



# Draft Environmental Impact Statement

## Volume 2 – Appendix Y (Part A)

October 2024

U.S. 6219, Section 050  
Transportation Improvement Project  
***Meyersdale, PA to Old Salisbury Road, MD***



FHWA-PA-EIS-24-01-D

**Draft Environmental Impact Statement**  
U.S. 6219, Section 050 Transportation Improvement Project  
*Meyersdale, PA to Old Salisbury Road, MD*

**APPENDIX Y (Part A): Biological Assessment**





## Biological Assessment

US 219 PROJECT  
MEYERSDALE, PA TO OLD SALISBURY ROAD, MD  
(USFWS PROJECT #2022-0001474)

October 2024



## TABLE OF CONTENTS

<b>1.0</b>	<b>INTRODUCTION.....</b>	<b>1</b>
1.1	Background and Purpose.....	1
1.2	Consultation History.....	2
1.3	Bat Survey Data History .....	3
1.4	Description of the Project Action Area .....	4
<b>2.0</b>	<b>COVERED SPECIES .....</b>	<b>5</b>
2.1	Indiana Bat.....	9
2.2	Northern Long-Eared Bat.....	10
2.3	Tricolored Bat.....	10
<b>3.0</b>	<b>HABITAT OCCURRENCE.....</b>	<b>11</b>
3.1	Foraging Habitat.....	11
3.2	Roosting Habitat.....	12
3.3	Maternity Roost Habitat .....	12
3.4	Hibernaculum.....	12
3.5	Rocky Habitat.....	13
<b>4.0</b>	<b>EFFECTS ANALYSIS.....</b>	<b>15</b>
4.1	Direct Effects .....	15
4.1.1	Timber Removal .....	15
4.1.2	Blasting .....	16
4.1.3	Noise .....	16
4.2	Indirect Effects .....	17
4.3	Cumulative Effects .....	17
<b>5.0</b>	<b>DETERMINATION OF EFFECTS.....</b>	<b>18</b>
<b>6.0</b>	<b>AVOIDANCE, MINIMIZATION AND CONSERVATION MEASURES .....</b>	<b>19</b>
<b>7.0</b>	<b>MITIGATION MEASURES.....</b>	<b>20</b>
<b>8.0</b>	<b>EFFECT DETERMINATIONS.....</b>	<b>21</b>
<b>9.0</b>	<b>REFERENCES.....</b>	<b>22</b>

## LIST OF APPENDICES

Appendix A. Figures

Appendix B. Agency Coordination and Correspondence

Appendix C. Bat Survey Reports

## LIST OF TABLES

Table 1. Summary of US 219 Improvement Project Trapping Results .....	6
Table 2. Summary of US 219 Improvement Project Acoustic Monitoring Results .....	8
Table 3. Potential Foraging Habitat within the Action Area and LOD .....	11
Table 4. Suitable Summer Habitat Within the Action Area and LOD .....	12
Table 5. Summary of Potentially Suitable Rocky Habitat Locations identified by BCM in 2014 .....	14
Table 6. Rocky Habitat Locations within LOD of Alternatives.....	14
Table 7. Timing Windows of Avoidance and Minimization Measures .....	20

## 1.0 INTRODUCTION

Pursuant to the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.), the Federal Highway Administration (FHWA) requests formal consultation with the United States Fish and Wildlife Service (USFWS) regarding federally threatened and endangered species that may be affected by the SR 6219, Section 050 (Meyersdale, PA to Old Salisbury Road, Maryland) Transportation project ("Proposed Action"), located in Elk Lick and Summit Townships, Somerset County, Pennsylvania; and Garrett County, Maryland (**Figure 1**).

This biological assessment (BA) has been prepared to evaluate potential effects of the Proposed Action described herein on ESA-listed and/or proposed ESA-listed species. This BA provides a comprehensive description of the Proposed Action, defines the Action Area, describes those species potentially impacted by the Proposed Action, and provides an analysis and determination of how the Proposed Action may affect listed species and/or their habitats. This BA additionally serves to provide a formal conference assessment of the effects of the proposed action on the tricolored bat (*Perimyotis subflavus*).

### 1.1 Background and Purpose

The Federal Highway Administration (FHWA), in conjunction with the Pennsylvania Department of Transportation (PennDOT) and the Maryland State Highway Administration (MD SHA), proposes to construct eight (8) miles of a new, limited-access section of SR 6219, Section 050 (previously Section 019) from Meyersdale, Pennsylvania, to Old Salisbury Road in Maryland. (**Figure 1**). The intent of this project is to complete Corridor N of the Appalachian Development Highway System (ADHS) through improvements to the section of US 219 between the terminus of the four-lane highway section south of Meyersdale, Pennsylvania and the north end of the newly constructed 1.4-mile segment of US 219 in Garrett County, Maryland. The US 219 Project represents the final remaining uncompleted eight (8) miles of corridor N (six (6) miles in Pennsylvania and two (2) miles in Maryland) and is a critical component of completing the ADHS. When completed, the project will supplement the interstate system by connecting I-68 and the Pennsylvania Turnpike (I-76), connecting the project area portion of Appalachia to the interstate system.

The purpose of the US 219 Project is to complete Corridor N of the ADHS, to improve the system linkage in the region, provide safe and efficient access for motorists traveling on US 219, and provide transportation infrastructure to support economic opportunities in existing and planned communities and employment/business centers and natural resource-based industries within the Appalachian Region. The project needs identified for this project includes:

- The existing US 219 does not provide efficient mobility for trucks and freight;
- There are numerous roadway, and geometric deficiencies present along the existing US 219 alignment;
- The existing roadway infrastructure is a limiting factor in economic development opportunities in the Appalachian Region.

Numerous proposed project alternatives have been considered during the history of the project. Most recently, the proposed project alternatives have been narrowed down to four (**Figure 2A-D**), listed in preferential order below. Alternatives 1-4 share approximately three miles of common alignment toward the north end of the Action Area, which would include improving several existing local roadways (Mason-Dixon Highway, Hunsrick Road Extension, Mountain Road, and Clark Road). Alternative 5 is the no build alternative. All five of these alternatives are being evaluated for the Project in this BA. Descriptions of the various alternatives are provided as they go from south to north throughout the Proposed Action Area.

- The Preferred Alternative (Alternative 1) is the E-Shift Modified Alternative. This ties into the newly constructed section of US 219 slightly eastward, farther from Old Salisbury Road to avoid and minimize

impacts to the Little Meadows Historic District (Figure 2A). After crossing the MD border into PA, the alternative has a bridge crossing over Meadow Run then continues northeast for 1.3 miles before the second bridge that crosses over SR2010, Piney Creek and Piney Run Road. This alternative continues northeast for another mile and then the alternatives merge for the terminal three miles continuing northeast. The recommended preferred alternative is the proposed action for the purposes of determining effects to the species.

