DRAFT
ENVIRONMENTAL IMPACT STATEMENT FOR PROPOSED UNITED STATES PENITENTIARY AND FEDERAL PRISON CAMP

Letcher County, Kentucky

Prepared for:

United States Department of Justice
Federal Bureau of Prisons
Capacity Planning and Construction Branch

February 2015

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DRAFT ENVIRONMENTAL IMPACT STATEMENT
FOR PROPOSED UNITED STATES PENITENTIARY AND FEDERAL PRISON CAMP

LETCHER COUNTY, KENTUCKY

FEBRUARY 2015

Lead Agency: Bureau of Prisons

Title of Proposed Action: United States Penitentiary and Federal Prison Camp, Letcher County, Kentucky

Point of Contact: Mr. Issac Gaston, Site Selection Specialist, 320 First Street NW, Washington, D.C. 20534, igaston@bop.gov

Abstract

The Federal Bureau of Prisons has prepared this Draft Environmental Impact Statement (EIS) to evaluate the environmental impacts of site acquisition and development of the a proposed United States Penitentiary (USP) and Federal Prison Camp (FPC) in Letcher County, Kentucky. The proposed action is to acquire the property and construct a new USP, FPC, ancillary facilities and access roads. The purpose of the proposed federal correctional facility in Letcher County, Kentucky, is to develop additional high-security and medium-security facilities to increase capacity for current inmate populations in the Mid-Atlantic Region based on an identified need for additional bedspace. The Bureau has determined that there is a need for additional high-security and medium- security facilities within this region to reduce the demonstrated overcrowding that compromises the mission of the Bureau. The Draft EIS analyzes the direct, indirect, and cumulative impacts of the No Action Alternative, two build alternatives, Alternative 1-Payne Gap and Alternative 2-Roxana, with regard to climate, topography, geology, soils, water, biological and cultural resources, air quality, noise, land use and zoning, socioeconomics, traffic and transportation, recreation, utilities, and hazardous substances.

Comments on this Draft EIS are due by: March 30, 2015, and may be submitted via mail to Issac Gaston, Site Selection Specialist, 320 First Street NW, Washington, D.C. 20534 or emailed to igaston@bop.gov.

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EXECUTIVE SUMMARY

INTRODUCTION

The Federal Bureau of Prisons (Bureau) is proposing to construct a new United States Penitentiary (USP), Federal Prison Camp (FPC) and associated ancillary facilities in Letcher County, Kentucky. The Bureau has prepared this Draft Environmental Impact Statement (EIS) to analyze the impacts associated with the construction and operation of the proposed action.

The USP is anticipated to be approximately 61,654 square meters (663,638 square foot) and will house approximately 1,088 inmates. The FPC is anticipated to be approximately 6,063 square meters (65,262 square foot) and house approximately 128 inmates. Ancillary buildings would include a central utility plant, firing range, outside warehouse, UNICOR warehouse, and staff training building. A non-lethal/lethal fence would be installed around the perimeter of the USP. Operation of the USP and FPC would employ approximately 300 full-time staff.

PURPOSE AND NEED

The purpose of the proposed federal correctional facility in Letcher County, Kentucky, is to develop additional high-security and medium-security facilities to increase capacity for current inmate populations in the Mid-Atlantic Region based on an identified need for additional bedspace. The Bureau has determined that there is a need for additional high-security and medium- security facilities within this region to reduce the demonstrated overcrowding that compromises the mission of the Bureau.

PROPOSED ACTION

The proposed action being evaluated in this Draft EIS is the acquisition of property and the construction and operation of a federal correctional facility in Letcher County, Kentucky. The Bureau proposes to acquire approximately 800 acres (324 hectares) to construct a USP (approximately 61,654 square meters or 663,638 square foot) and FPC (approximately 6,063 square meters or 65,262 square foot) in Letcher County. 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 facilities would house approximately 1,200 total inmates (approximately 1,088 within the USP and approximately 128 within the FPC). In addition to the USP and FPC, several ancillary facilities necessary for the operation of the USP and FPC would be constructed. A non-lethal/lethal fence would also be installed around the perimeter of the USP. The non-lethal/lethal fence would be placed between two parallel, chain link and razor wire fences

ALTERNATIVES CONSIDERED

Three alternatives were analyzed in this Draft EIS, the No Action Alternative and two build alternatives: Alternative 1-Payne Gap and Alternative 2-Roxana.

No Action Alternative

The No Action Alternative does not meet the project purpose and need; however, it represents the existing conditions and is analyzed in the Draft EIS as a baseline for comparing the proposed action. The purpose for this comparison is to allow the federal agency to assess the effects of taking no action versus implementing the proposed action. In some cases the no action alternative would result in impacts to

certain resources if the proposed action is not implemented. Therefore, the assessment of the no action alternative is an important component of all National Environmental Policy Act (NEPA) documents.

Alternative 1-Payne Gap

Under Alternative 1, the Bureau would acquire approximately 753 acres (305 hectares) of land known as the Payne Gap site. The site is located in eastern Letcher County, approximately 7 miles northeast of Whitesburg, along the Kentucky and Virginia border (**Figures 2-1 and 2-2**). The Bureau would then construct and operate a USP and FPC on this site.

Alternative 1 would require extensive earthwork to prepare the site for development. Approximately 8,342,922 cubic meters (10,912,130 cubic yards) of excavation and 10,568,450 cubic meters (13,823,012 cubic yards) of fill would be required prior to the beginning of construction activities.

Alternative 2-Roxana

Under Alternative 2, the Bureau would acquire approximately 700 acres (283 hectares) of land known as the Roxana site. The site is located 7.5 miles west of Whitesburg, Kentucky (**Figures 2-1 and 2-4**). The Bureau would construct and operate a USP and FPC on this site.

Alternative 2 would also require extensive earthwork to prepare the site for development. Approximately 2,929,582 cubic meters (3,831,749 cubic yards) of material would need to be excavated from the site and approximately 3,282,234 cubic meters (4,293,001 cubic yards) of fill would be required to prepare the site for construction activities.

PUBLIC INVOLVEMENT

The Bureau published a Notice of Intent to prepare an EIS on July, 26, 2013. The Bureau held a 30-day scoping period between July 26 and August 26, 2013. A public scoping meeting was held during this scoping period. The meeting was held August 13, 2013 to inform the public about the proposed project and to explain NEPA and the associated environmental impact analysis. A total of 453 community members attended the public meeting and a total of 320 comments were received during the 45-day public comment period. Additionally, 169 letters of support were presented at the public meeting, as well as two petitions in support of the project with a total of 124 signatures. Scoping comments were in support of the project with no major issues or concerns raised.

SUMMARY OF ENVIRONMENTAL EFFECTS

Table ES-1 provides a summary of the potential environmental effects from the No Action Alternative and the two build alternatives: Alternative 1-Payne Gap and Alternative 2-Roxana. Potential mitigation and site preparation costs have also been provided in this table. These mitigation measures and costs are likely to change over the course of the project, coordination with various agencies, and formal development of mitigation measures with the agencies; however, this is the best available information at the time this Draft EIS was drafted and serves to assist in the comparison of the alternatives.

Table ES-1. Summary of Environmental Consequences			
Resource Area	**Alternative 1 (Payne Gap)**	**Alternative 2 (Roxana)**	**No Action Alternative**
Land Use and Zoning	• Compatibility issues with adjacent properties	• Compatibility issues with adjacent properties	• No compatibility issues
Topography, Geology, and Soils	• Significant impacts to topography, geology, and soils	• Significant impacts to topography, geology, and soils	• No impacts to topography, geology, and soils
Socioeconomics and Environmental Justice	• No significant adverse effects • Potential beneficial economic effects	• No significant adverse effects • Potential beneficial economic effects	• Opportunity for beneficial economic effects would not exist
Community Facilities and Services	• No adverse impacts	• No adverse impacts	• No impact
Transportation and Traffic	• Adverse impacts to traffic • Traffic impact study would be required due to increases in volume and Kentucky Transportation Cabinet Requirements • Potential roadway improvements	• Adverse Impacts to Traffic and Roadways • Traffic Impact Study would be Required due to increases in Volume and Kentucky Transportation Cabinet Requirements • Potential Roadway Improvements would be required	• No impacts to traffic
Air Quality	• No significant impacts on the local or regional air quality	• No significant impacts on the local or regional air quality	• No increases in air emissions; therefore, no impacts to air quality
Noise	• Short-term, temporary construction related impacts	• Short-term, temporary construction related impacts	• No construction or operation of a new facility; therefore, no impacts from increases in noise
Infrastructure and Utilities	• Significant impacts to wastewater and natural gas infrastructure	• No significant impacts	• No construction or operation of a new facility; therefore, no increase in demand on infrastructure and utilities
Cultural Resources	• No adverse impacts	• No adverse impacts	• No construction or operation of a new facility; therefore, no impacts to cultural resources
Water Resources	• 2.84 acres (1.15 hectares) of wetland impacts • 14,693 linear feet of stream impacts	• 2.28 acres (0.92 hectares) of wetland impacts • 8,714 linear feet of stream impacts	• No construction or operation of a new facility; therefore, no impacts to water resources
Biological Resources	• 218 acres (88 hectares) of deforestation • Potential impacts to Indiana Bat Habitat	• 118 acres (48 hectares) of deforestation • Potential impacts to Indiana Bat Habitat	• No construction or operation of a new facility; therefore, no impacts to water resources.
Hazardous Materials and Waste	• No adverse impacts	• No adverse impacts	• No impacts
Known Mitigation and Associated Costs			
Infrastructure and Utilities	**$8,895,000**	**$15,850,000**	**No Cost**
Threatened and Endangered Species*	**$719,400**	**$973,500**	**No Mitigation**
Excavation and Grading Costs	**$217,327,748**	**$141,116,447**	**No Cost**

***Notes**: *Estimated costs are based on USFWS cost per acre for impacts to Potential Indiana bat habitat for Payne Gap and Swarming P1/P2 habitat for Payne Gap. Cost was calculated based on total forest impacts for each site and time of year habitat is removed. Cost is based only on summer habitat impacts.*

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ACRONYMS AND ABBREVIATIONS

AADT	Annual Average Daily Traffic
ac	acres
ACHP	Advisory Council on Historic Preservation
AEP	American Electrical Power
AMSL	above mean sea level
APE	Area of Potential Effects
ARH	Appalachian Regional Healthcare
BMPs	Best Management Practices
CAA	Clean Air Act
CAAA	Clean Air Act Amendment
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	carbon monoxide
CWA	Clean Water Act
dB	decibels
dBA	A-weighted decibels
EA	Environmental Assessment
EIS	Environmental Impact Statement
EMTs	emergency medical technicians
EO	Executive Order
ESA	Endangered Species Act
E&S	Erosion and Sedimentation
FEMA	Federal Emergency Management Agency
FIRM	Flood Rate Insurance Map
FPC	Federal Prison Camp
FPPA	Farmland Protection Policy Act
HAP	hazardous air pollutants
ITE	Institute of Transportation Engineers
KGS	Kentucky Geological Survey
KRADD	Kentucky River Area Development District
KYLMI	Kentucky Labor Market Information
KYTC	Kentucky Transportation Cabinet
LCPC	Letcher County Planning Commission
LWSD	Letcher County Water and Sewer District
MBTA	Migratory Bird Treaty Act
MOU	Memorandum of Understanding
MSAT	Mobile Source Air Toxics
msl	mean sea level
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO_2	nitrogen dioxide
NOx	nitrogen oxides
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetland Inventory
O_3	ozone
$PM_{2.5}$	particulate matter with a diameter of 2.5 microns or less
PM_{10}	particulate matter with a diameter less than 10 microns
ppb	parts per billion
ppm	parts per million
psi	pounds per square inch
SHPO	State Historic Preservation Officer
SO_2	sulphur dioxide
TCPs	Traditional Cultural Properties
TMDL	Total Maximum Daily Load
TPY	tons per year
U.S.	United States
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
USP	United States Penitentiary
WWTP	wastewater treatment plant
yd^3	cubic yards
µg/m3	micrograms per cubic
µS	microseconds

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1.0 PURPOSE AND NEED FOR THE PROPOSED ACTION

The United States (U.S.) Department of Justice, Federal Bureau of Prisons (Bureau) has prepared this Draft Environmental Impact Statement (EIS) in accordance with the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 Code of Federal Regulations [CFR] 1500-1508, and the Department of Justice procedures for implementing NEPA (28 CFR 61). The Bureau's Draft EIS evaluates the potential environmental consequences of the proposed construction and operation of a federal correctional facility in Letcher County, Kentucky. Two action alternatives and the No Action Alternative are assessed.

1.1 BACKGROUND

The Bureau was established in 1930 to provide more progressive and humane care for federal inmates, to professionalize the prison service, and to ensure consistent and centralized administration of federal prisons. The mission of the Bureau is to protect society by confining offenders in the controlled environments of prisons and community-based facilities that are safe, humane, cost efficient, and appropriately secure, and that provide work and other self-improvement opportunities to assist offenders in becoming law-abiding citizens.

1.2 SECURITY LEVELS

The Bureau accomplishes its mission through the appropriate use of the following types of community-correction, detention, and correctional facilities:

- Federally owned and operated
- Federally owned and non-federally operated
- Non-federally owned and operated

Regardless of facility ownership, the Bureau operates correction and detention facilities at various security levels. Each security level is characterized by the type of housing within the institution, internal security features, and staff-to-inmate ratio. Different security levels require particular features such as external patrols, guard towers, security barriers, or detection devices. The five categories of security levels are described as follows:

- ***Minimum-Security*** – Also known as Federal Prison Camps (FPCs) or satellite work camps. They are characterized by dormitory housing, a relatively low staff-to-inmate ratio, and are without fences. They are typically associated with a larger institution or military base where inmates can help serve labor needs of the institution or base.
- ***Low-Security*** – Federal Correctional Institutions with double fenced perimeters, primarily dormitory housing, and strong work and program components.
- ***Medium-Security*** – Federal Correctional Institutions with strengthened perimeters (e.g., double fences with electronic detection systems), cell-type housing, a wide variety of work and treatment programs, and an increased inmate-to-staff ratio to provide greater control.
- ***High-Security*** – Also known as United States Penitentiary (USP). These facilities have highly secure perimeters (e.g., walls or double fences with taut wire fencing, non-lethal/lethal

fences), multiple single occupant cell housing, guard towers, close staff supervision, and movement controls.

- ***Administrative*** – Institutions that house offenders who require an uncommon level of security due to their serious records of institutional misconduct, involvement in violent or escape-related behavior, and/or who have unusual security needs based on the nature of their offense. These facilities have highly secured perimeters consisting of walled or double fenced enclosures with guard towers.

1.3 EXISTING FEDERAL PRISON POPULATION

In 1981, the federal inmate population consisted of approximately 23,800 inmates. By 1986 the federal inmate population had increased to about 38,700: a 63 percent increase. Growth continued at a steady rate through the 1990s and in 1998 the federal inmate population had grown 280 percent, reaching 108,000 inmates. As of November 7, 2014, the Bureau inmate population reached 213,620; this includes 171,744 inmates being housed in 120 Bureau institutions, 27,627 being housed in privately-managed secure facilities, and 14,249 being housed in other contract care. Of the 171,744 inmates housed in Bureau institutions, 23,988 are high-security inmates. The Bureau houses these 23,988 high-security inmates in 19 USPs located throughout six regions within the U.S.: the Mid-Atlantic Region; North Central Region; Northeast Region; South Central Region; Southeast Region; and Western Region. Each region provides facilities for housing inmates at all security levels. The 19 USPs are rated for a total capacity of 14,274 high-security inmates. Therefore, the Bureau's high-security institutions are currently 52 percent overcrowded and are operating at above rated capacity.

To meet the current and projected bedspace needs, the Bureau evaluates the bedspace needs of the regions using a geographically balanced program. When considering placement of an individual, the Bureau considers the origin of the inmate and attempts to place the inmate in an institution that is within the region of the inmate's origin. Placing inmates within their region of origin provides greater opportunity for visitation with family, which aids in the rehabilitation process.

1.4 FEDERAL BUREAU OF PRISONS MID-ATLANTIC REGION

One of the regions identified by the Bureau as having an increasing need for additional high-security bedspace in order to reduce overcrowding in the Mid-Atlantic Region. Approximately 5,802 inmates, including those in special programs, are housed within the Mid-Atlantic Region. The current rated capacity for these institutions is 3,400. Therefore, the Bureau has determined that due to the overcrowding in the Mid-Atlantic Region, specifically within the USPs and FPCs, that construction of a new high-security facility would be warranted in the region.

There are currently 15 correctional facilities within the Bureau's Mid-Atlantic Region. Of these, only four are USPs or high-security facilities: USP Hazelton located in Hazelton, West Virginia, USP Lee located in Jonesville, Virginia, USP Big Sandy located in Inez, Kentucky, and USP McCreary located in McCreary, Kentucky. **Table 1-1** depicts the current populations associated with each of the USPs in the Mid-Atlantic Region.

Table 1-1. Mid-Atlantic Region USP Inmate Population		
USP	**Existing Inmate Population (does not include those in special programs)**	**Rated Capacity**
Hazelton	1,440	840
Lee	1,430	880
Big Sandy	1,245	800
McCreary	1,322	880
Total	5,802	3,400

1.5 PURPOSE AND NEED

The purpose of the proposed federal correctional facility in Letcher County, Kentucky, is to develop additional high-security and medium-security facilities 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 the USPs in the Mid-Atlantic Region are exceeding their rated capacity and their associated FPCs are at or near capacity. The Bureau has determined that there is a need for additional high-security and medium-security facilities within this region to reduce the demonstrated overcrowding that compromises the mission of the Bureau. 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, and appropriately secured, and that provide work and other self-improvement opportunities to assist offenders in becoming law-abiding citizens.

1.6 PROPOSED ACTION

The proposed action being evaluated in this Draft EIS is the acquisition of property and the construction and operation of a federal correctional facility in Letcher County, Kentucky. The Bureau proposes to acquire approximately 800 acres (324 hectares) to construct a USP (approximately 61,654 square meters [663,638 square foot]) and FPC (approximately 6,063 square meters [65,262 square foot]) in Letcher County. 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 facilities would house approximately 1,216 total inmates (approximately 1,088 within the USP and approximately 128 within the FPC). In addition to the USP and FPC, several ancillary facilities necessary for the operation of the USP and FPC would be constructed. A non-lethal/lethal fence would also be installed around the perimeter of the USP. The non-lethal/lethal fence would be placed between two parallel, chain link and razor wire fences. The fence would be approximately 12 feet high. The ancillary facilities would include the following:

- Central Utility Plant-1,217 square meters (13,100 square foot)
- Firing Range-96 square meters (1,033 square foot)
- Outside Warehouse-3,279 square meters (35,295 square foot)
- UNICOR Warehouse-1,375 square meters (14,800 square foot)
- Staff Training Building-910 square meters (9,795 square foot)
- Garage/Landscape Building-653 square meters (7,028 square foot)
- Access Roads

Operation of the USP and FPC would employ approximately 300 full-time staff.

1.6.1 General Design Features of the United States Penitentiary and Federal Prison Camp

The Bureau has standard design layouts for their correctional facilities that include similar design characteristics. General design features of a USP include:

- Single road for controlled access to each correctional facility
- Parking lot located near the public entrance to each correctional facility for use by both employees and visitors
- One- to four-story structures
- Multipurpose activity spaces
- Buffer areas around the facility providing visual and physical setbacks from the site boundaries

1.7 ENVIRONMENTAL REVIEW PROCESS

1.7.1 National Environmental Policy Act

In 1969, Congress enacted the National Environmental Policy Act (NEPA), which requires consideration of environmental issues in federal agency planning and decision-making. Regulations for federal agency implementation of the act were established by the President's CEQ. NEPA requires federal agencies to prepare an environmental assessment (EA) or environmental impact statement (EIS) for any federal action, except those actions that are determined to be "categorically excluded" from further analysis. An EIS is prepared for those federal actions that may significantly affect the quality of the human and natural environments or where the impacts are largely unknown or controversial. The EIS must disclose significant environmental impacts and inform decision makers and the public of the reasonable alternatives that would avoid or minimize adverse impacts or enhance the quality of the human environment. The intent of this EIS is to document the potential environmental impacts associated with the proposed action, acquisition of property and construction and operation of a USP and FPC. The Bureau is the decision-maker with regard to this proposed action. This document, together with its appendices and other documents incorporated by reference, constitutes the Draft EIS pursuant to NEPA, the CEQ regulations, and the Department of Justice procedures for implementing NEPA.

The Draft EIS evaluates environmental impacts to: land use and zoning; topography, geology, and soils; socioeconomics and environmental justice; community facilities and services (fire and police services, emergency services, health care facilities, etc.); transportation and traffic; air quality; noise; infrastructure and utilities; cultural resources (historic properties, archaeology); water resources; biological resources (threatened and endangered species, wetlands, vegetation, etc.); and hazardous materials and waste. The evaluation will determine the potential impacts of the proposed action and, if necessary, where impacts may be avoided or minimized, as well as if the impacts would require mitigation. The evaluation of the proposed sites will also determine which site would result in the least amount of impact to the environment.

1.7.2 Related Environmental Documents

In 2008, the Bureau conducted a site reconnaissance study in Letcher County, Kentucky. The site reconnaissance report identified several resources associated with potential sites that would require additional studies to determine if the sites were viable for the development of a federal correctional institution. Based on this 2008 study, a second study was conducted in 2010 to rank these sites and verify that the issues originally identified in 2008 had not changed. Based on the data collected from both the 2008 and 2010 studies, it was determined that a feasibility study to analyze the resources of concern would be conducted to further assess the viability of construction at each of the sites.

In 2012 a feasibility study was completed by the Bureau to evaluate four potential sites for the development of a USP and FPC in Letcher County, Kentucky (TEC, Inc. 2012). The purpose was to conduct additional studies, including wetland identification and delineation, cultural resource surveys, geotechnical studies, boundary surveys, and a utility assessment of the proposed sites to determine if there would be constraints associated with these resources and the development of the sites. The feasibility study evaluated the benefits, challenges, and potential risks associated with development of each site. Based on the results of the feasibility study and changes with the offers of sites, it was determined that two sites, Payne Gap and Roxana, would be carried forward for analysis in this Draft EIS.

1.7.3 Agency Coordination

In addition to NEPA, other laws, regulations, permits and licenses may be applicable to the proposed action. Specifically, the proposed action may require:

- Informal consultation with U.S. Fish and Wildlife Service regarding the occurrence of threatened and endangered species within the sites
- Concurrence from the State Historic Preservation Officer on cultural resource findings
- Clean Water Act Section 404 permit if wetland impacts occur
- National Pollutant Discharge Elimination permit for non-point source discharge
- Erosion and sedimentation control plan for new construction.

1.7.4 Public Involvement

NEPA requires the public be informed and involved throughout the development of the EIS, beginning with public scoping. The public scoping meeting is an opportunity for the federal agency, in this case the Bureau, to introduce the project to the public and receive input on the scope of the issues to be addressed in the EIS. The local public has knowledge of the area where the proposed action may take place, and can provide insight into local resources, as well as to the concerns of the community. Public involvement in the NEPA process is required and is an extremely valuable tool in the successful completion of NEPA documents.

The official scoping period for this project began when the Bureau published a Notice of Intent to prepare an EIS on July, 26, 2013, in the *Federal Register*, and lasted until August 26, 2013. A scoping meeting was held on August 13, 2013 to inform the public about the proposed project and to explain NEPA and the associated environmental impact analysis. A total of 453 community members attended the public meeting and a total of 320 comments were received during the 45-day public comment period. Additionally, 169 letters of support were presented at the public meeting, as well as two petitions in

support of the project with a total of 124 signatures. Scoping comments were in support of the project with no major issues or concerns raised.

2.0 ALTERNATIVES

CEQ's guidelines for implementing the procedural Provisions of the NEPA establish a number of policies for federal agencies, including "….using the NEPA process to identify and assess reasonable alternatives to the proposed action that will avoid or minimize adverse effects of these actions on the quality of the human environment" (40 CFR 1500.2[e]). The guidelines also require an analysis of alternatives based "on the information and analysis presented in the sections on the Affected Environment (§1502.15) and the Environmental Consequences (§1502.16)." The guidelines further state that the analysis "should present the environmental impacts of the proposal and the alternatives in comparative form, thus sharply defining the issues and providing a clear basis for choice." According to CEQ guidelines the alternatives analysis is also required to:

- "Include the alternative of no action";
- "…explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated";
- "Devote substantial treatment to each alternative considered in detail including the proposed action so that reviewers may evaluate their comparative merits";
- "Include reasonable alternatives not within the jurisdiction of the lead agency"';
- "Identify the agency's preferred alternative or alternatives, if one or more exists, in the draft statement and identify such alternative in the final statement unless another law prohibits the expression of such a preference"; and
- "Include appropriate mitigation measures not already included in the proposed action or alternatives."

The analysis of alternatives considered in this EIS was conducted under these guidelines to address the following:

- **No Action Alternative.** A decision not to proceed with the proposed action to develop a new USP and FPC.
- **Alternative Locations-Nationwide.** Locations other than the Letcher County, Kentucky area for implementation of the proposed action.
- **Alternative Locations.** Within the Geographic Area of Interest Warranting Consideration. Potential site(s) which meet minimum requirements for accommodating the proposed facility; are located with the geographic area of interest (Kentucky); and have been offered and are available for Bureau consideration.

A discussion of these alternatives follows. No reasonable alternatives outside the jurisdiction of the Bureau (the lead agency) have been identified or warrant inclusion in the Draft EIS.

2.1 NO ACTION ALTERNATIVE

Under the No Action Alternative, the Bureau would not acquire property or construct and operate a new USP or FPC. Existing USPs would remain overcrowded and prevent the Bureau from meeting its mission.

The No Action Alternative would avoid potential impacts associated with the development of a USP and FPC. The No Action Alternative does not meet the project purpose and need and is therefore, not considered a viable alternative. The No Action Alternative is discussed in this EIS because it serves as a baseline against which to compare the action alternatives.

2.2 ALTERNATIVE LOCATIONS-NATIONWIDE

The locations of new federal correctional facilities are determined by the need for incarceration in various regions of the country and the resources available to meet that need. To meet these needs the Bureau routinely identifies and evaluates potential sites that may be appropriate for development of new federal correctional facilities. Under an ongoing Congressional mandate, consideration is given to surplus properties while other publicly- or privately-owned properties offered to the Bureau are also examined for possible use.

The initial steps in the planning process include the identification and evaluation of potential sites. Identification of a site that has the potential to house more than one federal correctional facility is a key factor in the evaluation of sites. Acquisition of property that has the potential for facility expansion provides the Bureau with the opportunity to expand as the inmate population grows. The Bureau also responds to initiatives from communities requesting consideration to host new federal correctional facilities. When approached by a community to host a facility, the Bureau's first steps are to visit the sites offered and:

- Identify the interest and support of the community, including the support/opposition of elected and appointed officials, community leaders, stakeholders, and the general public in having a federal correctional facility within their community
- Identify suitable locations for development of the federal correctional facility based on infrastructure conditions, environmental resources, land use and zoning, and other related criteria
- Determine the on-site conditions including constructability of the site
- Identify potential environmental issues that require consideration under NEPA (National Historic Preservation Act, Clean Water Act, Endangered Species Act, etc.)
- Determine what further investigations and detailed studies may be warranted to obtain additional information about the potential sites

After the initial screening process, those sites with favorable conditions are moved forward and evaluated under another set of criteria, including optimal infrastructure and environmental requirements. The criteria used to evaluate the sites are established by the Bureau; however, these general criteria can be supplemented if needed to assess issues or potential issues and make sure they are addressed adequately in the evaluation of the sites. The general criteria the Bureau uses to screen potential sites for development include:

- The site should have sufficient land area (300-350 acres minimum [121-142 hectares]) to accommodate the institution and ancillary facilities, provide a buffer zone between the facility and neighboring properties, and allow for future expansion

- Proposed site should be relatively flat (less than 10 percent grade) to provide for minimal site preparation and proper drainage (this can be affected by geographic regions with mountainous terrain)
- Sites should avoid significant environmental resources (i.e., floodplains, wetlands, threatened and endangered species, cultural and historic resources, etc.)
- Sites should avoid potential incompatible land use conflicts.
- Emergency services, including police and fire protection, and utilities should be able to provide services to the prospective sites
- Site should be served by well-maintained state and county roadways to ensure safe commutes for employees, service vehicles, and visitors
- Support of key elected officials, community leaders, the public and owners of the sites

Sites that the Bureau determines meet these general criteria, and are viable for the development of a federal correctional facility, are then evaluated in more detail in either an EA or EIS, in compliance with NEPA.

2.3 ALTERNATIVES DEVELOPMENT

The Bureau has a priority need for additional facilities within the Bureau's Mid-Atlantic Region, which includes the State of Kentucky. The Bureau was contacted by the Letcher County Planning Commission (LCPC) with an offer of potential sites for a new USP and FPC in Letcher County, Kentucky. Understanding the needs of the Bureau, the LCPC identified potential locations for development and brought these sites to the attention of the Bureau to determine if the Bureau had an interest in developing a new facility at one of the locations. The opportunity to provide additional bedspace in Letcher County would meet the need for additional capacity within the Mid-Atlantic Region, afford the Bureau continued management of inmates originating from the region, and allow those inmates to remain close to family and friends.

The process to identify potential sites for constructing a USP and FPC in Letcher County began in 2008 with site reconnaissance studies of four sites that had been offered to the Bureau by members of the community. The purpose of the site reconnaissance studies was to collect preliminary data on the sites and determine their suitability for development based on site conditions, infrastructure and utilities, and environmental resources. Based on this initial analysis, it was determined that the four sites evaluated should be studied in more detail in a feasibility study: Meadow Branch, Payne Gap, Roxana, and Van/Fields. The feasibility study provided an opportunity for more detailed analysis of each site and identified constraints that may eliminate a site from further consideration. In 2011, the Bureau completed a feasibility study that assessed cultural resources, wetlands, geologic conditions, and infrastructure. The feasibility study also included the production of aerial and topographic mapping, and a boundary survey. During the initial phases of the feasibility study, the Meadow Branch site was removed from further consideration due to changes with the offeror, and the site no longer available for consideration by the Bureau; therefore, no detailed analysis of the site was included in the feasibility study. During the feasibility study for the remaining three sites, wetlands were delineated, archaeological and historic structures surveys were completed, and geotechnical studies were conducted. The feasibility study highlighted potential concerns with development of the sites, as well as estimated costs of infrastructure

improvement and site preparation (excavation and/or fill at each site, and grading activities) on each site. The feasibility study determined that there were no constraints that would prevent development of the three sites (TEC, Inc. 2012). During the finalization of the feasibility study there were changes with the offeror of the Van/Fields site, and this site was removed from further consideration. The remaining two sites, Payne Gap and Roxana, were identified as alternatives to be carried forward for study in an EIS (**Figure 2-1**).

2.4 ALTERNATIVE 1 – PAYNE GAP

Under Alternative 1, the Bureau would acquire approximately 753 acres (305 hectares) of land known as the Payne Gap (Payne Gap) site. The site is located in eastern Letcher County, approximately 7 miles northeast of Whitesburg, along the Kentucky and Virginia border (**Figures 2-1 and 2-2**). The Bureau would then construct and operate a USP and FPC on this site. The site is situated on a gently sloped to steeply sloped upland land form above the Kentucky River at its confluence with the Laurel Fork. State Route 119 is located along the north end of the proposed site and would provide site access. The site is forested with secondary growth forests and the original topography of portions of the site have been altered by past surface mining and associated mining activities such as spoil piles, roads, and fill piles. Mining permit applications indicate surface and underground mining operations have occurred within the proposed project site since the 1950s. **Figure 2-3** depicts the proposed conceptual layout of the facility at the Payne Gap site. To accommodate the USP, FPC, ancillary buildings, and roads as described in Section 1.6, *Proposed Action*, the site would require extensive excavation and fill material to level and prepare the site for construction. The Bureau would require a minimum of 300 acres (121 hectares) for construction of the USP and FPC at this site. **Table 2-1** depicts the site preparation quantities.

Table 2-1. Estimated Site Preparation Quantities for Alternative 1 - Payne Gap

Activity	Quantity
Spoil Excavation	2,794,660 yd^3
Rock Excavation	8,117,470 yd^3
Structural Fill	1,716,095 yd^3
Spoil Fill	12,106,917 yd^3
Dynamic Compaction	0
Clear Mined Area	7 ac
Clear Forest Area	211 ac

Notes: yd^3 = cubic yards, ac = acres.

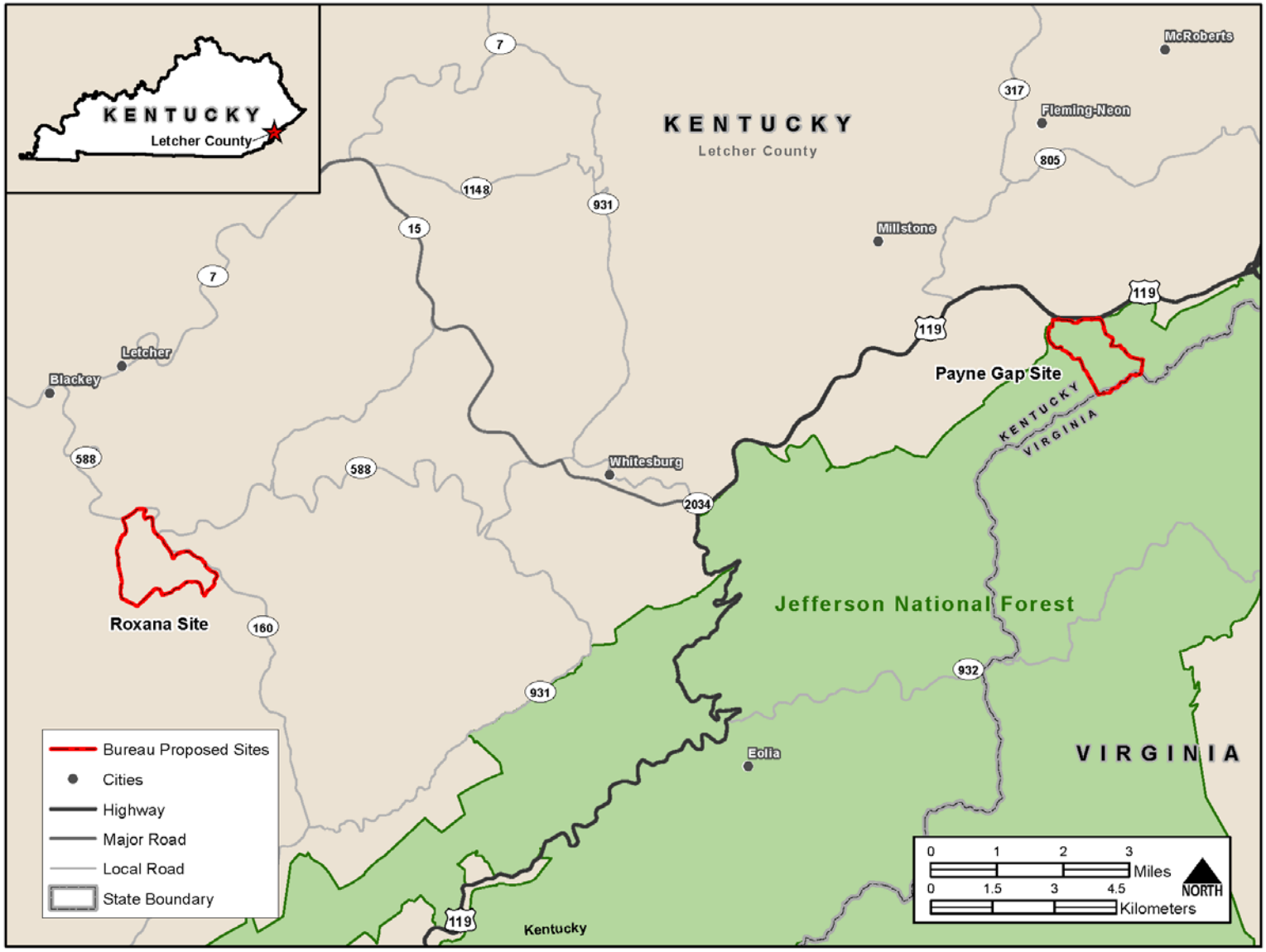

Figure 2-1. Payne Gap and Roxana Site Locations

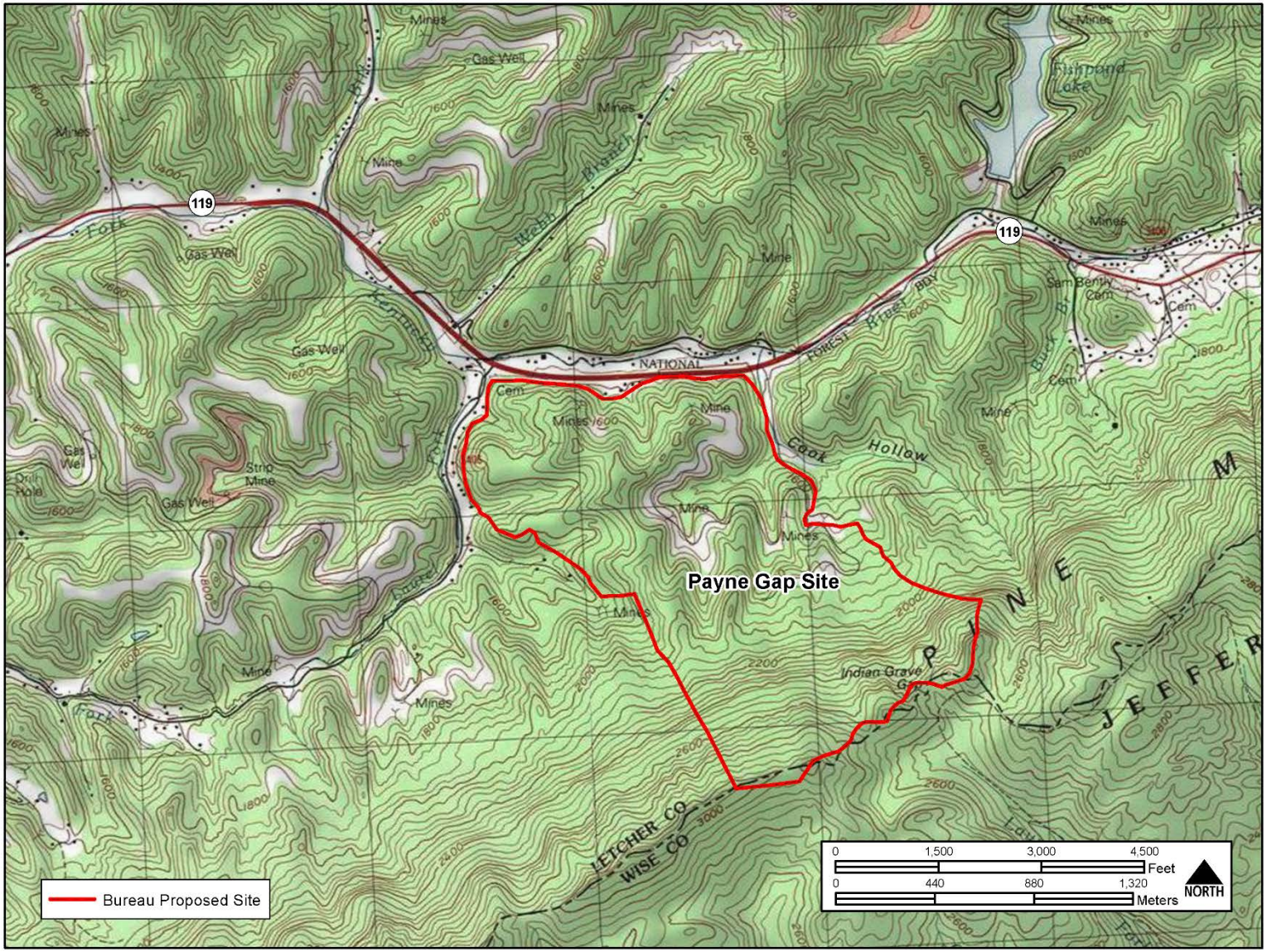

Figure 2-2. Payne Gap Project Location

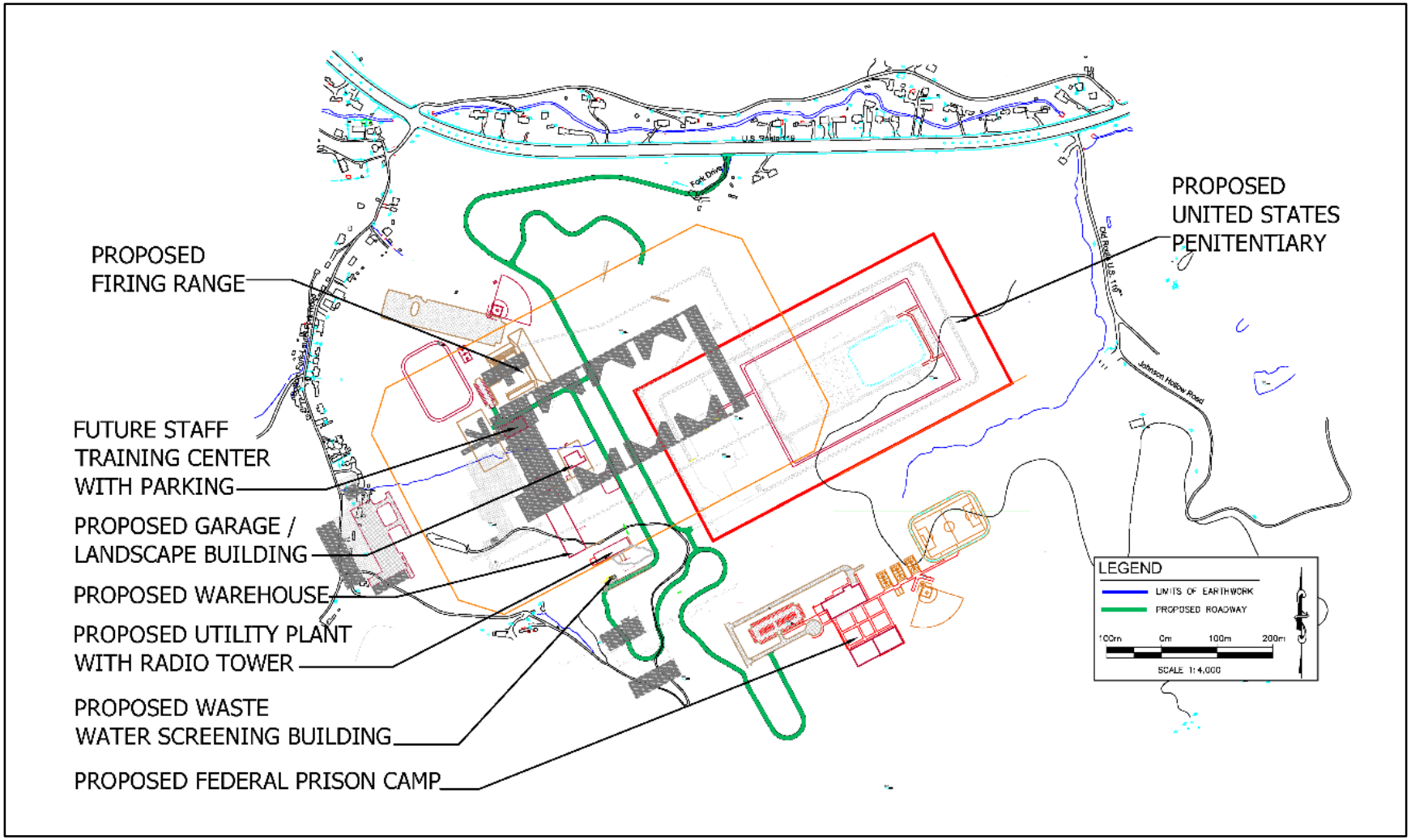

Figure 2-3. Payne Gap USP and FPC Conceptual Layout

2.5 ALTERNATIVE 2 – ROXANA

Under Alternative 2, the Bureau would acquire approximately 700 acres (283 hectares) of land known as the Roxana site. The site is located 7.5 miles west of Whitesburg, Kentucky (**Figures 2-1 and 2-4**). The Bureau would construct and operate a USP and FPC on this site. **Figure 2-5** depicts the proposed conceptual layout of the facility at the Roxana site. To accommodate the USP, FPC, ancillary buildings, and roads as described in Section 1.6, *Proposed Action*, the site would require extensive excavation of spoil material and lesser amounts of structural fill and spoil fill. Preparation of the site for construction activities would also require dynamic compaction, clear mined area, and forest clearing. The Bureau would require a minimum of 300 acres (121 hectares) for construction of the USP and FPC at this site. **Table 2-2** depicts site preparation quantities.

