

KY 32 ALTERNATIVES STUDY: ENVIRONMENTAL OVERVIEW

KYTC ITEM 9.192.00

by

HMB Professional Engineers, Inc.

August 2008

Summary

HMB conducted field visits in June 2008 throughout the project corridor to identify and locate aquatic, terrestrial, and hazardous materials resources and concerns. In addition to the field trips, databases were reviewed to provide background information on the existing status of aquatic and terrestrial species and to determine the presence and location of hazardous materials, including underground storage tanks.

Table 1, below, provides a summary of the potential environmental impacts that were identified within the corridor. Maps providing the location of environmental concerns are included at the back of this report.

Table 1: Summary of Potential Environmental Impacts

Study Area	Impacts
Stream Crossings	A new bridge over Big Caney Creek at the southern terminus and several ephemeral and intermittent streams.
Floodplain Encroachment	Impacts would be associated with area streams, including the Laurel Creek and Big Caney Creek, but maps were not available on the FEMA website. Coordination with FEMA will be required to determine the extent of area floodplains.
Springs	No springs were located within the project area.
Wells	A review of Kentucky Geological Society maps indicates an estimated that sixty to seventy oil wells are located within the project corridor.
Caves	No caves were evident during field trips, but the area does features caves. As alternatives are developed, caves will be identified.
Ponds	Several ponds exist within the proposed corridor. One small pond would be impacted by the Purple Alignment.
Jurisdictional Wetlands	No wetlands were identified within the project corridor.
Threatened and Endangered Species	A USFWS letter identified that the federally endangered Indiana bat, gray bat, Virginia big-eared bat, northern riffleshell mussel and pink mucket mussel could occur in the project area. The Bald Eagle is delisted, but still protected by the Migratory Bird Act. Surveys at stream crossings could be required. Mist netting for bats could be required. If species are identified, a biological assessment will be required.

Study Area	Impacts
Natural Areas	No natural areas exist within or adjacent to the project corridor.
Wild and Scenic Rivers	No wild and scenic river has been identified in the project area.
Special Waters	The Laurel Creek and Caney Creek are Cold Water Habitats, Exceptional Waters and Reference Reach Streams.
Hazardous Materials/ Underground Storage Tank Sites	<p>Sites containing hazardous materials or USTs are evident and located within communities along existing roadways. Most of these sites are gasoline/convenient stores and auto repair shops. The KYTC Elliott County maintenance garage is located along KY 32 approximately 4 miles west of Sandy Hook. This site has been included on the resource reference maps. A former gas station is located near the junction of KY 32 and County Road 504 in the Haldeman quadrangle near the western limits of the project corridor. A former gasoline station is located on KY 32 near the middle of the Ault quadrangle. An oil spill was recorded on the Whitley lease in the northeast corner of the project corridor in the Newfoundland quadrangle. No illegal land fills and no dump sites were identified during field trips. If federal funding becomes available, a Phase I Hazardous Materials investigation including field trips and data records searches will be required for the build alternatives.</p>

II. Terrestrial and Aquatic Ecosystems

A. Topography and Geology

1. Topography

Rowan County - The topography of Rowan County represents a mixture of the Highland Rim and the western edge of the Eastern Kentucky Coal Field. It is a well-dissected upland area, drained by numerous small streams. The Licking River forms the western boundary of the county, and the drainage of the county flows into it by the way of southwest-oriented valleys. Flat-topped ridges and bedrock terraces associated with resistant strata are present in the western part of the county. Except for these areas and the valleys of the principal streams, little flat land can be found. Most Rowan County features mountainous terrain. In the southeastern part of the county some of the high ridges and mountains are capped with resistant sandstones that have produced vertical or nearly vertical bluffs. The highest elevation in Rowan County is Limestone Knob, located about 3 miles southwest of Morehead. Limestone Knob is 1,435 feet in elevation, more than 700 feet above the valley of Triplett Creek, which is less than a mile to the north. Clack Mountain, 2 miles south of Clearfield, has elevations in excess of 1,320 feet; Sugarloaf Mountain, 5 1/2 miles north of Farmers, is 1,356 feet. The knob on which Triangle Lookout Tower is located, 2 miles east of Morehead, is at 1,386 feet. The lowest elevation is 625 feet, the point where Licking River leaves Rowan County. A flood-control structure has been constructed upstream from Farmers to create a reservoir in Licking River Valley. The reservoir, designated Cave Run Lake, has a normal pool level of 730 feet and a maximum flood pool of 765 feet. The elevation of Morehead, the county seat, is 748 feet. Other elevations include Clearfield, 740 feet; Cranston, 769 feet; Farmers, 670 feet; Haldeman, 940 feet; and Tollesboro, 816 feet.