- Alternative 2 is the E Modified Alternative that ties into the newly constructed section of US 219 at the northwest. The alternatives, including E-shift Modified, follow an adjacent and parallel course until the MD/PA border where the E-shift Modified alternative then shifts east. After crossing the MD border into PA, the alternative has a bridge crossing over Meadow Run then continues northeast for 1.3-miles before the second bridge crossing over SR2010, Piney Creek and Piney Run Road. There is another separation between alternatives for another mile and then the alternatives merge for the final three miles north.
- Alternative 3 is the DU-Shift Modified Alternative (Figure 2C) that ties into the newly constructed section of US 219 at the same location as Alternative 1, approximately 0.05-mile south of Old Salisbury Road (Figure 2B), slightly northwest. There is a bridge crossing that spans Meadow Run, a second spanning Greenville Road, followed by a third bridge crossing over both Piney Creek and Piney Run Road. After another mile, the alternatives merge for the final three miles.
- Alternative 4 is the DU Modified Alternative (Figure 2D) that ties into the newly constructed section of US 219 at the same location as Alternative 1, approximately 0.05-mile south of Old Salisbury Road (Figure 2B), slightly northwest. There is a bridge spanning Meadow Run, a second spanning across Greenville Road and followed by a third bridge crossing over both Piney Creek and Piney Run Road. After another mile, the alternatives merge for the final three miles.
- Alternative 5 is the No Build Alternative. The No Build Alternative involves taking no action, except routine maintenance, along US 219 and the existing two-lane alignment of US 219 between Meyersdale, Pennsylvania and Garrett County, Maryland would remain. No new alignments or additional roadway would be constructed. The No Build Alternative does not meet the approved Purpose and Need for the Proposed Action.

## 1.2 Consultation History

- On May 30, 2002, USFWS notified the Project proponents that Indiana bats were known to hibernate in the Project area and recommended seasonal restrictions on tree-cutting, in response to a May 6, 2002 letter requesting information regarding federally listed species.
- September 2, 2004, the USFWS recommended that bat surveys be conducted due to the proximity of proposed alignments to a known Indiana bat hibernaculum and the extent of forest removal being considered.
- On October 4, 2004, and again on December 21, 2004, the USFWS, FHWA, PennDOT, Maryland State Highway Administration, and their consultants held a site visit to discuss the Project's effects on Indiana bats.
- In June 2006, a BA was submitted to the United States Fish and Wildlife Service (USFWS) for Section 019.
- In February 2007, this BA was supplemented with an amendment.
- In October 2007, the USFWS issued their Biological Opinion on the Section 019 project (USFWS Project #2007-1091), which concluded that the proposed Section 019 project was "not likely to jeopardize the continued existence of the Indiana Bat (*Myotis sodalis*).” The associated Biological Assessment of 2006



determined that the project May Affect but was Not Likely to Adversely Affect the Indiana Bat; however, in the 2007 BO, the USFWS did not agree with that effects determination.

- In January 2008, the USFWS provided a letter indicating they could not concur with a determination that seasonal tree removal restrictions, alone, will adequately avoid all adverse effects if an Indiana bat maternity colony is present within the action area.
- In December 2010, and revised in January 2011, the BA prepared for Section 019 was amended (US 219 Improvement Project, SR 6219 Section 020, January 2011) to include Section 020. The results of a mist net survey during the summer of 2008 were included in this submittal.
- On August 28, 2011, consultation was reinitiated between the USFWS and FHWA; and a subsequent Biological Opinion was issued. Further design modifications to Section 20, as well as information related to previously undocumented mine portals and their use as hibernacula for bat species were identified resulting in an additional amendment to the consultation (US 219 IMPROVEMENT PROJECT, SR 6219 SECTION 020 (USFWS Project #2007-2430) ADDENDUM2, December 2012).
- On January 3, 2013, a request for reinitiation of consultation and a modification to the August 2011 Biological Opinion was submitted to the USFWS.
- On January 31, 2013, the USFWS issued a Supplemental Biological Opinion which did not alter the conclusion of the 2011 BO but rather supplemented that original BO by updating the Incidental Take Statement to include the direct loss of up to 90 acres.
- In October and December 2014, summer and hibernacula bat surveys were completed within the 2014 Route 219 Meyersdale to I-68 Project corridor (BCM 2014a and BCM 2014b).
- In June 2014 for Section 020, Addendum 3 to the to the US 219 Improvement Project, SR 6219 Section 019 Indiana Bat (*Myotis sodalis*) Biological Assessment (June 2006, as Amended February 2007, March 2011, and December (2012) USFWS Project #2007-1091) was submitted to the USFWS.
- August 2016, SHA initiates the US 219 breakout project. Informal consultation with the Chesapeake Bay Field Office as the lead USFWS office begins.
- December 23, 2016, FHWA (Maryland Division Office) reinitiates Section 7 Consultation for Indiana and Northern long-eared bats.
- On March 2, 2017, the USFWS concluded NLAA for the Indiana bat and the northern long-eared bat for the Maryland portion of US 219.
- On February 17, 2022, the USFWS indicated that the previous bat surveys conducted for the US 219 Improvement Project, SR 6219, Section 050 were outdated.
- On August 4, 2023, USFWS verbally indicated that a new Biological Assessment needs to be prepared.
- May 12, 2023 – Email correspondence between USFWS and Markosky Engineering providing updated project information on State Route 6219, Section 050 (Meyersdale to Maryland) Transportation project, located in Elk Lick and Summit Townships, Somerset County, Pennsylvania, and Garrett County, Maryland.
- On August 10, 2023, the USFWS formally recommended that the FHWA Biological Assessment (BA) for this project comply with section 7(a)(2) of the Endangered Species Act as a response to the May 12, 2023, email from Markosky Engineering.

### 1.3 Bat Survey Data History

The following is a timeline of bat survey data associated with the US 219 Project. A summary of each of the reports is provided within Section 2.0.

- August 27 - October 1, 2005: Abandoned Mine Investigations for the U.S. 6219, Section 019 Highway Improvement Project (Bat Conservation & Management) (BCM 2005)
- July 14 - August 11, 2008: Mist Net Survey for the Indiana Bat (*Myotis sodalis*); US 219 Improvement Project; SR 6219 Section 020 Meyersdale to Somerset, Somerset County, Pennsylvania (Bat Conservation & Management) (L. Robert Kimball & Associates 2009)
- December 2012, US Route 219 Improvement Project, SR 6219, Section 020, Bat Hibernaculum Investigations, Final Report by Skelly and Loy, Inc. (Skelly and Loy, Inc 2012)
- September 30 – October 2, 2013: Fall Bat Harp Trapping and Acoustic Surveys, U.S. Route 219 Improvements Project, S.R. 6219, Section 020 (Bat Conservation & Management) (BCM 2013)
- July 17 – August 5, 2014: 2014 Route 219 Meyersdale to I-68 Summer Bat Survey (Bat Conservation & Management) (BCM 2014a)
- October 2 - 12, 2014: 2014 RT 219 Fall Bat Harp Trapping and Abandoned Mine/Rocky Habitat Assessment (Bat Conservation & Management) (BCM 2014b)
- June 3 - August 16, 2022: US 6219, Section 050 Transportation Improvement Project Meyersdale, PA To Old Salisbury Road, MD Summer Bat Acoustic Survey (Bat Conservation & Management) (BCM 2022a)
- September 21 – October 26, 2022: US 6219, Section 050 Transportation Improvement Project Meyersdale, PA to Old Salisbury Road, MD, 2022 Fall Bat Capture Hibernacula Use Assessment (Bat Conservation & Management) (BCM 2022b)
- February 15 – April 26, 2023: US 6219, Section 050 Transportation Improvement Project Meyersdale, PA To Old Salisbury Road, MD 2023 Bat Hibernacula Habitat Assessment (Bat Conservation & Management) (BCM 2023a)
- September 19 – October 3, 2023: US 6219, Section 050 Transportation Improvement Project Meyersdale, PA To Old Salisbury Road, MD 2023 Fall Bat Capture Hibernacula Use Assessment (Bat Conservation & Management) (BCM 2023b)

