, and West Virginia in the U.S.A., and Chile and China

> **Design of Plug-Type Mine Seals** in compliance with 30CFR§75.335 (Federal regulation for mine seals)

> **Evaluation of Business Interruption Claim** at open pit copper mines

> **Regional Search for Coal Seams** containing specific trace elements

> **Longwall Equipment Entrapment**, damage, assessment and performance

> **Reclamation Liability** (Asset Retirement Obligation) **Assessment**

> **Valuation** of Companies, Assets, and Goodwill Impairment

Exhibits

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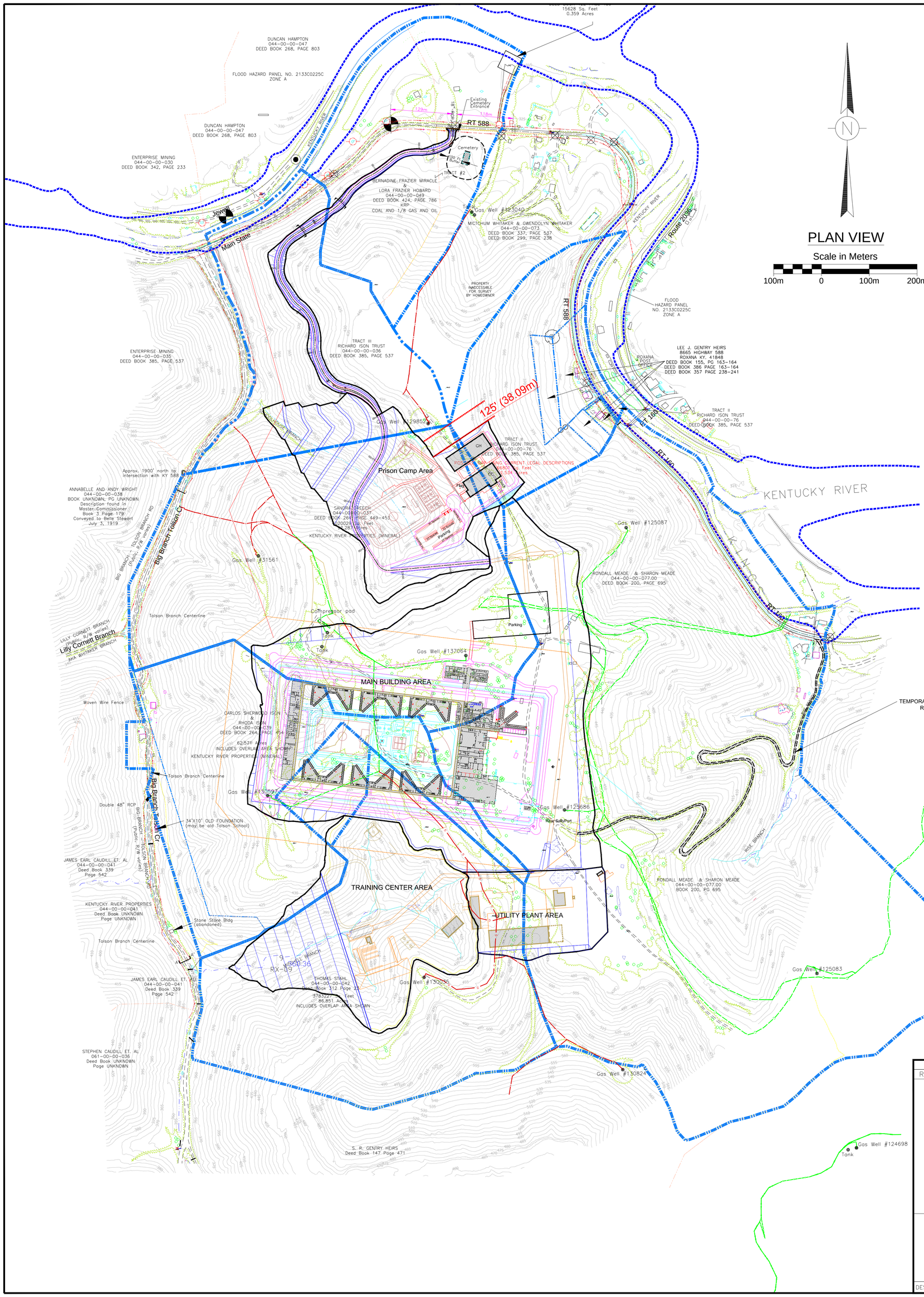
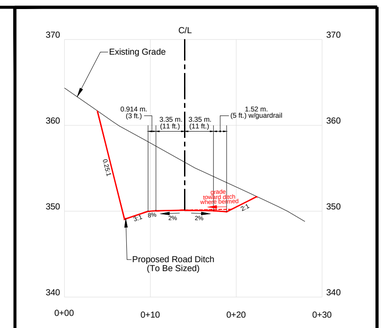
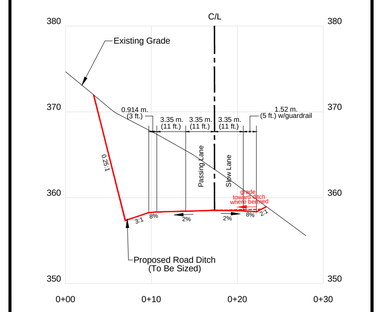




Cross Section Sta. 3+00
(Typical Two-Lane Roadway)



Cross Section Sta. 4+00
(Typical Three-Lane Roadway)

Scale in Meters
10m 0 10m 20m

LEGEND

- EXISTING TOPOGRAPHY
- EXISTING UNDERGROUND GAS LINES
- EXISTING ABOVE-GROUND GAS LINES
- Gas Well #125686 — EXISTING GAS WELL LOCATIONS
- ROAD CROSS SECTION BASELINE

Coordinate System: Kentucky South State Plane NAD 83 (Metric)

REVISION	DATE	DESCRIPTION	P.M.
	10/5/16		

Map RX-7
Facility Location Map

Federal Bureau of Prisons Roxana Site

Roxana Quadrangle
Letcher County, Kentucky

Prepared For:
Cardno Government Services
New Cumberland, Pennsylvania

Scale: As Shown

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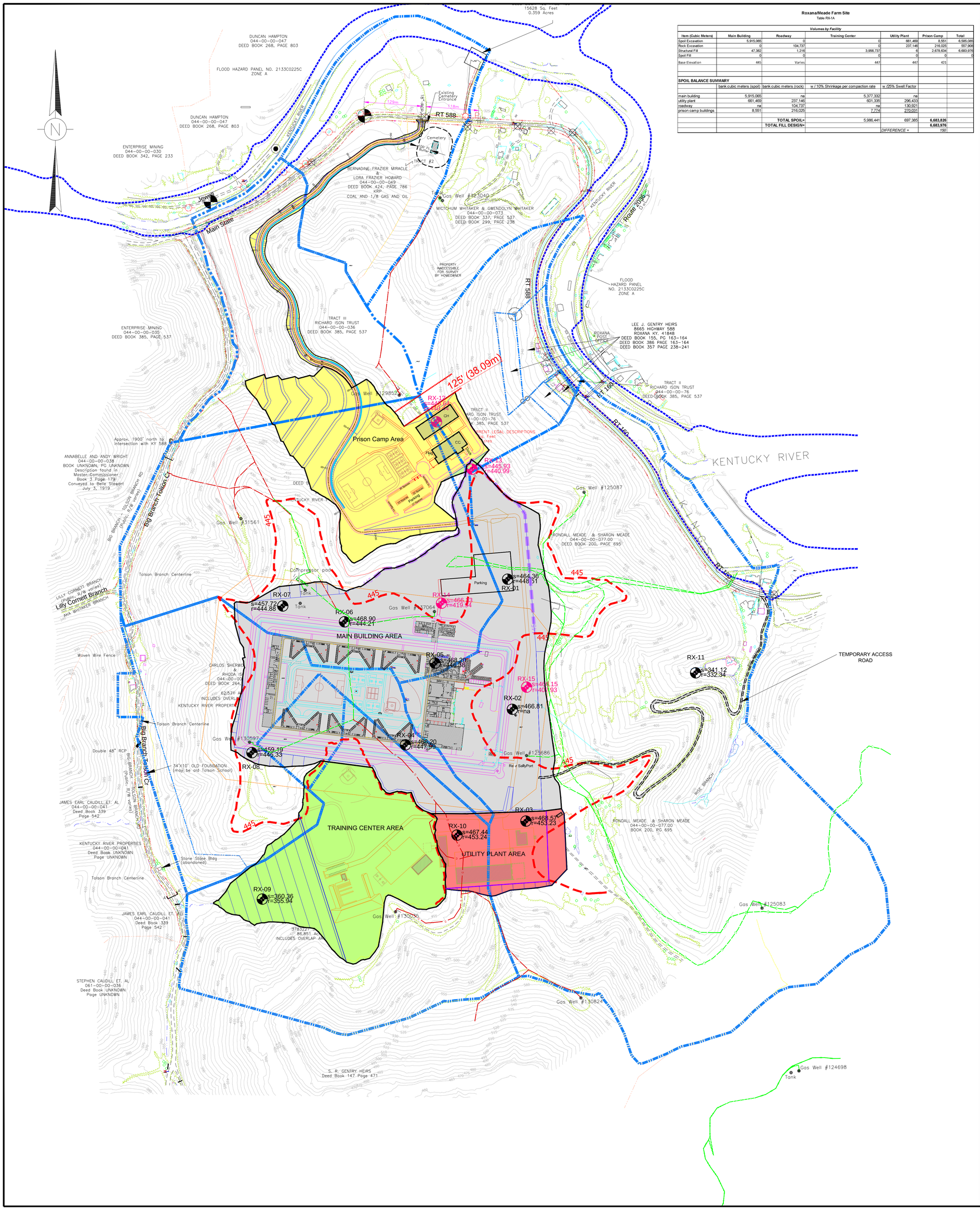
DESIGNED: 8/1/16 | DRAWN: ELC | APPROVED: DN

CARD022 Beckley, WV 9/16
Map RX-7.dwg ELC



Roxana/Meade Farm Site

Table RX-1A

Volumes by Facility						
Item (Cubic Meters)	Main Building	Roadway	Training Center	Utility Plant	Prison Camp	Total
Spoil Excavation	5,915,065	0	0	661,469	8,551	6,585,085
Rock Excavation	0	104,737	0	237,146	216,025	557,908
Structural Fill	47,382	1,216	3,956,737	6	2,678,634	6,683,976
Spoil Fill	0	0	0	0	0	0
Base Elevation	445	Varies	447	447	421	
SPOIL BALANCE SUMMARY						
	bank cubic meters (spoil)	bank cubic meters (rock)	w / 10% Shrinkage per compaction rate	w /25% Swell Factor		
main building	5,915,065	na	5,377,332	na		
utility plant	661,469	237,146	601,335	296,433		
roadway	na	104,737	na	130,921		
prison camp buildings	8,551	216,025	7,774	270,031		
		TOTAL SPOIL=	5,986,441	697,385	**6,683,826**	
		TOTAL FILL DESIGN=			**6,683,976**	
				DIFFERENCE =	*150*	

LEGEND

- TEST BORING LOCATIONS
- s = 464.36 — TEST BORE SURFACE ELEVATION
- r = 448.51 — TEST BORE BEDROCK ELEVATION
- NEW TEST BORING LOCATIONS
- s = 464.36 — NEW TEST BORE SURFACE ELEVATION
- r = 448.51 — NEW TEST BORE BEDROCK ELEVATION
- AREA OF DESIGN FOR THE PRISON CAMP AND PROPOSED ACCESS ROAD
- AREA OF DESIGN FOR THE MAIN PRISON BUILDING
- AREA OF DESIGN FOR THE TRAINING FACILITY
- AREA OF DESIGN FOR THE UTILITY PLANT
- 445 — PRE-CONSTRUCTION TOPOGRAPHY TO LOWEST CUT TO ROCK ELEVATION
- EXISTING TOPOGRAPHY
- —G——G— EXISTING UNDERGROUND GAS LINES
- —G——G— EXISTING ABOVE-GROUND GAS LINES
- Gas Well #125686 — EXISTING GAS WELL LOCATIONS

Revision History

DATE	Submittal	Submitted By
1/27/2012	Geotechnical Feasibility Study Draft	MM&A
6/12/2012	Site Grading – Roxana Study Area Final	MM&A
4/7/2014	Site Grading – Roxana Study Area Conceptual Plan	BOP
9/12/2014	Revised Site Grading – Roxana Study Area Draft	Cardno MM&A
10/23/2014	Revised Site Grading – Roxana Study Area Final	Cardno MM&A
8/2/2016	Revised Site Grading–Main Road and Prison Camp Location	Cardno
8/26/2016	Updated Geotechnical Study	Cardno
9/20/2016	Revised Main Road and Site Design	Cardno
9/29/2016	Revised Per BOP Comments Dated 9/27/16	Cardno

Design Volumes

Volume Report Prison CAMP FILL AND CAMP BUILDINGS – TOTAL DESIGN
Comparing Grid: Z:_permitting files\CARD022 Federal Prison\OG.grd
and Grid: Z:_permitting files\CARD022 Federal Prison\overall design.grd
Grid corner locations: 747545.81,588140.32 to 749345.81,590550.32
Grid resolution X: 180, Y: 241 Grid cell size X: 10.00, Y: 10.00
Area in Cut : 19,654.5 S.M.
Area in Fill: 103,854.7 S.M.
Total inclusion area: 123,509.2 S.M.
Cut to Fill ratio: 0.10
Cut Swell Factor : 1.250
Fill Shrink Factor: 1.000
Average Cut Depth: 11.43 Average Fill Depth: 25.79
Max Cut Depth: 23.42 Max Fill Depth: 75.83
Cut volume Bank: 224,575.84 C.M., Adjusted: 280,719.80 C.M.
Fill volume Bank: 2,678,634.33 C.M., Adjusted: 2,678,634.33 C.M.

Elevation Zone Volumes (Rock) Camp Buildings Site
Bank Cubic Meters

Zone 421.00 to 440.00

Cut volume : 216,025.36 C.M.

Volume Report ROAD DESIGN TO PRISON CAMP FROM HWY 588
Comparing Grid: Z:_permitting files\CARD022 Federal Prison\OG.grd
and Grid: Z:_permitting files\CARD022 Federal Prison\redesign per meeting 9-16\overall design.grd
Grid corner locations: 747545.81,588140.32 to 749345.81,590550.32
Grid resolution X: 180, Y: 241 Grid cell size X: 10.00, Y: 10.00
Area in Cut : 16,424.2 S.M.
Area in Fill: 1,248.8 S.M.
Total inclusion area: 17,673.0 S.M.
Cut to Fill ratio: 107.64
Cut Swell Factor : 1.250
Fill Shrink Factor: 1.000
Average Cut Depth: 6.38 Average Fill Depth: 0.97
Max Cut Depth: 21.07 Max Fill Depth: 3.53
Cut volume Bank: 104,736.74 C.M., Adjusted: 130,920.92 C.M.
Fill volume Bank: 1,216.32 C.M., Adjusted: 1,216.32 C.M.

Volume Report MAIN BUILDING AREA
Comparing Grid: Z:_permitting files\CARD022 Federal Prison\OG.grd
and Grid: Z:_permitting files\CARD022 Federal Prison\main building – utility plant – training center fill design.grd
Grid corner locations: 747545.81,588140.32 to 749345.81,590550.32
Grid resolution X: 180, Y: 241 Grid cell size X: 10.00, Y: 10.00
Area in Cut : 364,757.4 S.M.
Area in Fill: 5,177.3 S.M.
Total inclusion area: 369,934.8 S.M.
Cut to Fill ratio: 124.84
Average Cut Depth: 16.22 Average Fill Depth: 9.15
Max Cut Depth: 24.48 Max Fill Depth: 28.72
Cut volume: 5,915,064.83 C.M.
Fill volume: 47,381.98 C.M.

Volume Report UTILITY PLANT AREA – TOTAL DESIGN
Comparing Grid: Z:_permitting files\CARD022 Federal Prison\OG.grd
and Grid: Z:_permitting files\CARD022 Federal Prison\redesign per meeting 9-16\main building – utility plant – training center fill design.grd
Grid corner locations: 747545.81,588140.32 to 749345.81,590550.32
Grid resolution X: 180, Y: 241 Grid cell size X: 10.00, Y: 10.00
Area in Cut : 48,478.7 S.M.
Area in Fill: 32.2 S.M.
Total inclusion area: 48,510.9 S.M.
Cut to Fill ratio: 1431 10.02
Average Cut Depth: 18.54 Average Fill Depth: 0.19
Max Cut Depth: 39.00 Max Fill Depth: 0.92
Cut volume: 898,615.20 C.M.
Fill volume: 6.28 C.M.

Elevation Zone Volumes (Rock) Utility Plant Area

Bank Cubic Meters
Zone 447.00 to 453.00

Cut volume : 237,146.22 C.M.

Volume Report VALLEY FILL AT TRAINING CENTER AREA
Comparing Grid: Z:_permitting files\CARD022 Federal Prison\OG.grd
and Grid: Z:_permitting files\CARD022 Federal Prison\redesign per meeting 9-16\training fill.grd
Grid corner locations: 747545.81,588140.32 to 749345.81,590550.32
Grid resolution X: 180, Y: 241 Grid cell size X: 10.00, Y: 10.00
Area in Cut : 1,057.5 S.M.
Area in Fill: 128,818.5 S.M.
Total inclusion area: 129,876.0 S.M.
Cut to Fill ratio: 0.00
Average Cut Depth: 0.42 Average Fill Depth: 30.72
Max Cut Depth: 1.83 Max Fill Depth: 76.70
Cut volume: 449.19 C.M.
Fill volume: 3,956,736.70 C.M.

Coordinate System: Kentucky South State Plane NAD 83 (Metric)

REVISION	DATE	DESCRIPTION	P.M.

Map RX-8
Existing Topography and Boring Location Map

Federal Bureau of Prisons Roxana Site

Roxana Quadrangle
Letcher County, Kentucky

Prepared For:
Cardno Government Services
New Cumberland, Pennsylvania

Scale in Meters
100m 0 100m 200m

DESIGNED: 8/1/16 DRAWN: ELC APPROVED: JF

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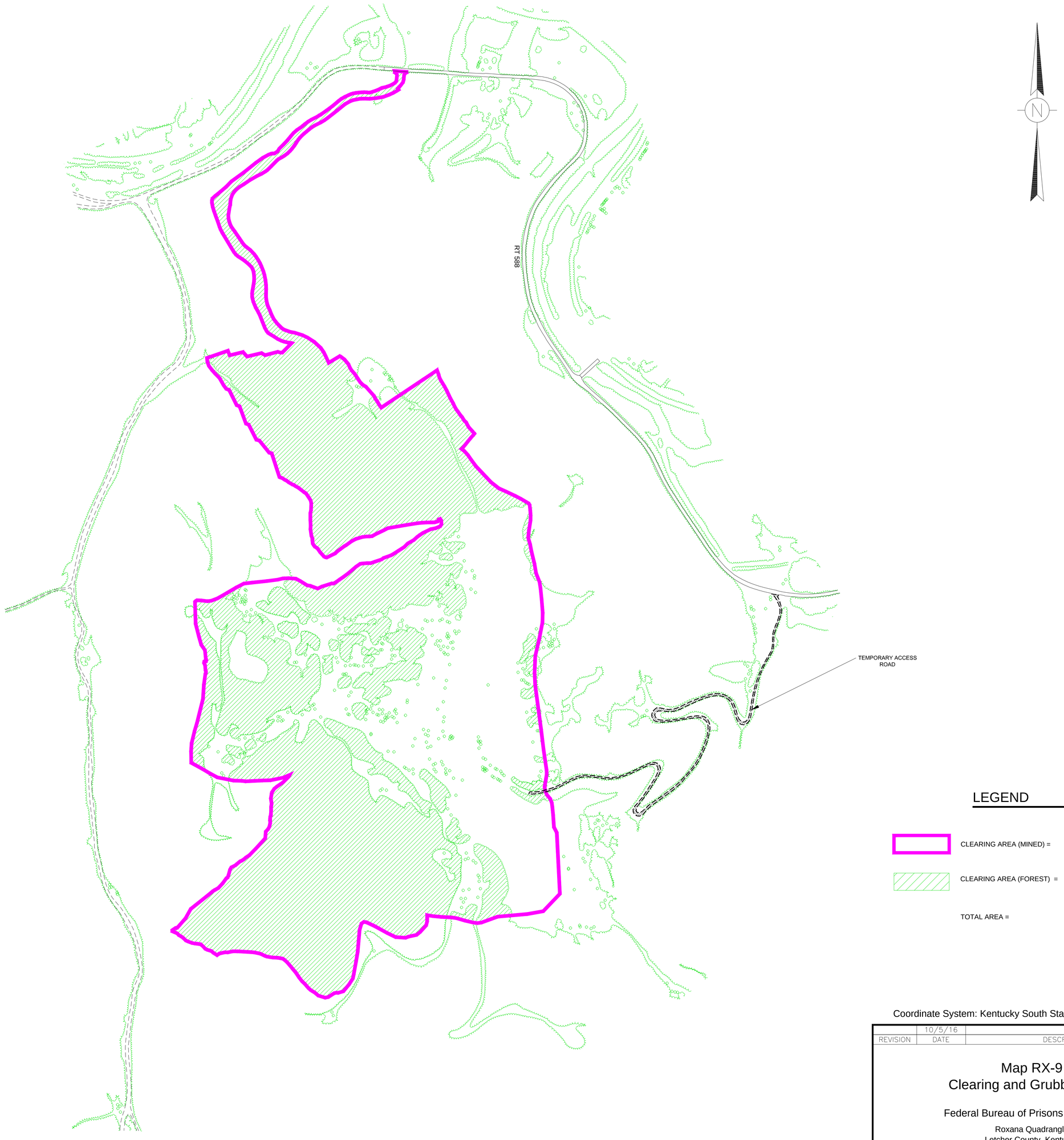
CARD022 Beckley, WV 8/16
Map RX-8.dwg ELC



LEGEND

	CLEARING AREA (MINED) =	241,032 Sq. Meters (59.56 acres)
	CLEARING AREA (FOREST) =	452,039 Sq. Meters (111.70 acres)
	TOTAL AREA =	693,071 Sq. Meters (171.26 acres)

Coordinate System: Kentucky South State Plane NAD 83 (Metric)

REVISION	DATE	DESCRIPTION	P.M.
	10/5/16		

Map RX-9
Clearing and Grubbing Map

Federal Bureau of Prisons Roxana Site

Roxana Quadrangle
Letcher County, Kentucky

Prepared For:
Cardno Government Services
New Cumberland, Pennsylvania

Scale in Meters

100m 0 100m 200m

DESIGNED: 8/1/16 | DRAWN: ELC | APPROVED: DN

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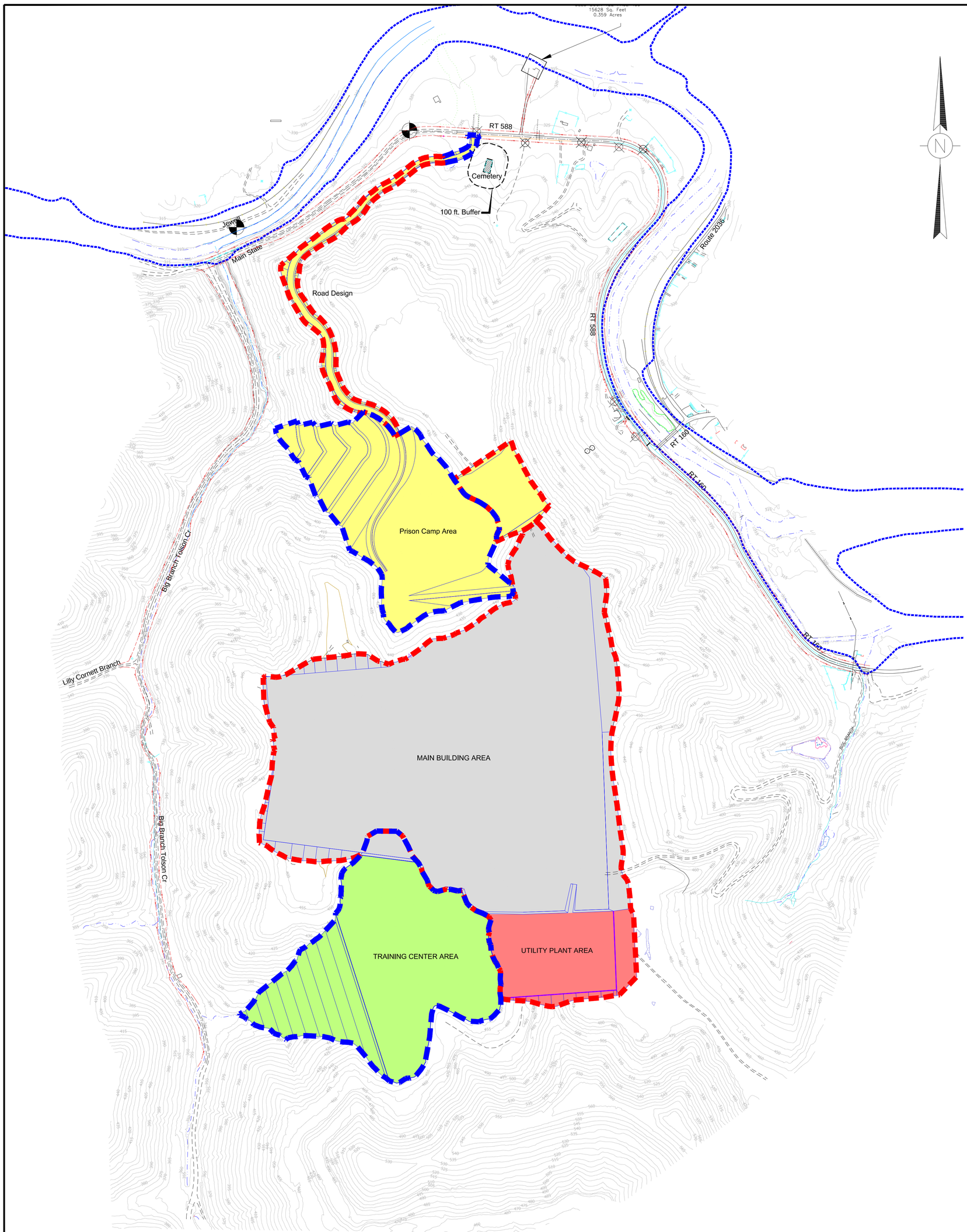
CARD022 Beckley, WV 9/16
clearing map.dwg ELC



LEGEND

- AREA OF DESIGN FOR THE PRISON CAMP AND PROPOSED ACCESS ROAD
- AREA OF DESIGN FOR THE MAIN PRISON BUILDING
- AREA OF DESIGN FOR THE TRAINING FACILITY
- AREA OF DESIGN FOR THE UTILITY PLANT
- EXISTING TOPOGRAPHY
- DESIGN - CUT AREA
- DESIGN - FILL AREA

Design Volumes

Volume Report Prison CAMP FILL AND CAMP BUILDINGS – TOTAL DESIGN
Comparing Grid: Z:_permitting files\CARD022 Federal Prison\OG.grd
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Cut Swell Factor : 1.250
Fill Shrink Factor: 1.000
Average Cut Depth: 11.43 Average Fill Depth: 25.79
Max Cut Depth: 23.42 Max Fill Depth: 75.83
Cut volume Bank: 224,575.84 C.M., Adjusted: 280,719.80 C.M.
Fill volume Bank: 2,678,634.33 C.M., Adjusted: 2,678,634.33 C.M.

Elevation Zone Volumes (Rock) Camp Buildings Site
Bank Cubic Meters

Zone 421.00 to 440.00

Cut volume : 216,025.36 C.M.

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Average Cut Depth: 6.38 Average Fill Depth: 0.97
Max Cut Depth: 21.07 Max Fill Depth: 3.53
Cut volume Bank: 104,736.74 C.M., Adjusted: 130,920.92 C.M.
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Total inclusion area: 369,934.8 S.M.
Cut to Fill ratio: 124.84
Average Cut Depth: 16.22 Average Fill Depth: 9.15
Max Cut Depth: 24.48 Max Fill Depth: 28.72
Cut volume: 5,915,064.83 C.M.
Fill volume: 47,381.98 C.M.

Volume Report UTILITY PLANT AREA – TOTAL DESIGN
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and Grid: Z:_permitting files\CARD022 Federal Prison\redesign per meeting 9-16\main building – utility plant – training center fill design.grd
Grid corner locations: 747545.81,588140.32 to 749345.81,590550.32
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Area in Cut : 48,478.7 S.M.
Area in Fill: 32.2 S.M.
Total inclusion area: 48,510.9 S.M.
Cut to Fill ratio: 143110.02
Average Cut Depth: 18.54 Average Fill Depth: 0.19
Max Cut Depth: 39.00 Max Fill Depth: 0.92
Cut volume: 898,615.20 C.M.
Fill volume: 6.28 C.M.

Elevation Zone Volumes (Rock) Utility Plant Area

Bank Cubic Meters
Zone 447.00 to 453.00

Cut volume : 237,146.22 C.M.

Volume Report VALLEY FILL AT TRAINING CENTER AREA
Comparing Grid: Z:_permitting files\CARD022 Federal Prison\OG.grd
and Grid: Z:_permitting files\CARD022 Federal Prison\redesign per meeting 9-16\training fill.grd
Grid corner locations: 747545.81,588140.32 to 749345.81,590550.32
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Cut to Fill ratio: 0.00
Average Cut Depth: 0.42 Average Fill Depth: 30.72
Max Cut Depth: 1.83 Max Fill Depth: 76.70
Cut volume: 449.19 C.M.
Fill volume: 3,956,736.70 C.M.

Coordinate System: Kentucky South State Plane NAD 83 (Metric)

REVISION	DATE	DESCRIPTION	P.M.
	10/6/16		

Map RX-10
Cut and Fill Limits

Federal Bureau of Prisons Roxana Site

Roxana Quadrangle
Letcher County, Kentucky

Prepared For:
Cardno Government Services
New Cumberland, Pennsylvania

Scale in Meters
100m 0 100m 200m

DESIGNED: 8/1/16 DRAWN: ELC APPROVED: JF

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CARD022 Beckley, WV 8/16
Map RX-10.dwg ELC

Appendices

APPENDIX A

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TEST BORING FIELD LOG

Cardno

Test Boring No.: RX-12
Location: N 589672.4, E 748441.1

Project Name: Letcher County Federal Bureau of Prisons Project No.: CARD022 Date: 7/27/2016
Logged By: WDN Drilling Company: Horn & Associates Drill Crew: Brooks, Caudill and Howe
Rig: Diedrich D-120 Drill Method: HSA Ground Surface Elevation: 443.64

Depth (m) From	Depth (m) To	Soil Visual Classification / Descriptions and Remarks Surface Condition:	Sample No.	1st 15.24 cm	2nd 15.24 cm	3rd 15.24 cm	Depth (meters) From	Depth (meters) To	Rec.	RQD (%)
0.00		Moist into wet, brown and gray clayey silt with shale and coal fragments with sandstone and shale layers	SS-1	8	6	5	0.61	1.07	4.57	
	2.77	(mine spoil)	SS-2	35	17	5	1.22	1.68		
2.77		Weathered Sandstone	SS-3	4	16	23	2.13	2.59		
	3.20	Auger Refusal	SS-4	50/.005			2.74	2.80		
3.20		Shaley sandstone, gray, fine to medium grained, weathered broken zone from 13.1' to 13.3'	RC-1				3.20	3.66	0.40	80
	4.94		RC-2				3.66	5.18	1.49	72
4.94		Sandstone, brownish gray, Medium grained, hard, weathered - lost water at 5.06 meters	RC-3				5.18	7.71	2.47	40
	7.65	Water returned at 5.18 meters, vertical fracture from 5.06 to 5.27 meters	RC-4				7.71	9.75	2.04	93
7.65		Shaley sandstone, gray, medium grained, core barrel blocked at 7.71 meters								
	7.74									
7.74		Sandstone conglomerate, gray								
	7.86									
7.86		Sandstone with shale streaks, medium gray, hard								
	9.75	Coring terminated								

Total Boring Depth:
Water Levels: _____ @ First Noted in Samples / Cuttings
_____ @ Completion
1.98 meters @ _____ After 2 Hrs
_____ @ Backfilling _____ (date/ time)

Comments: [Drill Method, Boring Diameter, UD Shelby Tubes, Well Construction (draw sketch on back), etc.]

Hammer Type: Donut Hammer / Safety Hammer / Automatic Hammer
SPT Hammer: (Weight / Drop / Spoon Dia.) 52.25 kg | 76.2 cm | 5.08 cm
Auger Dia.: ID / OD (inch): 20.32 cm/10.8 cm

Drilling Times:
Moving: 7:00 am - 7:15 am
Drilling: 7:15 am - 10:15 am
Standby:
Hauling Water:
Abandon/Grout Boring:
Fluid Losses: Total @ Depth 5.06 meters

HSA - Hollow Stem Augers
MD - Rotary Mud Drilling
REF - Refusal (Spoon or Auger)
RC - Rock Core
SS - SPT Split Spoon Sample
DC - Driven Casing (Hammer Type and Record Blows/ft vs. Depth)
ST - Shelby Tube Sample
WOR - SPT Weight of Rods
WOH - SPT Weight of Hammer
REC - Recovery (Meters)
RQD - Rock Quality Designation

TEST BORING FIELD LOG

Test Boring No.: RX-13
Location: N 589566.3, E 748520.5

Project Name: Letcher County Federal Bureau of Prisons Project No.: CARD022 Date: 7/27/2016
Logged By: WDN Drilling Company: Horn & Associates Drill Crew: Brooks, Caudill and Howe
Rig: Diedrich D-120 Drill Method: HSA Ground Surface Elevation: 445.93

Depth (m) From	Depth (m) To	Soil Visual Classification / Descriptions and Remarks Surface Condition:	Sample No.	1st 15.24 cm	2nd 15.24 cm	3rd 15.24 cm	Depth (meters) From	Depth (meters) To	Rec.	RQD (%)
0.00		Moist, brown and gray clayey silt with many shale, sandstone and coal fragments and layers	SS-1	18	13	11	0.76	1.22	2.13	
	4.48	(mine spoil)	SS-2	7	11	6	1.37	1.83	2.13	
4.48		Weathered Shaley Sandstone	SS-3	12	8	7	2.29	2.74	1.83	
	4.94	Auger Refusal	SS-4	5	9	10	2.90	3.35	1.83	
4.94		Sandstone, medium gray, fine to medium grained, hard with thin shale layers increasing with depth	SS-5	30	50/.005		4.42	4.63	0.40	
	9.08		RC-1				4.94	5.33	0.37	92
9.08		Sandstone, medium gray, fine to medium grained, hard, massive	RC-2				5.33	8.38	3.02	32
	11.43	Coring Terminated	RC-3				8.38	11.43	3.02	62

Total Boring Depth: _____

Water Levels:
_____ @ First Noted in Samples / Cuttings
_____ @ Completion
2.23 meters @ _____ After 0.5 Hrs
_____ @ Backfilling _____ (date/

Comments: [Drill Method, Boring Diameter, UD Shelby Tubes, Well Construction (draw sketch on back), etc.]

Hammer Type: Donut Hammer / Safety Hammer / Automatic Hammer
SPT Hammer: (Weight / Drop / Spoon Dia.) 52.25 kg 76.2 cm 5.08 cm
Auger Dia.: ID / OD (inch): 20.32 cm/10.8 cm

Drilling Times:
Moving: 10:15 am - 10:25 am
Drilling: 10:25 am - 12:25 am
Standby:
Hauling Water:
Abandon/Grout Boring:
Fluid Losses: _____ @ Depth _____

HSA - Hollow Stem Augers
MD - Rotary Mud Drilling
REF - Refusal (Spoon or Auger)
RC - Rock Core
SS - SPT Split Spoon Sample
DC - Driven Casing (Hammer Type and Record Blows/ft. vs. Depth)
ST - Shelby Tube Sample
WOR - SPT Weight of Rods
WOH - SPT Weight of Hammer
REC - Recovery (Meters)
RQD - Rock Quality Designation

TEST BORING FIELD LOG

Test Boring No.: RX-14
Location: N 589265.8, E 748452.3

Project Name: Letcher County Federal Bureau of Prisons Project No.: CARD022 Date: 7/25-26/16
Logged By: WDN Drilling Company: Horn & Associates Drill Crew: Brooks, Caudill and Howe
Rig: Diedrich D-120 Drill Method: HSA Ground Surface Elevation: 466.33

Depth (m)		Soil Visual Classification / Descriptions and Remarks	Sample	1st	2nd	3rd	Depth (meters)		Rec.	RQD
From	To	Surface Condition:	No.	15.24 cm	15.24 cm	15.24 cm	From	To		(%)
0.00		Damp, brown and gray clayey silt with many shale	SS-1	8	7	8	0.61	1.07	0.25	
		fragments and layers (mine spoil)	SS-2	4	3	6	1.22	1.68	0.33	
			SS-3	13	12	10	2.13	2.59	0.36	
			SS-4	5	6	8	2.74	3.20	0.25	
	7.77	Moist layers	SS-5	2	2	15	4.27	5.64	0.30	
7.77		Damp, brown clayey silt with gray sandstone fragments.	SS-6	18	18	14	5.79	6.25	0.25	
	9.30	(mine spoil)	SS-7	7	7	8	7.32	7.77	0.30	
9.30		Moist into damp, brown and gray clayey silt with sandstone and shale fragments and layers	SS-8	8	8	5	8.84	9.30	0.36	
		(mine spoil)	SS-9	8	10	12	10.36	10.82	0.33	
			SS-10	10	18	50/.4	11.89	12.31	0.36	
			SS-11	18	50/.01		13.41	13.69	0.25	
			SS-12	13	18	14	14.94	15.39	0.33	
	16.52		SS-13	50/.005			16.46	16.52	0.03	
16.52		Sandstone Boulder	SS-14	50/.01			17.98	18.11	0.10	
	17.28		SS-15	13	14	11	19.51	19.96	0.30	
17.28			SS-16	12	43	15	22.56	23.01	0.25	
		Moist into damp, brown and gray clayey silt with sandstone and shale fragments and layers	SS-17	18	18	18	24.08	24.54	0.30	
	27.22	(mine spoil)	SS-18	42	24	18	25.60	26.06	0.33	
27.22		Sandstone boulders and moist, brown and gray clayey silt with sandstone and shale fragments	SS-19	45	50/.005		27.13	27.34	0.20	
		(mine spoil)	RC-1				28.56	29.63	0.46	14
	33.22		RC-2				29.63	31.15	0.52	0
33.22		moist, brown and gray clayey silt with shale and sandstone fragments and boulders	RC-3				31.15	32.67	0.03	0
	34.66	Auger Refusal	RC-4				33.22	33.62	0.41	
34.66		Sandstone boulders and moist, brown and gray clayey silt with sandstone and shale fragments	RC-5				34.66	35.66	0.21	0
		(mine spoil)	RC-6				35.66	37.19	0.18	0
			RC-7				37.19	38.71	0.03	0
			RC-8				38.71	40.23	0.09	0

TEST BORING FIELD LOG

Test Boring No.: RX-14
Location N 589265.8, E 748452.3

Project Name: Letcher County Federal Bureau of Prisons Project No.: CARD022 Date: 7/25-26/16
Logged By: WDN Drilling Company: Horn & Associates Drill Crew: Brooks, Caudill and Howe
Rig: Diedrich D-120 Drill Method: HSA Ground Surface Elevation: 466.33

Depth (m)		Soil Visual Classification / Descriptions and Remarks	Sample	1st	2nd	3rd	Depth (meters)		Rec.	RQD
From	To	Surface Condition:	No.	15.24 cm	15.24 cm	15.24 cm	From	To		(%)
	46.39		RC-9				40.23	41.76	0.27	0
46.39			RC-10				41.76	43.28	0.09	0
		Sandstone, brown into gray, massive, fine to medium grained	RC-11				43.28	44.81	0.03	0
		Coal streaks beginning at 48.34 meters	RC-12				44.81	46.33	0.03	0
		Soft shale seam from 48.86 to 48.95 meters	RC-13				46.33	47.85	1.46	82
	50.90	Coring Terminated	RC-14				47.85	50.90	3.05	84

Total Boring Depth: _____

Comments: [Drill Method, Boring Diameter, UD Shelby Tubes, Well Construction (draw sketch on back), etc.]

Water Levels:
_____ @ First Noted in Samples / Cuttings
_____ @ Completion
2.23 meters @ _____ After 0.5 Hrs
_____ @ Backfilling _____ (date/ ti

Hammer Type: Donut Hammer / Safety Hammer / Automatic Hammer
SPT Hammer: (Weight / Drop / Spoon Dia.) 52.25 kg 76.2 cm 5.08 cm
Auger Dia.: ID / OD (inch): 20.32 cm/10.8 cm

Drilling Times:
Moving: 10:15 am - 10:25 am
Drilling: 10:25 am - 12:25 am
Standby:
Hauling Water:
Abandon/Grout Boring:
Fluid Losses: _____ @ Depth _____

HSA - Hollow Stem Augers
MD - Rotary Mud Drilling
REF - Refusal (Spoon or Auger)
RC - Rock Core
SS - SPT Split Spoon Sample
DC - Driven Casing (Hammer Type and Record Blows/ft. vs. Depth)
ST - Shelby Tube Sample
WOR - SPT Weight of Rods
WOH - SPT Weight of Hammer
REC - Recovery (Meters)
RQD - Rock Quality Designation

Cardno

TEST BORING FIELD LOG

Test Boring No.: RX-15
Location: N 589077.7, E 748642.9

Project Name: Letcher County Federal Bureau of Prisons Project No.: CARD022 Date: 7/25-28/16
Logged By: ED Drilling Company: Horn & Associates Drill Crew: Ison and Horn
Rig: Diedrich D-120 Drill Method: HSA , Casing Advancer Ground Surface Elevation: 466.15

Depth (m) From	Depth (m) To	Soil Visual Classification / Descriptions and Remarks Surface Condition:	Sample No.	1st 15.24 cm	2nd 15.24 cm	3rd 15.24 cm	Depth (meters) From	Depth (meters) To	Rec.	RQD (%)
0.00	1.37	Dry gray clayey silt and weathered shale (mine spoil)	SS-1	22	15	32	0.61	1.07	0.46	
1.37	2.59	Shale boulder (mine spoil)	SS-2	50/0.008			1.37	1.46	0.10	
2.68			SS-3	50/0.005			2.13	2.19	0.00	
		Moist, gray clayey silt and gray weathered shale (mine spoil)	SS-4	5	11	8	2.90	3.35	0.36	
	5.94		SS-5	3	6	12	4.42	4.88	0.28	
5.94		Moist brown and gray clayey silt with shale and sandstone fragments. (mine spoil)	SS-6	3	7	9	5.94	6.40	0.33	
	7.92		SS-7	5	2	5	7.47	7.92	0.36	
7.92		Weathered shale (mine spoil)	SS-8	27	2	2	8.99	9.45	0.15	
	10.97		SS-9	33	15	17	10.52	10.97	0.36	
10.97	13.78	Moist brown and gray clayey silt with sandstone and shale fragments (mine spoil)	SS-10	9	11	8	12.04	12.50	0.46	
13.78		Gray sandy shale (mine spoil)	SS-11	3	9	26	13.56	14.02	0.28	
	16.15		SS-12	5	12	17	15.09	15.54	0.38	
16.15			SS-13	11	10	7	16.61	17.07	0.46	
	21.18	Moist, gray and brown clayey silt with shale fragments (mine spoil)	SS-14	10	10	8	18.14	18.59	0.46	
21.18		Sandstone Boulder (mine spoil)	SS-15	4	7	5	19.66	20.12	0.36	
	21.64		SS-16	50/0			21.18	21.18	0.03	
21.64			SS-17	4	4	13	22.71	23.16	0.38	
		Moist, dark gray clayey silt with shale and sandstone fragments and boulders (mine spoil)	SS-18	11	9	9	24.23	24.69	0.38	
	27.28		SS-19	7	29	50/0.01	25.76	26.18	0.43	
27.28	27.74	Dry gray and brown clayey silt and shale (mine spoil)	SS-20	8	6	4	27.28	27.74	0.20	
27.74		Sandstone boulder (mine spoil)	SS-21	50/0			28.80	28.80	0.00	
	30.33		SS-22	11	13	22	30.33	30.78	0.46	
30.33			SS-23	17	27	15	31.85	32.31	0.46	
	33.83	Dark gray clayey silt and shale (mine spoil)	SS-24	17	24	16	33.38	33.83	0.46	
34.90		Dry gray shale and sandstone (mine spoil)	SS-25	18	9	7	34.90	35.36	0.38	
	36.88		SS-26	50/0.05			36.42	36.48	0.03	
36.88			SS-27	10	20	26	37.95	38.40	0.46	
		Moist brown and gray clayey silt with shale and sandstone fragments (mine spoil)	SS-28	26	45	14	39.47	39.93	0.46	
		Coal pieces at 45.72	SS-29	14	15	17	41.00	41.45	0.46	
			SS-30	11	32	37	42.52	42.98	0.46	
			SS-31	40	50/0.01		44.04	44.32	0.27	
	47.55		SS-32	13	50/0.01		45.57	46.02	0.27	

TEST BORING FIELD LOG

Test Boring No.: RX-15
Location: N 589077.7, E 748642.9

Project Name: Letcher County Federal Bureau of Prisons Project No.: CARD022 Date: 7/25-28/16
Logged By: ED Drilling Company: Horn & Associates Drill Crew: Ison and Horn
Rig: Diedrich D-120 Drill Method: HSA , Casing Advancer Ground Surface Elevation: 466.15

Depth (m) From	Depth (m) To	Soil Visual Classification / Descriptions and Remarks Surface Condition:	Sample No.	1st 15.24 cm	2nd 15.24 cm	3rd 15.24 cm	Depth (meters) From	Depth (meters) To	Rec.	RQD (%)
47.55		Begin casing advancer	SS-33	12	19	20	47.09	47.55	0.46	
		Gray sandstone and silty shale (mine spoil)	SS-34	10	12	8	48.77	49.23	0.46	
			SS-35	50/0			50.60	51.05	0.00	
	53.64		SS-36	13	21	38	52.12	52.58	0.46	
53.64		Moist into wet gray and brown silty clay with sandstone coal fragments (natural ground)	SS-37	12	18	20	53.64	54.10	0.46	
			SS-38	15	18	35	55.17	55.63	0.46	
	58.22		SS-39	24	35	50/0.01	56.69	57.06	0.43	
58.22		Sandstone, medium gray, fine to medium grained, massive, coal partings at 60.17 meters and below	RC-1				58.22	60.81	2.56	95
	63.86	Coring Terminated	RC-2				60.81	63.86	3.05	100

Total Boring Depth: _____

Comments: [Drill Method, Boring Diameter, UD Shelby Tubes, Well Construction (draw sketch on back), etc.]

Water Levels:
_____ @ First Noted in Samples / Cuttings
_____ @ Completion
44.5 meters @ _____ After 2 Hrs
_____ @ Backfilling _____ (date/

Hammer Type: Donut Hammer / Safety Hammer / Automatic Hammer
SPT Hammer: (Weight / Drop / Spoon Dia.) 52.25 kg | 76.2 cm | 5.08 cm
Auger Dia.: ID / OD (inch): 20.32 cm/10.8 cm

Drilling Times:
Moving: _____
Drilling: _____
Standby: _____
Hauling Water: _____
Abandon/Grout Boring: _____
Fluid Losses: _____ @ Depth _____

HSA - Hollow Stem Augers
MD - Rotary Mud Drilling
REF - Refusal (Spoon or Auger)
RC - Rock Core
SS - SPT Split Spoon Sample
DC - Driven Casing (Hammer Type and Record Blows/ft. vs. Depth)
ST - Shelby Tube Sample
WOR - SPT Weight of Rods
WOH - SPT Weight of Hammer
REC - Recovery (Meters)
RQD - Rock Quality Designation

Appendices

APPENDIX B

Cardno®
Shaping the Future

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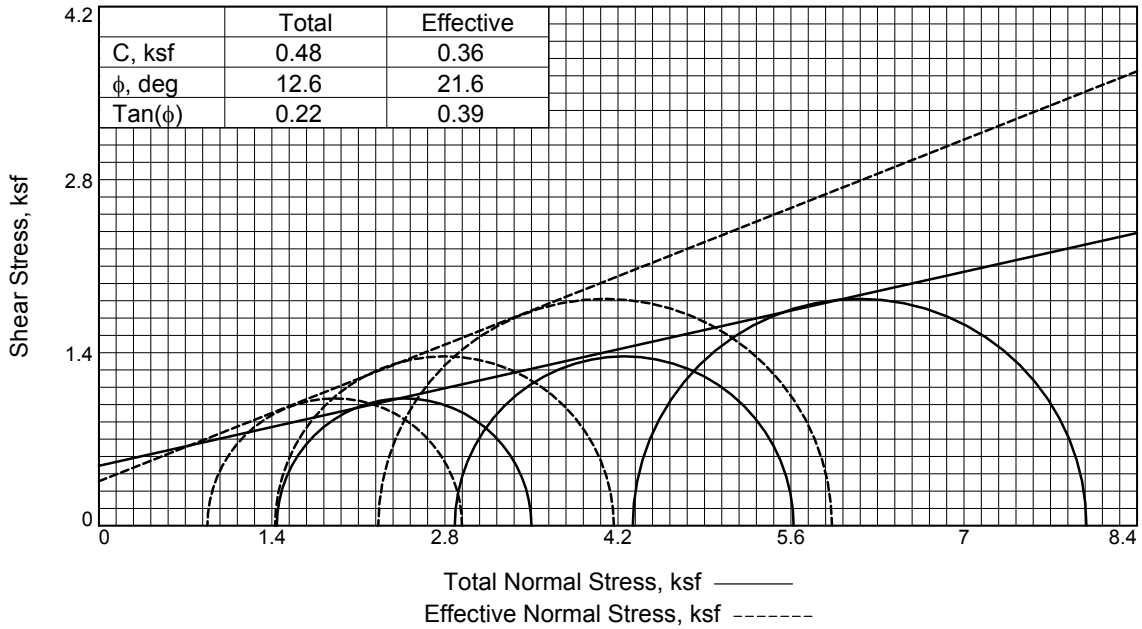
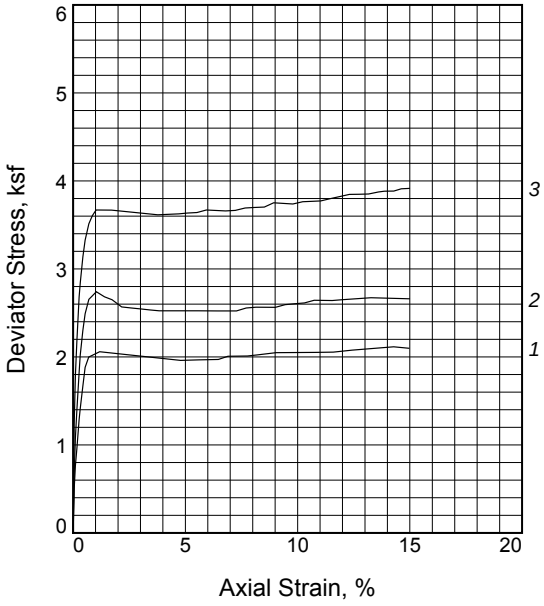
C and phi are not test results but an interpretation of the test results. The designer is responsible for interpreting test data as provided by S&ME, Inc.



	Total	Effective
C, ksf	0.48	0.36
ϕ, deg	12.6	21.6
Tan(ϕ)	0.22	0.39



Sample No.		1	2	3
Initial	Water Content, %	12.5	12.3	12.5
	Dry Density, pcf	112.4	112.6	112.1
	Saturation, %	72.5	71.7	72.0
	Void Ratio	0.4500	0.4474	0.4530
	Diameter, in.	2.799	2.797	2.799
	Height, in.	6.039	6.048	6.039
At Test	Water Content, %	15.7	15.3	14.8
	Dry Density, pcf	115.5	116.5	117.6
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.4110	0.3987	0.3857
	Diameter, in.	2.766	2.759	2.750
	Height, in.	6.016	6.005	5.965
Strain rate, %/min.		0.07	0.07	0.07
Eff. Cell Pressure, psi		10.00	20.00	30.00
Fail. Stress, ksf		2.06	2.74	3.67
Total Pore Pr., ksf		9.27	9.82	10.70
Strain, %		1.2	1.0	1.0
Final Stress, ksf		2.10	2.66	3.91
Total Pore Pr., ksf		9.37	10.12	11.17
Strain, %		15.0	15.0	15.0
$\bar{\sigma}_1$ Failure, ksf		2.94	4.17	5.93
$\bar{\sigma}_3$ Failure, ksf		0.88	1.43	2.26

Type of Test:
CU with Pore Pressures

Sample Type: Reconstituted specimen

Description: SC - Gray brown Clayey sand with gravel

LL= 29 **PL=** 20 **PI=** 9

Specific Gravity= 2.610

Remarks:

Client: Cardno

Project: New Road Geotech FBOP Roxanna

Source of Sample: RX-12 and 13 Composite

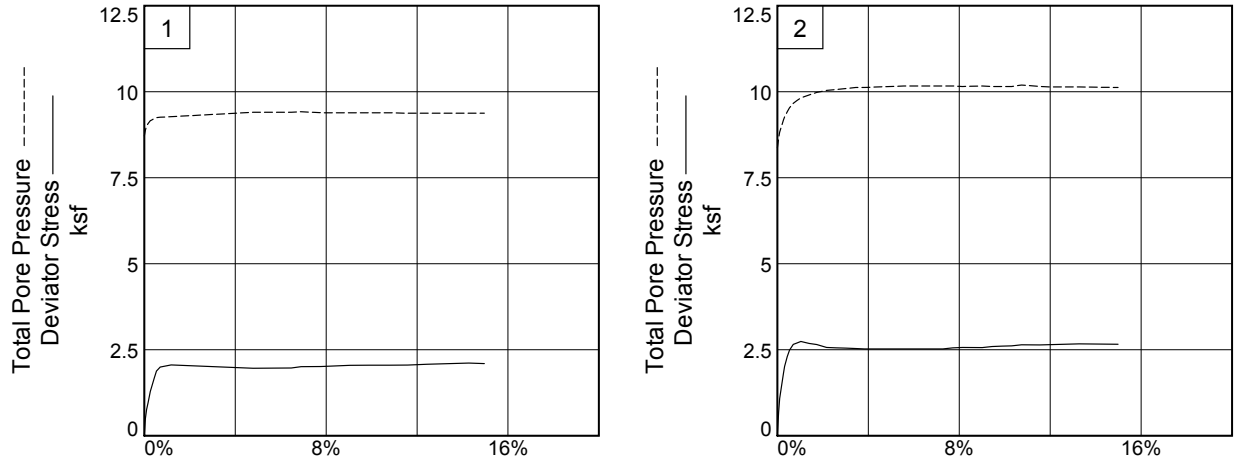
Sample Number: RX-12 and 13 **Depth:** 0.0 - 16.2 ft.

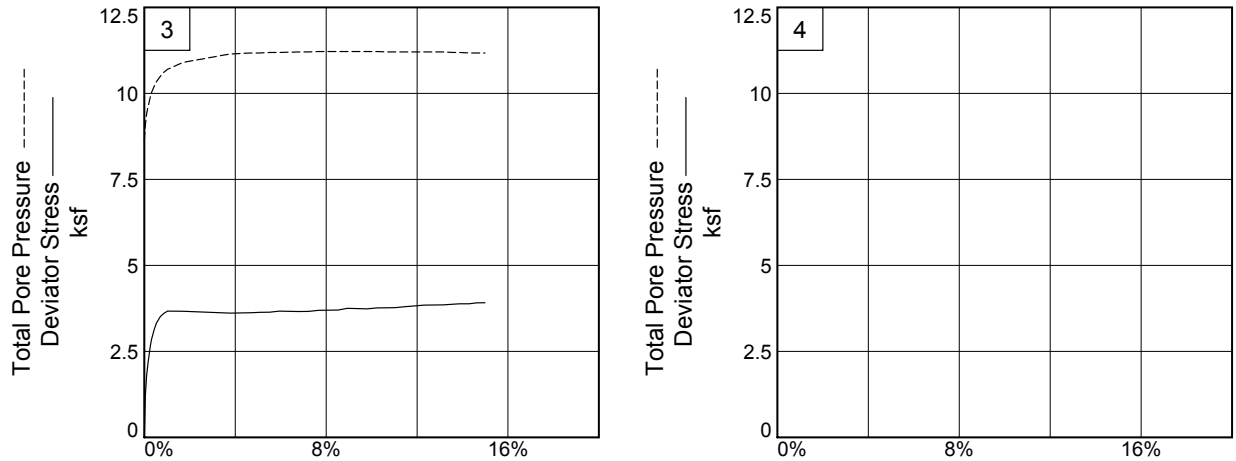
Proj. No.: 3783-16-007 **Date Sampled:** 08/02/16

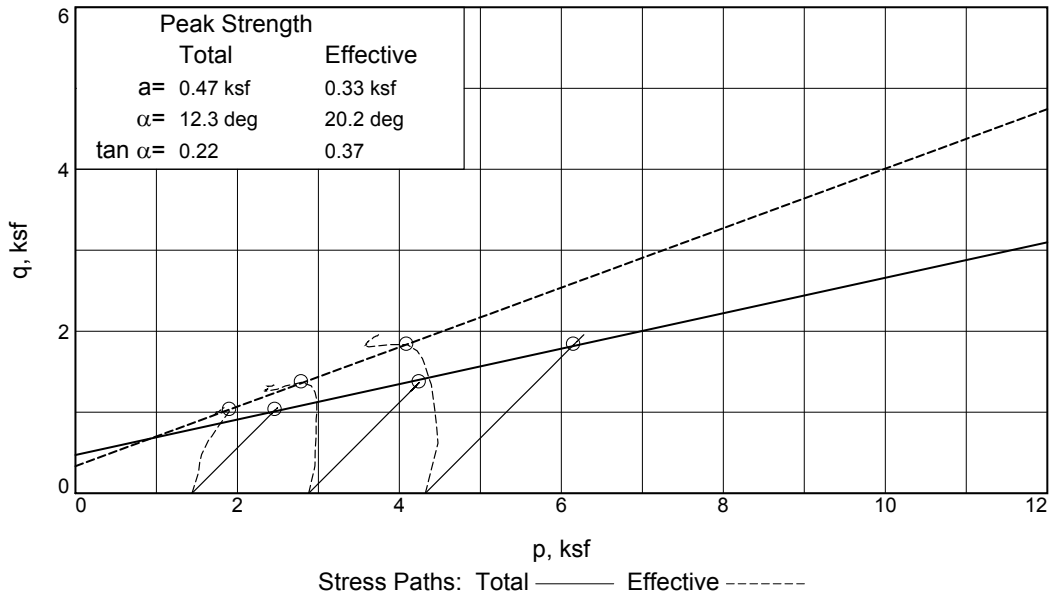
TRIAXIAL SHEAR TEST REPORT
S&ME, Inc.
Lexington, Kentucky

Figure Page 1 of 2

Tested By: M. Weber **Checked By:** DRAFT







Client: Cardno

Project: New Road Geotech FBOP Roxanna

Source of Sample: RX-12 and 13 Composite **Depth:** 0.0 - 16.2 ft. **Sample Number:** RX-12 and 13

Project No.: 3783-16-007 **Figure** Page 2 of 2

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Tested By: M. Weber **Checked By:** DRAFT

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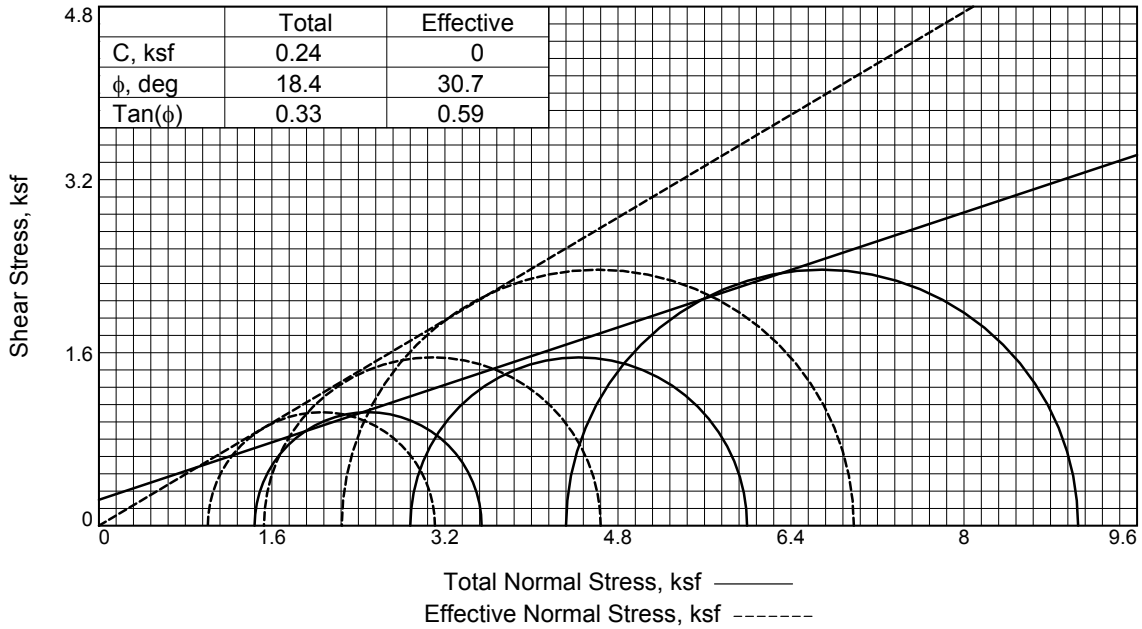
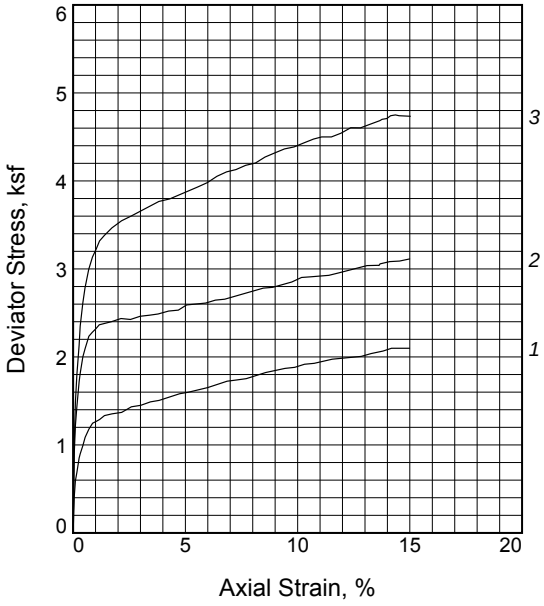


	Total	Effective
C, ksf	0.24	0
ϕ, deg	18.4	30.7
Tan(ϕ)	0.33	0.59



Sample No.		1	2	3
Initial	Water Content, %	12.4	12.4	12.1
	Dry Density, pcf	119.5	120.0	119.5
	Saturation, %	78.1	79.4	76.3
	Void Ratio	0.4364	0.4305	0.4361
	Diameter, in.	2.799	2.795	2.793
	Height, in.	6.045	6.036	6.084
At Test	Water Content, %	14.8	14.3	13.6
	Dry Density, pcf	122.0	123.2	125.0
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.4068	0.3931	0.3735
	Diameter, in.	2.779	2.767	2.745
	Height, in.	6.006	5.996	6.024
Strain rate, %/min.		0.02	0.02	0.02
Eff. Cell Pressure, psi		10.00	20.00	30.00
Fail. Stress, ksf		2.10	3.11	4.73
Total Pore Pr., ksf		8.09	12.07	10.76
Strain, %		15.0	15.0	15.0
Final Stress, ksf		2.10	3.11	4.73
Total Pore Pr., ksf		8.09	12.07	10.76
Strain, %		15.0	15.0	15.0
$\bar{\sigma}_1$ Failure, ksf		3.11	4.64	6.98
$\bar{\sigma}_3$ Failure, ksf		1.01	1.53	2.25

Type of Test:
CU with Pore Pressures
Sample Type: Reconstituted specimen
Description: Grayish brown Sandy lean clay

LL= 29 **PL=** 20 **PI=** 9
Specific Gravity= 2.75
Remarks:

Client: Cardno

Project: New Road Geotech FBOP Roxanna

Source of Sample: RX-14 **Depth:** 0-70 ft.
Sample Number: RX-14
Proj. No.: 3783-16-007 **Date Sampled:** 09/08/16

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Lexington, Kentucky

Figure Page 1 of 2

Tested By: M. Weber **Checked By:** DRAFT

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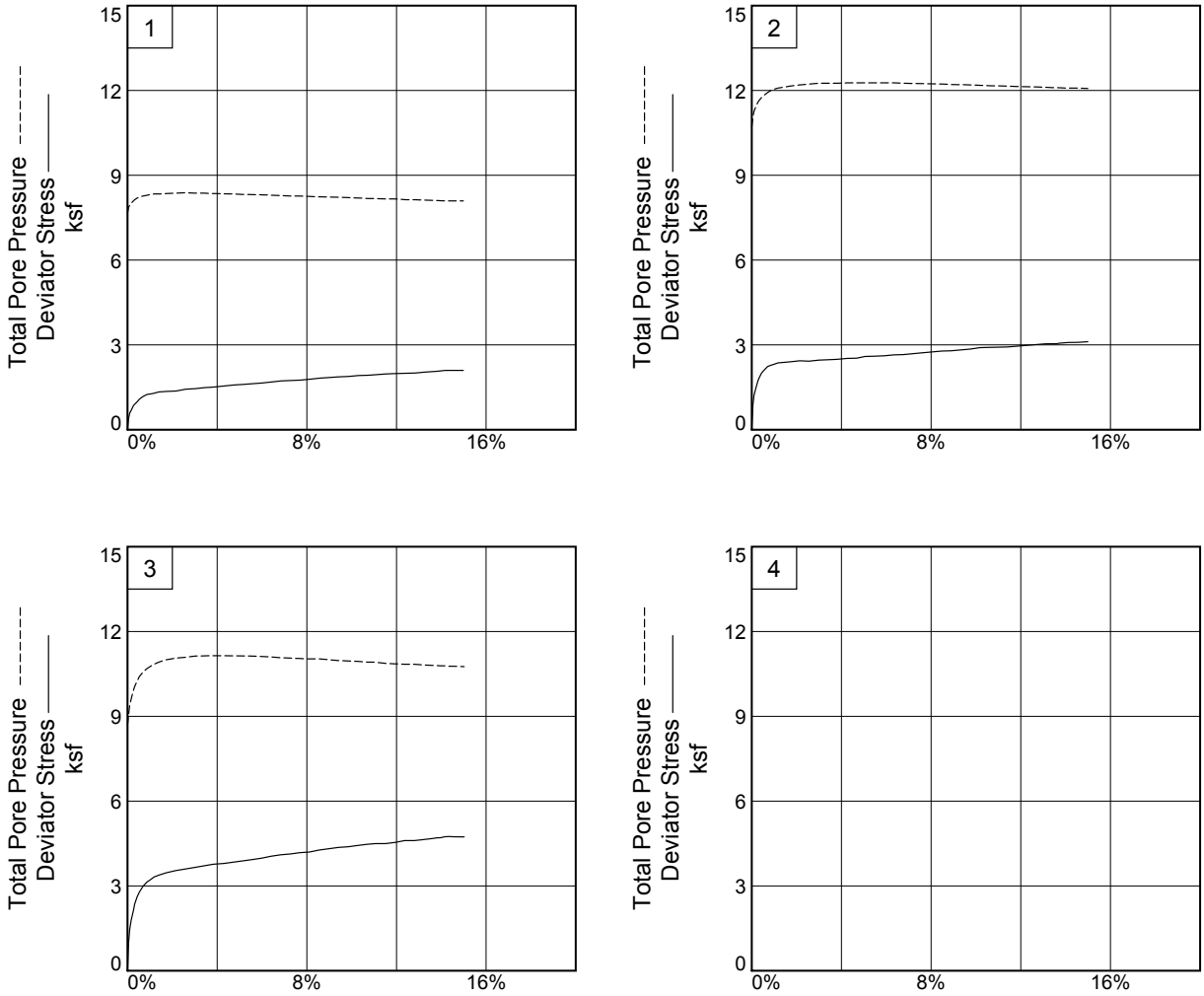

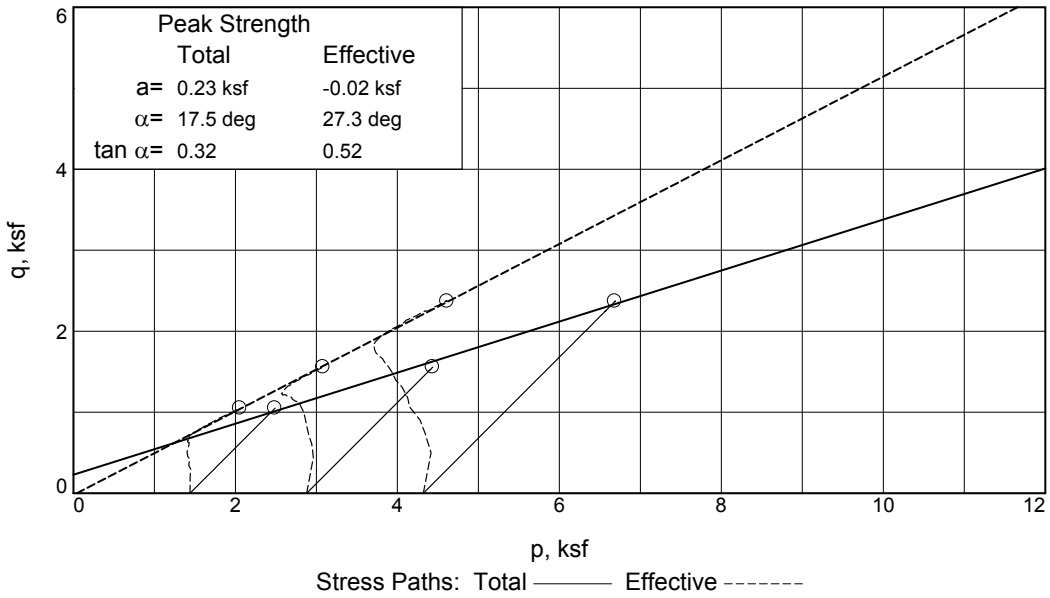

Client: Cardno

Project: New Road Geotech FBOP Roxanna

Source of Sample: RX-14 **Depth:** 0-70 ft. **Sample Number:** RX-14

Project No.: 3783-16-007 **Figure** Page 2 of 2

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Tested By: M. Weber **Checked By:** DRAFT

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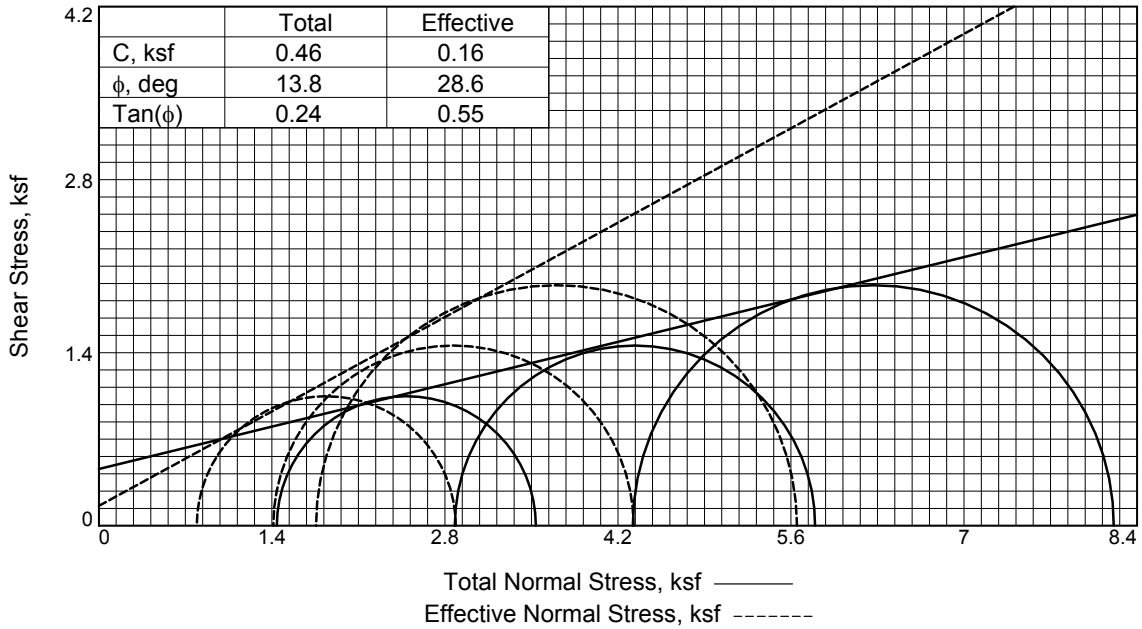
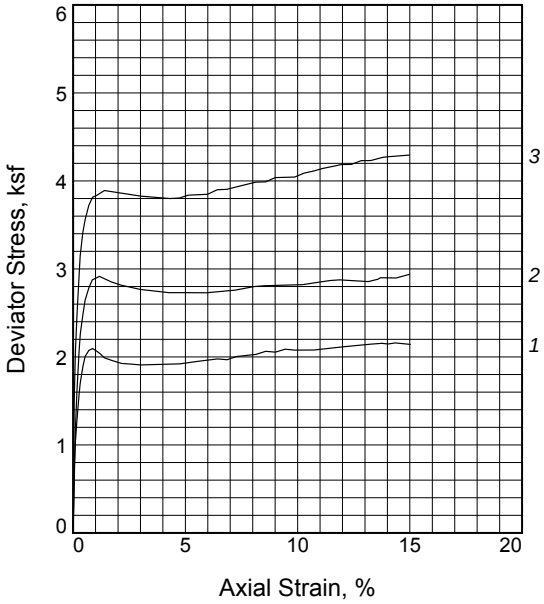


	Total	Effective
C, ksf	0.46	0.16
ϕ, deg	13.8	28.6
Tan(ϕ)	0.24	0.55



Sample No.		1	2	3
Initial	Water Content, %	10.6	10.5	10.9
	Dry Density, pcf	121.7	121.6	121.5
	Saturation, %	74.4	73.5	75.9
	Void Ratio	0.3844	0.3856	0.3875
	Diameter, in.	2.792	2.795	2.799
	Height, in.	6.030	6.023	6.045
At Test	Water Content, %	13.0	12.3	11.7
	Dry Density, pcf	124.8	126.4	128.0
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.3501	0.3332	0.3167
	Diameter, in.	2.763	2.754	2.735
	Height, in.	6.005	5.970	6.009
Strain rate, %/min.		0.07	0.07	0.07
Eff. Cell Pressure, psi		10.00	20.00	30.00
Fail. Stress, ksf		2.10	2.92	3.89
Total Pore Pr., ksf		9.13	9.94	9.78
Strain, %		0.9	1.2	1.4
Final Stress, ksf		2.14	2.94	4.29
Total Pore Pr., ksf		9.29	10.22	10.05
Strain, %		15.0	15.0	15.0
$\bar{\sigma}_1$ Failure, ksf		2.89	4.33	5.65
$\bar{\sigma}_3$ Failure, ksf		0.79	1.41	1.76

Type of Test:
CU with Pore Pressures
Sample Type: Reconstituted specimen
Description: Gray clayey sand with gravel

LL= 28 **PL=** 18 **PI=** 10
Specific Gravity= 2.7
Remarks:

Client: Cardno

Project: New Road Geotech FBOP Roxanna

Source of Sample: RX-15 **Depth:** 0 - 85 ft.
Sample Number: RX-15
Proj. No.: 3783-16-007 **Date Sampled:** 08/02/16

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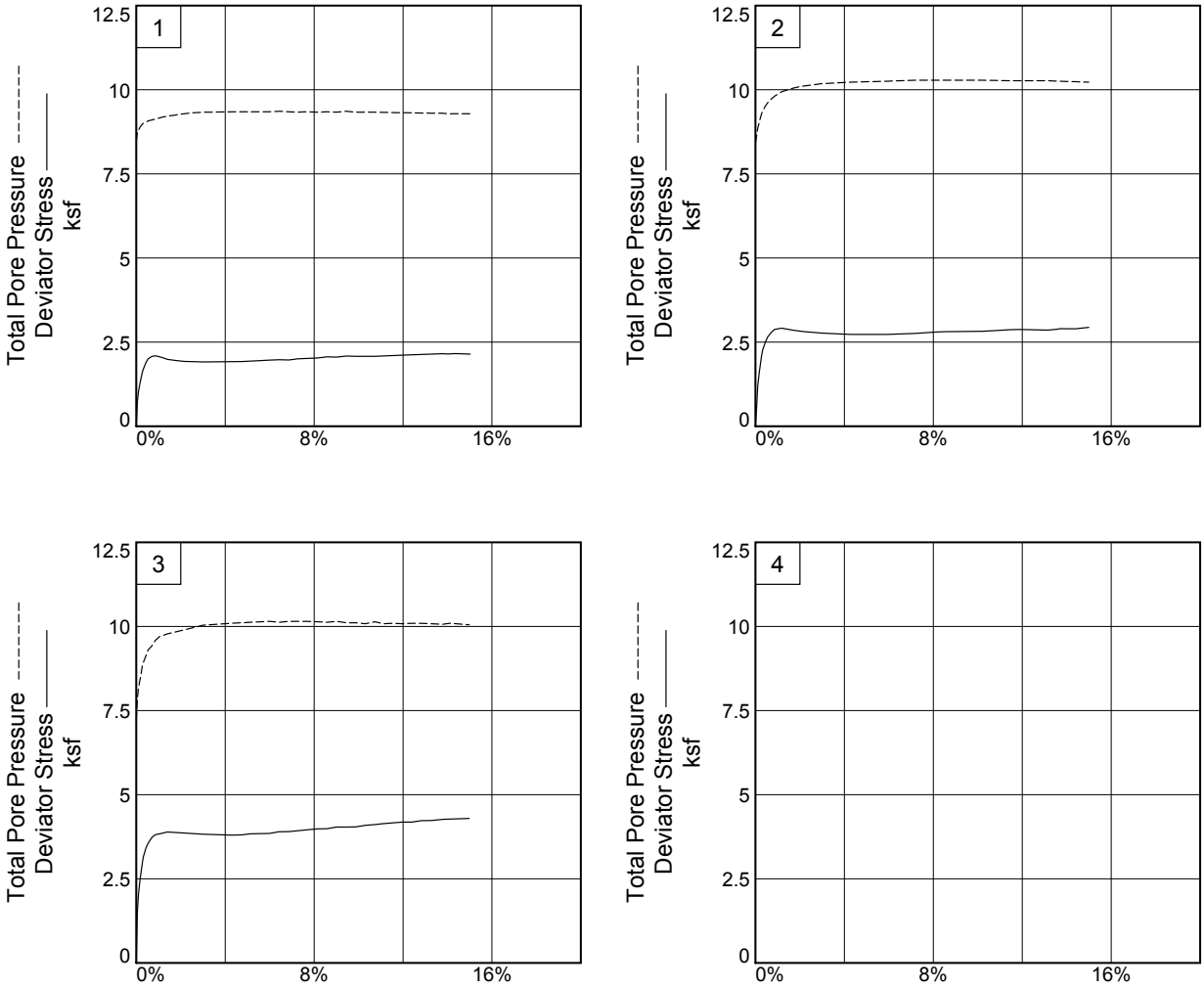
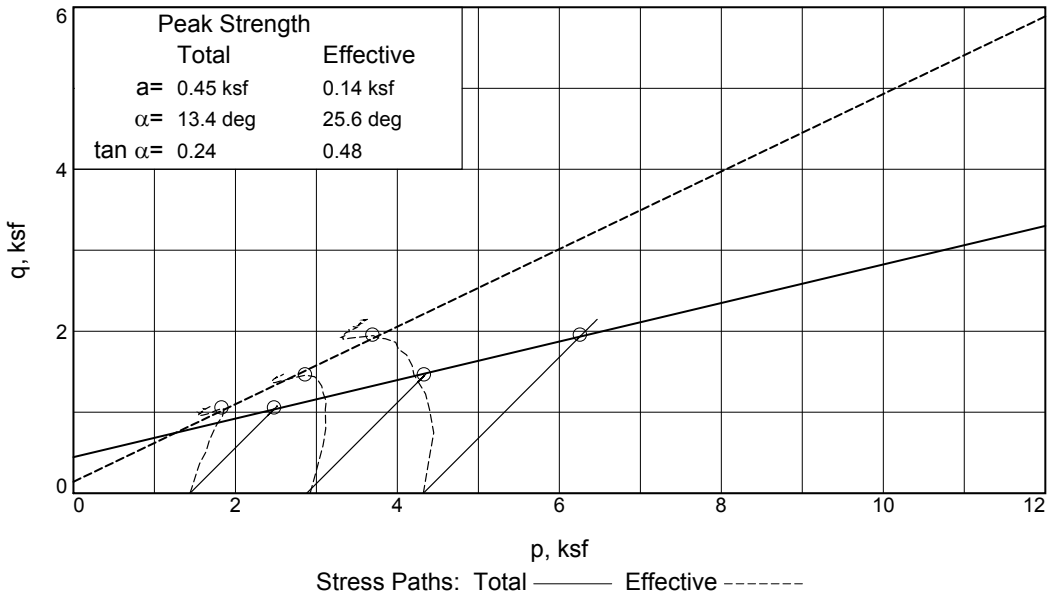
S&ME, Inc.
Lexington, Kentucky

Figure Page 1 of 2

Tested By: M. Weber **Checked By:** J. Folsom





Client: Cardno

Project: New Road Geotech FBOP Roxanna

Source of Sample: RX-15 **Depth:** 0 - 85 ft. **Sample Number:** RX-15

Project No.: 3783-16-007 **Figure** Page 2 of 2

S&ME, Inc.

Tested By: M. Weber **Checked By:** J. Folsom

C and phi are not test results but an interpretation of the test results. The designer is responsible for interpreting test data as provided by S&ME, Inc.

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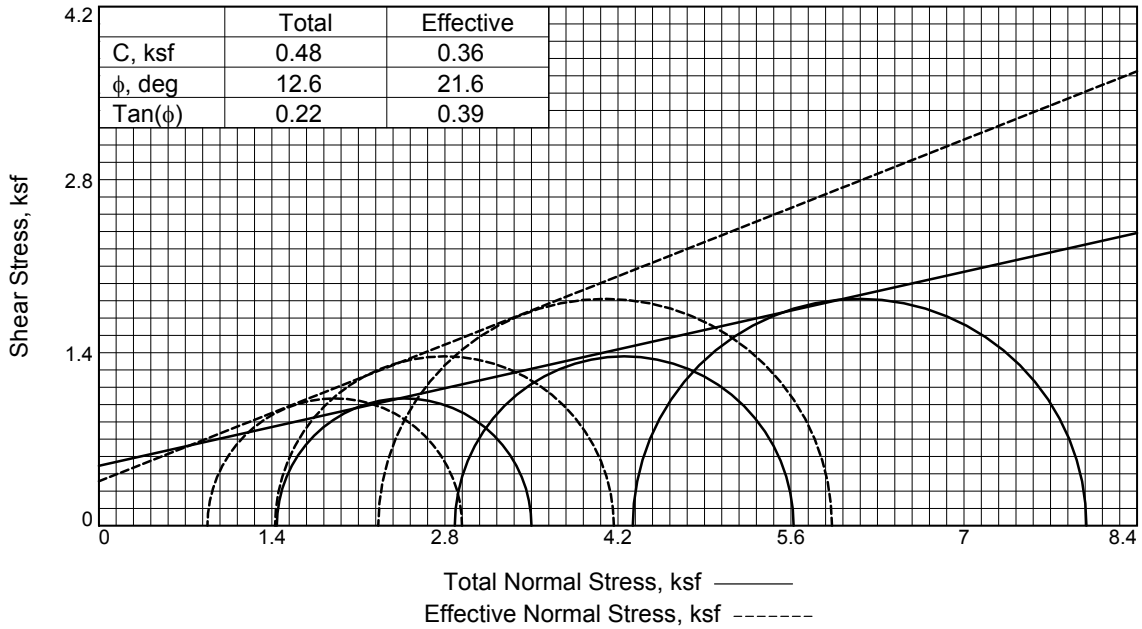
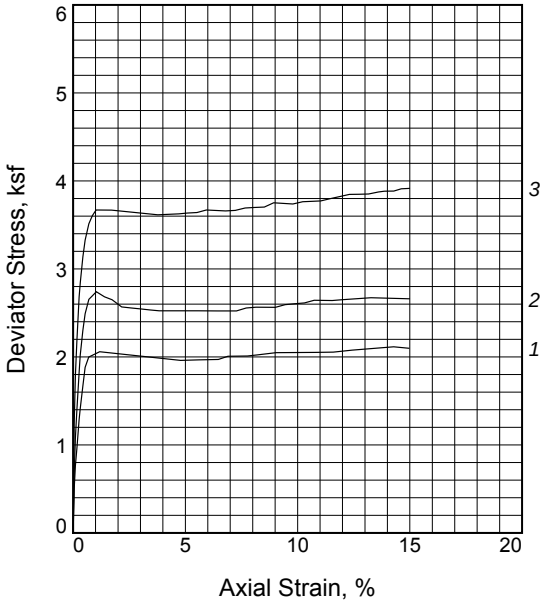


	Total	Effective
C, ksf	0.48	0.36
ϕ, deg	12.6	21.6
Tan(ϕ)	0.22	0.39



Sample No.		1	2	3
Initial	Water Content, %	12.5	12.3	12.5
	Dry Density, pcf	112.4	112.6	112.1
	Saturation, %	72.5	71.7	72.0
	Void Ratio	0.4500	0.4474	0.4530
	Diameter, in.	2.799	2.797	2.799
	Height, in.	6.039	6.048	6.039
At Test	Water Content, %	15.7	15.3	14.8
	Dry Density, pcf	115.5	116.5	117.6
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.4110	0.3987	0.3857
	Diameter, in.	2.766	2.759	2.750
	Height, in.	6.016	6.005	5.965
Strain rate, %/min.		0.07	0.07	0.07
Eff. Cell Pressure, psi		10.00	20.00	30.00
Fail. Stress, ksf		2.06	2.74	3.67
Total Pore Pr., ksf		9.27	9.82	10.70
Strain, %		1.2	1.0	1.0
Final Stress, ksf		2.10	2.66	3.91
Total Pore Pr., ksf		9.37	10.12	11.17
Strain, %		15.0	15.0	15.0
$\bar{\sigma}_1$ Failure, ksf		2.94	4.17	5.93
$\bar{\sigma}_3$ Failure, ksf		0.88	1.43	2.26

Type of Test:
CU with Pore Pressures

Sample Type: Intact specimen

Description: SC - Gray brown Clayey sand with gravel

LL= 29 **PL=** 20 **PI=** 9

Specific Gravity= 2.610

Remarks:

Client: Cardno

Project: New Road Geotech FBOP Roxanna

Source of Sample: RX-12 and 13 Composite

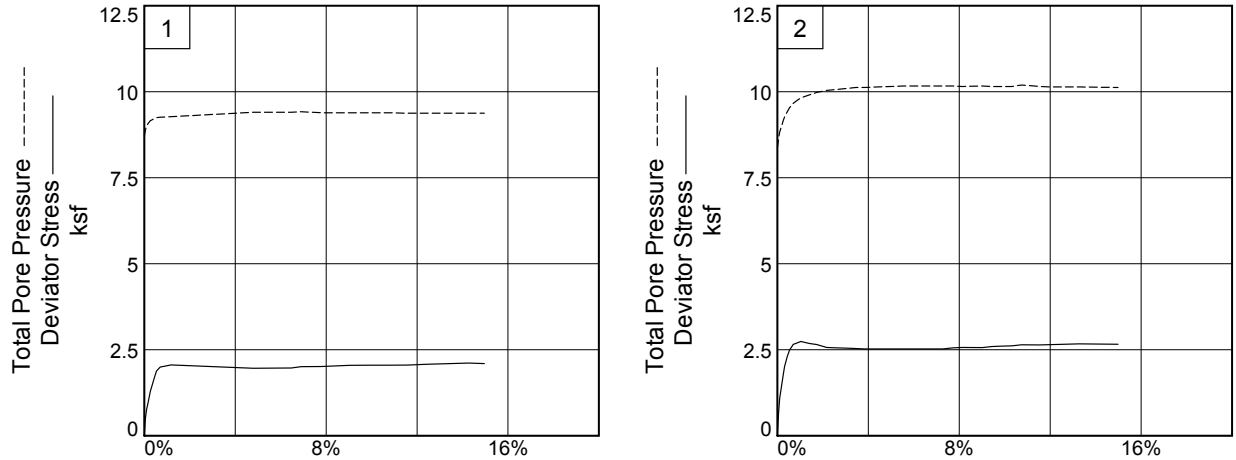
Sample Number: RX-12 and 13 **Depth:** 0.0 - 16.2 ft.

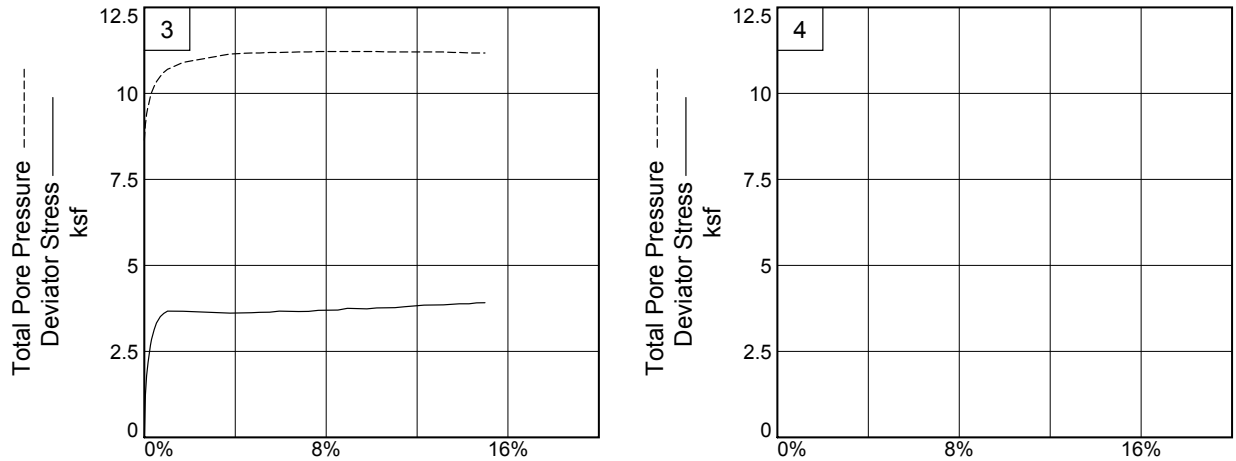
Proj. No.: 3783-16-007 **Date Sampled:** 08/02/16

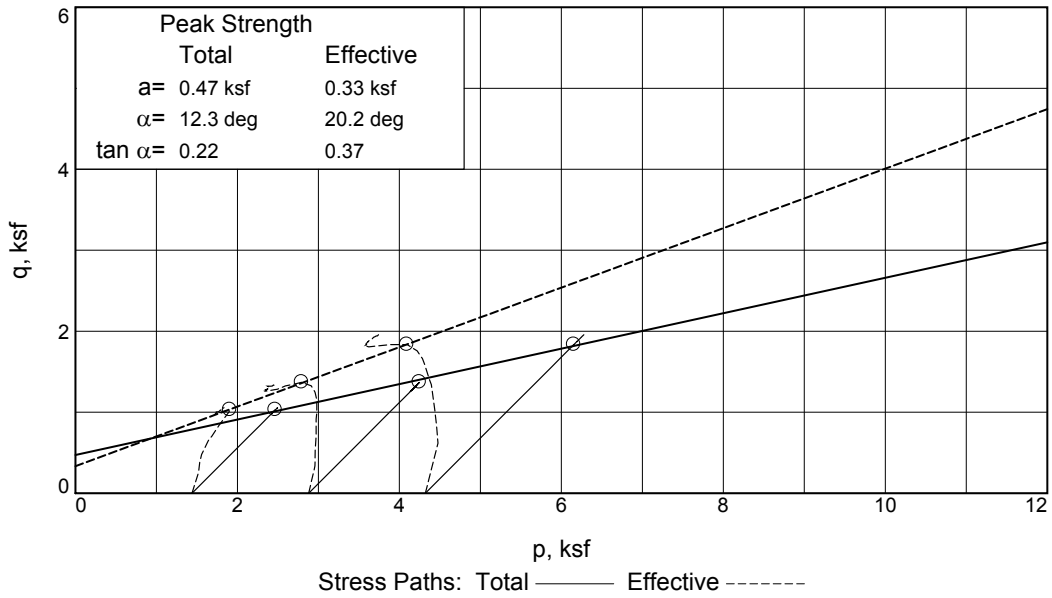
TRIAXIAL SHEAR TEST REPORT
S&ME, Inc.
Lexington, Kentucky

Figure Page 1 of 2

Tested By: M. Weber **Checked By:** DRAFT







Client: Cardno

Project: New Road Geotech FBOP Roxanna

Source of Sample: RX-12 and 13 Composite **Depth:** 0.0 - 16.2 ft. **Sample Number:** RX-12 and 13

Project No.: 3783-16-007 **Figure** Page 2 of 2

S&ME, Inc.

Tested By: M. Weber **Checked By:** DRAFT

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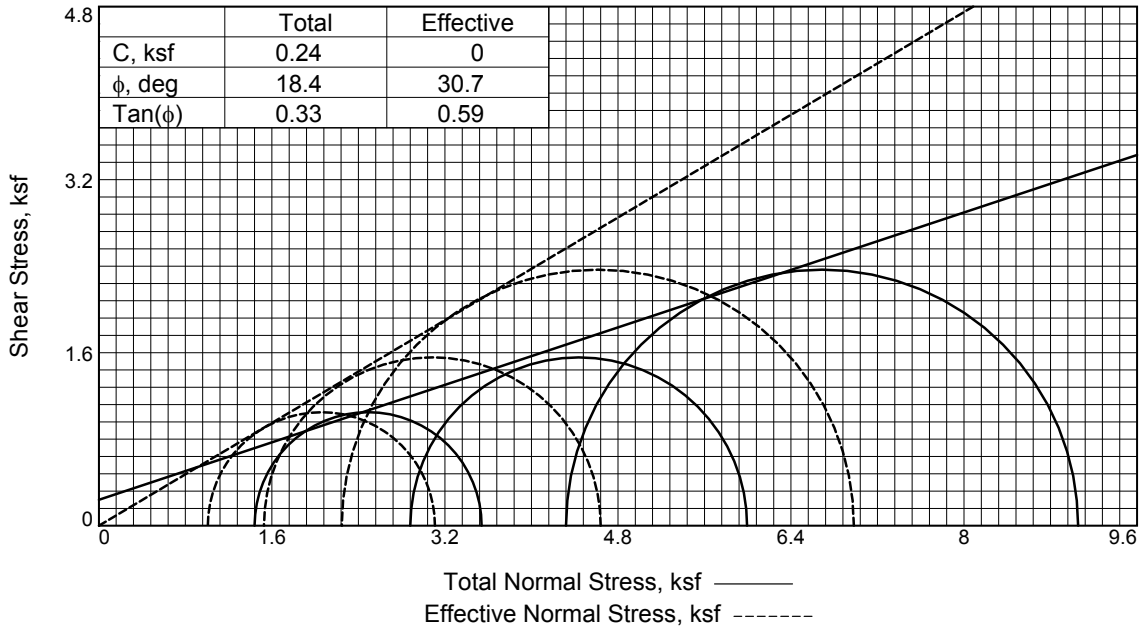
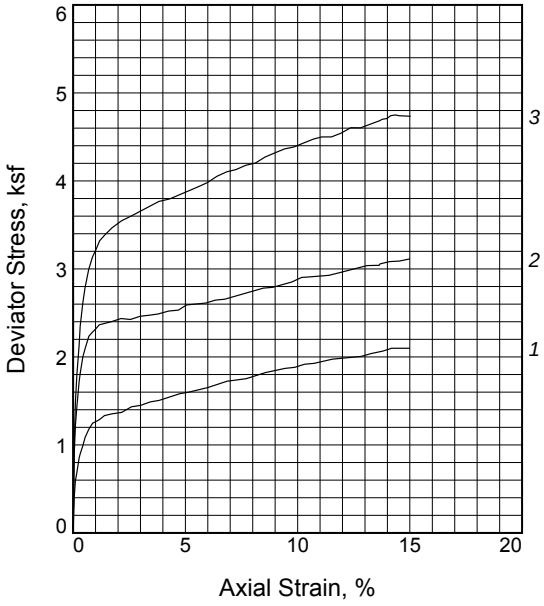


	Total	Effective
C, ksf	0.24	0
ϕ, deg	18.4	30.7
Tan(ϕ)	0.33	0.59



Sample No.		1	2	3
Initial	Water Content, %	12.4	12.4	12.1
	Dry Density, pcf	119.5	120.0	119.5
	Saturation, %	78.1	79.4	76.3
	Void Ratio	0.4364	0.4305	0.4361
	Diameter, in.	2.799	2.795	2.793
	Height, in.	6.045	6.036	6.084
At Test	Water Content, %	14.8	14.3	13.6
	Dry Density, pcf	122.0	123.2	125.0
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.4068	0.3931	0.3735
	Diameter, in.	2.779	2.767	2.745
	Height, in.	6.006	5.996	6.024
Strain rate, %/min.		0.02	0.02	0.02
Eff. Cell Pressure, psi		10.00	20.00	30.00
Fail. Stress, ksf		2.10	3.11	4.73
Total Pore Pr., ksf		8.09	12.07	10.76
Strain, %		15.0	15.0	15.0
Final Stress, ksf		2.10	3.11	4.73
Total Pore Pr., ksf		8.09	12.07	10.76
Strain, %		15.0	15.0	15.0
$\bar{\sigma}_1$ Failure, ksf		3.11	4.64	6.98
$\bar{\sigma}_3$ Failure, ksf		1.01	1.53	2.25

Type of Test:
CU with Pore Pressures
Sample Type: Intact specimen
Description: Grayish brown Sandy lean clay

LL= 29 **PL=** 20 **PI=** 9
Specific Gravity= 2.75
Remarks:

Client: Cardno

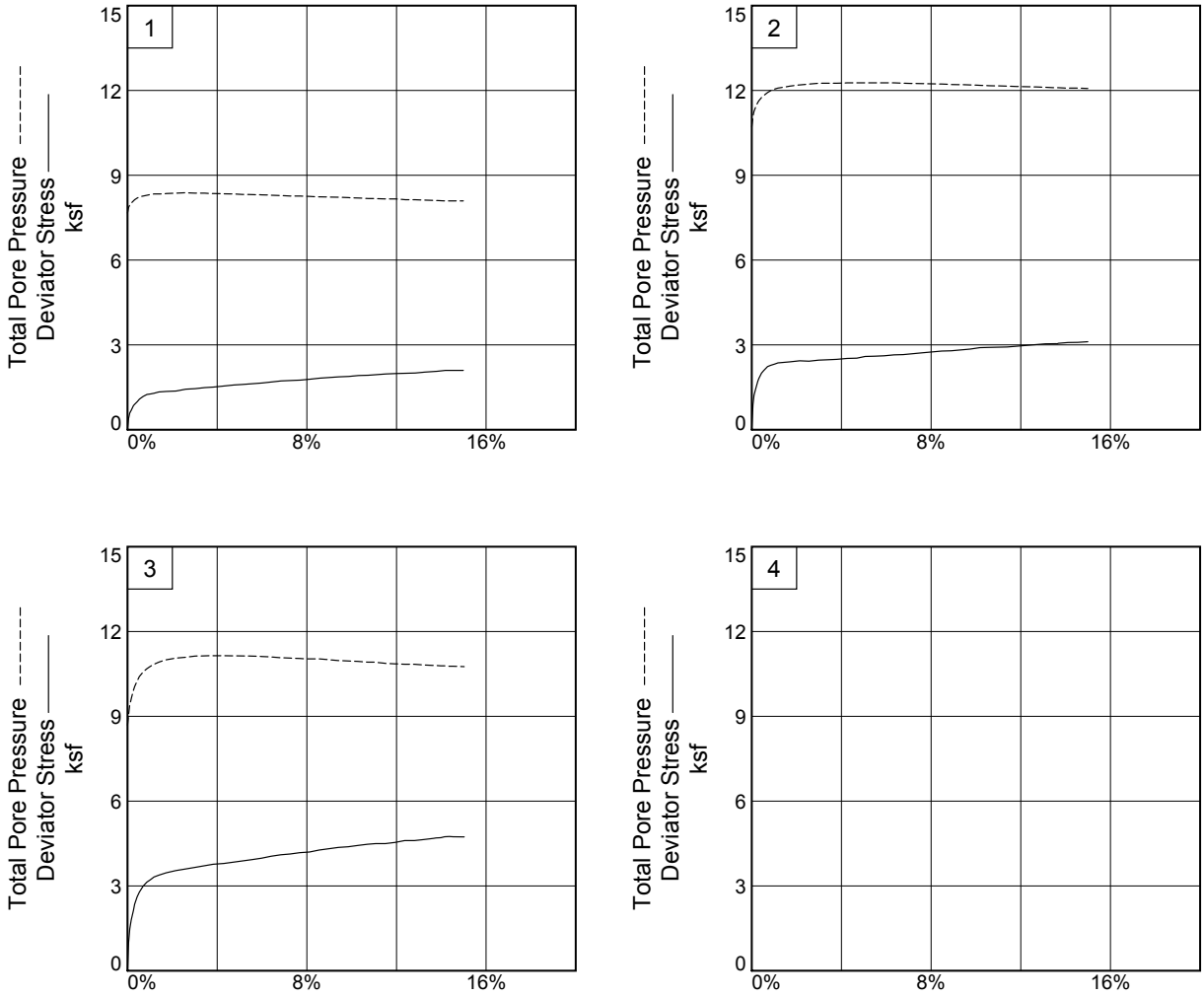
Project: New Road Geotech FBOP Roxanna

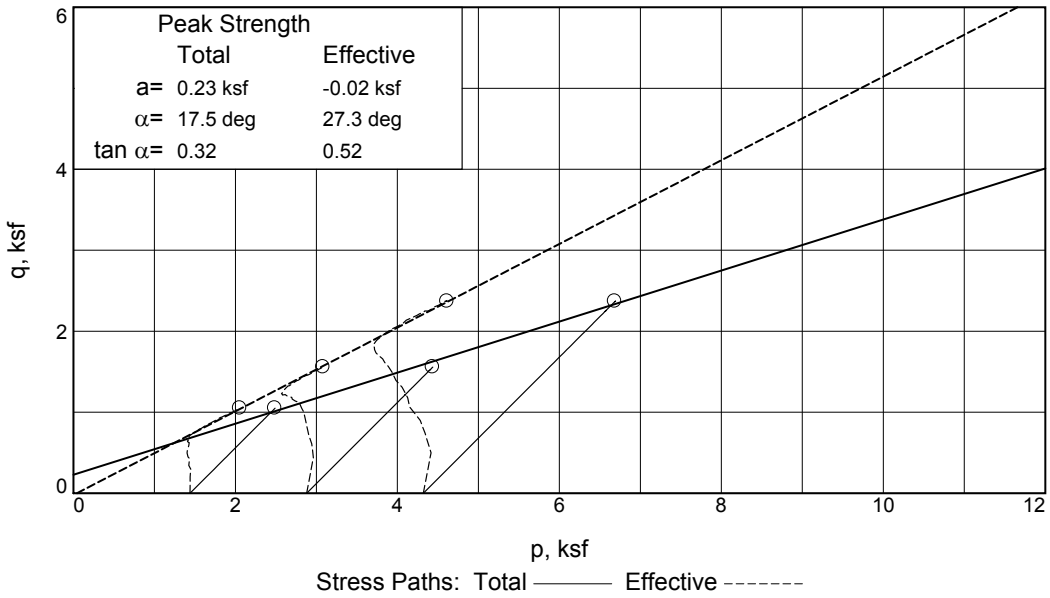
Source of Sample: RX-14 **Depth:** 0-70 ft.
Sample Number: RX-14
Proj. No.: 3783-16-007 **Date Sampled:** 09/08/16

TRIAXIAL SHEAR TEST REPORT
S&ME, Inc.
Lexington, Kentucky

Figure Page 1 of 2

Tested By: M. Weber **Checked By:** DRAFT





Client: Cardno

Project: New Road Geotech FBOP Roxanna

Source of Sample: RX-14 **Depth:** 0-70 ft. **Sample Number:** RX-14

Project No.: 3783-16-007 **Figure** Page 2 of 2

S&ME, Inc.

Tested By: M. Weber **Checked By:** DRAFT

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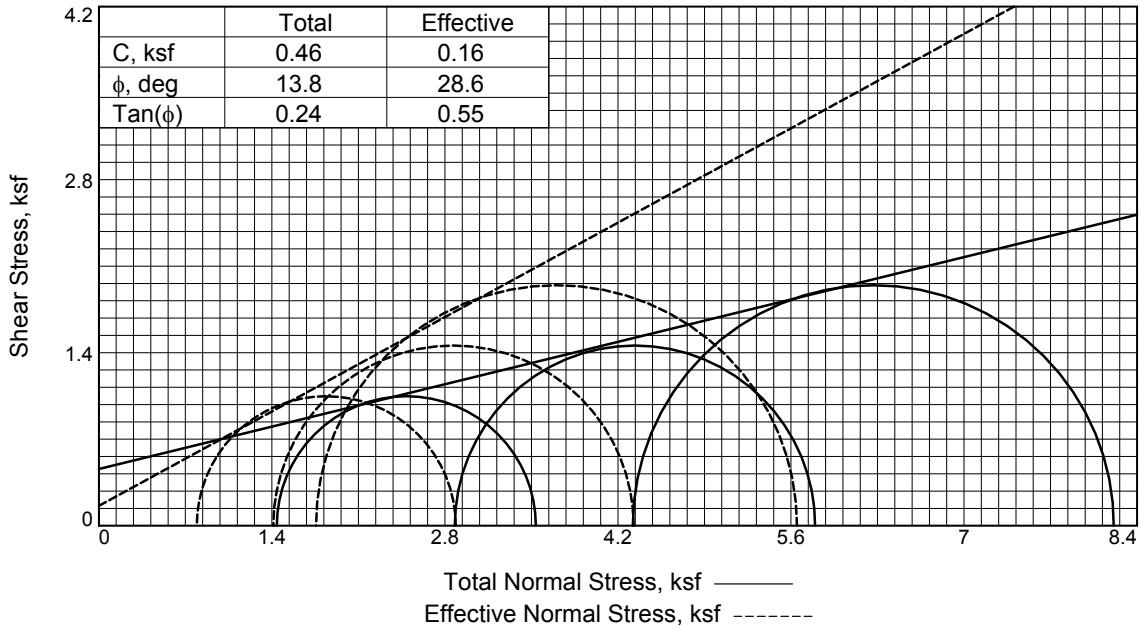
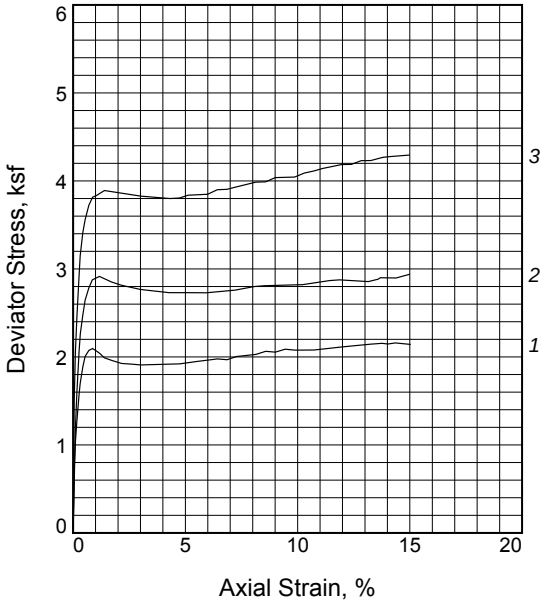


	Total	Effective
C, ksf	0.46	0.16
ϕ, deg	13.8	28.6
Tan(ϕ)	0.24	0.55



Sample No.		1	2	3
Initial	Water Content, %	10.6	10.5	10.9
	Dry Density, pcf	121.7	121.6	121.5
	Saturation, %	74.4	73.5	75.9
	Void Ratio	0.3844	0.3856	0.3875
	Diameter, in.	2.792	2.795	2.799
	Height, in.	6.030	6.023	6.045
At Test	Water Content, %	13.0	12.3	11.7
	Dry Density, pcf	124.8	126.4	128.0
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.3501	0.3332	0.3167
	Diameter, in.	2.763	2.754	2.735
	Height, in.	6.005	5.970	6.009
Strain rate, %/min.		0.07	0.07	0.07
Eff. Cell Pressure, psi		10.00	20.00	30.00
Fail. Stress, ksf		2.10	2.92	3.89
Total Pore Pr., ksf		9.13	9.94	9.78
Strain, %		0.9	1.2	1.4
Final Stress, ksf		2.14	2.94	4.29
Total Pore Pr., ksf		9.29	10.22	10.05
Strain, %		15.0	15.0	15.0
$\bar{\sigma}_1$ Failure, ksf		2.89	4.33	5.65
$\bar{\sigma}_3$ Failure, ksf		0.79	1.41	1.76

Type of Test:
CU with Pore Pressures
Sample Type: Intact specimen
Description: Gray clayey sand with gravel

LL= 28 **PL=** 18 **PI=** 10
Specific Gravity= 2.7
Remarks:

Client: Cardno

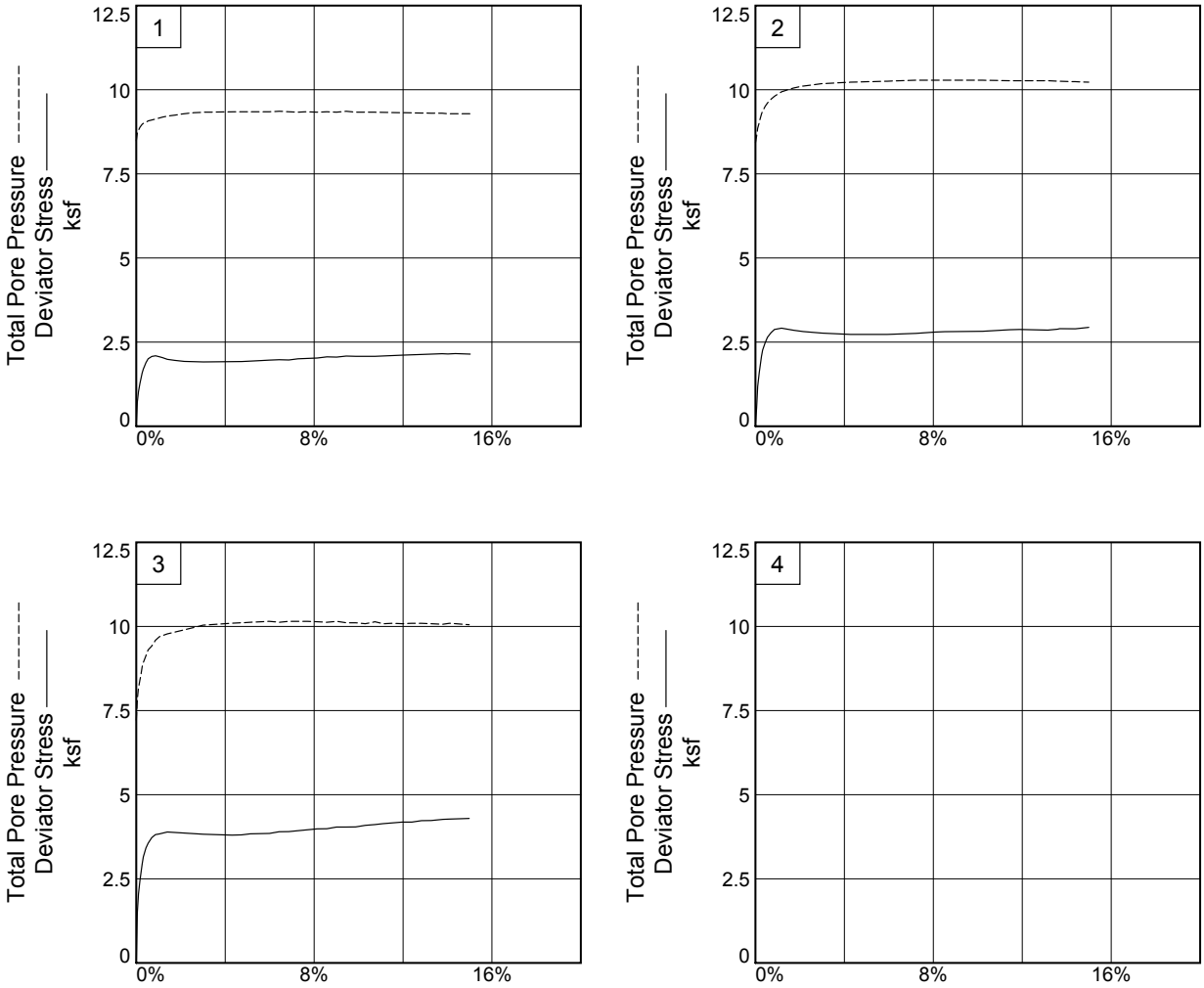
Project: New Road Geotech FBOP Roxanna

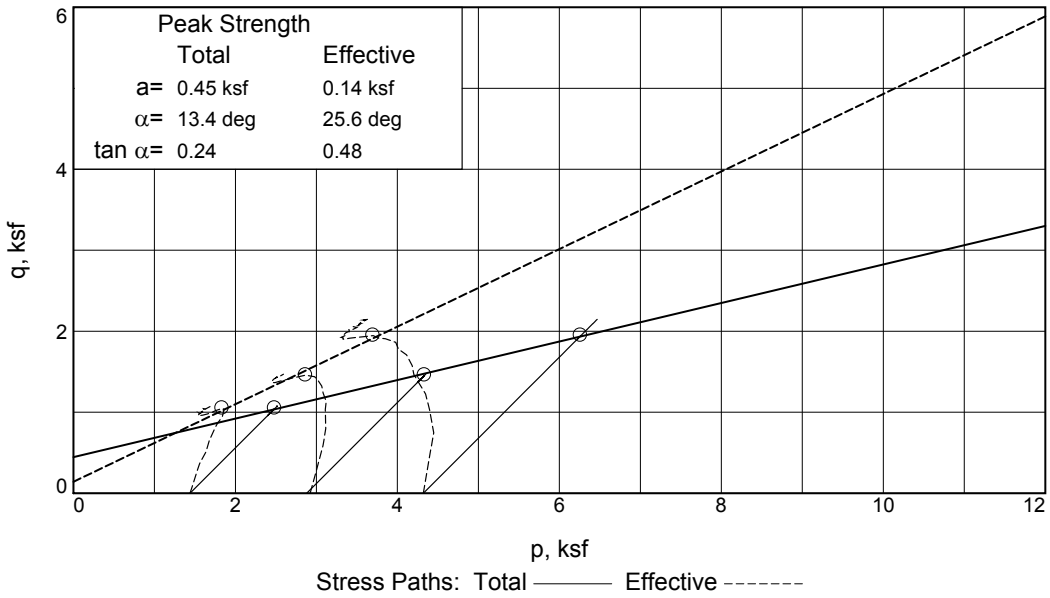
Source of Sample: RX-15 **Depth:** 0 - 85 ft.
Sample Number: RX-15
Proj. No.: 3783-16-007 **Date Sampled:** 08/02/16

TRIAXIAL SHEAR TEST REPORT
S&ME, Inc.
Lexington, Kentucky

Figure Page 1 of 2

Tested By: M. Weber **Checked By:** J. Folsom





Client: Cardno

Project: New Road Geotech FBOP Roxanna

Source of Sample: RX-15 **Depth:** 0 - 85 ft. **Sample Number:** RX-15

Project No.: 3783-16-007 **Figure** Page 2 of 2

S&ME, Inc.

Tested By: M. Weber **Checked By:** J. Folsom

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Form No: TR-D2216-T265-2
Revision No. 0
Revision Date: 02/22/08

Laboratory Determination of Water Content

S&ME

ASTM D 2216 ☑ *AASHTO T 265* ☐ *Quality Assurance*

S&ME, Inc - Lexington 2020 Liberty Road, Suite 105 Lexington, KY 40505

Project #:	**3783-16-007** -	Report Date:	09/02/16
Project Name:	New Road Geotech FBOP Roxanna	Test Date(s):	08/31/16
Client Name:	Cardno Engineering and Environmental Services		
Client Address:	5480 Swanton Drive, Lexington, KY 40509		

Sampling Method: Split Spoon Sample Date: 08/02/16

Method: **A (1%)** ☐ **B (0.1%)** ☑ *Balance ID.* ***23954*** *Calibration Date:* ***10/9/15***

Boring No.	Sample No.	Sample Depth	Tare #	Tare Weight	Tare Wt.+ Wet Wt	Tare Wt. + Dry Wt	Water Weight	Percent Moisture
		ft.		grams	grams	grams	grams	%
Rx12	2.0 - 3.5		B32	277.82	544.82	518.69	26.13	**10.8%**
RX12	7.0 - 8.5		S35	290.17	551.08	528.14	22.94	**9.6%**
Rx13	4.5 - 6.0		BB-16	295.23	413.36	407.23	6.13	**5.5%**
Rx13	9.5 - 11.0		BB-8	285.13	455.29	427.08	28.21	**19.9%**
Rx14	24.0 - 25.5		Q2	293.19	526.95	508.18	18.77	**8.7%**
Rx14	64.0 - 65.5		WIN	282.35	636.57	604.07	32.50	**10.1%**
Rx15	24.5 - 26.0		BLA3	283.55	539.55	512.99	26.56	**11.6%**
Rx15	74.5 - 76.0		F7	283.68	437.54	423.81	13.73	**9.8%**

Notes / Deviations / References

Gravel excluded from moisture content specimens.

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Bill Adams	Signature on File	T3	8/31/2016
Technician Name	*Signature*	*Certification Type / No.*	*Date*
Jacob Folsom		Project Professional	
Technical Responsibility	*Signature*	*Position*	

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Form No. TR-D422-3
Revision No. 0
Revision Date: 02/20/08

Particle Size Analysis of Soils

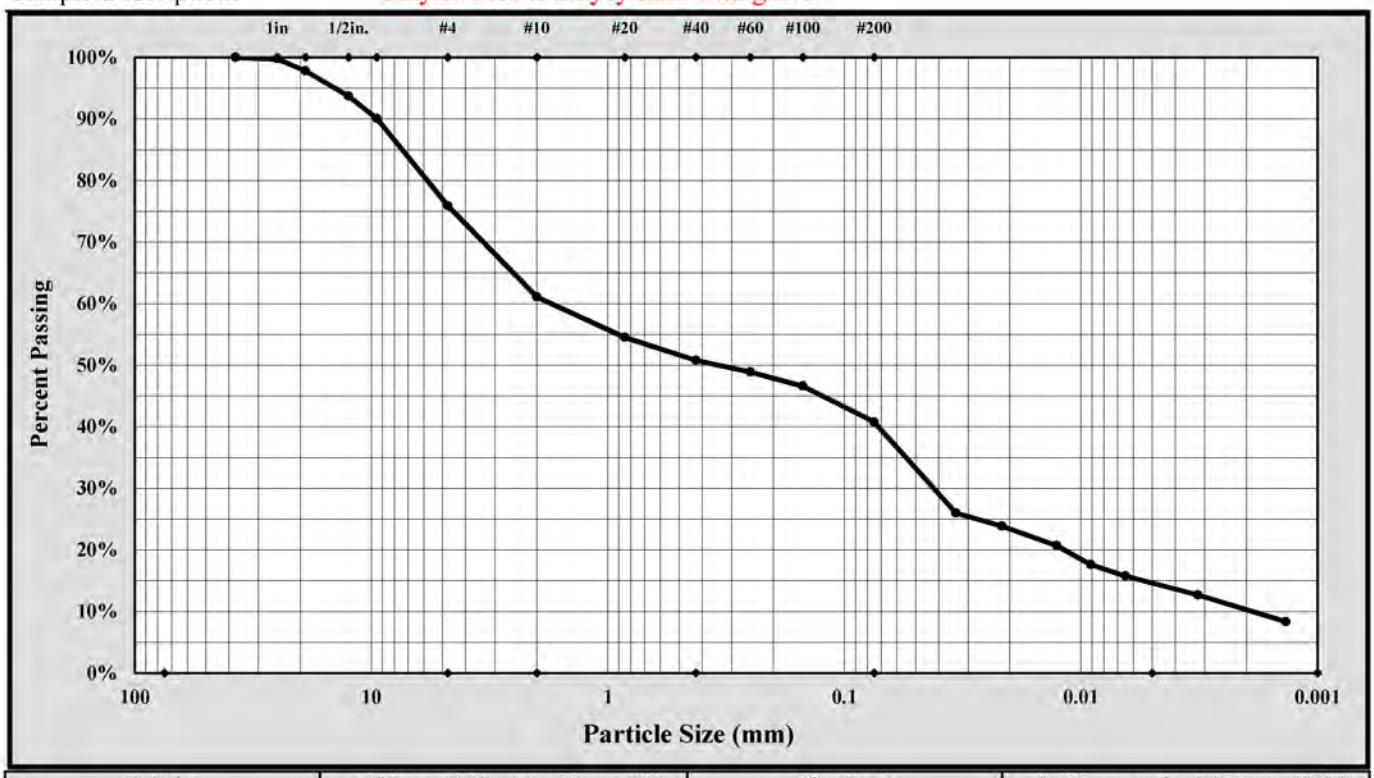
ASTM D422

Quality Assurance

S&ME, Inc. - Lexington 2020 Liberty Road, Suite 105, Lexington, Kentucky 40505

S&ME Project #:	3783-16-007	Report Date:	09/01/16
Project Name:	New Road Getoech FBOP Roxanna	Test Date(s):	08/12/16 - 08/31/16
Client Name:	Cardno Engineering and Environmental Services		
Address:	5480 Swanton Drive, Lexington, KY 40509		
Boring #:	RX 12 & RX 13	Sample Date:	08/02/16
		Depth (ft.):	0.0' - 16.2'

Sample Description: Grayish brown Clayey sand with gravel



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	1.5"	Gravel:	24.1%	Silt	26.1%
Silt & Clay (% Passing #200):	40.8%	Total Sand:	35.1%	Clay	14.6%
Relative Density	2.610	Moisture Content	6.2%		
Liquid Limit	29	Plastic Limit	20	Plastic Index	9
Coarse Sand:	14.9%	Medium Sand:	10.3%	Fine Sand:	10.0%

Description of Sand and Gravel: Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

Mechanical Stirring Apparatus A Dispersion Period: 1 min. Dispersing Agent: Sodium Hexametaphosphate: 40 g./ Liter

References / Comments / Deviations:

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

ASTM D 854: Specific Gravity of Soils. ASTM D6913 Gradation of Soils by Sieve Analysis was used for gradation of coarse material.

Jacob Folsom		Project Professional
Technical Responsibility	*Signature*	*Position*

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Form No. TR-D698-2
Revision No. : 0
Revision Date: 11/21/07

Moisture - Density Report

S&ME

Quality Assurance

S&ME, Inc. - Lexington 2020 Liberty Road, Suite 105, Lexington, KY 40505

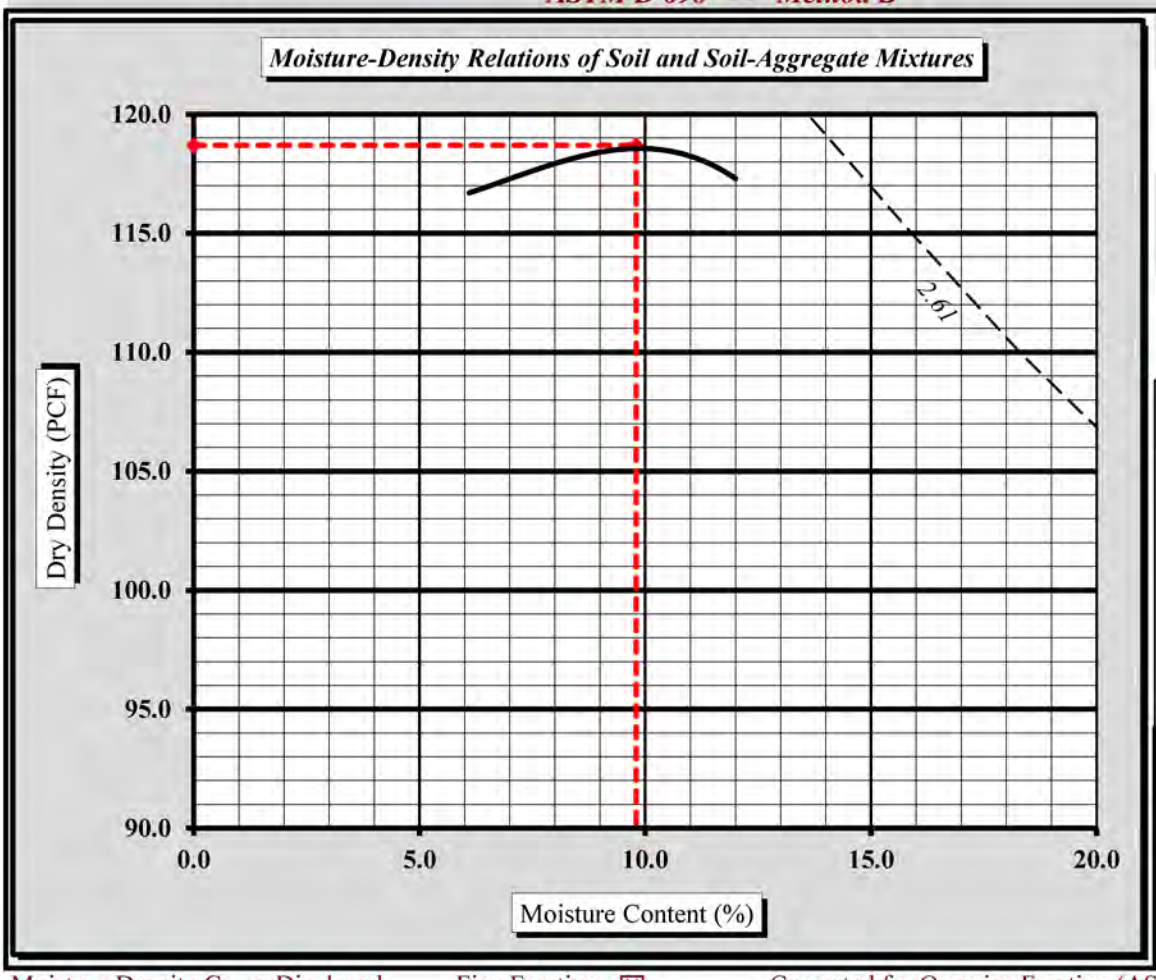
S&ME Project #:	**3783-16-007**	Report Date:	09/08/16
Project Name:	New Road Geotech FBOP Roxanna	Test Date(s):	08/16/16
Client Name:	Cardno Engineering and Environmental Services		
Client Address:	5480 Swanton Drive, Lexington, KY 40509		

Boring #:	RX 12 & RX 13	Sample #:	-	Sample Date:	08/02/16
Location:	-	Offset:	-	Depth (ft.):	0.0' - 16.2'

Sample Description: Grayish brown Clayey sand with gravel SC

Maximum Dry Density 118.7 PCF. **Optimum Moisture Content 9.8%**

ASTM D 698 - - Method B



Soil Properties	
Natural Moisture Content	6.2%
Specific Gravity of Soil (D854)	2.610
Liquid Limit	29
Plastic Limit	20
Plastic Index	9

% Passing	
3/4"	97.8%
3/8"	90.1%
#4	75.9%
#10	61.1%
#40	50.8%
#60	48.9%
#200	40.8%

Oversize Fraction	
Bulk Gravity	2.294
% Moisture	4.3%
% Oversize	9.9%
MDD	**120.7**
Opt. MC	**9.3%**

Moisture-Density Curve Displayed: Fine Fraction ☒ Corrected for Oversize Fraction (ASTM D 4718) ☐

Sieve Size used to separate the Oversize Fraction: #4 Sieve ☐ 3/8 inch Sieve ☒ 3/4 inch Sieve ☐

Mechanical Rammer ☐ Manual Rammer ☒ Moist Preparation ☐ Dry Preparation ☒

References / Comments / Deviations:

ASMT D854: Specific Gravity of Soil Solids by Water Pycnometer

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

ASTM D 698: Laboratory Compaction Characteristics of Soil Using Standard Effort

Jacob Folsom		Project Professional
Technical Responsibility	*Signature*	*Position*

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Form No. TR-D422-3
Revision No. 0
Revision Date: 02/20/08

Particle Size Analysis of Soils

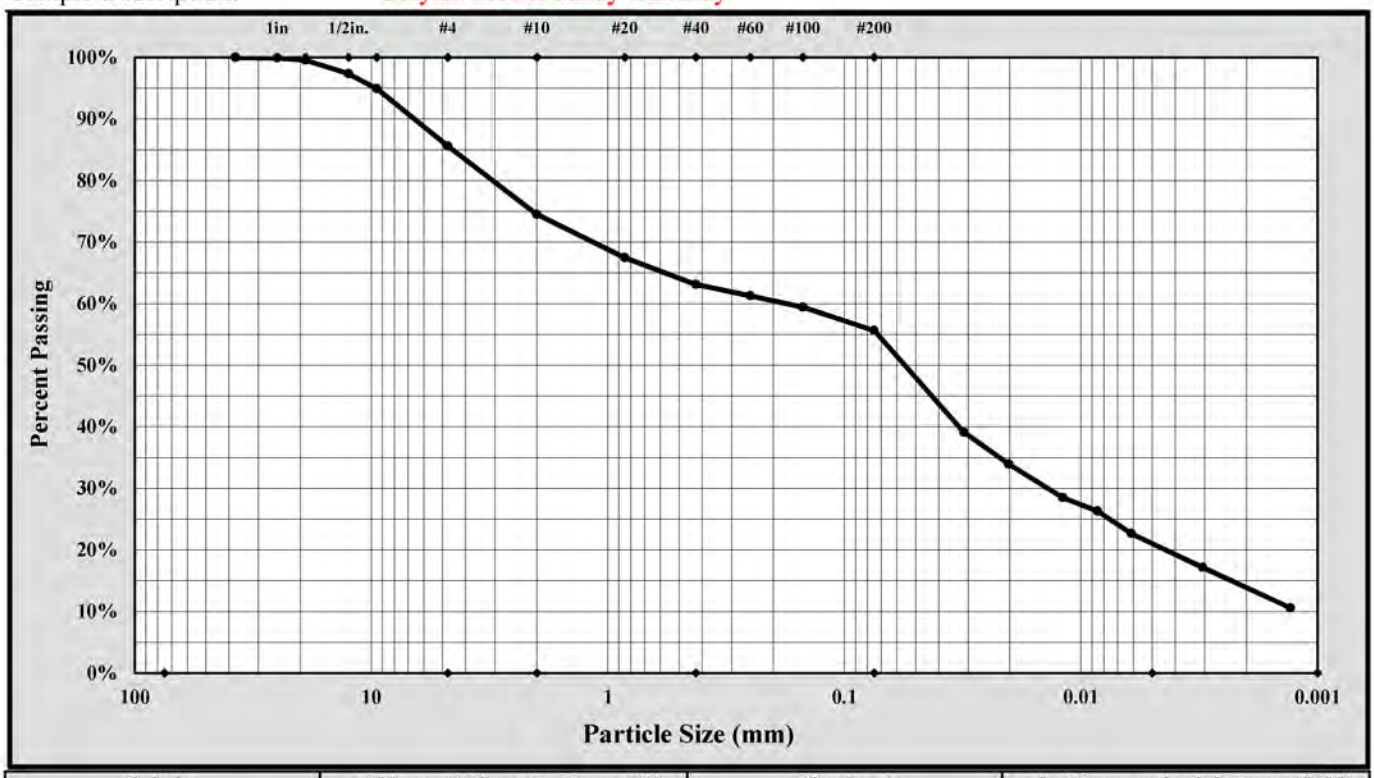
ASTM D422

Quality Assurance

S&ME, Inc. - Lexington 2020 Liberty Road, Suite 105, Lexington, Kentucky 40505

S&ME Project #:	3783-16-007	Report Date:	09/01/16
Project Name:	New Road Getoech FBOP Roxanna	Test Date(s):	08/12/16 - 08/31/16
Client Name:	Cardno Engineering and Environmental Services		
Address:	5480 Swanton Drive, Lexington, KY 40509		
Boring #:	RX 14	Sample Date:	08/02/16
		Depth (ft.):	0.0' - 70.0'

Sample Description: Grayish brown Sandy lean clay



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	1.5"	Gravel:	14.4%	Silt	34.6%
Silt & Clay (% Passing #200):	55.6%	Total Sand:	30.0%	Clay	21.0%
Relative Density	2.750	Moisture Content	6.6%		
Liquid Limit	29	Plastic Limit	20	Plastic Index	9
Coarse Sand:	11.1%	Medium Sand:	11.4%	Fine Sand:	7.5%

Description of Sand and Gravel Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

Mechanical Stirring Apparatus A Dispersion Period: 1 min. Dispersing Agent: Sodium Hexametaphosphate: 40 g./ Liter

References / Comments / Deviations:

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

ASTM D 854: Specific Gravity of Soils. ASTM D6913 Gradation of Soils by Sieve Analysis was used for gradation of coarse material.