Elliott County - Elliott County is located in the coal field area of northeastern Kentucky. It is a well-dissected upland area, and local reliefs of 250 to 300 feet are common. Locally, steep sandstone bluffs rim the valley walls. The highest elevations are found in the western and southwestern parts of the Elliott County, and this area includes the project corridor. The highest point, 1,340 feet, is located along the Elliott-Morgan County line, which is also the drainage divide between the Little Sandy and Licking Rivers. Locust Knob, at 1,316 feet, is another high point, in north-central Elliott County. The lowest elevation in the county is approximately 645 feet. This is the normal pool level of Grayson Lake and the approximate elevation of Little Fork of Little Sandy River at the Elliott-Carter County line.

The elevation of Sandy Hook, the county seat, is 775 feet. Other elevations include Ault, 1,133 feet; Bell City, 770 feet; Isonville, 690 feet; Little Sandy, 790 feet; and Newfoundland, 802 feet. Newfoundland is located along the existing KY 32 within the project corridor.

2. Geology

Rowan County - In Rowan County, water is collected from consolidated sedimentary rocks from the Ordovician to Pennsylvanian Periods, and from unconsolidated sediments of Quaternary age. The oldest rocks found on the surface in Rowan County were deposited in shallow seas 490 million years ago during the Ordovician Period. Resting above the Ordovician rocks, the Devonian New Albany Shale (400 million years

in age), was formed when the deep sea floor became covered with an organic black muck. The muck is now hard black oil shale, and is one of the most distinctive of all geologic formations in Kentucky. The Mississippian sandstones and siltstones are the result of a great influx of mud, silts, and sands brought in by rivers and streams from uplands several miles to the northeast and deposited as a great delta. The Mississippian limestones found in Rowan County were deposited 350 million years ago in the bottom of a warm, shallow sea. At the end of the Mississippian (320 million years ago) the seas receded and sediments of the Pennsylvanian Period were deposited. The warm climate of the Pennsylvanian allowed vast forests to grow and great coastal swamps to form at the edges of water bodies. Marine waters advanced and receded many times, which produced many layers of sandstone, shale, and coal. Vegetation of all sorts fell into the water and was buried under layers of sediments, which over a long geologic time, was compressed into coal. Non-vegetative sediments including sand, clay, and silt, were compressed into sandstone and shale. Over the past million years, unconsolidated Quaternary sediments have been deposited along the larger streams and rivers.

Geologic Formations in Rowan County

Unconsolidated deposits

ALLUVIUM (Qa)

HIGH-LEVEL FLUVIAL DEPOSITS (QTf)

Coals, sandstones, and shales

BREATHITT GROUP (Pbl) (Pikeville Formation)

Limestones

SLADE FORMATION (Mn)

Fractured shales

NEW ALBANY SHALE (MDnb)

BOYLE DOLOMITE (MDnb)

Sandstones

GRUNDY FORMATION (contains Lee-type sandstone of the former Lee Formation) (Plc)

Clay shales

CRAB ORCHARD FORMATION and BRASSFIELD DOLOMITE (Scb)

Interbedded clay shales, siltstones, and sandstones

BORDEN FORMATION (MDbb)

Elliott County Water in Elliott County is attained from consolidated sedimentary rocks from Mississippian to Pennsylvanian Periods, and from unconsolidated sediments of the Quaternary age. The Mississippian limestone found in Elliott County was deposited 350 million years ago in the bottom of a warm, shallow sea. At the end of the Mississippian Period, 320 million years ago, the seas receded and sediments of the Pennsylvanian Period were deposited. The warm climate of the Pennsylvanian featured wide-ranging forests and far-reaching coastal swamps formed at the edges of water bodies. Marine waters advanced and receded repeatedly, producing vast layers of sandstone, shale, and coal. A wide range of vegetation fell into the water and was buried under blankets of sediments, which over long geologic time were compressed into coal. The non-vegetative sediments such as sand, clay, and silt were compressed into sandstone and shale. Over the past million years, unconsolidated Quaternary sediments have been deposited along the larger streams and rivers.