#### 1.4 Description of the Project Action Area

The Action Area for this Proposed Project is defined as “all areas to be affected directly or indirectly by the Federal actions and not merely the immediate area involved in the action” (50CRF§402.02). The Action Area is defined as an area extending 0.25 miles from the limits of disturbance (LOD). The Action Area for this Project, Alternatives 1 to 4, is designated in **Figures 2A-2D**. The Proposed Action Area is primarily undeveloped forestland (**Figure 3A-3D**), scattered with agricultural land and rural residential homes. The agricultural land is actively farmed with crops including soybean, corn, oats, and hayfield (Markosky 2023). Additionally, there are several existing roads that will be improved as part of this project, rather than creating an undeveloped route. The forestland concentrated in the northern portion of the Action Area has been previously and extensively harvested, thus consisting of second and third growth stands. Several abandoned mines and coal mining operations that appear to have been active from 1967 through the mid-1990s, including a known large mine-cave situated in meadow mountain. The large mine-cave is an abandoned limestone mine, are also present within the Proposed Action Area (**Figure 4-4T**) (Markosky 2023). To protect the identity of the large mine-cave, this document does not use its formal name. The Proposed Action is within the Casselman River drainage basin, which includes two major sub-basins, Meadow Run and Piney Creek.

The Proposed Action’s northern terminus is the southern end of the existing Meyersdale Bypass, a limited access four-lane road, and the southern terminus is where the newly completed 1.4-mile section of US 219 was opened

to traffic in May 2021 from I-68 to just south of Old Salisbury Road in Maryland. The 2001 North-South Appalachia Corridor Feasibility Study identified the US 219 corridor from I-68 to the Pennsylvania Turnpike as possessing the greatest potential to benefit the region economically (PennDOT 1999).

## 2.0 COVERED SPECIES

The Proposed Action is located within the range of the federally endangered Indiana bat (*Myotis sodalis*), the federally endangered northern long-eared bat (*Myotis septentrionalis*), and the tricolored bat (*Perimyotis subflavus*), a species that is proposed to be listed as endangered.

An initial habitat and use assessment within the US 219 Improvement Project Area was conducted by Bat Conservation and Management, Inc. (BCM) in 2005, which delineated sites BCM 2005-01, BCM 2005-19, BCM 2005-27, and BCM 2005-28 as potential hibernacula and confirmed bat activity at all four sites (BCM 2005) (Table 1).

Based on bat surveys conducted by the Pennsylvania Game Commission (PGC) in 1999, 2003, and 2004, a total of five (5) Indiana bats have been identified in the large mine-cave (McCormick Taylor 2006).

Between July 14 and August 11, 2008, mist netting was conducted at a total of sixteen (16) sites, which resulted in the capture of one hundred forty (140) bats, representing four (4) species. A total of eleven (11) northern long-eared bats were captured amongst seven (7) of the sites (Site 05, 07, 08, 09, 11, 12, and 14). No Indiana bats or tricolored bats were captured.

Based on information from a desktop resource and mining methodology review, a field investigation was conducted in September – October 2012 (Skelly and Loy, Inc. 2012). Five (5) openings, found to meet 2012 PGC protocol criteria, were surveyed. As a result, only two (2) of the openings (Site 1 [Portal JAZ-3] and Site 4 [Air Shaft APN-2]) were discovered to be used by bats. Five (5) bat species were captured over fifteen (15) valid survey nights at Site 1, including northern long-eared (69 captures) and tri-colored bats (333 captures). Three (3) bat species were captured over fifteen (15) valid survey nights at Site 4, again including both northern long-eared (59 captures) and tri-colored bats (225 captures). No Indiana bats were captured at any of the surveyed sites.

Between September 30 – October 2, 2013, capture and acoustic surveys associated with the US 219 Projects, were conducted by BCM (BCM 2013). A PNDI letter, dated January 10, 2013, indicated that certain measures be taken by PennDOT to avoid and minimize impacts of the project to the eastern small-footed myotis (*Myotis leibii*; a Pennsylvania state threatened species). One of the measures required that two (2) hibernacula identified in 2012 (Sites 1 and 4) be surveyed during fall swarming for each year of construction and at least one-year post-construction. A total of twenty-six (26) bats comprised of two (2) species were captured (1 northern long-eared bat and 25 tricolored bats) with the most activity at Site 1. Bat acoustic detectors were also deployed near the entrances of Sites 1 and 4; a total of 197 bat passes, with the most activity recorded at Site 1, were recorded and confidently identified to 4 species, with 3 ambiguous species-guilds. The four (4) species identified included the big brown bat (*Eptesicus fuscus*), silver-haired bat (*Lasionycteris noctivagans*), eastern small-footed myotis, and tricolored bat. Visual recording surveys were also conducted at Site 1 for one (1) night, which resulted in several bats observed entering or existing portals. This is further evidence that bats were actively using this feature at the time of the survey.

In the summer of 2014, BCM surveyed thirty sites within the US 219 Summer Project study area (BCM 2014a). No Indiana bat or tricolored bats were captured; two northern long-eared bats were captured and outfitted with radio transmitters to be tracked to their respective day roosts, which were outside the LOD for all the alternatives. In fall of 2014, BCM conducted a follow up assessment where previously delineated habitat was re-evaluated and a search for new habitat was conducted (BCM 2014b). During this assessment, site BCM 2014-01 was delineated as a new

potential hibernaculum. Bat use at the four hibernacula established in 2005 and at the new 2014 potential hibernaculum were evaluated during trapping efforts in the fall of 2014, which resulted in the detection of only northern long-eared bats at BCM 2005-28 and the large mine-cave (Table 1). Additionally, acoustic detectors were deployed near the entrances of each of the five (5) hibernation sites. As a result, a total of two (2) bat passes at Site 2005-28, were recorded and identified as northern long-eared bats.

In the summer of 2022, between June 3 – August 16, BCM conducted acoustic bat surveys within the Project Area associated with the US 219 Project (BCM 2022a). Forty-six (46) acoustic sites were deployed within potential foraging and roosting habitat (Figure 6). All recordings initially classified as a type of *Myotis* species were manually reviewed. No files were confirmed as northern long-eared or Indiana bat. Tricolored bat was confirmed, with a maximum likelihood estimate (MLE)  $<0.05$ , at Site AM02 and Site AM19.

In the fall of 2022, BCM again trapped the five sites surveyed in 2014 to determine bat use (BCM 2022b). No bats were captured at sites 2005-01, 2005-28, or 2014-01 which suggested that these sites were not presently being used by bats of any species. One tricolored bat was captured at 2005-27. At the large-mine cave, three northern long-eared bats and four tricolored bats were captured (Table 1). Acoustic detectors were also deployed near the entrances at each of the 6 survey areas during all trapping nights. As bats using echolocation in and near high clutter areas, such as cave entrances, emit calls that are too ambiguous to identify, no bat recordings were classified to species. However, review of collected data showed that bat captures and acoustic detection of bat passes did not necessarily correlate. For example, on September 28, 2022, four bat captures occurred at the Large Mine-Cave, while no bat passes were recorded. Further, some sites had bat passes recorded but no captures. While acoustic results may confirm bat activity in the vicinity of trap sites, acoustic results alone are inconclusive regarding whether or not recorded bats are using a hibernacula.