Jacob Folsom		Project Professional
Technical Responsibility	*Signature*	*Position*

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Form No. TR-D698-2
Revision No. : 0
Revision Date: 11/21/07

Moisture - Density Report

S&ME

Quality Assurance

S&ME, Inc. - Lexington 2020 Liberty Road, Suite 105, Lexington, KY 40505

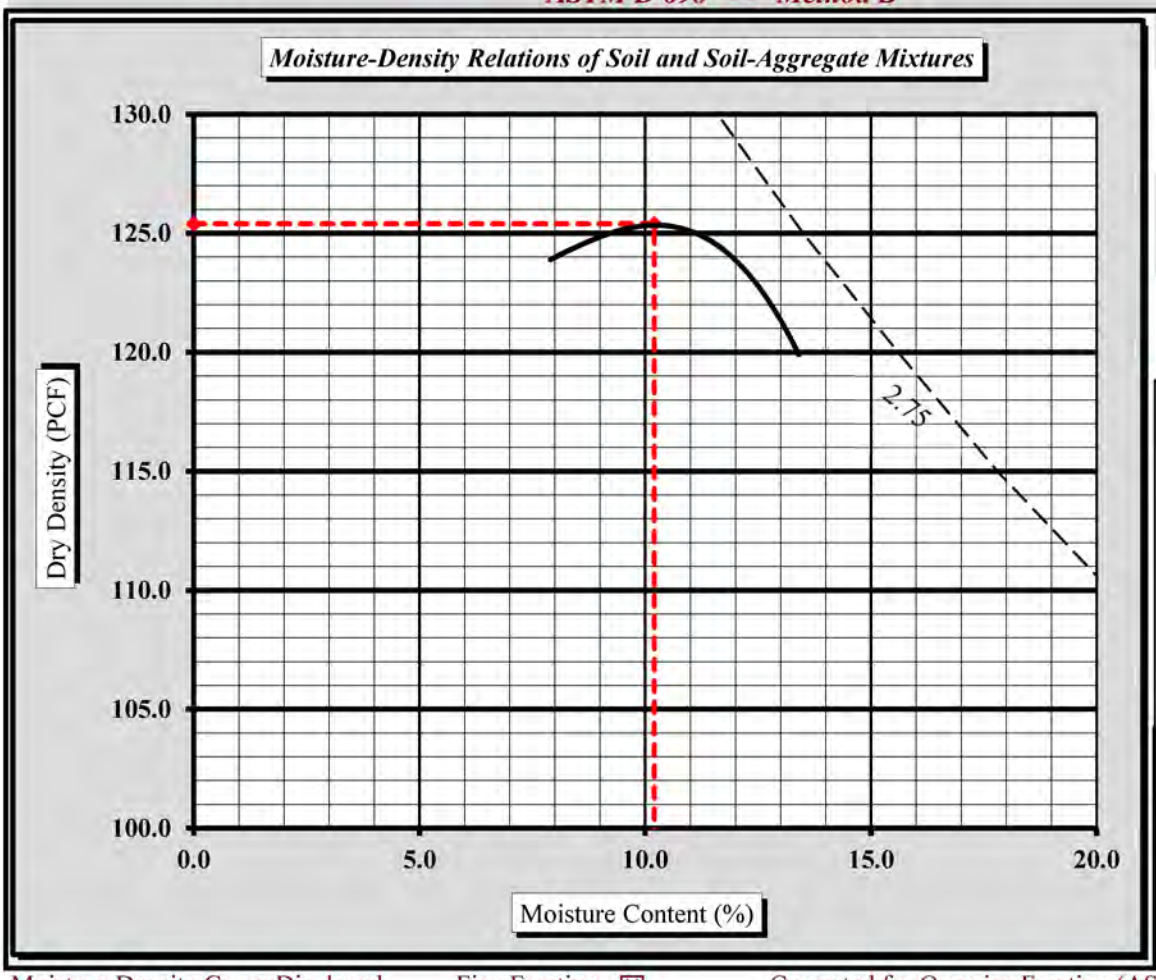
S&ME Project #:	**3783-16-007**	Report Date:	09/06/16
Project Name:	New Road Geotech FBOP Roxanna	Test Date(s):	08/16/16
Client Name:	Cardno Engineering and Environmental Services		
Client Address:	5480 Swanton Drive, Lexington, KY 40509		

Boring #:	RX 14	Sample #:	-	Sample Date:	08/02/16
Location:	-	Offset:	-	Depth (ft.):	0.0' - 70.0'

Sample Description: Grayish brown Sandy lean clay CL

Maximum Dry Density 125.4 PCF. **Optimum Moisture Content 10.2%**

ASTM D 698 - - Method B



Soil Properties

Natural Moisture Content	**6.6%**
Specific Gravity of Soil (D854)	**2.750**
Liquid Limit	**29**
Plastic Limit	**20**
Plastic Index	**9**

% Passing

3/4"	99.5%
3/8"	94.9%
#4	85.6%
#10	74.5%
#40	63.1%
#60	61.3%
#200	55.6%

Oversize Fraction

Bulk Gravity	2.562
% Moisture	3.1%
% Oversize	5.1%
MDD	**126.8**
Opt. MC	**9.8%**

Moisture-Density Curve Displayed: Fine Fraction ☒ Corrected for Oversize Fraction (ASTM D 4718) ☐

Sieve Size used to separate the Oversize Fraction: #4 Sieve ☐ 3/8 inch Sieve ☒ 3/4 inch Sieve ☐

Mechanical Rammer ☐ Manual Rammer ☒ Moist Preparation ☐ Dry Preparation ☒

References / Comments / Deviations:

ASMT D854: Specific Gravity of Soil Solids by Water Pycnometer
ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
ASTM D 698: Laboratory Compaction Characteristics of Soil Using Standard Effort

Jacob Folsom		Project Professional
Technical Responsibility	*Signature*	*Position*

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Form No. TR-D422-3
Revision No. 0
Revision Date: 02/20/08

Particle Size Analysis of Soils

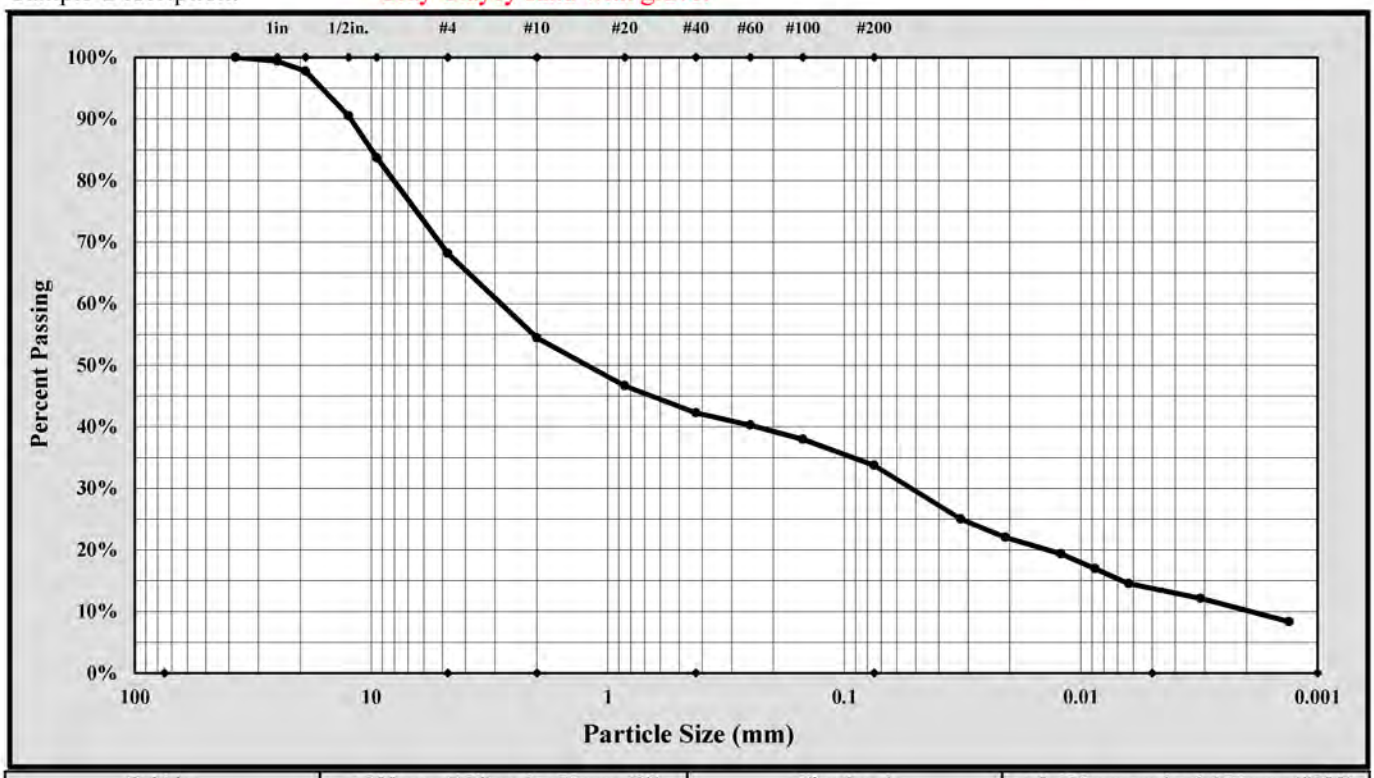
ASTM D422

Quality Assurance

S&ME, Inc. - Lexington 2020 Liberty Road, Suite 105, Lexington, Kentucky 40505

S&ME Project #:	3783-16-007	Report Date:	09/01/16
Project Name:	New Road Getoech FBOP Roxanna	Test Date(s):	08/12/16 - 08/31/16
Client Name:	Cardno Engineering and Environmental Services		
Address:	5480 Swanton Drive, Lexington, KY 40509		
Boring #:	RX 15	Sample Date:	08/02/16
		Depth (ft.):	0.0' - 85.0'

Sample Description: Gray Clayey sand with gravel



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and >2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	1.5"	Gravel:	31.8%	Silt	20.0%
Silt & Clay (% Passing #200):	33.8%	Total Sand:	34.4%	Clay	13.7%
Relative Density	2.700	Moisture Content	4.9%		
Liquid Limit	28	Plastic Limit	18	Plastic Index	10
Coarse Sand:	13.7%	Medium Sand:	12.2%	Fine Sand:	8.5%

Description of Sand and Gravel Rounded ☐ Angular ☒ Hard & Durable ☒ Soft ☐ Weathered & Friable ☐

Mechanical Stirring Apparatus A Dispersion Period: 1 min. Dispersing Agent: Sodium Hexametaphosphate: 40 g./ Liter

References / Comments / Deviations:

ASTM D 4318: Liquid Limit, Plastic Limit, & Plastic Index of Soils

ASTM D 2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System)

ASTM D 854: Specific Gravity of Soils. ASTM D6913 Gradation of Soils by Sieve Analysis was used for gradation of coarse material.

Jacob Folsom		Project Professional
Technical Responsibility	*Signature*	*Position*

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Form No. TR-D698-2
Revision No. : 0
Revision Date: 11/21/07

Moisture - Density Report

S&ME

Quality Assurance

S&ME, Inc. - Lexington 2020 Liberty Road, Suite 105, Lexington, KY 40505

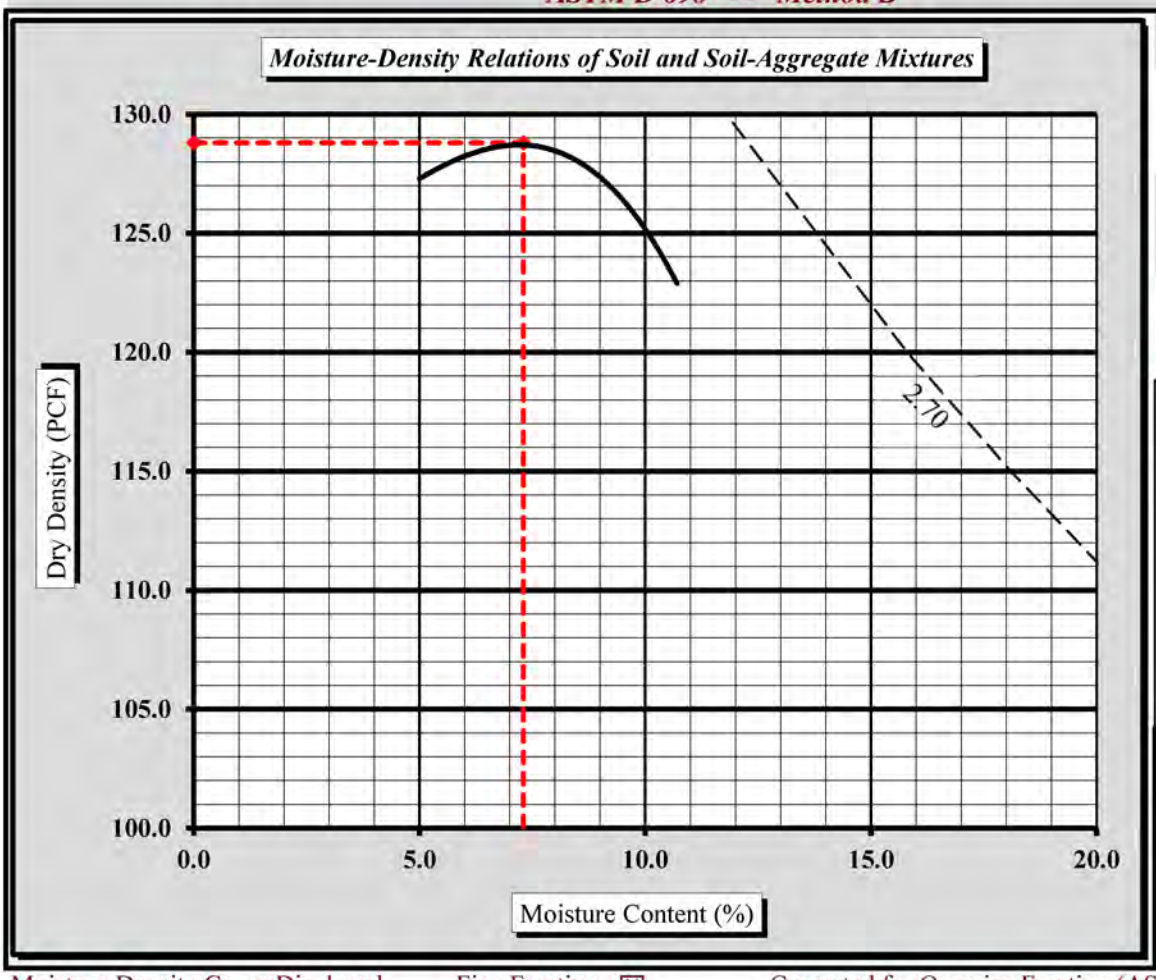
S&ME Project #:	**3783-16-007**	Report Date:	09/06/16
Project Name:	New Road Geotech FBOP Roxanna	Test Date(s):	08/16/16
Client Name:	Cardno Engineering and Environmental Services		
Client Address:	5480 Swanton Drive, Lexington, KY 40509		

Boring #:	RX 15	Sample #:	-	Sample Date:	08/02/16
Location:	-	Offset:	-	Depth (ft.):	0.0' - 85.0'

Sample Description: Gray Clayey sand with gravel SC

Maximum Dry Density 128.8 PCF. **Optimum Moisture Content 7.3%**

ASTM D 698 - - Method B



Soil Properties

Natural Moisture Content	**4.9%**
Specific Gravity of Soil (D854)	**2.700**
Liquid Limit	**28**
Plastic Limit	**18**
Plastic Index	**10**

% Passing

3/4"	97.8%
3/8"	83.7%
#4	68.2%
#10	54.5%
#40	42.3%
#60	40.3%
#200	33.8%

Oversize Fraction

Bulk Gravity	2.511
% Moisture	2.2%
% Oversize	16.3%
MDD	**132.6**
Opt. MC	**6.5%**

Moisture-Density Curve Displayed: Fine Fraction ☒ Corrected for Oversize Fraction (ASTM D 4718) ☐

Sieve Size used to separate the Oversize Fraction: #4 Sieve ☐ 3/8 inch Sieve ☒ 3/4 inch Sieve ☐

Mechanical Rammer ☐ Manual Rammer ☒ Moist Preparation ☐ Dry Preparation ☒

References / Comments / Deviations:

ASMT D854: Specific Gravity of Soil Solids by Water Pycnometer
ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
ASTM D 698: Laboratory Compaction Characteristics of Soil Using Standard Effort

Jacob Folsom		Project Professional
Technical Responsibility	*Signature*	*Position*

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Form No. TR-D2166-01
Revision No. : 0
Revision Date: 3/29/13

UNCONFINED COMPRESSIVE STRENGTH OF COHESIVE SOILS

S&ME

Client Report No: 1

ASTM D2166

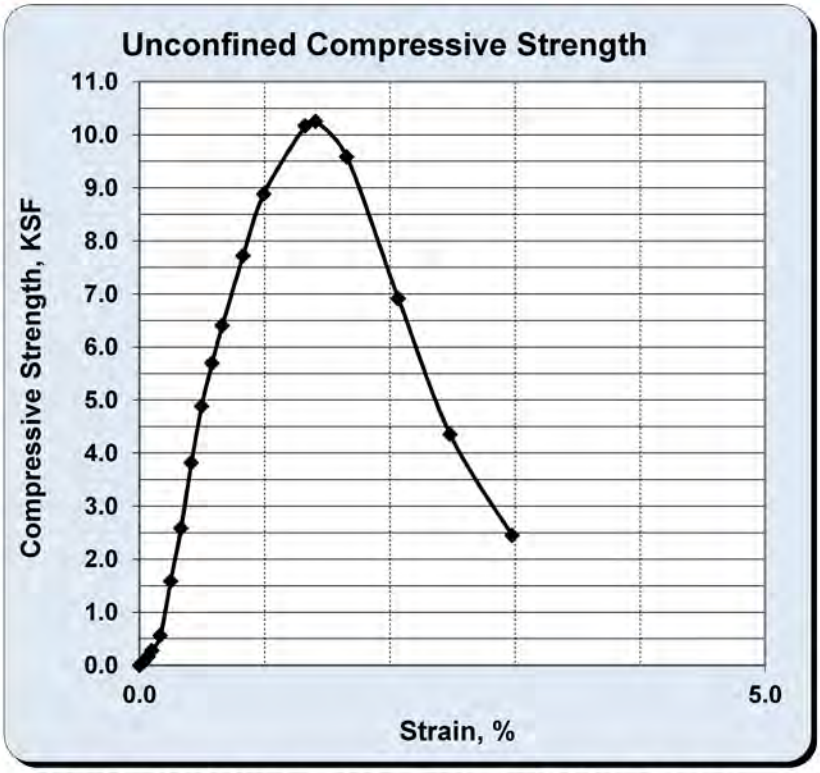
Quality Assurance

S&ME, Inc - Lexington 2020 Liberty Road, Suite 105 Lexington, KY 40505

Project No.:	3783-16-007	Report Date:	09/09/16
Project Name:	New Road Geotech FBOP Roxanna	Test Date(s):	09/09/16
Client Name:	Cardno Engineering and Environmental Services		
Client Address:	5480 Swanton Drive, Lexington, KY 40509		
Location:	RX-12&RX-13 Depth (ft.): 0 - 16	Sample Date:	08/02/16

Sample Description: Grayish brown Clayey sand with gravel SC

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.1 gram)	23954	10/09/15			
Calipers (0.001 inches)	24319	05/12/16			
Load Frame	24004	02/02/16			



Failed Specimen

Type of Sample: Reconstituted
Source of Moisture Sample: Trimmings

Initial Dry Unit Weight: 112.8 pcf Initial Water Content: 12.0%
Unconfined Compressive Strength, q_u: **10.258** KSF
Undrained Shear Strength, s_u: **5.129** KSF

Liquid Limit: 29
Plasticity Index: 9
Height to Diameter Ratio: 2.2
Rate of Strain (%/m): 1.2
Strain at Failure: 1.4

References / Comments / Deviations:

Jacob Folsom — *Technical Responsibility*
_____ — *Signature*
Project Professional — *Position*

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Form No. TR-D2166-01
Revision No. : 0
Revision Date: 3/29/13

UNCONFINED COMPRESSIVE STRENGTH OF COHESIVE SOILS

S&ME

Client Report No: 1

ASTM D2166

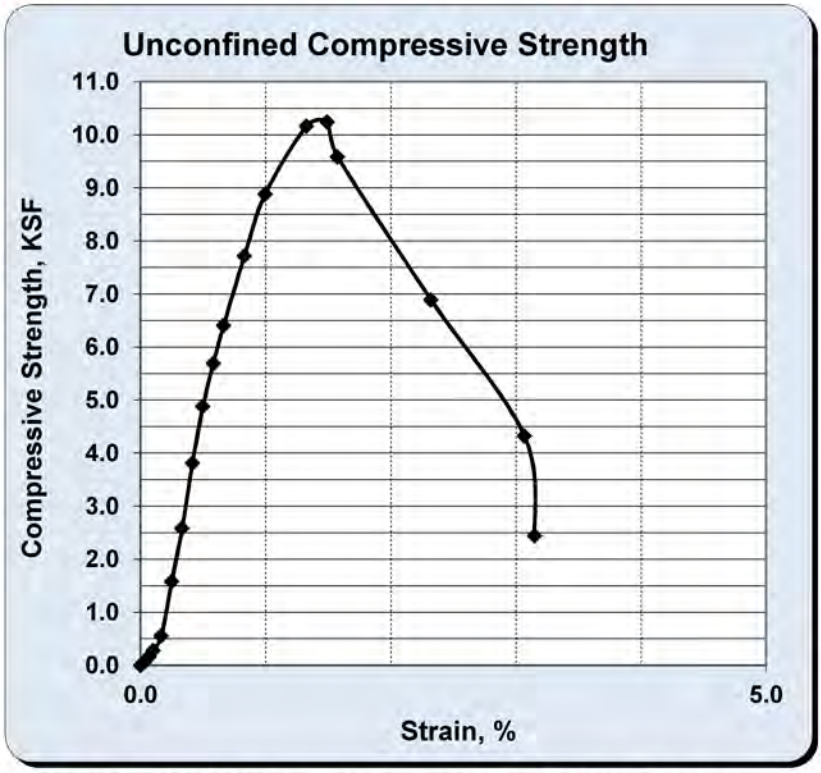
Quality Assurance

S&ME, Inc - Lexington 2020 Liberty Road, Suite 105 Lexington, KY 40505

Project No.:	3783-16-007	Report Date:	09/09/16
Project Name:	New Road Geotech FBOP Roxanna	Test Date(s):	09/09/16
Client Name:	Cardno Engineering and Environmental Services		
Client Address:	5480 Swanton Drive, Lexington, KY 40509		
Location:	RX-14 Depth (ft.): 0 - 70	Sample Date:	08/02/16

Sample Description: Grayish brown Sandy lean clay CL

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.1 gram)	23954	10/09/15			
Calipers (0.001 inches)	24319	05/12/16			
Load Frame	24004	02/02/16			



Failed Specimen

Type of Sample: Reconstituted
Source of Moisture Sample: Trimmings

Initial Dry Unit Weight: 120.2 pcf Initial Water Content: 12.0%
Unconfined Compressive Strength, q_u: **10.242** KSF
Undrained Shear Strength, s_u: **5.121** KSF

Liquid Limit: 29
Plasticity Index: 20
Height to Diameter Ratio: 2.2
Rate of Strain (%/m): 1.2
Strain at Failure: 1.5

References / Comments / Deviations:

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Project Professional — *Position*

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Form No. TR-D2166-01
Revision No. : 0
Revision Date: 3/29/13

UNCONFINED COMPRESSIVE STRENGTH OF COHESIVE SOILS

S&ME

Client Report No: 1

ASTM D2166

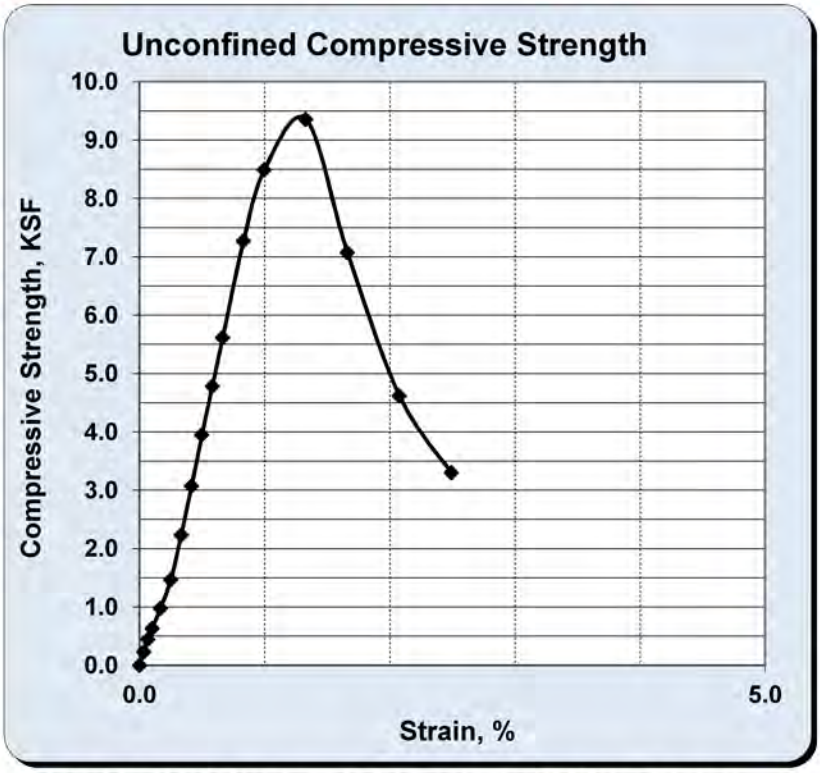
Quality Assurance

S&ME, Inc - Lexington 2020 Liberty Road, Suite 105 Lexington, KY 40505

Project No.:	3783-16-007	Report Date:	09/09/16
Project Name:	New Road Geotech FBOP Roxanna	Test Date(s):	09/09/16
Client Name:	Cardno Engineering and Environmental Services		
Client Address:	5480 Swanton Drive, Lexington, KY 40509		
Location:	RX-15 Depth (ft.): 0 - 85	Sample Date:	08/02/16

Sample Description: Gray Clayey sand with gravel SC

Type and Specification	*S&ME ID #*	*Cal Date:*	*Type and Specification*	*S&ME ID #*	*Cal Date:*
Balance (0.1 gram)	23954	10/09/15			
Calipers (0.001 inches)	24319	05/12/16			
Load Frame	24004	02/02/16			



Failed Specimen

Type of Sample: Reconstituted
Source of Moisture Sample: Trimmings

Initial Dry Unit Weight: 121.1 pcf Initial Water Content: 10.7%
Unconfined Compressive Strength, q_u: **9.360** KSF
Undrained Shear Strength, s_u: **4.680** KSF

Liquid Limit: 28
Plasticity Index: 10
Height to Diameter Ratio: 2.1
Rate of Strain (%/m): 1.2
Strain at Failure: 1.3

References / Comments / Deviations:

Jacob Folsom — *Technical Responsibility*
_____ — *Signature*
Project Professional — *Position*

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APPENDIX G

RESULTS OF INVESTIGATION OF MATERIALS TO BE EXCAVATED (2016)

Results of Investigation of Materials to be Excavated at the Proposed United States Penitentiary and Federal Prison Camp, Roxana Site Letcher County, Kentucky

January 2016

Prepared for:
United States Department of Justice
Federal Bureau of Prisons
320 First Street NW
Washington, DC 20534

Prepared by:
Ronald H. Mullennex, CPG, CGWP
Senior Principal, Practice Leader -
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1 Introduction

The **Federal Bureau of Prisons (*Bureau)*** proposes to construct a new United States Penitentiary (*USP*), Federal Prison Camp (*FPC*), and associated ancillary facilities on a property generally known as the "Meade Farm," near Roxana, Letcher County, Kentucky. **Cardno, Inc.** is contracted by the Bureau to undertake and/or oversee research and investigations of the subject property to, among other things, develop and support an Environmental Impact Statement as to the proposed development.

The subject development is to be located on a former coal surface mine site that has been reclaimed. The existing ground surface at the planned construction site is immediately underlain by up to approximately 17 meters (56 feet) of broken, rubblized rock material residual to the mining operation. That unconsolidated material will generally need to be removed (to allow for the planned site construction) and re-placed in head-of-hollow fills at certain points around the construction site perimeter. **Cardno's Engineering and Environmental Services** division (**Cardno**), mining advisory services group, has investigated the geochemical character of the rock rubble; and evaluated whether its further disturbance, removal, and re-placement is likely to induce material environmental impacts on the site and/or to streams receiving drainage from the site that could have significant bearing on human health due to the geochemical nature of the material.

1.1 Scope and Limitations

The focus of this component of the site investigation is to determine whether there is a likelihood of acid mine drainage (to include dissolution of metals of possible health concern) being generated by the handling and re-placement of rubblized rock material that is necessary for the planned site development. The investigation was conceived as a phased investigation, with the results of each stage dictating the need for or level of effort to be applied in a following stage. The scope of the commissioned investigation is an initial phase. However, as is discussed herein, the results are consistent and suggest that the investigation performed to date is adequate to serve the intent and purpose of the study. The investigation has involved: 1) sampling and analyses of existing water discharges from the site, most of which reflect water that has drained through the rubble material; and 2) collection, sampling, and analyses of the rubble material itself from multiple subsurface horizons at several locations within the area where construction and development are proposed. Additionally, site water quality information as documented in historical discharge monitoring reports associated with the surface mining permit, provided by the Bureau, has been compared to the recent data generated in this investigation.

In performing this investigation, Cardno has relied on information provided by others, including: historical water quality information from mine permit files, provided by the Bureau; a map of the boundary of underground mining provided in a report by Summit Engineering; and mine permit status information set forth in the Kentucky regulatory agency online-searchable database. Cardno has not attempted to verify the accuracy or completeness of such information, and makes no warranty as to such for information not generated by Cardno in this investigation.

The scope of investigation completed is consistent with that authorized by the client, and the approach and tasks performed are in accordance with accepted industry standards for the intended purpose. The consistency of results throughout indicate that a more intensive subsurface investigation is unlikely to produce significantly different results. However, no warranty or guarantee can be made as to whether a condition remains undetected by the extent of investigation conducted to date.

2 Site Location and Description

2.1 Location

The Meade Farm site, reportedly consisting of approximately 700 acres, lies on the south side of the North Fork of the Kentucky River near the small community of Roxana, Letcher County, Kentucky. The subject proposed development area is situated on the surface mined and reclaimed ridgecrest surrounded by the drainages of Tolson Branch to the west, North Fork Kentucky River to the north, and Kings Creek to the east. To the south, the subject site is bordered by the continuation of the ridgeline (*see Map 1, in pocket following page 8*).

2.2 Topography

The reclaimed surface mine site lies as a flattened ridgetop plateau at an elevation of approximately 460 meters (*m*) (1500 feet [*ft.*]) above mean sea level (*msl*). To the east, north, and west of the plateau, the mountain slopes drop steeply to the streams situated at elevations of approximately 310 m to 330 m (1000 to 1100 ft.) msl, for a total local topographic relief of 130 m to 150 m (400 to 500 ft.). It is expected that the rubblized rock material that currently mantles the bedrock surface will be excavated to allow the building foundations to be placed on firm bedrock material. The excavated material, as shown on *Map 1*, is to be placed in head-of-hollow fills situated adjacent to the northwest and southwest of the proposed USP location. (The northwest head-of-hollow contains an existing fill that was constructed during the previous surface mining, but may have additional remaining storage capacity.)

2.3 General Geology

Surficial bedrock strata at the proposed building site are of the Breathitt Formation of Pennsylvanian age. These strata consist of clastic sedimentary rocks including, in general, sandstone, siltstone, shale and/or clay shale, and coal beds. Structural dip of the strata is very gently to the northwest at a magnitude of approximately 1.0 percent.

2.4 Previous Mining

2.4.1 Surface Mining

The subject site was surface mined by mountaintop mining methods in the late 1980s – early 1990s (Kentucky Department for Surface Mining Reclamation and Enforcement Permanent Program Permit No. 867-0298, issued December 31, 1987, effective date of license of April 29, 1988 – *see Appendix A*). The site has been fully reclaimed and requires no further monitoring or reporting, based on research of Kentucky Department of Natural Resources, Division of Mine Permits, Surface Mining Information System databases. The permit is identified as having been released in the Division of Mines' Mine History Report for Cumulative Impact Area assessment (*see Appendix A*).

The surface mining involved the removal of up to about 60 m (200 ft.) of rock overburden to allow recovery of the Fireclay Rider (also known as Hazard No. 4 Rider) coal seam. Rubblized overburden material was re-placed onto the nearly horizontal coal seam pavement after the coal was extracted, and in three head-of-hollow fills located to the northwest, east, and southeast of the proposed facility (*see Map 1*). The depth of backstacked rubble on the reclaimed mine site ranges from nil to approximately 17 m (56 ft.), based on available exploratory drilling results.

2.4.2 Underground Mining

No underground mining is known to have occurred beneath the proposed locations of the USP, FPC, or the associated ancillary facilities. There is one small, long-inactive underground mine, in the Fireclay Rider coal bed, located to the south of the area of previous surface mining and planned subject development (Big Oak Coal Company, Kentucky Permit No. 867-5062). As can be seen on *Map 1*, the mine horizon is situated at an elevation of approximately 465 m (1525 ft.) above msl, and about 45 m (150 ft.) vertically upslope of the

proposed fill crest. The portal location was visited by Cardno, with the observation that there was no flowing water discharge on the day of the field visit, and no indication of any significant drainage at other times.

3 Reconnaissance of Existing Water Quality

The rubblized overburden generated in surface mining of the site in the late 1980s – early 1990s was placed back on top of the extracted coal seam horizon, and into three head-of-hollow fills around the mine perimeter. Infiltrating precipitation percolates through the rubble and concentrates in the bases of the hollow fills, then migrates downslope in the subsurface to discharge at the toes of those fills. That water is in contact with the rock rubble, and its quality upon discharge is an excellent indicator of the geochemical nature of the fill material and of the quality of water that is expected to issue from the material after it has been excavated from the backstack area (the plateau) and re-placed into new or expanded perimeter head-of-hollow fills. Further, the acidity/alkalinity ratio and pH of the water is a principal control upon its ability to dissolve and mobilize “heavy” metals that could be of possible human health concern. As is discussed below in section 3.3, low-pH, acidic water is much more likely to mobilize most metals, while net alkaline, moderate-pH water is not likely to promote such mobilization.

As an initial planning step, topographic maps, aerial photographs, and mine maps were reviewed to determine likely or potential locations where flowing water may be sampled as an indicator of site geochemical conditions. Features of note in that review include the three head-of-hollow fills, a fill toe pond at the base of the easterly fill, small stream segments downstream of the planned construction site, and the surface drift entry of the abandoned underground mine.

3.1 Field Reconnaissance and Water Sampling

Site hydrogeologic reconnaissance was conducted by a Cardno geologist on November 11, 2015. Water samples were collected from the toe discharges of each of the three hollow fills, the mouths of the two small streams flowing westerly from the site (one of which is below a hollow fill, and one of which does not have an upstream fill), and the eastern fill discharge after it has passed through the toe pond (*see Map 1*). The old underground mine portal was visited and confirmed to exhibit no surface discharge.

At each of the six sampling points, field measurements were recorded as to water temperature, pH, and conductivity. Samples were collected in four containers for each sample, placed on ice, and transported to the laboratory on November 13, 2015.

3.2 Water Analyses

The collected samples were transported to the main laboratory of Research Environmental & Industrial Consultants, Inc. (*REIC*), at Beaver, West Virginia, for analyses of general chemistry and metals. Specifically, the analytes and laboratory methods used were:

Analysis	Analytes	Method
Anions by Ion Chromatography	chlorides, sulfate	EPA 300.0, Rev. 2.1
Dissolved Metals by ICP	antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, copper, iron, lead, magnesium, manganese, potassium, selenium, sodium, thallium	EPA 200.7, Rev. 4.4
Total Metals by ICP	chromium, iron, manganese	EPA 200.7, Rev. 4.4
Dissolved Mercury	mercury	EPA 245.1, Rev. 3.0
Total Dissolved Solids	TDS	SM2540 C-1997
Total Suspended Solids	TSS	SM2540 D-1997
Acidity	total acidity	SM2310 B-1997
Alkalinity	total alkalinity (as $CaCO_3$)	SM2320 B-1997
pH	pH	SM4500-H^+-B-2000

Results of analyses are incorporated in A*ppendix B* and discussed below.

3.3 Water Chemistry

Excavation and rubblization of rock strata has the potential to expose relatively fresh, unweathered rock to air (oxygen) and water, accelerating the weathering process by which rock minerals are dissolved and leached from the rock. Breaking of the rock also increases the surface area potentially exposed to air and water. Water infiltrating and passing through the rubblized rock transports dissolved mineral constituents, so that chemical analysis of that water is an indicator of the mineral composition of the broken rock strata.

Oxidation of sulfidic minerals produces acidic, sulfate-enriched (SO_4) drainage. In the absence of acid-neutralization (alkalinity), the drainage tends to exhibit a low pH value[1], and most metals are more soluble at lower, as opposed to higher, pH values. Where minerals containing substantial acid-neutralizing constituents are present (principally calcium [Ca] and magnesium [Mg] carbonate minerals, in the subject strata), the acidic drainage may be fully neutralized, resulting in pH values in the desirable 6 to 9 range. At that pH range, most metals exhibit a markedly lower solubility than they do at pH values below that range.

All of the waters flowing from the site are of a Mg-Ca-SO_4 ionic facies, with elevated concentrations of magnesium, calcium, and sulfate, and with substantial net alkalinity (*see Stiff and Piper diagrams, Appendix C*). All show influence of weathering of both sulfide and alkaline-rich minerals, such that any acid production has been completely neutralized by calcareous or carbonate minerals. These characteristics and the associated total dissolved solids (TDS) levels are likely representative of virtually all hollow fill discharges in the region as a whole.

The analyses results indicate there to be no concentrations of metals at levels of human health concern in water that has migrated through the rubblized rock material. While the water exhibits elevated sulfate and total dissolved solids concentrations (and consequent elevated conductivity) reflective of oxidation and dissolution of sulfidic minerals in the rock, it also contains net alkalinity with dissolved calcium and magnesium that, again, reflect dissolution of acid-neutralizing minerals. Acidity generated by oxidation of sulfidic minerals has been, in all cases, fully neutralized. The resulting water quality exhibits net alkalinity, pH values in the range of 6.73 to 8.11, and extremely low to non-detectable concentrations of metals of potential human health concern in occupancy of the site. Parameters that are often indicators of impacts from gas or oil well drilling (that is, reflective of deep saline waters) such as sodium, chloride, and barium are of quite low concentrations in the site discharges, indicating no impact in that regard from the existing gas wells that occur within the site (*see Table 1 on page 5*).

As is discussed further below, re-handling of the site overburden materials is likely to result in no significant change in the chemistry of water draining from the site.

3.4 Historical Site Water Quality

Mining permit-related historical water quality reports from the 1993-1995 period show results consistent with those of the recent sampling; that is, the waters exhibit net alkalinity, moderate pH values (6.34 – 8.17), and low iron and manganese, indicating likely low dissolved metals concentrations in general. (The data are enclosed in *Appendix D*, but specific sampling locations are undetermined.)

[1] The pH value reflects the hydrogen ion activity level in a solution. It is expressed as the negative logarithm of that activity, such that the lower the pH value, the higher the hydrogen ion activity level.

The pH scale typically ranges from 0 to 14, and 7 is neutral (the point where hydrogen ion (H^+) activity and hydroxyl ion (OH^-) activity are in balance). Water quality standards typically reference a desired pH range of 6 to 9 (a common natural range) although normal rainwater is generally in the range of approximately 5 to 5.5 pH.

Summary of Water Quality
November 11, 2015 Sampling
Table 1

Parameter	Units	Southwest Stream Mouth	Northwest Toe Of Hollow Fill	Northwest Stream Mouth	Southeast Hollow Fill Toe	East Hollow Fill Toe	East Hollow Fill Below Pond
Field Temp	ºF	50.8	54.1	54.5	54.9	55.4	55.9
Field Conductivity	µmhos/cm	711	1,831	1,505	1,211	1,900	1,675
Field pH	su	6.73	7.05	8.11	7.75	7.90	7.97
Lab pH	su	7.22	7.41	8.31	7.89	8.09	8.23
Chromium	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Iron	mg/L	0.0503	0.0854	<0.0100	<0.0100	<0.0100	<0.0100
Manganese	mg/L	0.0162	0.0740	<0.0010	<0.0010	0.0061	0.0350
Chloride	mg/L	<0.20	3.95	2.34	1.93	3.02	2.26
Sulfate	mg/L	316	1,210	794	763	1,310	1,030
Total Dissolved Solids	mg/L	521	2,230	1,450	1,300	2,260	1,820
Total Suspended Solids	mg/L	<1	2	1	3	1	1
Total Acidity	mg/L	10.9	32.9	<1.0	11	<1.0	<1.0
Total Alkalinity	mg/L as CaCO3	51.1	377	215	191	308	270
Dissolved Antimony	mg/L	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080
Dissolved Arsenic	mg/L	<0.0070	<0.0070	<0.0070	<0.0070	<0.0070	<0.0070
Dissolved Barium	mg/L	0.0618	0.0335	0.0581	0.0373	0.0217	0.0277
Dissolved Beryllium	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Dissolved Cadmium	mg/L	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Dissolved Calcium	mg/L	63.5	259	181	155	250	207
Dissolved Chromium	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Dissolved Copper	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Dissolved Iron	mg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Dissolved Lead	mg/L	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Dissolved Magnesium	mg/L	54.7	234	178	153	238	216
Dissolved Manganese	mg/L	0.0161	0.0502	<0.0010	<0.0010	0.0064	0.0293
Dissolved Potassium	mg/L	3.42	13.2	9.14	8.87	16.4	14.3
Dissolved Selenium	mg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Dissolved Sodium	mg/L	8.73	24.1	20.3	17.3	32.5	25.7
Dissolved Thallium	mg/L	<0.0090	<0.0090	<0.0090	<0.0090	<0.0090	<0.0090
Dissolved Mercury	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

4 Investigation of Mine Overburden Material to be Handled

Six exploratory borehole drilling locations were specified by the Bureau (*see Map 1*). Drilling was conducted by Central Star Drilling, Inc., of Peebles, Ohio, using hollow-stem auger (*HSA*) and continuous split-spoon (*SPT*) sample collection techniques, under the supervision of a Cardno geologist. The geologist's logs of drilling results are enclosed in *Appendix E*.

The rubblized overburden is a mixture of clay shale, siltstone, and sandstone. In each of the six boreholes, auger refusal was encountered a few meters beneath the apparent base of the rubblized backstack material, in weathered sandstone that appears to be representative of the uppermost bedrock surface. A total of 45 samples were collected from the six borings. Sample selections were made by the geologist with the intent of achieving fair representation of the rubblized material and weathered bedrock that would or may be excavated and re-placed into a fill.

4.1 Overburden Distribution

As is shown on *Map 1*, two borehole locations (Nos. 3 and 4) are within the central part of the site where the USP would be built. They encountered approximately 12 and 16 m (39 and 52 ft.) of rubble material, and extended into apparent weathered bedrock for another 2 to 5 m (6 to 16 ft.). Two boreholes (Nos. 5 and 6) located at the southern end of the site (general vicinity of the proposed central utility plant and outside warehouse) encountered about 13 to 17 m (43 to 56 ft.) of rubble and another 2 to 6 m (6 to 20 ft.) of apparent weathered bedrock. The two boreholes (Nos. 1 and 2) located on the northern point of the ridgeline (proposed FPC area) revealed no significant distribution of backstacked rubble there, and auger refusal was reached in weathered sandstone at depths of 3 and 4 m (10 and 13 ft.) below the ground surface.

4.2 Acid-Base Accounting Analyses

The 45 selected samples were delivered to Appalachian Laboratories, Inc., of Beckley, West Virginia, for acid-base accounting (*ABA*) analyses. ABA (EPA 600/2-78-054) is essentially a screening test designed to determine the relative proclivity for a material to produce either acidic or alkaline drainage, based on the potentially acid-generating and acid-neutralizing minerals present in the materials.

Acid generation in rocks of the subject area is due to oxidation of sulfidic minerals (most commonly pyrite) that releases acidity (hydronium ion, H^+) and sulfate. Sulfur in the rock may occur as sulfate or as organic sulfur, but these forms do not produce acidity. It is common practice to perform a "total sulfur" analysis as the basis for an initial estimate (calculation) of the potential acid-generating capability of the material, and conduct further analysis of sulfur forms only where substantial acidity generation is suggested. This utilization of total sulfur as the basis for estimation overstates the actual acid-generating potential, and is thus conservative from the standpoint of identifying material that may produce more acidity than will be offset by its own neutralization potential.

The other principal component of ABA is the determination of acid-neutralizing potential. The majority of neutralizing potential (*NP*) is provided by calcium and/or magnesium carbonate minerals present in the rocks, although aluminosilicate minerals may also contribute to a typically small degree.

Material that contains a greater acid-generating than neutralizing potential is considered to be likely to produce acid drainage upon weathering, and low pH values resulting from the acidity favors the dissolution and mobility of many "heavy" metals during the weathering process. Conversely, material with more neutralizing than acid-generating potential is likely to produce neutral or somewhat alkaline drainage, which is not conducive to mobilization of those metals.

In addition to the determination of acid-producing versus acid-neutralizing potential, the ABA test procedures normally include quantification of the material color (a potential indicator of oxidation-reduction geochemical

conditions affecting the mineralogy of the material), a fizz (effervescence) rating (indicative of the degree and type of carbonate minerals present), and paste pH (indicative of the immediate tendency for acid or alkaline conditions to be formed).

Results of the ABA testing are enclosed in *Appendix F* and are discussed below.

4.3 Overburden Material Characterization

Results of the ABA testing show all of the sampled material to be quite low in sulfur content with very low potential to generate acidic drainage. Most of the material also exhibits only a mild neutralization potential (*NP*), and appears to be generally well-weathered material with relatively little remaining reactivity. There are a few scattered zones with greater than 2% total NP (as $CaCO_3$), but none exceed 3% NP. Most exhibit total NP in the range of 0.6 to 1.5%, with net NP (NP less acid-generating potential) of 0.3 to 1.0%.

It is concluded that the material that may be excavated and re-placed is weathered, low-reactivity material with a consistent excess net neutralization potential in all samples. It would be expected to produce net alkaline drainage of circumneutral pH, similar to that currently discharging from the site. Based on both the water analyses and the ABA test results, there are no zones that require special handling, and there is very low potential for mobilization of metals of any concern to either human health or aquatic environments.

5 Summary and Conclusions

The proposed construction activities will entail excavation of rubblized rock overburden associated with previous surface mining, and placement of that material into new or expanded existing head-of-hollow fills. Some small amounts of weathered bedrock material may also be included in such handling. Investigation of the material shows it to be of low reactivity geochemically, exhibiting more acid-neutralizing potential than acid-generating potential (which is extremely low), and posing no significant risk of producing acidic drainage or drainage with significant levels of dissolved metals of concern as to human health in occupancy of the site.

The existing water chemistry in discharges from the fill structures is consistent with the findings of the subsurface materials investigation. The total dissolved solids contents of that drainage are elevated, reflecting the high degree of weathering that has occurred since mining and the continued flushing out of weathering-produced dissolved components, but the drainage is essentially devoid of heavy metal or trace metal components. The character of current drainage is similar to that which existed upon completion of mining, and that condition is not likely to be significantly changed by the excavation and the proposed site development to take place.

Although it was beyond the stated scope of investigation, it is noted that the current water chemistry indicates that there is no significant or detectable impact from deep saline waters that may have been encountered in installation of the gas wells that are present at the subject site. (Natural water present at depths commonly associated with gas well installations in the subject area is saline, with very high [relative to surficial or shallow groundwater] concentrations of sodium, chloride, and often barium. Those elements are not enriched in the current water discharges from the site.)

6 References

> Draft Environmental Impact Statement for Proposed United States Penitentiary and Federal Prison Camp, Letcher County, Kentucky, Federal Bureau of Prisons, February 2015.

> Preliminary Engineering Report, Addendum #1: Report Update, prepared by Summit Engineering, Inc., for Letcher County Planning Commission.

> Geotechnical drilling logs, drilling performed in August-September 2011, prepared by Marshall Miller & Associates.

> Kentucky Department of Natural Resources, Division of Mine Permits, Surface Mining Information System.

> Kentucky Division of Mine Permits (2011, July 14); Kings Creek – North Fork Kentucky River, Cumulative Hydrologic Impact Assessment (HUC12:051002010105).
Retrieved from: http://eec.ky.gov/SearchCenter/Results.aspx?k=867-0298.

> Geologic Map of the Roxana Quadrangle, Edward K. Maughan, US Geological Survey, 1976.

Roxana Prison Site,
Letcher County, Kentucky

Map

Cardno®
Shaping the Future

Roxana Prison Site,
Letcher County, Kentucky

Biography of Writer

Cardno®
Shaping the Future

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Ronald H. Mullennex

Current Position

CPG, CGWP, Senior Principal, Practice Leader – Geology and Hydrogeology

Profession

Professional Geologist, Certified Ground Water Professional

Years' Experience

40

Joined Cardno

1977

Education

MS – Geology, West Virginia University, Morgantown, WV
BS – Geology, West Virginia University, Morgantown, WV

Professional Registrations

CPG

CGWP

PG – VA, SC, TN, PA, KY, NC, GA

LRS – WV

WVDEP Approved Person for preparing, signing and certifying surface mine permit applications

Competent Person for coal resource determination under JORC Code

Summary of Experience

Mr. Mullennex is a Certified Professional Geologist and Certified Ground Water Professional with over 40 years' professional experience in resource and mining geology, hydrogeology, environmental issues, and engineering applications. At Cardno, he directs geological and hydrogeological investigations, prepares and presents reports, and is frequently called upon in expert witness capacities in litigation concerning geological or hydrologic matters. He has authored a wide range of technical articles on coal resources, mining and mine drainage issues, groundwater and hydrogeology, environmental remediation, and geochemistry issues. He has also authored over 1,400 professional reports to clients in his consulting career.

A principal focus of his work in recent years has involved mineral resource evaluations and groundwater investigations in association with mineral extraction activities. Such groundwater studies include assessments of probable hydrologic consequences of mining; determination of existing and baseline hydrogeologic conditions; evaluation of hydrogeologic, geochemical, and geotechnical conditions and their potential impact on mining activities; and investigations of water quality and/or quantity impacts resulting from past mining or gas well drilling/operation. In mineral resource studies, his work has focused on resource distribution and classification, geologic factors affecting mineability and accessibility, and coal and tailings quality.

Mr. Mullennex earned Bachelor of Science and Master of Science degrees in Geology from West Virginia University in 1971 and 1975, respectively. He serves on the Visiting Committee for the Department of Geology and Geography at West Virginia University, and on the external advisory board for WVU's Advanced Energy Initiative. He holds certification, licensing, and/or registration as a professional geologist in seven states, and is a Licensed Remediation Specialist under West Virginia's Voluntary Remediation Program. He is a Competent Person in coal resource determination under the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Resources (JORC Code).

Affiliations

American Institute of Professional Geologists
Geological Society of America, Coal Geology and Hydrogeology Divisions
Society of Mining Engineers of Association of Mining, Metallurgical, and Petroleum Engineers
Sigma Gamma Epsilon (Earth Sciences Honorary Fraternity)
Association of Ground Water Scientists and Engineers, Division of National Ground Water Association
Association of Engineering Geologists
American Society of Mining and Reclamation
International Mine Water Association

Significant Projects

> Explore and evaluate geologic, hydrogeologic, and geochemical issues pertaining to large coal exploration, mine planning, and Definitive Feasibility Study (DFS) in virgin area of Western Australia, including water supply, mine inflow, water quality, and materials handling investigations, and delineation and assessment of resources and classification under JORC.

> Joint coordinator and principal investigator in compilation of environmental audit for World Bank affiliate, for large mining project in the People's Republic of China.

> Expert Witness in litigation and regulatory administrative proceedings. Qualified as expert in hydrogeology, geology, hydrology, water quality, and geomorphology.

> Evaluate sources, extent, and nature of impact of selenium leaching from mine disturbances into receiving streams and develop mitigation through water management and enhanced passive reduction-adsorption processes.

> Site characterization, monitoring, and implementation of enhanced bioattenuation remediation program in fractured bedrock aquifer.

> Hydrogeologic investigations of potential hydrologic consequences (PHC) by mining operations (numerous studies, some involving large areas).

> Hydrogeologic and geotechnical evaluations of conditions to be encountered, potential hydrologic impacts, and design of preventive measures for advancement of underground mines beneath stream valleys (numerous studies).

> Investigated and served as expert in litigations concerning natural flow, transference, and water chemistry of brackish and saline waters from deep underground mine.

> Water chemistry and contaminants investigations of alleged impacts to groundwater by gas well drilling and/or operations.

> Investigations and assessments of causative and contributory factors regarding landslides, subsidence, and flooding events, including geomorphological analysis of features.

> Hydrogeologic investigation and development of during-construction monitoring and preventive action to prevent adverse grout migration through the aquifer during mine shaft pre-grouting and construction project.

> Assessment of potential impact of high-extraction underground mining upon stream conditions, and worked with mine design engineering personnel to devise alternative mine plan to avoid impact to stream.

> Investigation of acid-producing rock materials and acid drainage for large highway construction program, and work with design engineers to develop materials handling plans, drainage structures and treatment plans.

> Hydrogeologic and geotechnical investigation of large pre–Subtitle D landfill located in karstic terrain to evaluate impact on environment and develop plans for closure.

> Remedial Investigation and Feasibility Study of a state superfund office site, involving ground water impact by dissolved trichloroethane and related compounds in fractured bedrock aquifer. Coordinated and critiqued baseline risk assessment.

> Served on Tazewell County, Virginia, Comprehensive Plan Committee, assessing karst impacts and ground water concerns for land use planning.

> Developed numerous Subtitle D landfill groundwater monitoring programs for solid waste and CDD facilities, and managed the implemented programs; to include sampling, analyses, data evaluation, and reporting.

> Development of landfill gas migration mitigation measures at sites complicated by karstic conditions and by underground mine workings.

Significant Projects (Continued)

> Utilized ground water modeling to design extraction/injection system for aquifer remediation.

> Hydrogeologic assessment, aquifer testing, groundwater modeling, and expert witness testimony concerning DNAPL–related contaminants in bedrock aquifer.

> Hydrogeologic investigation of impact of abandoned underground coal mine on adjacent stream and residential water supplies; developed successful remedial plan, and monitored results.

> Investigation of impacts to hydrologic regime resulting from underground mining in areas beneath stream valleys.

> Investigation and delineation of impacts and design inadequacies of several solid waste landfills for closure design. Led design team of geologists, hydrogeologists, and engineers in completing closure designs, and acted as Principal Investigator in the investigation and design phases.

> Served as Principal–in–Charge of Construction Quality Assurance/Quality Control and field inspection for landfill closure construction projects.

> Hydrogeologic investigation and litigation support in alleged salt impact to shallow groundwater.

> Supervision and peer review of numerous investigative reports involving leaking underground storage tanks and similar contaminant releases to ground water.

> Detailed investigation of geologic factors controlling or influencing coal resource distribution and development potential, with analysis of potential hazards to be encountered in longwall mining.

> Detailed depositional analysis and interpretation of coal resource distribution and factors impacting future development.

> Regional investigation and exploration of deep coals.

> Stratigraphic analysis and interpretation of depositional patterns responsible for producing extreme hazardous conditions encountered in mining.

> Exploration and delineation of coal resources; prediction of mine roof hazard areas.

> Exploration and delineation of stone resources and stone geochemical characteristics.

> Detailed investigation and interpretation of small–scale depositional features impacting coal reserve development.

> Study and interpretation of paleogeographic and depositional conditions controlling resource distribution in several different coal seams.

> Geologic investigation and expert witness for properties and mining ventures involved in prosecution in Federal court.

> Management of active oil and gas leaseholds.

> Evaluations of oil and gas estates involved in condemnation.

> Reserve and economic development feasibility evaluation of several thousand acres in widely scattered tracts. Served as expert witness in civil proceedings in Federal Tax Court, with beneficial results to client.

> Mapping, investigation, and evaluation of geologic, hydrogeologic, and geomorphic features relevant to new highway construction.

Significant Projects (Continued)

> Investigation of ground water contamination susceptibility of a regional area involving largely karstic limestone and dolomite bedrock, incorporating assessment of multiple geologic and cultural components to delineate relative hazard potential at any point within the area. Study involved evaluation of stratigraphy and lithologic factors, structural geology, soil types, remote sensing analysis of fracture systems, water table levels, ground water flow directions, recharge and discharge areas and points, and investigation of ground water communication between wells. Results used for determining relative need for sewerage construction at different points within study area.

> Investigation of karst sinkhole subsidence and triggering mechanisms, pertaining to damage to existing structures.

> Utilization of geologic evaluation and remote sensing analysis to locate high–yield water wells for municipalities and industries.

> Consultation to an engineering firm regarding dye–tracing applications to define ground water flow characteristics.

> Determination of karstic controls on ground water in evaluation of suitability of construction site.

> Conducting geologic evaluations and remote sensing analyses, and integrating these studies to define potential ground water flow characteristics that may impact underground mining.

> Supervision and analysis of packer testing techniques to determine permeability of formations in boreholes.

> Utilization of geophysical logs to identify ground water flow characteristics encountered in boreholes and select optimum horizons for piezometer installation.

> Utilization of geophysical logs and analytical data to define geochemical characteristics of rock and coal strata.

> Site evaluation of a planned large commercial landfill facility encompassing in excess of 500 acres. Acted as project manager for field activities including planning and executing of 58–borehole geologic and hydrogeologic exploration program; access road construction in very rugged terrain, with associated sediment and erosion control; and installation of single and nested piezometers and monitoring well construction. Performed analysis of geologic, geophysical, and hydrogeologic data to evaluate suitability of site, and determined post–construction monitoring requirements in relatively complex hydrogeologic setting. Acted as primary coordinator for report and permit application preparation, incorporating investigative reports from other consultants into a comprehensive permit application package.

Professional History

2014 - Present

Senior Principal, Practice Leader – Geology and Hydrogeology

Cardno, Inc. – Bluefield, Virginia (USA)

Responsible for office management and administration; project management, coordination, and supervision; and project reporting and presentation. Is Cardno's corporate officer member of the Radiation Safety Committee and provides management oversight of the company's geophysical logging division.

1979 - 2014

Senior Vice President

Cardno, Inc. (formerly Marshall Miller & Associates, Inc.) – Bluefield, Virginia (USA)

Responsible for office management and administration; project management, coordination, and supervision; and project reporting and presentation. Provided management oversight of drilling services division for several years. Projects involve all phases of geologic application to coal exploration, evaluation, and development in the United States and abroad; quarry stone resources and stone quality; construction and environmental site characterization; ground water and surface water investigations; investigation of mining and hydrogeologic considerations in the United States and abroad; underground injection permitting and impact assessment; and writing of technical reports. Specific experience includes coal and geologic mapping; mineral property evaluation; management and supervision of exploration programs; study of geologic factors in resource minability (geologic hazards, depositional analyses); initiation and utilization of stratigraphic and depositional environmental studies as applied to exploration and development; ground water availability, contamination, and monitoring studies; investigation of karst impacts on environmental considerations; utilization of remote sensing techniques, including lineament and fracture analyses; development of ground water monitoring strategies and systems for solid waste landfill facilities; assessment of monitoring data to determine impacts; coordination of full site investigation and remedial design teams for landfill closures and sites impacted by volatile organic compound contaminants in ground water; investigations of hydrologic impacts resulting from mining; risk assessment and development of remediation designs for ground water contamination; development of mitigative measures for landfill gas migration; geomorphic evaluations of flooding and earth movement issues, and serving as expert witness in cases concerning mineral properties, ground water, and flood analysis.

1977 - 1979

Project Geologist

Geological Consulting Services, Inc. – Bluefield, Virginia (USA)

Responsible for field and in–office project management, coordination, and supervision. Projects involved primarily coal property exploration and evaluation.

1974 - 1977

Coal Geologist, West Virginia Geological and Economic Survey

West Virginia Geological Survey – Morgantown, West Virginia (USA)

Responsible for mapping, data collection, and correlation of coals in regional study of coal resources and development potential.

Publications & Presentations

> "Selenium – Sources and Considerations for Treatment or Prevention" Wastewater Treatment and Water Quality for Indiana Coal Mines Workshop, 26th Annual Surface Mined Land Reclamation Technology Transfer Seminar, Jasper, Indiana, December 9, 2013.

> "A Cost-Effective Approach to In Situ Bioremediation in Fractured Bedrock," The Ninth International In Situ and On-Site Bioremediation Symposium, Baltimore, Maryland, May 7-10, 2007.

> “Stratigraphic Distribution of Selenium in Upper Kanawha-Lower Allegheny Formation Strata at a Location in Southwestern West Virginia,” 22nd Annual International Pittsburgh Coal Conference, Pittsburgh, Pennsylvania, September 14, 2005.

> “The Floods of July 8, 2001: A Review of Characteristics, Distribution and Contributing Factors,” Virginia Center for Coal and Energy Research and the Central Appalachian Section of SME, Abingdon, Virginia, April 2002.

> "Subsidence Impacts on Ground Water," Virginia Center for Coal and Energy Research and the Central Appalachian Section of SME, Abingdon, Virginia, June 2000.

> “Recognition of Paleosols From Wireline Logs,” Predictive Stratigraphic Analysis Workshop, U.S. Geological Survey, Reston, Virginia, April 1996.

> “Mitigation of Environmental Impacts Resulting From Mine Pool Build–up,” Mine Drainage Task Force Symposium, Morgantown, West Virginia, April 1996.

> “Integration of Hydrogeologic and Geophysical Techniques for Identification of AMD Seepage and Remedial Design,” R.H. Mullennex, C.P.G., C.G.W.P., V.P. Wiram, C.P.G., H.E. Naumann, P.E., Mine Drainage Task Force Symposium, Morgantown, West Virginia, April 1995.

> “Remedial Measures,” Business and the Environment Seminar, Bluefield, West Virginia, July 1993.

> “Hydrogeology of the Appalachian Plateau,” Ground Water Hydrology, Contamination and Management: Wellhead Protection in the Appalachian Plateau, USEPA and Cook College of Continuing Education, National Mine Safety and Health Academy, Beckley, West Virginia, June 1993.

> “Remedial Measures: Planning and Managing Closure and Post Closure Activities at your Sanitary Landfill,” Business and the Environment Seminar, Bluefield, Virginia, 1993.

> “Downhole Camera Brings Visible Benefits to Ground Water Monitoring,” *World Wastes*, Vol. 35, No. 12, December 1992.

> “Ground Water Monitoring at Sanitary Landfills – Sampling and Analysis Considerations Under Subtitle D,” *World Wastes*, Vol. 35, No. 6, June 1992.

> “Ground Water Monitoring at Sanitary Landfills – System Design Considerations Under Subtitle D,” *World Wastes*, Vol. 35, No. 2, February 1992.

> “Water–Bearing Fracture Identification Through High–Resolution Density Logging Techniques,” presented at National Water Well Association Exposition Forum on Ground Water Technologies for the 1990's, October 23, 1991, Washington, D.C. “Ground Water Issues,” Business and the Environment Seminar, Bluefield, Virginia, 1991.

> “Geological and Environmental Impact on Development and Construction in Our Area,” Business and the Environment Seminar, Bluefield, Virginia, 1991.

> “Preparing for an Environmentally Safe Landfill,” Business and the Environment Seminar, Bluefield, Virginia, 1991.

> “Lithologic Indicators of Geochemical Conditions of Sedimentation in Pennsylvanian Age Rocks of the Appalachian Basin,” C. Blaine Cecil, U.S.G.S.; Ronald W. Stanton, U.S.G.S.; and Ronald H. Mullennex, Geological Consulting Services, Inc.; American Association of Petroleum Geologists Symposium, Charleston, West Virginia, September 1988.

> “Geological Modeling Techniques for Evaluation of Productivity–Related Longwall Mining Roof Conditions: A Case Study,” Longwall U.S.A. Conference, Pittsburgh, Pennsylvania, co–author, September 1988.

> "Prediction of Coal Continuity, Quality, and Mining Conditions as Afforded by Depositional Analysis," Society of Mining Engineers of AIME, Fall Meeting, St. Louis Missouri, 1986.

> "Use of Depositional Models and Stratigraphic Mapping Techniques to Determine New Coal Reserve Potentials in the Appalachian Region," AIME Annual Meeting, Chicago, Illinois, published in *Transactions*, the permanent technical literature of the Society of Mining Engineers of AIME February 1981.

> "No. 3 Pocahontas Coal in Southern West Virginia – Resources and Depositional Trends,"
West Virginia Geological Survey Bulletin B–38, co–author 1981.

> "Case Histories and Depositional Modeling for Classifying Reserves in the Appalachian Region," Miller, M. S., and Mullennex, R. H., American Association of Petroleum Geologists Meeting, Morgantown, West Virginia, October 1980.

> "Major Cross–Strike Structures of the Central Sedimentary Appalachians," *Proceedings of the West Virginia Academy of Science*, Vol. 46, No. 2. , 1974.

Continuing Education

> Passive Treatments for Sulfate and Metals in Mine Water, American Society of Mining and Reclamation Conference, June 8, 2015, Lexington, Kentucky.

> West Virginia Surface Mine Drainage Task Force Symposium, Morgantown, West Virginia (Annually).

> Environmental Considerations in Energy Production, Society of Mining Engineers/Virginia Center for Coal & Energy Research, Virginia Tech, April 14-18, 2013.

> Landfill Leachate and Gases, Midwest Geosciences Group, February 5, 2013.

> Calculation and Use of Time of Concentration, American Society of Civil Engineers, December 20, 2012.

> Wastewater Treatment and Water Quality for Indiana Coal Mines Workshop, 26th Annual Surface Mined Land Reclamation Technology Transfer Workshop, Jasper, Indiana, December 9, 2013.

> Applications of Groundwater Geochemistry, National Ground Water Association, Nashville, Tennessee, October 17-18, 2011.

> Ground Water Geochemistry and Isotopes, National Ground Water Association Web Seminar, November 17, 2009.

> Pump/Yield Testing Design and Transducer Data Collection, National Ground Water Association Web Seminar, April 7, 2009.

> Geologic Sequestration Research Activities and EPA Requirements, Air & Waste Management Association Web Seminar, February 18, 2009.

> Environmental Geochemistry of Metals: Investigation and Remediation, National Ground Water Association, Las Vegas, Nevada, March 13 – 15, 2007.

> Basics of Natural Stream Design on Mined Lands, American Society for Mining and Reclamation/West Virginia Surface Mine Drainage Task Force, April 18-22, 2004.

> Regional Coalfield Water Resource Symposium, Virginia Water Resource Research Center and Virginia Tech, Wise, Virginia, September 4, 2002.

> Environmental Remediation in Coal Mining, Virginia Center for Coal and Energy Research and the Central Appalachian Section of SME, Abingdon, Virginia, June 8, 2000.

> Low–Cost Remediation Strategies for Contaminated Soil and Ground Water, National Ground Water Association, Baltimore, Maryland, June 1–2, 1998.

> Defining Coalbed Methane Exploration Fairways and Resources, 1997 International Coalbed Methane Symposium, Tuscaloosa, Alabama, May 1997.

> Advanced Applications of Borehole Geophysics to Hydrogeological Investigations, National Ground Water Association, Natick, MA, October 3, 1995.

> Capture Zone Analysis Techniques Applied to Ground Water Protection and Remediation, Environmental Education Enterprises, Columbus, Ohio, June 1993.

> Analysis and Design of Aquifer Tests, National Ground Water Association, Columbus, Ohio, March 1992.

> Selection and Analysis of Shallow Aquifer Tests, Association of Engineering Geologists, Chicago, Illinois, September 30, 1991.

> Remote Sensing Applications to Hydrogeology, National Water Well Association, 1988.

> Borehole Geophysics: Applications to Hydrogeology, National Water Well Association, 1988.

> Modeling Ground water Flow in an Aquifer, University of Kentucky, Institute of Mining and Minerals Research, 1988.

> Expert Witness Short Course, National Water Well Association, 1987.

> Ground Water Monitoring in Karst Terrains, National Water Well Association, 1987.

> Ground Water Monitoring Principles and Sampling Techniques, University of Kentucky, Institute of Mining and Minerals Research, 1986.

> Applied Hydrology and Sedimentology for Disturbed Areas, University of Kentucky, Institute of Mining and Minerals Research, 1985.

> Economic Evaluation and Investment Decision Methods, Colorado School of Mines, 1984.

> Roof Control and Pillar Design, University of Kentucky, Institute of Mining and Minerals Research, 1983.

> Technical Communications, Colorado School of Mines, 1981.

> Handling, Preparation, and Use of Coal, American Coal Testing Institute, 1980.

Roxana Prison Site,
Letcher County, Kentucky

Appendix

A

PERMIT NO. 867-0298 DOCUMENTATION

Cardno®
Shaping the Future

MARY HELEN MILLER
SECRETARY

Wallace G. Wilkinson
GOVERNOR

COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
FRANKFORT OFFICE PARK
18 REILLY ROAD
FRANKFORT, KENTUCKY 40601

KPDES COAL GENERAL PERMIT NOTIFICATION OF COVERAGE

Dear Permittee: Date: December 31, 1987

Those discharges that are or will be covered by the Kentucky Department for Surface Mining Reclamation and Enforcement Permanent Program Permit No. 867-0298 have (been [redacted]) approved for coverage under the Kentucky Division of Water's "General Permit for Coal Mining Activities in the Commonwealth of Kentucky". The coverage becomes effective on the date the permanent program permit is issued or the above date, which ever is later.

Coverage under the general permit requires compliance with the (____ existing source, ____ new discharger, ✓ new source) conditions set forth in the permit and the submission of self-monitoring reports to the appropriate DSMRE Regional Office. The general permit expires on February 28, 1989, at which time the conditions of the general permit may be altered.

Individual Kentucky Pollutant Discharge Elimination System (KPDES) Permits shall be required for the following types of facilities:

1. Mining activities which have been denied coverage under the general permit.
2. Coal preparation (washing) plants.
3. Operations not permitted under the Permanent Program.
4. Two acre operations.
5. Sanitary wastewater discharges.

If you disagree with this general permit coverage determination then contact the Industrial and Synfuel Section of the Division of Water by certified mail within thirty (30) days of the date of this notification.

Any questions concerning the coverage of the general permit, requests for permit applications or copies of the general permit should be addressed to: Larry Sowder of my staff at (502) 564-3410.

Sincerely,

Donald F. Harker, Jr.

Donald F. Harker, Jr., Director
Division of Water

DFH:LS:tre

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF MINES AND MINERALS
P.O. BOX 680 LEXINGTON, KENTUCKY

LICENSE NUMBER
1560-16316

LICENSE TO OPERATE A MINE

EXPIRES: 12/31/88

FIRM OR COMPANY:
MEADE & SHEPHERD COAL CO

PRINCIPAL EXECUTIVE:
LAWRENCE SHEPHERD
ADDRESS:
721 MARYLAND DR
WHITESBURG, KY 41858

DATE OF ISSUE: 05/09/88
EFFECTIVE DATE: 04/29/88

THIS LICENSE IS NOT TRANSFERABLE

14 MINE NAME OR NO.
13284.13 FILE NUMBER
ROXANA LOCATION
LETCHER COUNTY
STC TYPE MINE

Willard Stanley
WILLARD STANLEY COMMISSIONER

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF MINES AND MINERALS
P.O. BOX 680 LEXINGTON, KENTUCKY

LICENSE NUMBER
1561-16316

LICENSE TO OPERATE A MINE

EXPIRES: 12/31/88

FIRM OR COMPANY:
MEADE & SHEPHERD COAL CO

PRINCIPAL EXECUTIVE:
LAWRENCE SHEPHERD
ADDRESS:
721 MARYLAND DR
WHITESBURG, KY 41858

DATE OF ISSUE: 05/09/88
EFFECTIVE DATE: 04/29/88

THIS LICENSE IS NOT TRANSFERABLE

15 MINE NAME OR NO.
13284.14 FILE NUMBER
ROXANA LOCATION
LETCHER COUNTY
STC TYPE MINE

Willard Stanley
WILLARD STANLEY COMMISSIONER

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF MINES AND MINERALS
P.O. BOX 680 LEXINGTON, KENTUCKY

LICENSE NUMBER
1559-16316

LICENSE TO OPERATE A MINE

EXPIRES: 12/31/88

FIRM OR COMPANY:
MEADE & SHEPHERD COAL CO

PRINCIPAL EXECUTIVE:
LAWRENCE SHEPHERD
ADDRESS:
721 MARYLAND DR
WHITESBURG, KY 41858

DATE OF ISSUE: 05/09/88
EFFECTIVE DATE: 04/29/88

THIS LICENSE IS NOT TRANSFERABLE

16 MINE NAME OR NO.
13284.15 FILE NUMBER
ROZANA LOCATION
LETCHER COUNTY
STC TYPE MINE

Willard Stanley
WILLARD STANLEY COMMISSIONER

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF MINES AND MINERALS
P.O. BOX 680 LEXINGTON, KENTUCKY

LICENSE NUMBER 0044-16361

LICENSE TO OPERATE A MINE

EXPIRES: 12/31/90

FIRM OR COMPANY:
MEADE & SHEPHERD COAL CO

PRINCIPAL EXECUTIVE:
LAWRENCE SHEPHERD
ADDRESS:
HC 84 BOX 1404
WHITESBURG, KY 41858

DATE OF ISSUE: 01/15/90
EFFECTIVE DATE: 01/09/90

THIS LICENSE IS NOT TRANSFERABLE

14 MINE NAME OR NO.
13284.13 FILE NUMBER
ROXANA LOCATION
LETCHER COUNTY
STC TYPE MINE

Willard Stanley
WILLARD STANLEY COMMISSIONER

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF MINES AND MINERALS
P.O. BOX 680 LEXINGTON, KENTUCKY

LICENSE NUMBER 0045-16361

LICENSE TO OPERATE A MINE

EXPIRES: 12/31/90

FIRM OR COMPANY:
MEADE & SHEPHERD COAL CO

PRINCIPAL EXECUTIVE:
LAWRENCE SHEPHERD
ADDRESS:
HC 84 BOX 1404
WHITESBURG, KY 41858

DATE OF ISSUE: 01/15/90
EFFECTIVE DATE: 01/09/90

THIS LICENSE IS NOT TRANSFERABLE

16 MINE NAME OR NO.
13284.15 FILE NUMBER
ROXANA LOCATION
LETCHER COUNTY
STC TYPE MINE

Willard Stanley
WILLARD STANLEY COMMISSIONER

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF MINES AND MINERALS
P.O. BOX 680 LEXINGTON, KENTUCKY

LICENSE NUMBER 2164-00000

LICENSE TO OPERATE A MINE

EXPIRES: 12/31/85

FIRM OR COMPANY:
MEADE & SHEPHERD COAL CO

PRINCIPAL EXECUTIVE:
LUTHER MEADE
ADDRESS:
721 MARYLAND DR
WHITESBURG, KY 41858

DATE OF ISSUE: 06/18/85
EFFECTIVE DATE: 05/29/85

THIS LICENSE IS NOT TRANSFERABLE

13 MINE NAME OR NO.
13284.12 FILE NUMBER
ROXANA LOCATION
LETCHER COUNTY
STC TYPE MINE

Willard Stanley
WILLARD STANLEY COMMISSIONER

NOTICE OF BOND RELEASE

In accordance with provisions of KRS 350, notice is hereby given that Meade and Shepherd Coal Co., Inc., HC 84 Box 1404, Whitesburg, KY. 41858 has filed for Phase III bond release on permit no. 867-0298, which was issued on 4/25/96. The property is located approximately 0.36 miles Southeast of Roxana, Kentucky in Letcher County. The total area within the permit boundary is 151.69 acres.

The proposed bond release is approximately 0.36 miles Southeast from KY. 160's junction KY. 588 and located 0.13 miles East of Tolson Branch. The latitude 37°06'11". The longitude is 82°57'20". $119,200, respectively of which is approximately 40% is to be included in this application for release. This represents Increments I, III, IV.

Reclamation work thus far performed includes backfilling, grading and post mine land use achieved on or about Feb. 1992.

Surface owners notified are Douglas Gentry, Irvin Ison and Rondall Meade.

Public hearing date is 8-12-96. Written comments, objections or request for a permit conference must be received within thirty (30) days of 8-12-96. Contact Dept. of Reclamation and Enforcement, 109 Mays Branch Road, Pikeville, KY. 41501.

This is the final advertisement of this application; all comments, objections, or requests for a permit conference must be received within thirty (30) days of July 10, 1996.

Cumulative Hydrologic Impact Assessement

Mine History Report for Cumulative Impact Area

Kings Creek-North Fork Kentucky River

CIA Acreage: 18,612.00

HUC12: 051002010105

Date of Report: 7/14/2011

Status

Active

Permit #	Company Name	Status	Mine Types	Seams	Acreages Permitted	Acreages Disturbed
8670393	NALLY & HAMILTON ENTERPRISES INC	A2	SM SC SG	HAZARD 5A, HAZARD 4A, HAZARD 4 RIDER, HADDIX	657.03	575
8670444	ENTERPRISE MINING COMPANY LLC	A2	SC SG UG	HAZARD NO 4 RIDER, HAZARD NO 4	601.25	45
8670445	ENTERPRISE MINING COMPANY LLC	A2	SC SG UG	HAZARD 4 RIDER	1295.83	50
8670461	FLEENOR, INC	AP	SR SC UG SG	FIRECLAY HAZARD 4, FIRECLAY RIDGER HAZARD 4 RIDER, WHITESBURG, U AMBURGY 2, L AMBURGY 1	476.6	50
8670503	BSD1 LLC	ND	SC SG SR	HAZARD 4, HAZARD 4R	34.4	0
8675268	ENTERPRISE MINING COMPANY LLC	AP	UG SR SA SG	HAZARD NO4 RIDER, HAZARD NO4	957.8	52
8675270	ENTERPRISE MINING COMPANY LLC	A1	UG SG SA SC SR	FIRECLAY	303.69	84
8675312	SAPPHIRE COAL COMPANY	AP	UG SR	ELKHORN 3,	7575.85	0
8677024	ENTERPRISE MINING COMPANY LLC	A1	HR	XXXX	29.86	20
8678051	ENTERPRISE MINING COMPANY LLC	A1	PP RD SC SG SS	FIRE CLAY, FIRE CLAY RIDER	230.98	150
8678052	ENTERPRISE MINING COMPANY LLC	A1	PP	XXXX	26	25

Released

Permit #	Company Name	Status	Mine Types	Seams	Acreages Permitted	Acreages Disturbed
0260090	ROCK GAP COAL CO	FF	CM	MANCHESTER	8	8
0670020	GOLDEN OAK MINING CO INC	RC	CM	HAZARD NUMBER 4	112.43	46
0670105	RICHARD ISON	RC	SG	#4 RIDER ELEV 1480, #4 RIDER ELEV 1480, HAZARD #4 ELEV 1440, HAZARD #4 ELEV 1440	70	70
0675048	LAKE COAL CO INC	RC	UG	HAZARD #4	5.4	6
0675099	LAKE COAL CO INC	RC	UG	AMBURGEY	1	5
0675106	LAKE COAL CO INC	RC	UG	HAZARD NO 4	8	0
2670340	LAKE COAL CO INC	RC	UG	HZ NO 4	17.22	20
2675021	SOUTH-EAST COAL COMPANY	RC	UG	ELKHORN # 3	10	10
2678017	LAKE COAL CO INC	RC	PP	XXXXX	1.44	21
438175X	KY CAROLINA COAL CO	RC	CM	HAZARD NO 4	0	3
4670144	ASHERS QUALITY COAL CORPORATION	RC	SG	FIRECLAY	26	18.65

Status
Released

Permit #	Company Name	Status	Mine Types	Seams	Acreages Permitted	Acreages Disturbed
4675074	BISMARCK COAL INC	RC	UG	FIRECLAY	369.32	18
4677003	GOLDEN OAK MINING CO INC	RC	HR	XXXXX	4.1	5
547476X	B & A COAL CO	RC	SP	HAZARD NO 4	0	10
585376X	B & A COAL CO	RC	CM	HAZARD NO 4, WHITESBURG	0	10
6675066	LUCKY BRANCH COAL CO INC	FF	UG	FIRECLAY	256.11	7.56
673377X	L & J COAL CO	RC	CM	HAZARD NO 4	12	8
8670078	MEADE & SHEPHERD COAL COMPANY INC	RC	SC	FIRECLAY, FIRECLAY RIDER	23.18	14
8670117	TOLSON CREEK COAL COMPANY	RC	SC	HAMLIN	2	0
8670118	PEE WEE COAL COMPANY	RC	SC	HAMLIN	1.9	3.88
8670119	BUDDY COLLINS CONSTRUCTION	RC	SC	HAMLIN	2	0
8670145	RONNIE RATLIFF	FF	SC	AMBURGEY	2	1.6
8670171	CLIFFORD PITTMAN	RC	SC	HAZARD #4	1.96	20
8670183	JERALD PITTMAN	FF	SC	WHITESBURG	1.99	2
8670298	MEADE & SHEPHERD COAL COMPANY INC	RC	SC	FIRECLAY, FIRECLAY RIDER, HAMLIN, #4 RIDER	151.69	120
8670335	MANNING COAL CORPORATION	RC	SA SC SG SM UG	AMBURGEY, WHITESBURG, HAZARD #4, HAZARD #4R	269.6	50.79
8670346	MANNING COAL CORPORATION	RC	SA SC SG SM UG	5-A, HAMLIN, HAZARD NO 4 RIDER, HAZARD NO 4	932.34	189.46
8670363	KATCO MINING COMPANY INC	RC	SC SG	HAZARD 4, HAZARD 4 RIDER	47.06	39.64
8670364	KATCO MINING COMPANY INC	RC	SC	HAZARD 4, 4 RIDER	37.62	37.62
8670437	ENTERPRISE MINING COMPANY LLC	RC	SA SG	FIRE CLAY, FIRE CLAY RIDER	165.15	0
8674008	C & C COAL CO	FF	SC	HAMLIN	1.9	2
8675023	LAKE COAL CO INC	RC	UG	AMBURGY	264.2	1
8675032	COAL MOLE INC	RC	UG	FIRECLAY #4	406.19	4
8675062	BIG OAK COAL COMPANY	FF	UG	HAZARD #4	104.31	11
8675088	COAL MOLE INC	RC	UG	HAZARD NO 4, FIRECLAY	183.96	7.3
8675101	ENTERPRISE COAL COMPANY	RC	UG	HAZARD #4	321.78	43.92
8675113	W & P COAL COMPANY INC	RC	UG	FIRECLAY, W BURG	242.99	5
8675164	DLX INC	RC	UG	ELKHORN #3	111.92	3.64
8675165	DLX INC	RC	UG	ELKHORN #3	1018.89	9.29
8675169	PHOENIX MINING INC	RC	UG	HAZARD NO 7, HAZARD NO 4	1024.46	29.8
8675170	PHOENIX MINING INC	RC	UG	HAZARD NO 7	51.34	20.8
8675244	COASTAL COAL COMPANY LLC	RC	UG	FIRECLAY, UNNAMED, UNNAMED #2	453.96	9.96
8677022	COASTAL COAL COMPANY LLC	RC	HR	XXXX	4.6	4.6
8679015	ENTERPRISE MINING COMPANY LLC	RC	PP	XXXX	37	17

Status

Total Active Surface Acreage:	3,351.95	**Acreage Grand Totals:**	Permitted:	18,956.30
Total Active Underground Acreage:	8,837.34		Disturbed:	1965.51
Total Released Surface Acreage:	2,128.23		Reclaimed:	1514.76
Total Released Underground Acreage:	4,851.05			
Total Proposed Surface Acreage:	241.03			
Total Proposed Underground Acreage:	1.00			

Roxana Prison Site,
Letcher County, Kentucky

Appendix

B

NOVEMBER 11, 2015 SAMPLING RESULTS

Cardno®
Shaping the Future

REI Consultants, Inc.
PO Box 286
Beaver, WV 25813
TEL: (304) 255-2500
Website: www.reiclabs.com

Improving the environment, one client at a time...

3029-C Peters Creek Road
Roanoke, VA 24019
TEL: 540.777.1276

101 17th Street
Ashland, KY 41101
TEL: 606.393.5027

1557 Commerce Road, Suite 201
Verona, VA 24482
TEL: 540.248.0183

16 Commerce Drive
Westover, WV 26501
TEL: 304.241.5861

Friday, November 20, 2015

Mr. Steve Stansfield
CARDNO MM&A
534 INDUSTRIAL PARK RD
BLUEFIELD, VA 24605-9364

TEL: (276) 322-5467
FAX: (276) 322-1510

RE: ROXANA PRISON SITE

Work Order #: 1511G81

Dear Mr. Steve Stansfield:

REI Consultants, Inc. received 6 sample(s) on 11/13/2015 for the analyses presented in the following report.

Sincerely,

Beth Johnson

Beth Johnson

Project Manager

REI Consultants, Inc. - Case Narrative

WO#: 1511G81

Date Reported: 11/20/2015

Client: CARDNO MM&A

Project: ROXANA PRISON SITE

The analytical results presented in this report were produced using documented laboratory SOPs that incorporate appropriate quality control procedures as described in the applicable methods. Verification of required sample preservation (as required) is recorded on associated laboratory logs. Any deviation from compliance or method modification is identified within the body of this report by a qualifier footnote which is defined at the bottom of this page.

All sample results for solid samples are reported on an "as-received" wet weight basis unless otherwise noted.

Results reported for sums of individual parameters, such as TTHM and HAA5, may vary slightly from the sum of the individual parameter results, due to rounding of individual results, as required by EPA.

The test results in this report meet all NELAP and/or VELAP requirements for parameters clearly designated as PA, VA, PA/VA, or VELAP in the column labeled NELAP.

Please note if the sample collection time is not provided on the Chain of Custody, the default recording will be 0:00:00. This may cause some tests to be apparently analyzed out of hold.

All tests performed by REIC Service Centers are designated by an annotation on the test code. All other tests were performed by REIC's Main Laboratory in Beaver, WV.

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DEFINITIONS:
MCL: Maximum Contaminant Level
MDL: Method Detection Limit; The lowest concentration of analyte that can be detected by the method in the applicable matrix.
Mg/Kg or mg/L: Units of part per million (PPM) - milligram per Kilogram (weight/weight) or milligram per Liter (weight/volume).
NA: Not Applicable
ND: Not Detected at the PQL or MDL
PQL: Practical Quantitation Limit; The lowest verified limit to which data is quantified without qualifications. Analyte concentrations below PQL are reported either as ND or as a number with a "J" qualifier.
Qual: Qualifier that applies to the analyte reported.
TIC: Tentatively Identified Compound, Estimated Concentration denoted by "J" qualifier.
Ug/Kg or ug/L: Units of part per billion (PPB) - microgram per kilogram (weight/weight) or microgram per liter (weight/volume).

QUALIFIERS:
X: Reported value exceeds required MCL
B: Analyte detected in the associated Method Blank at a concentration > 1/2 the PQL
E: The sample result is within the method accepted Linear Dynamic Range determined by the lab for this analysis. However, it may be considered estimated when applying the TNI (The NELAC Institute) standard.
H: Holding time for preparation or analysis has been exceeded.
J: Analyte concentration is reported, and is less than the PQL and greater than or equal to the MDL. The result reported is an estimate.
S: % REC (% recovery) exceeds control limits

CERTIFICATIONS:
Beaver, WV: WVDHHR 00412CM, WVDEP 060, VADCLS 00281, KYDEP 90039, TNDEQ TN02926, NCDWQ 466, PADEP 68-00839, VADCLS (VELAP) 460148
Bioassay (Beaver, WV): WVDEP 060, VADCLS(VELAP) 460148, PADEP 68-00839
Roanoke, VA: VADCLS(VELAP) 460150
Verona, VA: VADCLS(VELAP) 460151
Ashland, KY: KYDEP 00094, WVDEP 389
Morgantown, WV: WVDHHR 003112M, WVDEP 387

REI Consultants, Inc. - Analytical Report

WO#: 1511G81

Date Reported: 11/20/2015

Client:	CARDNO MM&A	**Collection Date:**	11/11/2015 10:10:00 AM
Project:	ROXANA PRISON SITE	**Date Received:**	11/13/2015
Lab ID:	1511G81-01A	**Matrix:**	Liquid
Client Sample ID:	SOUTHWEST STREAM MOUTH	**Site ID:**	

Analysis	Result	MDL	PQL	MCL	Qual	Units	Date Analyzed	NELAP
Field/Miscellaneous Parameters			**Method: FLD/MISC**				**Analyst:**	
Field Sampler	SS	NA		NA				
Field Conductivity	711	NA		NA		µmhos/cm		
Field pH	6.73	NA		NA		SU		
Field Temp	50.8	NA		NA		DEG F		
METALS BY ICP			**Method: EPA 200.7 Rev. 4.4 (1994)**				**Analyst: LF**	
Chromium	ND	0.0010	0.0050	NA		mg/L	11/17/15	PA/VA
Iron	0.0503	0.0100	0.0500	NA		mg/L	11/17/15	PA/VA
Manganese	0.0162	0.0010	0.0050	NA		mg/L	11/17/15	PA/VA
ANIONS by ION CHROMATOGRAPHY			**Method: EPA 300.0, Rev.2.1 (1993)**				**Analyst: CF**	
Chloride	ND	0.20	1.00	NA		mg/L	11/13/15	PA/VA
Sulfate	316	10.0	50.0	NA		mg/L	11/16/15	PA/VA
TOTAL DISSOLVED SOLIDS			**Method: SM2540 C-1997**				**Analyst: KY**	
Total Dissolved Solids	521	5	10	NA		mg/L	11/17/15	PA/VA
TOTAL SUSPENDED SOLIDS			**Method: SM2540 D-1997**				**Analyst: KY**	
Total Suspended Solids	ND	NA	1	NA		mg/L	11/16/15	PA/VA
ACIDITY			**Method: SM2310 B-1997**				**Analyst: VS**	
Acidity, Total	10.9	1.0	10	NA		mg/L	11/16/15	PA/VA
ALKALINITY			**Method: SM2320 B-1997**				**Analyst: VS**	
Alkalinity, Total (As CaCO3)	51.1	1.0	20.0	NA		mg/L	11/16/15	PA/VA
pH - LAB TEST, HOLD TIME EXPIRED:			**Method: SM4500-H+-B-2000**				**Analyst: VS**	
pH	7.22	NA	NA	NA		SU	11/16/15 10:41AM	

REI Consultants, Inc. - Analytical Report

WO#: 1511G81

Date Reported: 11/20/2015

Client:	CARDNO MM&A	**Collection Date:**	11/11/2015 10:10:00 AM
Project:	ROXANA PRISON SITE	**Date Received:**	11/13/2015
Lab ID:	1511G81-01B	**Matrix:**	Liquid
Client Sample ID:	SOUTHWEST STREAM MOUTH	**Site ID:**	

Analysis	Result	MDL	PQL	MCL	Qual	Units	Date Analyzed	NELAP
Field/Miscellaneous Parameters			**Method: FLD/MISC**				**Analyst:**	
Field Sampler	SS	NA		NA				
DISSOLVED METALS BY ICP			**Method: EPA 200.7 Rev. 4.4 (1994)**				**Analyst: LF**	
Antimony	ND	0.0080	0.0200	NA		mg/L	11/17/15	PA/VA
Arsenic	ND	0.0070	0.0200	NA		mg/L	11/17/15	PA/VA
Barium	0.0618	0.0020	0.0050	NA		mg/L	11/17/15	PA/VA
Beryllium	ND	0.0002	0.0010	NA		mg/L	11/17/15	PA/VA
Cadmium	ND	0.0003	0.0010	NA		mg/L	11/17/15	PA/VA
Calcium	63.5	0.0500	0.500	NA	E	mg/L	11/17/15	PA/VA
Chromium	ND	0.0010	0.0050	NA		mg/L	11/17/15	PA/VA
Copper	ND	0.0020	0.0050	NA		mg/L	11/17/15	PA/VA
Iron	ND	0.0100	0.0500	NA		mg/L	11/17/15	PA/VA
Lead	ND	0.0030	0.0100	NA		mg/L	11/17/15	PA/VA
Magnesium	54.7	0.0500	0.500	NA	E	mg/L	11/17/15	PA/VA
Manganese	0.0161	0.0010	0.0050	NA		mg/L	11/17/15	PA/VA
Potassium	3.42	0.0400	0.100	NA		mg/L	11/17/15	PA/VA
Selenium	ND	0.0100	0.0200	NA		mg/L	11/17/15	PA/VA
Sodium	8.73	0.0300	0.100	NA		mg/L	11/17/15	PA/VA
Thallium	ND	0.0090	0.0100	NA		mg/L	11/17/15	PA/VA

Notes:

Calculation of the percent recovery on the matrix spike for Magnesium was not applicable since the spike added was <30% of the parent sample's background concentration.

MERCURY, Dissolved			**Method: EPA 245.1, Rev. 3.0 (1994)**				**Analyst: EP**
Mercury	ND	0.0001	0.0010	NA		mg/L	11/20/15

REI Consultants, Inc. - Analytical Report

WO#: 1511G81

Date Reported: 11/20/2015

Client:	CARDNO MM&A	**Collection Date:**	11/11/2015 11:50:00 AM
Project:	ROXANA PRISON SITE	**Date Received:**	11/13/2015
Lab ID:	1511G81-02A	**Matrix:**	Liquid
Client Sample ID:	NORTHWEST TOE OF HOLLOW FILL	**Site ID:**	

Analysis	Result	MDL	PQL	MCL	Qual	Units	Date Analyzed	NELAP
Field/Miscellaneous Parameters			**Method: FLD/MISC**				**Analyst:**	
Field Sampler	SS	NA		NA				
Field Conductivity	1831	NA		NA		umhos/cm		
Field pH	7.05	NA		NA		SU		
Field Temp	54.1	NA		NA		DEG F		
METALS BY ICP			**Method: EPA 200.7 Rev. 4.4 (1994)**				**Analyst: LF**	
Chromium	ND	0.0010	0.0050	NA		mg/L	11/17/15	PA/VA
Iron	0.0854	0.0100	0.0500	NA		mg/L	11/17/15	PA/VA
Manganese	0.0740	0.0010	0.0050	NA		mg/L	11/17/15	PA/VA
ANIONS by ION CHROMATOGRAPHY			**Method: EPA 300.0, Rev.2.1 (1993)**				**Analyst: CF**	
Chloride	3.95	0.20	1.00	NA		mg/L	11/13/15	PA/VA
Sulfate	1,210	25.0	125	NA		mg/L	11/16/15	PA/VA
TOTAL DISSOLVED SOLIDS			**Method: SM2540 C-1997**				**Analyst: KY**	
Total Dissolved Solids	2,230	5	10	NA		mg/L	11/17/15	PA/VA
TOTAL SUSPENDED SOLIDS			**Method: SM2540 D-1997**				**Analyst: KY**	
Total Suspended Solids	2	NA	1	NA		mg/L	11/16/15	PA/VA
ACIDITY			**Method: SM2310 B-1997**				**Analyst: VS**	
Acidity, Total	32.9	1.0	10	NA		mg/L	11/16/15	PA/VA
ALKALINITY			**Method: SM2320 B-1997**				**Analyst: VS**	
Alkalinity, Total (As CaCO3)	377	1.0	20.0	NA		mg/L	11/16/15	PA/VA
pH - LAB TEST, HOLD TIME EXPIRED:			**Method: SM4500-H+-B-2000**				**Analyst: VS**	
pH	7.41	NA	NA	NA		SU	11/16/15 10:41AM	

REI Consultants, Inc. - Analytical Report

WO#: 1511G81

Date Reported: 11/20/2015

Client:	CARDNO MM&A	**Collection Date:**	11/11/2015 11:50:00 AM
Project:	ROXANA PRISON SITE	**Date Received:**	11/13/2015
Lab ID:	1511G81-02B	**Matrix:**	Liquid
Client Sample ID:	NORTHWEST TOE OF HOLLOW FILL	**Site ID:**	

Analysis	Result	MDL	PQL	MCL	Qual	Units	Date Analyzed	NELAP
Field/Miscellaneous Parameters			**Method: FLD/MISC**				**Analyst:**	
Field Sampler	SS	NA		NA				
DISSOLVED METALS BY ICP			**Method: EPA 200.7 Rev. 4.4 (1994)**				**Analyst: LF**	
Antimony	ND	0.0080	0.0200	NA		mg/L	11/17/15	PA/VA
Arsenic	ND	0.0070	0.0200	NA		mg/L	11/17/15	PA/VA
Barium	0.0335	0.0020	0.0050	NA		mg/L	11/17/15	PA/VA
Beryllium	ND	0.0002	0.0010	NA		mg/L	11/17/15	PA/VA
Cadmium	ND	0.0003	0.0010	NA		mg/L	11/17/15	PA/VA
Calcium	259	0.500	5.00	NA		mg/L	11/18/15	PA/VA
Chromium	ND	0.0010	0.0050	NA		mg/L	11/17/15	PA/VA
Copper	ND	0.0020	0.0050	NA		mg/L	11/17/15	PA/VA
Iron	ND	0.0100	0.0500	NA		mg/L	11/17/15	PA/VA
Lead	ND	0.0030	0.0100	NA		mg/L	11/17/15	PA/VA
Magnesium	234	0.500	5.00	NA		mg/L	11/18/15	PA/VA
Manganese	0.0502	0.0010	0.0050	NA		mg/L	11/17/15	PA/VA
Potassium	13.2	0.0400	0.100	NA	E	mg/L	11/17/15	PA/VA
Selenium	ND	0.0100	0.0200	NA		mg/L	11/17/15	PA/VA
Sodium	24.1	0.0300	0.100	NA	E	mg/L	11/17/15	PA/VA
Thallium	ND	0.0090	0.0100	NA		mg/L	11/17/15	PA/VA
MERCURY, Dissolved			**Method: EPA 245.1, Rev. 3.0 (1994)**				**Analyst: EP**	
Mercury	ND	0.0001	0.0010	NA		mg/L	11/20/15	

REI Consultants, Inc. - Analytical Report

WO#: 1511G81

Date Reported: 11/20/2015

Client:	CARDNO MM&A	**Collection Date:**	11/11/2015 12:25:00 PM
Project:	ROXANA PRISON SITE	**Date Received:**	11/13/2015
Lab ID:	1511G81-03A	**Matrix:**	Liquid
Client Sample ID:	NORTHWEST STREAM MOUTH	**Site ID:**	

Analysis	Result	MDL	PQL	MCL	Qual	Units	Date Analyzed	NELAP
Field/Miscellaneous Parameters			**Method: FLD/MISC**				**Analyst:**	
Field Conductivity	1505	NA		NA		umhos/cm		
Field pH	8.11	NA		NA		SU		
Field Sampler	SS	NA		NA				
Field Temp	54.5	NA		NA		DEG F		
METALS BY ICP			**Method: EPA 200.7 Rev. 4.4 (1994)**				**Analyst: LF**	
Chromium	ND	0.0010	0.0050	NA		mg/L	11/17/15	PA/VA
Iron	ND	0.0100	0.0500	NA		mg/L	11/17/15	PA/VA
Manganese	ND	0.0010	0.0050	NA		mg/L	11/17/15	PA/VA
ANIONS by ION CHROMATOGRAPHY			**Method: EPA 300.0, Rev.2.1 (1993)**				**Analyst: CF**	
Chloride	2.34	0.20	1.00	NA		mg/L	11/13/15	PA/VA
Sulfate	794	25.0	125	NA		mg/L	11/16/15	PA/VA
TOTAL DISSOLVED SOLIDS			**Method: SM2540 C-1997**				**Analyst: KY**	
Total Dissolved Solids	1,450	5	10	NA		mg/L	11/17/15	PA/VA
TOTAL SUSPENDED SOLIDS			**Method: SM2540 D-1997**				**Analyst: KY**	
Total Suspended Solids	1	NA	1	NA		mg/L	11/16/15	PA/VA
ACIDITY			**Method: SM2310 B-1997**				**Analyst: VS**	
Acidity, Total	ND	1.0	10	NA		mg/L	11/16/15	PA/VA
ALKALINITY			**Method: SM2320 B-1997**				**Analyst: VS**	
Alkalinity, Total (As CaCO3)	215	1.0	20.0	NA		mg/L	11/16/15	PA/VA
pH - LAB TEST, HOLD TIME EXPIRED:			**Method: SM4500-H+-B-2000**				**Analyst: VS**	
pH	8.31	NA	NA	NA		SU	11/16/15 10:41AM	

REI Consultants, Inc. - Analytical Report

WO#: 1511G81

Date Reported: 11/20/2015

Client:	CARDNO MM&A	**Collection Date:**	11/11/2015 12:25:00 PM
Project:	ROXANA PRISON SITE	**Date Received:**	11/13/2015
Lab ID:	1511G81-03B	**Matrix:**	Liquid
Client Sample ID:	NORTHWEST STREAM MOUTH	**Site ID:**	

Analysis	Result	MDL	PQL	MCL	Qual	Units	Date Analyzed	NELAP
Field/Miscellaneous Parameters			**Method: FLD/MISC**				**Analyst:**	
Field Sampler	SS	NA		NA				
DISSOLVED METALS BY ICP			**Method: EPA 200.7 Rev. 4.4 (1994)**				**Analyst: LF**	
Antimony	ND	0.0080	0.0200	NA		mg/L	11/17/15	PA/VA
Arsenic	ND	0.0070	0.0200	NA		mg/L	11/17/15	PA/VA
Barium	0.0581	0.0020	0.0050	NA		mg/L	11/17/15	PA/VA
Beryllium	ND	0.0002	0.0010	NA		mg/L	11/17/15	PA/VA
Cadmium	ND	0.0003	0.0010	NA		mg/L	11/17/15	PA/VA
Calcium	181	0.0500	0.500	NA	E	mg/L	11/17/15	PA/VA
Chromium	ND	0.0010	0.0050	NA		mg/L	11/17/15	PA/VA
Copper	ND	0.0020	0.0050	NA		mg/L	11/17/15	PA/VA
Iron	ND	0.0100	0.0500	NA		mg/L	11/17/15	PA/VA
Lead	ND	0.0030	0.0100	NA		mg/L	11/17/15	PA/VA
Magnesium	178	0.0500	0.500	NA	E	mg/L	11/17/15	PA/VA
Manganese	ND	0.0010	0.0050	NA		mg/L	11/17/15	PA/VA
Potassium	9.14	0.0400	0.100	NA		mg/L	11/17/15	PA/VA
Selenium	ND	0.0100	0.0200	NA		mg/L	11/17/15	PA/VA
Sodium	20.3	0.0300	0.100	NA	E	mg/L	11/17/15	PA/VA
Thallium	ND	0.0090	0.0100	NA		mg/L	11/17/15	PA/VA
MERCURY, Dissolved			**Method: EPA 245.1, Rev. 3.0 (1994)**				**Analyst: EP**	
Mercury	ND	0.0001	0.0010	NA		mg/L	11/20/15	

REI Consultants, Inc. - Analytical Report

WO#: 1511G81

Date Reported: 11/20/2015

Client:	CARDNO MM&A	**Collection Date:**	11/11/2015 1:30:00 PM
Project:	ROXANA PRISON SITE	**Date Received:**	11/13/2015
Lab ID:	1511G81-04A	**Matrix:**	Liquid
Client Sample ID:	SOUTHEAST HOLLOW FILL TOE	**Site ID:**	

Analysis	Result	MDL	PQL	MCL	Qual	Units	Date Analyzed	NELAP
Field/Miscellaneous Parameters			**Method: FLD/MISC**				**Analyst:**	
Field Sampler	SS	NA		NA				
Field Conductivity	1211	NA		NA		umhos/cm		
Field pH	7.75	NA		NA		SU		
Field Temp	54.9	NA		NA		DEG F		
METALS BY ICP			**Method: EPA 200.7 Rev. 4.4 (1994)**				**Analyst: LF**	
Chromium	ND	0.0010	0.0050	NA		mg/L	11/17/15	PA/VA
Iron	ND	0.0100	0.0500	NA		mg/L	11/17/15	PA/VA
Manganese	ND	0.0010	0.0050	NA		mg/L	11/17/15	PA/VA
ANIONS by ION CHROMATOGRAPHY			**Method: EPA 300.0, Rev.2.1 (1993)**				**Analyst: CF**	
Chloride	1.93	0.20	1.00	NA		mg/L	11/13/15	PA/VA
Sulfate	763	25.0	125	NA		mg/L	11/16/15	PA/VA
TOTAL DISSOLVED SOLIDS			**Method: SM2540 C-1997**				**Analyst: KY**	
Total Dissolved Solids	1,300	5	10	NA		mg/L	11/17/15	PA/VA
TOTAL SUSPENDED SOLIDS			**Method: SM2540 D-1997**				**Analyst: KY**	
Total Suspended Solids	3	NA	1	NA		mg/L	11/16/15	PA/VA
ACIDITY			**Method: SM2310 B-1997**				**Analyst: VS**	
Acidity, Total	11.0	1.0	10	NA		mg/L	11/16/15	PA/VA
ALKALINITY			**Method: SM2320 B-1997**				**Analyst: VS**	
Alkalinity, Total (As CaCO3)	191	1.0	20.0	NA		mg/L	11/16/15	PA/VA
pH - LAB TEST, HOLD TIME EXPIRED:			**Method: SM4500-H+-B-2000**				**Analyst: VS**	
pH	7.89	NA	NA	NA		SU	11/16/15 10:41AM	

REI Consultants, Inc. - Analytical Report

WO#: 1511G81

Date Reported: 11/20/2015

Client:	CARDNO MM&A	**Collection Date:**	11/11/2015 1:30:00 PM
Project:	ROXANA PRISON SITE	**Date Received:**	11/13/2015
Lab ID:	1511G81-04B	**Matrix:**	Liquid
Client Sample ID:	SOUTHEAST HOLLOW FILL TOE	**Site ID:**	

Analysis	Result	MDL	PQL	MCL	Qual	Units	Date Analyzed	NELAP
Field/Miscellaneous Parameters			**Method: FLD/MISC**				**Analyst:**	
Field Sampler	SS	NA		NA				
DISSOLVED METALS BY ICP			**Method: EPA 200.7 Rev. 4.4 (1994)**				**Analyst: LF**	
Antimony	ND	0.0080	0.0200	NA		mg/L	11/17/15	PA/VA
Arsenic	ND	0.0070	0.0200	NA		mg/L	11/17/15	PA/VA
Barium	0.0373	0.0020	0.0050	NA		mg/L	11/17/15	PA/VA
Beryllium	ND	0.0002	0.0010	NA		mg/L	11/17/15	PA/VA
Cadmium	ND	0.0003	0.0010	NA		mg/L	11/17/15	PA/VA
Calcium	155	0.0500	0.500	NA	E	mg/L	11/17/15	PA/VA
Chromium	ND	0.0010	0.0050	NA		mg/L	11/17/15	PA/VA
Copper	ND	0.0020	0.0050	NA		mg/L	11/17/15	PA/VA
Iron	ND	0.0100	0.0500	NA		mg/L	11/17/15	PA/VA
Lead	ND	0.0030	0.0100	NA		mg/L	11/17/15	PA/VA
Magnesium	153	0.0500	0.500	NA	E	mg/L	11/17/15	PA/VA
Manganese	ND	0.0010	0.0050	NA		mg/L	11/17/15	PA/VA
Potassium	8.87	0.0400	0.100	NA		mg/L	11/17/15	PA/VA
Selenium	ND	0.0100	0.0200	NA		mg/L	11/17/15	PA/VA
Sodium	17.3	0.0300	0.100	NA	E	mg/L	11/17/15	PA/VA
Thallium	ND	0.0090	0.0100	NA		mg/L	11/17/15	PA/VA
MERCURY, Dissolved			**Method: EPA 245.1, Rev. 3.0 (1994)**				**Analyst: EP**	
Mercury	ND	0.0001	0.0010	NA		mg/L	11/20/15	

REI Consultants, Inc. - Analytical Report

WO#: 1511G81

Date Reported: 11/20/2015

Client:	CARDNO MM&A	**Collection Date:**	11/11/2015 3:35:00 PM
Project:	ROXANA PRISON SITE	**Date Received:**	11/13/2015
Lab ID:	1511G81-05A	**Matrix:**	Liquid
Client Sample ID:	EAST HOLLOW FILL TOE	**Site ID:**	

Analysis	Result	MDL	PQL	MCL	Qual	Units	Date Analyzed	NELAP
Field/Miscellaneous Parameters			**Method: FLD/MISC**				**Analyst:**	
Field Sampler	SS	NA		NA				
Field Conductivity	1900	NA		NA		umhos/cm		
Field pH	7.90	NA		NA		SU		
Field Temp	55.4	NA		NA		DEG F		
METALS BY ICP			**Method: EPA 200.7 Rev. 4.4 (1994)**				**Analyst: LF**	
Chromium	ND	0.0010	0.0050	NA		mg/L	11/17/15	PA/VA
Iron	ND	0.0100	0.0500	NA		mg/L	11/17/15	PA/VA
Manganese	0.0061	0.0010	0.0050	NA		mg/L	11/17/15	PA/VA
ANIONS by ION CHROMATOGRAPHY			**Method: EPA 300.0, Rev.2.1 (1993)**				**Analyst: CF**	
Chloride	3.02	0.20	1.00	NA		mg/L	11/13/15	PA/VA
Sulfate	1,310	25.0	125	NA		mg/L	11/16/15	PA/VA
TOTAL DISSOLVED SOLIDS			**Method: SM2540 C-1997**				**Analyst: KY**	
Total Dissolved Solids	2,260	5	10	NA		mg/L	11/17/15	PA/VA
TOTAL SUSPENDED SOLIDS			**Method: SM2540 D-1997**				**Analyst: KY**	
Total Suspended Solids	1	NA	1	NA		mg/L	11/16/15	PA/VA
ACIDITY			**Method: SM2310 B-1997**				**Analyst: VS**	
Acidity, Total	ND	1.0	10	NA		mg/L	11/16/15	PA/VA
ALKALINITY			**Method: SM2320 B-1997**				**Analyst: VS**	
Alkalinity, Total (As CaCO3)	308	1.0	20.0	NA		mg/L	11/16/15	PA/VA
pH - LAB TEST, HOLD TIME EXPIRED:			**Method: SM4500-H+-B-2000**				**Analyst: VS**	
pH	8.09	NA	NA	NA		SU	11/16/15 10:41AM	

REI Consultants, Inc. - Analytical Report

WO#: 1511G81

Date Reported: 11/20/2015

Client:	CARDNO MM&A	**Collection Date:**	11/11/2015 3:35:00 PM
Project:	ROXANA PRISON SITE	**Date Received:**	11/13/2015
Lab ID:	1511G81-05B	**Matrix:**	Liquid
Client Sample ID:	EAST HOLLOW FILL TOE	**Site ID:**	

Analysis	Result	MDL	PQL	MCL	Qual	Units	Date Analyzed	NELAP
Field/Miscellaneous Parameters			**Method: FLD/MISC**				**Analyst:**	
Field Sampler	SS	NA		NA				
DISSOLVED METALS BY ICP			**Method: EPA 200.7 Rev. 4.4 (1994)**				**Analyst: LF**	
Antimony	ND	0.0080	0.0200	NA		mg/L	11/17/15	PA/VA
Arsenic	ND	0.0070	0.0200	NA		mg/L	11/17/15	PA/VA
Barium	0.0217	0.0020	0.0050	NA		mg/L	11/17/15	PA/VA
Beryllium	ND	0.0002	0.0010	NA		mg/L	11/17/15	PA/VA
Cadmium	ND	0.0003	0.0010	NA		mg/L	11/17/15	PA/VA
Calcium	250	0.500	5.00	NA		mg/L	11/18/15	PA/VA
Chromium	ND	0.0010	0.0050	NA		mg/L	11/17/15	PA/VA
Copper	ND	0.0020	0.0050	NA		mg/L	11/17/15	PA/VA
Iron	ND	0.0100	0.0500	NA		mg/L	11/17/15	PA/VA
Lead	ND	0.0030	0.0100	NA		mg/L	11/17/15	PA/VA
Magnesium	238	0.500	5.00	NA		mg/L	11/18/15	PA/VA
Manganese	0.0064	0.0010	0.0050	NA		mg/L	11/17/15	PA/VA
Potassium	16.4	0.0400	0.100	NA	E	mg/L	11/17/15	PA/VA
Selenium	ND	0.0100	0.0200	NA		mg/L	11/17/15	PA/VA
Sodium	32.5	0.0300	0.100	NA	E	mg/L	11/17/15	PA/VA
Thallium	ND	0.0090	0.0100	NA		mg/L	11/17/15	PA/VA
MERCURY, Dissolved			**Method: EPA 245.1, Rev. 3.0 (1994)**				**Analyst: EP**	
Mercury	ND	0.0001	0.0010	NA		mg/L	11/20/15	

REI Consultants, Inc. - Analytical Report

WO#: 1511G81

Date Reported: 11/20/2015

Client:	CARDNO MM&A	**Collection Date:**	11/11/2015 4:50:00 PM
Project:	ROXANA PRISON SITE	**Date Received:**	11/13/2015
Lab ID:	1511G81-06A	**Matrix:**	Liquid
Client Sample ID:	EAST HOLLOW FILL BELOW POND	**Site ID:**	

Analysis	Result	MDL	PQL	MCL	Qual	Units	Date Analyzed	NELAP
Field/Miscellaneous Parameters			**Method: FLD/MISC**				**Analyst:**	
Field Sampler	SS	NA		NA				
Field Conductivity	1675	NA		NA		umhos/cm		
Field pH	7.97	NA		NA		SU		
Field Temp	55.9	NA		NA		DEG F		
METALS BY ICP			**Method: EPA 200.7 Rev. 4.4 (1994)**				**Analyst: LF**	
Chromium	ND	0.0010	0.0050	NA		mg/L	11/17/15	PA/VA
Iron	ND	0.0100	0.0500	NA		mg/L	11/17/15	PA/VA
Manganese	0.0350	0.0010	0.0050	NA		mg/L	11/17/15	PA/VA
ANIONS by ION CHROMATOGRAPHY			**Method: EPA 300.0, Rev.2.1 (1993)**				**Analyst: CF**	
Chloride	2.26	0.20	1.00	NA		mg/L	11/13/15	PA/VA
Sulfate	1,030	25.0	125	NA		mg/L	11/16/15	PA/VA
TOTAL DISSOLVED SOLIDS			**Method: SM2540 C-1997**				**Analyst: KY**	
Total Dissolved Solids	1,820	5	10	NA		mg/L	11/17/15	PA/VA
TOTAL SUSPENDED SOLIDS			**Method: SM2540 D-1997**				**Analyst: KY**	
Total Suspended Solids	1	NA	1	NA		mg/L	11/16/15	PA/VA
ACIDITY			**Method: SM2310 B-1997**				**Analyst: VS**	
Acidity, Total	ND	1.0	10	NA		mg/L	11/16/15	PA/VA
ALKALINITY			**Method: SM2320 B-1997**				**Analyst: VS**	
Alkalinity, Total (As CaCO3)	270	1.0	20.0	NA		mg/L	11/16/15	PA/VA
pH - LAB TEST, HOLD TIME EXPIRED:			**Method: SM4500-H+-B-2000**				**Analyst: VS**	
pH	8.23	NA	NA	NA		SU	11/16/15 10:41AM	

REI Consultants, Inc. - Analytical Report

WO#: 1511G81

Date Reported: 11/20/2015

Client:	CARDNO MM&A	**Collection Date:**	11/11/2015 4:50:00 PM
Project:	ROXANA PRISON SITE	**Date Received:**	11/13/2015
Lab ID:	1511G81-06B	**Matrix:**	Liquid
Client Sample ID:	EAST HOLLOW FILL BELOW POND	**Site ID:**	

Analysis	Result	MDL	PQL	MCL	Qual	Units	Date Analyzed	NELAP
Field/Miscellaneous Parameters			**Method: FLD/MISC**				**Analyst:**	
Field Sampler	SS	NA		NA				
DISSOLVED METALS BY ICP			**Method: EPA 200.7 Rev. 4.4 (1994)**				**Analyst: LF**	
Antimony	ND	0.0080	0.0200	NA		mg/L	11/17/15	PA/VA
Arsenic	ND	0.0070	0.0200	NA		mg/L	11/17/15	PA/VA
Barium	0.0277	0.0020	0.0050	NA		mg/L	11/17/15	PA/VA
Beryllium	ND	0.0002	0.0010	NA		mg/L	11/17/15	PA/VA
Cadmium	ND	0.0003	0.0010	NA		mg/L	11/17/15	PA/VA
Calcium	207	0.0500	0.500	NA	E	mg/L	11/17/15	PA/VA
Chromium	ND	0.0010	0.0050	NA		mg/L	11/17/15	PA/VA
Copper	ND	0.0020	0.0050	NA		mg/L	11/17/15	PA/VA
Iron	ND	0.0100	0.0500	NA		mg/L	11/17/15	PA/VA
Lead	ND	0.0030	0.0100	NA		mg/L	11/17/15	PA/VA
Magnesium	216	0.0500	0.500	NA	E	mg/L	11/17/15	PA/VA
Manganese	0.0293	0.0010	0.0050	NA		mg/L	11/17/15	PA/VA
Potassium	14.3	0.0400	0.100	NA	E	mg/L	11/17/15	PA/VA
Selenium	ND	0.0100	0.0200	NA		mg/L	11/17/15	PA/VA
Sodium	25.7	0.0300	0.100	NA	E	mg/L	11/17/15	PA/VA
Thallium	ND	0.0090	0.0100	NA		mg/L	11/17/15	PA/VA
MERCURY, Dissolved			**Method: EPA 245.1, Rev. 3.0 (1994)**				**Analyst: EP**	
Mercury	ND	0.0001	0.0010	NA		mg/L	11/20/15	

REI Consultants, Inc.
PO Box 286
Beaver, WV 25813
TEL: (304)255-2500
Website: www.reiclabs.com

Improving the environment, one client at a time...

Sample Receipt Checklist

Client Name:	**CAR044**			Work Order Number:	**1511G81**
RCPNo:	**1**	Date and Time Received:	**11/13/2015 2:19:00 PM**	Received by:	**Traves Meadows**
Completed By:	**Amanda Wilkins**		Reviewed By:	**Beth Johnson**	
Completed Date:	**11/13/2015 2:38:37 PM**		Reviewed Date:	**11/13/2015 3:57 PM**	

Carrier Name: REIC

1.	Chain of custody present?	Yes [x]	No [ ]	
2.	Chain of custody signed when relinquished and received?	Yes [x]	No [ ]	
3.	Are matrices correctly identified on Chain of custody?	Yes [x]	No [ ]	
4.	Is it clear what analyses were requested?	Yes [x]	No [ ]	
5.	Custody seals intact?	Yes [ ]	No [ ]	Not Present [x]
6.	Samples in proper container type and preservative?	Yes [x]	No [ ]	
7.	Were correct preservatives noted on COC?	Yes [x]	No [ ]	NA [ ]
8.	Sample containers intact?	Yes [x]	No [ ]	
9.	Sufficient sample volume for indicated test?	Yes [x]	No [ ]	
10.	Were container labels complete?	Yes [x]	No [ ]	
11.	All samples received within holding time?	Yes [x]	No [ ]	
12.	Was an attempt made to cool the samples?	Yes [x]	No [ ]	NA [ ]
13.	Sample Temp. taken and recorded upon receipt?	Yes [x]	No [ ]	To 1.2 ºC
14.	Water - Were bubbles absent in VOC vials?	Yes [ ]	No [ ]	No Vials [x]
15.	Are Samples considered acceptable?	Yes [x]	No [ ]	
16.	COC filled out properly?	Yes [x]	No [ ]	

Client Notification/Response

Client Name: **CAR044** Work Order Number: **1511G81**

Comment:

Client Contacted: Yes [ ] No [ ] NA [x] Person Contacted:

Contact Mode: Phone [ ] Fax: [ ] Email: [ ] In Person: [ ]

Date Contacted: Contacted By:

Regarding:

Client Instructions:

Corrective Action:

DBPix Evaluation

471178

CHAIN OF CUSTODY RECORD

REIC
Research Environmental & Industrial Consultants, Inc.
MAIN LABORATORY & CORPORATE HEADQUARTERS:
P.O. Box 286 • 225 Industrial Park Rd, Beaver, WV 25813
800-999-0105 • 304-255-2500 • 304-255-2572/fax • www.reiclabs.com

MID-OHIO VALLEY Service Center
101 17th Street
Ashland, KY 41101
606-393-5027

SHENANDOAH Service Center
1557 Commerce Rd., Ste 201
Verona, VA 24482
540-248-0183

ROANOKE Service Center
3029-C Peters Creek Rd
Roanoke, VA 24019
540-777-1276

MORGANTOWN Service Center
16 Commerce Drive
Westover, WV 26501
304-241-5861

Client: Cardno, Inc. PO #
Contact Person: Steve Stansfield Phone: 276-322-5467
QUOTE # Fax: Email: steve.stansfield@cardno.com
Address: 534 Industrial Park Rd. City: Bluefield State: VA Zip: 24605
Billing Address (if different): Same as Above
City State Zip
Site ID & State Project ID: Roxana Prison Site Sampler: Steve Stansfield (Cardno)

SAMPLE LOG & ANALYSIS REQUEST

TURNAROUND TIME: [✓] NORMAL
RUSH TURNAROUND*: [ ] 5 DAY [ ] 3 DAY [ ] 2 DAY [ ] 1 DAY
*Rush work needs prior laboratory approval and will incur additional charges

Send Results Via: [✓] Email [ ] Fax

All analytical requests are subject to REIC's Standard Terms and Conditions.

ANALYSIS & METHOD REQUESTED: Dissolved Sb, As, Ba, Be, Cd, Ca, Cr, Cu, Fe, Pb, Total Cr, Fe, Mn, pH, sulfate, alkalinity, chloride, Se, TDS, TSS, Mg, Mn, Hg, K, Se, Na, Thallium (Field-Filtered)

SAMPLE ID	No. & Type of Containers	Sampling Date/Time	Matrix	Sample Comp/Grab	2	2	0							
Southwest Stream Mouth	4 Plastic	11/11/15 1010	Water	Grab	✓	✓	✓							
Northwest Toe of Hollow Fill	4 Plastic	11/11/15 1150	Water	Grab	✓	✓	✓							
Northwest Stream Mouth	4 Plastic	11/11/15 1225	Water	Grab	✓	✓	✓							
Southeast Hollow Fill Toe	4 Plastic	11/11/15 1330	Water	Grab	✓	✓	✓							
East Hollow Fill Toe	4 Plastic	11/11/15 1535	Water	Grab	✓	✓	✓							
East Hollow Fill Below Pond	4 Plastic	11/11/15 1650	Water	Grab	✓	✓	✓							
	~~4 Plastic~~ (SS)		~~Water~~	~~Grab~~										
	~~4 Plastic~~ (SS)		~~Water~~	~~Grab~~										

ENTER PRESERVATIVE CODE

Preservative Codes:
0 None
1 Hydrochloric Acid
2 Nitric Acid
3 Sulfuric Acid
4 Sodium Thiosulfate
5 Sodium Hydroxide/ Sodium Arsenite
6 Sodium Hydroxide
7 Ascorbic Acid
8 Sodium Bisulfate/Methanol
9 Ammonium Chloride
10 CR6 Buffer
11 Sodium Sulfite/ Hydrochloric Acid
12 _____*
*(Use blank for a preservative not listed.)

COMMENTS:
- All "dissolved" analyses field-filtered
- Include field parameters on lab sheet
- Analyze mercury by 245.1
- Analyze all other metals by 200.7 low MDL

Temperature at arrival: 1.2 °C ICED? Y [X] N___ Containers provided by: [✓] REIC [ ] Client Delivered by: [ ] Client [X] REIC [ ] UPS [ ] FedEx [ ] USPS Other

	Relinquished by (signature)	Date/Time		Relinquished by (signature)	Date/Time		Relinquished by (signature)	Date/Time
1	[signature]	11/13/15 1021	2	[signature]	11-13-15 1320	3		
	Received by (signature) [signature]	11-13-15 Date/Time 10:21		Received by (signature)	Date/Time		Received by (signature)	Date/Time
4	Relinquished by (signature)	Date/Time	5	Relinquished by (signature)	Date/Time	6	Relinquished by (signature)	Date/Time
	Received by (signature)	Date/Time		Received by (signature)	Date/Time		Received by (signature)	Date/Time

COC-NCR-070115

CHAPMAN PRINTING CO. CHARLESTON, WV 25327

www.ammara.com

Roxana Prison Site
(Collected by Cardno, Inc.)
Field Parameters

Sample ID	Collection Date	Field pH (s.u.)	Field Conductivity (µmhos/cm)	Field Temp (°F)
Southwest Stream Mouth	11/11/15	6.73	711	50.8
Northwest Toe Of Hollow Fill	11/11/15	7.05	1831	54.1
Northwest Stream Mouth	11/11/15	8.11	1505	54.5
Southeast Hollow Fill Toe	11/11/15	7.75	1211	54.9
East Hollow Fill Toe	11/11/15	7.90	1900	55.4
East Hollow Fill Below Pond	11/11/15	7.97	1675	55.9

Roxana Prison Site,
Letcher County, Kentucky

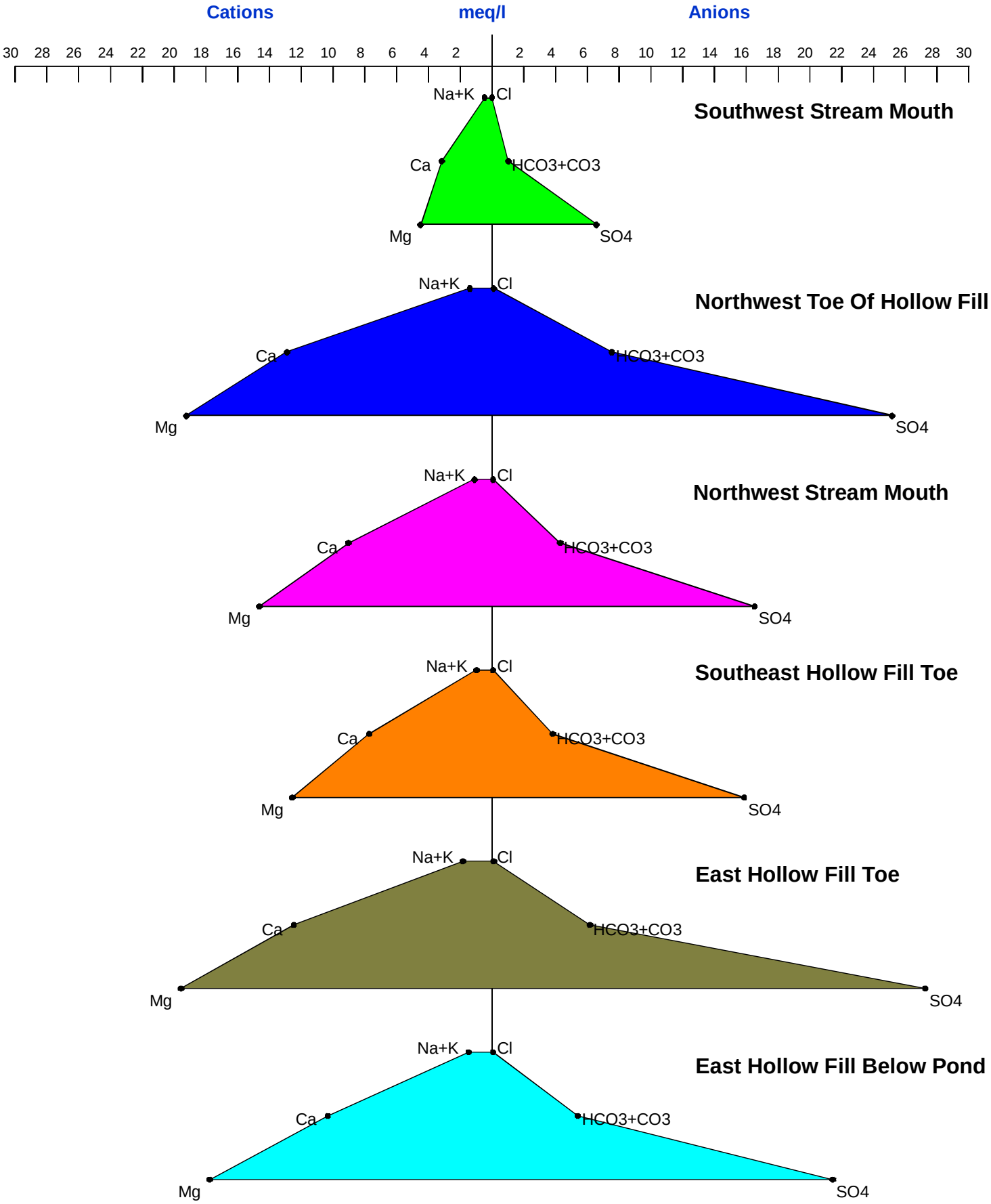
Appendix

C

STIFF AND PIPER DIAGRAMS

Cardno®
Shaping the Future

Roxana Prison Site
November 11, 2015 Sampling

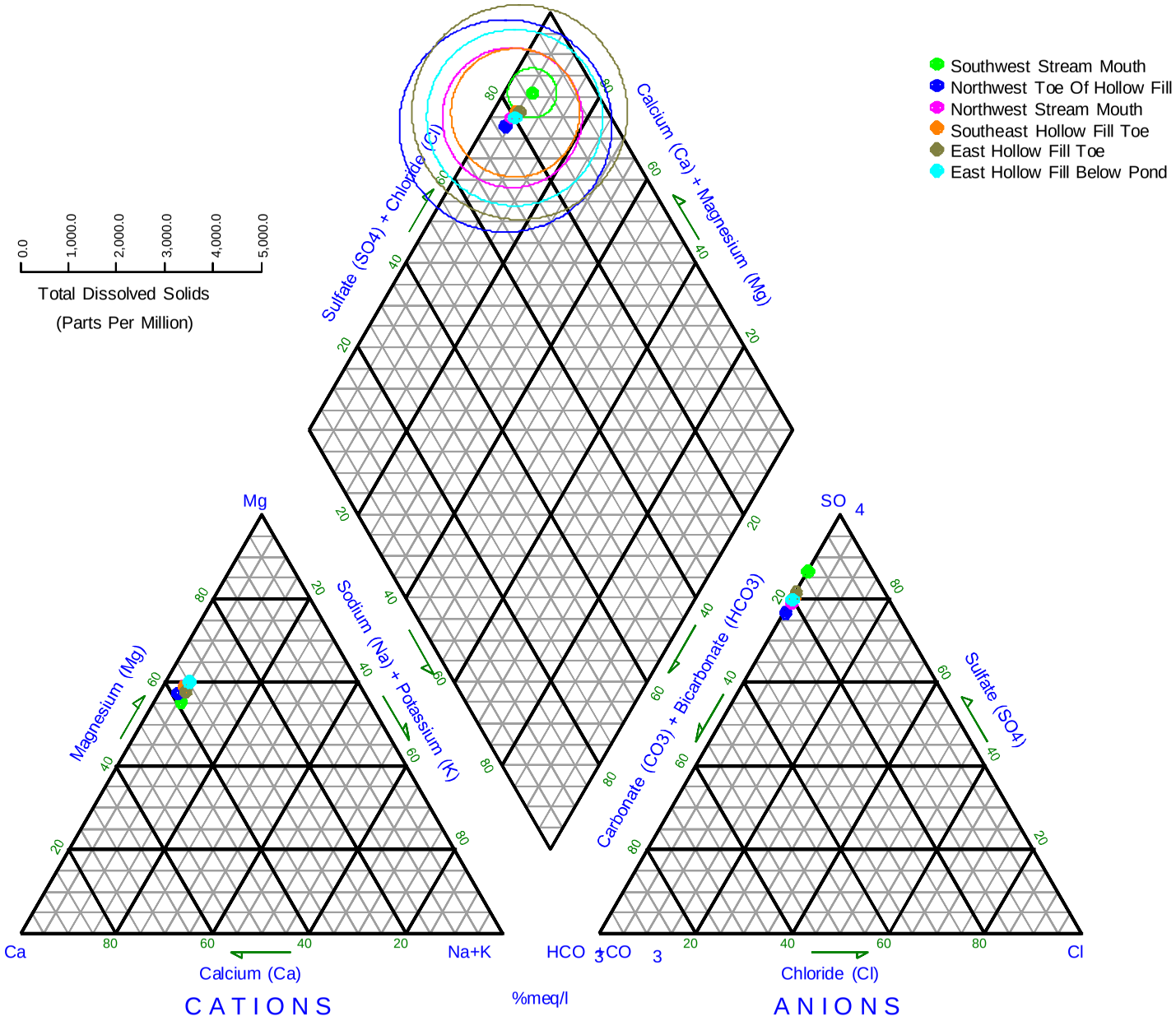


Cardno

CARD138 11/15 drd

Roxana Prison Site

November 11, 2015 Sampling



Roxana Prison Site,
Letcher County, Kentucky

Appendix

D

WATER QUALITY REPORTS FROM 1993-1995

Cardno®
Shaping the Future

Lab. No. 96674

Date Rec'd. 10/27/93

Date Sampled 10/27/93

Sampled By YOURSELVES

STANDARD LABORATORIES, INC.
PO BOX 606
WHITESBURG, KY 41858

MEADE & SHEPHERD COAL COMPANY
HC 84, BOX 1404
WHITESBURG
KENTUCKY 41858

SAMPLE ID:
P.N. 867-0298
SS-1
ROXANNA

WATER REPORT

pH	7.89	
TOTAL ALKALINITY,(AS CACO3 EQUIVALENT	233.10	MG/L
TOTAL ACIDITY, (AS CACO3 EQUIVALENT)	0.00	MG/L
TOTAL SUSPENDED SOLIDS	14	MG/L
TOTAL IRON	0.26	MG/L
TOTAL MANGANESE	<0.01	MG/L

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

Respectfully Submitted, Terry York

Lab. No. 96675

Date Rec'd 10/27/93

Date Sampled 10/27/93

Sampled By YOURSELVES

STANDARD LABORATORIES, INC.
PO BOX 606
WHITESBURG, KY 41858

SAMPLE ID:

MEADE & SHEPHERD COAL COMPANY
HC 84, BOX 1404
WHITESBURG
KENTUCKY 41858

P.N. 867-0298
SS-2
ROXANNA

WATER REPORT

pH	8.17
TOTAL ALKALINITY,(AS CACO3 EQUIVALENT	208.00 MG/L
TOTAL ACIDITY, (AS CACO3 EQUIVALENT)	0.00 MG/L
TOTAL SUSPENDED SOLIDS	20 MG/L
TOTAL IRON	0.42 MG/L
TOTAL MANGANESE	<0.01 MG/L

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

Respectfully Submitted, Gary York

Lab. No. 96676

Date Rec'd. 10/27/93

Date Sampled 10/27/93

Sampled By YOURSELVES

STANDARD LABORATORIES, INC.