Geologic Formations in the Elliott County

Limestones

Slade Formation (Mn)

Interbedded clay shales, siltstones, and sandstones

Conemaugh Formation (Pmc)

Sandstones

Grundy Formation (contains Lee-type sandstone of the former Lee Formation) (Plc)

Coals, sandstones, and shales

Breathitt Group (Pbu, Pbm, Pbl) (Princess Formation, Four Corners Formation, Hyden Formation, Pikeville Formation)

3. Soils Roadway construction, agricultural activities, and residential and commercial development have previously disturbed portions of the project area. Construction of the proposed project will result in the loss of previously disturbed areas, as well as agricultural areas composed of cropland and pastures. Impacts on soils and erosion of topsoil will decrease the productivity of the area. The use of heavy equipment to move soil and existing vegetation can disrupt natural drainage patterns, and can compact the soil and decreases permeability. Areas of prime farmland soil will be unavailable for agricultural uses due to paving.

B. Water Quality

Rowan County The quality of groundwater in the Bluegrass Region varies considerably from place to place and is determined by its geologic source. Groundwater in Rowan County is hard to very hard and may contain salt or hydrogen sulfide, especially at depths greater than 100 feet. The two most common natural constituents that make water in the Bluegrass Region objectionable for domestic use are common salt and hydrogen sulfide.

Rowan County had an estimated population of 18,309 (7,810 households) in 1999; projected population is 20,623 (9,580 households) in 2020. Public water is provided to about 87 percent of the county's residents. In areas not served by public water, about 70 percent of the households use wells and 30 percent use other sources. About 90 customers will be added to public water service through new line extensions from 2000 to 2020. If all proposed water line extensions are made, about 12 percent of the county will still rely on private water supplies in the year 2020.

Elliott County Groundwater obtained from most drilled wells contains noticeable amounts of iron and is considered extremely to moderately hard. The main naturally occurring contaminants that may be present in objectionable amounts in the groundwater are sulfate, salt (sodium chloride), iron (Fe), and manganese (Mn). In some locations, old abandoned oil and gas wells are responsible for contamination of shallow freshwater aquifers by salt water brought up from much deeper formations. High iron and manganese levels are found in the groundwater in many wells, and can produce objectionable taste and staining of laundry and porcelain fixtures. Often, coal mining aggravates these problems by increasing the amount of fresh surface area of the rocks exposed to oxidation, which can increase the sulfate and metals concentrations in the groundwater.

Elliott County had an estimated population of 6,506 (2,534 households) in 1999; projected population is 6,340 (2,680 households) in 2020. Public water is provided to 713 customers, or about 35 percent of the county's residents. In areas not served by

public water, about five of six households use wells and one of six use other sources. About 430 households will be added to public water service through new line extensions from 2000 to 2020. If all proposed water-line extensions are made, about 50 percent of the county will still rely on private water supplies in the year 2020.

2. Surface Water

The project corridor includes two special waters as identified by the Kentucky Energy and Environment Cabinet's Department for Environmental Protection, Kentucky Division of Water. The special waters identified are Caney Creek and Laurel Creek. Each stream is identified as Cold Water Habitats, Exceptional Waters and Reference Reach Streams. According to the Division of Water, only six river basins have streams that meet all three of these requirements. The only two



Figure 1: Big Caney Creek

streams in the eastern section of the state to meet these criteria are Big Caney and Laurel Creeks. The Division of Water stresses that careful consideration should be given to alternatives that avoid intrusion and impacts to these two streams. If these sensitive areas suffer degradation it is estimated that it would take generations to recover them to present conditions.

Multiple perennial surface streams were identified within the study corridor. The named streams are; Big Caney Creek, Laurel Creek, Rocky Creek, Hopkins Cave Creek, Mart Whitt Fork, South Ruin Creek, North Ruin Creek, Clifty Creek, Mart Bear Branch. Perennial streams contain water at all times except during extreme drought. The Big Caney Creek is located north of KY 32 running the length of the study corridor. Laurel Creek is located south of KY 32 it also runs the length of the study area. These two streams are the largest in the study area and are both considered cold water aquatic habitats.