Between February and April 2023, BCM conducted a bat hibernacula assessment to search for any undiscovered potential hibernacula and assess previously identified hibernacula (BMC 2023a). During the assessment, BCM surveyed 27 abandoned mine features that were previously identified in either 2005 or 2014 and two new potential bat hibernacula (BCM 2023-01 and BCM 2023-02). Five of the features had open portals where bat activity has been previously confirmed and the remaining features were recorded to not have open portals. BCM also noted degradation of habitat at three of the five known hibernacula sites, including visible signs of collapse, vegetation encroachment, internal ceiling collapses and deterioration of an existing bat gate.

In 2023, BCM conducted fall trapping at two new sites (BCM 2023-01 and BCM 2023-02) between September 19 and October 3, 2023 (BCM 2023b) and no bats were captured during the survey effort (Table 1). Acoustic monitoring was also completed where bat passes were tallied, and species calls were recorded and later identified. Two bat passes were recorded at site BCM 2023-01 during first two hours of survey, but they were on the edge of the detection range and not identified to a species. No bat passes were captured at BCM 2023-02. The results of these two surveys indicate that bats are not presently using the sites during the fall swarming season (BCM 2023b).

Survey Type	Survey Site Name	Survey Year	MYSE	PESU	MYSO
Mine Openings	BCM-2005-01	2005	7	6	-
		2014	-	-	-
		2022	-	-	-
	BCM-2005-19	2005	-	2	-
		2014	-	-	-
		2022	-	-	-
	BCM-2005-27	2005	-	2	-
		2014	-	-	-
		2022	-	1	-
	BCM-2005-28	2005	-	-	-

Survey Type	Survey Site Name	Survey Year	MYSE	PESU	MYSO
		2014	2	-	-
		2022	-	-	-
		1992	2	2	-
Mine Openings	Large Mine-Cave	1999	Unknown		1
		2003	Unknown		1
		2004/2005	unknown		3
		2014	48	14	-
		2022	3	4	-
		JAZ-2	2012	-	-
	PJD-2a	2012	-	-	-
	PJD-2b	2012	-	-	-
	Portal Site #1 (JAZ-3)	2012	69	333	-
		2013	1	19	-
	Air Shaft Site #4 (APN-2)	2012	59	225	-
		2013	-	6	-
	2014-01	2014	-	-	-
		2022	-	-	-
	BCM 2023-01	2023	-	-	-
	BCM 2023-02	2023	-	-	-
Summer Mist Nets Summer Mist Nets	Site 01	2009	-	-	-
	Site 02		-	-	-
	Site 03		-	-	-
	Site 04		-	-	-
	Site 05		1 Escapee	-	-
	Site 06		-	-	-
	Site 07		2	-	-
	Site 08		1	-	-
	Site 09		2	-	-
	Site 10		-	-	-
	Site 11		1	-	-
	Site 12		1	-	-
	Site 13		-	-	-
	Site 14		3	-	-
	Site 15		-	-	-
	Site 16		-	-	-
	MD01	2014	-	-	-
	MD02		1	-	-
	MD03		-	-	-
	MD04		-	-	-
	MD05		-	-	-
	MD06		-	-	-
	MD07		-	-	-
	MD08		-	-	-
	MD09		-	-	-
	PA01		-	-	-
	PA02		-	-	-
	PA03		-	-	-
	PA04		-	-	-
	PA05		-	-	-
	PA06		-	-	-
	PA07		-	-	-
	PA08		-	-	-
	PA09		-	-	-
	PA10	-	-	-	
	PA11	-	-	-	
PA12	-	-	-		
PA13	-	-	-		
PA14	-	-	-		
PA15	-	-	-		
PA16	-	-	-		
PA17	-	-	-		
PA18	-	-	-		



Survey Type	Survey Site Name	Survey Year	MYSE	PESU	MYSO
	PA19		-	-	-
	PA20		-	-	-
	PA21		-	-	-

MYSE = Northern long-eared bat (*Myotis septentrionalis*), PESU = tricolored bat (*Perimyotis subflavus*), MYSO = Indiana bat (*Myotis sodalis*)  
Yellow highlighted cells represent positive detections of the target species within the last 5 years (2019-2024).

**Table 2. Summary of US 219 Improvement Project Acoustic Monitoring Results**

Survey Type	Survey Site Name	Survey Year	MYSE	PESU	MYSO
Mine Openings	BCM-2005-01	2005	Yes	Yes	-
		2014	-	-	-
		2022	*		
	BCM-2005-19	2005	-	Yes	-
		2014	-	-	-
		2022	*		
	BCM-2005-27	2005	Yes	-	-
		2014	-	-	-
		2022	*		
	BCM-2005-28	2005	Yes	-	-
		2014	Yes	-	-
		2022	-	-	-
	Large Mine-Cave	2022	*		
	Portal Site #1 (JAZ-3)	2013	-	Yes	-
	Air Shaft Site #4 (APN-2)	2013	-	Yes	-
Summer Acoustic Data	2014-01	2014	-	-	-
		2022	*		
	BCM 2023-01	2023	*		
	BCM 2023-02	2023	-	-	-
	AM01	2022	-	-	-
	AM02		-	Yes	-
	AM03		-	-	-
	AM04		-	-	-
	AM05		-	-	-
	AM06		-	-	-
	AM07		-	-	-
	AM08		-	-	-
	AM09		-	-	-
	AM10		-	-	-
	AM11		-	-	-
	AM12		-	-	-
	AM13		-	-	-
	AM14		-	-	-
	AM15		-	-	-
	AM16		-	-	-
	AM17		-	-	-
	AM18		-	-	-
	AM19		-	Yes	-
	AM20		-	-	-
	AM21		-	-	-
	AM22		-	-	-
	AM23		-	-	-
	AM24		-	-	-
	AM25		-	-	-
	AM26		-	-	-
	AM27		-	-	-
	AM28		-	-	-
	AM29		-	-	-
	AM30		-	-	-
	AM31		-	-	-
	AM32		-	-	-
	AM33		-	-	-
	AM34		-	-	-
	AM35		-	-	-

Survey Type	Survey Site Name	Survey Year	MYSE	PESU	MYSO
	AM36		-	-	-
	AM37		-	-	-
	AM38		-	-	-
	AM39		-	-	-
	AM40		-	-	-
	AM41		-	-	-
	AM42		-	-	-
	AM43	2022	-	-	-
Summer Acoustic Data	AM44		-	-	-
	AM45		-	-	-
	AM46		-	-	-

MYSE = Northern long-eared bat (*Myotis septentrionalis*), PESU = tricolored bat (*Perimyotis subflavus*), MYSO = Indiana bat (*Myotis sodalis*)

\*= Bat passes/activity detection, but not identified to species

Yellow highlighted cells represent positive detections of the target species within the last 5 years (2019-2024).

## 2.1 Indiana Bat

The federally endangered Indiana bat is known to occur within Pennsylvania and Maryland. In Pennsylvania, Indiana bats are known to hibernate within eleven (11) counties. Indiana bats have never been numerous in Maryland caves in winter largely due to temperatures in the caves being too warm for them. White-Nose Syndrome (WNS), a fungal disease of hibernating bats, has devastated this wide-ranging species, once common throughout eastern North America. The species was originally listed as in danger of extinction under the ESA of 1966 (March 11) and is currently listed as endangered under the ESA of 1973, as amended.