Table 2-2. Estimated Site Preparation Quantities for Alternative 2 - Roxana

Activity	Quantity
Spoil Excavation	2,928,992 yd^3
Rock Excavation	902,757 yd^3
Structural Fill	2,087,607 yd^3
Spoil Fill	2,205,394 yd^3
Dynamic Compaction	25 ac
Clear Mined Area	82 ac
Clear Forest Area	79 ac

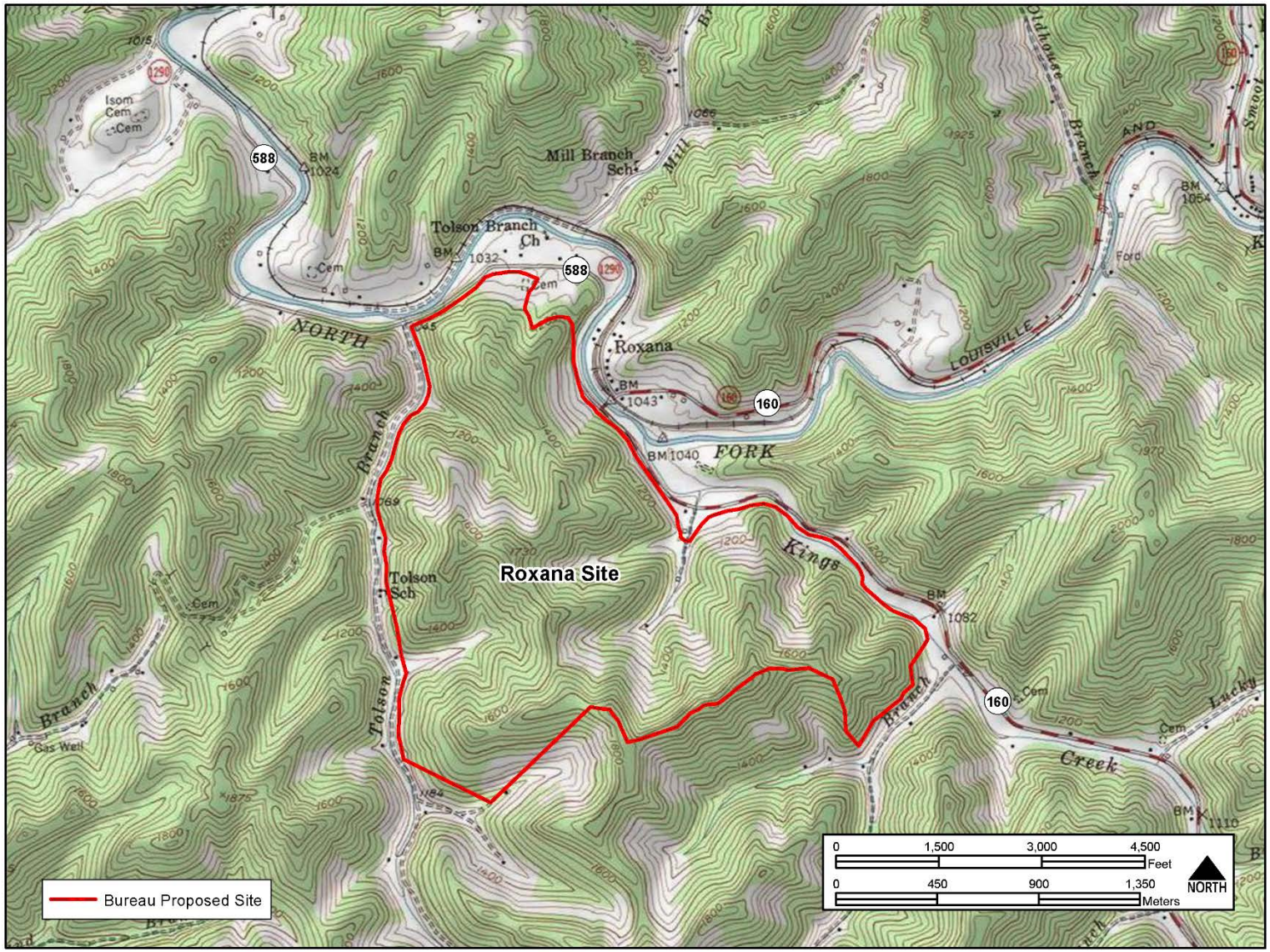

Figure 2-4. Roxana Project Location

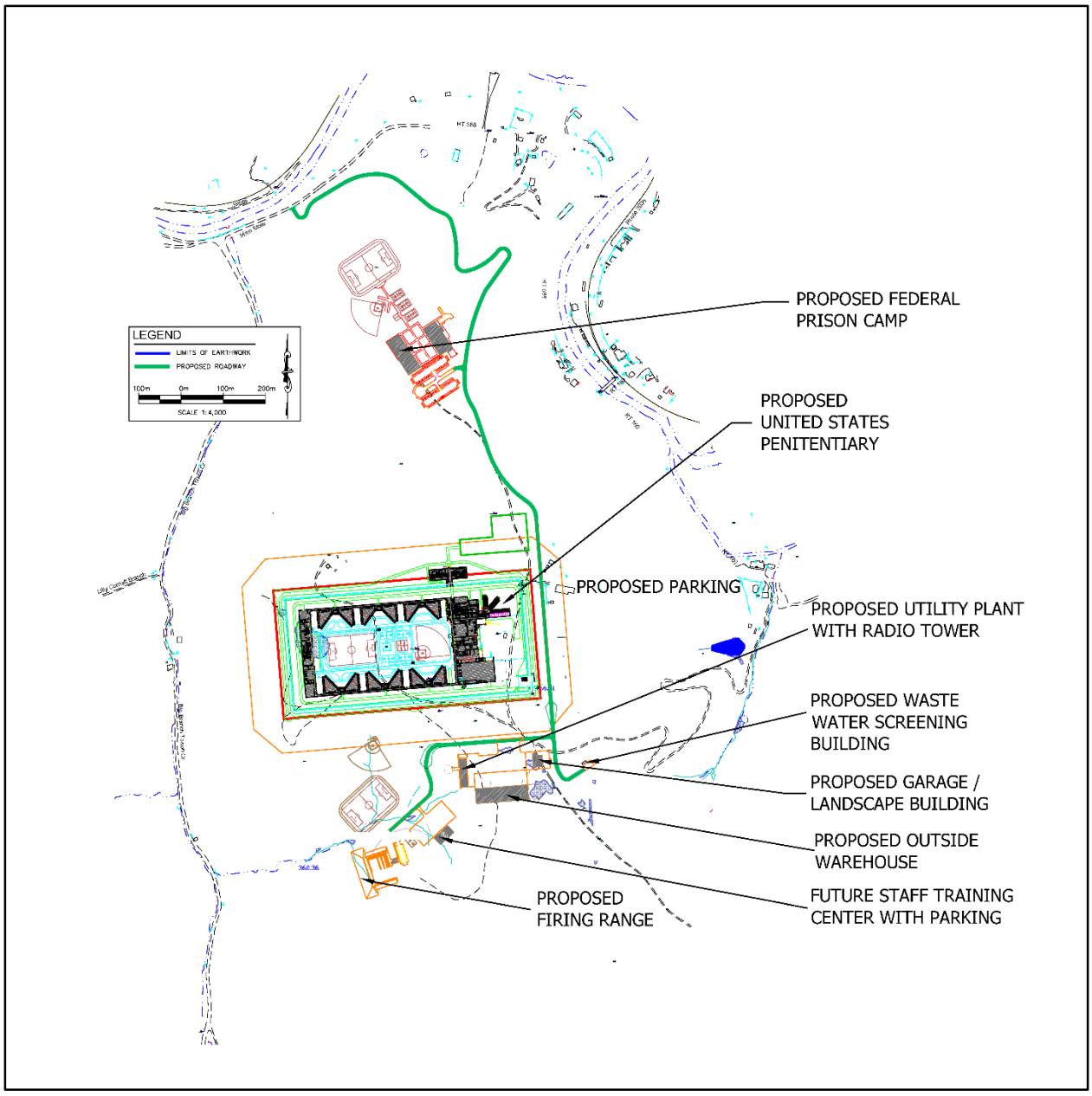

Figure 2-5. Roxana USP and FPC Conceptual Layout

3.0 DEFINITION OF RESOURCE

3.1 LAND USE AND ZONING

Land use often refers to human modification of land for residential or economic purposes. Land use categories typically include agriculture (includes livestock production), forestry, residential, commercial, industrial, transportation, utilities, mining, recreation, and communication. Land uses are frequently regulated by management plans, land use plans, comprehensive plans, and local zoning and ordinances. These plans and regulations assist in identifying where future development can occur so it is compatible with surrounding land uses and, in protecting specially designated or environmentally sensitive uses.

Land use is interrelated with other resource areas including noise, socioeconomics, biological resources, and cultural resources. The impact analysis in this EIS for land use focuses on those areas affected by proposed construction and operation of the USP and FPC.

3.2 TOPOGRAPHY, GEOLOGY, AND SOILS

Topography describes the physical surface of the land and includes elevation, slope, and other general surface features. Geologic factors influence soil stability, bedrock depth, and seismic properties. Soil is the unconsolidated material above bedrock. Soil is formed from the weathering of bedrock and other parent materials.

The Farmland Protection Policy Act (FPPA) (7 USC 4201 et seq.) was introduced to conserve farmland soil and discourage the conversion of prime farmland soil to a non-agricultural use. The FPPA considers prime farmland soils as those that have the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and are also available for these uses. It has the soil quality, growing season, and moisture supply needed to economically produce sustained high yields of crops when treated and managed. Soils of statewide importance are those soils that are nearly prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. The FPPA is based on the protection of prime farmland soils and not on whether the area is in agricultural use.

Topography, geology, and soil resources are analyzed in this EIS in terms of drainage, excavation and fill activities, erosion, and prime farmland. The analysis focuses on the area of soils that would be disturbed, the potential for erosion of soils from construction areas, and the potential for eroded soils to become pollutants in downstream surface water during storm events. Best Management Practices (BMPs) are identified to minimize soil impacts and prevent or control pollutant releases into stormwater.

3.3 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

Socioeconomics describes the basic attributes and resources associated with the human environment, particularly population, employment, income, and housing. The affected area for socioeconomics is defined as the area where principal effects arising from the construction and operation of the proposed USP and FPC are likely to occur. The proposed action alternatives have the potential to cause socioeconomic impacts to the communities around the proposed sites through changes or relocation of Bureau personnel and construction expenditures.

Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations* (Environmental Justice), was issued in 1994. It stipulates that each federal agency is to make achieving environmental justice a part of its mission by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. A minority population is defined as either: 1) the minority population of the affected area exceeds 50 percent, or 2) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the appropriate community of comparison. Low-income populations are identified where a meaningfully greater portion of the population is living below the poverty level threshold as compared to the appropriate community of comparison (CEQ 1997). The environmental justice analysis in this EIS addresses the characteristics of race, ethnicity, and poverty status for populations residing in the immediate area of the proposed USP and FPC.

EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks* (Protection of Children) was issued in 1997 requiring federal agencies to identify and assess environmental health risks and safety risks that may disproportionately affect children. It also requires that each federal agency is to ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks. In this EIS, the protection of children analysis addresses the population under 18 residing in areas potentially affected by the construction and operation of the proposed USP and FPC.

This socioeconomic analysis focuses on impacts due to population changes and construction expenditures. Economic impacts are defined to include direct effects, such as changes to employment, payrolls, and expenditures that affect the flow of dollars into the local economy and secondary effects, which result from the "ripple effect" of spending and re-spending in response to the direct effects.

Socioeconomic impacts, particularly impacts such as those being evaluated in this EIS, are often mixed: beneficial in terms of gains in jobs, expenditures, tax revenues, etc., and adverse in terms of growth management issues such as demands for housing and community services.

This analysis in this EIS identifies potential environmental justice issues. Impacts to environmental justice populations are identified where high and adverse human health or environmental effects may disproportionately affect minority or low-income populations. Impacts to children would occur if there was an increased disproportionate environmental, health, or safety risk to children.

3.4 COMMUNITY FACILITIES AND SERVICES

Community services include police protection, fire protection, healthcare services and schools. The potentially affected area includes the cities, towns, and county where the proposed sites are located and where Bureau employees associated with the proposed action would live and work.

The analysis in this EIS focuses on the existing conditions of community services within the adjacent communities in terms of capacity and availability. The anticipated demand for community services is described in relation to proposed population increases in inmates, Bureau personnel, and their families. Lastly, the analysis describes ability of community services to accommodate anticipated changes in the demand for those services resulting from the proposed action.

3.5 TRANSPORTATION AND TRAFFIC

Transportation and traffic refers to vehicle movement throughout a road and highway network. The study area for transportation and traffic includes the road and highway networks that surround and support the Payne Gap and Roxana sites. The American Association of Highway and Transportation Officials classify roadways as principal arterials, minor arterial streets, collector streets, and local streets. Principal arterials (i.e., arterial highways and interstates) serve to move traffic regionally and between population and activity centers with a minimal level of access to adjacent properties. Collector roadways (i.e., minor arterial and collector streets) serve to move traffic from population and activity centers and funnel them onto principal arterials with a moderate level of access to adjacent properties. Local roadways provide access to adjacent properties and move traffic onto collector and arterial roadways.

Impacts to transportation and traffic are analyzed in this Draft EIS by considering the possible changes to existing traffic conditions and the capacity of area roadways from proposed increases in commuter and construction traffic. Traffic impact studies are to be performed and the results, together with proposed mitigation measures appropriate for each site will be included in the Final EIS.

3.6 AIR QUALITY

Air quality is defined by ambient air concentrations of specific pollutants determined by the United States Environmental Protection Agency (USEPA) to be of concern related to the health and welfare of the general public and the environment and are widespread across the U.S. The primary pollutants of concern, called "criteria pollutants," include carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), ozone (O_3), suspended particulate matter less than or equal to 10 microns in diameter (PM_{10}), fine particulate matter less than or equal to 2.5 microns in diameter ($PM_{2.5}$), and lead. Under the Clean Air Act (CAA), the USEPA has established National Ambient Air Quality Standards (NAAQS) for these pollutants (40 CFR 50). The NAAQS represent the maximum levels of background pollution that are considered acceptable, with an adequate margin of safety, to protect public health and welfare. Short-term standards (1-, 3-, 8-and 24-hour periods) are established for pollutants contributing to acute health effects, while long-term standards (quarterly and annual averages) are established for pollutants contributing to chronic health effects. The Kentucky Department of Environmental Protection (KDEP) has adopted the NAAQS, which are presented in **Table 3-1**.

Table 3-1. Ambient Air Quality Standards			
Pollutant	**Averaging Time**	**Primary Standard**	**Secondary Standard**
CO	8-hr 1-hr	9 ppm 35 ppm	None
Lead	Rolling 3-Month Average	0.15 µg/m^3	Same as Primary
NO_2	Annual (arithmetic average) 1-hr	53 ppb 100 ppb	Same as Primary None
PM_{10}	24-hr	150 µg/m^3	Same as Primary
$PM_{2.5}$	Annual (arithmetic average) 24-hr	12.0 µg/m^3 35 µg/m^3	15.0 µg/m^3 Same as Primary
O_3	8-hr	0.075 ppm	Same as Primary
SO_2	1-hour 3-hour	75 ppb -	- 0.5 ppm

Notes: ppb – parts per billion; ppm – parts per million; µg/m3 – micrograms per cubic meter.
Source: *USEPA 2011.*

In addition to the ambient air quality standards for criteria pollutants, national standards exist for hazardous air pollutants (HAPs) which are regulated under Section 112(b) of the 1990 CAA Amendments. The National Emission Standards for Hazardous Air Pollutants regulate HAP emissions from stationary sources. HAPs emitted from mobile sources are called Mobile Source Air Toxics (MSATs); these are compounds emitted from highway vehicles and non-road equipment that are known or suspected to cause cancer or other serious health and environmental effects. In 2001, USEPA issued its first MSAT Rule, which identified 21 compounds as being HAPs that required regulation. A subset of six of these MSAT compounds were identified as having the greatest influence on health and include benzene; 1,3-butadiene; formaldehyde; acrolein; acetaldehyde; and diesel particulate matter. In February 2007, USEPA issued a second MSAT Rule, which generally supported the findings in the first rule and provided additional recommendations of compounds having the greatest impact on health. The rule also identified several engine emission certification standards that must be implemented.

Unlike the criteria pollutants, there are no NAAQS for HAPs. The primary control methodologies instituted by federal regulation for MSATs involve technological improvements for reducing their content in fuel and altering engine operating characteristics to reduce the volume of pollutants generated during combustion. MSATs would be the primary HAPs emitted by mobile sources during construction and operation of the proposed action alternatives. The equipment used during construction would likely vary in age and have a range of pollution reduction effectiveness. Construction equipment, however, would be operated intermittently over a large area and would produce negligible ambient HAPs in a localized area. Therefore, MSAT emissions are not considered further in this analysis.

A region's air quality is influenced by many factors including the type and amount of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing meteorological conditions. Pollutant emissions typically refer to the amount of pollutants or pollutant precursors introduced into the atmosphere by a source or group of sources. Pollutant emissions contribute to the ambient air concentrations of criteria pollutants, either by directly affecting the pollutant concentrations measured in the ambient air or by interacting in the atmosphere to form criteria pollutants. Primary pollutants, such as CO, SO_2, lead, and some particulates, are emitted directly into the atmosphere from emission sources. Secondary pollutants, such as O_3, NO_2, and some particulates are formed through

atmospheric chemical reactions that are influenced by meteorology, ultraviolet light, and other atmospheric processes.

The study area for the air quality analysis includes the Appalachian Intrastate Air Quality Control Region, which is defined in 40 CFR 81.191, and comprises several counties in Kentucky, including Letcher County. Air quality in the study area is considered good, with the study area designated as unclassifiable, attainment, or better than national standards for all criteria pollutants. Because the study area is in attainment for all criteria pollutants, the CAA General Conformity Rule does not apply and is not addressed in this analysis. Although a conformity analysis is not required, impacts to air quality from emissions associated with construction and operations are addressed in Chapters 4 and 5.

3.7 NOISE

Sound is a physical phenomenon consisting of minute vibrations that travel through a medium, such as air or water, and are sensed by the human ear. The perception and evaluation of sound involves three basic physical characteristics:

- ***Intensity*** – the acoustic energy, which is expressed in terms of sound pressure, in decibels (dB)
- ***Frequency*** – the number of cycles per second the air vibrates, in Hertz
- ***Duration*** – the length of time the sound can be detected

Noise is defined as unwanted or annoying sound that interferes with or disrupts normal human activities. Although continuous and extended exposure to high noise levels (e.g., through occupational exposure) can cause hearing loss, the principal human response to noise is annoyance. The response of different individuals to similar noise events is diverse and is influenced by the type of noise, perceived importance of the noise, its appropriateness in the setting, time of day, type of activity during which the noise occurs, and sensitivity of the individual.

Levels of noise are measured in units called decibels (dB). However, a number of factors affect how the human ear perceives sound: the actual level of noise, frequency, period of exposure, and fluctuations in noise levels during exposure. The human ear cannot equally perceive all pitches or frequencies and noise measurements are therefore adjusted or weighted to compensate for the human lack of sensitivity to low- and high-pitched sounds. This adjusted unit is known as the A-weighted decibel, or dBA. The A-weighted metric, de-emphasizes very low and very high pitched sound and is most often applied to noise generated by motor vehicle traffic, small boats, and aircraft. Background, or ambient, noise levels are all sounds present in an environment and are dependent upon land use. Very rural areas with little human activity would be expected to have the lowest levels of background noise, typically on the order of 15–20 dBA (USEPA 1971). Noise increases with increased population, as demonstrated in **Table 3-2**.

Table 3-2. Sound Levels Estimated by Population Density		
Description	**Population Density (people per square mile)**	**Sound Level (dB)**
Rural (undeveloped)	20	35
Quiet suburban	60	45
Normal suburban	600	50
Urban	2,000	55
Noisy urban	6,000	60
Very noisy urban	20,000	65

Source: USEPA 1982.

3.8 INFRASTRUCTURE AND UTILITIES

Infrastructure refers to the system of public works, such as utilities, that provides the underlying framework for a community. Infrastructure components and utilities discussed in this EIS include the water supply system, wastewater system, stormwater drainage system, electrical supply facilities, natural gas system, and solid waste management facilities. Transportation infrastructure, including roadway and street systems, the movement of vehicles, and mass transit, are discussed in Section 3.5, *Transportation and Traffic.*

Because infrastructure and utilities systems are directly related to activities within the communities from which they draw their services, the potentially affected area includes the county where they occur. The assessment of impacts is based on comparing existing use and conditions to anticipated changes in capacity associated with the utilities. The analysis compares current use with anticipated future demands to determine potential impacts.

3.9 CULTURAL RESOURCES

Cultural resources are defined as prehistoric or historic sites, buildings, structures, objects, archaeological sites, districts, or other physical evidence of human activity that are considered important to a culture or community for scientific, traditional, or religious reasons. Cultural resources include prehistoric and historic archaeological resources, architectural resources, and traditional cultural properties (TCPs).

- Archaeological resources – places where people changed the ground surface or left artifacts or other physical remains (e.g., arrowheads or bottles).
- Architectural resources – standing buildings, dams, canals, bridges, and other structures.
- Traditional cultural properties – resources associated with the cultural practices and beliefs of a living community that link that community to its past and help maintain its cultural identity. TCPs may include archaeological resources, locations of historic events, sacred areas, sources of raw materials for making tools, sacred objects, or traditional hunting and gathering areas.

Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and as implemented by 36 CFR 800, requires federal agencies to consider the effects of their actions on historic properties before undertaking a project that uses federal funds or is located on federal lands. A historic property is defined as any cultural resource that is included in, or eligible for inclusion in, the National Register of Historic Places (NRHP). The NRHP, administered by the National Park Service, is the official inventory of cultural resources that are significant in American history, prehistory, architecture, archaeology,

engineering, and culture. The NRHP also includes National Historic Landmarks. In consideration of 36 CFR 800, federal agencies are required to consult with the State Historic Preservation Office (SHPO), Indian Tribes, representatives of local governments, and the public in a manner appropriate to the agency planning process for the planned action (undertaking) and to the nature of the undertaking and its potential to cause effects on historic properties. The methodology for identifying, evaluating, and mitigating impacts to cultural resources has been established through federal laws and regulations including the NHPA, the Archaeological Resource Protection Act, the Native American Graves Protection and Repatriation Act, and the American Indian Religious Freedom Act.

The affected environment for cultural and traditional resources is also referred to as the area of potential effects (APE). The APE must be defined in order to assess the effects of a proposed action on a historic property. An APE is defined as the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist (36 CFR 800.16[d]).

The analysis in this EIS applies the criteria of adverse effect (36 CFR 800.5) to evaluate the effects of the proposed action on any historic properties located in the APE of each action alternative. A project affects a historic property when it alters the property's characteristics (including relevant features of its environment or use) that qualify it as significant according to National Register criteria. Adverse effects may include the following: physical destruction, damage, or alteration of all or part of the resource; alteration of the character of the surrounding environment that contributes to the resource's qualifications for the NRHP; introduction of visual, audible, or atmospheric elements that are out of character with the resource or alter its setting; and neglect of the resource resulting in its deterioration or destruction. Impacts to traditional Native American tribal properties can be determined only through consultation with the affected Tribes. However, ground disturbance to prehistoric archaeological sites and graves has often been cited as an adverse impact.

Analysis of potential impacts to historic properties considers both direct and indirect impacts. Direct impacts may be the result of physically altering, damaging, or destroying all or part of a historic property, or neglecting the property to the extent that it deteriorates or is destroyed. Indirect impacts are those that may occur as a result of the completed project by altering characteristics of the surrounding environment through the introduction of visual or audible elements that are out of character for the period the property represents. An example of an indirect effect is increased vehicular or pedestrian traffic in the vicinity of the property.

3.10 WATER RESOURCES

Water resources include both surface and subsurface water. For the purposes of this EIS, water resources include the following topics: surface water, groundwater, water quality, wetlands, and floodplains.

3.10.1 Clean Water Act

The Clean Water Act (CWA) of 1972, as amended (33 USC §§ 1251 et seq.), is the primary federal law that protects the nation's waters, including lakes, rivers, and coastal areas. The primary objective of the CWA is to restore and maintain the integrity of the nation's waters. The CWA prohibits all unpermitted discharge of any pollutant into any jurisdictional waters of the U.S. The USEPA is responsible for administering the water quality requirements of the CWA. To this end, the USEPA developed pollutant-specific water quality standards (referred to as total maximum daily load [TMDL]) to identify waters for

which quality is sufficiently poor and for which effluent limits would be insufficient to meet water quality standards (KDEP 2013).

In addition to the effluent restrictions, the CWA Section 404 requires a U.S. Army Corps of Engineers (USACE) issued permit for the dredging and/or filling of jurisdictional waters of the U.S. The USACE broadly defines jurisdictional waters to include navigable waters, intermittent streams, impoundments, tributary streams, and wetlands. Areas meeting the "waters of the U.S." definition are under the jurisdiction of the USACE. Anyone proposing to conduct a project that requires a federal permit or involves dredge or fill activities that may result in a discharge to surface waters and/or waters of the U.S. is required to obtain a CWA Section 401 Water Quality Certification, verifying that the project activities will comply with water quality standards.

3.10.2 Rivers and Harbors Act

Section 10 of the Rivers and Harbors Act of 1899, as amended (33 USC § 403) regulates structures or work that would affect navigable waters of the U.S. Structures include any pier, wharf, bulkhead, etc. Work includes dredging, filling, excavation, or other modifications to navigable waters of the U.S. The USACE issues permits for work or structures in navigable waters of the U.S.

3.10.3 Safe Drinking Water Act

Congress originally passed the Safe Drinking Water Act in 1974 (42 USC §§ 300 et seq.) to protect public health by regulating the nation's public drinking water supply. The law, amended in 1986 and 1996, requires the protection of drinking water and its sources.

3.10.4 Surface Water

Lakes, ponds, impoundments, rivers, and streams compose surface water resources that are important for economic, ecological, recreational, and human health reasons.

According to the USACE, streams are drainage features that may contain perennial streams (permanent flows), intermittent streams (flows during much of the year but drying seasonally), or ephemeral streams (flows only after storm events). Ponds are open water bodies (USACE 1987).

The U.S. is divided and sub-divided into successively smaller hydrologic units, which are classified into six levels: regions, sub-regions, basins, sub-basins, watersheds and sub-watersheds. The proposed sites lie in the Ohio Region (Hydrologic Unit Code [HUC] 05); Kentucky-Licking Subregion (HUC 0510); the Kentucky River Basin (HUC 051002); and the North Kentucky River Watershed (HUC 05100201) (USEPA 2013a). Both of the sites contain surface water features including headwater intermittent and perennial streams.

Pursuant to EO 11990, *Protection of Wetlands,* Section 404 of the CWA, and Section 10 of the Rivers and Harbors Act of 1899, an investigation was conducted to identify potential jurisdictional waters of the U.S. A May 2011 wetland delineation of both sites investigated the proposed project area, which included the areas of expected impact by the construction associated with the proposed action, excavation needed for construction, access roads (approximately 50 feet on either side of the existing access roads), and areas previously disturbed by past mining or gas line activities. An additional wetland delineation was conducted in 2014 based on the proposed conceptual layout. The 2011 and 2014 wetland delineations included Waters of the U.S., as well as wetlands which fall under the jurisdiction of the USACE and isolated wetlands which may be exempt from USACE jurisdiction but may be protected under Kentucky's

Department of Environmental Protection. These studies supplant the usage of the National Wetland Inventory (NWI) Wetland Mapper because it is believed they are significantly more accurate; however, NWI data was used for areas not delineated during fieldwork.

3.10.5 Wetlands and Floodplains

According to USACE regulations, wetlands are those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

EO 11990, *Protection of Wetlands*, directs federal agencies to take action to minimize the destruction, loss, or degradation of wetlands on their property and mandates review of proposed actions on wetlands through procedures established by NEPA. It requires that federal agencies establish and implement procedures to minimize development in wetlands. Wetlands provide many functions and values such as flood flow alteration, groundwater recharge/discharge, and fish and wildlife habitat.

Site specific wetland data was collected through onsite field work, aerial photographs, topographic maps, National Wetland Inventory wetland maps, and Natural Resource Conservation Service soil surveys. Based on these resources wetlands are present on the sites.

EO 11988, Floodplain Management, defines floodplains as the lowland and relatively flat areas adjoining inland waters, including at a minimum, that area subject to a 1 percent or greater chance of flooding in any given year. The area subject to a 1 percent chance of flooding is referred to as the 100-year floodplain. EO 11988 directs federal agencies to avoid construction in floodplains and establishes a process for analysis and public notice if development is unavoidable. In this EIS, the analysis of floodplains considers if any new construction is proposed within a floodplain or may impede the functions of floodplains in conveying floodwaters.

3.11 BIOLOGICAL RESOURCES

Biological resources include living, native, or naturalized plant and animal species and the habitats where they occur. Plant associations are referred to as vegetation and animal species are referred to as wildlife. Habitat can be defined as the resources and conditions present in an area that supports the existence of a plant or animal (Hall et al. 1997). Although the existence and preservation of biological resources are intrinsically valuable, these resources also provide aesthetic, recreational, and socioeconomic values to society. This analysis focuses on species or vegetation types that are important to the function of the ecosystem, of special societal importance, or are protected under federal or state law or statute.

For purposes of this EIS, these resources are divided into three major categories: vegetation, wildlife, and threatened and endangered species.

- ***Vegetation*** – includes terrestrial plant communities and the analysis will focus on vegetation types that are important to the function of the ecosystem or are protected under federal or state law.
- ***Wildlife*** – includes all vertebrate animals (i.e., mammals, reptiles, amphibians, birds, and fish) and sometimes invertebrate species or species groups such as mollusks or insects. Virtually all birds are protected under the Migratory Bird Treaty Act (MBTA). The MBTA was designed to protect migratory birds (including their eggs, nests, and feathers) and their

habitats. An activity has a significant adverse effect if, over a reasonable period of time, it diminishes the capacity of a population of a migratory bird species to maintain genetic diversity, to reproduce, and to function effectively in its native ecosystem.

- ***Threatened and Endangered Species*** – include plant and animal species that are listed or proposed for listing by the U.S. Fish and Wildlife Service (USFWS) under the Endangered Species Act (ESA). The federal ESA provides for the conservation of threatened and endangered species of plants and animals and the habitats where they are found. In addition, designated and proposed critical habitat for ESA-listed species will also be included in this EIS, as appropriate. This section will also address species that are listed by the State of Kentucky as threatened or endangered.

3.12 HAZARDOUS MATERIALS AND WASTE

The analysis of hazardous materials, hazardous waste, toxic substances, and contaminated sites focuses on the potential for these substances to be introduced into the environment from maintenance or during construction activities. Potentially affected areas consist of construction and operational maintenance areas. Factors considered in the analysis include the potential for increased human health risk or environmental exposure, as well as changes in the quantity and types of hazardous substances transported, stored, used, and disposed. The methodology for contaminated sites compares the proximity of proposed facility development to contaminated sites and considers the operational uses of the facilities to determine potential impacts to or from the sites.

3.12.1 Hazardous Materials

Hazardous materials are chemical substances that pose a substantial hazard to human health or the environment when improperly treated, handled, used, packaged, stored, transported or disposed. Hazardous materials are identified and regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (42 U.S.C. 9601 et seq.); the Occupational Safety and Health Act (29 U.S.C. 651 et seq.); and the Emergency Planning and Community Right-to-Know Act (42 U.S.C. 11001 et seq.). Hazardous materials commonly used at Bureau facilities include petroleum and oil.

3.12.2 Hazardous Waste

The Resource Conservation and Recovery Act (40 CFR 240-280) and the Hazardous and Solid Waste Amendments of 1984 (40 CFR 260) define hazardous waste as a solid waste, or combination of wastes that due to its quantity, concentration, or physical, chemical or infectious characteristics, may cause or significantly contribute to an increase in mortality or an increase in serious irreversible or incapacitating reversible illness, or may pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, disposed of, or otherwise managed. A solid waste is a hazardous waste if it is not excluded from regulation as a hazardous waste under 40 CFR 261.4(b) and if it exhibits identified characteristics of hazardous waste or meets other specified criteria (see 40 CFR 261.3(a).

3.12.3 Toxic Substances

The Toxic Substance Control Act addresses those chemical substances and mixtures that may present unreasonable risk of personal injury or health of the environment from their manufacturing, processing, distribution, use, or disposal. The Toxic Substance Control Act Chemical Substances Inventory lists

information on more than 62,000 chemicals and substances, such as asbestos, lead-based paint, and polychlorinated biphenyls. The sites under study in this EIS are undeveloped and do not include any structures; therefore, toxic substances are not discussed further in this EIS.

3.13 CUMULATIVE IMPACT ANALYSIS

This section defines cumulative impacts and describes the approach taken in the analysis of cumulative impacts. Chapter 8, Cumulative Impacts, contains descriptions of other actions relevant to cumulative impacts, an analysis of the incremental interaction the proposed action may have with other actions, and an evaluation of the cumulative impacts potentially resulting from these interactions.

The approach taken in the analysis of cumulative impacts follows the objectives of NEPA, CEQ regulations, and CEQ guidance. Cumulative impacts are defined in 40 C.F.R 1508.7 as:

> "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or Non-Federal) or person undertakes such other actions."

Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. A cumulative impact results from the additive effect of all projects in the same geographical area. Generally, an impact can be considered cumulative if: a) effects of several actions occur in the same locale, b) effects on a particular resource are the same in nature, and c) effects are long-term in nature. The common factor key to cumulative assessment is identifying any potential temporally and/or spatially overlapping or successive effects that may significantly affect resources in the analysis areas.

3.14 ASSESSING SIGNIFICANCE

Chapters 4 and 5 present the affected environment and analysis of the potential direct and indirect effects of each alternative for each resource area described in this chapter. Chapter 8 presents the analysis of the potential cumulative effects of each alternative for each resource area. The level of significance is assessed according to NEPA implementing regulations at 40 CFR 1508.27, which requires considerations of both context and intensity.

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4.0 ALTERNATIVE 1 – PAYNE GAP

4.1 LAND USE AND ZONING

Potential impacts to land use are assessed by comparing the existing land uses with the changes that would occur from implementation of the proposed action, including induced effects. Impacts to land use are evaluated for significance by determining the degree to which proposed development and uses conflict with existing land use and local plans and policies. Under the proposed action, potential short-term and long-term impacts to land use would occur from construction and operation of the USP and FPC.

Growth induced impacts to land use could result from spending wages and salaries by direct and indirect employees on items such as food, housing, transportation, and medical services. This spending creates induced employment in nearly all sectors of the economy; especially service sectors (see Section 4.3, *Socioeconomics and Environmental Justice*).

4.1.1 Affected Environment

Land use associated with the proposed location of Alternative 1 consists primarily of forested areas. The area was previously deep mined; however, mining activities no longer occur at the site. Land use surrounding the site is also primarily forested, with small single family residential homes adjacent to the site. There are no zoning ordinances or land use classifications identified for this area (DePriest 2013). **Figure 4-1** depicts existing land use associated with Alternative 1.

4.1.2 Environmental Consequences

4.1.2.1 Construction

Construction of a USP and FPC would result in changes to on-site land use. Land use associated with the Payne Gap site would be converted from forested and former mining land uses to a government/institutional land use. Changes to the on-site land use would change; however a buffer area around the USP and FPC separating it from the adjacent properties would remain and would be compatible with the adjacent land uses. Due to the lack of zoning ordinances and land use classifications. Construction of the proposed USP and FPC would not result in incompatible land uses from a regulatory perspective.

4.1.2.2 Operation

Once constructed, the operation of the USP and FPC would continue as a government/institutional on-site land use with a buffer area separating it from the adjacent properties that would be compatible with adjacent land uses.

4.1.3 No Action Alternative

Under the No Action Alternative, the USP and FPC would not be constructed at the Payne Gap site and no potential land use compatibility issues with adjacent land uses would occur.