In addition to the perennial streams, several ephemeral streams and many intermittent streams were identified within the study corridor including, but not limited to, Bates Branch, Bandy Branch, and Redwine Creek. Ephemeral streams are channels that carry water only during and immediately after periods of rainfall or snowmelt. Intermittent streams carry water after a considerable portion of the time because of ground water influence, but they cease to flow occasionally or seasonally because bed seepage, evaporation and transpiration exceed the available water supply.

Bridge construction or culvert placement could be required where surface streams are crossed. In areas where culverts are placed, there will be a loss of riparian vegetation and stream substrate. Construction along streams can cause erosion of stream banks.

Temporary and permanent impacts to aquatic and terrestrial habitats along the streams may also occur as a result of erosion and sedimentation. Sedimentation can impair water quality by decreasing oxygen availability while increasing turbidity, suspended solids, conductivity, and nutrient load. During the construction phase, erosion control measures will help prevent sediments and nonpoint pollution from reaching the streams.

The completed project may increase the amount of nonpoint source pollution that could find its way into streams or groundwater. Chemicals, such as petroleum products and herbicides, and heavy metals, such as lead, zinc, nickel, chromium, copper, and cadmium, are deposited on the roadway surface and can contaminate runoff from roadway traffic on existing or proposed roadways in the area. These chemicals and heavy metals can damage an aquatic ecosystem.

The project should not substantially affect the conditions of the streams in the project area. Following the requirements in Section 212 and 213 in the Kentucky Department of Highways Standard Specifications and employing best management practices will protect surface waters. Erosion control plans will be provided during the design phase. These plans will identify the use of such devices as silt checks, silt traps, silt fences, diversion channels, and sedimentation basins. These plans should help minimize any effects on the project area. To minimize impacts to surface water, efforts should be made to keep any bridge crossings from being placed in the normal pool of the streams and tributaries in the project corridor. Culverts should be designed so as not to impede high flow or low flow.



Figure 2: Unnamed ephemeral tributary in Elliottville at KY 32.

C.Channel Work

New or extended culverts of perennial, intermittent, and ephemeral streams will be required. Some bridges of perennial or intermittent streams may also be required. Depending on the placement of alignments, channel work could be required. Impacts to surface waters will require a Section 404 permit from the U.S. Army Corps of Engineers and a Section 401 permit from the Kentucky Environmental and Public Protection Cabinet, Division of Water. Depending on the extent of impacts, mitigation might be required.

D.Floodplain Encroachment

The Federal Emergency Management Agency (FEMA) was consulted for information regarding floodplain within the project corridor. Floodplain maps were not available for the project corridor, but it appears the project corridor would be likely to cross 100-year floodplains of area streams including the Laurel Creek and Big Caney Creek. Protection of floodplains and floodways is required by Executive Order 11988; Floodplain Management (May 24, 1977), U.S. Department of Transportation Order 5650.2: Floodplain Management and Protection, and Federal-Aid Policy Guide 23 (23 CFR 6580A). These regulations require KYTC to avoid or minimize highway encroachments within the 100-year floodplain, where practicable. KYTC will coordinate with FEMA to determine specific floodplain areas that might be affected as alternatives are developed. Where encroachment is unavoidable, KYTC will take appropriate measures to minimize impacts.

E. Wetlands

It is estimated that a high potential for wetlands exists along several streams within the corridor. The streams include the Laurel Creek, Big Caney Creek, Hopkins Cave Branch, Clifty Creek, and Rocky Creek. No wetlands sites were identified during the windshield survey within the study corridor, but the vast area of the corridor and the maps indicate that wetland areas exist. A more comprehensive survey should be completed once alternatives are developed. The NWI maps are over thirty years in age, and field trips will be required once alternatives are developed to delineate wetlands within the corridors.

Build alternatives should be developed to avoid or minimize wetland impacts to the maximum extent possible. The USACE would determine the jurisdictional status of each wetland on a case-by-case basis. Wetland mitigation, if required, would be subject to the USACE approval and be a condition of the Section 404 permit.

Several ponds are located within the study corridor. None of these sites are jurisdictional wetlands, but are used primarily as water supplies for livestock, and for fishing or swimming.

F. Permits

Federal and state laws require the KYTC to obtain the appropriate permits and certifications prior to construction activities that involve the waters of the United States, such as rivers, lakes, streams, and wetlands. Depending upon the size of the impacts, either a USACE Nationwide Permit or a Section 404 Individual Permit will be required. A Section 401 Water Quality Certification will likely be required from the Kentucky Division of Water during the design phase.