The Indiana bat is a medium-sized bat with chestnut brown to dark gray fur that is found over most of the eastern US, with some states supporting populations of over 40,000 individuals including Indiana, Missouri, Kentucky, Illinois, and New York (USFWS 2006). From mid-autumn to early spring, Indiana bats hibernate in fissure caves in felsic rocks, or occasionally in abandoned mines, called hibernacula. In the summer, they typically live in wooded or semi-wooded areas. Pregnant females will group together to form maternity colonies in crevices of trees or under loose, peeling bark of live trees. Typically, large (>9 inches in diameter at breast height [DBH]) dead and/or dying trees, exposed to direct sunlight throughout the day are preferred roosting sites for female Indiana bats (USFWS 2008). Male Indiana bats may utilize much smaller trees. A wide variety of tree species, including maple (*Acer* sp.), hickory (*Carya* sp.), ash (*Fraxinus* sp.), oak (*Quercus* sp.), elm (*Ulmus* sp.), pine (*Pinus* sp.), hemlock (*Tsuga canadensis*) and others, may be used for roosting. Indiana bats are also known to roost in human-made structures such as bridges, sheds, houses, and abandoned churches (USFWS 2004).

Indiana bats are known to migrate up to 360 miles from their hibernacula to find suitable summer habitat to raise offspring (Kurta and Murray 2002, Winhold and Kurta 2006). However, some migrate much shorter distances as evidenced by banded females recovered from maternity colonies at Mammoth Cave National Park. Additionally, recent radio-telemetry studies in New York found that of 70 individuals emerging from three hibernacula most migrated to summer habitat only 40 miles away (USFWS 2007). Until recently, it was thought that the entire species, except for some males, migrated north and west from their hibernacula to forested areas in Missouri, Indiana, Kentucky, Iowa, Ohio, and Michigan during the summer. This migration pattern was illustrated by Barbour and Davis (1969), with summer band recoveries near the Wayne National Forest in southern Ohio of both male and female bats banded at Carter Caves State Resort Park, in Carter County, Kentucky. Moreover, reproductive Indiana bats have now been documented in the following states: Arkansas, Illinois, Indiana, Iowa, Kentucky, Michigan, Maryland, Missouri, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Tennessee, Vermont, Virginia, and West Virginia (USFWS 2007).

Species lists from the USFWS indicate that the Indiana bat is known to exist in the Proposed Action Area. However, no critical habitat for the species is within the Proposed Action Area. According to the Pennsylvania Game Commission (PGC) biennial bat identification surveys in 1999 and 2003, 2004, and 2005, the Indiana bat was

identified in the large mine-cave in Pennsylvania. More recent trapping and acoustic surveys completed by BCM at the large mine-cave did not detect Indiana bats in either 2014 or 2022 indicating their last known detections at this location were in 2005. Although the mine does not currently appear to have populations of Indiana bats, it does possess ideal conditions, including areas of low and moderate temperatures. The Pennsylvania Game Commission has also indicated that the large mine-cave is part of the Pennsylvania reclamation project and is being designed to assist in the recovery of the Indiana bat given the impacts white-nose syndrome has had on the species. Based on the presence of this established potential hibernaculum, the Proposed Action Area may be utilized as foraging habitat for Indiana bats. Due to site access limitations, the most recent surveys were completed by BCM in 2022. However, habitat likely remains suitable, and we presume Indiana bats continue to utilize this hibernacula and surrounding forest during fall swarming, spring staging, during the summer for roosting, foraging and, possibly, maternity habitat.

## **2.2 Northern Long-Eared Bat**

The federally endangered northern long-eared bat occurs throughout Pennsylvania and Maryland. Like the Indiana bat, WNS has devastated this wide-ranging species, once common throughout eastern North America, particularly in the northeast (Turner et al. 2011). On November 30, 2022, the USFWS published a final rule reclassifying the northern long-eared bat under the ESA, up listing the bat from “threatened” to “endangered” status (see 87 FR 73488). The USFWS delayed the effective date of the final rule to reclassify the northern long-eared bat (NLEB) from threatened to endangered under the ESA. The USFWS extended the effective date by 60 days, from Jan. 30, 2023, to March 31, 2023, when the NLEB officially became endangered.

The northern long-eared bat is a medium sized bat, around 3.0 – 3.7 inches in length and a wingspan of 9 to 10 inches, that is distinguished by its long ears. Although the fur color is variable, these bats are typically medium brown on the upperparts with lighter belly fur (USFWS 2022d). This species of bat can be found through much of the eastern US, as well as eight Canadian provinces (USFWS 2022d). The NLEB spends winters hibernating in caves and mines with constant temperatures, high-humidity, and no air currents. During the summer, the northern long-eared bat roosts, singularly or in colonies, underneath sloughing bark or in cavities or crevices of both live and dead trees. The northern long-eared bat tends to be more flexible in selecting roosts, choosing trees based on suitability to retain bark or provide cavities or crevices. These species are also rarely found roosting in structures such as barns or sheds.

There is no definitive estimate of population size for the northern long-eared bat across the species distribution range. This species’ cryptic behavior during hibernation (i.e., roosting in cracks and crevices of hibernacula walls) makes it difficult to detect (BOEM 2020). Additionally, the USFWS has determined that the designation of critical habitat for the NLEB would not be beneficial and may pose a risk to the species. Therefore, this data does not exist.

According to most recent BCM capture data, the northern long-eared bat was last detected within the Action Area in 2022 at the Large Mine-Cave (3 captured adult males). No acoustic data has positively identified the species in the last 5 years. However, acoustic monitoring at Mine 1, Mine 19, Mine 27, Large Mine-Cave, 2014-01 and BCM 2023-01 did detect bat activity/passes, although they were not identified to species.

## **2.3 Tricolored Bat**

The tricolored bat occurs throughout Pennsylvania and Maryland. Ongoing spread of WNS has devastated this wide-ranging species, once common throughout eastern North America. An in-depth review found that the species has declined so dramatically across its range that it now meets the definition of endangered under the ESA. This disease (WNS) is currently present across 59 percent of the species’ range (USFWS 2022). On September 13, 2022, the USFWS announced a proposal to list the tricolored bat as endangered under the ESA.

The tricolored bat is a small bat with a body length of 2.9 to 3.5 inches and a wingspread of 8 to 10 inches. This bat is distinguished by its unique tricolored fur and often appears yellowish to nearly orange. In the summer, the species inhabits open woods near water, rock or cliff crevices, buildings, and caves.

This species hibernates from September through April or early May, inside caves or abandoned mines, and rock outcrops in zones where the temperature range is 52 to 55 degrees Fahrenheit. In the southern US, where caves are sparse, tricolored bats are often found roosting in road-associated culverts where the species exhibits shorter torpor bouts and forage during warm winter nights. During the spring, summer, and fall, tricolored bats are found in forested habitats where they roost in trees, primarily among leaves of live or recently dead deciduous hardwood trees, but may also be found in Spanish moss, pine trees, and occasionally human structures (USFWS 2022).

According to the BCM capture data, the tricolored bat was last detected within the Action Area in 2022 at both the Large Mine-Cave (1 adult female and 3 adult males captured) and Mine 27 [2005 - 27 (1 adult female captured)]. Additionally, acoustic monitoring positively identified the species at AM02 and AM19 in 2022. It should also be noted that acoustic monitoring at Mine 1, Mine 19, Mine 27, Large Mine-Cave, 2014-01 and BCM 2023-01 did detect bat activity/passes, although they were not identified to species.