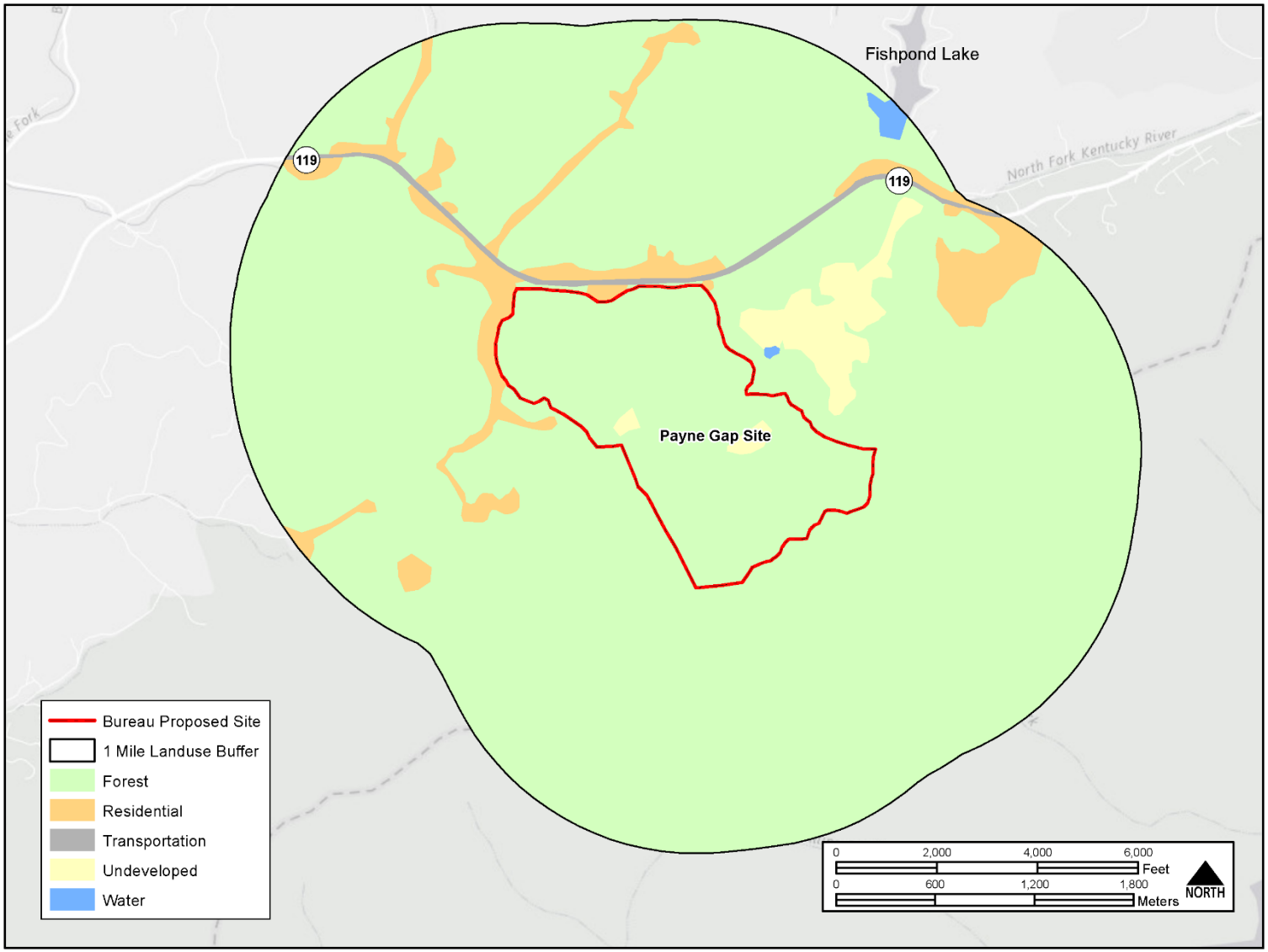

Figure 4-1. Payne Gap Land Use

4.1.4 Mitigation

Federal agencies are not subject to local/regional zoning or land use development regulations. However, the Bureau would take the following measures to help minimize potential adverse impacts to surrounding land uses:

- Provide an open space and vegetative buffer between the USP and FPC to maintain visual compatibility with surrounding properties;
- Design and locate the facilities to reduce the visual presence of the facility from neighboring properties.

4.2 TOPOGRAPHY, GEOLOGY, AND SOILS

4.2.1 Affected Environment

The topography on the Payne Gap site is typified by the mountains valleys complex associated with western Appalachian Mountains. The topography at Payne Gap has been significantly affected by strip mining activities, which historically occurred on site. According to the USGS 7.5 minute Jenkins West topographic quadrangle map, the elevation on site ranges from a low of 1,385 feet above mean sea level (AMSL) in the northwest corner of the site adjacent to the North Fork of the Kentucky River and a high of 2,965 feet AMSL on Pine Mountain in the southern portion of the site (University of Kentucky 2013a). The majority of slopes on site are very steep, well over 15 percent.

The Payne Gap site is underlain by the Breathitt Group which is composed of the Pikeville Formation and the Hyden Formation. The geology underlying the Payne Gap site is primarily Pikeville Formation (Kentucky Geological Survey [KGS] 2013).

The soils underlying the Payne Gap site are varied as a result of topography and mining disturbance, but none of the soils are listed as hydric by the National Resource Conservation Service (NRCS). The three most common soils at the Payne Gap site are composed of the Cloverlick-Kimper-Highsplint complex (30-65 percent slopes), the Dekalb-Gilpin-Raye complex (25-65 percent slopes), and the Kaymine, Fairpoint, and Fiveblock soil series (2-70 percent slopes). To a lesser degree, the following soils underlie the site; Caneyville-Renox-Bledsoe complex (50-80 percent slopes), Shelocta-Highsplint complex (30-65 percent slopes), and Urban land Udorthents complex (0-15 percent slopes) (NRCS 2013). These soils have not been designated by NRCS as prime farmland soils.

4.2.2 Environmental Consequences

Implementation of the proposed action under Alternative 1 would result in significant impacts to topography, geology, and soils.

4.2.2.1 Construction

Development of the site would require significant excavation and fill activities to create a level pad for construction of the facilities and construction of access roads. A 2:1 fill slope and a 1:1 cut slope were used in the estimate adjacent to the building pads and roads to transition to the original topography at the Payne Gap site. More detail on the earthwork calculations can be found in Appendix B. As described in Section 2.4, *Alternative 1 – Payne Gap*, and **Table 2-1,** *Estimated Site Preparation Quantities for Alternative 1 - Payne Gap*, of this document, excavation activities (cut) would include 2,794,660 cubic

yards (2,136,671 cubic meters) of soil material and 8,117,470 cubic yards (6,206,251 cubic meters) of rock. The excavated soil and rock would be filled into the valleys as spoil or compacted to create a structural fill in the building pads. The amount of structural fill was estimated to be 1,716,095 cubic yards (1,312,048 cubic meters) and the amount of spoil fill would be 12,106,917 cubic yards (9,256,402 cubic meters). All excavated materials would be used on-site for structural fill or placed as spoil fill. The maximum cut (excavation) at Payne Gap would be approximately 60 meters and the maximum fill would be approximately 80 meters. Removal of bedrock would require blasting activities. Impacts resulting from these activities would include loss of productive soil, erosion, and destabilization of slopes (as a result of the cuts and fills). As a result of the excavation and fill activities, the topography of the site would change at the maximum cut from 555 meters to 495 meters (mean sea level [MSL]) in the main building area and a maximum fill from 470 meters to 550 meters MSL in the prison camp area.

The project area does not contain prime farmland soils; therefore, prime farmland soils would not be impacted and the Farmland Protection Policy Act (FPPA) does not apply to this site and no further coordination would be required.

4.2.2.2 Operation

Once constructed, no further impacts to topography, geology or soils are anticipated from the operation of the USP and FPC.

4.2.3 No Action Alternative

Under the No Action Alternative, the USP and FPC would not be constructed. Therefore, significant excavation, fill, and grading activities would not occur. As a result, there would be no impacts to topography, geology, or soils.

4.2.4 Mitigation

A soil erosion and sedimentation (E&S) plan would be prepared and approved by Kentucky Division of Water prior to construction. The E&S plan would outline the requirements for controlling erosion and sedimentation on site including BMPs. BMPs may 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, and stormwater control plans to manage stormwater runoff and keep it on-site during construction. Additionally, construction could be phased so that construction of the USP, FPC and ancillary facilities occurred at different times resulting in the minimization of disturbed soil by clearing only the area necessary for the current phase of construction. Re-vegetation of disturbed areas following the completion of construction would also occur to minimize the erosion of exposed soil.

4.3 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

This socioeconomic analysis focuses on impacts due to construction and operation of the proposed action. The assessment examines how the alternatives would affect population, employment, income, and housing characteristics in the study area. Economic impacts are defined to include direct effects, such as changes to employment and expenditures that affect the flow of dollars into the local economy and indirect effects, which result from the "ripple effect" of spending and re-spending in response to the direct effects.

Socioeconomic impacts, particularly impacts such as those being evaluated in this EIS, are often mixed: beneficial in terms of gains in jobs, expenditures, tax revenues, etc., and potentially adverse in terms of growth management issues such as demands for housing and community services.

This analysis also identifies potential environmental justice issues. Impacts to environmental justice populations are identified where high and adverse human health or environmental effects may disproportionately affect minority or low-income populations. Impacts to children would occur if there was an increased disproportionate environmental health or safety risk to children.

4.3.1.1 Population

The 2013 population of Letcher County was 24,025. Letcher County's population decreased by approximately 3% between 2000 and 2010 (**Table 4-1**). The City of Whitesburg grew by approximately 34% from 2000 to 2010 and the City of Jenkins population decreased by 3% during the same time period. The decrease in population is likely the result of people who leave the area for better education and employment opportunities (Kentucky River Area Development District [KRADD] 2013). This trend is anticipated to continue within the county with the population decreasing by an additional 8% by the year 2020.

Table 4-1. Study Area Population Trends, 2000-2010

Geographic Area	2000	2010	Percent Change 2000-2010	2020 Projected Population*	Projected Percent Change 2010-2020
Whitesburg, Kentucky	1.598	2,139	33.85	—	—
Jenkins, Kentucky	2,273	2,203	-3.08	—	---
Letcher County, Kentucky	25,275	24,519	-2.99	22,655	-6.88
Kentucky	4,041,769	4,339,357	7.36%	4,699,880	8.3

Notes: *2020 Projections only available for county and state.
Source: U.S. Census Bureau 2000, U.S. Census Bureau 2010, Proximity One 2014.

4.3.1.2 Employment and Income

Letcher County's 2013 employed civilian labor force was 7,103, out of a total civilian labor force of 8,201. Employment by industry in Letcher County is depicted in **Table 4-2**. The industries that employ the greatest number of people in Letcher County include educational services, and health care and social assistance (33.4%); agriculture, forestry, fishing and hunting, and mining (13.0%); and retail trade (12.7%). In Kentucky, the largest industry employers are educational services, and health care and social assistance (24.5%); manufacturing (13.7%); and retail trade (11.8%) (U.S. Census Bureau 2014a).

Letcher County is part of the largest coal producing area in eastern Kentucky. While study area jobs in the coal mining industry have been declining, positions in the health care, retail, and the secondary wood industries have increased. However, these jobs typically pay less than coal mining jobs. The study area is part of a region characterized by high unemployment and poverty rates (KRADD 2013).

Table 4-2. Study Area Employment, 2013				
	Letcher County, Kentucky		Kentucky	
Industry	Number Employed-	Percent Employed	Number Employed	Percent Employed
Agriculture, forestry, fishing and hunting, and mining	922	13.0	52,348	2.8
Construction	442	6.2	111,646	6.0
Manufacturing	213	3.0	255,938	13.7
Wholesale Trade	209	2.9	49,171	13.7
Retail Trade	904	12.7	219,721	11.8
Transportation and warehousing, and utilities	360	5.1	112,005	6.0
Information	98	1.4	29,217	1.6
Finance and insurance, and real estate and rental/leasing	199	2.8	102,380	5.5
Professional, scientific, management, and administrative and waste management services	413	5.8	144,589	7.8
Educational services, health care and social assistance	2,369	33.4	456,293	24.5
Arts, entertainment, recreation, accommodation, and food services	468	6.6	159,679	8.6
Other services, except public administration	252	3.5	87,228	4.7
Public administration	254	3.6	85,390	4.6
Total	**7,103**		**1,865,605**	

Source: U.S. Census Bureau 2014a.

While unemployment rates in Kentucky have decreased from a peak of 10.3% in 2009 to 6.5% in 2014, the unemployment rate in Letcher County increased dramatically from 10.6% in 2009 to 17.3% in 2013 (**Table 4-3**). The preliminary 2014 unemployment rate for Letcher County has decreased to 11.5%. The comparable rate for the U.S. was 6.3% (Kentucky Labor Market Information [KYLMI] 2014).

Unemployment rates in the study area are higher than the comparable rates for the state and the nation. Along with the "displaced worker," the study area has a higher percentage of "discouraged" workers who no longer actively seek employment and are, therefore, not included in the official unemployment statistics. Therefore, the official unemployment rate in the study area is deceptively lower than actual unemployment (KRADD 2013).

Table 4-3. Study Area Percent Unemployment Rates								
Jurisdiction	2007	2008	2009	2010	2011	2012	2013	2014[a]
Letcher County, Kentucky	7.7	7.1	10.6	11.4	10.3	13.8	17.3	11.5
Kentucky	5.6	6.6	10.3	10.2	9.5	8.3	8.3	6.5

Notes: Unemployment rates are not seasonally adjusted. [a]August 2014, preliminary.
Source: KYLMI 2014.

Total personal income includes net earnings by place of residence; dividends, interest, and rent received; and benefits paid by federal, state, and local governments and businesses. A larger portion of personal income in Letcher County comes from government and business benefits than for Kentucky and the U.S (U.S. Department of Commerce 2014).

Total personal income in Letcher County decreased by almost 2% from 2010 to 2012, while over the same time period personal income increased by approximately 10% in Kentucky (**Table 4-4**). Between 2010 and 2012, per capita income increased in Letcher County by less than 1% while per capita income in Kentucky increased by 8%. The national per capita income was $43,735 (U.S. Department of Commerce 2014).

Table 4-4. Study Area Personal and Per Capita Income

Jurisdiction	2010 Personal Income (000)[a]	2012 Personal Income (000)[a]	Percent Change 2010-2012	2010 Per Capita Income	2012 Per Capita Income	Percent Change 2010-2012
Letcher County. Kentucky	$686,680	$674,369	-1.8	$27,948	$28,155	0.7
Kentucky	$143,210,961	$157,043,042	9.7	$32,947	$35,643	8.2

Notes: Not adjusted for inflation.
Source: U.S. Department of Commerce 2014.

4.3.1.3 Housing

There were 11,519 housing units in Letcher County in 2013, with a total vacancy rate of approximately 19% (**Table 4-5**). The vacancy rate for owner-occupied units was 0.3% and vacancy rate for rental units was 1.9%. The comparable vacancy rates in Kentucky were higher, 12.4%, 2.1%, and 6.7% respectively (U.S. Census Bureau 2014b).

Table 4-5. Study Area Housing Units 2013

Geographic Area	Housing Units	Vacant Housing Units	Percent Vacant	Homeowner Vacancy Rate	Rental Vacancy Rate
Letcher County, Kentucky	11,519	2,155	18.7	0.3	1.9
Kentucky	1,933,019	239,620	12.4	2.1	6.7

Source: U.S. Census Bureau 2014b.

4.3.1.4 Environmental Justice

For the purpose of this evaluation, minority refers to people who identified themselves in the census as Black or African American, Asian, Hawaiian or Pacific Islander, American Indian or Alaskan Native, other non-White races, or as being of Hispanic or Latino origin. Persons of Hispanic and Latino origin may be of any race (CEQ 1997). The CEQ identifies these groups as minority populations when either (1) the minority population of the affected area exceeds 50% or (2) the minority population percentage in the affected area is meaningfully greater than the minority population percentage in the general population or the geographic region of comparison (most often the state in which the affected area is part). The geographical unit for comparison in this analysis is Kentucky.

U.S. Census Bureau data on the racial and ethnic composition of the study area in 2013 are summarized in **Table 4-6**. Overall, the majority of the study area is white. Letcher County has a smaller percentage of minority and Hispanic populations than Kentucky.

Table 4-6. Study Area Percent Race and Ethnicity 2013						
Jurisdiction	**White**	**Black/African American**	**American Indian/Alaska Native**	**Asian**	**Native Hawaiian/Other Pacific Islander**	**Hispanic or Latino Origin[a]**
Whitesburg, Kentucky	97.1	1.5	0.0	0.6	0.0	1.3
Jenkins, Kentucky	98.4	0.5	0.2	0.0	0.0	0.9
Letcher County, Kentucky	98.3	0.2	0.0	0.6	0.0	0.7
Kentucky	87.8	7.9	0.2	1.2	0.0	3.2

Notes: Data presented reflects most reported race and ethnicity categories; percentages may not add to 100 % due to rounding. *Hispanic origin may be of any race.

Source: U.S. Census Bureau 2014c.

Table 4-7 presents data on low-income families and individuals in the study area. The percentages of low-income families and individuals in Letcher County with incomes below poverty level (based on family size and composition) are greater than for Kentucky. In the study are, the City of Jenkins has the highest percentages of families and individuals with incomes below the poverty level.

Table 4-7. Study Area Percent Race and Ethnicity 2013		
Jurisdiction	**Families Below Poverty Level**	**Individuals Below Poverty Level**
Whitesburg, Kentucky	5.5	14.2
Jenkins, Kentucky	27.6	32.1
Letcher County, Kentucky	20.0	24.2
Kentucky	14.6	19.1

Source: U.S. Census Bureau 2014a.

4.3.1.5 Protection of Children

The percentage of children under the age of 18 is lower in Whitesburg, Jenkins, and Letcher County than for Kentucky (**Table 4-8**).

Table 4-8. Study Area Percent Under the Age of 18 2013	
Jurisdiction	**<18**
Whitesburg, Kentucky	16,4
Jenkins, Kentucky	20.8
Letcher County, Kentucky	22.3
Kentucky	23.3

Source: U.S. Census Bureau 2014c.

4.3.2 Environmental Consequences

4.3.2.1 Population

Approximately 300 new employees would be needed to operate the proposed USP and FPC. It is anticipated that some of these employees would be existing BOP employees who would relocate to the area and the rest would be hired locally. Under a maximum case scenario, all 300 new personnel are assumed to move to the study area.

The BOP personnel would likely be accompanied by their families or other household members. The U.S. Census Bureau has determined that the average household size for the U.S., which is assumed to be similar to the average household size of transfer employees, is 2.58 (U.S. Census Bureau 2010). Under this assumption, approximately 774 people would be added to the study area population. This would represent 3.2% of the Letcher County 2013 population. This gain would help to offset some of the recent and projected population losses in Letcher County. Alternative 1 would result in a minor beneficial impact to the study area's short- and long-term population trends.

4.3.2.2 Employment and Income

The increase of 300 full-time positions would represent approximately 4% of the Letcher County 2013 civilian labor force. Study area personal income would also increase as a result of job growth. Some of the increased wage earnings would be paid to taxes, and some would be saved and invested, but most would be spent on consumer goods and services in the study area.

This spending would, in turn, "ripple" through the economy, generating additional indirect jobs and income and benefitting the study area economy. Given the rate of unemployment in the study area (11.5%), it would be expected that many of these indirect positions would be filled by unemployed local residents. In addition, inmates' family members would be expected to visit, boosting visitor spending in hotels/motels and restaurants in the study area. No population in-migration to the study area would be expected as a result of indirect job growth.

The increase in construction spending would also generate direct construction jobs and indirect jobs, typically in food services and retail trade. Additional construction workers may move into the study area in response to the direct construction jobs, but these workers would most likely leave the area for other opportunities when the construction projects near completion. Further, given the study area unemployment rate, it would be expected that most of the indirect positions would be filled by unemployed study area workers. While there may be some population in-migration to the study area as a result of construction spending, it would not be expected to significantly affect population trends. Alternative 1 would result in beneficial employment and income impacts in the study area.

While the purchase of land by the Bureau for Alternative 1 would reduce property tax revenues, additional taxes would accrue to federal, state, and local governments as a result of the increase in payrolls, and operational and construction spending. It is anticipated that, on balance, the fiscal/economic impacts would be beneficial and there would be no significant adverse fiscal/economic impacts.

4.3.2.3 Housing

Alternative 1 would result in an increase of 300 full-time positions in the study area. Under a conservative scenario, all these personnel would seek housing in Letcher County at the same time. This would represent about 2.6% of Letcher County's total housing units and approximately 14% of the vacant units. Some additional housing may be developed by the private market to support USP and FPC employees who choose to live in Letcher County. However, not all new personnel would live in Letcher County and the increase in personnel would occur over the construction period before the USP and FPC become operational, reducing any potential negative impacts to the study area's housing market.

4.3.2.4 Environmental Justice

This EIS has identified no adverse environmental impacts that would have disproportionately high or adverse environmental effects on minority or low-income populations. Therefore, Alternative 1 would not result in significant adverse impacts to environmental justice communities.

4.3.2.5 Protection of Children

This EIS had identified no adverse environmental impacts that would result in disproportionate health or safety risks to children. Therefore, Alternative 1 would not result in significant adverse impacts to the health or safety of children.

4.3.3 No Action Alternative

Under the No Action Alternative, the USP and FPC would not be constructed. As a result, there would be no potential for beneficial socioeconomic impacts such as new jobs and potential growth of business within the region. This could result in the sustained poor economic climate in the region. The No Action Alternative would not result in adverse impacts to environmental justice communities or children.

4.3.4 Mitigation

No adverse impacts to socioeconomics, environmental justice populations, or children would be expected; therefore, no mitigation would be warranted. Beneficial impacts would be anticipated and the community is prepared to accommodate growth.

4.4 COMMUNITY FACILITIES AND SERVICES

4.4.1 Affected Environment

4.4.1.1 Police

Law enforcement servicing the area around and including the Payne Gap site is serviced by the Fleming Neon Police Department, Jenkins Police Department, Letcher County Sheriff, and Kentucky State Police. The Fleming Neon Police Department has three full-time employees consisting of one police chief and two police officers, as well as one volunteer that operate out of a single station in Fleming Neon. The station has three squad cars and provides service 24-hours per day, seven days a week (Fleming Neon Police Department 2013).

The Jenkins Police Department has six full-time personnel consisting of one police chief, four police officers, and the Public Safety Director. The department is currently short staffed by one person. The police department operates out of one station in Jenkins. The station operates eight squad cars and provides 24-hour coverage (Jenkins Police Department 2013).

The Letcher County Sheriff's office is comprised of 13full-time employees including 10 deputies and 3 dispatchers. The office operates 10 squad cars and is headquartered in Whitesburg. The office provides 24-hour coverage, seven days per week (Letcher County Sheriff 2013).

The Kentucky State Police for Letcher County operates out of the Hazard Post and covers a total of five counties including Letcher County. The Hazard Post currently has 39 state troopers, 18 dispatchers, 3 clerks, 1 custodian, 1 criminal analyst, and 1 arson specialist. They operate 39 squad cars, and have 8-10 spare squad cars available in the event one is needed (Kentucky State Police 2013).

4.4.1.2 Fire

Fire departments that provide emergency services for the Payne Gap area include the Fleming Neon Fire Department, Jenkins Volunteer Fire Station, and Whitesburg Fire and Rescue. The Fleming Neon Fire Department has approximately 36 firefighters and emergency medical technicians (EMTs) at the Fleming Neon Volunteer Fire Station. Sixteen are paid, full-time employees and 20 are volunteers. The station has seven paramedics and eight EMTs. The department has a single station in Fleming Neon and a substation in Whitesburg. The Fleming Neon Station has two fire engines, 10 ambulances, 1 tanker truck, 1rescue truck, 1 dive trailer (for underwater rescue) and 1 all-terrain vehicle for search and rescue operations. Four ambulances run during the day and 1 run at night. Firefighters run 3 crews during the day and 1 crew at night. The station has mutual aid agreements with all the towns in Letcher County (Fleming Neon Fire Department 2013).

The Jenkins Volunteer Fire Station consists of between 25-28 firefighters and three administrative personnel with two stations in Jenkins. All firefighters are volunteers and 5 of the firefighters are also EMTs. Equipment associated with the stations includes 2 fire engines, an 85-foot tower truck, a 65-foot ladder truck, a 2,500 gallon tanker truck, 1 heavy rescue truck, and 1 vehicle for personnel transport. The Jenkins Volunteer Fire Station has mutual aid agreements with all other stations in Letcher County (Jenkins Volunteer Fire Station 2013).

4.4.1.3 Healthcare

Appalachian Regional Healthcare (ARH) serves over 350,000 residents in eastern Kentucky and southern West Virginia. Their operations in Letcher County, Kentucky include the Whitesburg ARH Hospital, ARH Clinic, Jenkins ARH Clinic, Neon ARH Clinic, ARH Cardiology Clinic and Home Health Agency. Whitesburg ARH completed an $11 million dollar renovation project in 2011 that included a 15,000 square foot addition to the facility that houses surgical, obstetric, and newborn patients. Renovations to the existing space included a complete remodel of the third floor to include six Intensive Care Unit beds and 20 private patient rooms. Whitesburg ARH Hospital provides 24-hour emergency service for both adult and pediatric patients and has an on-site heliport for receiving and transferring patients. Whitesburg ARH is an acute care hospital that covers internal medicine, family practice, pediatrics, general surgery, advanced laparoscopic surgery, obstetrics and gynecology, cardiology, pulmonology, radiology and emergency services.

Mountain Comprehensive Health Corporation located in Whitesburg, Kentucky offers dental, family and internal medicine, pediatrics, cardiology, pulmonology, and obstetrics and gynecological services, as well as a rehabilitation program. Mountain Comprehensive Health Corporation also has a full service laboratory.

4.4.1.4 Schools

The schools in Letcher County are administered by the Letcher County School District. There are five elementary schools, three middle schools, and one high school. **Table 4-9** depicts the names of the schools, the grades they serve, the number of students enrolled for the 2014-2015 school year and the actual capacity of each school.

Table 4-9. Letcher County Schools Enrollment and Capacity for 2014-2015			
School	**Grades**	**Number of Students**	**Capacity**
Arlie Boggs Elementary	K-8	127	248
Cowan Elementary	K-8	423	440
Fleming Neon Middle School	6-8	202	352
Letcher County Elementary	K-5	372	418
Letcher County Middle School	6-8	158	225
Letcher County Central High School	9-12	929	1033
West Whitesburg Elementary School	K-5	392	440
Whitesburg Middle School	6-8	170	225
Martha Jane Potter Elementary	K-5	438	425

Source: Wagoner 2014.

4.4.2 Environmental Consequences

4.4.2.1 Police

The law enforcement groups that have jurisdiction over the area where the Payne Gap site is located would be able to provide assistance in the event of an emergency situation at the USP that required assistance beyond the capabilities of the USP. The individual law enforcement agencies have stated they would be willing to discuss the development of a Memorandum of Understanding (MOU) with the Bureau to provide these services. Law enforcement indicated this would not result in impacts to their services or require the hiring of additional staff; therefore, the proposed action would have no impact to law enforcement.

4.4.2.2 Fire

Fire departments that would provide emergency services for the area where the Payne Gap site is located would be able to provide assistance to the USP and FPC in the event there was an incident that was beyond the capabilities of the USP and FPC. The individual fire departments have indicated they would be willing to discuss the development of a MOU with the Bureau to provide these services. The fire departments indicated that this would not result in impacts to their services or require the hiring of additional staff; therefore, the proposed action would have no impact to emergency services.

4.4.2.3 Healthcare

Healthcare facilities are located within close proximity to the Payne Gap site and would be able to accommodate inmates at the proposed USP and FPC if needed. Discussions with ARH indicate they have staff familiar with accommodating inmates and the necessary security requirements that would need to be implemented to bring an inmate into a healthcare facility. ARH indicated this would not be a problem and they would be able to accommodate the facility if an inmate would require care outside of the USP or FPC. ARH also indicated they would be willing to work with the Bureau to develop a MOU (Sparkman 2014).

4.4.2.4 Schools

It is assumed that approximately 300 new employees would be needed to operate the proposed USP and FPC. It is anticipated that some of these employees would be existing Bureau employees that would relocate to the area. Bureau employees relocating to operate the facility may not all reside within the immediate area (Whitesburg, Jenkins, or Letcher County). It would be anticipated that some would reside outside of the immediate area. With the exception of Martha Jane Potter Elementary school, all the schools within Letcher County School District have sufficient capacity to accept new students.

4.4.3 No Action Alternative

Under the No Action Alternative, the USP and FPC would not be constructed. Community facilities and services would continue to operate under existing conditions. Law enforcement, emergency services, and healthcare providers within the area would not be asked to support the facility in emergency situations; therefore, no impacts to these services would occur.

4.4.4 Mitigation

Impacts to community facilities and services would not occur; therefore, no mitigation would be warranted.

4.5 TRANSPORTATION AND TRAFFIC

The analysis of transportation and traffic describes both personal and public vehicle movement throughout a road and highway network. The study area for transportation and traffic includes the road and highway networks that surround and provide access to the proposed site parcels.

Rural collector roads are divided into major and minor collector roads. Major collector roads are used for inter-county travel or for carrying vehicles to routes of higher classification (principal arterials and minor arterials) (Division of Planning 2011). Minor collector roads collect traffic from local roads and carry it to major collector roads, minor arterial roads, and/or principal arterials. Rural principal arterials are those roadways that have continuous routes that lend themselves to statewide or interstate travel and typically have limited access (Division of Planning 2011).

4.5.1 Affected Environment

The Payne Gap site is located approximately 7.5 miles to the east of Whitesburg, Kentucky. This project alternative would be constructed to the south of U.S. Route 119, to the east of Bottom Fork Road (KY 3406), and to the west of Talman Drive. In the project vicinity, U.S. 119 is designated as a rural principal arterial1 in the Kentucky Transportation Cabinet (KYTC's) statewide map of roadway functional classifications (KYTC 2014a). KYTC traffic count station 272 is located on U.S. 119 approximately 0.5 miles west of the site. The year 2010 Annual Average Daily Traffic (AADT) traffic volume at this location was 6,778 vehicles per day (KYTC 2014b). The site has several access options. These include driveways onto Bottom Fork Road, U.S. Route 119, Talman Drive, and a connection to Fork Drive, which is an existing roadway that extends southward from U.S. Route 119.

As defined by KYTC, rural principal arterials "comprise a system of continuous, connected, rural routes having trip length and density suitable for statewide or interstate travel. They provide for movement between all urban areas with a population of 50,000 or more and most urban areas with a population of at least 25,000" (KYTC 2014a).

4.5.2 Environmental Consequences

A Traffic Impact Study is in progress for the Payne Gap site. The study will identify specific impacts as a result of increases in construction and operational traffic. The study will also identify specific mitigation measures that should be considered. The final results of the Traffic Impact Study will be presented in the Final EIS. The following describes known impacts that could be determined without the results of the Traffic Impact Study.

4.5.2.1 Construction

Implementation of either action alternative would involve temporary traffic impacts resulting from construction activities. The following types of additional trips are expected be added to the highway network:

- Construction worker commuting trips
- Trips involving the delivery and removal of construction equipment and materials
- Trips involving the removal of demolition debris and/or excess fill material

These trips would be temporary, and would not continue after the completion of project construction. Whereas construction worker commuter trips are expected to be concentrated during the traditional peak commuting periods, other trips would likely be dispersed throughout the typical working day. Trucks would be used to deliver/remove construction equipment and materials and to remove demolition debris and/or excess fill material during construction. Because of their size and weight, trucks have a relatively greater impact on street capacity and pavement conditions, as compared to passenger cars. Given the temporary nature of construction truck traffic, and given that trucks are not expected to be concentrated in peak commuting periods, the potential impact to roadway capacity would be less than significant. The potential impact to roadway wear and tear would be avoided or reduced to a less than significant level with the implementation of mitigation described below in Section 4.5.4, *Mitigation*. With this measure, the addition of construction-related trips is not expected to result in a significant traffic-related impact.

4.5.2.2 Operation

Following construction, the proposed facility would add traffic to the surrounding street 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. As discussed in Section 1.6, *Proposed Action*, the proposed facility would have a staff of 300 full-time employees. The proposed action's traffic generation was estimated using trip generation rates published in the Institute of Transportation Engineers' (ITE) Trip Generation Manual (ITE 2012). **Table 4-10** presents peak hour traffic generation. As shown in this table, the proposed facility would add approximately 126 trips during the morning peak hour and 69 during the afternoon peak hour.

Table 4-10. Estimated Peak Hour Traffic Generation

Land Use [a]	Number	AM Peak Hour Trips				PM Peak Hour Trips			
		Trip Rate [b]	In	Out	Total	Trip Rate [b]	In	Out	Total
Prison	300 employees	0.42	83	43	126	0.2	31	38	69

***Note:*:**[a] Land use and trip rates from ITE Trip Generation Manual, 9th Edition (ITE 2012) for Land Use 571 (Prison).

The proposed action's operational traffic has the potential to incrementally increase congestion on the surrounding roadway network. Potential effects include increased delay at intersections and/or reduced travel speed on roadway segments. These potential impacts would be avoided or reduced to a less than significant level with the implementation of mitigation described below in Section 4.5.4, *Mitigation*.

4.5.3 No Action Alternative

Under the No Action Alternative, the USP and FPC would not be constructed and increases in traffic to area roadways would not occur. It is anticipated that traffic would remain close to existing conditions; therefore, no impacts to transportation or traffic would occur.

4.5.4 Mitigation

Specific mitigation measures would be developed based on the outcome of the ongoing Traffic Impact Study. The Final EIS would identify these specific mitigation measures.

4.6 AIR QUALITY

4.6.1 Affected Environment

The air quality analysis evaluates projected future emissions, including construction and operations. Air quality impacts would be significant if emissions associated with the proposed action would: 1) increase ambient air pollution concentrations above the NAAQS, 2) impair visibility within federally mandated Prevention of Significant Deterioration Class I areas, 3) result in the potential for any stationary source to be considered a major source of emissions if total emissions of any pollutant subject to regulation under the CAA is greater than 250 tons per year (TPY) for attainment areas, or 4) for mobile source emissions, result in an increase in emissions to exceed 250 TPY for any pollutant. The air quality assumptions and calculations are provided in Appendix C, *Air Emission Calculations.*

Pollutants considered in this analysis include the criteria pollutants. Airborne emissions of lead are not considered because there would be no sources of airborne lead associated with the proposed action with the exception of the firing range, which would be indoors.

For criteria pollutant emissions, 250 TPY per pollutant was used as a comparative analysis threshold. This value is used by the USEPA in their New Source Review standards as an indicator for impact analysis for listed new major stationary sources in attainment areas. No similar regulatory threshold is available for mobile source emissions, which are the primary sources for the construction phases, and also a component of operational emissions for the proposed action. Lacking any mobile source emissions thresholds, the 250 TPY major stationary source threshold was used to equitably assess and compare mobile source emissions.

Pollutants would be generated by numerous sources, including diesel exhaust from construction equipment, gasoline exhaust from the driving tracks and operations such as generators and boilers. In general, volatile organic compound (VOC), carbon monoxide (CO), nitrous oxides (NOx), and sulfur dioxide (SO_2) emissions would be primarily generated by diesel-fueled heavy equipment operating in construction areas. Particulate matter (PM) emissions, in the form of PM_{10} and $PM_{2.5}$ would be primarily due to fugitive dust created by land disturbance activities, which would include land clearing; soil excavation, cutting, and filling; trenching; and grading. The fugitive dust emission factor for PM_{10}, which is used as part of the $PM_{2.5}$ calculation (Midwest Research Institute 2005), is assumed to include the

effects of typical control measures such as routine site watering and other measures for dust control. A dust control effectiveness of 50% is assumed, based on the estimated control effectiveness of watering (Western Governors' Association 2006). Other sources of emissions include diesel emissions from heavy construction equipment. Refer to Appendix C, *Air Emission Calculations*, for further discussion of the technical approach and assumptions.

Air emissions were analyzed, where applicable, based on proposed construction activities and operational emissions that would occur during full operation.

Under the CAA, motor vehicles and construction equipment are exempt from air permitting requirements. Since the emissions from these sources associated with the proposed action would occur in areas that are in attainment of the NAAQS for all criteria pollutants, the General Conformity Rule is not applicable. Nonetheless, NEPA and its implementing regulations require analysis of the significance of air quality impacts from these sources as well as non-major stationary sources. However, neither NEPA nor its implementing regulations have established criteria for determining the significance of air quality impacts from such sources in CAA attainment areas.

As noted above, the General Conformity Rule is not applicable to these mobile sources and minor (i.e., non-major) stationary sources in attainment areas. Therefore, the analysis of construction and operational incremental emissions from these sources in attainment areas and the significance criteria selected (250 TPY) are solely for the purpose of informing the public and decision makers about the relative air quality impacts from the Proposed Action under NEPA requirements.

4.6.2 Environmental Consequences

The results of the air emissions analysis show that construction and operational emissions would remain well below the significance thresholds and would not have a significant impact on the local or regional air quality. A summary of the analysis is presented below and the complete analysis is provided in Appendix C, *Air Emission Calculations*.

4.6.2.1 Construction

Direct impacts from emissions from construction would include combustion emissions from fossil fuel-powered equipment and fugitive dust emissions (PM_{10} and $PM_{2.5}$) during clearing, demolition activities, earth moving activities, and operation of equipment on bare soil. **Table 4-11** presents estimates for the primary construction activities that would utilize heavy duty diesel equipment for the Payne Gap site.

Table 4-11. Construction Emission Estimates for Payne Gap Site

Site	Year	VOC Tons	CO Tons	NO_x Tons	SO2 Tons	PM_{10} Tons	$PM_{2.5}$ Tons
Payne Gap	1	7.80	32.35	108.53	1.90	217.59	27.05
Payne Gap	2	7.80	32.35	108.53	1.90	147.09	20.00

Fugitive dust from land disturbance activities would be the primary source of emissions during construction, with most of the emissions occurring during Year 1. PM_{10} emissions are estimated using wetting and other typical reduction practices to reduce dust release by 50%. PM_{10} emissions are predicted to be greatest in Year 1 at the Payne Gap site, at 217.59 TPY. These emissions, however, would remain well below the significance threshold of 250 TPY. Construction emissions would not have direct or indirect significant impacts on the region's air quality.

Direct impacts to air quality may also include emissions from the burning of construction debris, if such an activity were undertaken during construction. Vegetative debris and/or demolition and construction materials would be disposed in accordance with all laws and regulations. Should open burning be necessary, it would be conducted in accordance with Title 401 of the Kentucky Administrative Code, Section 63 (401 KAR 63:005) Open Burning.

4.6.2.2 Operations

Table 4-12 presents the annual emissions based on the site being fully operational. Operational emissions would be the same regardless of the location selected. Stationary sources operating onsite include two 2000-kilowatt diesel-powered emergency generators and three boilers to provide heat and hot water for the site. The boilers have been estimated at 15 MMBtu/hr. One of the boilers would serve as a backup, so air emission calculations evaluated use of two boilers. All of these stationary sources would require an air permit and be regulated by the KDEP, Division for Air Quality. Analysis of permit requirements based on the final stationary source(s) type and design would be performed as design requirements are more fully delineated. This would ensure regulatory permit compliance and that all requisite source registrations would be submitted.

In addition to stationary sources, the emissions from staff commuting to and from work have been estimated at 300 employees and working 365 days per year. The round trip was estimated at 40 miles because of the rural locations that have been selected for analysis.

Table 4-12. Estimated Annual Operational Emissions

Source	VOC Tons/Year	CO Tons/year	NO_x Tons/ Year	SO_2 Tons/Year	PM_{10} Tons/Year	$PM_{2.5}$ Tons/Year
Generators	0.25	2.15	5.09	0.00	0.27	0.27
Boilers	0.26	3.80	15.2	0.16	0.76	0.19
Staff Vehicles	0.19	23.38	1.07	0.02	0.12	0.11
Total	**0.70**	**29.33**	**21.36**	**0.18**	**1.16**	**0.58**

All of the criteria pollutant emissions remain well below the significance threshold of 250 TPY. Based on the emission estimates, operation of the BOP complex would not have direct or indirect significant impacts on the local or regional air quality.

4.6.3 No Action Alternative

Under the No Action alternative, the USP and FPC would not be constructed in Letcher County. The No Action Alternative would not result in emissions of any air pollutants. Therefore, there would be no impact to regional air quality.

4.6.4 Mitigation

Impacts to air quality (PM_{10} emissions) from fugitive dust would be minimized by periodic wetting during construction activities when clearing, excavation, filling and grading activities would occur.

4.7 NOISE

4.7.1 Affected Environment

The Occupational Safety and Health Administration (OSHA) regulates noise impacts to workers and sets forth thresholds for a safe work environment. OSHA has set permissible noise exposure limits (codified in 29 CFR 1910.95[b]). Based on these limits, an employee should not be subjected to continuous noise exceeding 90 dBA for durations lasting more than 8 hours per day (**Table 4-13**). As the level increases, the allowed duration of noise decreases. The maximum limit is 115 dBA for duration of 15 minutes or less. OSHA standards are the best documented requirements in regards to long-term human noise exposure. In addition, OSHA standards state that exposure to impulsive or impact noise (loud, short duration sounds) is not to exceed 140 dB peak sound pressure level (OSHA 2013).