G. Flora and Fauna

1. Identified Species and Habitats Land uses in the study area are a mixture of forested, agricultural, and residential. Several churches, gas stations, and small businesses are found within the study corridor within and near communities. These communities include Elliottville, Sandy Hook, and Newfoundland. Distinctive habitats were identified within the project corridor. The four habitat types include open, wooded, stream, and residential/commercial areas. A complete list of floral and faunal species identified was not compiled for the overview phase of this project, but wildlife species that would be expected to occur in the project area are common species and include deer, rabbits, squirrels, and robins.

The land use in the corridor consists mostly of forested areas in mountainous terrain. The residential areas consist of manicured lawns with introduced and native species. The construction of this project may disturb or eliminate plant communities and wildlife habitats due to noise, dust, and the direct or indirect loss of open and wooded areas. If forested areas are taken, this could create a reduction of habitat for small mammals and any larger game animals that might inhabit the area.

The construction of this project will result in a loss of habitat, biomass, and primary productivity by the conversion of mainly forested areas, and some open and residential

areas, to pavement. Removal of the herbaceous layer could result in both short-term and long-term effects that affect productivity. The destruction of grassland areas would be limited to a short-term loss if the areas are reseeded with native species after the initial disturbance. Loss of forested areas could result in longer term losses to trees and would impact species dependent upon the forested areas for habitat and forage purposes. The displacement of wildlife could have long-term effects if forested areas are removed or if native herbaceous species are not re-established.

Impacts to native flora and fauna might occur if construction of the roadway facilitates the spread of invasive species. Highway corridors provide opportunities for movement of invasive species through the landscape. Invasive plants can be introduced into areas during spraying and mowing operations or through movement of vehicles and construction equipment. The use of mulch, imported soil or gravel, and sod can also facilitate the spread of these non-native species. Re-vegetation with native flora species will stabilize construction areas and minimize introduction of invasive species.

2. Threatened and Endangered Species - Information from the United States Fish and Wildlife Service (USFWS) indicates that the federally endangered Indiana bat (*Myotis sodalis*) and gray bat (*Myotis grisescens*) are known in Elliott County. The Virginia big-eared bat (*Corynorhinus townsendii virginianus*) has potential to be in Elliott County. The Indiana bat (*Myotis sodalis*), Virginia big-eared bat (*Corynorhinus townsendii virginianus*), Northern Riffleshell (*Epioblasma torulosa rangiana*), and the pink mucket (*Lampsilis abrupta*) are known for Rowan County. The bald eagle (*Haliaeetus leucocephalus*) has been downlisted to threatened and has a known occurrence in Rowan County.

Indiana Bat - The federally endangered Indiana bat (*Myotis sodalis*) is a medium sized bat, 3.5 inches in length, with dark, gray to brownish-black fur (Slone and Wethington, 2001). Typical winter habitats for the Indiana bat include limestone caves with stable temperatures of 39 to 46 degrees F. During summer months, maternity colonies roost under loose bark in floodplain and riparian forests. Indiana bats forage along streams or other bodies of water near forests, as well as in the canopy of upland and bottomland forests. The Indiana bat is listed as occurring in Rowan and Elliott Counties. The project corridor is likely to contain suitable habitat since it contains vast contiguous forested areas and several streams (Of the 32,049 acres within the entire project corridor, approximately 23,367 acres of the project area features tree canopy or forested areas).

Gray Bat - The Gray bat was listed as endangered on April 28, 1976. The Gray bat is a year-around resident of caves, but may migrate seasonally between hibernaculum and maternity caves. Caves selected by gray bats must meet certain temperature and environmental criteria; thus all caves are not suitable habitat. The bats are extremely loyal to particular home territories. Maternity caves are typically located within a kilometer of streams or reservoirs. Summer colonies may occupy a traditional area with several roosting caves. Adult pregnant female gray bats give birth to a single young in late May to early June. During this time the lactating females and their young amass in one specific traditional maternity cave. Males and non-reproductive females cluster in other caves within the colony home range. The primary population centers for the Gray bat are the southern Appalachian and the Ozark areas. Gray bats occur nearly statewide in Kentucky.