### 3.0 HABITAT OCCURRENCE

#### 3.1 Foraging Habitat

Most data suggests that a 2.5-mile radius is the usual extent of foraging area for Indiana bats, 1.5-mile radius for the northern long-eared bat, and 5-mile radius for the tricolored bat. However, the USFWS and the PGC identified the area within a 5-mile radius of large mine-cave as important foraging habitat for all three bat species. All the Proposed Action Area falls within the 5-mile radius of the large mine-cave. While a large variation of habitats may be considered potential foraging habitat for bats, primary habitat features include riparian corridors and cleared utility line rights-of-way. Therefore, within this BA, foraging habitat is defined and analyzed as the areas that include these features (**Figure 4-4T**). Therefore, **Table 3** identifies potential foraging habitat within the Action Area, foraging habitat within the LOD, and the percentage of foraging habitat within the LOD out of the available foraging habitat in the Action Area for each alternative.

Alternatives E-Shift Modified, E Modified, DU Modified, and DU-Shift Modified each impact less than 20% total foraging habitat within the Action Area and less than 2% of the total forestland within a 5-mile radius of the Action Area. In Maryland, approximately 72-acres of forestland will be replaced through the no-net-loss wetland mitigation and reforestation plan, even further reducing the potential for an adverse impact (Maryland 2022).

The Proposed Action Area is also partially within or adjacent to approximately 54,450 acres of protected suitable forest habitat in form of State Game Lands No. 231 Somerset County, Pennsylvania and the Savage River State Forest located in the north and northeastern part of Garrett County, Maryland.

Due to the loss of a relatively small amount of foraging habitat when compared to the Action Area (12%), small amount of forestland loss when compared to the 5-mile radius (<2%), the replacement of acres in Maryland, and the nearby protected suitable forest habitat, each alternative would not be expected to cause adverse impacts on the protected bat species.

**Table 3. Potential Foraging Habitat within the Action Area and LOD**

Alternatives	Action Area (acres)	LOD (acres)	Percentage of Action Area
Alt. 1- E-Shift Modified	74	8	11
Alt. 2- E Modified	74	8	11
Alt. 3- DU-Shift Modified	78	9	12

Alternatives	Action Area (acres)	LOD (acres)	Percentage of Action Area
Alt. 4- DU Modified	78	9	12
Alt. 5- No Build Alternative	-	-	-

### 3.2 Roosting Habitat

The protected bat species all utilize live and dead standing trees (snags) with loose, exfoliating bark, that receive some direct sunlight, as roost trees. As there is the potential for the bat species to utilize the Proposed Action Area as summer habitat, it is assumed that suitable roosting habitat may exist and may be impacted by the Proposed Action. Within this BA, potential roosting habitat is defined as all forested habitat (**Figure 4**). Therefore, **Table 4** identifies suitable summer habitat for roosting (forested habitat in **Figures 4-4T**) in the entire Action Area, roosting habitat within the LOD/direct impacts, and the percentage of the suitable summer roosting habitat in the LOD out of the available roosting habitat within the Action Area. Alternatives E-Shift Modified, E Modified, DU Modified, and DU-Shift Modified impact less than 20% total forest habitat within the Area and less than 2% within a 5-mile radius of the Action Area, not all of which would be considered suitable roosting trees.

**Table 4. Suitable Summer Habitat Within the Action Area and LOD**

Alternative	Action Area (Forested Acres)	LOD (Forested Acres)	Percentage of Action Area
Alt. 1- E-Shift Modified	2418	398	16
Alt. 2- E Modified	2425	399	16
Alt. 3- DU-Shift Modified	2394	444	19
Alt. 4- DU Modified	2400	446	19
Alt. 5- No Build	-	-	-

### 3.3 Maternity Roost Habitat

Similar to roost trees, the protected bat species use live and dead trees with exfoliating bark, hollows, cavities, or crevices that are exposed to sunlight as maternity roost sites. However, maternity roost trees generally receive more sunlight because they are larger (greater than 12 inches in diameter) or located near forest edges or openings. Therefore, the most likely locations for maternity colonies would be on the edge of forested areas and/or along cleared fields, as these areas would provide the most direct sunlight.

The USFWS concurred with the results of the August 2008 mist-net survey that failed to detect Indiana bat maternity activity within the Proposed Action Area. During the summer of 2014, thirty (30) sites were surveyed in Pennsylvania and Maryland, two (2) northern long-eared bats were captured and affixed with a transmitter and a total of five (5) roost were identified. No Indiana bats or tricolored bats were captured in the 2014 survey effort. In the summer of 2022, BCM conducted acoustic surveys at 46 sites throughout the study area and neither Indiana bat nor northern long-eared bats were detected any night. The tricolored bat was detected at 2 of the 46 sites. Based on the negative mist-net and acoustic survey results, Indiana bat and northern long-eared bat maternity colonies are not likely to occur within the Proposed Action Area (BCM 2022a).

### 3.4 Hibernaculum

The large mine-cave, previously mentioned, is a known Indiana bat, northern long-eared bat, and tricolored bat hibernaculum, is situated just east of the US 219 Proposed Action Area, approximately 0.5 miles north of the Pennsylvania and Maryland state line (**Figure 5-5T**). During the summer of 2005, at the request of the USFWS, the large mine-cave passageways were mapped and sketched utilizing distance measurements, compass bearings, and degree slope measurements. It was determined that the large mine-cave contains 8,443 feet of mine passages, all of which travel in a slightly northeast-southwest direction, parallel to the E Modified and E-Shift Modified Alternatives and are not closer than 1,400 feet from the proposed alternatives. None of the passageways travel in a direction toward the alternatives. The mine opening is located 1,400 feet horizontally from the proposed roadway



centerline and 200 feet lower than the grade from the proposed alternatives, therefore no direct impact would occur to the bats as they emerge from or enter the mine as a result of the construction activities and the newly constructed facility. Furthermore, the most likely travel corridor to foraging and roosting areas after leaving the mine-cave would be the riparian forest corridor along Piney Creek between elevations of 19 to 98 feet above ground level. It is also expected that the bats would travel under the proposed Piney Creek bridge, which is proposed to be 190 ft high by 1,500 ft long.

Because bats exposed to WNS are more vulnerable to microclimate and construction disturbance effects, these changes may result in reduced overwintering success or potentially create disturbances that render a hibernaculum unsuitable. Blasting, drilling, and noises from construction activities undertaken while bats are hibernating may result in premature arousal and may result in lethal effects (USFWS 2016). These activities will be conducted between and April 1 to September 30, when it is expected that bats are not hibernating.

The large mine-cave is a known bat hibernaculum. The PGC confirmed the presence of the northern long-eared bat in the fall of 2004 and the Indiana bat in March of 2005 at the large mine-cave. In the fall of 2022, BCM confirmed the presence of the northern long-eared bat and tricolored bats at the large mine-cave and tricolored bats at one of the mine portal sites (BCM 2005-27).