Table 4-13. OSHA Permissible Noise Exposures

Duration per Day (hours)	Sound Level (dBA)
8	90
6	92
4	95
3	97
2	100
1.5	102
1	105
0.5	110
0.25 or less	115

Source: 29 CFR 1910.95(b).

The Payne Gap site is located in a rural area with minimal noise. Areas of the site located immediately adjacent to Highway 119 would experience some noise from traffic traveling through the area. There is nothing located on the site that currently generates noise.

4.7.2 Environmental Consequences

4.7.2.1 Construction

Construction activities associated with the proposed action would result in temporary, short-term increases in noise levels. Noise associated with construction equipment and vehicles, as well as blasting activities to remove bedrock.

As stated in Section 3.6.1, *Affected Environment*, OSHA standards (29 CFR 1910.95) state that employees should not be subjected to continuous noise exceeding 90 dBA for durations lasting more than 8 hours per day. For the purposes of this analysis, noise at a sensitive receptor above the level for a residential district, 55 dBA, is noted for impacts, and noise emissions exceeding 90 dBA for more than 8 hours per day at a sensitive receptor location would be considered to have significant adverse impacts.

A noise sensitive receptor is defined as a location or facility where people involved in indoor or outdoor activities may be subject to stress or considerable interference from noise. Such locations or facilities often include residential dwellings, hospitals, nursing homes, educational facilities, and libraries. Sensitive noise receptors may also include supporting habitat for certain wildlife species or noise sensitive cultural practices.

The proposed action would generate noise during the construction phases of the USP and FPC. Phases of construction that would generate noise include: land clearing and excavations, pile driving, foundation and capping, erection of structural materials, and construction of exterior walls. Construction activities that would impact noise levels include noise from construction equipment operating at the site, construction/delivery vehicles traveling to and from the site, and pile driving activities required for placement of deep pile foundations. Noise levels at a given receptor location would depend on the type and number of pieces of construction equipment being operated and the receptor's distance from the construction site. Construction related noise emissions are listed in **Table 4-14** and can range from 74 to 101 dBA when measured 50 feet from the respective piece of equipment.

Table 4-14. Airborne Construction Related Noise Emissionsyu

Equipment Description	Actual Measured L_{max} at 50 feet (dBA)
Flat Bed Truck	74
Welder/Torch	74
Man Lift	75
Dump Truck	76
Backhoe	78
Compressor (air)	78
Concrete Mixer Truck	79
Drill Rig Truck	79
Front End Loader	79
Rivet Buster/Chipping Gun	79
Ventilation Fan	79
Drum Mixer	80
Vibratory Concrete Mixer	80
Concrete Pump Truck	81
Crane	81
Generator	81
Pumps	81
Dozer	82
Boring Jack Power Unit	83
Warning Horn	83
Auger Drill Rig	84
Scraper	84
Pneumatic Tools	85
Vacuum Excavator	85
Vibrating Hopper	87
Jackhammer	89
Concrete Saw	90
Mounted Impact Hammer (hoe ram)	90
Sheers (on backhoe)	96
Impact Pile Driver	101
Vibratory Pile Driver	101

Source: Federal Highway Administration 2006.

Small increases in noise levels would be expected as a result of the operation of delivery trucks and other construction vehicles. However, larger increases in noise levels would result if pile driving activities are necessary. Increased noise levels would be greatest during the early stages of each construction phase, although these periods would be of relatively short duration. However, under the worst case scenario

during pile driving, there would be periods during construction when noise would range from 101 dBA at 50 feet from the equipment to 89 dBA at 200 feet from the equipment. The 200-foot radius from the equipment would encompass primarily rural undeveloped areas, depending on the location of the pile driving equipment at any given time on the Payne Gap site. When compared to the existing noise conditions at the Payne Gap site (35 dBA) and the OSHA noise thresholds for workers, the pile driving activities would result in significant short-term impacts to noise receptors located within 200 feet of the pile driving equipment location at the construction site, which would vary as the foundation piles would be driven throughout the foundation footprint. Moderate noise impacts would extend up to 1.5 miles from the construction site, as this is the distance at which noise levels would attenuate down to 55–60 dBA.

In conclusion, temporary and short-term noise disturbance would occur during construction; however, implementation of noise attenuation measures described below would reduce potential disturbance from noise. Therefore, implementation of Alternative 1 would have no significant impacts to sensitive noise receptors from noise.

4.7.2.2 Operation

The operation of the proposed USP and FPC, once construction is completed, is not expected to significantly increase ambient noise levels.

4.7.3 No Action Alternative

Under the No Action Alternative, the USP and FPC would not be constructed and no increases in noise as a result of construction or operation would occur. It is anticipated that the site would remain undeveloped; therefore, no increases in noise that my present impacts to nearby noise receptors would occur.

4.7.4 Mitigation

To minimize the impact to noise receptors during the operation of the pile driving equipment, a variety of measures could be taken, including but not limited to:

- Using noise bellows systems to provide further noise attenuation
- Performing the work during daytime hours
- Scheduling the louder construction activities for less intrusive times (mid-morning to mid-afternoon)

4.8 INFRASTRUCTURE AND UTILITIES

4.8.1 Affected Environment

4.8.1.1 Potable Water

Letcher County Water and Sewer District (LWSD) would provide service to the Payne Gap site. LWSD has been extending service in the area which includes an area along Highway 119, adjacent to the Payne Gap site. The water main at this location is 8 inches in diameter and has water pressure near the connection point of approximately 110 pounds per square inch (psi). Potable water would be provided by LWSD via a connection approximately 3.5 miles away from the Payne Gap site (Cardno 2014a). The existing permitted capacity for water is 4,000,000 gallons per day with 2,000,000 gallons per day currently being used.

4.8.1.2 Waste Water

Sanitary sewer service would be provided by the City of Jenkins and treated at the Jenkins Waste Water Treatment Plant (WWTP). The nearest connection point is located at the Gateway Industrial Park in Jenkins, approximately 1.5 miles east of the Payne Gap site (**Figure 4-2**). The facility was designed to treat approximately 600,000 gallons per day and currently treats approximately 400,000 gallons per day (KRADD 2012).

4.8.1.3 Natural Gas

There is one gas well on site, located in the northeast corner of the property. In addition there is an above ground 16-inch high pressure transmission line running directly through the property. The gas well and transmission line are both owned by EQT (Cardno 2014a).

4.8.1.4 Electricity

American Electrical Power (AEP) lines extend along Route 119 in the vicinity of the Payne Gap site and would be able to provide electricity to the Payne Gap site (Cardno 2014a).

4.8.1.5 Telecommunications

Windstream provides telecommunications service in the area of Payne Gap with fiber and copper cables in the vicinity of Route 119. Windstream has sufficient capacity in this area to provide adequate service to the proposed Bureau facility (Cardno 2014a).

4.8.1.6 Solid Waste

Solid waste generated within Letcher County is disposed of at the Laurel Ridge Landfill in London, Kentucky, approximately 90 miles west of Whitesburg, Kentucky (Crouch 2014). The Laurel Ridge Landfill has a maximum annual limit of 350,000 tons. The landfill currently receives approximately 320,000 tons annually. Based on their current capacity, the landfill has a 30-year life expectancy.

4.8.2 Environmental Consequences

4.8.2.1 Potable Water

The USP and FPC are anticipated to require 214 gallons per day per inmate. Based on an anticipated inmate population of 1,200 a total of 258,000 gallons per day would be required under the proposed action. Additionally, the utility plant, warehouses, and training building would require approximately 6,160 gallons per day. Based on the available permitted capacity of 4,000,000 gallons per day and current usage of approximately 2,000,000 gallons per day the additional usage by the USP, FPC and ancillary facilities would not result in impacts to the water supply.

4.8.2.2 Waste Water

Average waste water generated by the USP, FPC and ancillary facilities is anticipated to be 224,000 gallons per day. This would result in the City of Jenkins WWTP exceeding their design capacity of 600,000 gallons per day by approximately 24,000 gallons per day. As a result, the proposed action would result in significant impacts to the City of Jenkins WWTP.

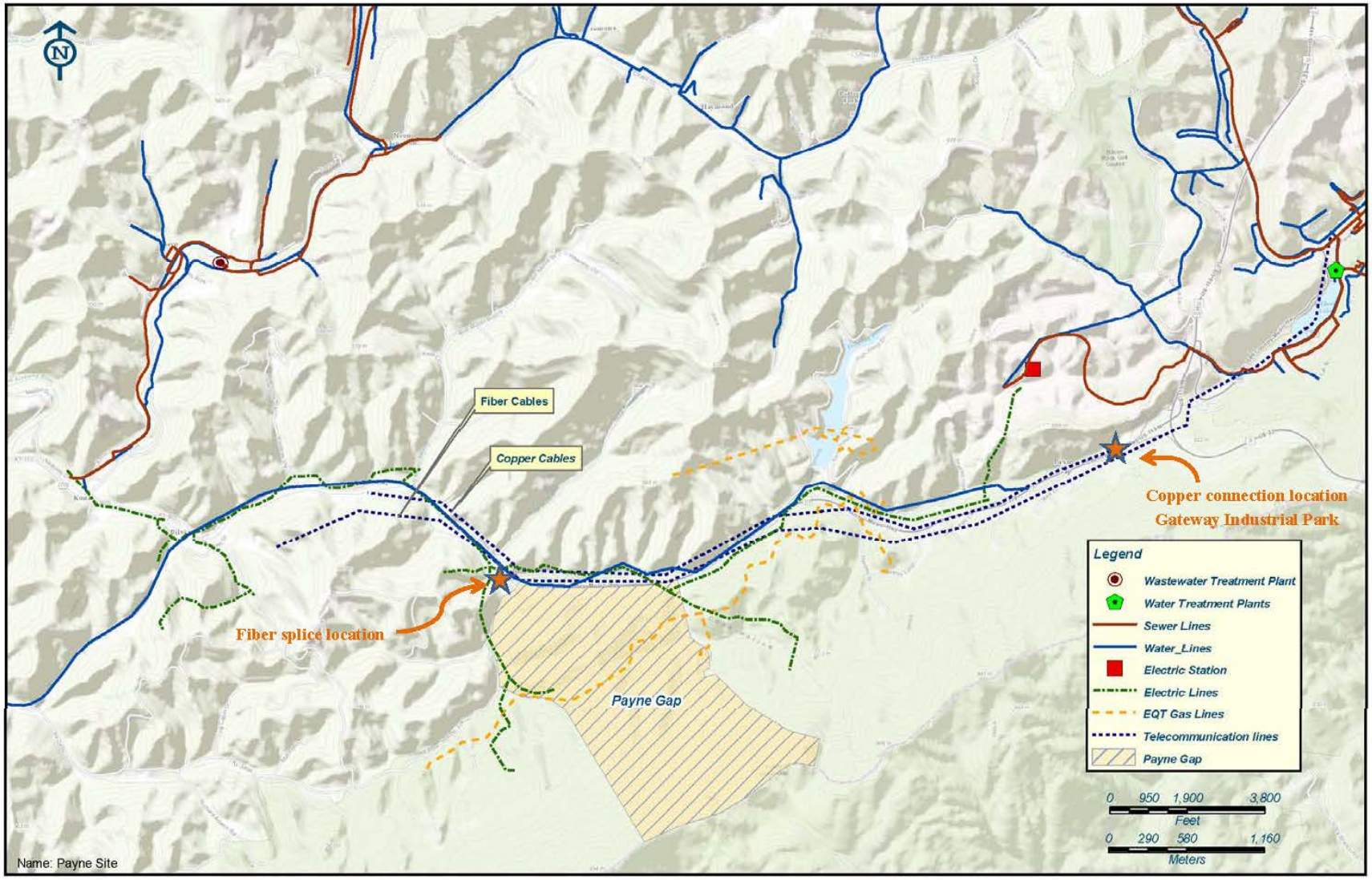

Figure 4-2. Payne Gap Existing Utilities

4.8.2.3 Natural Gas

Implementation of the proposed action at the Payne Gap site would result in the closure and abandonment of a gas well and relocation of an above ground natural gas pipeline. Closure of the gas well would result in lost natural gas production and profit to the owner of the well, EQT. Additionally, the relocation of the natural gas pipeline would result in a loss of transmission and resulting profit to EQT during the relocation process. EQT would also have expend resources to relocate the gas line, as well as acquire right-of-way and permits to complete the relocation. Due to the location of the Jefferson National Forest to the south, the relocation of the line is limited to moving it to the north of its current location. As a result of the implementation of the proposed action at Payne Gap, significant impacts to natural gas infrastructure would occur.

4.8.2.4 Electricity

Coordination with the service provider, AEP, has indicated they have ample capacity to provide service to the facility. AEP would extend overhead lines to a pre-determined handoff point to the secure facility and the Bureau would extend the service on-site to the needed facilities (Cardno 2014a). There would be no charge to extend the overhead lines to the handoff point and no issues with capacity; therefore, no adverse impacts to electrical capacity would occur as a result of the proposed action.

4.8.2.5 Telecommunications

Windstream has indicated that they have sufficient capacity to meet the needs of the proposed USP, FPC, and ancillary facilities at the Payne Gap site. The Bureau would be responsible for connecting the fiber cables at a splice location adjacent to the Payne Gap site, as well as connection of copper cables at the Gateway Industrial Park in Jenkins. Connection costs would be approximately $35,000.

4.8.2.6 Solid Waste

It is anticipated that inmates would generate 4 pounds of solid waste per day or 1,460 pounds per year. With an estimated 1,200 inmates that would result in 4,800 pounds per day or 1,752,000 pounds per year (876 tons per year). Under the proposed action, the solid waste generated at the facility would increase the current tons per year taken to the Laurel Ridge Landfill from 320,000 to 320,876 tons per year. This increase would not result in the landfill going over there current yearly maximum intake of solid waste; therefore, there would be no adverse impacts to the Laurel Ridge Landfill.

4.8.3 No Action Alternative

Under the No Action Alternative, the USP and FPC would not be constructed and the Payne Gap site is anticipated to remain undeveloped. If the Payne Gap site is not developed, there would be no requirement for additional utilities; therefore, it is anticipated that utility usage would remain similar to existing usage.

4.8.4 Mitigation

Mitigation for impacts to wastewater treatment as a result of the implementation of the proposed action at the Payne Gap site would require either the upgrade of the existing City of Jenkins WWTP or the construction of a new WWTP closer to the Payne Gap site. Coordination with the City of Jenkins indicates there are two options to provide waste water treatment to the Payne Gap site (Cardno 2014a). The Bureau would have to pay for these mitigation measures which would be approximately $3,800,000.

Mitigation of impacts to natural gas infrastructure at the Payne Gap site would require the Bureau to pay for the closure of the gas well and relocation of the natural gas pipeline. The gas well would require closure at a cost of $850,000. Additionally, the above ground gas line would require relocation off-site. It is anticipated that 9,000 linear feet of gas line would need to be relocated at a cost of $455 per linear foot (Cardno 2014a). This would result in a total cost for relocation of approximately, $4,095,000. The Bureau would also have to pay for a connection fee of $110,000. In addition to the relocation costs, it would take a minimum of 2-years to design, permit and install this pressure main. The Bureau would also be required to assess the impacts of both the removal of the gas line and the relocation of the gas line, which could result in additional studies and mitigation (i.e. wetland delineation, cultural resource studies, threatened and endangered species).

4.9 CULTURAL RESOURCES

An APE was defined to take into consideration both potential direct and indirect effects to cultural resources from implementation of the proposed action. The APE for Alternative 1 includes the 753-acre Payne Gap site and adjacent areas to the north (**Figure 4-3**). The APE extends beyond the north boundary of the Payne Gap site because of the potential for visual effects to any historic properties that may be present within the viewshed of the proposed federal correctional facility's one- to four-story buildings. Effects to archaeological resources, however, would be limited to the 300-acre area within the APE where construction (direct ground disturbance) would occur.

4.9.1 Affected Environment

4.9.1.1 Archaeological Resources

The Payne Gap site has been subject to previous mining activities; however, the mining activities did not appear to extend to the entire site. Therefore, a Phase I Archaeological Survey was conducted in August 2011 and an additional Phase I archaeological investigation was conducted in August 2014. The surveys conducted pedestrian traversal of transects across areas that were not too steep, surface survey in areas of high ground surface visibility, search of rocky outcrops for rockshelters and other cultural features, and limited subsurface testing of flatter ridgetop, ridgeline, and slope terraces. In addition, background research indicated that no previously identified archaeological sites were present at the proposed Payne Gap site.

A total of 40 shovel test pits were excavated within the APE during both Phase I surveys. No artifacts and no prehistoric or historic archaeological sites eligible for listing on the NRHP were discovered. As a result of both surveys, no further work was recommended at the proposed Payne Gap site. Concurrence on the 2011 survey recommendation was received from the SHPO on January 24, 2012, and concurrence on the 2014 survey recommendation was received on December 22, 2014 (Appendix A, *Agency Coordination*).

4.9.1.2 Traditional Cultural Properties (TCPs)

Under Section 106 of the NHPA, a federal agency is required to give consideration to issues of traditional religious or cultural areas concerning Native American groups. No TCPs have been identified within the project APE based on there being no federally recognized tribes within Kentucky.

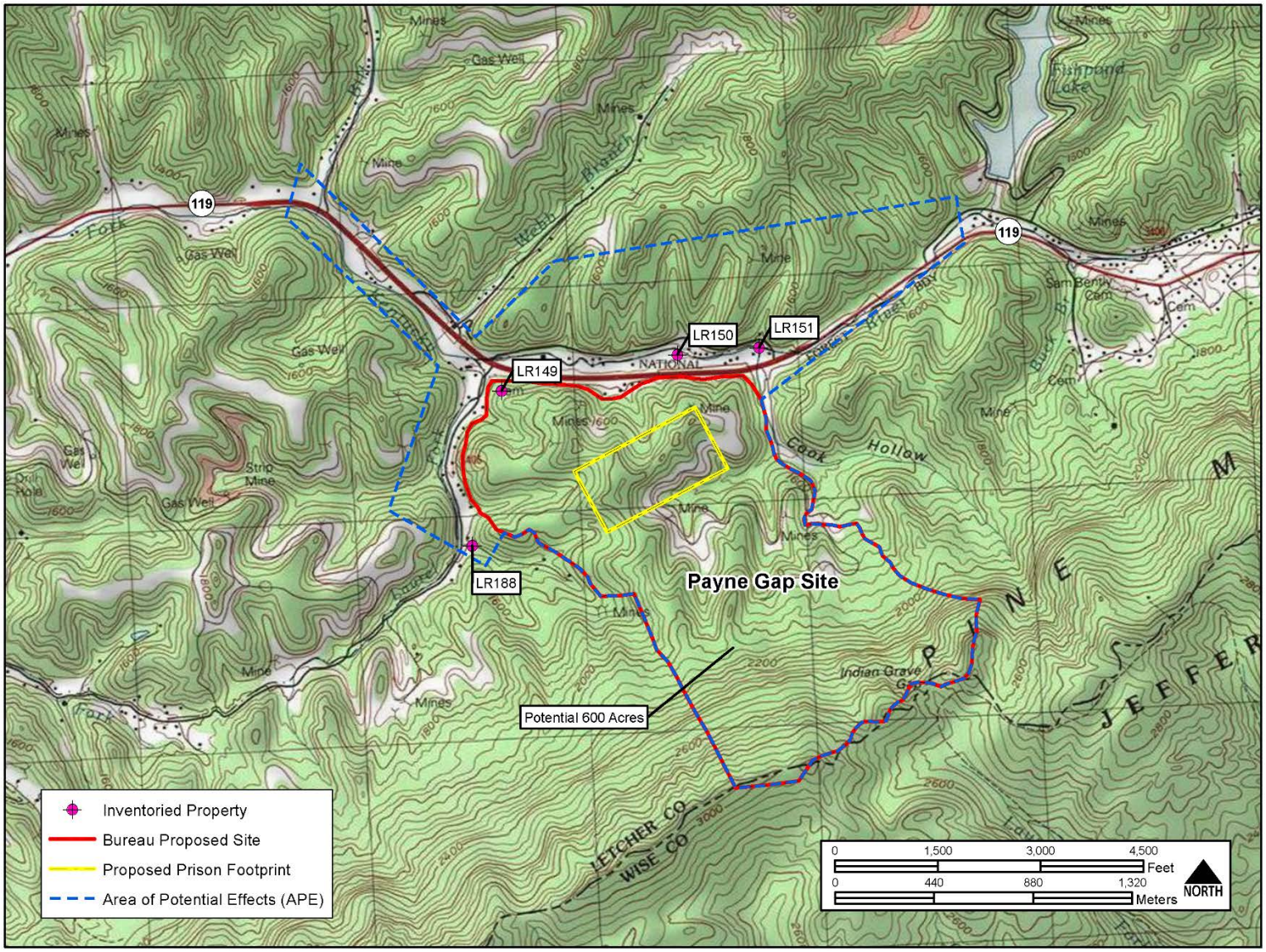

Figure 4-3. Payne Gap Architectural Resources

4.9.1.3 Architectural Resources

Architectural surveys were conducted to identify historic properties in the Payne Gap site APE. The initial reconnaissance survey of the APE was conducted in May 2011. The survey recommended four architectural resources for further investigation to determine their eligibility for inclusion in the NRHP. Other architectural resources located in the APE were not associated with significant historical or architectural contexts of Letcher County and/or were in poor condition; therefore, they were not recommended for further work (TEC, Inc. 2011a). The Kentucky Heritage Council (KHC), the Kentucky SHPO, concurred with the reconnaissance survey recommendations (KHC 2011).

An intensive level survey of the four architectural resources recommended for further investigation as a result of the reconnaissance survey was conducted in August 2013. The resources consist of: two cemeteries (LR149 and LR150); a late-nineteenth century vernacular T-plan house (LR151); and an early-twentieth century vernacular central passage, double pile house (LR188) (Figure 4-3; **Table 4-15**).

Archival and historical research and detailed field survey were undertaken to evaluate the NRHP eligibility of each property. Based on the field and research data, the survey concluded that none of the resources are eligible because they do not meet the NRHP criteria for eligibility (Cardno 2014b). The KHC concurred that the resources are not eligible for the NRHP (KHC 2014) (Appendix A, *Agency Coordination*).

Table 4-15. Architectural Resources in the Payne Gap Site APE Evaluated for NRHP Eligibility

Site Number	Property Name	Year Built	Description	NRHP Eligibility
LR149	Laurel Fork Cemetery	1918–present	Cemetery	Not Eligible
LR150	Wright Cemetery	1863–1961	Private, family cemetery	Not Eligible
LR151	Samuel J. Wright House	Ca. 1885	Vernacular T-plan residence	Not Eligible
LR188	Holbrook-Craft House	Ca. 1903–1914	Vernacular central passage, double pile house	Not Eligible

4.9.2 Environmental Consequences

The cultural resources surveys for the proposed action did not identify any archaeological sites or architectural resources eligible for inclusion in the NRHP in the APE for the Payne Gap site. Therefore, Alternative 1 would have no effect on NRHP-listed or eligible cultural resources.

4.9.3 No Action Alternative

Under the No Action Alternative, the USP and FPC would not be constructed and the site would remain undeveloped and no potential impacts to cultural resources would occur.

4.9.4 Mitigation

Alternative 1 would have no impact to NRHP-listed or eligible cultural resources; therefore, no mitigation is required.

4.10 WATER RESOURCES

4.10.1 Affected Environment

The Payne Gap site has two domestic single household wells located on the northern portion of the site. One well is at an elevation of 1,500 feet with water found at 60 feet below the surface. The second well is located at an elevation of 1,480 feet with water found at an elevation of 40 feet below the surface (KGS 2013). There are no groundwater wells on the Roxana site but there is a domestic single household well located north of the site at an elevation of 1,200 feet with a depth to water of 80 feet. Groundwater flow tends to follow the slope topography. Variations in groundwater conditions are expected based on location and elevation across the site, seasonal conditions, and weather patterns. Both sites are underlain by the Breathitt Group which is comprised of the Pikeville Formation and the Hyden Formation at both sites; however, only the Roxana site is also underlain by the Four Corners Formation. The Breathitt Group yields more than 500 gal/day in more than three-quarters of the wells drilled in valley bottoms, more than 500 gal/day in about three quarters of the wells on hillsides, and more than 100 gal/day to nearly all wells on ridges within Letcher County (KGS 2013). There are no sole source aquifers underlying either site (USEPA 2013b).

The quality of the groundwater in Letcher County ranges from moderately hard in most of the county to moderately soft south of Pine Mountain. Naturally occurring contaminants present in the groundwater consist of sulfate, salt (sodium chloride), iron, and manganese (University of Kentucky 2013b).

According to the Kentucky Division of Water, Groundwater Branch, Letcher County has areas of moderate and high sensitivity to groundwater pollution. The hydrogeologic sensitivity reflects the ease and speed with which a contaminant can move into and within a groundwater system. The hydrogeologic sensitivity of Letcher County has been given a value of three out of five, with five being the most susceptible to groundwater pollution and one being the least susceptible. The region is given a three due to subcutaneous drain and enlarged fractures influence groundwater recharge, fissure networks influence flow, and bidirectional dispersal patters influence overall dispersion (KDEP 1994).

4.10.1.1 Water Quality

Water Quality refers to the suitability of water for a particular use based on selected physical, chemical, and biological characteristics. Potential uses considered include potable water, irrigation, and water able to support life. For the purposes of this EIS, water quality is considered with the statutory requirements regarding water quality conditions.

Water Quality is regulated under the Federal Water Pollution Control Act (FWPCA), as amended by the CWA. The CWA prohibits spills, leaks, or other discharges of oil or hazardous substances into the waters of the U.S. in quantities that may be harmful. Direct discharges of effluents are regulated under the CWA through National Pollutant Discharge Elimination System (NPDES) permit program administered by the USEPA or under state NPDES programs approved by the USEPA. The CWA also requires each state to establish water quality standards for its surface waters derived from the amount of pollutants that can be assimilated by a body of water without deterioration of a designated use. Waters not meeting the water quality standards may require the establishment of a TMDL for the waterbody. Impaired waters requiring a TMDL are called 303 (d) listed waters (KDEP 2013).

According to Environmental Protection Agency data none of the streams on either site have been assessed. Subsequently there are no identified impaired waters or TMDLs for either of the sites (USEPA

2013). The closest assessed water body to the Payne Gap site is Fish Pond, located north of the site, on the opposite side on Kona Cut Road (Route 119). Fish Pond was determined to be good for secondary contact recreation water, warm water aquatic habitat, and cold water aquatic habitat. The closest assessed water body to the Roxana site is the North Fork of the Kentucky River, located north of the site on the opposite side of Route 588/ 160. The North Fork of the Kentucky River was assessed for primary contact recreation and was determined to be impaired as a result of elevated levels of fecal coliform. The elevated levels of fecal coliform were believed to be the result of point source discharges from sewage or packaging plants (USEPA 2013a).

4.10.1.2 Floodplains

EO 11988, *Floodplain Management*, sets forth the responsibilities of federal agencies for reducing the risk of flood loss or damage to personal property, minimizing the impacts of flood loss, and restoring the natural and beneficial functions of floodplains. This order was issued in furtherance of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

4.10.1.3 Wetlands and Waters of the U.S.

Wetland delineations were conducted in May 2011 and August 2014. Hydrology at the site has been highly disturbed as a result of historic mining activities. The delineation included the identification of wetlands and Waters of the U.S.

During delineations approximately 2.84 acres (1.15 hectares) of wetlands were identified within the proposed project area on the Payne Gap site. The majority of the wetlands are located immediately adjacent to an existing or historic road which has impacted water movement in the area. NWI does not depict any wetlands onsite, within or outside of the proposed project area. In addition, several intermittent, perennial and ephemeral streams were delineated on site (TEC, Inc. 2011b, TEC, Inc. 2011c and Cardno 2014c).

Hydrology supporting the wetlands is a result of both groundwater and surface water; runoff and direct precipitation. Dominant vegetation within the wetlands identified at the Payne Gap site consists of Eleocharis obtusa, Juncus effuses, Typha latifolia, and Carex lurida.

Figure 4-4 depicts the wetlands and streams delineated within the Payne Gap site and **Table 4-16** lists the acreages of wetland by type.

Table 4-16. Wetland and Streams Delineated at Payne Gap

Feature Type	Payne Gap Site	
	Acres	Linear Feet
Wetlands		
Palustrine Emergent	1.73	N/A
Palustrine Scrub-Shrub	0.69	N/A
Palustrine Forested	0.42	N/A
Riverine		
Jurisdictional Stream	N/A	14,693
Non-Jurisdictional Stream	N/A	-
TOTAL	**2.84**	**14,693**

Note: N/A = Not Applicable.

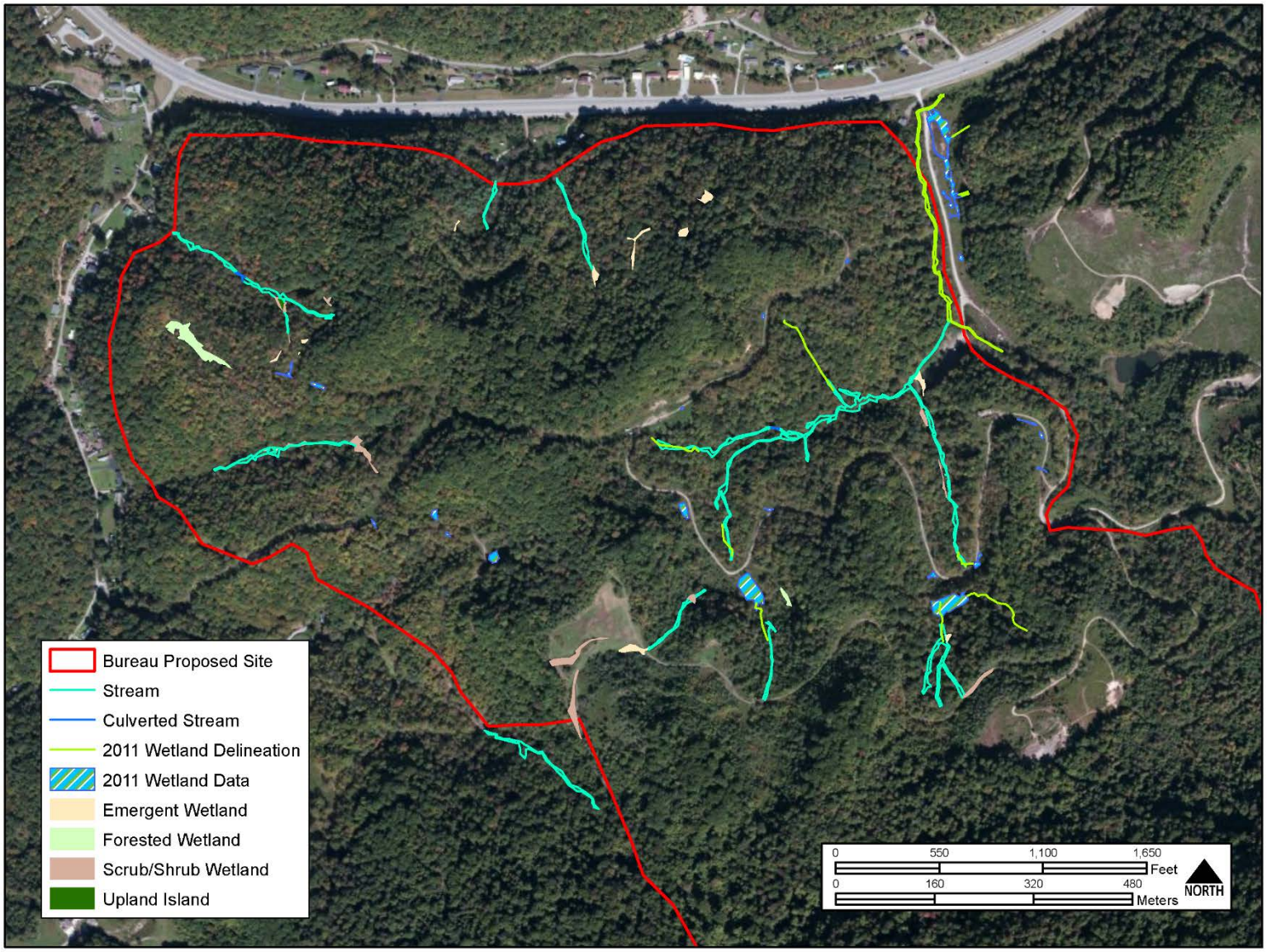

Figure 4-4. Payne Gap Wetlands and Waters of the U.S.

Based on Federal Emergency Management Agency floodplain mapping, there are no 100-year floodplains at the Payne Gap site (Marshall Miller 2012a).

4.10.2 Environmental Consequences

Implementation of the proposed action is not anticipated to affect groundwater, as excavation and construction activities are anticipated to occur at elevations well above the groundwater table.

It is not anticipated that water quality of nearby streams and wetlands would be adversely impacted by on site construction. BMPs would be implemented based on an approved erosion and sediment control plan that would minimize sediment and pollutants from the construction site being carried into nearby water courses.

Implementation of the proposed action at the Payne Gap site would result in approximately 9,072 linear feet of stream impacts, 0.38 acres (0.15 hectares) of impacts to palustrine emergent wetlands, 0.42 acres (0.17 hectares) of impact to palustrine forested wetland and 0.69 acres (0.28 hectares) of impacts to palustrine scrub-shrub wetlands. These impacts would be to the streams and wetlands delineated in 2011 and 2014 (refer to **Table 4-16**) and would result primarily from the excavation and grading activities that would be required to prepare the site for the development of the USP, FPC, ancillary buildings, and roads.

No floodplains are present on the Payne Gap site; therefore no impacts to floodplains would occur.

4.10.3 No Action Alternative

Under the No Action Alternative, the Payne Gap site would not be developed and no impacts to surface waters or wetlands would occur.

4.10.4 Mitigation

Mitigation would be based on the requirements outlined in the Section 404 permit obtained for the project and may include stream restoration, wetland mitigation, or payment into a wetland bank or in-lieu fee program. The Bureau would coordinate the appropriate mitigation with the USACE and KDEP. Additionally, BMPs such as sediment fencing would be placed adjacent to wetlands and streams to minimize sediment from the construction site from being deposited in these areas. Other BMPs may include the placement of a buffer around these resources to reduce the chance of construction equipment encroaching on these resources. A jurisdictional determination would be conducted with the USACE for the preferred alternative to officially receive concurrence from the USACE on the wetland and stream delineation and identify appropriate mitigation. During an August 2013 site visit, the USACE reviewed areas of wetlands and streams delineated during the 2011 wetland delineation. Based on the areas viewed, the USACE agreed with the approach and methodology.

4.11 BIOLOGICAL RESOURCES

4.11.1 Affected Environment

Biological resources include living, native, or naturalized plant and animal species and the habitats where they occur. Habitat can be defined as the resources and conditions present in an area that supports the existence of a plant or animal (Hall et al. 1997). Although the existence and preservation of biological resources are intrinsically valuable, these resources also provide aesthetic, recreational, and socioeconomic values to society.

This analysis focuses on species and vegetation types that are important to the function of the ecosystem, of special societal importance, or are protected under Federal or state law or statute. For the purposes of this EIS, these resources are divided into three major categories: vegetation, wildlife, and special-status species.

Vegetation includes terrestrial plant communities and the analysis focuses on vegetation types that are important to the function of the ecosystem or are protected under Federal or State law.

Wildlife includes all common animal species, with the exception of those identified as special-status species (see below). The wildlife category includes invertebrates, fish, amphibians, reptiles, mammals, and birds, including native bird species protected under the Migratory Bird Treaty Act (MBTA).

Special-status species includes plant and animal species that are listed or proposed for listing by USFWS as threatened and endangered or are candidate species under the ESA. ESA candidate species are plant or animal species for which USFWS has sufficient information on file regarding biological vulnerability and threats to support a proposal that would list them as endangered or threatened under the ESA, based on the most recent candidate review. In addition, designated and proposed critical habitat for ESA-listed species are also included in this EIS, as appropriate. Critical habitat is a specific geographic area(s) that contains features essential for the conservation of a threatened or endangered species and that may require special management and protection. This section also addresses species that are listed by the State of Kentucky as threatened or endangered.

4.11.1.1 Vegetation

The Payne Gap site is primarily covered in mature hardwood forest with herbaceous and scrub shrub vegetation dominating areas previously disturbed by historic strip mining activities and along the shoulders of the site access roads. Site observations indicate upland vegetation on the Payne Gap site includes, American beech (*Fagus grandifolia*), tuliptree (*Liriodendron tulipifera*), northern red oak (*Quercus rubra*), sourwood (*Oxydendrum arboreum*), American elm (*Ulmus americana*), Allegheny blackberry (*Rubus allegheniensis*), autumn olive (*Elaeagnus umbellata*), white clover (*Trifolium repens*), sericea lespedeza (*Lespedeza cuneata*), multiflora rose (*Rosa multiflora*), Kentucky bluegrass (*Poa pratensis*), and summer grape (*Vitis aestivalis*). Wetland vegetation includes American sycamore (*Platanus occidentalis*), black willow (*Salix nigra*), green ash (*Fraxinus pennsylvanica*), jewelweed (*Impatiens capensis*), common rush (*Juncus effusus*), broadleaf cattail (*Typha latifolia*), fowl mannagrass (*Glyceria striata*), sallow sedge (*Carex lurida*), and woolgrass (*Scirpus cyperinus*).

4.11.1.2 Wildlife

Due to relative proximity wildlife on both sites are believed to be similar; however, during a site visit a herd of eastern elk (*Cervus elaphus*) was observed on the Payne Gap site. Species likely to be found on both sites includes red-winged blackbirds (*Agelaius phoeniceus*), tufted titmouses (*Baeolophus bicolor*), red-tailed hawks (*Buteo jamaicensis*), coyotes (*Canis latrans*), Virginia opossums (*Dipelphis virginiana*), American black bears (*Ursus americanus*), eastern gray squirrels (*Sciurus carolinensis*), green frogs (*Rana clamitans melanota*), American toads (*Bufo americanus*), black rat snakes (*Elaphe obsoleta obsolete*), southern flying squirrels (*Glaucomys volans*), eastern spotted skunks (*Spilogale putorius*), copperheads (*Agkistrodon contortrix*), eastern hognose snakes (*Heterodon platirhinos*), fence lizards (*Sceloporus undulates*), ,wild turkeys (*Meleagris gallopavo*), and white tailed deer (*Odocoileus virginianus*) (Kentucky Department of Fish and Wildlife Resources 2013).

The MBTA is the primary legislation established to conserve migratory birds. The act prohibits taking, killing, or possessing migratory birds unless permitted by regulation.

4.11.1.3 Federally Threatened and Endangered and State Listed Special Status Species

Due to the number of state listed species listed by Kentucky as potentially occurring in Letcher County and subsequently on the two proposed sites the following section will focus on federal listed species. A full list of special status species and their status is included in **Table 4-17**.

The gray bat (*Myotis grisescens*) is federally listed as endangered and listed by Kentucky as threatened. The gray bat roosts in caves throughout the year although suitable caves are rare. For winter hibernacula the bats require vertical caves with domed halls. The winter caves must also have a temperature of between 6 and 11 degrees Celsius. Forested areas along the banks of streams and lakes provide important protection for adults and young. Summer caves are always within 1 km of a river or reservoir where the bats forage. Forests provide important feeding areas for young bats, which will not forage in areas where the forests have been cleared (Natureserve 2013a).

The Indiana bat (*Myotis sodalis*) is federally listed as endangered and is listed by Kentucky as endangered. The Indiana bat hibernates in caves; however, maternity sites are generally behind loose bark of dead or dying trees or in tree cavities. They forage in riparian areas, upland forests, ponds, and fields, but forested landscapes are the most important habitat. They typically hibernate in the coldest area of a cave to ensure a low enough metabolic rate in order to conserve fat reserves throughout the winter; however they will move away from areas that dip below freezing. Known roost tree species include elm, oak, beech, hickory, maple, ash, sassafras, birch, sycamore, locust, aspen, cottonwood, pine, and hemlock with a preference for trees with exfoliating bark (Natureserve 2013b).

According to the USFWS there is no federal designated Critical Habitat on either site (USFWS 2013).

Based on coordination with USFWS the Payne Gap site is considered to have the potential for Indiana bat as well as gray bat. A Phase I survey conducted in December 2014 confirmed the presence of both winter and summer habitat (Copperhead Environmental Consulting 2014).