PO BOX 606
WHITESBURG, KY 41858

SAMPLE ID:

MEADE & SHEPHERD COAL COMPANY
HC 84, BOX 1404
WHITESBURG
KENTUCKY 41858

P.N. 867-0298
G.W.
ROXANNA

WATER REPORT

pH	8.05	
TOTAL ALKALINITY,(AS CACO3 EQUIVALENT	126.00	MG/L
TOTAL ACIDITY, (AS CACO3 EQUIVALENT)	0.00	MG/L
TOTAL DISSOLVED SOLIDS	136	MG/L
TOTAL SULFATE	53.27	MG/L
DISSOLVED IRON	0.14	MG/L
DISSOLVED MANGANESE	0.03	MG/L

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Respectfully Submitted, Terry York

Lab. No. 96714

Date Rec'd 07/15/93

Date Sampled 07/15/93

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PO BOX 606
WHITESBURG, KY 41858

MEADE & SHEPHERD COAL COMPANY
HC 84, BOX 1404
WHITESBURG
KENTUCKY 41858

SAMPLE ID:

P.N. 867-0298
POND #1
ROXANNA

WATER REPORT

pH	7.11
TOTAL ALKALINITY,(AS CACO3 EQUIVALENT	216.00 MG/L
TOTAL ACIDITY, (AS CACO3 EQUIVALENT)	0.00 MG/L
TOTAL SUSPENDED SOLIDS	16 MG/L
TOTAL IRON	0.29 MG/L
TOTAL MANGANESE	<0.01 MG/L

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

Respectfully Submitted, Terry York

Lab. No. 96715

Date Rec'd. 07/29/93

Date Sampled 07/29/93

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WHITESBURG, KY 41858

SAMPLE ID:

MEADE & SHEPHERD COAL COMPANY
HC 84, BOX 1404
WHITESBURG
KENTUCKY 41858

P.N. 867-0298
POND #1
ROXANNA

WATER REPORT

pH	7.39	
TOTAL ALKALINITY,(AS CACO3 EQUIVALENT	280.00	MG/L
TOTAL ACIDITY, (AS CACO3 EQUIVALENT)	0.00	MG/L
TOTAL SUSPENDED SOLIDS	31	MG/L
TOTAL IRON	0.74	MG/L
TOTAL MANGANESE	<0.01	MG/L

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

Respectfully Submitted, Terry York

Lab. No. 96716

Date Rec'd. 08/12/93

Date Sampled 08/12/93

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KENTUCKY 41858

P.N. 867-0298
POND #1
ROXANNA

WATER REPORT

pH	7.50	
TOTAL ALKALINITY,(AS CACO3 EQUIVALENT	264.00	MG/L
TOTAL ACIDITY, (AS CACO3 EQUIVALENT)	0.00	MG/L
TOTAL SUSPENDED SOLIDS	17	MG/L
TOTAL IRON	0.26	MG/L
TOTAL MANGANESE	0.03	MG/L

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

Respectfully Submitted, Terry York

Lab. No. 96717

Date Rec'd. 08/27/93

Date Sampled 08/27/93

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WHITESBURG, KY 41858

SAMPLE ID:

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HC 84, BOX 1404
WHITESBURG
KENTUCKY 41858

P.N. 867-0298
POND #1
ROXANNA

WATER REPORT

pH	7.60	
TOTAL ALKALINITY,(AS CACO3 EQUIVALENT	234.00	MG/L
TOTAL ACIDITY, (AS CACO3 EQUIVALENT)	0.00	MG/L
TOTAL SUSPENDED SOLIDS	33	MG/L
TOTAL IRON	0.31	MG/L
TOTAL MANGANESE	<0.01	MG/L

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

Respectfully Submitted, Terry York

Lab. No. 96718

Date Rec'd. 09/09/93

Date Sampled 09/09/93

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WHITESBURG, KY 41858

SAMPLE ID:

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WHITESBURG
KENTUCKY 41858

P.N. 867-0298
POND #1
ROXANNA

WATER REPORT

pH	7.20	
TOTAL ALKALINITY,(AS CACO3 EQUIVALENT	250.00	MG/L
TOTAL ACIDITY, (AS CACO3 EQUIVALENT)	0.00	MG/L
TOTAL SUSPENDED SOLIDS	11	MG/L
TOTAL IRON	0.32	MG/L
TOTAL MANGANESE	<0.01	MG/L

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

Respectfully Submitted, Terry York

Lab. No. 96719

Date Rec'd. 09/23/93

Date Sampled 09/23/93

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PO BOX 606
WHITESBURG, KY 41858

MEADE & SHEPHERD COAL COMPANY
HC 84, BOX 1404
WHITESBURG
KENTUCKY 41858

SAMPLE ID:

P.N. 867-0298
POND #1
ROXANNA

WATER REPORT

pH	7.55
TOTAL ALKALINITY,(AS CACO3 EQUIVALENT	270.00 MG/L
TOTAL ACIDITY, (AS CACO3 EQUIVALENT)	0.00 MG/L
TOTAL SUSPENDED SOLIDS	33 MG/L
TOTAL IRON	0.92 MG/L
TOTAL MANGANESE	<0.01 MG/L

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

Respectfully Submitted, Terry York

Lab. No. 96720

Date Rec'd. 10/28/93

Date Sampled 10/28/93

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PO BOX 606
WHITESBURG, KY 41858

SAMPLE ID:

MEADE & SHEPHERD COAL COMPANY
HC 84, BOX 1404
WHITESBURG
KENTUCKY 41858

P.N. 867-0298
POND #1
ROXANNA

WATER REPORT

pH	7.93
TOTAL ALKALINITY,(AS CACO3 EQUIVALENT	274.00 MG/L
TOTAL ACIDITY, (AS CACO3 EQUIVALENT)	0.00 MG/L
TOTAL SUSPENDED SOLIDS	25 MG/L
TOTAL IRON	0.21 MG/L
TOTAL MANGANESE	<0.01 MG/L

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Respectfully Submitted, Gary York

Lab. No. 96721

Date Rec'd. 07/15/93

Date Sampled 07/15/93

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WHITESBURG, KY 41858

SAMPLE ID:

MEADE & SHEPHERD COAL COMPANY
HC 84, BOX 1404
WHITESBURG
KENTUCKY 41858

P.N. 867-0298
POND #2
ROXANNA

WATER REPORT

pH	7.87
TOTAL ALKALINITY,(AS CACO3 EQUIVALENT	302.00 MG/L
TOTAL ACIDITY, (AS CACO3 EQUIVALENT)	0.00 MG/L
TOTAL SUSPENDED SOLIDS	9 MG/L
TOTAL IRON	0.18 MG/L
TOTAL MANGANESE	<0.01 MG/L

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Respectfully Submitted, Terry York

Lab. No. 96722

Date Rec'd. 07/29/93

Date Sampled 07/29/93

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HC 84, BOX 1404
WHITESBURG
KENTUCKY 41858

P.N. 867-0298
POND #2
ROXANNA

WATER REPORT

pH	7.57
TOTAL ALKALINITY,(AS CACO3 EQUIVALENT	198.00 MG/L
TOTAL ACIDITY, (AS CACO3 EQUIVALENT)	0.00 MG/L
TOTAL SUSPENDED SOLIDS	17 MG/L
TOTAL IRON	0.22 MG/L
TOTAL MANGANESE	<0.01 MG/L

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Respectfully Submitted, Terry York

Lab. No. 96723

Date Rec'd. 08/12/93

Date Sampled 08/12/93

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WHITESBURG
KENTUCKY 41858

SAMPLE ID:

P.N. 867-0298
POND #2
ROXANNA

WATER REPORT

pH	7.77
TOTAL ALKALINITY,(AS CACO3 EQUIVALENT	242.00 MG/L
TOTAL ACIDITY, (AS CACO3 EQUIVALENT)	0.00 MG/L
TOTAL SUSPENDED SOLIDS	17 MG/L
TOTAL IRON	0.25 MG/L
TOTAL MANGANESE	<0.01 MG/L

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Respectfully Submitted, Terry York

Lab. No. 96724

Date Rec'd. 08/27/93

Date Sampled 08/27/93

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SAMPLE ID:

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HC 84, BOX 1404
WHITESBURG
KENTUCKY 41858

P.N. 867-0298
POND #2
ROXANNA

WATER REPORT

pH	7.88	
TOTAL ALKALINITY,(AS CACO3 EQUIVALENT	282.00	MG/L
TOTAL ACIDITY, (AS CACO3 EQUIVALENT)	0.00	MG/L
TOTAL SUSPENDED SOLIDS	11	MG/L
TOTAL IRON	0.22	MG/L
TOTAL MANGANESE	<0.01	MG/L

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Respectfully Submitted, Terry York

Lab. No. 96725

Date Rec'd. 09/09/93

Date Sampled 09/09/93

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PO BOX 606
WHITESBURG, KY 41858

SAMPLE ID:

MEADE & SHEPHERD COAL COMPANY
HC 84, BOX 1404
WHITESBURG
KENTUCKY 41858

P.N. 867-0298
POND #2
ROXANNA

WATER REPORT

pH	7.83	
TOTAL ALKALINITY,(AS CACO3 EQUIVALENT	260.00	MG/L
TOTAL ACIDITY, (AS CACO3 EQUIVALENT)	0.00	MG/L
TOTAL SUSPENDED SOLIDS	12	MG/L
TOTAL IRON	0.33	MG/L
TOTAL MANGANESE	<0.01	MG/L

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Respectfully Submitted, Terry York

Lab. No. 96726

Date Rec'd. 09/23/93

Date Sampled 09/23/93

Sampled By YOURSELVES

STANDARD LABORATORIES, INC.
PO BOX 606
WHITESBURG, KY 41858

SAMPLE ID:

MEADE & SHEPHERD COAL COMPANY
HC 84, BOX 1404
WHITESBURG
KENTUCKY 41858

P.N. 867-0298
POND #2
ROXANNA

WATER REPORT

pH	7.81
TOTAL ALKALINITY,(AS CACO3 EQUIVALENT	250.00 MG/L
TOTAL ACIDITY, (AS CACO3 EQUIVALENT)	0.00 MG/L
TOTAL SUSPENDED SOLIDS	13 MG/L
TOTAL IRON	0.11 MG/L
TOTAL MANGANESE	<0.01 MG/L

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Respectfully Submitted, Terry York

Lab. No. 96727

Date Rec'd. 10/28/93

Date Sampled 10/28/93

Sampled By YOURSELVES

STANDARD LABORATORIES, INC.
PO BOX 606
WHITESBURG, KY 41858

MEADE & SHEPHERD COAL COMPANY
HC 84, BOX 1404
WHITESBURG
KENTUCKY 41858

SAMPLE ID:
P.N. 867-0298
POND #2
ROXANNA

WATER REPORT

pH	7.99	
TOTAL ALKALINITY,(AS CACO3 EQUIVALENT	320.00	MG/L
TOTAL ACIDITY, (AS CACO3 EQUIVALENT)	0.00	MG/L
TOTAL SUSPENDED SOLIDS	14	MG/L
TOTAL IRON	0.22	MG/L
TOTAL MANGANESE	<0.01	MG/L

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

Respectfully Submitted, Terry York

Lab. No. 96728

Date Rec'd. 10/28/93

Date Sampled 10/28/93

Sampled By YOURSELVES

STANDARD LABORATORIES, INC.
PO BOX 606
WHITESBURG, KY 41858

SAMPLE ID:

MEADE & SHEPHERD COAL COMPANY
HC 84, BOX 1404
WHITESBURG
KENTUCKY 41858

P.N. 867-0298
G.W.

WATER REPORT

pH	7.98
TOTAL ALKALINITY,(AS CACO3 EQUIVALENT	264.00 MG/L
TOTAL ACIDITY, (AS CACO3 EQUIVALENT)	0.00 MG/L
TOTAL DISSOLVED SOLIDS	144 MG/L
TOTAL SULFATE	56.39 MG/L
DISSOLVED IRON	0.12 MG/L
DISSOLVED MANGANESE	0.02 MG/L

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

Respectfully Submitted, Terry York

WATER QUALITY DATA ENTRY FORMS: Part 1

Type of Report:
[ ] Premining
[ ] During Mining/Reclamation
[ ] Other

STATION INFORMATION

PERMIT #: 867-0298 STATION #: GW SOAP PERMITTEE #: _____

*COUNTY #: _____ *BASIN #: _____ QUAD NAME: _____

STATION TYPE (check): [01] Spring [04] Well
[02] Stream [05] Sediment Pond/Influent
[03] Lake [06] Sediment Pond/Discharge

FOR WELLS ONLY

DEPTH (ft): _____ CASING DIAMETER (in): _____ AQUIFER DESCRIPTION: _____
TOP OF AQUIFER (MSL): _____ AQUIFER THICKNESS (ft): _____ TOP OF WELL ELEVATION (MSL): _____

WATERSHED DESCRIPTION: _____ DRAINAGE AREA (acres): _____

LATITUDE (DMS): _____ LONGITUDE (DMS): _____

UTM ZONE: _____ 16 West of 84° Longitude 17 East of 84° Longitude UTM EASTING: _____ UTM NORTHING: _____

LOCAL STREAM NAME: _____

COAL COMPANY NAME: Meade & Shepherd Coal Co.

COLLECTING FIRM NAME: Meade & Shepherd Coal Co.

ANALYZING FIRM NAME: Standard Labs Inc.

COMMENTS: _____

* Refer to Coding Instructions for list of codes.

4014.pdf

SAMPLE DATA

PERMIT # 867-0298 STATION # GW

Sample No. [ ]

PARAMETER	DATE MM/DD/YY	TEMP(F)	DISCHARGE (cfs)	CONDUCTIVITY (umhos)	pH, (Std. Units)	ACIDITY mg/l	ALKALINITY mg/l	TSS mg/l	TDS mg/l	SETT. SOLIDS ml/l
VALUE	9-16-94				6.87	0	110		132	

PARAMETER	SO_4 DISS. mg/l	O_2 DISS. mg/l	Fe, Diss. mg/l	Fe, Total mg/l	Mn, Diss. mg/l	Mn, Total mg/l	Depth to Water/ft.			
VALUE	9.88		0.05		0.18					

COMMENT:

Sample No. [ ]

PARAMETER	DATE MM/DD/YY	TEMP(F)	DISCHARGE (cfs)	CONDUCTIVITY (umhos)	pH, (Std. Units)	ACIDITY mg/l	ALKALINITY mg/l	TSS mg/l	TDS mg/l	SETT. SOLIDS ml/l
VALUE										

PARAMETER	SO_4 DISS. mg/l	O_2 DISS. mg/l	Fe, Diss. mg/l	Fe, Total mg/l	Mn, Diss. mg/l	Mn, Total mg/l	Depth to Water/ft.			
VALUE										

COMMENT:

Sample No. [ ]

PARAMETER	DATE MM/DD/YY	TEMP(F)	DISCHARGE (cfs)	CONDUCTIVITY (umhos)	pH, (Std. Units)	ACIDITY mg/l	ALKALINITY mg/l	TSS mg/l	TDS mg/l	SETT. SOLIDS ml/l
VALUE										

PARAMETER	SO_4 DISS. mg/l	O_2 DISS. mg/l	Fe, Diss. mg/l	Fe, Total mg/l	Mn, Diss. mg/l	Mn, Total mg/l	Depth to Water/ft.			
VALUE										

Lab. No. 4014

Date Rec'd 09/16/94

Date Sampled 09/16/94

Sampled By YOURSELVES

STANDARD LABORATORIES, INC.
BOX 606
WHITESBURG, KY 41858

SAMPLE ID:

MEADE & SHEPHERD COAL COMPANY
HC 84, BOX 1404
WHITESBURG, KY 41858

ROXANA
PN 867-0298
GW

WATER REPORT

pH	6.87
TOTAL ALKALINITY, (AS CACO3 EQUIVALENT	110 MG/L
TOTAL ACIDITY, (AS CACO3 EQUIVALENT)	0 MG/L
TOTAL DISSOLVED SOLIDS	132 MG/L
TOTAL SULFATE	9.88 MG/L
DISSOLVED IRON	0.05 MG/L
DISSOLVED MANGANESE	0.18 MG/L

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

Respectfully Submitted,

DeLano Thomas

WATER QUALITY DATA ENTRY FORMS: Part 1

Type of Report:
[ ] Premining
[ ] During Mining/Reclamation
[ ] Other

STATION INFORMATION

PERMIT #: 867-0298 STATION #: GW SOAP PERMITTEE #: _____

*COUNTY #: _____ *BASIN #: _____ QUAD NAME: _____

STATION TYPE (check): [01] Spring [04] Well
[02] Stream [05] Sediment Pond/Influent
[03] Lake [06] Sediment Pond/Discharge

FOR WELLS ONLY

DEPTH (ft): _____ CASING DIAMETER (in): _____ AQUIFER DESCRIPTION: _____
TOP OF AQUIFER (MSL): _____ AQUIFER THICKNESS (ft): _____ TOP OF WELL ELEVATION (MSL): _____

WATERSHED DESCRIPTION: _____ DRAINAGE AREA (acres): _____

LATITUDE (DMS): _____ LONGITUDE (DMS): _____

UTM ZONE: _____ 16 West of 84° Longitude 17 East of 84° Longitude UTM EASTING: _____ UTM NORTHING: _____

LOCAL STREAM NAME: _____

COAL COMPANY NAME: Meade & Shepherd Coal Co.

COLLECTING FIRM NAME: Meade & Shepherd Coal Co.

ANALYZING FIRM NAME: Standard Labs Inc.

COMMENTS: _____

* Refer to Coding Instructions for list of codes.

4015.pdf

SAMPLE DATA

PERMIT # 867-0298 STATION # GW

Sample No. [ ]

PARAMETER	DATE MM/DD/YY	TEMP(F)	DISCHARGE (cfs)	CONDUCTIVITY (umhos)	pH, (Std. Units)	ACIDITY mg/l	ALKALINITY mg/l	TSS mg/l	TDS mg/l	SETT. SOLIDS ml/l
VALUE	9-16-94				6.75	0	114		116	

PARAMETER	SO_4 DISS. mg/l	O_2 DISS. mg/l	Fe, Diss. mg/l	Fe, Total mg/l	Mn, Diss. mg/l	Mn, Total mg/l	Depth to Water/ft.			
VALUE	139.53		0.11		0.13					

COMMENT:

Sample No. [ ]

PARAMETER	DATE MM/DD/YY	TEMP(F)	DISCHARGE (cfs)	CONDUCTIVITY (umhos)	pH, (Std. Units)	ACIDITY mg/l	ALKALINITY mg/l	TSS mg/l	TDS mg/l	SETT. SOLIDS ml/l
VALUE										

PARAMETER	SO_4 DISS. mg/l	O_2 DISS. mg/l	Fe, Diss. mg/l	Fe, Total mg/l	Mn, Diss. mg/l	Mn, Total mg/l	Depth to Water/ft.			
VALUE										

COMMENT:

Sample No. [ ]

PARAMETER	DATE MM/DD/YY	TEMP(F)	DISCHARGE (cfs)	CONDUCTIVITY (umhos)	pH, (Std. Units)	ACIDITY mg/l	ALKALINITY mg/l	TSS mg/l	TDS mg/l	SETT. SOLIDS ml/l
VALUE										

PARAMETER	SO_4 DISS. mg/l	O_2 DISS. mg/l	Fe, Diss. mg/l	Fe, Total mg/l	Mn, Diss. mg/l	Mn, Total mg/l	Depth to Water/ft.			
VALUE										

Lab. No. 4015

Date Rec'd 09/16/94

Date Sampled 09/16/94

Sampled By YOURSELVES

STANDARD LABORATORIES, INC.
BOX 606
WHITESBURG, KY 41858

SAMPLE ID:

MEADE & SHEPHERD COAL COMPANY
HC 84, BOX 1404
WHITESBURG, KY 41858

ROXANA
PN 867-0298
GW

WATER REPORT

pH	6.75	
TOTAL ALKALINITY, (AS CACO3 EQUIVALENT	114	MG/L
TOTAL ACIDITY, (AS CACO3 EQUIVALENT)	0	MG/L
TOTAL DISSOLVED SOLIDS	116	MG/L
TOTAL SULFATE	139.53	MG/L
DISSOLVED IRON	0.11	MG/L
DISSOLVED MANGANESE	0.13	MG/L

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

Respectfully Submitted,

[illegible]

ATER QUALITY DATA ENTRY FORMS: Part 1

Type of Report:
[ ] Premining
[ ] During Mining/Reclamation
[ ] Other

STATION INFORMATION

ERMIT #: 867-0298 STATION #: GW SOAP PERMITTEE #: _____

COUNTY #: _____ *BASIN #: _____ QUAD NAME: _____

TATION TYPE (check): [01] Spring [04] Well
[02] Stream [05] Sediment Pond/Influent
[03] Lake [06] Sediment Pond/Discharge

OR WELLS ONLY

EPTH (ft): _____ CASING DIAMETER (in): _____ AQUIFER DESCRIPTION: _____
OP OF AQUIFER (MSL): _____ AQUIFER THICKNESS (ft): _____ TOP OF WELL ELEVATION (MSL): _____

ATERSHED DESCRIPTION: _____ DRAINAGE AREA (acres): _____

ATITUDE (DMS): _____ LONGITUDE (DMS): _____

TM ZONE: _____ 16 West of 84° Longitude UTM EASTING: _____ UTM NORTHING: _____
17 East of 84° Longitude

LOCAL STREAM NAME: _____

COAL COMPANY NAME: Meade & Shepherd Coal Co.

COLLECTING FIRM NAME: Meade & Shepherd Coal Co.

ANALYZING FIRM NAME: Standard Labs Inc.

COMMENTS: _____

* Refer to Coding Instructions for list of codes.

4017.pdf

SAMPLE DATA

PERMIT # 867-0298 STATION # GW

Sample No. [ ]

PARAMETER	DATE MM/DD/YY	TEMP(F)	DISCHARGE (cfs)	CONDUCTIVITY (umhos)	pH, (Std. Units)	ACIDITY mg/l	ALKALINITY mg/l	TSS mg/l	TDS mg/l	SETT. SOLIDS ml/l
VALUE	9-16-94				6.95	0	126		128	

PARAMETER	SO_4 DISS. mg/l	O_2 DISS. mg/l	Fe, Diss. mg/l	Fe, Total mg/l	Mn, Diss. mg/l	Mn, Total mg/l	Depth to Water/ft.			
VALUE	156.00		0.05		0.12					

COMMENT:

Sample No. [ ]

PARAMETER	DATE MM/DD/YY	TEMP(F)	DISCHARGE (cfs)	CONDUCTIVITY (umhos)	pH, (Std. Units)	ACIDITY mg/l	ALKALINITY mg/l	TSS mg/l	TDS mg/l	SETT. SOLIDS ml/l
VALUE										

PARAMETER	SO_4 DISS. mg/l	O_2 DISS. mg/l	Fe, Diss. mg/l	Fe, Total mg/l	Mn, Diss. mg/l	Mn, Total mg/l	Depth to Water/ft.			
VALUE										

COMMENT:

Sample No. [ ]

PARAMETER	DATE MM/DD/YY	TEMP(F)	DISCHARGE (cfs)	CONDUCTIVITY (umhos)	pH, (Std. Units)	ACIDITY mg/l	ALKALINITY mg/l	TSS mg/l	TDS mg/l	SETT. SOLIDS ml/l
VALUE										

PARAMETER	SO_4 DISS. mg/l	O_2 DISS. mg/l	Fe, Diss. mg/l	Fe, Total mg/l	Mn, Diss. mg/l	Mn, Total mg/l	Depth to Water/ft.			
VALUE										

Lab. No. 4017

Date Rec'd 09/16/94

Date Sampled 09/16/94

Sampled By YOURSELVES

STANDARD LABORATORIES, INC.
BOX 606
WHITESBURG, KY 41858

SAMPLE ID:

MEADE & SHEPHERD COAL COMPANY
HC 84, BOX 1101
WHITESBURG, KY 41858

ROXANA
PN 867-0298
GW

WATER REPORT

pH	6.95
TOTAL ALKALINITY, (AS CACO3 EQUIVALENT	126 MG/L
TOTAL ACIDITY, (AS CACO3 EQUIVALENT)	0 MG/L
TOTAL DISSOLVED SOLIDS	128 MG/L
TOTAL SULFATE	156.00 MG/L
DISSOLVED IRON	0.05 MG/L
DISSOLVED MANGANESE	0.12 MG/L

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

Respectfully Submitted,

WATER QUALITY DATA ENTRY FORMS: Part 1

Type of Report:
[ ] Premining
[ ] During Mining/Reclamation
[ ] Other

STATION INFORMATION

PERMIT #: 867-0298 STATION #: Stream SOAP PERMITTEE #: _____

*COUNTY #: _____ *BASIN #: _____ QUAD NAME: _____

STATION TYPE (check): [01] Spring [04] Well
[02] Stream [05] Sediment Pond/Influent
[03] Lake [06] Sediment Pond/Discharge

FOR WELLS ONLY

DEPTH (ft): _____ CASING DIAMETER (in): _____ AQUIFER DESCRIPTION: _____
TOP OF AQUIFER (MSL): _____ AQUIFER THICKNESS (ft): _____ TOP OF WELL ELEVATION (MSL): _____

WATERSHED DESCRIPTION: _____ DRAINAGE AREA (acres): _____

LATITUDE (DMS): _____ LONGITUDE (DMS): _____

UTM ZONE: _____ 16 West of 84° Longitude UTM EASTING: _____ UTM NORTHING: _____
17 East of 84° Longitude

LOCAL STREAM NAME: _____

COAL COMPANY NAME: Meade & Shepherd Coal Co.

COLLECTING FIRM NAME: Meade & Shepherd Coal Co.

ANALYZING FIRM NAME: Standard Labs Inc.

COMMENTS: _____

* Refer to Coding Instructions for list of codes.

4020.pdf

SAMPLE DATA

PERMIT # 867-0298 STATION # Stream

Sample No. [ ]

PARAMETER	DATE MM/DD/YY	TEMP(F)	DISCHARGE (cfs)	CONDUCTIVITY (umhos)	pH, (Std. Units)	ACIDITY mg/l	ALKALINITY mg/l	TSS mg/l	TDS mg/l	SETT. SOLIDS ml/l
VALUE	9-16-94			0.160	6.81	0	114	30	92	

PARAMETER	SO_4 DISS. mg/l	O_2 DISS. mg/l	Fe, Diss. mg/l	Fe, Total mg/l	Mn, Diss. mg/l	Mn, Total mg/l	Depth to Water/ft.			
VALUE	88.49			0.69		0.09				

COMMENT:

Sample No. [ ]

PARAMETER	DATE MM/DD/YY	TEMP(F)	DISCHARGE (cfs)	CONDUCTIVITY (umhos)	pH, (Std. Units)	ACIDITY mg/l	ALKALINITY mg/l	TSS mg/l	TDS mg/l	SETT. SOLIDS ml/l
VALUE										

PARAMETER	SO_4 DISS. mg/l	O_2 DISS. mg/l	Fe, Diss. mg/l	Fe, Total mg/l	Mn, Diss. mg/l	Mn, Total mg/l	Depth to Water/ft.			
VALUE										

COMMENT:

Sample No. [ ]

PARAMETER	DATE MM/DD/YY	TEMP(F)	DISCHARGE (cfs)	CONDUCTIVITY (umhos)	pH, (Std. Units)	ACIDITY mg/l	ALKALINITY mg/l	TSS mg/l	TDS mg/l	SETT. SOLIDS ml/l
VALUE										

PARAMETER	SO_4 DISS. mg/l	O_2 DISS. mg/l	Fe, Diss. mg/l	Fe, Total mg/l	Mn, Diss. mg/l	Mn, Total mg/l	Depth to Water/ft.			
VALUE										

Lab. No. 4020

Date Rec'd 09/16/94

Date Sampled 09/16/94

Sampled By YOURSELVES

STANDARD LABORATORIES, INC.
PO BOX 606
WHITESBURG, KY 41858

SAMPLE ID:

HEADE & SHEPHERD COAL COMPANY
HC 84, BOX 1404
WHITESBURG, KY 41858

ROXANA
PN 867-0298
STREAM

WATER REPORT

pH	6.81	
TOTAL ALKALINITY,(AS CACO3 EQUIVALENT	114	MG/L
TOTAL ACIDITY, (AS CACO3 EQUIVALENT)	0	MG/L
TOTAL SUSPENDED SOLIDS	30	MG/L
TOTAL IRON	0.69	MG/L
TOTAL MANGANESE	0.09	MG/L
TOTAL DISSOLVED SOLIDS	92	MG/L
TOTAL SULFATE	88.49	MG/L
SPECIFIC CONDUCTANCE	0.160	MICROMHOS/CM

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

Respectfully Submitted,

WATER QUALITY DATA ENTRY FORMS: Part 1

Type of Report:
[ ] Premining
[ ] During Mining/Reclamation
[ ] Other

STATION INFORMATION

PERMIT #: 867-0298 STATION #: Stream SOAP PERMITTEE #: _____

*COUNTY #: _____ *BASIN #: _____ QUAD NAME: _____

STATION TYPE (check): [01] Spring [04] Well
[02] Stream [05] Sediment Pond/Influent
[03] Lake [06] Sediment Pond/Discharge

FOR WELLS ONLY

DEPTH (ft): _____ CASING DIAMETER (in): _____ AQUIFER DESCRIPTION: _____
TOP OF AQUIFER (MSL): _____ AQUIFER THICKNESS (ft): _____ TOP OF WELL ELEVATION (MSL): _____

WATERSHED DESCRIPTION: _____ DRAINAGE AREA (acres): _____

LATITUDE (DMS): _____ LONGITUDE (DMS): _____

UTM ZONE: _____ 16 West of 84° Longitude 17 East of 84° Longitude UTM EASTING: _____ UTM NORTHING: _____

LOCAL STREAM NAME: _____

COAL COMPANY NAME: Meade & Shepherd Coal Co.

COLLECTING FIRM NAME: Meade & Shepherd Coal Co.

ANALYZING FIRM NAME: Standard Labs Inc.

COMMENTS: _____

* Refer to Coding Instructions for list of codes.

4023.pdf

SAMPLE DATA

PERMIT # 867-0298 STATION # Stream

Sample No. [ ]

PARAMETER	DATE MM/DD/YY	TEMP(F)	DISCHARGE (cfs)	CONDUCTIVITY (umhos)	pH, (Std. Units)	ACIDITY mg/l	ALKALINITY mg/l	TSS mg/l	TDS mg/l	SETT. SOLIDS ml/l
VALUE	9-16-94			0.128	7.00	0	106	50	250	

PARAMETER	SO_4 DISS. mg/l	O_2 DISS. mg/l	Fe, Diss. mg/l	Fe, Total mg/l	Mn, Diss. mg/l	Mn, Total mg/l	Depth to Water/ft.			
VALUE	108.25			0.64		0.10				

COMMENT:

Sample No. [ ]

PARAMETER	DATE MM/DD/YY	TEMP(F)	DISCHARGE (cfs)	CONDUCTIVITY (umhos)	pH, (Std. Units)	ACIDITY mg/l	ALKALINITY mg/l	TSS mg/l	TDS mg/l	SETT. SOLIDS ml/l
VALUE										

PARAMETER	SO_4 DISS. mg/l	O_2 DISS. mg/l	Fe, Diss. mg/l	Fe, Total mg/l	Mn, Diss. mg/l	Mn, Total mg/l	Depth to Water/ft.			
VALUE										

COMMENT:

Sample No. [ ]

PARAMETER	DATE MM/DD/YY	TEMP(F)	DISCHARGE (cfs)	CONDUCTIVITY (umhos)	pH, (Std. Units)	ACIDITY mg/l	ALKALINITY mg/l	TSS mg/l	TDS mg/l	SETT. SOLIDS ml/l
VALUE										

PARAMETER	SO_4 DISS. mg/l	O_2 DISS. mg/l	Fe, Diss. mg/l	Fe, Total mg/l	Mn, Diss. mg/l	Mn, Total mg/l	Depth to Water/ft.			
VALUE										

Lab. No. 4023

Date Rec'd 09/16/94

Date Sampled 09/16/94

Sampled By YOURSELVES

STANDARD LABORATORIES, INC.

PO BOX 606
WHITESBURG, KY 41858

SAMPLE ID:

MEADE & SHEPHERD COAL COMPANY
HC 84, BOX 1404
WHITESBURG, KY 41858

ROXANA
PN 867-0298
STREAM

WATER REPORT

pH	7.00	
TOTAL ALKALINITY,(AS CACO3 EQUIVALENT	106	MG/L
TOTAL ACIDITY, (AS CACO3 EQUIVALENT)	0	MG/L
TOTAL SUSPENDED SOLIDS	50	MG/L
TOTAL IRON	0.64	MG/L
TOTAL MANGANESE	0.10	MG/L
TOTAL DISSOLVED SOLIDS	250	MG/L
TOTAL SULFATE	108.25	MG/L
SPECIFIC CONDUCTANCE	.128	MICROMHOS/CM

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

Respectfully Submitted,

ATER QUALITY DATA ENTRY FORMS: Part 1

Type of Report:
[ ] Premining
[ ] During Mining/Reclamation
[ ] Other

STATION INFORMATION

ERMIT #: 867-0298 STATION #: Stream SOAP PERMITTEE #: _____

COUNTY #: _____ *BASIN #: _____ QUAD NAME: _____

STATION TYPE (check): [01] Spring [04] Well
[02] Stream [05] Sediment Pond/Influent
[03] Lake [06] Sediment Pond/Discharge

FOR WELLS ONLY

DEPTH (ft): _____ CASING DIAMETER (in): _____ AQUIFER DESCRIPTION: _____
TOP OF AQUIFER (MSL): _____ AQUIFER THICKNESS (ft): _____ TOP OF WELL ELEVATION (MSL): _____

WATERSHED DESCRIPTION: _____ DRAINAGE AREA (acres): _____

LATITUDE (DMS): _____ LONGITUDE (DMS): _____

UTM ZONE: _____ 16 West of 84° Longitude 17 East of 84° Longitude UTM EASTING: _____ UTM NORTHING: _____

LOCAL STREAM NAME: _____

COAL COMPANY NAME: Meade & Shepherd Coal Co.

COLLECTING FIRM NAME: Meade & Shepherd Coal Co.

ANALYZING FIRM NAME: Standard Labs Inc.

COMMENTS: _____

* Refer to Coding Instructions for list of codes.

4024.pdf

SAMPLE DATA

PERMIT # 867-0298 STATION # Stream

Sample No. [ ]

PARAMETER	DATE MM/DD/YY	TEMP(F)	DISCHARGE (cfs)	CONDUCTIVITY (umhos)	pH, (Std. Units)	ACIDITY mg/l	ALKALINITY mg/l	TSS mg/l	TDS mg/l	SETT. SOLIDS ml/l
VALUE	9-16-94			0.154	6.70	0	116	70	80	

PARAMETER	SO_4 DISS. mg/l	O_2 DISS. mg/l	Fe, Diss. mg/l	Fe, Total mg/l	Mn, Diss. mg/l	Mn, Total mg/l	Depth to Water/ft.			
VALUE	122.66			0.57		0.07				

COMMENT:

Sample No. [ ]

PARAMETER	DATE MM/DD/YY	TEMP(F)	DISCHARGE (cfs)	CONDUCTIVITY (umhos)	pH, (Std. Units)	ACIDITY mg/l	ALKALINITY mg/l	TSS mg/l	TDS mg/l	SETT. SOLIDS ml/l
VALUE										

PARAMETER	SO_4 DISS. mg/l	O_2 DISS. mg/l	Fe, Diss. mg/l	Fe, Total mg/l	Mn, Diss. mg/l	Mn, Total mg/l	Depth to Water/ft.			
VALUE										

COMMENT:

Sample No. [ ]

PARAMETER	DATE MM/DD/YY	TEMP(F)	DISCHARGE (cfs)	CONDUCTIVITY (umhos)	pH, (Std. Units)	ACIDITY mg/l	ALKALINITY mg/l	TSS mg/l	TDS mg/l	SETT. SOLIDS ml/l
VALUE										

PARAMETER	SO_4 DISS. mg/l	O_2 DISS. mg/l	Fe, Diss. mg/l	Fe, Total mg/l	Mn, Diss. mg/l	Mn, Total mg/l	Depth to Water/ft.			
VALUE										

Lab. No. 4024

Date Rec'd 09/16/94

Date Sampled 09/16/94

Sampled By YOURSELVES

STANDARD LABORATORIES, INC.
PO BOX 606
WHITESBURG, KY 41858

SAMPLE ID:

MEADE & SHEPHERD COAL COMPANY
HC 84, BOX 1404
WHITESBURG, KY 41858

ROXANA
PN 867-0298
STREAM

WATER REPORT

pH	6.70
TOTAL ALKALINITY,(AS CACO3 EQUIVALENT	116 MG/L
TOTAL ACIDITY, (AS CACO3 EQUIVALENT)	0 MG/L
TOTAL SUSPENDED SOLIDS	70 MG/L
TOTAL IRON	0.57 MG/L
TOTAL MANGANESE	0.07 MG/L
TOTAL DISSOLVED SOLIDS	80 MG/L
TOTAL SULFATE	122.66 MG/L
SPECIFIC CONDUCTANCE	0.154 MICROMHOS/CM

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

Respectfully Submitted,

Lab. No. 4203

Date Rec'd 09/28/94

Date Sampled

Sampled By YOURSELVES

STANDARD LABORATORIES, INC.
PO BOX 606
WHITESBURG, KY 41858

SAMPLE ID:

MEADE & SHEPHERD COAL COMPANY
HC 84, BOX 1404
WHITESBURG, KY 41858

ROXANA - STREAM
PN #867-0298

WATER REPORT

pH	6.43	
TOTAL ALKALINITY,(AS CACO3 EQUIVALENT	116	MG/L
TOTAL ACIDITY, (AS CACO3 EQUIVALENT)	0	MG/L
TOTAL SUSPENDED SOLIDS	12	MG/L
TOTAL IRON	0.57	MG/L
TOTAL MANGANESE	0.08	MG/L
TOTAL DISSOLVED SOLIDS	158	MG/L
TOTAL SULFATE	4.94	MG/L
SPECIFIC CONDUCTANCE	0.686	MICROMHOS/CM

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

Respectfully Submitted,

Delano Thomas, VP

WATER QUALITY DATA ENTRY FORMS: Part 1

Type of Report:
[ ] Premining
[ ] During Mining/Reclamation
[ ] Other

STATION INFORMATION

PERMIT #: 867-0298 STATION #: Stream SOAP PERMITTEE #: _____

*COUNTY #: _____ *BASIN #: _____ QUAD NAME: _____

STATION TYPE (check): [01] Spring [02] Stream [03] Lake [04] Well [05] Sediment Pond/Influent [06] Sediment Pond/Discharge

FOR WELLS ONLY

DEPTH (ft): _____ CASING DIAMETER (in): _____ AQUIFER DESCRIPTION: _____

TOP OF AQUIFER (MSL): _____ AQUIFER THICKNESS (ft): _____ TOP OF WELL ELEVATION (MSL): _____

WATERSHED DESCRIPTION: _____ DRAINAGE AREA (acres): _____

LATITUDE (DMS): _____ LONGITUDE (DMS): _____

UTM ZONE: _____ 16 West of 84° Longitude 17 East of 84° Longitude UTM EASTING: _____ UTM NORTHING: _____

LOCAL STREAM NAME: _____

COAL COMPANY NAME: Meade + Shepherd Coal Co.

COLLECTING FIRM NAME: Meade + Shepherd Coal Co.

ANALYZING FIRM NAME: Standard Labs. Inc.

COMMENTS: _____

* Refer to Coding Instructions for list of codes.

4204.pdf

SAMPLE DATA

PERMIT # 867-0298 STATION # Stream

Sample No. [ ]

PARAMETER	DATE MM/DD/YY	TEMP(F)	DISCHARGE (cfs)	CONDUCTIVITY (umhos)	pH, (Std. Units)	ACIDITY mg/l	ALKALINITY mg/l	TSS mg/l	TDS mg/l	SETT. SOLIDS ml/l
VALUE	9-28-94			0.697	6.34	0	124	20	160	

PARAMETER	SO_4 DISS. mg/l	O_2 DISS. mg/l	Fe, Diss. mg/l	Fe, Total mg/l	Mn, Diss. mg/l	Mn, Total mg/l	Depth to Water/ft.			
VALUE	4.94			0.77		0.34				

COMMENT:

Sample No. [ ]

PARAMETER	DATE MM/DD/YY	TEMP(F)	DISCHARGE (cfs)	CONDUCTIVITY (umhos)	pH, (Std. Units)	ACIDITY mg/l	ALKALINITY mg/l	TSS mg/l	TDS mg/l	SETT. SOLIDS ml/l
VALUE										

PARAMETER	SO_4 DISS. mg/l	O_2 DISS. mg/l	Fe, Diss. mg/l	Fe, Total mg/l	Mn, Diss. mg/l	Mn, Total mg/l	Depth to Water/ft.			
VALUE										

COMMENT:

Sample No. [ ]

PARAMETER	DATE MM/DD/YY	TEMP(F)	DISCHARGE (cfs)	CONDUCTIVITY (umhos)	pH, (Std. Units)	ACIDITY mg/l	ALKALINITY mg/l	TSS mg/l	TDS mg/l	SETT. SOLIDS ml/l
VALUE										

PARAMETER	SO_4 DISS. mg/l	O_2 DISS. mg/l	Fe, Diss. mg/l	Fe, Total mg/l	Mn, Diss. mg/l	Mn, Total mg/l	Depth to Water/ft.			
VALUE										

Lab. No. 4204

Date Rec'd 09/28/94

Date Sampled

Sampled By YOURSELVES

STANDARD LABORATORIES, INC.

PO BOX 606
WHITESBURG, KY 41858

SAMPLE ID:

HEADE & SHEPHERD COAL COMPANY
HC 84, BOX 1404
WHITESBURG, KY 41858

ROXANA - STREAM
PN #867-0298

WATER REPORT

pH	6.34
TOTAL ALKALINITY, (AS CACO3 EQUIVALENT	124 MG/L
TOTAL ACIDITY, (AS CACO3 EQUIVALENT)	0 MG/L
TOTAL SUSPENDED SOLIDS	20 MG/L
TOTAL IRON	0.77 MG/L
TOTAL MANGANESE	0.34 MG/L
TOTAL DISSOLVED SOLIDS	160 MG/L
TOTAL SULFATE	4.94 MG/L
SPECIFIC CONDUCTANCE	0.697 MICROMHOS/CM

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

Respectfully Submitted,

Delano Thomas, VP

WATER QUALITY DATA ENTRY FORMS: Part 1

Type of Report:
[ ] Premining
[ ] During Mining/Reclamation
[ ] Other

STATION INFORMATION

PERMIT #: 867-0298 STATION #: Stream SOAP PERMITTEE #: _____

*COUNTY #: _____ *BASIN #: _____ QUAD NAME: _____

STATION TYPE (check): [01] Spring [04] Well
[02] Stream [05] Sediment Pond/Influent
[03] Lake [06] Sediment Pond/Discharge

FOR WELLS ONLY

DEPTH (ft): _____ CASING DIAMETER (in): _____ AQUIFER DESCRIPTION: _____
TOP OF AQUIFER (MSL): _____ AQUIFER THICKNESS (ft): _____ TOP OF WELL ELEVATION (MSL): _____

WATERSHED DESCRIPTION: _____ DRAINAGE AREA (acres): _____

LATITUDE (DMS): _____ LONGITUDE (DMS): _____

UTM ZONE: _____ 16 West of 84° Longitude 17 East of 84° Longitude UTM EASTING: _____ UTM NORTHING: _____

LOCAL STREAM NAME: _____

COAL COMPANY NAME: Meade & Shepherd Coal Co.

COLLECTING FIRM NAME: Meade & Shepherd Coal Co.

ANALYZING FIRM NAME: Standard Labs Inc.

COMMENTS: _____

* Refer to Coding Instructions for list of codes.

4205.pdf

SAMPLE DATA

PERMIT # 867-0298 STATION # Stream

Sample No. [ ]

PARAMETER	DATE MM/DD/YY	TEMP(F)	DISCHARGE (cfs)	CONDUCTIVITY (umhos)	pH, (Std. Units)	ACIDITY mg/l	ALKALINITY mg/l	TSS mg/l	TDS mg/l	SETT. SOLIDS ml/l
VALUE	9-28-94			0.678	6.42	0	103	8	162	

PARAMETER	SO_4 DISS. mg/l	O_2 DISS. mg/l	Fe, Diss. mg/l	Fe, Total mg/l	Mn, Diss. mg/l	Mn, Total mg/l	Depth to Water/ft.			
VALUE	3.29			0.60		0.17				

COMMENT:

Sample No. [ ]

PARAMETER	DATE MM/DD/YY	TEMP(F)	DISCHARGE (cfs)	CONDUCTIVITY (umhos)	pH, (Std. Units)	ACIDITY mg/l	ALKALINITY mg/l	TSS mg/l	TDS mg/l	SETT. SOLIDS ml/l
VALUE										

PARAMETER	SO_4 DISS. mg/l	O_2 DISS. mg/l	Fe, Diss. mg/l	Fe, Total mg/l	Mn, Diss. mg/l	Mn, Total mg/l	Depth to Water/ft.			
VALUE										

COMMENT:

Sample No. [ ]

PARAMETER	DATE MM/DD/YY	TEMP(F)	DISCHARGE (cfs)	CONDUCTIVITY (umhos)	pH, (Std. Units)	ACIDITY mg/l	ALKALINITY mg/l	TSS mg/l	TDS mg/l	SETT. SOLIDS ml/l
VALUE										

PARAMETER	SO_4 DISS. mg/l	O_2 DISS. mg/l	Fe, Diss. mg/l	Fe, Total mg/l	Mn, Diss. mg/l	Mn, Total mg/l	Depth to Water/ft.			
VALUE										

Lab. No. 4205

Date Rec'd 09/28/94

Date Sampled

Sampled By YOURSELVES

STANDARD LABORATORIES, INC.

PO BOX 606
WHITESBURG, KY 41858

SAMPLE ID:

MEADE & SHEPHERD COAL COMPANY
HC 84, BOX 1404
WHITESBURG, KY 41858

ROXANA - STREAM
PN #867-0298

WATER REPORT

pH	6.42
TOTAL ALKALINITY,(AS CACO3 EQUIVALENT	103 MG/L
TOTAL ACIDITY, (AS CACO3 EQUIVALENT)	0 MG/L
TOTAL SUSPENDED SOLIDS	8 MG/L
TOTAL IRON	0.60 MG/L
TOTAL MANGANESE	0.17 MG/L
TOTAL DISSOLVED SOLIDS	162 MG/L
TOTAL SULFATE	3.29 MG/L
SPECIFIC CONDUCTANCE	0.678 MICROMHOS/CM

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

Respectfully Submitted,

DeLano Thomas, Jr.

WATER QUALITY DATA ENTRY FORMS: Part 1

Type of Report:
[ ] Premining
[ ] During Mining/Reclamation
[ ] Other

STATION INFORMATION

PERMIT #: 867-0298 STATION #: GW SOAP PERMITTEE #: _____

*COUNTY #: _____ *BASIN #: _____ QUAD NAME: _____

STATION TYPE (check): [01] Spring [04] Well
[02] Stream [05] Sediment Pond/Influent
[03] Lake [06] Sediment Pond/Discharge

FOR WELLS ONLY

DEPTH (ft): _____ CASING DIAMETER (in): _____ AQUIFER DESCRIPTION: _____
TOP OF AQUIFER (MSL): _____ AQUIFER THICKNESS (ft): _____ TOP OF WELL ELEVATION (MSL): _____

WATERSHED DESCRIPTION: _____ DRAINAGE AREA (acres): _____

LATITUDE (DMS): _____ LONGITUDE (DMS): _____

UTM ZONE: _____ 16 West of 84° Longitude 17 East of 84° Longitude UTM EASTING: _____ UTM NORTHING: _____

LOCAL STREAM NAME: _____

COAL COMPANY NAME: Meade & Shepherd Coal Co.

COLLECTING FIRM NAME: Meade & Shepherd Coal Co.

ANALYZING FIRM NAME: Standard Lab Inc.

COMMENTS: _____

* Refer to Coding Instructions for list of codes.

4209.pdf

SAMPLE DATA

PERMIT # 867-0298 STATION # GW

Sample No. [ ]

PARAMETER	DATE MM/DD/YY	TEMP(F)	DISCHARGE (cfs)	CONDUCTIVITY (umhos)	pH, (Std. Units)	ACIDITY mg/l	ALKALINITY mg/l	TSS mg/l	TDS mg/l	SETT. SOLIDS ml/l
VALUE	9-28-94				6.75	0	118		124	

PARAMETER	SO_4 DISS. mg/l	O_2 DISS. mg/l	Fe, Diss. mg/l	Fe, Total mg/l	Mn, Diss. mg/l	Mn, Total mg/l	Depth to Water/ft.			
VALUE	5.76		0.16		0.20					

COMMENT:

Sample No. [ ]

PARAMETER	DATE MM/DD/YY	TEMP(F)	DISCHARGE (cfs)	CONDUCTIVITY (umhos)	pH, (Std. Units)	ACIDITY mg/l	ALKALINITY mg/l	TSS mg/l	TDS mg/l	SETT. SOLIDS ml/l
VALUE										

PARAMETER	SO_4 DISS. mg/l	O_2 DISS. mg/l	Fe, Diss. mg/l	Fe, Total mg/l	Mn, Diss. mg/l	Mn, Total mg/l	Depth to Water/ft.			
VALUE										

COMMENT:

Sample No. [ ]

PARAMETER	DATE MM/DD/YY	TEMP(F)	DISCHARGE (cfs)	CONDUCTIVITY (umhos)	pH, (Std. Units)	ACIDITY mg/l	ALKALINITY mg/l	TSS mg/l	TDS mg/l	SETT. SOLIDS ml/l
VALUE										

PARAMETER	SO_4 DISS. mg/l	O_2 DISS. mg/l	Fe, Diss. mg/l	Fe, Total mg/l	Mn, Diss. mg/l	Mn, Total mg/l	Depth to Water/ft.			
VALUE										

Lab. No. 4209

Date Rec'd. 09/28/94

Date Sampled

Sampled By YOURSELVES

STANDARD LABORATORIES, INC.
PO BOX 606
WHITESBURG, KY 41858

SAMPLE ID:

MEADE & SHEPHERD COAL COMPANY
HC 84, BOX 1404
WHITESBURG, KY 41858

ROXANA - GROUND WATER
PN #867-0298

WATER REPORT

pH	6.75
TOTAL ALKALINITY,(AS CACO3 EQUIVALENT	118 MG/L
TOTAL ACIDITY, (AS CACO3 EQUIVALENT)	0 MG/L
TOTAL DISSOLVED SOLIDS	124 MG/L
TOTAL SULFATE	5.76 MG/L
DISSOLVED IRON	0.16 MG/L
DISSOLVED MANGANESE	0.20 MG/L

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

Respectfully Submitted,

Delano Thomas

ATER QUALITY DATA ENTRY FORMS: Part 1

Type of Report:
[ ] Premining
[ ] During Mining/Reclamation
[ ] Other

STATION INFORMATION

ERMIT #: 867-0298 STATION #: GW SOAP PERMITTEE #:

COUNTY #: *BASIN #: QUAD NAME:

TATION TYPE (check): [01] Spring [04] Well
[02] Stream [05] Sediment Pond/Influent
[03] Lake [06] Sediment Pond/Discharge

OR WELLS ONLY

EPTH (ft): CASING DIAMETER (in): AQUIFER DESCRIPTION:

OP OF AQUIFER (MSL): AQUIFER THICKNESS (ft): TOP OF WELL ELEVATION (MSL):

WATERSHED DESCRIPTION: DRAINAGE AREA (acres):

LATITUDE (DMS): LONGITUDE (DMS):

UTM ZONE: 16 West of 84° Longitude 17 East of 84° Longitude UTM EASTING: UTM NORTHING:

LOCAL STREAM NAME:

COAL COMPANY NAME: Meade & Shepherd Coal Co.

COLLECTING FIRM NAME: Meade & Shepherd Coal Co.

ANALYZING FIRM NAME: Standard Labs Inc.

COMMENTS:

* Refer to Coding Instructions for list of codes.

4210.pdf

SAMPLE DATA

PERMIT # 867-0298 STATION # GW

Sample No. [ ]

PARAMETER	DATE MM/DD/YY	TEMP(F)	DISCHARGE (cfs)	CONDUCTIVITY (umhos)	pH, (Std. Units)	ACIDITY mg/l	ALKALINITY mg/l	TSS mg/l	TDS mg/l	SETT. SOLIDS ml/l
VALUE	9-28-94				6.52	0	104		148	

PARAMETER	SO_4 DISS. mg/l	O_2 DISS. mg/l	Fe, Diss. mg/l	Fe, Total mg/l	Mn, Diss. mg/l	Mn, Total mg/l	Depth to Water/ft.			
VALUE	32.93		0.25		0.14					

COMMENT:

Sample No. [ ]

PARAMETER	DATE MM/DD/YY	TEMP(F)	DISCHARGE (cfs)	CONDUCTIVITY (umhos)	pH, (Std. Units)	ACIDITY mg/l	ALKALINITY mg/l	TSS mg/l	TDS mg/l	SETT. SOLIDS ml/l
VALUE										

PARAMETER	SO_4 DISS. mg/l	O_2 DISS. mg/l	Fe, Diss. mg/l	Fe, Total mg/l	Mn, Diss. mg/l	Mn, Total mg/l	Depth to Water/ft.			
VALUE										

COMMENT:

Sample No. [ ]

PARAMETER	DATE MM/DD/YY	TEMP(F)	DISCHARGE (cfs)	CONDUCTIVITY (umhos)	pH, (Std. Units)	ACIDITY mg/l	ALKALINITY mg/l	TSS mg/l	TDS mg/l	SETT. SOLIDS ml/l
VALUE										

PARAMETER	SO_4 DISS. mg/l	O_2 DISS. mg/l	Fe, Diss. mg/l	Fe, Total mg/l	Mn, Diss. mg/l	Mn, Total mg/l	Depth to Water/ft.			
VALUE										

Lab. No. 4210

Date Rec'd 09/28/94

Date Sampled

Sampled By YOURSELVES

STANDARD LABORATORIES, INC.
PO BOX 606
WHITESBURG, KY 41858

SAMPLE ID:

MEADE & SHEPHERD COAL COMPANY
HC 84, BOX 1404
WHITESBURG, KY 41858

ROXANA - GROUND WATER
PN #867-0298

WATER REPORT

pH	6.52
TOTAL ALKALINITY,(AS CACO3 EQUIVALENT	104 MG/L
TOTAL ACIDITY, (AS CACO3 EQUIVALENT)	0. MG/L
TOTAL DISSOLVED SOLIDS	148 MG/L
TOTAL SULFATE	32.93 MG/L
DISSOLVED IRON	0.25 MG/L
DISSOLVED MANGANESE	0.14 MG/L

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

Respectfully Submitted, Delano Thomas

Delano Thomas, VP

WATER QUALITY DATA ENTRY FORMS: Part 1

Type of Report:
[ ] Premining
[ ] During Mining/Reclamation
[ ] Other

STATION INFORMATION

PERMIT #: 867-0298 STATION #: GW SOAP PERMITTEE #: _____

*COUNTY #: _____ *BASIN #: _____ QUAD NAME: _____

STATION TYPE (check): [01] Spring [04] Well
[02] Stream [05] Sediment Pond/Influent
[03] Lake [06] Sediment Pond/Discharge

FOR WELLS ONLY

DEPTH (ft): _____ CASING DIAMETER (in): _____ AQUIFER DESCRIPTION: _____
TOP OF AQUIFER (MSL): _____ AQUIFER THICKNESS (ft): _____ TOP OF WELL ELEVATION (MSL): _____

WATERSHED DESCRIPTION: _____ DRAINAGE AREA (acres): _____

LATITUDE (DMS): _____ LONGITUDE (DMS): _____

UTM ZONE: _____ 16 West of 84° Longitude 17 East of 84° Longitude UTM EASTING: _____ UTM NORTHING: _____

LOCAL STREAM NAME: _____

COAL COMPANY NAME: Meade & Shepherd Coal Co.

COLLECTING FIRM NAME: Meade & Shepherd Coal Co.

ANALYZING FIRM NAME: Standard Labs Inc.

COMMENTS: _____

* Refer to Coding Instructions for list of codes.

4211.pdf

SAMPLE DATA

PERMIT # 867-0298 STATION # GW

Sample No. [ ]

PARAMETER	DATE MM/DD/YY	TEMP(F)	DISCHARGE (cfs)	CONDUCTIVITY (umhos)	pH, (Std. Units)	ACIDITY mg/l	ALKALINITY mg/l	TSS mg/l	TDS mg/l	SETT. SOLIDS ml/l
VALUE	9-28-94				6.56	0	118		68	

PARAMETER	SO_4 DISS. mg/l	O_2 DISS. mg/l	Fe, Diss. mg/l	Fe, Total mg/l	Mn, Diss. mg/l	Mn, Total mg/l	Depth to Water/ft.			
VALUE	17.29		0.43		0.25					

COMMENT:

Sample No. [ ]

PARAMETER	DATE MM/DD/YY	TEMP(F)	DISCHARGE (cfs)	CONDUCTIVITY (umhos)	pH, (Std. Units)	ACIDITY mg/l	ALKALINITY mg/l	TSS mg/l	TDS mg/l	SETT. SOLIDS ml/l
VALUE										

PARAMETER	SO_4 DISS. mg/l	O_2 DISS. mg/l	Fe, Diss. mg/l	Fe, Total mg/l	Mn, Diss. mg/l	Mn, Total mg/l	Depth to Water/ft.			
VALUE										

COMMENT:

Sample No. [ ]

PARAMETER	DATE MM/DD/YY	TEMP(F)	DISCHARGE (cfs)	CONDUCTIVITY (umhos)	pH, (Std. Units)	ACIDITY mg/l	ALKALINITY mg/l	TSS mg/l	TDS mg/l	SETT. SOLIDS ml/l
VALUE										

PARAMETER	SO_4 DISS. mg/l	O_2 DISS. mg/l	Fe, Diss. mg/l	Fe, Total mg/l	Mn, Diss. mg/l	Mn, Total mg/l	Depth to Water/ft.			
VALUE										

Lab. No. 4211

Date Rec'd 09/28/94

Date Sampled

Sampled By YOURSELVES

STANDARD LABORATORIES, INC.
PO BOX 606
WHITESBURG, KY 41858

SAMPLE ID:

MEADE & SHEPHERD COAL COMPANY
HC 84, BOX 1404
WHITESBURG, KY 41858

ROXANA - GROUND WATER
PN #867-0298

WATER REPORT

pH	6.56	
TOTAL ALKALINITY,(AS CACO3 EQUIVALENT	118	MG/L
TOTAL ACIDITY, (AS CACO3 EQUIVALENT)	0	MG/L
TOTAL DISSOLVED SOLIDS	68	MG/L
TOTAL SULFATE	17.29	MG/L
DISSOLVED IRON	0.43	MG/L
DISSOLVED MANGANESE	0.25	MG/L

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

Respectfully Submitted, Delano Thomas

Delano Thomas, VP

Lab. No. 5753

Date Rec'd. 1/10/95

Date Sampled 12/31/94

Sampled By YOURSELVES

STANDARD LABORATORIES, INC.
PO BOX 606
WHITESBURG, KY 41858

SAMPLE ID:

MEADE & SHEPHERD COAL COMPANY
HC 84, BOX 1404
WHITESBURG, KY 41858

LETCHER
P.N. #867-0298

WATER REPORT

pH	7.86
TOTAL ALKALINITY,(AS CACO3 EQUIVALENT)	220.00 MG/L
TOTAL ACIDITY, (AS CACO3 EQUIVALENT)	0.00 MG/L
TOTAL SUSPENDED SOLIDS	8 MG/L
TOTAL IRON	0.65 MG/L
TOTAL MANGANESE	0.05 MG/L
TOTAL DISSOLVED SOLIDS	1321 MG/L
TOTAL SULFATE	811.65 MG/L
SPECIFIC CONDUCTANCE	1.559 MICROMHOS/CM

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

Respectfully Submitted,

Delano Thomas, VP

Lab. No. 5754

Date Rec'd 01/10/95

Date Sampled 12/31/94

Sampled By YOURSELVES

STANDARD LABORATORIES, INC.
PO BOX 606
WHITESBURG, KY 41858

MEADE & SHEPHERD COAL COMPANY
HC 84, BOX 1404
WHITESBURG, KY 41858

SAMPLE ID:
LETCHER
P.N. #867-0298

WATER REPORT

pH	7.85
TOTAL ALKALINITY,(AS CACO3 EQUIVALENT)	200.00 MG/L
TOTAL ACIDITY, (AS CACO3 EQUIVALENT)	0.00 MG/L
TOTAL SUSPENDED SOLIDS	7 MG/L
TOTAL IRON	0.54 MG/L
TOTAL MANGANESE	0.01 MG/L
TOTAL DISSOLVED SOLIDS	1221 MG/L
TOTAL SULFATE	812.50 MG/L
SPECIFIC CONDUCTANCE	1.581 MICROMHOS/CM

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

Respectfully Submitted,

Delano Thomas, VP

Lab. No. 5755

Date Rec'd. 1/10/95

Date Sampled 12/31/94

Sampled By YOURSELVES

STANDARD LABORATORIES, INC.
PO BOX 606
WHITESBURG, KY 41858

SAMPLE ID:

MEADE & SHEPHERD COAL COMPANY
HC 84, BOX 1404
WHITESBURG, KY 41858

LETCHER
P.N. #867-0298

WATER REPORT

pH	7.89	
TOTAL ALKALINITY, (AS CACO3 EQUIVALENT)	226.00	MG/L
TOTAL ACIDITY, (AS CACO3 EQUIVALENT)	0.00	MG/L
TOTAL SUSPENDED SOLIDS	11	MG/L
TOTAL IRON	0.70	MG/L
TOTAL MANGANESE	0.02	MG/L
TOTAL DISSOLVED SOLIDS	1310	MG/L
TOTAL SULFATE	829.37	MG/L
SPECIFIC CONDUCTANCE	1.544	MICROMHOS/CM

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

Respectfully Submitted,

Delano Thomas, VP

Lab. No. 5759

Date Rec'd. 1/10/95

Date Sampled 12/31/94

Sampled By YOURSELVES

STANDARD LABORATORIES, INC.

PO BOX 606
WHITESBURG, KY 41858

SAMPLE ID:

MEADE & SHEPHERD COAL COMPANY
HC 84, BOX 1404
WHITESBURG, KY 41858

LETCHER
P.N. #867-0298

WATER REPORT

pH	6.80
TOTAL ALKALINITY,(AS CACO3 EQUIVALENT)	66.00 MG/L
TOTAL ACIDITY, (AS CACO3 EQUIVALENT)	0.00 MG/L
TOTAL DISSOLVED SOLIDS	75 MG/L
DISSOLVED IRON	1.46 MG/L
DISSOLVED MANGANESE	0.04 MG/L
TOTAL SULFATE	51.45 MG/L

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

Respectfully Submitted,

Delano Thomas, VP

Lab. No. 5760

Date Rec'd. 1/10/95

Date Sampled 12/31/94

Sampled By YOURSELVES

STANDARD LABORATORIES, INC.

PO BOX 606
WHITESBURG, KY 41858

SAMPLE ID:

MEADE & SHEPHERD COAL COMPANY
HC 84, BOX 1404
WHITESBURG, KY 41858

LETCHER
P.N. #867-0298

WATER REPORT

pH	6.68
TOTAL ALKALINITY,(AS CACO3 EQUIVALENT)	94.00 MG/L
TOTAL ACIDITY, (AS CACO3 EQUIVALENT)	0.00 MG/L
TOTAL DISSOLVED SOLIDS	108 MG/L
DISSOLVED IRON	0.24 MG/L
DISSOLVED MANGANESE	0.02 MG/L
TOTAL SULFATE	34.16 MG/L

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

Respectfully Submitted,

Delano Thomas, VP

Lab. No. 5761

Date Rec'd. 1/10/95

Date Sampled 12/31/94

Sampled By YOURSELVES

STANDARD LABORATORIES, INC.

PO BOX 606
WHITESBURG, KY 41858

SAMPLE ID:

MEADE & SHEPHERD COAL COMPANY
HC 84, BOX 1404
WHITESBURG, KY 41858

LETCHER
P.N. #867-0298

WATER REPORT

pH	6.72
TOTAL ALKALINITY,(AS CACO3 EQUIVALENT)	84.00 MG/L
TOTAL ACIDITY, (AS CACO3 EQUIVALENT)	0.00 MG/L
TOTAL DISSOLVED SOLIDS	102 MG/L
DISSOLVED IRON	0.70 MG/L
DISSOLVED MANGANESE	<0.01 MG/L
TOTAL SULFATE	36.22 MG/L

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

Respectfully Submitted,

Delano Thomas, VP

QUALITY DATA ENTRY FORMS: Part 1

Type of Report:
[ ] Premining
[ ] During Mining/Reclamation
[ ] Other

STATION INFORMATION

IT #: January 867-0298

STATION #: Stream

SOAP PERMITTEE #:

NTY #:

*BASIN #:

QUAD NAME:

ION TYPE (check): [01] Spring [02] Stream [03] Lake [04] Well [05] Sediment Pond/Influent [06] Sediment Pond/Discharge

WELLS ONLY

TH (ft):

CASING DIAMETER (in):

AQUIFER DESCRIPTION:

TOP OF WELL ELEVATION (MSL):

OF AQUIFER (MSL):

AQUIFER THICKNESS (ft):

DRAINAGE AREA (acres):

ERSHED DESCRIPTION:

LONGITUDE (DMS):

ITITUDE (DMS):

UTM NORTHING:

UTM EASTING:

H ZONE:

16 West of 84° Longitude
17 East of 84° Longitude

CAL STREAM NAME:

AL COMPANY NAME: Meade + Shepherd

OLLECTING FIRM NAME: Meade + Shepherd

ALYZING FIRM NAME: Standard Labs, Inc.

OMMENTS:

STREAM ANALYSIS

COMPANY	PERMIT #	STATION #	SAMPLE #	DATE
Meade/Shepherd	867-0298	SW	7707	6/25/95
pH	**ALKALINITY mg/l**	**ACIDITY mg/l**	**TSS mg/l**	**IRON mg/l**
7.57	224	0	11	0.46
MN mg/l	**TDS mg/l**	**SO4 mg/l**	**SP. COND (umhos)**	**FIELD pH**
0.04	996	526.85	0.556	
TEMP (c)	**FLOW gal. per day**			

STANDARD LABORATORIES, INC.

Lab No. 7707

Date Rec'd. 05/24/95

Date Sampled 03/31/95

Sampled By YOURSELVES

PO BOX 606
WHITESBURG, KY 41858

SAMPLE ID:

MEADE & SHEPHERD COAL COMPANY
HC 84, BOX 1404
WHITESBURG, KY 41858

ROXANA
867-0298
JANUARY

WATER REPORT

pH	7.57
TOTAL ALKALINITY,(AS CACO3 EQUIVALENT)	224.00 MG/L
TOTAL ACIDITY, (AS CACO3 EQUIVALENT)	0.00 MG/L
TOTAL SUSPENDED SOLIDS	11 MG/L
TOTAL IRON	0.46 MG/L
TOTAL MANGANESE	0.04 MG/L
TOTAL DISSOLVED SOLIDS	996 MG/L
TOTAL SULFATE	526.85 MG/L
SPECIFIC CONDUCTANCE	0.556 MICROMHOS/CM

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

Respectfully Submitted,

DELANO THOMAS, VP

QUALITY DATA ENTRY FORMS: Part 1

Type of Report:
[ ] Premining
[ ] During Mining/Reclamation
[ ] Other

STATION INFORMATION

LT #: February 867-0298

STATION #: Stream

SOAP PERMITTEE #:

NTY #:

*BASIN #:

QUAD NAME:

ION TYPE (check): [01] Spring [02] Stream [03] Lake [04] Well [05] Sediment Pond/Influent [06] Sediment Pond/Discharge

WELLS ONLY

PTH (ft):

CASING DIAMETER (in):

AQUIFER DESCRIPTION:

TOP OF WELL ELEVATION (MSL):

OF AQUIFER (MSL):

AQUIFER THICKNESS (ft):

DRAINAGE AREA (acres):

ERSHED DESCRIPTION:

LONGITUDE (DMS):

ITUDE (DMS):

UTM NORTHING:

UTM EASTING:

16 West of 84° Longitude
17 East of 84° Longitude

ZONE:

CAL STREAM NAME:

AL COMPANY NAME: Meade + Shepherd

OLLECTING FIRM NAME: Meade + Shepherd

NALYZING FIRM NAME: Standard Labs, Inc.

OMMENTS:

STREAM ANALYSIS

COMPANY	PERMIT #	STATION #	SAMPLE #	DATE
Meade/Shepherd	867-0298	SW	7708	3/31/95
pH	ALKALINITY mg/l	ACIDITY mg/l	TSS mg/l	IRON mg/l
7.5	234	0	9	0.35
MN mg/l	TDS mg/l	SO4 mg/l	SP. COND (umhos)	FIELD pH
0.06	1058	622.75	0.427	
TEMP (c)	FLOW gal. per day			

WATER QUALITY DATA FORMS: PART 2

STANDARD LABORATORIES, INC.

Lab No. 7708

Date Rec'd. 05/24/95

Date Sampled 03/31/95

Sampled By YOURSELVES

PO BOX 606
WHITESBURG, KY 41858

SAMPLE ID:

MEADE & SHEPHERD COAL COMPANY
HC 84, BOX 1404
WHITESBURG, KY 41858

ROXANA
867-0298
FEBRUARY

WATER REPORT

pH	7.50	
TOTAL ALKALINITY, (AS CACO3 EQUIVALENT)	234.00	MG/L
TOTAL ACIDITY, (AS CACO3 EQUIVALENT)	0.00	MG/L
TOTAL SUSPENDED SOLIDS	9	MG/L
TOTAL IRON	0.35	MG/L
TOTAL MANGANESE	0.06	MG/L
TOTAL DISSOLVED SOLIDS	1058	MG/L
TOTAL SULFATE	622.75	MG/L
SPECIFIC CONDUCTANCE	0.427	MICROMHOS/CM

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

Respectfully Submitted,

DELANO THOMAS, VP

QUALITY DATA ENTRY FORMS: Part 1

Type of Report:
[ ] Premining
[ ] During Mining/Reclamation
[ ] Other

STATION INFORMATION

IT #: March 867-0298 STATION #: Stream SOAP PERMITTEE #:

NTY #: *BASIN #: QUAD NAME:

ION TYPE (check): [01] Spring [02] Stream [03] Lake [04] Well [05] Sediment Pond/Influent [06] Sediment Pond/Discharge

WELLS ONLY

TH (ft): CASING DIAMETER (in): AQUIFER DESCRIPTION: TOP OF WELL ELEVATION (MSL):

OF AQUIFER (MSL): AQUIFER THICKNESS (ft):

ERSHED DESCRIPTION: DRAINAGE AREA (acres):

ITUDE (DMS): LONGITUDE (DMS): UTM NORTHING:

UTM EASTING:

I ZONE: 16 West of 84° Longitude 17 East of 84° Longitude

CAL STREAM NAME:

AL COMPANY NAME: Meade + Shepherd

OLLECTING FIRM NAME: Meade + Shepherd

NALYZING FIRM NAME: Standard Kalis, Inc.

OMMENTS:

STREAM ANALYSIS

COMPANY	PERMIT #	STATION #	SAMPLE #	DATE
Meade/Shepherd	867-0298	SW	7709	3/31/95
pH	ALKALINITY mg/l	ACIDITY mg/l	TSS mg/l	IRON mg/l
7.52	226	0	7	0.35
MN mg/l	TDS mg/l	SO4 mg/l	SP. COND (umhos)	FIELD pH
0.06	988	603.41	0.397	
TEMP (c)	FLOW gal. per day			

WATER QUALITY DATA FORMS: PART 2

STANDARD LABORATORIES, INC.

Lab No. 7709

Date Rec'd. 05/24/95

Date Sampled 03/31/95

Sampled By YOURSELVES

PO BOX 606
WHITESBURG, KY 41858

SAMPLE ID:

MEADE & SHEPHERD COAL COMPANY
HC 84, BOX 1404
WHITESBURG, KY 41858

ROXANA
867-0298
MARCH

WATER REPORT

pH	7.52
TOTAL ALKALINITY,(AS CACO3 EQUIVALENT)	226.00 MG/L
TOTAL ACIDITY, (AS CACO3 EQUIVALENT)	0.00 MG/L
TOTAL SUSPENDED SOLIDS	7 MG/L
TOTAL IRON	0.35 MG/L
TOTAL MANGANESE	0.06 MG/L
TOTAL DISSOLVED SOLIDS	988 MG/L
TOTAL SULFATE	603.41 MG/L
SPECIFIC CONDUCTANCE	0.397 MICROMHOS/CM

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

Respectfully Submitted,

DELANO THOMAS, VP

QUALITY DATA ENTRY FORMS: Part 1

Type of Report:
[ ] Premining
[ ] During Mining/Reclamation
[ ] Other

STATION INFORMATION

IT #: April 867-0298 STATION #: Stream SOAP PERMITTEE #:

NTY #: *BASIN #: QUAD NAME:

ION TYPE (check): [01] Spring [02] Stream [03] Lake [04] Well [05] Sediment Pond/Influent [06] Sediment Pond/Discharge

WELLS ONLY

PTH (ft): CASING DIAMETER (in): AQUIFER DESCRIPTION: TOP OF WELL ELEVATION (MSL):

OF AQUIFER (MSL): AQUIFER THICKNESS (ft):

DRAINAGE AREA (acres):

ERSHED DESCRIPTION:

LONGITUDE (DMS):

ITUDE (DMS):

UTM NORTHING:

UTM EASTING:

I ZONE: 16 West of 84° Longitude 17 East of 84° Longitude

CAL STREAM NAME:

AL COMPANY NAME: Meade + Shepherd

OLLECTING FIRM NAME: Meade + Shepherd

NALYZING FIRM NAME: Standard Labs, Inc.

OMMENTS:

STREAM ANALYSIS

COMPANY	PERMIT #	STATION #	SAMPLE #	DATE
Meade/Shepherd	867-0298	SW	7710	6/25/95
pH	ALKALINITY mg/l	ACIDITY mg/l	TSS mg/l	IRON mg/l
7.95	222	0	7	0.27
MN mg/l	TDS mg/l	SO4 mg/l	SP. COND (umhos)	FIELD pH
0.05	954	629.34	0.397	
TEMP (c)	FLOW gal. per day			

WATER QUALITY DATA FORMS: PART 2

STANDARD LABORATORIES, INC.

Lab No. 7710

Date Rec'd. 05/24/95

Date Sampled 05/24/95

Sampled By YOURSELVES

PO BOX 606
WHITESBURG, KY 41858

SAMPLE ID:

MEADE & SHEPHERD COAL COMPANY
HC 84, BOX 1404
WHITESBURG, KY 41858

ROXANNE
867-0298
APRIL

WATER REPORT

pH	7.95	
TOTAL ALKALINITY, (AS CACO3 EQUIVALENT)	222.00	MG/L
TOTAL ACIDITY, (AS CACO3 EQUIVALENT)	0.00	MG/L
TOTAL SUSPENDED SOLIDS	7	MG/L
TOTAL IRON	0.27	MG/L
TOTAL MANGANESE	0.05	MG/L
TOTAL DISSOLVED SOLIDS	954	MG/L
TOTAL SULFATE	629.34	MG/L
SPECIFIC CONDUCTANCE	0.397	MICROMHOS/CM

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

Respectfully Submitted,

DELANO THOMAS, VP

QUALITY DATA ENTRY FORMS: Part 1

Type of Report:
[ ] Premining
[ ] During Mining/Reclamation
[ ] Other

STATION INFORMATION

IT #: May 867-0298 STATION #: Stream SOAP PERMITTEE #:

NTY #: *BASIN #: QUAD NAME:

ION TYPE (check): [01] Spring [02] Stream [03] Lake [04] Well [05] Sediment Pond/Influent [06] Sediment Pond/Discharge

WELLS ONLY

PTH (ft): CASING DIAMETER (in): AQUIFER DESCRIPTION: TOP OF WELL ELEVATION (MSL):

OF AQUIFER (MSL): AQUIFER THICKNESS (ft):

ERSHED DESCRIPTION: DRAINAGE AREA (acres):

ITUDE (DMS): LONGITUDE (DMS):

N ZONE: 16 West of 84° Longitude 17 East of 84° Longitude UTM EASTING: UTM NORTHING:

CAL STREAM NAME:

AL COMPANY NAME: Meade + Shepherd

OLLECTING FIRM NAME: Meade + Shepherd

NALYZING FIRM NAME: Standard Labs, Inc.

OMMENTS:

STREAM ANALYSIS

COMPANY	PERMIT #	STATION #	SAMPLE #	DATE
Meade/Shepherd	867-0298	SW	7711	6/25/95
pH	ALKALINITY mg/l	ACIDITY mg/l	TSS mg/l	IRON mg/l
7.44	226	0	12	0.34
MN mg/l	TDS mg/l	SO4 mg/l	SP. COND (umhos)	FIELD pH
0.05	1086	631.39	0.406	
TEMP (c)	FLOW gal. per day			

WATER QUALITY DATA FORMS: PART 2

STANDARD LABORATORIES, INC.

Lab No. 7711

Date Rec'd. 05/24/95

Date Sampled 05/24/95

Sampled By YOURSELVES

PO BOX 606
WHITESBURG, KY 41858

SAMPLE ID:

MEADE & SHEPHERD COAL COMPANY
HC 84, BOX 1404
WHITESBURG, KY 41858

ROXANNE
867-0298
MAY

WATER REPORT

pH	7.44
TOTAL ALKALINITY,(AS CACO3 EQUIVALENT)	226.00 MG/L
TOTAL ACIDITY, (AS CACO3 EQUIVALENT)	0.00 MG/L
TOTAL SUSPENDED SOLIDS	12 MG/L
TOTAL IRON	0.34 MG/L
TOTAL MANGANESE	0.05 MG/L
TOTAL DISSOLVED SOLIDS	1086 MG/L
TOTAL SULFATE	631.39 MG/L
SPECIFIC CONDUCTANCE	0.406 MICROMHOS/CM

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

Respectfully Submitted,

DELANO THOMAS, VP

QUALITY DATA ENTRY FORMS: Part 1

Type of Report:
[ ] Premining
[ ] During Mining/Reclamati
[ ] Other

STATION INFORMATION

IT #: June 867-0298 STATION #: Stream SOAP PERMITTEE #:

INTY #: *BASIN #: QUAD NAME:

TION TYPE (check): [01] Spring [02] Stream [03] Lake [04] Well [05] Sediment Pond/Influent [06] Sediment Pond/Discharge

WELLS ONLY

TH (ft): CASING DIAMETER (in): AQUIFER DESCRIPTION: TOP OF WELL ELEVATION (MSL):

OF AQUIFER (MSL): AQUIFER THICKNESS (ft):

DRAINAGE AREA (acres):

ERSHED DESCRIPTION:

LONGITUDE (DMS):

TITUDE (DMS):

UTM NORTHING:

H ZONE: 16 West of 84° Longitude 17 East of 84° Longitude UTM EASTING:

CAL STREAM NAME:

AL COMPANY NAME: Meade + Shepherd

OLLECTING FIRM NAME: Meade + Shepherd

NALYZING FIRM NAME: Standard Labs, Inc.

OMMENTS:

STREAM ANALYSIS

COMPANY	PERMIT #	STATION #	SAMPLE #	DATE
Meade/Shepherd	867-0298	SW	7712	6/25/95
pH	ALKALINITY mg/l	ACIDITY mg/l	TSS mg/l	IRON mg/l
7.55	224	0	10	0.23
MN mg/l	TDS mg/l	SO4 mg/l	SP. COND (umhos)	FIELD pH
0.08	1028	630.57	0.388	
TEMP (c)	FLOW gal. per day			

WATER QUALITY DATA FORMS: PART 2

STANDARD LABORATORIES, INC.

Lab No. 7712

Date Rec'd. 05/24/95

Date Sampled 05/24/95

Sampled By YOURSELVES

PO BOX 606
WHITESBURG, KY 41858

SAMPLE ID:

MEADE & SHEPHERD COAL COMPANY
HC 84, BOX 1404
WHITESBURG, KY 41858

ROXANNE
867-0298
JUNE

WATER REPORT

pH	7.55
TOTAL ALKALINITY,(AS CACO3 EQUIVALENT)	224.00 MG/L
TOTAL ACIDITY, (AS CACO3 EQUIVALENT)	0.00 MG/L
TOTAL SUSPENDED SOLIDS	10 MG/L
TOTAL IRON	0.23 MG/L
TOTAL MANGANESE	0.08 MG/L
TOTAL DISSOLVED SOLIDS	1028 MG/L
TOTAL SULFATE	630.57 MG/L
SPECIFIC CONDUCTANCE	0.388 MICROMHOS/CM

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

Respectfully Submitted,

DELANO THOMAS, VP

QUALITY DATA ENTRY FORMS: Part 1

Type of Report:
[ ] Premining
[ ] During Mining/Reclamation
[ ] Other

STATION INFORMATION

T #: January 867-0298

STATION #: Ground Water

SOAP PERMITTEE #:

TY #:

*BASIN #:

QUAD NAME:

ION TYPE (check): [01] Spring [02] Stream [03] Lake [04] Well [05] Sediment Pond/Influent [06] Sediment Pond/Discharge

WELLS ONLY

H (ft):

CASING DIAMETER (in):

AQUIFER DESCRIPTION:

TOP OF WELL ELEVATION (MSL):

OF AQUIFER (MSL):

AQUIFER THICKNESS (ft):

DRAINAGE AREA (acres):

RSHED DESCRIPTION:

LONGITUDE (DMS):

TUDE (DMS):

UTM NORTHING:

UTM EASTING:

ZONE: 16 West of 84° Longitude; 17 East of 84° Longitude

AL STREAM NAME:

L COMPANY NAME: Meade + Shepherd

LLECTING FIRM NAME: Meade + Shepherd

ALYZING FIRM NAME: Standard Labs, Inc.

MMENTS:

GROUNDWATER ANALYSIS

COMPANY	PERMIT #	STATION #	SAMPLE #	DATE
Meade/Shepherd	867-0298	GW	7719	3/31/95
pH	ALKALINITY mg/l	ACIDITY mg/l	TDS mg/l	SO4 mg/l
6.85	86	0	123	30.05
DISS. IRON mg/l	DISS MANG. mg/l	FIELD pH	TEMP (c)	Water depth (ft)
0.26	0.04			
Depth to water (ft)	Well depth (ft)			

WATER QUALITY DATA FORMS: PART 2

STANDARD LABORATORIES, INC.

Lab No. 7719

Date Rec'd. 05/24/95

Date Sampled 03/31/95

Sampled By YOURSELVES

PO BOX 606
WHITESBURG, KY 41858

SAMPLE ID:

MEADE & SHEPHERD COAL COMPANY
HC 84, BOX 1404
WHITESBURG, KY 41858

ROXANNE
867-0298
JANUARY

WATER REPORT

pH	6.85
TOTAL ALKALINITY, (AS CACO3 EQUIVALENT)	86.00 MG/L
TOTAL ACIDITY, (AS CACO3 EQUIVALENT)	0.00 MG/L
TOTAL DISSOLVED SOLIDS	123 MG/L
DISSOLVED IRON	0.26 MG/L
DISSOLVED MANGANESE	0.04 MG/L
TOTAL SULFATE	30.05 MG/L

Respectfully Submitted,

DELANO THOMAS, VP

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

QUALITY DATA ENTRY FORMS: Part 1

Type of Report:
[ ] Premining
[ ] During Mining/Reclamation
[ ] Other

STATION INFORMATION

T #: February 867-0298

STATION #: Ground Water

SOAP PERMITTEE #:

ITY #:

*BASIN #:

QUAD NAME:

ION TYPE (check): [01] Spring [02] Stream [03] Lake [04] Well [05] Sediment Pond/Influent [06] Sediment Pond/Discharge

WELLS ONLY

H (ft):

CASING DIAMETER (in):

AQUIFER DESCRIPTION:

TOP OF WELL ELEVATION (MSL):

OF AQUIFER (MSL):

AQUIFER THICKNESS (ft):

DRAINAGE AREA (acres):

ERSHED DESCRIPTION:

LONGITUDE (DMS):

ITUDE (DMS):

UTM NORTHING:

UTM EASTING:

ZONE:

16 West of 84° Longitude
17 East of 84° Longitude

AL STREAM NAME:

AL COMPANY NAME: Meade + Shepherd

LLECTING FIRM NAME: Meade + Shepherd

ALYZING FIRM NAME: Standard Labs, Inc.

MMENTS:

GROUNDWATER ANALYSIS

COMPANY	PERMIT #	STATION #	SAMPLE #	DATE
Meade/Shepherd	867-0298	GW	7720	3/31/95
pH	ALKALINITY mg/l	ACIDITY mg/l	TDS mg/l	SO4 mg/l
6.91	104	0	123	23.46
DISS. IRON mg/l	DISS MANG. mg/l	FIELD pH	TEMP (c)	Water depth (ft)
0.44	<0.01			
Depth to water (ft)	Well depth (ft)			

WATER QUALITY DATA FORMS: PART 2

STANDARD LABORATORIES, INC.

Lab No. 7720

Date Rec'd. 05/24/95

Date Sampled 03/31/95

Sampled By YOURSELVES

PO BOX 606
WHITESBURG, KY 41858

SAMPLE ID:

MEADE & SHEPHERD COAL COMPANY
HC 84, BOX 1404
WHITESBURG, KY 41858

ROXANNE
867-0298
FEBRUARY

WATER REPORT

pH	6.91
TOTAL ALKALINITY,(AS CACO3 EQUIVALENT)	104.00 MG/L
TOTAL ACIDITY, (AS CACO3 EQUIVALENT)	0.00 MG/L
TOTAL DISSOLVED SOLIDS	123 MG/L
DISSOLVED IRON	0.44 MG/L
DISSOLVED MANGANESE	<0.01 MG/L
TOTAL SULFATE	23.46 MG/L

FOR YOUR PROTECTION THIS DOCUMENT HAS
BEEN PRINTED ON CONTROLLED PAPER STOCK.
NOT VALID IF ALTERED.

Respectfully Submitted,

DELANO THOMAS, VP

QUALITY DATA ENTRY FORMS: Part 1

Type of Report:
[ ] Premining
[ ] During Mining/Reclamation
[ ] Other

STATION INFORMATION

.T #: March 867-0298 STATION #: Ground Water SOAP PERMITTEE #:

ITY #: *BASIN #: QUAD NAME:

ION TYPE (check): [01] Spring [02] Stream [03] Lake [04] Well [05] Sediment Pond/Influent [06] Sediment Pond/Discharge

WELLS ONLY

:H (ft): CASING DIAMETER (in): AQUIFER DESCRIPTION: TOP OF WELL ELEVATION (MSL):

OF AQUIFER (MSL): AQUIFER THICKNESS (ft):

DRAINAGE AREA (acres):

ERSHED DESCRIPTION:

LONGITUDE (DMS):

ITUDE (DMS): UTM NORTHING:

UTM EASTING:

ZONE: 16 West of 84° Longitude
17 East of 84° Longitude

:AL STREAM NAME:

AL COMPANY NAME: Meade + Shepherd

LLECTING FIRM NAME: Meade + Shepherd

ALYZING FIRM NAME: Standard Labs, Inc.

MMENTS:

GROUNDWATER ANALYSIS

COMPANY	PERMIT #	STATION #	SAMPLE #	DATE
Meade/Shepherd	867-0298	GW	7721	3/31/95
pH	ALKALINITY mg/l	ACIDITY mg/l	TDS mg/l	SO4 mg/l
6.72	94	0	126	23.46
DISS. IRON mg/l	DISS MANG. mg/l	FIELD pH	TEMP (c)	Water depth (ft)
0.27	<0.01			
Depth to water (ft)	Well depth (ft)			

WATER QUALITY DATA FORMS: PART 2

STANDARD LABORATORIES, INC.

Lab No. 7721

Date Rec'd. 05/24/95

Date Sampled 03/31/95

Sampled By YOURSELVES

PO BOX 606
WHITESBURG, KY 41858

SAMPLE ID:

MEADE & SHEPHERD COAL COMPANY
HC 84, BOX 1404
WHITESBURG, KY 41858

ROXANNE
867-0298
MARCH

WATER REPORT

pH	6.72
TOTAL ALKALINITY,(AS CACO3 EQUIVALENT)	94.00 MG/L
TOTAL ACIDITY, (AS CACO3 EQUIVALENT)	0.00 MG/L
TOTAL DISSOLVED SOLIDS	126 MG/L
DISSOLVED IRON	0.27 MG/L
DISSOLVED MANGANESE	<0.01 MG/L
TOTAL SULFATE	23.46 MG/L

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

Respectfully Submitted,

DELANO THOMAS, VP

QUALITY DATA ENTRY FORMS: Part 1

Type of Report:
[ ] Premining
[ ] During Mining/Reclamation
[ ] Other

STATION INFORMATION

IT #: April 867-0298 STATION #: Ground Water SOAP PERMITTEE #:

NTY #: *BASIN #: QUAD NAME:

ION TYPE (check): [01] Spring [02] Stream [03] Lake [04] Well [05] Sediment Pond/Influent [06] Sediment Pond/Discharge

WELLS ONLY

TH (ft): CASING DIAMETER (in): AQUIFER DESCRIPTION: TOP OF WELL ELEVATION (MSL):

OF AQUIFER (MSL): AQUIFER THICKNESS (ft):

DRAINAGE AREA (acres):

ERSHED DESCRIPTION:

LONGITUDE (DMS):

ITUDE (DMS): UTM NORTHING:

UTM EASTING:

H ZONE: 16 West of 84° Longitude
17 East of 84° Longitude

CAL STREAM NAME:

AL COMPANY NAME: Meade + Shepherd

OLLECTING FIRM NAME: Meade + Shepherd

NALYZING FIRM NAME: Standard Labs, Inc.

OMMENTS:

GROUNDWATER ANALYSIS

COMPANY	PERMIT #	STATION #	SAMPLE #	DATE
Meade/Shepherd	867-0298	GW	7722	6/25/95
pH	ALKALINITY mg/l	ACIDITY mg/l	TDS mg/l	SO4 mg/l
6.87	92	0	126	57.62
DISS. IRON mg/l	DISS MANG. mg/l	FIELD pH	TEMP (c)	Water depth (ft)
0.06	0.02			
Depth to water (ft)	Well depth (ft)			

WATER QUALITY DATA FORMS: PART 2

STANDARD LABORATORIES, INC.

Lab No. 7722

Date Rec'd. 05/24/95

Date Sampled 05/24/95

Sampled By YOURSELVES

PO BOX 606
WHITESBURG, KY 41858

SAMPLE ID:

MEADE & SHEPHERD COAL COMPANY
HC 84, BOX 1404
WHITESBURG, KY 41858

ROXANNE
867-0298
APRIL

WATER REPORT

pH	6.87
TOTAL ALKALINITY, (AS CACO3 EQUIVALENT)	92.00 MG/L
TOTAL ACIDITY, (AS CACO3 EQUIVALENT)	0.00 MG/L
TOTAL DISSOLVED SOLIDS	126 MG/L
DISSOLVED IRON	0.06 MG/L
DISSOLVED MANGANESE	0.02 MG/L
TOTAL SULFATE	57.62 MG/L

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

Respectfully Submitted,

DELANO THOMAS, VP

Type of Report:
[ ] Premining
[ ] During Mining/Reclamation
[ ] Other

QUALITY DATA ENTRY FORMS: Part 1

STATION INFORMATION

:T #: May 867-0298 STATION #: Ground Water SOAP PERMITTEE #:

NTY #: *BASIN #: QUAD NAME:

ION TYPE (check): [01] Spring [02] Stream [03] Lake [04] Well [05] Sediment Pond/Influent [06] Sediment Pond/Discharge

WELLS ONLY

:H (ft): CASING DIAMETER (in): AQUIFER DESCRIPTION: TOP OF WELL ELEVATION (MSL):

OF AQUIFER (MSL): AQUIFER THICKNESS (ft):

DRAINAGE AREA (acres):

ERSHED DESCRIPTION:

LONGITUDE (DMS):

ITUDE (DMS): UTM NORTHING:

UTM EASTING:

ZONE: 16 West of 84° Longitude 17 East of 84° Longitude

CAL STREAM NAME:

AL COMPANY NAME: Meade + Shepherd

LLECTING FIRM NAME: Meade + Shepherd

ALYZING FIRM NAME: Standard Labs, Inc.

MMENTS:

GROUNDWATER ANALYSIS

COMPANY	PERMIT #	STATION #	SAMPLE #	DATE
Meade/Shepherd	867-0298	GW	7723	6/25/95
pH	ALKALINITY mg/l	ACIDITY mg/l	TDS mg/l	SO4 mg/l
6.8	86	0	157	40.75
DISS. IRON mg/l	DISS MANG. mg/l	FIELD pH	TEMP (c)	Water depth (ft)
0.3	<0.01			
Depth to water (ft)	Well depth (ft)			

STANDARD LABORATORIES, INC.

Lab No. 7723

Date Rec'd. 05/24/95

Date Sampled 05/24/95

Sampled By YOURSELVES

PO BOX 606
WHITESBURG, KY 41858

SAMPLE ID:

HEADE & SHEPHERD COAL COMPANY
HC 84, BOX 1404
WHITESBURG, KY 41858

ROXANNE
867-0298
MAY

WATER REPORT

pH	6.80
TOTAL ALKALINITY, (AS CACO3 EQUIVALENT)	86.00 MG/L
TOTAL ACIDITY, (AS CACO3 EQUIVALENT)	0.00 MG/L
TOTAL DISSOLVED SOLIDS	157 MG/L
DISSOLVED IRON	0.30 MG/L
DISSOLVED MANGANESE	<0.01 MG/L
TOTAL SULFATE	40.75 MG/L

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

Respectfully Submitted,

DELANO THOMAS, VP

QUALITY DATA ENTRY FORMS: Part 1

Type of Report:
[ ] Premining
[ ] During Mining/Reclamation
[ ] Other

STATION INFORMATION

LT #: June 867-0298 STATION #: Ground Water SOAP PERMITTEE #:

NTY #: *BASIN #: QUAD NAME:

ION TYPE (check): [01] Spring [04] Well
[02] Stream [05] Sediment Pond/Influent
[03] Lake [06] Sediment Pond/Discharge

WELLS ONLY

PTH (ft): CASING DIAMETER (in): AQUIFER DESCRIPTION: TOP OF WELL ELEVATION (MSL):
OF AQUIFER (MSL): AQUIFER THICKNESS (ft):

ERSHED DESCRIPTION: DRAINAGE AREA (acres):

ITUDE (DMS): LONGITUDE (DMS):

UTM EASTING: UTM NORTHING:

ZONE: 16 West of 84° Longitude
17 East of 84° Longitude

CAL STREAM NAME:

AL COMPANY NAME: Meade + Shepherd

OLLECTING FIRM NAME: Meade + Shepherd

NALYZING FIRM NAME: Standard Labs, Inc.

OMMENTS:

GROUNDWATER ANALYSIS

COMPANY	PERMIT #	STATION #	SAMPLE #	DATE
Meade/Shepherd	867-0298	GW	7724	6/25/95
pH	ALKALINITY mg/l	ACIDITY mg/l	TDS mg/l	SO4 mg/l
6.89	86	0	146	39.1
DISS. IRON mg/l	DISS MANG. mg/l	FIELD pH	TEMP (c)	Water depth (ft)
0.23	<0.01			
Depth to water (ft)	Well depth (ft)			

WATER QUALITY DATA FORMS: PART 2

STANDARD LABORATORIES, INC.

Lab No. 7724

Date Rec'd. 05/24/95

Date Sampled 05/24/95

Sampled By YOURSELVES

PO BOX 606
WHITESBURG, KY 41858

SAMPLE ID:

MEADE & SHEPHERD COAL COMPANY
HC 84, BOX 1404
WHITESBURG, KY 41858

ROXANNE
867-0298
JUNE

WATER REPORT

pH	6.89
TOTAL ALKALINITY,(AS CACO3 EQUIVALENT)	86.00 MG/L
TOTAL ACIDITY, (AS CACO3 EQUIVALENT)	0.00 MG/L
TOTAL DISSOLVED SOLIDS	146 MG/L
DISSOLVED IRON	0.23 MG/L
DISSOLVED MANGANESE	<0.01 MG/L
TOTAL SULFATE	39.10 MG/L

FOR YOUR PROTECTION THIS DOCUMENT HAS BEEN PRINTED ON CONTROLLED PAPER STOCK. NOT VALID IF ALTERED.

Respectfully Submitted,

DELANO THOMAS, VP

Roxana Prison Site,
Letcher County, Kentucky

Appendix

E

GEOLOGIST'S LOGS OF DRILLING RESULTS

Cardno®
Shaping the Future

TEST BORING FIELD LOG

Cardno Shaping the Future

Test Boring No.: BH-1-15
Location: Roxana Prison

Project Name: BoP, Letcher County EIS, Roxana Prison Site **Project No.:** CARD138 **Date:** 11/20/15

Logged By: Steve Stansfield **Drilling Company:** Central Star **Drill Crew:** Andrew Risner/Richard Knisley

Rig: CME850 **Drill Method:** HSA / Split Spoon **Page:** 1 of 1

Depth (m) From	Depth (m) To	Soil Visual Classification / Descriptions and Remarks Surface Condition:	Sample No.	1st 0.152 m	2nd 0.152 m	3rd 0.152 m	4th 0.152 m	5th 0.152 m	Rec. (%)
0.00	0.61	Top 0.08 m: Brown organic soil with roots, moist From 0.08 m - 0.61 m: Silty clay becoming more sandy downward, tan to brown, moist, weathered, coal lense near base (Sample SS-1 from 0.08 m - 0.61 m)	SS-1	3	8	11	8		73
0.61	1.22	Top 0.46 m is sandy clay, highly weathered, tan to brown, moist, slight plasticity Bottom 0.15 m: grey sandstone, micaceous, dry, mostly unweathered.	-	4	5	20	14		80
1.22	1.83	Sandy shale, highly weathered, soft, brown at top becoming grey and crumbly downward.	-	4	4	5	3		42
1.83	2.44	Very weathered sandstone, soft, brown, coal laminations throughout, micaceous, moist (Sample SS-2)	SS-2	6	7	5	10		45
2.44	3.05	From 2.44 m - 2.82 m: Predominantly sandstone, weathered grey to tan, micaceous, dry From 2.82 m - 3.05 m: Sandstone, light grey, unweathered, dry	SS-3	7	7	7	50/0.15		70
3.05	3.35	Sandstone, grey, unweathered, hard, dry, micaceous Auger Refusal at 3.35 m	-	50/.05	-	-	-		25
		Note: BH-1-15 did not encounter any rock fill material.							

Total Boring Depth: _____

Comments: [Drill Method, Boring Diameter, UD Shelby Tubes, Well Construction (draw sketch on back), etc]

Water Levels: _____ @ First Noted in Samples / Cuttings
_____ @ Completion
_____ @ _____ After _____Hrs
_____ @ Backfilling _____ (date/ time)

Hammer Type: Donut Hammer / Safety Hammer / Automatic Hammer
SPT Hammer: (Weight / Drop / Spoon Dia.) _____
Auger Dia.: ID / OD (meters): _____

Drilling Times:
Moving: _____
Drilling: _____
Standby: _____
Hauling Water: _____
Abandon/Grout Boring: _____
Fluid Losses: _____ @ Depth _____

HSA - Hollow Stem Augers
MD - Rotary Mud Drilling
REF - Refusal (Spoon or Auger)
RC - Rock Core
SS - SPT Split Spoon Sample
DC - Driven Casing (Hammer Type and Record Blows/ft vs. Depth)

ST - Shelby Tube Sample
WOR - SPT Weight of Rods
WOH - SPT Weight of Hammer
REC - Recovery (Meters)
RQD - Rock Quality Designation

Cardno
Shaping the Future

TEST BORING FIELD LOG

Test Boring No.: BH-2-15
Location: Roxana Prison

Project Name: BoP, Letcher County EIS, Roxana Prison Site **Project No.:** CARD138 **Date:** 11/20/15

Logged By: Steve Stansfield **Drilling Company:** Central Star **Drill Crew:** Andrew Risner/Richard Knisley

Rig: CME850 **Drill Method:** HSA / Split Spoon **Page:** 1 of 1

Depth (m) From	Depth (m) To	Soil Visual Classification / Descriptions and Remarks Surface Condition:	Sample No.	1st 0.152 m	2nd 0.152 m	3rd 0.152 m	4th 0.152 m	5th 0.152 m	Rec. (%)
0.00	0.61	Top 0.05 m: Brown organic soil, moist Bottom 0.56 m: Silty clay, grey with occasional brown sandy zones, numerous shale fragments, becoming sandy downward, very slightly moist (Sample SS-1 from 0.05 m - 0.61 m).	SS-1	5	7	9	8		66
0.61	1.22	Top 0.18 m: Sandy clay, dark grey, very slightly moist, slight plasticity, slightly micaceous, becoming more sandy downward Bottom 0.43m: Predominantly sandstone, grey, occasional coal spars, micaceous, weathered	-	10	12	8	9		72
1.22	1.83	Sandy shale, weathered, grey with occasional brown sandstone fragments, dry, slightly micaceous	-	6	6	4	5		65
1.83	2.44	Predominantly sandstone, grey, weathered, dry, micaceous, some tan weathered zones, poor recovery	-	7	5	6	5		27
2.44	3.05	Sandstone, top 0.06 m weathered brown, remainder light grey, micaceous, dry	-	14	9	9	4		57
3.05	3.66	Sandstone, very weathered and soft, light grey to mostly brown, occasional orange stains and coal spars, slightly moist (Sample SS-2)	SS-2	3	8	12	11		66
3.66	4.21	Spoon only advanced to 4.02 m: Top 0.18 m is weathered grey sandstone, soft. From 3.84 m - 3.93 m there is coal and shale with orange staining. From 3.93 m - 4.02 m: Sandstone, light grey with tan zones, rare coal spars. Auger Refusal at 4.21 m (Sample SS-3)	SS-3	17	20	50/0.05	-		95

Total Boring Depth: _____

Comments: [Drill Method, Boring Diameter, UD Shelby Tubes, Well Construction (draw sketch on back), etc]

Water Levels: _____ @ First Noted in Samples / Cuttings
_____ @ Completion
_____ @ _____ After _____Hrs
_____ @ Backfilling _____ (date/ time)

Hammer Type: Donut Hammer / Safety Hammer / Automatic Hammer
SPT Hammer: (Weight / Drop / Spoon Dia.) _____
Auger Dia.: ID / OD (meters): _____

Drilling Times:
Moving: _____
Drilling: _____
Standby: _____
Hauling Water: _____
Abandon/Grout Boring: _____
Fluid Losses: _____ @ Depth _____

HSA - Hollow Stem Augers
MD - Rotary Mud Drilling
REF - Refusal (Spoon or Auger)
RC - Rock Core
SS - SPT Split Spoon Sample
DC - Driven Casing (Hammer Type and Record Blows/ft vs. Depth)
ST - Shelby Tube Sample
WOR - SPT Weight of Rods
WOH - SPT Weight of Hammer
REC - Recovery (Meters)
RQD - Rock Quality Designation

TEST BORING FIELD LOG

Test Boring No.: BH-3-15
Location: Roxana Prison

Project Name: BoP, Letcher County EIS, Roxana Prison Site **Project No.:** CARD138 **Date:** 11/19/15

Logged By: Steve Stansfield **Drilling Company:** Central Star **Drill Crew:** Andrew Risner/Richard Knisley

Rig: CME850 **Drill Method:** HSA / Split Spoon **Page:** 1 of 3

Depth (m) From	Depth (m) To	Soil Visual Classification / Descriptions and Remarks Surface Condition:	Sample No.	1st 0.152 m	2nd 0.152 m	3rd 0.152 m	4th 0.152 m	5th 0.152 m	Rec. (%)
0.00	0.61	Top 0.15 m: Organic clay, brown, wet, root material Bottom 0.46 m: Silty clay, moist, weathered , light grey, occasional coal fragments, numerous shale fragments	-	4	7	10	11		62
0.61	1.22	Silty clay, light grey, weathered, numerous shale fragments, moist, becoming less plastic downward	-	8	7	6	6		87
1.22	1.83	Silty clay, light grey, occasional coal fragments, numerous shale fragments, slightly moist, low plasticity (Sample SS-1)	SS-1	5	6	7	5		61
1.83	2.44	Silty clay, becoming sandy downward, light grey, rare coal fragments, slightly moist, low plasticity, sandy zone is tan/brown	-	3	3	6	22		60
2.44	3.05	Sandy clay becoming silty clay downward, occasional sandstone fragments, sandy zones weathered brown, light grey shale fragments downward, moist	-	14	5	4	5		62
3.05	3.66	Clayey sand, brown to grey with some orange staining, occasional coal spars, light grey shale inclusions, friable, micaceous (Sample SS-2)	SS-2	6	15	17	14		92
3.66	4.27	Silty clay, immediate top is brown weathered sandy zone, light grey, dry, non-plastic	-	16	5	5	5		70
4.27	4.88	Silty clay, grey, moist, somewhat plastic, occasional sandstone inclusions with orange staining, numerous grey shale fragments	-	5	3	3	5		90
4.88	5.49	Silty clay, grey, moist, somewhat plastic, sandstone inclusions throughout that are orange, occasional coal fragments (Sample SS-3)	SS-3	3	4	4	5		52
5.49	6.10	Silty clay, grey, moist, somewhat plastic, sandstone inclusions throughout that are orange, occasional coal fragments	-	3	5	7	4		70
6.10	6.71	Silty clay, grey, not as moist or plastic as above, rare sandstone inclusions, numerous light grey shale fragments	-	8	4	5	9		75
6.71	7.32	Silty clay, moist, somewhat plastic, grey with dark grey zones, some orange stained sandstone throughout, rare coal fragments (Sample SS-4)	SS-4	3	3	4	3		75
7.32	7.92	Silty clay, only slightly moist and plastic, sandstone lense near top, rare sandstone fragment inclusions and occasional shale inclusions	-	5	3	3	6		67
7.92	8.53	Silty clay, grey, slightly moist with slight plasticity, numerous shale inclusions, very rare sandstone fragments	-	6	7	6	6		95
8.53	9.14	Silty clay, grey, slightly moist with slight plasticity, increasing orange stained sandstone fragments, occasional coal fragments (Sample SS-5)	SS-5	8	8	18	11		74

Total Boring Depth: _____

Comments: [Drill Method, Boring Diameter, UD Shelby Tubes, Well Construction (draw sketch on back), etc]

Water Levels:
_____ @ First Noted in Samples / Cuttings
_____ @ Completion
_____ @ _____ After _____Hrs
_____ @ Backfilling _____ (date/ time)

Hammer Type: Donut Hammer / Safety Hammer / Automatic Hammer
SPT Hammer: (Weight / Drop / Spoon Dia.) _____
Auger Dia.: ID / OD (meters): _____

Drilling Times:
Moving: _____
Drilling: _____
Standby: _____
Hauling Water: _____
Abandon/Grout Boring: _____
Fluid Losses: _____ @ Depth _____

HSA - Hollow Stem Augers
MD - Rotary Mud Drilling
REF - Refusal (Spoon or Auger)
RC - Rock Core
SS - SPT Split Spoon Sample
DC - Driven Casing (Hammer Type and Record Blows/ft vs. Depth)
ST - Shelby Tube Sample
WOR - SPT Weight of Rods
WOH - SPT Weight of Hammer
REC - Recovery (Meters)
RQD - Rock Quality Designation

TEST BORING FIELD LOG

Cardno Shaping the Future

Test Boring No.: BH-3-15
Location: Roxana Prison

Project Name: BoP, Letcher County EIS, Roxana Prison Site **Project No.:** CARD138 **Date:** 11/19/15

Logged By: Steve Stansfield **Drilling Company:** Central Star **Drill Crew:** Andrew Risner/Richard Knisley

Rig: CME850 **Drill Method:** HSA / Split Spoon **Page:** 2 of 3

Depth (m) From	Depth (m) To	Soil Visual Classification / Descriptions and Remarks Surface Condition:	Sample No.	1st 0.152 m	2nd 0.152 m	3rd 0.152 m	4th 0.152 m	5th 0.152 m	Rec. (%)
9.14	9.75	Silty clay, grey, very slightly moist with increasing sand content, mostly non-plastic, very rare brown sandstone fragments and coal fragments	-	5	5	6	7		78
9.75	10.36	Silty sand, light grey to grey, mostly dry, non-plastic, slightly micaceous	-	6	6	8	11		74
10.36	10.97	Silty sand becoming more sandy downward, occasional orange stained sandstone fragments, scattered coal fragments, shale and sandy shale fragments throughout, grey, dry (Sample SS-6)	SS-6	6	10	40	50/0.08		87
10.97	11.58	Very difficult auger drilling Hard rock Only spoon returns consisted of hard, fine grained sandstone, grey	-	50/0.05	-	-	-		
11.58	12.19	Silty clay, grey, rare brown/orange lenses, shale inclusions throughout, dry	-	10	10	13	9		86
12.19	12.80	Silty clay, grey, dry, non-plastic, scattered shale inclusions some of which are silty, very rare and small sandstone fragments (broken)	-	7	7	10	8		71
12.80	13.41	Silty clay, grey to dark grey, slightly moist and slight plasticity, occasional orange sandstone inclusions and coal fragments, slightly sandy downward (Sample SS-7)	SS-7	5	8	9	14		90
13.41	14.02	Silty clay, grey to dark grey, mostly dry and non-plastic, silty shale inclusions throughout	-	7	11	9	8		60
14.02	14.63	Silty clay, grey to dark grey, mostly dry and non-plastic, silty shale inclusions throughout, very rare brown sandstone fragments	-	5	10	6	7		74
14.63	15.24	Silty clay, grey to dark grey, carbonaceous zones, scattered coal fragments throughout, sandy at immediate top, brown to orange sandstone lense in center (Sample SS-8)	SS-8	6	7	8	8		72
15.24	15.85	Top 0.15 m: Wet clayey sand, dark Bottom 0.46 m: Brown to grey sandstone, micaceous, coal fragments at base (Sample SS-9)	SS-9	4	12	12	12		91
15.85	16.46	Predominantly sandstone, alternating grey and brown, dry, micaceous, driller reports drilling conditions becoming more difficult	-	10	18	21	19		62
16.46	17.07	Predominantly sandstone, alternating grey and brown, dry, micaceous, few coal fragments at base	-	12	19	11	8		60
17.07	17.68	Claystone with sandstone lenses, dark grey, occasional orange sandstone lenses, coal fragments throughout, moist, somewhat plastic (Sample SS-10)	SS-10	6	9	10	9		82
17.68	18.29	Top 0.30 m: Claystone with sandstone lenses, dark grey, occasional orange sandstone lenses, coal fragments throughout, moist, somewhat plastic Bottom 0.30 m: Predominantly sandstone, alternating grey and brown, micaceous, dry, scattered coal fragments at base	-	12	17	21	13		95

Total Boring Depth: _____

Comments: [Drill Method, Boring Diameter, UD Shelby Tubes, Well Construction (draw sketch on back), etc]

Water Levels:
_____ @ First Noted in Samples / Cuttings
_____ @ Completion
_____ @ _____ After _____Hrs
_____ @ Backfilling _____ (date/ time)

Hammer Type: Donut Hammer / Safety Hammer / Automatic Hammer
SPT Hammer: (Weight / Drop / Spoon Dia.) _____
Auger Dia.: ID / OD (meters): _____

Drilling Times:
Moving: _____
Drilling: _____
Standby: _____
Hauling Water: _____
Abandon/Grout Boring: _____
Fluid Losses: _____ @ Depth _____

HSA - Hollow Stem Augers
MD - Rotary Mud Drilling
REF - Refusal (Spoon or Auger)
RC - Rock Core
SS - SPT Split Spoon Sample
DC - Driven Casing (Hammer Type and Record Blows/ft vs. Depth)

ST - Shelby Tube Sample
WOR - SPT Weight of Rods
WOH - SPT Weight of Hammer
REC - Recovery (Meters)
RQD - Rock Quality Designation

TEST BORING FIELD LOG

Test Boring No.: BH-3-15
Location: Roxana Prison

Project Name: BoP, Letcher County EIS, Roxana Prison Site **Project No.:** CARD138 **Date:** 11/19/15

Logged By: Steve Stansfield **Drilling Company:** Central Star **Drill Crew:** Andrew Risner/Richard Knisley

Rig: CME850 **Drill Method:** HSA / Split Spoon **Page:** 3 of 3

Depth (m) From	Depth (m) To	Soil Visual Classification / Descriptions and Remarks Surface Condition:	Sample No.	1st 0.152 m	2nd 0.152 m	3rd 0.152 m	4th 0.152 m	5th 0.152 m	Rec. (%)
18.29	18.90	Sandstone, grey with alternating tan layers, dry, micaceous, crumbly	-	N/A	N/A	N/A	12		61
18.90	19.51	Sandstone, grey with alternating tan layers, micaceous, crumbly, scattered coal fragments near base, dry, friable	-	10	9	9	12		85
19.51	20.12	Sandstone, grey with alternating tan layers, micaceous, crumbly, very scattered coal fragments, friable	-	7	12	14	21		45
20.12	20.73	Sandstone, grey with alternating tan layers, micaceous, crumbly, very scattered coal fragments, friable, Total Depth	-	23	14	26	28		53

Total Boring Depth: _____

Comments: [Drill Method, Boring Diameter, UD Shelby Tubes, Well Construction (draw sketch on back), etc]

Water Levels:
_____ @ First Noted in Samples / Cuttings
_____ @ Completion
_____ @ _____ After _____Hrs
_____ @ Backfilling _____ (date/ time)

Hammer Type: Donut Hammer / Safety Hammer / Automatic Hammer

SPT Hammer: (Weight / Drop / Spoon Dia.) _____

Auger Dia.: ID / OD (meters): _____

Drilling Times:
Moving: _____
Drilling: _____
Standby: _____
Hauling Water: _____
Abandon/Grout Boring: _____
Fluid Losses: _____ @ Depth _____

HSA - Hollow Stem Augers
MD - Rotary Mud Drilling
REF - Refusal (Spoon or Auger)
RC - Rock Core
SS - SPT Split Spoon Sample
DC - Driven Casing (Hammer Type and Record Blows/ft vs. Depth)
ST - Shelby Tube Sample
WOR - SPT Weight of Rods
WOH - SPT Weight of Hammer
REC - Recovery (Meters)
RQD - Rock Quality Designation

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TEST BORING FIELD LOG

Test Boring No.: BH-4-15
Location: Roxana Prison

Project Name: BoP, Letcher County EIS, Roxana Prison Site **Project No.:** CARD138 **Date:** 11/16-17/15

Logged By: Steve Stansfield **Drilling Company:** Central Star **Drill Crew:** Andrew Risner/Richard Knisley

Rig: CME850 **Drill Method:** HSA / Split Spoon **Page:** 1 of 2

Depth (m) From	Depth (m) To	Soil Visual Classification / Descriptions and Remarks Surface Condition:	Sample No.	1st 0.152 m	2nd 0.152 m	3rd 0.152 m	4th 0.152 m	5th 0.152 m	Rec. (%)
0.00	0.61	Organic material, very slightly moist, some shale fragments and rare weathered sandstone fragments, non-plastic	-	20	50/0.15				40
0.61	1.22	Silty clay, slightly moist, non-plastic, occasional weathered light grey shale fragments	-	32	33	18	22		65
1.22	1.83	Silty clay, slightly moist, dark grey, low plastic, very rare fine grained sandstone (Sample SS-1)	SS-1	6	50/0.05				30
1.83	2.44	Silty clay and shale, light grey, mostly dry, non-plastic, occasional sandstone boulder	-	23	19	7	5		38
2.44	3.05	Silty clay, dark grey, moist with some iron staining in matrix, slightly plastic (Sample SS-2)	SS-2	5	7	8	5		65
3.05	3.66	Silty clay, medium grey with tan sandstone boulders, mostly dry and non-plastic	-	34	50/0.03				30
3.66	4.27	Silty clay, medium grey, numerous shale fragments, mostly dry but slightly damp at immediate base, very minimal sandstone (Sample SS-3)	SS-3	20	15	12	11		80
4.27	4.88	Silty clay, moist, dark grey, shale fragments within matrix, very slightly plastic (Sample SS-4)	SS-4	5	11	5	5		70
4.88	5.49	Silty clay, moist, dark grey, shale fragments within matrix, very slightly plastic	-	6	6	9	11		70
5.49	6.10	Silty clay, slightly moist, dark grey, numerous shale fragments, rare coal spars, very slightly plastic (Sample SS-5)	SS-5	8	7	6	6		54
6.10	6.71	Silty clay, slightly moist, dark grey, numerous shale fragments, rare coal spars, very slightly plastic	-	10	4	5	4		65
6.71	7.32	Silty clay, slightly moist, slightly plastic, very rare sandstone fragments (some weathered), abundant dark shale fragments (Sample SS-6)	SS-6	4	5	5	6		55
7.32	7.92	Sandy clay, light grey, predominantly sandstone with some weathering, mostly dry, non-plastic	-	9	8	11	7		75
7.92	8.53	Sandy clay, predominantly light grey sandstone with abundant coal laminations, some highly weathered zones, dry, non-plastic (Sample SS-7)	SS-7	9	23	4	13		66
8.53	9.14	Top half predominantly silty clay, bottom predominantly sandstone fragments, grey to light grey, slightly moist, top slightly plastic	-	11	15	9	50/0.13		80

Total Boring Depth: _____

Comments: [Drill Method, Boring Diameter, UD Shelby Tubes, Well Construction (draw sketch on back), etc]

Water Levels:
_____ @ First Noted in Samples / Cuttings
_____ @ Completion
_____ @ _____ After _____Hrs
_____ @ Backfilling _____ (date/ time)

Hammer Type: Donut Hammer / Safety Hammer / Automatic Hammer
SPT Hammer: (Weight / Drop / Spoon Dia.) _____
Auger Dia.: ID / OD (meters): _____

Drilling Times:
Moving: _____
Drilling: _____
Standby: _____
Hauling Water: _____
Abandon/Grout Boring: _____
Fluid Losses: _____ @ Depth _____

HSA - Hollow Stem Augers
MD - Rotary Mud Drilling
REF - Refusal (Spoon or Auger)
RC - Rock Core
SS - SPT Split Spoon Sample
DC - Driven Casing (Hammer Type and Record Blows/ft vs. Depth)

ST - Shelby Tube Sample
WOR - SPT Weight of Rods
WOH - SPT Weight of Hammer
REC - Recovery (Meters)
RQD - Rock Quality Designation

TEST BORING FIELD LOG

Test Boring No.: BH-4-15
Location: Roxana Prison

Project Name: BoP, Letcher County EIS, Roxana Prison Site **Project No.:** CARD138 **Date:** 11/16-17/15

Logged By: Steve Stansfield **Drilling Company:** Central Star **Drill Crew:** Andrew Risner/Richard Knisley

Rig: CME850 **Drill Method:** HSA / Split Spoon **Page:** 2 of 2

Depth (m) From	Depth (m) To	Soil Visual Classification / Descriptions and Remarks Surface Condition:	Sample No.	1st 0.152 m	2nd 0.152 m	3rd 0.152 m	4th 0.152 m	5th 0.152 m	Rec. (%)
9.14	9.75	Predominantly sandstone and siltstone fragments, micaceous, slightly weathered, mostly dry, non-plastic	-	12	14	19	9		82
9.75	10.36	Silty clay, occasional highly weathered tan shale zones and coal lenses, moist, somewhat plastic (Sample SS-8)	SS-8	15	9	7	10		85
10.36	10.97	Silty clay, dark grey, slightly moist, shale fragments, rare tan weathered zones, slightly plastic	-	7	8	4	4		67
10.97	11.58	Silty clay, medium to dark grey, slightly moist zones, occasional carbonaceous lenses, shale fragments and rare weathered zones, mostly non-plastic, sandy at base	-	8	8	8	9		75
11.58	12.19	Predominantly highly weathered sandstone and siltstone, grey to tan, micaceous, non-plastic, moist	-	11	19	11	16		47
12.19	12.80	Predominantly highly weathered sandstone and siltstone, tan with some orange zones, micaceous, rare shale fragments, moist, non-plastic (Sample SS-9)	SS-9	15	22	24	13		52
12.80	13.41	Predominantly highly weathered sandstone and siltstone, tan with some orange zones, micaceous, rare shale fragments, moist, non-plastic	-	31	25	50/0.10			65
13.41	13.56	Predominantly highly weathered sandstone and siltstone, tan with some orange zones, micaceous, rare shale fragments, moist, non-plastic, Auger refusal.	-	50/0.05					55

Total Boring Depth: _____

Comments: [Drill Method, Boring Diameter, UD Shelby Tubes, Well Construction (draw sketch on back), etc]

Water Levels: _____ @ First Noted in Samples / Cuttings
_____ @ Completion
_____ @ _____ After _____Hrs
_____ @ Backfilling _____ (date/ time)

Hammer Type: Donut Hammer / Safety Hammer / Automatic Hammer

SPT Hammer: (Weight / Drop / Spoon Dia.) _____

Auger Dia.: ID / OD (meters): _____

Drilling Times:

Moving: _____
Drilling: _____
Standby: _____
Hauling Water: _____
Abandon/Grout Boring: _____
Fluid Losses: _____ @ Depth _____

HSA - Hollow Stem Augers
MD - Rotary Mud Drilling
REF - Refusal (Spoon or Auger)
RC - Rock Core
SS - SPT Split Spoon Sample
DC - Driven Casing (Hammer Type and Record Blows/ft vs. Depth)

ST - Shelby Tube Sample
WOR - SPT Weight of Rods
WOH - SPT Weight of Hammer
REC - Recovery (Meters)
RQD - Rock Quality Designation

TEST BORING FIELD LOG

Cardno Shaping the Future

Test Boring No.: BH-5-15
Location: Roxana Prison

Project Name: BoP, Letcher County EIS, Roxana Prison Site **Project No.:** CARD138 **Date:** 11/18/15

Logged By: Steve Stansfield **Drilling Company:** Central Star **Drill Crew:** Andrew Risner/Richard Knisley

Rig: CME850 **Drill Method:** HSA / Split Spoon **Page:** 1 of 3

Depth (m) From	Depth (m) To	Soil Visual Classification / Descriptions and Remarks Surface Condition:	Sample No.	1st 0.152 m	2nd 0.152 m	3rd 0.152 m	4th 0.152 m	5th 0.152 m	Rec. (%)
0.00	0.61	Top 0.30 m: Dark organic soil with roots, coal chip and occasional sandstone fragments Bottom 0.30 m: Sandy soil, numerous sandstone fragments, micaceous, dry, non-plastic, weathered tan	-	3	3	12	18		83
0.61	1.22	Sandy clay, predominantly soft weathered sandstone fragments, very slightly moist, tan, no noticeable staining, non-plastic	-	20	20	20	18		100
1.22	1.83	Predominantly silty shale fragments, light grey, mostly dry, non-plastic rare coal fragments and weathered tan sandstone inclusions (Sample SS-1)	SS-1	26	10	9	10		80
1.83	2.44	Silty clay, numerous shale fragments, mainly dry and non-plastic, very rare weathered (tan) sandstone fragments	-	8	32	20	33		70
2.44	3.05	Predominantly crumbled sandstone fragments, mostly dry, micaceous, non-plastic, very little weathering, light grey	-	11	10	10	5		52
3.05	3.66	Predominantly weathered shaley sandstone, more weathered and tan than above, some minor orange staining, dry, non-plastic (Sample SS-2)	SS-2	8	8	19	17		55
3.66	4.27	Predominantly shaley sandstone, hard, dry, micaceous, not as weathered as above, non-plastic, grey (no recovery from 3.81 m - 4.27 m)	-	5	50/0.13				90
4.27	4.88	Shaley sandstone, hard, grey, dry (no recovery from 4.36 m - 4.88 m) (Note: Driller added ~5 gallons of water, very difficult auger drilling)	-	50/0.05					-
4.88	5.49	Intermixed shaley sandstone and weathered shale, moist at top and dry at base, coal lense near middle, some orange staining (Sample SS-3)	SS-3	21	26	48	50		80
5.49	6.10	Silty clay at top and becoming more sandy downward, moist, slightly plastic, some orange staining throughout and red at base (Sample SS-4)	SS-4	12	8	7	7		77
6.10	6.71	Silty clay, weathered, grey, becoming sandy downward, little to no orange staining noted, moist	-	6	6	3	3		50
6.71	7.32	Silty clay, numerous coal fragments, rare orange sandstone fragments, moist, slightly plastic, sandstone fragments near base (Sample SS-5)	SS-5	3	1	2	1		47
7.32	7.92	Silty clay, numerous orange stains throughout, moist, moderate plasticity, occasional shale and coal fragments (Sample SS-6)	SS-6	1	1	4	9		57
7.92	8.53	Predominantly clay soil, moist, brown, occasional sandstone and shale fragments, moderate plasticity	-	8	4	4	6		35
8.53	9.14	Sandy clay, numerous sandstone fragments and boulders, tan to brown, very rare shale inclusions, moist	-	3	6	6	9		56

Total Boring Depth: _____

Comments: [Drill Method, Boring Diameter, UD Shelby Tubes, Well Construction (draw sketch on back), etc]

Water Levels:
_____ @ First Noted in Samples / Cuttings
_____ @ Completion
_____ @ _____ After _____Hrs
_____ @ Backfilling _____ (date/ time)

Hammer Type: Donut Hammer / Safety Hammer / Automatic Hammer
SPT Hammer: (Weight / Drop / Spoon Dia.) _____
Auger Dia.: ID / OD (meters): _____

Drilling Times:
Moving: _____
Drilling: _____
Standby: _____
Hauling Water: _____
Abandon/Grout Boring: _____
Fluid Losses: _____ @ Depth _____

HSA - Hollow Stem Augers
MD - Rotary Mud Drilling
REF - Refusal (Spoon or Auger)
RC - Rock Core
SS - SPT Split Spoon Sample
DC - Driven Casing (Hammer Type and Record Blows/ft vs. Depth)

ST - Shelby Tube Sample
WOR - SPT Weight of Rods
WOH - SPT Weight of Hammer
REC - Recovery (Meters)
RQD - Rock Quality Designation

TEST BORING FIELD LOG

Cardno Shaping the Future

Test Boring No.: BH-5-15
Location: Roxana Prison

Project Name: BoP, Letcher County EIS, Roxana Prison Site **Project No.:** CARD138 **Date:** 11/18/15

Logged By: Steve Stansfield **Drilling Company:** Central Star **Drill Crew:** Andrew Risner/Richard Knisley

Rig: CME850 **Drill Method:** HSA / Split Spoon **Page:** 2 of 3

Depth (m) From	Depth (m) To	Soil Visual Classification / Descriptions and Remarks Surface Condition:	Sample No.	1st 0.152 m	2nd 0.152 m	3rd 0.152 m	4th 0.152 m	5th 0.152 m	Rec. (%)
9.14	9.75	Sandy clay, moist to wetter downward, tan to brown, scattered shale and coal inclusions throughout, dense, some orange/red staining	-	3	3	4	4		100
9.75	10.36	Silty clay, dark grey, moist, large coal fragments, some sandstone inclusions (tan to brown), scattered shale fragments, moderate plasticity (Sample SS-7)	SS-7	3	6	5	4		57
10.36	10.97	Silty clay at top with predominantly sandstone downward, scattered shale and sandstone inclusions in top (Moist, moderate plasticity); sandstone is light grey, micaceous, dry with rare coal spars	-	6	5	24	4		90
10.97	11.58	Predominantly sandstone, crumbly, light grey to tan/orange, micaceous, dry	-	8	5	22	11		30
11.58	12.19	Sandy clay, numerous sandstone inclusions, grey to tan, crumbly, coal spars throughout, rare orange staining (Sample SS-8)	SS-8	6	7	7	6		67
12.19	12.80	Predominantly weathered sandstone, light grey and tan, occasional orange staining, micaceous, crumbly, dry	-	9	26	28	18		47
12.80	13.41	Friable sandstone, tan to orange, grey shale inclusions, moderate soft, very slightly damp, occasional large coal fragments (Sample SS 9). Note: A piece of wiring was in spoon sample from 12.80 m - 13.41 m, indicating boring is not in natural rock at this depth.	SS-9	8	7	9	14		90
13.41	14.02	Friable sandstone, brown to tan, rare grey shale and coal inclusions, mostly dry	-	10	14	10	14		52
14.02	14.63	Clayey sand, brown to tan, rare grey shale and small coal inclusions, somewhat moist, some larger sandstone boulders	-	6	4	8	8		56
14.63	15.24	Clayey sand, brown to tan, rare grey shale and small coal inclusions, somewhat moist, some larger sandstone boulders (Sample SS-10)	SS-10	5	5	10	7		57
15.24	15.85	Top half: Clayey sand, brown to tan, rare grey shale and small coal inclusions, somewhat moist, some larger sandstone boulders (Driller added water, difficult augering) Bottom half: Predominantly sandstone, tan, micaceous, dry	-	6	12	8	8		61
15.85	16.46	Clayey sand, brown, micaceous, several large shale fragments, micaceous (sample wet due to driller adding water to hole)	-	5	8	8	6		39
16.46	17.07	Intermixed clayey sand and shale, numerous coal fragments, sand is tan to orange color, sample wet due to driller adding water (Sample S-11)	SS-11	4	6	6	11		95
17.07	17.68	Predominantly sandstone, some shale inclusions, tan/brown, friable, micaceous (sample wet due to driller adding water)	-	8	11	11	9		57

Total Boring Depth: _____

Comments: [Drill Method, Boring Diameter, UD Shelby Tubes, Well Construction (draw sketch on back), etc]

Water Levels:
_____ @ First Noted in Samples / Cuttings
_____ @ Completion
_____ @ _____ After _____Hrs
_____ @ Backfilling _____ (date/ time)

Hammer Type: Donut Hammer / Safety Hammer / Automatic Hammer

SPT Hammer: (Weight / Drop / Spoon Dia.) _____

Auger Dia.: ID / OD (meters): _____

Drilling Times:

Moving: _____
Drilling: _____
Standby: _____
Hauling Water: _____
Abandon/Grout Boring: _____
Fluid Losses: _____ @ Depth _____

HSA - Hollow Stem Augers
MD - Rotary Mud Drilling
REF - Refusal (Spoon or Auger)
RC - Rock Core
SS - SPT Split Spoon Sample
DC - Driven Casing (Hammer Type and Record Blows/ft vs. Depth)

ST - Shelby Tube Sample
WOR - SPT Weight of Rods
WOH - SPT Weight of Hammer
REC - Recovery (Meters)
RQD - Rock Quality Designation

TEST BORING FIELD LOG

Cardno Shaping the Future

Test Boring No.: BH-5-15
Location: Roxana Prison

Project Name: BoP, Letcher County EIS, Roxana Prison Site **Project No.:** CARD138 **Date:** 11/18/15

Logged By: Steve Stansfield **Drilling Company:** Central Star **Drill Crew:** Andrew Risner/Richard Knisley

Rig: CME850 **Drill Method:** HSA / Split Spoon **Page:** 3 of 3

Depth (m) From	Depth (m) To	Soil Visual Classification / Descriptions and Remarks Surface Condition:	Sample No.	1st 0.152 m	2nd 0.152 m	3rd 0.152 m	4th 0.152 m	5th 0.152 m	Rec. (%)
17.68	18.29	Predominently sandstone, tan to brown, weathered, occasional coal streaks, micaceous, Auger refusal		4	6	27	50/0.08		

Total Boring Depth: _____

Comments: [Drill Method, Boring Diameter, UD Shelby Tubes, Well Construction (draw sketch on back), etc]

Water Levels: _____ @ First Noted in Samples / Cuttings
_____ @ Completion
_____ @ _____ After _____Hrs
_____ @ Backfilling _____ (date/ time)

Hammer Type: Donut Hammer / Safety Hammer / Automatic Hammer
SPT Hammer: (Weight / Drop / Spoon Dia.) _____
Auger Dia.: ID / OD (meters): _____

Drilling Times:
Moving: _____
Drilling: _____
Standby: _____
Hauling Water: _____
Abandon/Grout Boring: _____
Fluid Losses: _____ @ Depth _____

HSA - Hollow Stem Augers
MD - Rotary Mud Drilling
REF - Refusal (Spoon or Auger)
RC - Rock Core
SS - SPT Split Spoon Sample
DC - Driven Casing (Hammer Type and Record Blows/ft vs. Depth)
ST - Shelby Tube Sample
WOR - SPT Weight of Rods
WOH - SPT Weight of Hammer
REC - Recovery (Meters)
RQD - Rock Quality Designation

TEST BORING FIELD LOG

Test Boring No.: BH-6-15
Location: Roxana Prison

Project Name: BoP, Letcher County EIS, Roxana Prison Site **Project No.:** CARD138 **Date:** 11/17/15

Logged By: Steve Stansfield **Drilling Company:** Central Star **Drill Crew:** Andrew Risner/Richard Knisley

Rig: CME850 **Drill Method:** HSA / Split Spoon **Page:** 1 of 2

Depth (m) From	Depth (m) To	Soil Visual Classification / Descriptions and Remarks Surface Condition:	Sample No.	1st 0.152 m	2nd 0.152 m	3rd 0.152 m	4th 0.152 m	5th 0.152 m	Rec. (%)
0.00	0.61	Brown organic material grading to silty clay, moist, shale fragments with plant impressions, moderate plasticity, moist, slightly weathered tan to grey	-	3	6	5	9		81
0.61	1.22	Silty clay with coal laminations, tan to dark grey, top weathered, slightly moist, slightly organic at top (top 0.335 m sampled) (Sample SS-1)	SS-1	6	14	11	8		95
1.22	1.83	Silty clay, moist, dark grey, scattered coal pieces, moderately weathered, shale fragments, slightly plastic	-	8	8	11	9		63
1.83	2.44	Silty clay with coal and carbonaceous shale layers, dark grey, moist, moderate plasticity, scattered sandstone fragments (Sample SS-2)	SS-2	2	5	6	9		66
2.44	3.05	Silty clay with coal and carbonaceous shale layers, dark grey, moist, moderate plasticity, scattered sandstone fragments	-	4	3	6	5		47
3.05	3.66	Intermixed silty clay and sandstone, slightly moist, coal fragments throughout, mostly non-plastic, light grey (sandstone) to dark grey (Sample SS-3)	SS-3	8	8	5	23		52
3.66	4.27	Silty clay and sand, slightly moist, dark grey, very slight plasticity, shale and occasional sandstone fragments	-	12	11	12	7		55
4.27	4.88	Silty sand, very slightly moist, predominantly light gray sandstone with occasional dark grey shale fragments, non-plastic, thin orange zone at immediate base	-	34	15	11	19		77
4.88	5.49	Silty clay with some sandy zones, fairly moist, some tan to orange coloring but mostly dark grey, shale and occasional sandstone fragments (Sample SS-4)	SS-4	11	4	12	8		65
5.49	6.10	Silty clay with some siltstone/shale fragments throughout, rare sandstone fragments, dark grey, moist, medium plasticity in silty zones, moderate orange staining downward, large wood fragments at base	SS-5	7	4	6	8		69
6.10	6.71	Predominantly wood stump with thin silty clay at base	-	25	4	6	5		52
6.71	7.32	No recovery (possible wood stump?)	-	3	4	4	5		0
7.32	7.92	Clay with sandstone boulder, moist, brown to tan, sandstone is weathered with red-orange coloration, clay is plastic	-	5	5	4	5		40
7.92	8.53	Brown clay matrix with occasional sandstone and coal fragments, sandstone is weathered and occasional red, plastic (Sample SS-6)	SS-6	3	3	2	4		58
8.53	9.14	From 8.53 m - 8.84 m: Brown clay matrix with occasional sandstone and coal fragments, sandstone is weathered and occasional red, plastic From 8.84 m - 9.14 m: Silty clay, dark grey, very slightly moist, non-plastic, occasional shale and red sandstone fragments	-	3	33	3	14		55

Total Boring Depth: _____

Comments: [Drill Method, Boring Diameter, UD Shelby Tubes, Well Construction (draw sketch on back), etc]

Water Levels:
_____ @ First Noted in Samples / Cuttings
_____ @ Completion
_____ @ _____ After _____Hrs
_____ @ Backfilling _____ (date/ time)

Hammer Type: Donut Hammer / Safety Hammer / Automatic Hammer
SPT Hammer: (Weight / Drop / Spoon Dia.) _____
Auger Dia.: ID / OD (meters): _____

Drilling Times:
Moving: _____
Drilling: _____
Standby: _____
Hauling Water: _____
Abandon/Grout Boring: _____
Fluid Losses: _____ @ Depth _____

HSA - Hollow Stem Augers
MD - Rotary Mud Drilling
REF - Refusal (Spoon or Auger)
RC - Rock Core
SS - SPT Split Spoon Sample
DC - Driven Casing (Hammer Type and Record Blows/ft vs. Depth)

ST - Shelby Tube Sample
WOR - SPT Weight of Rods
WOH - SPT Weight of Hammer
REC - Recovery (Meters)
RQD - Rock Quality Designation

TEST BORING FIELD LOG

Cardno Shaping the Future

Test Boring No.: BH-6-15
Location: Roxana Prison

Project Name: BoP, Letcher County EIS, Roxana Prison Site **Project No.:** CARD138 **Date:** 11/17/15

Logged By: Steve Stansfield **Drilling Company:** Central Star **Drill Crew:** Andrew Risner/Richard Knisley

Rig: CME850 **Drill Method:** HSA / Split Spoon **Page:** 2 of 2

Depth (m) From	Depth (m) To	Soil Visual Classification / Descriptions and Remarks Surface Condition:	Sample No.	1st 0.152 m	2nd 0.152 m	3rd 0.152 m	4th 0.152 m	5th 0.152 m	Rec. (%)
9.14	9.75	Silty clay, dark grey, numerous shale fragments, mostly dry and non-plastic, coal fragments near base (Sample SS-7)	SS-7	26	19	7	5		35
9.75	10.36	Dark grey, silty clay at immediate top, light grey sandstone in bottom three-quarters, micaceous, dry, non-plastic	-	7	17	12	10		45
10.36	10.97	Intermixed silty clay and sandstone, coal zone, numerous shale and sandstone fragments, slightly moist, non-plastic (Sample SS-8)	SS-8	8	11	22	14		65
10.97	11.58	Top 0.30 m: Intermixed silty clay and sandstone, coal zone, numerous shale and sandstone fragments, slightly moist, non-plastic Bottom 0.30 m: Clayey silt with shale fragments, some very faint orange stains, moist, plastic	-	12	29	8	7		87
11.58	12.19	Silty clay, moist, tan to dark grey, numerous small diameter red-orange inclusions, occasional coal fragments, moderate plasticity (Sample SS-9)	SS-9	6	5	6	5		92
12.19	12.80	Silty clay, moist, tan to dark grey, numerous small diameter red-orange inclusions, occasional coal fragments, moderate plasticity	-	4	7	8	6		90
12.80	13.41	Predominantly sandstone, weathered tan to light grey with rare red-orange zones, mostly dry and non-plastic	-	7	6	14	7		67
13.41	14.02	Highly weathered sandstone with clay zones, micaceous, some green sandstone at base, moist	-	6	13	10	9		90
14.02	14.63	Claystone, dark gray, moist, plastic, occasional coal incluions	-	4	9	15	50/0.08		70
14.63	14.69	Siltstone, grey, unweathered, Auger Refusal	-	50/0.08	-	-	-		

Total Boring Depth: _____

Comments: [Drill Method, Boring Diameter, UD Shelby Tubes, Well Construction (draw sketch on back), etc]

Water Levels:
_____ @ First Noted in Samples / Cuttings
_____ @ Completion
_____ @ _____ After _____Hrs
_____ @ Backfilling _____ (date/ time)

Hammer Type: Donut Hammer / Safety Hammer / Automatic Hammer
SPT Hammer: (Weight / Drop / Spoon Dia.) _____
Auger Dia.: ID / OD (meters): _____

Drilling Times:
Moving: _____
Drilling: _____
Standby: _____
Hauling Water: _____
Abandon/Grout Boring: _____
Fluid Losses: _____ @ Depth _____

HSA - Hollow Stem Augers
MD - Rotary Mud Drilling
REF - Refusal (Spoon or Auger)
RC - Rock Core
SS - SPT Split Spoon Sample
DC - Driven Casing (Hammer Type and Record Blows/ft vs. Depth)
ST - Shelby Tube Sample
WOR - SPT Weight of Rods
WOH - SPT Weight of Hammer
REC - Recovery (Meters)
RQD - Rock Quality Designation

Roxana Prison Site,
Letcher County, Kentucky

Appendix

F

ACID-BASE ACCOUNTING RESULTS

Cardno®
Shaping the Future

Appalachian Laboratories, Inc.