Because gray bats are year-round residents of caves and often inhabit particular caves in large numbers, they are highly vulnerable to human disturbance. Major disturbance events at one major hibernaculum or maternity colony could potentially impact a substantial percentage of the total population. The major cause of decline of gray bats appears to be disturbance of caves (both hibernaculum and maternity sites) by humans. Accumulation of toxins ingested through feeding and drinking (particularly insecticides) has been shown to cause mortality in gray bats (Tuttle 1986). Other probable negative impacts to gray bat populations are siltation and other pollution of streams, which affect a major food component (insects with aquatic larva), and destruction of foraging habitat.

Recovery efforts for the gray bat have been fairly successful. The protection of caves through the use of appropriately designed cave gates as well as reduction in cave disturbance through signs and education is largely credited with the recent increases in the gray bat population (Tuttle 1986).

Virginia Big-Eared Bat - The Virginia big-eared bat was listed on the November, 30 1979. It is a medium sized bat with ears that can exceed more than one inch in length. Their weight is typically between 7 and 12 grams. They prefer caves in karst areas dominated by oak-hickory or beech-maple-hemlock forests. They are also found towards the entrances of the caves preferring temperatures that range from 32 to 54 degrees F.

Virginia big-eared bats are also year-round residents of caves making them highly vulnerable to human disturbance much like the gray bat. Disturbance during hibernation will cause the bats to use up their fat reserves causing them to die before spring. Also disturbance to maternity colonies may cause the females to drop their young to their death or they may choose to roost in an undesirable location.

Mussels

The following species of mussels are known to exist in the project counties:

Northern Riffleshell (*Epioblasma torulosa rangiana*) - This Northern subspecies is a small to medium-sized, sexually dimorphic freshwater mussel. Shell lengths of adults range from 4.5 - 7.6 cm. The availability of silt-free, riffle habitat is probably the main factor limiting the occurrence of the subspecies throughout its range (Bogan and Parmalee, 1983).

The pink mucket pearlymussel (*Lampsilis abrupta*) – The pink mucket pearlymussel was federally listed as an endangered species on June 14, 1976. This species of freshwater mussel is typically found inhabiting medium to large rivers with strong current having sand, gravel, or pocket ledge substrates. This species has however been found to reproduce in impounded areas with mud or sand substrates. The pink mucket's range has substantially decreased from its historical distribution of 25 rivers and tributaries in the Ohio, Cumberland, Mississippi, and Tennessee River systems. Records from 1990 reported findings in 16 of the historical rivers and tributaries.

The Laurel Creek and Big Caney Creek have been identified as a cold water habitats and it is likely that mussels could populate these waters. As alternatives are developed,

it is suggested that these resources be avoided. If they cannot be avoided, crossings should be made as perpendicular to the stream as possible. If bridges are required, efforts to place piers out of the stream and its banks are recommended.

Birds

The bald eagle (*Haliaeetus leucocephalus*), the only eagle unique to North America, has notably been in decline since the 1880's. Today, the bald eagle is protected under several legislative acts all aimed at returning the bald eagle closer to its historical population across the US. The Migratory Bird Treaty Act of 1918 was the first legislative act, designed mostly to coordinate between five countries, making unlawful the act of, taking, killing or possessing migratory birds. While this law covered all migratory birds, a law specific to bald eagles, the Bald Eagle Protection Act passed in 1940 protects only bald eagles. This law prohibits the take, possession, sale, purchase, barter, offer to sell, purchase or barter, transport, export or import, of any bald eagle, alive or dead, including any part, nest, or egg, unless allowed by permit. Take includes pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, or molest or disturb, except in Alaska until 1952 (USFWS, 1995).

Bald eagles in Kentucky are mostly seen in the winter months through ecotourism events hosted by KDFWR. Wintering bald eagles are viewable at Dale Hollow Lake, Kentucky Lake, and Lake Barkley. Estimated bald eagle populations are believed to be around 300 individuals in January and February, however actual counts by KDFWR were less than 200 in 1994 (according to KDFWR website). There are currently 39 nesting pair of bald eagles in Kentucky with three new nest sites, one located at Cave Run Lake, in 1994 (according to KDFWR website).