In addition, the Kentucky arrow darter is known to exist in the upper Kentucky River basin. Habitat for the species consists of pools and transitional areas between riffles and pools in moderate to high gradient streams. The streams within the project area are primarily small channels that do not contain riffle and pool complexes (USFWS 2013).

Table 4-17. State and Federal Report of Endangered, Threatened, and Special Concern Plants, Animals, and Natural Communities of Letcher County, Kentucky

Scientific Name	Common Name	Status (State/Federal)
Liverworts		
Plagiochila caduciloba	Gorge Leafy Liverwort	E/N
Mosses		
Anomodon rugelii	None	T/N
Brachythecium populeum	Matted Feather Moss	E/N
Cirriphyllum piliferum	None	T/N
Dicranodontium asperulum	None	E/N
Entodon brevisetus	None	E/N
Neckera pennata	None	T/N
Oncophorus raui	None	E/N

Table 4-17. State and Federal Report of Endangered, Threatened, and Special Concern Plants, Animals, and Natural Communities of Letcher County, Kentucky		
Scientific Name	**Common Name**	**Status (State/Federal)**
Polytrichum pallidisetum	A Hair Cap Moss	T/N
Polytrichum strictum	None	E/N
Sphagnum quinquefarium	Five-ranked Bogmoss	E/N
Vascular Plants		
Adlumia fungosa	Allegheny-vine	H/N
Angelica triquinata	Filmy Angelica	E/N
Baptisia tinctoria	Yellow Wild Indigo	T/N
Botrychium matricariifolium	Matricary Grape-fern	E/N
Boykinia aconitifolia	Brook Saxifrage	E/N
Carex aestivalis	Summer Sedge	E/N
Carex appalachica	Appalachian Sedge	T/N
Castanea pumila	Allegheny Chinkapin	T/N
Circaea alpine	Small Enchanter's Nightshade	S/N
Corydalis sempervirens	Rock Harlequin	S/N
Cymophyllus fraserianus	Fraser's Sedge	E/N
Cypripedium parviflorum	Small Yellow Lady's-slipper	T/N
Eupatorium steelei	Steele's Joe-pye-weed	T/N
Gentiana decora	Showy Gentian	S/N
Hexastylis contracta	Southern Heartleaf	E/SOMC
Houstonia serpyllifolia	Michaux's Bluets	E/N
Hydrophyllum virginianum	Eastern Waterleaf	T/N
Juglans cinerea	White Walnut	T/SOMC
Leucothoe recurve	Red-twig Doghobble	E/N
Lilium superbum	Turk's Cap Lily	T/N
Listera smallii	Kidney-leaf Twayblade	T/N
Monotropsis odorata	Sweet Pinesap	T/SOMC
Oenothera oakesiana	Evening Primrose	H/N
Oenothera perennis	Small Sundrops	E/N
Orontium aquaticum	Golden Club	T/N
Pogonia ophioglossoides	Rose Pogonia	E/N
Prosartes maculate	Nodding Mandarin	S/N
Sanguisorba Canadensis	Canada Burnet	E/N
Saxifraga michauxii	Michaux's Saxifrage	T/N
Saxifraga micranthidifolia	Lettuce-leaf Saxifrage	E/N
Solidago curtisii	Curtis' Goldenrod	S/N
Trillium undulatum	Painted Trillium	T/N
Terrestrial Snails		
Glyphyalinia rhoadsi	Sculpted Glyph	T/N
Neohelix dentifera	Big-tooth Whitelip	T/N
Patera panselenus	Virginia Bladetooth	S/N
Crustaceans		
Cambarus bunting	Longclaw Crayfish	S/N
Cambarus parvoculus	Mountain Midget Crayfish	T/N
Insects		
Amphiagrion saucium	Eastern Red Damsel	E/N
Calephelis borealis	Northern Metalmark T /	T/N
Erora laeta	Early Hairstreak	T/N
Litobrancha recurvate	A Burrowing Mayfly	S/N
Papaipema speciosissima	Osmunda Borer Moth	E/N
Phyciodes batesii	Tawny Crescent	H/SOMC

Table 4-17. State and Federal Report of Endangered, Threatened, and Special Concern Plants, Animals, and Natural Communities of Letcher County, Kentucky		
Scientific Name	**Common Name**	**Status (State/Federal)**
Stylurus notatus	Elusive Clubtail	E/SOMC
Stylurus scudderi	Zebra Clubtail	E/N
Fishes		
Chrosomus cumberlandensis	Blackside Dace	T/LT
Etheostoma sagitta	Cumberland Arrow Darter	S/C
Amphibians		
Cryptobranchus alleganiensis alleganiensis	Eastern Hellbender	E / SOMC
Plethodon wehrlei	Wehrle's Salamander	E/N
Breeding Birds		
Accipiter striatus	Sharp-shinned Hawk	S/N
Corvus corax	Common Raven	T/N
Pheucticus ludovicianus	Rose-breasted Grosbeak	S/N
Tyto alba	Barn Owl	S/N
Vermivora chrysoptera	Golden-winged Warbler	T/SOMC
Mammals		
Clethrionomys gapperi maurus	Kentucky Red-backed Vole	S/SOMC
Corynorhinus rafinesquii	Rafinesque's Big-eared Bat	S/SOMC
Mustela nivalis	Least Weasel	S/N
Myotis leibii	Eastern Small-footed Myotis	T/SOMC
Myotis sodalist	Indiana Bat	E/LE
Sorex cinereus	Cinereus Shrew	S/N
Sorex dispar blitchi	Long-tailed Shrew	E/N
Spilogale putorius	Eastern Spotted Skunk	S/N
Ursus americanus	American Black Bear	S/N
Communities		
Appalachian seep/bog	Appalachian seep/bog	T/N

Notes: N – None, E – Endangered, T – Threatened, S - Special Concern, SOMC - Species of Management Concern, H – Historic.
Source: KSNPC 2013.

4.11.2 Environmental Consequences

4.11.2.1 Vegetation

Approximately 218 acres (88 hectares) of forested area would be impacted by the proposed action. These impacts would be the result of excavation and grading activities required to prepare the site for development.

4.11.2.2 Wildlife

Wildlife species found on the sites would likely be displaced during construction activities due to the loss of habitat and increases in noise. However, over 535 acres (217 hectares) of the site itself would remain undisturbed and continue to provide habitat, including breeding and foraging areas, for wildlife species found on-site. Additionally, the site is surrounded by similar habitat that could accommodate species that are displaced by construction activities. Based on the available habitat that will remain on site and habitat adjacent to the site (Jefferson National Forest), it is anticipated that these impacts would not adversely affect wildlife species that are currently present on-site.

Use of the non-lethal/lethal fence has the potential to result in adverse impacts to small animals and avian species, should they pass through the outer fences and into the area of the non-lethal/lethal fence fence.

4.11.2.3 Federally Threatened and Endangered and State Listed Special Status Species

Implementation of the proposed action at the Payne Gap site has the potential to impact Indiana bats and gray bats. Phase I bat habitat surveys conducted in December 2014 at the Payne Gap site have identified the presence of both summer and winter habitat. The Phase I survey is currently under review by the USFWS and based on the outcome of the review, the Bureau would coordinate with USFWS to determine if additional studies are required and the potential for impacts to the Indiana bats and gray bats. The Bureau, through coordination with USFWS, would avoid or minimize impacts to a degree where they can be considered insignificant or discountable. The impact assessment would include the potential noise from the proposed outdoor firing range. The range would be used approximately once a month for small arms training and maintenance.

It is not anticipated that the Kentucky arrow darter would be impacted by the project. The streams within the project site are small channels and do not contain riffle pool complexes. Additionally conductivity measurements were taken within streams on the project site. Conductivity measurements ranged from 562 microseconds (µS) to 1,970 µS. Studies have demonstrated that Kentucky arrow darters are not likely to be present when conductivity levels exceed approximately 250 µS; therefore no impacts to Kentucky arrow darter are anticipated (USFWS 2010).

4.11.3 No Action Alternative

Under the No Action Alternative, the Payne Gap site would not be developed and there would be no impacts to vegetation, wildlife, or threatened and endangered species.

4.11.4 Mitigation

Mitigation measures for construction impacts to vegetation and wildlife would be to minimize disturbance of existing vegetation 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 would be revegetated to the maximum extent possible while maintaining the Bureau's site requirements.

Mitigation and minimization measures for threatened and endangered species would be dependent on USFWS comments and coordination between USFWS and the Bureau would be ongoing to determine appropriate mitigation measures. Mitigation measures may include:

- Timbering restrictions
- Minimization of sedimentation/erosion impacts to streams. The erosion and sedimentation control plan that would be developed prior to construction would account for the implementation of BMPs to minimize impacts to streams
- Mitigation fund for habitat removal based on time of year habitat is removed
- Minimize noise from the firing range through use of noise shielding structures
- Times when firing range is used

The Bureau has conducted prior EAs regarding the installation of non-lethal/lethal fences for potential impacts, especially to avian and small mammal species. These prior assessments have found less than

significant adverse impacts and less than significant impacts are anticipated with the non-lethal/lethal fence to be installed as part of this proposed action. However, following activation of the non-lethal/lethal fence, the Bureau would monitor the fence line to determine if wildlife, particularly avian species are being adversely effected. The Bureau would collect data regarding these occurrences including identification of species and photographs. The data collected would be used to document and analyze emerging trends. If adverse effects were identified through the analysis of data collected the Bureau would contact USFWS and appropriate state wildlife agencies to determine if changes to the operation of the fence are warranted.

4.12 HAZARDOUS MATERIALS AND WASTE

4.12.1 Affected Environment

4.12.1.1 Hazardous Materials

The proposed USP and FPC construction site is located in a relatively undeveloped area. No hazardous materials are known to be in storage or in use in this area. According the USEPA "Cleanups In My Community" mapping tool, there are no Brownfield, Superfund or RCRA Corrective Action sites in the vicinity of the proposed project area. No sites in the town of Payne Gap were listed in USEPAs TSCA, TRI or RCRA databases. No hazardous materials or evidence of their presence (i.e. stressed vegetation, stained soils, drums) on the site were observed during site visits conducted by Cardno in 2011, 2013, and 2014.

4.12.1.2 Hazardous Wastes

The proposed USP and FPC construction site is located in a relatively undeveloped area. No hazardous wastes are known to be in storage or generated in this area. According the USEPA Cleanups In My Community mapping tool, there are no Brownfield, Superfund or RCRA Corrective Action sites in the vicinity of the proposed project area. No sites in the town of Payne Gap were listed in USEPAs TSCA, TRI or RCRA databases. No hazardous wastes or evidence of their presence (i.e. stressed vegetation, stained soils, drums, batteries) on the site and no evidence of acid mine drainage was observed during site visits conducted by Cardno in 2011, 2013, and 2014.

4.12.1.3 Radon

The USEPA classifies Letcher County as having a moderate potential for radon intrusion (Zone 2). Zone 2 counties have a predicted average indoor radon screening level between 2 and 4 pCi/L. The USEPA action level for radon is 4 pCi/L.

4.12.2 Environmental Consequences

4.12.2.1 Hazardous Materials

Construction activities would require the use of hazardous materials. The majority of the hazardous materials expected to be used are common to construction and include diesel fuel, gasoline, and propane to fuel the construction equipment; hydraulic fluids, oils, and lubricants; and batteries. The transport and use of hazardous materials would have the potential to result in accidental spills that could adversely impact soil and groundwater on and adjacent to the construction site or along transportation routes. Hazardous materials associated with construction activities would be delivered and stored in a manner that would prevent these materials from leaking, spilling, and potentially polluting soils or groundwater,

and in accordance with applicable federal, state, and local environmental and public and occupational health and safety regulations. With the implementation of appropriate handling and management procedures, hazardous materials used during construction would have no significant impacts to the environment.

4.12.2.2 Hazardous Wastes

Hazardous waste would be generated during construction activities and would include but not be limited to empty containers, spent solvents, waste oil, spill cleanup materials (if used), and lead-acid batteries from construction equipment. Construction contractors would be responsible for safely removing these construction-generated wastes from the construction site and for arranging for recycling or disposal in accordance with applicable regulations. The total monthly generation of hazardous waste during construction is anticipated to be less than 100 kilograms during a calendar month. The construction contractor would be responsible for determining their regulatory status regarding hazardous waste generation during construction, and obtaining and maintaining compliance in accordance with federal and state laws. Hazardous wastes associated with construction activities would be handled and stored in a manner that would minimize human exposure to these materials and prevent these materials from polluting soils or groundwater, and in accordance with applicable federal, state, and local environmental and human health and safety regulations. Adherence to these policies, procedures, and regulations would minimize the potential impacts from exposure and accidental releases during revetment construction. In the event of an accidental release, contaminated media would be treated on-site or would be promptly removed and disposed of in accordance with applicable federal and state regulations. With the implementation of appropriate handling and management procedures, hazardous wastes generated during construction would have no significant impacts to the environment.

Operation of the UPC and FPC would require the use of small amounts of hazardous materials such as petroleum, oils and lubricants for lawn maintenance equipment, pesticides and paints. These materials would be acquired as needed and large volumes would not be stored on site. Those volumes that are stored on site would be stored, used and disposed in accordance with applicable regulations and would have no significant impacts on the environment.

Expended lead and brass from firing range operations would be recovered and recycled as part of general range maintenance activities and would have no significant impacts to the environment.

Radon

Structures intended for human occupancy may be equipped with radon detectors or may incorporate best management practices for radon control into their design to ensure there are no impacts from radon.

4.12.3 No Action Alternative

Under the No Action Alternative, the Payne Gap site would not be developed and there would be no impacts associated with hazardous materials and waste.

4.12.4 Mitigation

Alternative 1 would have no significant impacts to hazardous materials and wastes; therefore, no mitigation is required.

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5.0 ALTERNATIVE 2 – ROXANA

5.1 LAND USE AND ZONING

5.1.1 Affected Environment

Land use associated with the proposed location of Alternative 2 consists primarily of forest, residential area, strip mines, oil and gas wells and a small model airplane airstrip. The area was previously deep mined; however mining activities no longer occur at the site. Land use surrounding the site is also primarily forested, with small single family residential homes in the area. There are also several state parks and nature preserves within the area. They include Bad Branch Falls State Nature Preserve, Kingdom Come State Park, and Pine Mountain Wildlife Management Area. There are no zoning ordinances or land use classifications identified for this area (DePriest 2013). Land use associated with the Roxana site is depicted in **Figure 5-1**.

5.1.2 Environmental Consequences

Changes to land use would occur on the 800-acre (324-hectare) Roxana site. The site would be converted from an undeveloped open space containing a mix of grass and scrub-shrub vegetation to a government institution consisting of several facilities, parking lots, etc. Additionally, the model airplane strip would be removed. The oil and gas wells would require closure and these impacts are further discussed in Section 5.8, *Infrastructure and Utilities*.

5.1.3 No Action Alternative

The No Action Alternative would be the same as that described in Section 4.1.3.

5.1.4 Mitigation

Mitigation for Alternative 2 would be the same as that described for Alternative 1 in Section 4.1.4.

5.2 TOPOGRAPHY, GEOLOGY AND SOILS

5.2.1 Affected Environment

The topography at the Roxana site has been significantly impacted by mountaintop removal coal mining. A plateau resulting from mining has replaced a mountain ridge in the central portion of the site. This change has not been accounted for on USGS topographic maps; however, the highest point and lowest points of the site remain unchanged. The highest elevation is located in the south eastern portion of the site at an elevation of approximately 1,850 feet AMSL. The lowest elevation on site is approximately 1,035 feet AMSL, located in the north western portion of the site adjacent to the North Fork of the Kentucky River.

The Roxana site underlain by the Breathitt Group which is comprised of the Pikeville Formation and the Hyden Formation; however, the Roxana site is also underlain by the Four Corners Formation. The geology underlying the Roxana site is primarily the Hyden Formation (KGS 2013).

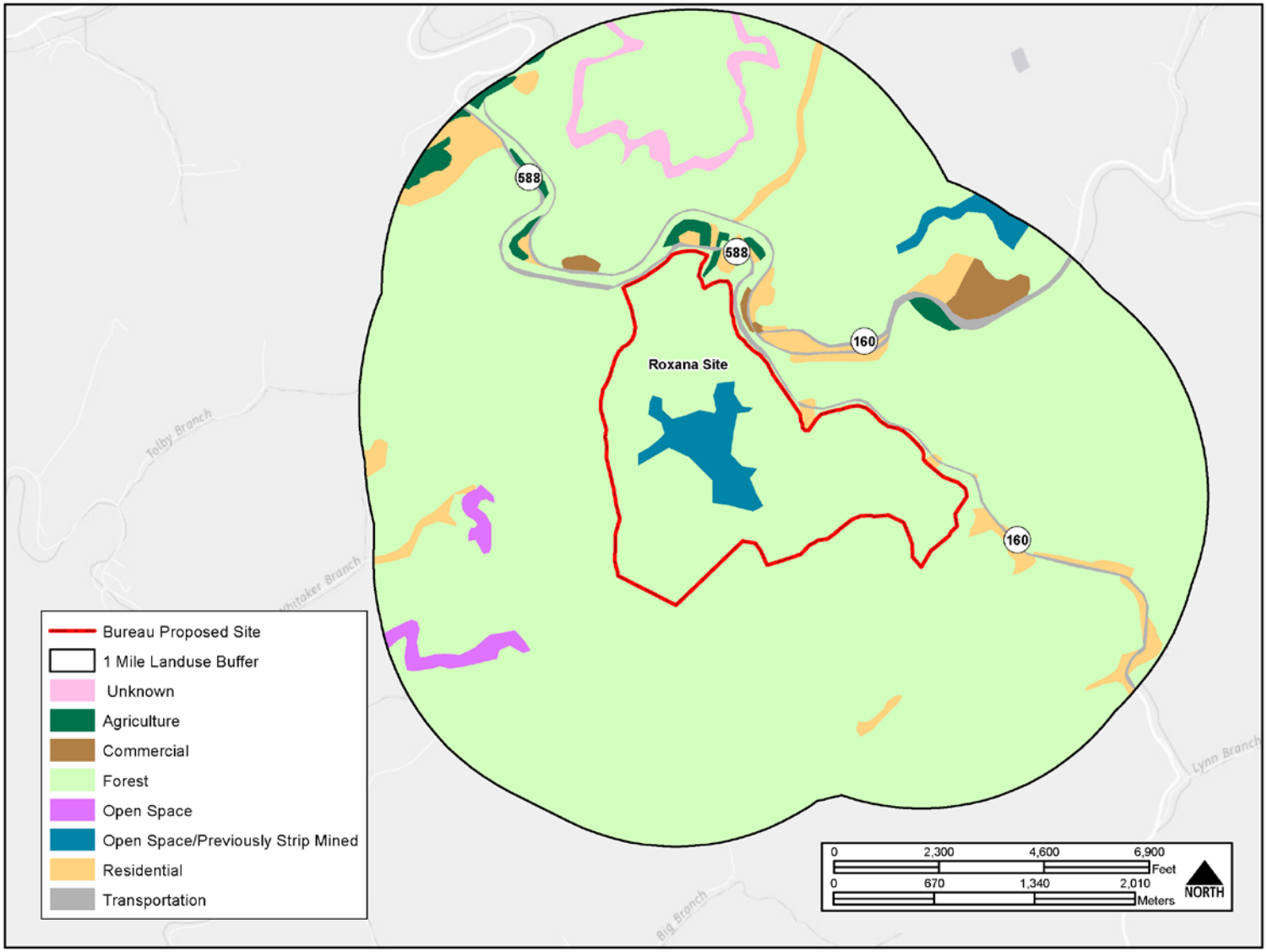

Figure 5-1. Roxana Land Use

The three most common soils on the Roxana site are the Cloverlick-Kimper-Highsplint complex, (30-65 percent slopes), the Kaymine, Fairpoint and Fiveblock soils map unit (2-70 percent slopes), and the Shelocta-Highsplint (30-65 percent slopes). To a lesser degree the following soils underlie the site; Allegheny Loam (2-25 percent slopes), Dekalb-Gilpin-Rayne complex (25-65 percent slopes), Fiveblock and Kaymine soils (0-30 percent slopes), Gilpin-Shelocta complex (12-25 percent), Grigsby sandy loam (occasionally flooded), Grigsby-Urban land complex (0-6 percent slopes), Urban land-Udorthents complex (0-15 percent slopes), and Urban land-Udorthents-Grigsby complex (0-6 percent slopes) (NRCS 2013).

The Roxana site contains a small area of soils designated as farmland of statewide importance (NRCS 2013). The soil is Allegheny Loam and is located in the floodplain of the North Fork of the Kentucky River in the northernmost portion of the site. None of the soils associated with the Roxana site are listed as hydric by NRCS.

5.2.2 Environmental Consequences

Development of the site would require significant excavation and fill activities to create a level pad for construction of the facilities or to build a road. A 2:1 fill slope and a 1:1 cut slope were used in the estimate adjacent to the pads and roads to transition to the original topography at the Roxanna site. More detail on the earthwork calculations can be found in Appendix B. As described in Section 2.5, *Alternative 2 – Roxana,* and **Table 2-2 ,** *Estimated Site Preparation Quantities for Alternative 2 – Roxana,* of this document, excavation activities (cut) would include 2,928,992 cubic yards (2,239,375 cubic meters) of spoil material and 902,757 cubic yards (690,207 cubic meters) of rock. The excavated soil and rock would be compacted to create a structural fill in the building pads and the valleys. The amount of structural fill was estimated to be 2,087,607 cubic yards (1,596,090 cubic meters) and the spoil fill was estimated to be 2,205,394 cubic yards (1,686,115 cubic meters). All excavated materials would be used on-site for structural fill. The maximum cut (excavation) at Roxanna would be approximately 20 meters and the maximum fill would be approximately 65 meters. Removal of bedrock would require blasting activities. Impacts resulting from these activities would include loss of productive soil, erosion, and destabilization of slopes (as a result of cuts and fills). As a result of the excavation and fill activities, the topography of the site would change at the maximum cut from 465 meters to 445 meters MSL in the main building area and a maximum fill from 380 meters to 445 meters MSL in the main building area.

5.2.3 No Action Alternative

The No Action Alternative would be the same as that described in Section 4.2.3.

5.2.4 Mitigation

Mitigation for Alternative 2 would be the same as the mitigation and BMPs described for Alternative 1 in Section 4.2.4.

5.3 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

5.3.1 Affected Environment

Under Alternative 2, the Bureau would acquire approximately 700 acres (283 hectares) of land known as the Roxana site. The site is located 7.5 miles west of Whitesburg in Letcher County, Kentucky (**Figure 2-**

4). The affected environment of the socioeconomics and environmental justice study area for Alternative 2 would be the same as described for Alternative 1.

5.3.2 Environmental Consequences

The socioeconomic and environmental justice impacts of Alternative 2 would be the same as described for Alternative 1 because construction costs and operation expenditures of the proposed USP and FPC would be essentially the same. Therefore, implementation of Alternative 2 would have beneficial impacts to socioeconomics and no impacts to environmental justice populations or to children.

5.3.3 No Action Alternative

The No Action Alternative would be the same as that described in Section 4.3.3.

5.3.4 Mitigation

Mitigation for Alternative 2 would be the same as that described for Alternative 1 in Section 4.3.4.

5.4 COMMUNITY FACILITIES AND SERVICES

5.4.1 Affected Environment

Community facilities and services are similar for the Roxana site are similar to those described for the Payne Gap site in Section 4.4, with the exception of the local police and fire departments, as described below.

5.4.1.1 Police

The Whitesburg Police Department is comprised of six police officers, one chief of police, one second in command and one secretary. They are currently short staffed one police officer. The department has eight squad cars and provides 24 hour coverage (Whitesburg Police Department 2013).

5.4.1.2 Fire

The Letcher County Fire and Rescue provide fire response to the area of the Roxana site. Letcher County Fire and Rescue is comprised of 32 firefighters (20 paid and 12 volunteer). Fifteen of the personnel are EMTs. Letcher County Fire and Rescue has three stations: Jeremiah, Blackey, and Hallie and services the southern portion of Letcher County. Fire rescue equipment includes five ambulances, two tanker trucks and three engines (Letcher County Fire and Rescue 2013).

Whitesburg Fire and Rescue consists of 30 firefighters (25 volunteer and 5 paid). Five of the firefighters are EMTs. The station has five engines and a boom truck with a snorkel. Whitesburg Fire and Rescue has mutual aid agreements with the rest of Letcher County and are able to assist with emergencies throughout the county if dispatched (Whitesburg Fire and Rescue 2013).

5.4.1.3 Healthcare

Existing healthcare services are the same as those described for the Payne Gap site in Section 4.4.

5.4.1.4 Schools

Existing school conditions are the same as those described for the Payne Gap site in Section 4.4.

5.4.2 Environmental Consequences

5.4.2.1 Police

The law enforcement groups that have jurisdiction over the area where the Roxana site is located would be able to provide assistance in the event of an emergency situation at the USP that required assistance beyond the capabilities of the USP. The individual law enforcement agencies have stated they would be willing to discuss the development of a MOU with the Bureau to provide these services. With the exception of the Whitesburg Police Department Law enforcement indicated this would not result in impacts to their services or require the hiring of additional staff; therefore, the proposed action would have no impact to law enforcement. The Whitesburg Police Department may be impacted due to the need for an additional officer and the potential need for additional equipment.

5.4.2.2 Fire

Fire departments that would provide emergency services for the area where the Roxana site is located would be able to provide assistance to the USP and FPC in the event there was an incident that was beyond the capabilities of the USP and FPC. The individual fire departments have indicated they would be willing to discuss the development of a MOU with the Bureau to provide these services. The fire departments indicated that this would not result in impacts to their services or require the hiring of additional staff; therefore, the proposed action would have no impact to emergency services.

5.4.2.3 Healthcare

Impacts to healthcare would be the same as those described for Payne Gap in Section 4.4.

5.4.2.4 Schools

Impacts to schools would be the same as those described for Payne Gap in Section 4.4.

5.4.3 No Action Alternative

The No Action Alternative would be the same as that described in Section 4.4.3.

5.4.4 Mitigation

With the exception of the potential for an adverse impact to the Whitesburg Police Department. No impacts to community facilities and services would occur; therefore, no mitigation would be warranted. With respect to the Whitesburg Police Department, the Bureau would discuss the development of a MOU with the chief of police and the Mayor of Whitesburg and determine the department's status and what steps may be taken to off-set those impacts.

5.5 TRANSPORTATION AND TRAFFIC

5.5.1 Affected Environment

The Roxana site is located approximately 6.1 miles to the west of Whitesburg, Kentucky, and would be constructed to the south of KY 588 and to the west of KY 160. Proximate to the proposed facility, KY 588 is designated as a rural minor collector[2], while KY 160 is classified as a rural major collector[3] (KYTC 2014a). In terms truck weight, both KY 588 and KY 160 are Class "A" roadways that can accommodate trucks having a gross vehicle weight of up to 44,000 pounds (KYTC 2014c). Potential access points include a connection to the north to KY 588, a connection to the east to KY 160, and/or a connection to

the west to an existing roadway that is traverses north/south between KY 588 and Lilly Cornett Branch Road. A KYTC count station on KY 588 had an AADT volume of 641 vehicles per day in 2008, while a count station of KY 160 had an AADT of 676 vehicles per day during the same year (KYTC 2014b).

5.5.2 Environmental Consequences

The transportation network associated with the Roxana site is primarily two-lane unstripped rural roadways. The infrastructure would not be able to support construction equipment and vehicles traveling to the site.

As defined by KYTC, rural minor collectors "provide service to…smaller communities, link locally important traffic generators to larger towns, and collect traffic from local roads. They should be spaced at intervals consistent with population density to bring all developed areas within a reasonable distance of a collector road" (KYTC 2014a).

Per KYTC, rural major collectors "Provide service to county seats, larger towns, and other traffic generators of intracounty importance, which are not directly served by a higher system and link them to larger towns or routes with higher classifications. Examples of traffic generators for this classification include schools, shipping points, county parks, and important mining and agricultural areas" (KYTC 2014a).

5.5.2.1 Construction

This alternative would involve the same types of construction activity as Alternative 1, and would temporarily increase traffic volumes during the construction period. As discussed above in Section 4.5, trucks would be used to deliver/remove construction materials and equipment, and to haul excess fill material and/or construction debris. Because traffic volumes are relatively low on roadways that provide access to the site, the temporary increase in truck traffic is not expected to have a significant effect on street capacity. However, particularly heavy trucks could exceed the maximum weight limit of certain bridges located near the proposed action. This potential impact would be avoided or reduced to a less than significant level with the implementation of mitigation described below in Section 5.5.4, *Mitigation*. With the implementation of this measure, the addition of construction related trips is not expected to result in a significant traffic-related impact.

5.5.2.2 Operation

The Roxana Alternative would involve the same types of activities and the same number of employees as the Payne Gap Alternative. Therefore, the traffic generation previously presented in **Table 4-10** would also apply to this action alternative. Accordingly, Alternative 2's operations traffic has the potential to incrementally increase congestion on the surrounding roadway network. Potential effects include increased delay at intersections and/or reduced travel speed on roadway segments. These potential impacts would be avoided or reduced to a less than significant level with the implementation of mitigation described below in Section 5.5.4, *Mitigation*.

5.5.3 No Action Alternative

The No Action Alternative would be the same as that described in Section 4.5.3.

5.5.4 Mitigation

In order to identify and mitigate potential traffic impacts, the following mitigation measures are recommended:

- Prepare and process a Traffic Impact Study in accordance with the procedures and criteria published by KYTC (KYTC 2012). Implement measures as appropriate to avoid, minimize, and/or mitigate significant traffic impacts
- Route construction trucks so as to ensure that construction vehicles do not exceed the weight restrictions of bridges that lie along the travel route(s)
- Route construction truck traffic to and from the site in accordance with the gross vehicle weight classifications published by the KYTC (KYTC 2014d)

5.6 AIR QUALITY

5.6.1 Affected Environment

The affected environment for Alternative 2 would be the same as the affected environment described for Alternative 1 as the sites are both in the Appalachian Intrastate Air Quality Control Region.

5.6.2 Environmental Consequences

The results of the air emissions analysis show that construction and operational emissions would remain well below the significance thresholds and would not have a significant impact on the local or regional air quality. A summary of the analysis is presented below and the complete analysis is provided in Appendix C, *Air Emission Calculations*.

5.6.2.1 Construction

Direct impacts from emissions from construction would include combustion emissions from fossil fuel-powered equipment and fugitive dust emissions (PM_{10} and $PM_{2.5}$) during clearing, demolition activities, earth moving activities, and operation of equipment on bare soil. Table 5-1 presents estimates for the primary construction activities that would utilize heavy duty diesel equipment for the Roxana site.

Table 5-1. Construction Emission Estimates for Roxana Site

Site	Year	VOC Tons	CO Tons	NO_x Tons	SO^2 Tons	PM_{10} Tons	$PM_{2.5}$ Tons
Roxana	1	3.27	13.87	42.32	0.83	158.71	18.05
Roxana	2	3.27	13.87	42.32	0.83	106.64	12.85

Fugitive dust from land disturbance activities would be the primary source of emissions during construction, with most of the emissions occurring during Year 1. PM_{10} emissions are estimated using wetting and other typical reduction practices to reduce dust release by 50%. PM_{10} emissions are predicted to be greatest in Year 1 at the Roxana site, at 158 TPY. These emissions, however, would remain well below the significance threshold of 250 TPY. Construction emissions would not have direct or indirect significant impacts on the region's air quality.

Direct impacts to air quality may also include emissions from the burning of construction debris, if such an activity were undertaken during construction. Vegetative debris and/or demolition and construction materials would be disposed in accordance with all laws and regulations. Should open burning be

necessary, it would be conducted in accordance with Title 401 of the Kentucky Administrative Code, Section 63 (401 KAR 63:005) Open Burning.

5.6.2.2 Operations

Impacts associated with Alternative 2 would be similar to those described for Alternative 1.

5.6.3 No Action Alternative

Under the No Action Alternative, construction of the USP and FPC would not occur. The No Action Alternative would not result in emissions of any air pollutants. Therefore, there would be no impact to regional air quality

5.6.4 Mitigation

Mitigation for Alternative 2 would be the same as that described for Alternative 1 in Section 4.6.4.

5.7 NOISE

5.7.1 Affected Environment

The affected noise environment at the Roxana site would be the same as those conditions described for the Payne Gap site in Section 4.7.1.

5.7.2 Environmental Consequences

The environmental consequences associated with the Roxanna site would be the same as those described for the Payne Gap site in Section 4.7.2. The residences adjacent to the Roxana site are well over 200 feet from the majority of construction areas. Increases in noise would be short-term and only occur during daytime hours.

5.7.3 No Action Alternative

The No Action Alternative would be the same as that described in Section 4.7.3.

5.7.4 Mitigation

Mitigation and minimization measures would be the same as those described Alternative 1 in Section 4.7.3.

5.8 INFRASTRUCTURE AND UTILITIES

5.8.1 Affected Environment

5.8.1.1 Potable Water

LWSD would provide service to the Roxana site. LWSD is currently in the process of extending their water system to the eastern property boundary of the proposed Roxana site. The water main at this location is 8 inches in diameter and has water pressure near the connection point of approximately 110 psi. Potable water would be provided by LWSD via this connection at the eastern property boundary (Cardno 2014a). LWSD is capable of providing 4 million gallons per day to the region.

5.8.1.2 Wastewater

LWSD would provide sanitary sewer service to the proposed Roxana site. As with the water service, LWSD is currently extending their wastewater collection service in the area of the Roxana site. The closest existing connection is approximately 2.75 miles from the Roxana site (**Figure 5-2**). LWSD does not currently have plans to extend the sanitary sewer service to the property boundary of the Roxana site (Cardno 2014a). LWSD has a permitted capacity of 600,000 gallons per day and currently treats approximately 300,000 gallons per day.

5.8.1.3 Natural Gas

The Roxana site contains multiple gas wells and gas transmission lines. There are fourteen Hayden Harper gas wells and one EQT gas well within the Roxana site (Cardno 2014a). Gas transmission lines are also adjacent to the Roxana site.

5.8.1.4 Electricity

The affected environment for Alternative 2 is the same as that as described for Alternative 1.

5.8.1.5 Telecommunications

Birch Communications provides telecommunications services to the area where the Roxana site is located (Cardno 2014a). Birch Communications has the capacity to provide telecommunications service to the Roxana site.

5.8.1.6 Solid Waste

Solid waste for Alternative 2 is the same as that described for Alternative 1.

5.8.2 Environmental Consequence

5.8.2.1 Potable Water

Impacts to potable water associated with Alternative 2 would be the same as those described for Alternative 1.

5.8.2.2 Wastewater

Implementation of the proposed action under Alternative 2 would result in an increase of approximately 224,000 gallons per day. This would increase wastewater treatment at LWSD to 524,000 gallons per day, which would not result in LWSD exceeding their permitted capacity of 600,000 gallons per day; therefore, no adverse impacts to wastewater would occur.

5.8.2.3 Natural Gas

Implementation of the proposed action under Alternative 2 would require the closure of fifteen gas wells that are located within the site the Bureau would acquire for development of the proposed USP and FPC. It would take approximately six months to close these wells. Closure of the fifteen gas wells would result in significant impacts to Hayden Harper and EQT, the owners of the gas wells. The Bureau would be able to connect to the natural gas distribution system located adjacent to the Roxana property for the cost of the meter and tap. Costs for the meter and tap are estimated to be $110,000. There is sufficient natural gas available and use of natural gas at the USP and FPC would not impact natural gas availability.

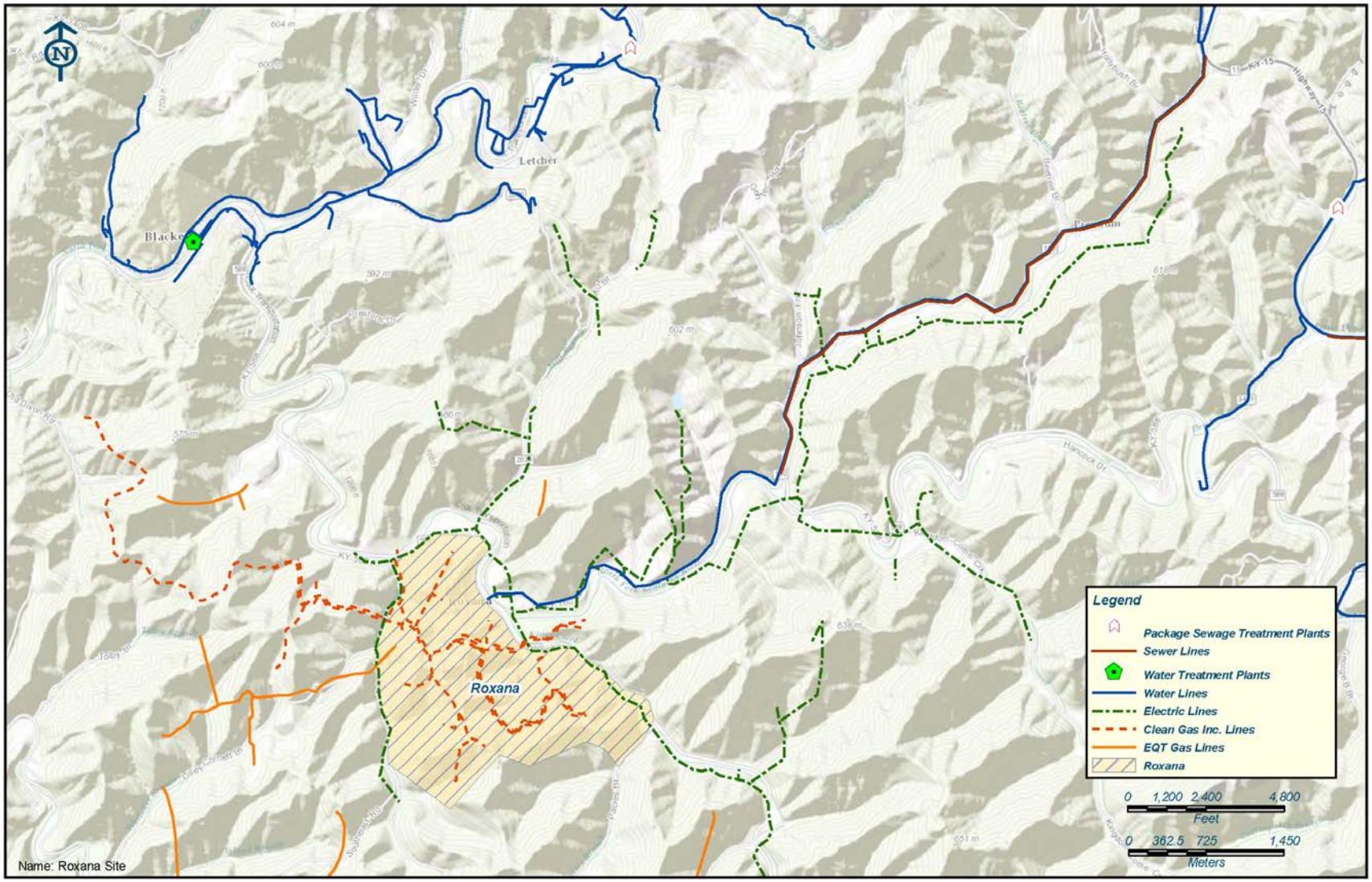

Figure 5-2. Roxana Existing Utilities

5.8.2.4 Electricity

Alternative 2 impacts would be the same as those described for Alternative 1.

5.8.2.5 Telecommunications

Implementation of the proposed action under Alternative 2 would not result in impacts to the available capacity of Birch Communications; however, in order to provide the service a new remote terminal would need to be constructed, as well as the installation of approximately 4 miles of fiber optic cables and 0.5 miles of copper cable. Construction of the terminal and cables would be the responsibility of the Bureau (Cardno 2014a). Costs to complete construction and install the cables would be approximately $190,000.

5.8.2.6 Solid Waste

Impacts to solid waste under Alternative 2 would be the same as those described for Alternative 1.

5.8.3 No Action Alternative

The No Action Alternative would be the same as that described in Section 4.8.3.

5.8.4 Mitigation

Impacts to the gas wells associated with the Roxana site would require the Bureau to pay the owners of the wells (Hayden Harper and EQT) for the costs associated with closure and abandonment of the wells. The anticipated cost ranges between $300,000 to $1,000,000 per well based on the remaining production of each well. The anticipated cost to close all 15 wells is $12.75 million. No other mitigation would be required.

5.9 CULTURAL RESOURCES

An APE was defined to take into consideration both potential direct and indirect effects to cultural resources from implementation of the proposed action. The APE for Alternative 2 includes the 700-acre Roxana site and adjacent areas to the north (**Figure 5-3**). The APE extends beyond the north boundary of the Roxana site because of the potential for visual effects to any historic properties that may be present within the viewshed of the proposed federal correctional facility's one- to four-story buildings. Effects to archaeological resources, however, would be limited to the 300-acre area within the APE where construction (direct ground disturbance) would occur.