P.O. BOX 392
BECKLEY, WEST VIRGINIA 25802

PHONE 304-253-8677
FAX 304-253-4157
E-mail: applabs@charter.net

Client: Cardno

Date Sampled: 11/20/2015
Date Received: 11/24/2015
Date Analyzed: 11/30/2015

Roxana Prison
BH-1-15
ACID BASE ACCOUNTABILITY
CAC03 Equiv. (Tons/1000 Tons of Material)

Lab No.	SAMPLE ID	Color	Fizz	% Sulfur	Max. From %	Amount Present	Max. Needed pH 7	Excess	Paste pH
15631	SS-1	10yr/6/2	none	0.0510	1.5938	7.5000	-0-	5.9062	7.16
15632	SS-2	10yr/5/1	none	0.0404	1.2625	7.2500	-0-	5.9875	7.20
15633	SS-3	10yr/5/2	none	0.0554	1.7313	10.0000	-0-	8.2687	7.49

*Calculated from the Pyritic Sulfur Content
See Attachment

cardno roxana prison bh-1-15 acid base,11-30-15

Respectively Submitted: Donald M. Fox

Appalachian Laboratories, Inc.

P.O. BOX 392
BECKLEY, WEST VIRGINIA 25802

PHONE 304-253-8677
FAX 304-253-4157
E-mail: applabs@charter.net

Client: Cardno

Date Sampled: 11/20/2015
Date Received: 11/24/2015
Date Analyzed: 11/30/2015

Roxana Prison
BH-2-15
ACID BASE ACCOUNTABILITY
CAC03 Equiv. (Tons/1000 Tons of Material)

Lab No.	SAMPLE ID	Color	Fizz	% Sulfur	Max. From %	Amount Present	Max. Needed pH 7	Excess	Paste pH
15634	SS-1	10yr/6/2	none	0.0585	1.8281	6.7500	-0-	4.9219	7.49
15635	SS-2	10yr/5/2	none	0.0897	2.8031	12.2500	-0-	9.4469	6.94
15633	SS-3	10yr/6/1	slight	0.1088	3.4000	24.2500	-0-	20.8500	7.84

*Calculated from the Pyritic Sulfur Content
See Attachment

cardno roxana prison bh-2-15 acid base,11-30-15

Respectively Submitted: Kenneth M. Fox

Appalachian Laboratories, Inc.

P.O. BOX 392
BECKLEY, WEST VIRGINIA 25802

PHONE 304-253-8677
FAX 304-253-4157
E-mail: applabs@charter.net

Client: Cardno

Date Sampled: 11/19/2015
Date Received: 11/24/2015
Date Analyzed: 11/30/2015

Roxana Prison
BH-3-15
ACID BASE ACCOUNTABILITY
CAC03 Equiv. (Tons/1000 Tons of Material)

Lab No.	SAMPLE ID	Color	Fizz	% Sulfur	Max. From %	Amount Present	Max. Needed pH 7	Excess	Paste pH
15637	SS-1	10yr/6/1	none	0.0895	2.7969	13.7500	-0-	10.9531	7.76
15638	SS-2	10yr/6/2	none	0.0462	1.4438	15.0000	-0-	13.5562	7.70
15639	SS-3	10yr/6/2	none	0.1228	3.8375	7.7500	-0-	3.9125	7.32
15640	SS-4	10yr/7/2	none	0.1133	3.5406	7.0000	-0-	3.4594	6.95
15641	SS-5	10yr/7/1	none	0.1662	5.1938	12.5000	-0-	7.3062	7.25
15642	SS-6	10yr/7/1	none	0.1340	4.1875	6.5000	-0-	2.3125	7.36
15643	SS-7	10yr/6/1	none	0.1178	3.6813	11.0000	-0-	7.3187	7.43
15644	SS-8	10yr/5/1	none	0.1010	3.1563	10.5000	-0-	7.3437	7.31
15645	SS-9	10yr/5/1	none	0.0972	3.3075	6.5000	-0-	3.4625	7.15
15646	SS-10	10yr/6/2	none	0.0801	2.5031	6.7500	-0-	4.2469	7.11

*Calculated from the Pyritic Sulfur Content
See Attachment

cardno roxana prison bh-3-15 acid base,11-30-15

Respectively Submitted: _____

Appalachian Laboratories, Inc.

P.O. BOX 392
BECKLEY, WEST VIRGINIA 25802

PHONE 304-253-8677
FAX 304-253-4157
E-mail: applabs@charter.net

Client: Cardno

Date Sampled: 11/16/2015
Date Received: 11/24/2015
Date Analyzed: 11/30/2015

Roxana Prison
BH-4-15
ACID BASE ACCOUNTABILITY
CAC03 Equiv. (Tons/1000 Tons of Material)

Lab No.	SAMPLE ID	Color	Fizz	% Sulfur	Max. From %	Amount Present	Max. Needed pH 7	Excess	Paste pH
15647	SS-1	10yr/6/2	none	0.0376	1.1750	9.0000	-0-	7.8250	7.57
15648	SS-2	10yr/6/1	none	0.0594	1.8563	6.0000	-0-	4.1437	6.82
15649	SS-3	10yr/5/2	none	0.1186	3.7063	8.5000	-0-	4.7937	6.56
15650	SS-4	10yr/6/1	slight	0.0972	3.0375	21.0000	-0-	17.9625	7.85

*Calculated from the Pyritic Sulfur Content
See Attachment

cardno roxana prison bh-4-15 acid base,11-30-15

Respectively Submitted: _____

Appalachian Laboratories, Inc.

P.O. BOX 392
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Client: Cardno

Date Sampled: 11/17/2015
Date Received: 11/24/2015
Date Analyzed: 11/30/2015

Roxana Prison
BH-4-15

ACID BASE ACCOUNTABILITY
CAC03 Equiv. (Tons/1000 Tons of Material)

Lab No.	SAMPLE ID	Color	Fizz	% Sulfur	Max. From %	Amount Present	Max. Needed pH 7	Excess	Paste pH
15651	SS-5	10yr/6/1	none	0.1437	4.4906	12.7500	-0-	8.2594	7.42
15652	SS-6	10yr/6/1	slight	0.1408	4.4000	23.2500	-0-	18.8500	7.57
15653	SS-7	10yr/6/1	none	0.1807	5.6469	13.2500	-0-	7.6031	7.55
15654	SS-8	10yr/6/2	none	0.0990	3.0938	9.5000	-0-	6.4062	7.33
15655	SS-9	10yr/7/3	moderate	0.0008	0.0250	26.2500	-0-	26.2250	8.07

*Calculated from the Pyritic Sulfur Content
See Attachment

cardno roxana prison bh-4-15 (5-9) acid base,11-30-15

Respectively Submitted: Kenneth M. Lee

Appalachian Laboratories, Inc.

P.O. BOX 392
BECKLEY, WEST VIRGINIA 25802

PHONE 304-253-8677
FAX 304-253-4157
E-mail: applabs@charter.net

Client: Cardno

Date Sampled: 11/18/2015
Date Received: 11/24/2015
Date Analyzed: 11/30/2015

Roxana Prison
BH-5-15
ACID BASE ACCOUNTABILITY
CAC03 Equiv. (Tons/1000 Tons of Material)

Lab No.	SAMPLE ID	Color	Fizz	% Sulfur	Max. From %	Amount Present	Max. Needed pH 7	Excess	Paste pH
15656	SS-1	10yr/7/1	none	0.0446	1.3938	5.0000	-0-	3.6062	7.84
15657	SS-2	10yr/6/1	none	0.1109	3.4656	20.5000	-0-	17.0344	7.77
15658	SS-3	10yr/6/1	slight	0.4033	12.6031	26.7500	-0-	14.1469	7.33
15659	SS-4	10yr/6/2	none	0.2140	6.6875	15.5000	-0-	8.8125	7.32
15660	SS-5	10yr/6/1	none	0.1688*	5.2750	6.5000	-0-	1.2250	6.89
15661	SS-6	10yr/7/3	slight	0.1121	3.5031	23.2500	-0-	19.7469	7.27
15662	SS-7	10yr/7/3	none	0.0760	2.3750	7.5000	-0-	5.1250	7.12
15663	SS-8	10yr/7/3	none	0.0231	0.7219	7.2500	-0-	6.5281	7.41
15664	SS-9	10yr/7/4	none	0.0497	1.5531	7.2500	-0-	5.6969	7.07
15665	SS-10	10yr/7/4	none	0.0452	1.4125	3.5000	-0-	2.0875	5.49
15666	SS-11	10yr/7/4	none	0.0406	1.2688	2.5000	-0-	1.2312	5.37

*Calculated from the Pyritic Sulfur Content
See Attachment

cardno roxana prison bh-5-15 acid base,11-30-15

Respectively Submitted: _____

Appalachian Laboratories, Inc.

P.O. BOX 392
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FAX 304-253-4157
E-mail: applabs@charter.net

Client: Cardno

Date Sampled: 11/18/2015
Date Received: 11/24/2015
Date Analyzed: 11/30/2015

Roxana Prison
BH-5-15
%
SULFUR FORMS

Lab No.	I.D. No.	% Pyritic Sulfur	% Organic Sulfur	% Sulfate Sulfur	% Total Sulfur
15660	SS-5	0.1688	0.2521	<0.0001	0.4209

Respectively Submitted: _____

Appalachian Laboratories, Inc.

P.O. BOX 392
BECKLEY, WEST VIRGINIA 25802

PHONE 304-253-8677
FAX 304-253-4157
E-mail: applabs@charter.net

Client: Cardno

Date Sampled: 11/17/2015
Date Received: 11/24/2015
Date Analyzed: 11/30/2015

Roxana Prison
BH-6-15
ACID BASE ACCOUNTABILITY
CAC03 Equiv. (Tons/1000 Tons of Material)

Lab No.	SAMPLE ID	Color	Fizz	% Sulfur	Max. From %	Amount Present	Max. Needed pH 7	Excess	Paste pH
15667	SS-1	10yr/5/1	none	0.1460	4.5625	6.7500	-0-	2.1875	7.51
15668	SS-2	10yr/4/1	none	0.2132	6.6625	10.0000	-0-	3.3375	7.69
15669	SS-3	10yr/6/1	none	0.0928	2.9000	9.2500	-0-	6.3500	7.93
15670	SS-4	10yr/6/2	slight	0.0870	2.7188	29.2500	-0-	26.5312	7.77
15671	SS-5	10yr/6/2	none	0.0632	1.9750	12.7500	-0-	10.7750	7.56
15672	SS-6	10yr/6/4	none	0.0351	1.0969	3.5000	-0-	2.4031	6.51
15673	SS-7	10yr/6/1	none	0.0440	1.3750	6.7500	-0-	5.3750	7.54
15674	SS-8	10yr/4/1	none	0.0976	3.0500	5.0000	-0-	1.9500	6.54
15675	SS-9	10yr/6/2	none	0.0943	2.9469	4.5000	-0-	1.5531	6.14

*Calculated from the Pyritic Sulfur Content
See Attachment

cardno roxana prison bh-6-15 acid base,11-30-15

Respectively Submitted: _____

APPENDIX H

USFWS ENDANGERED SPECIES ACT CONSULTATION (2017)

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Kentucky Ecological Services Field Office
330 West Broadway, Suite 265
Frankfort, Kentucky 40601
(502) 695-0468

August 7, 2014

Ms. Deborah Henson
Cardno Tec
18 S. George Street, Suite 400
York, PA 17401

Re: FWS 2013-B-0627; Federal Bureau of Prisons; proposed federal penitentiary; located in Letcher County, Kentucky

Dear Ms. Henson:

Thank you for the opportunity to provide comments on the above-referenced project. The U.S. Fish and Wildlife Service (Service) has reviewed this proposed project and offers the following comments in accordance with the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) and the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 *et seq.*). This is not a concurrence letter. Please read carefully, as further consultation with the Service may be required.

In accordance with the provisions of the Fish and Wildlife Coordination Act, the Service has reviewed the project with regards to the effects the proposed actions may have on wetlands and/or other jurisdictional waters. We recommend that project plans be developed to avoid impacting wetland areas and/or streams, and reserve the right to review any required federal or state permits at the time of public notice issuance. The U.S. Army Corps of Engineers should be contacted to assist you in determining if wetlands or other jurisdictional waters are present or if a permit is required.

In accordance to section 7 of the ESA, the Service must evaluate the potential for all the direct, indirect, and cumulative effects of a proposed project on federally listed species. This includes effects of any "interrelated actions" that are part of a larger action and depend on the larger action for their justification and "interdependent actions" that have no independent utility apart from the action under consideration. Please include information about all of the potential impacts associated with the proposed project, including those from interrelated or interdependent actions (*e.g.*; utilities, etc.) and future actions that are reasonably certain to occur as a result of the proposed project.

In order to assist you in determining if the proposed project has the potential to impact protected species we have searched our records for occurrences of listed species within the vicinity of the proposed project. Based upon the information provided to us and according to our databases, we believe that the following federally listed species have the potential to occur within the project vicinity:

Group	Species	Common name	Legal* Status
Mammals	*Myotis sodalis*	Indiana bat	E
	Myotis grisescens	gray bat	E
	Myotis septentrionalis	northern long-eared bat	P
Fishes	*Etheostoma sagitta spilotum*	Kentucky arrow darter	C

** Key to notations: E = Endangered, T = Threatened, P = Proposed, C = Candidate, CH = Critical Habitat*

We must advise you that collection records available to the Service may not be all-inclusive. Our database is a compilation of collection records made available by various individuals and resource agencies. This information is seldom based on comprehensive surveys of all potential habitats and thus does not necessarily provide conclusive evidence that protected species are present or absent at a specific locality.

Indiana bat

The entire state of Kentucky is within the range of the Indiana bat; (1) caves, rockshelters, and abandoned underground mines provide suitable wintering habitat for the Indiana bat; and (2) forested areas provide suitable summer roosting and foraging habitat for the Indiana bat. In order to address the concerns and be in compliance with the ESA, we have the following recommendations relative to potential direct and/or indirect effects as a result of impacts to the habitats listed above:

(1) During hibernation, the Indiana bat prefers limestone caves, sandstone rockshelters, and abandoned underground mines with stable temperatures of 39 to 46 degrees F and humidity above 74 percent but below saturation. Prior to hibernation, Indiana bats utilize the forest habitat up to five miles from the hibernacula to feed and roost until temperatures drop to a point that forces them into hibernation. This "swarming" period is dependent upon weather conditions and lasts from about September 15 to about November 15. This is a critical time for Indiana bats, since they are acquiring additional fat reserves and mating prior to hibernation.

Based on the presence of numerous caves, rock shelters, and underground mines in Kentucky, we believe that it is reasonable to assume that other caves, rock shelters, and/or abandoned underground mines may occur within the project area, and, if they occur, they could provide winter habitat for Indiana bats. Therefore, we recommend that the project proponent conduct a phase 1 winter hibernacula habitat assessment following the March 15, 2014 "Supplemental Indiana bat survey guidance for Kentucky." This assessment should identify any caves, rock shelters, and underground mines and assess their potential as suitable Indiana bat hibernacula. Depending on the results of the habitat assessment, subsequent bat presence/absence surveys may be necessary to determine if the species is using a feature as a hibernaculum. These presence/absence surveys must be conducted between September 1 and October 31 or April 1 and April 21 following the protocol found in the guidance document cited above.

(2) The Indiana bat utilizes a wide array of forested habitats, including riparian forests, bottomlands, and uplands for both summer foraging and roosting habitat. Indiana bats typically roost under exfoliating bark, in cavities of dead and live trees, and in snags (*i.e.*, dead trees or dead portions of live trees). Trees in excess of 16 inches diameter at breast

height (DBH) are considered optimal for maternity colony roosts, but trees in excess of 9 inches DBH appear to provide suitable maternity roosting habitat. Male Indiana bats have been observed roosting in trees as small as 5 inches DBH.

We recommend that the project proponent design or modify the proposed project to eliminate or reduce impacts to suitable Indiana bat habitat, thus avoiding impacts. A habitat assessment may useful in determining if suitable Indiana bat summer roosting or foraging habitat is present in the action area of the proposed project. If suitable habitat removal cannot be avoided, the following are the typical options available to address potential impacts to the species:

- The project proponent survey the project site to determine the presence or likely absence of Indiana bats within the project area in an effort to determine if potential effects are likely. A qualified biologist who holds the appropriate collection permits for the Indiana bat must undertake such surveys in accordance with our most current survey guidance. If any Indiana bats are identified, we would request written notification of such occurrence(s) and further coordination and consultation.

- The project proponent can request formal section 7 consultation through the lead federal action agency associated with the proposed project. To request formal consultation, the project proponent would need to submit a Biological Assessment that describes the action and evaluates the effects of the action on the listed species in the project area. After formal consultation is initiated, the Service has 135 days to prepare a Biological Opinion that analyzes the effects of the action on the listed species and recommends strategies to minimize those effects.

- The project proponent may provide the Service with additional information through the informal consultation process, prepared by a qualified biologist, that includes site-specific habitat information and a thorough effects analysis (direct, indirect, and cumulative) to support a "not likely to adversely affect" determination. The Service will review this and decide if there is enough supporting information to concur with the determination.

- The project proponent may choose to assume presence of the species in the project area and enter into a Conservation Memorandum of Agreement (MOA) with the Service to account for the incidental take of Indiana bats. By entering into a Conservation MOA with the Service, Cooperators gain flexibility with regard to the removal of suitable Indiana bat habitat. In exchange for this flexibility, the Cooperator provides recovery-focused conservation benefits to the Indiana bat through the implementation of minimization and mitigation measures that are described in the Indiana Bat Mitigation Guidance for the Commonwealth of Kentucky. For additional information about this option, please notify our office.

The Payne Gap / Lawson site is in potential Indiana bat habitat; all of the options listed above are appropriate for addressing potential impacts to the species at this site. Because the Roxana site is in known "P1/P2 swarming" habitat, we already know that the species is present in the proposed project area, and, therefore, further surveys are not necessary. Impacts to the species at the Roxana site should be addressed by using one of the last three bullet points listed above.

Gray bat

Gray bats roost, breed, rear young, and hibernate in caves year round. They migrate between summer and winter caves and will use transient or stopover caves along the way. Gray bats eat a variety of flying aquatic and terrestrial insects present along streams, rivers, and lakes. Low-flow streams produce an abundance of insects and are especially valuable to the gray bat as foraging habitat. For hibernation, the roost site must have an average temperature of 42 to 52 degrees F. Most of the caves used by gray bats for hibernation have deep vertical passages with large rooms that function as cold air traps. Summer caves must be warm, between 57 and 77 degrees F, or have small rooms or domes that can trap the body heat of roosting bats. Summer caves are normally located close to rivers or lakes where the bats feed. Gray bats have been known to fly as far as 12 miles from their colony to feed.

Because we have concerns relating to the gray bat on this project and due to the lack of occurrence information available on this species relative to the proposed project area, we have the following recommendations relative to gray bats.

- Based on the presence of numerous caves, rock shelters, and underground mines in Kentucky, we believe that it is reasonable to assume that other caves, rock shelters, and/or abandoned underground mines may occur within the project area, and, if they occur, they could provide winter/summer habitat for gray bats. Therefore, we would recommend that the project proponent survey the project area for caves, rock shelters, and underground mines. Additional evaluation and/or surveys may be necessary if suitable gray bat hibernacula and/or roosting habitat exists in the action area of the proposed project.

- Sediment Best Management Practices (BMPs) should be utilized and maintained to minimize siltation of the streams located within and in the vicinity of the project area, as these streams represent potential foraging habitat for the gray bat.

Northern long-eared bat

The northern long-eared bat was proposed for federal listing under the ESA on October 2, 2013. The Service has extended the deadline for the final determination to April 2, 2015. Both proposed project sites are located in "known summer" northern-long-eared bat habitat. During the summer, northern long-eared bats typically roost singly or in colonies in a wide-variety of forested habitats, where they seek shelter during daylight hours underneath bark or in cavities/crevices of both live trees and snags, including relatively small trees and snags that are less than 5 inches in diameter at breast height (DBH). Northern long-eared bats have also been documented roosting in man-made structures (i.e., buildings, barns, etc.) during the summer. According to current winter occurrence data, northern long-eared bats predominately winter in hibernacula that include caves, tunnels, and underground mine passages.

Although species proposed for listing are not afforded protection under the ESA, when a species is listed, the prohibitions against jeopardizing its continued existence and unauthorized take are effective immediately, **regardless of an action's stage of completion**. Therefore, to avoid significant project delays, we recommend that the project proponent evaluate and address potential impacts to northern long-eared bat summer habitat and winter habitat that is present in the action area of the proposed project.

Kentucky Arrow Darter

The Kentucky arrow darter is a rather large, brightly colored darter that is restricted to the upper Kentucky River basin in eastern Kentucky. The species' preferred habitat consists of pools or transitional areas between riffles and pools (runs and glides) in moderate to high gradient streams with bedrock, boulder, and cobble substrates. The species' habitat and range have been severely degraded and limited by water pollution from surface coal mining and gas-exploration activities; removal of riparian vegetation; stream channelization; increased siltation associated with poor mining, logging, and agricultural practices; and deforestation of watersheds. A habitat assessment and/or survey may be necessary to determine if impacts to these species are likely as a result of the proposed project.

As a federal candidate species, the Service sufficient information on the biological status and threats of the species to propose it as endangered or threatened under the ESA, but development of a proposed listing regulation is precluded by other higher priority listing activities. Candidate species receive no statutory protection under the ESA. The Service encourages cooperative conservation efforts for these species because they are, by definition, species that may warrant future protection under the ESA. Addressing the needs of Kentucky arrow darter before the regulatory requirements associated with a listed threatened or endangered species come into play, would allow future developers, landowners, and other entities greater management flexibility to stabilize or restore the species and its habitat for future projects. In addition, as such threats are reduced and populations are increased or stabilized, priority for listing can be shifted to those species in greatest need of the ESA's protective measures. Ideally, sufficient threats can be removed to eliminate the need for listing.

Presence/absence surveys would provide additional information regarding the likelihood that the proposed project would impact Kentucky arrow darter. Surveys would not be necessary if habitat assessments, especially specific conductivity measurements, supported that suitable habitat does not exist in the action area of the proposed project.

Thank you again for your request. Your concern for the protection of endangered and threatened species is greatly appreciated. If you have any questions regarding the information that we have provided, please contact Jessi Miller at (502) 695-0468 extension 104.

Sincerely,

Virgil Lee Andrews, Jr.
Field Supervisor

U.S. Department of Justice

Federal Bureau of Prisons

Washington, DC 20534

January 16, 2015

Ms. Jessica Miller
United States Fish and Wildlife Service
Kentucky Field Office
330 W Broadway, Suite 265
Frankfort, KY 40601

Subject: Phase I Indiana and Gray Bat Survey for the Environmental Impact Statement for new Federal Bureau of Prisons United States Penitentiary and Federal Prison Camp in Letcher County, Kentucky

Dear Ms. Miller:

Please find attached one copy of the Desktop Analysis and Habitat Survey for the Indiana Bat (*Myotis sodalis)*, Gray Bat (*Myotis grisescens*), and Northern Long-eared Bat (*Myotis septentrionalis*) at two Sites for a Proposed Federal Correctional Facility in Letcher County, Kentucky for your review. The report has been prepared in accordance with your letter dated August 7, 2014. Please contact me with any questions at 202-514-6470 or at igaston@bop.gov.

Sincerely,

Issac Gaston, Site Selection Specialist
Capacity Planning and Construction Branch

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Kentucky Ecological Services Field Office
330 West Broadway, Suite 265
Frankfort, Kentucky 40601
(502) 695-0468

February 4, 2015

Ms. Deborah Henson
Cardno Tec
18 S. George Street, Suite 400
York, PA 17401

Re: FWS 2013-B-0627; Federal Bureau of Prisons; proposed federal penitentiary; located in Letcher County, Kentucky

Dear Ms. Henson:

The U.S. Fish and Wildlife Service (Service) has reviewed your January 16, 2015 correspondence and the January 2, 2015 bat habitat assessment prepared by Copperhead Environmental Consulting, Inc. (Copperhead) regarding the above-referenced project. The Service offers the following comments in accordance with the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*).

Copperhead reviewed printed resources and GIS data and conducted a pedestrian field survey to identify and investigate caves, rockshelters, and mine adits in and around the two sites, Roxana and Payne Gap, being considered for the proposed project. No potential bat winter habitat was identified at the Roxana site. Numerous underground mines were encountered at the Payne Gap site. Most were closed; seven locations were further investigated in phase I habitat assessments. Of these, five were identified as suitable winter habitat for federally listed bat species. One feature contained a torpid Indiana bat (*Myotis sodalis*) at its entrance. To further evaluate the impacts of the proposed project at the Payne Gap site, spring or fall portal surveys should be conducted on all suitable mine portals that may be impacted directly or indirectly by the proposed project. Spring portal surveys must be conducted between April 1 and April 21 and fall portal surveys between September 1 and October 31. These surveys should be conducted by permitted biologists and should follow the Service's current survey guidance.

Thank you again for your request. Your concern for the protection of endangered and threatened species is greatly appreciated. If you have any questions regarding the information that we have provided, please contact Jessi Miller at (502) 695-0468 extension 104.

Sincerely,

Virgil Lee Andrews, Jr.
Field Supervisor

From: Deborah Henson
To: "Miller, Jessica"
Subject: RE: FW: Letcher County Indiana and Northern Long-Eared Bat Mitigation
Date: Tuesday, June 30, 2015 1:54:00 PM

Thanks Jessi. I will make sure that is clear in the mitigation section of the FEIS.

Deborah Henson
PROJECT MANAGER
GOVERNMENT SERVICES DIVISION
CARDNO

Office (+1) 717-547-6278 Mobile (+1) 717-433-7550 Fax (+1) 717-547-6357
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From: Miller, Jessica [mailto:jessica_miller@fws.gov]
Sent: Tuesday, June 30, 2015 1:49 PM
To: Deborah Henson
Subject: Re: FW: Letcher County Indiana and Northern Long-Eared Bat Mitigation

That looks good, Deb. The only other thing that comes to mind is that tree removal during June and July is not covered under the CMOA.

Jessi

On Fri, Jun 26, 2015 at 9:22 AM, Deborah Henson <Deborah.Henson@cardno-gs.com> wrote:

Hi Jessi,

I just wanted to follow up on the below email and make sure there is nothing else you need prior to us moving forward with publication of the Final EIS?

Thanks,
Deb

Deborah Henson
PROJECT MANAGER
GOVERNMENT SERVICES DIVISION
CARDNO

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From: Henson, Deborah
Sent: Friday, June 12, 2015 9:32 AM
To: Jessica Miller (jessica_miller@fws.gov)
Cc: igaston@bop.gov
Subject: Letcher County Indiana and Northern Long-Eared Bat Mitigation

Good morning Jessi,
Just a follow up to our May 20, 2015 meeting to discuss mitigation for the Indiana and northern long-eared bat at the Roxana site. Below is the summary of that meeting and subsequent discussions we have had regarding the Roxana site and mitigation.

1) During the May 20 meeting we discussed that approximately 105 acres of summer habitat for the Indian bat and northern long-eared bat would be impacted at the Roxana site. To be covered under the MOA the impacts must be under 100 acres. Subsequently, the impact areas were re-evaluated and impacts will be approximately 92.5 acres. Based on coordination with you on June 11, 2015 you reviewed the map detailing the impact areas and agree that based on this impact assessment, the Roxana site can be covered through the Conservation Memorandum Agreement (CMOA) following the guidance provided in the USFWS's April 2015 Conservation Strategy for Forest Dwelling Bats in the Commonwealth of Kentucky (Conservation Strategy).

2) The CMOA will be put in place between the USFWS and the Bureau when construction funds become available. Mitigation will be in place prior to any disturbance to the site would occur.

3) Mitigation identified in the CMOA would include payment to the Kentucky Natural Lands Trust which would be placed in the Imperiled Bat Conservation Fund. The mitigation payment would be used to acquire, protect, and manage bat habitat in Kentucky. Based on 2015 rates mitigation would range from approximately $930,00.00 to $1.3 million. Mitigation payment will depend on the time of year the habitat is impacted and rates may change prior to construction funding becoming available.

4) Once construction funding is available, the Bureau will meet with USFWS to ensure the CMOA is in place and mitigation requirements are fulfilled prior to any disturbance at the site (excavation, grading, timber removal, etc.).

5) Sediment Best Management Practices would be implemented to minimize sediment being carried to streams on site which may be potential foraging habitat for the gray bat.

6) At this time, based on the Preferred Alternative (Roxana), no formal Section 7 consultation is required for the Letcher County EIS project. Should anything change during the development of the final design site plans, the Bureau will notify USFWS to discuss any changes and how they may effect additional studies and mitigation.

Please let me know if you concur with this summary or have any additions or questions.

Thanks,
Deb

Deborah Henson
PROJECT MANAGER
GOVERNMENT SERVICES DIVISION

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Jessica Blackwood Miller
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Ph: (502) 695-0468 ext. 104
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Desktop Analysis and Habitat Survey for the Indiana Bat (*Myotis sodalis*), Gray Bat (*Myotis grisescens*), and Northern Long-eared Bat (*Myotis septentrionalis*) at Two Sites for a Proposed Federal Correctional Facility
Letcher County, Kentucky

March 2016

Completed for:

Cardno

Completed by:
Price Sewell
Copperhead Environmental Consulting, Inc.

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INTRODUCTION

Copperhead Environmental Consulting, Inc. (Copperhead) was contracted by Cardno Government Services, Inc. (Cardno) to conduct an Indiana bat (*Myotis sodalis*), gray bat (*Myotis grisescens*), and northern long-eared bat (NLEB, *Myotis septentrionalis*) habitat analysis of two properties in Letcher County, Kentucky under consideration for development by the Federal Bureau of Prisons (BOP). The two sites under consideration are the Roxana Site and the Payne Gap Site (Figure 1). The Roxana Site is located approximately 7 miles west of Whitesburg, Kentucky near the community of Roxana on the Roxana, KY United States (U.S.) Geologic Survey (USGS) 7.5-minute topographic quadrangle (Figure 2). The Payne Gap Site is located approximately 7 miles east of Whitesburg near Kona, Kentucky at the foot of Pine Mountain on the Jenkins West, KY-VA USGS 7.5-minute topographic quadrangle (Figure 3).

In response to coordination initiated by Deborah Henson of Cardno, the U.S. Fish and Wildlife Service (USFWS) sent an August 7, 2014 letter identifying the potential to impact the Indiana bat (federally endangered), the gray bat (federally endangered), and the NLEB (federally proposed endangered[1]), and recommended that a habitat assessment be conducted (Appendix I).

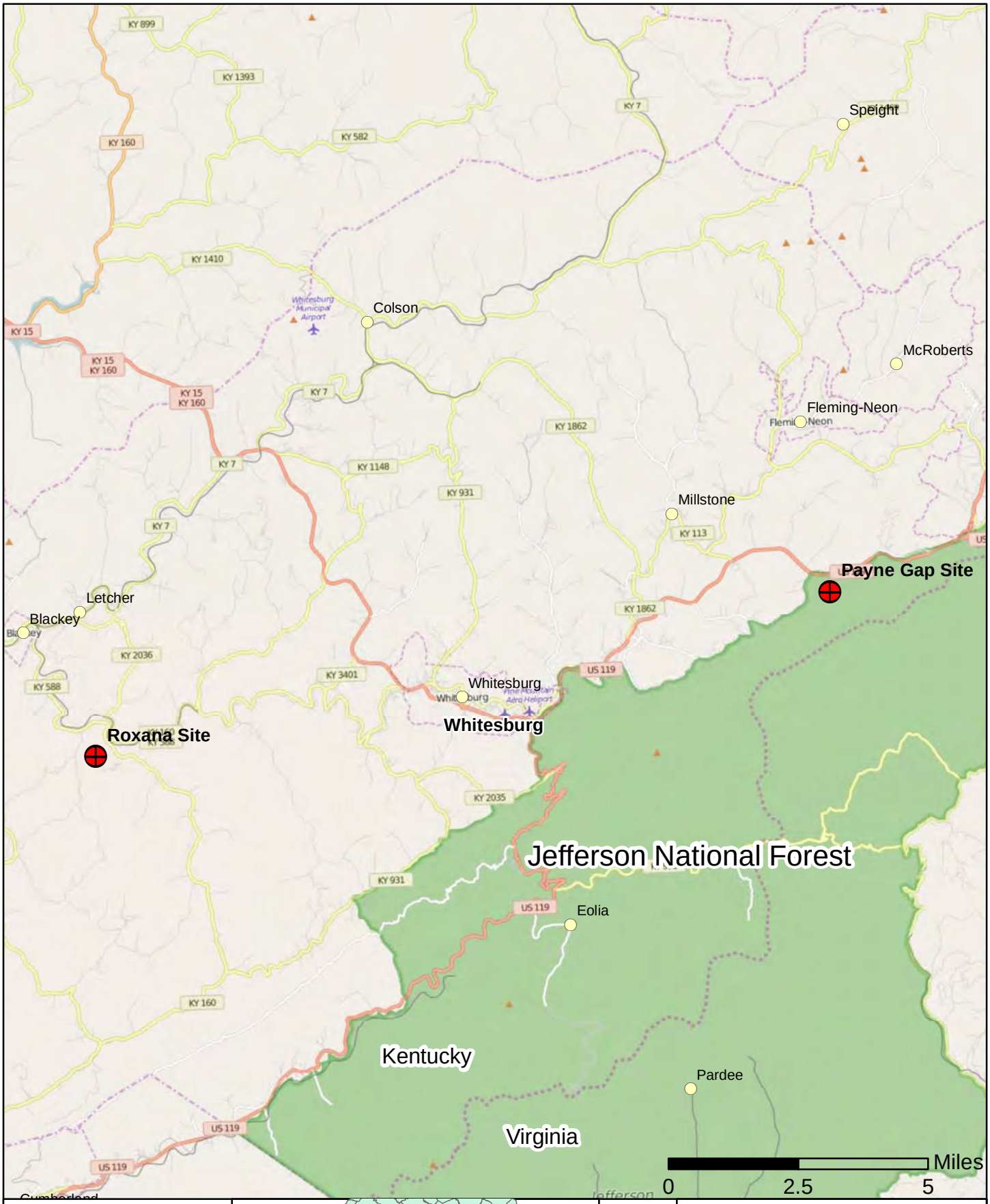
Desktop analyses and field surveys were conducted in accordance with the *Indiana Bat Survey Guidance for Kentucky* (USFWS and Kentucky Department for Fish and Wildlife Resources [KDFWR] 2013) and *Supplemental Indiana Bat Survey Guidance for Kentucky* (USFWS and KDFWR 2014).

METHODS

Indiana Bat and NLEB Winter Habitat and Gray Bat Roosting Habitat Assessment

To determine if caves and cave-like structures used for winter hibernation by Indiana bats, NLEBs, and gray bats and for summer roosting by gray bats were present or likely present, a desktop analysis was conducted using aerial photography, USGS 7.5-minute topographic quadrangle maps, USGS geologic quadrangle maps, and data from the Kentucky Mine Mapping Information System (KMMIS) (2014). USGS geologic quadrangle maps were used to identify the presence of any cave forming geology at the surface. Locations of historic mine records and locations identified as having high potential for underground mine surface connections were used to determine potential search contours that were uploaded to handheld global positioning system (GPS) units to be used during field investigations. Aerial photography was used to calculate forested acreage and to review current and past land uses on and adjacent to the sites.

[1]*Note*: the NLEB was listed as threatened in April 2015 after this report was initially prepared in January 2015.



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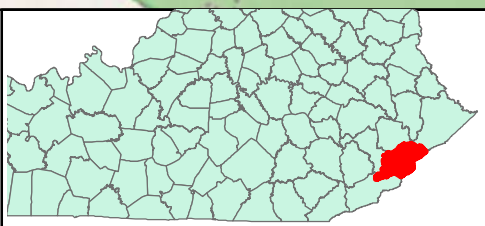

Letcher County, KY

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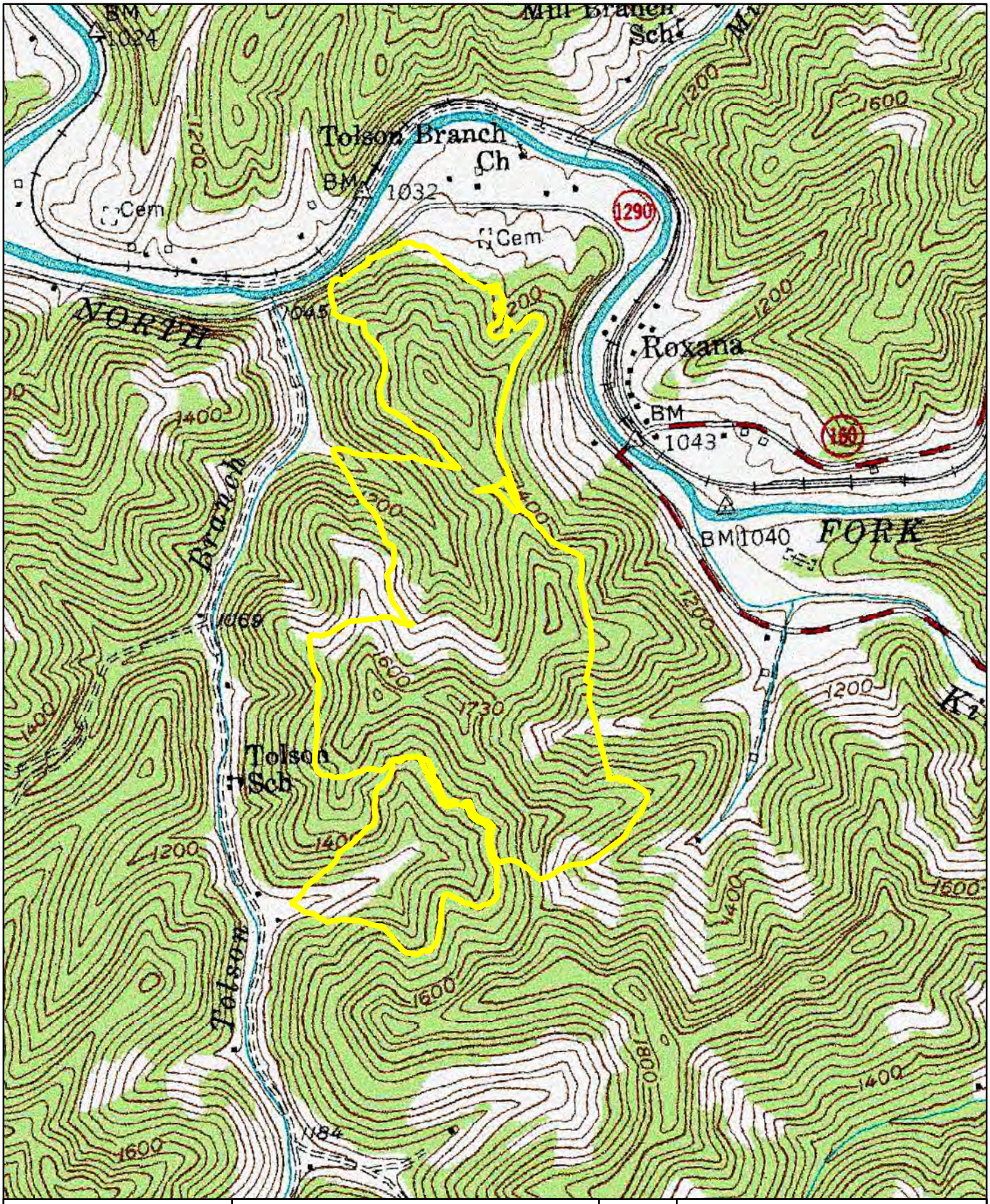
Figure 1. Project Location Map

City

Potential Site Location



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Legend

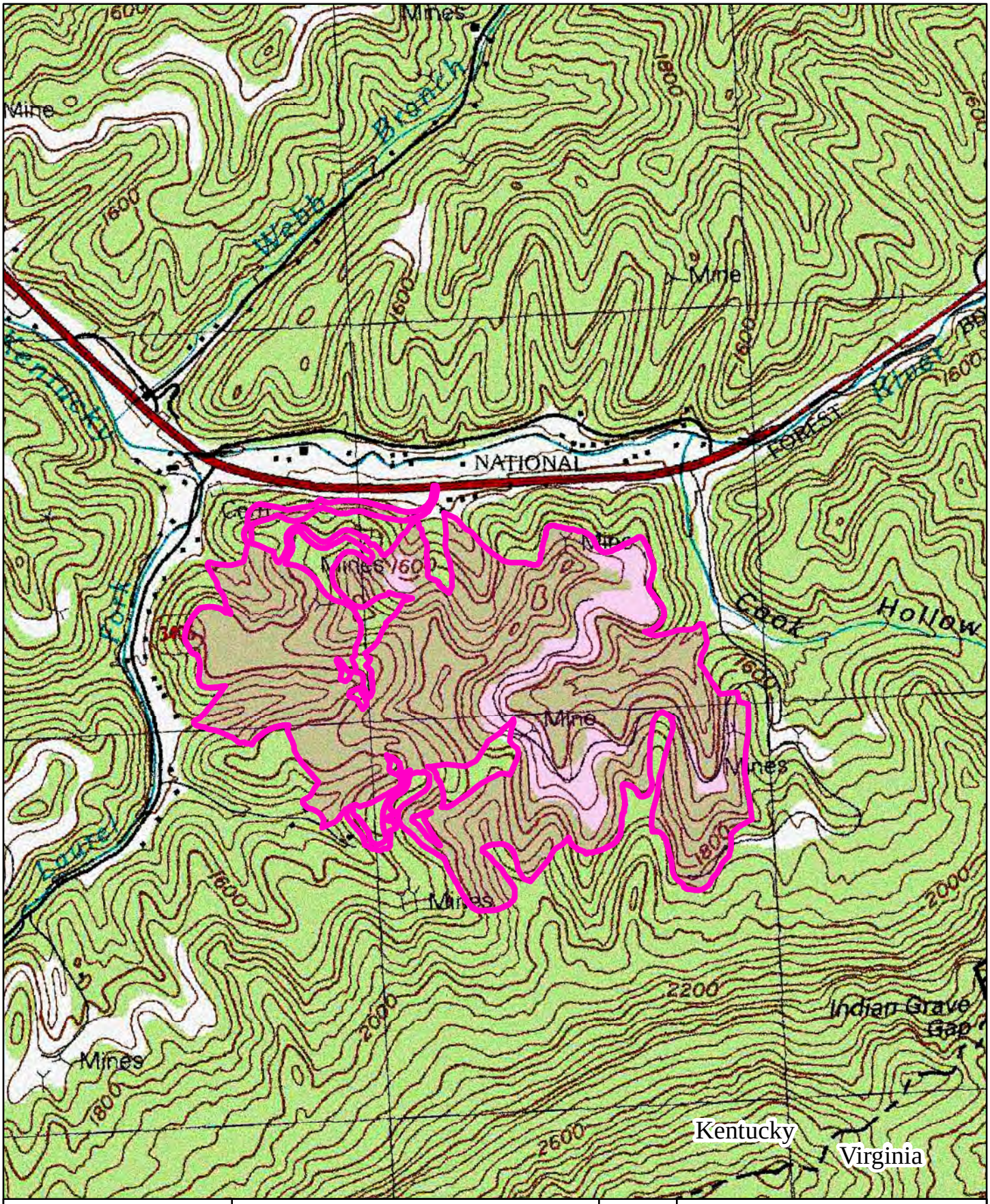
Roxana Impact Area

Miles
0 0.2 0.4

N

Figure 2. Proposed Disturbance Limits of the Roxana Site.

Roxana, KY USGS 7.5" Topographic Quadrangle Map



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Legend

Payne Gap Impact Area

0 0.2 0.4 Miles

N

Figure 3. Proposed Disturbance Limits of the Payne Gap Site

Jenkins West, KY-VA USGS 7.5" Topographic Quadrangle Map

Copperhead maintains a database of Kentucky cave locations and associated bat records. The database is a combination of data collected by Copperhead, data shared by resource agencies, and data provided by caving grottos and local individuals. Copperhead's Kentucky cave database typically contains the same significant bat caves that are used to generate USFWS's hibernacula buffers. While coordination with the USFWS will reveal whether or not a site is located within cave "swarming habitat" buffers for known hibernacula, it does not identify the distance from hibernacula, which can be important in determining the potential for impact. Therefore, Copperhead's cave database was used to estimate distances of the Roxana and Payne Gap sites from known hibernacula.

No surface geologic layers with the potential to yield caves were present on either site based on USGS geologic quadrangle maps; therefore, ground searches focused on potential underground mine openings and rock shelters.

Field surveys were conducted December 2–3, 2014 and consisted of searching within and around those areas identified during the desktop assessment deemed most likely to contain underground mines and associated openings that could provide potential Indiana bat, gray bat, and NLEB winter habitat and summer gray bat habitat. Field personnel meandered above and below GPS tracks searching for mine openings. Additional search effort was made around locations identified during desktop analysis as potential mine openings. Field personnel also followed the edges of old mine high walls in search of mine openings.

When potential winter habitat was located, personnel recorded data on *Phase I Habitat Assessment Data Sheets* provided in Appendix 1 of the *Supplemental Indiana Bat Survey Guidance for Kentucky* (USFWS and KDFWR 2014). Completed datasheets are provided in Appendix II. Field personnel used non-contact infrared thermometers to determine internal and external temperatures from the entrances of mine openings. The ground at each entrance was searched for guano and insect parts indicating bat use. When ceilings were observable from the entrance of mine openings, ceilings were viewed for bats and staining typical of heavy bat use. Cracks and crevices at mine openings were searched for bats. Mines in close proximity with apparent passages leading toward each other were assumed to be connected. A location point for each mine opening was recorded on a GPS unit.

Summer Foraging/Swarming Habitat Assessment

Aerial photography was used to determine forested acreage present within the potential impact areas for each site. Habitat assessed during the desktop analysis was confirmed in the field. Field maps were generated, delineating areas of potential habitat so field personnel could visit and ground truth habitat areas. All distinct habitat types visible on aerial photography were checked in the field to confirm habitat type, except for areas that were inaccessible. During hibernation and summer habitat assessment, an effort was made to look for suitable potential roosts, and the number of potential primary and secondary roosts identified for each proposed site was recorded. The search for potential roosts in forested sections was not exhaustive. Roosts that were documented are likely only a portion of those available onsite. Within shrub and grass habitats, all trees were observed. Mapping was reviewed for major streams that could provide foraging and travel habitat for Indiana bats, NLEBs and gray bats. Major streams that

were identified during the desktop analysis would be field-verified to determine suitability for all three bat species, had major streams been present.

RESULTS

Desktop Analysis: Indiana Bat and NLEB Winter Habitat and Gray Bat Roosting Habitat

Desktop analysis showed the potential for both summer and winter habitat for target bat species at both sites. Review of geologic quadrangle maps did not show limestone at the surface of either site, so natural caves were not considered likely to be present. Both sites showed a history of mining, with historical underground coal mining having occurred at both sites.

Roxana Site

The Roxana Site has been surface mined since deep mining occurred at the site, thereby decreasing the likelihood that deep mines are still present and accessible to bats. No historic mine adits were shown on USGS topographic or geologic mapping for this site. KMMIS data did show historical potential underground mines, and locations for potential connections to the surface were identified on the northern spur of the Roxana Impact Area and just outside the southern edge of the impact boundary (Figure 4). Locations with few historical mine records that have subsequently been surface mined seldom yield intact connections to underground mines, though there is still some possibility. A review of Copperhead's Kentucky cave database showed the Roxana Site to be 7.5 miles from a Priority 3[(2)] Indiana bat hibernaculum identified in the Recovery Plan (USFWS 2007), 8.4 miles from a Priority 4 hibernaculum, and 8.5 miles from a Priority 1 hibernaculum (Copperhead 2014). The Roxana Site was also identified as occurring within known "P1/P2 swarming" by the USFWS in their coordination response letter of August 7, 2014 (Appendix I: page 3).

Payne Gap Site

Review of USGS topographic maps showed five historic deep mine openings within the proposed impact area of the Payne Gap Site. Review of KMMIS data showed several historical underground mines, and 17 locations were identified where historical deep mines could potentially come to the surface (Figure 5). Past experience with these resources has shown that while any individual record is unlikely to yield an intact deep mine entrance, the presence of this number of records makes deep mines in the area likely. Review of Copperhead's Kentucky cave database showed the Payne Gap Site to be 20.9 miles from the nearest Priority 3 Indiana bat hibernaculum, 22.3 miles from the nearest Priority 4 hibernaculum, and 22.6 miles from the nearest Priority 1 hibernaculum (Copperhead 2014). This site was not identified as occurring within any known "P1/P2 swarming" habitat by the USFWS in their coordination response letter of August 7, 2014 (Appendix I).

[2] Indiana bat hibernacula priority definitions: Priority 1 have current or historic population of >= 10,000 Indiana bats; Priority 2 have current or historic population between 1,000 and 9,999 Indiana bats; Priority 3 have a current or historic population between 50 and 999 Indiana bats; Priority 4 have a current or observed population between 1 and 49 Indiana bats (USFWS 2007).

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Historically mined areas

Roxana Impact Area

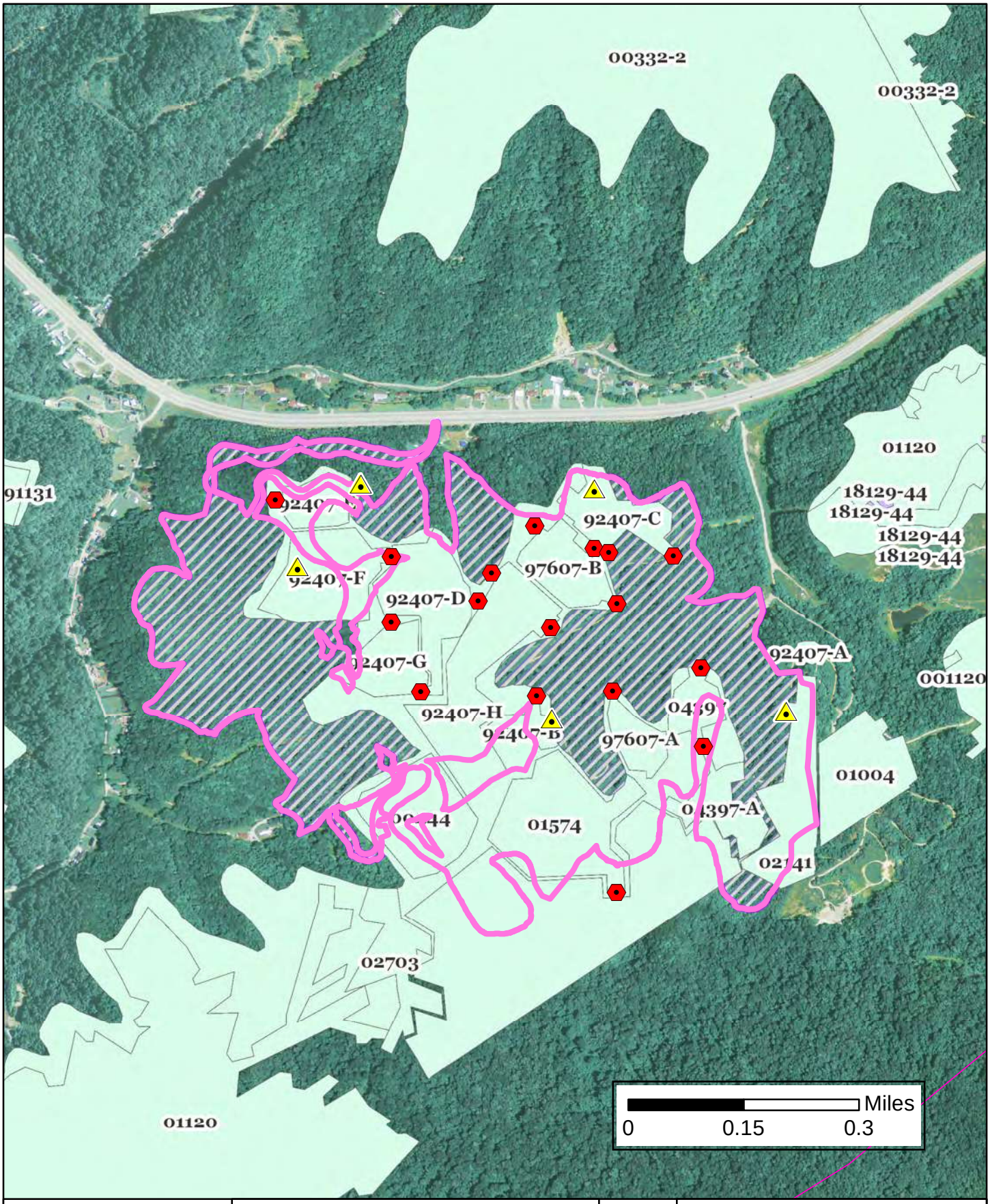
KY Mine Data

Miles
0 0.15 0.3

N

Figure 4. Potential Underground Mines at the Roxana Site

Source: KMMIS (2014)



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Historically mined areas
Potential Mine-KMMIS
Potential Mine-USGS
Payne Gap Impact Area

N

Figure 5. Potential Underground Mines at the Payne Gap Site

Source: KMMIS (2014)

Desktop Analysis: Indiana Bat and NLEB Summer Foraging and Roosting Habitat and Gray Bat Summer Foraging Habitat

Aerial photography (U.S. Department of Agriculture [USDA] 2012) showed forested areas on both sites that appeared to be suitable foraging habitat for Indiana bats and NLEBs, and suitable Indiana bat and NLEB roosting habitat. Major water bodies typical of gray bat foraging were not apparent from desktop analysis, so the potential for foraging habitat for this species appeared to be low.

Roxana Site

Aerial photography for the Roxana Site showed the potential for up to 141.8 acres (69.8% of total impact area) of Indiana bat/NLEB summer habitat. This habitat could be appropriate for either summer maternity/bachelor use or spring/fall swarming habitat for Indiana bats or NLEBs if hibernacula are located nearby. No significant streams or other large bodies of water were apparent that might provide foraging or travel habitat for gray bats.

Payne Gap Site

Aerial photography for the Payne Gap site showed the potential for up to 195.5 acres (92.4% of total impact area) of Indiana bat/NLEB summer habitat. This habitat could be appropriate for either summer maternity/bachelor use or spring/fall swarming habitat for Indiana bats or NLEBs if hibernacula are located nearby. No significant streams or other large bodies of water were apparent that might provide foraging or travel habitat for gray bats.

Field Surveys: Indiana Bat, Gray Bat, and NLEB Winter Habitat and Gray Bat Summer Roosting Habitat

Winter habitat for Indiana bats and gray bats is similar with both selecting areas of caves or cave-like structures that are cool as compared to average outside temperature (USFWS 1982, USFWS 2007). Although winter habitat for NLEBs is poorly understood, they also tend to occur in caves with cool temperatures (0–9 degrees C) with numerous cracks and crevices (USFWS 2014). Despite also occurring in caves or cave-like structures, gray bat summer habitat is considerably different from winter habitat. Summer roosting sites for gray bats are typically considerably warmer than hibernation sites (USFWS 1982). However, mine entrance surveys cannot elucidate these differences if they occur beyond the entrance passage and abandoned mine entry is generally not deemed safe. For this reason, all mines found with entrances that meet the criteria of the *Supplemental Indiana Bat Survey Guidance for Kentucky* (USFWS and KDFWR 2014) were considered potential winter habitat for Indiana bats, NLEBs, and gray bats as well as summer habitat for gray bats. Because gray bats typically roost in relatively large numbers in summer, a season when their digestive system is active, gray bat summer roosting sites typically accumulate a noticeable distribution of guano around the entrance. While use of a mine by individual gray bats cannot be ruled out by lack of guano, sites where guano cannot be found are less likely to be occupied by gray bats in the summer.

Roxana Site

Field surveys found no evidence of potential winter habitat for Indiana bats or NLEBs, and gray bat summer roosting habitat. The majority of the site is on reclaimed surface mine or on disturbed soils resulting from surface mining activities. A large portion of the site is dominated by fescue (*Festuca* sp.) and other grasses. Side slopes are dominated by autumn olive (*Elaeagnus umbellata)* and stunted trees. Surface mining over much of the site has extracted the entire coal

layer, either removing historical underground mines completely, or collapsing/pushing them closed. The ridgetop remained relatively intact in the northern spur of the property, though extensive searching in this area did not yield any underground mine access points. Historical underground mines on the Roxana Site appear to be either removed entirely or inaccessible by bats or humans. No evidence of Indiana bat/NLEB winter habitat or gray bat summer roosting habitat was present and review of geologic quadrangle maps showed no limestone layers at the surface.

Payne Gap Site

Field surveys found five open underground mines (with eight openings) and evidence of additional deep mines that have been closed either through collapse or intentional closing by humans. Mine openings located during field surveys did not correspond exactly to those identified during desktop analysis, though they did roughly occur within the same contour range. This is the norm when using historic mine location data in the region. This occurs for a variety of reasons, some being: inaccurate hand mapping of historic locations, subsequent mining operations excavated or buried old mine entrances, highwall collapse covered historic opening, etc. In total, seven locations were investigated as potential Indiana bat, gray bat, and NLEB winter habitat or gray bat summer roosting habitat. Of those seven, five (including eight openings) appeared to offer potential habitat for bats (mines M03, M04, M05, M06, and M07 [Table 1; Figure 6]). Openings that appeared to be connected internally were considered a single site with multiple openings. Descriptions of all openings considered to be potential habitat are included below. Datasheets for all sites investigated are included in Appendix II and photographs of openings are included in Appendix III.

M01 was a mine opening that had collapsed. Because no passage that was accessible to bats was observed and no evidence of any bat use was found, this site was not considered potential habitat for Indiana, NLEB, or gray bats.

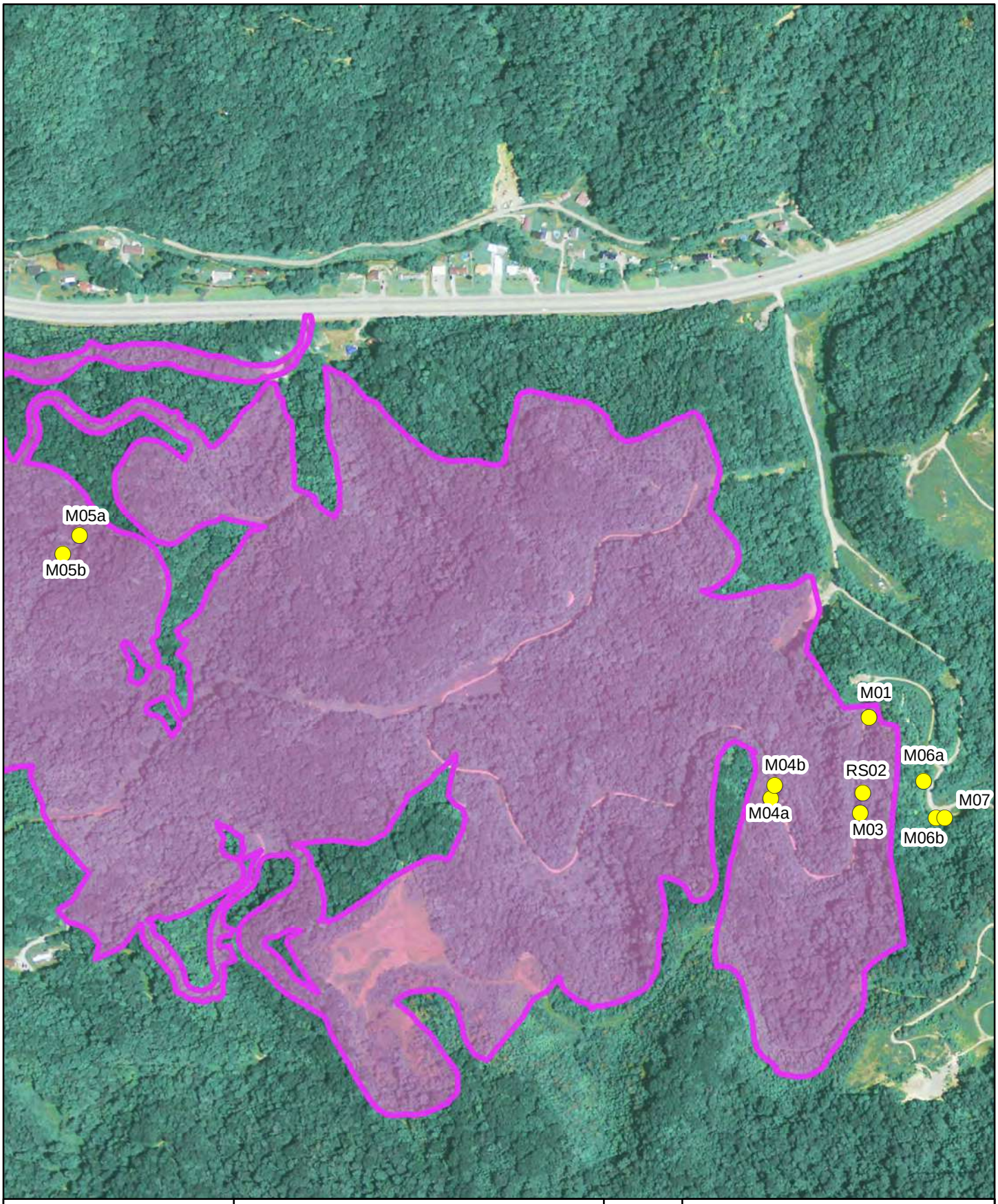
RS02 was a rock shelter that appeared to be created by a section of high wall shifting away from the main mass, leaving three connected openings. While the site offered approximately 30 feet of passage, the ceiling was flaking, unstable shale with some dirt and root material and was wet for most of its length. The entire length of the passage was visible. No evidence of bat use was present. Due to the ceiling condition, this site was not considered habitat for Indiana bats, NLEBs or gray bats.

M03 was a mine opening with significant horizontal passage visible from the entrance. Ceiling condition was appropriate for bat roosting and appeared stable. It appeared that water was pooled in the back portion of the mine, though there was no evidence of flooding up to the higher elevation of the shaft between the opening and the pooled water. One eastern small-footed bat (*Myotis leibii*) and one big brown bat (*Eptesicus fuscus*) were observed in crevices at the entrance. This site appeared to be suitable winter habitat for Indiana bats, gray bats, and NLEBs. Though use by individual gray bats cannot be completely ruled out, based on the lack of observable guano near the entrance, it does not appear that M03 is being used by gray bats as summer roosting habitat.

Table 1. Potential Winter Indiana Bat and NLEB, and Gray Bat Summer Habitat within the Payne Gap Site (December 2, 2014)

Habitat ID	M03	M04A	M04B	M05A	M05B	M06A	M06B	M07
Latitude	37.14326	37.14347	37.14355	37.14685	37.1467	37.14363	37.14317	37.14312
Longitude	-82.68992	-82.69126	-82.69133	-82.70168	-82.70181	-82.68884	-82.68877	-82.68884
Opening Type	Shaft	Adit	Adit	Adit	Adit	Adit	Adit	Shaft
Opening Dimensions (ft)	4 x 30	3 x 7	3 x 5	1 x 4	1 x 6	4 x 2.5	2.5 x 10	3 x 7
Internal Dimensions (ft)	5 x 30	4 x 15	4 x 10	1 x 3	3 x 5	4 x 8	5.5 x 20	3 x 15
Slope	Down	Down	Down	Down	Down	Down	Down	Down
Entrance Stability	Stable	Moderate	Moderate	No	No	Moderate	Yes	Yes
Airflow	In	None	Slight/Out	None	None	Slight/Out	Slight/Out	Slight/Out
External Temp (^{0}C)	4.1	6.9	6.6	10.9	6.1	7.5	7.5	11.6
Internal Temp (^{0}C)	7.1	5.2	4.9	9.8	4.7	3.3	5.1	8.4
Evidence of Collapse	No	No	No	Yes	Yes	Yes	Yes	Yes
Ceiling	Good	Flat/Stable	Stable	Unstable	Unstable	Unstable	Stable	Stable
Water in Opening	No	No	No	No	No	No	No	No
Past Flooding	Yes	No	No	No	No	No	No	No
Length (ft)	100	50	40	10	40	20	50	30
Distance to Water	<500 m	<500 m	<500 m	<500 m	<500 m	<500 m	<500 m	<500 m
% Canopy Cover	0.9	0.7	0.9	0.5	0.5	0.7	0.7	0.8
Signs of Bat Use	No	No	No	No	No	No	No	No
Bat(s) Observed	Yes(1)	No	No	No	No	No	Yes(2)	No

Notes: (1)One eastern small-footed bat (*Myotis leibii*) and one big brown bat (*Eptesicus fuscus*).
(2)One Indiana bat.



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Payne Gap Mines

Payne Gap Impact Area

Miles
0 0.1 0.2

N

Figure 6. Potential Bat Winter Habitat Identified at the Payne Gap Site

Source: KMMIS (2014)

M04A was a mine opening. Although the passage only ran a short distance, a side passage appeared to extend a significant distance parallel to the high wall face. The entrance was moderately stable. No air flow was detected at this site. At the point where the entrance passage met the coal seam, the ceiling was composed of chunky unstable coal material that likely would not have been appropriate for bat use, though side walls were usable. No evidence of bat use was detected. While the observable portion of this mine did not appear to be as optimal hibernation habitat for Indiana bats, gray bats, or NLEBs as M03, winter bat use by these species could not be ruled out. Though use by individual gray bats cannot be completely ruled out, based on the lack of observable guano near the entrance, it does not appear that M04A is being used by gray bats as summer roosting habitat..

M04B was a mine opening that had a passage leading toward M04A. This opening had slight airflow in an outward direction. The entrance was stable and approximately 40 feet of passage was visible. Temperature inside the mine was cooler than ambient. While no evidence of bat use was observed, this site could potentially be used by Indiana bats, gray bats, and NLEBs for hibernation. Though use by individual gray bats cannot be completely ruled out, based on the lack of observable guano near the entrance, it does not appear that M04B is being used by gray bats as summer roosting habitat.

M05A was a mostly closed mine opening in the western portion of the site. Internal temperature was cooler than ambient. No airflow was observed. Ceiling condition appeared unstable. No water or evidence of flooding was present. No sign of bat use was present. Only about 10 feet of passage was observed, though the passage turned and continued. Openings M05A and M05B were suspected to be connected due to proximity. The opening was very small and appeared to be intentionally closed. While this looked like very poor winter habitat for Indiana bats, gray bats, and NLEBs, it cannot be ruled out due to the potential presence of underground connections. Though use by individual gray bats cannot be completely ruled out, based on the lack of observable guano near the entrance, it does not appear that M05A is being used by gray bats as summer roosting habitat.

M05B was a mostly closed mine opening in the western portion of the site. Internal temperature was cooler than ambient. No airflow was observed. Ceiling condition appeared unstable. No water or evidence of flooding was present. No sign of bat use was present. About 40 feet of passage was observed. The opening was very small and appeared to be intentionally closed. While this looked like very poor winter habitat for Indiana bats, gray bats, and NLEBs, without knowing underground connections, it cannot be ruled out. Though use by individual gray bats cannot be completely ruled out, based on the lack of observable guano near the entrance, it does not appear that M05B is being used by gray bats as summer roosting habitat.

M06A was an adit just outside the eastern boundary of the project impact area. It appeared to be connected to M06B as each had passage leading toward the other. The opening had slight airflow out and was cooler internally than ambient. There was evidence of ceiling collapse and the ceiling appeared unstable. No evidence of flooding or water near the entrance was observed. No evidence was seen of bat use. This site was considered potential winter habitat for Indiana bats, gray bats, and NLEBs. Though use by individual gray bats cannot be completely ruled out, based on the lack of observable guano near the entrance, it does not appear that M05B is being used by gray bats as summer roosting habitat.

M06B was a mine opening just outside the eastern boundary of the project impact area. It appeared to be connected to M06A as each had a passage leading toward the other. The opening had slight airflow out and was cooler internally than ambient. There was slight breakdown indicating prior ceiling collapse, but the ceiling appeared stable. There was no sign of flooding or water near the entrance. No guano, staining, or insect parts were observed but a solitary torpid Indiana bat was seen just inside the entrance (Appendix III). This site was considered potential winter habitat for Indiana bats, gray bats, and NLEBs. Though use by individual gray bats cannot be completely ruled out, based on the lack of observable guano near the entrance, it does not appear that M05B is being used by gray bats as summer roosting habitat.

M07 was an opening just outside the eastern boundary of the project impact area. No obvious connections to other mine openings were apparent. The opening had slight airflow in an outward direction. Despite some evidence of previous collapse, the ceiling appeared stable. Internally, the mine was cooler than ambient. No evidence of bat use was observed. This site was considered potential winter habitat for Indiana bats, gray bats, and NLEBs. Though use by individual gray bats cannot be completely ruled out, based on the lack of observable guano near the entrance, it does not appear that M05B is being used by gray bats as summer roosting habitat.

Field Surveys: Summer Foraging and Roosting/Swarming Habitat

Roxana Site

Gray bats are known to forage over and near major bodies of water. Gray bat summer roost sites and hibernation sites are typically caves or cave like structures (USFWS 1982). The Roxana Site is upland and is not adjacent to a major water body. The site is not in the vicinity of known gray bat hibernation or summer roosts. No open deep mines or other cave like structures were found during field surveys. None of the Roxana Site was considered potential summer or winter habitat for gray bats.

Habitat types identified during desktop analyses were revised via ground truthing conducted during the field surveys. Habitat types identified are mapped in Appendix IV. Ground truthing showed that the upper elevations of the Roxana Site were predominantly reclaimed surface mine. Much of the upland habitat that appeared sparsely forested on aerial photography was actually regenerated scrub habitat dominated by shrubs (autumn olive and others) with a small number of small pines and hardwoods. No usable Indiana bat or NLEB roost trees were identified in these areas during field activities. This habitat was defined as scrub on disturbed soils and was considered to offer no bat roosting habitat and to have little or no significant foraging value for Indiana bats or NLEBs. Therefore, Indiana bat and NLEB summer/swarming habitat within the Roxana Site proposed impact area was revised to 104.9 acres (Table 2).

Table 2. Acreage of ESA-Listed Bat Summer/Swarming Habitat within the Roxana Impact Area

Site Name	Project Acreage	Habitat Acreage in Impact Area	Non-Habitat Acreage in Impact Area	Percent Habitat
Roxana	203.2	104.9	98.3	51.64%

Summer/swarming habitat was further delineated after ground truthing to give greater clarity to the quality of habitat available at the site. All areas not accessible by field crews, due to safety concerns (e.g., mining highwall prevented access) that appear to be forested on 2012 aerial photography were labeled "unknown forested".

The largest habitat type observed at the Roxana Site was defined as "regenerated forest on spoil." Although limited in its potential to develop good roost trees for Indiana bats and NLEBs, this habitat would be moderately appropriate for Indiana bat and NLEB foraging, especially along edges, above the canopy, or in areas with lower stem density.

Grasses and other herbaceous groundcover was the second most prevalent habitat type on the Roxana Site. This was the dominant habitat along the highest elevations and was likely the result of surface mine reclamation. This habitat type was not considered habitat for Indiana bats or NLEBs.

Mature hardwood 2nd growth was the major habitat component of the northern spur of the Roxana Site. It appeared to be the result of natural regeneration from historical logging. Trees of multiple age classes were present including some trees over 60 centimeters DBH. Hardwoods were the major component with occasional pines present. This habitat type offered both Indiana bat and NLEB potential roosting and foraging habitat.

"Scrub on disturbed soils" was usually found along the edges of the grass-dominated habitats and was comprised of a shrub layer with sparse pines and a few small hardwoods. No usable snags were found in this habitat and trees were too spread out and seldom over 20 feet tall. This habitat type was not considered suitable for Indiana bat or NLEB use.

The Roxana Site also had small components of dense shrub without mature trees and young mixed forest. A summary of target bat habitat components is provided in Table 3.

Table 3. Acreage of Habitat Types within the Roxana Site Impact Area

Habitat Type	Habitat Acreage in Impact Area	Indiana Bat and NLEB Habitat?	Gray Bat Habitat?
Dense shrub, no mature trees	8.18	No	No
Grasses or other herbaceous	61.32	No	No
Mature hardwood 2nd growth	29.30	Yes	No
Regenerated forest on spoil	73.37	Yes	No
Scrub on disturbed soils	28.71	No	No
Young mixed forest	2.32	Yes	No

Four potential Indiana bat or NLEB roost trees were identified at the Roxana Site. All were located in the mature hardwood 2nd growth habitat in the northern portion of the site. All potential roosts observed in this area were considered typical of secondary roosts, as none had sufficient solar exposure for a primary roost tree.

Payne Gap Site

Gray bats are known to forage over and near major bodies of water. Roost sites and hibernation sites are typically caves and cave like structures (USFWS 1982). The Payne Gap Site is upland

and is not adjacent to a major water body. The site is not in the vicinity of known gray bat hibernation or summer roosts. None of the Payne Gap Site was considered potential summer foraging habitat for gray bats. Field surveys did identify open deep mine portals that could potentially provide gray bat hibernation or summer roost habitat. These were considered to have very low potential to have been used during summer by gray bats prior to the survey based on the lack of guano found in and around the openings.

Desktop identified habitat types were revised via ground truthing conducted during the field surveys. Habitat types identified are mapped in Appendix IV. Ground-truthing at the Payne Gap Site largely confirmed the desktop habitat analysis findings, and the estimate of 195.5 acres (Table 4) of potential habitat was found to be accurate. It should be noted that ridge tops were often above mine highwalls and could not be safely accessed. However, these areas do appear to be forested and, thus, were considered potential foraging and roosting habitat for Indiana bats and NLEBs.

Table 4. Acreage of ESA-Listed Bat Summer/Swarming Habitat within the Payne Gap Site Impact Area

Site Name	Project Acreage	Habitat Acreage in Impact Area	Non-Habitat Acreage in Impact Area	Percent Habitat
Payne Gap	211.6	195.5	16.1	92.38%

The majority of the Payne Gap Site was mature hardwood 2nd growth (described above) which covered over 80% of the site (Table 5). All usable roosts encountered during field investigation on the Payne Gap Site were found in this habitat. Mature hardwood 2nd growth offered both roosting and foraging habitat for Indiana bats and NLEBs. Additional habitat types found at the Payne Gap Site include: unknown forest, mine road, grasses and herbaceous, and shrubs and herbaceous.

Table 5. Acreage of Habitat Types within the Payne Gap Site Impact Area

Habitat Type	Habitat Acreage in Impact Area	Indiana Bat and NLEB Habitat?	Gray Bat Habitat?
Grasses or other herbaceous	6.10	No	No
Mature hardwood 2nd growth	174.24	Yes	No
Mine road	10.00	No	No
Shrubs and herbaceous	0.07	No	No
Unknown forest	21.25	Yes	No

Five potential Indiana bat/NLEB roost trees were identified during field investigations at the Payne Gap Site. All of these were encountered in the mature hardwood 2nd growth habitat. All potential roosts observed were considered secondary roosts as they did not have sufficient solar exposure to be typical of primary Indiana bat roost trees.

CONCLUSIONS

Of the two sites, Payne Gap appears to offer both higher quality and quantity of summer and swarming habitat for Indiana bats and NLEBs. Payne Gap has several mines that were deemed suitable for Indiana bat, NLEB, and gray bat hibernation, including one that had a torpid

Indiana bat hanging near the entrance at the time of the habitat assessment. While it appears unlikely that mines on the Payne Gap Site are occupied by gray bats during the summer, the possibility cannot be entirely ruled out without a summer survey. From the perspective of both summer/swarming habitat and from Indiana bat and NLEB winter habitat and gray bat summer roost habitat, the Payne Gap Site appeared to provide better potential habitat for ESA-listed bat species than the Roxana Site.

Although the Roxana Site is within the 10-mile buffer that defines potential swarming habitat, it is approximately 8.5 miles to the east-northeast of the nearest hibernaculum. The Roxana Site is largely disturbed and does not appear to be particularly good habitat for Indiana bats and NLEBs, especially when compared to surrounding forested areas. The site was not considered to be summer or winter habitat for gray bats.

If the proposed action were to be constructed, the Roxana site would be substantially less likely to incur impacts to Indiana bats, NLEBs, and gray bats as well as to potential foraging or roosting habitat for these species.

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Appendix I.
USFWS Correspondence

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Kentucky Ecological Services Field Office
330 West Broadway, Suite 265
Frankfort, Kentucky 40601
(502) 695-0468

August 7, 2014

Ms. Deborah Henson
Cardno Tec
18 S. George Street, Suite 400
York, PA 17401

Re: FWS 2013-B-0627; Federal Bureau of Prisons; proposed federal penitentiary; located in Letcher County, Kentucky

Dear Ms. Henson:

Thank you for the opportunity to provide comments on the above-referenced project. The U.S. Fish and Wildlife Service (Service) has reviewed this proposed project and offers the following comments in accordance with the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) and the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 *et seq.*). This is not a concurrence letter. Please read carefully, as further consultation with the Service may be required.

In accordance with the provisions of the Fish and Wildlife Coordination Act, the Service has reviewed the project with regards to the effects the proposed actions may have on wetlands and/or other jurisdictional waters. We recommend that project plans be developed to avoid impacting wetland areas and/or streams, and reserve the right to review any required federal or state permits at the time of public notice issuance. The U.S. Army Corps of Engineers should be contacted to assist you in determining if wetlands or other jurisdictional waters are present or if a permit is required.

In accordance to section 7 of the ESA, the Service must evaluate the potential for all the direct, indirect, and cumulative effects of a proposed project on federally listed species. This includes effects of any "interrelated actions" that are part of a larger action and depend on the larger action for their justification and "interdependent actions" that have no independent utility apart from the action under consideration. Please include information about all of the potential impacts associated with the proposed project, including those from interrelated or interdependent actions (*e.g.*; utilities, etc.) and future actions that are reasonably certain to occur as a result of the proposed project.

In order to assist you in determining if the proposed project has the potential to impact protected species we have searched our records for occurrences of listed species within the vicinity of the proposed project. Based upon the information provided to us and according to our databases, we believe that the following federally listed species have the potential to occur within the project vicinity:

Group	Species	Common name	Legal* Status
Mammals	*Myotis sodalis*	Indiana bat	E
	Myotis grisescens	gray bat	E
	Myotis septentrionalis	northern long-eared bat	P
Fishes	*Etheostoma sagitta spilotum*	Kentucky arrow darter	C

* *Key to notations: E = Endangered, T = Threatened, P = Proposed, C = Candidate, CH = Critical Habitat*

We must advise you that collection records available to the Service may not be all-inclusive. Our database is a compilation of collection records made available by various individuals and resource agencies. This information is seldom based on comprehensive surveys of all potential habitats and thus does not necessarily provide conclusive evidence that protected species are present or absent at a specific locality.

Indiana bat

The entire state of Kentucky is within the range of the Indiana bat; (1) caves, rockshelters, and abandoned underground mines provide suitable wintering habitat for the Indiana bat; and (2) forested areas provide suitable summer roosting and foraging habitat for the Indiana bat. In order to address the concerns and be in compliance with the ESA, we have the following recommendations relative to potential direct and/or indirect effects as a result of impacts to the habitats listed above:

(1) During hibernation, the Indiana bat prefers limestone caves, sandstone rockshelters, and abandoned underground mines with stable temperatures of 39 to 46 degrees F and humidity above 74 percent but below saturation. Prior to hibernation, Indiana bats utilize the forest habitat up to five miles from the hibernacula to feed and roost until temperatures drop to a point that forces them into hibernation. This "swarming" period is dependent upon weather conditions and lasts from about September 15 to about November 15. This is a critical time for Indiana bats, since they are acquiring additional fat reserves and mating prior to hibernation.

Based on the presence of numerous caves, rock shelters, and underground mines in Kentucky, we believe that it is reasonable to assume that other caves, rock shelters, and/or abandoned underground mines may occur within the project area, and, if they occur, they could provide winter habitat for Indiana bats. Therefore, we recommend that the project proponent conduct a phase 1 winter hibernacula habitat assessment following the March 15, 2014 "Supplemental Indiana bat survey guidance for Kentucky." This assessment should identify any caves, rock shelters, and underground mines and assess their potential as suitable Indiana bat hibernacula. Depending on the results of the habitat assessment, subsequent bat presence/absence surveys may be necessary to determine if the species is using a feature as a hibernaculum. These presence/absence surveys must be conducted between September 1 and October 31 or April 1 and April 21 following the protocol found in the guidance document cited above.

(2) The Indiana bat utilizes a wide array of forested habitats, including riparian forests, bottomlands, and uplands for both summer foraging and roosting habitat. Indiana bats typically roost under exfoliating bark, in cavities of dead and live trees, and in snags (*i.e.*, dead trees or dead portions of live trees). Trees in excess of 16 inches diameter at breast

height (DBH) are considered optimal for maternity colony roosts, but trees in excess of 9 inches DBH appear to provide suitable maternity roosting habitat. Male Indiana bats have been observed roosting in trees as small as 5 inches DBH.

We recommend that the project proponent design or modify the proposed project to eliminate or reduce impacts to suitable Indiana bat habitat, thus avoiding impacts. A habitat assessment may useful in determining if suitable Indiana bat summer roosting or foraging habitat is present in the action area of the proposed project. If suitable habitat removal cannot be avoided, the following are the typical options available to address potential impacts to the species:

- The project proponent survey the project site to determine the presence or likely absence of Indiana bats within the project area in an effort to determine if potential effects are likely. A qualified biologist who holds the appropriate collection permits for the Indiana bat must undertake such surveys in accordance with our most current survey guidance. If any Indiana bats are identified, we would request written notification of such occurrence(s) and further coordination and consultation.

- The project proponent can request formal section 7 consultation through the lead federal action agency associated with the proposed project. To request formal consultation, the project proponent would need to submit a Biological Assessment that describes the action and evaluates the effects of the action on the listed species in the project area. After formal consultation is initiated, the Service has 135 days to prepare a Biological Opinion that analyzes the effects of the action on the listed species and recommends strategies to minimize those effects.

- The project proponent may provide the Service with additional information through the informal consultation process, prepared by a qualified biologist, that includes site-specific habitat information and a thorough effects analysis (direct, indirect, and cumulative) to support a "not likely to adversely affect" determination. The Service will review this and decide if there is enough supporting information to concur with the determination.

- The project proponent may choose to assume presence of the species in the project area and enter into a Conservation Memorandum of Agreement (MOA) with the Service to account for the incidental take of Indiana bats. By entering into a Conservation MOA with the Service, Cooperators gain flexibility with regard to the removal of suitable Indiana bat habitat. In exchange for this flexibility, the Cooperator provides recovery-focused conservation benefits to the Indiana bat through the implementation of minimization and mitigation measures that are described in the Indiana Bat Mitigation Guidance for the Commonwealth of Kentucky. For additional information about this option, please notify our office.

The Payne Gap / Lawson site is in potential Indiana bat habitat; all of the options listed above are appropriate for addressing potential impacts to the species at this site. Because the Roxana site is in known "P1/P2 swarming" habitat, we already know that the species is present in the proposed project area, and, therefore, further surveys are not necessary. Impacts to the species at the Roxana site should be addressed by using one of the last three bullet points listed above.

Gray bat

Gray bats roost, breed, rear young, and hibernate in caves year round. They migrate between summer and winter caves and will use transient or stopover caves along the way. Gray bats eat a variety of flying aquatic and terrestrial insects present along streams, rivers, and lakes. Low-flow streams produce an abundance of insects and are especially valuable to the gray bat as foraging habitat. For hibernation, the roost site must have an average temperature of 42 to 52 degrees F. Most of the caves used by gray bats for hibernation have deep vertical passages with large rooms that function as cold air traps. Summer caves must be warm, between 57 and 77 degrees F, or have small rooms or domes that can trap the body heat of roosting bats. Summer caves are normally located close to rivers or lakes where the bats feed. Gray bats have been known to fly as far as 12 miles from their colony to feed.

Because we have concerns relating to the gray bat on this project and due to the lack of occurrence information available on this species relative to the proposed project area, we have the following recommendations relative to gray bats.

- Based on the presence of numerous caves, rock shelters, and underground mines in Kentucky, we believe that it is reasonable to assume that other caves, rock shelters, and/or abandoned underground mines may occur within the project area, and, if they occur, they could provide winter/summer habitat for gray bats. Therefore, we would recommend that the project proponent survey the project area for caves, rock shelters, and underground mines. Additional evaluation and/or surveys may be necessary if suitable gray bat hibernacula and/or roosting habitat exists in the action area of the proposed project.

- Sediment Best Management Practices (BMPs) should be utilized and maintained to minimize siltation of the streams located within and in the vicinity of the project area, as these streams represent potential foraging habitat for the gray bat.

Northern long-eared bat

The northern long-eared bat was proposed for federal listing under the ESA on October 2, 2013. The Service has extended the deadline for the final determination to April 2, 2015. Both proposed project sites are located in "known summer" northern-long-eared bat habitat. During the summer, northern long-eared bats typically roost singly or in colonies in a wide-variety of forested habitats, where they seek shelter during daylight hours underneath bark or in cavities/crevices of both live trees and snags, including relatively small trees and snags that are less than 5 inches in diameter at breast height (DBH). Northern long-eared bats have also been documented roosting in man-made structures (i.e., buildings, barns, etc.) during the summer. According to current winter occurrence data, northern long-eared bats predominately winter in hibernacula that include caves, tunnels, and underground mine passages.

Although species proposed for listing are not afforded protection under the ESA, when a species is listed, the prohibitions against jeopardizing its continued existence and unauthorized take are effective immediately, **regardless of an action's stage of completion**. Therefore, to avoid significant project delays, we recommend that the project proponent evaluate and address potential impacts to northern long-eared bat summer habitat and winter habitat that is present in the action area of the proposed project.

Kentucky Arrow Darter

The Kentucky arrow darter is a rather large, brightly colored darter that is restricted to the upper Kentucky River basin in eastern Kentucky. The species' preferred habitat consists of pools or transitional areas between riffles and pools (runs and glides) in moderate to high gradient streams with bedrock, boulder, and cobble substrates. The species' habitat and range have been severely degraded and limited by water pollution from surface coal mining and gas-exploration activities; removal of riparian vegetation; stream channelization; increased siltation associated with poor mining, logging, and agricultural practices; and deforestation of watersheds. A habitat assessment and/or survey may be necessary to determine if impacts to these species are likely as a result of the proposed project.

As a federal candidate species, the Service sufficient information on the biological status and threats of the species to propose it as endangered or threatened under the ESA, but development of a proposed listing regulation is precluded by other higher priority listing activities. Candidate species receive no statutory protection under the ESA. The Service encourages cooperative conservation efforts for these species because they are, by definition, species that may warrant future protection under the ESA. Addressing the needs of Kentucky arrow darter before the regulatory requirements associated with a listed threatened or endangered species come into play, would allow future developers, landowners, and other entities greater management flexibility to stabilize or restore the species and its habitat for future projects. In addition, as such threats are reduced and populations are increased or stabilized, priority for listing can be shifted to those species in greatest need of the ESA's protective measures. Ideally, sufficient threats can be removed to eliminate the need for listing.

Presence/absence surveys would provide additional information regarding the likelihood that the proposed project would impact Kentucky arrow darter. Surveys would not be necessary if habitat assessments, especially specific conductivity measurements, supported that suitable habitat does not exist in the action area of the proposed project.

Thank you again for your request. Your concern for the protection of endangered and threatened species is greatly appreciated. If you have any questions regarding the information that we have provided, please contact Jessi Miller at (502) 695-0468 extension 104.

Sincerely,

Virgil Lee Andrews, Jr.
Field Supervisor

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Appendix II.
Field Datasheets

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Appendix 2. Phase I Habitat Assessment Sample Data Sheet

Point name

Location Payne Gap (01A)

Observers Price Sewell, Taylor Culbertson

Latitude 37.14434 **Longitude** -82.68988

Date 12-2-14 **Time** 0850 **Temp (outside)** 5.3°C

Lat 37.14434
Long 82.68988

(inside) 4.1°C

	Portal #1 (01A)	Portal #2	Portal #3	Portal #4
Opening (cave, quarry, shaft, or adit)	adit			
Opening Size: Height x Width (or Diameter) (ft)	4.5 x 12			
Internal Dimensions: Height x Width	2.5 x 10			
Slope (up or down from entrance)	up			
Entrance Stable?	no			
Direction of Airflow (In or out?)	Ø			
Amount of Airflow (e.g., none, slight, heavy)	none			
Air warmer or cooler than outside temp.	(4.1°C) cooler			
Evidence of collapse?	yes			
Ceiling Condition	good			
Amount of water in opening	none			
Evidence of past flooding?	no			
Observed length of portal	2 m			
* Distance to nearest water source	<500 m			
% Canopy Cover at portal entrance	90			
Foraging Signs? (e.g., moth wings)	Ø			

Pic # 822

Are any portals suspected or known to be connected? Which ones?

Any observable side passages? no

Additional comments:
(01A) Collapsed

Not considered habitat

Entry of abandoned mine portals, quarries, or caves can be extremely dangerous because of the potential for ceiling collapse and presence of toxic gases. Safety or health problems may occur as a result of entering abandoned mines. The USFWS does not authorize or require anyone to enter any potential hibernaculum that is or could be unsafe while implementing surveys. In some cases, entry is prohibited by the Kentucky Department of Mines and Minerals (KRS 352.100) and Mine Safety and Health Administration (30 CFR 75.202(b)). These guidelines do not require any applicant or applicant employee, consultant, lessee, or other such designee to enter into any cave, quarry, or mine portal.

Appendix 2. Phase I Habitat Assessment Sample Data Sheet

Location Payne Gap, Letcher County Mine 02

Observers P. Sewell T. Culbertson

Latitude 37.14350 **Longitude** -82.68989

Date 2-December-2013 **Time** 0920 **Temp (outside)** 6.2°C

	~~Portal #1~~ A	~~Portal #2~~ B	~~Portal #3~~ C	Portal #4
Opening (cave, quarry, shaft, or adit)	Rock Shelter	Rock Shelter	Rock Shelter	
Opening Size: Height x Width (or Diameter)	4'x 3'	5'x2'	2'x 1'	
Internal Dimensions: Height x Width	8'x 3'	"	"	
Slope (up or down from entrance)	down	up	up	
Entrance Stable?	no	no	no	
Direction of Airflow (In or out?)	none	none	none	
Amount of Airflow (e.g., none, slight, heavy)	none	none	none	
Air warmer or cooler than outside temp.	Cooler	Cooler	Cooler	
Evidence of collapse?	Yes	Yes	Yes	
Ceiling Condition	Flaking shale	"	"	
Amount of water in opening	none	none	none	
Evidence of past flooding?	no	no	no	
Observed length of portal	30'	30'	30'	
Distance to nearest water source	<500 m	<500 m	<500 m	
% Canopy Cover at portal entrance	80%	80%	80%	
Foraging Signs? (e.g., moth wings)	no	no	no	

Pic# 824

Are any portals suspected or known to be connected? Which ones? Yes 3 openings Connect

Any observable side passages? yes

Additional comments: Section of mine highwall has partially fallen leaving substantial "rock shelter". No guano or other evidence of bat use. Probable poor thermal buffering Not considered habitat. All of this shelter was visible

Entry of abandoned mine portals, quarries, or caves can be extremely dangerous because of the potential for ceiling collapse and presence of toxic gases. Safety or health problems may occur as a result of entering abandoned mines. The USFWS does not authorize or require anyone to enter any potential hibernaculum that is or could be unsafe while implementing surveys. In some cases, entry is prohibited by the Kentucky Department of Mines and Minerals (KRS 352.100) and Mine Safety and Health Administration (30 CFR 75.202(b)). These guidelines do not require any applicant or applicant employee, consultant, lessee, or other such designee to enter into any cave, quarry, or mine portal.

Appendix 2. Phase I Habitat Assessment Sample Data Sheet

Location Payne Gap, Letcher Co, Mine 3

Observers Price Sewell, Taylor Culbertson

Latitude 37.14326 **Longitude** -82.68992

Date 12-2-14 **Time** 0932 **Temp (outside)** 4.1°c

	Portal #1	Portal #2	Portal #3	Portal #4
Opening (cave, quarry, shaft, or adit)	shaft			
Opening Size: Height x Width (or Diameter)	4 x 30			
Internal Dimensions: Height x Width	5 x 30			
Slope (up or down from entrance)	down			
Entrance Stable?	yes			
Direction of Airflow (In or out?)	In			
Amount of Airflow (e.g., none, slight, heavy)	Slight			
Air warmer or cooler than outside temp.	warmer 7.1°c			
Evidence of collapse?	no			
Ceiling Condition	good			
Amount of water in opening	Ø			
Evidence of past flooding?	yes			
Observed length of portal	100 ft			
Distance to nearest water source	<500m			
% Canopy Cover at portal entrance	90%			
Foraging Signs? (e.g., moth wings)	no			

Pic# 825

Are any portals suspected or known to be connected? Which ones? No

Any observable side passages? Yes. Appears to fork

Additional comments: One Myotis leibii & 1 Eptesicus fuscus observed in cracks @ the entrance. This site has the potential to be a hibernacula for listed species though the lack of guano @ entrance would suggest low numbers if present.

Entry of abandoned mine portals, quarries, or caves can be extremely dangerous because of the potential for ceiling collapse and presence of toxic gases. Safety or health problems may occur as a result of entering abandoned mines. The USFWS does not authorize or require anyone to enter any potential hibernaculum that is or could be unsafe while implementing surveys. In some cases, entry is prohibited by the Kentucky Department of Mines and Minerals (KRS 352.100) and Mine Safety and Health Administration (30 CFR 75.202(b)). These guidelines do not require any applicant or applicant employee, consultant, lessee, or other such designee to enter into any cave, quarry, or mine portal.

Appendix 2. Phase I Habitat Assessment Sample Data Sheet

Location Payne Gap, Letcher Co, Mine 04, 04B

Observers Price Sewell, Taylor Culbertson

Latitude 37.14347, **Longitude** 82.69126

Date 12-2-14 **Time** 1000 **Temp (outside)** 6.9°C (04), 6.6°C (04B)

	04A Portal #1	04B Portal #2	Portal #3	Portal #4
Opening (cave, quarry, shaft, or adit)	adit	adit		
Opening Size: Height x Width (or Diameter) ft	3 X 7	3 X 5		
Internal Dimensions: Height x Width	4 X 15	4 X 10		
Slope (up or down from entrance)	down	down		
Entrance Stable?	moderate	moderate		
Direction of Airflow (In or out?)	Ø	out		
Amount of Airflow (e.g., none, slight, heavy)	none	slight		
Air warmer or cooler than outside temp.	Cooler 5.2°C	Cooler 4.4°C		
Evidence of collapse?	no	no		
Ceiling Condition	flat/stable	stable		
Amount of water in opening	none	none		
Evidence of past flooding?	no	no		
Observed length of portal	50+ ft	40+ ft		
Distance to nearest water source	<500 m	<500 m		
% Canopy Cover at portal entrance	70%	90		
Foraging Signs? (e.g., moth wings)	no	no		
Rc#	827	828		

Are any portals suspected or known to be connected? Which ones?

It appears mine 04A connects to mine 04B through passage to right.

Any observable side passages?

(Mine 04) Narrow Passage to right, 50+ ft / (Mine 04B) narrow passage to right 30+ ft

Additional comments:

Entry of abandoned mine portals, quarries, or caves can be extremely dangerous because of the potential for ceiling collapse and presence of toxic gases. Safety or health problems may occur as a result of entering abandoned mines. The USFWS does not authorize or require anyone to enter any potential hibernaculum that is or could be unsafe while implementing surveys. In some cases, entry is prohibited by the Kentucky Department of Mines and Minerals (KRS 352.100) and Mine Safety and Health Administration (30 CFR 75.202(b)). These guidelines do not require any applicant or applicant employee, consultant, lessee, or other such designee to enter into any cave, quarry, or mine portal.

Appendix 2. Phase I Habitat Assessment Sample Data Sheet

Location Payne Gap, Letcher Co. Mine 05A, 05B

Observers Price Sewell, Taylor Culbertson

Latitude 37.14670 **Longitude** -82.70181

Date 12-2-14 **Time** 1148 **Temp (outside)** 10.9°C, 6.1°C (05A, 05B)

	05A Portal #1	05B Portal #2	Portal #3	Portal #4
Opening (cave, quarry, shaft, or adit)	adit	adit		
Opening Size: Height x Width (or Diameter)	1 x4	1 x6		
Internal Dimensions: Height x Width	1 x3	3 x5		
Slope (up or down from entrance)	down	down		
Entrance Stable?	no	no		
Direction of Airflow (In or out?)	Ø	Ø		
Amount of Airflow (e.g., none, slight, heavy)	none	none		
Air warmer or cooler than outside temp.	Cooler (9.8°C)	cooler (4.7°C) (4.7)		
Evidence of collapse?	yes	yes		
Ceiling Condition	unstable	unstable		
Amount of water in opening	none	none		
Evidence of past flooding?	no	no		
Observed length of portal	10 ft	40 ft		
Distance to nearest water source	<500 m	<500 m		
% Canopy Cover at portal entrance	50%	50%		
Foraging Signs? (e.g., moth wings)	no	no		

Pic# 832

Are any portals suspected or known to be connected? Which ones?
It is suspected that mine 05A connects to 05B due to its close proximity

Any observable side passages?
no

Additional comments:
Both appear to have been intentionally collapsed. Although observable portion looks very poor for bats, passage did continue out of site.

Entry of abandoned mine portals, quarries, or caves can be extremely dangerous because of the potential for ceiling collapse and presence of toxic gases. Safety or health problems may occur as a result of entering abandoned mines. The USFWS does not authorize or require anyone to enter any potential hibernaculum that is or could be unsafe while implementing surveys. In some cases, entry is prohibited by the Kentucky Department of Mines and Minerals (KRS 352.100) and Mine Safety and Health Administration (30 CFR 75.202(b)). These guidelines do not require any applicant or applicant employee, consultant, lessee, or other such designee to enter into any cave, quarry, or mine portal.

Appendix 2. Phase I Habitat Assessment Sample Data Sheet

Location Payne Gap, Letcher Co. Mine 06A, 06B

Observers Price Sewell, Taylor Culbertson

Latitude (06A) 37.14363 **Longitude** 82.68884

Date 12-2-14 **Time** 1405 **Temp (outside)** 7.5°C

(06B) 37.14317, 82.68877

	06A Portal #1	06B Portal #2	Portal #3	Portal #4
Opening (cave, quarry, shaft, or adit)	adit	adit		
Opening Size: Height x Width (or Diameter) ft	4 x 2.5	2.5 x 10		
Internal Dimensions: Height x Width	4 x 8	5.5 x 20		
Slope (up or down from entrance)	down	down		
Entrance Stable?	moderate	yes		
Direction of Airflow (In or out?)	out	out		
Amount of Airflow (e.g., none, slight, heavy)	slight	slight		
Air warmer or cooler than outside temp.	cooler (3.3°C)	cooler (5.1)		
Evidence of collapse?	yes	yes		
Ceiling Condition	unstable	stable		
Amount of water in opening	none	none		
Evidence of past flooding?	no	no		
Observed length of portal	20 ft	50 ft		
Distance to nearest water source	<500 m	<500 m		
% Canopy Cover at portal entrance	70%	70%		
Foraging Signs? (e.g., moth wings)	no	no		

Pic# Mine 06A 839

Are any portals suspected or known to be connected? Which ones?

no

Any observable side passages?

(06A) small passage to left leading down

Additional comments:

(06B) Single Myotis sodalis near entrance. This site was considered potential habitat, location is just outside boundary

Entry of abandoned mine portals, quarries, or caves can be extremely dangerous because of the potential for ceiling collapse and presence of toxic gases. Safety or health problems may occur as a result of entering abandoned mines. The USFWS does not authorize or require anyone to enter any potential hibernaculum that is or could be unsafe while implementing surveys. In some cases, entry is prohibited by the Kentucky Department of Mines and Minerals (KRS 352.100) and Mine Safety and Health Administration (30 CFR 75.202(b)). These guidelines do not require any applicant or applicant employee, consultant, lessee, or other such designee to enter into any cave, quarry, or mine portal.

Appendix 2. Phase I Habitat Assessment Sample Data Sheet

Location Payne Gap 07

Observers P. Sewell; T. Culbertson

Latitude 37.14312 **Longitude** -82.68884

Date 2-December-2014 **Time** 1406 **Temp (outside)** 11.6°C

	Portal #1	Portal #2	Portal #3	Portal #4
Opening (cave, quarry, shaft, or adit)	Shaft			
Opening Size: Height x Width (or Diameter)	3x7			
Internal Dimensions: Height x Width	3x15			
Slope (up or down from entrance)	Down			
Entrance Stable?	yes			
Direction of Airflow (In or out?)	out			
Amount of Airflow (e.g., none, slight, heavy)	Slight			
Air warmer or cooler than outside temp.	cooler 8.4°C			
Evidence of collapse?	yes			
Ceiling Condition	Stable			
Amount of water in opening	none			
Evidence of past flooding?	none			
Observed length of portal	30 ft			
Distance to nearest water source	<500 m			
% Canopy Cover at portal entrance	80%			
Foraging Signs? (e.g., moth wings)	no			

Pic 835

Are any portals suspected or known to be connected? Which ones?

Any observable side passages? yes. passage to the right

Additional comments: This site was considered potential habitat, location is just outside boundary

Entry of abandoned mine portals, quarries, or caves can be extremely dangerous because of the potential for ceiling collapse and presence of toxic gases. Safety or health problems may occur as a result of entering abandoned mines. The USFWS does not authorize or require anyone to enter any potential hibernaculum that is or could be unsafe while implementing surveys. In some cases, entry is prohibited by the Kentucky Department of Mines and Minerals (KRS 352.100) and Mine Safety and Health Administration (30 CFR 75.202(b)). These guidelines do not require any applicant or applicant employee, consultant, lessee, or other such designee to enter into any cave, quarry, or mine portal.

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Appendix III.
Site Photographs

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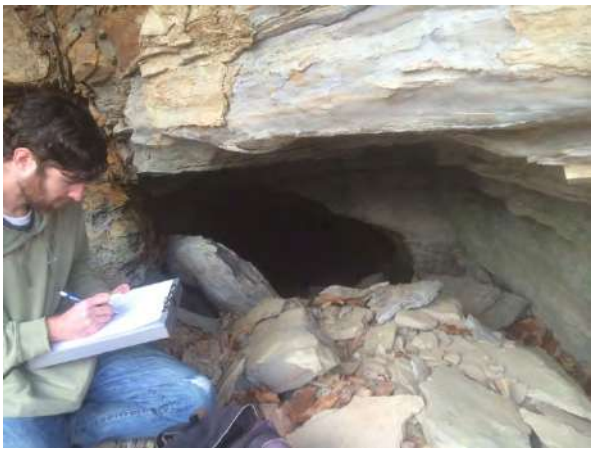
M01

RS02

M03

M04A



M04B

M05A

M06A

M06B

M07

Indiana bat found inside the entrance to M06B

Example of potential Indiana bat and NLEB summer roost habitat in “mature hardwood 2nd growth” habitat

Appendix IV.
Additional Desktop Analysis Resources

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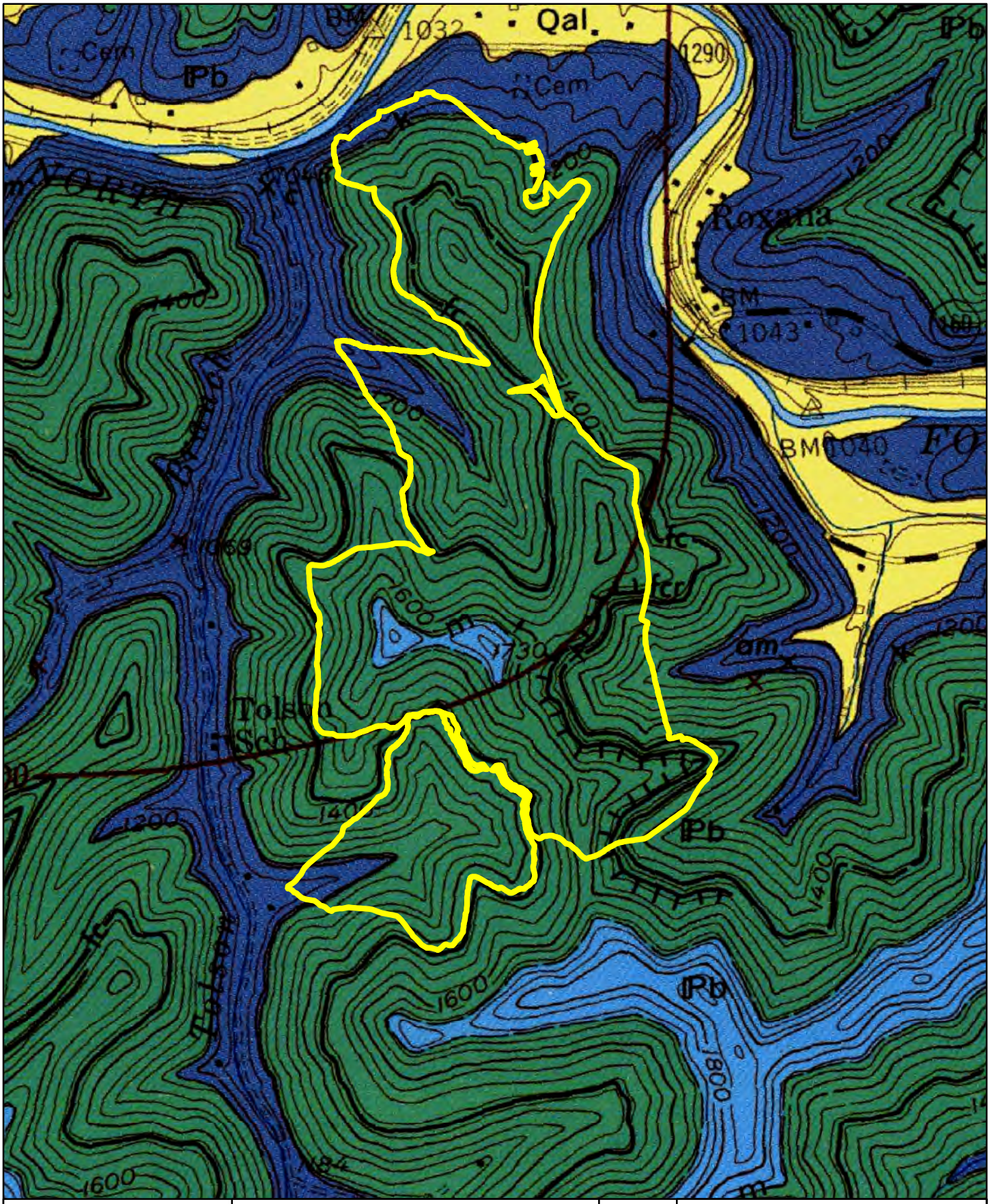


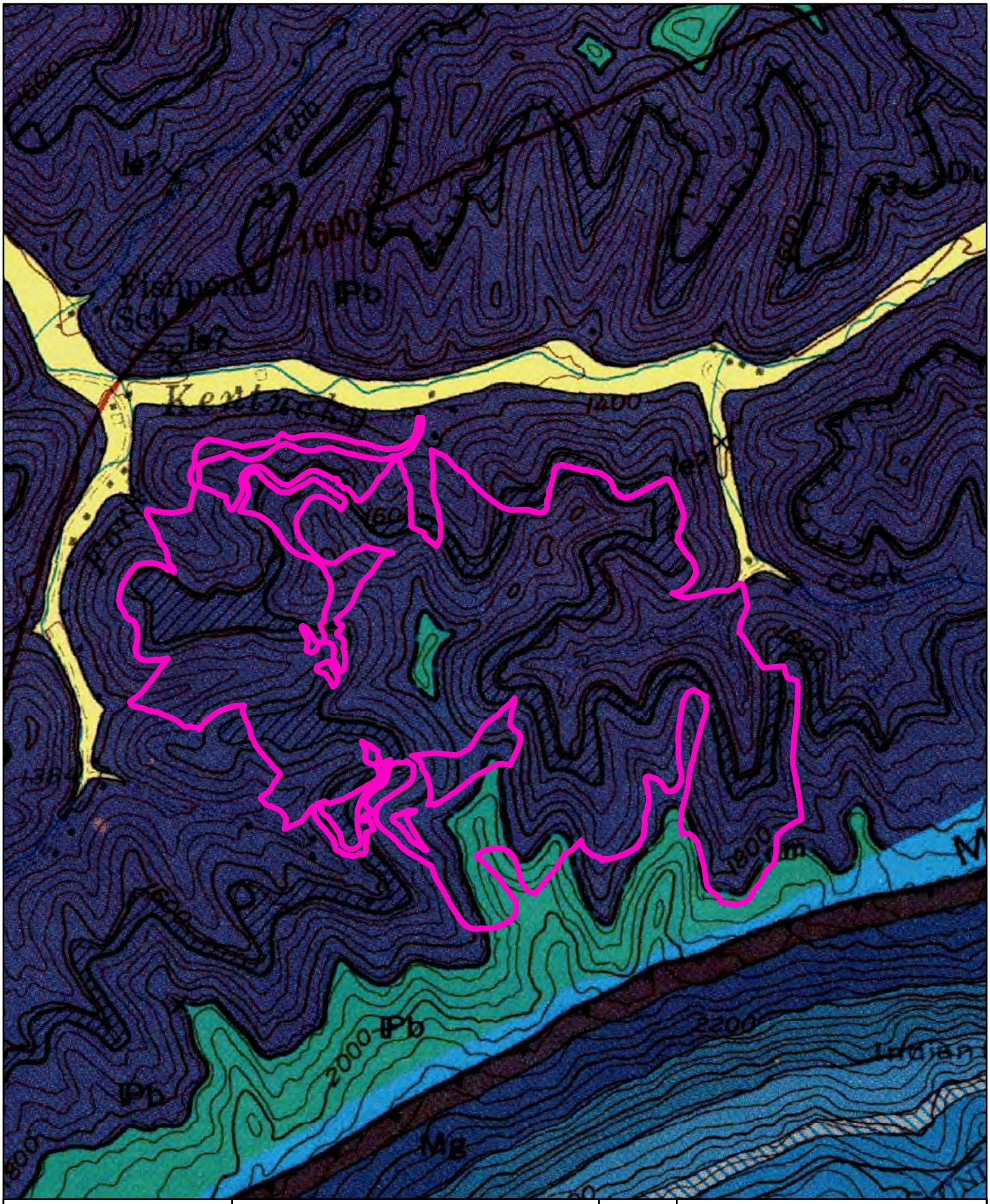
COPPERHEAD
ENVIRONMENTAL CONSULTING

Roxana Impact Area

Miles
0 0.15 0.3

N

USGS Geology Quadrangle
Map of the Roxana Site



COPPERHEAD
ENVIRONMENTAL CONSULTING

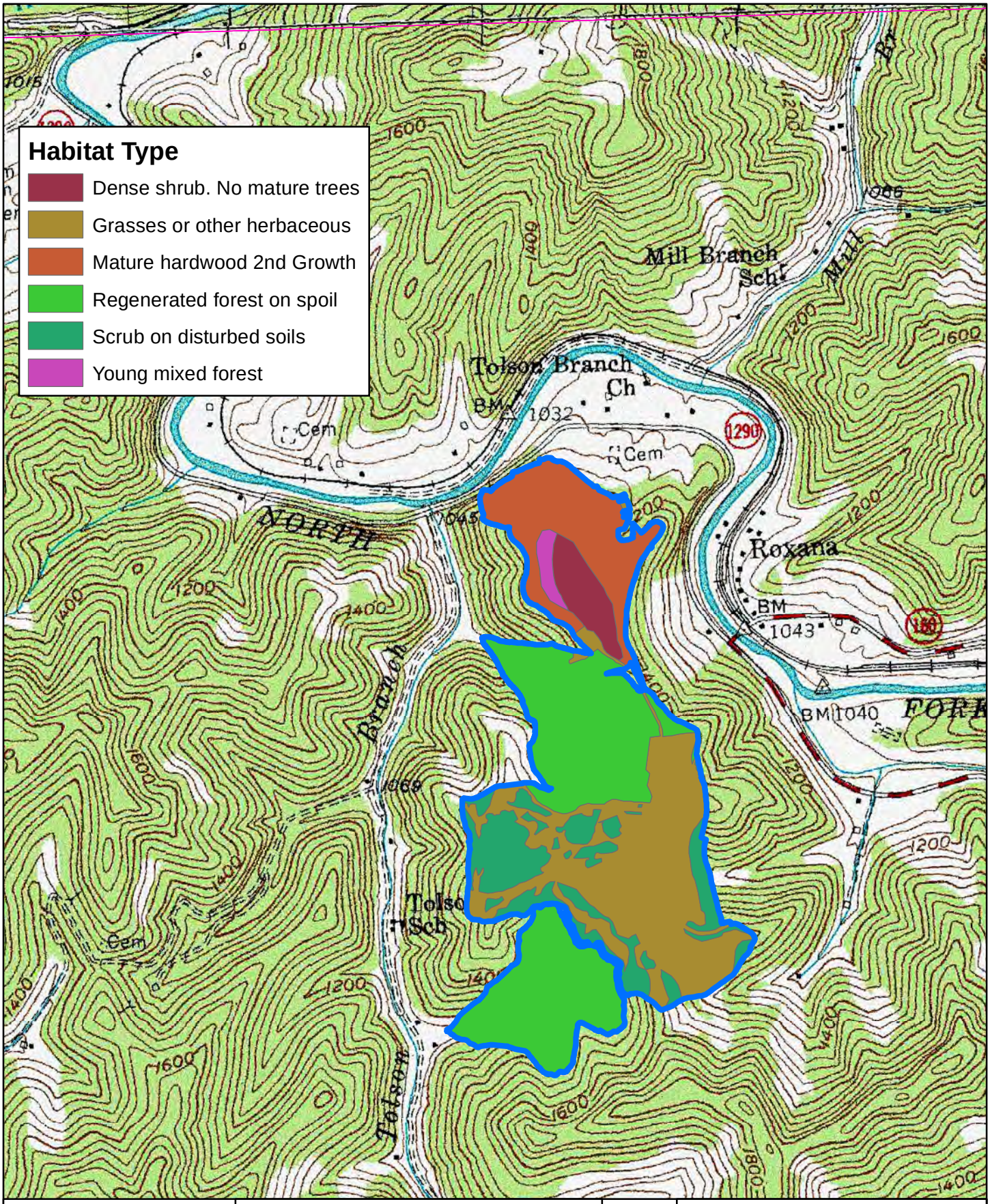
Legend

Payne Gap Impact Area

Miles
0 0.15 0.3

N

USGS Geology Quadrangle
Map of the Payne Gap Site



COPPERHEAD
ENVIRONMENTAL CONSULTING

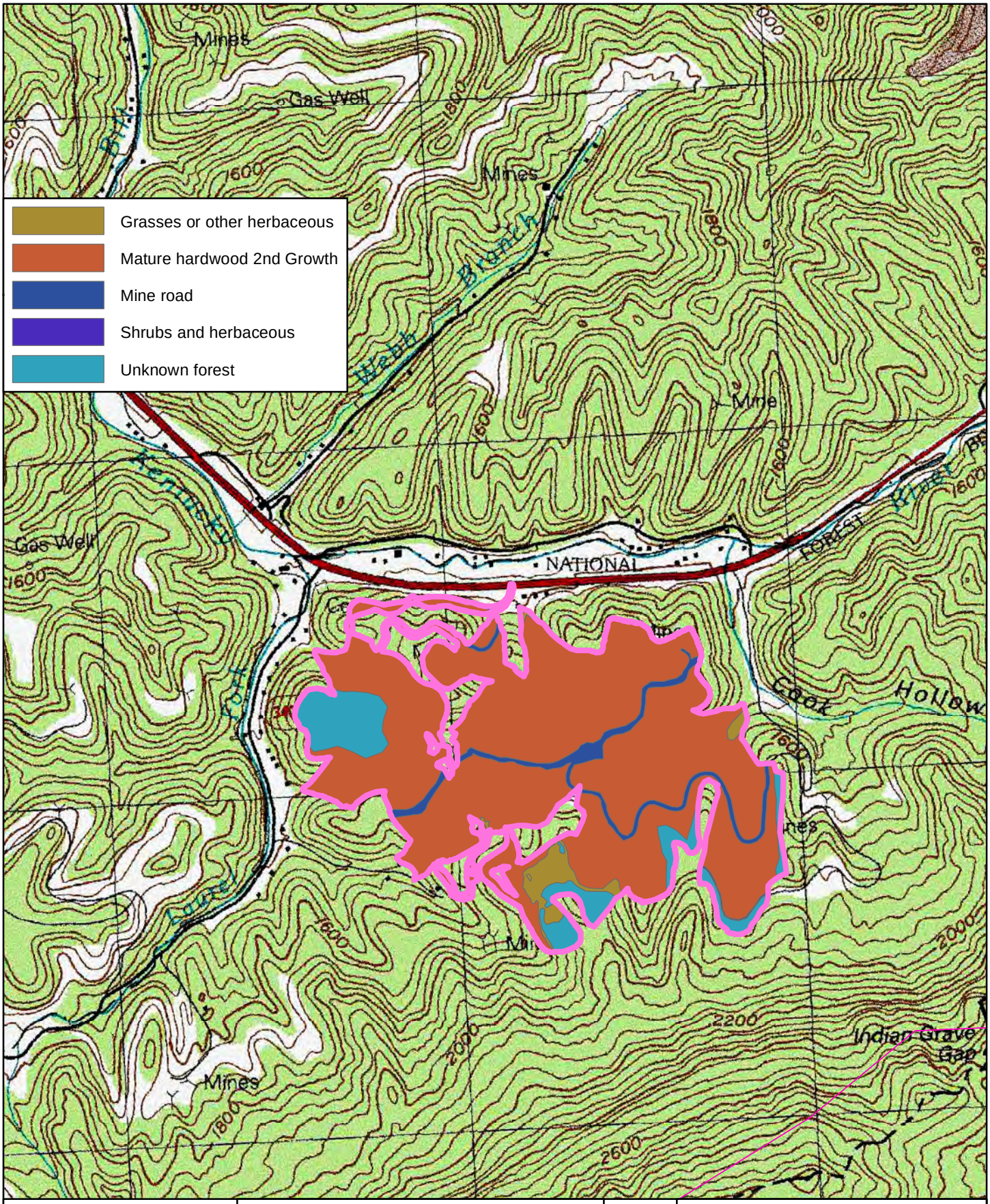
Legend

Roxana Impact Area

Miles
0 0.225 0.45

N

Habitat types identified at the Roxana Site during desktop and field investigation



COPPERHEAD
ENVIRONMENTAL CONSULTING

Legend

Payne Gap Impact Area

Miles
0 0.225 0.45

N

Habitat types identified at the Payne Gap Site during desktop and field investigation

November 29, 2016

Cardno

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Ms. Jessica Miller
Fish and Wildlife Biologist
United States Fish and Wildlife Service
Kentucky Field Office
330 W. Broadway, Suite 265
Frankfort, KY 40601

Subject: Federal Bureau of Prisons Proposed U.S. Penitentiary and Federal Prison Camp, Letcher County, Kentucky – Bat Habitat Assessment

Dear Ms. Miller:

On behalf of the Federal Bureau of Prisons, I am pleased to submit for your review and comment the Draft *Habitat Assessment for the Indiana Bat (*Myotis sodalis*), Gray Bat (*Myotis grisescens*), and Northern Long-eared Bat (*Myotis septentrionalis*) for the Proposed U.S. Penitentiary and Federal Prison Camp, Letcher County, Kentucky,* prepared by Copperhead Environmental Consulting. One paper copy and one electronic copy on CD are enclosed.

This habitat assessment was conducted for the subject project, and covers additional areas at the proposed Roxana Site in Roxana, Letcher County. A previous bat habitat assessment was conducted at the Roxana Site in December 2014; the report was reviewed by your office in February 2015. Please contact Issac Gaston, Federal Bureau of Prison Site Selection Specialist, at igaston@bop.gov or (202) 514-6470 if you have any questions.

Sincerely,

Lori Thursby
Senior Architectural Historian

Enc: 1 paper copy of report
1 CD with pdf of report

cc: Issac Gaston, Federal Bureau of Prisons

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Kentucky Ecological Services Field Office
330 West Broadway, Suite 265
Frankfort, Kentucky 40601
(502) 695-0468

December 15, 2016

Mr. Issac Gaston
Prison Site Specialist
U.S. Department of Justice
Federal Bureau of Prisons
320 First Street, NW
Washington, DC 20534

RE: FWS 2013-B-0627; Federal Bureau of Prisons; Proposed U.S. Penitentiary and Federal Prison Camp; Letcher County, Kentucky

Dear Mr. Gaston:

The U.S. Fish and Wildlife Service (Service) received the draft Bat Habitat Assessment for the above-referenced project attached to a November 29, 2016 letter from Ms. Lori Thursby of Cardno, consultant on behalf of the Federal Bureau of Prisons. The Service has reviewed this document and offers the following comments in accordance with the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*). This is not a concurrence letter. Please read carefully, as further consultation with the Service may be required.

The habitat assessment was conducted by Copperhead Environmental Consulting, Inc. (Copperhead) on September 6-9, 2016 and supplements a previously-submitted habitat assessment conducted by Copperhead in December 2014. Between the two habitat assessments, an approximate 505-acre area was assessed in and around the proposed footprint of the project. Based on the project information available to us, we believe that the habitat assessment was adequate in identifying potential habitat for these species.

Copperhead found one feature that represents potential winter habitat for gray bats, Indiana bats, and/or northern long-eared bats. Based on the information provided to us at this time, we would assume that this feature is being used by these species as winter hibernacula. According to the report, this feature would not be directly impacted by the construction of the project. Potential indirect impacts to these species as a result of the construction activities, including the loss of forested habitat in proximity to the hibernacula, and the operation of the prison facility should be evaluated.

Thank you for the opportunity to review this draft habitat assessment. Your concern for the protection of endangered and threatened species is greatly appreciated. If you have any questions regarding the information that we have provided, please contact Jessica Blackwood Miller at (502) 695-0468 extension 104 or jessica_miller@fws.gov.

Sincerely,

Virgil Lee Andrews, Jr.
Field Supervisor

U.S. Department of Justice

Federal Bureau of Prisons

Washington, DC 20534

January 9, 2017

Mr. Virgil Lee Andrews, Jr.
Field Supervisor
Fish and Wildlife Service
Kentucky Ecological Services Field Office
330 W. Broadway, Suite 265
Frankfort, KY 40601

Subject: FWS 2013-B-0627; Federal Bureau of Prisons Proposed U.S. Penitentiary and Federal Prison Camp, Letcher County, Kentucky – Final Bat Habitat Assessment

Dear Mr. Andrews,

Enclosed please find one paper copy and one electronic copy on CD of the Final *Habitat Assessment for the Indiana Bat (*Myotis sodalis*), Gray Bat (*Myotis grisescens*), and Northern Long-eared Bat (*Myotis septentrionalis*) for the Proposed U.S. Penitentiary and Federal Prison Camp, Letcher County, Kentucky*. Based on the comments in your December 15, 2016 letter, no changes were made in the final version of the report. The Bureau is in the process of preparing a Biological Assessment describing the subject project and its potential effects on Endangered Species Act (ESA)-listed species, and will request initiation of formal section 7 ESA consultation with your office. Please contact me at igaston@bop.gov or (202) 514-6470 if you have any questions.

Sincerely,

Issac Gaston, Site Selection Specialist
Capacity, Planning and Construction Branch

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Final

Habitat Assessment for the Indiana Bat (*Myotis sodalis*), Gray Bat (*Myotis grisescens*), and Northern Long-eared Bat (*Myotis septentrionalis*) for the Proposed U.S. Penitentiary and Federal Prison Camp, Letcher County, Kentucky

Prepared for:

Cardno
145 Limekiln Road, Suite 100
New Cumberland, PA 17070

Prepared by:

COPPERHEAD
ENVIRONMENTAL CONSULTING

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30 December 2016

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INTRODUCTION

Copperhead Environmental Consulting, Inc. (Copperhead) was contracted by Cardno to conduct a habitat assessment for Endangered Species Act-listed bat species that may occur within the area proposed for the construction and operation of a United States (U.S.) penitentiary and federal prison camp at the Roxana Site in Letcher County, Kentucky (Figure 1). Federally listed bat species include the Indiana bat (*Myotis sodalis*), gray bat (*Myotis grisescens*), and northern long-eared bat (*Myotis septentrionalis*). A previous habitat assessment for these species was conducted in December 2014 within an approximate 203-acre project area; a habitat assessment report was submitted to and accepted by the U.S. Fish and Wildlife Service (USFWS) in February 2015. This current habitat assessment covers an additional 302-acre area immediately adjacent to the west, south, and east of the 2014 survey area (Figures 1 and 2). Fieldwork for this habitat assessment was conducted September 6-9, 2016. The proposed site plan and tree clearing area are shown in Figure 3.

A desktop analysis and field survey were conducted in accordance with the *2016 Range-wide Indiana Bat Summer Survey Guidelines* (USFWS and Kentucky Department for Fish and Wildlife Resources [KDFWR] 2016a) and *Supplemental Indiana Bat Survey Guidance for Kentucky* (USFWS and KDFWR 2016b).

FEDERALLY LISTED SPECIES SYNOPSES

Indiana Bat

Indiana bats are known to summer roost primarily in trees under sloughing bark or in cracks and cavities in dead or damaged trees, although live trees are occasionally used (Kurta and Kennedy 2002). In some cases, Indiana bats utilize manmade structures like bridges, attics, bat houses, or artificial bark (Kurta and Kennedy 2002; Adams et al. 2015). Summer colonies are typically segregated into groups of adult females and juveniles, and groups of males. Most known maternity roosts have been located in or near wooded areas where canopy gaps are present, allowing full or partial solar exposure to the roost site. Roost trees can be divided into two categories: primary (>30 bats for more than one night) and alternate (<30 bats) (Callahan et al. 1997). Little published data is available on roost temperatures for Indiana bat maternity roosts. Indiana bats hibernate in caves and cave-like structures (mines, rock shelters, etc.). The species often hibernates in clusters, and requires a narrow temperature range for hibernation (3-7.2 degrees Celsius [°C]) (Kurta and Kennedy 2002), leaving few suitable sites available across their range. Though hibernation sites can hold many thousands of Indiana bats, some hibernacula have only a few individuals (USFWS 2007).

Gray Bat

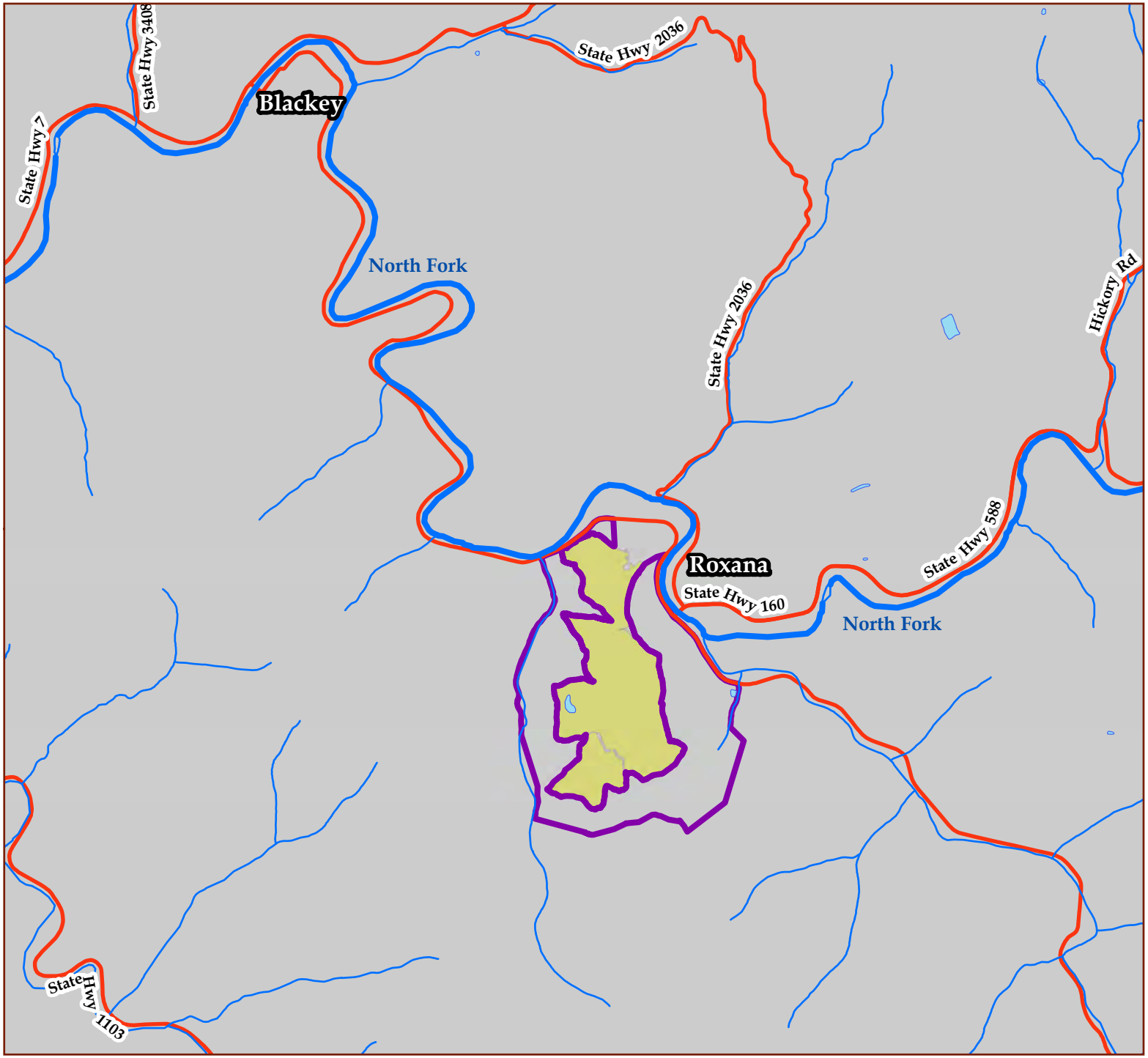
Gray bats are known to forage over and near major streams and lakes (Brady et al. 1982). Gray bats utilize caves and cave-like structures as both summer roosts and winter hibernacula. Summer roosts are typically in warm caves or sections of caves (14-26 °C) within 2 kilometers of major water bodies (Tuttle 1976). Sexual segregation at separate summer roost sites is typical for the species (Brady et al. 1982). Maternity sites typically house many individuals and have telltale guano deposits (USFWS 2009). Gray bats utilize cooler caves or areas of caves (6-10 °C) for hibernation (Brady et al. 1982). It is estimated that less than 5% of caves are suitable for gray bat hibernation (Tuttle 1976).

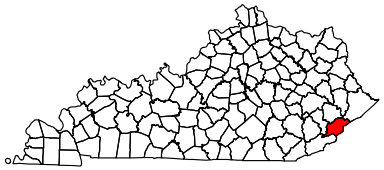
Northern Long-eared Bat

The northern long-eared bat utilizes forested habitat throughout the summer months. This species is found in both mature forest and younger more cluttered forested habitats, where it often forages below the canopy. The species typically roosts in tree cavities or under sloughing bark of dead or damaged trees in the summer (Lacki and Schwierjohann 2001; Carter and Feldhamer 2005). Available published literature does not include temperature data for northern long-eared bat summer roosts. Summer colonies segregate with females and juveniles roosting together and males typically roosting individually (Bat Conservation International 2001). Little is known about northern long-eared bat hibernation. They are incidentally encountered in caves and cave-like structures in the winter, often occupying narrow cracks and recesses, where they are likely undercounted. Temperatures in known hibernation sites typically vary from 0-9 ˚C (USFWS 2014). This species has been rapidly decimated by White-nose Syndrome in the eastern U.S. (USFWS 2014) and is declining in eastern Kentucky (Tracy Hemberger, Kentucky Department of Fish and Wildlife Resources: Wildlife Diversity Program, pers. comm., 10/11/2016).