The proximity of Grayson and Cave Run Lakes to the project corridor indicates the area might be suitable for the bald eagle as forage. Field trips did not identify any eagles in the corridor, but the trips were conducted in the summer when the eagle is not seen in Kentucky. Care should be taken during the development of alternatives to avoid the any identified eagle nests as alternatives are developed.

KSNPC also indicates that some state threatened and/or endangered species could occur within the project area. This list is attached in Table 2 of the Appendix.

If necessary, Further Section 7 coordination with the USFWS will be conducted by KYTC when the final alignment is chosen. If necessary, a biological assessment for federal threatened and endangered species listed at that time will be completed by KYTC prior to the acquisition of right-of-way.

H.Natural Areas

Natural areas are defined as land or water units where natural conditions are maintained to the greatest extent possible. Natural conditions usually result from allowing ordinary physical and biological processes to operate with a minimum of human intervention. No natural areas exist within or near the project corridors. No impacts will occur and no mitigation measures will be required. Natural areas exist within Rowan and Elliott Counties, but are not located within the vicinity of the project corridor.

I. Comments and Coordination

The USFWS, KDFWR, and KSNPC were contacted, or their online databases were reviewed, for information on protected federal and state listed species that may be affected by the project. Information was also requested from the KY State Nature Preserves Commission and the KY Energy and Environmental Cabinet concerning critical habitat areas and monitored natural areas.

VI. Hazardous Materials/Underground Storage Tanks

HMB Professional Engineers conducted a windshield survey of the project area to identify any sites with hazardous materials or underground storage tanks. The site visit did not identify any sites of concern. Reviews of the RCRA Notifiers' List of hazardous waste generators, sites on the Comprehensive Environmental Response, Compensation, and Liability Act Information System of potential Superfund sites, or sites with incidents involving hazardous materials included only one area that would be of concern. The KYTC Elliott County maintenance garage is located along KY 32 approximately 4 miles west of Sandy Hook. This site has been included on the map. A former gasoline station was located in Elliottville and is included on the figure above.



Figure 3: Former gasoline station in Elliottville.

The windshield survey identified some existing businesses within the project corridor that appear to contain hazardous materials. These sites are primarily automobile repair shops and gasoline stations. If federal funding is incorporated into the project funding, a baseline analysis be need to be conducted once project alternatives are developed. This analysis will identify and compare potential impacts and mitigation measures for affected sites for each build alternative.

VII. References

1. Bogan, A.E., and P.W. Parmalee. 1983. Tennessee's rare wildlife. Vol. 2: The mollusks. Tennessee Wildlife Resource Agency and the Tennessee Conservation Department. 123pp.
2. Federal Emergency Management Agency website – <http://msc.fema.gov>
3. Federal Highway Administration. Guidance on Invasive Species for Executive Order 13112. 10 Aug, 1999.
4. Kentucky Department of Fish and Wildlife Resources. #1 Game Farm Road, Frankfort, KY 40601
5. Kentucky Environmental and Public Protection Cabinet. Division of Water. 14 Reilly Road, Frankfort, KY 40601.
6. Kentucky State Nature Preserves Commission. 801 Schenkel Lane, Frankfort, KY 40601.
7. McGrain, Preston, and Currens, James C. Series X, Topography of Kentucky, USGS. University of Kentucky, Lexington, KY; 1978.
8. United States Department of the Interior, Fish and Wildlife Service website.

XIII. APPENDIX

- Table 1, Species listed with the KY Department of Fish and Wildlife Resources
- Table 2, Species listed with the US Fish and Wildlife Service
- Table 3, Species listed with the KY State Nature Preserves Commission

Table 1 Kentucky Department of Fish and Wildlife Services

List of Federal Threatened, Endangered, and Candidate Species observations in 5 selected quads.

**Selected quads are: Ault, Bruin, Haldeman, Isonville, Sandy Hook.
2 species are listed.**

Scientific Name and Life History	Common Name and Pictures	Quad	US Status	KY Status
<i>Myotis grisescens</i>	Gray bat	Ault	Listed Endangered	Threatened
<i>Myotis sodalis</i>	Indiana Bat	Ault	Listed Endangered	Endangered