5.9.1 Affected Environment

5.9.1.1 Archaeological Resources

Mapping, aerial photos, and a pedestrian reconnaissance in August 2011 and August 2014 indicated that the Roxana Farm Site had been completely disturbed by former surface mining activities. Photo-documentation was conducted at the site; however, no subsurface testing was completed. In addition, background research indicated that no previously identified archaeological sites were present at the proposed Roxana Farm Site. No archaeological resources eligible for listing on the NRHP are present and no further work was recommended at the Roxana site as a result of the 2011 and 2014 archaeological surveys. Concurrence was received from the SHPO on January 24, 2012 and on December 22, 2014 (Appendix A, *Agency Coordination*).

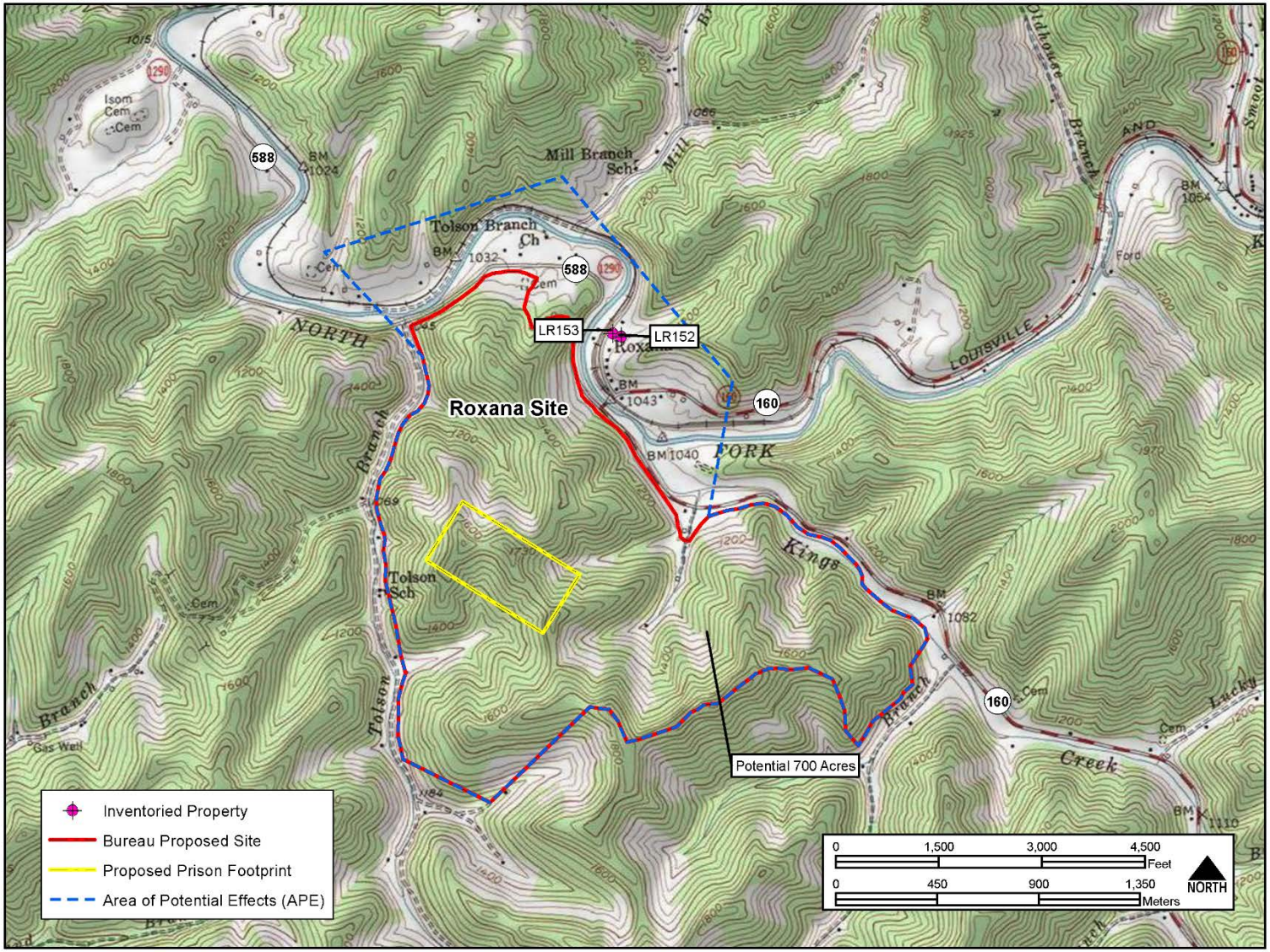

Figure 5-3. Roxana Architectural Resources

5.9.1.2 Traditional Cultural Properties (TCPs)

Under Section 106 of the NHPA, a federal agency is required to give consideration to issues of traditional religious or cultural areas concerning Native American groups. No TCPs have been identified within the project APE.

5.9.1.3 Architectural Resources

The 2011 reconnaissance survey of the Roxana site APE identified two architectural resources for further investigation; the other architectural resources in the APE were not recommended for further work because they were not associated with significant historical or architectural contexts of Letcher County and/or were in poor condition (TEC, Inc. 2011). An intensive-level survey of two mid-twentieth century square-plan pyramidal houses (LR152 and LR153) was conducted in 2013 to determine the NRHP eligibility of the properties (**Figure 5-3, Table 5-2**). One of the houses (LR153) also included several domestic and agricultural outbuildings. Both properties were recommended not eligible for listing in the NRHP because they do not meet the NRHP criteria for eligibility (Cardno 2014b). The KHC concurred that both properties are not eligible (KHC 2014) (Appendix A, *Agency Coordination*).

Table 5-2. Architectural Resources in the Roxana Site APE Evaluated for NRHP Eligibility

Site Number	Property Name	Year Built	Description	NRHP Eligibility
LR152	Pearl Whitaker House	Ca. 1940	Square-plan pyramidal house	Not Eligible
LR153	George Whitaker House	1940	Square-plan pyramidal house and nine outbuildings	Not Eligible

5.9.2 Environmental Consequences

The cultural resources surveys for the proposed action did not identify any archaeological sites or architectural resources eligible for inclusion in the NRHP in the APE for the Roxana site. Therefore, Alternative 2 would have no effect on NRHP-listed or eligible cultural resources.

5.9.3 No Action Alternative

The No Action Alternative would be the same as that described in Section 4.9.3.

5.9.4 Mitigation

Alternative 2 would have no impact to NRHP-listed or eligible cultural resources; therefore, no mitigation is required.

5.10 WATER RESOURCES

5.10.1 Affected Environment

The affected environment for the Roxana site is similar to that described in Section 4.10.1 for Payne Gap with respect to ground water, water quality, and floodplains.

The Roxana site is situated on top of a plateau which is the result of mining of a portion of the mountain. As a result of the mining onsite the hydrology of the site has been greatly disturbed. There are several ephemeral, intermittent, and perennial unnamed, small streams identified and mapped within proposed

project area. Additionally, an open water wetland (pond) comprising approximately 0.41 acres (0.17 hectares) is located along the eastern boundary, north of Rise Branch.

Site specific wetland data was collected through onsite field work, aerial photographs, topographic maps, National Wetland Inventory wetland maps, and Natural Resource Conservation Service soil surveys. Based on these resources wetlands are present on the sites.

Wetlands associated with the Roxana receive their hydrology from surface runoff from the surrounding lands, groundwater and direct precipitation. Dominant vegetation within the wetland identified on site is typified by Typha latifolia, Salix nigra, Lindera benzoin, Microstegium vimineum, and Osmunda cinnamomea. and Scirpus cyperinus.

Table 5-3 summarizes the wetland types and acreages, as well as streams and linear feet, identified within the Roxana site. **Figure 5-4** depicts wetlands and streams delineated within the Roxana site.

Table 5-3. Summary of Supplemental Jurisdictional Delineation Results

Feature Type	Roxana Site	
	Acres	Linear Feet
Wetlands		
Palustrine Emergent	1.53	N/A
Palustrine Scrub-Shrub	0.02	N/A
Palustrine Forested	0.73	N/A
Riverine		
Jurisdictional Stream	-	8,532
Non-Jurisdictional Stream	-	182
TOTAL	2.28	8,714

Notes: N/A = Not Applicable.

5.10.2 Environmental Consequences

Implementation of the proposed action at the Roxana Site would result in permanent impacts to approximately 908 linear feet of stream and 0.37 acres (0.15 hectares) of forested wetlands due to site excavation and development. These impacts would be to the streams and wetlands delineated in 2011 and 2014 (**Table 5-3**) and would result primarily from the excavation and grading activities that would be required to prepare the site for the development of the USP, FPC, ancillary buildings, and roads.

5.10.3 No Action Alternative

The No Action Alternative would be the same as that described in Section 4.10.3.

5.10.4 Mitigation

Mitigation activities would be the same as those described for Alternative 2 in Section 4.10.4.

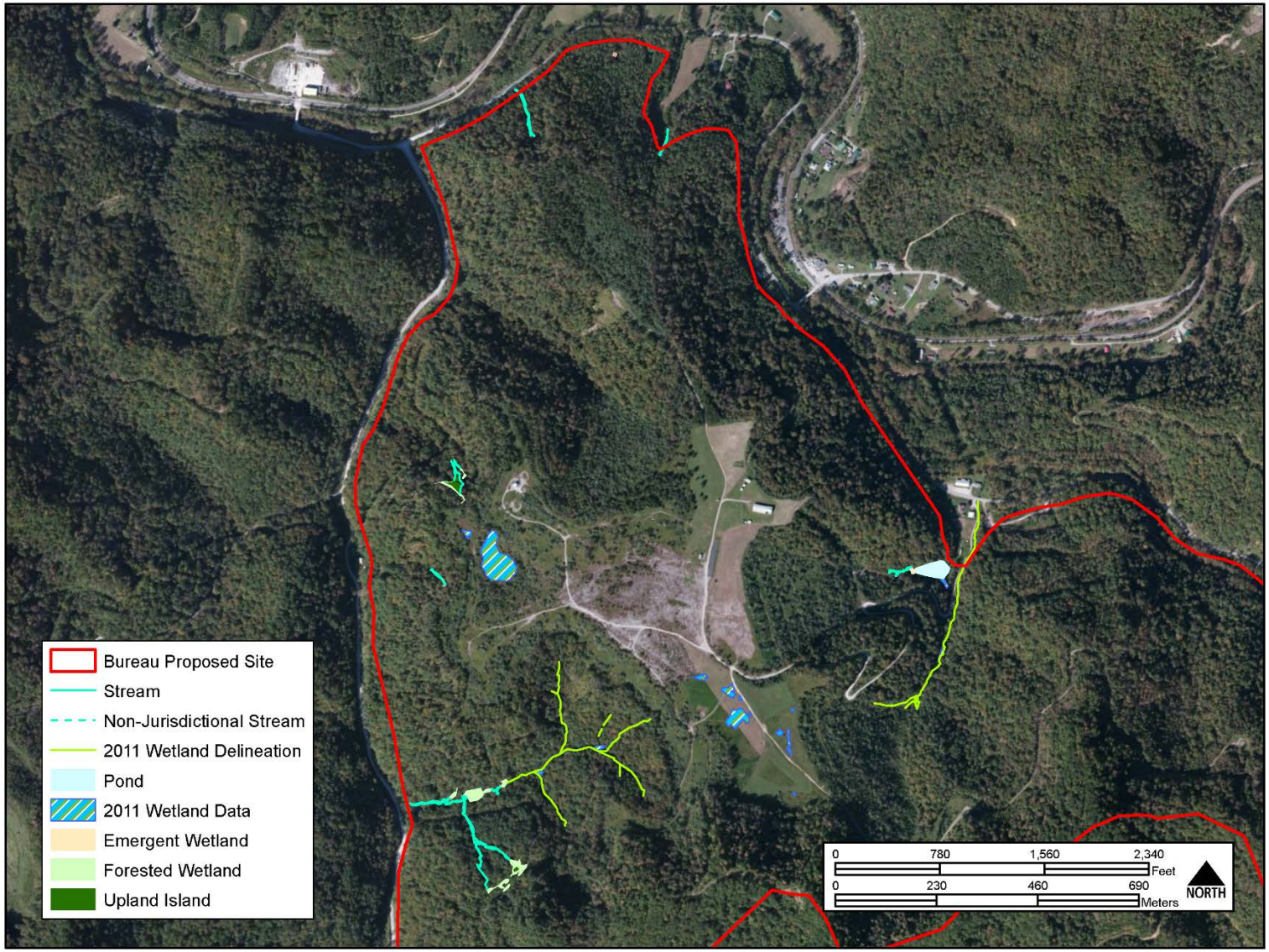

Figure 5-4. Roxana Wetlands and Waters of the U.S.

5.11 BIOLOGICAL RESOURCES

5.11.1 Affected Environment

5.11.1.1 Vegetation

A large portion of the Roxana site has been disturbed by historic mining activities which created a relatively level area on the mountaintop. A site visit indicated a level portion of the site is farmed and portions not under agriculture are routinely bushhogged or are dominated by scrub shrub vegetation (e.g., autumn olive, multiflora rose, etc.). The mountain slopes are primarily forested with the exception of slopes created by fill from mining which are dominated by invasive species such as autumn olive and paradise tree (*Ailanthus altissima*). Upland vegetation includes northern red oak, eastern red cedar (*Juniperus virginiana*), sericea lespedeza, paradise tree, Allegheny blackberry, Virginia pine (*Pinus virgininana*), bluestem broomsedge (*Andropogon virginicus*), tuliptree, American beech, Virginia creeper (*Parthenocissus quinquefolia*), Ohio buckeye (*Aesculus glabra*), red maple (*Acer rubrum*), stinging nettle (*Urtica dioica*), and Christmas fern (*Polystichum acrostichoides*). Wetland vegetation at the Roxana site includes American sycamore, woolgrass, black willow, spicebush (*Lindera benzoin*), Nepalese browntop (*Microstegium vimineum*), small spike falsenettle (*Boehemeria cylindrica*), and cinnamon fern (*Osmunda cinnamomea*).

5.11.1.2 Wildlife

Wildlife associated with the Roxana site is the same as described for Alternative 1-Payne Gap wildlife in Chapter 3.11.1.

5.11.1.3 Federal Listed Threatened and Endangered Species and State Listed Threatened and Endangered Species

Federal and State listed threatened and endangered species is the same as described for Alternative 1-Payne Gap in Chapter 3.11.1. Coordination with USFWS indicates the Roxana site is in known P1/P2 swarming habitat for the Indiana bat.

5.11.2 Environmental Consequences

5.11.2.1 Vegetation

Approximately 118 acres (48 hectares) of forested area would be impacted by the proposed action. These impacts would be the result of excavation and grading activities required to prepare the site for development.

5.11.2.2 Wildlife

Wildlife species found on the sites would likely be displaced during construction activities due to the loss of habitat and increases in noise. However, over 582 acres (236 hectares) of the site itself would remain undisturbed and continue to provide habitat, including breeding and foraging areas, for wildlife species found on-site. Additionally, the site is surrounded by similar habitat that could accommodate species that are displaced by construction activities. Based on the available habitat that will remain on site and habitat adjacent to the site (Jefferson National Forest), it is anticipated that these impacts would not adversely affect wildlife species that are currently present on-site.

5.11.2.3 Federally Threatened and Endangered and State Listed Special Status Species

Implementation of the proposed action at the Roxana site has the potential to impact Indiana bats and gray bats. Phase I bat habitat surveys are currently being conducted for the Roxana site to determine if summer and/or winter habitat is present. Based on the outcome of these studies the habitat areas will be assessed for impacts and if necessary Section 7 consultation with USFWS will be initiated if the impacts could not be avoided or minimized to a degree where they can be considered insignificant or discountable. Impact assessment would include the potential noise from the proposed outdoor firing range. Noise associated with the firing range is not anticipated to result in significant impacts, as the range would be used once a year and any impact would be temporary and short-term.

It is not anticipate that the Kentucky arrow darter would be impacted by the project. The streams within the project site are small channels and do not contain riffle pool complexes. Additionally conductivity measurements were taken within streams on the project site. Conductivity measurements were taken within one stream that contained flow and the result was a conductivity of 332 µS. Studies have demonstrated that Kentucky arrow darters are not likely to be present when conductivity levels exceed approximately 250 µS; therefore no impacts to the Kentucky arrow darter are anticipated (USFWS 2010).

5.11.3 No Action Alternative

The No Action Alternative would be the same as that described in Section 4.11.3.

5.11.4 Mitigation

Mitigation measures for vegetation, wildlife, and threatened and endangered species would be the same as those described for Alternative 1 in Section 4.11.4.

5.12 HAZARDOUS MATERIALS AND WASTE

5.12.1 Affected Environment

The proposed USP and FPC construction site is located in a relatively undeveloped area. No hazardous materials are known to be in storage or in use in this area. According the USEPA "Cleanups In My Community" mapping tool, there are no Brownfield, Superfund or RCRA Corrective Action sites in the vicinity of the proposed project area. No sites in the town of Roxana were listed in USEPAs TSCA or TRI databases. Three sites were listed in the USEPA RCRA database, Coastal Coal Company LLC, Enterprise Mining Company LLC and Roxana BP. All three sites are located to the east of the proposed project site and are unlikely to impact site conditions based on the topography and inferred hydrology of the area. Site visits conducted in 2011, 2013, and 2014 did not observe any hazardous materials or evidence of their presence (i.e. stressed vegetation, stained soils, drums) on the site.

5.12.1.1 Hazardous Wastes

The proposed USP and FPC construction site is located in a relatively undeveloped area. No hazardous wastes are known to be in storage or generated in this area. According the USEPA Cleanups In My Community mapping tool, there are no Brownfield, Superfund or RCRA Corrective Action sites in the vicinity of the proposed project area. No sites in the town of Roxana were listed in USEPAs TSCA, TRI or RCRA databases. Site visits conducted in 2011, 2013, and 2014 did not observe any hazardous wastes or evidence of their presence (i.e. stressed vegetation, stained soils, drums, batteries) on the site and no evidence of acid mine drainage was observed.

5.12.1.2 Radon

The USEPA classifies Letcher County as having a moderate potential for radon intrusion (Zone 2). Zone 2 counties have a predicted average indoor radon screening level between 2 and 4 pCi/L. The USEPA action level for radon is 4 pCi/L.

5.12.2 Environmental Consequences

Environmental consequences identified for Alternative 2 would be the same as those described for Alternative 1.

5.12.3 No Action Alternative

The No Action Alternative would be the same as that described in Section 4.12.3.

5.12.4 Mitigation

Mitigation identified for Alternative 2 would be the same as that described for Alternative 1 in Section 4.12.4.

6.0 RELATIONSHIP BETWEEN SHORT-TERM USE OF THE ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Regulations for the preparation of Environmental Impact Statements require they address the relationship between short-term use of the environment and the maintenance of long-term productivity.

Construction of proposed facilities on the site would last an estimated 30-months following ground-breaking. Construction would involve clearing and grubbing, excavating and filling, paving erecting structures, installation of lighting and signage, and landscaping. There would also be temporary disruptions to traffic associated with construction vehicles and equipment utilizing area roadways. It is anticipated that disruptions would be temporary and that construction and operation of the proposed USP and FPC would generate economic productivity in terms of new construction jobs, new payrolls, induced personal income, purchasing of materials, supplies, and services, and potential purchasing of new homes by Bureau staff once the facility opens.

The economic viability of the Letcher County, Kentucky region would experience long-term benefits by virtue of the approximately 300 new permanent jobs that would need to be filled at the USP and FPC.

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7.0 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Regulations for the preparation of EISs also require they address irreversible and irretrievable commitments of resources associated with the proposed action. Construction and operation of the proposed USP and FPC would result in both direct and indirect commitments of resources. In some cases, resources committed would be recovered in a relatively short period of time. In other cases resources would be irreversibly or irretrievably committed by virtue of being consumed or by the apparent limitlessness of the period of their commitment to a specific use. Irreversible and irretrievable commitments of resources can sometimes be compensated for by the provision of similar resources with substantially the same use or value.

Under the proposed action only a portion of the site would be required for the actual construction of the USP and FPC. Resources consumed as a result of the development of the correctional facility would be offset by the creation of the facility and the resulting societal benefits. The use of the developed portion of the land could be considered irretrievably committed. The proposed action would also require the commitment of various construction materials, including cement, aggregate, steel, asphalt, and lumber. There is the potential however, that these materials could be recycled at some point in the future; therefore, they may not be an irreversible or irretrievable commitment of resources.

The proposed action would also require the consumption of fossil fuels and electrical energy during both the construction and operation of the facility and would be considered an irretrievable commitment of a resource.

Costs associated with roadway and utility improvements to serve the site are not precisely known at this time; however, these costs would be offset by the direct economic benefits of the total project-related expenditures and the annual operating budget. Over the long-term, construction of the proposed facility could result in an increase in the pace of development within Letcher County than would occur if the project were not constructed. Although the nature of such development can be controlled through the application of land use regulations, any induced land development is for all practical purposes, an irreversible and irretrievable commitment of land and materials.

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8.0 CUMULATIVE IMPACTS

This chapter 1) describes past, present, and reasonably foreseeable future actions relevant to cumulative impacts, 2) analyzes the incremental interaction Alternative 1 may have with other actions, and, 3) evaluates cumulative impacts potentially resulting from these interactions. The definition of cumulative impacts was discussed in Section 3.13.

8.1 PAST, PRESENT, AND REASONABLY FORESEEABLE FUTURE ACTION

This section identifies past, present, and reasonably foreseeable future actions not related to Alternative 1 t or Alternative 2 hat have the potential to cumulatively impact the resources in the affected environment for proposed action and its regionally affected area. Geographic distribution, intensity, duration, and historical effects of similar activities were considered when determining whether a particular activity may contribute cumulatively and significantly to the impacts of Alternative 1 or Alternative 2 on the resources identified in the Environmental Impact Statement (EIS). Based on discussions with the economic development leaders for Letcher County development within the county has not been strong and there are very few past, present, or reasonably foreseeable future actions that when combined with the proposed action would result in cumulative impacts to the resources evaluated in this EIS (DePriest 2013). Future projects identified include a new regional airport and Gateway Regional Business Park. In addition to these projects, there are infrastructure and utility projects associated with the proposed action that have the potential to result in cumulative impacts.

8.1.1 Letcher County Airport Project

The airport board has applied to be included in the FAA's National Plan of Integrated Airport Systems Program and the project qualifies for FAA funding. The Kentucky Department of Aviation funded a Site Selection Study and based on the study a site was identified for development of the airport. The airport board is currently working with landowners to purchase the site. Once the acquisition of property has occurred the airport board would apply to FAA to fund the development of an airport layout plan and environmental assessment. Potential impacts resulting from the project could include land use, topography, geology, and soils, air quality, noise, socioeconomics, traffic, infrastructure and utilities, natural resources and cultural resources. Siting of the airport may have impacts to land use compatibility with adjacent land uses. Excavation and grading activities to prepare the site for development may result in changes and impacts to topography, geology, and soils. Both short- and long- term impacts to air quality could occur as the result of construction and operation activities of the airport. Development of the airport has the potential to result in short-term and long-term impacts to traffic as a result of construction vehicles accessing the site during construction and long-term impacts as a result of increased traffic to area roadways once the airport is operational. Short-term and long-term impacts due to increases in noise would likely result from construction activities and the operation of aircraft. It is anticipated that infrastructure and utilities would have increased demands placed on them during construction as well as operation of the airport. Other impacts that could result due to construction of the airport include cultural and natural resources. Beneficial impacts would be anticipated to the economy of the region due to new jobs and potential tax base.

8.1.2 Gateway Regional Business Park

The Gateway Regional Business Park is approximately 261 acres (106 hectares) located just north of Payne Gap. Development of the site would have potential impacts to land use, air quality, noise, infrastructure and utilities, and transportation and traffic. The Gateway Regional Business Park has the potential to be incompatible with surrounding land uses; however, Letcher County does not have any zoning ordinances that would regulate development and compatibility. The project also has the potential to have short-term temporary impacts to air quality and noise as a result of construction activities. Infrastructure and utilities would also have the potential to be impacted due to increased demands on potable water, waste water treatment, and solid waste. Additionally, development of the business park would likely increase traffic on Route 119 and may contribute to impacts to congestion on area roadways.

8.1.3 Infrastructure and Utility Projects

Alternative 1 and Alternative 2 would both require utility companies to upgrade facilities, extend cable, and construct new facilities to provide service to the proposed USP, FPC, and ancillary facilities. These projects would be dependent on the preferred alternative and conducted by the individual utility company. Impacts associated with these projects have the potential to include land use, air quality, noise, soils, natural resources, and cultural resources. The projects have the potential to be incompatible with surrounding land use, result in temporary increases to air emissions and temporary air quality impacts, temporary noise impacts due to construction activities, disturbance of soils that could result in erosion and sedimentation issues, as well as impacts to natural and cultural resources depending on the type and location of the upgrade or new construction, and placement of cable.

8.1.4 Proposed Action

The proposed action would result in conversion of land uses and contribute to incompatibility with adjacent land uses. The proposed action would also contribute to short-term temporary increases to noise and increase local air emissions, as well as have an overall contribution to greenhouse gases (GHGs). The proposed action has the potential to impact transportation and traffic. The proposed action is not anticipated to have impacts to infrastructure and utilities.

As stated in Sections 4.6 and 5.6, there are small emission increases anticipated for all criteria pollutants; however, all increases are considered to be minor adverse impacts. As a result, this cumulative impacts analysis focuses on GHGs. Since individual sources of GHG emissions are not large enough to have an appreciable effect on climate change and the potential effects of proposed GHG emissions on climate change are global by nature, the study area for this aspect is not defined.

GHGs are gases in the Earth's atmosphere that prevent heat from escaping into space, resulting in climate change as the Earth's surface temperature increases above past levels. GHGs result primarily from the combustion of fossil fuels, and include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). EO 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*, requires federal agencies to inventory and report direct and indirect emissions of GHGs, including those associated with fuel consumption and the purchase of electricity. In addition, facilities with stationary combustion sources must determine applicability of the USEPA's Greenhouse Gas Reporting Program, as promulgated in 40 CFR Part 98, which requires reporting from facilities that emit 25,000 metric tons CO2 -equivalent (CO2 e) or more per year from stationary source fuel combustion. Emission sources evaluated in this EIS are associated with

construction and site operations. The primary GHG emission associated with these sources is CO_2, and to a lesser extent, CH_4 and N_2O. Emissions of these GHGs are carried forward in the analysis.

GHGs are produced from the burning of fossil fuels, as well as through industrial and biological processes. There are no published NEPA thresholds of significance for GHG emissions resulting from a proposed action and formulation of thresholds is difficult when attempting to identify what level of emissions would substantially contribute to global climate change. The cumulative effects for GHG emissions were evaluated for the proposed construction and subsequent operation activities.

Table 8-1 compares the GHG emissions associated with the proposed construction activities at the Payne Gap site to the U.S. 2011 GHG emissions. The estimated GHG emissions from the proposed construction activities are less than a thousandth of 1 percent of the total GHG emissions generated by the United States in 2011.

Table 8-1. Estimated GHG Emissions from Construction Activities at Payne Gap Site

Year	**CO_2e *(metric tons per year)***
1	10,913
2	10,913
Total	*21,826*
[1]U.S. 2011 GHG Emissions	$6{,}708.3 \times 10^6$
Percent of U.S. 2011 GHG Emissions	.00032

Source: USEPA 2013c.

Table 8-2 compares the GHG emissions associated with the proposed construction activities at the Roxana site to the U.S. 2011 GHG emissions. The estimated GHG emissions from the proposed construction activities are less than a thousandth of 1 percent of the total GHG emissions generated by the U.S. in 2011.

Table 8-2. Estimated GHG Emissions from Construction Activities at Roxana Site

Year	**CO_2e**
1	4,006
2	4,006
Total	*8,012*
[1]U.S. 2011 GHG Emissions	$6{,}708.3 \times 10^6$
Percent of U.S. 2011 GHG Emissions	.00012

Source: USEPA 2013c.

Table 8-3 compares the GHG emissions associated with the proposed operation of stationary sources (boilers and emergency generators) and staff commuter emissions once the facilities are operational. The estimated GHG emissions from the proposed operations are less than ten thousandth of 1 percent of the total GHG emissions generated by the U.S. in 2011.

Table 8-3. Estimated GHG Emissions from Operations at Either Site	
CO_2e	1,271
[1]U.S. 2011 GHG Emissions	$6{,}708.3 \times 10^6$
Percent of U.S. 2011 GHG Emissions	.000019

Source: USEPA 2013c.

Individual sources of anthropogenic GHG emissions are not large enough to have an appreciable effect on climate change. For this reason, emissions of GHGs from the proposed action alone would not cause appreciable global warming that would lead to climate change. These emissions would increase the atmosphere's concentration of GHGs, and, in combination with past and future emissions from all other sources, contribute incrementally to the global warming that produces the adverse effects of climate change. Therefore, an appreciable impact on global climate change would, if current predictions are accurate, only occur when proposed GHG emissions combine with other GHG emissions from other man-made activities on a global scale.

8.1.5 Potential Cumulative Impacts

When combined with past, present, and reasonably foreseeable future projects, the proposed action would likely contribute to permanent impacts to land use and transportation, as well as temporary impacts to air quality and noise. However, under the proposed action, land use compatibility issues with adjacent properties would be minimized through the siting of the facility and use of buffer areas to reduce potential incompatibility issues with surround residences and forested/undeveloped areas.

Under the proposed action, the potential impact to traffic would be reduced to a less than significant level with the implementation of mitigation outlined in the pending Traffic Impact Study. Therefore, while the proposed action may contribute to cumulative impacts, mitigation measures would be in place and the cumulative impact would be considered less than significant.

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Jenkins, KY. 41437

Letcher County Planning Commission
Box 370
Whitesburg, KY. 41858

Letcher County Emergency Management
156 Main Street, Suite 107
Whitesburg, KY 41858

Libraries

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220 Main Street
Whitesburg, KY 41858

Blackey Public Library
295 Main St. Loop
Blackey, KY 41804

Jenkins Public Library
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Jenkins, KY 41537

Lillian Webb Memorial Library
1049 Highway 317
Neon, KY 41840

APPENDIX A
AGENCY COORDINATION

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STEVEN L. BESHEAR
GOVERNOR

TOURISM, ARTS AND HERITAGE CABINET
KENTUCKY HERITAGE COUNCIL

MARCHETA SPARROW
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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
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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

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

STEVEN L. BESHEAR
GOVERNOR

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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)

APPENDIX B
EXCAVATION AND GRADING CALCULATIONS

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October 24, 2014

Mr. Deborah Henson, Project Manager
Cardno Government Services Division
145 Limekiln Road, Suite 100
New Cumberland, Pennsylvania 17070

Subject: Revised Earthwork Quantities and Construction Costs; Proposed Federal Correction Facility • Payne Gap and Roxana Sites
Cardno MM&A Project No. CARD003

Dear Ms. Henson:

Per your request, **Cardno MM&A *(Cardno)*** is providing revised *earthwork quantities and construction costs* for the "Proposed **Federal Correction Facility *(FCF)***" in Letcher County, Kentucky. The original document was prepared for the *Payne Gap* and *Roxana* sites and published in a report by **Marshall Miller & Associates, Inc.** (now **Cardno MM&A**) titled "*Geotechnical Feasibility Report dated June 2012*."

Earthwork quantities and construction costs were presented in the 2012 report for both of these sites. The **United States Federal Bureau of Prisons *(BOP)*** provided a conceptual plan for the supporting facilities and access roads for the FCF at both the Payne Gap and Roxana sites.

The proposed "cut shading" on the BOP drawing for the Payne Gap site differed from the proposed cut shading in the Cardno 2012 report. There were no adjustments made in the earthwork quantities provided in this letter report related to this difference. The fill slopes for the supporting facilities at Payne Gap and Roxana were designed at 2:1. "Cut" slopes were designed for the two sites at 1:1. Additional geotechnical studies may indicate the cut slopes can be constructed at ½:1 or steeper. Select fill slopes for the access roads at Payne Gap were steeper than 2:1 to accommodate the existing topography. Slopes steeper than 2:1 may require stabilization which was not estimated for this revision.

Cardno determined the best fit for the access roads and supporting facilities relative to the topography present at the two sites.

The unit costs for the construction quantities were based on "RSMeans Cost Data"[1] and updated to reflect 2014 costs.

The earthwork quantities were determined for the supporting facilities and added to the quantities previously determined for the Payne Gap FCF. A 25 % swell factor was used for all fill at the site. A site plan depicting the facilities along with the earthwork cut and fills is attached to this letter report as **Map No. PG-4 (Revised)**. The additional parking area and additional spoil fill area shown on the site plan for the Payne Gap site were added to the main building area.

Payne Gap Earthwork Quantities

	Unit Cost	Unit Cost	Units	Units	Cost
Item	$/Cubic Meters	$/Cubic Yards	Cubic Meters	Cubic Yards	$ Dollars
Soil Excavation	$13.08	$10.00	2,136,671	2,794,660	$27,947,657
Rock Excavation	$27.47	$21.00	6,206,251	8,117,470	$170,485,715
Structural Fill	$3.92	$3.00	1,312,049	1,716,095	$5,143,232
Spoil Fill	$1.31	$1.00	9,256,402	12,106,917	$12,125,887
	$/Hectare	$/Acres	Hectare	Acres	$ Dollars
Clear Mined Area	$740	$300	2.7	7	$1,998
Clear Forest Area	$19,030	$7,700	85.3	211	$1,623,259
				Total	**$217,327,748**

The earthwork quantities were determined for the supporting facilities and added to the quantities previously determined for the Roxana FCF. Due to space limitations at the site and for cut/fill balancing purposes, all material cut will have to be placed as a structural fill. The swell factor for the rock excavation was 25% and the mine spoil was reduced by 10% for the structural fill. The rock elevations at the prison camp were inferred from borings to the south. The actual rock elevations should be confirmed. Constructing the prison camp at different levels could reduce the amount of rock excavation. A site plan depicting the facilities along with the earthwork cut and fills is attached to this letter report as **Map No. RX-4 (Revised)**. Two locations shown as cut in the main building area will require further investigation.

[1] Fortier, Robert, PE, Senior Editor, RSMeans Heavy Construction Cost Data, 28th Annual Edition, A Division of Reed Construction Data, LLC, Construction Publishers & Consultants, 2014.

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Roxana Earthwork Quantities

	Unit Cost	Unit Cost	Units	Units	Cost
Item	**$/Cubic Meters**	**$/Cubic Yards**	**Cubic Meters**	**Cubic Yards**	**$ Dollars**
Spoil Excavation	$13.08	$10.00	7,037,223	9,204,340	$92,046,877
Rock Excavation	$27.47	$21.00	728,809	953,246	$20,020,383
Structural Fill	$3.92	$3.00	7,188,790	9,402,582	$28,180,057
	$/Hectare	**$/Acres**	**Hectare**	**Acres**	**$ Dollars**
Clear Mined Area	$740	$300	32.7	81	$24,198
Clear Forest Area	$19,030	$7,700	44.4	110	$844,932
				Total	**$141,116,447**

The revised earthwork quantities and construction costs are based on the provided conceptual plan and the analysis of same, as well as published data and information collected during the *2012 Geotechnical Feasibility Study*. Additional geotechnical studies should be conducted to confirm that the earthwork volumes estimated are adequate to meet the quantified material required for structural fills in the final design.

The earthwork quantities were itemized by facility and are presented on the ***Tables PG-1A*** and ***RX-1A*** attached to this letter report.

We reserve the right to amend our computations, if any additional information becomes available. This revision is furnished as privileged and confidential to the addressee. Release to any other company, concern, or individual is solely the responsibility of the addressee. We appreciate the opportunity to have assisted you with this project.

Sincerely,

W. Dale Nicholson, P.E., P.L.S.
Senior Forensic Engineer
for Cardno MM&A
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Email: Dale.Nicholson@cardno.com

WDN/cfn
Attachments Map PG-4 (Revised) – "Site Grading – Payne Gap Study Area"
Map RX-4 (Revised) – "Site Grading – Roxana Study Area"
Tables PG-1A and RX-1A
c: File/CARD003
File: Revised Earthwork.docx

Cardno Government Services Division

Payne Gap/Lawson Site

Table PG-1A

Volumes by Facility						
Item (Cubic Meters)	**Main Building**	**Roadway**	**Training Center**	**Utility Plant**	**Prison Camp**	**Total**
Spoil Excavation	1,266,966	95,830	356,105	140,405	277,365	2,136,671
Rock Excavation	5,005,811	19,850	587,430	185,610	407,550	6,206,251
Structural Fill	883,064	14,920	249,150	30,890	134,025	1,312,049
Spoil Fill	8,096,932	40,050	414,805	704,615	0	9,256,402
Base Elevation	495	Varies	480	480	550	

Cardno Government Services Division

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	4,881,322	0	0	1,507,283	648,618	7,037,223
Rock Excavation	0	169,438	0	0	559,371	728,809
Structural Fill	3,322,628	3,742	3,862,420	0	0	7,188,790
Base Elevation	445	Varies	445	451	425	

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MAP PG–4 (REVISED)

Cardno Government Services Division
Feasibility Study
Federal Correctional Facility – Letcher County, Kentucky

Site Grading - Payne Gap Study Area

- TEST BORING LOCATIONS (DRILLED)
- LIMITS OF EARTHWORK
- PROPOSED CUT
- PROPOSED FILL
- PROPOSED STRUCTURAL FILL
- PROPOSED ROADWAY
- PROPOSED CONTOUR

100m 0m 100m 200m

SCALE 1: 4,000

COORDINATE SYSTEM: KENTUCKY SOUTH STATE PLANE NAD 83 (METERS)

Notes

1. Test Boring Locations were surveyed by Allegheny Surveys.
2. Earthwork slopes presented in soil are (2.5 horizontal : 1 vertical) and in rock are (1 horizontal : 1 vertical)*.
3. Test Boring PG-7 was not drilled due to landowner denying access.

*Due to slope restrictions in areas added to the original layout, soil slopes are proposed at 2:1 in those areas with the exception of the additional spoil fill area, for which the slope continues at 2.5:1.

FUTURE STAFF TRAINING CENTER WITH PARKING

PROPOSED FIRING RANGE

PROPOSED UNITED STATES PENITENTIARY

91 METER BUFFER ZONE

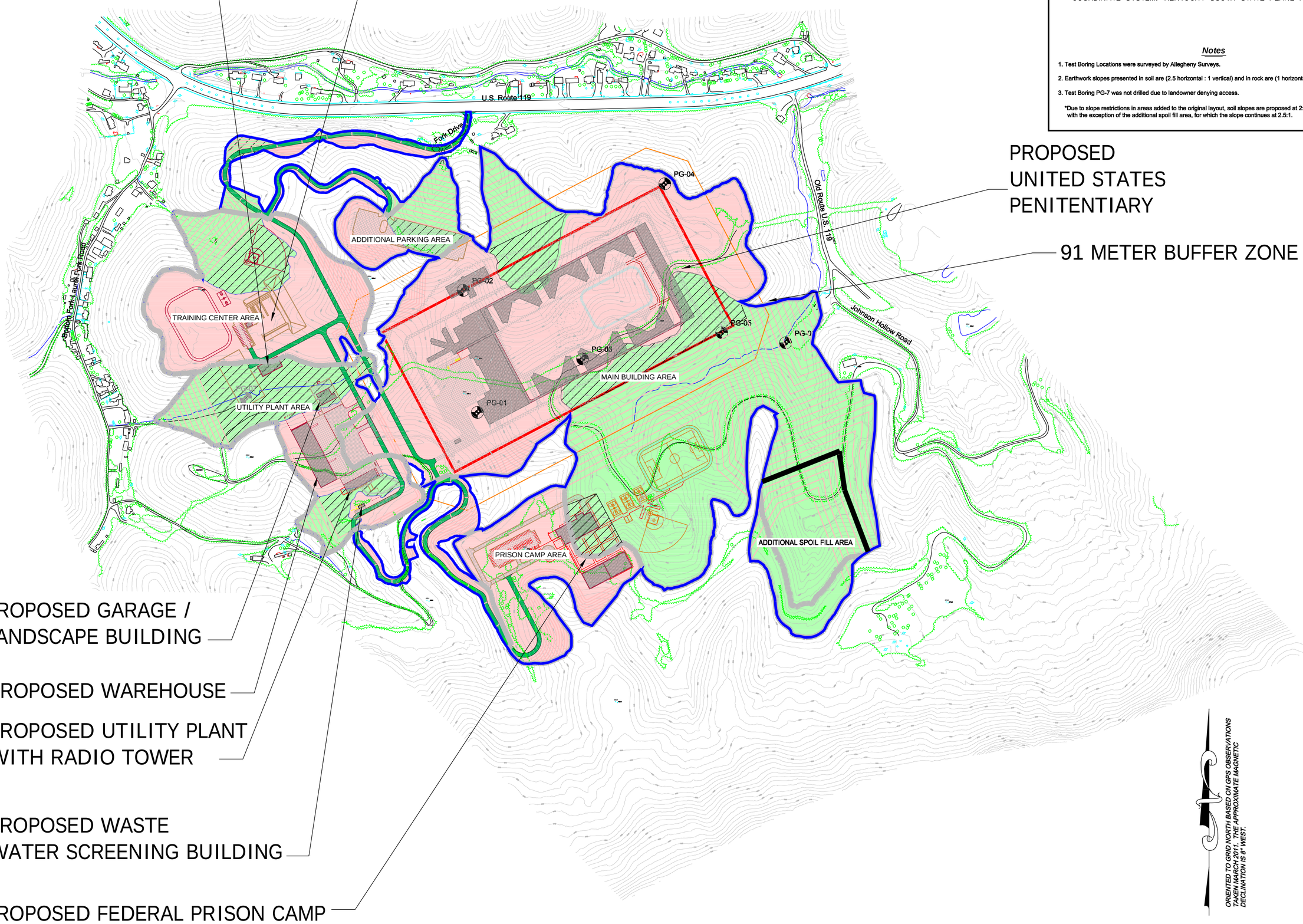
PROPOSED GARAGE / LANDSCAPE BUILDING

PROPOSED WAREHOUSE

PROPOSED UTILITY PLANT WITH RADIO TOWER

PROPOSED WASTE WATER SCREENING BUILDING

PROPOSED FEDERAL PRISON CAMP



ORIENTED TO GRID NORTH BASED ON GPS OBSERVATIONS TAKEN MARCH 2011. THE APPROXIMATE MAGNETIC DECLINATION IS 8° WEST.