Roxana Site Habitat Assessment

Figure 1. Project Location Map





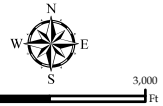
Letcher County, Kentucky

2016 Survey Area

2014 Survey Area

Roads

1:36,000
or
1 inch = 3,000 ft



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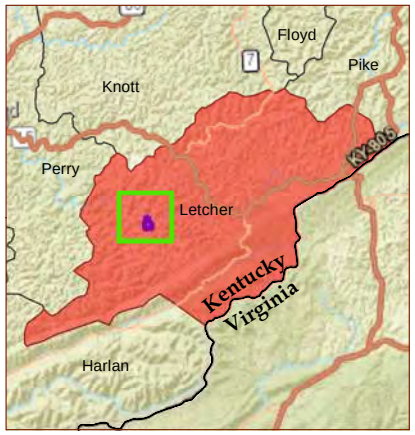
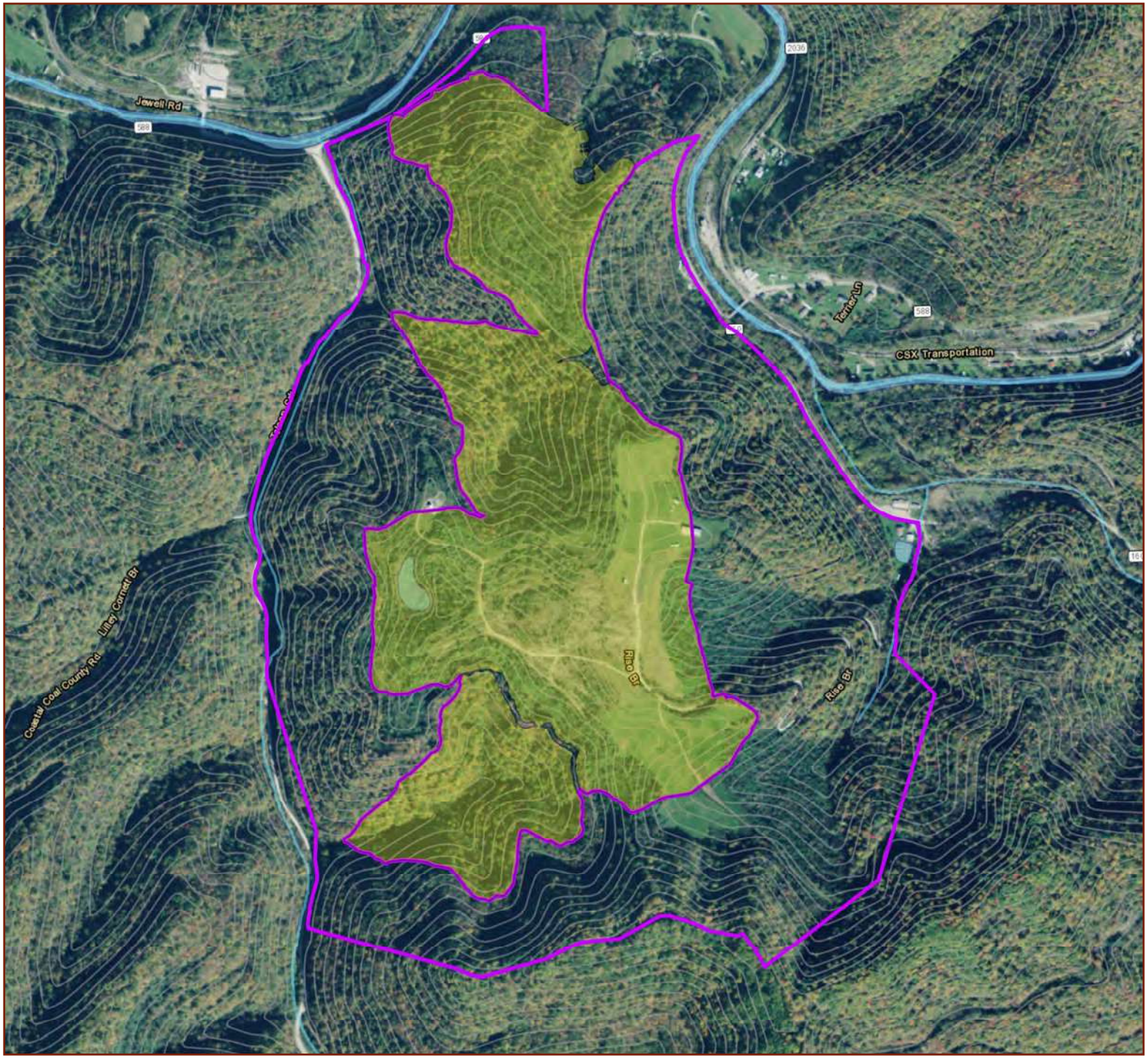
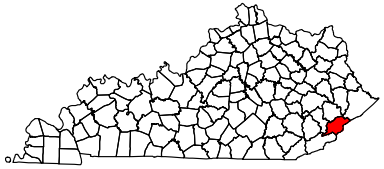
Date: 10/27/2016





Roxana Site Habitat Assessment

Figure 2. 2016 Habitat Assessment Area

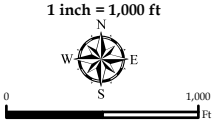


Letcher County, Kentucky

2014 Survey Area

2016 Survey Area

1:12,000
or
1 inch = 1,000 ft



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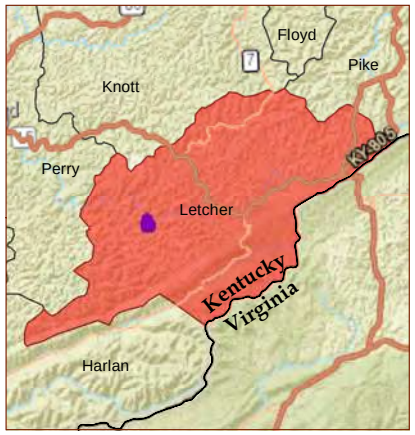
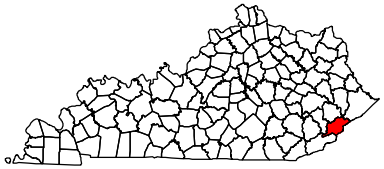
Date: 10/31/2016

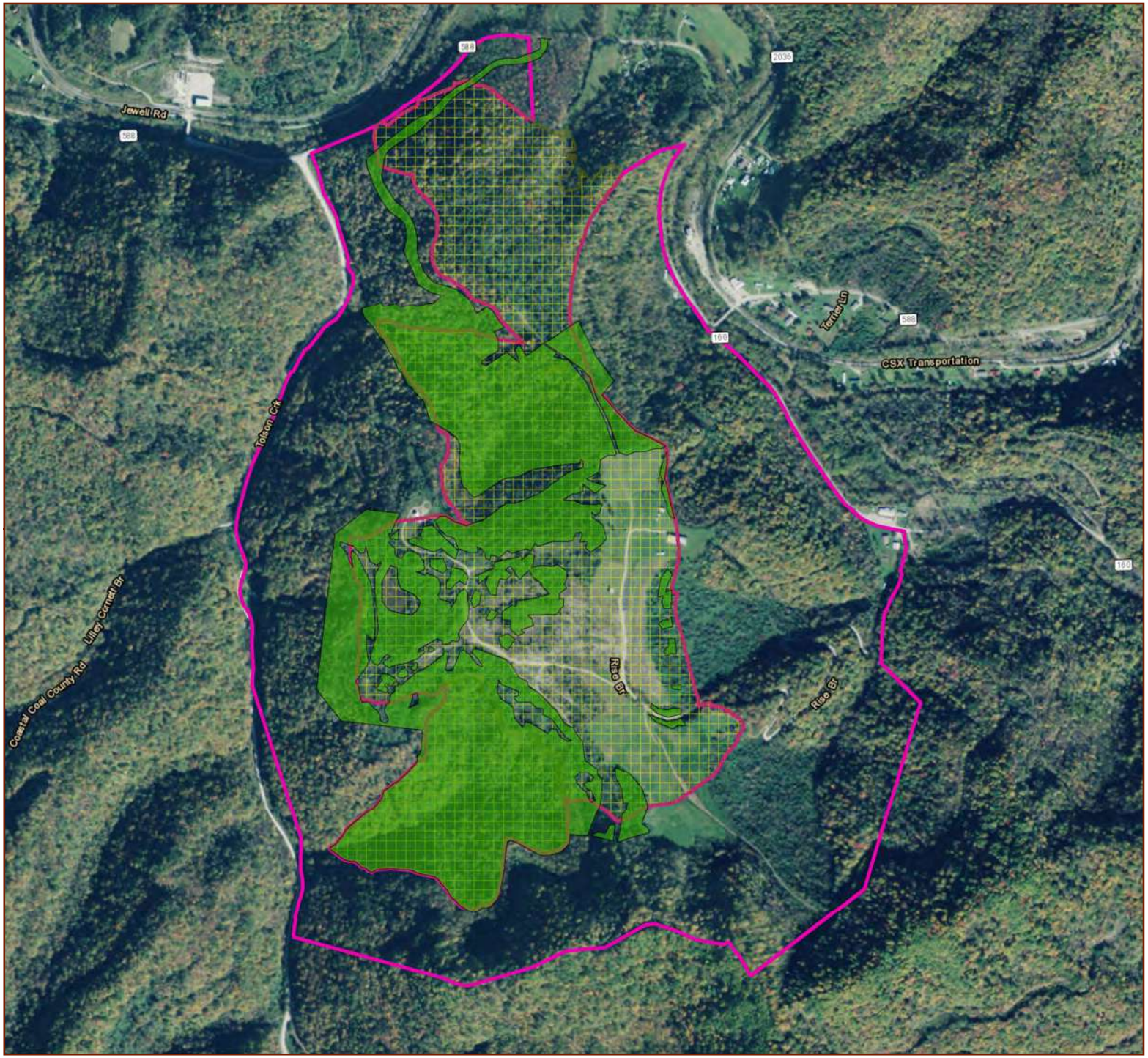


Roxana Site Habitat Assessment

Figure 3. Proposed Site Plan



Letcher County, Kentucky



Proposed Tree Removal
2014 Survey Area
2016 Survey Area

1:12,000
or
1 inch = 1,000 ft

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Coordinate System: NAD 1983 StatePlane Kentucky FIPS 1600 Feet
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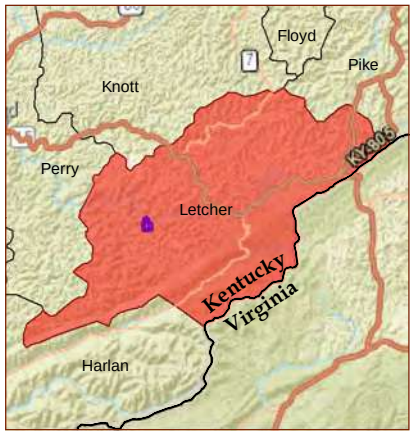


METHODS

Desktop Analysis

In order to determine if caves and cave-like structures with the potential for hibernation by target species were present or likely present within the survey area, a desktop analysis was conducted. United States Geological Survey (USGS) 7.5-minute topographic quadrangle maps and USGS geologic quadrangle maps were used to identify if cave forming geology was present at the surface. Locations of historic mine records and locations identified as having high potential for underground mine surface connections (Kentucky Mine Mapping Information System [KMMIS] 2016) were used to develop search areas and contours that were uploaded to handheld global positioning system (GPS) units for field investigations. Aerial photography was used to calculate forested acreage and to review current and past land use on and adjacent to the site.

Geographic information system (GIS) analysis included review of known cave locations previously compiled from numerous sources (e.g., KDFWR, Kentucky Speleological Survey, National Speleological Society – Pine Mountain Grotto). Cave location information has been compiled by Copperhead over numerous years and was not done specifically for this assessment.

Contiguous vegetative communities were identified from aerial photography to assess potential summer use by listed bat species and to aid field crews in ground-truthing habitat types.

Field Survey Methods

Listed Bat Winter Habitat and Gray Bat Summer Roost Habitat

Identification of potential winter habitat for all listed bats and summer roosting habitat for gray bats focused on searching for underground structures including limestone caves, cave-like rock shelters, underground mines, and other human-created underground shelters (bunkers, cisterns, bore holes, etc.). Field surveys consisted of searching within and around those areas identified during the desktop assessment as most likely to contain underground mines and associated openings that could provide potential Indiana bat, gray bat, and northern long-eared bat winter roosting habitat and gray bat summer roosting habitat. Biologists meandered above and below search contours preloaded onto GPS units, and additional search effort was made around locations identified during desktop analysis as having the potential to contain mine openings. Field personnel followed the edges of mine high-walls in search of mine openings, checked all habitats with any evidence of prior deep mining, and searched areas where it was likely that coal seams were located near the surface. Areas showing concentrated contours on topography mapping, indicating potential cliff-lines, were searched for rock shelters.

Potential winter habitat features encountered were investigated and data was recorded on field datasheets (Appendix 1). Biologists used handheld GPS units to record field survey tracks (Appendix 2). Photographs were taken of potential winter habitat features (Appendix 3).

Indiana and Northern Long-eared Bat Summer Foraging/Roosting Habitat

All vegetative communities identifiable from aerial photography were ground-truthed to determine forest structure and composition. Areas with suitable forest structure for Indiana bat and northern long-eared bat foraging were noted, as was the presence of snags suitable for summer roosting for these species. Photographs were taken of potential summer habitat for Indiana and northern long-eared bats (Appendix 3).

Gray Bat Summer Foraging Habitat

Gray bat summer foraging habitat is generally considered to occur over or near major watercourses, lakes, and other significant bodies of water. No major water bodies were apparent from desktop analysis. Major water bodies observed during the field survey were noted.

RESULTS

Gray Bat Habitat

Summer Foraging Habitat

The survey area is predominantly upland with only the outside boundary approaching lowlands. Streams within the area are ephemeral or intermittent and unsuitable for gray bat use during summer. Based on the desktop review, the North Fork of the Kentucky River is the closest potential gray bat foraging habitat. The river borders the proposed project area to the north, but is not within the proposed development area.

Field surveys found no areas consistent with gray bat foraging habitat and no major bodies of water were located on site.

Winter/Summer Roosting Habitat

No evidence of caves or cave forming geology was found through desktop analysis (Figure 4). Desktop research found a substantial history of mining in the area. Surface mining and several potential underground mine locations were identified using KMMIS data. Potential underground locations identified were from permitted commercial mining operations and were listed as "inactive" (KMMIS 2016). Locations of potential underground mines were used to identify search areas and search contours (Figure 5).

No limestone caves were found during field surveys. Two small hand dug underground coal mines (MN01 and MN02) and one cave-like rock shelter (RS01) were found within

the project limits (Figure 6; Appendix 3, Photos P1-P4). The two mines that were found were likely excavated for home use and did not offer sufficient internal expanse or conditions that would be suitable to support roosting gray bats during summer or winter. The rock shelter had developed in a crack in a rock outcrop, which was covered over by soil and had an internal extent that extended beyond what could be seen from the entrance. The ceiling condition was stable and internal temperature was cooler than ambient temperature. The shelter could not be ruled out as winter habitat for gray bats. The cave-like rock shelter was unlikely to have recently been used by gray bats in the summer, as summer use by this species would typically leave obvious guano on the ground at the entrance. No visible sign of bat use could be found near the entrance. The rock shelter is located outside of the proposed area for tree clearing and would not be directly impacted by proposed construction activities.

Indiana Bat Habitat

Summer Foraging and Roosting Habitat

Desktop analysis showed the majority of the habitat within the project area to be forested, which could provide suitable Indiana bat summer habitat.

Field surveys confirmed that the majority of the area was forested and is considered summer foraging and roosting habitat for Indiana bats. A total of 251.5 acres is considered suitable summer foraging habitat for Indiana bats (Figure 7). Forested areas included mature forest with open understory and young forest with high stem density. Mature forest areas were typically dominated by tulip poplar (*Liriodendron tulipifera*), maples (Acer sp.), hickories (Cary sp.), and northern red oak (*Quercus rubra*). Young forest with high stem density was dominated by American beech (*Fagus grandifolia*), eastern hemlock (*Tsuga canadensis*), and maples (*Acer sp.*). Snags determined to be potential alternate Indiana bat roosts were present in all forested habitats. No potential primary roosts were identified during field surveys, though the field survey was designed to identify winter habitat and to confirm presence of summer habitat, and primary roost trees may have been missed. A total of 50.1 acres was determined to be unsuitable foraging or roosting habitat for Indiana bats. Areas considered unsuitable habitat included grasslands and scrub habitat (dominated by blackberry [*Rhubus* sp.] and autumn olive [*Elaeagnus umbellate*]) on a reclaimed strip mine.

Winter Habitat

No evidence of caves or cave forming geology was found through desktop analysis. Desktop research found a substantial history of mining in the area. Surface mining and several potential underground mine locations were identified using KMMIS data. Potential underground locations identified were from commercial mining operations and

were listed as "inactive" (KMMIS 2016). Locations of potential underground mines were used to identify search areas and search contours (Figure 5).

No limestone caves were found during the field survey. Two small hand dug underground coal mines (MN01 and MN02) and one cave-like rock shelter (RS01) were found within the project limits (Figure 6; Appendix 3, Photos P1-P4). The two mines that were found were likely excavated for home use and did not offer sufficient expanse or conditions to be likely to harbor hibernating Indiana bats. The rock shelter had developed in a crack in a rock outcrop, which was covered over by soil and had an internal extent that extended beyond what could be seen from the entrance. The ceiling condition was stable and internal temperature was cooler than ambient temperature. The shelter could not be ruled out as hibernation habitat for Indiana bats. No visible sign of bat use was found near the entrance. The rock shelter is located outside of the proposed area for tree clearing and would not be directly impacted by proposed construction activities.

Northern Long-eared Bat Habitat

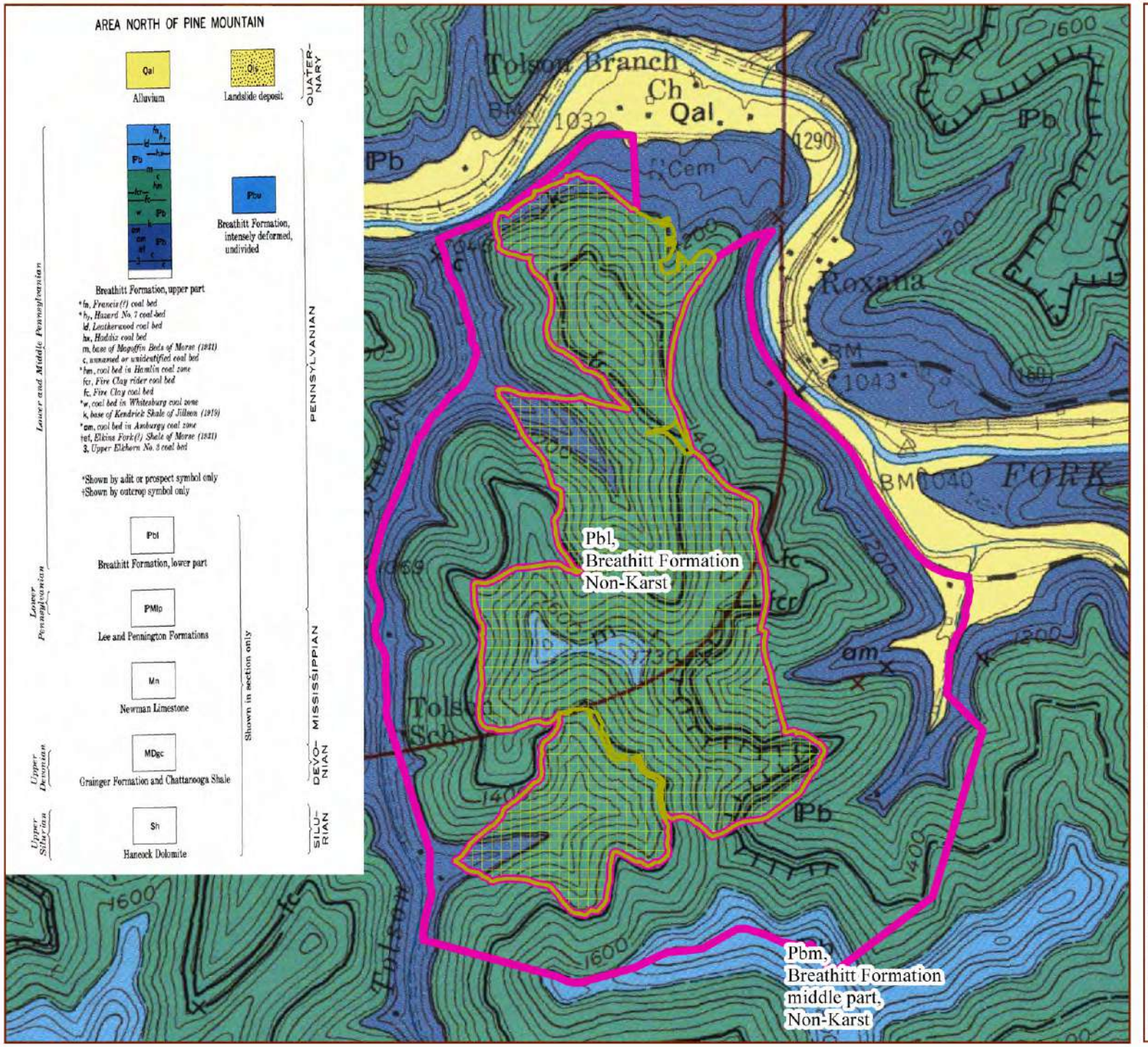
Summer Foraging and Roosting Habitat

Desktop analysis showed the majority of the habitat within the project area to be forested, which could provide suitable northern long-eared bat summer habitat.

Field surveys confirmed that the majority of the area was forested and is considered summer foraging and roosting habitat for northern long-eared bats. Forested areas included mature forest with open understory and young forest with high stem density. Mature forest areas were typically dominated by tulip poplar, maples, hickories, and northern red oak. Young forest with high stem density was dominated by American beech, eastern hemlock, and maples. In total, 251.5 acres were considered suitable summer foraging habitat for northern long-eared bat (Figure 7). Multiple snags and live damaged trees were found, which appeared to be appropriate for northern long-eared bat maternity roosting. A total of 50.1 acres was determined to be unsuitable foraging or roosting habitat for northern long-eared bats. Non-habitat areas included grasslands and scrub habitat (dominated by blackberry and autumn olive) on a reclaimed strip mine.

Roxana Site Habitat Assessment

Figure 4. Project Area Geology



Letcher County, Kentucky

2014 Survey Area

2016 Survey Area

1:13,250
or
1 inch = 1,104 ft

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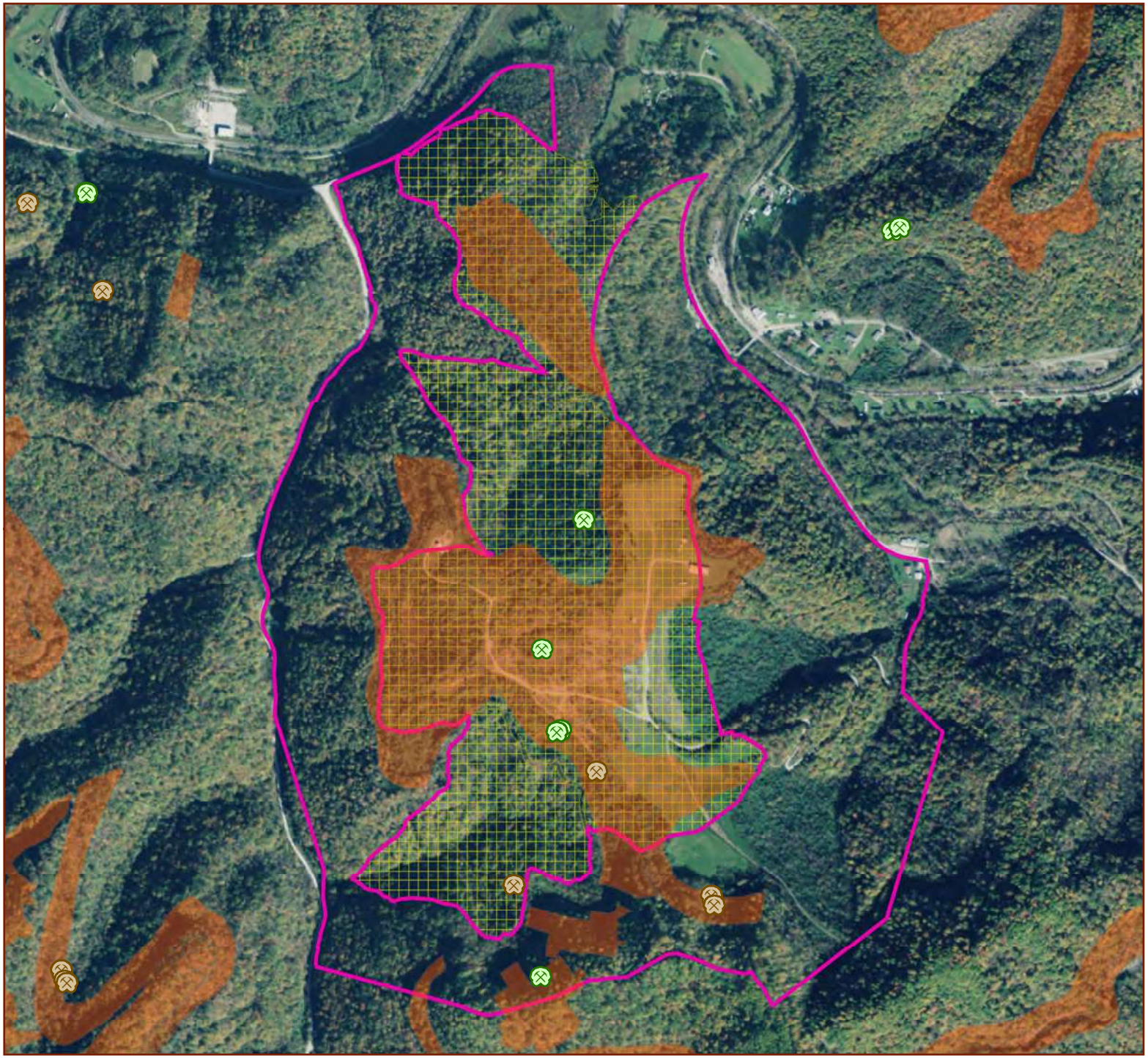
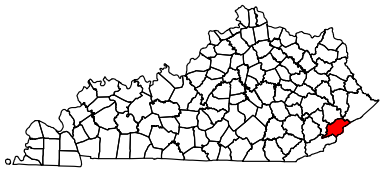
Projection: Lambert Conformal Conic
Datum: North American 1983
Sources: USDA, ESRI, USGS
Date: 10/31/2016



Roxana Site Habitat Assessment

Figure 5. Historic Mining Activity within the Project Area



Letcher County, Kentucky

Inactive Mines

- Surface
- Underground
- Mined Out Area
- 2014 Survey Area
- 2016 Survey Area

1:12,000
or
1 inch = 1,000 ft

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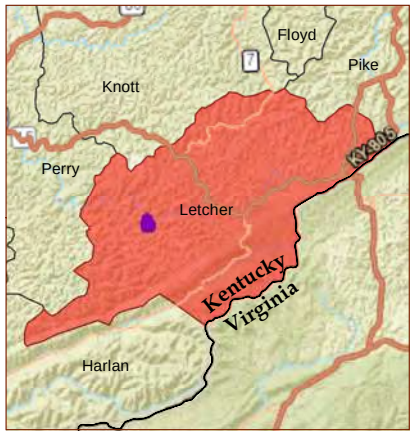
Coordinate System: NAD 1983 StatePlane Kentucky FIPS 1600 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983
Sources: USDA, ESRI, USGS
Date: 10/31/2016



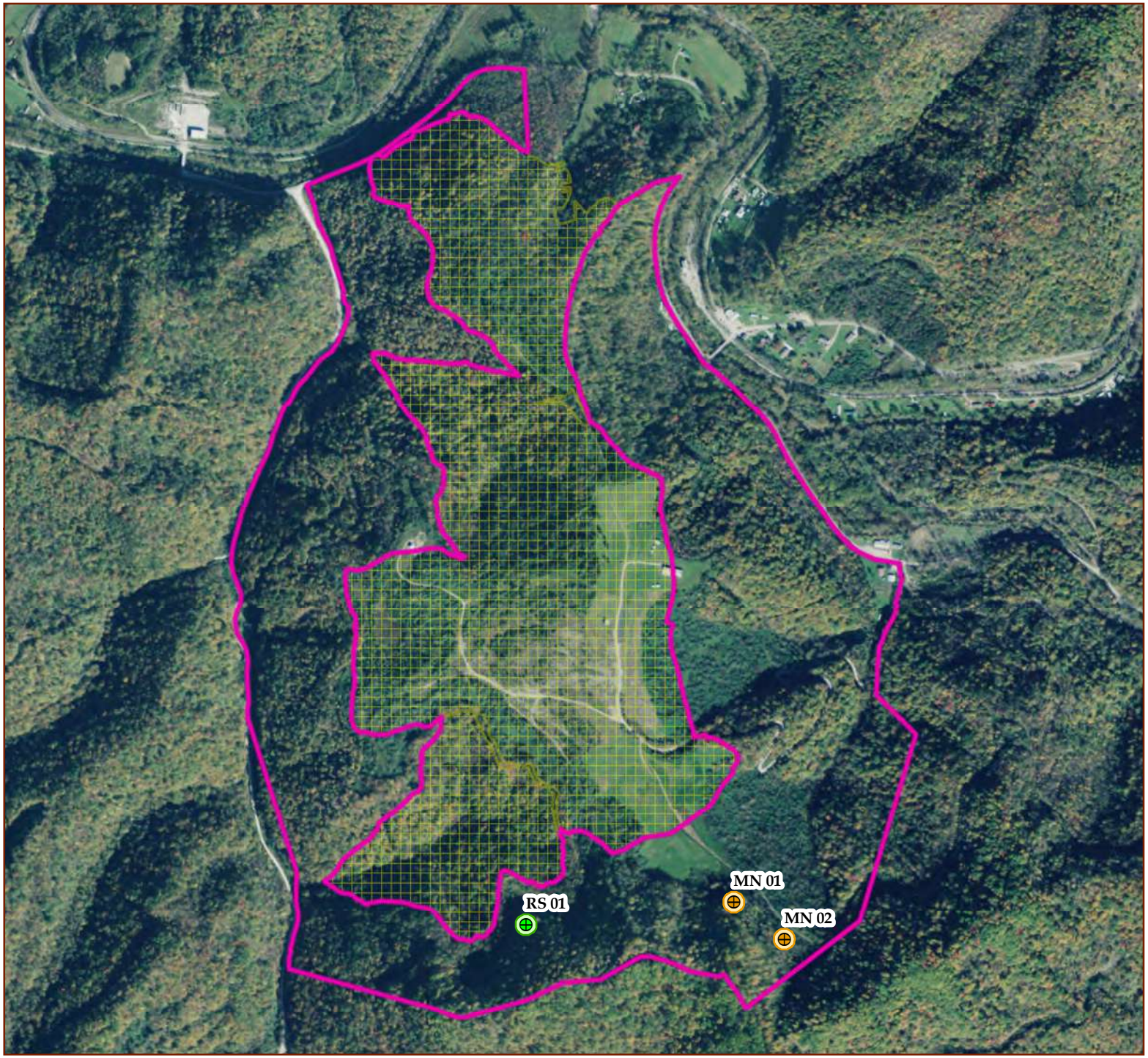
Winter Habitat

No evidence of caves or cave forming geology was found through desktop analysis. Desktop research found a substantial history of mining in the area. Surface mining and several potential underground mine locations were identified using KMMIS data. Potential underground locations identified were from permitted commercial mining operations and were listed as "inactive" (KMMIS 2016). Locations of potential underground mines were used to identify search areas and search contours (Figure 5).

No limestone caves were found during field surveys. Two small hand dug underground coal mines (MN01 and MN02) and one cave-like rock shelter (RS01) were found within the project limits (Figure 6; Appendix 3, Photos P1-P4). The two mines that were found were likely excavated for home use and did not offer sufficient expanse or conditions to be likely to harbor hibernating northern long-eared bats. The rock shelter had developed in a crack in a rock outcrop, which was covered over by soil and had an internal extent that extended beyond what could be seen from the entrance. The ceiling condition was stable and internal temperature was cooler than ambient temperature. The shelter could not be ruled out as winter hibernation habitat for northern long-eared bats. No visible sign of bat use could be found near the entrance. The rock shelter is located outside of the proposed area for tree clearing and will not be directly impacted by construction.

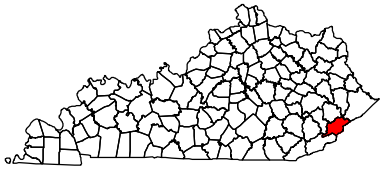
CONCLUSIONS

A total of 251.5 acres of the 2016 survey area was determined to be suitable Indiana and northern long-eared bat summer foraging habitat. One cave-like rock shelter was found that is considered suitable for use as a hibernaculum by Indiana bats, northern long-eared bats, and gray bats. The rock shelter is located outside of the proposed area for tree clearing and would not be directly impacted by proposed construction activities.



Roxana Site Habitat Assessment

Figure 6. Potential Winter Habitat for Listed Bat Species



Letcher County, Kentucky

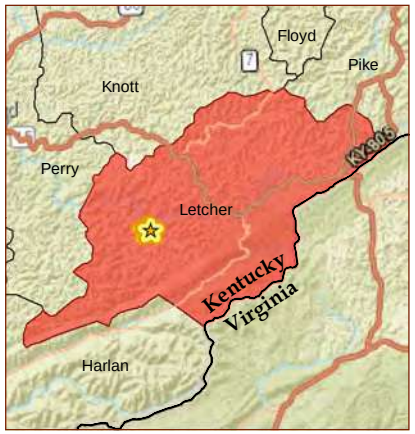
- Coal Mine, Deemed Not Habitat
- Rock Shelter, Potential Habitat
- 2016 Survey Area
- 2014 Survey Area

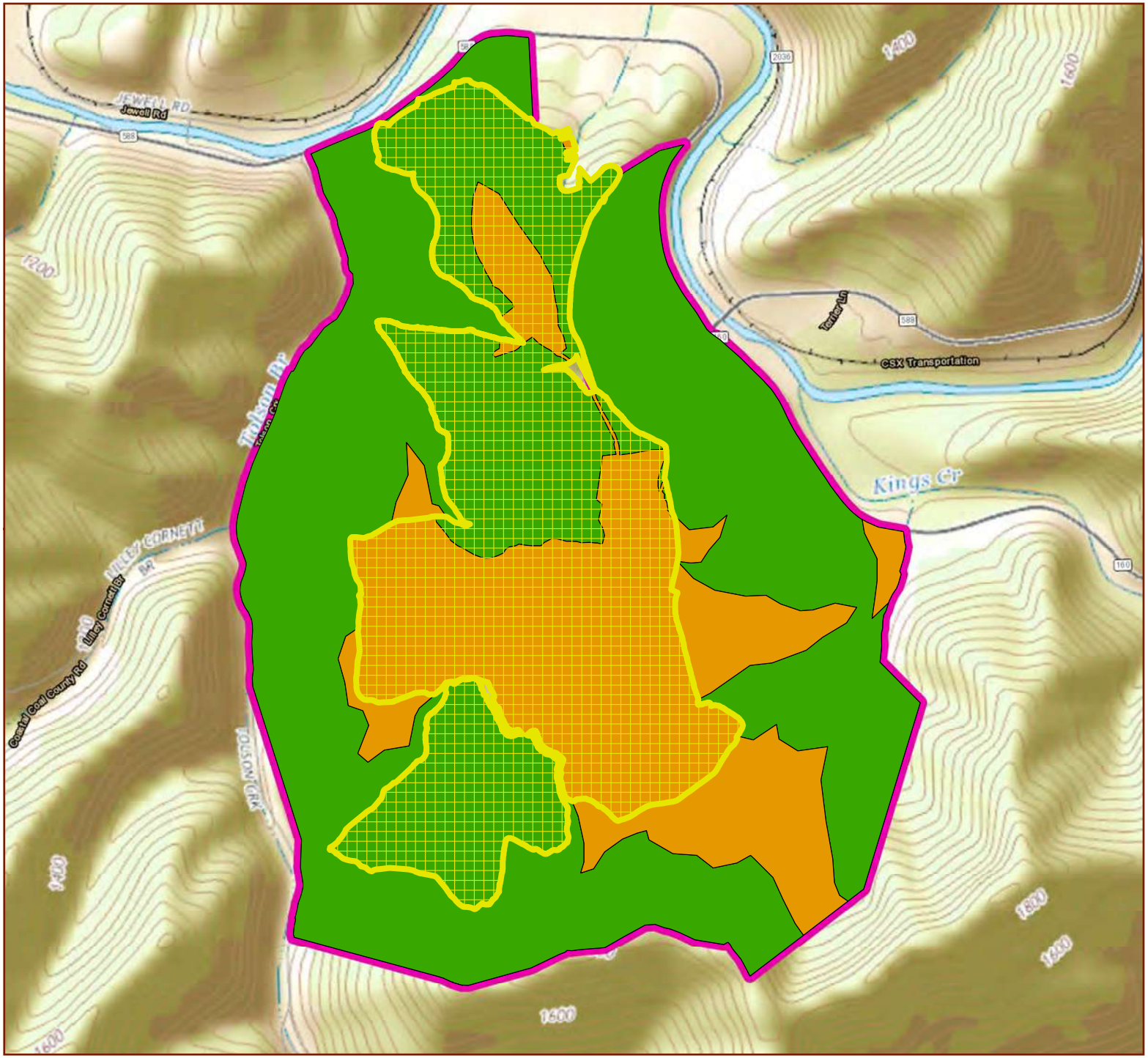
1:12,000
or
1 inch = 1,000 ft

N
W E
S

0 1,000 Ft

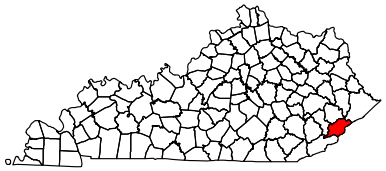
Coordinate System: NAD 1983 StatePlane Kentucky FIPS 1600 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983
Sources: USDA, ESRI, USGS
Date: 10/31/2016





Roxana Site Habitat Assessment

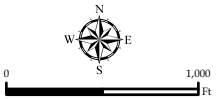
Figure 7. Potential Summer Habitat for Indiana and Northern Long-eared Bats



Letcher County, Kentucky

- 2014 Survey Area
- Habitat
- Not Habitat
- 2016 Survey Area

1:12,000
or
1 inch = 1,000 ft



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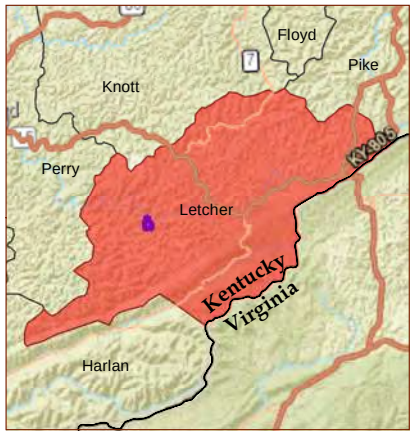
Sources: USDA, ESRI, USGS
Date: 11/9/2016



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Appendix 1: Field Survey Datasheets

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Appendix 1. Phase I Habitat Assessment Sample Data Sheet

Location Roxanna ky, hillside on southern ridge (northern slope) "Mine_1"

Observers (include permit numbers) J. Culbertson, A. Dart-Padover

Latitude 37.09803 **Longitude** -82.95036

Date 9/6/2016 **Time** 15:20 **Temp (outside)** 75.2° F

	Portal #1	Portal #2	Portal #3	Portal #4
Opening (e.g., cave, quarry, shaft)	quarry			
Opening Size: Height x Width (or Diameter)	1 x 2.5 ft			
Internal Dimensions: Height x Width	1.5 x 8 ft			
Slope (up or down from entrance)	down			
Entrance Stable?	no			
Direction of Airflow (In or out?)	Ø			
Amount of Airflow (e.g., none, slight, heavy)	none			
Air warmer or cooler than outside temp.	65.2° F			
Evidence of collapse?	Possible			
Ceiling Condition	unknown			
Amount of water in opening	none			
Evidence of past flooding?	no			
Observed length of portal	10 ft			
Distance to nearest water source	~2,100 ft			
% Canopy Cover at portal entrance	100%			
Foraging Signs? (e.g., moth wings)	no			

Are any portals suspected or known to be connected? Which ones?
no

Any observable side passages?
no

Additional comments:
Small prospecting site, not suitable for bat use.

Entry of abandoned mine portals, quarries, or caves can be extremely dangerous because of the potential for ceiling collapse and presence of toxic gases. Safety or health problems may occur as a result of entering abandoned mines. The FWS does not authorize or require anyone to enter any potential hibernaculum that is or could be unsafe while implementing surveys. These guidelines do not require any applicant or applicant employee, consultant, lessee, or other such designee to enter into any cave, quarry, or mine portal.

Appendix 1. Phase I Habitat Assessment Sample Data Sheet

Location Roxanna KY, Hillside at northern base of southern ridge "Mine_2"

Observers (include permit numbers) T. Culbertson, A. Dart-Padover

Latitude 37.09727 **Longitude** -82.94924

Date 9/6/2016 **Time** 1557 **Temp (outside)** 73.2 °F

	Portal #1	Portal #2	Portal #3	Portal #4
Opening (e.g., cave, quarry, shaft)	quarry			
Opening Size: Height x Width (or Diameter)	1 x 3 ft			
Internal Dimensions: Height x Width	3 x 3.5 ft			
Slope (up or down from entrance)	down			
Entrance Stable?	Moderate			
Direction of Airflow (In or out?)	Ø			
Amount of Airflow (e.g., none, slight, heavy)	none			
Air warmer or cooler than outside temp.	57.8°F			
Evidence of collapse?	yes			
Ceiling Condition	some collapse			
Amount of water in opening	none			
Evidence of past flooding?	no			
Observed length of portal	40 ft			
Distance to nearest water source	~2,300 ft			
% Canopy Cover at portal entrance	100%			
Foraging Signs? (e.g., moth wings)	no			

Are any portals suspected or known to be connected? Which ones?
no

Any observable side passages?
no

Additional comments:
Appears to be a bore hole into a coal seam.

Entry of abandoned mine portals, quarries, or caves can be extremely dangerous because of the potential for ceiling collapse and presence of toxic gases. Safety or health problems may occur as a result of entering abandoned mines. The FWS does not authorize or require anyone to enter any potential hibernaculum that is or could be unsafe while implementing surveys. These guidelines do not require any applicant or applicant employee, consultant, lessee, or other such designee to enter into any cave, quarry, or mine portal.

RS-01

RS 01

Appendix 1. Phase I Habitat Assessment Sample Data Sheet

Location Roxanna Ky, West side of Southern Topo feature (North Slope)

Observers (include permit numbers) T. Culbertson; A. Dart-Padover

Latitude 37.09771 **Longitude** -82.95548

Date 9/8/2016 **Time** 12:20 **Temp (outside)** 81.5°F

	Portal #1	Portal #2	Portal #3	Portal #4
Opening (e.g., cave, quarry, shaft)	Rock Shelter			
Opening Size: Height x Width (or Diameter)	3x1 ft			
Internal Dimensions: Height x Width	15x1 ft			
Slope (up or down from entrance)	down			
Entrance Stable?	yes			
Direction of Airflow (In or out?)	ø			
Amount of Airflow (e.g., none, slight, heavy)	none			
Air warmer or cooler than outside temp.	72.1°F cooler			
Evidence of collapse?	no			
Ceiling Condition	good			
Amount of water in opening	none			
Evidence of past flooding?	no			
Observed length of portal	35 ft			
Distance to nearest water source	1,700 ft			
% Canopy Cover at portal entrance	100%			
Foraging Signs? (e.g., moth wings)	no			

Are any portals suspected or known to be connected? Which ones? no

Any observable side passages? no

Additional comments: Crevice may continue past 35 ft. appears to curve to the right. Could provide adequate shelter for bats, though no evidence was seen. Considered Suitable

Entry of abandoned mine portals, quarries, or caves can be extremely dangerous because of the potential for ceiling collapse and presence of toxic gases. Safety or health problems may occur as a result of entering abandoned mines. The FWS does not authorize or require anyone to enter any potential hibernaculum that is or could be unsafe while implementing surveys. These guidelines do not require any applicant or applicant employee, consultant, lessee, or other such designee to enter into any cave, quarry, or mine portal.

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Appendix 2: Field Survey GPS Tracks

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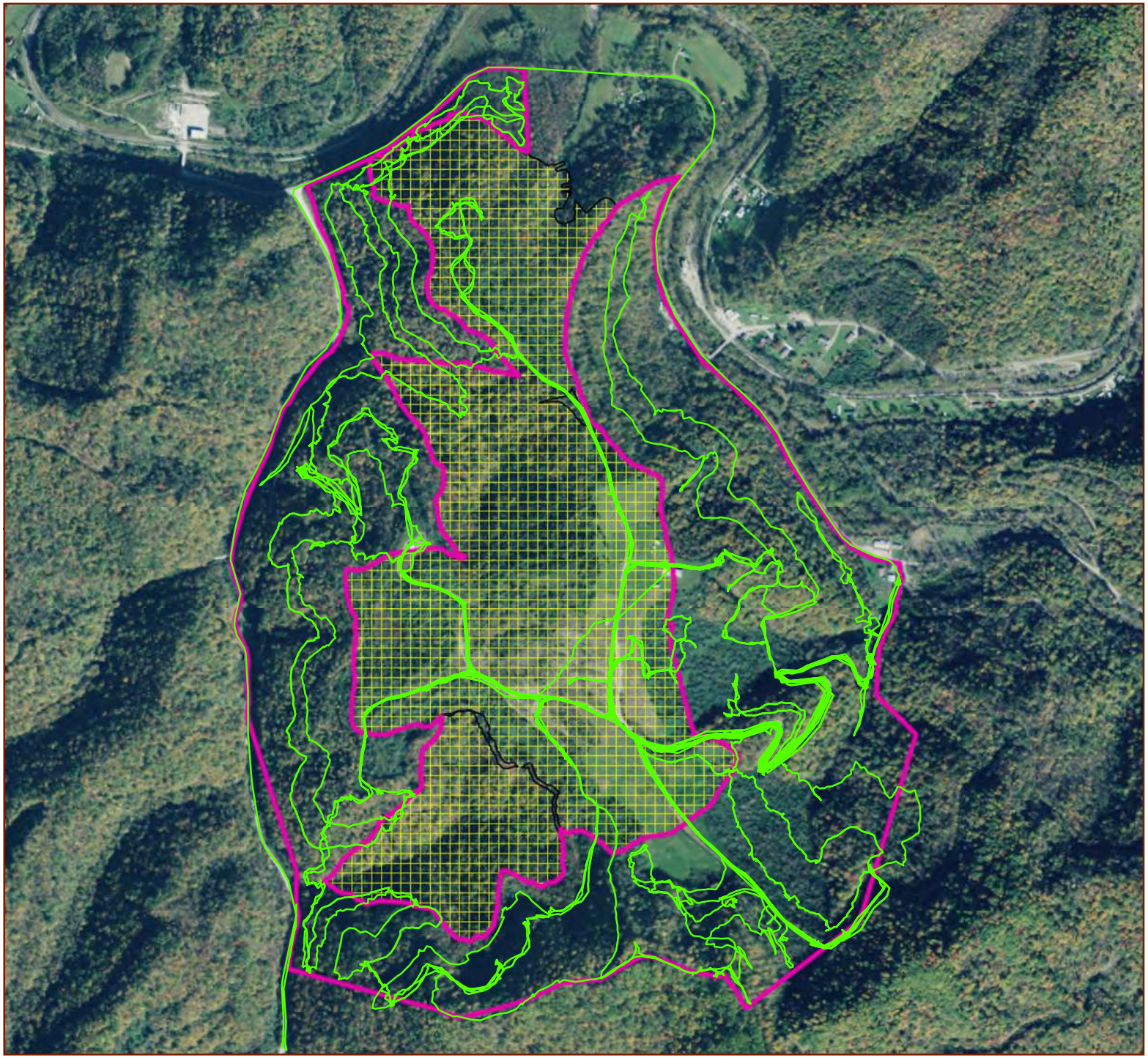
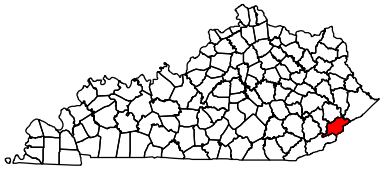


Roxana Site Habitat Assessment

GPS Tracks from 2016 Survey



Letcher County, Kentucky

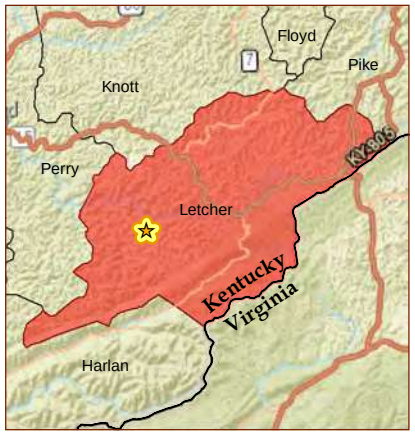
Survey Tracks

2016 Survey Area

2014 Survey Area

1:12,000
or
1 inch = 1,000 ft

Coordinate System: NAD 1983 StatePlane Kentucky FIPS 1600 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983
Sources: USDA, ESRI, USGS
Date: 10/28/2016



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Appendix 3: Field Survey Photographs

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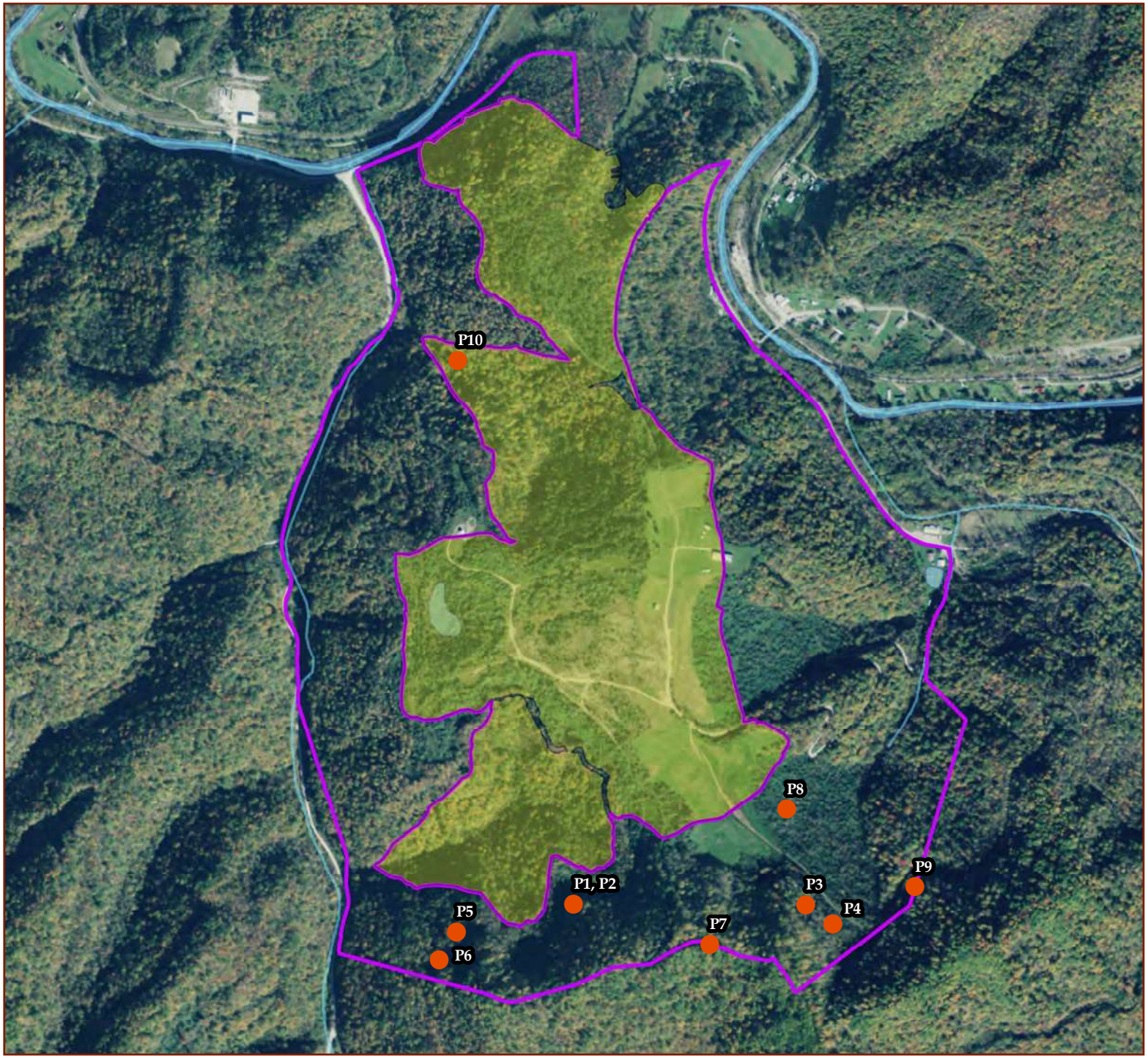
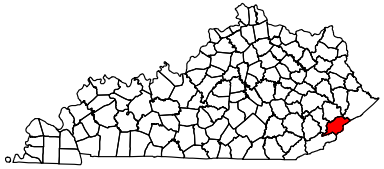


Roxana Site Habitat Assessment

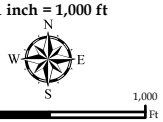
Photo Location Map



Letcher County, Kentucky

- Photograph
- 2014 Survey Area
- 2016 Survey Area

1:12,000
or
1 inch = 1,000 ft



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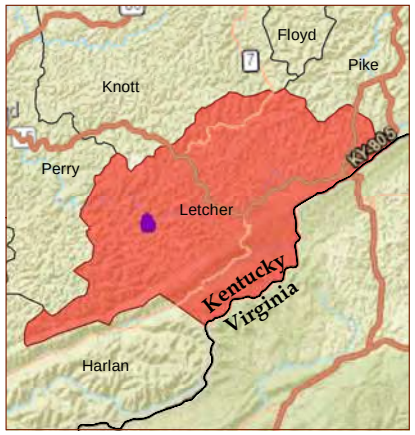

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COPPERHEAD ENVIRONMENTAL CONSULTING	**Habitat Survey for the Indiana Bat, Gray Bat, and Northern Long-eared Bat for the Proposed U.S. Penitentiary and Federal Prison Camp at the Roxana Site**	
Project No.: 517	**County, State:** Letcher Co., KY	**Client:** Cardno

Photo Map Key.: P1	
Date of Photo: September 8, 2016	
RS 01 on Figure 6	
Location: Roxana Site	
View: Entrance	
Description: Photo of cave-like Rock Shelter	

Photo Map Key.: P2	
Date of Photo: September 8, 2016	
RS 01 on Figure 6	
Location: Roxana Site	
View: Internal Photo	
Description: Photo of the inside of the cave-like rock shelter deemed suitable habitat	

COPPERHEAD ENVIRONMENTAL CONSULTING	Habitat Survey for the Indiana Bat, Gray Bat, and Northern Long-eared Bat for the Proposed U.S. Penitentiary and Federal Prison Camp at the Roxana Site	
Project No.: 517	**County, State:** Letcher Co., KY	**Client:** Cardno

Photo Map Key.: P3	
Date of Photo: September 6, 2016	
MN 01 on Figure 6	
Location: Roxana Site	
View: Entrance	
Description: Photo of the entrance of MN-01 deemed not-suitable for use by listed bats.	

Photo Map Key.: P4	
Date of Photo: September 6, 2016	
MN 02 on Figure 6	
Location: Roxana Site	
View: Entrance	
Description: Photo of entrance of MN_02, deemed not-suitable for listed bats.	

COPPERHEAD ENVIRONMENTAL CONSULTING	**Habitat Survey for the Indiana Bat, Gray Bat, and Northern Long-eared Bat for the Proposed U.S. Penitentiary and Federal Prison Camp at the Roxana Site**	
Project No.: 517	**County, State:** Letcher Co., KY	**Client:** Cardno

Photo Map Key.: P5	
Date of Photo: September 6, 2016	
Location: Roxana Site	
View:	
Description: Mature forest with open understory in the southern portion of the property. Deemed suitable summer habitat for Indiana and northern long-eared bats.	

Photo Map Key.: P6	
Date of Photo: September 6, 2016	
Location: Roxana Site	
View:	
Photo of new growth with high stem density, deemed suitable summer habitat for Indiana and northern long-eared bats.	

COPPERHEAD ENVIRONMENTAL CONSULTING	Habitat Survey for the Indiana Bat, Gray Bat, and Northern Long-eared Bat for the Proposed U.S. Penitentiary and Federal Prison Camp at the Roxana Site	
Project No.: 517	**County, State:** Letcher Co., KY	**Client:** Cardno

Photo Map Key.: P7	
Date of Photo: September 7, 2016	
Location: Roxana Site	
View:	
Description: Foreground shows grasses and herbaceous growth on reclaimed strip mine, deemed not suitable for summer use by listed bats.	

Photo Map Key.: P8	
Date of Photo: September 7, 2016	
Location: Roxana Site	
View:	
Description: Photo shows scrub habitat deemed not suitable as summer habitat for listed bats.	

COPPERHEAD ENVIRONMENTAL CONSULTING	Habitat Survey for the Indiana Bat, Gray Bat, and Northern Long-eared Bat for the Proposed U.S. Penitentiary and Federal Prison Camp at the Roxana Site	
Project No.: 517	**County, State:** Letcher Co., KY	**Client:** Cardno

Photo Map Key.: P9	
Date of Photo: September 7, 2016	
Location: Roxana Site	
View:	
Description: Photo of mine highwall on southern boundary of the property.	

Photo Map Key.: P10	
Date of Photo: September 8, 2016	
Location:	
View:	
Description: Photo of intermittent stream deemed not suitable for gray bat summer habitat. Forest and water source are suitable habitat for Indiana and northern long-eared bats.	

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From:	Issac Gaston
To:	George Younger; Jeffrey J. Limjoco; Jody L. Smith; Mitch Miskimins
Cc:	Cheryl Ciccone; Craig Meyers; Lori Thursby
Subject:	Fwd: Final Bat Habitat Assessment - Letcher County prison
Date:	Wednesday, January 18, 2017 1:00:25 PM

>>> "Miller, Jessica" <jessica_miller@fws.gov> 1/18/2017 12:33 PM >>>
Mr. Gaston,

We have received the final copy of the Bat Habitat Assessment for the Letcher County prison site. Thank you for providing this to our office.

Jessi

--
Jessica Blackwood Miller
Fish & Wildlife Biologist
Kentucky Field Office
U.S. Fish & Wildlife Service
330 W. Broadway, Rm 265
Frankfort, KY 40601
Ph: (502) 695-0468 ext. 104
Fax: (502) 695-1024

NOTE: This email correspondence and any attachments to and from this sender is subject to the Freedom of Information Act (FOIA) and may be disclosed to third parties.

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U.S. Department of Justice

Federal Bureau of Prisons

Washington, DC 20534

May 1, 2017

Ms. Jessica Blackwood Miller, Fish & Wildlife Biologist
U.S. Fish and Wildlife Service
Kentucky Field Office
330 W. Broadway, Rm. 265
Frankfort, KY 40601

Subject: Initiation of Formal Section 7 Consultation for Proposed U.S. Penitentiary and Federal Prison Camp, Letcher County, Kentucky

Dear Ms. Miller,

The Federal Bureau of Prisons requests initiation of formal section 7 Endangered Species Act (ESA) consultation for the proposed development and operation of a U.S. Penitentiary and Federal Prison Camp in Letcher County, Kentucky. The enclosed Biological Assessment (BA) provides a description of the actions being taken and a description of the specific resources that may be affected. As required by section 7 of the ESA, the Federal Bureau of Prisons has considered the potential impacts of the Proposed Action on ESA-listed species in drafting the BA and we have determined:

1. The Proposed Action will have no effect on the threatened Kentucky arrow darter. As such, this species is excluded from analysis in the BA.
2. The Proposed Action "may affect, is likely to adversely affect" the endangered Indiana bat and the threatened northern long-eared bat (NLEB).
3. The Proposed Action "may affect, is not likely to adversely affect" the endangered gray bat.

In conclusion, the Federal Bureau of Prisons requests initiation of formal consultation under section 7 of the ESA for the Indiana bat, NLEB, and gray bat. We appreciate your office's previous commitment to a 90-day timeline for preparing the Biological Opinion (BO) for this consultation. We respectively request a copy of a Draft BO for our review.

Thank you for your assistance. Please contact me at igaston@bop.gov or at (202) 514-6470 if you have any questions or require additional information.

Sincerely,

Issac Gaston, Site Selection Specialist
Capacity Planning and Construction Branch

Attachment: Final Biological Assessment, Potential Effects on Species under the Jurisdiction of the U.S. Fish and Wildlife Service from Construction and Operation of a Proposed U.S. Penitentiary and Federal Prison Camp, Letcher County, Kentucky (May 2017)

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Kentucky Ecological Services Field Office
330 West Broadway, Suite 265
Frankfort, Kentucky 40601
(502) 695-0468

May 10, 2017

Mr. Isaac Gaston
U.S. Department of Justice
Federal Bureau of Prisons
Capacity Planning and Construction Branch
320 First Street, NW
Washington, DC 20534

Re: FWS 04EK1000-2016-F-0023; 2013-B-0627; Federal Bureau of Prisons; Proposed Penitentiary and Federal Prison Camp; Letcher County, Kentucky

Dear Mr. Gaston:

This letter acknowledges the U.S. Fish and Wildlife Service's (Service) May 2, 2017 receipt of the Federal Bureau of Prison's (Bureau) letter, dated May 1, 2017, regarding the above-referenced project. Your letter includes the Bureau's species effects determinations and an attached Biological Assessment (BA) in accordance with the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*).

Indiana Bat
Northern Long-eared Bat
We concur with the Bureau's "may affect, likely to adversely affect" determinations for the federally-endangered Indiana bat (*Myotis sodalis*) and the federally-threatened northern long-eared bat (*Myotis septentrionalis*). The BA provides information describing the adverse effects likely to occur to these species. Based on the information in the BA, the Service believes that it is appropriate to initiate formal section 7 consultation on this project.

Section 7 allows the Service up to 90 calendar days to conclude formal consultation with your agency and an additional 45 calendar days to prepare our biological opinion (unless we mutually agree to an extension). To assist the Bureau in expediting their process, we believe that we can provide you with our biological opinion within 60 to 90 days, no later than July 31, 2017.

As a reminder, the Endangered Species Act requires that, after initiation of formal consultation, the Federal action agency may not make any irreversible or irretrievable commitment of resources that limits future options. This practice ensures that agency actions do not preclude

the formulation or implementation of reasonable and prudent alternatives that avoid jeopardizing the continued existence of endangered or threatened species or destroying or modifying their critical habitats.

Gray Bat

The Bureau determined that the proposed project is not likely to adversely affect the gray bat (*Myotis grisescens*). In a November 23, 2016 bat habitat assessment, Copperhead Environmental Consulting, Inc. (Copperhead) identified one cave-like feature on the proposed project property that could potentially provide bat habitat. Copperhead concluded that this feature was not used by gray bats as a maternity roost but could potentially be used as winter hibernacula. This feature is not in the clearing and grading limits of the proposed project, and blasting will not be conducted from November 15 – March 31 when the species may be using the feature during hibernation.

In addition, there are some streams and wetlands in the proposed clearing and grading limits. These features are relatively small and most are in an already cleared area on the site that does not contain forested foraging corridors. Any effects on gray bats from the permanent loss of this low-quality foraging habitat is expected to be insignificant. Any temporary increases in sedimentation of downstream foraging resources would be minimized through implementation of an erosion and sediment control plan, and any resulting effects on the gray bat are expected to be insignificant. Based on the information available to us, we concur with your "may affect – not likely to adversely affect" determination for the gray bat.

Kentucky Arrow Darter

The Bureau determined that the proposed project would have no effect on the Kentucky arrow darter (*Etheostoma sagitta spilotum*). The Bureau does not need concurrence from the Service for "no effect" determinations. We have no further comments regarding the Kentucky arrow darter.

If you have any questions or concerns about this consultation or the consultation process in general, please feel free to contact Jessica Blackwood Miller at (502) 695-0468 extension 104 or jessica_miller@fws.gov.

Sincerely,

Jennifer Larland

for Virgil Lee Andrews, Jr.
Field Supervisor

Final

Biological Assessment
Potential Effects on Species under the Jurisdiction of the U.S. Fish and Wildlife Service from Construction and Operation of a Proposed U.S. Penitentiary and Federal Prison Camp Letcher County, Kentucky

Prepared for:

U.S. Department of Justice
Federal Bureau of Prisons
Capacity Planning and Construction Branch

May 2017

ABBREVIATIONS AND ACRONYMS

ac	acre(s)
BA	Biological Assessment
BMPs	best management practices
Bureau	Federal Bureau of Prisons
^{o}C	degrees Celsius
Caltrans	California Department of Transportation
Copperhead	Copperhead Environmental Consulting, Inc.
dB	decibel(s)
dBA	A-weighted decibel(s)
dBP	peak decibel(s)
ESA	Endangered Species Act
^{o}F	degrees Fahrenheit
FPC	Federal Prison Camp
ft	foot/feet
ft^2	square foot/feet
ha	hectare(s)
Hz	Hertz
in	inches
KEPPC	Kentucky Exotic Pest Plant Council
km	kilometer(s)
KRADD	Kentucky River Area Development District
m	meter(s)
m^2	square meter(s)
NEPA	National Environmental Policy Act
NLCD	National Land Cover Database
NLEB	northern long-eared bat
NMFS	National Marine Fisheries Service
U.S.	United States
USC	U.S. Code
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
USP	U.S. Penitentiary
WNS	white-nose syndrome
WVDEP	West Virginia Department of Environmental Protection

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Appendix I. Coordination History

EXECUTIVE SUMMARY

The Federal Bureau of Prisons (Bureau), as the action agency, has prepared this Biological Assessment (BA) to support formal consultation under section 7 of the Endangered Species Act (ESA) (16 United States [U.S.] Code [USC] 1531 et seq.). Section 7(a)(2) of the ESA requires Federal agencies to ensure that any action authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of any federally threatened or endangered species or result in the destruction or adverse modification of critical habitat. This document also supports the Bureau's compliance with Section 102 of the National Environmental Policy Act (42 USC 4321 *et seq.*) mandating that appropriate consideration be given to environmental resources impacted by the preferred alternative presented in the *Supplemental Revised Final Environmental Impact Statement for Proposed United States Penitentiary and Federal Prison Camp, Letcher County, Kentucky*.

This BA has been prepared to analyze and address the potential effects on federally threatened and endangered species under the jurisdiction of the U.S. Fish and Wildlife Service (USFWS) from the construction and operation of a proposed U.S. Penitentiary and Federal Prison Camp near the community of Roxana, Letcher County, Kentucky. Table ES-1 provides information on the ESA-listed species that occur within the Action Area and, based on the evaluation presented in this BA, presents the Bureau's effects determination for each ESA-listed species from the implementation of the proposed project.

Table ES-1. Summary of Findings for ESA-Listed Species

Common Name	Scientific Name	Status	Effects Determination
Northern long-eared bat	*Myotis septentrionalis*	Threatened	May affect, is likely to adversely affect
Indiana bat	*Myotis sodalis*	Endangered	May affect, is likely to adversely affect
Gray bat	*Myotis grisescens*	Endangered	May affect, not likely to adversely affect
Kentucky arrow darter	*Etheostoma spilotum*	Threatened	No effect

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1.0 INTRODUCTION

The Federal Bureau of Prisons (Bureau), as the action agency, has prepared this Biological Assessment (BA) to support formal consultation under section 7 of the Endangered Species Act (ESA) (16 United States [U.S.] Code [USC] 1531 et seq.). Section 7(a)(2) of the ESA requires Federal agencies to ensure that any action they authorize, fund, or otherwise carry out is not likely to jeopardize the continued existence of any ESA-listed species or result in the destruction or adverse modification of critical habitat. This document also supports the Bureau's compliance with Section 102 of the National Environmental Policy Act (NEPA) (42 USC 4321 *et seq.*) mandating that appropriate consideration be given to environmental resources potentially impacted by the preferred alternative presented in the *Draft Supplemental Revised Final Environmental Impact Statement for Proposed United States Penitentiary and Federal Prison Camp, Letcher County, Kentucky* (Federal Bureau of Prisons 2017).

This BA has been prepared to analyze and address the potential impacts on federally threatened and endangered species under the jurisdiction of the U.S. Fish and Wildlife Service (USFWS) from the construction and operation of a proposed U.S. Penitentiary (USP) and Federal Prison Camp (FPC) near the community of Roxana, Letcher County, Kentucky (Figure 1-1).

1.1 PURPOSE OF AND NEED FOR THE PROPOSED ACTION

The Bureau's mission is to protect society by confining offenders in the controlled environments of prisons and community-based facilities that are safe, humane, cost-efficient, appropriately secured, and that provide work and other self-improvement opportunities to assist offenders in becoming law-abiding citizens. The purpose of the proposed federal correctional facility in Letcher County, Kentucky is to provide an additional high-security penitentiary and an associated prison camp to increase capacity for current inmate populations in the Mid-Atlantic Region. The need for the proposed facility is that the current inmate populations of high-security male facilities (USPs) in the Mid-Atlantic Region are exceeding their rated capacity and their associated minimum-security facilities (FPCs) are at or near capacity. The overcrowding level in the USPs in the Mid-Atlantic Region is currently 35%. Current inmates from the four existing USPs in the Mid-Atlantic Region could be moved from these overcrowded facilities to the proposed Letcher County USP. The Bureau has determined that there is a need for additional high-security facilities within this region to reduce the demonstrated overcrowding that compromises the mission of the Bureau (Federal Bureau of Prisons 2017).

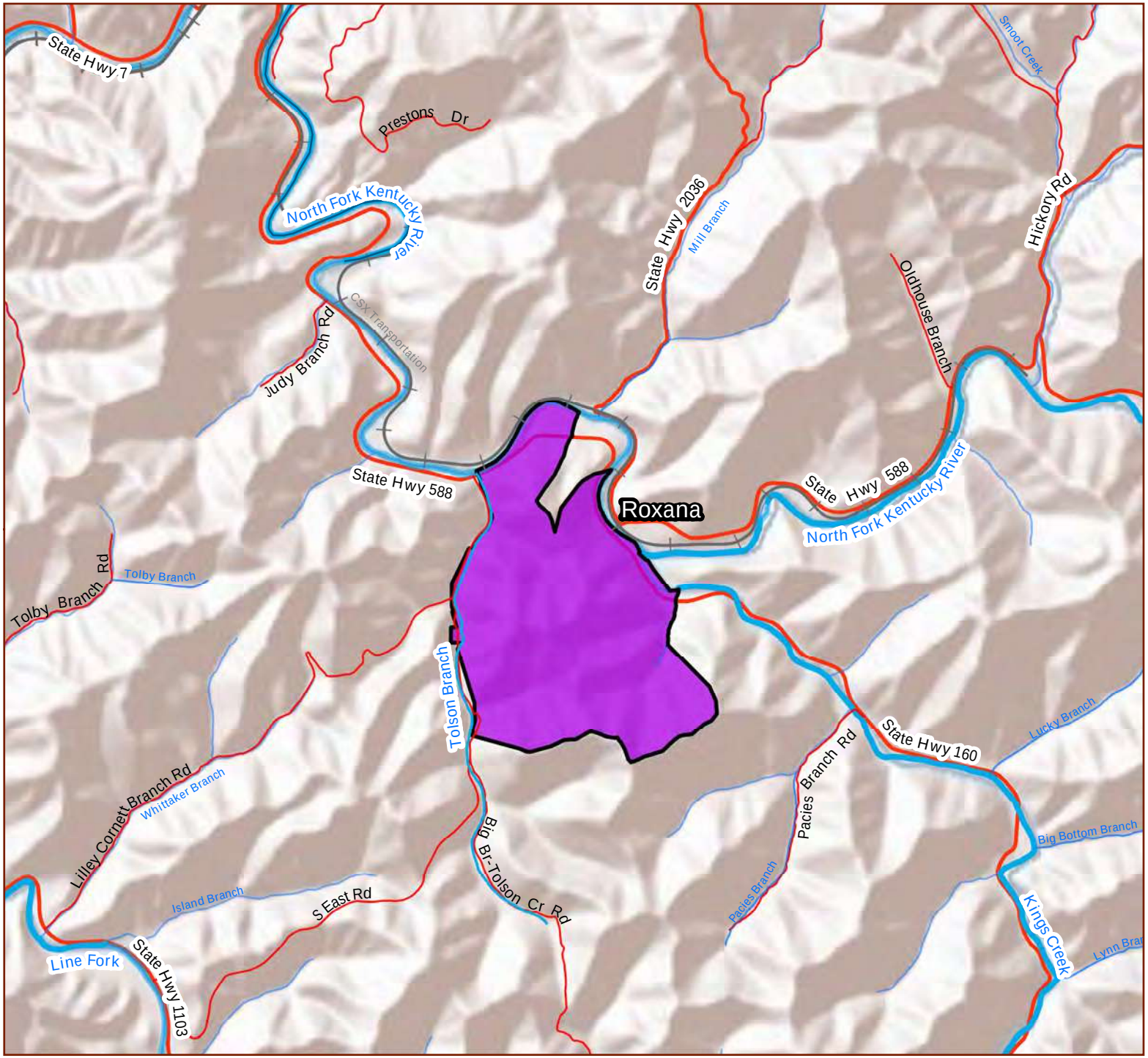
1.2 SCOPE AND CONTENT OF THE BA

1.2.1 SPECIES ADDRESSED IN THIS BA

ESA-listed species are defined as those plant and animal species currently listed by the USFWS under the ESA as threatened or endangered. Based upon guidance from the USFWS Kentucky Ecological Services Field Office received on August 7, 2014 (USFWS 2014; included in Appendix I of this BA), four ESA-listed species may potentially occur within the Action Area and are addressed in this BA (Table 1-1). The definition of the Action Area is provided in Section 3.1. Throughout this BA, the phrase "ESA-listed bats" applies to the listed bat species that are considered: northern long-eared bat (NLEB), Indiana bat, and gray bat.

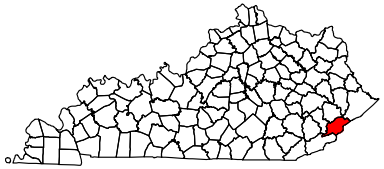
Table 1-1. ESA-listed Species Potentially Occurring within the Action Area

Common Name	Scientific Name	ESA Status
Northern long-eared bat	*Myotis septentrionalis*	Threatened
Indiana bat	*Myotis sodalis*	Endangered
Gray bat	*Myotis grisescens*	Endangered
Kentucky arrow darter	*Etheostoma spilotum*	Threatened



Biological Assessment

Figure 1-1. Project Location of Proposed USP and FPC, Letcher County, KY



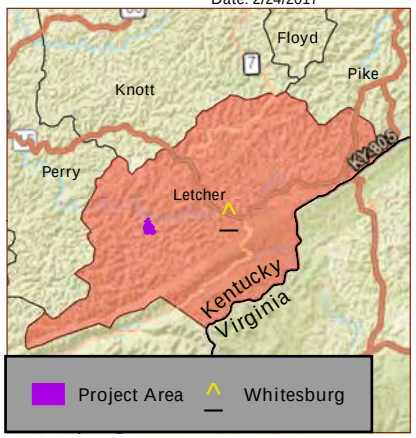
Letcher County, Kentucky

- Project Area
- Railroad
- Rivers/Streams
- Roads

1:36,000
or
1 inch = 3,000 ft

0 2,500 Ft

Coordinate System: NAD 1983 StatePlane Kentucky FIPS 1600 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983
Sources: ESRI 2017, USGS 2009, US Census 2015, KYTC 2015, Bureau 2017
Date: 2/24/2017



The USFWS published occurrence records for the Kentucky arrow darter in the critical habitat designation for the species (USFWS 2016e). Stream reaches containing all extant populations are considered critical habitat. No extant arrow dater populations are known to occur within the Action Area or Letcher County. The closest population measured along watercourses through which fish or pollutants must travel for the project to have effect on the population, is approximately 44 stream miles (71 kilometers [km]) from the Project Area and is considered too remote to be affected by the project. Therefore, given the species does not occur within the Action Area and the proposed construction and operation of the USP and FPC would have no effect on the closest occurrence of the species via waterway connection, the Kentucky arrow darter is dismissed from further analysis in this BA.

1.2.2 CRITICAL HABITAT

Critical habitat is defined in ESA section 3(5)(A)] as: "(1) the specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the provisions of section 4 of the Act, on which are found those physical or biological features (constituent elements) (a) essential to the conservation of the species and (b) which may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provisions of section 4 of the Act, upon a determination by the Secretary that such areas are essential for the conservation of the species."

Critical habitat has not been designated for the gray bat or NLEB (USFWS 2015e, 2017a). While critical habitat has been designated in Kentucky for the Indiana bat (USFWS 1976), no areas of critical habitat are located within or in the vicinity of the Action Area.

1.2.3 ORGANIZATION OF THE BA

Chapter 1 of this BA provides an introduction to the Proposed Action, including information on the scope and content of the BA. Chapter 2 provides a description of the Proposed Action and proposed conservation measures to avoid, minimize and compensate for potential effects to ESA-listed species. Chapter 3 provides a definition of the Action Area and existing conditions within the Action Area. Chapter 4 provides information on the ESA-listed species in the Action Area. Chapter 5 provides analyses of the potential effects of the Proposed Action on ESA-listed species, given implementation of the conservation measures. Chapter 6 discusses any non-federal actions within the Action Area that may result in cumulative effects. Finally, Chapter 7 presents conclusions of the BA, including the Bureau's section 7 effects determinations.

1.3 CONSULTATION HISTORY

Initial conversations between the Bureau and USFWS personnel began in June 2013, which began informal consultation. The following summarizes the consultation history.

- July 15, 2013 – Letter from the Bureau notifying the USFWS of its intent to prepare an Environmental Impact Statement for a new USP and FPC in Letcher County, and inviting the USFWS to a scoping field view on August 13, 2013.
- August 13, 2013 – USFWS attends the Bureau's scoping field view.
- August 7, 2014 – Letter from USFWS to Cardno with comments on the Proposed Action in accordance with the ESA and the Fish and Wildlife Coordination Act. The letter identified two federally listed endangered species (Indiana bat, gray bat), one species proposed for listing as endangered (NLEB), and one candidate species (Kentucky arrow darter) that have the potential to occur within the project vicinity. USFWS recommended presence/absence or habitat surveys for these species.
- December 2–3, 2014 – Field survey for a habitat assessment for Indiana bat, gray bat, and NLEB was conducted by Copperhead Environmental Consulting, Inc. (Copperhead) at the proposed Roxana and Payne Gap sites.

- January 16, 2015 – Letter from the Bureau to USFWS submitting the habitat assessment report for Indiana bat, gray bat, and NLEB at the proposed Roxana and Payne Gap sites.
- February 4, 2015 – Letter from USFWS to Cardno acknowledging receipt and review of the January 2, 2015 Habitat Assessment and the January 16, 2015 submittal, recommending a spring portal survey of the Payne Gap site.
- May 20, 2015 – The Bureau and Cardno met with the USFWS in Frankfort, Kentucky to discuss mitigation for impacts to summer habitat of the Indiana bat and NLEB at the Roxana site.
- June 12, 2015 – Email from Cardno to USFWS summarizing May 20, 2015 meeting on mitigation for Indiana bat and NLEB at the Roxana site.
- June 30, 2015 – Email correspondence between Cardno and USFWS. USFWS notified Cardno that tree removal during June and July is not covered under the Conservation Memorandum of Agreement.
- July 15, 2016 – Email exchange between USFWS and the Bureau describing potential scenarios associated with summer presence/absence bat surveys and winter habitat surveys.
- September 6–8, 2016 – Field habitat assessment of revised 2016 survey area was completed for listed bat habitat by Copperhead.
- October 31 and November 9, 2016 – Emails from USFWS to Copperhead detailing type and distance of listed bat records from the proposed Roxana site.
- December 15, 2016 – Letter from the USFWS to the Bureau acknowledging receipt of the habitat assessment report for Indiana bat, gray bat, and NLEB for additional areas at the Roxana site. The survey found suitable summer habitat for Indiana bats and NLEB. One cave-like rock shelter was found that was deemed potentially suitable as winter habitat for listed bat species. The USFWS concurred with determination of potential habitat for the species. The USFWS suggested that indirect impacts to the species as a result of construction activities and operation of the facility, including loss of forested habitat in proximity to the suitable cave-like rock shelter, should be evaluated.

2.0 PROPOSED ACTION AND CONSERVATION MEASURES

2.1 PROPOSED ACTION

The following is a summary of the proposed action addressed in this BA; further detail can be found in the *Draft Supplemental Revised Final Environmental Impact Statement for Proposed United States Penitentiary and Federal Prison Camp, Letcher County, Kentucky* (Federal Bureau of Prisons 2017). The Proposed Action evaluated in this BA is the acquisition of property and the construction and operation of a federal correctional facility in Letcher County, Kentucky. The proposed site is located near the community of Roxana 7.5 miles (12.1 km) west of the city of Whitesburg, Kentucky (Figure 2-1).

The Proposed Action would include the construction and operation of a USP and a FPC. Inmates housed in the USP would be high-security male inmates and those housed in the FPC would be minimum-security male inmates. The proposed USP and FPC would house approximately 1,216 inmates (approximately 960 within the USP and approximately 256 within the FPC). Operation of the USP and FPC would require approximately 300 full-time staff. On-site ancillary facilities necessary for the operation of the USP and FPC would include the following:

- Central Utility Plant (13,100 square ft [ft^2] [1,217 square m {m^2}])
- Training Center including an Outdoor Firing Range (1,033 ft^2 [96 m^2]) and Staff Training Building (9,795 ft^2 [910 m^2])
- Outside Warehouse (35,295 ft^2 [3,279 m^2])
- Garage/Landscape Building (7,028 ft^2 [653 m^2])
- Access Roads and Parking

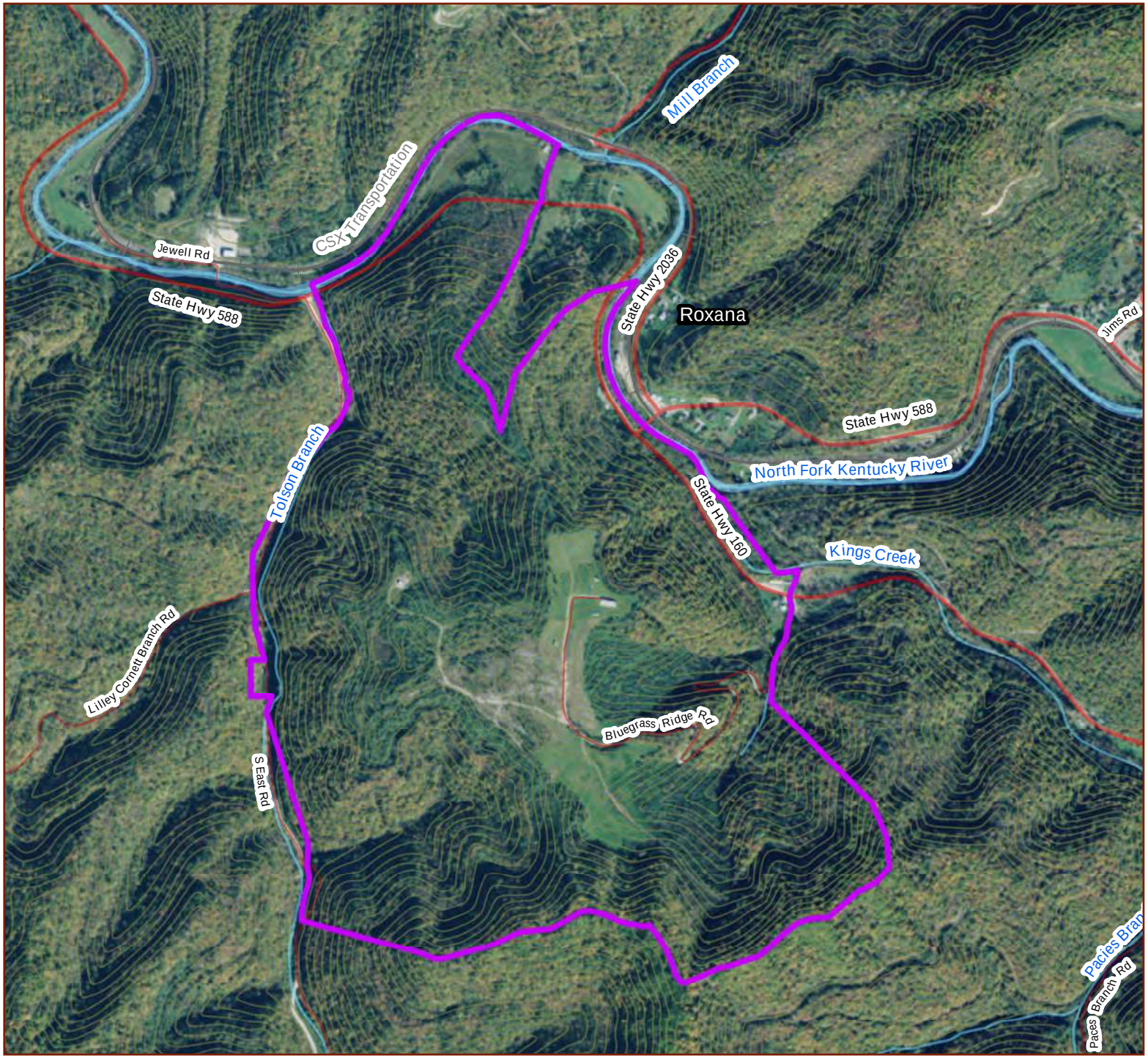
A non-lethal/lethal fence and lighting would also be installed. The non-lethal/lethal fence would be placed around the perimeter of the USP between two parallel, chain link and razor wire fences. The fence would be approximately 12 feet (ft) (3.6 meters [m]) high. The site lighting would consist of 100-ft (30-m) high-mast lighting poles placed along the security perimeter road around the correctional facility, in the parking lot, and around the buildings. The lighting would include hooded fixtures with a combination of high pressure sodium and metal halide lights or light-emitting diode (LED) lights to provide a minimum of 1.5 foot candles of illumination. The number and mix of light sources used to illuminate the secure compound are selected for the ability to relight the facility quickly in the event of a power outage.

2.1.1 CONSTRUCTION AND OPERATIONAL ACTIVITIES

The Bureau proposes to acquire approximately 570 acres (ac) (231 hectares [ha]) west of Roxana to construct a USP (approximately 15.2 ac [6.2 ha]) and FPC (approximately 1.5 ac [0.6 ha]). The 570-ac (231 ha) Project Area and conceptual site layout are presented in Figure 2-2. A forested buffer area would remain around the USP and FPC providing visual and physical setbacks from the site boundaries.

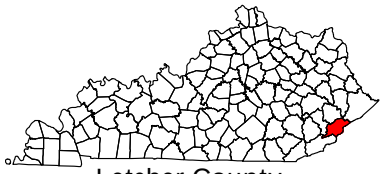
Preparation of the site for construction would require forest clearing and clearing a previously mined area, and extensive excavation of spoil material and lesser amounts of rock. All excavated mine spoil and rock would be used on-site for structural fill. The excavated soil and rock would be compacted to create a structural fill for the building foundations or transported to the valleys adjacent to the northwest of the proposed FPC location and southwest of the proposed USP location and compacted as structural fill. The total area required for clearing and grading is approximately 180.5 ac (73.1 ha) (Figure 2-3).

The outdoor firing range would be used by Bureau staff on an annual and monthly basis. Annual small arms training for employees, along with annual qualification/recertification for firearms instructors, would last 6 weeks during the months of March and April. Monthly firearms training for special operations response teams would last 1 day.



Biological Assessment

Figure 2-1. Roxana Site for the Proposed USP and FPC, Letcher County, KY



Letcher County, Kentucky

- Project Area
- Elevation Contours
- Railroad
- Rivers/Streams
- Roads

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or
1 inch = 1,250 ft

Coordinate System: NAD 1983 StatePlane Kentucky FIPS 1600 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983
Sources: ESRI 2009, USGS 2009, US Census 2015, KYTC 2015, Bureau 2017.
Date: 2/24/2017

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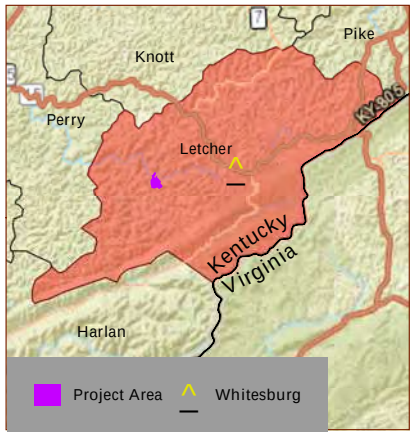
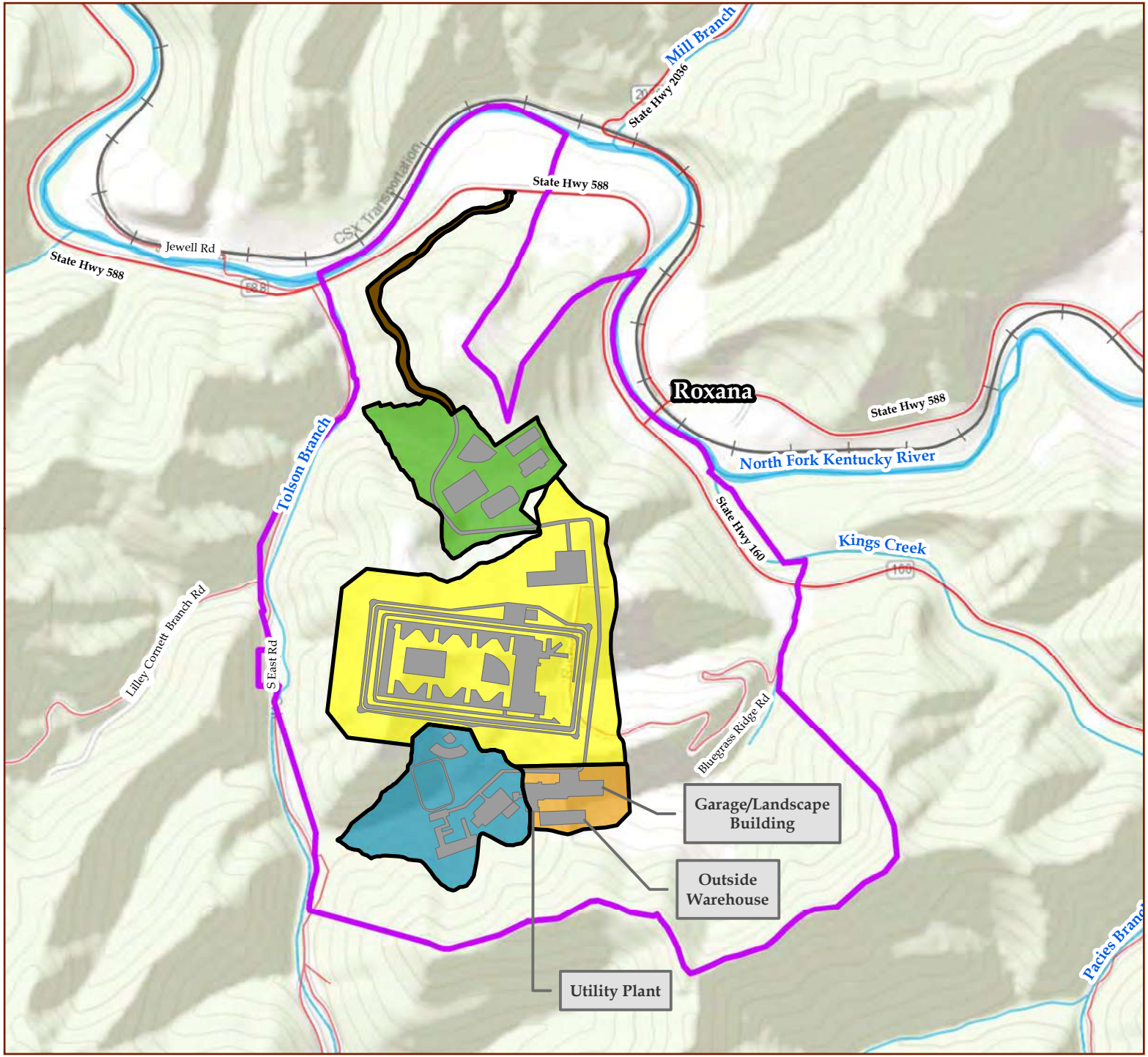


Biological Assessment

Figure 2-2. Conceptual Site Layout for the Proposed USP and FPC



Letcher County, Kentucky

Facilities and Infrastructure

- USP
- FPC
- Road
- Training Center/ Firing Range
- Central Utility Plant

- Project Area
- Roads
- Rivers/Streams

1:15,000
or
1 inch = 1,250 ft

N W E S

0 2,000 Ft

Coordinate System: NAD 1983 StatePlane Kentucky FIPS 1600 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983
Sources: ESRI 2017, USGS 2009, KYTC 2015, US Census 2015, Bureau 2017
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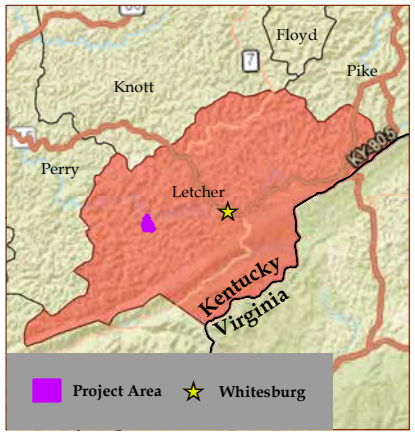
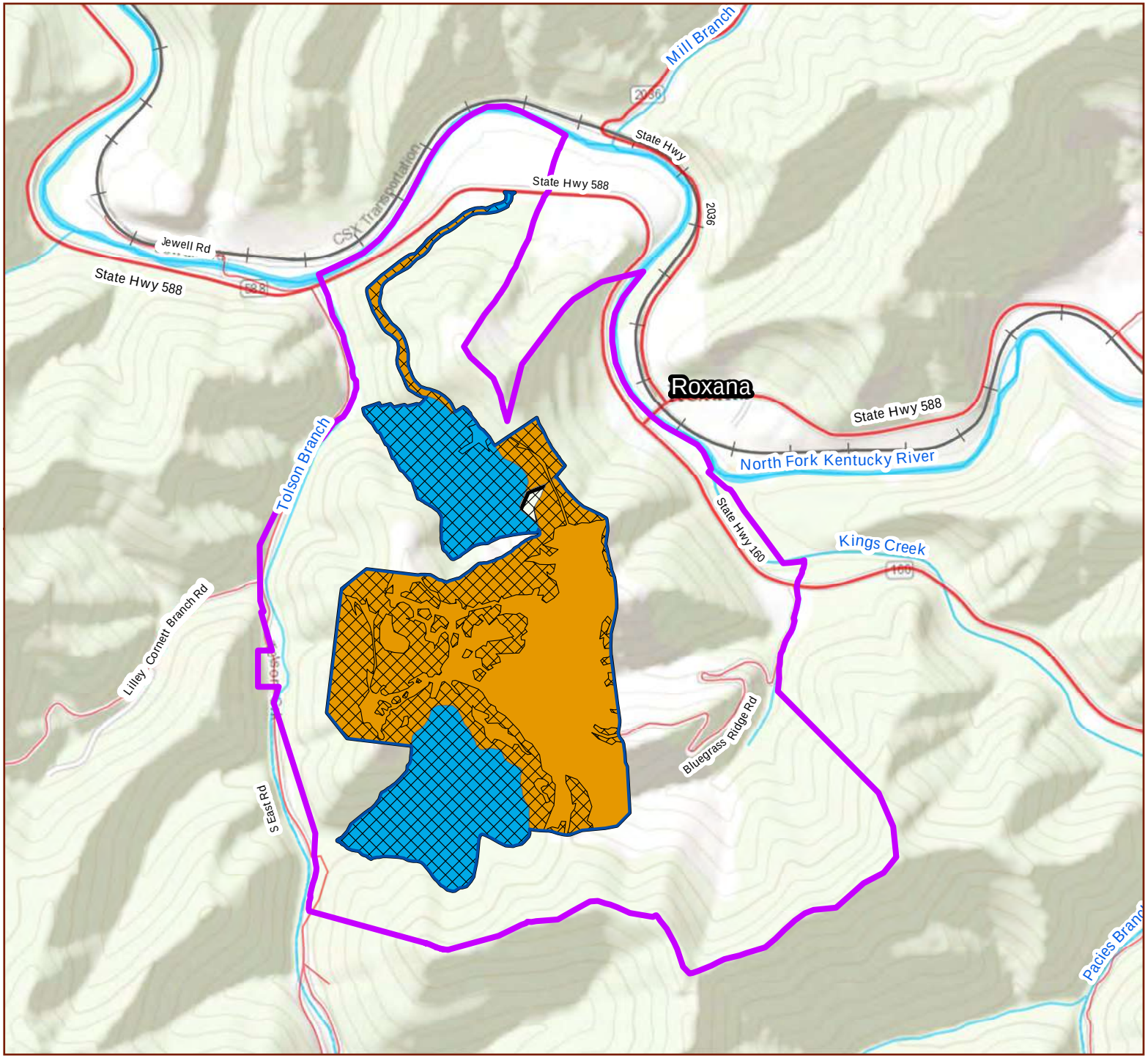




Biological Assessment

Figure 2-3. Proposed Ground Disturbance, Fill, Excavation, and Tree Clearing

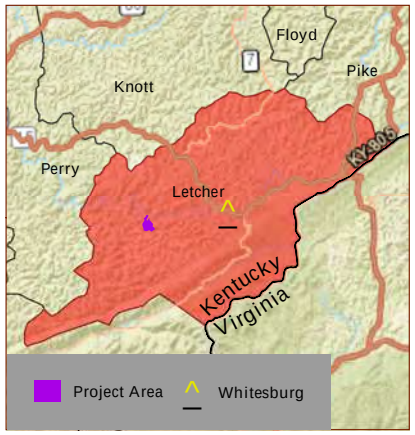
Letcher County, Kentucky

- Project Area
- Proposed Ground Disturbance and Clearing
- Proposed Tree Clearing
- Proposed Excavation Area
- Proposed Fill Area

1:15,000
or
1 inch = 1,250 ft

0 2,000 Ft

Coordinate System: NAD 1983 StatePlane Kentucky FIPS 1600 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983
Sources: ESRI 2017, USGS 2009, US Census 2015, KYTC 2015, Bureau 2017.
Date: 2/24/2017



2.1.2 PROJECT TIMELINE

The initial step for project development would be property acquisition. Property acquisition would involve acquisition of both surface and mineral rights from multiple owners, and would be estimated to take several months to a year or longer. Project construction would begin after property acquisition is completed, and would take 4-5 years. Once open, the facility would continue operation indefinitely.

2.1.3 INTERRELATED AND INTERDEPENDENT ACTIONS

No interrelated or interdependent actions are currently known concerning the Proposed Action.

2.2 PROPOSED CONSERVATION MEASURES TO AVOID, MINIMIZE, AND COMPENSATE FOR POTENTIAL EFFECTS TO ESA-LISTED SPECIES

Construction impacts to vegetation and wildlife would be minimized to the greatest extent possible. An open area with a direct line of site is required for the areas surrounding the USP and FPC. However, upon completion of construction, disturbed areas that are not developed would be revegetated and maintained as grassy lawn areas.

2.2.1 SOIL DISTURBANCE

The project would require a substantial amount of earth-moving that could potentially increase sediment runoff. The Bureau would prepare a soil erosion and sediment control plan and submit it to the Kentucky Division of Water for approval prior to construction. The erosion and sediment control plan would outline the measures and best management practices (BMPs) to be used for controlling on-site erosion and sedimentation during construction. BMPs could include placement of silt fencing adjacent to surface waters and wetlands to prevent the introduction of sediment; the use of hay bales to minimize the spread of sediment off the construction site; stabilization of steep slopes; use of tree clearing plans. In addition, construction period and permanent surface water and stormwater control plans would be implemented to manage stormwater runoff during construction. Additionally, construction of the USP, FPC, and ancillary facilities could be phased to occur at different times, resulting in the minimization of disturbed soil by clearing only the area necessary for the current phase of construction. Revegetation of disturbed areas following the completion of construction would also occur to minimize the erosion of exposed soil.

In addition to mitigation and conservation measures, the Bureau will obtain the required permits to meet regulatory requirements related to environmental impacts. Required permits include Clean Water Act section 401 and 404 permits; Kentucky Pollutant Discharge Elimination System permit; and an air quality permit.

2.2.2 TREE REMOVAL

Standing trees will not be removed during June and July of any year during construction. Following the guidance provided in the USFWS's 2016 Revised Conservation Strategy for Forest-Dwelling Bats in the Commonwealth of Kentucky, or appropriate succeeding document (USFWS 2016j), the Bureau will mitigate for impacts to summer habitat and potential take of listed bat species through payment into the Imperiled Bat Conservation Fund. Payment into the fund would be based on the acreage and time of year that forested habitat is removed (120.6 ac [48.8 ha]). The Imperiled Bat Conservation Fund would then provide the mitigation fees to the Kentucky Natural Lands Trust to support conservation and recovery actions for the species.

2.2.3 CONSTRUCTION BLASTING

The Proposed Action would require blasting within 0.5 mile (0.8 km) of one cave-like feature identified during the 2016 Habitat Assessment as potential ESA-listed bat winter habitat. In the absence of swarming surveys or an internal survey of the cave-like feature, listed bat species are assumed to be present within the feature during the winter. Likewise, winter presence of listed bat species is assumed for areas outside the Project Area surveyed during the habitat assessments (Copperhead 2016a, 2016b). In

order to avoid potential adverse effects to hibernating ESA-listed bats at potential hibernacula within 0.5 mile (0.8 km) of the Project Area, the Bureau will not conduct construction blasting from November 15 through March 31.

2.2.4 SITE LIGHTING

The Bureau would implement conservation measures to avoid and minimize potential effects of site lighting on the Indiana bat and NLEB during construction and operations. To maintain the character of the surrounding rural environment, hooded lights with reflectors would be used to completely conceal the light source above the rim of the fixture, which would result in maximum down-lighting effects. Illumination of forest will be kept to an absolute minimum. In addition, all outdoor construction activities would be conducted during daylight hours from April 15 through October 31 in known or suitable summer habitat to avoid harassment of foraging Indiana bats and NLEB.

3.0 EXISTING CONDITIONS OF THE ACTION AREA

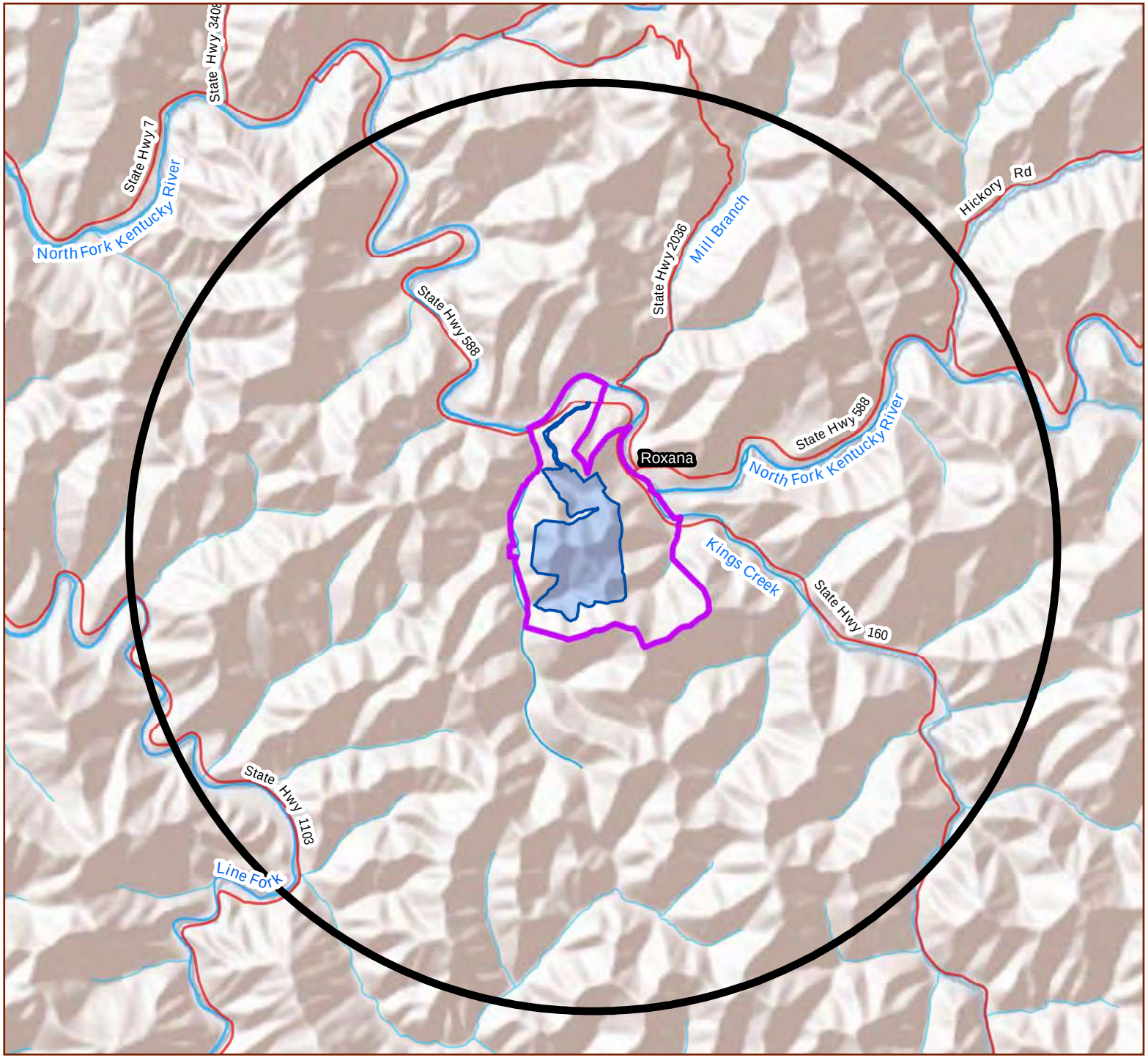
3.1 DETERMINATION OF THE ACTION AREA

Determination of the Action Area followed the Section 7 Consultation Handbook and through coordination with the Kentucky Field Office. The USFWS advises that "the Action Area is defined by measurable or detectable changes in land, air, and water, or to other measurable factors that may elicit a response in species or critical habitat" (USFWS 2015c). The Action Area includes "all areas that may be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action" (USFWS and National Marine Fisheries Service [NMFS] 1998).

The USFWS Kentucky Field Office recommends a habitat analysis buffer of 2.5 miles (4.0 km) and 1.5 miles (2.4 km) from a project's center to address potential impacts to Indiana bats and NLEB bats, respectively (Figure 3-1) (USFWS 2016g; 2016j). The buffers are used to compare amount of suitable bat habitat removed by projects with the amount of suitable bat habitat available in the area. For the purposes of the Proposed Action, the Action Area is that area 2.5 miles (4.0 km) from the center of the proposed facilities and includes potential direct and indirect impacts to ESA-listed species from vegetation removal, noise and vibration, potential changes in water quality, and lighting. The Action Area corresponds to the 2.5 mile buffer used for Indiana bat habitat analysis.

3.2 ECOREGION DESCRIPTION

The Action Area occurs in Dissected Appalachian Plateau of the Central Appalachian Ecoregion (Woods et al. 2002). The ecoregion is composed of narrow ridges and valleys, deep coves with cool, high gradient streams, and is mostly forested. The Central Appalachian Ecoregion is underlain by flat-lying Pennsylvanian shale, siltstone, sandstone, and coal. Surface and underground coal mining, logging, and both gas and oil production are common and have degraded surface waters. Nutrient levels in streams are very low and reflect the ecoregion's low population density, limited agriculture, and non-carbonate rocks.



Biological Assessment

Figure 3-1. Action Area for Proposed USP and FPC

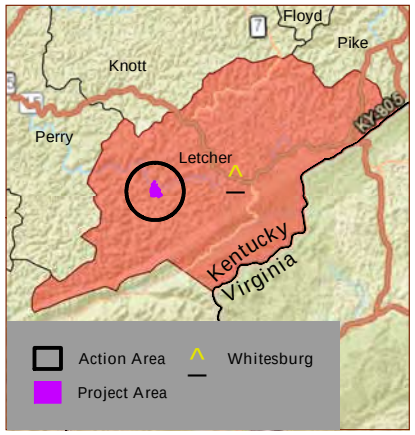
Letcher County, Kentucky

- Action Area
- Project Area
- Proposed Ground Disturbance and Clearing

1:48,000
or
1 inch = 4,000 ft

0 1 Miles

Coordinate System: NAD 1983 StatePlane Kentucky FIPS 1600 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983
Sources: ESRI 2017, USGS 2009, US Census 2015, KYTC 2015, Bureau 2017, Copperhead Consulting 2016.
Date: 2/24/2017



3.3 LAND USE

Based on the 2011 National Land Cover Database (NLCD) (Homer et al. 2015), 11 land cover types occur within the Action Area (Table 3-1 and Figure 3-2).

Table 3-1. NLCD Classes within the Action Area

Class\Value	Classification Description
WATER	
Open Water	Areas of open water, generally with less than 25% cover of vegetation or soil.
DEVELOPED	
Open Space	Areas with a mixture of some constructed materials, but mostly vegetation in the form of lawn grasses. Impervious surfaces account for less than 20% of total cover. These areas most commonly include large-lot single-family housing units, parks, golf courses, and vegetation planted in developed settings for recreation, erosion control, or aesthetic purposes.
Low Intensity	Areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 20–49% percent of total cover. These areas most commonly include single-family housing units.
Medium Intensity	Areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 50–79% of the total cover. These areas most commonly include single-family housing units.
BARREN	
Barren Land (Rock/Sand/Clay)	Areas of bedrock, desert pavement, scarps, talus, slides, volcanic material, glacial debris, sand dunes, strip mines, gravel pits, and other accumulations of earthen material. Generally, vegetation accounts for less than 15% of total cover.
FOREST	
Deciduous Forest	Areas dominated by trees generally greater than 5 m tall, and greater than 20% of total vegetation cover. More than 75% of the tree species shed foliage simultaneously in response to seasonal change.
Evergreen Forest	Areas dominated by trees generally greater than 5 m tall, and greater than 20% of total vegetation cover. More than 75% of the tree species maintain their leaves all year. Canopy is never without green foliage.
Mixed Forest	Areas dominated by trees generally greater than 5 m tall, and greater than 20% of total vegetation cover. Neither deciduous nor evergreen species are greater than 75% of total tree cover.
SHRUBLAND	
Shrub/Scrub	Areas dominated by shrubs; less than 5 m tall with shrub canopy typically greater than 20% of total vegetation. This class includes true shrubs, young trees in an early successional stage, or trees stunted from environmental conditions.
HERBACEOUS	
Herbaceous	Areas dominated by graminoid or herbaceous vegetation, generally greater than 80% of total vegetation. These areas are not subject to intensive management such as tilling, but can be utilized for grazing.
PLANTED/CULTIVATED	
Hay/Pasture	Areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops, typically on a perennial cycle. Hay/pasture vegetation accounts for greater than 20% of total vegetation.

Source: Multi-Resolution Land Characteristics Consortium 2016.

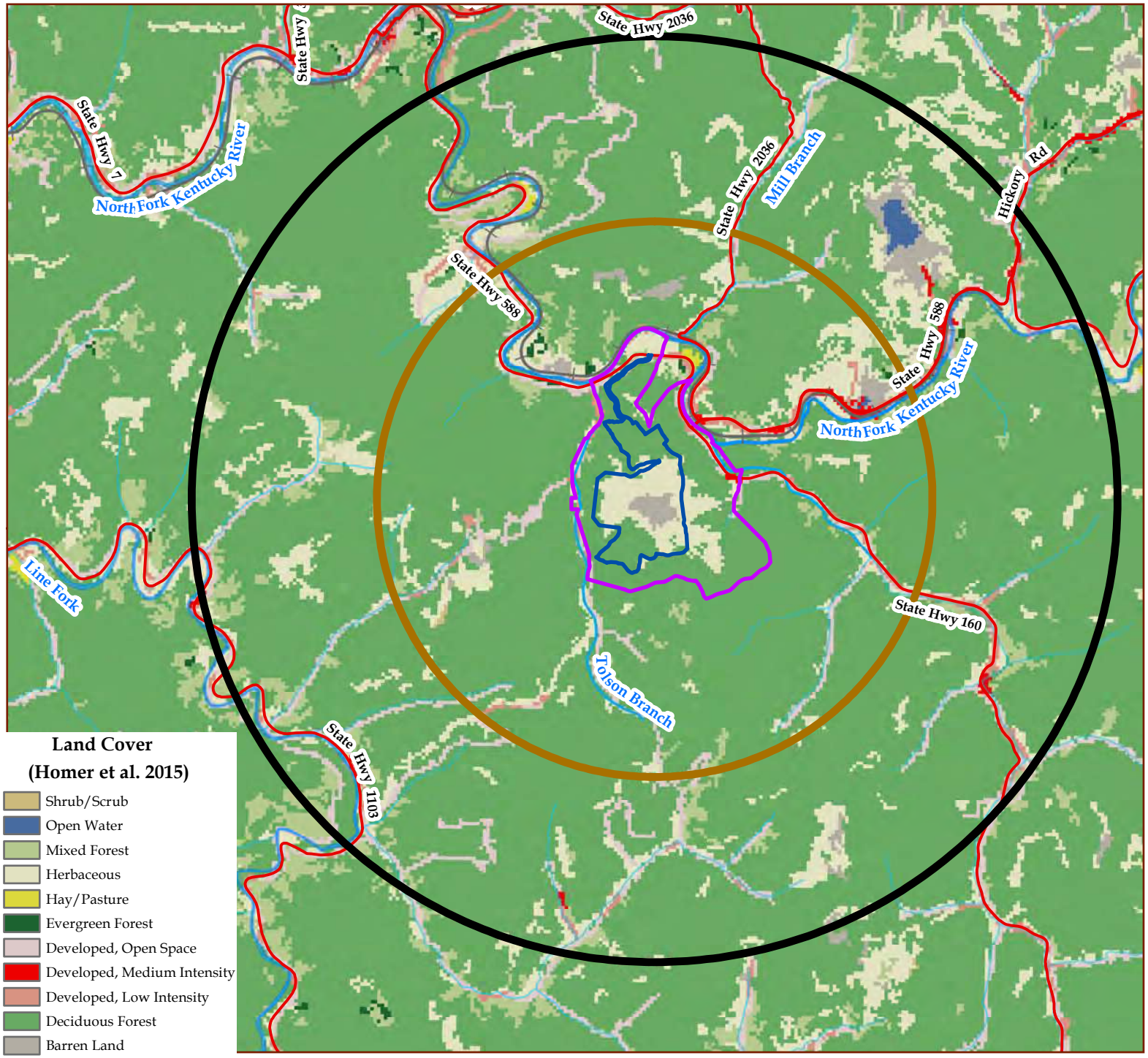
The 11 land cover types total 12,565 ac (5,085 ha) within the Action Area, with approximately 83% (10,460 ac [4,233 ha]) forested, primarily Deciduous Forest (80%) (Table 3-2 and Figure 3-2). Herbaceous areas total 9% (1,154 ac [467 ha]) and developed areas total 6% (775 ac [314 ha]).

Table 3-2. Acreage and Percent NLCD Classes within the Action Area

NLCD Class	Area (ac)	% of Action Area	Indiana Bat and NLEB Summer Habitat
Forest			
Deciduous Forest	10,020.3	79.7%	Yes
Mixed Forest	425.8	3.4%	Yes
Evergreen Forest	13.5	0.1%	Yes
Herbaceous	1,154.2	9.2%	No
Developed			
Open Space	553.5	4.4%	No
Low Intensity	180.2	1.4%	No
Medium Intensity	41.4	0.3%	No
Barren Land	140.6	1.1%	No
Open Water	24.0	0.2%	Yes
Hay/Pasture	9.3	0.1%	No
Shrub/Scrub	2.2	0.02%	No
Total	**12,565.0**		

Biological Assessment

Figure 3-2. Land Cover Types within the Action Area for the Proposed USP and FPC



Letcher County, Kentucky

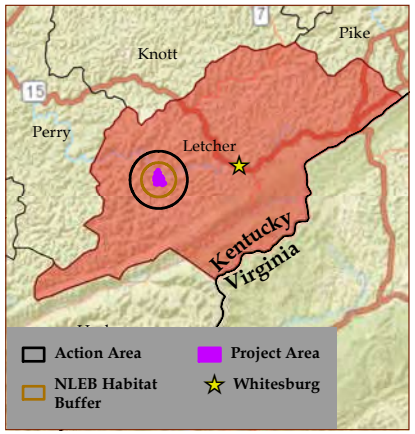
- Action Area
- NLEB Habitat Buffer
- Proposed Ground Disturbance and Clearing
- Project Area

1:48,000
or
1 inch = 4,000 ft

N W E S

0 1 Miles

Coordinate System: NAD 1983 StatePlane Kentucky FIPS 1600 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983
Sources: ESRI 2017, USGS 2009, US Census 2015, KYTC 2015, Homer et al. 2015, Bureau 2017
Date: 4/19/2017



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3.4 SUMMARY OF FINDINGS OF THE PROJECT AREA HABITAT ASSESSMENTS

Two habitat assessments were conducted within the Project Area focusing on habitat for ESA-listed bats. The first, finalized in March 2016 with field work conducted in December 2014, detailed habitat on 203.2 ac (82.2 ha) of the original Roxana site (Copperhead 2016a). The second habitat assessment, finalized in December 2016 with field effort in September 2016, detailed habitat on an additional 302 ac (122 ha) within the boundaries of the Roxana site after project planning changes were incorporated (Copperhead 2016b). The combined survey area (i.e., Project Area) is shown on Figure 3-3.

The habitat assessments involved initial desktop research followed by field surveys. Desktop analysis identified history of mining and probable presence of summer habitat for Indiana bats and NLEB. Desktop analysis data was used to focus field survey activities. No cave-forming geology was indicated through desktop analysis (Copperhead 2016a, 2016b).

The 2014/2016 habitat assessment identified 104.9 ac (42.5 ha) of potential suitable summer habitat for Indiana bats and NLEB and no potential winter habitat for ESA-listed bat species; no suitable habitat was found onsite for gray bats during any season (Copperhead 2016a).

The 2016 habitat assessment identified 251.5 ac (101.8 ha) of potential suitable Indiana bat and NLEB summer habitat and one underground feature that was considered potentially suitable for use as a hibernaculum by Indiana bats, NLEB, and gray bats. The feature was considered unlikely to be used by gray bats during summer as no signs of use, typical of gray bat summer sites, were present (Copperhead 2016b).

Of the combined areas surveyed during both bat habitat assessments (505.2 ac [204.4 ha]), a total of 356.4 ac (144.2 ha) were considered potential suitable Indiana bat and NLEB summer habitat within the Project Area. A total of 180.5 ac (73.1 ha) would be cleared and graded, of which 120.6 ac (48.8 ha) is forested (Copperhead 2016b). Potential suitable habitat for ESA-listed bat species is shown in Figure 3-3.

3.5 SUMMER BAT HABITAT WITHIN THE ACTION AREA

NLCD class descriptions were reviewed and four classes were deemed suitable as Indiana bat and NLEB summer habitat within the Action Area: Deciduous Forest, Mixed Forest, Evergreen Forest, and Open Water (Table 3-1). These were determined to comprise approximately 10,484 ac (4,243 ha) of potential Indiana bat and NLEB summer roosting and foraging habitat within the Action Area (Figure 3-4). While grasslands do contribute to the production of insect prey and may be used as foraging or commuting habitat for these species, potential project-related impacts to these habitats are considered to have an insignificant and/or discountable effect on ESA-listed bat species and are not included in the summer habitat acreage (Table 3-3).

Typical Indiana bat foraging range was used to determine the buffer (provided by USFWS) for the Action Area; however, NLEBs typically occupy a smaller area surrounding roosts. Per the direction of USFWS, habitat within a 1.5 mile (2.4 km) radius around the project center was used for the NLEB summer habitat analysis (USFWS 2016j). Total area within this buffer is 4,534.5 ac (1,835.1 ha), of which 81.5% is considered NLEB habitat (Table 3-3 and Figure 3-4).

Table 3-3. Area of Summer Habitat for ESA-listed Bats within the Roxana Site and Action Area

Area	NLEB (ac)	Indiana Bat (ac)	Gray Bat (ac)
Project Area	356.4 (72.4%)[a]	356.4 (72.4%)[a]	0
Action Area (2.5-mile radius Indiana bat habitat buffer)	10,483.6 (83.4%)[b]	10,483.6 (83.4%)[b]	71.5 (0.6%)[c]
NLEB 1.5-mile radius habitat buffer	3,696.3 (81.5%)[b]	3,696.3 (81.5%)[b]	0

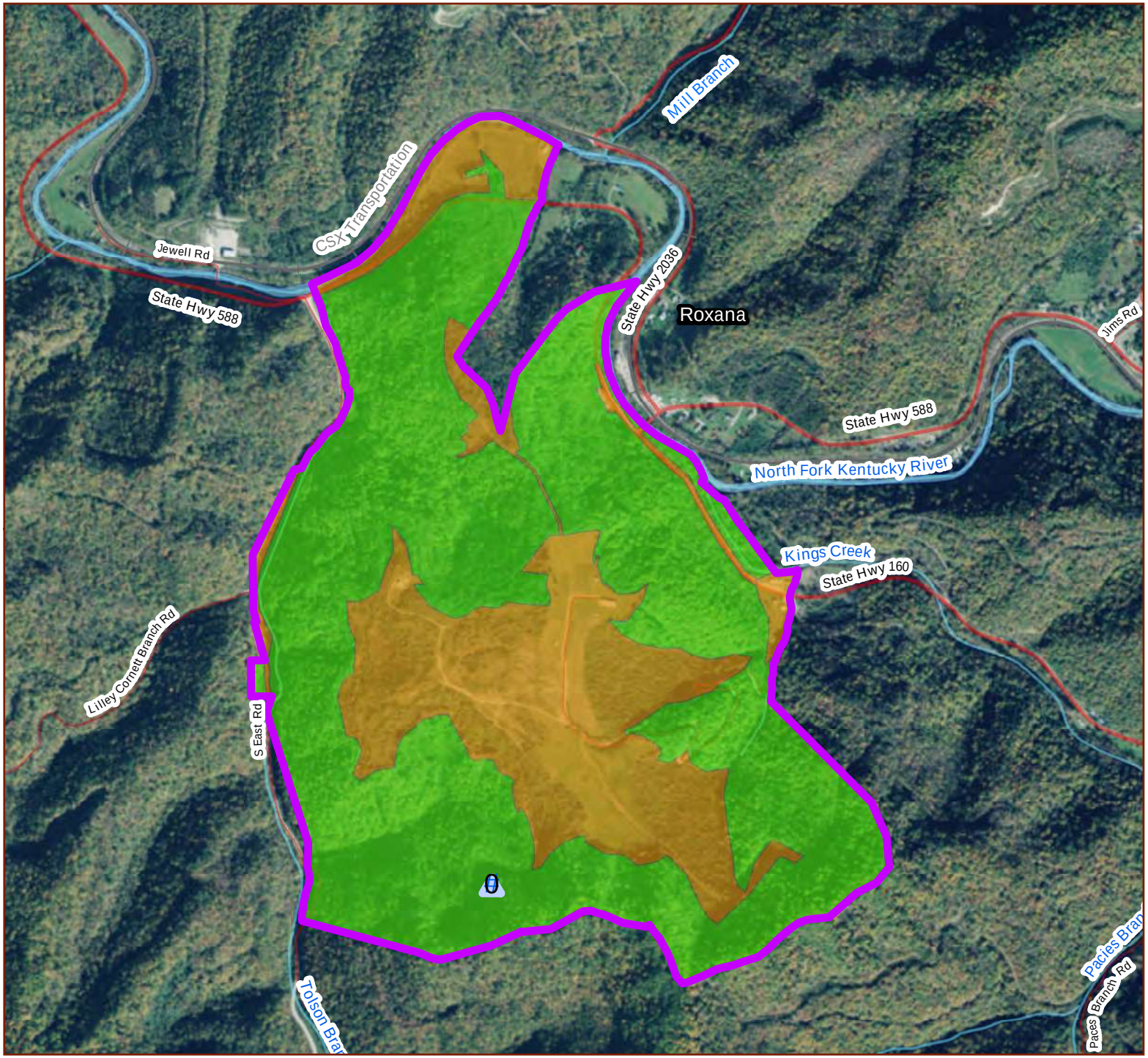
Notes: [a]Suitable habitat within the Roxana Site determined via field surveys.
[b]Suitable habitat determined via NLCD.
[c]Suitable habitat determined via U.S. Geological Survey National Hydrography Dataset and NLCD.

Gray bat summer habitat in the Action Area was assumed to be the North Fork of the Kentucky River and its major drainages. The U.S. Geological Survey (USGS) National Hydrography Dataset polygons for major drainages (USGS 2016) were used to determine large stream areas. In addition, areas of streams greater than third order were delineated to determine area for smaller streams that were still considered possible gray bat summer habitat (Figure 3-4). Gray bat habitat comprised 0.6 % (71.5 ac [28.9 ha]) of the Action Area. While upland forested habitats contribute to the generation of potential gray bat prey and individuals will commute across and opportunistically forage in these habitats, impacts from the Proposed Action to upland forested sites are considered to have an insignificant and discountable effect to the species and are not included in habitat acreage for the species (Figure 3-4).

3.6 WINTER BAT HABITAT WITHIN THE PROJECT AREA AND ACTION AREA

One underground feature within the Project Area is considered potential winter habitat for NLEB, Indiana bats, and gray bats. In the absence of a fall/spring trapping or winter survey to determine use of the underground feature, it is assumed to be winter habitat for ESA-listed bats. The feature is 217.7 ft (66.4 m) south of the proposed construction and tree clearing limits for the Proposed Action (Figure 3-3).

Habitat assessment field efforts were conducted only on properties where access permission was provided (the Project Area). For that reason, all habitat within the Action Area, excluding the Project Area, is assumed to have potential winter habitat (hibernacula) for ESA-listed bat species. However, the number and locations of any potential hibernacula is unknown.



Biological Assessment

Figure 3-3. Delineated Potential Suitable Habitat for ESA-listed Bats within the Project Area

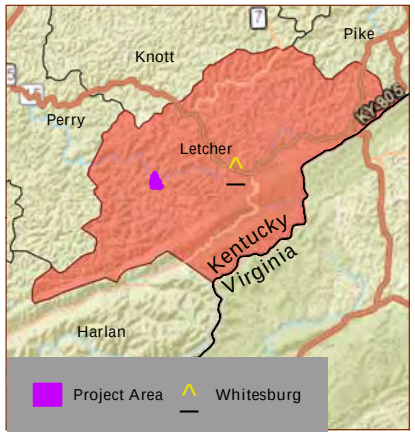
Letcher County, Kentucky

- Project Area
- Potential Indiana Bat and NLEB Roosting and Foraging Habitat
- Grassland/Scrub Habitat on Mine Spoil
- Potential Suitable ESA-listed Bat Hibernaculum
- Railroad
- Roads
- Rivers/Streams

1:15,000
or
1 inch = 1,250 ft

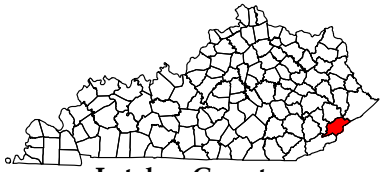
Coordinate System: NAD 1983 StatePlane Kentucky FIPS 1600 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983
Sources: ESRI 2009/2017., USGS 2009, US Census 2015, KYTC 2015, Bureau 2017, Copperhead Consulting 2016.
Date: 2/24/2017

0 2,000 Ft



Biological Assessment

Figure 3-4. Potential Summer Habitat for ESA-listed Bats within the Action Area



Letcher County, Kentucky

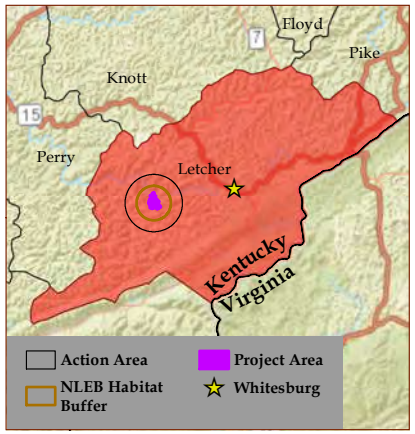
- Action Area
- NLEB Habitat Buffer
- Project Area
- Proposed Ground Disturbance and Clearing
- Gray Bat Summer Habitat (USGS-NHD 2009)
- Indiana Bat and NLEB Summer Habitat (Homer et. al. 2015)

N
W E
S

1:45,000
or
1 inch = 3,750 ft

0 1 Miles

Coordinate System: NAD 1983 StatePlane Kentucky FIPS 1600 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983
Sources: ESRI 2016, USGS 2009, Us Census 2015, Homer et. al. 2015, Bureau 2017, Copperhead Consulting 2016
Date: 4/19/2017



State Hwy 7
State Hwy 3
North Fork Kentucky River
State Hwy 588
State Hwy 2036
Hickory Rd
Roxana
State Hwy 588
North Fork Kentucky River
Kings Creek
State Hwy 160
Tolson Branch
Line Fork
State Hwy 1103

4.0 DESCRIPTION OF ESA-LISTED SPECIES THAT MAY BE AFFECTED BY THE PROPOSED ACTION

4.1 NORTHERN LONG-EARED BAT (*MYOTIS SEPTENTRIONALIS*)

4.1.1 SPECIES DESCRIPTION

The NLEB is a medium-sized bat that utilizes a wide variety of forested habitats for roosting and foraging during the summer throughout the eastern U.S. The species uses hawking and gleaning techniques to forage on a diversity of insect prey often under the canopy (USFWS 2015a).

4.1.2 LISTING STATUS

The NLEB was listed as threatened under the ESA with an interim 4(d) Rule in May 2015; the Final 4(d) Rule was issued in January 2016 (USFWS 2015a, 2016a). The Final 4(d) Rule prohibits purposeful take of NLEB throughout the species' range, except in instances of removal of NLEB from human structures, defense of human life (including public health monitoring), and removal of hazardous trees for protection of human life and property. The 4(d) Rule restricts clearing of potential roost trees within 0.25 mile (0.4 km) of a known hibernaculum, removal of known occupied maternity roost trees, or removal of other trees within a 150-ft (45.7-m) radius of a known occupied maternity roost tree during the maternity season (June 1 – July 31). Incidental take resulting from otherwise lawful activities is prohibited in areas not yet affected by white-nose syndrome (WNS). WNS is a fungal disease affecting many hibernating U.S. bat species. The Action Area occurs within the WNS zone (USFWS 2016d). A recovery plan has not yet been prepared for the NLEB.

4.1.3 THREATS

WNS is the most significant contributor to the population decline of NLEB and the primary reason the species was federally listed as threatened (USFWS 2015a). WNS is caused by a fungus (*Pseudogymnoascus destructans*) that lives in cold environments such as the caves and mines where bats hibernate. WNS was first documented in New York in 2007 and has since spread to 32 states and 5 Canadian provinces (White-nose Syndrome.org 2016). WNS has caused severe declines in bat populations in eastern North America (Blehert et al. 2009; Turner et al. 2011). Francl et al. (2012) found that NLEB were the dominate species captured (41%) in West Virginia before the arrival of WNS, but the capture rates of NLEB in West Virginia declined by approximately 23% after the arrival of WNS. By 2010, NLEB were the third most abundant species captured (24% of captures). Turner et al. (2011) documented a 98% decline in NLEB across 42 hibernation sites in New York, Pennsylvania, Vermont, Virginia, and West Virginia.

Artificial lighting can have adverse effects on bat activity and behavior. Although lights often attract flying insects and therefore bats that prey on those insects, there is variation of the effect of artificial lighting among species. Stone et al. (2012) found that the activity of *Myotis* species significantly decreased in areas receiving artificial light. Stone et al. (2009) also found that lit areas delayed the emergence of the lesser horseshoe bat (*Rhinolophus hipposideros*). Typically, bats emerge at or near dusk in conjunction with prey availability (Jones and Rydell 1994). A delay in emergence due to the presence of artificial light may cause bats to miss the peak abundance of their insect prey, potentially causing reduced foraging effectiveness and longer commutes. Longer travel distances can have a negative impact on growth rates and mass of juvenile bats (Tuttle 1976).

Vibrations caused by blasting for construction, quarrying, or mining have the potential to adversely impact hibernating bats. Vibrations are greatest along the ground surface and have been found to be 2.0 to 7.8 times greater than underground levels (Vibra-Tech Engineers 2001; West Virginia Department of Environmental Protection [WVDEP] 2006). Studies have documented an increase in Indiana bat and Virginia big-eared bat (*Corynorhinus townsendii virginianus*) populations subjected to vibrations associated with blasting suggesting these populations can tolerate vibrations of 0.06 to 0.20 inches

(in)/second (sec) (1.52 to 5.08 millimeters [mm]/sec) without negative effects (Besha 1984; WVDEP 2006). Vibra-Tech Engineers (2001) found peak particle velocities in a cave closest to blasting to range from 0.05 to 0.18 in/sec (1.27 to 4.57 mm/sec) and described the noise level in the cave to be comparable to far-off thunder. Vibration has the potential to arouse bats from hibernation, cause abandonment of hibernacula or in extreme cases, cause collapse within hibernacula (WVDEP 2006). Disturbance or modification of normal torpor patterns, abandonment of roosts, and felling of roosts during spring, summer, and fall are also a concern.

Additional threats to NLEB include deforestation, wind energy, and climate change. These threats likely have a cumulative effect on the NLEB population, but not to the extent of WNS. Deforestation is thought to be of minor concern for NLEB as they appear to be resilient to forest conversion. Reviews of studies involving 62 wind energy facilities found NLEB mortalities to occur at 29% of the facilities and comprise less than 1% of all bat mortalities (USFWS 2015b). Climate change may also influence the range of some bat species due to food availability, timing of hibernation, reproduction, frequency and duration of torpor, and rate of energy expenditure (Loeb and Winters 2013; Sherwin 2013).

4.1.4 ECOLOGY

4.1.4.1 Winter Habitat

To date, relatively little is known about NLEB hibernation. Although NLEB do occur in caves during winter, they are rarely found in high numbers. There are approximately 1,508 known hibernacula across the NLEB's U.S. range, which include caves and abandoned or active mines (USFWS 2015b). Length of hibernation for bats in the genus *Myotis* varies with latitude and environmental factors, but can occur from September to May (Fenton 1969; Caire et al. 1979; Whitaker and Rissler 1992a, 1992b; Nagorsen and Brigham 1993). Bats select hibernacula based on physical structure, air circulation, temperature profile (constant, cool temperatures 32–48 degrees Fahrenheit [^{o}F] (0–9 degrees Celsius [^{o}C], and high humidity), and distance to foraging sites (Tuttle and Stevenson 1978; USFWS 2015a).

NLEB are often found hibernating individually or in small groups deep in crevices in hibernacula. This habit likely contributes to the difficulty in their detection during winter census (USFWS 2015a). Whitaker and Rissler (1992a) documented a large number of NLEB entering a cave in Indiana and subsequently found it difficult to find them in the cracks of the cave. Furthermore, these bats may remain active throughout the winter and move between hibernacula (Whitaker and Rissler 1992a), which compounds difficulties associated with estimating populations.

4.1.4.2 Summer Habitat

NLEB utilize a wide variety of forested habitats during the summer for foraging, roosting, and commuting. During the summer, NLEB roost in a wide variety of tree species, heights, and diameters. Lacki et al. (2009) found the NLEB roost heights to be 11.8–34.8 ft (3.6–10.6 m). Studies indicate roost trees typically have a diameter at breast height (DBH) between 4 and 10 in (10 and 25 centimeters [cm]). Maternity colonies usually occur in live or dead trees greater than 3 in (7.6 cm) DBH under sloughing bark, in crevices, or in cavities (USFWS 2015a), although there is some use of artificial roosts (e.g., BrandenBarkTM, Steve Samoray, Copperhead, pers. obs., 2013), and bat boxes and anthropogenic structures (e.g., shutters) (Broders and Forbes 2004; Henderson and Broders 2008). Maternity colonies are generally small but vary in size from 30 to 60 individuals (USFWS 2015a).

4.1.4.3 Foraging and Diet

NLEB are acrobatic fliers and can fly and forage in dense or loose aggregates of trees with variable amounts of canopy closure. NLEB diet includes moths, flies, leafhoppers, caddisflies, and beetles. Additionally, the presence of spiders, non-flying insects and leaf material in gut contents suggests some gleaning strategy is also employed (USFWS 2015a). While the species relies on forested habitats for

foraging and roosting it will occasionally use riparian areas (Caceres and Pybus 1997; Brack and Whitaker 2001; USFWS 2015a).

4.1.4.4 Migration

Little is known about NLEB migration in part because band identification for hibernating individuals can be difficult due to the species habit of hibernating in crevices. Migration timing is likely similar to that of Indiana bats with spring migration occurring between mid-March to mid-May and fall migration occurring between mid-August and mid-October (USFWS 2015e). Migration distances of NLEB tend to be shorter than their congeners, ranging from 56 to 88.5 miles (90 to 142 km) (Griffin 1945; Nagorsen and Brigham 1993).

4.1.5 Historical and Current Distribution

The range of the NLEB includes the eastern, southern, and north-central U.S. and all Canadian provinces west to the southern Yukon Territory and eastern British Columbia. In the U.S., the species can be found in the District of Columbia and 37 states ranging from Maine west to Montana, south to eastern Kansas, eastern Oklahoma, Arkansas, and east to South Carolina (USFWS 2015a). Historically, NLEB were most common in the eastern parts of its range and have been rarely captured in the western parts of its range (Caceres and Barclay 2000). However, NLEB populations in the east have greatly diminished with the arrival of WNS and it is now estimated that the eastern range only supports 17% of the population (USFWS 2015a).

4.1.6 Status of Species within the Action Area

USFWS identified seven records of NLEB within 3.4 miles (5.5 km) from the estimated center of the project footprint. Four maternity records range from approximately 0.4 to 2.8 miles (0.6 to 4.5 km), one non-maternity record at 3.4 miles (5.5 km), and two non-specified records at 2.5 and 2.8 miles (4.0 and 4.5 km) (USFWS 2016f).

4.1.7 Critical Habitat

Critical habitat has not been designated for the NLEB (USFWS 2016b).