Table 2



<div>  <div> U.S. Fish & Wildlife Service <i>Kentucky Ecological Services Field Office</i> </div> <div> U.S. Fish & Wildlife Service 3761 Georgetown Rd. Frankfort, KY 40601 Phone: 502-695-0468 Fax: 502-695-1024 </div> </div>					
Endangered, Threatened, & Candidate Species in _____ ELLIOTT _____ County, KY					
Group	Species	Common name	Legal* Status	Known** Potential	Special Comments
Mammals	<i>Myotis grisescens</i>	gray bat	E	K	
	<i>Myotis sodalis</i>	Indiana bat	E	K	
	<i>Corynorhinus townsendii virginianus</i>	Virginia big-eared bat	E	P	
NOTES:					
* Key to notations: E = Endangered, T = Threatened, C = Candidate, CH = Critical Habitat					
**Key to notations: K = Known occurrence record within the county, P = Potential for the species to occur within the county based upon historic range, proximity to known occurrence records, biological, and physiographic characteristics.					

Table 2A

 <div style="display: inline-block; text-align: center;"> U.S. Fish & Wildlife Service <i>Kentucky Ecological Services Field Office</i> </div>	<p style="text-align: center;"> U.S. Fish & Wildlife Service 3761 Georgetown Rd. Frankfort, KY 40601 Phone: 502-695-0468 Fax: 502-695-1024 </p>
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Endangered, Threatened, & Candidate Species in _____ ROWAN _____ County, KY					
Group	Species	Common name	Legal* Status	Known** Potential	Special Comments
Mammals	<i>Myotis sodalis</i>	Indiana bat	E	K	
	<i>Corynorhinus townsendii virginianus</i>	Virginia big-eared bat	E	K	
Mussels	<i>Epioblasma torulosa rangiana</i>	Northern riffleshell	E	K	
	<i>Lampsilis abrupta</i>	pink mucket	E	K	
Birds	<i>Haliaeetus leucocephalus</i>	bald eagle	T	K	

NOTES:

* Key to notations: E = Endangered, T = Threatened, C = Candidate, CH = Critical Habitat

**Key to notations: K = Known occurrence record within the county, P = Potential for the species to occur within the county based upon historic range, proximity to known occurrence records, biological, and physiographic characteristics.

Table 3: Kentucky State Nature Preserve Commission (KSNPC) species reported to have the potential to occur within the counties listed.

Taxonomic Group	Species	KSNPC Status	County
Mosses	<i>Cirriphyllum piliferum</i>	T	Elliott
	<i>Polytrichum pallidisetum</i> (Hair Cap Moss)	T	Elliott
Plants	<i>Acer spicatum</i> (Mountain Maple)	E	Elliott
	<i>Calopogon tuberosus</i> (Grass Pink)	E	Rowan
	<i>Circaea meric</i> (Small Enchanter's Nightshade)	S	Elliott
	<i>Eleocharis flavescens</i> (Bright Green Spikerush)	S	Elliott
	<i>Hydrocotyle mericana</i> (American Weter-pennywart)	E	Elliott
	<i>Juncus articulatus</i> (Jointed Rush)	S	Elliott
	<i>Scutellaria saxatilis</i> (Rock Skullcap)	T	Elliott
	<i>Alasmidonta marginata</i> (Elktoe)	T	Elliott
	<i>Villosa lienosa</i> (Little Spectaclecase)	S	Elliott
Mussels	<i>Lasmigona compressa</i> (Creek Heelspliter)	E	Elliott
	<i>Ichthyomyzon fossor</i> (Northern Brook Lamprey)	T	Elliott
	<i>Percopsis omiscomaycus</i> (Trout-perch)	S	Elliott
Fishes	<i>Accipiter striatus</i> (Sharp-shinned Hawk)	S	Rowan
	<i>Cistothorus platensis</i> (Sedge Wren)	S	Rowan
	<i>Lophodytes cucullatus</i> (hooded Merganser)	T	Rowan
	<i>Tyto alba</i> (Barn Owl)	S	Rowan
Birds	<i>Corynorhinus rafinesquii</i> (Rafinesque's Big-eared Bat)	S	Rowan
	<i>Corynorhinus townsendii virginianus</i> (Virginia Big-eared Bat)	E	Rowan
	<i>Myotis sodalis</i> (Indiana Bat)	E	Rowan Elliott
	<i>Myotis grisescens</i> (Gray Bat)	T	Rowan
	<i>Ursus americanus</i> (American Black Bear)	S	Rowan
Mammals	<i>Mustela nivalis</i> (Least Weasel)	S	Rowan