DATE	Submittal	Submitted By
1/27/2012	Geotechnical Feasibility Study Draft	MM&A
6/12/2012	Site Grading – Payne Gap Study Area Final	MM&A
4/7/2014	Site Grading – Payne Gap Study Area Conceptual Plan	BOP
9/12/2014	Revised Site Grading – Payne Gap Study Area Draft	Cardno MM&A
10/23/2014	Revised Site Grading – Payne Gap Study Area Final	Cardno MM&A

MAP RX–4 (REVISED)

Cardno Government Services Division
Feasibility Study
Federal Correctional Facility – Letcher County, Kentucky

Roxana Study Area

TEST BORING LOCATIONS (DRILLED)

LIMITS OF EARTHWORK

PROPOSED CUT

PROPOSED FILL

PROPOSED STRUCTURAL FILL

AREA REQUIRING FURTHER INVESTIGATION

PROPOSED ROADWAY

PROPOSED CONTOUR

100m 0m 100m 200m

SCALE 1: 4,000

COORDINATE SYSTEM: KENTUCKY SOUTH STATE PLANE NAD 83 (METERS)

Notes

1. Test Boring Locations were surveyed by Allegheny Surveys.
2. Earthwork slopes presented in soil are (2.5 horizontal : 1 vertical) and in rock are (1 horizontal : 1 vertical)*.

ORIENTED TO GRID NORTH BASED ON GPS OBSERVATIONS TAKEN MARCH 2011. THE APPROXIMATE MAGNETIC DECLINATION IS 8° WEST.

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

APPENDIX C
AIR EMISSION CALCULATIONS

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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	7.80	32.35	108.53	1.90	217.59	27.05	11,212
Construction	2	7.80	32.35	108.53	1.90	147.09	20.00	11,212
Operations	Yearly	0.70	29.33	21.36	0.18	1.16	0.58	1,271

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	3.27	13.87	42.32	0.83	158.71	18.05	4,304
Construction	2	3.27	13.87	42.32	0.83	106.64	12.85	4,304
Operations	Yearly	0.70	29.33	21.36	0.18	1.16	0.58	1,271

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 8,974 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	90	185	0.59	0.34	1.21	4.08	0.12	0.23	0.22	536
Wheel Loader for Spreading	112	87	0.59	0.35	1.25	4.23	0.12	0.24	0.23	536
Compactor	247	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	17,948	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	27.30	144.34	647.39	0.32	27.00	26.16	61,715
Subtotal (lbs):	**48**	**219**	**897**	**7**	**41**	**40**	**93,033**
Gravel Work Grand Total in Tons	**0.02**	**0.11**	**0.45**	**0.00**	**0.02**	**0.02**	
Gravel Work Grand Total in Metric Tons							**42**

Table 1.4 Concrete Work
Foundation Work 6,806 CY
Sidewalks, etc. 453 CY
Total 7,259 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

367,526 SF Foundation

809,951 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 4,337 CY

Paving - HMA 117,087 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	Productivity based Speed	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	865	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	117,087	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	7.80	32.35	108.53	1.90	217.59	27.05	11,212
Year 2	7.80	32.35	108.53	1.90	147.09	20.00	11,212

Alternative 2 - Roxana

Table 2.1 Clearing

161 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	1,868	145	0.58	0.38	1.41	4.17	0.12	0.30	0.29	536
Loader/Backhoe	1,868	87	0.21	1.43	7.35	6.35	0.15	1.06	1.03	692
Small Backhoe	1,868	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	130.42	489.74	1,445.16	39.90	102.49	99.42	185,494
Loader w/ integral Backhoe	107.70	552.88	477.59	11.19	79.98	77.58	52,030
Small backhoe	68.09	349.52	301.92	7.07	50.56	49.04	32,892

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	855	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	21.09	111.50	500.12	0.25	20.86	20.21	47,676
Subtotal in lbs	327	1504	2725	58	254	246	318092
Clearing Grand Total in Tons	**0.16**	**0.75**	**1.36**	**0.03**	**0.13**	**0.12**	
Clearing Grand Total in Metric Tons							**144.3**

Table 2.2 Site Prep

Site Prep - Excavate/Fill (CY) 8,124,680 CY

Grading (SY) 779,240 SY Assume compact 0.5 feet (0.166 yards) = 787,517 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	27,082	243	0.59	0.34	1.21	4.03	0.12	0.22	0.22	536
Skid Steer Loader	32,499	160	0.23	0.38	1.47	4.34	0.12	0.31	0.30	536
Dozer (Rubber Tired)	29,437	145	0.59	0.38	1.41	4.17	0.12	0.30	0.29	536
Compactor	958	103	0.58	0.40	1.57	4.57	0.12	0.32	0.31	536
Grader	277	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	2,943.97	10,351.16	34,493.08	986.58	1,907.24	1,850.02	4,586,419
Skid Steer Loader	1,010.50	3,875.59	11,438.76	303.81	805.19	781.04	1,412,368
Dozer (Rubber Tired)	2,091.18	7,852.42	23,171.51	639.77	1,643.34	1,594.04	2,974,180
Compactor	49.86	198.17	576.19	14.54	40.27	39.06	67,595
Grader	34.67	121.81	410.44	11.62	22.75	22.06	54,031

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)	27,082	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)	206.00	1,088.97	4,884.29	2.44	203.72	197.40	465,617
Subtotal in lb:	**6,336**	**23,488**	**74,974**	**1,959**	**4,623**	**4,484**	**9,560,210**
Site Prep Grand Total in Tons	**3.17**	**11.74**	**37.49**	**0.98**	**2.31**	**2.24**	
Site Prep Grand Total in Metric Tons							**4,336**

Table 2.3 Gravel Work 8,701 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	87	185	0.59	0.34	1.21	4.08	0.12	0.23	0.22	536
Wheel Loader for Spreading	109	87	0.59	0.35	1.25	4.23	0.12	0.24	0.23	536
Compactor	240	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	17,402	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	26.47	139.95	627.69	0.31	26.18	25.37	59,837
Subtotal (lbs):	**46**	**212**	**870**	**7**	**40**	**39**	**90,203**
Gravel Work Grand Total in Tons	**0.02**	**0.11**	**0.43**	**0.00**	**0.02**	**0.02**	
Gravel Work Grand Total in Metric Tons							**41**

Table 2.4 Concrete Work

Foundation Work 6,806 CY

Sidewalks, etc. 453 CY

Total 7,259 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

367,526 SF Foundation

809,951 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 3,790 CY

Paving - HMA 102,323 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	Productivity based Speed	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	756	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	102,323	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	32.20	154	104.1	0.1	10.4

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	3.27	13.87	42.32	0.83	158.71	18.05	4,304
Year 2	3.27	13.87	42.32	0.83	106.64	12.85	4,304

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-(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. 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
Total	**0.51**	**5.95**	**20.29**	**0.17**	**1.03**	**0.46**	**474**

Table 5. 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	5.689E-05	5.192E-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 6. 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	1,271

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
UNICOR Warehouse				1,375	14,800	1,375	14,800	1		274	18	274
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									4,337	2,168		
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	75,247	809,951	34,144	367,526		4,337	8,974	453	6,806
Roads/Parking - Roxana									3,790	1,895		
Fill/Excavate - Roxana			8,124,680									
Grading - Roxana		779,240										
Clearing Roxana	161											
Roxana Total	161	779,240	8,124,680	74,594		34,144			3,790	8,701	453	6,806

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

Alternative 2 **Roxana**

700 acres

161 acres cleared

2,928,922	CY soil excavated	3,831,679	CY total excavation	Total excavation + fill=	8,124,680
902,757	CY rock excavated				
2,087,607	CY structural fill	4,293,001	CY total fill		
2,205,394	CY spoil 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

APPENDIX D
ENHANCED UTILITY REPORT

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Enhanced Utility Investigation Report

Federal Bureau of Prisons

Letcher County, Kentucky

Prepared by:

Cardno
Shaping the Future

October 2014

United States Department of Justice

Federal Bureau of Prisons

320 First St NW

Washington, DC 20534

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EXECUTIVE SUMMARY

In 2011, Cardno (formerly TEC Inc.) was retained by the Federal Bureau of Prisons (BOP) to conduct a Feasibility Study for the development of a 1,800-bed federal correctional facility to be located at one of three identified sites located near the town of Whitesburg in Letcher County, Kentucky (KY). As part of the Feasibility Study, a Utility Investigation Report was prepared in order to assess the viability and costs associated with providing utilities to each site. The purpose of the utility report was to assess the availability of water, sanitary sewer, natural gas, electricity, and telecommunications for each of the proposed locations.

The results of the Feasibility Study have allowed the project to proceed into the next phase, which includes the preparation of an Environmental Impact Statement (EIS). At the conclusion of the Feasibility Study, it was determined that one of the three potential sites is not a viable option for constructing a new BOP correctional facility and therefore the EIS includes the assessment of only two sites. Also, since the conclusion of the Feasibility Study, the size of the facility has been reduced to a 1,200-bed correctional facility. To address this change and account for any other possible changes to the utilities over the past three years, the EIS includes the preparation of this Enhanced Utility Investigation Report. This "enhanced" report replaces the initial Utility Study. All information presented in the original report has been updated to reflect the changes associated with the various utility systems. All pertinent utility information is incorporated into this Enhanced Utility Investigation Report.

It is assumed that the on-site utility requirements would be comparable for both sites and that the factors determining the most viable and cost effective option would be related to connecting each of the potential sites to the existing utility infrastructure. Therefore, on-site utilities have not been included in this assessment. The two sites included in this report are Roxana/Meade Farm and Payne Gap, both of which are located within 10 miles of the town of Whitesburg. To determine viability of bringing the utilities to both identified sites, the capacity of the existing utility systems and the distance from the proposed connection points were assessed and cost estimates were prepared.

For both sites, water service has been extended or is in the process of being extended to the property lines and the wastewater utility providers have indicated that they intend to extend their existing systems to the proposed sites at no cost to BOP; however, it is likely that BOP will need to provide some cost sharing for the sanitary sewer extension to the Roxana site, if it is selected. Conversations with American Electric Power (AEP), the power provider for both sites, indicate that the existing system has ample capacity to handle the facility at either of the potential locations and there would be no costs to BOP associated with the AEP connection, assuming overhead connections. The telecommunications lines also have adequate capacity to provide service to both sites, but BOP will be responsible for the cost of the necessary infrastructure to connect to the existing telecommunications systems. For the natural gas connection, both sites would require the installation of a meter and tap, which would be the responsibility of BOP. This cost would be comparable at both sites. At the Roxana/Meade Farm site there are multiple gas wells that would need to be closed and abandoned and lines that need to be relocated. This would require a BOP investment of approximately $12.8 million. Similarly there is a well at the Payne Gap site that would need to be abandoned and a 16-inch natural gas line that would need to be relocated around the perimeter of the site. These costs are estimated at $5 million.

With respect to capital investment for all utilities, the Roxana site is more costly by nearly $7 million. However, the time associated with abandoning the wells is about six months, compared to a minimum of

two years to relocate the 16-inch gas line at Payne Gap. These cost and schedule factors associated with the natural gas components are critical to the site selection recommendation as it pertains to the utilities. All other utility costs and scheduling factors are relatively comparable and have negligible impacts on site selection.

In addition to identifying the most viable location for the construction of a new BOP federal correctional facility, this study identifies some potential options for implementing alternative energy and sustainability practices at the new facility. Kentucky does not lie within a prime area of the country that supports the implementation of a primary wind, solar, or geothermal alternative energy system. However, solar and geothermal systems could be further evaluated for supplementing the power systems at the new facility. This evaluation would be needed after site selection is complete and detailed design planning commences. Additionally, the implementation of practices such as gray water disposal, water reduction efforts, and installation of green roof technology should also be considered during design to help meet sustainability goals.

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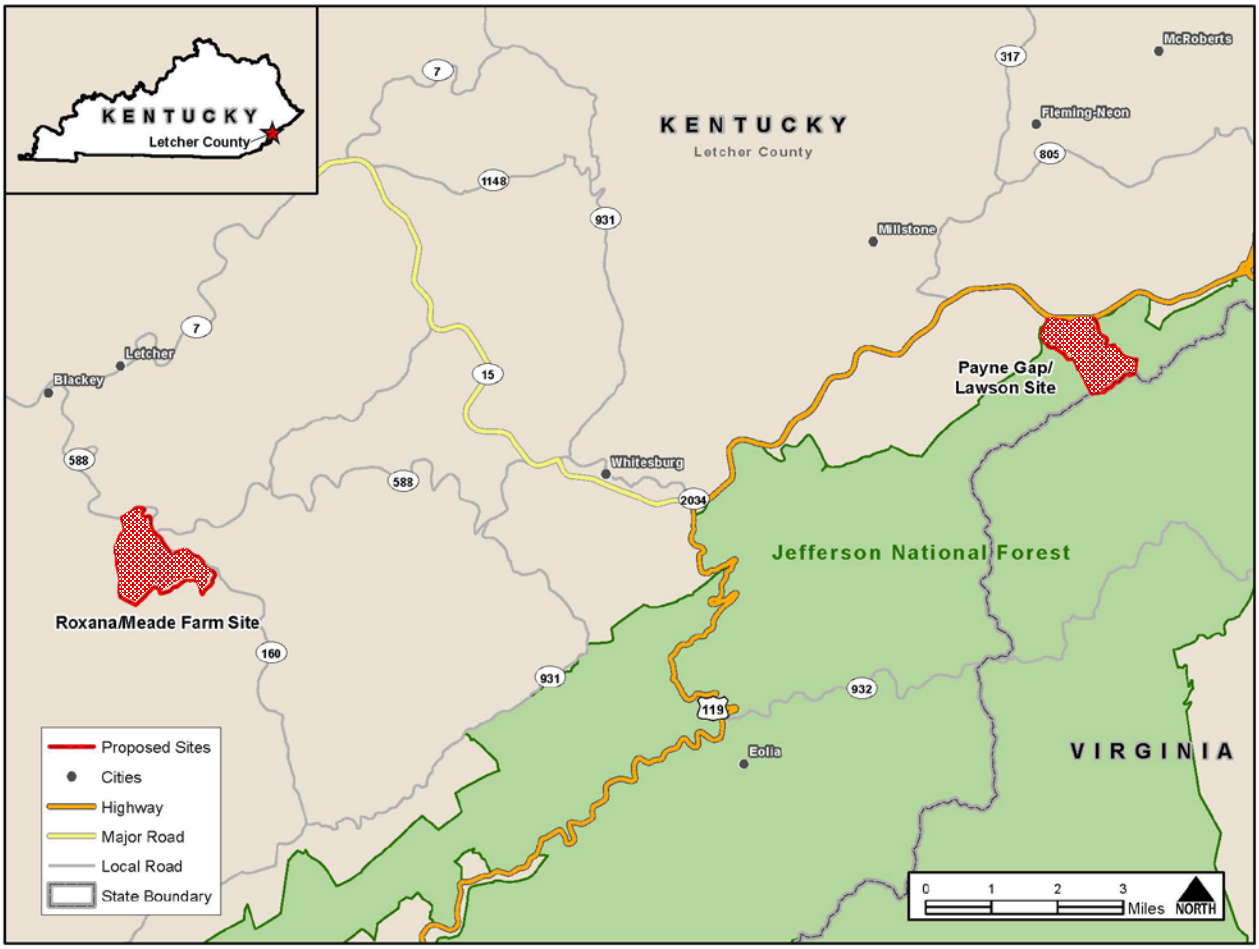
1.0 INTRODUCTION

Cardno has been retained by the Federal Bureau of Prisons (BOP) to prepare an Environmental Impact Statement (EIS) for the development of a 1,200-bed federal correctional facility in Letcher County, Kentucky (KY). Two potential sites located near the town of Whitesburg are currently being considered for the construction of the new facility, as illustrated in Figure 1-1.

The two potential sites are identified as Roxana/Meade Farm and Payne Gap. As depicted in Figure 1, the Roxana/Meade Farm site is located less than 10 miles to the west of Whitesburg and the Payne Gap site is located on the Kentucky-Virginia border, less than 10 miles to the east of Whitesburg. This report is being prepared in coordination with the EIS and is designed to investigate the availability, cost, and feasibility of providing utilities to both of the potential sites, identify the pros and cons for each of the sites, and develop recommendations for potential development.

Figure 1-1 - Potential BOP Federal Correctional Facility Locations



2.0 BACKGROUND INFORMATION

This "Enhanced" Utility Investigation Report is an enhancement to the Utility Investigation Report prepared for BOP in 2011. In 2011, Cardno (formerly TEC Inc.) was retained by BOP to prepare the initial Utility Investigation Report, in which three sites were considered. In addition to the two sites that remain under consideration, the third site included the Van Fields Site, just north of Whitesburg, on Route 15.

Prior to the initial Utility Investigation Report, several studies had previously been performed in support of the potential construction of a new federal correctional facility at the three potential sites. These studies include:

- *Site Reconnaissance Study* prepared by the Louis Berger Group (November 2008)
- *Mine History Reports* (each site) prepared by Summit Engineering (August 2010)
- *Site Investigation Trip Memo* prepared by KCI Technologies (October 2010)

Information from each of these studies was utilized in developing background information, baseline data starting points, initial contact information, and additional evaluation criteria.

The *Site Investigation Trip* memo (KCI 2010) provided ranking criteria for the potential sites. Based on a scale of 1 to 5 (1 being the highest), the average utilities rank for the three sites ranged from 2.25 to 3.25, indicating the results of the initial utility assessment were fairly comparable for the three potential sites. However, based on other concerns associated with past mining, accessibility, and excavation requirements, KCI recommended that the Payne Gap site be removed from consideration. Since the purpose of this report is to further assess the utilities, the BOP decided to continue to include the Payne Gap site in this study, as it is still a feasible option.

Several other studies were performed concurrently with the initial Utility Investigation Report. One such study was a Topographical and Boundary survey performed by Marshall Miller and Associates (MMA). This survey has allowed realistic layouts of the facilities to be developed within the property boundaries. The layouts along with the elevations at the site will be imperative for infrastructure design, most importantly for establishing requirements for water distribution and sanitary sewer lift stations.

3.0 DESIGN CRITERIA

This section describes the utility needs for the proposed BOP federal correctional facility and the utility design criteria to meet those needs. The initial basis for utility design criteria was outlined in the *Site Reconnaissance Study* prepared by the Louis Berger Group in November 2008. The criteria outlined in the *Site Reconnaissance Study* were based on a 1,400 bed facility. This was utilized as an initial starting point for discussions with the local utility providers to determine if the required minimum demand was available, and if not, what would be required to provide utilities to the potential sites. In addition to the minimum criteria, the potential for increased capacity due to future expansions and plans was investigated. The initial population of 1,400 beds for the proposed BOP facility, as discussed in the *Site Reconnaissance Study*, was initially increased to a 1,800 bed facility in the initial Utility Investigation Report, but has been decreased to a 1,200 bed facility in this final study.

3.1 Utility Systems

The design criteria used to assess the utilities in this report are based on providing utilities to the US Penitentiary (USP) and Federal Prison Camp (FPC) facilities. The total capacity for these two facilities is 1,200 inmates and it is estimated that approximately 300 full-time staff would be required to operate the two facilities as well as the ancillary support facilities listed below. The utility usage estimated in this section is based on providing utilities to similar types and sizes of facilities. Additionally actual useage could be considerably less based on energy efficient considerations that will be evaluated during design and construction. All utility use will be metered and the Bureau will be invoiced based on actual useage.

USP and FPC Support Facilities

- Central Utility Plant 1,217 square feet
- Firing Range 96 square feet
- Outside Warehouse 3,279 square feet
- UNICOR Warehouse 1,375 square feet
- Staff Training Building 910 square feet

3.1.1 Water

- Average Water Demand:
  - USP and FPC Facilities: 215 gallons per day (gpd) per bed x 1,200 beds = 258,000 gpd
  - Utility Plant: 2,000 gpd per acre x 0.03 acres = 60 gpd
  - Warehouses: 1,000 gpd per acre x 0.1 acres = 100 gpd
  - Training Building: 20 gpd per person x 300 people = 6,000 gpd

  Total Average Water Demand = 264,160 gpd or approximately 185 gallons per minute (gpm)

- Peak Water Demand:
  - 4 times average water demand
  - 185 gpm x 4 = 740 gpm
- Fire Flow Requirement: 2,000 gpm for four hours
- Minimum Water Pressure: 40 pounds per square inch (psi)
- Preferred Water Pressure: 80 psi
- Water Storage Capacity: 500,000 gallons

[The utility provider must be able to meet peak demands and fire flow requirements during select periods when the tank is taken off-line for maintenance and repairs]

3.1.2 Sanitary Sewer

- Average Wastewater Flow:
  - 85% of Average Water Demand
  - 264,160 gpd x 0.85 ~ 225,000 gpd
  - 156 gpm
- Peak Wastewater Flow:
  - 3.5 times average wastewater flow
  - 156 gpm x 3.5 = 546 gpm

3.1.3 Natural Gas

- Usage based on typical correctional facility:
  - Annual Energy Usage: 50 – 70 million cubic feet (mcf)
  - Maximum Hourly Usage: 25,000 – 28,000 cubic feet per hour (cfph)
  - Maximum Daily Usage: 250,000 – 280,000 cubic feet (cf)

3.1.4 Electric

- Usage based on typical correctional facility:
  - System Requirements: 12–15 kilovolt (kV) system with 3-phases and 4-wire components
  - Average Energy Usage: 18 – 19 million kilowatt hours (kWh) (could be higher depending on design and equipment)
  - Demand Load: 4,500 – 5,000 kilowatts (kW)
  - On-site Transformer Requirements: 5,000 kilovolt ampere (kVa)

3.1.5 Telecommunications

Telecommunications service also includes internet and security connections for communications with outside correctional officials and facilities. The minimum requirements for new construction, generally coordinated through the local telecommunications company, include:

- Primary Rate Interface (PRI) T1 for the Federal Telecommunications System
- Integrated Services Digital Network (ISDN) T1 for local calls
- 200 pair copper
- 400 continuous Direct Inward Dialing (D.I.D.) numbers

4.0 UTILITY PROVIDERS

The information regarding utility providers for the five utility systems listed in Section 3.0 was gathered through phone conversations, email communications, and on-site meetings held with the individual utility providers for each of the sites during the preparation of the initial Utility Investigation Report.

The Letcher County Water and Sewer District (LWSD) provides sanitary sewer service to the Roxana/Meade Farm site through the Whitesburg Wastewater Treatment Plant (WWTP). The Whitesburg WWTP was recently upgraded in anticipation of the proposed BOP federal correctional facility to a capacity of 600,000 gpd with an average load of 300,000 gpd. The facility was built with the ability to phase-in upgrades as necessary to handle additional flows.

The LWSD is in the process of upgrading and connecting all of the county's water systems in order to provide redundancy in the system. These plans have included connections between all the existing water systems, and new connections in the city of Jenkins and Fleming Neon. Water service has been or is in the process of being extended to both potential BOP sites.

American Electric Power (AEP) provides electricity in the vicinity of both sites. AEP recently constructed a 4 megawatt facility in the vicinity of the Roxana site for a gas co-generation plant. The plant was never constructed; therefore, there is ample capacity in the existing system to handle the additional load from a new BOP facility, regardless of site selection.

Telecommunication and natural gas lines are provided by various utility providers. The providers are listed in Table 4-1, and the systems adjacent to the Roxana/Meade Farm and Payne Gap sites are discussed further in Sections 4.1 and 4.2, respectively. In addition, a brief discussion is provided for each site, which includes estimates of probable connection costs, summaries of the advantages and disadvantages associated with utility connections to each site, a map of each site, and the locations of the existing utility infrastructure.

Table 4-1 – Utility Providers

Site	Utility Providers				
	Water	**Wastewater**	**Natural Gas**	**Electric**	**Telecommunication**
Roxana/Meade Farm	LWSD	LWSD	Equitable Gas (EQT) & Clean Gas Inc./Hayden Harper	AEP	Birch Communications
Payne Gap	LWSD	City of Jenkins	EQT	AEP	Windstream

4.1 Roxana/Meade Farm

The Roxana/Meade Farm property is located southwest of Whitesburg, with existing access from Route 160 east of the intersection with State Highway 588. As described in Summit Engineering's (2010) *Mine History Report*, the property has past mountaintop mining with approximately 30 feet of spoils and has a level top. There are multiple gas lines and wells throughout the area of interest.

Water Service: Public water would be provided by the LWSD. LWSD is in the process of extending their water system to the eastern property boundary of the proposed Roxana site. Therefore, to bring water to the new BOP federal correctional facility, the connection would be limited to a tap on the existing system near the property boundary and the installation of on-site infrastructure. The new line being run to the site is an 8-inch pipeline and should be adequate to meet the 80 psi pressure requested for the BOP facilities. This water system is capable of providing 4 million gallons per day to the region, which is ample capacity to meet the needs of the new BOP facilities.

Sanitary Sewer Service: LWSD would also be providing sanitary sewer service to the proposed Roxana site. As with the water service, LWSD is also extending their wastewater collection service, but the extension has not yet been completed as far as the proposed Roxana site. Currently, the connection point is approximately 2.75 miles from the proposed site. To connect to the existing system, construction of a lift station would be required as well as the installation of approximately 2.75 miles of a new collection system. Although the initial intention of LWSD was to construct the required extension all the way to the proposed site at no cost to the BOP, LWSD would likely need some funding assistance to complete the extension of the collection system to the proposed site. This assistance may need to be provided by or be facilitated by BOP. For the purposes of this report, it is assumed that LWSD would require 50% contribution from BOP for this extension.

Natural Gas: The site consists of multiple gas wells and gas transmission lines. Currently there are 14 Hayden Harper gas wells and 1 EQT gas well within the Roxana/Meade Farm property. Since the BOP does not own or operate gas wells and does not become involved in mineral rights, all wells within the property boundary would need to be closed and abandoned, regardless of proximity to proposed facilities. It would take up to six months to close and abandon these wells. The cost associated with closure and abandonment of wells can range from $300,000 to $1,000,000. Due to the large production potential of many of the wells at this site, it is estimated that each closure would cost approximately $850,000. To abandon all 15 wells, the associated costs would be approximately $12.75 million. There would also be a connection fee for BOP to connect to the natural gas distribution system. Since the system is in close proximity to the site, the connection would be limited to the cost of the meter and tap, which is estimated at $110,000.

Electric Power: As indicated in Section 4.0, AEP has sufficient capacity in the immediate vicinity to supply power to the proposed BOP facility. With the projected load and revenue from the proposed BOP facility, AEP has indicated that the connection to the handoff point for the secure perimeter would be provided at no cost to the BOP. The service would be provided via overhead lines directly to the handoff point to the proposed BOP facility with no on-site facilities needed. If underground connections (conduit) are required for service to the proposed BOP facility, the cost of the conduit and running of lines would be the responsibility of the BOP and would be calculated as part of the site development costs.

Telecommunications: Birch Communications, the telecommunications company serving the area, has the capability to meet the minimum requirements of the proposed BOP facility. There is a remote

terminal located in close proximity. However approximately 2 miles of fiber optic cables and 4 miles of copper cables would be required to bring service to the edge of the property. At this time, it should be assumed that the costs to install these cables would be the responsibility of BOP. However, during the design phase, Birch Communications should be contacted to discuss potential cost-sharing options.

Opinion of Probable Costs: The costs to provide adequate utility service to the Roxana/Meade Farm site are presented in Table 4-2. The estimates are based on the information provided through the utility provider interviews and based on the engineering reports listed in Section 2. These costs are intended as an indicator of the general order of magnitude for the activities outlined. These costs should be used for site cost comparison purposes only. More detailed studies will be required to identify all factors associated with the actual costs required for extending the utility infrastructure and making the connections.

Table 4-2 – Roxana/Meade Farm Utility Service Opinion of Probable Cost

Utility	Items Included	Cost	
		BOP	**Others[1]**
Water	Costs associated with bringing water to the site will be associated with installation of on-site infrastructure - TBD during design	$0	$0
Sanitary Sewer	- Gravity Main Force Main - Manholes - Lift Station(s) - 15% Construction Contingency - 30% Design/Admin/ROW/Legal/ Permitting	$1.4 million	$1.4 million
		LWSD to provide *May require some assistance from BOP* (50% assumed)	
Natural Gas	Meter and Tap (incl. connection fees)	$110,000	$0
	Well Closure: $850,000 x 15	$12,750,000	
Electrical	N/A (assumes no underground conduit required)	$0	$0
Telecommunications	- Construction of Local Remote Terminal - Installation of fiber optic cables - Installation of copper cable - Local electronics	$165,000	$0
	UTILITY CONNECTION FEES	**$14,425,000**	**$1,400,000**
	TOTAL	**$15,825,000**	

1. Fee responsibility breakdown assumes the utility provider would contribute the portion of the costs listed above. If conditions change, BOP could potentially be responsible for all or portions of the "Others" fees.

Advantages:

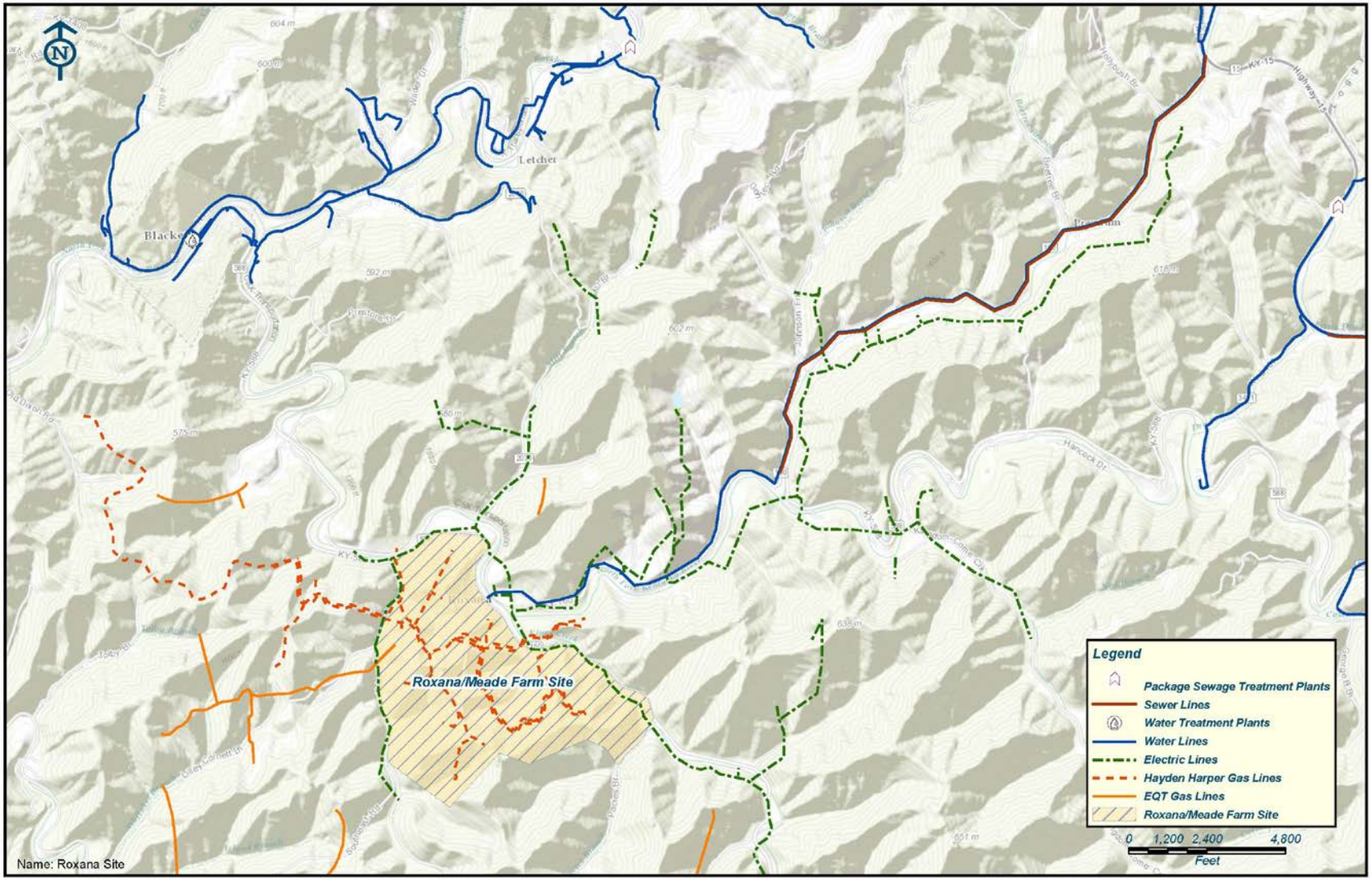
- Proposed site is relatively level
- Water transmission main has already been brought to the site
- LWSD already has plans underway to extend the wastewater collection system to the site
- Sufficient capacity available to supply electric power to the site at no cost to BOP

Disadvantages:

- Multiple gas wells and lines on the property would need to be closed and abandoned and/or relocated off the site at the expense (costly) of BOP
- Extension of the wastewater collection system would likely require some funding assistance from BOP
- There is no telecommunication remote terminal in the vicinity of the proposed Roxana/Meade Farm site, requiring the construction of a new remote terminal

A map of the existing utilities in the vicinity of the Roxana/Meade Farm site is included in Figure 4-1.

Figure 4-1 - Existing Utilities at Roxana/Meade Farm Site



4.2 Payne Gap

The Payne Gap property is located east of Whitesburg along the south side of Highway 119, between Routes 805 and 23. The property has deep mines and would need to be excavated and filled in order to create a level surface for construction. This location offers the most direct access to major highways.

The *Site Investigation Trip* memo (KCI 2010) recommended that the Payne Gap site be removed from consideration due to "significant concerns with its locations, past mining, and excavation." However the BOP feels that the site should remain under consideration because of its accessibility and proximity to alternative utility suppliers not associated with the Roxana/Meade Farm site.

Water Service: Public water would be provided to the Payne Gap site by the LWSD. As described previously, LWSD has recently been extending its service area. In addition to extending the service to Roxana, the service has already been extended along Highway 119, adjacent to the proposed Payne Gap property. An 8-inch diameter watermain is in the vicinity of the Payne Gap site, and the water pressure near the connection point is approximately 110 psi. This is more than adequate to meet the 80 psi pressure requirements of the BOP facilities. Currently, the system in the vicinity of Payne Gap is being upgraded to ensure the average and peak water demands at the new facilities would be met. As with the Roxana site, the costs to BOP to provide water to its facilities would be limited to tapping the existing watermain and installing the necessary on-site water distribution infrastructure. All other water system upgrades are being provided by LWSD.

Sanitary Sewer Service: Sanitary sewer services would be provided by the City of Jenkins and handled at the Jenkins WWTP. The nearest connection point to the Payne Gap site is located in close proximity to the Gateway Industrial Park in Jenkins. The connection point is an 8-inch gravity line, which would provide sufficient capacity for the estimated flow from the proposed BOP federal correctional facility. In order to reach the proposed connection point, construction of a lift station would be required. According to City officials and their representative engineering firm, Nesbitt Engineering, the WWTP has sufficient capacity to handle the proposed volume from the proposed BOP Facility. The City of Jenkins intends to provide construction of the sanitary sewer services to the proposed BOP facility at no cost to the BOP.

Natural Gas: There is one gas well on-site, as well as a transmission line running directly through the property. The transmission line is a 16-inch high pressure main, owned and operated by EQT. The well is also owned and operated by EQT. The cost to relocate the gas line would be approximately $455 per linear foot (lf) and there would be a fee of approximately $110,000 for the connection and installation of a meter. Due to its proximity to the Jefferson National Forest, it would be necessary to reroute the new transmission line to the north and along Highway 119. This would require approximately 9,000 feet of a new pressure main. It is anticipated that it would take a minimum of two years to design, permit, and install this pressure main. In addition to the transmission line relocation, the EQT well would need to be abandoned and plugged. This would require an additional investment of approximately $850,000 from the BOP.

Electric Power: As indicated previously, AEP has sufficient capacity in the immediate vicinity to supply power to the proposed facility. With the projected load and revenue from the BOP facility, AEP has indicated that the connection to the handoff point for the secure perimeter would be provided at no cost to the BOP. The service would be provided via overhead lines directly to the handoff point to the secure facility with no on-site facilities needed. If underground connections (conduit) are required for service to

the proposed BOP facility, the cost of the conduit and running of lines would be the responsibility of the BOP and would be considered part of the site development costs.

Telecommunications: Windstream, the telecommunications company serving the area, has the capability to meet the minimum requirements of the proposed BOP facility. However, the connection to the existing infrastructure would be the responsibility of BOP. This would include the connection to the fiber cables at a splice location adjacent to the site and the connection to the copper cables at the Gateway Industrial Park in Jenkins.

Opinion of Probable Costs: The costs to provide adequate utility service to the Payne Gap site are presented in Table 4-3. The estimates are based on the information provided through the utility provider interviews and based on the engineering reports listed in Section 2. These costs are intended as an indicator of the general order of magnitude for the activities outlined. These costs should be used for site cost comparison purposes only. More detailed studies will be required to identify all factors associated with the actual costs required for extending the utility infrastructure and making the connections.

Table 4-3 – Payne Gap Utility Service Opinion of Probable Cost

Utility	Items Included	Cost	
		BOP	Others[1]
Water	Costs associated with bringing water to the site will be associated with installation of on-site infrastructure - TBD during design	$0	$0
Sanitary Sewer	- Gravity Main / Force Main - Manholes - Lift Station(s) - 15% Construction Contingency - 30% Design/Admin/ROW/Legal/ Permitting	$0	$3.8 million [City of Jenkins]
Natural Gas	Meter and Tap (incl. connection fees)	$110,000	$0
	16-inch main relocation (9,000 ft @ $455/lf)	$4,100,000	
	Well closure	$850,000	
Electrical	N/A (assumes no underground conduit required)	$0	$0
Telecommunications	Installation of fiber optic cables Installation of copper cables	$35,000	$0
	UTILITY CONNECTION FEES	**$5,095,000**	**$3,800,000**
	TOTAL	**$8,895,000**	

1. Fee responsibility breakdown assumes the utility provider would contribute the portion of the costs listed above. If conditions change, BOP could potentially be responsible for all or portions of the "Others" fees.