Prior to the current 2023 Bat Hibernaculum Habitat and Use Assessments, an initial habitat and use assessment within the US 219 Improvement Project Area was conducted by BCM in 2005 which delineated sites BCM 2005-01, BCM 2005-19, BCM 2005-27, and BCM 2005-28 as potential hibernacula (Abandoned Mine Investigations for the US 6219, Section 019 Highway Improvement Project, August 27 – October 1, 2005) (**Figure 4**). In the fall of 2005, a BCM Bat Hibernaculum Use Assessment trapping survey confirmed bat activity at all four sites. In 2014, BCM conducted a follow up assessment where previously delineated habitat was re-evaluated and a search for new habitat was conducted (*2014 RT 219 Fall Bat Harp Trapping and Abandoned Mine/Rocky Habitat Assessment, October 2 - 12, 2014*). During this assessment, site BCM 2014-01 was delineated as a new potential hibernaculum. Bat use at the four hibernacula established in 2005 and at the new 2014 potential hibernaculum was evaluated during a trapping survey in the fall of 2014 (*2014 RT 219 Fall Bat Harp Trapping and Abandoned Mine/Rocky Habitat Assessment, October 2 - 12, 2014*). In the fall of 2022 BCM again trapped the five sites surveyed in 2014 to determine bat use (US 6219, Section 050 Transportation Improvement Project Meyersdale, PA to Old Salisbury Road, MD, 2022 Fall Bat Capture Hibernacula Use Assessment). No bats were captured during fall assessments at site BCM 2014-01 in 2014 or 2022. In addition to the five previous sites surveyed in 2022, the large mine-cave was also trapped by BCM in the fall of 2022. The large mine-cave is a known bat hibernaculum within the Proposed Action Area buffer that was last surveyed for bat activity in the fall of 2004 and during an internal survey in March of 2005 by the PGC.

### 3.5 Rocky Habitat

Rocky outcrops can serve as important habitat for bats (Johnson et al., 2024). While infrequent, northern long-eared bats and tricolored bats have been known to use rocky habitats as summer roosts and winter habitat (tricolored bat). Between December 15 and March 15, from 2018 to 2021, Johnson et al. (2024) surveyed 179 rocky outcrop hibernacula and documented eleven (11) features that were used by tricolored bats in Ohio and Pennsylvania. Additionally, eastern small-footed bats have been known to use rocky habitats such as road cuts, talus slopes, and other rock outcrop habitats as summer roost and maternity colony habitats. Therefore, rocky habitats within the action area are discussed below.

In 2014, BCM completed a rocky habitat assessment for potential eastern small-footed bat (*Myotis leibii*) roosts (BCM, 2014b). The roosts were categorized into levels (low, medium or high) of summer habitat quality and rocky habitats were surveyed for any potential winter hibernacula features. Size and aspect of the rock formation, type of rock, number and depth of crevices, and spatiotemporal extent of solar exposure were all taken into

consideration when determining the quality level. Descriptions of each of the quality levels are detailed in the ‘2014 Rt. 219 Fall Bat Harp Trapping and Abandoned Mine/Rocky Habitat Assessment Report’ (BCM, 2014b). A total of fifteen (15) rocky habitat locations were identified during the 2014 survey (**Table 5**), with six (6) of the locations designated as “for the record only (FRO)”, meaning they contained no suitable solar exposure and/or crevice dimension that were deemed suitable for eastern small-footed bat summer use. The location of each of the identified rocky habitats are shown on **Figure 5**.

**Table 5. Summary of Potentially Suitable Rocky Habitat Locations identified by BCM in 2014**

Habitat Site Name	Use Potential <sup>1</sup>	Site Size Longest Length (m)	Site Size Average Width (m)	Comments
CMPL2014-03-25316	FRO	230	80	Boulder field in deciduous forest with 100% canopy cover.
RH2014-01	FRO	22	10	Small open face rock facing north was beside a creek. The rocky habitat had a small overhang, but no crevices.
RH2014-02	FRO	35	10	Majority of rock out crop was covered in organic matter. No crevices were present.
RH2014-03	Low/Medium	30	10	Isolated rock piles formed medium crevices along agricultural field. Habitat faces south to southeast with good sun exposure.
RH2014-04	FRO	26	10	Recent tree removal around rock habitat. Few shallow rock crevices were found. Majority of the crevices were filled with organic matter.
RH2014-05	Low	32	1	Small cliff edge facing highway with tall grass shading crevices in part of the rocky habitat.
RH2014-06	Low	24	8	Southwest orientation with about five hours of sun exposure. Rocky habitat is on edge of deciduous forest.
RH2014-07	Low	100	50	Boulder field in deciduous forest with majority of habitat covered in organic matter.
RH2014-08	Low	80	30	Southeast exposure, however majority of the habitat covered in organic matter.
RH2014-09	Low	25	5	Small drainage ditch off Highway 68 with shallow crevices.
RH2014-10	Low/Medium	400	10	Talus slopes on either side of highway.
RH2014-11	Low	30	8	Northeast sun exposure along road. Majority of rock was covered in organic matter.
RH2014-12	FRO	10	5	Northeast sun exposure along road. Rocky habitat was overgrown with grasses and covered in organic matter.
RH2014-13	FRO	40	10	Northeast sun exposure along road. Rocky habitat was overgrown with grasses and covered in organic matter.
RH2014-14	Low/Medium	150	15	Northeast sun exposure along road. Some spots contained deep crevices, but majority of the rocky habitat was overgrown.

<sup>1</sup>= Quality assessed for eastern small-footed bat.

Of the fifteen (15) identified rocky habitat locations, RH2014-03 is the only feature that was identified within the LOD of an Alternative (**Table 6**). Rocky habitat location RH2014-03 was documented within the LOD of Alternative 1 (E-Shift Modified), 2 (E Modified), 3 (DU-Shift Modified), and 4 (DU Modified).

**Table 6. Rocky Habitat Locations within LOD of Alternatives**

Alternative	Number of Rocky Habitat Locations Identified within the LOD	Habitat Site Name
Alt. 1- E-Shift Modified	1	RH2014-03
Alt. 2- E Modified	1	RH2014-03
Alt. 3- DU-Shift Modified	1	RH2014-03
Alt. 4- DU Modified	1	RH2014-03
Alt. 5- No Build	-	-

## 4.0 EFFECTS ANALYSIS

Due to the similarity in habitat usage, direct and indirect effects of the Proposed Action on the Indiana bat, northern long-eared bat, and the tricolored bat will be very similar. As such, avoidance, minimization, conservation, and mitigation measures provided will also apply to each of the species.

Pursuant to ESA requirements, this BA analyzes the potential direct, indirect, and cumulative effects of the Proposed Action on the Indiana bat, northern long-eared bat, tricolored bat, and/or associated habitats to determine if the Proposed Action is likely to adversely affect these species or habitats (50 CFR § 402.12). This analysis uses the following definitions in the effects determination.

- No effect—Generally, a listed resource is not exposed to the Proposed Action and therefore, no impacts (positive or negative) will occur.
- May affect, but not likely to adversely affect—This is the appropriate determination if effects to listed resources are either:
  - Beneficial, meaning entirely positive, with no adverse effects.
  - Insignificant, which are related to the size of the impact and include effects that are too small to be measured, evaluated, or are otherwise undetectable.
  - Discountable, which are effects that are extremely unlikely to occur.
- May affect, likely to adversely affect—This is the appropriate determination if any direct or indirect adverse effects to listed resources that are not entirely beneficial, insignificant, or discountable will occur as a result of the Proposed Action.

The Proposed Action, as described herein, has the potential to affect the following ESA-listed species under the jurisdiction of the USFWS: Indiana bat, northern long-eared bat, and the (proposed) tricolored bat.