4.2 Indiana Bat (*Myotis sodalis*)

4.2.1 Species Description

The Indiana bat is a medium-sized migratory bat that hibernates in caves and mines during the winter and migrates to summer habitat. Indiana bats utilize a variety of habitats during the summer for roosting, commuting, and foraging. Moths are the predominate prey taken by Indiana bats but they will forage on a diversity of other insects (USFWS 2007).

4.2.2 Listing Status

The Indiana bat was originally listed as an endangered species in March 1967 under the Endangered Species Preservation Act of 1966, and is currently listed as endangered under the ESA of 1973, as amended (USFWS 2007). The Indiana bat has been assigned a Recovery Priority of 8, indicating that the species has a moderate degree of threat and high recovery potential (USFWS 2007).

The USFWS, in cooperation with the Indiana Bat Recovery Team, prepared the Indiana Bat Recovery Plan in 1976, followed by a revised document in 1983. The plan has since undergone additional revisions: one in 1996 and another in 2007 (USFWS 2007).

4.2.3 Threats

Prior to the emergence of WNS in the U.S., habitat loss/degradation of both summer and winter habitat was considered the major threat to Indiana bats. Cave modifications, physical disturbance of hibernating bats, and overutilization of hibernacula for recreation often have negative effects on cave dwelling bats

(USFWS 2007). Modifications to a cave's micro-climate caused by entrance closures can potentially lead to catastrophic declines to the bat population (Richter et al. 1993). "Bat friendly" gates offer closure with negligible changes to micro-climate and in many cases, has resulted in a complete recovery of the bat population within an individual hibernaculum (Johnson et al. 2002). However, there are instances where cave gates have had adverse impacts causing collisions due to flyway restriction. Commercialization of caves, recreational caving, and vandalism are the most common forms of human disturbance to hibernating bats (USFWS 2007). Disturbance causes bats to arouse from hibernation, which is metabolically expensive (Thomas et al. 1990) and can cause mortality or decreased fitness when bats emerge in the spring (USFWS 2007).

Summer habitat loss/degradation potentially impacts maternity colonies. Reduction in numbers of suitable roosting trees can negatively impact reproductive success and, subsequently, population levels. Stress, fewer suitable roosts, reduced ability to thermoregulate via clustering, or reduced ability to communicate likely contribute to reduced reproductive success when roost trees are lost (Brigham and Fenton 1986; Willis and Brigham 2004). However, degree with which a colony is impacted varies on the scale of roost loss. The loss of a primary maternity roost tree can fragment a colony, potentially damaging the social structure of the colony, while the loss of an alternate roost likely has little impact on Indiana bats (Kurta 2005; USFWS 2007).

WNS has greatly impacted Indiana bat populations like many other North American bat species. Turner et al. (2011) documented a 72% decline in Indiana bat populations across 42 sites from five states (New York, Pennsylvania, Vermont, Virginia, and West Virginia). Francl et al. (2012) found the capture rate of Indiana bats in West Virginia to decline by 10.8% after the arrival of WNS. As discussed in Section 4.1.3, artificial lighting can cause avoidance of foraging areas in many species and has the potential to delay emergence and increase commuting distances to foraging areas. Sparks et al. (2005) found Indiana bats foraged very little over open water, potentially in response to the amount of light around the ponds. Although intrusive use of artificial light in hibernacula is known to disturb hibernating Indiana bats, Johnson et al. (1998) found that incidental artificial light created as part of normal human activities near the cave did not appear to greatly disturb Indiana bats overwintering at Wyandotte Cave in Indiana.

As discussed in Section 4.1.3, potential effects of vibration to Indiana bats include abandonment or collapse of hibernacula, disturbance to hibernation or torpor, and abandonment or felling of roosts.

Additional threats to Indiana bats include climate change and wind energy. Climate change may influence the range of some bat species including Indiana bats. Loeb and Winters (2013) predict that the western maternity range of Indiana bats will become climatically unsuitable and the northeastern U.S. and Appalachian Mountains will serve as a refuge. Although bats in the genus *Lasiurus* are the most commonly killed species at wind energy facilities, there are five known Indiana bat fatalities across four states (USFWS 2013). Four of the five individuals were killed during fall migration suggesting that migration is the time when Indiana bats are at the greatest risk for wind turbine collisions.

4.2.4 ECOLOGY

4.2.4.1 Winter Habitat

As of October 2006, the USFWS reported records of extant winter populations of Indiana bats at approximately 281 hibernacula in 19 states (USFWS 2007). The 2015 winter census estimate of the range wide population was 523,636 individuals (USFWS 2015f). Indiana bats hibernate in large numbers in a few caves that provide the adequate microclimate. Eleven caves and two mines across six states were designated as critical habitat in 1976 (USFWS 2007). The most successful hibernacula have temperatures between 37.4–45 °F (3.0–7.2 °C) and have a chimney-effect air flow between at least two entrances (Tuttle and Kennedy 2002). Brack (2007) suggests that hibernacula temperatures below 41 °F (5 °C) are too cold. Humidity could be an important hibernaculum characteristic (UFSW 2007), but Tuttle and Kennedy (2002) document that humidity is not as important as temperature. Indiana bats typically form

large dense clusters on cave ceilings but will also congregate in small clusters (USFWS 2007). Hibernation occurs from October to late April/early May (USFWS 2007).

4.2.4.2 Summer Habitat

Indiana bats roost in a variety of habitats including riparian zones, bottomland and floodplain habitats, wooded wetlands, and upland communities (USFWS 2007). Carter et al. (2002) found that roosting areas contained more patches of water (e.g., ponds, lakes) than randomly chosen sites. In general, sources of drinking water tend to be well within foraging range of resident bats, making the energy expenditures required to fly to such sites insignificant. As such, resident bats probably consider the relative amount of available water sources across the landscape in their choice of home range rather than day-to-day roost locations (USFWS 2007).

The USFWS reported 269 maternity colonies in 16 states as of 2006. Roosts are typically located within canopy gaps, in a fence line, or along wooded edges (USFWS 2007). Most known maternity roosts have been located in or near wooded areas where some light gap is present, allowing full or partial solar exposure to the roost site. In Illinois, Carter et al. (2002) documented habitat surrounding roost trees differed from random plots by containing fewer and smaller patches of urban development as well as more and larger patches of closed-canopy deciduous forest. In addition, roosts typically occurred in highly fragmented forests and roosting areas contained more patches of bottomland forest and agriculture. Range wide, Indiana bats have been found to roost in over 33 species of trees (Kurta 2005). While Indiana bats probably utilize tree species according to their availability, roost choice is probably more a reflection of roost character (i.e., condition, usable bark, amount of solar exposure, tree size, distance to water resources, elevation) than species (Humphrey et al. 1977; Gardner et al. 1991a; Callahan et al. 1997; USFWS 2007). Roosting typically occurs under the exfoliating bark of dead or live trees, but Indiana bats have also been found to use cavities or crevices of live-damaged trees (USFWS 2007) and artificial roost structures (e.g., BrandenBark™) (Gumbert et al. 2013). There is some evidence that suggests Indiana bats exhibit fidelity to summer roosting areas and even specific trees from year to year (Gumbert et al. 2002).

4.2.4.3 Foraging and Diet

Foraging home ranges of Indiana bats vary by habitat, sex, region, and time of year. Kurta (1995) found that the home ranges of pregnant females during summer encompassed 128 ac (52 ha) of foraging habitat. Following birth of young, the ranges increased to 232 ac (94 ha). More recent surveys by Butchkoski and Hassinger (2002) indicate that females use a minimum of 49 to 96 ac (20 to 39 ha) for foraging during summer. Documented foraging range for the species varies greatly by population. Gardner et al. (1991a) reported foraging range in Illinois to be 40 ac (16 ha), while Rommé et al. (2002) reported a foraging range of 151 ac (61 ha) in Missouri.

Although additional studies are needed to determine the preferred foraging habitat for Indiana bats, foraging is apparently concentrated in wooded areas (Butchkoski and Hassinger 2002). LaVal et al. (1976, 1977) found that during summer, females and juveniles forage within or near the tree foliage of riparian and floodplain areas, but adult males typically forage over densely wooded areas along ridges and hillside forests (Kiser and Elliott 1996). A study in Indiana determined that Indiana bats preferred to forage within upper forest canopy layers where overstory canopy cover ranged from 50 to 70% (Rommé et al. 1995). Indiana bats typically forage or commute to foraging areas at a height of 6.5 to 98.4 ft (2 to 30 m) (Humphrey et al. 1977). This species also forages over clearings with early successional habitat, such as clearcuts, and along the edges of forest openings (Gardner et al. 1991b).

The Indiana bat is an insectivorous species, consuming a variety of small, soft-bodied flying insects. Food sources are predominately moths, but also include beetles, flies, caddisflies, and stoneflies (LaVal and LaVal 1980; Thomson 1982). Where Indiana bats forage is likely dependent on a number of factors including terrain, weather, densities of competitors and prey, and the location and juxtaposition of available resources. While they are known to establish and exhibit fidelity to feeding areas, Indiana bats

probably feed opportunistically as they transition to and from these areas. This, coupled with the fact that these bats are highly mobile fliers often traveling as far as 3 miles (5 km) over a given night, suggests that they likely utilize a number of habitat types during their nightly movements.

4.2.4.4 Spring Migration

Evidence suggests that male Indiana bats are less migratory in nature and have been shown to remain much closer to their hibernacula during the summer months (USFWS 2007). By comparison, using band recoveries, females have been documented to travel 323 to 357 miles (520 to 575 km) (Kurta and Murray 2002; Winhold and Kurta 2006). Indiana bats generally emerge from hibernacula in late March to early April and might immediately start migration or remain in the general vicinity of the hibernaculum for several days (USFWS 2007). Some individuals have been documented at maternity trees as early as April 9th (Copperhead unpublished data). Recent migration studies on Indiana bats have begun to shed light on movement between hibernacula and summer habitat (USFWS 2007; Hawkins and Gumbert 2009; Copperhead unpublished data). Movements from winter to summer habitat appear to happen quickly; for example, one female released in New York flew 35 miles (56 km) in approximately 85 minutes (Sanders and Chenger 2001). Indiana bats migrating from a cave in Tennessee generally traveled north, but one bat flew 162 miles (261 km) southwest over a three-night period (Copperhead unpublished data). Bats that have been tracked over multiple nights during spring migration appeared to migrate in the same general direction in which they began from the hibernaculum (i.e., initial azimuths flown upon emergence were maintained), although some minor directional changes have been documented. Nevertheless, Indiana bats appear to typically leave hibernacula and migrate directly to summer habitat, greatly reducing the overall time bats are migrating across the landscape (Copperhead unpublished data).

During spring migration, Indiana bats appear to navigate by using natural landscape features and are most likely flying near the top of the forest canopy in order to take advantage of these navigational features. Migrating bats have been shown to use streams, rivers, lakes, mountain ridges, as well as take advantage of natural gaps in mountain ranges (Sanders and Chenger 2001; Butchkoski 2004; Copperhead unpublished data). In addition, manmade structures such as highways and powerline corridors are likely used to aide in navigation (Sanders and Chenger 2001; Butchkoski 2004). One female Indiana bat radio-tracked during spring migration was documented changing direction abruptly to fly through a gap in a mountain ridge (Copperhead unpublished data). Sanders and Chenger (2001) also documented an Indiana bat using a powerline corridor to cross a mountain ridge during spring migration.

The use of roosts during spring migration is temporary in nature (as bats move on to their maternity grounds) and is probably limited to the provision of shelter and protection from predators. Research documenting the habitat preferences of specific roost trees used during migration is limited, but roost choice probably reflects local forest community composition. Because bats are yet to be saddled with the care of offspring, migrating Indiana bats may be less choosy of roosts along migratory routes.

4.2.4.5 Fall Migration

In late summer/early fall, maternity colonies begin to break up and disperse (USFWS 2007). Evidence suggests that specific fall migratory routes may exist. For example, two female Indiana bats were killed at the Fowler Ridge wind facility in Indiana during consecutive fall migration seasons (USFWS 2013) suggesting that the facility may be in the direct path of a specific fall migration route for Indiana bats. In addition, the facility is located in extensive agriculture with large expanses of open habitat, suggesting that Indiana bats may use something other than natural landscape features to navigate and are flying at higher altitudes than during spring migration.

Roby and Gumbert (2016) found two female Indiana bats that migrated to their hibernacula 123 and 127 miles (198 and 204 km) in a single night. Both bats traveled rather straight vectors to their hibernacula and appeared to avoid heavily lighted areas. These bats traveled faster than bats in the spring and did not

appear to forage during their migration like bats migrating in the spring. This indicates that migration behavior varies between spring and fall.

4.2.5 HISTORICAL AND CURRENT DISTRIBUTION

The range of Indiana bat includes the eastern, midwestern, and southern parts of the U.S. There are historical records (summer or winter) of Indiana bat in 25 states ranging from New York west to eastern Oklahoma and south to Florida (USFWS 2007). As of 2015, the range of the Indiana bat includes 22 states from New York west to eastern Oklahoma and south to Alabama (USFWS 2015d).

4.2.6 STATUS OF SPECIES WITHIN THE ACTION AREA

Although the USFWS did not identify any records for Indiana bats within the Action Area, the Project Area is within known Swarming 1 habitat for Indiana bats (USFWS 2016i). There is also a P1/P2 Indiana bat hibernaculum approximately 7.2 miles (11.6 km) from the estimated center of the Project Area (USFWS 2016f), well outside the defined Action Area.

4.2.7 CRITICAL HABITAT

Critical habitat was designated for the Indiana bat in 1976. Critical habitat consists of several mines and caves found in Illinois, Indiana, Kentucky (Carter County and Edmonson County), Missouri, Tennessee, and West Virginia. Bat Cave in Carter County, Kentucky, approximately 86 miles [138 km]) north of the Action Area, is the closest designated Indiana bat critical habitat (USFWS 2007).

4.3 GRAY BAT (*MYOTIS GRISESCENS*)

4.3.1 SPECIES DESCRIPTION

The gray bat is the largest *Myotis* species found in eastern North America. Gray bats roost in caves year-round and forage on a diversity of insects, with aquatic insects being the most common prey (USFWS 1982).

4.3.2 LISTING STATUS

The gray bat was listed as endangered in April 1976. The Gray Bat Recovery Plan was published in 1982 (USFWS 1982).

4.3.3 THREATS

The primary threat to gray bat populations has been attributed to disturbance of caves (Tuttle 2003). It is estimated that less than 5% of cave habitats are suitable as roosts, and site fidelity is well documented for gray bats (USFWS 1982). Approximately 95% of the total population hibernates in 17 caves: Tennessee (5), Missouri (4), Arkansas (5), Kentucky (2), and Alabama (1) (Harvey et al. 2005; Martin 2007). This tendency to form large aggregations makes gray bats particularly vulnerable to human disturbance and vandalism (Tuttle 2003; USFWS 2016h).

Section 4.1.3 details WNS impacts on populations of other bat species within the current range of the syndrome in the U.S. The first case of WNS confirmed in gray bats was in 2012 (USFWS 2012a). However, gray bats have not shown the same level of mortality as has been recorded for other WNS-affected species. It is possible that population declines from WNS have yet to be seen (USFWS 2012b).

Potential effects on bats from artificial lighting are discussed in Section 4.1.3. These effects are applicable to gray bats. As discussed previously, artificial lighting has the potential to change bat emergence times, which can cause bats to increase commutes to foraging areas. Tuttle (1976) found that longer travel distances for gray bats can have a negative impact on growth rates and mass of juvenile bats.

The effects of vibration on bats were discussed in Section 4.1.3. Potential effects to gray bats include abandonment or collapse of hibernacula and disturbance to hibernation or torpor, and abandonment of roosts sites.

Other factors that have contributed to the species' decline are improper gating or fencing of caves, impoundment of waterways, and channelization and siltation of waterways (USFWS 1982). Permanent conversion of forest habitat to non-forest uses, particularly along stream channels, is suspected of reducing available foraging habitat. Environmental contaminants such as pesticides and heavy metals have also been attributed in the decline of the species (Tuttle 1979). Climate change may also influence the range of some bats species (Loeb and Winters 2013) due to food availability, timing of hibernation, reproduction, frequency and duration of torpor, and rate of energy expenditure (Sherwin 2013). While few wind turbines occur within the range of the gray bat (Diffendorfer et al. 2015) and no known gray bat fatalities due to wind turbines have been recorded (American Wind Wildlife Institute 2016), future development of wind energy could be of concern.

4.3.4 ECOLOGY

4.3.4.1 Winter Habitat

Gray bats have very specific hibernation temperature and humidity requirements. It has been estimated that less than 5% of available caves are suitable for use across the species' range (USFWS 1982). Approximately 95% of the total population hibernates in 17 caves in five states: Tennessee (5), Missouri (4), Arkansas (5), Kentucky (2), and Alabama (1) (Harvey et al. 2005; Martin 2007). Gray bats primarily hibernate in deep vertical caves that serve as cold air traps where temperatures average 41–52 ^{o}F (5–11 ^{o}C) (USFWS 2009).

Gray bats hibernate in larger clusters of up to several thousand individuals (Tuttle 1979; Harvey et al. 2005). Female gray bats enter hibernation during September and October while males have been recorded to remain active until November 10 before entering hibernation (USFWS 2009). Gray bats hibernate for 6 to 7 months with adult females emerging first followed by juvenile and adult males (USFWS 1982).

4.3.4.2 Summer Habitat

During the summer maternity season, gray bats typically roost in relatively warm caves in rooms with domed ceilings and temperatures ranging from 57 to 79 °F (13.9 to 26.3 °C) (USFWS 1982, 2009; Harvey et al. 2005). These caves are usually within 0.6 mile (1 km) and rarely farther than 2.5 miles (4 km) of rivers or other major bodies of water (Tuttle 1976). Occasionally, bats have been found roosting in storm sewers, mines, railroad tunnels, dams, buildings, and bridges during the summer months (Hays and Bingman 1964; Martin 2007). Once at their maternity sites, female gray bats congregate in large clusters on the cave ceiling in areas indicated by guano deposits and ceiling staining (Tuttle 1979; USFWS 2009).

Female maternity colonies occupy a traditional home range that might include several caves scattered within an area as large as 31 by 3 miles (50 by 5 km). While colony members show fidelity to their home range, they often disperse among several different caves within the area after arriving at their summer maternity grounds (Tuttle 1979; USFWS 2009). During summer months, males typically form bachelor colonies with home ranges along river valleys that can stretch over a distance of 43.5 miles (70 km), although some individuals may continue to roost with females until young are born (USFWS 2009).

4.3.4.3 Foraging and Diet

Gray bats utilize the forest canopy to travel from their cave roosts to their primary foraging grounds above water. Once at their foraging grounds the bats fly approximately 10 ft (3 m) above the water's surface (Tuttle 1976). The diet of gray bats is diverse and is comprised of spiders and insects (beetles, flies, mayflies, true bugs, wasps/bees/ants, moths/butterflies, scorpion flies, lacewings/mantidflies/antlions, dragonflies/damselflies, grasshoppers, stoneflies, thrips, and caddisflies). However, they primarily forage on aquatic insects such as mayflies, caddisflies, and stoneflies (Rabinowitz and Tuttle 1982).

4.3.4.4 Migration

Adult female gray bats travel from their winter hibernacula to their maternity area in late March or early April while adult males and juveniles make the journey between mid-April to mid-May (Martin 2007). During these transient periods, they travel from their cold hibernacula caves to warmer summer maternity caves. After the females give birth, the maternity colonies break up by late July or early August (Tuttle 1979). The migration back to the hibernacula starts with the adult female gray bat leaving maternity grounds by early September and juveniles departing by mid-October (Martin 2007). During these transient periods, gray bats are less specific in their choice of roosts and utilize a wider variety of caves (USFWS 1982). While regular one-way travel of gray bats ranges from 11 to 23 miles (17 to 37 km) migration distances of up to 310 miles (500 km) are believed to occur (Martin 2007). Tuttle (1975) observed migration movements from a Florida colony of gray bats to be greater than 267 miles (430 km).

4.3.5 Historical and Current Distribution

The primary range of the gray bat is located within the limestone karst areas of the southeastern U.S. (USFWS 1982). Populations of gray bats are predominantly found in Alabama, Arkansas, Kentucky, Missouri, and Tennessee, with smaller populations found in the adjacent states (USFWS 1982, 2009). Additionally, in 2016 the first summer record of a gray bat was documented in Logan County, West Virginia representing a range-expansion for the species (USFWS 2016c).

4.3.6 Status of Species within the Action Area

Major waterbodies surrounded by forested landscapes do occur within the Action Area. The closest record of a gray bat to the Project Area was an adult male approximately 9 miles (15 km) away (USFWS 2017b).

4.3.7 Critical Habitat

Critical habitat has not been designated for the gray bat.

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5.0 ANALYSIS OF POTENTIAL EFFECTS TO ESA-LISTED SPECIES

5.1 APPROACH TO ANALYSIS

This chapter presents an analysis of potential direct, indirect, and cumulative effects on the endangered gray and Indiana bats and threatened NLEB from implementation of the construction and operational activities of the Proposed Action.

Direct effects are defined as the direct or immediate effects of the Proposed Action on the species or its habitat. Direct effects result from the Proposed Action including the effects of interrelated actions and interdependent actions. Indirect effects are those that are caused by the Proposed Action and are later in time, but are still reasonably certain to occur. All direct and indirect project effects on ESA-listed species have been further classified and evaluated based on their anticipated longevity (i.e., temporary or permanent effects). Effects of the action under consultation are analyzed together with the effects of other activities that are interrelated to, and interdependent with, that action. Interrelated actions are those that are part of a larger action and depend on the larger action for its justification. Interdependent actions are those that have no independent utility apart from the action under consideration. Under this Proposed Action, there are no interrelated or interdependent actions.

As they relate to the species considered in this BA, direct and indirect effects from proposed activities within the Action Area have been evaluated herein based upon: (1) an understanding of the methods and equipment that would be used during construction and operations within the Action Area, (2) knowledge of the potential for such methods and equipment to disturb the natural resources on which the subject species depend, and (3) awareness of the types of effects that have resulted from similar actions in the past.

5.1.1 STRESSORS AND THREATS INCLUDED FOR ANALYSIS

The Bureau identified threats to the subject ESA-listed bat species associated with the proposed construction and operational activities based on previous consultations as well as review of the *Federal Register* notice for the listing of each species. Eight stressors have been identified (Table 5-1).

Table 5-1. Potential Effects on ESA-listed Bat Species Based on Stressors Associated with the Proposed Action

Stressor	Potential Direct (D) or Indirect (I) Effect
Habitat Loss	Direct permanent loss of habitat reduces species' ability to reproduce, find food, find shelter, and survive. (D)
Stream Sedimentation	Potential temporary impact during construction to streams by covering bed substrates with sediment, potentially degrading drinking resources, and prey insect production. (D, I)
Noise and Vibration	Disturbance to species from noise depends on the type of noise generated, the proximity to the noise source, duration of the sound, frequency of events, and the past history of exposure to noise events by individuals of a species. (D, I)
Increased Human Presence	Increased human presence could cause wildlife to avoid the area. (D. I)
Collisions with Vehicles	Direct mortality due to vehicle strikes during construction and operation of the proposed USP and FPC. (D)
Invasive Species Introductions	Construction activities could potentially increase the potential for the introduction of invasive species from equipment or fill material. These introductions can degrade habitats by altering native species composition and structure. (I)
Hazardous Materials Spills	During construction and operation, there is the potential for spills of gas, fuel, oil, or solvents. (I)
Night Lighting	Artificial lighting may result in abandonment of foraging and roosting areas by bats. (D, I)

5.2 EFFECTS ANALYSIS

Although Indiana bats and NLEBs do exhibit niche partitioning, their foraging and roosting habitats closely coincide at the landscape level. While gray bats typically forage along streams and reservoirs rather than upland habitats, Indiana bats and NLEBs also utilize these resources. Gray bat roost habitat (i.e., caves, mines, etc.) differs significantly from Indiana bats and NLEBs, though it often occurs within forested landscapes appropriate for Indiana and NLEB foraging/roosting. The three species exhibit significant overlap in winter hibernation habitat. Due to the high degree of habitat overlap between the three species, their effects analysis is combined.

5.2.1 HABITAT LOSS

5.2.1.1 Direct and Indirect Effects from Habitat Loss during Spring, Summer, and Fall

Under the Proposed Action, approximately 180.5 ac (73.1 ha) would be permanently cleared, including approximately 120.6 ac (48.8 ha) of forested habitat and 59.9 ac (24.2 ha) of grassland on mine spoil (Copperhead 2016a, 2016b). Table 5-2 details habitat loss to each species considered.

Table 5-2. Quality and Utilization of ESA-listed Bat Species Habitat Cleared under the Proposed Action

	Forested	**Grassland on Spoil**
Acreage of Loss	120.6	59.9
INDIANA BAT		
Potential Indiana Bat Utilization	Foraging and Roosting	Foraging
Indiana Bat Habitat Quality	Good – foraging and roosting potential, and prey production.	Insignificant – minimal prey production and foraging potential.
NLEB		
Potential NLEB Utilization	Foraging and Roosting	Foraging
NLEB Habitat Quality	Good – foraging and roosting potential, and prey production	Insignificant – minimal prey production and foraging potential.
GRAY BAT		
Potential Gray Bat Utilization	Foraging	Foraging
Gray Bat Habitat Quality	Insignificant – minimal prey production and foraging potential.	Insignificant – minimal prey production and foraging potential.

A total of 10,484 ac (4,243 ha) of potentially suitable Indiana bat and NLEB habitat occurs within the Action Area representing 83.4% of the total land cover. The Proposed Action would remove 1.7% of the total available Indiana bat and NLEB habitat within the Action Area (Figure 3-4).

USFWS occurrence records indicate one NLEB summer maternity record within the Action Area, approximately 0.4 mile (0.6 km) from the Project Area. An additional non-specified record is documented approximately 2.5 miles (4.0 km) from the Project Area and is assumed to be within the Action Area. Forested habitats within the Project Area provide potential habitat for roosting and foraging NLEBs and could provide habitat for NLEB maternity colonies. Grasslands on coal mine spoil potentially could support NLEBs in the production of insect prey and as an occasional foraging resource, though impacts to these habitats from the Proposed Action is considered to have an insignificant and discountable effect on the species.

USFWS correspondence did not identify any records for Indiana bats within the Action Area. Spring and fall roosts for the species have the potential to occur within the Action Area and Project Area. The Project Area is within known Swarming 1 habitat for Indiana bats (USFWS 2016i). USFWS identified a P1/P2 hibernacula occurring 7.2 miles (11.6 km) from the Project Area. USFWS classifies Indiana bat hibernacula based on the number of bats overwintering there. For reference, P1 hibernacula are those caves that have harbored >10,000 bats and P2 hibernacula have contained 1,000-9,999 bats. Forested

areas within the Project Area could provide potential habitat for roosting and foraging Indiana bats including maternity colonies. Grasslands on mine spoil may potentially support Indiana bats in the production of insect prey and as an occasional foraging resource, though impacts to these habitats from the Proposed Action are expected to have insignificant and discountable effects on the species.

The USFWS did not identify gray bat records within the Action Area. The closest record was an individual male captured approximately 9 miles (14.5 km) from the Project Area (USFWS 2016i). While upland habitats support gray bats through production of prey insects and for commuting and occasional foraging, they are not considered key habitats of the species. Impacts to these habitats from the Proposed Action are considered insignificant and discountable to the species and are not included in the analysis. Field surveys of the Project Area conducted for the habitat assessments did not identify lacustrine or riverine habitats associated with foraging for this species and did not identify potential underground summer roost sites (Copperhead 2016a, 2016b). Direct removal of gray bat habitat is not anticipated under the Proposed Action.

Impacts to spring, summer, and fall habitat for ESA-listed bat species will be minimized through use of BMPs. Only those trees necessary for construction and maintenance of appropriate line of site for security surrounding the facilities will be removed, and removal of any standing trees would not occur during June and July of any year during construction. Impacts to summer habitat will be mitigated through contribution to the Imperiled Bat Conservation Fund. Payment into the fund would be based on the acreage and time of year that forested habitat is removed.

5.2.1.2 Direct and Indirect Effects from Habitat Loss during Hibernation

One potential hibernaculum for ESA-listed species was identified within the Project Area during the 2016 habitat assessment (Copperhead 2016b). It will not be directly disturbed by proposed construction or operational activities. While use of the potential hibernaculum by ESA-listed species cannot be ruled out, no evidence of bat use was seen. Based on investigation of the feature during the 2016 habitat assessment, it was concluded that if the site is occupied by hibernating ESA-listed species, it is likely to be used by only a few individuals because of the limited volume of the visible extent, its narrow entrance flyway, the lack of air flow, and no evidence of bat use (e.g. guano, insect parts) (Copperhead 2016b). All of the 120.6 ac (48.8 ha) of forested habitat would be within the potential swarming area surrounding the potential hibernaculum (5-mile radius for priority 3 and 4 hibernacula) if it is occupied by ESA-listed species.

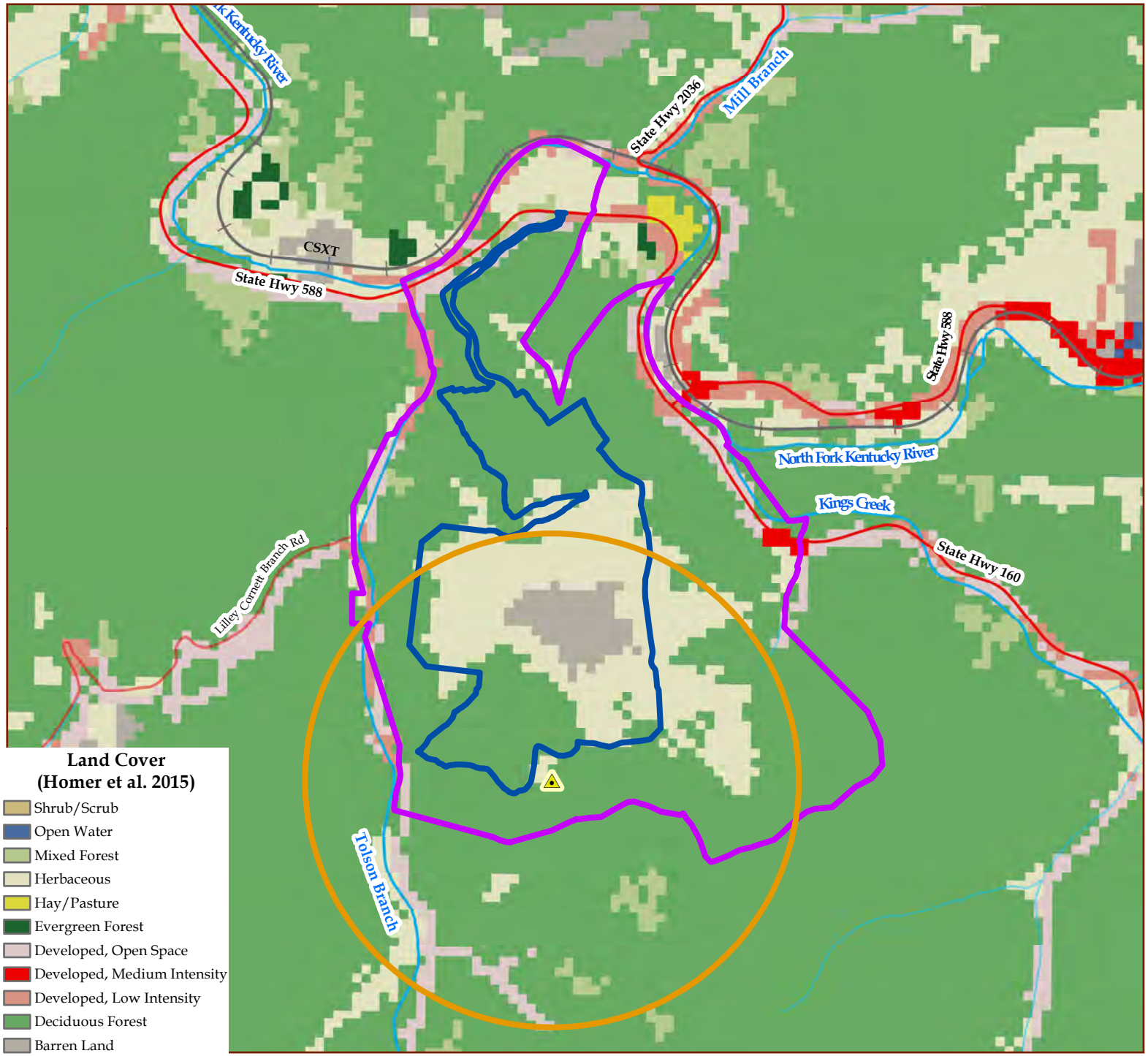
The potential hibernaculum is located 217.7 ft (66.4 m) south of the proposed edge of tree clearing and ground disturbance. Following USFWS recommendations, forested habitat within 0.5 mile (0.8 km) of the winter habitat feature was calculated. The buffer surrounding the feature is 70.2% forested, with a total of 353.7 forested ac (143.1 ha) within the 503.8-ac (203.9 ha) buffer (Figure 5-1). Of the forested habitat within the buffer, 4.7% or 41.0 ac (16.6 ha) would be removed for the Proposed Action.

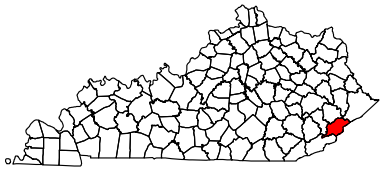
No known hibernacula for any ESA-listed bat species are known within the Action Area. The Project Area was identified as being within Indiana bat Swarming 1 habitat (USFWS 2016i), and swarming activities (i.e., roosting, foraging, mating, etc.) associated with the feature could occur. All the 120.6 ac (48.8 ha) of forested habitat removed would be within Swarming 1 habitat.

Impacts to swarming habitat will be minimized through use of BMPs. Only those trees necessary for construction and maintenance of appropriate line of site for security surrounding the facilities will be removed. Impacts to swarming habitat will be mitigated through contribution to the Imperiled Bat Conservation Fund. Payment into the fund would be based on the acreage and time of year that forested habitat is removed.

Biological Assessment

Figure 5-1. Land Cover Types within a 0.5 mile Buffer Surrounding the Potential ESA-listed Species Winter Habitat





Letcher County, Kentucky

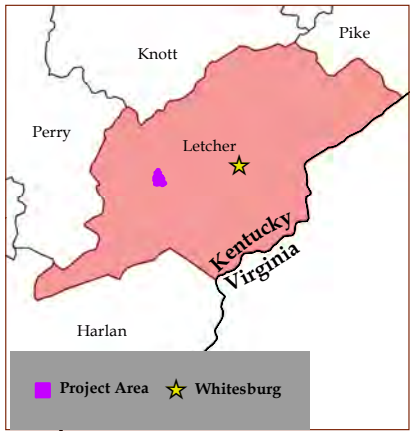
- Project Area
- Proposed Ground Disturbance and Clearing
- 0.5 Mile Hibernaculum Buffer
- Potential Suitable ESA-listed Bat Hibernaculum

1:18,000
or
1 inch = 1,500 ft

N W E S

0 2,500 Feet

Coordinate System: NAD 1983 StatePlane Kentucky FIPS 1600 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983
Sources: ESRI 2017, USGS 2009, US Census 2015, KYTC 2015, Homer et al. 2015, Bureau 2017
Date: 4/21/2017



5.2.2 Stream Sedimentation

5.2.2.1 Direct and Indirect Effects from Potential Stream Sedimentation

Temporary effects to water quality could occur during project-related construction and potential sedimentation of streams. Siltation of waterways over which ESA-listed bats forage could be detrimental to drinking and feeding activities. Stream sedimentation can reduce populations of flying aquatic insects, which are a known component of the diet of all considered species (USFWS 1982, 2007, 2015a). Fugitive dust from land disturbance activities and the movement of truck/construction equipment during construction could settle into local streams contributing to sedimentation. Sedimentation impacts also have the potential to migrate offsite and into receiving streams.

Of the three species considered, gray bats have the greatest potential to be impacted by sedimentation. The species is known to predominantly forage over waterways and a major portion of its diet is reported to be flying insects with aquatic larval stages (USFWS 1982).

Stream sedimentation impacts tend to be temporary in nature during the construction period provided that construction activities with the potential to cause erosion problems are properly planned and sited, and adhere to project-specific BMPs and appropriate regulatory permit requirements. BMPs that include an erosion and sediment control plan and site-specific groundwater protection plan will reduce potential impacts. Therefore, it is not anticipated that water quality of nearby streams and wetlands would be adversely impacted by on-site construction (Federal Bureau of Prisons 2017).

5.2.3 Noise and Vibration

Noise duration can be continuous, transient (short in duration), or impulsive (less than 1 second). Three characteristics of noise influence the potential for impacts to wildlife:

- Duration – the length of time the sound can be detected.
- Magnitude – the acoustic energy, expressed in terms of sound pressure. It is typically expressed in decibels (dB); however, A-weighted decibels (dBA) and peak decibels (dBP) were also used in this analysis.
- Frequency – the number of cycles per second of the sound wave, expressed in Hertz (Hz).

5.2.3.1 Direct and Indirect Effects from Noise and Vibration during Spring, Summer, and Fall

Of potential noise effects, construction noise will have the farthest impact extent, but will be limited in duration to the period of construction and will occur during daylight hours. Although proposed blasting activities will result in the loudest noise levels, blast noise is within the frequency range of 2 to 200 Hz (Cardno Mining Division 2016), outside the hearing range of bats (reported to be typically above 1,000 Hz) (Siemers and Schaub 2011). Loud high frequency noise disturbance (>20,000 Hz) has been shown to deter bats from using established roosts in bridges (California Department of Transportation [Caltrans] 2016). Bats have been shown to decrease foraging use in areas with significant noise disturbance (Schaub et al. 2008). Displacement from roosting and foraging areas has the potential to decrease fitness by increasing susceptibility to predation, reducing foraging efficiency, and reducing roosting environment quality (Caltrans 2016). However, USFWS reported that bats can acclimate to loud noise stimuli over time, and that Indiana bats subjected to repeated military training noise at Camp Atterbury maintained near base wide distribution, and that bats at Fort Leonard Wood subjected to simulated artillery and small-arms fire did not startle, frighten, or leave the area. Further they reported that Indiana bats did not avoid active night training areas or change foraging during night maneuvers (USFWS 2010).

Construction noise is anticipated to occur during daylight hours only and is not expected to have a negative effect on ESA-listed bat foraging. Ample forested habitat occurs adjacent to the construction footprint within the Action Area. Landscape outside the Action Area is heavily forested as well. Impacts from construction noise will be temporary in nature. Blasting noise is expected to be outside the hearing range of bats as discussed above. Therefore, impacts from noise to roosting ESA-listed bats in the summer are expected to be minimal.

Once in operation, noise associated with small arms live-fire at the proposed outdoor firing range is expected to have the potential to impact ESA-listed bats. Cardno conducted a noise analysis to predict peak noise levels from the proposed outdoor firing range in comparison with noise-sensitive land uses (Federal Bureau of Prisons 2017). Figure 5-2 shows the predicted peak noise contours for the firearms recertification at the firing range.

The 104 dBP contour encompasses 47.09 total ac (19.06 ha), of which 84% (39.60 ac, 16.03 ha) is forested potential Indiana bat and NLEB foraging and roosting habitat. Construction disturbance would remove 74.12% (29.35 ac, 11.88 ha) of the forested habitat within the 104 dBP firing range noise contour.

The 87 dBP noise contour encompasses 710.19 ac (287.4 ha), of which 73.66% (523.12 ac, 211.7 ha) is forested potential Indiana bat and NLEB foraging and roosting habitat. Construction disturbance would remove 14.31% (74.87 ac, 30.30 ha) of forested habitat within the 87 dBP firing range noise contour.

Potential noise impacts from live-fire activities would be limited to roosting bats because all firing would occur within daylight hours. Firing activities are anticipated to be limited to 1 day per month and daily during an annual 6-week qualification/recertification program during the months of March and April. Each year the major portion of firearms recertification will occur when bats are still in hibernation and it will end before juveniles are present on the landscape.

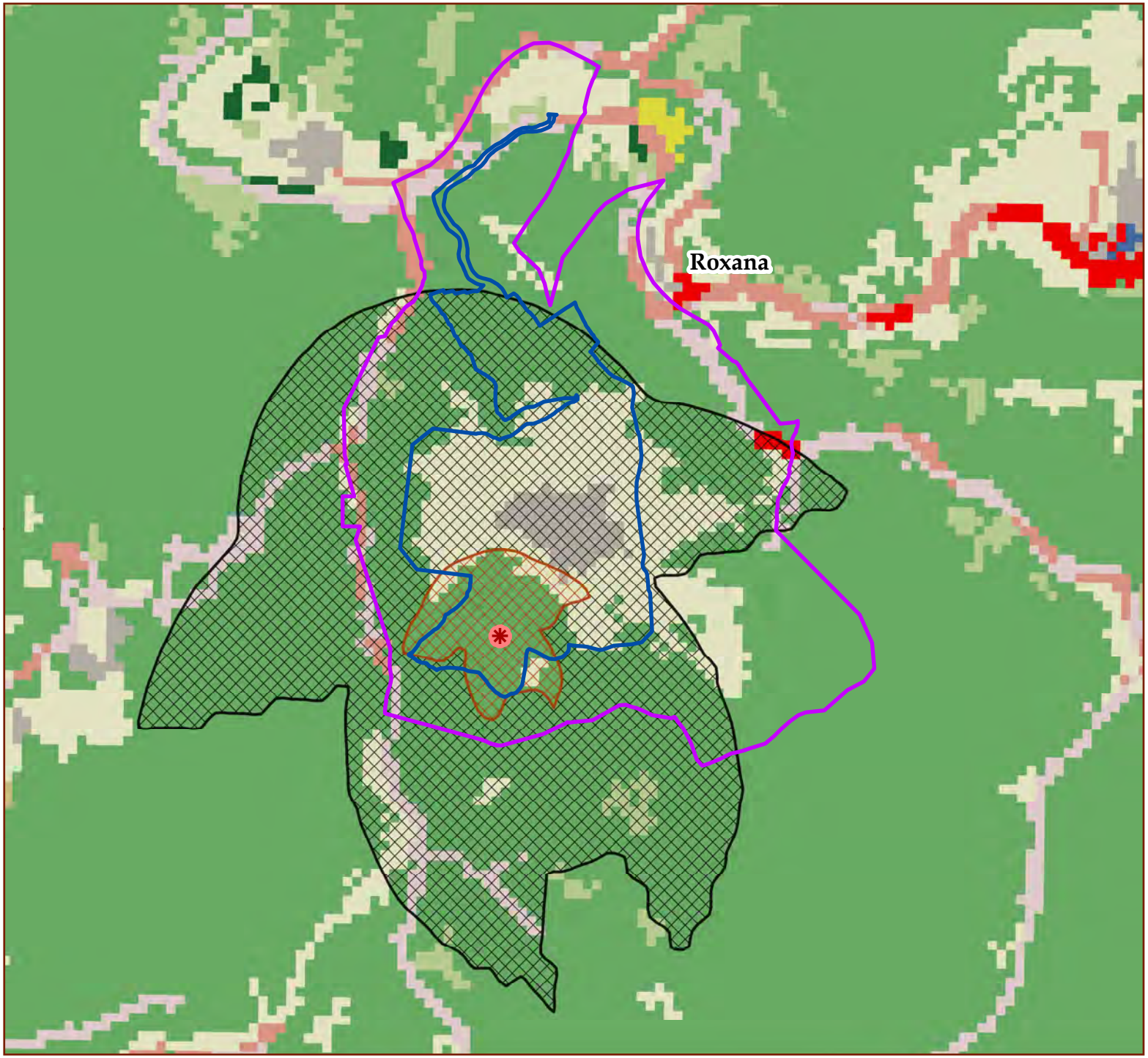
As stated above, the USFWS reported that Indiana bats subjected to repeated military training noise at Camp Atterbury maintained near base wide distribution, and that bats at Fort Leonard Wood subjected to simulated artillery and small-arms fire did not startle, frighten, or leave the area. Due to the recurring use of the outdoor firing range, live fire activities at the outdoor firing range are expected to have minor, periodic, and temporary effects on roosting ESA-listed bats.

Potential vibration impacts to ESA-listed bats from project-related construction activities outside of hibernation would occur within the Action Area. While some vibration will be produced by construction machinery, the greatest and farthest reaching impact would occur from blasting. Primary vibration impacts outside of hibernation are likely associated with displacement from roosts and disturbance to torpor during cool weather. Effects from vibration are temporary and would be limited to the period of construction. Similar to noise, vibration from blasting would only occur during and immediately following a blasting event.

5.2.3.2 Direct and Indirect Effects from Noise and Vibration during Hibernation

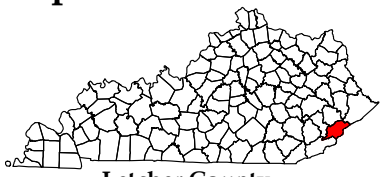
Vibration during hibernation has the potential to modify normal hibernation patterns and may cause abandonment of hibernacula or specific sites within hibernacula. Past studies have indicated that hibernating bats can tolerate vibration levels of 1.52 to 5.08 mm/sec (WVDEP 2006).

Blasting during construction would be the primary source of vibration with the potential to effect hibernating bats. The Proposed Action would require blasting within 0.5 mile (0.8 km) of one cave-like feature (potential hibernaculum) identified during the 2016 habitat assessment as potential ESA-listed bat winter habitat (Copperhead 2016b). In the absence of swarming surveys or internal winter surveys of the potential hibernaculum, listed bat species are assumed to be present within the feature during the winter.



Biological Assessment

Figure 5-2. Modeled Noise Contours for Outdoor Firing Range Operations at the Proposed USP and FPC



Letcher County, Kentucky

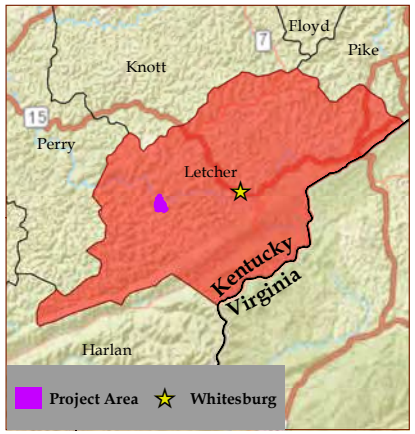
- Project Area
- Proposed Ground Disturbance and Clearing
- Small Arms Firing Point
- 104 dBP Noise Contour
- 87 dBP Noise Contour

N
W E
S

1:18,000
or
1 inch = 1,500 ft

Coordinate System: NAD 1983 StatePlane Kentucky FIPS 1600 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983
Sources: ESRI 2017, USGS 2009, US Census 2015, KYTC 2015, Bureau 2017.
Date: 4/19/2017

0 3,000 Feet



In order to avoid potential adverse effects to hibernating ESA-listed bats at potential hibernacula within 0.5 mile (0.8 km) of the Project Area, the Bureau will not conduct construction blasting from November 15 through March 31.

5.2.4 INCREASED HUMAN PRESENCE

Human disturbance during construction would be limited to daylight hours during the period of construction. Potential for disturbance once the Proposed Action is in operation would be minimized because most areas receiving human disturbance would already have been cleared of habitat. Additionally, studies cited in section 5.2.3.1 show that bats at Fort Leonard Wood and Camp Atterbury acclimated to human disturbance and continued use of previously used areas. This suggests that ESA-listed bats occurring in the Project Area could habituate to human disturbance.

Disturbance to hibernating ESA-listed bats can cause arousal and the depletion of energy and water reserves needed to survive hibernation. Disturbance also has the potential to limit the ability of females to successfully fertilize, gestate, and birth pups in the spring. The Proposed Action is a federal USP and FPC and access to the site will be tightly controlled. Internal access to the potential hibernaculum will not be permitted. In addition, the potential hibernaculum will be fenced off and warning signs installed around the area to prevent direct disturbance.

5.2.5 COLLISIONS WITH VEHICLES

Bat mortality, including ESA-listed species, caused by collisions with motor vehicles is known to occur. Russel et al. (2009) found 27 road-killed little brown bats, 1 Indiana bat, and 1 unknown *Myotis* when searching a heavily trafficked highway in Pennsylvania from May through September. While minor traffic increases are anticipated during construction (Federal Bureau of Prisons 2016), the majority of new traffic would occur during daylight hours and have no impact on nocturnal bats.

Once in operation, the facility would staff approximately 300 full-time employees. Operations would add approximately 156 trips during the morning peak hours (7:00–9:00 a.m.) and 204 trips during the afternoon peak hours (3:00–5:00 p.m.). Additional trips would occur from inmate transfer, visitors, and deliveries. A total of 360 trips are expected to occur during peak traffic hours, typically daylight hours (Federal Bureau of Prisons 2016). Because most of these trips would occur during daylight hours, the potential for bat-vehicle collisions is expected to be discountable.

5.2.6 INTRODUCTION OF INVASIVE SPECIES

Transportation and spread of invasive species within the Project Area could be facilitated by the implementation of the Proposed Action and could degrade habitat for ESA-listed bat species.

The Kentucky Exotic Pest Plant Council (KEPPC) maintains a list of Exotic Invasive Plants of Kentucky. A total of 38 species have been identified as *Severe Threat*, which is defined as those species that "possess characteristics of invasive species and spread easily into native plant communities and displace native vegetation" (KEPPC 2013). Invasive species can degrade local habitats, changing insect prey abundance and diversity, and can degrade roosting and foraging habitat for ESA-listed bat species. Introduction of invasive species to the site can occur via contractor equipment during construction, or can be introduced through fill material transported from offsite. In addition, soils disturbed during construction are often quickly colonized by invasive species.

Contractors shall be required to inspect vehicles and equipment to ensure that visible plant and seed material has been removed prior to entering the Project Area. Fill material utilized during construction will be taken from onsite. Estimated construction excavation material volume to be used as structural fill

exceeds estimated fill volume need (Federal Bureau of Prisons 2017). Therefore, no fill material will be brought on site.

Upon completion of construction, disturbed areas that are not developed would be revegetated and maintained as grassy lawn areas. Implementation of appropriate invasive species control procedures will greatly reduce the colonization of the Action Area related to the Proposed Action to the extent that it should have no effect on ESA-listed bats.

5.2.7 Hazardous Materials Spills

There is a possibility of small scale spills of hazardous materials during the period of construction. The primary hazardous materials with the potential to be spilled are diesel fuel, gasoline, hydraulic fluids, oils, lubricants, paints, solvents, adhesives, and battery chemicals. Accidental hazardous material spills could adversely impact soil and surface and groundwater in the Action Area in the vicinity of the construction site and along transportation routes. Spills entering surface or groundwater could have a negative impact on aquatic fauna that make up part of the prey base for the ESA-listed species or could be directly consumed by bats while drinking. The implementation of BMPs, sediment control plan, site specific groundwater protection plan, appropriate waste disposal, and appropriate handling and storage procedures will decrease the likelihood of spills and should prevent migration of hazardous materials away from spill locations. Construction contractors will be responsible for following regulations pertaining to hazardous materials and it is the contractor's responsibility to comply with all federal, state, and local regulations.

Once implemented, the facility will utilize machinery and vehicles that require cleaning, painting, batteries, and routine maintenance. The same types of hazardous materials identified above will be utilized onsite, although quantities needed and potential for spills will be lower than during construction. During operation of the facility, proper hazardous materials handling and storage protocols combined with proper spill response would decrease the likelihood of spills and reduce the potential effects to ESA-listed bat species to the extent that they are discountable.

5.2.8 Night Lighting

5.2.8.1 Direct and Indirect Effects from Night Lighting during Spring, Summer, and Fall

While many species of bats frequently forage around lighting, other species appear to avoid it (Jung and Kalko 2010). Indiana bats are known to avoid foraging in well-lit urban areas, with avoidance potentially driven by light avoidance (Sparks et al. 2005). ESA-listed bats may be susceptible to predation while being illuminated by artificial lighting at the Project Area as they forage and commute between foraging and roosting areas. Lighting could reduce time spent foraging in lit areas and could increase the risk of predation (Federal Highway Administration et al. 2016).

Night lighting will be necessary during the construction period. Possible lighting locations will be at the entrance off of KY 588, at points along the access road to the construction areas, at construction and material storage trailers, and in the construction zones for buildings to meet safety standards. The construction lighting will not be as intensive as the lighting required for the institution once it is activated. Construction lighting will be aimed toward construction activities and away from forested habitat and thus will primarily affect areas already cleared of habitat. Once constructed, security of the facilities will require significant artificial lighting throughout dark hours. Permanent lighting of the facility will be addressed using hooded lights with reflectors to completely conceal the light sources above the rim of the fixture, thereby minimizing the amount of incidental light reaching the forest (Federal Bureau of Prisons 2017). Effects from lighting are anticipated to be largely concentrated in areas where trees have been cleared for construction that will no longer be suitable habitat for ESA-listed bats.

5.2.8.2 Direct and Indirect Effects from Night Lighting during Hibernation

As discussed in Section 5.2.8.1, lighting will be addressed with hoods and reflectors which should conceal the light sources above the rim of the fixture. The potential hibernaculum within the project area is outside the tree clearing limits and area of ground disturbance, and would not be impacted by the proposed lighting of the facilities.

5.3 EFFECTS DETERMINATIONS

5.3.1 EFFECTS DETERMINATION ON THE NLEB

Based on the information discussed above, construction and operation of the Proposed Action "may affect, is likely to adversely affect" the NLEB. Table 5-3 summarizes the potential effects to the NLEB.

Table 5-3. Summary of Potential Effects to the NLEB

Stressor	Potential Direct and Indirect Effects
Habitat Loss	Loss of 120.6 ac (48.8 ha) of summer habitat reduces the number of roost sites and area of foraging habitat. No potential hibernacula will be lost. Swarming habitat near potential hibernacula will be removed.
Stream Sedimentation	Potential impact to drinking and prey production. Use of BMPs, erosion control plan, sediment control plan, and site-specific groundwater protection plan would avoid and minimize potential effects to the species from sedimentation. Effects expected to be insignificant.
Noise and Vibration	Disturbance to species is dependent on noise type, proximity, duration, incidence, and acclimation of local population, if present. Primary impacts would be from operation of firing range. Disturbance to species is dependent on intensity of vibration and distance to habitat. Primary impact is the potential for summer roost abandonment near blasting sites. Blasting during the hibernation period will not be conducted.
Increased Human Presence	Disturbance could cause abandonment of roosts, foraging areas, or hibernacula. Human disturbance is likely in areas that will no longer be NLEB habitat. Potential hibernaculum will not be disturbed. Effects expected to be insignificant.
Collisions with Vehicles	Collisions with vehicles has the potential to cause direct take of NLEBs; however, anticipated traffic increase during night time is expected to be low. Effects expected to be discountable.
Invasive Species	Construction activities could increase the potential for the introduction of invasive species from equipment or fill material. Introductions can change prey abundance and vegetative community composition. Due to invasive species control procedures, no effect anticipated.
Hazardous Materials Spills	Potential for spills to contaminate water sources utilized for drinking and supporting insect prey. Use of BMPs and site-specific groundwater protection plan would avoid impacts to the species from hazardous materials. Effects expected to be discountable.
Night Lighting	Light pollution could result in disruption of normal foraging and roosting behavior, and modify the local insect population and distribution. Effects expected to be insignificant.

5.3.2 EFFECTS DETERMINATION ON THE INDIANA BAT

Based on the information discussed above, construction and operation of the Proposed Action "may affect, is likely to adversely affect" the Indiana bat. There would be no effect to Indiana bat critical habitat as none occurs within the Action Area. Table 5-4 summarizes the potential effects to the Indiana bat.

Table 5-4. Summary of Potential Effects to the Indiana Bat

Stressor	Potential Direct and Indirect Effects
Habitat Loss	Loss of 120.6 ac (48.8 ha) of summer habitat reduces the number of roost sites and area of foraging habitat. No potential hibernacula will be lost. Swarming habitat near potential hibernacula will be removed.
Stream Sedimentation	Potential impact to drinking and prey production. Use of BMPs, erosion control plan, sediment control plan, and site-specific groundwater protection plan would avoid and minimize potential effects to the species from sedimentation. Effects expected to be insignificant.
Noise and Vibration	Disturbance to species is dependent on noise type, proximity, duration, incidence, and acclimation of local population, if present. Primary impacts would be from operation of firing range. Disturbance to species is dependent on intensity of vibration and distance to habitat. Primary impact is the potential for summer roost abandonment near blasting sites. Blasting during the hibernation period will not be conducted.
Increased Human Presence	Disturbance could cause abandonment of roosts, foraging areas, or hibernacula. Most human-related disturbance is likely to occur in areas that will no longer be Indiana bat habitat. Potential hibernacula will not be disturbed. Effects expected to be insignificant.
Collisions with Vehicles	Collisions with vehicles has the potential to cause direct take of Indiana bats; however, anticipated traffic increase during night time is expected to be low. Effects expected to be discountable.
Invasive Species	Construction activities could increase the potential for the introduction of invasive species from equipment or fill material. Introductions can change prey abundance and vegetative community composition. Due to invasive species control procedures, no effect anticipated.
Hazardous Materials Spills	Potential for spills to contaminate water sources utilized for drinking and supporting insect prey. Use of BMPs and site-specific groundwater protection plan would avoid impacts to the species from hazardous materials. Effects expected to be discountable.
Night Lighting	Light pollution could result in disruption of normal foraging and roosting behavior, and modify the local insect population and distribution. Effects expected to be insignificant.

5.3.3 EFFECTS DETERMINATION ON THE GRAY BAT

Based on the information discussed above, construction and operation of the Proposed Action "may affect, is not likely to adversely affect" the gray bat. Table 5-5 summarizes the potential effects to the gray bat.

Table 5-5. Summary of Effects to the Gray Bat

Stressor	Potential Direct and Indirect Effects
Habitat Loss	No direct loss of summer habitat is anticipated. No potential hibernacula will be lost. Swarming habitat near potential hibernaculum will be removed.
Stream Sedimentation	Potential impact to drinking and prey production. Use of BMPs, erosion control plan, sediment control plan, and site-specific groundwater protection plan would avoid and minimize potential effects to the species from sedimentation. Effects expected to be insignificant.
Noise and Vibration	Disturbance to species is dependent on noise type, proximity, duration, incidence, and acclimation of local population, if present. Primary impacts would be from operation of firing range. Disturbance to species is dependent on intensity of vibration and distance to habitat. Primary impact is the potential for summer roost abandonment near blasting sites. Blasting during the hibernation period will not be conducted.
Increased Human Presence	Disturbance could cause abandonment of roosts, foraging areas, or hibernacula. Human disturbance is likely to occur in areas that will no longer be gray bat habitat. Potential hibernaculum will not be disturbed. Effects expected to be insignificant.
Collisions with Vehicles	Collisions with vehicles has the potential to cause direct take of gray bats; however, anticipated traffic increase during night time is expected to be low. Effects expected to be discountable.
Invasive Species	Construction activities could increase the potential for the introduction of invasive species from equipment or fill material. Introductions can change prey abundance and vegetative community composition. Due to invasive species control procedures, no effect anticipated.
Hazardous Materials Spills	Potential for spills to contaminate water sources utilized for drinking and supporting insect prey. Use of BMPs and site-specific groundwater protection plan would avoid impacts to the species from hazardous materials. Effects expected to be discountable.
Night Lighting	Light pollution could result in disruption of normal foraging behavior and modify the local insect population and distribution. Effects expected to be insignificant.

6.0 CUMULATIVE EFFECTS

As defined in 50 Code of Federal Regulations Part 402.02, under the ESA cumulative effects include the effects of unrelated future state and/or private activities, not involving Federal activities, which are reasonably certain to occur within the Action Area of the Federal action subject to consultation. The cumulative effects analysis includes all known activities that are reasonably certain to occur within the Action Area.

The majority of the Action Area is comprised of forested habitat (deciduous, evergreen, and mixed forest), and it is reasonable to expect that timber extraction and other forestry management practices are likely to occur within the Action Area. The timing of and the extent to which the removal of forested habitat associated with forestry practices will or will not affect listed bats species is not known. However, it can be assumed that impacts to forested areas and/or waterways could have negative direct or indirect effects on bats.

Available resources were consulted to determine potential local development in the area. The Kentucky Transportation Cabinet's FY 2016 – FY 2022 Recommended Highway Plan (Kentucky Transportation Cabinet 2016) was reviewed to determine if road projects were planned within the Action Area. No proposed projects within the Action Area were identified. The Comprehensive Economic Development Strategy for the Kentucky River Area Development District (KRADD) – 2015 Update lists 8 proposed wastewater projects and 15 proposed water projects for Letcher County, KY, however none of these occur within the Action Area. Other proposed non-federal projects listed in the development strategy do not occur within the Action Area (2015). NEPA documentation conducted for the Proposed Action did not identify non-federal projects proposed within the Action Area (Federal Bureau of Prisons 2016, 2017).

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7.0 CONCLUSIONS AND SUMMARY OF EFFECTS DETERMINATIONS

Based on the evaluation presented above, Table 7-1 presents the Bureau's effects determinations for ESA-listed species from implementation of the Proposed Action within the Action Area.

Table 7-1. Summary of Findings for ESA-listed Species

Common Name	Scientific Name	Status	Effects Determination
Northern long-eared bat	*Myotis septentrionalis*	Threatened	May affect, is likely to adversely affect
Indiana bat	*Myotis sodalis*	Endangered	May affect, is likely to adversely affect
Gray bat	*Myotis grisescens*	Endangered	May affect, is not likely to adversely affect
Kentucky arrow darter	*Etheostoma spilotum*	Threatened	No effect

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Appendix I: Coordination History

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U.S. Department of Justice

Federal Bureau of Prisons

Washington, DC 20534

July 15, 2013

Ms. Jessica Miller
United States Fish and Wildlife Service
Kentucky Field Office
330 West Broadway, Suite 265
Frankfort, Kentucky 40601

Subject: Environmental Impact Statement for new Federal Bureau of Prisons United States Penitentiary and Federal Prison Camp in Letcher County, Kentucky

Dear Ms. Miller:

The Federal Bureau of Prisons (BOP) is preparing to publish the Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS) for a new United States Penitentiary and Federal Prison Camp in Letcher County, Kentucky. Following the publication of the NOI in the Federal Register, the BOP will be conducting a public scoping meeting on August 13, 2013 from 5:30 p.m. to 8:00 p.m.

The BOP would also like to conduct an agency site visit the morning of August 13, 2013 for those representatives of agencies interested in viewing the two sites that will be evaluated in the EIS. Enclosed are project location maps for the two sites. The scoping field view will be held from 8:30 a.m. to 12:30 p.m. The meeting will begin at the Pine Mountain Grill in Whitesburg, Kentucky with a brief overview of the project (location map and address attached). We will leave from the Pine Mountain Grill and carpool to the sites. The field view will conclude at the Pine Mountain Grill where attendees can have lunch and participate in a question and answer session if needed. We ask that you let us know if you will be attending by August 2, 2013 to ensure we have sufficient transportation to the sites for all attendees.

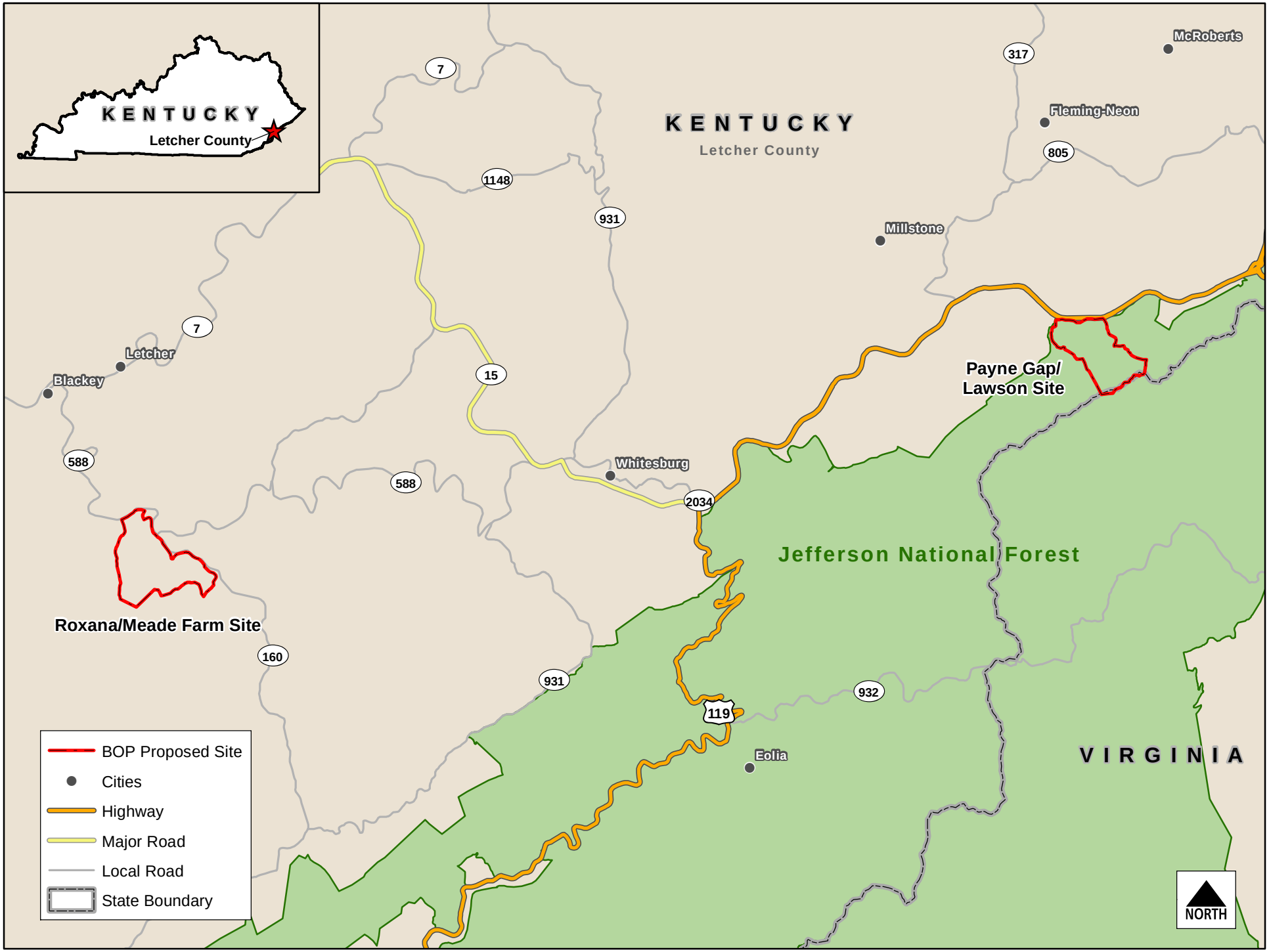
The BOP requests your participation in the scoping process by attending either the scoping field view or public scoping meeting on August 13, 2013 or contacting me with any questions if you are unable to attend the meetings. I can be reached at (202) 514-6470 or blyles@bop.gov.

Sincerely,

Bridgette Lyles
Site Specialist
Capacity Planning and
Site Selection Branch

Enclosures

1. Project Location Maps
2. Pine Mountain Grill Address and Location Map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BOP Proposed Site
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Roxana/Meade Farm Site
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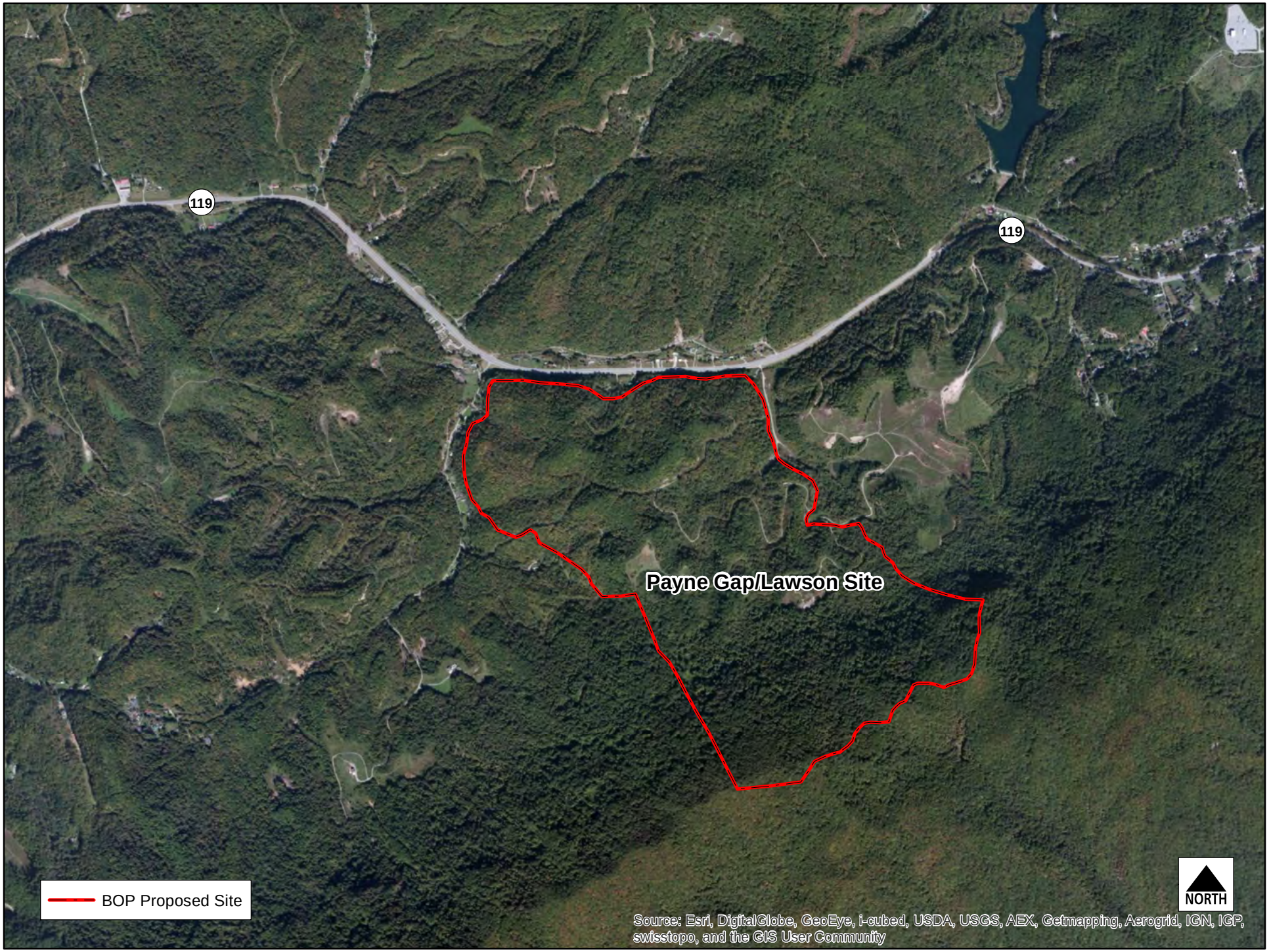
Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community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Payne Gap/Lawson Site
BOP Proposed Site
NORTH
Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

To see all the details that are visible on the screen, use the "Print" link next to the map.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Kentucky Ecological Services Field Office
330 West Broadway, Suite 265
Frankfort, Kentucky 40601
(502) 695-0468

August 7, 2014

Ms. Deborah Henson
Cardno Tec
18 S. George Street, Suite 400
York, PA 17401

Re: FWS 2013-B-0627; Federal Bureau of Prisons; proposed federal penitentiary; located in Letcher County, Kentucky

Dear Ms. Henson:

Thank you for the opportunity to provide comments on the above-referenced project. The U.S. Fish and Wildlife Service (Service) has reviewed this proposed project and offers the following comments in accordance with the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) and the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 *et seq.*). This is not a concurrence letter. Please read carefully, as further consultation with the Service may be required.

In accordance with the provisions of the Fish and Wildlife Coordination Act, the Service has reviewed the project with regards to the effects the proposed actions may have on wetlands and/or other jurisdictional waters. We recommend that project plans be developed to avoid impacting wetland areas and/or streams, and reserve the right to review any required federal or state permits at the time of public notice issuance. The U.S. Army Corps of Engineers should be contacted to assist you in determining if wetlands or other jurisdictional waters are present or if a permit is required.

In accordance to section 7 of the ESA, the Service must evaluate the potential for all the direct, indirect, and cumulative effects of a proposed project on federally listed species. This includes effects of any "interrelated actions" that are part of a larger action and depend on the larger action for their justification and "interdependent actions" that have no independent utility apart from the action under consideration. Please include information about all of the potential impacts associated with the proposed project, including those from interrelated or interdependent actions (*e.g.*; utilities, etc.) and future actions that are reasonably certain to occur as a result of the proposed project.

In order to assist you in determining if the proposed project has the potential to impact protected species we have searched our records for occurrences of listed species within the vicinity of the proposed project. Based upon the information provided to us and according to our databases, we believe that the following federally listed species have the potential to occur within the project vicinity:

Group	Species	Common name	Legal* Status
Mammals	*Myotis sodalis*	Indiana bat	E
	Myotis grisescens	gray bat	E
	Myotis septentrionalis	northern long-eared bat	P
Fishes	*Etheostoma sagitta spilotum*	Kentucky arrow darter	C

* *Key to notations: E = Endangered, T = Threatened, P = Proposed, C = Candidate, CH = Critical Habitat*

We must advise you that collection records available to the Service may not be all-inclusive. Our database is a compilation of collection records made available by various individuals and resource agencies. This information is seldom based on comprehensive surveys of all potential habitats and thus does not necessarily provide conclusive evidence that protected species are present or absent at a specific locality.

Indiana bat

The entire state of Kentucky is within the range of the Indiana bat; (1) caves, rockshelters, and abandoned underground mines provide suitable wintering habitat for the Indiana bat; and (2) forested areas provide suitable summer roosting and foraging habitat for the Indiana bat. In order to address the concerns and be in compliance with the ESA, we have the following recommendations relative to potential direct and/or indirect effects as a result of impacts to the habitats listed above:

(1) During hibernation, the Indiana bat prefers limestone caves, sandstone rockshelters, and abandoned underground mines with stable temperatures of 39 to 46 degrees F and humidity above 74 percent but below saturation. Prior to hibernation, Indiana bats utilize the forest habitat up to five miles from the hibernacula to feed and roost until temperatures drop to a point that forces them into hibernation. This "swarming" period is dependent upon weather conditions and lasts from about September 15 to about November 15. This is a critical time for Indiana bats, since they are acquiring additional fat reserves and mating prior to hibernation.

Based on the presence of numerous caves, rock shelters, and underground mines in Kentucky, we believe that it is reasonable to assume that other caves, rock shelters, and/or abandoned underground mines may occur within the project area, and, if they occur, they could provide winter habitat for Indiana bats. Therefore, we recommend that the project proponent conduct a phase 1 winter hibernacula habitat assessment following the March 15, 2014 "Supplemental Indiana bat survey guidance for Kentucky." This assessment should identify any caves, rock shelters, and underground mines and assess their potential as suitable Indiana bat hibernacula. Depending on the results of the habitat assessment, subsequent bat presence/absence surveys may be necessary to determine if the species is using a feature as a hibernaculum. These presence/absence surveys must be conducted between September 1 and October 31 or April 1 and April 21 following the protocol found in the guidance document cited above.

(2) The Indiana bat utilizes a wide array of forested habitats, including riparian forests, bottomlands, and uplands for both summer foraging and roosting habitat. Indiana bats typically roost under exfoliating bark, in cavities of dead and live trees, and in snags (*i.e.*, dead trees or dead portions of live trees). Trees in excess of 16 inches diameter at breast

height (DBH) are considered optimal for maternity colony roosts, but trees in excess of 9 inches DBH appear to provide suitable maternity roosting habitat. Male Indiana bats have been observed roosting in trees as small as 5 inches DBH.

We recommend that the project proponent design or modify the proposed project to eliminate or reduce impacts to suitable Indiana bat habitat, thus avoiding impacts. A habitat assessment may useful in determining if suitable Indiana bat summer roosting or foraging habitat is present in the action area of the proposed project. If suitable habitat removal cannot be avoided, the following are the typical options available to address potential impacts to the species:

- The project proponent survey the project site to determine the presence or likely absence of Indiana bats within the project area in an effort to determine if potential effects are likely. A qualified biologist who holds the appropriate collection permits for the Indiana bat must undertake such surveys in accordance with our most current survey guidance. If any Indiana bats are identified, we would request written notification of such occurrence(s) and further coordination and consultation.

- The project proponent can request formal section 7 consultation through the lead federal action agency associated with the proposed project. To request formal consultation, the project proponent would need to submit a Biological Assessment that describes the action and evaluates the effects of the action on the listed species in the project area. After formal consultation is initiated, the Service has 135 days to prepare a Biological Opinion that analyzes the effects of the action on the listed species and recommends strategies to minimize those effects.

- The project proponent may provide the Service with additional information through the informal consultation process, prepared by a qualified biologist, that includes site-specific habitat information and a thorough effects analysis (direct, indirect, and cumulative) to support a "not likely to adversely affect" determination. The Service will review this and decide if there is enough supporting information to concur with the determination.

- The project proponent may choose to assume presence of the species in the project area and enter into a Conservation Memorandum of Agreement (MOA) with the Service to account for the incidental take of Indiana bats. By entering into a Conservation MOA with the Service, Cooperators gain flexibility with regard to the removal of suitable Indiana bat habitat. In exchange for this flexibility, the Cooperator provides recovery-focused conservation benefits to the Indiana bat through the implementation of minimization and mitigation measures that are described in the Indiana Bat Mitigation Guidance for the Commonwealth of Kentucky. For additional information about this option, please notify our office.

The Payne Gap / Lawson site is in potential Indiana bat habitat; all of the options listed above are appropriate for addressing potential impacts to the species at this site. Because the Roxana site is in known "P1/P2 swarming" habitat, we already know that the species is present in the proposed project area, and, therefore, further surveys are not necessary. Impacts to the species at the Roxana site should be addressed by using one of the last three bullet points listed above.

Gray bat

Gray bats roost, breed, rear young, and hibernate in caves year round. They migrate between summer and winter caves and will use transient or stopover caves along the way. Gray bats eat a variety of flying aquatic and terrestrial insects present along streams, rivers, and lakes. Low-flow streams produce an abundance of insects and are especially valuable to the gray bat as foraging habitat. For hibernation, the roost site must have an average temperature of 42 to 52 degrees F. Most of the caves used by gray bats for hibernation have deep vertical passages with large rooms that function as cold air traps. Summer caves must be warm, between 57 and 77 degrees F, or have small rooms or domes that can trap the body heat of roosting bats. Summer caves are normally located close to rivers or lakes where the bats feed. Gray bats have been known to fly as far as 12 miles from their colony to feed.

Because we have concerns relating to the gray bat on this project and due to the lack of occurrence information available on this species relative to the proposed project area, we have the following recommendations relative to gray bats.

- Based on the presence of numerous caves, rock shelters, and underground mines in Kentucky, we believe that it is reasonable to assume that other caves, rock shelters, and/or abandoned underground mines may occur within the project area, and, if they occur, they could provide winter/summer habitat for gray bats. Therefore, we would recommend that the project proponent survey the project area for caves, rock shelters, and underground mines. Additional evaluation and/or surveys may be necessary if suitable gray bat hibernacula and/or roosting habitat exists in the action area of the proposed project.

- Sediment Best Management Practices (BMPs) should be utilized and maintained to minimize siltation of the streams located within and in the vicinity of the project area, as these streams represent potential foraging habitat for the gray bat.

Northern long-eared bat

The northern long-eared bat was proposed for federal listing under the ESA on October 2, 2013. The Service has extended the deadline for the final determination to April 2, 2015. Both proposed project sites are located in "known summer" northern-long-eared bat habitat. During the summer, northern long-eared bats typically roost singly or in colonies in a wide-variety of forested habitats, where they seek shelter during daylight hours underneath bark or in cavities/crevices of both live trees and snags, including relatively small trees and snags that are less than 5 inches in diameter at breast height (DBH). Northern long-eared bats have also been documented roosting in man-made structures (i.e., buildings, barns, etc.) during the summer. According to current winter occurrence data, northern long-eared bats predominately winter in hibernacula that include caves, tunnels, and underground mine passages.

Although species proposed for listing are not afforded protection under the ESA, when a species is listed, the prohibitions against jeopardizing its continued existence and unauthorized take are effective immediately, **regardless of an action's stage of completion**. Therefore, to avoid significant project delays, we recommend that the project proponent evaluate and address potential impacts to northern long-eared bat summer habitat and winter habitat that is present in the action area of the proposed project.

Kentucky Arrow Darter

The Kentucky arrow darter is a rather large, brightly colored darter that is restricted to the upper Kentucky River basin in eastern Kentucky. The species' preferred habitat consists of pools or transitional areas between riffles and pools (runs and glides) in moderate to high gradient streams with bedrock, boulder, and cobble substrates. The species' habitat and range have been severely degraded and limited by water pollution from surface coal mining and gas-exploration activities; removal of riparian vegetation; stream channelization; increased siltation associated with poor mining, logging, and agricultural practices; and deforestation of watersheds. A habitat assessment and/or survey may be necessary to determine if impacts to these species are likely as a result of the proposed project.

As a federal candidate species, the Service sufficient information on the biological status and threats of the species to propose it as endangered or threatened under the ESA, but development of a proposed listing regulation is precluded by other higher priority listing activities. Candidate species receive no statutory protection under the ESA. The Service encourages cooperative conservation efforts for these species because they are, by definition, species that may warrant future protection under the ESA. Addressing the needs of Kentucky arrow darter before the regulatory requirements associated with a listed threatened or endangered species come into play, would allow future developers, landowners, and other entities greater management flexibility to stabilize or restore the species and its habitat for future projects. In addition, as such threats are reduced and populations are increased or stabilized, priority for listing can be shifted to those species in greatest need of the ESA's protective measures. Ideally, sufficient threats can be removed to eliminate the need for listing.

Presence/absence surveys would provide additional information regarding the likelihood that the proposed project would impact Kentucky arrow darter. Surveys would not be necessary if habitat assessments, especially specific conductivity measurements, supported that suitable habitat does not exist in the action area of the proposed project.

Thank you again for your request. Your concern for the protection of endangered and threatened species is greatly appreciated. If you have any questions regarding the information that we have provided, please contact Jessi Miller at (502) 695-0468 extension 104.

Sincerely,

Virgil Lee Andrews, Jr.
Field Supervisor

From: Miller, Jessica
To: Henson, Deborah A.
Subject: Re: Federal Bureau of Prisons Letcher County, KY EIS
Date: Thursday, September 11, 2014 4:46:09 PM
Attachments: image001.png

I think that looks good, Deb.

On Thu, Sep 11, 2014 at 4:26 PM, Henson, Deborah A. <Deborah.Henson@cardno-gs.com> wrote:

> Jessi,
>
> Thanks again for discussing the approach for Letcher County. The following is the approach I am going to discuss moving forward with BOP. If there are any discrepancies from our discussion, please let me know.
>
> 1) Conduct a Phase I survey of both sites. The results may not be ready in time for the Draft EIS; however, the Draft EIS will include your letter and the approach BOP is taking with the Phase I surveys. Upon completion of the Phase I surveys the results will be incorporated into the Final EIS.
>
> 2) Based on the findings of the Phase I survey, if additional surveys are required and a biological opinion is needed, this would be coordinated with you (USFWS) and formal Section 7 consultation would occur for the preferred alternative.
>
> 3) MOA for Indiana bat forested habitat removal would be done for the preferred alternative (and likely for the Northern long-eared bat when it is listed).
>
> If I missed something let me know,
>
> Thanks,
>
> Deb
>
> Deborah Henson
>
> PROJECT MANAGER
> CARDNO, GOVERNMENT SERVICES DIVISION
>
> Phone (+1) 717-547-6278 Fax (+1) 717-547-6357 Mobile (+1) 717-433-7550
> Address 145 Limekiln Road Suite 100, New Cumberland, PA 17070 USA
>
> **From:** Miller, Jessica [mailto:jessica_miller@fws.gov]

Sent: Thursday, September 11, 2014 3:45 PM
To: Henson, Deborah A.
Subject: Re: Federal Bureau of Prisons Letcher County, KY EIS

Hi Deb,

My responses to your questions are in your email text below. I hope this answers your questions. Please give me a call if anything doesn't make sense.

Jessi

On Wed, Sep 10, 2014 at 9:54 AM, Henson, Deborah A. <Deborah.Henson@cardno-gs.com> wrote:

Hi Jessi,

I hope all is well. I've discussed the attached letter with BOP to develop an approach and they have a few questions. I've also included some of the proposed approach.

1) I think they would like to move straight to developing an MOA for the Indiana Bat; however, they did want to clarify that they would only develop an MOA for the preferred alternative and that if they went straight to the MOA that no biological opinion would be necessary? They would only need to do an MOA for the preferred alternative. If they do an MOA to mitigate for forested habitat removal, they will not have to do formal consultation (biological opinion) to address effects to Indiana bat summer and swarming habitat. Depending on what other habitat is found in the project area (e.g., caves, mines, ect.), formal consultation may still be necessary if impacts to listed species cannot be avoided or minimized to the point where they are insignificant/discountable. The EIS would discuss the potential habitat at Payne Gap and the known P1/P2 swarming at Roxana, as well as the development of the MOA for the preferred alternative. They will want to wait until the preferred alternative is decided before entering into an MOA. They can proposed the MOA process in their documentation and refer to the documents that support our process on this webpage: http://www.fws.gov/frankfort/indiana_bat_procedures.html. The northern long-eared bat may be listed before this project is started.
Our office is finalizing the process to incorporate that species in the process that we have established for the Indiana bat.

2) We will have someone from the qualified KY Bat Surveyors List walk the sites to identify habitat for the Gray bat and the Northern long-eared bat. With regard to the Gray bat if habitat is found BOP would then coordinate with you to determine the next steps. If habitat is found at one, or both sites and further surveys are required could those surveys be done solely for the preferred alternative? I think this is up to you and your process. Could the results of these surveys be used as deciding factors of which alternative to use? With regard to the Northern long-eared bat BOP would document in the EIS qualitatively that habitat is or is not present based on the findings of the surveyor and if there would be any impacts to the habitat.

3) Conductivity for the streams on both sites was collected and will be documented in the EIS (I don't believe there were any streams that would be suitable habitat for the Kentucky Arrow Darter).

Thanks for looking over these questions and anticipated approach, if you have any questions or would like to discuss I can give you a call at your convenience.

Thanks,

Deb

Deborah Henson

PROJECT MANAGER
CARDNO, GOVERNMENT SERVICES DIVISION

Cardno
Shaping the Future

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--

Jessica Blackwood Miller

Fish & Wildlife Biologist

Kentucky Field Office

U.S. Fish & Wildlife Service

330 W. Broadway, Suite 265

Frankfort, KY 40601

Ph: (502) 695-0468 ext. 104

Fax: (502) 695-1024

U.S. Department of Justice

Federal Bureau of Prisons

Washington, DC 20534

January 16, 2015

Ms. Jessica Miller
United States Fish and Wildlife Service
Kentucky Field Office
330 W Broadway, Suite 265
Frankfort, KY 40601

Subject: Phase I Indiana and Gray Bat Survey for the Environmental Impact Statement for new Federal Bureau of Prisons United States Penitentiary and Federal Prison Camp in Letcher County, Kentucky

Dear Ms. Miller:

Please find attached one copy of the Desktop Analysis and Habitat Survey for the Indiana Bat (*Myotis sodalis)*, Gray Bat (*Myotis grisescens*), and Northern Long-eared Bat (*Myotis septentrionalis*) at two Sites for a Proposed Federal Correctional Facility in Letcher County, Kentucky for your review. The report has been prepared in accordance with your letter dated August 7, 2014. Please contact me with any questions at 202-514-6470 or at igaston@bop.gov.

Sincerely,

Issac Gaston, Site Selection Specialist
Capacity Planning and Construction Branch

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Kentucky Ecological Services Field Office
330 West Broadway, Suite 265
Frankfort, Kentucky 40601
(502) 695-0468

February 4, 2015

Ms. Deborah Henson
Cardno Tec
18 S. George Street, Suite 400
York, PA 17401

Re: FWS 2013-B-0627; Federal Bureau of Prisons; proposed federal penitentiary; located in Letcher County, Kentucky

Dear Ms. Henson:

The U.S. Fish and Wildlife Service (Service) has reviewed your January 16, 2015 correspondence and the January 2, 2015 bat habitat assessment prepared by Copperhead Environmental Consulting, Inc. (Copperhead) regarding the above-referenced project. The Service offers the following comments in accordance with the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*).

Copperhead reviewed printed resources and GIS data and conducted a pedestrian field survey to identify and investigate caves, rockshelters, and mine adits in and around the two sites, Roxana and Payne Gap, being considered for the proposed project. No potential bat winter habitat was identified at the Roxana site. Numerous underground mines were encountered at the Payne Gap site. Most were closed; seven locations were further investigated in phase I habitat assessments. Of these, five were identified as suitable winter habitat for federally listed bat species. One feature contained a torpid Indiana bat (*Myotis sodalis*) at its entrance. To further evaluate the impacts of the proposed project at the Payne Gap site, spring or fall portal surveys should be conducted on all suitable mine portals that may be impacted directly or indirectly by the proposed project. Spring portal surveys must be conducted between April 1 and April 21 and fall portal surveys between September 1 and October 31. These surveys should be conducted by permitted biologists and should follow the Service's current survey guidance.

Thank you again for your request. Your concern for the protection of endangered and threatened species is greatly appreciated. If you have any questions regarding the information that we have provided, please contact Jessi Miller at (502) 695-0468 extension 104.

Sincerely,

Virgil Lee Andrews, Jr.
Field Supervisor

From: Deborah Henson
To: "Miller, Jessica"
Subject: RE: FW: Letcher County Indiana and Northern Long-Eared Bat Mitigation
Date: Tuesday, June 30, 2015 1:54:00 PM

Thanks Jessi. I will make sure that is clear in the mitigation section of the FEIS.

Deborah Henson
PROJECT MANAGER
GOVERNMENT SERVICES DIVISION
CARDNO

Office (+1) 717-547-6278 Mobile (+1) 717-433-7550 Fax (+1) 717-547-6357
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From: Miller, Jessica [mailto:jessica_miller@fws.gov]
Sent: Tuesday, June 30, 2015 1:49 PM
To: Deborah Henson
Subject: Re: FW: Letcher County Indiana and Northern Long-Eared Bat Mitigation

That looks good, Deb. The only other thing that comes to mind is that tree removal during June and July is not covered under the CMOA.

Jessi

On Fri, Jun 26, 2015 at 9:22 AM, Deborah Henson <Deborah.Henson@cardno-gs.com> wrote:

Hi Jessi,

I just wanted to follow up on the below email and make sure there is nothing else you need prior to us moving forward with publication of the Final EIS?

Thanks,
Deb

Deborah Henson
PROJECT MANAGER
GOVERNMENT SERVICES DIVISION
CARDNO

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From: Henson, Deborah
Sent: Friday, June 12, 2015 9:32 AM
To: Jessica Miller (jessica_miller@fws.gov)
Cc: igaston@bop.gov
Subject: Letcher County Indiana and Northern Long-Eared Bat Mitigation

Good morning Jessi,
Just a follow up to our May 20, 2015 meeting to discuss mitigation for the Indiana and northern long-eared bat at the Roxana site. Below is the summary of that meeting and subsequent discussions we have had regarding the Roxana site and mitigation.

1) During the May 20 meeting we discussed that approximately 105 acres of summer habitat for the Indian bat and northern long-eared bat would be impacted at the Roxana site. To be covered under the MOA the impacts must be under 100 acres. Subsequently, the impact areas were re-evaluated and impacts will be approximately 92.5 acres. Based on coordination with you on June 11, 2015 you reviewed the map detailing the impact areas and agree that based on this impact assessment, the Roxana site can be covered through the Conservation Memorandum Agreement (CMOA) following the guidance provided in the USFWS's April 2015 Conservation Strategy for Forest Dwelling Bats in the Commonwealth of Kentucky (Conservation Strategy).
2) The CMOA will be put in place between the USFWS and the Bureau when construction funds become available. Mitigation will be in place prior to any disturbance to the site would occur.
3) Mitigation identified in the CMOA would include payment to the Kentucky Natural Lands Trust which would be placed in the Imperiled Bat Conservation Fund. The mitigation payment would be used to acquire, protect, and manage bat habitat in Kentucky. Based on 2015 rates mitigation would range from approximately $930,00.00 to $1.3 million. Mitigation payment will depend on the time of year the habitat is impacted and rates may change prior to construction funding becoming available.
4) Once construction funding is available, the Bureau will meet with USFWS to ensure the CMOA is in place and mitigation requirements are fulfilled prior to any disturbance at the site (excavation, grading, timber removal, etc.).
5) Sediment Best Management Practices would be implemented to minimize sediment being carried to streams on site which may be potential foraging habitat for the gray bat.
6) At this time, based on the Preferred Alternative (Roxana), no formal Section 7 consultation is required for the Letcher County EIS project. Should anything change during the development of the final design site plans, the Bureau will notify USFWS to discuss any changes and how they may effect additional studies and mitigation.

Please let me know if you concur with this summary or have any additions or questions.

Thanks,
Deb

Deborah Henson
PROJECT MANAGER
GOVERNMENT SERVICES DIVISION

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--

Jessica Blackwood Miller
Fish & Wildlife Biologist
Kentucky Field Office
U.S. Fish & Wildlife Service
330 W. Broadway, Suite 265
Frankfort, KY 40601
Ph: (502) 695-0468 ext. 104
Fax: (502) 695-1024

From: Miller, Jessica
To: Issac Gaston
Subject: Re:
Date: Friday, July 15, 2016 3:09:43 PM

Mr. Gaston,

The project site is in known Indiana bat fall swarming habitat and known summer northern long-eared bat habitat. In the absence of known Indiana bat summer records at the site, we would assume presence based on the presence of suitable Indiana bat summer habitat on the site. Because of the known records that we have for the species in that area, conducting a summer presence/absence survey in the summer would only provide additional information about whether or not Indiana bats use the site in the summer. We typically do not recommend bat presence/absence surveys (mist net or acoustical) in areas that we already consider known bat habitat because there is often limited or no benefit to the project proponent to do so. For this project, survey results that support probable absence of the Indiana bat during the summer would only benefit BOP if BOP chooses to address potential impacts to the northern long-eared bat with the 4(d) rule rather than mitigate for northern long-eared bat forested habitat loss. In this scenario, the monetary contribution for the mitigation (as determined by the guidance in the Conservation Strategy) would be reduced some amount (1/3 or less, depending on the time of year of the proposed tree removal). However, because of the potential legal uncertainty surrounding the 4(d) rule and the limited timeframe for which survey results are valid (a little less than 2 years), this may not be the most beneficial scenario for BOP for this project. If BOP chooses to address effects to the northern long-eared bat through compensatory mitigation with the Indiana bat, the amount of the monetary contribution would be the same regardless of the results of a summer presence/absence survey for Indiana bats. This is because the mitigation ratio would already factor in summer usage of that habitat for the northern long-eared bat at the same ratio for the Indiana bat. Our process does not require accounting for both species on the same area, and since the ratio would be the same for both species, the mitigation amount would not be different.

As far as winter habitat is concerned, BOP has the option to conduct habitat assessments for winter habitat within a ½ mile buffer of the project footprint or assume presence of Indiana bat and northern long-eared bat suitable winter habitat in this area. If presence of winter habitat in this area is assumed, the BA would need to evaluate the potential for indirect impacts to the winter habitat. There may be the need to implement avoidance and minimization measures to reduce indirect effects. An example of such measures could be to restrict blasting to certain times of year to avoid disturbing hibernating bats that mat be in the area and affected by such actions.

I hope this all makes sense. Please let me know if you have any other questions. I can also provide some mitigation contribution amount estimates using the different scenarios discussed above, if that would be helpful for making a decision.

Jessi

On Fri, Jul 15, 2016 at 12:20 PM, Issac Gaston <IGaston@bop.gov> wrote:

> Hello Ms. Miller,
>
> Based on your conversation this morning, I wanted to make sure my understanding of our conversation was correct. You mentioned that a "Mis-netted Bat Survey and " An Absence or Presence Bat Study" is not

required for the Letcher County (Roxana) site.

Issac J. Gaston
Federal Bureau of Prisons
320 First Street, NW
Washington, DC 20534
202-514-6470

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>>> "Miller, Jessica" <jessica_miller@fws.gov> 7/14/2016 7:08 AM >>>
Mr. Gaston,

I just received your message this morning. I was out of the office and apparently did not correctly set my out of office notice. I am in a meeting all day today, but will return your call tomorrow.

Jessi

--
Jessica Blackwood Miller
Fish & Wildlife Biologist
Kentucky Field Office
U.S. Fish & Wildlife Service
330 W. Broadway, Suite 265
Frankfort, KY 40601
Ph: (502) 695-0468 ext. 104
Fax: (502) 695-1024

Price Sewell

From: Miller, Jessica <jessica_miller@fws.gov>
Sent: Monday, October 31, 2016 8:53 AM
To: Price Sewell
Cc: Lori Thursby
Subject: Re: 517 Bat Records in proximity to the proposed Letcher County Penitentiary.

Price,

Sorry for the delay on getting this to you, Price. I did not understand what you were asking for. Unfortunately, we cannot provide the exact locations, but here is what I can provide:

MYSO P1/P2 hibernacula ~7.2 mi. from Roxana site
MYSE 4 maternity records ~ 0.4 mi., 2.6 mi., 2.6 mi., 2.8 mi.
MYSE non-maternity record ~ 3.4 mi.
MYSE 2 non-specified records ~2.5 mi., 2.8 mi.

To get distances, I used a GPS coordinate near the estimated center of the Roxana site. The records I listed above are only those for which the buffer that we assign overlaps, or comes very close to that estimated center point of the Roxana site.

Please let me know if there is any additional information that I can provide to you.

Jessi

On Thu, Oct 27, 2016 at 4:16 PM, Price Sewell <psewell@copperheadconsulting.com> wrote:

> Jessi,
>
> During the October 4th conference call, you said you might be able to provide information on listed bat records or bat reports in the vicinity of the project. Do you need anything from Copperhead/Cardno to provide the information (mapping or lat/long)?
>
> If we could have the location of records that would be great, or if the Service cannot disseminate that, distance from the project location would suffice. Please include type of record (maternity roost, hibernacula, maternity capture, non-maternity capture, etc).
>
> Thanks,
>
> Price

Price Sewell

Biologist

Copperhead Environmental Consulting, Inc.

11641 Richmond Rd.

P.O. Box 73

Paint Lick, KY 40461

859.925.9012 - Office

859.925.9816 - Fax

859.338.7605 - Mobile

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--

Jessica Blackwood Miller
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NOTE: This email correspondence and any attachments to and from this sender is subject to the Freedom of Information Act (FOIA) and may be disclosed to third parties.

Price Sewell

From: Price Sewell
Sent: Monday, January 2, 2017 7:40 PM
To: Price Sewell
Subject: FW: 517 Bat Records in proximity to the proposed Letcher County Penitentiary.

From: Miller, Jessica [mailto:jessica_miller@fws.gov]
Sent: Monday, November 7, 2016 1:01 PM
To: Price Sewell <psewell@copperheadconsulting.com>
Cc: Lori Thursby <Lori.Thursby@cardno-gs.com>
Subject: Re: 517 Bat Records in proximity to the proposed Letcher County Penitentiary.

Price,

The buffer sizes for IN bat and NLEB habitat can be found in the "explanations of terms" in our Conservation Strategy: https://www.fws.gov/frankfort/pdf/20160601%20Revised%20FDBatConservStrategy.pdf

For gray bat, the nearest gray bat record is almost 9 miles away. It was a male.

Jessi

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Kentucky Ecological Services Field Office
330 West Broadway, Suite 265
Frankfort, Kentucky 40601
(502) 695-0468

December 15, 2016

Mr. Issac Gaston
Prison Site Specialist
U.S. Department of Justice
Federal Bureau of Prisons
320 First Street, NW
Washington, DC 20534

RE: FWS 2013-B-0627; Federal Bureau of Prisons; Proposed U.S. Penitentiary and Federal Prison Camp; Letcher County, Kentucky

Dear Mr. Gaston:

The U.S. Fish and Wildlife Service (Service) received the draft Bat Habitat Assessment for the above-referenced project attached to a November 29, 2016 letter from Ms. Lori Thursby of Cardno, consultant on behalf of the Federal Bureau of Prisons. The Service has reviewed this document and offers the following comments in accordance with the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*). This is not a concurrence letter. Please read carefully, as further consultation with the Service may be required.

The habitat assessment was conducted by Copperhead Environmental Consulting, Inc. (Copperhead) on September 6-9, 2016 and supplements a previously-submitted habitat assessment conducted by Copperhead in December 2014. Between the two habitat assessments, an approximate 505-acre area was assessed in and around the proposed footprint of the project. Based on the project information available to us, we believe that the habitat assessment was adequate in identifying potential habitat for these species.

Copperhead found one feature that represents potential winter habitat for gray bats, Indiana bats, and/or northern long-eared bats. Based on the information provided to us at this time, we would assume that this feature is being used by these species as winter hibernacula. According to the report, this feature would not be directly impacted by the construction of the project. Potential indirect impacts to these species as a result of the construction activities, including the loss of forested habitat in proximity to the hibernacula, and the operation of the prison facility should be evaluated.

Thank you for the opportunity to review this draft habitat assessment. Your concern for the protection of endangered and threatened species is greatly appreciated. If you have any questions regarding the information that we have provided, please contact Jessica Blackwood Miller at (502) 695-0468 extension 104 or jessica_miller@fws.gov.

Sincerely,

Virgil Lee Andrews, Jr.
Field Supervisor

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Kentucky Ecological Services Field Office
330 West Broadway, Suite 265
Frankfort, Kentucky 40601
(502) 695-0468

July 27, 2017

Mr. Issac Gaston
U.S. Department of Justice
Federal Bureau of Prisons
Capacity Planning and Construction Branch
320 First Street, NW
Washington, DC 20534

Subject: FWS 04EK1000-2016-F-0023; 2013-B-0627; Federal Bureau of Prisons; Proposed U.S. Penitentiary and Federal Prison Camp; Letcher County, Kentucky

Dear Mr. Gaston:

This letter transmits the enclosed biological opinion (BO) of the U.S. Fish and Wildlife Service (Service) for the Federal Bureau of Prisons' (Bureau) proposed construction and operation of a proposed U.S. Penitentiary and Federal Prison Camp in Letcher County, Kentucky (the Action). The Service received on May 2, 2017, your letter, dated May 1, 2017, requesting formal consultation for the Action described in the "Final Biological Assessment: Potential Effects on Species under the Jurisdiction of the U.S. Fish and Wildlife Service from Construction and Operation of a Proposed U.S. Penitentiary and Federal Prison Camp Letcher County, Kentucky." You determined that the Action is likely to adversely affect the Indiana bat (*Myotis sodalis*) and the northern long-eared bat (*Myotis septentrionalis*).

You also determined that the Action is not likely to adversely affect the gray bat (*Myotis grisescens*) and would have "no effect" on the Kentucky arrow dater (*Etheostoma sagitta spilotum*). The Service previously concurred with your determination that the Action is not likely to adversely affect the gray bat by letter dated May 10, 2017. The Bureau does not need concurrence from the Service for "no effect" determinations.

The enclosed BO answers your request for formal consultation, and concludes that the Action is not likely to jeopardize the continued existence of the Indiana bat and the northern long-eared bat. These findings fulfill the requirements applicable to the Action for completing consultation under §7(a)(2) of the Endangered Species Act (ESA) of 1973, as amended.

The BO includes an Incidental Take Statement that requires the Bureau to implement reasonable and prudent measures that the Service considers necessary or appropriate to minimize the impacts of anticipated taking on the listed wildlife species. Incidental taking of listed wildlife

species that is compliance with the terms and conditions of this statement is exempted from the prohibitions against taking under the ESA.

Reinitiating consultation is required if the Bureau retains discretionary involvement or control over the Action (or is authorized by law) when:

a. the amount or extent of incidental take is exceeded;
b. new information reveals that the Action may affect listed species or designated critical habitat in a manner or to an extent not considered in this BO;
c. the Action is modified in a manner that causes effects to listed species or designated critical habitat not considered in this BO; or
d. a new species is listed or critical habitat designated that the Action may affect.

A complete administrative record of this consultation is on file in the Service's Kentucky Field Office. If you have any questions about the BO, please contact Jessica Blackwood Miller by phone at 502-695-0468 x104 or by email at jessica_miller@fws.gov.

Sincerely,

Virgil Lee Andrews, Jr.
Field Supervisor

Biological Opinion

Federal Bureau of Prisons' Proposed Construction and Operation of a U.S. Penitentiary and Federal Prison Camp in Letcher County, Kentucky

FWS Log #: 04EK1000-2016-F-0023

Prepared by:

U.S. Fish and Wildlife Service
Kentucky Field Office
330 West Broadway, Room 265
Frankfort, Kentucky 40601

Virgil Lee Andrews, Jr.
Field Supervisor

7/27/17
Date

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EXECUTIVE SUMMARY

This Endangered Species Act (ESA) Biological Opinion (BO) of the U.S. Fish and Wildlife Service (Service) addresses the Federal Bureau of Prisons' (Bureau) proposed construction and operation of a U.S. Penitentiary and Federal Prison Camp on an approximately 231.1-hectare (570-acre) property near Roxana, in Letcher County, Kentucky (the Action). The Bureau determined that the Action is likely to adversely affect the Indiana bat (*Myotis sodalis*) and the northern long-eared bat (*Myotis septentrionalis*) and requested formal consultation with the Service. The BO concludes that the Action is not likely to jeopardize the continued existence of these species, and is not likely to destroy or adversely modify designated critical habitat. This conclusion fulfills the requirements applicable to the Action for completing consultation under §7(a)(2) of the ESA of 1973, as amended, with respect to these species.

The Bureau also determined that the Action is not likely to adversely affect the gray bat (*Myotis grisescens*) and requested Service concurrence. The Service concurs with these findings. We provided our basis for this concurrence by letter dated May 10, 2017. This concurrence fulfills the requirements applicable to the Action for completing consultation with respect to this species. The Bureau also determined that the Action would have "no effect" on the Kentucky arrow darter (*Etheostoma sagitta spilotum*). Federal action agencies do not need concurrence from the Service for "no effect" determinations.

The Action Area is defined as the area within a 4.0 km (2.5 mi) radius from the approximate center of the proposed facilities. The Action Area includes the 231.1-hectare (570-acre) property proposed for the facility. Of these 231.1 hectares (570 acres), 73 hectares (180.5 acres) are within the clearing and grading limits. The remaining 157.6 hectares (389.5 acres) will remain undisturbed. The Action includes constructing a U.S. Penitentiary, a Federal Prison Camp, a central utility plant, a training center with an outdoor firing range and staff training building, a warehouse, a garage/landscape building, access roads, and parking areas. Construction of the facility would take place during a 4-5 year time frame. Once constructed, the facility would continue in operation indefinitely.

As part of the Action, the Bureau proposes to implement the following conservation measures to minimize the effects of the take:

- Retain 157.6 hectares (389.5 acres), 95.4 forested hectares (235.8 acres), of the 231.1-hectare (570-acre) property as undisturbed buffer to the facility.
- Contribute to the Imperiled Bat Conservation Fund (IBCF) as compensatory mitigation for the adverse effects on Indiana bats and northern long-eared bats that will result from the permanent loss and modification of forested habitat.

- Develop an erosion and sediment control plan detailing best management practices (BMPs) to be implemented during construction and submit the plan to the Kentucky Division of Water for approval.
- Implement the approved erosion and sediment control plan.
- Avoid tree removal during the months of June and July.
- Avoid blasting from November 15 through March 31.
- Conduct all construction activities occurring from April 15 – October 31 in suitable Indiana bat and/or northern long-eared bat habitat during daylight hours.
- Require contractors to inspect vehicles and equipment to ensure that visible plant and seed material has been removed prior to entering the construction area.
- Aim construction lighting toward construction and away from forested habitat.
- Install lights exterior lights with full cutoff light fixtures (which do not emit direct uplight) for operational activities at the facility.
- Fence a feature that was identified as a potential hibernaculum and install warning signs around the area to prevent direct disturbance.

Indiana bats and northern long-eared bats hibernate in caves and cave-like structures during the winter. After emergence, they forage around hibernacula for a few days to weeks before migrating to a summer area. During the summer they roost in trees during the day and forage on insects at night. Indiana bats often forage along riparian corridors and forested edges, and northern long-eared bats typically use forest interiors. Reproductive females roost in maternity colonies. Both species show high site fidelity to summer habitat. Non-volant pups are present in June and July. In the fall, individuals swarm around hibernacula for several weeks where they mate and build up fat reserves for hibernation.

The Action Area is within the 16.1 km (10-mile) swarming range of the Line Fork Cave system that is used by Indiana bats during fall swarming. There are no documented hibernacula in the Action Area. Field assessments revealed one feature, a crack in a small rock shelter, which could potentially provide winter habitat for Indiana bats and northern long-eared bats. This feature was not surveyed for presence of the species and, for the purposes of our evaluation, we are assuming it is used by Indiana bats and northern long-eared bats as a hibernaculum. The surrounding properties could not be assessed in the field; we are assuming that there is one additional hibernaculum located just off of the property.

The Action Area contains forested habitat suitable for Indiana bats and northern long-eared bats as roosting, foraging, and commuting habitat. This includes 48.8 hectares (120.6 acres) of forested habitat at the site of the proposed facility that will be removed by the Action. The nearest known hibernacula are the Line Fork complex approximately 8.9 km (5.5 mi) to the southeast. In the absence of recent summer surveys for the species, we are assuming that there is

an Indiana bat maternity colony and male Indiana bats roosting near the center of the proposed clearing and grading limits and that these individuals use habitat in the clearing and grading limits for roosting, foraging, and commuting. There are six summer records of northern long-eared bats within 4.8 km (3-mi) of the proposed clearing and grading limits. We are assuming that each of these represents a maternity colony and male bats, and that these individuals use habitat in the clearing and grading limits for roosting, foraging, and commuting.

Based on our assumptions and our knowledge of the biology of the species we assume that the following numbers of individual Indiana bats and northern long-eared bats are using the Action Area during the specified timeframes:

	Indiana bats	**Northern long-eared bats**
Hibernation (*Nov. 15 – Mar. 31*)	24	10
Spring Staging (*Apr. 1 – May 14*)	24	10
Summer (*Apr. 1 – Aug. 15*)	270	810
Fall Swarming (*Aug. 16 – Nov. 14*)	148	10

We identified several stressors resulting from the proposed Action and evaluated their effects on the Indiana bat and the northern long-eared bat. We concluded that the following stressors would have insignificant and/or discountable effects on the species: stream sedimentation, hazardous material spills during construction and/or operation of the facility, noise/vibrations from blasting, noise/vibrations from other construction activities, increased human presence during construction and during facility operation, traffic, and collisions with vehicles. We identified and evaluated several stressors that we concluded will have significant adverse effects on the Indiana bat and the northern long-eared bat: strikes from equipment or trees, removal of occupied roost trees, loss of forested habitat on the landscape, night lighting during construction and facility operation, and noise from small arms fire.

The duration of the effects from the specific stressors will vary. The effects from strikes from equipment or trees, removal of occupied roost trees, and night lighting during construction, would be temporary during the 4-5 year construction period and the following year. The loss of forested habitat on the landscape and night lighting during facility operation would be permanent, but we expect Indiana bats and northern long-eared bats to adapt their behavior to the altered landscape. The effects of noise from small arms fire will occur intermittently in perpetuity.

We assume that, as a result of the Action, some of the Indiana bats and northern long-eared bats will experience harm, some will experience harassment, and some will experience both harm and harassment. We cannot determine how many will experience each of these effects. We expect most of the effects to be in the form of harassment and not result in mortality. We estimate that the Action would result in the take of 418 Indiana bats and 810 northern long-eared bats.

The BO includes an Incidental Take Statement that requires the Bureau to implement reasonable and prudent measures that the Service considers necessary or appropriate to minimize the impacts of anticipated taking on the listed species. Incidental taking of listed species that is in compliance with the terms and conditions of this statement is exempted from the prohibitions against taking under the ESA.

In the Conservation Recommendations section, the BO outlines voluntary actions that are relevant to the conservation of the listed species addressed in this BO and are consistent with the authorities of the Bureau.

Reinitiating consultation is required if the Bureau retains discretionary involvement or control over the Action (or is authorized by law) when:

(a) the amount or extent of incidental take is exceeded;
(b) new information reveals that the Action may affect listed species or designated critical habitat in a manner or to an extent not considered in this BO;
(c) the Action is modified in a manner that causes effects to listed species or designated critical habitat not considered in this BO; or
(d) a new species is listed or critical habitat designated that the Action may affect.

CONSULTATION HISTORY

This section lists key events and correspondence during consultation. A complete administrative record of this consultation is on file at the U.S. Fish and Wildlife Service's Kentucky Field Office (KFO).

February 28, 2017	The Bureau of Prisons (Bureau) provided the KFO with a draft Biological Assessment (BA).
March 21, 2017	The KFO provided the Bureau with comments on the draft BA.
May 1, 2017	The Bureau requested initiation of formal consultation with the Service and provided a final BA.
May 10, 2017	The KFO notified the Bureau that the submitted BA contained sufficient information to initiate formal consultation, and formal consultation was initiated.
June 5, 2017	The Bureau sent an email to the Service regarding the timing of the mitigation contribution (Appendix A).
July 5, 2017	The KFO provided the Bureau with a draft Biological Opinion (BO).
July 21, 2017	The Bureau provided the KFO with comments on the draft BO.
July 27, 2017	The KFO issued the final BO.

BIOLOGICAL OPINION

A Biological Opinion (BO) is the document that states the opinion of the U.S. Fish and Wildlife Service (Service) under the Endangered Species Act of 1973, as amended (ESA), as to whether a Federal action is likely to:

a) jeopardize the continued existence of species listed as endangered or threatened, or
b) result in the destruction or adverse modification of designated critical habitat.

The Federal action addressed in this BO is the U.S. Department of Justice Federal Bureau of Prison's (Bureau) proposed construction and operation of a U.S. Penitentiary (USP) and Federal Prison Camp (FPC) in Letcher County, Kentucky (the Action). This BO considers the effects of the Action on the Indiana bat (*Myotis sodalis*) and the northern long-eared bat (*Myotis septentrionalis*). The Action does not affect designated critical habitat; therefore, this BO does not further address critical habitat.

In the letter, dated May 1, 2017, accompanying the BA, the Bureau made effects determinations for the gray bat (*Myotis grisescens*) and the Kentucky arrow dater (*Etheostoma sagitta spilotum*). The Service concurred with the Bureau's determination that the Action is not likely to adversely affect the gray bat in a letter dated May 10, 2017, so this species is not further addressed in this BO. In addition, the Bureau determined that the Action would have "no effect" on the Kentucky arrow darter. Federal action agencies do not need concurrence from the Service for "no effect" determinations. Therefore, we have no further comments regarding the Kentucky arrow darter.

A BO evaluates the effects of a Federal action, along with those resulting from interrelated and interdependent actions and non-federal actions unrelated to the proposed Action (cumulative effects), relative to the status of listed species and the status of designated critical habitat. A Service opinion that concludes a proposed Federal action is *not* likely to jeopardize species and is *not* likely to destroy or adversely modify critical habitat fulfills the Federal agency's responsibilities under §7(a)(2) of the ESA of 1973, as amended.

"*Jeopardize the continued existence*" means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR §402.02).

This BO uses hierarchical numeric section headings. Primary (level-1) sections are labeled sequentially with a single digit (e.g., 1. PROPOSED ACTION). Secondary (level-2) sections within each primary section are labeled with two digits (e.g., 1.1. Action Area), and so on for level-3 sections. The basis of our opinion for the Indiana bat and the basis for our opinion for the

northern long-eared bat are contained in separate level-1 sections that address the status, baseline, effects of the Action, cumulative effects, and conclusion relative to each species.

1. PROPOSED ACTION

A BO evaluates the effects of a proposed Action. For purposes of consultation under ESA §7, the effects of a Federal action on listed species or critical habitat include the direct and indirect effects caused by the Action, plus the effects caused by interrelated or interdependent actions. "Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration" (50 CFR §402.02).

The Bureau's proposed Action is to construct and operate a USP and a FPC near Roxana in Letcher County, Kentucky.

1.1. Action Area

For purposes of consultation under ESA §7, the Action Area is defined as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action" (50 CFR §402.02). The "Action Area" for this consultation encompasses a 4.0 km (2.5 mi) radius from the approximate center of the proposed facilities (Fig. 1). The Action Area is defined in this manner because it represents the area that an Indiana bat maternity colony would be expected to use, if the maternity colony was centered on the site. Centering the assumed maternity colony in this way means that the entire project site is considered, for consultation purposes, known habitat for the Indiana bat and that the colony's home range and behaviors would be centered in the area where construction and operation of the facility will occur. This helps ensure that our evaluation does not underestimate likely potential effects on the Indiana bat, which could happen if only a portion of the site was considered known habitat.

Similarly, the 4.0 km (2.5 mi) radius would include the area that a northern long-eared bat maternity colony would be expected to use. Northern long-eared bat maternity colonies typically have a smaller home range than this (Fig. 2), so assuming that this larger area is known habitat would also help ensure that our evaluation does not underestimate impacts to the species.

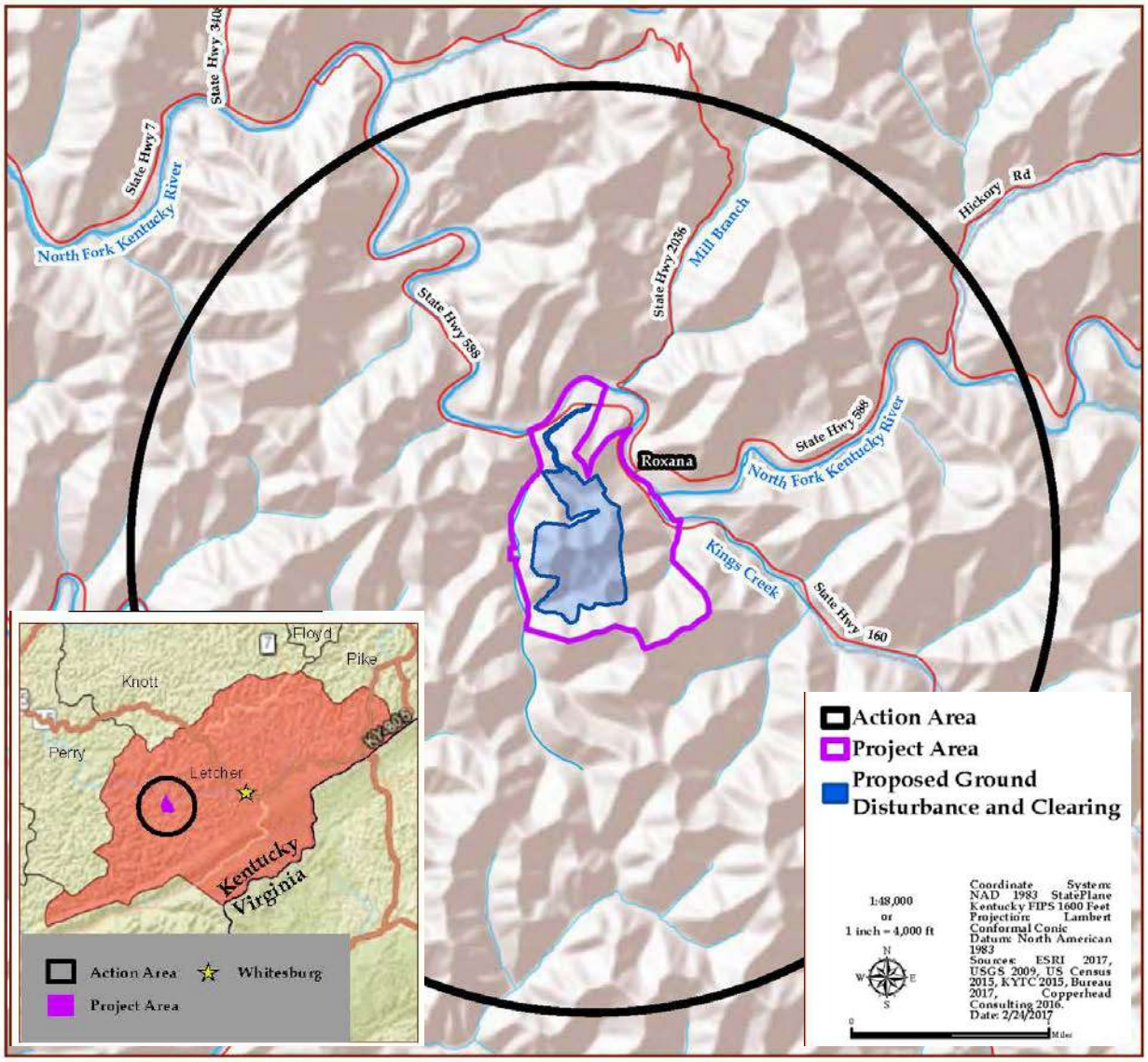

Figure 1. The Action Area of the project (Bureau 2017b).

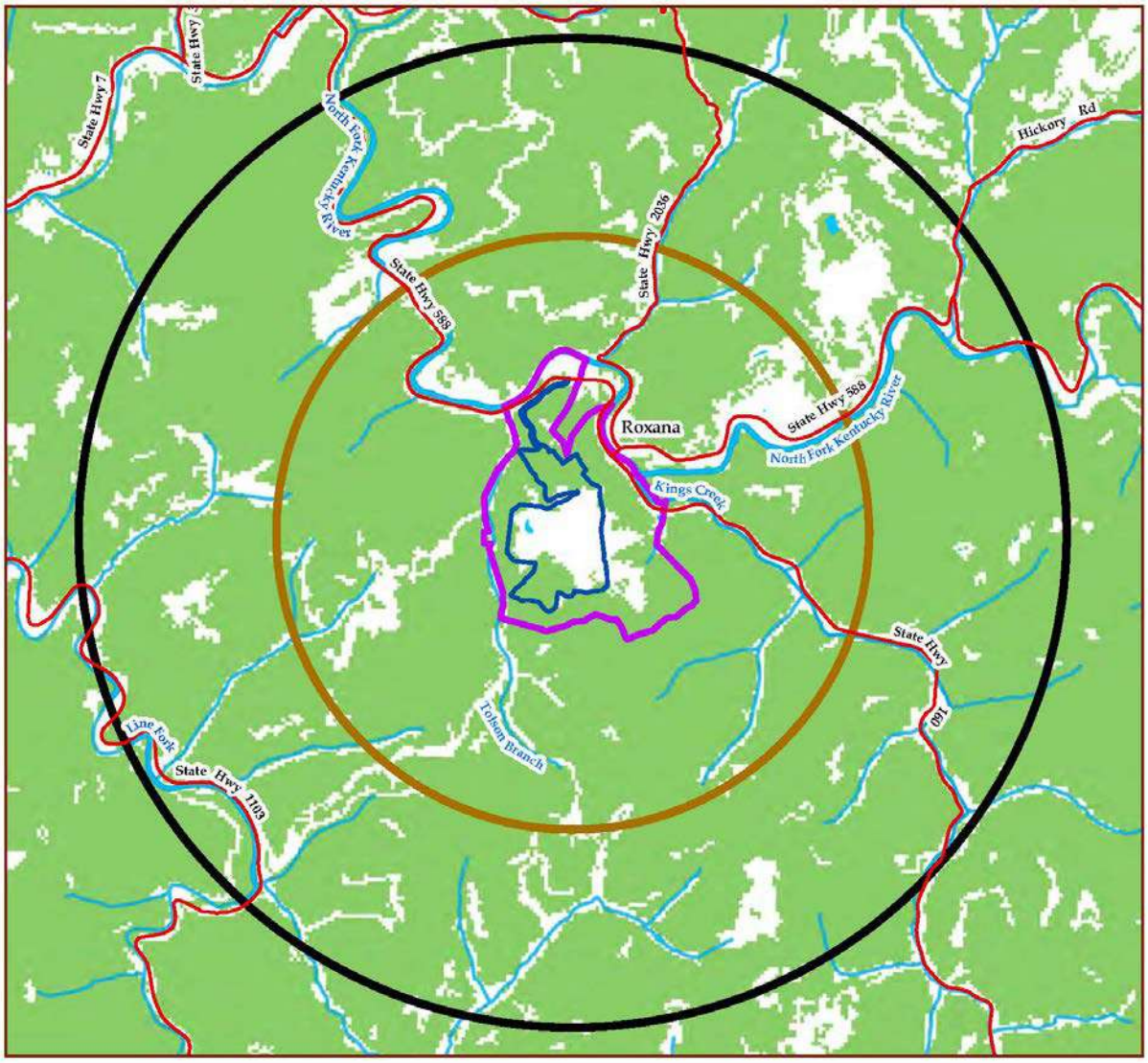

Figure 2. Forested habitat in a 2.4-km (1.5-mi) buffer and a 4-km (2.5-mi) buffer from the center of the proposed clearing limits (Bureau 2017b).

1.2. **Land Acquisition**

Prior to construction, the Bureau would acquire an approximate 231.1-hectare (570-acre) property near Roxana for the proposed facility (Fig. 1). This BO refers to this area as the "property;" this is the same area referred to as the "project area" in the BA and in figures from the BA included in this BO. Of that property, 157.6 hectares (389.5 acres) would not be disturbed and would remain as a buffer to the facility. Of that buffer, 95.4 hectares (235.8 acres) are currently forested.

1.3. **Compensatory Mitigation**

As a conservation measure, the Bureau will contribute to the Imperiled Bat Conservation Fund (IBCF) as compensatory mitigation for the adverse effects on Indiana bats and northern long-eared bats that will result from the permanent loss and modification of forested habitat. The contribution amount would be determined according to the process described in the Service's 2016 *Revised Conservation Strategy for Forest-Dwelling Bats in the Commonwealth of Kentucky* (USFWS 2016) or an appropriate succeeding document. The contribution would be based on the acreage (currently proposed as 48.8 hectares (120.6 acres)) and the time of year that the forested habitat is removed. The entire contribution will be made prior to tree removal on the project site, as described in a June 5, 2017 email from the Bureau (Appendix A).

1.4. **Construction Activities**

The construction phase would take approximately 4-5 years and would include the following activities:

- Clearing of vegetation on approximately 73 hectares (180.5 acres), including trees on the 120.6 acres that is currently forested (Fig. 2).
- Excavation, including blasting, filling, and grading, on the 73 hectares (180.5 acres).
- Construction of a facility that would include the following: USP, a FPC, a central utility plant, a training center with an outdoor firing range and staff training building, a warehouse, a garage/landscape building, access roads, and parking areas.

The following is a list of specific conservation measures that the Bureau would implement during the construction activities:

- Develop an erosion and sediment control plan detailing best management practices (BMPs) to be implemented during construction and submit the plan to the Kentucky Division of Water for approval.

- Implement the approved erosion and sediment control plan.
- Avoid tree removal during the months of June and July.
- Avoid blasting from November 15 through March 31.
- Conduct all construction activities occurring from April 15 – October 31 in suitable Indiana bat and/or northern long-eared bat habitat during daylight hours.
- Aim construction lighting toward construction and away from forested habitat.
- Require contractors to inspect vehicles and equipment to ensure that visible plant and seed material has been removed prior to entering the construction area.

1.5. Operational Activities

After the facility is constructed, it would continue in operation indefinitely. The USP and FPC would house approximately 1,216 inmates and require approximately 300 full-time staff. Traffic and human activity will occur on the site. The facility would be illuminated with artificial lighting at night. The outdoor firing range would be used for training one day a month and five days a week (Monday – Friday) during a six-week period each year.

The following is a list of specific conservation measures that the Bureau would implement to reduce impacts during operation of the facility:

- Install lights exterior lights (high mast, wall packs, and parking lot and sidewalk light poles) with full cutoff light fixtures (which do not emit direct uplight) for operational activities at the facility.
- Fence off the feature identified as a potential hibernaculum and install warning signs around the area to prevent direct disturbance.

1.6. Interrelated and Interdependent Actions

In its request for consultation, the Bureau did not describe, and the Service is not aware of, any interrelated or interdependent actions in addition to actions that were included in the proposed Action. Therefore, this BO does not further address the topic of interrelated or interdependent actions.

2. INDIANA BAT

This section summarizes the best available data about the biology and curre
Indiana bat (*Myotis sodalis*) throughout its range that are relevant to formulating an opinion about the Action. The Service published its decision to list the Indiana bat as endangered on March 11, 1967 (Federal Register 32[48]:4001) under the Endangered Species Preservation Act

of October 15, 1966 (80 Stat. 926; 16 U.S.C. 668aa[c]). The Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) subsequently extended full legal protection from unauthorized take to the species. Critical habitat was designated for the species on September 24, 1976 (41 FR 14914). Thirteen hibernacula, including 11 caves and two mines in six states, were listed as critical habitat.

The Service has published a recovery plan that outlines recovery actions (U.S. Fish and Wildlife Service (USFWS) 1983). Briefly, the objectives of the plan are to: (1) protect hibernacula; (2) maintain, protect, and restore summer maternity habitat; and (3) monitor population trends through winter censuses. An agency draft of a revised recovery plan was provided for public review and comment in the Federal Register on April 9, 1999, but has not yet been finalized. A revised draft recovery plan was noticed in the Federal Register for public review and comment on April 16, 2007 (USFWS 2007).

The Service's Bloomington, Indiana Field Office completed a 5-Year Review of the Indiana bat (USFWS 2009), which summarizes the current status of the species, its progress toward recovery, and the remaining threats to the species. The draft recovery plan and 5-Year Review are available at http://www.fws.gov/midwest/Endangered/mammals/inba/index.html and are hereby incorporated by reference. The 5-Year Review found that all of the required recovery criteria for the Indiana bat had not been achieved, so the species should remain at its current endangered status.

2.1. **Description of the Indiana Bat**

The Indiana bat is a temperate, insectivorous, migratory bat that hibernates in caves and mines in the winter and summers in forested areas. It is a medium-sized bat, having a wing span of 9 to 11 inches and weighing only one-quarter of an ounce. It has brown to dark-brown fur and the facial area often has a pinkish appearance. The Indiana bat closely resembles the little brown bat (*Myotis lucifugus*) and the northern long-eared bat (*Myotis septentrionalis*). It is distinguished from these species by its foot structure and fur color. The Indiana Bat Draft Recovery Plan (Service 2007) provides a comprehensive summary of the description of the species and is incorporated by reference.

2.2. **Life Cycle of the Indiana Bat**

The life cycle of the Indiana bat is summarized in Figure 3. The species hibernates in caves and mines in the winter (typically October through April) and migrates to forested summer habitat. When arriving at their traditional hibernacula in August-September, Indiana bats "swarm" for several weeks prior to hibernation. Some male bats may begin to arrive at hibernacula as early

as July, but females typically arrive later. The time of highest swarming activity in Indiana and Kentucky has been documented as early September (Cope and Humphrey 1977). Swarming is a critical part of the life cycle when Indiana bats converge at hibernacula, mate, and forage until sufficient fat reserves have been deposited to sustain them through the winter (USFWS 1983). Swarming behavior typically involves large numbers of bats flying in and out of cave entrances throughout the night, while most of the bats continue to roost in trees during the day (Cope and Humphrey 1977). Body weight may increase by 2 grams within a short time, mostly in the form of fat. Copulation occurs on cave ceilings near the cave entrance during the latter part of the swarming period (USFWS 2007). Females may mate their first autumn, whereas males may not mature until the second year (USFWS 2007). By late September, many females have entered hibernation, but males may continue swarming well into October in what is believed to be an attempt to breed with late arriving females.

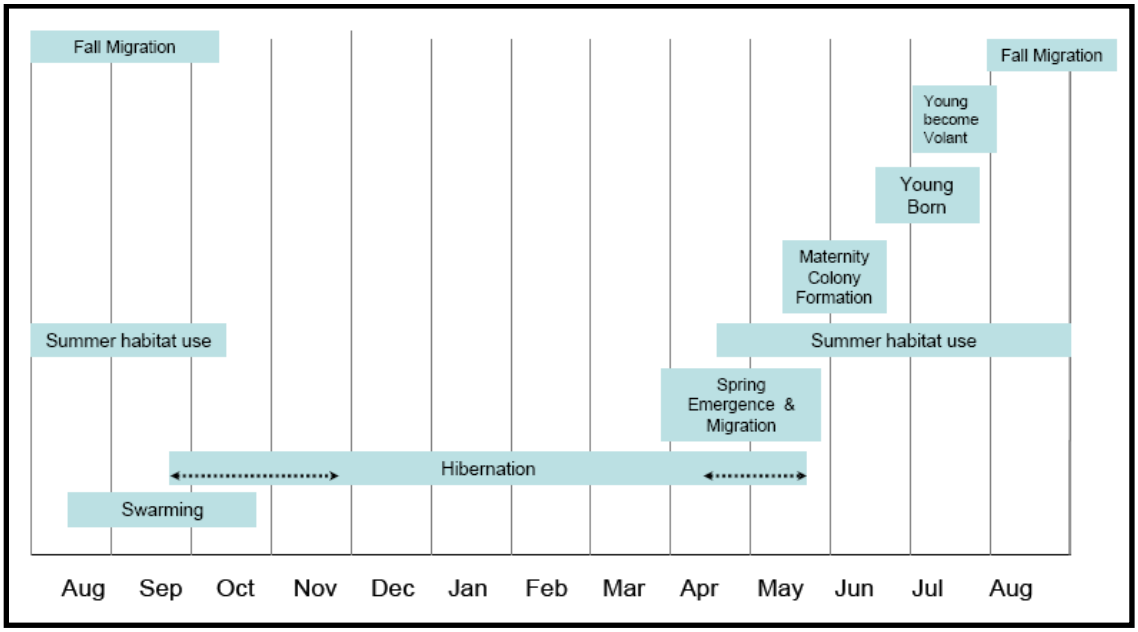

Figure 3. Indiana bat annual chronology (USFWS 2007).

The initiation of hibernation may vary by latitude and annual weather conditions; however, most bats are hibernating by the end of November (USFWS 2007). Hibernation facilitates survival during winter when insect prey is unavailable. Hibernating Indiana bats cluster on cave ceilings in densities of approximately 300-484 bats per square foot, from approximately October through April. Clusters may protect individuals from temperature changes and reduce sensitivity to disturbance. Like other cave bats, the Indiana bat naturally arouses during hibernation (Sealander & Heidt 1990). Arousals are more frequent and longer at the beginning and end of the hibernation period (Sealander & Heidt 1990). Limited mating occurs throughout the winter and in early April as bats emerge (USFWS 2007).

Spring emergence occurs when outside temperatures have increased and insects (forage) are more abundant (Richter et al. 1993). Most Indiana bats emerge in late March or early April; the timing of annual emergence may vary across the range depending on latitude and annual weather conditions. Females emerge before males. Shortly after emerging from hibernation, the females become pregnant via delayed fertilization from the sperm that has been stored in their reproductive tracts through the winter (USFWS 2007). During the "staging" period, the bats forage for a few days or weeks near their hibernaculum before migrating to their traditional summer roosting areas. Most populations leave their hibernacula by late April. Migration is stressful for the Indiana bat, particularly in the spring when their fat reserves and food supplies are low. As a result, adult mortality may be the highest in late March and April.

Most of the published literature indicates that Indiana bats migrate north for the summer maternity season (USFWS 2007, Gardner and Cook 2002); however, recent migration studies have documented lateral and southward migrations (Piper Roby, pers. comm. 2014). Some reproductive females have been documented to migrate up to 357 miles (Winhold and Kurta 2006) to form maternity colonies; others have been found to form maternity colonies within only a few miles of their hibernacula (U.S. Army Garrison Fort Drum 2011). Males and non-reproductive females have been observed roosting individually and in colonies (Hall 1962, Carter et al. 2001, Whitaker and Brack 2002). Males are commonly found roosting near the hibernacula and have also been documented to migrate long distances to their summer habitat (Kurta and Rice 2002).