Advantages:

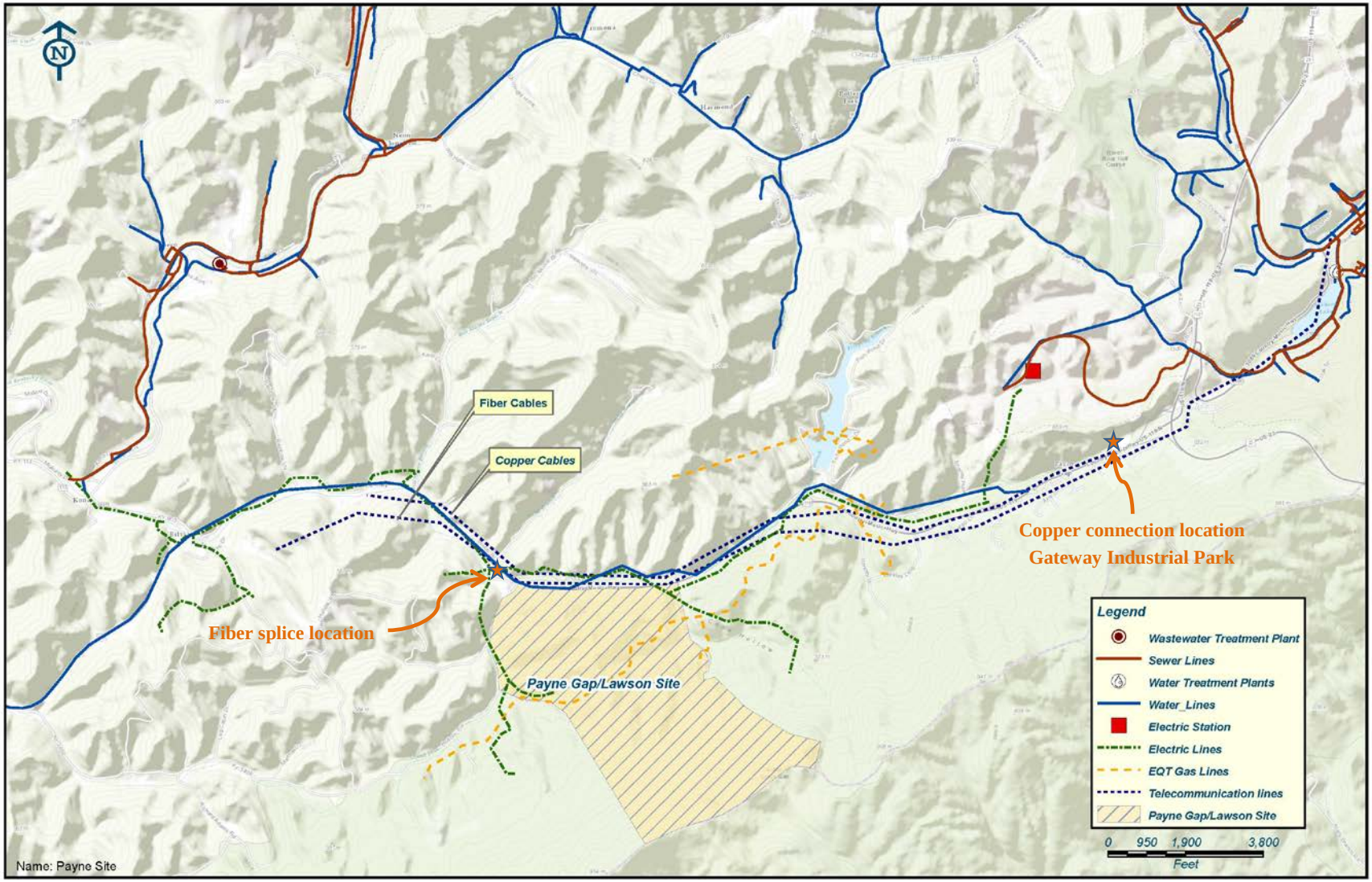
- Water service has already been extended to the site with adequate pressure and modifications to the water supply are currently underway to meet the estimated BOP water demand
- The City of Jenkins to provide a connection to the existing sanitary sewer collection system at no cost to BOP. Could cost approximately $3.8 million.
- Sufficient capacity available to supply electric power to the site at no cost to BOP
- Existing telecommunications service is adequate to meet minimum requirements of the proposed BOP facility, with minimal distance to the connection location

Disadvantages:

- Excavation and fill required to level property
- The existing 16-inch natural gas transmission line currently running through the proposed site would need to be relocated at the expense of BOP. Although the current pipeline is approximately 4,000 feet, it would require more than twice that distance to reroute the transmission line around the property. It would require at least two years to design, permit and construct the new line.
- There are two EQT gas wells on site that need to be relocated

A map of the existing utilities in the vicinity of the Payne Gap site is included in Figure 4-2.

Figure 4-2 - Existing Utilities at Payne Gap Site



5.0 ALTERNATIVE ENERGY AND SUSTAINABILITY

Part of Executive Order 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*, requires Federal agencies to increase energy efficiency, conserve water, reduce waste, support sustainable communities, and leverage Federal purchasing power to promote environmentally responsible products and technologies. This reduction of demand from the natural environment and load back to the natural environment would benefit not only the local community, but also the proposed BOP federal correctional facility itself by reducing operating costs.

Without a detailed design for the proposed BOP facility, specific alternative energy designs and sustainability practices consistent with a new facility are difficult to identify at this time. However, some general practices aimed at the implementation of alternative energy sources and sustainability goals are discussed in this section, along with limitations associated with the sites. It is unlikely that the feasibility of specific practices would vary at the different proposed BOP facility sites that have been assessed. The viability and limitations are primarily associated with the entire region and any space constraints, which are comparable at both sites.

5.1 Alternative Energy

Use of alternate or renewable sources of energy supports the Executive Order 13514 initiative by utilizing energy generated from natural resources that can be replenished naturally, without depleting the source. The two most widely recognized sources of renewable energy are related to solar and wind power. However, there are other sources of renewable energy such as biomass energy and geothermal systems that are gaining in popularity.

The National Renewable Energy Laboratory (NREL) is focused on the advancement of our nation's energy goals, through the research and development of renewable energy and implementation of energy efficient systems. Through their research, NREL has performed numerous studies on the efficacy of different types of renewable energy sources. This section provides a discussion on available renewable energy sources, as well as the results of NREL's research on their effectiveness in various parts of the country, and an assessment of potential use at the proposed BOP facility.

The renewable energy sources discussed in this assessment include:

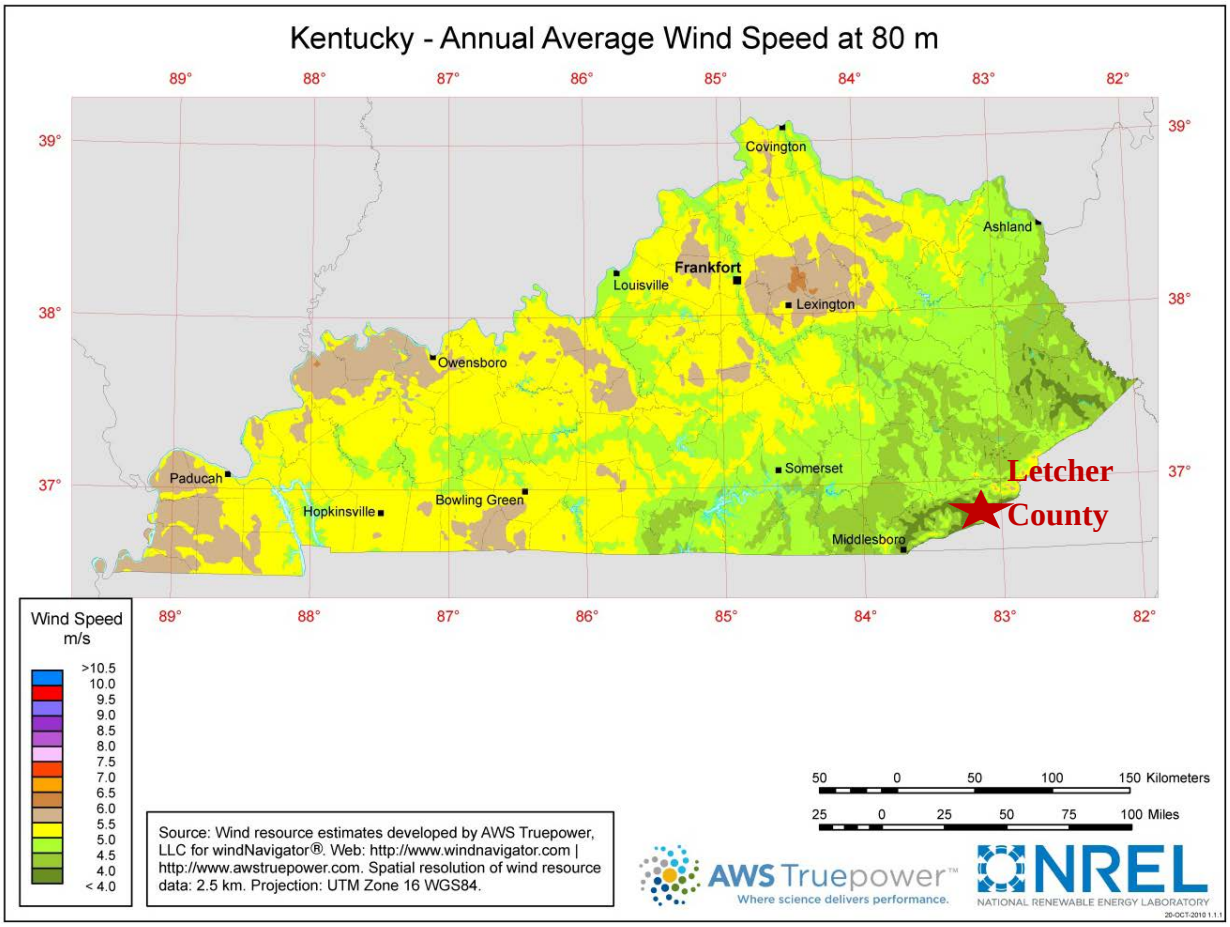
- Wind Energy
- Photovoltaics/Solar Power
- Geothermal Systems
- Biomass Energy

5.1.1 Wind Energy

Wind energy is harnessed through catching naturally occurring wind with wind turbines and converting the wind's energy into electricity. Turbines are typically installed on towers over 100 feet tall in order to harness higher wind speeds. Wind turbines can be installed individually, or in large groups, depending on their intended application, which can range from supplementing small portions of a facility's energy consumption to providing the primary source of electricity.

In order for wind turbines to harness and convert wind into electricity there needs to be a consistent and sufficient amount of wind. NREL, in coordination with the Department of Energy's Wind Program, published a wind resource map for the state of Kentucky. The wind resource map shows the predicted mean annual wind speeds at an 80-meter (m) [262.5-ft] height. Areas with annual average wind speeds of 6.5 meters per second and greater at an 80-m height are generally considered to be suitable for wind development. Figure 5-1 shows the wind resource potential at 80-m heights for Kentucky.

Figure 5-1 - Kentucky Wind Map



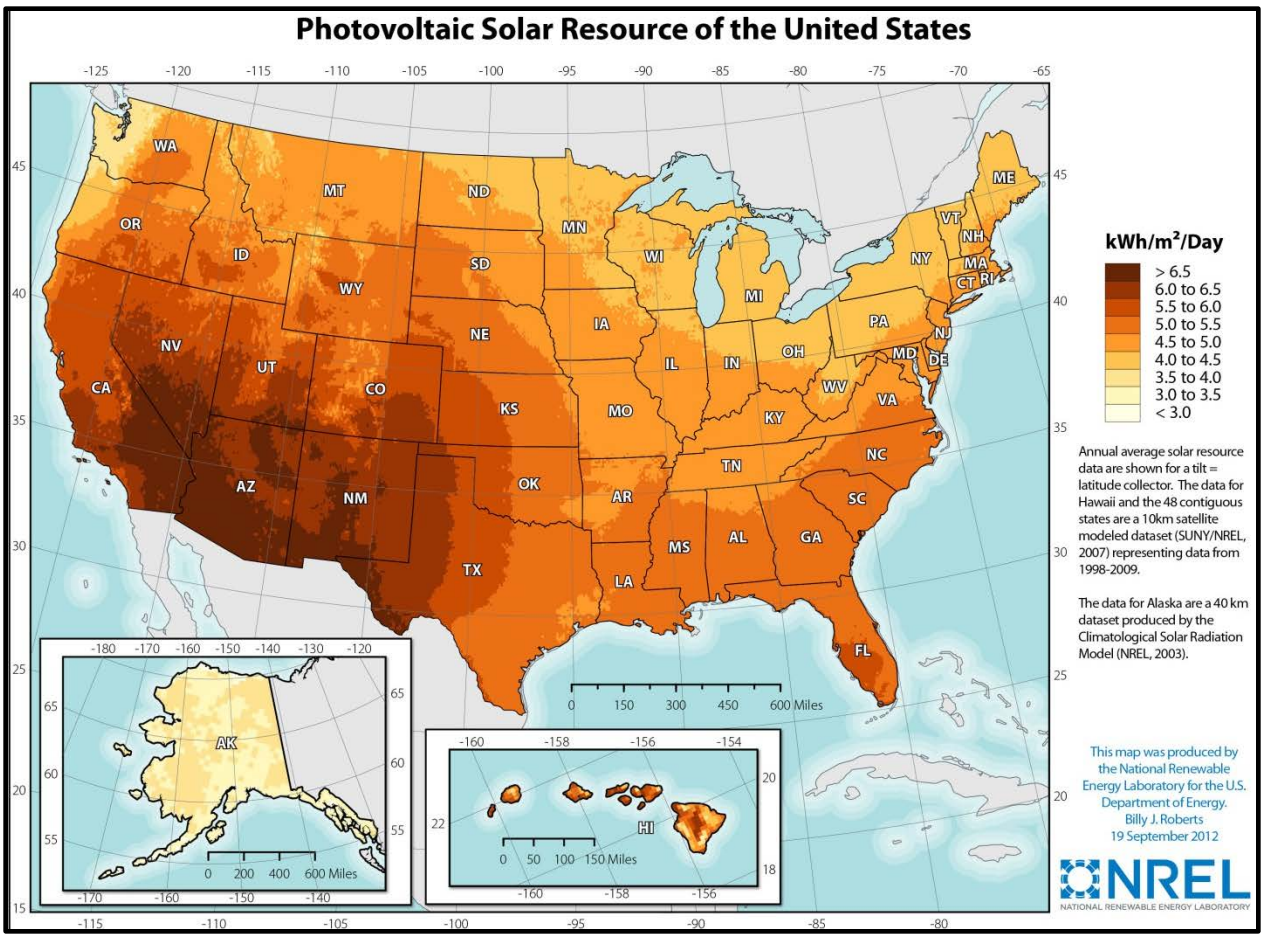
Source: NREL. Kentucky – Annual Average Wind Speed at 80 m. October 2010. http://apps.eere.energy.gov/wind/windexchange/pdfs/wind.maps/ky_80m.pdf

Letcher County's average annual wind speed falls below the 5.0 meters per second at the 80-m height. While the map is a nationally produced map and specific localized data was not gathered, it is generally accepted that wind power is an unlikely source for alternative energy for this part of the country.

5.1.2 Photovoltaics

Solar power is an ever developing trend, with advances in the industry occurring regularly. Photovoltaics (PV) use semiconductor materials to convert sunlight energy into electricity. There are several types of collectors available for collecting the sun's rays in different ways; some collect only direct rays and others collect both direct rays and reflected light. NREL has published a map of photovoltaic solar resources across the country. As seen in Figure 5-2, eastern Kentucky lies in a more moderate solar resource region. This does not necessarily indicate that PV is not a viable option for the new facility. There are a number of effective PV systems being utilized throughout the state of Kentucky.

Figure 5-2 - Photovoltaic Solar Resource of the U.S.



Source: NREL. Photovoltaic Solar Resource of the United States. September 2012. http://www.nrel.gov/gis/images/eere_pv/national_photovoltaic_2012-01.jpg

In discussion with a representative of the Kentucky Solar Partnership, solar power in eastern Kentucky can be a feasible option for supplementing power supply. While the energy generated from the solar panels would probably not be cost effective for the entire proposed BOP facility, solar panels could easily be utilized for providing power to the hot water tanks and smaller, energy-hungry appliances that would be utilized at the proposed BOP facility. Additionally, there are incentives and net metering alternatives to help reduce the demand from the energy provider. Therefore, it is recommended that PV systems be further investigated during the design of the new facility as a supplemental source of power.

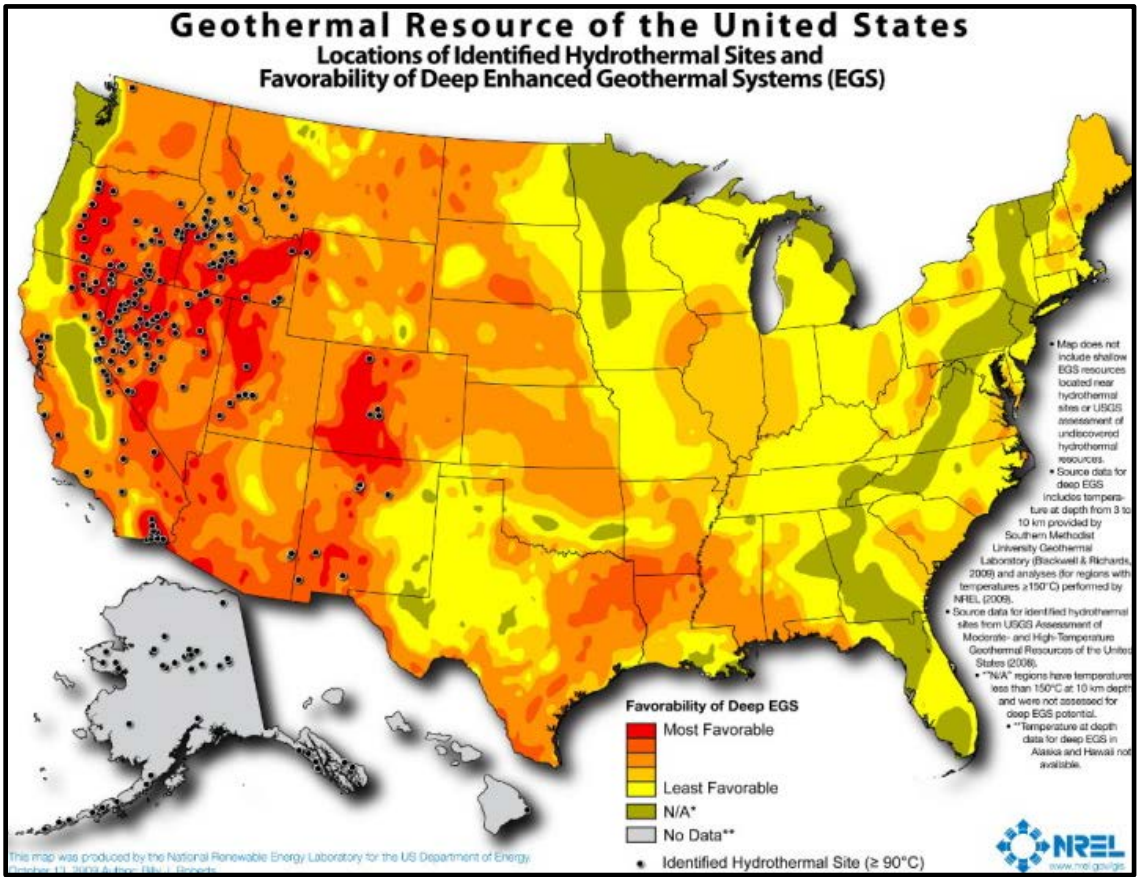
5.1.3 Geothermal Systems

Geothermal systems use the temperature of the earth to heat and cool buildings. By installing a series of looped pipes deep into the ground, and pumping fluid through the system of pipes, geothermal systems utilize the relatively constant temperature of the earth to absorb and transfer heat to or from a building. Typically, the upper 10 feet of the Earth's surface maintains a temperature of between 50° and 60°F (10° and 16°C). Geothermal heat pump systems include the system of pipes, a heat pump, and an air duct system. In the winter, the system pumps the heat into the buildings and in the summer the process is reversed to remove the heat from the building.

NREL has published a map of known hydrothermal sites and areas most conducive to the installation of geothermal systems. As seen in Figure 5-3, most geothermal reservoirs of hot water are located in the western states, as are the most favorable conditions for geothermal systems.

Although Eastern Kentucky is located in a "Least Favorable" zone, it does not preclude the BOP from implementing a supplemental geothermal system at the proposed correctional facility. These systems are relatively inexpensive to install and maintain, and are available in a wide range of capacities. This type of system would not be viable for providing all the heating and cooling needs of the proposed BOP facility, but such a system could supplement the building's heating and cooling needs and should be considered during the design of the facility.

Figure 5-3 - Geothermal Resource of the U.S.

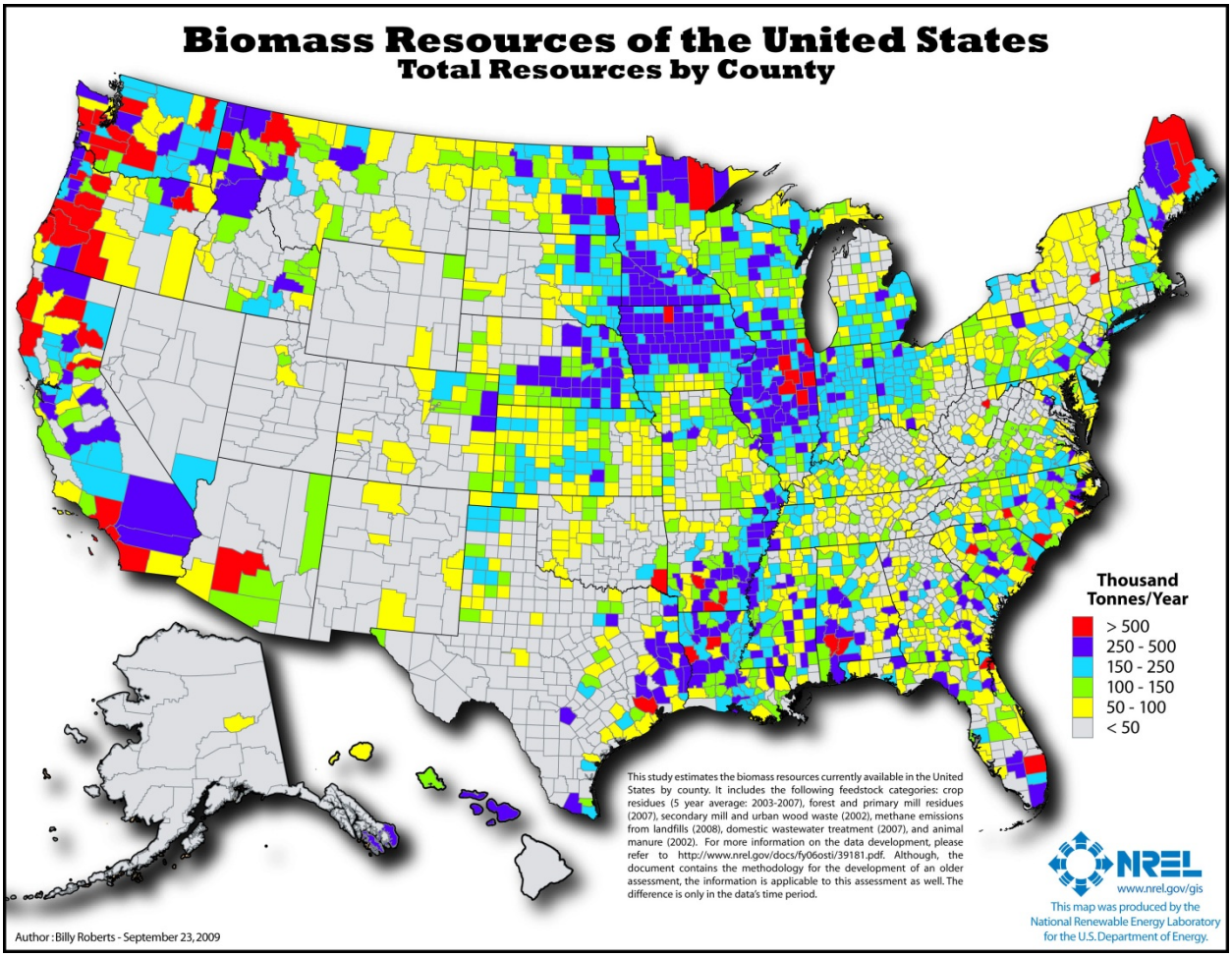


Source: NREL. Geothermal Resource of the United States. Oct. 2009. http://www.nrel.gov/gis/images/geothermal_resource2009-final.jpg

5.1.4 Biomass Energy

Biomass energy is the conversion of plant matter into either electricity or liquid or gaseous fuels. Common sources of biomass are grasses, agricultural crops, and forestry residues. The viability of using biomass energy as an alternative energy source is typically associated with the proximity of the source (plant material) to the point of use. NREL has published a map estimating the range of biomass resources available throughout the country. As seen below in Figure 5-4, the resources available in eastern Kentucky are minimal.

Figure 5-4 - Biomass Resources Available in the U.S.



Source: NREL. Biomass Resources of the United States. Sep. 2009. http://www.nrel.gov/gis/images/map_biomass_total_us_new.jpg

Although the map does not indicate that Kentucky has a wide supply of resources available to support a biomass energy system, a small system to supplement an existing gas supply system could be plausible, if there is a source within close proximity of the selected site. This option could be considered further during the design of the proposed BOP facility as a supplemental power source.

5.2 Sustainability

The concept of sustainability is often considered synonymous with environmental stewardship. Although green practices are integral to sustainability, the broader principle of sustainability implements the concept that development that meets the needs of the present should not compromise the ability of future generations to meet their own needs. The concept of the "triple bottom line" (TBL) states that success is measured not only by financial performance, but by balanced achievements in environmental stewardship, economic growth and social responsibility. The TBL is achieved when an integrated solution is found that simultaneously achieves excellence in these components, as opposed to finding tradeoffs among these areas.

The Environmental Stewardship component of the TBL focuses on practices such as reducing waste, minimizing carbon and water footprints, preventing pollution and conserving natural resources. However, to be truly "sustainable" as opposed to just "green," it is important to also incorporate economic growth and social responsibility practices. Economic growth concepts focus on practices such as the use of local contractors and supplies, and creating and strengthening markets such as alternative energy. Social responsibility concepts focus on practices such as implementing fair labor practices or educating surrounding communities.

To implement these concepts of sustainability with respect to the construction of a new BOP federal correctional facility, there are some components that should be focused on during design and construction. Other practices can be implemented after facility construction and maintained as part of the facility's standard operating procedures. During construction, recycled building materials should be utilized when available. Also, materials and labor should be selected from local vendors and suppliers, as applicable. As BOP begins to operate the facility, participation in programs promoting waste reduction, recycling, reuse and composting should be coordinated with the local Public Works and Public Health organizations. Some sustainability concepts that could be implemented with respect to reducing utility demands at the new site include:

1. Gray Water Disposal - The Letcher County Environmental Health Department indicated that there is availability to utilize gray water disposals for a portion of the sanitary sewer load. The gray water beds would be connected to the washing machine outfall only and could significantly reduce the amount of flow to the Whitesburg WWTP.

2. Water Reduction – To reduce the water demand at the new facility, the installation of water saving appliances such as low-flow toilets and high-efficiency clothes washers should be considered. Other considerations should be given when selecting landscaping alternatives. Xeriscaping refers to the selection of plants based on their drought tolerance and their ability to thrive without regular maintenance. Xeriscapes offer a viable alternative for attractive exterior space planning without consuming dwindling water resources and creating excessive cuttings or plant waste.

3. Green Roof - The inclusion of a "green" roof on top of the facility has the potential to improve the energy efficiency of the building by providing additional insulation and reducing electricity costs. Additionally, green roofs protect the roof membrane, which can result in a longer roof lifespan.

6.0 CONCLUSIONS

The purpose of this Enhanced Utility Investigation Report was to assess the viability of providing utilities to the Roxana and Payne Gap sites for the proposed BOP federal correctional facility. Since many of the factors associated with the site work necessary to install the utility infrastructure are comparable at both sites, this comparison focuses on the cost to the BOP for bringing the utility connections to the edge of the properties. Potable water service has already been (or in the process of being) extended to both sites and the LWSD and the City of Jenkins are both amenable to providing wastewater collection lines to both sites. While the intention is to extend wastewater collection service to the sites at no cost to the BOP, it is likely that the Roxana site would require some cost sharing by BOP. Electric and telecommunications services are both readily available at both potential sites with some system extension and connection fees required for telecommunications services.

The one utility with significant impact on the costs associated with site development is natural gas. BOP does not want any wells or gas lines located on their property and therefore the construction of a new facility would require abandoning and closing a number of natural gas wells at Roxana or relocating an existing gas line around the property line at Payne Gap. The costs associated with these factors are significant and represent the primary construction cost difference associated with site selection. As seen in Table 6-1, the estimated cost to BOP for the connection at the Payne Gap site is significantly lower than the costs associated with Roxana. However, the relocation of the existing gas line will take approximately two years compared to the six months required to abandon the wells at Roxana.

Table 6-1 – Utility Connection and Construction Costs Associated with Gas Wells and Transmission Lines - Probable Cost Comparison

	Utility Connection Costs (in millions)		
Location	**BOP**	**Others**	**TOTAL**
Roxana/Meade Farm	$14.4	$1.4	$15.8
Payne Gap	$5.1	$3.8	$8.9

The two important factors associated with bringing utilities to the sites include cost to BOP and the time associated with constructing the infrastructure necessary to make the connections to the various services. As discussed previously the costs and time associated with bringing all of the utilities, with the exception of natural gas, to the site are relatively comparable. The exception would be if BOP is required to provide some cost sharing for the extension of the wastewater collection system to Roxana. This could require approximately $1.4 million in BOP funding. The primary difference in cost is the natural gas modifications. As depicted in Table 6.1, the Roxana well closures are much more costly than the Payne Gap gas line relocation. However, with respect to time requirements, the relocation would require at least two years, while abandoning the wells would take about six months. These are the two key factors associated with the utilities that need to be considered during site selection.

After site selection is finalized, the BOP would have the opportunity to assess their options for implementing alternate energy systems and sustainability practices. These options and opportunities would need to be assessed in more detail during the design and operation and maintenance phases of this project. Although, it is not practical to install an alternative energy system to power the proposed BOP facility in its entirety, there are numerous systems that could potentially supplement the power provided

to the site, and should be considered. Additionally, sustainability practices should be planned and coordinated with the local regulators to allow BOP to meet the goals set forth in Executive Order 13514 to increase energy efficiency, conserve water, reduce waste, and promote environmentally responsible products and technologies.

APPENDIX 1 – FIELD PHOTOGRAPHS

[Includes pictures at all identified sites prior to eliminating non-viable locations]

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Photo #1 – Entrance Drive to Roxana Site

Photo #2 – Roxana Field

Photo #3 – Roxana Field looking West

Photo #4 – Buildings on Roxana Site

Photo #5 – Edge of Roxana Plateau

Photo #6 – Overview of Roxana Property

Photo #7 – Cell Tower on Van Fields Property

Photo #8 – Van Fields plateau

Photo #9 – Van Fields property looking northeast

Photo #10 – View of lower field at Van Fields

Photo #11 – Meadow Branch Entrance Drive

Photo #12 – Meadow Branch logging road

Photo #13 – Results of logging activity at Meadow Branch

Photo #14 – Logging Truck leaving Meadow Branch site

Photo #15 – Entrance drive to Payne Gap in heavy rain

Photo #16 – Entrance drive to Payne Gap in heavy rain

APPENDIX 2 – SITE INVESTIGATION UTILITY MEETINGS MEMO

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Memo

To: File

From: Curtis Lipsey

Cc: Deborah Henson

Date: May 9, 2011

Re: BOP – Letcher County Utility investigation

This memo covers the Utility Investigation Meetings held in Whitesburg Kentucky, week of May 2 – May 5. The utility investigation is one phase of the feasibility study for the four locations identified during the Reconnaissance Report by Louis Berger in 2008. The four sites identified are:

1. Roxana / Meade farm (ROX)
2. Van / Fields (VF)
3. Payne Gap (PG)
4. Meadow Branch (MB)

Attendees:

The following personnel were present at each of the site visits and utility meetings:

- Elwood Cornett – Letcher Co. Planning Commission (LCPC)
- Jim Jones – LCPC consultant
- Bridgettte Lyles – Bureau of Prisons (BOP)
- Parke Ransom – BOP
- Shaym Sharma – BOP
- Deborah Henson – TEC Inc.
- Curtis Lipsey – TEC Inc.

Site Visits: Site visits to the four potential sites were conducted on Tuesday, May 3, 2011. In addition to the above listed attendees, Jim Ward - County Judge / Executive and Joe DePriest – LCPC. The field visit to the Payne Gap site was conducted from inside the vehicles due to heavy rains; a short site walk was conducted at the remainder of the three sites.

Utility Meetings: The memo is divided into the discussions held for each utility type and provides a brief overview of the capacities, responsibilities, availability, and preliminary cost assumptions. Each meeting was attended by Mr. Elwood Cornett and Mr. Jim Jones, whom also provided input during several of the meetings.

WATER/SEWER:

Meeting Attendees:

Attendee	ROX	VF	PG	MB	Date
Jim Ward – County Judge / Executive	W/S	W/S	W		5-4
Benny Hamilton – KRADD					
Jamie Noe – Bell Engineering					
Director of Letcher Co Water / Sewer					
Matt Curtis – Nesbitt Engineering			S		5-5
Mayor G.C. Kinder – City of Jenkins					
Todd DePriest – City of Jenkins					
Kevin Howard - Summit Engineering	W/S	W/S	W/S		5-2
Brett Fisher – Summit Engineering					
Mayor James Wylie – Whitesburg	W/S	W/S			

- MB will be served by the Town of Pound VA, whom was unreachable for the meetings.
- Judge Ward and the Director of Letcher Co Water and Sewer stated several times that water and sewer service would be extended to ROX/VF/PG at no cost to the BOP if one of those sites was selected.
- ROX: Existing water lines are located within 5 miles of the site.
- VF: Existing water lines are located adjacent to the site.
- ROX/VF/PG: Regardless of whether the BOP facility is established, Letcher County is planning on upgrading and connecting the county's water system with neighboring counties and utility providers for consistency of service.
- ROX/VF/PG: Bell Engineering will perform an engineering estimate based on the estimated elevation of the facility to determine location and quantity of booster pumps to service the facility and elevated storage tanks.
- ROX/VF/PG: Bell Engineering to provide pdf maps of proposed county water systems.
- ROX/VF/PG: Upgrades of nearby tanks and lines may be required in order to provide service to the facility during times the elevated storage tank is off line for maintenance.
- ROX: Sanitary Sewer is located approximately 9 miles of the site entrance by the Parkway Inn.
- VF: Sanitary sewer is located approximately 2.5 miles from the site entrance by the Parkway Inn.

- ROX: The Whitesburg WWTP is located approximately 10 miles from the site entrance.
- VF: The Whitesburg WWTP is located approximately 4 miles from the site entrance.
- ROX / VF: The Whitesburg WWTP was recently upgraded, partly in anticipation of the BOP project, to handle 630,000 gpd and is currently receiving approximately half of the capacity. The plant was designed to be upgraded with additional modules to nearly 1,000,000 gpd.
- ROX / VF: The County is considering providing a dedicated sanitary line and system for the facility.
- Letcher County would prefer to know which site is preferred so they could focus their effort towards that location.
- The county does not have commercial rates, only residential, the connection fees are minimal and may be waived for the project.
- Mayor Wylie reiterated the planning commissions and Judge wards sentiments regarding provision of service to the selected site.

LETCHER COUNTY ENVIRONMENTAL HEALTH

Attendees:

Attendee	ROX	VF	PG	MB	Date
Kevin Nichols – Letcher Co Health	X	X	X	X	5-3

- On-site wells for water service are no longer a feasible option in Letcher Co.
- On-site sewer disposal (underground leech fields) would be significant in construction and cost.
- Basic calculations performed by Kevin Nichols resulted in the following numbers:
    - 210,000 gal tank
    - 41,800 lf – 12-ft wide chamber beds
    - Based on 1400 bed facility
- On-site WWTP would be permitted through the State Division of Water, Letcher Co representative located in Hazard, KY – Damon White.
- On-site WWTP would require discharge to a blue line stream – def.: water running in stream all year long.
- State Division of Water also responsible for spray irrigation option, common in Kentucky.
- Graywater beds for washing machine discharge – 28,340 lf of 2-ft wide by 2-ft deep beds.
    - Cross section of bed – 6-in stone / 4-in pipe / 6-in stone / 4-inch straw / topsoil

NATURAL GAS SERVICE

Attendees:

Attendee	ROX	VF	PG	MB	Date
Don Goble – Troublesome Creek (TC)	X				5-4
Jed Weinberg – Clean Gas Inc.(CG)	X				5-5
Maurice Royster – EQT	X	X	X	X	5-5
Darryl Smith – EQT					

- Each representative stated that most gas contracts regarding the wells and transmission lines have a clause that the gas company will relocate the transmission lines one time at no cost to the property owner. As long as the move is a property development action. Each representative was checking into the applicable properties for clarification.
- ROX: In addition to Troublesome Creek and Clean Gas, Kinzer Drilling (KD) also owns wells within the site. Kinzer has since been contacted and a conference call is being established.
- ROX: There are several wells (TC/CG/KD) and underground lines within the proposed site location. These wells would be located within the property of the future BOP facility and would either need to be capped and abandoned (at a cost) or agreements with the BOP made to continue operation. The lines will have to be adjusted to avoid the BOP facilities.
- VF: EQT has one gas well shown on the mining report map by Summit Engineering. EQT is preparing a cost estimate to abandon the well, including compensation for the well. TC has several wells located just outside of the proposed BOP property limits as estimated by Summit Engineering.
- PG: There are no wells located within the proposed property limits of the BOP facility.
- PG: EQT has a 16-inch gas main located through the center of the site that will need to be relocated. EQT is researching cost to relocate the gas main as well as legal responsibility.
- MG: EQT has a 4-inch gas line running through the proposed site location that will need to be relocated. EQT is researching cost to relocate the gas main as well as legal responsibility.
- MB: According to the Mining Report map produced by Summit Engineering, There are three wells by Columbia Natural Resources Inc./Triana Energy (CNR) within the proposed property limits. CNR has been contacted and we are waiting on return calls.
- According to Don Goble (TC) a small building for monitoring equipment would be located on-site near the meter and tap.

- TC gas wells and transmission lines (4-in) carry 1.23 BTU, zero to low sulfur, and can be routed directly into facility with no treatment processes.
- The wells in the ROX area have an estimated 20-25 year life.
- Approximate cost to abandon wells - $40,000 construction and $60,000-$80,000 compensation for lost revenues.
- CG: Jed Weinberg will pull comparable costs to the wells in the ROX site for cost estimating of abandoning the wells. Typical costs could run between $300,000 and $1,000,000 per well.

ELECTRICITY

Attendees:

Attendee	ROX	VF	PG	MB	Date
Mark Abner – Cumberland Valley Elec. (CVE)				X	5-4
Mike Laslo – Appalachia Electric (AEP)	X	X	X		5-5
Mike L. – AEP	X	X	X		5-5

- MB: New transmission lines (69-kV) would need to be run to site.
  - Approx. 2-year construction time
  - Temporary service could be provided today.
  - Would locate a substation on site, 1-acre compound.
  - Sole Source to BOP facility
  - Would provide cable to master meter, up to BOP to provide conduit and connect facility to master meter.
- ROX / VF / PG: No on-site facilities would be required.
- AEP: Has 12 kV line adjacent to PG site
  - Has 34 kV line adjacent to ROX /VF sites.
- ROX / VF / PG: Transmission lines would be run above ground
- ROX / VF / PG: 2 month estimated bill deposit required.
- AEP: Willing to give discounts for facility providing own "sustainable" power but would not buy back power.

TELECOMMUNICATIONS

Attendees:

Attendee	ROX	VF	PG	MB	Date
Frank Dawahare – SouthEast Telephone (SE)	X	X	X	X	5-4
Roy Harlow – Intermountain Cable (IC)			X		5-5
Kenny Samons – TVS Cable	X	X	X		5-5

- SE: Provision of services to all four sites is not an issue. Service cost will depend on required bandwidth.
  - T-1 lines are easily run, cost depends on whether T-1 is constant / dynamic / symmetrical / bonded?

    - Depending on bandwidth, upgrades to system (signal boosters) may be required. Cost for installation shared amongst SE and BOP.
    - Concern with service is reliability of upload speed.
- Roy Harlow @ intermountain Cable did not show for his meeting but called to apologize and stated we could work via phone and email.
- TVS: Can easily service the VF/PG sites but has questionable service to the ROX site.
    - PG site can be provided with fiber optic and coax.
- TVS – suggested checking with ATT for service to ROX site.

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