Female Indiana bats, like most temperate members of the family Vespertilionidae, give birth to one young each year (Mumford and Calvert 1960, Humphrey et al. 1977, Thomson 1982). The proportion of female Indiana bats that produce young is not well documented. At a colony in Indiana, 23 of 25 female Indiana bats produced volant young during one year and 23 of 28 females the following year (Humphrey et al. 1977). Based on cumulative mist-netting captures over multiple years, Kurta and Rice (2002) estimated that 89% of adult females in Michigan maternity colonies were in reproductive condition (pregnant, lactating, or post-lactating). Racey (1982) notes that a particular ratio of fat to lean mass is normally necessary for puberty and the maintenance of female reproductive activity in mammals. He suggests further that the variation in the age of puberty in bats is due to nutritional factors, possibly resulting from the late birth of young and their failure to achieve threshold body weight in their first autumn. Once puberty is achieved, reproductive rates frequently reach 100% among healthy bats of the family Vespertilionidae and young, healthy female bats can mate in their first autumn as long as their prey base is sufficient to allow them to reach a particular fat to lean mass ratio.

Studies by Belwood (2002) show asynchronous births among members of a colony. This results in great variation in size of juveniles (newborn to almost adult size young) in the same colony.

Young Indiana bats are capable of flight within a month of birth. Young born in early June may be flying as early as the first week of July (Clark et al. 1987), with others flying from mid- to late July. Mortality between birth and weaning was found to be about 8% (Humphrey et al. 1977).

The average life span of the Indiana bat is 5 to 10 years, but banded individuals have been documented living as long as 14 and 15 years (Humphrey and Cope 1977). Using winter sampling of unknown-age bats over a 23-year period, Humphrey and Cope (1977) estimated annual survival. Female survivorship in an Indiana population was 76% for ages 1 to 6 years and 66% for ages 6 to 10 years. Male survivorship was 70% for ages 1 to 6 years and 36% for ages 6 to 10 years. Following 10 years, the survival rate for females dropped to only 4% (Humphrey and Cope 1977).

2.3. Habitat Characteristics and Use of the Indiana Bat

2.3.1. Winter Habitat

Indiana bats roost in caves or mines with configurations that provide a suitable temperature and humidity microclimate (Brack et al. 2003, USFWS 2007). Only a small percentage of caves have areas that meet these requirements (Brack et al. 2003, USFWS 2007). Mid-winter temperatures range from 4-8 C (39 to 46º F) (USFWS 1983). Stable, low temperatures allow bats to maintain low metabolic rates and conserve fat reserves to survive the winter (USFWS 2007). In many caves, these areas are located near the cave entrance, but they may also be deeper in the cave where cold air flows and is trapped. Relative humidity of roosts usually ranges from 74% to just below saturation, although readings as low as 54% have been recorded. Hibernacula often contain large populations of several species of bats. Other bat species found in Indiana bat hibernacula include little brown bats (*Myotis lucifugus*), tri-colored bats (*Perimyotis subflavus*), northern long-eared bats (*Myotis septentrionalis*), gray bats (*Myotis grisescens*), big brown bats (*Eptesicus fuscus*), and silver-haired bats (*Lasionycteris noctivagans*) (Brack et al. 2003).

2.3.2. Summer Habitat

Summering Indiana bats (males and females) use forested habitat for roosting, foraging, and commuting. Indiana bats are often associated with floodplain or riparian forests with large trees, scattered canopy gaps, and open understories (USFWS 2007). Research has showed adaptability in habitats used, including upland forests, forests altered by grazing, swine feedlots, row-crops, hay fields, residences, clear-cut harvests, and shelterwood cuts (Garner and Gardner 1992, USFWS 1999).

Suitability of a roost tree is determined by its condition (dead or alive), suitability of loose bark, solar exposure, spatial relationship to other trees, and tree's spatial relationship to water sources and foraging areas. Potentially suitable roost trees can be trees of any species with bark separating from the tree after the tree dies, senesces, or is injured and living species of hickories (*Carya* spp.) and large white oaks (*Quercus alba*) with shaggy bark. Many maternity colonies have been associated with oak-hickory and elm-ash-cottonwood forest types. Tree cavities, hollow portions of tree boles or limbs, and crevice and splits from broken tops occasionally have been used as roosts, usually by individual bats. Roost longevity is variable due to many factors, such as the rate at which bark sloughs off or the tree falls down. Some roosts may only be habitable for 1-2 years, but species with good bark retention, such as slippery elm (*Ulmus rubra*), cottonwood (*Populus deltoides*), green ash (*Fraxinus pennsylvanica*), and various oaks (*Quercus* spp.) and hickories (*Carya* spp.) may provide habitat for 4-8 years (USFWS 1999).

Trees in excess of 40 cm (15.7 in) diameter-at-breast-height (dbh) are considered optimal for maternity colonies, but trees in excess of 22 cm (8.6 in) dbh are used as alternate roosts (USFWS 2002). Females have been documented using roost trees as small as 14 cm (5.5 in) dbh (Kurta 2005). The average size of roost trees used by males tends to be smaller than the roost trees used by female maternity colonies; in one instance, a male was observed in a roost tree 6.4 cm (2.5 in) dbh (Gumbert et al. 2002).

Garner and Gardner (1992) found that Indiana bats select for roosts far from paved roads. Conversely, several roosts at the Indianapolis Airport have been located near I-70 and near lightly traveled, low maintenance roads (USFWS 2002). Although Indiana bats may be more adaptable than previously thought, it still is not known how a maternity colony's stability and reproductive success responds to increasing levels of habitat alteration and fragmentation.

Maternity colonies use a range of 8 to 25 trees per season (Callahan et al. 1997, Kurta et al. 2002). The extent and configuration of the roosting area is probably determined by availability of suitable roost trees. Distances between roosts can be a few meters to a few kilometers (Kurta et al. 1996, 2002). Primary roosts are generally larger in diameter and located in openings or at the edge of forest stands, while alternate roosts can either be in openings or the interior of the forest stand. Maternity colony movements among multiple roosts seem to depend on climatic changes, particularly solar radiation (Humphrey et al. 1977). Cool temperatures can delay fetal development and growth of juvenile young; selection of maternity roost sites may be critical to reproductive success. Kurta et al. (1993) suggest movement between roosts may be the way that bats deal with the ephemeral nature of roost trees. It is not known how many alternate roosts must be available to assure retention of a colony within a particular area, but large, nearby forest tracts would improve the potential for an area to provide adequate roosting habitat (Callahan 1993, Callahan et al. 1997).

Indiana bats feed on aquatic and terrestrial insects. Diet varies seasonally and among different ages, sexes, and reproductive status (USFWS 1999). Numerous foraging habitat studies have found that Indiana bats forage in closed to semi-open forested habitats and forest edges located in floodplains, riparian areas, lowlands, and uplands; old fields and agricultural fields are also used (USFWS 2007). At a study site near the Indianapolis International Airport, Sparks et al. (2005) found Indiana bats spending nearly 51% of their time foraging over agricultural fields with movements focused on a riparian corridor. Indiana bats frequently forage along riparian corridors and obtain water from streams; ponds and water-filled road ruts in the forest uplands are also serve as water sources.

Very little research has focused on the use of travel corridors by Indiana bats. Most information pertaining to bat movements and travel corridors is incidental to other portions of a study and/or general observations. Murray and Kurta (2004) showed that Indiana bats increased commuting distance by 55% to follow tree-lined paths rather than flying over large agricultural fields, some of which were at least 1 km (0.6 mi) wide. Data collected from a residential development in northern New York showed use of linear features (i.e., hedgerows and tree-lined fence rows) by Indiana bats (Environmental Solutions and Innovations, Inc. 2006). Apparently suitable, but distant, forest patches may not be available to Indiana bats unless they are connected by a wooded corridor; however, the maximum size of an opening Indiana bats may cross is not known.

Home range size may vary between seasons, sexes, and reproductive status of the females (Lacki et al. 2007). Menzel et al. (2005) tracked seven female and four male Indiana bats from May to August in Illinois. No significant differences in home ranges between males and females were observed, and home range estimates were subsequently grouped to obtain a mean summer home range of 144.4 hectares (357 acres). Watrous et al. (2006) calculated a mean home range of 83 hectares (205 acres) for 14 female Indiana bats in Vermont. Without site-specific data, the Service generally considers the potential home range for an Indiana bat to include all suitable habitat within 4 km (2.5 mi) of documented roost(s) (USFWS 2011), recognizing the area of actual use may be just a portion of that area.

Gumbert et al. (2002) differentiated between roost tree and roost area fidelity in Indiana bats and found that bats are faithful to both areas and particular trees within those areas. Indiana bats also show a high degree of fidelity to foraging ranges. Kurta and Murray (2002) documented recapturing 41% of females when mist netting within the same area in subsequent years. Indiana bat maternity colonies in Illinois, Indiana, Michigan, and Kentucky have been shown to use the same roosting and foraging areas during subsequent years (Gardner et al. 1991a; Humphrey et al. 1977; Kurta and Murray 2002; Kurta et al. 1996, 2002). Bats using familiar foraging and roosting areas are thought to benefit from decreased susceptibility to predators, increased

foraging efficiency, and the ability to switch roosts in case of emergencies or alterations surrounding the original roost (Gumbert et al. 2002).

2.3.3. Spring and Fall Habitat

In general, Indiana bats use habitats in the spring and fall similar to those selected during the summer. Suitable spring staging/fall swarming habitat consists of the variety of forested/wooded habitats where they roost, forage, and travel. These areas are most typically within 10 miles of a P1/P2 hibernaculum and 5 miles of a P3/P4 hibernacula[1]; however, use of habitat areas that are farther than 10 miles from a P1/P2 hibernaculum or farther than 5 miles from a P3/P4 hibernaculum have been documented (Kiser and Elliot 1996; MacGregor et al. 1999; Rommé et al. 2002; Hawkins et al. 2005.

2.4. Status and Distribution of the Indiana Bat

Indiana bats are found over most of the eastern half of the United States (Fig. 4). The recovery program for the Indiana bat delineates four Recovery Units (RUs): the Ozark-Central, Midwest, Appalachian Mountains, and Northeast RUs (USFWS 2007).

Because the vast majority of Indiana bats form dense aggregations or "clusters" on the ceilings of a relatively small number of hibernacula (i.e., caves and mines) each winter, conducting standardized surveys of the hibernating bats during that time is the most feasible and efficient means of estimating and tracking population and distribution trends across the species' range. Collectively, winter hibernacula surveys provide the Service with the best representation of the overall population status and relative distribution that is available.

The data regarding Indiana bat abundance prior to federal listing are limited, but the information suggests that Indiana bats were once far more abundant than they were in the 1960s. Tuttle and colleagues, for example, believe the overall abundance of Indiana bats likely rivaled that of the now extinct passenger pigeon (USFWS 2007). The basis for the estimates of millions of Indiana bats prior to European settlement is primarily based on historic accounts (e.g., Blatchley 1897, Silliman et al. 1851), extensive staining left on the ceilings of several historic hibernacula (Tuttle 1997, 1999), and other paleontological evidence (Munson and Keith 1984, Toomey et al. 2002). For example, an analysis of bone deposits in Bat Cave, Kentucky revealed that an estimated 300,000 Indiana bats died during a single flood event at some point in history (Hall 1962).

[1] Priority 1 (P1) hibernacula have a current or historical winter population of ≥ 10,000 Indiana bats; priority 2 (P2) have 1,000 -9.999 bats; priority 3 (P3) have 50-999 bats; and priority 4 (P4) have < 50 bats (USFWS 2007).

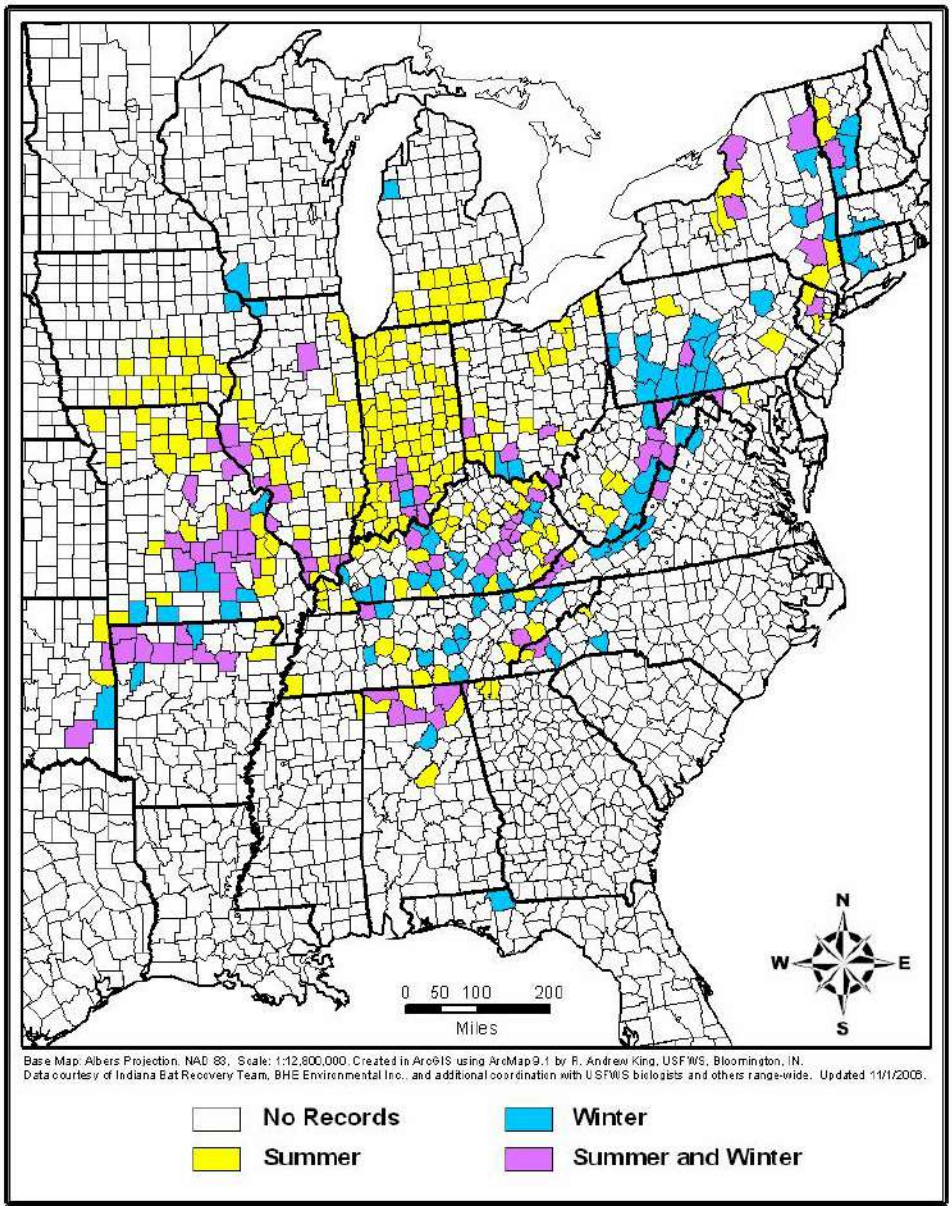

Figure 4. Distribution of counties with known summer and winter records of the Indiana bat.

When the Indiana bat was originally listed as endangered in 1967, there were approximately 883,300 bats, and most of these hibernated in a small number of hibernacula (Clawson 2002). Since the species was listed, its population numbers have apparently continued to decline through approximately 2001. Although some winter bat surveys began as early as the late 1950s, systematic surveys were not conducted across the range until the mid-1980s when there were an

estimated 678,750 Indiana bats (Clawson 2002). Since being listed, large population declines have been observed, especially at hibernacula in Kentucky and Missouri. Caves in Kentucky suffered dramatic losses due to changes in microclimate caused by poor cave gate design at two of the three most important hibernacula (Humphrey 1978), and Indiana bat numbers in Kentucky hibernacula had continued to decline until 2005 when an increase was first observed (USFWS, unpublished data, 2007). Despite recovery efforts, Indiana bats in Missouri caves have continuously declined with a loss of more than 80% of the previous population size (Clawson 2002). The rangewide population estimate dropped approximately 57% from 1965 to 2001 (USFWS 2007).

The Service has collated the population data gathered during the 2007 through 2015 biennial winter hibernacula surveys from throughout the Indiana bat's range and determined that the Indiana bat's 2015 range-wide population stands at approximately 523,636 bats, which is a 9.8% decrease over the 2013 range-wide population estimate of 580,717 bats (Fig. 5). The range-wide, biennial population estimates had been increasing from 2001 to 2007, indicating that the species' long-term decline had been arrested and likely reversed (USFWS 2015). The observed range-wide decline since 2007 is likely attributable to White-Nose Syndrome (or "WNS"; see discussion below), especially for decreased population estimates in the Northeast Recovery Unit.

Winter surveys in 2014-2015 found hibernating Indiana bats dispersed across 16 states. Over 90% of the estimated range-wide population hibernated in four states – Indiana (35.5%), Missouri (35.5%), Kentucky (12.6%), and Illinois (10.7%) (USFWS 2015).

Summer distribution of the Indiana bat occurs throughout a wider geographic area than its winter distribution. Most summer occurrences are from the upper Midwest including southern Iowa, northern Missouri, much of Illinois and Indiana, southern Michigan, Wisconsin, western Ohio, and Kentucky. In the past decade, many summer maternity colonies have been found in the northeastern states of Pennsylvania, Vermont, New Jersey, New York, West Virginia, and Maryland. Maternity colonies have also been found in the south, including northern Arkansas, Georgia, Alabama, Mississippi (Piper Roby, pers. comm. 2014), and southwestern North Carolina (Britzke et al. 2003, Service 2007). Non-reproductive summer records for the Indiana bat have also been documented in eastern Oklahoma, northern Mississippi, Alabama, and Georgia.

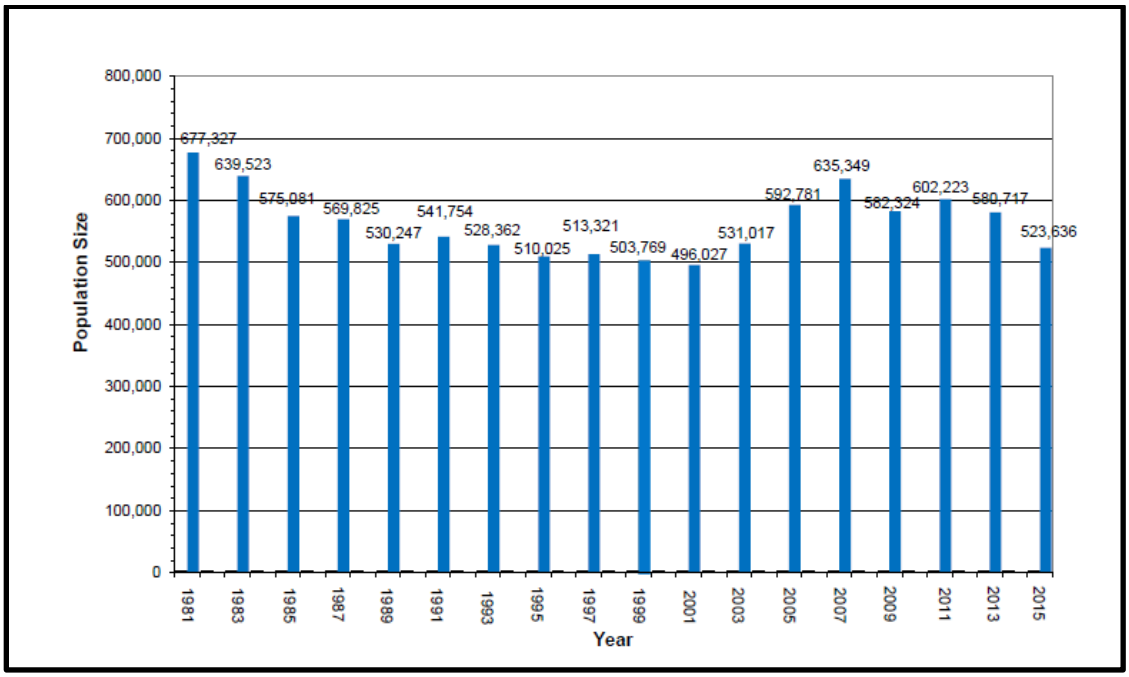

Figure 5. Indiana bat rangewide population estimates from 1981-2015.

2.5. Stressors to the Indiana Bat

2.5.1. Destruction/Degradation of Hibernacula

There are well-documented examples of modifications to Indiana bat hibernacula that affected the thermal regime of the cave and, thus, the ability of the cave to support hibernating Indiana bats, as summarized in the draft revised Recovery Plan (USFWS 2007). Generally, threats to the integrity of hibernacula have decreased since the time that Indiana bats were listed as endangered under the ESA. Increasing awareness of the importance of cave microclimates to hibernating bats and regulatory authorities under the ESA have reduced, but not eliminated, this threat. In addition to purposeful modifications, there are threats from stochastic events (*e.g.*, collapse in mines, flooding).

2.5.2. Loss/Degradation of Forested Habitat

Loss of forest cover and degradation of forested habitats have been cited as contributing to the decline of Indiana bats (USFWS 1983, Garner and Gardner 1992, Drobney and Clawson 1995, Whitaker and Brack 2002). Throughout the range of the Indiana bat, there is less forest land

now than there was prior to European settlement (Smith et al. 2003), particularly within the core of the species' range in the Midwest. Conversion to agriculture has been the largest single cause of forest loss. The conversion of floodplain and bottomland forests, recognized as high quality habitats for Indiana bats, has been a particular cause of concern (Humphrey 1978). More recently, since the 1950s, some marginal farmlands have been abandoned and allowed to revert to forest and there has been a net increase in forest land within the range of the Indiana bat, particularly in the Northeast (Smith et al. 2003). Forest cover has also increased within the Midwest Recovery Unit (Smith et al. 2003). Not only has the amount of forest cover increased since the 1950s, but also the average diameter of trees has increased (Smith et al. 2003), which may equate to an increased supply of suitable roost trees for Indiana bats.

Urbanization and development is currently the greatest contributor to forested habitat loss within the range of the Indiana bat (Wear and Greis 2002; U.S. Forest Service (USFS) 2005, 2006), which results in permanent conversion to land uses generally unsuitable for Indiana bats. At a study site in central Indiana, Indiana bats avoided foraging in a high-density residential area (Sparks et al. 2005), although maternity roosts have been found in low-density residential areas (Belwood 2002). Duchamp (2006) found that greater amounts of urban land use was negatively related to bat species diversity in north-central Indiana; several bat species, including the Indiana bat, were less likely to occur in landscapes with greater amounts of urban and suburban development. Development directly destroys habitat and fragments remaining habitat.

Forest cover is not a completely reliable predictor of where Indiana bat maternity colonies will be found on the landscape (Farmer et al. 2002). Indiana bat maternity colonies occupy habitats ranging from completely forested to areas of highly fragmented forest. Nonetheless, trends in forest cover are of interest relative to Indiana bats, with increasing forest cover suggesting at least the potential for improved habitat conditions. Conversely, in areas where almost all forest land has been lost, the absence of woodlands on the landscape certainly equates to less habitat than in prehistoric and early historic periods.

Throughout the range of the Indiana bat, forest conversion is expected to increase due to commercial and urban development, energy production and transmission, and natural changes. The 2010 Resources Planning Act Assessment projects forest losses of 6.5-13.8 million hectares (16–34 million acres) (or 4–8% of 2007 forest area) across the conterminous United States, and forest loss is expected to be concentrated in the southern United States, with losses of 3.6-8.5 million hectares (9–21 million acres) (USFS 2012). Forest conversion causes loss of potential habitat, fragmentation of remaining habitat, and if occupied at the time of the conversion, direct injury or mortality to individuals.

2.5.3. Disturbance of Hibernating Bats

The original recovery plan for the species stated that human disturbance of hibernating Indiana bats was one of the primary threats to the species (USFWS 1983). The primary forms of human disturbance to hibernating bats result from cave commercialization (cave tours and other commercial uses of caves), recreational caving, vandalism, and research-related activities. Progress has been made in reducing the number of caves in which disturbance threatens hibernating Indiana bats, but the threat has not been eliminated. Biologists throughout the range of the Indiana bat were asked to identify the primary threat at specific hibernacula, and "Human disturbance" was identified as the primary threat at 41% of Priority 1, 2 and 3 hibernacula combined.

2.5.4. White-nose Syndrome

WNS is an emerging infectious wildlife disease caused by a fungus of European origin *Pseudogymnoascus destructans* (Pd), which poses a considerable threat to hibernating bat species throughout North America, including the Indiana bat. White-nose syndrome is responsible for unprecedented mortality of insectivorous bats in eastern North America (Blehert et al. 2009; Turner et al. 2011). No other threat is as severe and immediate for the Indiana bat as the disease WNS. Since the disease was first observed in New York in 2007 (later biologists found evidence from 2006 photographs), WNS has spread rapidly in bat populations from the East to the Midwest and the South.

WNS may affect behavioral changes in infected individuals. For example, at some WNS-affected sites, a shift of hibernating bats from traditional winter roosts to roosts unusually close to hibernacula entrances has been observed. Bats have also been observed flying outside of hibernacula during winter (often during the day) at some affected sites. At some sites, bat carcasses (particularly of the little brown bat) have been found outside affected hibernacula. Many infected bats do not survive the winter. The exact processes by which the fungal skin infection leads to death are not known, but depleted fat reserves (i.e., starvation) contribute to mortality (Reeder et al. 2012, Warnecke et al. 2012) and dehydration may also have a role (Willis et al. 2011, Cryan et al. 2013, Ehlman et al. 2013). It is also suspected that some of the affected bats that survive hibernation emerge in such poor condition that they die soon after emergence or during the summer. Among those bats that do survive, it appears that productivity of female survivors may be negatively affected (Francl et al. 2012; Pettit and O'Keefe 2017).

The Northeast Recovery Unit, where WNS was first observed in the winter of 2006-2007, lost over 70% of its Indiana bats between 2007 and 2015. At the time dead bats were first observed in the winter of 2006-2007, it is not known how long the (previously unidentified) fungus, Pd,

had been present in affected sites. Based on subsequent observations as WNS spread, it appears that the arrival of the fungus in an area may precede large-scale fatality of bats by several years. Between 2011 and 2015 the Appalachian Recovery Unit, where WNS was confirmed in the winter of 2008-2009, declined by 84%. The Midwest Recovery Unit, where WNS was confirmed in the winter of 2010-2011, declined by 16% between 2011 and 2015. The Ozark-Central Recovery Unit, where WNS was confirmed in the winter of 2011-2012, declined by less than 1% between 2013 and 2015. As of 2016, WNS or Pd was confirmed in all the states within the species' range. We expect further declines in Indiana bat populations from the disease in the future.

Additional information on WNS, which is constantly evolving, can be found online at http://whitenosesyndrome.org/.

2.5.5. Environmental Contaminants

With the restrictions on the use of organochlorine pesticides in the 1970s, this significant threat to Indiana bats was reduced. However, cholinesterase-inhibiting insecticides, organophosphates, and carbamates have now become the most widely used insecticides (Grue et al. 1997), and the impact of these chemicals on Indiana bats is not known. Because of the unique physiology of bats in relation to reproduction, high energy demands and sophisticated thermoregulatory abilities, much more research needs to be done with these pesticides and their effects on bats. These and other contaminants likely remain a significant and poorly understood threat to Indiana bats. USFWS (2007) summarizes known and suspected contaminant threats to bats.

2.5.6. Climate Change

The capacity of climate change to result in changes in the range and distribution of wildlife species is recognized, but detailed assessments of how climate change may affect specific species, including Indiana bats, are limited. During winter, only a small proportion of caves provide the right conditions for hibernating Indiana bats because of the species' very specific temperature requirements. Surface temperature is directly related to cave temperature, so climate change that involves increased surface temperatures will inevitably affect the suitability of hibernacula. Impacts on the availability or timing of emergence of insect prey are also likely. Loeb and Winters (2013) modeled potential changes in Indiana bat summer maternity range within the United States; in their model, the area suitable for summer maternity colonies of Indiana bats was forecasted to decline significantly.

2.5.7. Wind Turbines

There is growing concern that Indiana bats (and other bat species) may be threatened by the recent surge in construction and operation of wind turbines across the species' range. Eight Indiana bat mortalities have been documented at wind turbines; five of those were during the fall migration period (USFWS 2014). Not all facilities conduct fatality monitoring and, even when monitoring is conducted, only a small proportion of dead bats are likely to be found. Based on this information, it is likely that additional Indiana bat mortality has occurred at these facilities and at other wind facilities throughout the range of the species.

2.6. Environmental Baseline for the Indiana Bat

This section is an analysis of the effects of past and ongoing human and natural factors leading to the current status of the Indiana bat, its habitat, and ecosystem within the Action Area. The environmental baseline is a "snapshot" of the species' health in the Action Area at the time of the consultation, and does not include the effects of the Action under review.

2.6.1. Action Area Numbers, Reproduction, and Distribution

In the absence of recent survey data for the species in the Action Area of the project, the Service must make assumptions about the status of the species within the Action Area based on the habitat in and around the Action Area, available past survey data, and our knowledge of the biology of the species. We have made assumptions about the status of the species in the Action Area specific to the timeframes listed below. The timeframes represent when the Service assumes the species is in specific periods of its life cycle in Kentucky (USFWS 2016).

Winter Hibernation (November 15 – March 31)

Copperhead Environmental Consulting, Inc. (Copperhead) conducted a winter bat habitat assessment in the 82.2-hectare (203-acre) portion of the project area where construction activities would occur in 2015, and again in 2016 after the site for the proposed facility was modified. The 2016 assessment covered an additional 122.2 hectares (302 acres). Copperhead reviewed information from the following resources: aerial photography, USGS 7.5 minute topographic quadrangle maps, USGS geology quadrangle maps, the Kentucky Coal Mine Mapping Information System, and information about cave locations from the Kentucky Department of Fish and Wildlife Resources and the National Speleological Society – Pine Mountain Grotto. Pedestrian field assessments conducted by Copperhead biologists focused on areas identified during the desktop analysis as having a high potential for underground mine portals and rock shelters (i.e., cliff lines, mined areas). The desktop analysis did not reveal any cave locations or

evidence of cave-forming geology in the Action Area of the project. Known caves and Indiana bat hibernacula in the vicinity are concentrated in an area of karst geology that follows Pine Mountain. This area is approximately 8.9 km (5.5 mi) to the southeast at the closest point of the project area (Fig. 6).

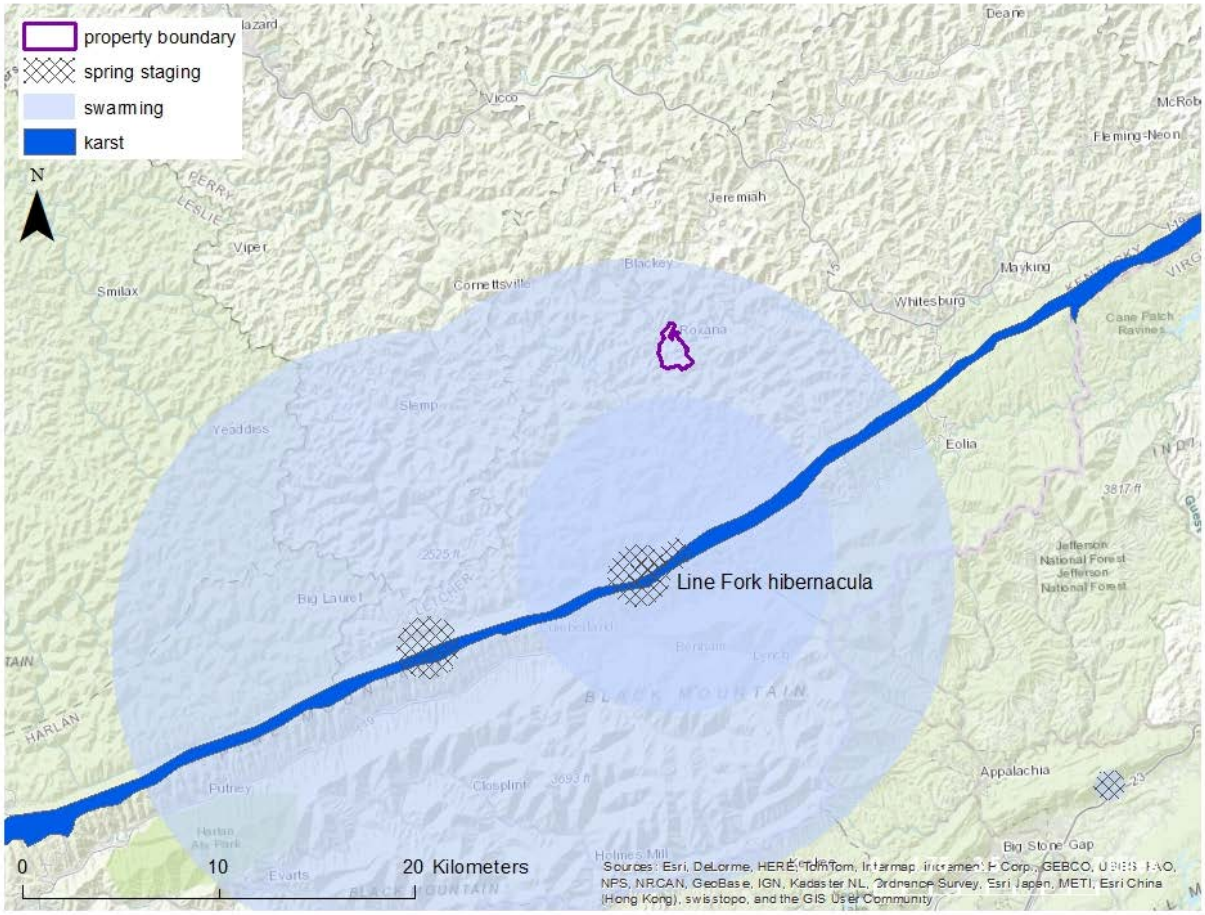

Figure 6. The property boundary in relation to surrounding karst geology and known Indiana bat hibenacula and associated swarming habitat.

There has been substantial history of surface and underground mining in this region of Kentucky. However, only one feature was found during the field assessment that could potentially be used as a winter hibernaculum by Indiana bats (Fig. 7). This feature is a crack in a small rock shelter approximately 60 m (197 ft) from the construction limits of the project. The dimensions of the opening to this feature are 0.3 m x 0.9 m (1-foot by 3-feet), and it widens into a 4.6 m x 0.3 m (15-feet by 1-feet) space. Copperhead observed that the feature extended approximately 10.7 m (35 feet) and that it may extend beyond what Copperhead staff could see from the entrance. Because the feature provides potentially suitable habitat but was not surveyed, we assume, for

the purposes of this consultation, that it is used by Indiana bats during the winter. Due to the conditions that were visible to Copperhead staff, including a narrow flyway, a lack of air flow, and a lack of visible guano deposits, we assume that the feature is unlikely to be a significant hibernaculum. The Service ranks Indiana bat hibernacula as Priority (P) 1 – P4, by order of significance. The least significant hibernacula, P4, contain less than 50 Indiana bats. In Kentucky, P4 hibernacula contain an average of 12 bats. For the purposes of our evaluation, we will refer to this feature as "assumed hibernaculum #1" and assume that it is used by 12 Indiana bats for hibernation.

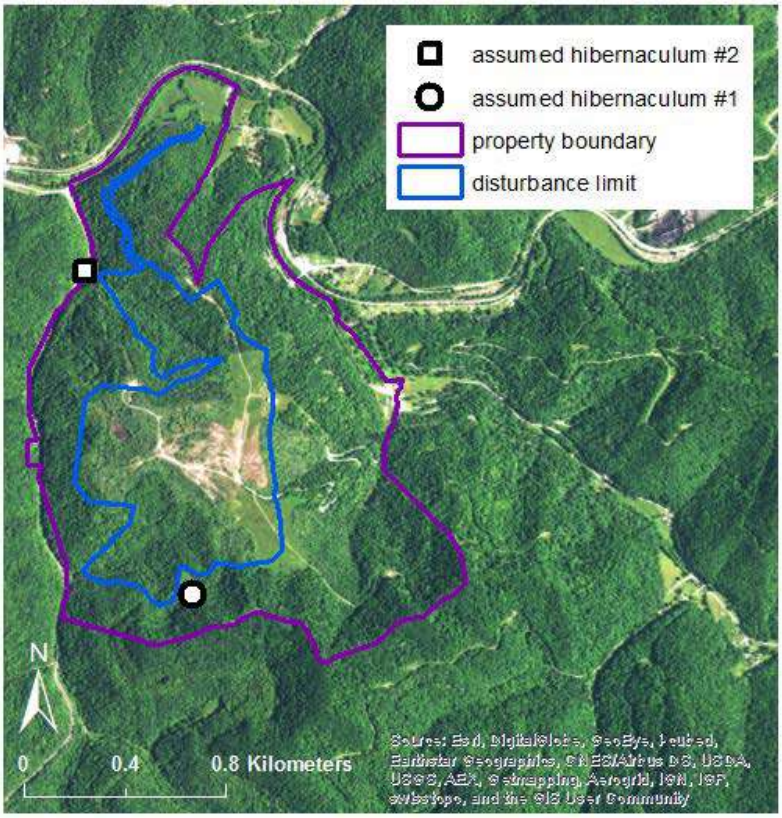

Figure 7. Locations of assumed hiberncula #1 and #2.

Copperhead assessed 204.4 hectares (505 acres) of the 231.1-hectare (570-acre) property for potential winter hibernacula (Fig. 8). The remaining area on the property was not assessed due to access constraints. The areas within the property that were not included in the survey are outside of the proposed clearing and grading limits, with the exception of a short (< 100-m (328-ft)) section of corridor for the proposed access road. Because this area does not contain clifflines or other topography that would support caves or other voids, it is unlikely to contain features suitable as hibernacula. We assume that additional winter habitat is present in the Action Area due to the potential that currently undocumented hibernacula (e.g., mine portals, crevices) may exist. For the purposes of our evaluation, we assume that there is one additional Indiana bat

hibernaculum in the Action Area. To ensure that potential adverse effects are not underestimated, we assume that this hibernaculum is located in an unsurveyed area in close proximity to the construction limits of the project (Fig. 7). Because there are no mapped caves in the area and the potential for karst formation is low, it is likely that any unidentified Indiana bat hibernacula are underground mine portals or small voids in clifflines. However, underground mine portals are not likely to be important hibernacula to Indiana bats, and there are no known Indiana bat hibernacula in mines in Kentucky or in neighboring Virginia and West Virginia. For these reasons, we assume that the feature is unlikely to be a significant hibernaculum. The Service ranks Indiana bat hibernacula as Priority (P) 1 – P4, by order of significance. The least significant hibernacula, P4, contain less than 50 Indiana bats. In Kentucky, known P4 hibernacula contain an average of 12 bats. For the purposes of our evaluation, we will refer to this feature as "assumed hibernaculum #2" and assume that it is used by 12 Indiana bats for hibernation.

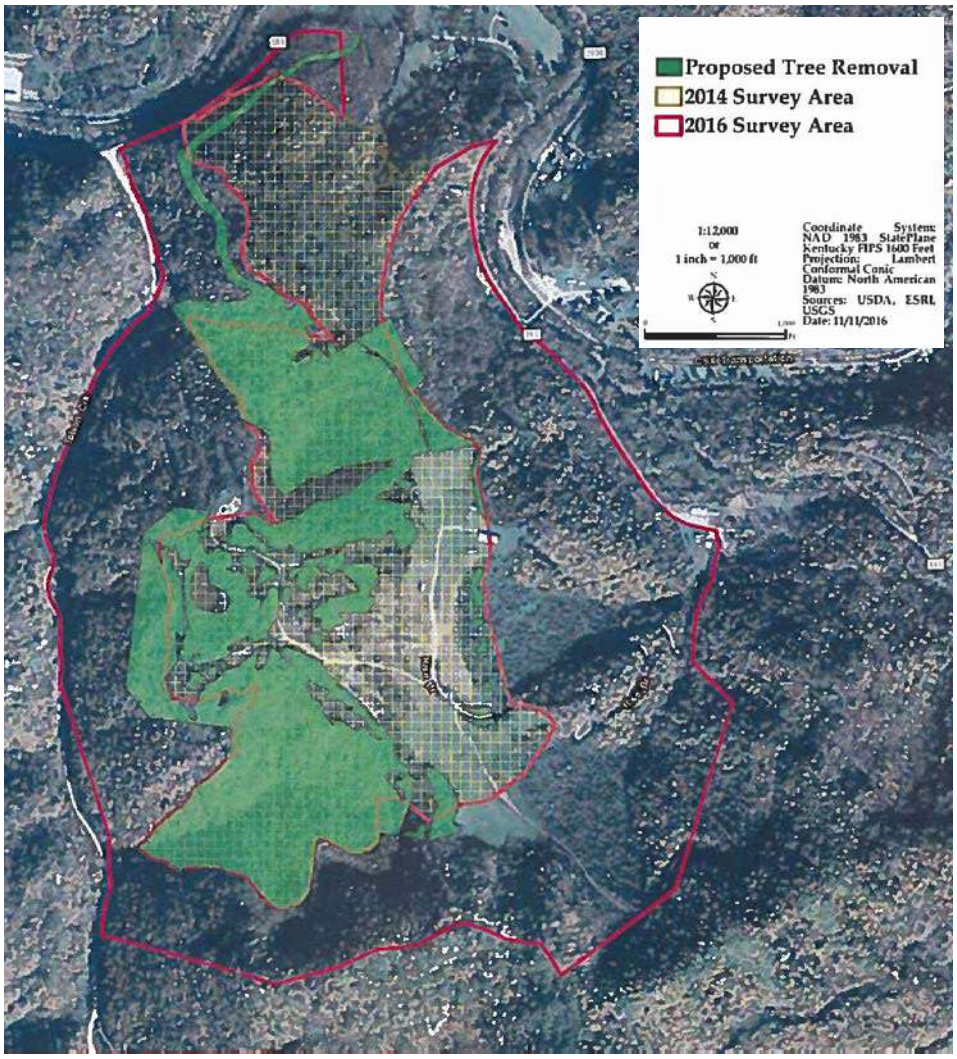

Figure 8: Areas included in the winter habitat assessment (Copperhead 2016).

Spring Staging (April 1 – May 14)

The Action Area of the proposed project is not within the spring staging area for any known Indiana bat hibernacula. However, the Action Area of the project includes areas within the 0.8 km (0.5 mile) buffer around assumed hibernacula #1 and #2. These areas include forested and other habitat where spring staging would occur. Based on our assumptions, 24 bats (12 per assumed P4 hibernaculum) use the Action Area of the project during spring staging for roosting, foraging, and commuting.

Summer Roosting (April 1 – August 15)

In the absence of recent summer surveys conducted for the species, we assume that Indiana bats are present in the Action Area during the summer. Specifically, we are assuming that one or more Indiana bat maternity colony roost trees are located near the center of the Action Area, within the construction limits of the project. The KFO reviewed Indiana bat presence/probable absence survey data in Kentucky post-WNS (2011–2014) and found that Indiana bats were detected at 1.4% (8 of 569 sites) of suitable mist-net sites. Thus, we estimate that no more than one Indiana bat maternity colony would likely occur within the Action Area. Based on the species biology and the information we have on the composition of known maternity colonies, we assume that this maternity colony consists of 90 adult females, 90 juveniles (post parturition), and 90 adult males for a total of 270 Indiana bats using this area during the summer for roosting, foraging, and commuting. Though some Indiana bats, particularly males, may summer near their hibernacula, we are assuming that the 24 individuals that hibernate in features in the Action Area migrate to summer roosting areas outside the Action Area. Thus, the 270 Indiana bats that we assume roost in the Action Area during the summer do not include the 24 individuals that we assume hibernate in the Action Area and use the Action Area during spring staging. We make this assumption so that we do not underestimate the total number of Indiana bats potentially affected by the proposed project.

Fall Swarming (August 16 – October 14)

The Action Area is within the 16.1 km (10-mile) swarming range of the Line Fork Cave system, a P1 Indiana bat hibernacula complex (Fig. 6). The center of the project area is approximately 12.1 km (7.5 miles) from that hibernacula complex, which contained 1,997 Indiana bats in 2015. The Action Area represents 6.2% of the swarming range of these hibernacula, so only a subset of these Indiana bats is expected to use the Action Area. If the 1,997 Indiana bats were evenly distributed throughout the 16.1 km (10-mile) swarming area, approximately 124 Indiana bats (1,997 x 0.062 = 123.8) would be expected to use the Action Area. However, Indiana bats are not likely to be evenly distributed throughout the swarming area; we expect them to be

concentrated closer to the hibernacula and in areas of optimal habitat. Due to the position of the Action Area at the edge of the swarming buffer and the high occurrence of forested habitat throughout the swarming buffer, 124 bats is likely an overestimation of the number of Indiana bats from the Line Fork Cave system that use the Action Area during fall swarming. However, we are not aware of and do not have a better method to calculate a more realistic estimate of Indiana bats using the Action Area during the fall swarming period, so we will use the conservative estimate of 124 Indiana bats in our evaluation of the effects of the Action. For the purposes of our evaluation, we expect 124 bats from the Line Fork Cave system to use the habitat in the Action Area during fall swarming for roosting, foraging and commuting.

Additionally, the Action Area is within the 8 km (5-mile) swarming range of assumed hibernacula #1 and #2. Therefore, we expect that the 24 Indiana bats that are predicted to hibernate in these assumed hibernacula use the Action Area for roosting, foraging, and commuting during fall swarming.

Based on the information available to us and the assumptions described above, the Action Area is used by 148 Indiana bats during fall swarming (124 from Line Fork and 24 from each of the two assumed P4 hibernacula).

Summary

The number of Indiana bats in the Action Area of the project varies throughout the year. During the hibernation period (November 14 - March 31), we expect a total of 24 individuals to be using assumed hibernacula #1 and #2 within the Action Area. We do not expect any Indiana bats within the construction limits of the project during this time period. During spring staging (April 1 – May 14), we expect those 24 individuals to be using the Action Area of the project, including the area within the construction limits, for roosting, foraging, and commuting. During the summer period (April 1- August 15), we expect 270 individuals (90 adult females, 90 adult males, and 90 juveniles) to use the Action Area, including the areas within the construction limits, for roosting and foraging. We assume that there is no overlap in individuals that use the Action Area during spring staging and those that use the Action Area during summer roosting. Thus, there could potentially be 294 Indiana bats in the Action Area from April 1 – May 14, depending on the timing of individuals' migration. During fall swarming, we expect 148 individuals (124 from Line Fork plus 24 from assumed hibernacula #1 and #2) to use the Action Area and the areas within the construction limits for roosting, foraging, and commuting.

2.6.2. Factors Affecting the Species in the Action Area

Forest Loss and Fragmentation

The foraging and roosting behaviors of the Indiana bats that use the Action Area of the proposed project are influenced by the forested habitat in their home range: the amount and quality of habitat, the distribution of that habitat, and changes that occur to the amount and distribution of the habitat. Approximately 83% of the land cover in the Action Area is forested and likely represents suitable roosting, foraging, and/or commuting habitat (Table 1, Appendix B) (Bureau 2017b). The major cause of deforestation in the Action Area is past mining activities. Much of the 9.2% of the Action Area that is in herbaceous cover is regenerating mining areas. The Action Area is located in a rural area that does not currently appear to be experiencing rapid development, so 6.1% is currently classified as developed, with the majority developed open space. Removal of forested habitat in the Action Area reduces the amount of habitat available to foraging and roosting bats and alters the connectivity of that habitat, potentially leading to adverse effects on Indiana bats, particularly at the local population level.

White-nose Syndrome

WNS was first discovered in one cave in Kentucky in 2011 but has since spread across the state. Mortality at infected sites first became apparent in 2013, with an increase in observed mortality in 2014. Preliminary reports indicate that Pd and/or WNS has been detected in approximately 74% of caves surveyed in Kentucky (T. Hemberger, pers. comm. 2017). Many of those caves without positive records have not been surveyed in recent years. Indiana bats have shown declines at some hibernacula, and the overall post-WNS decline in Kentucky is estimated to be less than 9% (T. Hemberger, pers. comm. 2017). Although the population and trend data following the arrival of WNS at Kentucky hibernacula is difficult to interpret, the data are currently not showing the near or total loss of Indiana bat populations that has been documented in the northeastern United States.

WNS was confirmed in the Line Fork cave system in 2013. Because Indiana bats can migrate hundreds of miles from their hibernacula and WNS has been documented from Kentucky and all of the adjacent states, we assume that all the Indiana bats that are known and assumed to occupy habitat within the Action Area have been exposed to WNS. The Indiana bats in the Action Area are, therefore, expected to be experiencing stress and reduced body weights from their exposure to WNS.

Impacts to Water Quality

Degradation of water quality could negatively impact the larvae of aquatic insects upon which Indiana bats feed. Forest clearing for mining activities and other land uses cause erosion that

introduces sediment into the streams. The resulting substrate embeddedness supports fewer larvae of aquatic insects. Streams that support aquatic insect larvae and provide drinking water for Indiana bats can also become contaminated from pollutants from mining activities and runoff from developed areas, such as roads.

2.7. Effects of the Action on the Indiana Bat

This section analyzes the direct and indirect effects of the Action on the Indiana bat, which includes the direct and indirect effects of interrelated and interdependent actions. Direct effects are caused by the Action and occur at the same time and place. Indirect effects are caused by the Action, but are later in time and reasonably certain to occur. Our analyses are organized according to the description of the Proposed Action in section 1 of this BO.

2.7.1. Effects of Property Acquisition

The Bureau's acquisition of the approximate 570-acre property protects the property from other development and non-federal projects. However, acquisition of the property would result in indirect adverse effects to the Indiana bat as a result of the subsequent actions involving the construction and operation of the proposed facility as described in the following sections. Of the 231.1-hectare (570-acre) property, 157.6 hectares (389.5 acres) would remain undisturbed buffer. Of that buffer, 95.4 hectares (235.8 acres) are currently forested and will continue to provide roosting, foraging, and commuting habitat for Indiana bats. The retention of these 95.4 hectares (235.8 acres) of forested habitat would provide beneficial effects to the Indiana bat.

2.7.2. Effect of Compensatory Mitigation

The contribution that the Bureau will provide to the IBCF for compensatory mitigation will provide habitat conservation to contribute to conservation and recovery goals to the Indiana bat. These goals are described in more detail in the 2016 *Revised Conservation Strategy for Forest-Dwelling Bats in the Commonwealth of Kentucky* (USFWS 2016). The compensatory mitigation is a component of the Action that would provide beneficial effects to the Indiana bat.

2.7.3. Effects of Construction Activities

Several proposed construction activities have the potential to impact Indiana bats. The stressors resulting from these activities are discussed below.

2.7.3.1. Stressor - Strikes from Equipment or Trees

Bats roosting in trees while tree removal is occurring could be struck by equipment, struck by the roost tree when it hits the ground, or struck by adjacent trees that are felled. We are aware of three accounts of occupied Indiana bat roost trees being felled. In all cases, it was not known that the tree contained a bat roost when it was cut, and, in all cases, some of the bats in the tree were killed or injured. Cope et al. (1974) reported on the first known Indiana bat maternity roost tree, a dead elm in Wayne County, Indiana. The tree was located near a hedgerow that was being removed, and, when the tree was destroyed during bulldozing, bats were observed exiting. The original account stated that eight bats were "captured and identified as Indiana bats," and that about 50 bats flew from the tree. Although the original account did not specify how the eight bats were captured, J. Whitaker (Indiana State University, pers. comm., 2005, as cited in the draft revised Indiana bat recovery plan) recounted that those bats were killed or disabled, retrieved by the landowner, and subsequently identified by a biologist. In another case, Belwood (2002) reported on the felling of a dead maple in a residential lawn in Ohio. One dead adult female and 33 non-volant young were retrieved by the researcher. Three of the young bats were already dead when they were picked up, and two more died subsequently. The rest were apparently retrieved by adult bats that had survived. In a third case, 11 dead adult female Indiana bats were retrieved (by people) when their roost was felled in Knox County, Indiana (J. Whitaker, pers. comm., 2005, as cited in the draft revised Indiana bat recovery plan).

Exposure

Indiana bats roosting in a tree that is being removed could be exposed to this stressor. Exposure would only potentially occur in daylight hours during the portion of the 4-5 year construction period of the project when trees would be removed. Any Indiana bats roosting in the clearing limits of the project could be exposed to this stressor. The Bureau will implement the following conservation measure to reduce Indiana bats' exposure to this stressor:

- Trees will not be removed during June and July (the time in which non-volant pups would be present).

We assume that there is a maternity colony near the center point of the clearing limits, that male bats are roosting within the clearing limits during the summer, that 124 Indiana bats from the Line Fork cave system roost in trees in the clearing limits during fall swarming, and that bats from assumed hibernacula #1 and #2 roost in trees in the clearing limits during spring staging and fall swarming. Because tree removal will not occur during June or July, all the bats exposed to this stressor are expected to have the ability to fly (e.g. adults and volant juveniles). Indiana bats that do not flush from the tree before or as it is felled may be exposed to this stressor.

We expect that some of the Indiana bats will be able to avoid this stressor by flushing from the roost tree prior to its removal or before the cut tree hits the ground. The number of individuals potentially

exposed to this stressor would be the total number of Indiana bats roosting in the clearing limits of the project:

- 270 bats from April 1 – August 15 (excluding June – July),
- 24 bats from April 1 – May 14, and
- 148 bats from August 16 – November 14.

We do not expect all of these bats to be exposed to this stressor, because we do not expect all of the Indiana bats roosting in the Action Area to be roosting in a tree that would be removed by the Action. The exact number of Indiana bats exposed to this stressor is indeterminable because we do not know in which specific trees Indiana bats are roosting.

Response

Based on the documented accounts of Indiana bat mortality in response to this stressor, we expect that some affected Indiana bats that are struck by equipment or trees during construction activities will be injured or killed. Further, if bats are seriously injured, they may die later.

Effects

Indiana bats that die will cause a direct decrease in the population of the species. Injured bats that do not subsequently die from the injuries may experience decreased reproductive success. We expect exposure to this stressor to result in take of Indiana bats in the form of "harm".

2.7.3.2. Stressor - Removal of Occupied Roost Trees

Bats that are not struck while a roost tree is being removed may flush before the tree is felled, during the felling of the tree, or once the tree is felled and hits the ground.

Exposure

Indiana bats roosting in a tree that is removed could be exposed to this stressor. Exposure would only potentially occur during daylight hours during the portion of the 4-5 year construction period of the project when trees would be removed. The Bureau will implement the following conservation measure to reduce Indiana bats' exposure to this stressor:

- Trees will not be removed during June and July (the time in which non-volant pups are most likely to be present).

We assume that there is a maternity colony near the center point of the clearing limits, that male bats are roosting within the clearing limits during the summer, that 124 Indiana bats from the

Line Fork cave system roost in trees in the clearing limits during fall swarming, and that bats from assumed hibernacula #1 and #2 roost in trees in the clearing limits during spring staging and fall swarming. Because tree removal will not occur during June or July, all the bats exposed to this stressor are expected to have the ability to fly. The number of individuals potentially exposed to this stressor would be the total number of Indiana bats roosting in the clearing limits of the project:

- 270 bats from April 1 – August 15 (excluding June and July),
- 24 bats from April 1 – May 14, and
- 148 bats from August 16 – November 14.

We do not expect all of these bats to be exposed to this stressor, because we do not expect all of the Indiana bats roosting in the Action Area to be roosting in a tree that would be removed by the Action. The exact number of Indiana bats exposed to this stressor is indeterminable because we do not know in which specific trees Indiana bats are roosting.

Response

Indiana bats that flush from a roost tree will be exposed to increased potential for predation. Flushed individuals will also likely have to find new roosting sites. Because large amounts of habitat will be removed, it is likely that multiple alternate roosts will also be removed and that bats will have to expend extra energy to search for new roost trees in new roosting areas.

Effects

Indiana bats that are consumed by predators to which they would not normally be exposed would result in a direct decrease in the population of the species. If Indiana bats have to increase their energy expenditure to search for a new roost tree during a sensitive period of a bat's reproductive cycle (e.g., pregnancy), it is possible that spontaneous abortion or other stress-related reproductive delays or losses in fecundity may occur in some individuals, particularly those that may have already been under other environmental stressors (e.g., WNS). It has been hypothesized that these stresses and delays in reproduction could also cause lower fat reserves and lead to lower winter survival rates (USFWS 2002). For example, females that give live birth may have pups with lower birth weights or their pups may have delayed development rates (i.e., late into the summer). This could, in turn, affect the over-winter survival of these young-of-the-year bats if they enter fall migration and winter hibernation periods with inadequate fat reserves. Increased energy expenditures and lower weight gains during fall swarming could result in lower fitness in those stressed individuals as exhibited by reduced survival and/or reproductive success. Impacts to non-reproductive adults would be less severe than those impacts to reproductive females and juveniles, because there are fewer stresses on these individuals. However, these individuals are still likely to be impacted by the loss of summer habitat through increased energy

expenditures associated with finding new roosting habitats and/or traveling longer distances to forage.

We expect exposure to this stressor to result in take of some Indiana bats in the form of "harm" by habitat modification that kills or injures Indiana bats by significantly impairing essential behavioral patterns such as breeding, feeding, or sheltering. We expect exposure to this stressor to result in take of some Indiana bats in the form of "harassment" by annoying Indiana bats to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. We expect exposure of this stressor to result in take of some Indiana bats in the forms of both "harm" and "harassment". Thus, we expect take of Indiana bats from exposure of this stressor to be in the form of "harm" and/or "harassment". Because of the availability of other forested habitat in the vicinity, we expect that these bats would find other areas in which to roost and would likely recover from the effects of this stressor by the following roosting season.

2.7.3.3. Stressor - Loss of Forested Habitat on the Landscape

The construction of the proposed facility will reduce the amount of forested habitat on the landscape that is available to the Indiana bat for roosting, foraging, and commuting.

Exposure

All Indiana bats that roost, forage, and commute in the forested habitat that is within the clearing limits of the project will be exposed to this stressor. Because Indiana bats show high site fidelity to roosting and foraging areas, even bats that are in hibernation during tree removal will be exposed to this stressor after they emerge. The Bureau will implement the following conservation measure to reduce Indiana bats' exposure to this stressor:

- A buffer of 157.6 hectares (389.5 acres) will remain undisturbed on the 231.1-hectare (570-acre) property. Of that buffer, 95.4 hectares (235.8 acres) are currently forested and will continue to provide roosting, foraging, and commuting habitat for Indiana bats.

We expect all of the Indiana bats that use forested habitat in the clearing limits of the project to be exposed to this stressor:

- 270 bats from April 1 – August 15,
- 24 bats from April 1 – May 14, and
- 148 bats from August 16 – November 14.

Response

The removal of forested habitat may require bats to expend additional energy to seek out new habitat for roosting, foraging, and commuting. The significance of the response will be influenced by the amount of habitat removed and the availability and quality of remaining habitat.

The proposed forest removal would reduce the forested habitat within a 4.0-km (2.5-mi) radius of the project area, the area used by the assumed Indiana bat maternity colony, from 83.2% to 82.3% (Fig. 2 and Appendix B: Table 1). The bats that use this habitat will have to find new primary and alternate roost trees to use and new foraging and commuting habitat.

The entire clearing limits for the proposed project are within the 16-km (10-mi) radius of the Line Fork Cave system and would be used during swarming by 124 of the Indiana bats that hibernate there. The proposed forest removal would reduce the forested habitat in the swarming area from 82.09% to 82.05% (Appendix B: Table 2 and Fig. 8).

The proposed forest removal would reduce the forested habitat used by Indiana bats during spring staging prior to hibernation and during fall swarming after hibernation in assumed hibernaculum #1. In an 0.8 km (0.5 mi) radius area used during spring staging, the forested habitat would be reduced from 59.3% to 55.8% (Appendix B: Table 3 and Fig. 2). In an 8 km (5 mi) radius area used during fall swarming, the forested habitat would be reduced slightly but would remain at approximately 52.0% (Appendix B: Table 4 and Fig. 3). Bats that hibernate in this feature would use habitat in this area during fall swarming.

The proposed forest removal would reduce the forested habitat within 0.8 km (0.5 mi) radius of assumed hibernaculum #2 from 71.2% to 62.8% (Appendix B: Table 5 and Fig. 4). It would reduce the forested habitat within an 8 km (5 mi) radius of this feature from 81.4% to 81.2% (Appendix B: Table 6 and Fig. 5).

Because the majority of the area outside of the clearing limits of the project is forested, we expect that bats will be able to find adequate habitat for roosting, foraging, and commuting. Bats will alter their behavior more significantly if they are exposed to this stressor during a time in their life cycle when they utilize smaller areas of forested habitat (i.e., fall swarming and spring staging). After an initial extra energy expenditure to find these areas, we expect that Indiana bats will shift their roosting areas, foraging range, and commuting routes to adapt to the changed landscape. After this adaptation, we do not expect Indiana bats to have a significant response to this reduction in habitat.

Effects

If Indiana bats have to increase their energy expenditure to search for a new roost tree during a sensitive period of a bat's reproductive cycle (e.g., pregnancy), it is possible that spontaneous abortion or other stress-related reproductive delays or losses in fecundity may occur in some individuals, particularly those that may have already been under other environmental stressors (e.g., WNS). It has been hypothesized that these stressors and delays in reproduction could also cause lower fat reserves and lead to lower winter survival rates (USFWS 2002). For example, females that give live birth may have pups with lower birth weights or their pups may have delayed development rates (i.e., late into the summer). This could, in turn, affect the over-winter survival of these young-of-the-year bats if they enter fall migration and winter hibernation periods with inadequate fat reserves. Increased energy expenditures and lower weight gains during fall swarming could result in lower fitness in those stressed individuals as exhibited by reduced survival and/or reproductive success. Impacts to non-reproductive adults would be less than those impacts to reproductive females and juveniles, because there are fewer stresses on these individuals. However, these individuals are still likely to be impacted by the loss of summer habitat through increased energy expenditures associated with finding new roosting habitats, longer foraging distances or disrupted travel corridors.

We expect significant effects as a result of the removal of forested habitat that Indiana bats are accustomed to using. We expect exposure to this stressor to result in take of some Indiana bats in the form of "harm" by habitat modification that kills or injures Indiana bats by significantly impairing essential behavioral patterns such as breeding, feeding, or sheltering. We expect exposure to this stressor to result in take of some Indiana bats in the form of "harassment" by annoying Indiana bats to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. We expect exposure of this stressor to result in take of some Indiana bats in the forms of both "harm" and "harassment". Thus, we expect take of Indiana bats from exposure of this stressor to be in the form of "harm" and/or "harassment". Because of the availability of other forested habitat in the vicinity, we expect that these bats would find other areas in which to roost and would likely recover from the effects of this stressor by the following roosting season.

2.7.3.4. Stressor - Loss of Water Resources

This project will result in the loss of approximately 1.7 linear kilometers (5,610 linear feet) of stream and 0.89 hectare (2.44 acres) of wetlands (Bureau 2017a). The project site is on the top of a mountain from which several first order streams flow. The streams that will be directly impacted are intermittent or ephemeral streams. Most of the wetlands that will be impacted are in the areas that were previously cleared and exist in depressions (e.g., roads) created during or after the mining operation.

Exposure

The loss of streams and wetlands reduces the areas for Indiana bats to drink and reduces the number of insects present in the project area that could contribute to the diets of Indiana bats. The Bureau is implementing the following conservation measure that would reduce the exposure of Indiana bats to this stressor:

- 4.7 linear kilometers (15,440 LF) of stream and 0.32 hectare (0.66 acre) of wetlands on the property will not be impacted.

We expect all of the Indiana bats that use these resources for drinking and/or foraging to be exposed to this stressor. This could be all of Indiana bats that use habitat in the Action Area for foraging:

- 270 bats from April 1 – August 15,
- 24 bats from April 1 – May 14, and
- 148 bats from August 16 – November 14.

Response

Indiana bats that currently use water resources in the construction limits of the project may have to change their behavior to find new areas in which to forage and/or drink. Because of the periodic flow status of the impacted streams, the low quality of the wetlands, and the lack of forested habitat surrounding the wetlands, these features are not likely to be significant drinking or foraging resources for the species. The property contains other streams and wetlands that would not be impacted by the proposed project and is bordered by the North Fork Kentucky River, Kings Creek, and Tolson Branch, which are all less than 2,000 feet from the clearing limits of the project. Therefore, Indiana bats that use these resources would not have to expend significant additional energy to find high-quality perennial streams with forested riparian habitat areas.

Effects

Due to the low quality of the ephemeral and intermittent streams as foraging habitat and the proximity of other aquatic resources to the site, we believe that any resulting change in the effort required to find adequate drinking and/or foraging resources would have an insignificant effect on the Indiana bat.

2.7.3.5. Stressor - Stream Sedimentation

Erosion during and immediately after the construction of the proposed project will result in short-term impacts to water quality as a result of increased sediment. This sedimentation will occur in streams in the project area and downstream. Increased sedimentation can negatively impact aquatic insects upon which Indiana bats feed.

Exposure

All of the Indiana bats using these resources for drinking and foraging will be temporarily exposed to this stressor. The Bureau will implement the following conservation measure to reduce Indiana bats' exposure to this stressor:

- An erosion and sediment control plan will be developed that specifies the site-specific BMPs that will be used to reduce erosion from the site and sedimentation in the streams.

We expect all of the Indiana bats that use these resources for drinking and/or foraging to be exposed to this stressor. This could be all of the Indiana bats that use habitat in the Action Area for foraging:

- 270 bats from April 1 – August 15,
- 24 bats from April 1 – May 14, and
- 148 bats from August 16 – November 14.

Response

Indiana bats that currently use water resources impacted by sedimentation may have to travel to find new areas in which to forage and/or drink. Indiana bats that do use these resources would not have to expend significant additional energy to travel long distances to find high-quality perennial streams with forested riparian areas. The property contains streams and wetlands that would not be impacted by the proposed project. The project site is bounded by the North Fork Kentucky River, Kings Creek, and Tolson Branch, which are all less than 2,000 feet from the clearing limits of the project.

Effects

Due to the temporary nature of the stressor, the use of BMPs to minimize the intensity of the stressor, and the proximity of unaffected aquatic resources to the site, we believe that any change in the effort required to find adequate drinking and/or foraging resources would have an insignificant effect on the Indiana bat.

2.7.3.6. Stressor - Hazardous Materials Spills

There is the potential for hazardous material spills during the construction of the facility. The primary hazardous materials with the potential to be spilled are: diesel fuel, gasoline, hydraulic fluids, oils, lubricants, solvents, adhesives, and battery chemicals used during construction activities. These materials could drain or otherwise mobilize into streams and contaminate the water.

Exposure

Indiana bats using contaminated streams for drinking and foraging could be temporarily exposed to this stressor. The Bureau will implement the following conservation measures to reduce Indiana bats' exposure to this stressor:

- a site-specific groundwater protection plan,
- appropriate waste disposal,
- appropriate chemical handling and storage procedures, and
- a proper spill response protocol.

We expect all the Indiana bats that use impacted streams for foraging and/or drinking to be exposed to this stressor. This could be all of Indiana bats that use habitat in the Action Area for foraging:

- 270 bats from April 1 – August 15,
- 24 bats from April 1 – May 14, and
- 148 bats from August 16 – November 14.

Response

Indiana bats that drink from water resources impacted by hazardous materials spills may be sickened or poisoned. Indiana bats that currently forage on insects in water resources impacted by hazardous material spills may be sickened or poisoned by the insects they consume from contaminated waters. Aquatic insect populations could decline in contaminated waters, and Indiana bats may then have to travel to find new areas in which to forage (the effects of this response are discussed in section 2.7.3.5).

Effects

Indiana bats that are sickened or poisoned directly from contaminated water sources or indirectly

by ingesting contaminated insects may experience reduced fitness or mortality. Due to the measures to prevent hazardous material spills, we believe that a significant spill is unlikely and, thus, the potential for effects to the Indiana bat would be discountable.

2.7.3.7. Stressor - Noise and Vibration from Blasting

Blasting will be used during the preparation of the site. Although blasting produces high-levels of noise, most of that noise is within the frequency range of 2-200 Hz (Cardno Mining Division 2016), which is outside the hearing range of bats, which is typically greater than 1,000 Hz (Siemers and Schaub 2011). There will likely be some noise produced that can be detected by Indiana bats. Vibrations will be produced during blasting, but we do not know how far the vibrations will travel from the site of the blasting. Indiana bats roosting closer to the location of the blasting would experience greater exposure to these vibrations, while those bats roosting farther away would have less likelihood of exposure.

Exposure

Indiana bats present in the Action Area during blasting activities may be exposed to the effects of blasting. The Bureau will implement the following conservation measure to reduce Indiana bats' exposure to this stressor:

- Blasting will not occur from November 15 – March 31 when Indiana bats would be in hibernation.

Blasting will only occur during the day, when the bats would be roosting. The exposure would be intermittent and of short duration. All the Indiana bats assumed to be day roosting in the Action Area of the project could be exposed to this stressor:

- 270 bats from April 1 – August 15,
- 24 bats from April 1 – May 14, and
- 148 bats from August 16 – November 14.

Response

Bats may become startled by the noise and/or vibrations and, in the most severe cases, they may flush from their roosts. The nature of the response will vary, with bats roosting closer to the blasting being more likely to flush. However, because of the short duration and intermittent frequency of blasting, we expect any bats that flush from their roost trees to recover from the disturbance after a short period of time and return to the roost tree.

Effects

Indiana bats that flush from their roost trees will experience altered behavior. We expect the likelihood of Indiana bats experiencing harm as a result of flushing from their roost tree (e.g., predation) to be discountable. The most severe effects of flushing a bat from a roost tree would be if the bat was a female within a roost tree containing pups. The longer the female is absent, the more likely the effects to the pups would be significant. Because the blasting will be conducted in areas that have previously been cleared of trees, the frequency will be intermittent, and the duration will be short, we expect most Indiana bats roosting in the Action Area will not flush, and we expect those that do flush will return to their roost trees in a short period of time. For these reasons, we expect the effects of noise and vibrations from blasting to Indiana bats to be insignificant.

2.7.3.8. Stressor - Noise and Vibration from Other Construction Activities

Construction activities other than blasting will also produce noise and vibration in the Action Area. Construction activities will occur year-round for 4-5 years. Noise and vibration from these activities are stressors that may disrupt normal feeding, sheltering, and breeding activities of the Indiana bat.

Callahan (1993) noted the likely cause of the bats in his study area abandoning a primary roost tree was disturbance from a bulldozer clearing brush adjacent to the tree. At low noise levels (or farther distances), bats initially may be startled, but they would likely habituate to the low background noise levels. At closer distances and louder noise levels (particularly if accompanied by physical vibrations from heavy machinery and the crashing of falling trees), many bats would probably be startled to the point of fleeing from their day-time roosts. The novelty of these noises will also contribute to the range of responses from individuals or colonies of bats.

Novel noises would be expected to result in some changes to bat behaviors, but research suggests that bats can become habituated to this stressor. For example, several construction projects on Fort Drum have occurred adjacent to multiple known Indiana bat roosts. Construction around these project sites has been ongoing for multiple years during the active season, but has not seemingly appeared to affect known roosts or Indiana bat behavior. The last known capture and roosting locations of Indiana bat in the vicinity of these projects have been within approximately 800 and 400 meters (0.5 and 0.25 mi) of the construction activities, respectively. A military installation generally has large amounts of noise and disturbance, but Indiana bats have continued to occupy Fort Drum, suggesting that noise from machinery may disturb colonies of roosting bats, but such disturbances would have to be severe to cause roost abandonment.

Exposure

Indiana bats using the Action Area when construction activities are occurring could potentially be exposed to noise and vibrations from other construction activities. The Bureau will implement the following conservation measure to reduce Indiana bats' exposure to this stressor:

- The clearing limits of the project will be 66 m (216.5 ft) from assumed hibernaculum #1.

Additionally, the clearing limits of the project will be 60 m (199 ft) from assumed hibernaculum #2.

We do not know how far noise and vibration will travel from where construction activities are occurring. Indiana bats roosting closer to the location of the activities would experience greater exposure while those roosting farther away would experience less exposure. There will be a forested buffer between the construction limits of the project and assumed hibernacula #1 and #2. Additionally, assumed hibernaculum #1 is located downslope from the construction limits of the project and opens away from the construction limits. For these reasons, we do not expect hibernating Indiana bats to be exposed to this stressor. Construction activities will only occur during the daylight hours when the bats would be roosting. The exposure will be of long duration during the 4-5 year construction period. All the Indiana bats assumed to be roosting in the Action Area of the project could be exposed to this stressor:

- 270 bats from April 1 – August 15,
- 24 bats from April 1 – May 14, and
- 148 bats from August 16 – November 14.

Response

The response of Indiana bats to this stressor will vary according to the distance of the roosting bat to the stressor and the specifications of each of the specific activities. Indiana bats roosting in trees near construction activities could respond to the stressor by flushing from the roost tree. However, because the construction activities will be conducted in areas cleared of trees, Indiana bats are not likely be roosting immediately adjacent to the source of this stressor. For this reason, we expect that most Indiana bats roosting in the Action Area will not flush, and we expect those that do flush will to return to their roost trees in a short amount of time. Additionally, we expect Indiana bats to become habituated to the noise and vibrations from construction activities.

Effects

Indiana bats that flush from their roost trees will experience altered behavior. We expect the likelihood of Indiana bats experiencing harm as a result of flushing from their roost tree (e.g.,

predation) to be discountable. We do not expect these behavior alterations to have significant effects on Indiana bats because we expect there to be few, if any flushed Indiana bats, and we expect those that do flush to return to their roost tree in a short period of time. Therefore, we expect the effects of noise and vibrations from construction activities other than blasting to Indiana bats to be insignificant and/or discountable.

2.7.3.9. Stressor - Increased Human Presence

Human activity will be increased on the site during construction activities. The stressor of increased human presence will be concurrent with other construction activities (*e.g.*, clearing, grading, blasting). We have already discussed the effects of those activities in the preceding sections. We do not expect the increased human presence to elicit additional significant responses by Indiana bats.

2.7.3.10. Stressor - Night Lighting

Some areas will be lit during construction. The lighting will be aimed towards areas that have already been cleared of trees.

Exposure

The Bureau will implement the following conservation measure to reduce Indiana bats' exposure to this stressor:

- Construction lighting will be aimed toward construction activities and away from forested habitat.

Because assumed hibernacula #1 and #2 are located outside of the area that will be cleared for the facility and the topography is such hibernaculum #1 would not open towards the construction area, we do not expect Indiana bats to be exposed to this stressor during hibernation. Indiana bats that use the footprint of the project area at night while foraging and/or commuting will be exposed to this stressor. Indiana bats show high site fidelity to foraging and commuting habitat and those that have used areas within the construction limits of the project for foraging and commuting in the past may still use the area after it is cleared of trees. They would likely avoid the areas that are lighted. Areas lighted during construction will likely only comprise a portion of the total clearing and disturbance limits at any one time. For the purposes of this analysis, we are going to consider the entire clearing and disturbance limits lighted during the entire 4-5 year construction phase.

All the Indiana bats foraging and/or commuting in the Action Area could be exposed to this stressor:

- 270 bats from April 1 – August 15,
- 24 bats from April 1 – May 14, and
- 148 bats from August 16 – November 14.

Response

Foraging and commuting Indiana bats are likely to be deterred from lighted areas while foraging and/or commuting, shifting their flight paths to avoid these artificially-lit areas. The removal of forested habitat may require Indiana bats to expend additional energy to seek out new habitat for foraging and commuting.

The proposed clearing and disturbance limits (73 hectares (180.5 acres)) represent the following portions of the areas used by Indiana bats in Action Area:

- 1.4% of the area within a 4.0-km (2.5-mi) radius of the project area, which is the area used by the assumed Indiana bat maternity colony;
- less than 0.1% within the 16-km (10-mi) radius of the Line Fork Cave system, which is used during swarming by the Indiana bats that hibernate there;
- 12.5% within a 0.8 km (0.5 mi) of assumed hibernaculum #1, which is used during spring staging; and 17.5% within a 0.8 km (0.5 mi) of assumed hibernaculum #2, which is used during spring staging; and
- 3.4% within the 8-km (5 mi) radius of the assumed hibernacula #1 and #2, which is used during fall swarming.

Because the majority of the area outside of the clearing and disturbance limits of the project is undeveloped, we expect that bats will be able to find adequate habitat for foraging and commuting. Bats will alter their behavior more significantly if they are exposed to this stressor during a time in their life cycle when they utilize smaller areas of forested habitat (i.e., fall swarming and spring staging). After an initial extra energy expenditure to find these areas, we expect that Indiana bats will shift their foraging range and commuting routes to adapt to the changed landscape. After this adaptation, we do not expect Indiana bats to have a significant response to this reduction in habitat.

Effects

If Indiana bats have to increase their energy expenditure to search for new foraging and commuting habitat during a sensitive period of a bat's reproductive cycle (e.g., pregnancy), it is

possible that spontaneous abortion or other stress-related reproductive delays or losses in fecundity may occur in some individuals, particularly those that may have already been under other environmental stressors (e.g., WNS). It has been hypothesized that these stressors and delays in reproduction could also cause lower fat reserves and lead to lower winter survival rates (USFWS 2002). For example, females that give live birth may have pups with lower birth weights or their pups may have delayed development rates (i.e., late into the summer). This could, in turn, affect the over-winter survival of these young-of-the-year bats if they enter fall migration and winter hibernation periods with inadequate fat reserves. Increased energy expenditures and lower weight gains during fall swarming could result in lower fitness in those stressed individuals as exhibited by reduced survival and/or reproductive success. Impacts to non-reproductive adults would be less than those impacts to reproductive females and juveniles, because there are fewer stresses on these individuals. However, these individuals are still likely to be impacted by the loss of habitat through increased energy expenditures associated with longer foraging distances or disrupted travel corridors.

We expect significant effects as a result of the loss of foraging and commuting habitat that Indiana bats are accustomed to using. We expect exposure to this stressor to result in take of some Indiana bats in the form of "harm" by habitat modification that kills or injures Indiana bats by significantly impairing essential behavioral patterns such as breeding, feeding, or sheltering. We expect exposure to this stressor to result in take of some Indiana bats in the form of "harassment" by annoying Indiana bats to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. We expect exposure of this stressor to result in take of some Indiana bats in the forms of both "harm" and "harassment". Thus, we expect take of Indiana bats from exposure of this stressor to be in the form of "harm" and/or "harassment". Because of the availability of other undeveloped habitat in the vicinity, we expect that these bats would find other areas in which to forage and commute and would likely recover from the effects of this stressor by the following roosting season.

2.7.3.11. Stressor - Invasive Species

Invasive species may be introduced to the site during the construction of the facility. Contractors will be required to inspect vehicles and equipment prior to entering the site to minimize the transport of invasive species. Fill material will be taken from onsite, and invasive species will be controlled on the grounds of the facility during its operation. Because of the measures to prevent the introduction and establishment of invasive species on the site, we do not expect significant effects to the species from this stressor.

2.7.4. Effects of Facility Operation

2.7.4.1. Stressor - Hazardous Materials Spills

There is the potential for hazardous material spills during the operation of the facility. The primary hazardous materials with the potential to be spilled are: diesel fuel, gasoline, hydraulic fluids, oils, lubricants, solvents, adhesives, and battery chemicals stored and used at the facility. The exposure, response, and effects of this stressor from the operation of the facility are similar to those resulting from hazardous materials spills during construction activities. This analysis was discussed in section 2.7.3.6 and will not be repeated here.

2.7.4.2. Stressor - Traffic

Noise and vibration from traffic will occur in perpetuity at the site during the operation of the facility. Traffic will occur during all times of the year and could occur at any time of the day or night. It will be intermittent, but not constant. Peak traffic is anticipated from 7:00-9:00 am and 3:00-5:00 pm with approximately 156 trips and 204 trips, respectively, during those times.

Some studies have demonstrated that Indiana bats select roost trees away from roads, while other demonstrate that they can habituate to the disturbance. In Illinois, 56 Indiana bat roosts were located significantly farther from paved highways than from unpaved roads (Garner and Gardner 1992). Adult females roosted further from paved roads than juveniles or males, and reproductive females rarely roosted within 1,640 feet (500 m) of paved roads (Garner and Gardner 1992). Conversely, Indiana bats have also been noted to tolerate traffic noise or other effects from roads. During spring emergence studies in New York, biologists have documented roost trees within 195 and 207 meters (640-680 ft) of I-81, 113 meters (370 ft) of I-481, and 65 meters (213 ft) of I-84 (USFWS 2008). Indiana bats have also been documented roosting within approximately 300 meters of a busy State route adjacent to Fort Drum Military Installation (U.S. Army Garrison Fort Drum 2014). In another study near 1-70 and the Indianapolis Airport, a primary maternity roost was located 1,970 feet (0.6 km) south of 1-70 (3D/International, Inc. 1996). This primary maternity roost was not abandoned despite constant noise from the Interstate and airport runways. However, the roost's proximity to 1-70 may be related to a general lack of suitable roosting habitat in the vicinity, and due to the fact that the noise levels from the airport were not novel to the bats (USFWS 2002).

Exposure

Indiana bats in certain areas within the Action Area could potentially be exposed to this stressor at any time during the operation of the facility. We do not know how far noise and vibration will

travel from the roads on the site and, therefore, cannot specify the distance around the facility in which Indiana bats would be exposed to this stressor. The level of exposure will decrease as the distance increases from the Indiana bat to the source of the stressor. There will be a forested buffer between the construction limits of the project and assumed hibernacula #1 and #2. Additionally, hibernaculum #1 located downslope from the construction limits of the project and opens away from the construction limits. For these reasons, we do not expect hibernating Indiana bats to be exposed to this stressor. All the Indiana bats roosting, foraging, and/or commuting in the vicinity of the facility could be exposed to this stressor:

- 270 bats from April 1 – August 15,
- 24 bats from April 1 – May 14, and
- 148 bats from August 16 – November 14.

Response

We expect Indiana bats that continue to roost in the project area in close proximity of the proposed facility to be have become accustomed to similar disturbances during the 4-5 year construction period (from tree removal or noise and vibration during construction). Bats in the vicinity of the facility would have already become accustomed to the traffic on the existing roads nearby; the site is bounded on the north and half of the east side by state highways and on the west by another road. The traffic accessing the facility will be occurring in new areas. We expect Indiana bats that remain in the vicinity of the facility after construction to become habituated to the additional traffic.

Effects

Because we do not anticipate a significant response from Indiana bats to this stressor, we do not believe that this stressor would result in significant effects to the Indiana bat.

2.7.4.3. Stressor - Noise from Small Arms Fire

The facility will include a small arms (*e.g.* handguns, shotguns, and rifles) firing range for training purposes.

Exposure

Firing range activities will occur annually during a six-week period during March and April (five days a week, Monday – Friday) and on one day each month of the year. This will continue in perpetuity. All the firing will occur during daylight hours. Any Indiana bats roosting in the

Action Area during the use of the firing range could potentially be exposed to this stressor. The firing range will be located in an area that has been cleared of vegetation, reducing the availability of roosting habitat in the areas that would experience the greatest noise. Noise level modeling shows the 87 peak decibel levels (dBP) and 104 dBP contours (Fig. 9) (Bureau 2017b). Some forested habitat is present in the areas that would experience these noise levels. The level of exposure (*i.e.*, received sound level) an Indiana bat experiences would decrease with increasing distance from the source of the stressor (firing range). All the Indiana bats roosting in the vicinity of the facility could potentially be exposed to this stressor:

- 270 bats from April 1 – August 15,
- 24 bats from April 1 – May 14, and
- 148 bats from August 16 – November 14.

Response

There will be a forested buffer between the facility and assumed hibernacula #1 and #2. Additionally, hibernaculum #1 is located downslope from the construction limits of the project and opens away from the construction limits. For these reasons, we do not expect hibernating Indiana bats to respond to this stressor. The response of non-hibernating Indiana bats to this stressor will vary according to distance of the roosting bat to the firing range. Some Indiana bats roosting in trees near the firing range will likely respond to the stressor by flushing from the roost tree. Research from Camp Atterbury and Fort Leonard Wood have demonstrated that Indiana bats exposed to repeated military training noise continued to forage while these activities were taking place. These bats likely became habituated to the constant disturbance. Because of the intermittent use of the proposed firing range, we do not expect the Indiana bats nearby to become habituated to this stressor. The small arms fire will continue throughout the day on the monthly training days and for several hours a day during the six-week training. Because of the duration of the disturbance, we expect Indiana bats to be repeatedly disturbed by the noise produced on the days the firing range is used.

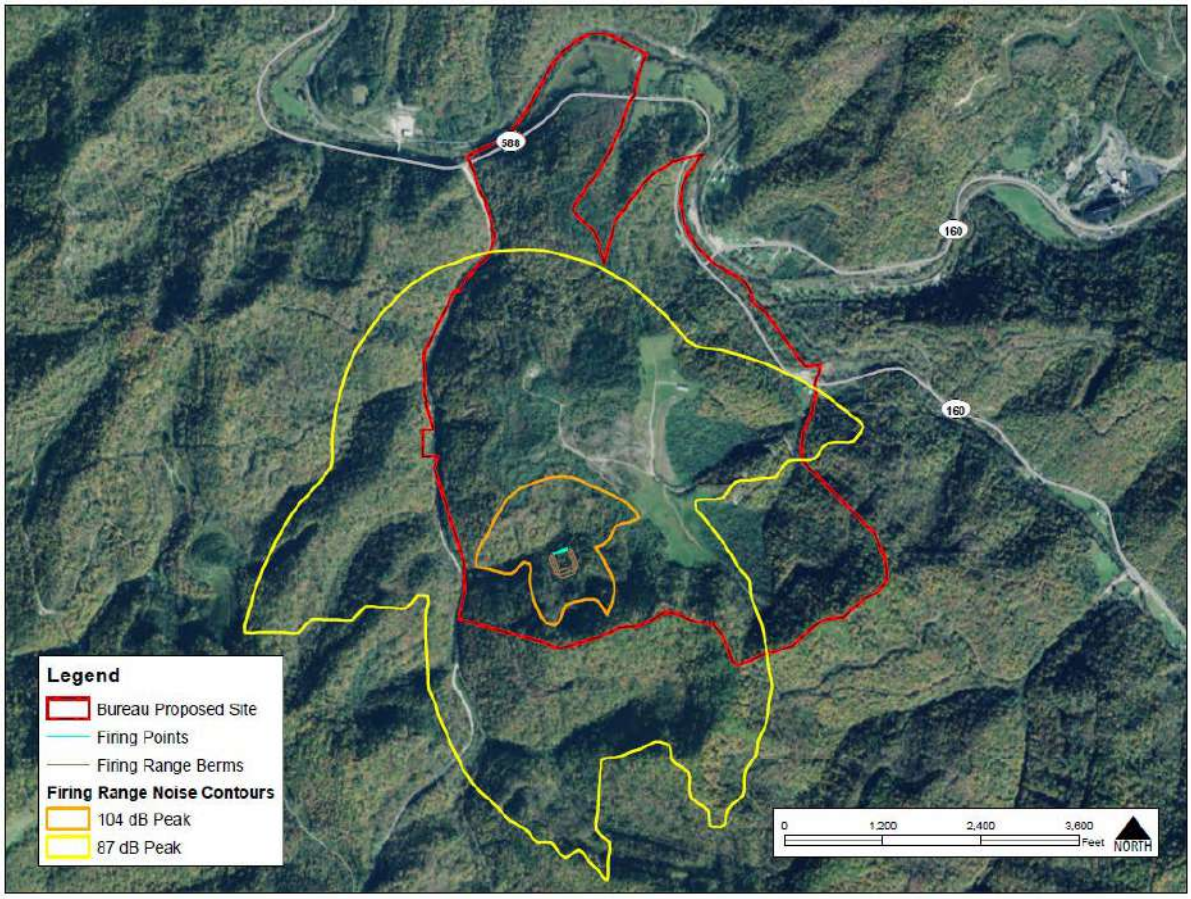

Figure 9. Modeled noise contours for outdoor firing range at the proposed USP and FPC (provided to Service from Bureau (I. Gaston, pers. comm. 2017))

Effects

Indiana bats that flush from their roost trees will experience altered behavior. We expect the likelihood of Indiana bats experiencing harm as a result of flushing from their roost tree (e.g., predation) to be discountable. If displaced Indiana bats have to increase their energy expenditure to search for a new roost tree during a sensitive period of a bat's reproductive cycle (e.g., pregnancy), it is possible that spontaneous abortion or other stress-related reproductive delays or losses in fecundity may occur in some individuals, particularly those that may have already been under other environmental stressors (e.g., WNS). It has been hypothesized that these stressors and delays in reproduction could also cause lower fat reserves and lead to lower winter survival rates (USFWS 2002). For example, females that give live birth may have pups with lower birth weights or their pups may have delayed development rates (i.e., late into the summer). This could, in turn, affect the over-winter survival of these young-of-the-year bats if they enter fall

migration and winter hibernation periods with inadequate fat reserves. Increased energy expenditures and lower weight gains during fall swarming could result in lower fitness in those stressed individuals as exhibited by reduced survival and/or reproductive success. Impacts to non-reproductive adults would be less than those impacts to reproductive females and juveniles, because there are fewer stresses on these individuals. Females may be flushed from roost trees containing pups. Female bats do leave their pups in roost trees for some amount of time while they forage at night, but the longer the female is absent, the more likely the effects to the pups would be significant. We expect the responses of some adult Indiana bats to this stressor to result in significant adverse effects. We also expect some pups to be significantly affected by the extended absence of adults from the roost tree. We expect exposure of this stressor to result in take of some Indiana bats in the forms of both "harm" and "harassment". Thus, we expect take of Indiana bats from exposure of this stressor to be in the form of "harm" and/or "harassment".

2.7.4.4. Stressor - Increased Human Presence

Human activity during the operation of the facility will occur during all hours of the day and night and will continue in perpetuity. Human presence will be limited to the facility within which the forested habitat would have been cleared and the area maintained as lawn. There would be no roosting habitat in close proximity to the areas in which humans will be and human presence at night will be limited to areas that will already be impacted by night lighting. We do not expect the increased human presence to elicit additional significant responses by Indiana bats.

2.7.4.5. Stressor - Collisions with Vehicles

The traffic to the site increases the risk of a vehicle colliding with an Indiana bat.

Exposure

Indiana bats could be exposed to this stressor when they are flying while foraging and/or commuting. Traffic will occur during all times of the year. This new traffic could occur at any time of the day or night and will be intermittent, but not constant. Peak traffic is anticipated from 7:00-9:00 am and 3:00-5:00 pm with approximately 156 trips and 204 trips, respectively, during those times. All the Indiana bats in the Action Area that use the Action Area for foraging and/or commuting could be exposed to this stressor:

- 270 bats from April 1 – August 15,
- 24 bats from April 1 – May 14, and
- 148 bats from August 16 – November 14.

Response

Indiana bat collisions with vehicles will likely result in immediate mortality or injury and subsequent mortality.

Effects

Because vehicular traffic is already occurring on adjacent roads and the additional traffic will occur mostly during the daylight hours when the bats would not be active, we believe the potential for effects of collisions with vehicles to the Indiana bat is discountable.

2.7.4.6. Stressor - Night Lighting

During operation, the facility will be artificially lighted throughout the dark hours in perpetuity.

Exposure

The Bureau will implement the following conservation measures to reduce Indiana bats' exposure to this stressor:

- Exterior lights (high mast, wall packs, and parking lot and sidewalk light poles) will have full cutoff features.

Because assumed hibernacula #1 and #2 are located outside of the area that will be cleared for the facility and the topography is such that hibernaculum #1 would not open towards the construction area, we do not expect Indiana bats to be exposed to this stressor during hibernation. Bats that use the footprint of the project area at night while foraging and/or commuting will be exposed to this stressor. Indiana bats show high site fidelity to foraging and commuting habitat, and those Indiana bats that have used the footprint of the proposed facility for foraging and commuting in the past may still use the area after it is cleared of trees. They would likely avoid this lighted area during the operation of the facility.

All the Indiana bats foraging and/or commuting in the Action Area could be exposed to this stressor:

- 270 bats from April 1 – August 15,
- 24 bats from April 1 – May 14, and
- 148 bats from August 16 – November 14.

Response

Foraging and commuting Indiana bats are likely to be deterred from lighted areas during while foraging and/or commuting. They will likely shift their flight paths while foraging and when commuting to avoid these artificially-lit areas. The removal of forested habitat may require Indiana bats to expend additional energy to seek out new habitat for foraging and commuting.

The proposed clearing and disturbance limits (73 hectares (180.5 acres)) represents the following portions of the areas used by Indiana bats in Action Area:

- 1.4% of the area within a 4.0-km (2.5-mi) radius of the project area, which is the area used by the assumed Indiana bat maternity colony;
- less than 0.1% within the 16-km (10-mi) radius of the Line Fork Cave system, which is used during swarming by Indiana bats that hibernate there;
- 5.1% within a 0.8 km (0.5 mi) of assumed hibernaculum #1, which is used during spring staging; 17.5% within a 0.8 km (0.5 mi) of assumed hibernaculum #2, which is used during spring staging; and
- 3.4% within the 8-km (5 mi) radius of assumed hibernacula # 1 and #2, which is used during fall swarming.

Because the majority of the area outside of the clearing and disturbance limits of the project is undeveloped, we expect that bats will be able to find adequate habitat for foraging and commuting. Indiana bats will alter their behavior more significantly if they are exposed to this stressor during a time in their life cycle when they utilize smaller areas of forested habitat (i.e., fall swarming and spring staging). After an initial extra energy expenditure to find these areas, we expect that Indiana bats will shift their foraging range and commuting routes to adapt to the changed landscape. After this adaptation, we do not expect Indiana bats to have a significant response to this reduction in habitat.

Effects

If Indiana bats have to increase their energy expenditure to search for new foraging and commuting habitat during a sensitive period of a bat's reproductive cycle (e.g., pregnancy), it is possible that spontaneous abortion or other stress-related reproductive delays or losses in fecundity may occur in some individuals, particularly those that may have already been under other environmental stressors (e.g., WNS). It has been hypothesized that these stressors and delays in reproduction could also cause lower fat reserves and lead to lower winter survival rates (USFWS 2002). For example, females that give live birth may have pups with lower birth weights or their pups may have delayed development rates (i.e., late into the summer). This could, in turn, affect the over-winter survival of these young-of-the-year bats if they enter fall

migration and winter hibernation periods with inadequate fat reserves. Increased energy expenditures and lower weight gains during fall swarming could result in lower fitness in those stressed individuals as exhibited by reduced survival and/or reproductive success. Impacts to non-reproductive adults would be less than those impacts to reproductive females and juveniles, because there are fewer stresses on these individuals. However, these individuals are still likely to be impacted by the loss of habitat through increased energy expenditures associated with longer foraging distances or disrupted travel corridors.

We expect significant effects as a result of the removal of foraging and commuting habitat that Indiana bats are accustomed to using. We expect exposure to this stressor to result in take of some Indiana bats in the form of "harm" by habitat modification that kills or injures Indiana bats by significantly impairing essential behavioral patterns, such as breeding, feeding, or sheltering. We expect exposure to this stressor to result in take of some Indiana bats in the form of "harassment" by annoying Indiana bats to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. We expect exposure of this stressor to result in take of some Indiana bats in the forms of both "harm" and "harassment". Thus, we expect take of Indiana bats from exposure of this stressor to be in the form of "harm" and/or "harassment". Because of the availability of other undeveloped habitat in the vicinity, we expect that these bats would find other areas in which to forage and commute and would likely recover from the effects of this stressor by the following roosting season.

2.8. **Conclusion for the Indiana bat**

We have considered the status of the species across its range, the status of the species within the Action Area, and the effects of the Action to the Indiana bat. In our effects analysis, we identified several ways in which Indiana bats would be adversely affected by the Action. We estimate that 418 Indiana bats use the construction limits for roosting, foraging, and/or commuting: 270 bats from April 1 – August 15; 24 bats from April 1 – May 14; and 148 bats from August 16 – November 14 (the 24 bats that use the habitat from April 1 – May 14 are part of the 148 bats from August 16 – November 14). All 418 of the Indiana bats that use the Action Area for roosting, foraging, and/or commuting could be exposed to stressors associated with the Action. All of these 418 Indiana bats have the potential to be adversely affected by the following stressors: strikes from equipment or trees, removal of occupied roost trees, loss of forested habitat on the landscape, night lighting during construction, noise from small arms fire, and night lighting during facility operation.

The duration of the effects from the specific stressors will vary. The effects from strikes from equipment or trees, removal of occupied roost trees, and night lighting during construction would be temporary during the 4-5 year construction period and the following year. The loss of forested habitat on the landscape and night lighting during facility operation would be

permanent, but we expect Indiana bats to adapt their behavior to the altered landscape. The effects of noise from small arms fire will occur intermittently, presumably in perpetuity.

We assume that, as a result of the Action, some of these 418 Indiana bats will experience harm, some will experience harassment, and some will experience both harm and harassment. We cannot determine how many of these 418 Indiana bats will experience each of these effects. We expect most of the effects to be in the form of harassment and not result in mortality. The effects of the Action to Indiana bat are summarized in Table 1.

The recovery goals for the species include obtaining a minimum overall population estimate of 457,000 and demonstrating positive population growth rate. The number of bats adversely affected by the Action would be 418. This is 0.09% of the 2015 rangewide estimate of Indiana bats (532,636). The Action would, therefore, adversely affect only a small proportion of the rangewide species' population, and most of the effects to individual bats would not be lethal. The number of Indiana bats that we have estimated to occur in the Action Area is likely an overestimate based on the assumptions that we detailed in section 2.6.1. Furthermore, the number of Indiana bats adversely affected by the Action is likely to be less than the number of Indiana bats in the Action Area. Therefore, 418 Indiana bats is likely an overestimate of the number of Indiana bats that would experience adverse effects from the Action.

"*Jeopardize the continued existence*" means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR §402.02). After reviewing the current status of the species, the environmental baseline for the Action Area, the effects of the Action and the cumulative effects, it is the Service's biological opinion that the Action is not likely to jeopardize the continued existence of the Indiana bat.

Table 1. Summary of the effects of the Action on the Indiana bat.

	Hibernation	**All other times**
Property Acquisition	beneficial*	
Compensatory Mitigation	beneficial	
Construction Activities:		
Strikes from Equipment or Trees	none	harm harassment
Removal of Occupied Roost Trees	none	harm harassment
Loss of Forested Habitat on Landscape	none	harm harassment
Loss of Water Resources	none	insignificant
Stream Sedimentation	none	insignificant
Hazardous Materials Spills	none	discountable
Noise/Vibrations from Blasting	none	insignificant
Noise/Vibrations from Other Construction Activities	none	insignificant / discountable
Increased Human Presence	none	insignificant
Night Lighting	none	harm harassment
Facility Operation Activities:		
Hazardous Materials Spills	none	discountable
Traffic	none	insignificant
Noise from Small Arms Fire	insignificant	harassment
Increased Human Presence	none	insignificant
Collisions with Vehicles	none	discountable
Night Lighting	none	harm harassment

* There are adverse indirect effects resulting from the property acquisition. These are discussed subsequently under construction activities and facility operation activities.

3. NORTHERN LONG-EARED BAT

The Service listed the northern long-eared bat as a threatened species on April 2, 2015 with an interim 4(d) rule (80 FR 17973). The final rule determined that critical habitat designation for the northern long-eared bat was prudent, but not determinable at the time. On January 14, 2016, the Service finalized a rule under the authority of section 4(d) of the ESA (81 FR 1900-1922).

3.1. Description of the Northern Long-eared Bat

The northern long-eared bat (*Myotis septentrionalis*) is a medium-sized bat species, weighing 5 to 8 grams, with females tending to be slightly larger than males (Caceres and Pybus 1997). Pelage colors include medium to dark brown fur on its back; dark brown, but not black, ears and wing membranes; and tawny to pale-brown fur on the ventral side (Nagorsen and Brigham 1993; Whitaker and Mumford 2009). As indicated by its common name, the northern long-eared bat is distinguished from other Myotis species by its large ears that average 17 mm (Whitaker and Mumford 2009) and, when laid forward, extend beyond the nose but less than 5 mm beyond the muzzle (Caceres and Barclay 2000). The tragus is long (averaging 9mm), and pointed (Nagorsen and Brigham 1993; Whitaker and Mumford 2009).

3.2. Life Cycle of the Northern Long-eared Bat

The timing of the life cycle of the northern long-eared bat in Kentucky is similar to that of the Indiana bat in Figure 3 (p. 9). The northern long-eared bat is a migratory bat, hibernating in caves and mines in the winter (typically October through April) and migrating to forested summer habitat. In general, northern long-eared bats arrive at hibernacula in August or September, enter hibernation in October and November, and leave the hibernacula in March or April (Caire et al. 1979; Whitaker and Hamilton 1998; Amelon and Burhans 2006). In northern latitudes, such as in upper Michigan's copper mining district, northern long-eared bat hibernation may begin as early as late August and may last for eight and nine months (Stones and Fritz 1969; Fitch and Shump 1979). Upon arrival at hibernacula, northern long-eared bats "swarm", a behavior in which large numbers of bats fly in and out of cave entrances from dusk to dawn, while relatively few roost in caves during the day. Swarming continues for several weeks, and mating occurs during the latter part of the period. Breeding commences when males begin to swarm near hibernacula and initiate copulation activity (Whitaker and Hamilton 1998; Whitaker and Mumford 2009; Caceres and Barclay 2000; Amelon and Burhans 2006). After mating, females enter directly into hibernation but not necessarily at the same hibernaculum where mating occurred. A majority of bats of both sexes hibernate by the end of November (by mid-

October in northern areas). Hibernating females store sperm until spring, exhibiting a delayed fertilization strategy (Racey 1979; Caceres and Pybus 1997).

The period after hibernation and just before spring migration is typically referred to as “staging”, a time when bats forage and a limited amount of mating occurs. This period can be as short as a day for an individual, but not all bats emerge on the same day. Ovulation takes place at the time of emergence from the hibernaculum, followed by fertilization of a single egg, resulting in a single embryo (Cope and Humphrey 1972; Caceres and Pybus 1997; Caceres and Barclay 2000); Copulation occasionally occurs again in the spring (Racey 1982).

While the northern long-eared bat is not considered a long-distance migratory species, short migratory movements between summer roost and winter hibernacula covering between to 56 km (34.8 mi) and 88.5 km (55 mi) have been documented (Nagorsen and Brigham 1993; Griffith 1945). Males and non-reproductive females may summer near hibernacula, or migrate to summer habitat away from their hibernacula. The spring migration period likely runs from mid-March to mid-May (Caire et al. 1979; Easterla 1968; Whitaker and Mumford 2009).

Reproductive female northern long-eared bats actively form maternity colonies in the summer (Foster and Kurta 1999). Maternity colonies, consisting of females and young, range widely in size (reported range of 7 to 100 individuals; Owen et al. 2002; Whitaker and Mumford 2009), although about 30-60 may be most common (Whitaker and Mumford 2009; Caceres and Barclay 2000; Service 2014b). These colonies exhibit fission-fusion behavior (Garroway and Broders 2007), where members frequently coalesce to form a group, but composition of the group is in flux (Barclay and Kurta 2007).

Gestation is approximately 60 days (Kurta 1995), and parturition likely occurs in late May or early June (Caire et al. 1979; Easterla 1968; Whitaker and Mumford 2009) but may occur as late as July (Whitaker and Mumford 2009). Females give birth to a single offspring. Lactation then lasts 3 to 5 weeks, with pups becoming volant between early July and early August. The non-volancy period for the species is generally considered to occur from June1 to July 31 (80 FR 2374), but it may be earlier or later depending on latitude. Males are reproductively inactive until late July, with testes descending in most males during August and September (Caire et al. 1979; Amelon and Burhans 2006). Fall migration likely occurs between mid-August and mid-October.

Adult longevity is estimated to be up to 19 years (Kurta 1995). Most mortality for northern long-eared and many other species of bats occurs during the juvenile stage (Caceres and Pybus 1997).

3.3. Habitat Characteristics and Use of the Northern Long-eared Bat

3.3.1. Winter Habitat

Northern long-eared bats will typically hibernate between mid-fall through mid-spring each year. Suitable winter habitat (hibernacula) for the northern long-eared bat includes underground caves and cave-like structures (e.g. abandoned or active mines, railroad tunnels). These hibernacula typically have large passages with significant cracks and crevices for roosting. Microclimate preferences for northern long-eared bats are similar to Indiana bats and include relatively constant, cool temperatures (0-9 degrees Celsius), high humidity and minimal air currents. Specific areas where they hibernate have very high humidity, so much so that droplets of water are often seen on the fur of hibernating individuals. Northern long-eared bats have been documented hibernating in man-made, cave-like features (Griffin 1945; Goehring 1954; Kurta and Teramino 1994) and anecdotal reports indicate there may be other landscape features that are used by northern long-eared bats during the winter (M. Armstrong, pers. comm. 2014). Mist-net captures during the winter months in the piedmont of North Carolina suggest that, in some regions, northern long-eared bats do not hibernating through the winter (J. Hawkins, pers. comm. 2016; G. Jordan, pers. comm. 2016, 2017).

Northern long-eared bat tend to roost singly or in small groups of a few individuals (Service 2014b). Within hibernacula, surveyors find them in small crevices or cracks, often with only the nose and ears visible. Northern long-eared bats display more winter activity than other cave species, with individuals often moving between hibernacula throughout the winter (Griffin 1940; Whitaker and Rissler 1992; Caceres and Barclay 2000). Northern long-eared bats have shown a high degree of philopatry for a hibernaculum (Pearson 1962), although they may not return to the same hibernaculum in successive seasons (Caceres and Barclay 2000).

3.3.2. Summer Habitat

Northern long-eared bats typically occupy summer habitat from mid-May through mid-September each year. Suitable summer habitat for northern long-eared bats consists of a wide variety of forested/wooded habitats that they use for roosting, foraging, and commuting. Forested/wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure and include forests and woodlots containing potential roosts, as well as linear features such as fencerows, riparian forests, and other wooded corridors. Summer habitat may also include some adjacent and interspersed non-forested habitats.

Northern long-eared bats are often found roosting in intact, cluttered, interior (Broders et al. 2006, Henderson et al. 2008) and older forests (Carter and Feldhamer 2005, Lacki and Schwierjohann 2001, Perry and Thill 2007). Johnson et al. (2009) found that northern long-eared bats readily exploited alterations to forest structure, likely due to enlargement of existing or creation of new canopy gaps. Roost selection is likely adaptable and variable depending on the forest characteristics (Ford et al. 2006). In general, roosting northern long-eared bats appear to use tree species in proportion to the tree species' availability in the forest stands. This implies that finding trees with suitable characteristics for roosting is more important than the specific tree species. (Foster and Kurta 1999; Krynak 2010; Menzel et al. 2002; Sasse and Pekins 1996; Schultes 2002).

Northern long-eared bats roost in cavities, underneath bark, crevices, or hollows of both live and dead trees (typically ≥3 inches dbh). Studies have found that males more readily use smaller diameter trees for roosting than females, suggesting males are more flexible in roost selection than females (Lacki and Schwierjohann 2001; Broders and Forbes 2004; Perry and Thill 2007). Males and non-reproductive females may also roost in cooler places, such as caves and mines (Barbour and Davis 1969; Amelon and Burhans 2006). Northern long-eared bats have also been occasionally found roosting in structures like buildings, barns, sheds, houses, and bridges (Krochmal and Sparks 2007; Timpone et al. 2010; USFWS 2013).

The roost site selection of reproductive females, in terms of canopy cover and tree height, changes depending on reproductive stage. Relative to pre- and post-lactation periods, lactating northern long-eared bats have been shown to roost higher in tall trees situated in areas of relatively less canopy cover and tree density (Garroway and Broders 2008). Northern long-eared bats switch roosts often (Sasse and Perkins 1996), typically every 2-3 days (Foster and Kurta 1999; Owen et al. 2002; Carter and Feldhamer 2005; Timpone et al. 2010). One study tracked 30 northern long-eared bats over two years and found the mean number of different roosts used by each bat to be 8.6 (range 2 – 11) (Jackson 2004). The distance traveled between consecutive roosts varies widely from 6.1 m (20 ft) (Foster and Kurta 1999) to 3.9 km (2.4 mi) (Timpone et al. 2010). They use networks of roost trees often centered near one or more central-node roost trees (Johnson et al. 2012) with multiple alternate roost trees.

An analysis of mist net survey data in Kentucky (Service 2014, unpublished data) shows that most males and non-reproductive females are captured in the same locations as reproductively active females, suggesting substantial overlap (94%) in the summer home range of reproductive females and other individuals.

The home range for northern long-eared bats may vary by sex. Broders et al. (2006) found home ranges of females to be larger than males. Also, Broders et al. (2006) and Henderson and Broders (2008) found foraging areas (of either sex) to be six or more times larger than roosting

areas. Female summer home range size ranges from 19 to 172 hectares (47-425 acres) (Lacki et al. 2009). The mean distance between roost trees and foraging areas of radio-tagged individuals in New Hampshire was 620 m (2034.1 ft) (Sasse and Perkins 1996). Northern long-eared bats exhibit inter-annual site fidelity to their summer home ranges (Perry 2011).

The northern long-eared bat has a diverse diet including moths, flies, leafhoppers, caddisflies, and beetles (Nagorsen and Brigham 1993; Brack and Whitaker 2001; Griffith and Gates 1985), with diet composition differing geographically and seasonally (Brack and Whitaker 2001). Lepidopterans, especially smaller lepidopterans, comprise the majority of the diet (Dodd et al. 2012). Foraging techniques include hawking and gleaning, in conjunction with passive acoustic cues (Nagorsen and Brigham 1993; Ratcliffe and Dawson 2003). Hawking is aerial foraging characterized by catching insects in flight through the use of echolocation. Gleaning behavior is characterized by catching prey on surfaces via echolocation. The echolocation calls of this species are generally short in duration, high frequency, and of low intensity, characteristics that are difficult for some invertebrate prey to detect (Faure et al. 1993).

Emerging at dusk, most hunting occurs above the understory, 1 to 3 m (3.3 to 9.8 ft) above the ground, but under the canopy (Nagorsen and Brigham 1993). Foraging patterns indicate a peak activity period within 5 hours after sunset, followed by a secondary peak within 8 hours after sunset (Kunz 1973). Northern long-eared bats seem to focus foraging on hillsides and ridges of upland, mature forests (Brack and Whitaker 2001; Caceres and Pybus 1998; LaVal et al. 1977) with occasional foraging over forest clearings, over water and along roads (Van Zyll de Jong 1985).

3.3.3. Spring and Fall Habitat

In general, northern long-eared bats use habitats in the spring and fall similar to those selected during the summer. Suitable spring staging and fall swarming habitat consists of the variety of forested/wooded habitats where they roost, forage, and travel, which is most typically within 5 miles of a hibernaculum.

3.4. Status and Distribution of the Northern Long-eared Bat

The northern long-eared bat ranges across much of the eastern and north central United States (U.S.), and all Canadian provinces west to the southern Northwest Territories and eastern British Columbia (Nagorsen and Brigham 1993; Caceres and Pybus 1997) (Fig. 10). In the United States, the species' range encompasses 37 states from Maine west to Montana, south to eastern Kansas, eastern Oklahoma, Arkansas, and east to South Carolina (Whitaker and Hamilton 1998; Caceres and Barclay 2000; Amelon and Burhans 2006). Historically, the species has been most

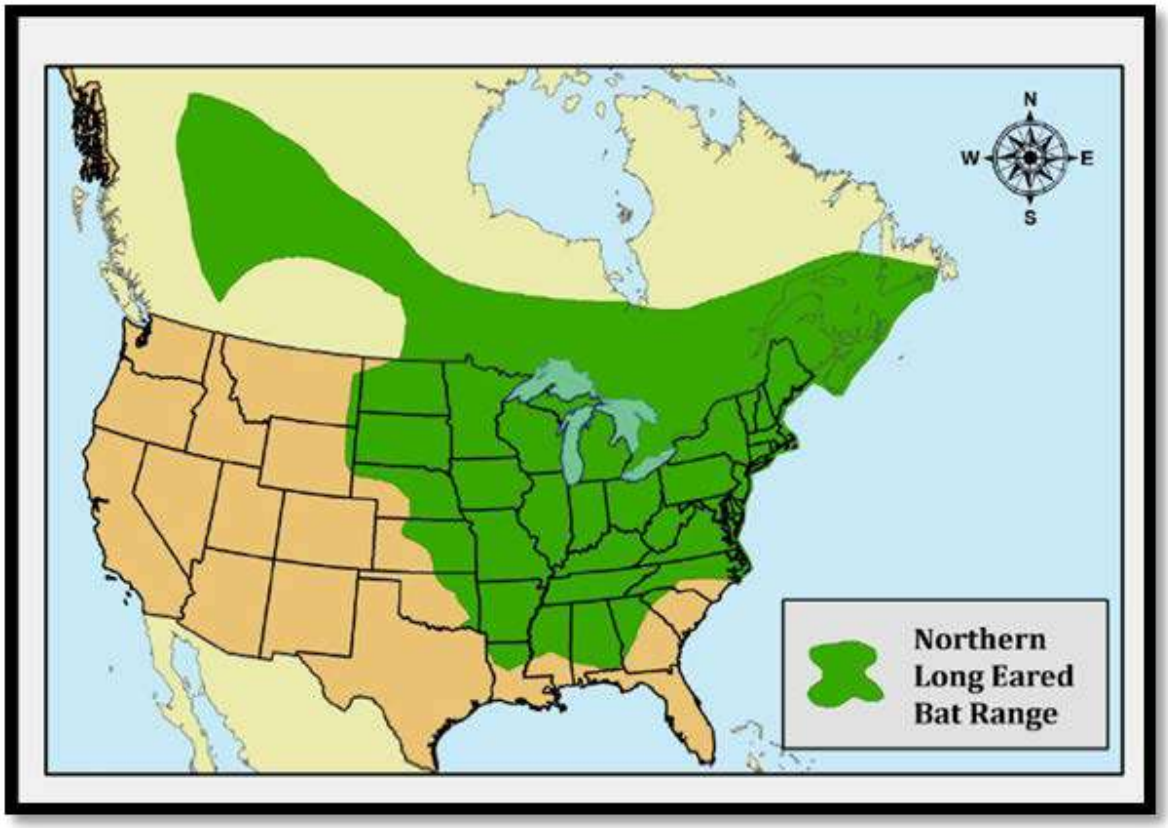

Figure 10. Range of the northern long-eared bat.

frequently observed in the northeastern United States and in Canadian provinces of Quebec and Ontario, and, historically, the species was less common in the southern and western portions of the range than in the northern portion of the range (Amelon and Burhans 2006).

Northern long-eared bats are typically found in low numbers in inconspicuous roosts, typically in small crevices or cracks on cave or mine walls or ceilings, where they can be easily overlooked during surveys (Griffin 1940; Barbour and Davis 1969; Caire et al. 1979; Van Zyll de Jong 1985; Caceres and Pybus 1997; Whitaker and Mumford 2009). Even prior to WNS, surveyors in many hibernacula observed only a few (1 to 3) individuals (Whitaker and Hamilton 1998), though there may have been more individuals present that were not easily observable. There are likely many unknown hibernacula.

The current range and distribution of the northern long-eared bat is likely best described and understood within the context of the impacts of WNS. Prior to the onset of WNS, the best available information on the northern long-eared bat came primarily from surveys (primarily focused on Indiana bat or other bat species) and some targeted research projects. In these efforts,

northern long-eared bats were very frequently encountered, and the species was often considered the most common myotid bat in many areas. Overall, the species was considered to be widespread and abundant throughout its historic range (Caceres and Barclay 2000). However, the current situation appears to be very different in that northern long-eared bats continue to be distributed across much of the historical range, but there are many gaps within the range where bats are no longer detected or captured, and, in other areas, their occurrence is sparse given local declines and extirpations.

3.5. Stressors to the Northern Long-eared Bat

3.5.1. Destruction/Degradation of Hibernacula

There are documented examples of flooding and collapse impacting northern long-eared bat hibernacula (French 2012, unpublished data; Graham 2011, unpublished data; Hemberger 2011, unpublished data). These events can directly kill northern long-eared bats, trap them inside, and potentially render a hibernaculum unusable in the future.

Increasing awareness about the importance of cave and mine microclimates to hibernating bats and the regulation of other cave-dwelling bats under the ESA have helped to alleviate the destruction or modification of hibernation habitat, at least where the Indiana bat is present (USFWS 2007). The northern long-eared bat has likely benefitted from the protections given to the Indiana bat and its winter habitat, as the species' range overlaps significantly with the Indiana bat's range.

3.5.2. Loss/Degradation of Forested Habitat

Although there is still much to learn about the effects of forest removal on northern long-eared bats and their associated summer habitat, studies to date have found that the northern long-eared bat shows a varied degree of sensitivity to timber harvesting practices. It is possible that its flexibility in roosting habits allows northern long-eared bats to be adaptable in managed forests, which allows them to avoid competition for roosting habitat with more specialized species, such as the Indiana bat (Timpone et al. 2010). However, the northern long-eared bat has shown a preference for contiguous tracts of forest cover for foraging (Owen et al. 2003; Yates and Muzika 2006). In the Appalachians, Ford et al. (2006) assessed that northern long-eared bats may be a suitable management indicator species for assessing mature forest ecosystem integrity, since they found male bats using roosts in mature forest stands of mostly second growth or regenerated forests.

Throughout the range of the northern long-eared bat, forest conversion is expected to increase due to commercial and urban development, energy production and transmission, and natural changes. The 2010 Resources Planning Act Assessment projects forest losses of 16–34 million acres (or 4–8 percent of 2007 forest area) across the conterminous United States, and forest loss is expected to be concentrated in the southern United States, with losses of 9–21 million acres (USFS 2012). Forest conversion causes loss of potential habitat, fragmentation of remaining habitat, and if occupied at the time of the conversion, direct injury or mortality to individuals.

3.5.3. Disturbance of Hibernating Bats

The threat of commercial use of caves and mines during the hibernation period has decreased at many sites known to harbor Indiana bats, and we believe that this also applies to northern long-eared bats. Intentional killing of northern long-eared bats has been documented at a small percentage of hibernacula (e.g., several cases of vandalism at hibernacula in Kentucky, one case of shooting disturbance in Maryland, one case of bat torching in Massachusetts where approximately 100 bats (northern long-eared bats and other species) were killed) (78 FR 61059), but we do not have evidence that this is happening on a large enough scale to have population-level effects.

3.5.4. White-nose Syndrome

White-nose syndrome (WNS) is considered the major stressor to the northern long-eared bat. A general description of this disease is found in section 2.5.4. The northern long-eared bat is one of the species most severely affected by the disease (Herzog and Reynolds 2012). Turner et al. (2011) compared the pre-WNS count to post-WNS count for 6 cave bat species, including the northern long-eared bat and reported a 98% decline between pre- and post-WNS in the number of hibernating northern long-eared bats at 30 hibernacula in New York, Pennsylvania, Vermont, Virginia, and West Virginia in caves with confirmed WNS mortality for at least two years. In hibernacula surveys in New York, Vermont, Connecticut, and Massachusetts, Langwig et al. (2012) reported larger declines in hibernacula with larger pre-WNS populations of northern long-eared bats, suggesting a density-dependent decline due to WNS. Also, based on temporal analyses of population trends, they found that, although some species' populations stabilized at drastically reduced levels compared to pre-WNS (e.g., tri-colored bat, Indiana bat), each of the 14 populations of northern long-eared bats evaluated within the study became locally extinct within 2 years due to disease presence, and none of these populations were remaining 5 years post-WNS (Langwig et al. 2012).

For the final listing rule, the Service conducted an analysis of additional survey information at 103 sites across 12 U.S. States and Canadian provinces (New York, Pennsylvania, Vermont,

West Virginia, Virginia, New Hampshire, Maryland, Connecticut, Massachusetts, North Carolina, New Jersey, and Quebec) and found comparable declines in winter colony size. At these sites, total northern long-eared bat counts declined by an average of 96% after the arrival of WNS; 68% of the sites declined to zero northern long-eared bats, and 92% of sites declined by more than 50%. Frick et al. (2015) consider the northern long-eared bat now extirpated from 69% of the hibernacula in Vermont, New York, Pennsylvania, Maryland, Virginia, and West Virginia that had colonies of northern long-eared bat prior to WNS. Langwig et al. (2012) reported that 14 populations of northern long-eared bat in New York, Vermont, and Connecticut became locally extinct within 2 years due to disease.

However, due to their life-history trait of favoring small cracks or crevices in cave walls and ceilings, which makes them more challenging to locate during hibernacula surveys, hibernacula data in some states (particularly those with a greater number caves with more cracks or crevices) may not give an entirely clear picture of the level of decline the species is experiencing (Turner et al. 2011). When dramatic declines due to WNS occur, the overall rate of decline appears to vary by site; some sites experience the progression from the detection of a few bats with visible fungus to wide-spread mortality after a few weeks and at other sites after a year or more (Turner et al. 2011).

Although significant northern long-eared bat population declines have only been documented due to the spread of WNS, the decreases in populations and fitness may render the species increasingly vulnerable to other stressors that they may have previously had the ability to withstand. These impacts could potentially be seen on two levels. First, individual northern long-eared bats sickened or struggling with infection by WNS may be more susceptible to other stressors. Second, northern long-eared bat populations impacted by WNS, with smaller numbers and reduced fitness among individuals, may be less able to recover making them more prone to extirpation. The status and potential for these impacts will vary across the range of the species.

3.5.5. Environmental Contaminants

With the restrictions on the use of organochlorine pesticides in the 1970s, this significant threat to northern long-eared bats was reduced. However, cholinesterase inhibiting insecticides, organophosphates, and carbamates have now become the most widely used insecticides (Grue et al. 1997), and the impact of these chemicals on northern long-eared bats is not known. Because of the unique physiology of bats in relation to reproduction, high energy demands, and sophisticated thermoregulatory abilities, much more research needs to be done with these pesticides and their effects on bats. These and other contaminants likely remain a significant and poorly understood threat to northern long-eared bats. The final 4(d) rule (81 FR 1906) summarizes known and suspected contaminant threats to northern long-eared bats.

3.5.6. Climate Change

The capacity of climate change to result in changes in the range and distribution of wildlife species is recognized, but detailed assessments of how climate change may affect specific species, including northern long-eared bats, are limited. Surface temperature is directly related to cave temperature, so climate change could affect the suitability of hibernacula if surface temperatures rise. Impacts on the availability or timing of emergence of insect prey are also likely.

3.5.7. Wind Turbines

The majority of bats killed include migratory foliage-roosting species: the hoary bat (*Lasiurus cinereus*) and eastern red bat (*Lasiurus borealis*); migratory tree and cavity-roosting silver-haired bats (*Lasionycteris noctivagans*); and tri-colored bats (*Perimyotis subflavus*) (Arnett et al. 2008). Although the northern long-eared bat is not considered a long-distance migrant, even limited migration distances between summer and winter habitats pose a risk to the species in Illinois due to the increasingly large line of wind farms across most of the central portion of the state (Kath 2012, pers. comm.). Wind projects have been constructed in areas within a large portion of the range of northern long-eared bats, suggesting they may be exposed to the risk of turbine-related mortality.

3.6. Environmental Baseline for the Northern Long-eared Bat

This section is an analysis of the effects of past and ongoing human and natural factors leading to the current status of the northern long-eared bat, its habitat, and ecosystem within the Action Area. The environmental baseline is a “snapshot” of the species’ health in the Action Area at the time of the consultation and does not include the effects of the Action under review.

3.6.1. Action Area Numbers, Reproduction, and Distribution

In the absence of recent survey data for the species in the Action Area of the project, the Service must make assumptions about the status of the species within the Action Area based on the habitat in and around the Action Area, available past survey data, and our knowledge of the biology of the species. We have made assumptions about the status of the species in the Action Area specific to the timeframes listed below. The timeframes represent when the Service assumes the species is in specific periods of its life cycle in Kentucky (USFWS 2016).

Winter Hibernation (November 15 – March 31)

Copperhead Environmental Consulting, Inc. (Copperhead) conducted a winter bat habitat assessment in the 82.1-hectare (203-acre portion) of the project area where construction activities would occur in 2015, and again in 2016 after the site for the proposed facility was modified. The 2016 assessment covered an additional 122.2 hectares (302 acres). Copperhead reviewed information from the following resources: aerial photography, USGS 7.5 minute topographic quadrangle maps, USGS geology quadrangle maps, the Kentucky Coal Mine Mapping Information System, and information about cave locations from the Kentucky Department of Fish and Wildlife Resources and the National Speleological Society – Pine Mountain Grotto. Pedestrian field assessments conducted by Copperhead biologists focused on areas identified during the desktop analysis as having a high potential for underground mine portals and rock shelters (i.e., cliff lines, mined areas).

The desktop analysis did not reveal any cave locations or evidence of cave-forming geology in the Action Area of the project. Known caves and northern long-eared bat hibernacula in the vicinity are concentrated in an area of karst geology that follows Pine Mountain. This area is approximately 8.9 km (5.5 mi) to the southeast at the closest point of the clearing and grading limits (Fig. 11).

There has been substantial history of surface and underground mining in this region of Kentucky. However, only one feature was found during the field assessment that could potentially be used as a winter hibernaculum by northern long-eared bats (Fig. 7, p. 23). This feature is a crack in a small rock shelter approximately 60 m (197 ft) from the construction limits of the project. The dimensions of the opening to this feature are 0.3 m x 0.9 m (1-foot by 3-feet), and it widens into a 4.6 m x 0.3 m (15-feet by 1-feet) space. Copperhead observed that the feature extended approximately 10.7 m (35 feet) and that it may extend beyond what Copperhead staff could see from the entrance. Because the feature provides potentially suitable habitat but was not surveyed, we assume, for the purposed of this consultation, that it is used by northern long-eared bats during the winter. Due to the conditions that were visible to Copperhead staff (i.e., including a narrow flyway, a lack of air flow, and a lack of visible guano deposits) we assume that the feature is unlikely to be a significant hibernaculum. The Service ranks (nleb) and because northern long-eared bats are typically found in small numbers in hibernacula (1-5 individuals in 2016-2017 surveys in Kentucky (USFWS, unpublished data)), and would be occupied by a maximum of 5 northern long-eared bats. We refer to this feature in this consultation as “assumed hibernaculum #1”. This is the same feature as “assumed hibernaculum #1” that was discussed in the Indiana bat section of this BO.

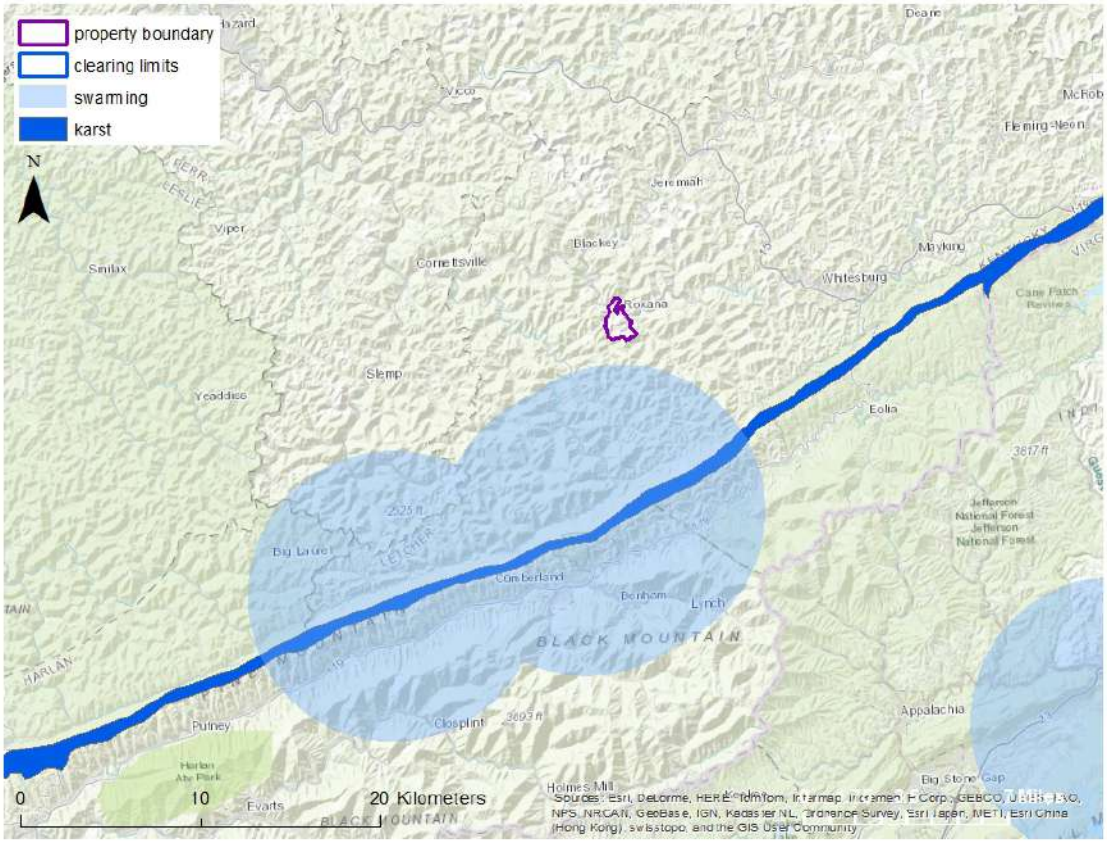

Figure 11. The property boundary in relation to surrounding karst geology and swarming habitat surounding known northern long-eared bat hibenacula.

Copperhead assessed 204.4 hectares (505 acres) of the 231.1-hectare (570-acre) property for potential winter hibernacula (Fig. 8, p. 24). The remaining area on the property was not assessed due to access constraints. The areas within the property that were not included in the survey are areas outside of the proposed clearing and grading limits, with the exception of a short, less than 100-m (328-ft), section of corridor for the proposed access road. Because this area does not contain clifflines or other topography that would support caves or other voids, it is unlikely to contain features suitable as hibernacula. We assume that additional winter habitat is present in the Action Area due to the likelihood that other potential hibernacula (e.g., mine portals, crevices) may exist. For the purposes of our evaluation, we assume that there is one additional Indiana bat hibernaculum in the Action Area. To ensure that potential adverse effects are not underestimated, we assume that this hibernaculum is located in an unsurveyed area in close proximity to the construction limits of the project (Fig. 7, p. 23). Because there are no mapped caves in the area and the potential for karst formation is low, it is likely that any unidentified northern long-eared bat hibernacula are underground mine portals or small voids in clifflines.

Because northern long-eared bats are typically found in small numbers in hibernacula (1-5 individuals in 2016-2017 surveys in Kentucky (USFWS, unpublished data)), we assume that the feature is unlikely to contain a significant hibernaculum and would be occupied by a maximum of 5 northern long-eared bats; thus, it would be a P4 hibernaculum. We refer to this feature in this consultation as "assumed hibernaculum #2" and is the same feature that was discussed in the Indiana bat section of this BO (section 2.6.1 and Fig. 7).

Spring Staging (April 1 – May 14)

The Action Area of the proposed project is not within the spring staging area for any known northern long-eared bat hibernacula. The Action Area of the project does include areas within the 0.8 km (0.5 mile) buffer around assumed hibernacula # 1 and #2 in which spring staging would occur. Based on our assumptions, 10 bats (5 per hibernaculum) use the Action Area of the project during spring staging for roosting, foraging, and commuting.

Summer Roosting (April 1 – August 15)

Summer presence/absence surveys were not conducted for this proposed Action. There are many existing summer records of the species from the vicinity of the proposed project (Fig. 12). The clearing limits of the proposed project is in a 4.8 km (3-mi) buffer for six northern long-eared bat records. These buffers are applied to northern long-eared bat summer mist-net captures and includes the area in the 2.4 km (1.5-mi) radius around the unknown roost tree used by the individual (USFWS 2016). Four of these records indicated a maternity colony (*i.e.*, females in reproductive status or juveniles) and two did not provide information about the individual captured. We assume that each of these six records represents a maternity colony. Based on the species biology, we assume that each maternity colony consists of 45 adult females, 45 juveniles (post parturition) and 45 sympatric adult males, for a total of 135 northern long-eared bats. Without knowing the specific location of the roost trees, we assume that all 135 bats use the clearing limits of the proposed project for roosting, foraging, and commuting. Thus, a total of 810 (135 individuals for each of the six colonies) northern long-eared bats would use this habitat during the summer roosting timeframe. Though some northern long-eared bats may summer near their hibernacula, we assume that the 10 individuals that hibernate in features in the Action Area migrate to summer roosting areas outside the Action Area. Thus, the 810 northern long-eared bats that we assume roost in the Action Area during the summer do not include the 10 individuals that we assume hibernate in the Action Area and use the Action area during spring staging. We make this assumption so that we do not underestimate the total number of northern long-eared bats potentially affected by the proposed project.

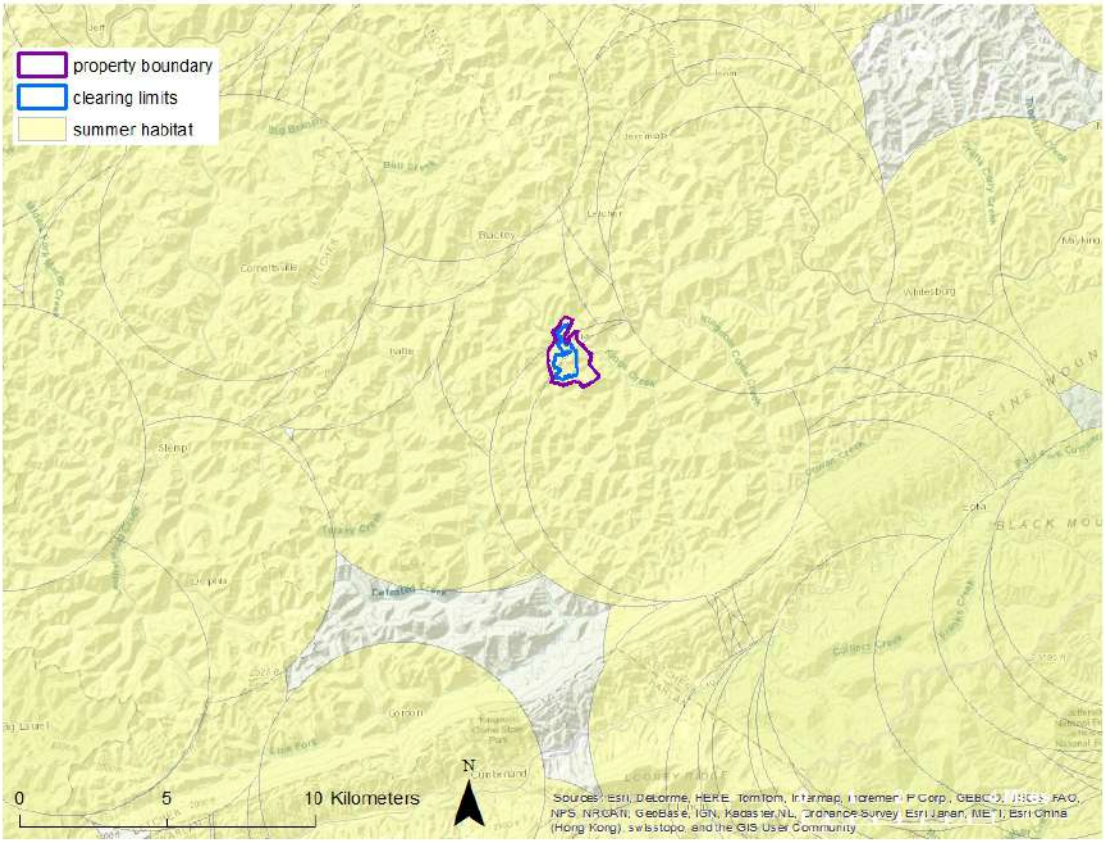

Figure 12. The property boundary and clearing limits in relation to 4.8 km (3-mi) buffers applied to summer northern long-eared bat records in the vicinity.

Fall Swarming (August 16 – October 14)

The Action Area does not include swarming habitat of any known northern long-eared bat hibernacula. The Action Area is within the 8 km (5-mile) swarming range of assumed northern hibernacula # 1 and #2. Therefore we expect that 10 bats, those that are assumed to hibernate in these features, use the Action Area for roosting, foraging, and commuting during fall swarming.

Summary

The number of northern long-eared bats in the Action Area of the project varies throughout the year. During the hibernation period (November 14 - March 31), we expect a total of 10 individuals to be using assumed hibernacula #1 and #2. During spring staging (April 1 – May 14), we expect those 10 individuals to be using the Action Area of the project, including the area within the construction limits, for roosting, foraging, and commuting. During the summer period

(April 1- August 15), we expect 810 individuals (45 adult females, 45 adult males, and 45 juveniles associated with each of the six records) to use the Action Area, including the areas within the construction limits, for roosting and foraging. During fall swarming, we expect 10 northern long-eared bats to use the Action Area and the areas within the construction limits for roosting, foraging, and commuting.

3.6.2. Factors Affecting the Species in the Action Area

The factors affecting the northern long-eared bat in the Action Area are the same as those that are affecting the Indiana bat described in section 2.6.2. As stated in section 3.5.4, WNS is the most significant factor affecting the species. The disease has been detected throughout hibernacula in Kentucky, and we expect it to also be the major stressor to the species in the Action Area.

3.7. Effects of the Action on the Northern Long-eared Bat

This section analyzes the direct and indirect effects of the Action on the northern long-eared bat, which includes the direct and indirect effects of interrelated and interdependent actions. Direct effects are caused by the Action and occur at the same time and place. Indirect effects are caused by the Action, but are later in time and reasonably certain to occur. Our analyses are organized according to the description of the Action in section 1 of this BO.

3.7.1. Effects of Property Acquisition

The Bureau's acquisition of the approximately 231.1-hectare (570-acre) property protects the property from other development and non-federal projects. The acquisition of the property would result in indirect adverse effects to the northern long-eared bat through the subsequent actions of the construction and operation of the proposed facility, described in the following sections. Of the 231.1-hectare (570-acre) property, 157.6 hectares (389.5 acres) would remain undisturbed buffer and continue to provide roosting, foraging, and commuting habitat for northern long-eared bats. The retention of the habitat on these 157.6 hectares (389.5 acres) would provide beneficial effects to the northern long-eared bat.

3.7.2. Effect of Compensatory Mitigation

The contribution that the Bureau will provide to the Imperiled Bat Conservation Fund for compensatory mitigation will provide habitat conservation to contribute to conservation and

recovery goals to the northern long-eared bat. These goals are described in more detail in the 2016 *Revised Conservation Strategy for Forest-Dwelling Bats in the Commonwealth of Kentucky*. The compensatory mitigation is a component of the Action that would provide beneficial effects on the northern long-eared bat.

3.7.3. Effects of Construction Activities

Several proposed construction activities have the potential to impact northern long-eared bat. The stressors resulting from these activities are discussed below

3.7.3.1. Stressor - Strikes from Equipment or Trees

Northern long-eared bats roosting in trees while tree removal is occurring could be struck by equipment, struck by the roost tree when it hits the ground, or struck by adjacent trees that are felled. We are not aware of any documented instances where this has occurred with northern long-eared bats. However, three accounts of occupied Indiana bat roost trees being felled are discussed in section 2.7.3.1. Because northern long-eared bats also roost in trees, we expect that this stressor could also impact the northern long-eared bat.

Exposure

Northern long-eared bats roosting in a tree that is being removed could be exposed to this stressor. Exposure would only potentially occur in daylight hours during the portion of the 4-5 year construction period of the project when trees would be removed. Any northern long-eared bats roosting in the clearing limits of the project could be exposed to this stressor. The Bureau will implement the following conservation measure to reduce northern long-eared bats' exposure to this stressor:

- Trees will not be removed during June and July (the time in which non-volant pups would be present).

We assume that six northern long-eared bat maternity colonies roost in the clearing limits, that male bats are roosting in the area in the clearing limits during the summer, and that bats that use the assumed hibernacula #1 and #2 roost in trees in the clearing limits during spring staging and fall swarming. Because tree removal will not occur during June or July, all the bats exposed to this stressor are expected to have the ability to fly (e.g. adults and volant juveniles). Northern long-eared bats that do not flush from the tree before or as it is felled may be exposed to this stressor.

We expect that some the northern long-eared bats will be able to avoid this stressor by flushing from

the roost tree prior to its removal or before the cut tree hits the ground. The number of individuals potentially exposed to this stressor would be the total number of northern long-eared bats roosting in the clearing limits of the project:

- 810 bats from April 1 – August 15 (excluding June – July),
- 10 bats from April 1 – May 14, and
  10 bats from August 16 – November 14.

We do not expect all of these bats to be exposed to this stressor, because we do not expect all of the northern long-eared bats roosting in the Action Area to be roosting in a tree that would be removed by the Action. The exact number of northern long-eared bats exposed to this stressor is indeterminable because we do not know in which specific trees northern long-eared bats are roosting.

Response

As discussed under the "exposure" heading, there are documented accounts of northern long-eared bat mortality in response to this stressor. We expect northern long-eared bats that are struck by equipment or trees during construction activities associated with the Action to be injured or immediately killed. If they are injured, they may die at a later time.

Effects

Northern long-eared bats that die will cause a direct decrease in the population of the species. Injured bats that do not subsequently die from the injuries may experience decreased reproductive success. We expect exposure to this stressor to result in take of northern long-eared bats in the form of "harm".

3.7.3.2. Stressor - Removal of Occupied Roost Trees

Northern long-eared bats that are not struck while a roost tree is being removed (stressor discussed above in section 3.7.3.1) will flush before the tree is felled, after it is felled before the tree hits the ground, or after the tree hits the ground.

Exposure

Northern long-eared bats roosting in a tree that is being removed could be exposed to this stressor. Exposure would only potentially occur during daylight hours during the portion of the 4-5 year construction period of the project when trees would be removed. The Bureau will implement the following conservation measure to reduce northern long-eared bats' exposure to this stressor:

- Trees will not be removed during June and July (the time in which non-volant pups are most likely to be present).

We assume that 6 maternity colonies roost within the clearing limits, that male bats are roosting in the area in the clearing limits during the summer, and that bats that use assumed hibernacula #1 and #2 roost in trees in the clearing limits during spring staging and fall swarming. Because tree removal will not occur during June or July, all the bats exposed to this stressor are expected to have the ability to fly. The number of individuals potentially exposed to this stressor would be the total number of northern long-eared bats roosting in the clearing limits of the project:

- 810 bats from April 1 – August 15 (excluding June and July),
- 10 bats from April 1 – May 14, and
  10 bats from August 16 – November 14.

We do not expect all of these bats to be exposed to this stressor, because we do not expect all of the northern long-eared bats roosting in the Action Area to be roosting in a tree that would be removed by the Action. The exact number of northern long-eared bats exposed to this stressor is indeterminable because we do not know in which specific trees northern long-eared bats are roosting.

Response

Northern long-eared bats that flush from a roost tree will be exposed to increased potential for predation. Flushed individuals will have to find new roosting sites. Because large amounts of habitat will be removed, it is likely that multiple alternate roosts will also be removed and that bats will have to expend extra energy to search for new roost trees in new roosting areas.

Effects

Northern long-eared bats that are consumed by predators to which they would not normally be exposed would result in a direct decrease in the population of the species. If northern long-eared bats have to increase their energy expenditure to search for a new roost tree during a sensitive period of a their reproductive cycle (e.g., pregnancy), it is possible that spontaneous abortion or other stress-related reproductive delays or losses in fecundity may occur in some individuals, particularly those that may have already been under other environmental stressors (e.g., WNS). It has been hypothesized that these stressors and delays in reproduction could also cause lower fat reserves and lead to lower winter survival rates in Indiana bats (USFWS 2002). Because both species use forested habitat, we believe these effects could also occur in northern long-eared bats exposed to this stressor. For example, females that give live birth may have pups with lower birth weights or their pups may have delayed development rates (i.e., late into the summer). This could, in turn, affect the over-winter survival of these young-of-the-year bats if they enter fall migration and winter hibernation periods with inadequate fat reserves. Increased energy

expenditures and lower weight gains during fall swarming could result in lower fitness in those stressed individuals as exhibited by reduced survival and/or reproductive success. Impacts to non-reproductive adults would be less than those impacts to reproductive females and juveniles, because there are fewer stresses on these individuals. However, these individuals are still likely to be impacted by the loss of summer habitat through increased energy expenditures associated with finding new roosting habitats, longer foraging distances or disrupted travel corridors.

We do expect significant effects as a result of the removal of forested habitat that northern long-eared bats are accustomed to using. We expect exposure to this stressor to result in take of northern long-eared bats in the form of "harm" and/or "harassment." Because of the availability of other forested habitat in the vicinity, we expect that these bats would find other areas in which to roost and would likely recover from the effects of this stressor by the following roosting season.

3.7.3.3. Stressor - Loss of Forested Habitat on the Landscape

The construction of the proposed facility will reduce the amount of forested habitat on the landscape that is available to the northern long-eared bat for roosting, foraging, and commuting.

Exposure

All northern long-eared bats that roost, forage, and commute in the forested habitat that is within the clearing limits of the project will be exposed to this stressor. Because northern long-eared bats show site fidelity to their summer home ranges, even bats that are in hibernation during the tree removal will be exposed to this stressor after they emerge. The Bureau will implement the following conservation measure to reduce northern long-eared bats' exposure to this stressor:

- A buffer of 157.6 hectares (389.5 acres) will remain undisturbed on the 231.1-hectare (570-acre) property. Of that buffer, 95.4 hectares (235.8 acres) are currently forested and will continue to provide roosting, foraging, and commuting habitat for northern long-eared bats.

We expect all of the northern long-eared bats that use forested habitat in the clearing limits of the project to be exposed to this stressor:

- 810 bats from April 1 – August 15,
- 10 bats from April 1 – May 14, and
- 10 bats from August 16 – November 14.

Response

The removal of forested habitat may require northern long-eared bats to expend additional energy to seek out new habitat for roosting, foraging, and commuting. The significance of the response will be influenced by the amount of habitat removed and the availability and quality of remaining habitat.

The proposed forest removal would reduce the forested habitat within a 2.4-km (1.5-mi) radius of the project area, the area that would be used by a northern long-eared bat maternity colony centered in the clearing and disturbance limits, from 81.7% to 79.0% (Bureau 2017b). The northern long-eared bats that use this habitat will have to find new primary and alternate roost trees to use and new foraging and commuting habitat.

The proposed forest removal would reduce the forested habitat used by northern long-eared bats hibernating in assumed hibernaculum # 1. In a 0.8 km (0.5 mi) radius, the area used during spring staging, the forested habitat would be reduced from 59.3% to 55.8% (Appendix B: Table 3 and Fig. 2). In an 8 km (5 mi) radius, the area used during fall swarming, the forested habitat would be reduced slightly and would remain approximately 52.0% (Appendix B: Table 4 and Fig. 3). Northern long-eared bats that hibernate in this feature would use habitat in this area during fall swarming.

The proposed forest removal would reduce the forested habitat within 0.8 km (0.5 mi) radius of the assumed hibernaculum #2 from 71.2% to 62.8% (Appendix B: Table 5 and Fig. 4). It would reduce the forested habitat within a 8 km (5 mi) radius of this feature from 81.4% to 81.2% (Appendix B: Table 6 and Fig. 5).

Because the majority of the area outside of the clearing limits of the project is forested, we expect that northern long-eared bats will be able to find adequate habitat for roosting, foraging, and commuting. Northern long-eared bats will alter their behavior more significantly if they are exposed to this stressor during a time in their life cycle when they utilize smaller areas of forested habitat (i.e., fall swarming and spring staging). After an initial extra energy expenditure to find these areas, we expect that northern long-eared bats will shift their roosting areas, foraging range, and commuting routes to adapt to the changed landscape. After this adaptation, we do not expect northern long-eared bats to have a significant response to this reduction in habitat.

Effects

If northern long-eared bats have to increase their energy expenditure to search for a new roost tree during a sensitive period of a their reproductive cycle (e.g., pregnancy), it is possible that

spontaneous abortion or other stress-related reproductive delays or losses in fecundity may occur in some individuals, particularly those that may have already been under other environmental stressors (e.g., WNS). It has been hypothesized that these stressors and delays in reproduction could also cause lower fat reserves and lead to lower winter survival rates in Indiana bats (USFWS 2002). Because both species use forested habitat, we believe these effects could also occur in northern long-eared bats exposed to this stressor. For example, females that give live birth may have pups with lower birth weights or their pups may have delayed development rates (i.e., late into the summer). This could, in turn, affect the over-winter survival of these young-of-the-year bats if they enter fall migration and winter hibernation periods with inadequate fat reserves. Increased energy expenditures and lower weight gains during fall swarming could result in lower fitness in those stressed individuals as exhibited by reduced survival and/or reproductive success. Impacts to non-reproductive adults would be less than those impacts to reproductive females and juveniles, because there are fewer stresses on these individuals. However, these individuals are still likely to be impacted by the loss of summer habitat through increased energy expenditures associated with finding new roosting habitats, longer foraging distances or disrupted travel corridors.

We expect significant effects as a result of the removal of forested habitat that northern long-eared bats are accustomed to using. We expect exposure to this stressor to result in take of some northern long-eared bats in the form of "harm" by habitat modification that kills or injures northern long-eared bats by significantly impairing essential behavioral patterns such as breeding, feeding, or sheltering. We expect exposure to this stressor to result in take of some northern long-eared bats in the form of "harassment" by annoying northern long-eared bats to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. We expect exposure of this stressor to result in take of some northern long-eared bats in the forms of both "harm" and "harassment." Thus, we expect take of northern long-eared bats from exposure of this stressor to be in the form of "harm" and/or "harassment." Because of the availability of other forested habitat in the vicinity, we expect that these bats would find other areas in which to roost and would likely recover from the effects of this stressor by the following roosting season.

3.7.3.4. Stressor - Loss of Water Resources

This project will result in the loss of approximately 1.7 linear kilometers (5,610 linear feet) of stream and 0.89 hectare (2.44 acres) of wetlands (Bureau 2017a). The project site is on the top of a mountain from which several first order streams flow. The streams that will be directly impacted are intermittent or ephemeral streams. Most of the wetlands that will be impacted are in the areas that were previously cleared and exist in depressions (e.g., roads) created during or after the mining operation.

Exposure

The loss of streams and wetlands reduces the areas for northern long-eared bats to drink and reduces the number of insects that spend part of their life cycle there. Northern long-eared bats occasionally forage over water, and insects with aquatic larvae (*e.g.*, caddisflies) comprise a portion, but not the majority, of their diet. The Bureau is implementing the following conservation measure that would reduce the exposure of northern long-eared bats to this stressor:

- 14.7 linear kilometers (15,440 LF) of stream and 0.32 hectare (0.66 acre) of wetlands on the property will not be impacted.

We expect all of the northern long-eared bats that use these resources for drinking and/or foraging to be exposed to this stressor. This could be all of northern long-eared bats that use habitat in the Action Area for foraging:

- 810 bats from April 1 – August 15,
- 10 bats from April 1 – May 14, and
- 10 bats from August 16 – November 14.

Response

Northern long-eared bats that currently use water resources in the construction limits of the project may have to change their behavior to find new areas in which to forage and/or drink. Because of the periodic flow status of the impacted streams, the low quality of the wetlands, and the lack of forested habitat surrounding the wetlands, these features are not likely to be significant drinking or foraging resources for the species. The property contains other streams and wetlands that would not be impacted by the proposed project and is bordered by the North Fork Kentucky River, Kings Creek, and Tolson Branch, which are all less than 2,000 feet from the clearing limits of the project. Therefore, northern long-eared bats that use these resources would not have to expend significant additional energy to find high-quality perennial streams with forested riparian habitat areas.

Effects

Due to the low quality of the ephemeral and intermittent streams as foraging habitat and the proximity of other aquatic resources to the site, we believe that any resulting change in the effort required to find adequate drinking and/or foraging resources would have an insignificant effect on the northern long-eared bat.

3.7.3.5. Stressor - Stream Sedimentation

Erosion during and immediately after the construction of the proposed project will result in short-term impacts to water quality as a result of increased sediment. This sedimentation will occur in streams in the project area and downstream. Increased sedimentation can negatively impact the drinking water and aquatic insects that comprise a portion of northern long-eared bats' diets.

Exposure

All the northern long-eared bats using these resources for drinking and/or foraging will be temporarily exposed to this stressor. Northern long-eared bats occasionally forage over water, and insects with aquatic larvae (*e.g.*, caddisflies) comprise a portion, but not the majority, of their diet. The Bureau will implement the following conservation measure to reduce northern long-eared bats' exposure to this stressor:

- An erosion and sediment control plan will be developed that specifies the site-specific BMPs that will be used to reduce erosion from the site and sedimentation in the streams.

We expect all of the northern long-eared bats that use these resources for drinking and/or foraging to be exposed to this stressor. This could be all of northern long-eared bats that use habitat in the Action Area for foraging:

- 810 bats from April 1 – August 15,
- 10 bats from April 1 – May 14, and
- 10 bats from August 16 – November 14.

Response

Northern long-eared bats that currently use water resources that would become impacted by sedimentation may have to travel to find new areas in which to forage and/or drink. Northern long-eared bats that do use these resources would not have to expend significant additional energy to travel long distances to find high-quality perennial streams with forested riparian areas. The property contains streams and wetlands that would not be impacted by the proposed project. The project site is bounded by the North Fork Kentucky River, Kings Creek, and Tolson Branch, all less than 2,000 feet from the clearing limits of the project.

Effects

Due to the temporary nature of the stressor, the use of BMPs to minimize the intensity of the

stressor, and the proximity of unaffected aquatic resources to the site, we believe that any change in the effort required to find adequate drinking and/or foraging resources would have an insignificant effect on the northern long-eared bat.

3.7.3.6. Stressor - Hazardous Materials Spills

There is the potential for hazardous material spills during the construction of the facility. The primary hazardous materials with the potential to be spilled are: diesel fuel, gasoline, hydraulic fluids, oils, lubricants, solvents, adhesives, and battery chemicals used during construction activities. These materials could drain or otherwise mobilize into streams and contaminate the water.

Exposure

Northern long-eared bats using contaminated streams for drinking and/or foraging could be temporarily exposed to this stressor. The Bureau will implement the following conservation measures to reduce northern long-eared bats' exposure to this stressor:

- a site-specific groundwater protection plan,
- appropriate waste disposal,
- appropriate chemical handling and storage procedures, and
- a proper spill response protocol.

We expect all the northern long-eared bats that use impacted streams for foraging and/or drinking to be exposed to this stressor. This could be all of Indiana bats that use habitat in the Action Area for foraging:

- 810 bats from April 1 – August 15,
- 10 bats from April 1 – May 14, and
- 10 bats from August 16 – November 14.

Response

Northern long-eared bats that drink from water resources impacted by hazardous materials spills may be poisoned. Northern long-eared bats that currently forage on insects in water resources impacted by hazardous material spills may be poisoned by insects they consume from contaminated waters. Aquatic insects populations could decline in contaminated waters and northern long-eared bats may then have to travel to find new areas in which to forage (the effects of this response are discussed in section 3.7.3.5).

Effects

Northern long-eared bats that are poisoned directly or indirectly (*i.e.*, by ingesting contaminated insects) by contaminated water may experience reduced fitness or mortality. Due to the measures to prevent hazardous material spills, we believe that such a spill is unlikely and, thus, the potential for effects to the northern long-eared bat would be discountable.

3.7.3.7. Stressor - Noise and Vibration from Blasting

Blasting will be used during the preparation of the site. Though blasting produces high-levels of noise, most of that noise is within the frequency range of 2-200 Hz (Cardno Mining Division 2016), which is outside the hearing range of bats, which is typically greater than 1,000 Hz (Siemers and Schaub 2011). There will likely be some noise produced that can be detected by northern long-eared bats. We do not know how far noise and vibration will travel from the site of the blasting. Northern long-eared bats roosting closer to the location of the blasting would experience greater exposure while those roosting farther away would experience less exposure.

Exposure

Northern long-eared bats using the Action Area when blasting activities are occurring could potentially be exposed to the effects of blasting. The Bureau will implement the following conservation measure to reduce northern long-eared bats' exposure to this stressor:

- Blasting will not occur from November 15 – March 31 when northern long-eared bats would be in hibernation.

Blasting will only occur during the day, when the bats would be roosting. The exposure would be intermittent and of short duration. All the northern long-eared bats assumed to be day roosting in the Action Area of the project could be exposed to this stressor:

- 810 bats from April 1 – August 15,
- 10 bats from April 1 – May 14, and
- 10 bats from August 16 – November 14.

Response

Northern long-eared bats may become startled by the noise and vibrations and, in the most severe cases, they may flush from their roosts. The nature of the response will vary, with bats roosting

closer to the blasting being more likely to flush. Northern long-eared bats that are flushed from their roost tree would be subject to increased chances of predation. However, because of the short duration and intermittent frequency of blasting, we expect any northern long-eared bats that flush from their roost trees to recover from the disturbance after several minutes and return to the roost tree.

Effects

Northern long-eared bats that flush from their roost trees will experience altered behavior. We expect the likelihood of northern long-eared bats experiencing harm as a result of flushing from their roost tree (e.g., predation) to be discountable. The most severe effects of flushing a bat from a roost tree would be if the bat was a female with in a roost tree containing pups. The longer the female is absent, the more likely the effects to the pups would be significant. Because the blasting will be conducted in areas that have been previously cleared of trees, the frequency will be intermittent, the duration will be short, we expect most northern long-eared bats roosting in the Action Area will not flush and we expect those that do flush to return their roost trees in a short amount of time. For these reasons, we expect the effects of noise and vibrations from blasting to northern long-eared bats to be insignificant.

3.7.3.8. Stressor - Noise and Vibration from Other Construction Activities

Construction activities other than blasting will also produce noise and vibration in the Action Area. Construction activities will occur year-round for 4-5 years. Noise and vibration from these activities are stressors that may disrupt normal feeding, sheltering, and breeding activities of the northern long-eared bat.

Callahan (1993) noted the likely cause of the Indiana bats in his study area abandoning a primary roost tree was disturbance from a bulldozer clearing brush adjacent to the tree. We expect northern long-eared bats to react similarly. At low noise levels (or farther distances), bats initially may be startled, but they would likely habituate to the low background noise levels. At closer distances and louder noise levels (particularly if accompanied by physical vibrations from heavy machinery and the crashing of falling trees), many northern long-eared bats would probably be startled to the point of fleeing from their day-time roosts. The novelty of these noises will also contribute to the range of responses from individuals or colonies of bats. Novel noises would be expected to result in some changes to northern long-eared bat behaviors, but research suggests that they may become habituated to this stressor. Gardner et al. (1991a) had evidence that Indiana bats continued to roost and forage in an area with active timber harvest. This suggested that noise and exhaust emissions from machinery could possibly disturb colonies of roosting bats, but such disturbances would have to be severe to cause roost abandonment. Several construction projects on Fort Drum are adjacent to multiple known Indiana bat roosts.

Construction around project sites has been ongoing for multiple years during the active season, but has not seemingly appeared to affect known roosts or Indiana bat behavior. The last known capture and roosting locations have been within approximately 800 and 400 meters (0.5 and 0.25 mi) of construction, respectively. A military installation generally has large amounts of noise and disturbance, and these bat species continue to occupy Fort Drum. We would expect northern long-eared bats to similarly become habituated to this stressor.

Exposure

Northern long-eared bats using the Action Area when construction activities are occurring could potentially be exposed to noise and vibrations from other construction activities. The Bureau will implement the following conservation measure to reduce northern long-eared bats' exposure to this stressor:

- The clearing limits of the project will be 66 m (216.5 ft) from assumed hibernaculum #1.

Additionally, the clearing limits of the project will be 38.5 m (126 ft) from assumed hibernaculum #2.

We do not know how far noise and vibration will travel from where construction activities are occurring. Northern long-eared bats roosting closer to the location of the activities would experience greater exposure while those roosting farther away would experience less exposure. There will be a forested buffer between the construction limits of the project and assumed hibernacula #1 and #2. Additionally, hibernaculum #1 is located downslope from the construction limits of the project and opens away from the construction limits. For these reasons, we do not expect hibernating northern long-eared bats to be exposed to this stressor. Construction activities will only occur during the day when the bats would be day roosting. The exposure will be of long duration during the 4-5 year construction period. All the northern long-eared bats assumed to be day roosting in the Action Area of the project could be exposed to this stressor:

- 810 bats from April 1 – August 15,
- 10 bats from April 1 – May 14, and
- 10 bats from August 16 – November 14.

Response

The response of northern long-eared bats to this stressor will vary according to the distance of the roosting bat to the stressor and the specifications of each of the specific activities. Northern long-eared bats roosting in trees near construction activities could respond to the stressor by flushing from the roost tree. However, because the construction activities will be conducted in

areas cleared of trees, northern long-eared bats are not likely be roosting immediately adjacent to the source of this stressor. For this reason, we expect most northern long-eared bats roosting in the Action Area will not flush, and we expect those that do flush to return to their roost trees in a short amount of time. Additionally, we expect northern long-eared bats to become habituated to the noise and vibrations from construction activities.

Effects

Northern long-eared bats that flush from their roost trees will experience altered behavior. We expect the likelihood of northern long-eared bats experiencing harm as a result of flushing from their roost tree (e.g., predation) to be discountable. We do not expect these behavior alterations to have significant effects on northern long-eared bats because we expect there to be few, if any flushed northern long-eared bats, and we expect those that do flush to return to their roost tree in a short period of time. Therefore, we expect the effects of noise and vibrations from construction activities other than blasting to northern long-eared bats to be insignificant and/or discountable.

3.7.3.9. Stressor - Increased Human Presence

Human activity will be increased on the site during construction activities. The stressor of increased human presence will be concurrent with other construction activities (*e.g.*, clearing, grading, blasting). We have already discussed the effects of those activities in the preceding sections. We do not expect the increased human presence to elicit additional significant responses by northern long-eared bats.

3.7.3.10. Stressor - Night Lighting

Some areas will be lit during construction. The lighting will be aimed towards areas that have already been cleared of trees.

Exposure

The Bureau will implement the following conservation measure to reduce northern long-eared bats' exposure to this stressor:

- Construction lighting will be aimed toward construction activities and away from forested habitat.

Because assumed hibernacula #1 and #2 are located outside of the area that will be cleared for the facility and the topography is such that hibernaculum #1 would not open towards the construction area, we do not expect northern long-eared bats to be exposed to this stressor during

hibernation. Northern long-eared bats that use the footprint of the project area at night while foraging and/or commuting will be exposed to this stressor. Northern long-eared bats show high site fidelity to foraging and commuting habitat, and the northern long-eared bats that have used the construction limits of the project for foraging and commuting in the past may still use the area after it is cleared of trees. They would likely avoid the areas that are lighted. Areas lighted during construction will likely only comprise a portion of the total clearing and disturbance limits at any one time. For the purposes of this analysis, we are going to consider the entire clearing and disturbance limits lighted during the entire 4-5 year construction phase.

All the northern long-eared bats foraging and/or commuting in the Action Area could be exposed to this stressor:

- 810 bats from April 1 – August 15,
- 10 bats from April 1 – May 14, and
- 10 bats from August 16 – November 14.

Response

Foraging and commuting northern long-eared bats are likely to be deterred from lighted areas during while foraging and/or commuting, shifting their flight paths to avoid these artificially-lit areas. The removal of forested habitat may require northern long-eared bats to expend additional energy to seek out new habitat for foraging and commuting.

The proposed clearing and disturbance limits (73.1 hectares (180.5 acres)) represents the following portions of the areas used by northern long-eared bats in Action Area:

- 1.4% of the area within a 4-km (2.5-mi) radius of the project area, the area used a northern long-eared bat maternity colony located in the center of the clearing limits;
- 12.5% within a 0.8 km (0.5 mi) of assumed hibernaculum #1, used during spring staging; 17.5% within a 0.8 km (0.5 mi) of assumed hibernaculum #2, used during spring staging; and
- 3.4% within the 8-km (5 mi) radius of assumed hibernacula #1 and #2, used during fall swarming.

Because the majority of the area outside of the clearing and disturbance limits of the project is undeveloped, we expect that northern long-eared bat will be able to find adequate habitat for foraging and commuting. Northern long-eared bats will alter their behavior more significantly if they are exposed to this stressor during a time in their life cycle when they utilize smaller areas of forested habitat (i.e., fall swarming and spring staging). After an initial extra energy expenditure to find these areas, we expect that northern long-eared bats will shift their foraging

range and commuting routes to adapt to the changed landscape. After this adaptation, we do not expect northern long-eared bats to have a significant response to this reduction in habitat.

Effects

If northern long-eared bats have to increase their energy expenditure to search for new foraging and commuting habitat during a sensitive period of a bat's reproductive cycle (e.g., pregnancy), it is possible that spontaneous abortion or other stress-related reproductive delays or losses in fecundity may occur in some individuals, particularly those that may have already been under other environmental stressors (e.g., WNS). It has been hypothesized that these stressors and delays in reproduction could also cause lower fat reserves and lead to lower winter survival rates in Indiana bats (USFWS 2002). Because both species use forested habitat, we believe these effects could also occur in northern long-eared bats exposed to this stressor. For example, females that give live birth may have pups with lower birth weights or their pups may have delayed development rates (i.e., late into the summer). This could, in turn, affect the over-winter survival of these young-of-the-year bats if they enter fall migration and winter hibernation periods with inadequate fat reserves. Increased energy expenditures and lower weight gains during fall swarming could result in lower fitness in those stressed individuals as exhibited by reduced survival and/or reproductive success. Impacts to non-reproductive adults would be less than those impacts to reproductive females and juveniles, because there are fewer stresses on these individuals. However, these individuals are still likely to be impacted by the loss of habitat through increased energy expenditures associated with longer foraging distances or disrupted travel corridors.

We expect significant effects as a result of the loss of foraging and commuting habitat that northern long-eared bats are accustomed to using. We expect exposure to this stressor to result in take of some northern long-eared bats in the form of "harm" by habitat modification that kills or injures northern long-eared bats by significantly impairing essential behavioral patterns such as breeding, feeding, or sheltering. We expect exposure to this stressor to result in take of some northern long-eared bats in the form of "harassment" by annoying northern long-eared bats to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. We expect exposure of this stressor to result in take of some northern long-eared bats in the forms of both "harm" and "harassment." Thus, we expect take of northern long-eared bats from exposure of this stressor to be in the form of "harm" and/or "harassment." Because of the availability of other undeveloped habitat in the vicinity, we expect that these bats would find other areas in which to forage and commute and would likely recover from the effects of this stressor by the following roosting season.

3.7.3.11. Stressor - Invasive Species

Invasive species may be introduced to the site during the construction of the facility. Contractors will be required to inspect vehicles and equipment prior to entering to minimize the transport of invasive species. Fill material will be taken from onsite. Invasive species will be controlled on the grounds of the facility during its operation. Because of the measures to prevent the introduction and establishment of invasive species on the site, we do not expect significant effects to the species from this stressor.

3.7.4. Effects of Facility Operation

3.7.4.1. Stressor - Hazardous Materials Spills

There is the potential for hazardous material spills during the operation of the facility. The primary hazardous materials with the potential to be spilled are: diesel fuel, gasoline, hydraulic fluids, oils, lubricants, solvents, adhesives, and battery chemicals stored and used at the facility. The exposure, response, and effects of this stressor from the operation of the facility similar to those resulting hazardous materials spills during construction activities and was discussed in section 3.7.3.6.

3.7.4.2. Stressor - Traffic

Noise and vibration from traffic will occur in perpetuity at the site during the operation of the facility. Traffic will occur during all times of the year and could occur at any time of the day or night. It will be intermittent, but not constant. Peak traffic is anticipated from 7:00-9:00 am and 3:00-5:00 pm with approximately 156 trips and 204 trips, respectively, during those times.

Exposure

Northern long-eared bats in certain areas within the Action Area at any time during the operation of the facility could potentially be exposed to this stressor. We do not know how far noise and vibration will travel from the roads on the site and, therefore, cannot specify the distance around the facility in which northern long-eared bats would be exposed to this stressor. The level of exposure will decrease as the distance the northern long-eared bat from the source of the stressor increases. There will be a forested buffer between the construction limits of the project and assumed hibernacula #1 and #2. Additionally, hibernaculum #1 is located downslope from the construction limits of the project and opens away from the construction limits. For these reasons we do not expect hibernating northern long-eared bats to be exposed to this stressor. All the

northern long-eared bats roosting, foraging, and/or commuting in the vicinity of the facility could be exposed to this stressor:

- 810 bats from April 1 – August 15,
- 10 bats from April 1 – May 14, and
- 10 bats from August 16 – November 14.

Response

We expect northern long-eared bats that continue to roost in the project area in close proximity of the proposed facility to have become accustomed to similar disturbances during the 4-5 year construction period (from tree removal or noise and vibration during construction). Northern long-eared bats in the vicinity of the facility would have already become accustomed to the traffic on the existing roads nearby; the site is bounded on the north and half of the east side by state highways and on the west by another road. The traffic accessing the facility will be occurring in new areas. We expect northern long-eared bats that remain in the vicinity of the facility after construction to become habituated to the additional traffic.

Effects

Because we do not anticipate a significant response from northern long-eared bats to this stressor, we do not believe that this stressor would result in significant effects to the northern long-eared bat.

3.7.4.3. Stressor - Noise from Small Arms Fire

The facility will include a small arms (*e.g.* handguns, shotguns, and rifles) firing range for training purposes.

Exposure

Firing range activities will occur annually during a six-week period during March and April (five days a week, Monday – Friday) and on one day each month of the year. This will continue in perpetuity. All the firing will occur during daylight hours. Any northern long-eared bats roosting in the Action Area during the use of the firing range could potentially be exposed to this stressor. The firing range will be located in an area that has been cleared of vegetation, reducing the availability of roosting habitat in the areas that would experience the greatest noise. Noise level modeling shows the 87 peak decibel levels (dBP) and 104 dBP contours (Fig. 9) (Bureau 2017b). Some forested habitat is present in the areas that would experience these noise levels.

The level of exposure (*i.e.*, received sound level) a northern long-eared bat experiences would decrease with increasing distance from the source of the stressor (firing range). All the northern long-eared bats roosting in the vicinity of the facility could potentially be exposed to this stressor:

- 810 bats from April 1 – August 15,
- 10 bats from April 1 – May 14, and
- 10 bats from August 16 – November 14.

Response

There will be a forested buffer between the facility and the features assumed hibernacula #1 and #2. Additionally, hibernaculum #1 is located downslope from the construction limits of the project and opens away from the construction limits. For these reasons we do not expect hibernating northern long-eared bats to respond to this stressor. The response of northern long-eared bats to this stressor will vary according to distance of the roosting bat to the firing range. Some northern long-eared bats roosting in trees near firing range will likely respond to the stressor by flushing from the roost tree. Because of the intermittent use of the proposed firing range, we do not expect the northern long-eared bats nearby to become habituated to this stressor. The small arms fire will continue throughout the day on the monthly training days and for several hours a day during the six-week training. Because of the duration of the disturbance, we expect northern long-eared bats to be repeatedly disturbed by the noise produced on the days the firing range is used.

Effects

Northern long-eared bats that flush from their roost trees will experience altered behavior. We expect the likelihood of northern long-eared bats experiencing harm as a result of flushing from their roost tree (e.g., predation) to be discountable. If displaced northern long-eared bats have to increase their energy expenditure to search for a new roost tree during a sensitive period of a bat's reproductive cycle (e.g., pregnancy), it is possible that spontaneous abortion or other stress-related reproductive delays or losses in fecundity may occur in some individuals, particularly those that may have already been under other environmental stressors (e.g., WNS). It has been hypothesized that these stressors and delays in reproduction could also cause lower fat reserves and lead to lower winter survival rates in Indiana bats (USFWS 2002). Because both species use forested habitat, we believe these effects could also occur in northern long-eared bats exposed to this stressor. For example, females that give live birth may have pups with lower birth weights or their pups may have delayed development rates (i.e., late into the summer). This could, in turn, affect the over-winter survival of these young-of-the-year bats if they enter fall migration and winter hibernation periods with inadequate fat reserves. Increased energy expenditures and

lower weight gains during fall swarming could result in lower fitness in those stressed individuals as exhibited by reduced survival and/or reproductive success. Impacts to non-reproductive adults would be less than those impacts to reproductive females and juveniles, because there are fewer stresses on these individuals. Females may be flushed from roost trees containing pups. Female bats do leave their pups in roost trees for some amount of time while they forage at night, but the longer the female is absent, the more likely the effects to the pups would be significant. We expect the responses of some adult northern long-eared bats to this stressor to result in significant adverse effects. We also expect some pups to be significantly affected by the extended absence of adults from the roost tree. We expect exposure of this stressor to result in take of some northern long-eared bats in the forms of both "harm" and "harassment". Thus, we expect take of northern long-eared bats from exposure of this stressor to be in the form of "harm" and/or "harassment".

3.7.4.4. Stressor - Increased Human Presence

Human activity during the operation of the facility will occur during all hours of the day and night and will continue in perpetuity. Human presence will be limited to the facility within which the forested habitat would have been cleared and the area maintained as lawn. There would be no roosting habitat in close proximity to the areas in humans will be and human presence at night will be limited to areas that will already be impacted by night lighting. We do not expect the increased human presence to elicit additional significant responses by northern long-eared bats.

3.7.4.5. Stressor - Collisions with Vehicles

The traffic to the site increases the risk of a vehicle colliding with a northern long-eared bat.

Exposure

Northern long-eared bats could be exposed to this stressor when they are flying while foraging and/or commuting. Traffic will occur during all times of the year. This new traffic could occur at any time of the day or night and will be intermittent, but not constant. Peak traffic is anticipated from 7:00-9:00 am and 3:00-5:00 pm with approximately 156 trips and 204 trips, respectively, during those times. All the northern long-eared bats in the Action Area that use the Action Area for foraging and/or commuting could be exposed to this stressor:

- 810 bats from April 1 – August 15,
- 10 bats from April 1 – May 14, and
- 10 bats from August 16 – November 14.

Response

Northern long-eared bat collisions with vehicles will likely result in immediate mortality or injury and subsequent mortality.

Effects

Because vehicular traffic is already occurring on adjacent roads and the additional traffic will occur mostly during the daylight hours when the bats would not be active, we believe the potential for effects of collisions with vehicles to the northern long-eared bat is discountable.

3.7.4.6. Stressor - Night Lighting

During operation, the facility will be artificially lighted throughout the dark hours in perpetuity.

Exposure

The Bureau will implement the following conservation measures to reduce northern long-eared bats' exposure to this stressor:

- Exterior lights (high mast, wall packs, and parking lot and sidewalk light poles) will have full cutoff features.

Because assumed hibernacula #1 and #2 are located outside of the area that will be cleared for the facility and the topography of hibernaculum #1 is such these features would not open towards the construction area, we do not expect northern long-eared bats to be exposed to this stressor during hibernation. Northern long-eared bats that use the footprint of the project area at night while foraging and/or commuting will be exposed to this stressor. Northern long-eared bats show site fidelity to foraging and commuting habitat. Northern long-eared bats that have used the footprint of the proposed facility for foraging and commuting in the past may still use the area after it is cleared of trees. They would likely avoid this lighted area during the operation of the facility.

All the northern long-eared bats foraging and/or commuting in or near lighted areas would be exposed to this stressor:

- 810 bats from April 1 – August 15,
- 10 bats from April 1 – May 14, and
- 10 bats from August 16 – November 14.

Response

Foraging and commuting northern long-eared bats are likely to be deterred from lighted areas during while foraging and/or commuting. They will likely shift their flight paths while foraging and when commuting to avoid these artificially-lit areas. The removal of forested habitat may require northern long-eared bats to expend additional energy to seek out new habitat for foraging and commuting.

The proposed clearing and disturbance limits (73.1 hectares (180.5 acres)) represents the following portions of the areas used by northern long-eared bats in Action Area:

- 1.4% of the area within a 4-km (2.5-mi) radius of the project area, the area used a northern long-eared bat maternity colony located in the center of the clearing limits;
- 5.1% within a 0.8 km (0.5 mi) of assumed hibernaculum #1, used during spring staging; 17.5% within a 0.8 km (0.5 mi) of assumed hibernaculum #2, used during spring staging; and
- 3.4% within the 8-km (5 mi) radius of assumed hibernaculum and the potential hibernaculum, used during fall swarming.

Because the majority of the area outside of the clearing and disturbance limits of the project is undeveloped, we expect that northern long-eared bats will be able to find adequate habitat for foraging and commuting. Northern long-eared bats will alter their behavior more significantly if they are exposed to this stressor during a time in their life cycle when they utilize smaller areas of forested habitat (i.e., fall swarming and spring staging). After an initial extra energy expenditure to find these areas, we expect that northern long-eared bats will shift their foraging range and commuting routes to adapt to the changed landscape. After this adaptation, we do not expect northern long-eared bats to have a significant response to this reduction in habitat.

Effects

If northern long-eared bats have to increase their energy expenditure to search for new foraging and commuting habitat during a sensitive period of a bat's reproductive cycle (e.g., pregnancy), it is possible that spontaneous abortion or other stress-related reproductive delays or losses in fecundity may occur in some individuals, particularly those that may have already been under other environmental stressors (e.g., WNS). It has been hypothesized that these stressors and delays in reproduction could also cause lower fat reserves and lead to lower winter survival rates in Indiana bats (USFWS 2002). Because both species use forested habitat, we believe these effects could also occur in northern long-eared bats exposed to this stressor. For example, females that give live birth may have pups with lower birth weights or their pups may have delayed development rates (i.e., late into the summer). This could, in turn, affect the over-winter

survival of these young-of-the-year bats if they enter fall migration and winter hibernation periods with inadequate fat reserves. Increased energy expenditures and lower weight gains during fall swarming could result in lower fitness in those stressed individuals as exhibited by reduced survival and/or reproductive success. Impacts to non-reproductive adults would be less than those impacts to reproductive females and juveniles, because there are fewer stresses on these individuals. However, these individuals are still likely to be impacted by the loss of habitat through increased energy expenditures associated with longer foraging distances or disrupted travel corridors.

We expect significant effects as a result of the removal of foraging and commuting habitat that northern long-eared bats are accustomed to using. We expect exposure to this stressor to result in take of some northern long-eared bats in the form of "harm" by habitat modification that kills or injures northern long-eared bats by significantly impairing essential behavioral patterns such as breeding, feeding, or sheltering. We expect exposure to this stressor to result in take of some northern long-eared bats in the form of "harassment" by annoying northern long-eared bats to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. We expect exposure of this stressor to result in take of some northern long-eared bats in the forms of both "harm" and "harassment." Thus, we expect take of northern long-eared bats from exposure of this stressor to be in the form of "harm" and/or "harassment." Because of the availability of other undeveloped habitat in the vicinity, we expect that these bats would find other areas in which to forage and commute and would likely recover from the effects of this stressor by the following roosting season.

3.8. **Conclusion for the Northern Long-eared Bat**

We have considered the status of the species across its range, the status of the species within the Action Area, and the effects of the Action to the northern long-eared bat. In our effects analysis, we identified several ways in which northern long-eared bats would be adversely affected by the Action. We estimate that 820 northern long-eared bats use the construction limits for roosting, foraging, and/or commuting: 810 bats from April 1 – August 15; 10 bats from April 1 – May 14; and 820 bats from August 16 – November 14 (the 20 bats that use the habitat from April 1 – May 14 are part of the 820 bats from August 16 – November 14). All 820 of the northern long-eared bats that use the Action Area for roosting, foraging, and/or commuting could be exposed to stressors associated with the Action. All of these 820 northern long-eared bats have the potential to be adversely affected by the following stressors: strikes from equipment or trees, removal of occupied roost trees, loss of forested habitat on the landscape, night lighting during construction, noise from small arms fire, and night lighting during facility operation.

The duration of the effects from the specific stressors will vary. The effects from strikes from

equipment or trees, removal of occupied roost trees, and night lighting during construction would be temporary during the 4-5 year construction period and the following year. The loss of forested habitat on the landscape and night lighting during facility operation would be permanent, but we expect northern long-eared bats to adapt their behavior to the altered landscape. The effects of noise from small arms fire will occur intermittently, presumably in perpetuity.

We assume that, as a result of the Action, some of these 810 northern long-eared bats will experience harm, some will experience harassment, and some will experience both harm and harassment. We cannot determine how many of these 810 northern long-eared bats will experience each of these effects. We expect most of the effects to be in the form of harassment and not result in mortality. The effects of the Action to northern long-eared bat are summarized in Table 8.

There are no population estimates for the northern long-eared bat, and the Service has not completed a Recovery Plan for the species. The number of northern long-eared bats adversely affected by the Action would be 820. These are the northern long-eared bats from 2 assumed hibernacula and 6 summer records. There are 123 northern long-eared bat hibernacula records and 1,367 summer northern long-eared bat records in Kentucky (USFWS, unpublished data). The northern long-eared bats affected by the Action represent those that occupy 1.6% of the hibernacula and 0.4% of the summer records in Kentucky. The Action would adversely affect a small proportion of the species' population in Kentucky and rangewide, and most of the effects would not be lethal. The number of northern long-eared bats that we have estimated to occur in the Action Area is likely an overestimate based on the assumptions that we detailed in section 3.6.1. Furthermore, the number of northern long-eared bats adversely affected by the Action is likely to be less than the number of northern long-eared bats in the Action Area. Therefore, 820 northern long-eared bats is likely an overestimate of the number of northern long-eared bats that would experience adverse effects from the Action.

The Action would be consistent with conservation measures in Service's January 5, 2016, intra-Service Programmatic BO (4(d) BO) on the final 4(d) rule for the northern long-eared bat final 4(d) rule and, therefore, the take of these 820 northern long-eared bats is not prohibited. However, to provide greater regulatory certainty throughout the duration of the Action, the Bureau has chosen to address the take of the northern long-eared bat in this project-specific BO.

"*Jeopardize the continued existence*" means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR §402.02). After reviewing the current status of the species, the environmental baseline for the Action Area, the effects of the Action and the cumulative effects,

it is the Service's biological opinion that the Action is not likely to jeopardize the continued existence of the northern long-eared bat.

Table 2. Summary of the effects of the Action on the northern long-eared bat.

	Hibernation	**All other times**
Property Acquisition	beneficial*	
Compensatory Mitigation	beneficial	
Construction Activities:		
Strikes from Equipment or Trees	none	harm harassment
Removal of Occupied Roost Trees	none	harm harassment
Loss of Forested Habitat on Landscape	none	harm harassment
Loss of Water Resources	none	insignificant
Stream Sedimentation	none	insignificant
Hazardous Materials Spills	none	discountable
Noise/Vibrations from Blasting	none	insignificant
Noise/Vibrations from Other Construction Activities	none	insignificant / discountable
Increased Human Presence	none	insignificant
Night Lighting	none	harm harassment
Facility Operation Activities:		
Hazardous Materials Spills	none	discountable
Traffic	none	insignificant
Noise from Small Arms Fire	insignificant	harassment
Increased Human Presence	none	insignificant
Collisions with Vehicles	none	discountable
Night Lighting	none	harm harassment

* There are adverse indirect effects resulting from the property acquisition. These are discussed subsequently under construction activities and facility operation activities.

4. INCIDENTAL TAKE STATEMENT

ESA §9 and regulations issued under §4(d) prohibit the take of endangered and threatened species, respectively, without special exemption. The term "take" in the ESA means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." The Service defines "harass" as an intentional or negligent act or omission that creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns, which include, but are not limited to, breeding, feeding or sheltering. The Service defines "harm" as an act that actually kills or injures wildlife, including significant habitat modification or degradation that significantly impairs essential behavioral patterns, such as breeding, feeding, or sheltering. "Incidental take" is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of ESA §7(b)(4) and §7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered prohibited, provided that such taking is in compliance with the terms and conditions of an incidental take statement (ITS).

For the exemption in ESA §7(o)(2) to apply to the Action considered in this BO, the Bureau must undertake the non-discretionary measures described in this ITS, and these measures must become binding conditions of any permit, contract, or grant issued for implementing the Action. The Bureau has a continuing duty to regulate the activity covered by this ITS. The protective coverage of §7(o)(2) may lapse if the Bureau fails to:

(a) assume and implement the terms and conditions; or
(b) require a permittee, contractor, or grantee to adhere to the terms and conditions of the ITS through enforceable terms that are added to the permit, contract, or grant document.

In order to monitor the impact of incidental take, the Bureau must report the progress of the Action and its impact on the species to the Service as specified in this ITS.

4.1. Amount or Extent of Take

This section specifies the amount or extent of take of listed wildlife species that the Action is reasonably certain to cause, which we estimated in the "Effects of the Action" section(s) of this BO. We do not repeat these analyses here.

4.1.1. Indiana Bat

The Service anticipates that the Action is reasonably certain to cause incidental take of individual Indiana bats consistent with the definition of harass and/or harm resulting from strikes from

equipment or trees, removal of occupied roost trees, loss of forested habitat on the landscape, night lighting during construction and operation, and noise from small arms fire (see section 2.8, Conclusion for the Indiana bat).

Anticipated Take of Indiana Bats

Amount or Extent	Life Stage	Form of Take
418	Adults / Volant Young	Harass and/or Harm

Instructions for monitoring and reporting take are provided in section 4.4.

4.1.2. Northern Long-eared Bat

The Service anticipates that the Action is reasonably certain to cause incidental take of individual northern long-eared bats consistent with the definition of harass and/or harm resulting from strikes from equipment or trees, removal of occupied roost trees, loss of forested habitat on the landscape, night lighting during construction and operation, and noise from small arms fire (see section 3.8, Conclusion for the northern long-eared bat).

Anticipated Take of Northern Long-eared Bats

Amount or Extent	Life Stage	Form of Take
820	Adults / Volant Young	Harass and/or Harm

Instructions for monitoring and reporting take are provided in section 4.4.

4.2. Reasonable and Prudent Measures

The Service believes the following reasonable and prudent measure (RPM) is necessary or appropriate to minimize the impact of incidental take caused by the Action on listed wildlife species:

RPM: The Bureau shall ensure that the project will occur as designed, planned, and documented in the BA and this BO.

4.3. **Terms and Conditions**

In order for the exemption from the take prohibitions of §9 and of regulations issued under §4(d) of the ESA to apply to the Action, the Bureau must comply with the term and condition (T&C) of this ITS provided below. This T&C is mandatory. As necessary and appropriate to fulfill this responsibility, the Bureau must require any permittee, contractor, or grantee to implement this T&C through enforceable terms that are added to the permit, contract, or grant document.

T&C: The Bureau shall ensure that the project will occur as designed, planned, and documented in the BA and this BO.

4.4. **Monitoring and Reporting Requirements**

In order to monitor the impacts of incidental take, the Bureau must report the progress of the Action and its impact on the species to the Service as specified in the ITS (50 CFR §402.14(i)(3)). This section provides the specific instructions for such monitoring and reporting. As necessary and appropriate to fulfill this responsibility, the Bureau must require any permittee, contractor, or grantee to accomplish the monitoring and reporting through enforceable terms that are added to the permit, contract, or grant document. Such enforceable terms must include a requirement to immediately notify the Bureau and the Service if the amount or extent of incidental take specified in this ITS is exceeded during implementation of the Action.

The Bureau will monitor the take of this project annually by (1) ensuring that all of the identified Conservation Measures are implemented and maintained, as necessary, by the contractor(s) and (2) informing the Service as soon as possible if the amount of take is exceeded or if any Indiana bats and/or northern long-eared bats are observed or injured within the project area. The Bureau will report any changes or deviations to the above monitoring requirements, to the Service's Kentucky Field Office, as soon as possible, or annually once the project is in operation.

5. CONSERVATION RECOMMENDATIONS

§7(a)(1) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by conducting conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary activities that an action agency may undertake to avoid or minimize the adverse effects of a proposed action, implement recovery plans, or develop information that is useful for the conservation of listed species. The Service offers the following recommendation that is relevant to the listed species addressed in this BO and that we believe is consistent with the authorities of the Bureau:

- Minimize tree removal during the occupied timeframe (April 1 – November 15) to the greatest extent practicable.

6. REINITIATION NOTICE

Formal consultation for the Action considered in this BO is concluded. Reinitiating consultation is required if the Bureau retains discretionary involvement or control over the Action (or is authorized by law) when:

a. the amount or extent of incidental take is exceeded;
b. new information reveals that the Action may affect listed species or designated critical habitat in a manner or to an extent not considered in this BO;
c. the Action is modified in a manner that causes effects to listed species or designated critical habitat not considered in this BO; or
d. a new species is listed or critical habitat designated that the Action may affect.

In instances where the amount or extent of incidental take is exceeded, the Bureau is required to immediately request a reinitiation of formal consultation. Please note that the Service cannot exempt from the applicable ESA prohibitions any Action-caused take that exceeds the amount or extent specified in the ITS of this BO that may occur before the reinitiated consultation is concluded.

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APPENDIX A - Email Addendum to BA

Miller, Jessica <jessica_miller@fws.gov>

Re: bat mitigation for Letcher County prison

Issac Gaston <IGaston@bop.gov> Mon, Jun 5, 2017 at 8:14 PM
To: jessica_miller@fws.gov

Yes. The BOP should make the contribution prior to tree removal.

Sent from my BlackBerry 10 smartphone on the Verizon Wireless 4G LTE network.

From: Miller, Jessica
Sent: Monday, June 5, 2017 3:04 PM
To: Issac Gaston
Subject: bat mitigation for Letcher County prison

Mr. Gaston,

I need to put some details in the BO about when the Bureau would make the mitigation contribution to the Imperiled Bat conservation Fund. The preferable option is to have the entire contribution completed prior to any tree removal. Would that work for the Bureau?

Jessi

--
Jessica Blackwood Miller
Fish & Wildlife Biologist
Kentucky Field Office
U.S. Fish & Wildlife Service
330 W. Broadway, Rm 265
Frankfort, KY 40601
Ph: (502) 695-0468 ext. 104
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NOTE: This email correspondence and any attachments to and from this sender is subject to the Freedom of Information Act (FOIA) and may be disclosed to third parties.

APPENDIX B – Additional Figures and Tables

Table 1. Current land cover and land cover predicted after construction of the proposed facility in a 4-km (2.5-mile) radius of the project area (Bureau 2017b).

Land Cover Type	Current		Predicted	
	hectares (acres)	percent	hectares (acres)	percent
Forest	4,232.8 (10,459.6)	83.24	4,184.0 (10,339.0)	82.28
Herbaceous	467.1 (1,154.2)	9.20	467.1 (1,154.2)	9.20
Developed	313.7 (775.1)	6.17	362.5 (895.7)	7.12
Barren Land	56.9 (140.6)	1.10	56.9 (140.6)	1.10
Open Water	9.7 (24.0)	0.20	9.7 (24.0)	0.20
Hay/Pasture	3.8 (9.3)	0.10	3.8 (9.3)	0.10
Shrub/Scrub	0.9 (2.2)	0.02	0.9 (2.2)	0.02
Total	5,084.9 (12,565.0)		5,084.9 (12,565.0)	

Table 2. Current land cover and land cover predicted after construction of the proposed facility in a 16-km (10-mile) radius of the Line Fork cave system. Land cover data is from the National Land Cover Database 2011 (Homer et al. 2015).

Land Cover Type	Current		Predicted	
	Hectares (acres)	percent	Hectares (acres)	percent
Forest	6,679,724 (16,505,957)	82.09	6,676,484 (16,497,951)	82.05
Herbaceous	612,594 (1,513,752)	7.53	612,594 (1,513,752)	7.53
Developed	484,397 (1,196,971)	5.95	491,652 (1,214,899)	6.04
Barren Land	263,332 (650,708)	3.24	262,549 (648,773)	3.23
Open Water	2,925 (7,228)	0.04	2,925 (7,228)	0.04
Hay/Pasture	8,452 (20,885)	0.10	8,452 (20,885)	0.10
Shrub/Scrub	84,435 (208,643)	1.04	81,203 (200,657)	1.00
Wetlands	846 (2,090.5)	0.00	846 (2,090.5)	0.00
Total	8,136,707 (20,106,241)		8,136,707 (20,106,241)	

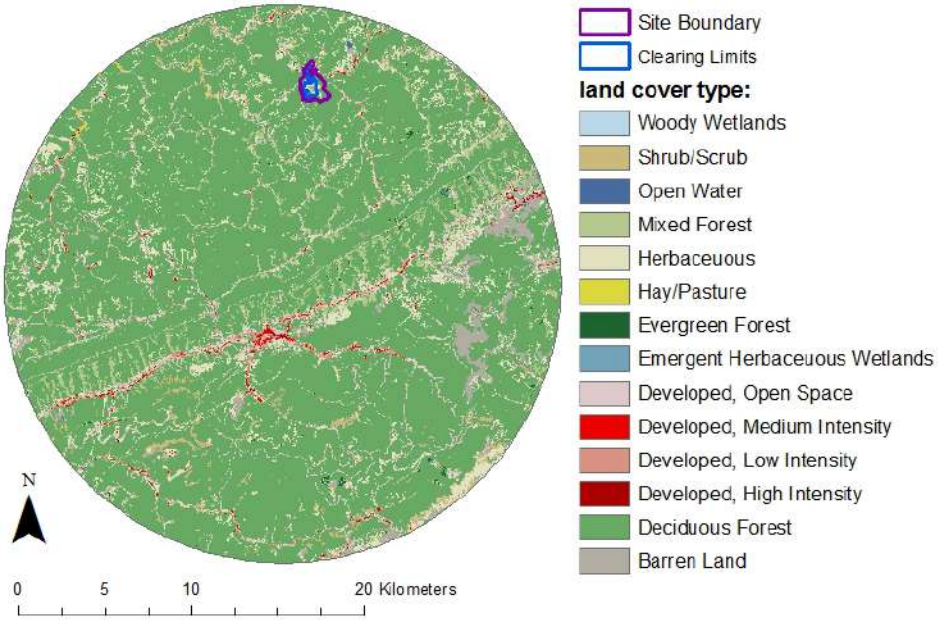

Figure 1. Current land cover in a 16-km (10-mile) radius of the Line Fork cave system. Land cover data is from the National Landover Database 2011 (Homer et al. 2015).

Table 3. Current land cover and land cover predicted after construction of the proposed facility in a 0.8-km (0.5-mile) radius of assumed hibernaculum #1. Land cover data is from the National Landover Database 2011 (Homer et al. 2015).

Land Cover Type	Current		Predicted	
	Hectares (acres)	percent	Hectares (acres)	percent
Forest	123.0 (618.3)	59.3	114.5 (575.7)	55.8
Developed	5.9 (29.8)	2.9	31.6 (158.7)	15.3
Barren Land	3.9 (19.8)	1.9	0 (0)	0
Herbaceous	22.8 (114.5)	11.7	9.6 (48.0)	4.9
Hay/Pasture	17.4 (87.6)	8.5	17.4 (87.6)	8.5
Cultivated Crops	30.0 (150.2)	14.7	29.9 (150.2)	14.7
Woody Wetlands	1.6 (8.2)	0.9	1.6 (8.2)	0.9
Total	204.6 (502.7)		204.6 (502.7)	

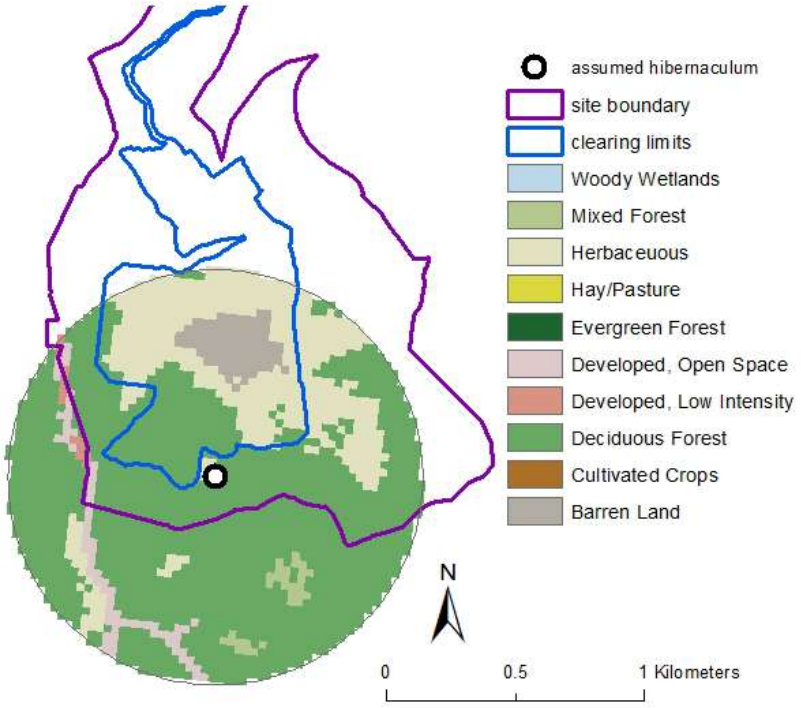

Figure 2. Current land cover and land cover predicted after construction of the proposed facility in a 0.8-km (0.5-mile) radius of assumed hibernaculum #1. Land cover data is from the National Landover Database 2011 (Homer et al. 2015).

Table 4. Current land cover and land cover predicted after construction of the proposed facility in a 8-km (5-mile) radius of assumed hibernaculum #1. Land cover data is from the National Landover Database 2011 (Homer et al. 2015).

Land Cover Type	Current		Predicted	
	Hectares (acres)	percent	Hectares (acres)	percent
Forest	10,588 (26,162)	52.0	10,571 (26,122)	52.0
Developed	1,330 (3,288)	6.5	1,367 (3377)	6.7
Open Water	109 (268)	0.5	109 (268)	0.5
Barren Land	101 (251)	0.5	97 (241)	0.5
Herbaceous	984 (2,431)	4.8	967 (2,391)	4.8
Hay/Pasture	495 (1,223)	2.4	495 (1,223)	2.4
Cultivated Crops	6,437 (15,905)	31.6	6,437 (15,905)	31.6
Woody Wetlands	218 (538)	1.1	218 (538)	1.1
Emergent Herbaceous Wetlands	75 (185)	0.4	75 (185)	0.4
Total	20,342 (50,266)		20,342 (50,266)	

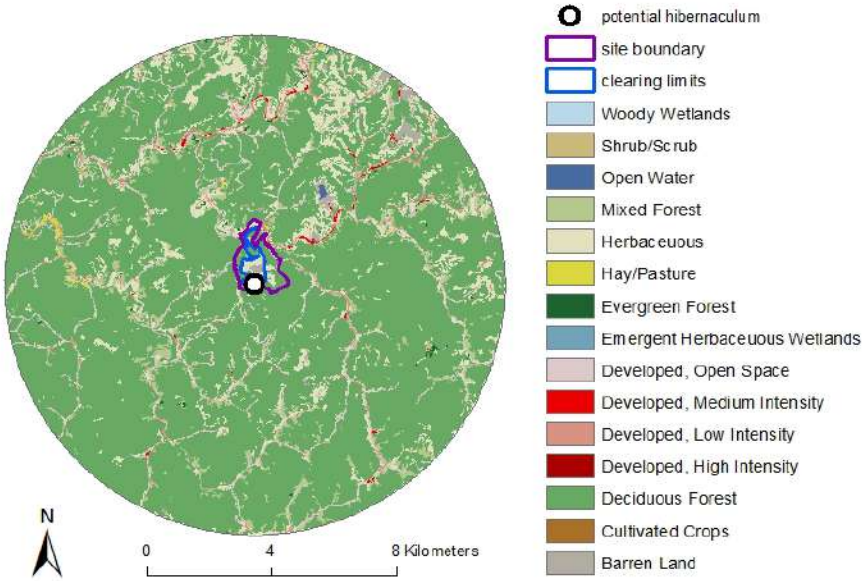

Figure 3. Current land cover and land cover predicted after construction of the proposed facility in a 8-km (5-mile) radius of assumed hibernaculum #1. Land cover data is from the National Landover Database 2011 (Homer et al. 2015).

Table 5. Current land cover and land cover predicted after construction of the proposed facility in a 0.8-km (0.5-mile) radius of assumed hibernaculum #2. Land cover data is from the National Landover Database 2011 (Homer et al. 2015).

Land Cover Type	Current		Predicted	
	Hectares (acres)	percent	Hectares (acres)	percent
Forest	145.7 (357.9)	71.2	128.4 (315.5)	62.8
Developed	18.3 (44.9)	8.9	53.2 (130.8)	26.0
Barren Land	4.2 (10.2)	2.0	3.4 (8.4)	1.7
Herbaceous	36.5 (89.7)	17.8	19.5 (48.0)	9.5
Total	204.6 (502.7)		204.6 (502.7)	

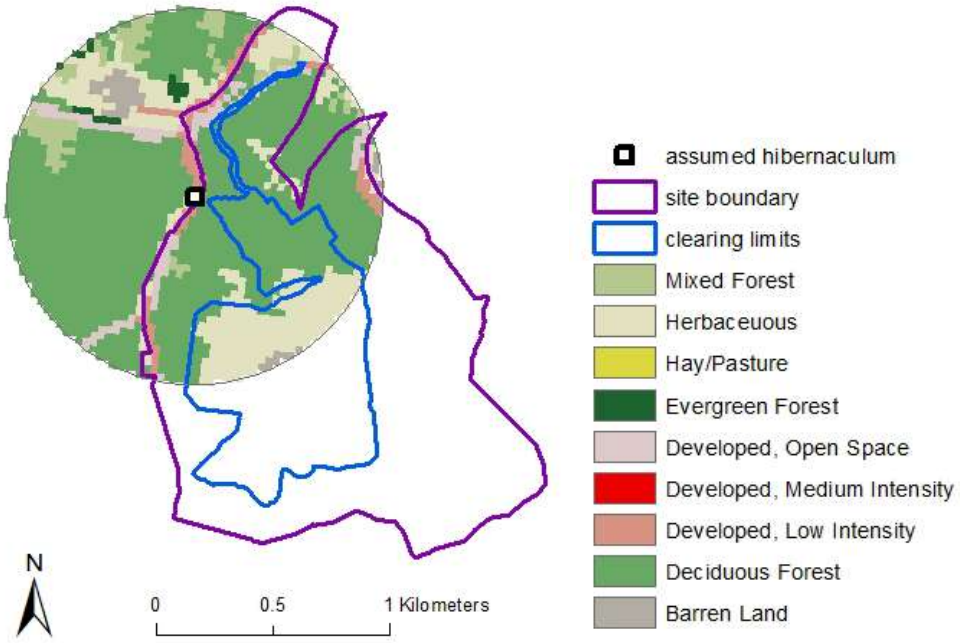

Figure 4. Current land cover and land cover predicted after construction of the proposed facility in a 0.8-km (0.5-mile) radius of assumed hibernaculum #2. Land cover data is from the National Landover Database 2011 (Homer et al. 2015).

Table 6. Current land cover and land cover predicted after construction of the proposed facility in a 8-km (5-mi) radius of assumed hibernaculum #2. Land cover data is from the National Landover Database 2011 (Homer et al. 2015).

Land Cover Type	Current		Predicted	
	Hectares (acres)	percent	Hectares (acres)	percent
Forest	16,553 (40,904)	81.4	16,521 (40,824)	81.2
Developed	1,279 (3,161)	6.3	1,352 (3,340)	6.6
Open Water	11 (27)	0.1	11 (27)	0.1
Barren Land	252 (624)	1.2	245 (604)	1.2
Shrub/Scrub	6 (15)	0.0	6 (15)	0.0
Herbaceous	2,202 (5,440)	10.8	2,169 (5,361)	10.7
Hay/Pasture	38 (95)	0.2	38 (95)	0.2
Total	20,342 (50,266)		20,342 (50,266)	

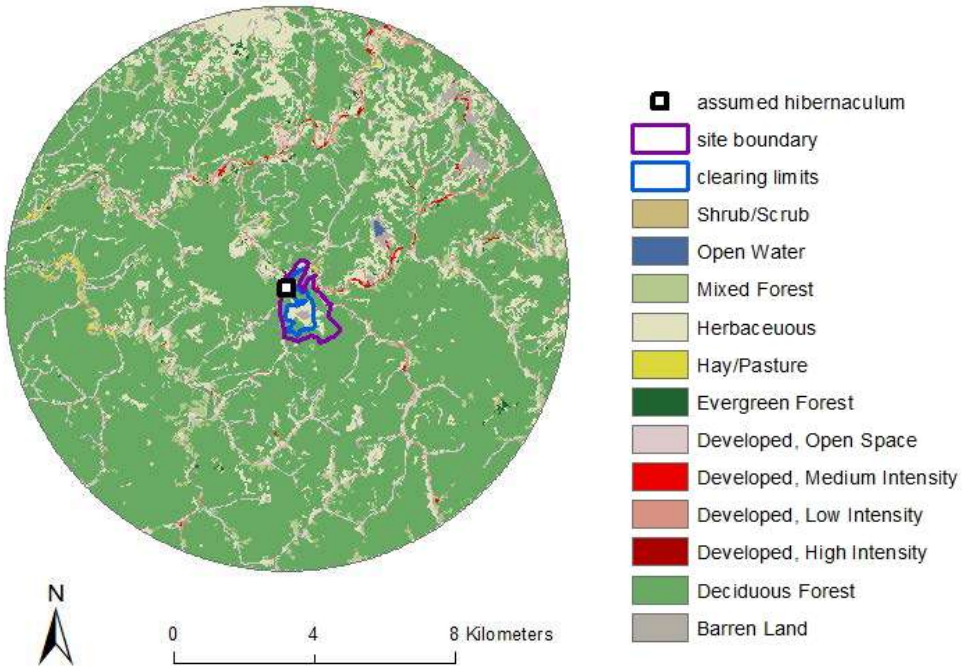

Figure 5. Current land cover and land cover predicted after construction of the proposed facility in a 8-km (0.8-mile) radius of assumed hibernaculum #2. Land cover data is from the National Landover Database 2011 (Homer et al. 2015).

APPENDIX I

TRAFFIC IMPACT STUDY (2015)

Federal Correctional Facility Environmental Impact Statement

Draft Traffic Impact Study

Prepared for:

FEDERAL BUREAU OF PRISONS

Prepared by:

PARSONS BRINCKERHOFF

Revision History:

Revision	Date	Description	Submitted by
1	2/26/15	Revisions by Cardno	L. Walker
2	3/25/15	Revisions by Federal Bureau of Prisons	L. Walker
3	4/23/15	Revisions by Kentucky Transportation Cabinet	L. Walker

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1.0 INTRODUCTION

1.1. Study Purpose and Objectives

Parsons Brinckerhoff (PB) was contracted by the Federal Bureau of Prisons to conduct a Traffic Impact Study (TIS) and provide related traffic engineering services in the evaluation of two alternative sites for a proposed federal correctional facility in Letcher County, Kentucky.

The purpose of this TIS is to analyze the traffic operating conditions in the vicinity of the new facility. Specific attention will be given to the proposed access points that will serve the development. It is the goal of this document to follow the guidelines[1] established by the Kentucky Transportation Cabinet (KYTC) on traffic impact studies that impact state-maintained facilities.

1.2. Summary of Proposed Action

The "Proposed Action" is a proposed federal correctional facility. It is expected that during construction the Proposed Action would temporarily add the following types of trips to the highway network:

- Construction worker commuting trips
- Trips involving the delivery and removal of construction equipment

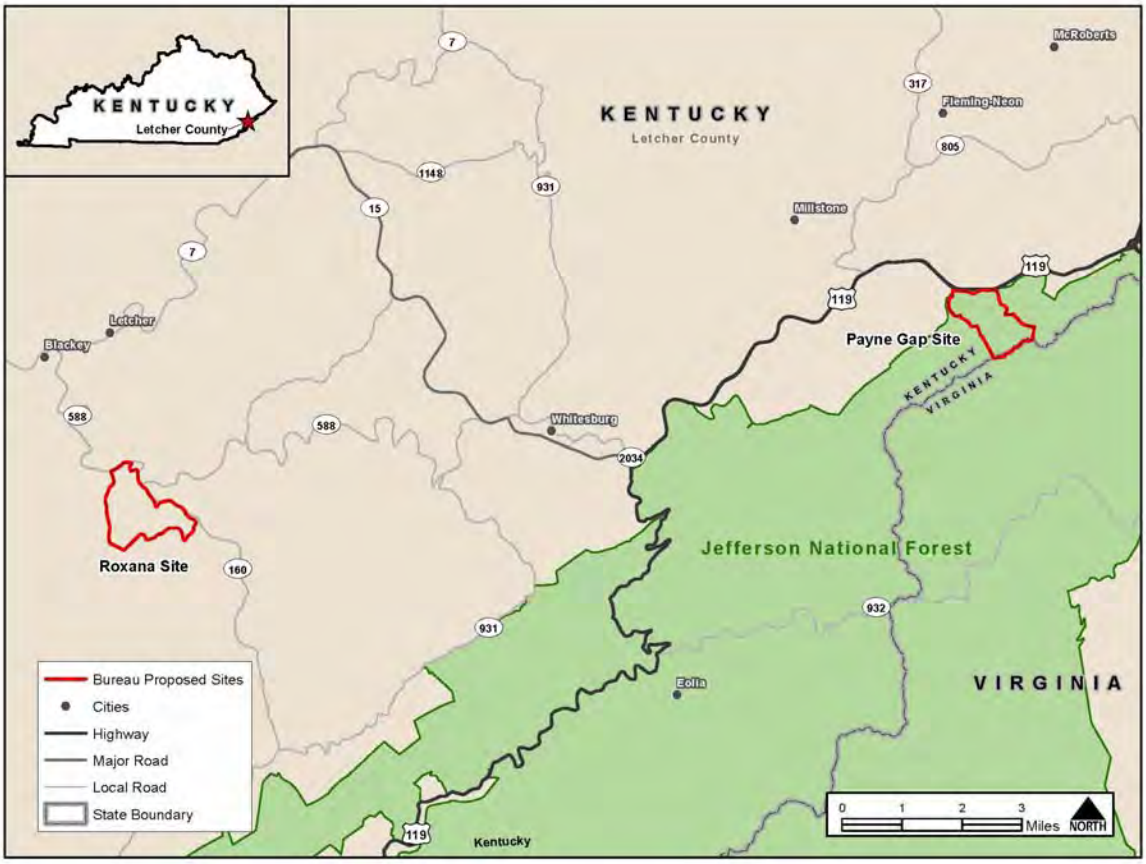
Following construction, the proposed facility would add traffic to the surrounding roadway network on a recurring basis. This traffic increase would include employee commuting trips, plus additional trips (such as the transfer of inmates, inmate visitors, delivery of supplies and equipment, etc.) that would not necessarily coincide with peak commuting periods. The proposed facility would have a staff of 300 full-time employees. The employees would be expected to add trips during peak commuting periods. Based on hourly count data from KYTC, existing peak periods are 7:00 – 9:00 AM and 3:00 – 5:00 PM on a typical weekday.

1.3. Study Area

Two potential sites have been identified for the Proposed Action. The first site is referred to as the Payne Gap Site. It is located approximately 7.5 miles to the east of Whitesburg, Kentucky. The site is accessed from US 119 and is located east of Bottom Fork Road (KY 3406) and west of Talman Drive. The other site is referred to as the Roxana Site. It is located approximately 7.5 miles to the west of Whitesburg, Kentucky. The site is located south of KY 588 and to the west of KY 160. The site locations are shown in **Figure 1-1**.

[1] 2012 KYTC Traffic Impact Study Requirements; http://transportation.ky.gov/Permits/Documents/2012%20POLICY-TIS%20Requirements.pdf

Figure 1-1: Study Area



Access to the Payne Gap Site is expected to be from US 119 only. Access to the Roxana Site is expected to be from KY 588 just east of Tolson Creek

1.4. Data Collection

Data (including Annual Average Daily Traffic (AADT) volumes) collected for this TIS was obtained from two different sources:

1) Existing 48-hour traffic counts provided by the KYTC for routes located near the study sites. These include the following stations:

   - US 119 – Station 272: 2013 AADT = 6,010
   - KY 160 – Station 755: 2014 AADT = 550
   - KY 588 – Station 796: 2014 AADT = 330
   - KY 2036 – Station 776: 2012 AADT = 80

2) Supplemental 48-hour classification counts at four locations conducted January 19 – 21, 2015. These counts were performed at the following locations:

- US 119 (east of intersection with KY 805)
- KY 160 (between KY 2036 and KY 588)
- KY 588 (Big Branch Tolson Creek)
- KY 588 (just north of Paces Branch Rd)

All count data is included in **Appendix A**.

2.0 EXISTING CONDITIONS AND LEVEL OF SERVICE

For this analysis, the Highway Capacity Software 2010 package (HCS 2010) based on the 2010 Highway Capacity Manual was used to assess the peak period traffic operating conditions for the following study segments that are expected to be most impacted by the Proposed Action:

- US 119
- KY 588

US 119 is a four-lane facility with a flush median, and is therefore evaluated as a multi-lane highway. KY 588 is a two-lane facility and is considered to be a Class II highway[2]. Class II highways include lower speed collector roadways and roads primarily designed to provide access. Levels of service for Class II highways are defined only in terms of a vehicle's percent time spent following. Percent time spent following is the average percent of total travel time that vehicles must travel in platoons behind slower vehicles because of inability to pass on a two-lane highway[3]. Average travel speed is not considered since drivers typically will tolerate lower speeds on a Class II facility because of its function as an access roadway (serving shorter trips and fewer through trips).

For each study segment, the volume to capacity ratio (v/c) as well as the resulting levels of service (LOS) was determined. It was assumed that LOS D or better would be acceptable for KY 588 (rural mountainous collector) based on guidelines from the *AASHTO A Policy on Geometric Design of Highways and Streets (6th Edition)*. For US 119 (rural level arterial), LOS B is the desired LOS based on the same guidelines. Also, it should be noted that all HCS 2010 output is included in **Appendix B**.

The major software inputs require roadway geometry (i.e. lane and shoulder widths), as well as traffic volumes by direction. The roadway geometry for the existing conditions was determined from the HIS database as well as aerial photos. The traffic volumes were determined from the data collection efforts.

Based on previous hourly counts from KYTC as well as the hourly counts conducted for this study, the peak hours on a weekday were noted between 7:00 – 9:00 AM and 3:00 – 5:00 PM. The highest hourly volumes from the counts were used for this analysis from these time periods. **Table 2-1** and **Table 2-2** present the v/c ratio and level of service for the study area segments for both the AM and PM peak periods.

[2] Highway classifications for two-lane facilities based on the Highway Capacity Manual 2010.
[3] Highway Capacity Manual 2010

Table 2-1: AM Peak Period

Segment	v/c ratio	LOS
US 119	0.08	A
KY 588	0.04	A

Table 2-2: PM Peak Period

Segment	v/c ratio	LOS
US 119	0.09	A
KY 588	0.02	A

Traffic volumes are very low on KY 588 (less than 50 vehicles per hour). Based on the analysis of the v/c ratio, there is plenty of available capacity along these segments. A ratio of 1.0 is considered at capacity and all ratios shown are substantially below that threshold.

3.0 DEVELOPMENT

A copy of the development plan for the correctional facility or United States Penitentiary (USP) was provided by the Federal Bureau of Prisons. Included in this development plan were locations of site access, parking areas and the internal roadway network. The anticipated completion date is 2020. **Figure 3-1** and **Figure 3-2** provides the preliminary development plans for informational purposes only.

Figure 3-1: Payne Gap Site Development Plan

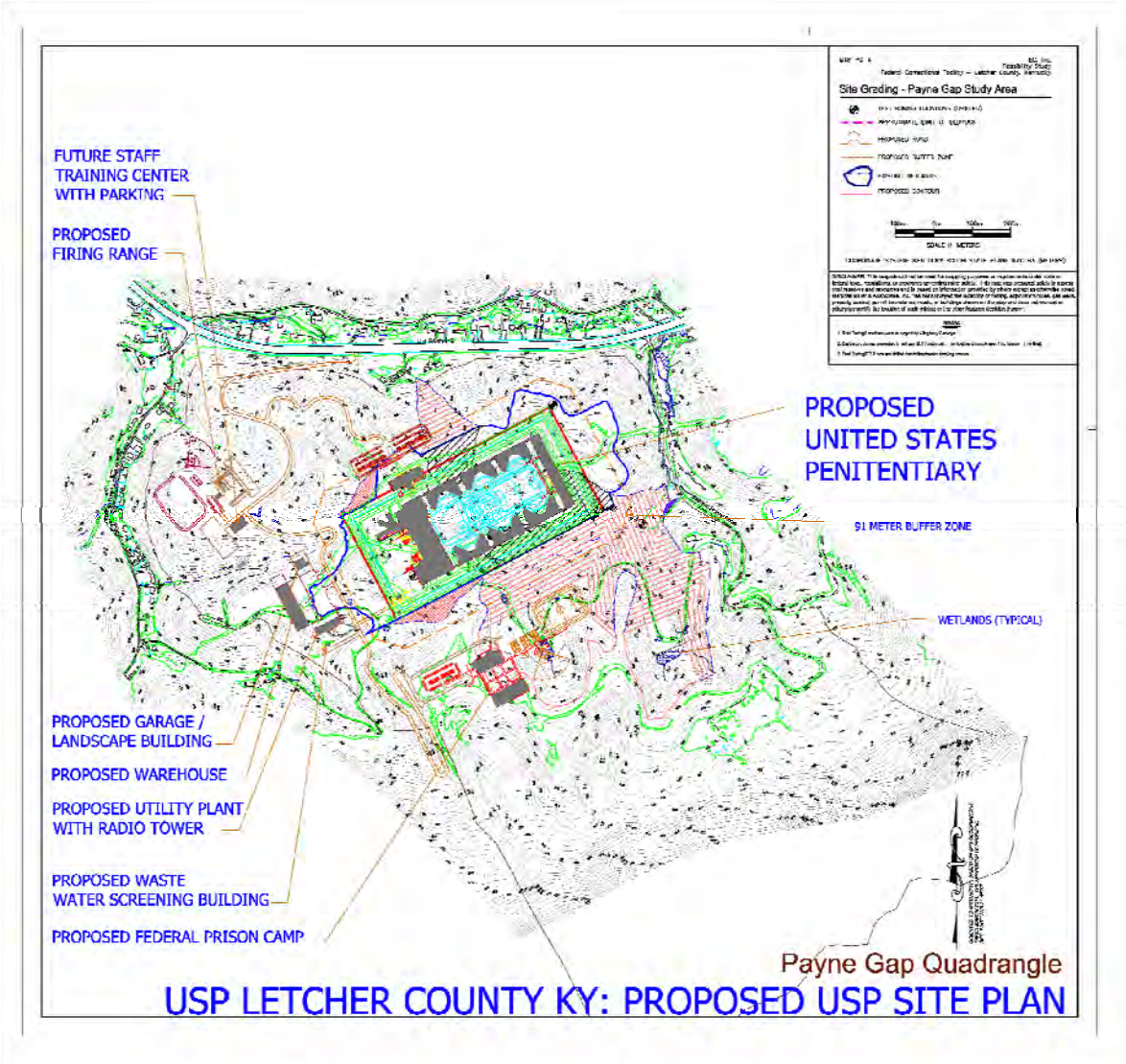
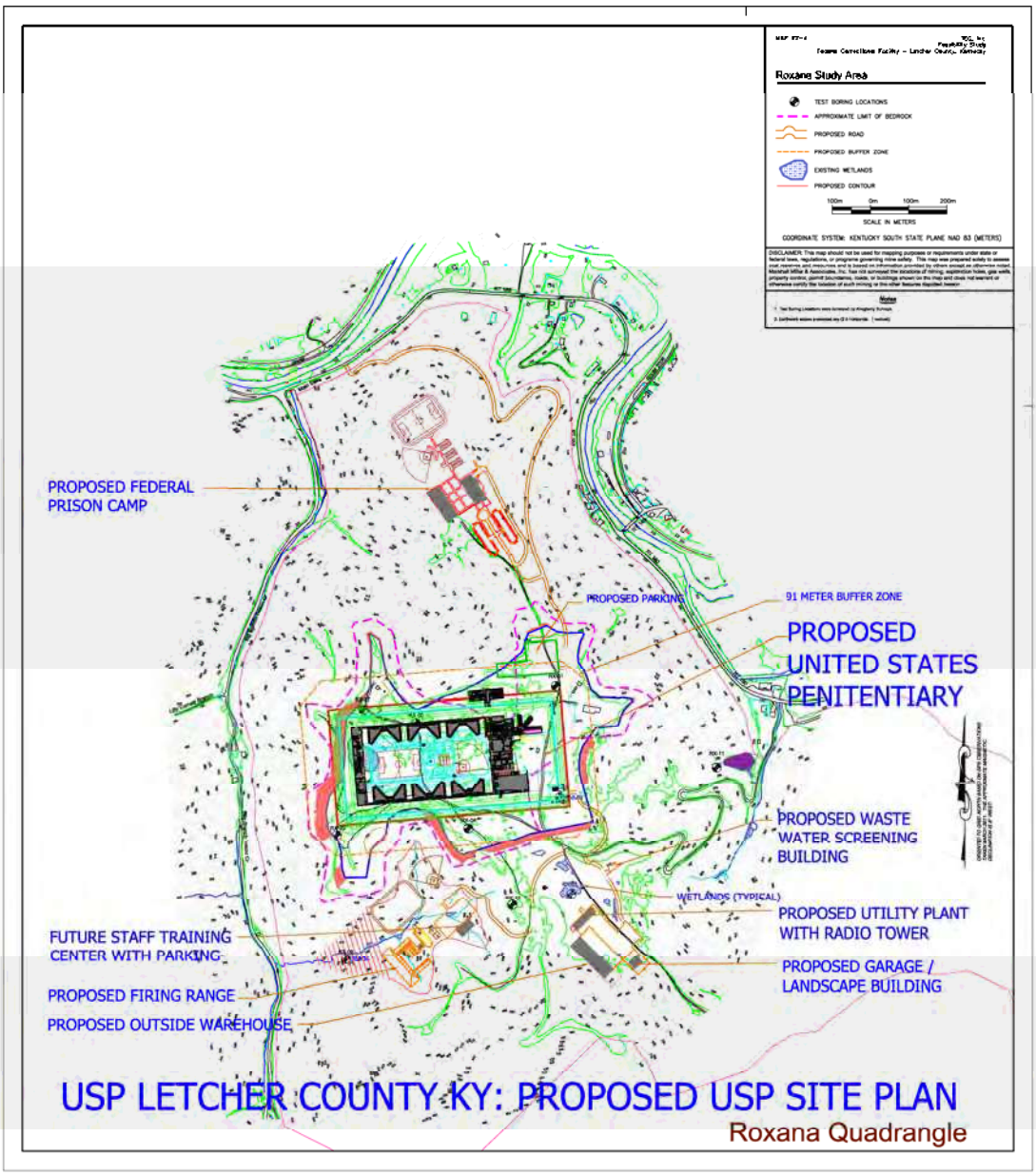


Figure 3-2: Roxana Site Development Plan



4.0 TRIP GENERATION

The primary development under consideration is a federal correctional facility. A review of the *Institute of Transportation Engineer's (ITE) Trip Generation Manual* (9th *Edition)* does provide data for a similar land use (Land Use 571). Two values are presented for both the AM and PM Peak hours: 1) Number of trips generated in the peak hour of the generator; and, 2) In/out distribution percentages of those trips. The variable these values are based on is the number of employees. Background information provided by Cardno during the scoping process of this study noted that the proposed facility would have a staff of 300 full-time employees. Employees would be expected to add trips during peak commuting periods.

Utilizing this information**, Table 4-1** provides a summary of the trip generation results. As both sites would have the same number of employees, these numbers are valid for both the Payne Gap and Roxana sites.

Table 4-1: Trip Generation Results

Variable	AM Peak	PM Peak
Trips Generated	156	204
Percent In	62%	27%
Percent Out	38%	73%

A higher number of trips are expected to be generated in the PM Peak period based on the previous studies performed and documented in the *ITE Trip Generation Manual* of traffic patterns associated with a federal correctional facility. There are expected to be other trips to / from the sites that would not necessarily coincide with peak commuting periods. These trips include transfer of inmates, inmate visitors, and delivery of supplies and equipment. Given the low volumes on both KY 588 and US 119, there is expected to be little to no impact related to these off-peak trips. The peak periods evaluated represent the "worst case" scenario for traffic impacts to the existing routes.

5.0 TRIP DISTRIBUTION AND ASSIGNMENT

The data collected for this study was used to determine directional splits of traffic entering / exiting the sites. Only trips generated by the site are included in the distribution and assignment. It is assumed that no pass-by trips are expected for this study given the proposed development. Due to the unique nature of the site as well, it is expected that there will not be any internal capture trips for this study.

Appendix C provides a summary of the trip generation / trip distribution for this study.

6.0 TRAFFIC FORECASTING AND ANALYSIS

The next step involved forecasting the traffic volumes for year 2020 (anticipated opening year). This was done using historical traffic trends of nearby KYTC count stations. The stations included 272 (US 119) and 796 (KY 588) in Letcher County. The change in traffic volumes from year to year resulted in an average decline for each of these stations ranging from 0.68% to 6.35% per year. Given the trending decline in growth, the conservative estimate for traffic impacts in the future would be to assume no growth at this point. Therefore, volumes evaluated for the 2020 year analysis are assumed to be the same as those used for the current year analysis.

Table 6-1 and **Table 6-2** presents the level of service for the two segments previously evaluated utilizing the assumed 2020 base year volumes with the added trip generation due to the new prison facility. **Table 6-3** and **Table 6-4** provide analysis for the new intersections created by the new access road to the prison. The initial analysis assumed the intersections were STOP controlled on the minor approach (access road) with the mainline (KY 588 and US 119) left at free-flow conditions. No turn lanes were assumed for the initial analysis as well to provide a baseline for operations.

Table 6-1: Future Year (2020) AM Peak Period

Segment	v/c ratio	LOS
US 119	0.10	A
KY 588	0.09	B

Table 6-2: Future Year (2020) PM Peak Period

Segment	v/c ratio	LOS
US 119	0.11	A
KY 588	0.10	B

Table 6-3: Payne Gap Site Intersection Analysis

Approach	AM Approach Delay (sec)	AM Approach LOS	PM Approach Delay (sec)	PM Approach LOS
Westbound	8.2	A	8.0	A
Northbound	12.3	B	13.3	B

Table 6-4: Roxana Site Intersection Analysis

Approach	AM Approach Delay (sec)	AM Approach LOS	PM Approach Delay (sec)	PM Approach LOS
Westbound	7.5	A	7.4	A
Northbound	9.6	A	9.7	A

As shown, the intersections at both sites operate at an acceptable LOS. Based on these volumes, no separate turn lanes are warranted at this time. A review of traffic signal warrants (per the Manual on Uniform Traffic Control Devices (MUTCD)) found that none of the volume warrants were met (Warrant 1: Eight-Hour Vehicular Volume, Warrant 2: Four-Hour Vehicular Volume, and Warrant 3: Peak Hour). Therefore, installation of a traffic control signal is not warranted at this time.

After consultation with the Kentucky Transportation Cabinet (KYTC), a recommendation was made to consider constructing a left turn lane along US 119 and KY 588 into the site. This consideration was made base on safety implications – looking to reduce the possibility of a following vehicle rear-ending the turning vehicle. It may be necessary to move some of the grade drains in the middle of the median along US 119 depending on the exact entrance to the access road.

7.0 CONSTRUCTION TRAFFIC IMPACTS ON ROADWAYS

An additional task as part of this evaluation includes determining the construction impacts on the roadways accessing the sites.

First, an analysis of the existing pavement of the two key routes was conducted using construction plans (as available) from KYTC.

US 119

Construction traffic may come from the east (Jenkins area) or west (Whitesburg area) along US 119. US 119 is a main route in Eastern Kentucky and should be able to support all associated construction traffic for the development of the site. The evaluation of the pavement and the supportable load is given below.

Archived design plans for the section of US 119 near the proposed site are from 1971. The design plans note the following:

- 24” Stabilized Rock Roadbed
- 11” Crushed Stone Base
- 2.75” Asphalt Base

- 2.75" Asphalt Base
- 1" Asphalt Surface

An Equivalent Single Axle Load (ESAL) is a measure of pavement damage and is used in pavement design. The ESALs (based on future year traffic and truck volumes) is 2,400,000. According to the KYTC calculation sheet, the current design should be acceptable up to 7,000,000 ESALs. The ESAL calculation sheet is included in **Appendix D**. It should be noted that US 119 is a state-maintained coal haul route and has a maximum gross vehicle weight of 80,000 lbs per KYTC Truck Weight Classification. Therefore, this route is intended to accommodate heavy truck traffic.

KY 588

The construction traffic would likely access this site from Whitesburg. This route follows KY 3401 to KY 588 / KY 160. It is a total of approximately 10 miles.

The available archived plans for KY 588 show it as a gravel road. However, it has been paved since then though those plans were not available for review. Through email communication with KYTC it was confirmed that no design plans were available. Therefore, for purposes of this study, an assumption was made that the pavement design of KY 588 would be less than that of a designated US Route such as US 119. It was further assumed that KY 588 (as a rural minor collector road with given traffic volumes and truck traffic) would have a pavement design as follows:

- 4" Crushed Stone Base
- 3.00" Asphalt Base
- 3.00" Asphalt Base
- 1.25" Asphalt Surface

The ESALs (based on future year traffic and truck volumes) for KY 588 are calculated at 100,000. The ESAL calculation sheet is included in **Appendix D**. Determination or confirmation of the pavement design and calculation of the maximum ESALs the pavement could support should be made and compared to the calculated ESALs (based on traffic volumes) to confirm if the existing pavement can support the projected loadings. It can be noted that per KYTC Truck Weight Classification, KY 588 is designated as a class "A" highway with a maximum gross vehicle weight of 44,000 lbs.

Construction Traffic Types

Next, research was conducted to obtain the Federal Highway Administration (FHWA) vehicles classification. These categories are presented in **Table 7-1**.

Table 7-1: FHWA Vehicle Classification (from FHWA)

Class	Type	Description	Typical ESALs per Vehicle
1	Motorcycles	All two- or three-wheeled motorized vehicles. Typical vehicles in this category have saddle type seats and are steered by handle bars rather than wheels. This category includes motorcycles, motor scooters, mopeds, motor-powered bicycles, and three-wheel motorcycles. This vehicle type may be reported at the option of the State.	negligible
2	Passenger Cars	All sedans, coupes, and station wagons manufactured primarily for the purpose of carrying passengers and including those passenger cars pulling recreational or other light trailers.	negligible
3	Other Two-Axle, Four-Tire Single Unit Vehicles	All two-axle, four tire, vehicles, other than passenger cars. Included in this classification are pickups, panels, vans, and other vehicles such as campers, motor homes, ambulances, hearses, and carryalls. Other two-axle, four-tire single unit vehicles pulling recreational or other light trailers are included in this classification.	negligible
4	Buses	All vehicles manufactured as traditional passenger-carrying buses with two axles and six tires or three or more axles. This category includes only traditional buses (including school buses) functioning as passenger-carrying vehicles. All two-axle, four-tire single unit vehicles. Modified buses should be considered to be a truck and be appropriately classified.	0.57
5	Two-Axle, Six-Tire, Single Unit Trucks	All vehicles on a single frame including trucks, camping and recreational vehicles, motor homes, etc., having two axles and dual rear wheels.	0.26
6	Three-Axle Single Unit Trucks	All vehicles on a single frame including trucks, camping and recreational vehicles, motor homes, etc., having three axles.	0.42

Class	Type	Description	Typical ESALs per Vehicle
7	Four or More Axle Single Unit Trucks	All trucks on a single frame with four or more axles.	0.42
8	Four or Less Axle Single Trailer Trucks	All vehicles with four or less axles consisting of two units, one of which is a tractor or straight truck power unit.	0.30
9	Five-Axle Single Trailer Trucks	All five-axle vehicles consisting of two units, one of which is a tractor or straight truck power unit.	1.20
10	Six or More Axle Single Trailer Trucks	All vehicles with six or more axles consisting of two units, one of which is a tractor or straight truck power unit.	0.93
11	Five or Less Axle Multi-Trailer Trucks	All vehicles with five or less axles consisting of three or more units, one of which is a tractor or straight truck power unit.	0.82
12	Six-Axle Multi-Trailer Trucks	All six-axle vehicles consisting of three or more units, one of which is a tractor or straight truck power unit.	1.06
13	Seven or More Axle Multi-Trailer Trucks	All vehicles with seven or more axles consisting of three or more units, one of which is a tractor or straight truck power unit.	1.39

Flatbed trucks that may transport construction equipment to / from the site would be classified as a Class 13. Most dump trucks will be classified as Class 7. Therefore construction equipment at the site may consist of a range of vehicles between these classes but these will be assumed to provide the upper and lower boundaries of impact.

To avoid damage to the existing roadways, it is recommended that the construction traffic loading not exceed the determined design pavement ESAL loadings calculated for each location. For US 119, vehicle weight limits should not exceed 80,000 lbs to comply with legal weight limits on this route.

Mitigation Measures

US 119 is not expected to have adverse impacts related to construction traffic based on the assessment of pavement design and geometric standards.

KY 588 has the potential to require mitigation measures due to additional construction traffic given the narrow lane widths and pavement design that is not at a level for a national or state truck route. Construction traffic may also affect other roadways in Letcher County. The location and intensity of these impacts can be estimated following the selection of the construction contractor(s).

To minimize impacts on KY 588, and other potentially affected roadways in Letcher County, the selected construction contractor would be required to perform an assessment of the routing of construction traffic to the site. Based on this analysis, the contractor would be required to:

- To the extent feasible, route construction vehicles so that the gross vehicle weight does not exceed the maximum weight limitations established by the KYTC and / or the pavement loading conditions set forth by the ESAL evaluation.
- For roadways that construction traffic may exceed these limitations, damage to the roadway surface would be need to be repaired by the contractor.
- For oversized vehicles and loads, maintenance of traffic plans should be developed to accommodate to maintain traffic flow during transport times. This will likely utilize flaggers to negotiate traffic flow as a result of narrow lanes.

8.0 RECOMMENDATIONS / CONCLUSION

The results presented in this document provide an overview of the anticipated traffic impacts associated with the construction of a proposed federal correctional facility in Letcher County, Kentucky. Based on the analysis conducted for this study:

- Both proposed sites have minimal impact on the traffic operations of the existing nearby state routes (US 119 and KY 588). The projected LOS for traffic operations is LOS A or B which is at or better than the desired LOS B for US 119 and LOS D for KY 588.

- Consideration should be given to constructing a left turn lane on US 119 and KY 588 into the site to minimize the potential for rear-end vehicle collisions. Depending on the exact site access, grade drains may need to be moved.

- Construction impacts to the existing US 119 roadway are expected to be minimal (if any).

- KY 588 has the potential to require mitigation measures as it is not a designated truck route and has limiting geometric features including narrow lane widths. Other roadways in Letcher County may also be affected, depending on the origin(s) of construction trips. The selected contractor for the development of this project would be required to perform an assessment of the routing of construction traffic to the site and potentially repair any surface damage caused by moving equipment as well as provide maintenance of traffic plans for moving oversized vehicles / equipment.

APPENDIX J

AIR EMISSION CALCULATIONS (2017)

TAB A. **SUMMARY**

Alternative 1 **Payne Gap/Larson Site**

Activity	Year	VOC Tons	CO Tons	NOx Tons	SO2 Tons	PM10 Tons	PM2.5 Tons	CO_2 Metric Tons
Construction	1	7.81	32.40	108.78	1.90	217.60	27.06	11,232
Construction	2	7.81	32.40	108.78	1.90	147.10	20.01	11,232
Operations	Yearly	0.70	29.33	21.36	0.18	1.16	0.58	1,288

Modified Alternative 2 **Roxana Site**

Activity	Year	VOC Tons	CO Tons	NOx Tons	SO2 Tons	PM10 Tons	PM2.5 Tons	CO_2 Metric Tons
Construction	1	3.48	14.06	43.62	0.95	158.82	18.16	4,644
Construction	2	3.48	14.06	43.62	0.95	158.82	18.16	4,644
Construction	3	3.48	14.06	43.62	0.95	158.82	18.16	4,644
Operations	Yearly	0.70	29.33	21.36	0.18	1.16	0.58	1,288

TAB B. CONSTRUCTION EMISSIONS

Alternative 1 - Payne Gap/Larson

Table 1.1 Clearing

218 acres

Off-road Equipment	Hours of Operation	Engine HP	Load Factor	VOC g/hp-hr	CO g/hp-hr	NOx g/hp-hr	SO_2 g/hp-hr	PM10 g/hp-hr	PM2.5 g/hp-hr	CO_2 g/hp-hr
Dozer	2,529	145	0.58	0.38	1.41	4.17	0.12	0.30	0.29	536
Loader/Backhoe	2,529	87	0.21	1.43	7.35	6.35	0.15	1.06	1.03	692
Small Backhoe	2,529	55	0.21	1.43	7.35	6.35	0.15	1.06	1.03	692
				VOC lb	CO lb	NOx lb	SO2 lb	PM10 lb	PM2.5 lb	CO_2 lb
			Dozer	176.60	663.13	1,956.81	54.03	138.78	134.61	251,166
			Loader w/ integral Backhoe	145.84	748.63	646.67	15.15	108.29	105.04	70,450
			Small backhoe	92.20	473.27	408.81	9.58	68.46	66.41	44,538

On-road Equipment	Hours of Operation	Engine HP	Speed (mph)	VOC lb/mile	CO lb/mile	NOx lb/mile	SO_2 lb/mile	PM10 lb/mile	PM2.5 lb/mile	CO_2 lb/mile
Dump Truck	1,158	230	16	0.0015	0.0080	0.0361	0.0000	0.0015	0.0015	3.4385
				VOC lb	CO lb	NOx lb	SO2 lb	PM lb	PM2.5 lb	CO_2 lb
			Dump Truck	28.56	150.98	677.18	0.34	28.24	27.37	64,555
			Subtotal in lbs	443	2036	3689	79	344	333	430709
			Clearing Grand Total in Tons	**0.22**	**1.02**	**1.84**	**0.04**	**0.17**	**0.17**	
			Clearing Grand Total in Metric Tons							**195.4**

Table 1.2 Site Prep

Site Prep - Excavate/Fill (CY) 25,760,829 CY

Grading (SY) 1,055,120 SY

Assume compact 0.5 feet (0.166 yards) = 175,150 CY

Off-road Equipment	Hours	Engine HP	Load Factor	VOC g/hp-hr	CO g/hp-hr	NOx g/hp-hr	SO_2 g/hp-hr	PM10 g/hp-hr	PM2.5 g/hp-hr	CO_2 g/hp-hr
Excavator	85,869	243	0.59	0.34	1.21	4.03	0.12	0.22	0.22	536
Skid Steer Loader	103,043	160	0.23	0.38	1.47	4.34	0.12	0.31	0.30	536
Dozer (Rubber Tired)	93,336	145	0.59	0.38	1.41	4.17	0.12	0.30	0.29	536
Compactor	1,297	103	0.58	0.40	1.57	4.57	0.12	0.32	0.31	536
Grader	375	285	0.58	0.34	1.21	4.07	0.12	0.23	0.22	536
				VOC lb	CO lb	NOx lb	SO2 lb	PM lb	PM2.5 lb	CO_2 lb
			Excavator	9,334.40	32,820.31	109,366.82	3,128.13	6,047.26	5,865.84	14,542,105
			Skid Steer Loader	3,203.99	12,288.30	36,268.76	963.29	2,553.02	2,476.43	4,478,179
			Dozer (Rubber Tired)	6,630.48	24,897.59	73,469.64	2,028.50	5,210.52	5,054.20	9,430,197
			Compactor	67.51	268.33	780.18	19.69	54.53	52.89	91,526
			Grader	46.94	164.93	555.75	15.74	30.80	29.87	73,160

On-road Equipment	Miles	MPH	Engine HP	VOC lb/mile	CO lb/mile	NOx lb/mile	SO_2 lb/mile	PM10 lb/mile	PM2.5 lb/mile	CO_2 lb/mile
Dump Truck (14 CY)	85,869	5	230	0.0015	0.0080	0.0361	0.0000	0.0015	0.0015	3.4385
				VOC lb	CO lb	NOx lb	SO2 lb	PM lb	PM2.5 lb	CO_2 lb
			Dump Truck (12 CY)	4,990.66	26,381.47	118,326.87	59.19	4,935.37	4,782.13	11,280,045
			Subtotal in lb:	**24,274**	**96,821**	**338,768**	**6,215**	**18,832**	**18,261**	**39,895,212**
			Site Prep Grand Total in Tons	**12.14**	**48.41**	**169.38**	**3.11**	**9.42**	**9.13**	
			Site Prep Grand Total in Metric Tons							**18,096**

Table 1.3 Gravel Work 12,257 CY

Off-road Equipment	Hours	Engine HP	Load Factor	VOC g/hp-hr	CO g/hp-hr	NOx g/hp-hr	SO_2 g/hp-hr	PM_{10} g/hp-hr	$PM_{2.5}$ g/hp-hr	CO_2 g/hp-hr
Dozer	125	185	0.59	0.34	1.21	4.08	0.12	0.23	0.22	536
Wheel Loader for Spreading	157	87	0.59	0.35	1.25	4.23	0.12	0.24	0.23	536
Compactor	346	103	0.43	0.36	1.34	4.45	0.12	0.26	0.25	536
				VOC lb	CO lb	NOx lb	SO2 lb	PM10 lb	PM2.5 lb	CO_2 lb
			Dozer	7.42	26.07	88.11	2.49	4.88	4.74	11,570
			Wheel Loader for Spreading	4.43	15.85	53.74	1.46	3.03	2.94	6,801
			Compactor	8.69	32.35	107.58	2.78	6.21	6.03	12,947

On-road Equipment	Miles	Engine HP	VOC lb/mile	CO lb/mile	NOx lb/mile	SO_2 lb/mile	PM_{10} lb/mile	$PM_{2.5}$ lb/mile	CO_2 lb/mile
Dump Truck	44,754	230	0.0015	0.0080	0.0361	0.0000	0.0015	0.0015	3.4385
			VOC lb	CO lb	NOx lb	SO2 lb	PM10 lb	PM2.5 lb	CO_2 lb
		Dump Truck	68.09	359.91	1614.28	0.81	67.33	65.24	153,888
		Subtotal (lbs):	**89**	**434**	**1,864**	**8**	**81**	**79**	**185,207**
		Gravel Work Grand Total in Tons	**0.04**	**0.22**	**0.93**	**0.00**	**0.04**	**0.04**	
		Gravel Work Grand Total in Metric Tons							**84**

Table 1.4 Concrete Work

Foundation Work	6,532	CY
Sidewalks, etc.	435	CY
Total	6,967	CY

Note: Assume all excavated soil is accounted for in Excavate/Fill and Trenching

Off-road Equipment	Hours of Operation	Engine HP	Load Factor	Emission Factors VOC g/hp-hr	CO g/hp-hr	NOx g/hp-hr	SO_2 g/hp-hr	PM10 g/hp-hr	PM2.5 g/hp-hr	CO_2 g/hp-hr
Concrete Mixer	382	3.5	0.43	0.69	3.04	6.17	0.13	0.54	0.52	588
Concrete Truck	346	300	0.43	0.38	1.75	6.18	0.11	0.27	0.26	530
				Annual Emissions VOC lb	CO lb	NOx lb	SO2 lb	PM lb	PM2.5 lb	CO_2 lb
			Concrete Mixer	0.87	3.86	7.83	0.16	0.69	0.66	746
			Concrete Truck	37.31	171.62	607.77	11.21	26.41	25.62	52,092
			Subtotal (lbs):	**38**	**175**	**616**	**11**	**27**	**26**	**52,838**
			Concrete Work Grand Total in Tons	**0.02**	**0.09**	**0.31**	**0.01**	**0.01**	**0.01**	
			Concrete Work Grand Total in Metric Tons							**24**

Table 1.5 Building Construction

352,726 SF Foundation

795,151 SF Total

Off-road Equipment	Hours of Operation	Engine HP	Load Factor	Emission Factors VOC g/hp-hr	CO g/hp-hr	NOx g/hp-hr	SO_2 g/hp-hr	PM10 g/hp-hr	PM2.5 g/hp-hr	CO_2 g/hp-hr
Crane	4,050	330	0.58	0.25	1.22	5.26	0.11	0.21	0.20	530
Concrete Truck	4,050	300	0.43	0.19	1.45	4.32	0.12	0.21	0.20	536
Diesel Generator	3,240	40	0.43	0.26	1.41	3.51	0.11	0.23	0.22	536
Telehandler	8,100	99	0.59	0.51	3.94	4.93	0.13	0.52	0.51	595
Scissors Lift	6,480	83	0.59	0.51	3.94	4.93	0.13	0.52	0.51	595
Skid Steer Loader	4,050	67	0.59	1.69	7.97	6.70	0.15	1.19	1.15	691
Pile Driver	18,951	260	0.43	0.46	1.55	5.90	0.11	0.31	0.30	530
All Terrain Forklift	162	84	0.59	0.51	3.94	4.93	0.13	0.52	0.51	595
				Annual Emissions VOC lb	CO lb	NOx lb	SO2 lb	PM lb	PM2.5 lb	CO_2 lb
			Crane	419.87	2083.97	8988.25	194.94	354.97	344.32	906,208
			Concrete Truck	216.07	1675.27	4976.34	132.86	241.94	234.69	617,636
			Diesel Generator	32.25	173.08	430.99	13.26	28.49	27.63	65,873
			Telehandler	531.45	4109.13	5140.90	133.40	543.53	527.22	620,179
			Scissors Lift	356.45	2756.02	3448.04	89.47	364.55	353.61	415,959
			Skid Steer Loader	597.30	2812.06	2363.91	52.44	419.69	407.10	243,832
			Pile Driver	2167.58	7248.75	27568.82	532.17	1466.10	1422.12	2,474,001
			All Terrain Forklift	9.02	69.73	87.24	2.26	9.22	8.95	10,524

On-road Equipment	Hours of Operation	Engine HP	Speed (mph)	VOC lb/mile	CO lb/mile	NOx lb/mile	SO2 lb/mile	PM lb/mile	PM2.5 lb/mile	CO_2 lb/mile
Delivery Truck	19,439	265	45	0.0015	0.0080	0.0361	0.0000	0.0015	0.0015	3.4385
				VOC lb	CO lb	NOx lb	SO2 lb	PM lb	PM2.5 lb	CO_2 lb
			Delivery Truck	1330.77	7034.69	31552.17	15.78	1316.03	1275.17	3,007,854
			Subtotal (lbs):	**5,661**	**27,963**	**84,557**	**1,167**	**4,745**	**4,601**	**8,362,065**
			Building Construction Grand Total in Tons	**2.83**	**13.98**	**42.28**	**0.58**	**2.37**	**2.30**	
			Building Construction Grand Total in Metric Tons							**3,793**

Table 1.6 Paving

Pavement - Surface Area 234,173 SF 5,725 CY

Paving - HMA 155,959 CF

Off-road Equipment	Hours of Operation	Engine HP	Load Factor	VOC g/hp-hr	CO g/hp-hr	NOx g/hp-hr	SO2 g/hp-hr	PM g/hp-hr	PM2.5 g/hp-hr	CO_2 g/hp-hr
Grader	717	145	0.59	0.38	1.41	4.16	0.12	0.30	0.29	536
Roller	1,076	401	0.59	0.34	2.46	5.53	0.12	0.34	0.33	536
Paving Machine	1,434	164	0.59	0.38	1.44	4.25	0.12	0.30	0.29	536
Asphalt Curbing Machine	143	130	0.59	0.40	1.57	4.57	0.12	0.32	0.31	536
				VOC lb	CO lb	NOx lb	SO2 lb	PM lb	PM2.5 lb	CO_2 lb
			Grader	50.91	191.01	562.86	15.59	40.00	38.80	72,458
			Roller	191.53	1,381.86	3,105.60	64.67	190.04	184.34	300,633
			Paving Machine	116.27	441.36	1,301.01	35.26	91.79	89.04	163,901
			Asphalt Curbing Machine	9.58	38.09	110.74	2.79	7.74	7.51	12,991

On-road Equipment	Hours of Operation	Engine HP	based Speed (miles/hour)	VOC lb/mile	CO lb/mile	NOx lb/mile	SO2 lb/mile	PM lb/mile	PM2.5 lb/mile	CO_2 lb/mile
Dump Truck	1,142	230	0	0.001521	0.008042	0.036070	1.80E-05	0.001504	0.001458	3.438541
Water Truck	23	230	10	0.001521	0.008042	0.036070	1.80E-05	0.001504	0.001458	3.438541
				VOC lb	CO lb	NOx lb	SO2 lb	PM lb	PM2.5 lb	CO_2 lb
			Dump Truck	21.99	116.26	521.44	0.26	21.75	21.07	49,709
			Water Truck	0.35	1.85	8.28	0.00	0.35	0.33	789

Hot Mix Asphalt (HMA)	Volume of HMA (ft^3)	Weight of HMA (tons)	VOC lb/ton	VOC lb	CO lb	NOx lb	SO2 lb	PM10 lb	PM2.5 lb	CO_2 lb
Standard Hot Mix Asphalt	155,959	8,489	0.04	339.55	-	-	-	-	-	-
			Subtotal (lbs):	**730**	**2,170**	**5,610**	**119**	**352**	**341**	**600,480**
			Paving Grand Total in Tons	**0.37**	**1.09**	**2.80**	**0.06**	**0.18**	**0.17**	
			Paving Grand Total in Metric Tons							**272**

Table 1.7 **Fugitive Dust Emissions**

Year	PM_{10} tons/acre/mo	acres	days of disturbance	PM_{10} Total	PM2.5/ PM_{10} Ratio	$PM_{2.5}$ Total
Year 1	0.42	65.40	154	211.5	0.1	21.2
Year 2	0.42	43.60	154	141.0	0.1	14.1

Table 1.8 **Total Emissions**

Year	VOC Tons	CO Tons	NOx Tons	SO2 Tons	PM10 Tons	PM2.5 Tons	CO_2 Metric Tons
Year 1	7.81	32.40	108.78	1.90	217.60	27.06	11,232
Year 2	7.81	32.40	108.78	1.90	147.10	20.01	11,232

Modified Alternative 2 - Roxana

Table 2.1 Clearing

181 acres

Off-road Equipment	Hours of Operation	Engine HP	Load Factor	VOC g/hp-hr	CO g/hp-hr	NOx g/hp-hr	SO_2 g/hp-hr	PM10 g/hp-hr	PM2.5 g/hp-hr	CO_2 g/hp-hr
Dozer	2,100	145	0.58	0.38	1.41	4.17	0.12	0.30	0.29	536
Loader/Backhoe	2,100	87	0.21	1.43	7.35	6.35	0.15	1.06	1.03	692
Small Backhoe	2,100	55	0.21	1.43	7.35	6.35	0.15	1.06	1.03	692
				VOC lb	CO lb	NOx lb	SO2 lb	PM10 lb	PM2.5 lb	CO_2 lb
			Dozer	146.65	550.67	1,624.96	44.87	115.24	111.79	208,572
			Loader w/ integral Backhoe	121.10	621.67	537.00	12.58	89.93	87.23	58,503
			Small backhoe	76.56	393.01	339.48	7.95	56.85	55.14	36,985

On-road Equipment	Hours of Operation	Engine HP	Speed (mph)	VOC lb/mile	CO lb/mile	NOx lb/mile	SO_2 lb/mile	PM10 lb/mile	PM2.5 lb/mile	CO_2 lb/mile
Dump Truck	961	230	16	0.0015	0.0080	0.0361	0.0000	0.0015	0.0015	3.4385
				VOC lb	**CO** lb	**NOx** lb	**SO2** lb	**PM** lb	**PM2.5** lb	**CO_2** lb
			Dump Truck	23.71	125.32	562.11	0.28	23.45	22.72	53,585
			Subtotal in lbs	368	1691	3064	66	285	277	357,645
			Clearing Grand Total in Tons	**0.18**	**0.85**	**1.53**	**0.03**	**0.14**	**0.14**	
			Clearing Grand Total in Metric Tons							**162.2**

Table 2.2 Site Prep

Site Prep - Excavate/Fill (CY) 18,084,992 CY

Grading (SY) 876,040 SY

Assume compact 0.5 feet (0.166 yards) = 145,423 CY

Off-road Equipment	Hours	Engine HP	Load Factor	VOC g/hp-hr	CO g/hp-hr	NOx g/hp-hr	SO_2 g/hp-hr	PM10 g/hp-hr	PM2.5 g/hp-hr	CO_2 g/hp-hr
Excavator	60,283	243	0.59	0.34	1.21	4.03	0.12	0.22	0.22	536
Skid Steer Loader	72,340	160	0.23	0.38	1.47	4.34	0.12	0.31	0.30	536
Dozer (Rubber Tired)	65,525	145	0.59	0.38	1.41	4.17	0.12	0.30	0.29	536
Compactor	673	103	0.58	0.40	1.57	4.57	0.12	0.32	0.31	536
Grader	311	285	0.58	0.34	1.21	4.07	0.12	0.23	0.22	536
				VOC lb	**CO** lb	**NOx** lb	**SO2** lb	**PM** lb	**PM2.5** lb	**CO_2** lb
			Excavator	6,552.89	23,040.37	76,777.20	2,195.99	4,245.27	4,117.91	10,208,783
			Skid Steer Loader	2,249.26	8,626.62	25,461.37	676.25	1,792.27	1,738.50	3,143,769
			Dozer (Rubber Tired)	4,654.70	17,478.49	51,576.83	1,424.04	3,657.86	3,548.13	6,620,145
			Compactor	35.02	139.19	404.69	10.21	28.28	27.44	47,476
			Grader	38.96	136.90	461.28	13.06	25.56	24.80	60,723

On-road Equipment	Hours	MPH	Engine HP	VOC lb/mile	CO lb/mile	NOx lb/mile	SO_2 lb/mile	PM10 lb/mile	PM2.5 lb/mile	CO_2 lb/mile
Dump Truck (14 CY)	60,283	5	230	0.0015	0.0080	0.0361	0.0000	0.0015	0.0015	3.4385
				VOC lb	**CO** lb	**NOx** lb	**SO2** lb	**PM** lb	**PM2.5** lb	**CO_2** lb
			Dump Truck (12 CY)	458.55	2,423.97	10,872.05	5.44	453.47	439.39	1,036,428
			Subtotal in lb:	**13,989**	**51,846**	**165,553**	**4,325**	**10,203**	**9,896**	**21,117,323**
			Site Prep Grand Total in Tons	**6.99**	**25.92**	**82.78**	**2.16**	**5.10**	**4.95**	
			Site Prep Grand Total in Metric Tons							**9,579**

Table 2.3 Gravel Work 11,535 CY

Off-road Equipment	Hours	Engine HP	Load Factor	VOC g/hp-hr	CO g/hp-hr	NOx g/hp-hr	SO_2 g/hp-hr	PM_{10} g/hp-hr	$PM_{2.5}$ g/hp-hr	CO_2 g/hp-hr
Dozer	116	185	0.59	0.34	1.21	4.08	0.12	0.23	0.22	536
Wheel Loader for Spreading	148	87	0.59	0.35	1.25	4.23	0.12	0.24	0.23	536
Compactor	326	103	0.43	0.36	1.34	4.45	0.12	0.26	0.25	536
				VOC lb	**CO** lb	**NOx** lb	**SO2** lb	**PM10** lb	**PM2.5** lb	**CO_2** lb
			Dozer	7.20	25.28	85.43	2.41	4.73	4.59	11,218
			Wheel Loader for Spreading	4.29	15.36	52.10	1.42	2.94	2.85	6,594
			Compactor	8.43	31.37	104.31	2.70	6.02	5.84	12,553

On-road Equipment	Miles	Engine HP	VOC lb/mile	CO lb/mile	NOx lb/mile	SO_2 lb/mile	PM_{10} lb/mile	$PM_{2.5}$ lb/mile	CO_2 lb/mile
Dump Truck	59,045	230	0.0015	0.0080	0.0361	0.0000	0.0015	0.0015	3.4385
			VOC lb	**CO** lb	**NOx** lb	**SO2** lb	**PM10** lb	**PM2.5** lb	**CO_2** lb
		Dump Truck	89.83	474.84	2129.76	1.07	88.83	86.07	203,029
		Subtotal (lbs):	**110**	**547**	**2,372**	**8**	**103**	**99**	**233,394**
		Gravel Work Grand Total in Tons	**0.05**	**0.27**	**1.19**	**0.00**	**0.05**	**0.05**	
		Gravel Work Grand Total in Metric Tons							**106**

Table 2.4 Concrete Work

Foundation Work	6,532	CY
Sidewalks, etc.	435	CY
Total	6,967	CY

Note: Assume all excavated soil is accounted for in Excavate/Fill and Trenching

Off-road Equipment	Hours of Operation	Engine HP	Load Factor	Emission Factors VOC g/hp-hr	CO g/hp-hr	NOx g/hp-hr	SO_2 g/hp-hr	PM10 g/hp-hr	PM2.5 g/hp-hr	CO_2 g/hp-hr
Concrete Mixer	382	3.5	0.43	0.69	3.04	6.17	0.13	0.54	0.52	588
Concrete Truck	346	300	0.43	0.38	1.75	6.18	0.11	0.27	0.26	530
				Annual Emissions						
				VOC lb	**CO** lb	**NOx** lb	**SO2** lb	**PM** lb	**PM2.5** lb	**CO_2** lb
			Concrete Mixer	0.87	3.86	7.83	0.16	0.69	0.66	746
			Concrete Truck	37.31	171.62	607.77	11.21	26.41	25.62	52,092
			Subtotal (lbs):	**38**	**175**	**616**	**11**	**27**	**26**	**52,838**
			Concrete Work Grand Total in Tons	**0.02**	**0.09**	**0.31**	**0.01**	**0.01**	**0.01**	
			Concrete Work Grand Total in Metric Tons							**24**

Table 2.5 Building Construction

352,726 SF Foundation

795,151 SF Total

Off-road Equipment	Hours of Operation	Engine HP	Load Factor	Emission Factors VOC g/hp-hr	CO g/hp-hr	NOx g/hp-hr	SO_2 g/hp-hr	PM10 g/hp-hr	PM2.5 g/hp-hr	CO_2 g/hp-hr
Crane	4,050	330	0.58	0.25	1.22	5.26	0.11	0.21	0.20	530
Concrete Truck	4,050	300	0.43	0.19	1.45	4.32	0.12	0.21	0.20	536
Diesel Generator	3,240	40	0.43	0.26	1.41	3.51	0.11	0.23	0.22	536
Telehandler	8,100	99	0.59	0.51	3.94	4.93	0.13	0.52	0.51	595
Scissors Lift	6,480	83	0.59	0.51	3.94	4.93	0.13	0.52	0.51	595
Skid Steer Loader	4,050	67	0.59	1.69	7.97	6.70	0.15	1.19	1.15	691
Pile Driver	18,951	260	0.43	0.46	1.55	5.90	0.11	0.31	0.30	530
All Terrain Forklift	162	84	0.59	0.51	3.94	4.93	0.13	0.52	0.51	595
				Annual Emissions						
				VOC lb	**CO** lb	**NOx** lb	**SO2** lb	**PM** lb	**PM2.5** lb	**CO_2** lb
			Crane	419.87	2083.97	8988.25	194.94	354.97	344.32	906,208
			Concrete Truck	216.07	1675.27	4976.34	132.86	241.94	234.69	617,636
			Diesel Generator	32.25	173.08	430.99	13.26	28.49	27.63	65,873
			Telehandler	531.45	4109.13	5140.90	133.40	543.53	527.22	620,179
			Scissors Lift	356.45	2756.02	3448.04	89.47	364.55	353.61	415,959
			Skid Steer Loader	597.30	2812.06	2363.91	52.44	419.69	407.10	243,832
			Pile Driver	2167.58	7248.75	27568.82	532.17	1466.10	1422.12	2,474,001
			All Terrain Forklift	9.02	69.73	87.24	2.26	9.22	8.95	10,524

On-road Equipment	Hours of Operation	Engine HP	Speed (mph)	VOC lb/mile	CO lb/mile	NOx lb/mile	SO2 lb/mile	PM lb/mile	PM2.5 lb/mile	CO_2 lb/mile
Delivery Truck	19,439	265	45	0.0015	0.0080	0.0361	0.0000	0.0015	0.0015	3.4385
				VOC lb	**CO** lb	**NOx** lb	**SO2** lb	**PM** lb	**PM2.5** lb	**CO_2** lb
			Delivery Truck	1330.77	7034.69	31552.17	15.78	1316.03	1275.17	3,007,854
			Subtotal (lbs):	**5,661**	**27,963**	**84,557**	**1,167**	**4,745**	**4,601**	**8,362,065**
			Building Construction Grand Total in Tons	**2.83**	**13.98**	**42.28**	**0.58**	**2.37**	**2.30**	
			Building Construction Grand Total in Metric Tons							**3,793**

Table 2.6 Paving

Pavement - Surface Area 204,645 SF 5,003 CY

Paving - HMA 135,066 CF

Off-road Equipment	Hours of Operation	Engine HP	Load Factor	VOC g/hp-hr	CO g/hp-hr	NOx g/hp-hr	SO2 g/hp-hr	PM g/hp-hr	PM2.5 g/hp-hr	CO_2 g/hp-hr
Grader	627	145	0.59	0.38	1.41	4.16	0.12	0.30	0.29	536
Roller	940	401	0.59	0.34	2.46	5.53	0.12	0.34	0.33	536
Paving Machine	1,253	164	0.59	0.38	1.44	4.25	0.12	0.30	0.29	536
Asphalt Curbing Machine	125	130	0.59	0.40	1.57	4.57	0.12	0.32	0.31	536
				VOC lb	CO lb	NOx lb	SO2 lb	PM lb	PM2.5 lb	CO_2 lb
			Grader	50.91	191.01	562.86	15.59	40.00	38.80	72,458
			Roller	191.53	1,381.86	3,105.60	64.67	190.04	184.34	300,633
			Paving Machine	116.27	441.36	1,301.01	35.26	91.79	89.04	163,901
			Asphalt Curbing Machine	9.58	38.09	110.74	2.79	7.74	7.51	12,991

On-road Equipment	Hours of Operation	Engine HP	based Speed (miles/hour)	VOC lb/mile	CO lb/mile	NOx lb/mile	SO2 lb/mile	PM lb/mile	PM2.5 lb/mile	CO_2 lb/mile
Dump Truck	998	230	17	0.001521	0.008042	0.036070	1.80E-05	0.001504	0.001458	3.438541
Water Truck	20	230	10	0.001521	0.008042	0.036070	1.80E-05	0.001504	0.001458	3.438541
				VOC lb	CO lb	NOx lb	SO2 lb	PM lb	PM2.5 lb	CO_2 lb
			Dump Truck	19.22	101.60	455.69	0.23	19.01	18.42	43,441
			Water Truck	0.31	1.61	7.23	0.00	0.30	0.29	690

Hot Mix Asphalt (HMA)	Volume of HMA (ft^3)	Weight of HMA (tons)	VOC lb/ton	VOC lb	CO lb	NOx lb	SO2 lb	PM10 lb	PM2.5 lb	CO_2 lb
Standard Hot Mix Asphalt	136,294	7,418	0.04	296.74	-	-	-	-	-	-
			Subtotal (lbs):	**685**	**2,156**	**5,543**	**119**	**349**	**338**	**594,113**
			Paving Grand Total in Tons	**0.34**	**1.08**	**2.77**	**0.06**	**0.17**	**0.17**	
			Paving Grand Total in Metric Tons							**269.48**

Table 2.7. Fugitive Dust Emissions

Year	PM_{10} tons/acre/mo	acres	days of disturbance	PM_{10} Total	PM2.5/ PM_{10} Ratio	$PM_{2.5}$ Total
Year 1	0.42	48.30	154	156.2	0.1	15.6
Year 2	0.42	48.30	154	156.2	0.1	15.6
Year 3	0.42	48.30	154	156.2	0.1	15.6

Table 2.8 Total Emissions

Year	VOC Tons	CO Tons	NOx Tons	SO2 Tons	PM10 Tons	PM2.5 Tons	CO_2 Metric Tons
Year 1	3.48	14.06	43.62	0.95	158.82	18.16	4,644
Year 2	3.48	14.06	43.62	0.95	158.82	18.16	4,644
Year 3	3.48	14.06	43.62	0.95	158.82	18.16	4,644

TAB C. OPERATIONAL EMISSIONS

Factory-fabricated and assembled water-tube flexible tube boilers, dual fired natural gas and fuel oil.
Two diesel Emergency Generators -2 megawatts each or 2682 HP each

Table 1. Operational Emissions - Emergency Generators

Assume the IC engines are typically operated 0.5 hours per week for testing and maintenance = 26 hr/yr
Assume additional five 24-hour periods for total power outages per year = 120 hr/yr
146 Total Hours

Generator		VOC	CO	NOx	SO2	PM	CO2
kW	#	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr
2000	2	503	4,307	10,181	10	548	908,447
	Tons/yr	**0.25**	**2.15**	**5.09**	**0.00**	**0.27**	**454**
						metric tons/yr	**412**

Pollutant	Emission Factors Diesel Fuel [a, b] > 447 kW
	lb/hp-hr
CO	0.0055
NO_x	0.013
PM	0.0007
SO_2 [c]	0.00809 S
S	0.0015
VOC[d]	0.000642
CO2	1.16

[b] Emission factors from U.S. EPA. Compilation of Air Pollutant Emission Factors - Volume I (AP-42), Section 3.4, 5th Edition; . factors based upon power output

[c] The variable S in the emissions factor equals the sulfur content of the fuel expressed as percent weight.

[d] VOC = TOC - methane (9%)

SO_2 factor was assumed to equal 0.0015 for diesel fuel.

Table 2. Operational Parameters - Boilers

1-02-005-02/03, 1-03-0 Distillate oil fired Boilers <100 Million Btu/hr

Example boiler that is < 100 MM Btu:

Heat Input (MMBtu/hr)[a]	Fuel Type	Annual Hours of Operation	Est. Qty Oil consumed Annually (gal)
15	Oil	5100	759,900
15	Oil	5100	759,900

Total est. quantity of oil consumed annually 1,519,800 gal

140,000 btu/gal fuel oil 149 gal/hour fuel consumption @
80 % efficiency

Assume heat 10/15 to 4/14

182 heating days

183 non heating days

Emission Factor	
Pollutant	(lb/10^3 gal)[a,b]
CO	5
NO_x	20
PM_{10}	1
$PM_{2.5}$	0.25
SO_2	0.213
VOC	0.34
CO2	22,300
N2O	0.26
CH4	0.216

0.0015 Percent Sulfur content in fuel

[a] Emission factors from U.S. Environmental Protection Agency. Compilation of Air Pollutant Emission Factors - Volume I (AP-42), Section 1.3, 5th Edition.

[b] Emission factors based on burning fuel oil with a heating value of 140 MMBtu/10^3 gal

Table 3. Annual Emissions for Boilers

	Annual Emissions in lbs								
Emission Source	**VOC**	**CO**	**NOx**	**SO2**	**PM10**	**PM2.5**	**CO2**	**N2O**	**CH4**
Boiler 1	258	3800	15198	162	760	190	3800	198	164
Boiler 2	258	3800	15198	162	760	190	3800	198	164
Total in Tons/yr	**0.26**	**3.80**	**15.20**	**0.16**	**0.76**	**0.19**	**3.80**	**0.20**	**0.16**
						CO2e =	**62**	metric tons/yr	

Table 4. Wastewater Treatment Plant Operations

Aerobic treatment		
Anticipated flow =	300,000	Gallons per day
Assumed BOD	25	mg/l effluent
GHG EF =	1.6	kg CO2e/kg BOD
Daily GHG emissions	45.42	kg CO2e/day
Annual	16.58	metric tons per year

9.46353E-05 kg/gal

Assumed BOD from Table 2 of EPA 832-F-00-016, Wastewater Technology Fact Sheet, Package Plants

GHG EF from Contribution of On-site and Off-site Processes to GHG Emissions by Wastewater Treatment Plants, Yerushalmi, L. et al., 2009

Table 5. Total Annual Emissions for All Equipment

Stationary Source	VOC t/yr	CO t/yr	NOx t/yr	SO2 t/yr	PM10 t/yr	PM2.5 t/yr	CO2e MT/yr
Generators	0.25	2.15	5.09	0.00	0.27	0.27	412
Boilers	0.26	3.80	15.20	0.16	0.76	0.19	62
WWTP							17
Total	**0.51**	**5.95**	**20.29**	**0.17**	**1.03**	**0.46**	**491**

Table 6. Commuting Staff **300 per day**

Vehicles	# vehicles	# days	[4]mi/day	[3]VOCs lb/mi	[3]CO lb/mi	[3]NOx lb/mi	[3]SO_2 lb/mi	[3]PM_{10} lb/mi	[3]$PM_{2.5}$ lb/mi	[4,5]CO_2 g/mi
passenger vehicles	300	365	40	8.593E-05	1.067E-02	4.873E-04	7.357E-06	5.68927E-05	5.19227E-05	182.00
				VOCs lb	**CO** lb	**NOx** lb	**SO_2** lb	**PM_{10}** lb	**$PM_{2.5}$** lb	**CO_2** g
				376.36	46755.73	2134.28	32.23	249.19	227.42	797,160,000
			Tons per Year	**0.19**	**23.38**	**1.07**	**0.02**	**0.12**	**0.11**	
			Metric Tons per Year							**797**
									CO2e in metric tons/year	**797**

Table 7. Total Annual Operating Emissions from Stationary Sources and Commuters

	VOC t/yr	CO t/yr	NOx t/yr	SO2 t/yr	PM10 t/yr	PM2.5 t/yr	CO2e MT/yr
Operating Emissions	0.70	29.33	21.36	0.18	1.16	0.58	1,288

TAB D. CONSTRUCTION ASSUMPTIONS

Buildings Common to both Alternatives

Project Name	Clearing (AC)	Grading (SY)	Site Prep - Excavate/Fill (CY)	Building Construction - Total Size (sm)	Building Construction - Total Size (sf)	Foundation footprint (sm)	Foundation footprint (sf)	# Stories	Paving (CY)	Gravel Work (CY)	Concrete Work - sidewalks, etc (CY)	Concrete Work - foundation (CY)
Central Utility Plant				1,217	13,100	1,217	13,100	1		243	16	243
Firing Range				96	1,033	96	1,033	1		19	1	19
Outside Warehouse				3,279	35,295	3,279	35,295	1		654	44	654
Staff Training Bldg				910	9,795	910	9,795	1		181	12	181
Penitentiary				61,654	663,637	20,551	221,212	3		4,097	273	4,097
Prison Camp				6,063	65,262	6,063	65,262	1		1,209	80	1,209
Garage/Landscape				653	7,029	653	7,029	1		130	9	130
Roads/Parking - Payne Gap									5,725	5,725		
Fill/Excavate - Payne Gap			25,760,829									
Grading - Payne Gap		1,055,120										
Clearing Payne Gap	218											
Payne Gap Total	218	1,055,120	25,760,829	73,872	795,151	32,769	352,726		5,725	12,257	435	6,532
Roads/Parking - Roxana									5,003	5,003		
Fill/Excavate - Roxana			18,084,992									
Grading - Roxana		876,040										
Clearing Roxana	181											
Roxana Total	181	876,040	18,084,992	73,219		32,769			5,003	11,535	435	6,532

300 full-time staff

Alternative 1 Payne Gap/Larson 753 acres

218 acres cleared
2,794,660 CY soil excavation 10,912,130 CY total excavation Total excavation + fill= 25,760,829
8,117,470 CY rock excavation
1,540,797 CY structural fill 14,848,699 CY total fill
13,307,902 CY spoil fill

Road Estimates Assume road width of 18 feet

Entry road/to warehouses	900	m	2,953	ft
USP access	600	m	1,969	ft
Camp access	2000	m	6,562	ft
			11,483	**ft total**
			206,693	**SF total**

Parking/paved areas Require parking for 100 vehicles per shift; overlap; visitors; deliveries
27,480 sf total

Modified Alternative 2 Roxana 570 acres

181	acres cleared				
8,612,966	CY soil excavated	9,342,682	CY total excavation	Total excavation + fill=	18,084,992
729,716	CY rock excavated				
8,742,310	CY structural fill				
25	ac dynamic compaction				

Road Estimates Assume road width of 18 feet

Total length 3000 m

9,843 ft total

177,165 SF total

Parking/paved areas Require parking for 100 vehicles per shift; overlap; visitors; deliveries

27,480 sf total