### 4.1 Direct Effects

Direct effects of the Proposed Action include timber removal, blasting and noise. For Alternatives 1 and 2, there are no known or potential hibernacula within the LOD. Additionally, with Alternatives 3 and 4, there is a proposed bridge crossing over Piney Creek, adjacent to which are three known hibernacula – BCM 2005-19, 2005-27, and 2005-28 (**Figure 5M and 5R**). Fall trapping surveys were conducted at BCM 2005-19 and 2005-27 in 2005, 2014, and 2022. Only tricolored bats were detected at BCM 2005-19 in 2005 and BCM 2005-27 in 2005 and 2022. No northern long-eared bats were detected at either known hibernacula. Fall trapping surveys conducted at BCM 2005-28 in 2005, 2014, and 2022 detected tricolored bats in 2005 and northern long-eared bats 2014. No Indiana bats were detected at any of the known hibernacula. These three hibernacula are within the LOD and would be directly impacted and removed with construction. There is no critical habitat designated for the Indiana Bat within the Action Area and therefore there will be no direct effects to that habitat. There is no critical habitat designated for northern long-eared bats.

#### 4.1.1 Timber Removal

The Proposed Action Area includes approximately 2,505 acres of forested habitat as estimated using Geographic Information System (GIS) to delineate forest. All tree removal is proposed to be conducted outside of the seasonal clearing restriction dates. Alternative 1, E-Shift Modified Alternative would result in the removal of approximately 398 acres of forested land, which represents 1.3% of the total forested land within a 5-mile radius (29,809 acres) of the Proposed Action Area, and approximately 72 acres will be replaced acre-for-acre in Maryland to comply with Maryland's Reforestation Laws. Therefore, Alternative 1(E-Shift Modified) would result in a net loss of just 1.10% (326 acres) of forestland within a 5-mile radius of the Proposed Action Area. When compared to what is available in just the Proposed Action Area alone, the relatively small amount of forested land removed would not be expected

to cause an adverse impact on the protected bat species. Additionally, the Savage River State Forest and Pennsylvania State Game Land No. 231 are both protected forest lands and present within 4 miles of the known hibernaculum, the large mine-cave. Furthermore, the Casselman River watershed, which surrounds the large mine-cave, is estimated to have over 202,300 acres of forested land. The net loss of forested land with Alternative 1 (E-Shift Modified) is less than 0.2% of the forested land available in the watershed. Therefore, no adverse effect from timber removal is anticipated.

#### 4.1.2 Blasting

The large mine-cave entrance is situated approximately 1,400 feet southeast of the proposed centerline of Alternatives 1 (E-Shift Modified) and 2 (E Modified) and 1,100 feet southeast from the LOD on a south-facing hillside above Piney Creek. This cave is situated within the Wymps Gap Limestone geologic feature. Limestone features are known to provide quality hibernacula for bats including Indiana bat and tricolored bat throughout their range. This large mine-cave is situated approximately 200 feet below the surface of the proposed roadway. Furthermore, the geologic feature containing the large mine-cave is separated by bedrock formations from the geological layer underneath the proposed alternatives. Excavations for the proposed roadway will occur exclusively in the stratigraphically higher Pennsylvania age Pittsville group of rocks. The maximum excavation depth within the LOD nearest to the mine is approximately 20 feet at the roadway centerline. Additionally, the ground elevation of the mine entrance is approximately 200 feet lower in elevation than the proposed excavations for Alternatives 1 and 2 (E-Shift and E Modified). None of the mine passages are located any closer than 1,100 feet horizontally from the top of cut for Alternatives 1 and 2. Furthermore, the mine passageways all trend in a slightly northeast-southwest direction, parallel to Alternatives 1 and 2 (E-Shift and E Modified, respectively).

The frequency spectrum of blasting-induced shear waves is relatively high with low amplitude. The amplitude of the blasting would have the greatest impact on cave and mine walls and as this is low, their effect would be minimal. Blasting-induced seismic waves generally propagate on a horizontal plane. Therefore, with the differences in elevation between the proposed alternatives and the large mine-cave, their effect would be minimal. Furthermore, seismic wave propagation in bedrock is attenuated by the presence of discontinuities in the bedrock such as the significant stratigraphic elevation difference in bedrock between the Pottsville Group rocks near the proposed alternatives and the Wymps Gap Limestone at the large cave-mine. Finally, current PGC guidelines will be followed that limit the peak particle velocity at the large mine and vibration monitoring would be required. Recent literature studying the effects of blasting on hibernating bats in a mine in Wisconsin supports the notion that blasting does not significantly influence bat activity (Summers et al. 2022). Based on this information, any shear waves from blasting for roadway excavations would have negligible or no adverse impact on the large mine cave (known hibernaculum).

#### 4.1.3 Noise

The large mine-cave is approximately 1,100 feet from the LOD and approximately 1,400 feet from the centerline of Alternatives 1 (E-Shift Modified) and 2 (E Modified). A typical noise analysis for a proposed highway project evaluates distances up to 1,000 feet horizontally. The mine-cave opening is approximately 200 feet lower in elevation than the proposed grade and, at the Piney Creek bridge, a 40-foot-high knoll exists between the proposed location of Alternatives 1 (E-Shift Modified) and 2 (E Modified) and the mine. Additionally, although understood to be lower traffic volumes, Greenville Road (1,400 feet from the mine) and Piney Run Road (50 feet from the mine) are currently influencing the existing noise levels at the mine. Considering Alternatives 1 (E-Shift Modified) and 2 (E Modified) horizontal distance from the mine-cave, the difference in elevation, the influence of current topography, and the mine-cave's current surroundings are already influenced by traffic noise, there should be no substantial change in noise levels at the mine from the existing to the predicted future conditions. Therefore, no impacts due to noise are expected to occur at the large mine-cave because of the Project.

Alternatives 3 (DU-Shift Modified) and 4 (DU Modified), will impact the noise levels in the Action Area similarly to Alternatives 1 and 2 through construction activities as well as the future use of the highway. Additionally, these two alternatives are farther from the large mine-cave resulting in a smaller impact to the bat species.

## 4.2 Indirect Effects

Indirect effects are those that are caused by or will result from the Proposed Action but will occur in the foreseeable future. Indirect effects to the three federally listed or proposed listed bat species include loss of forested habitat (winter clearing), bat mortality due to vehicular collisions, and disturbance to the aquatic ecosystem (feeding source).

In addition to direct effects of construction on these bat species and their habitat, the road may also indirectly lead to bat mortality later through collisions of bats with cars. Russell et al. (2009) documented mortality of 27 little brown bats, one Indiana bat, and one unidentifiable *Myotis* sp. found during multiple searches of a section of road in Pennsylvania (approximately 4.5 km of road). In addition, they found that bats generally used forest canopy to approach and cross roads. Where available canopy was low ( $\leq 6$  m), bats crossed roads at lower heights, at which height they were susceptible to collision with vehicles. Additionally, Russell et al. (2009) found that the majority of commuting bats flying over open fields flew at a height less than 2 m above the ground. Therefore, by the elimination of canopy cover, it may be reasonable to assume that bats will be traveling at lower heights where they are more susceptible to vehicular mortality.

Removal of trees to facilitate the construction of Alternatives E Modified/ E-Shift Modified may help expose existing trees to more sunlight, thus increasing the likelihood that the protected bat species may utilize those trees as general roost or maternity roosts.

Another potential indirect effect of the Proposed Action is disturbance to the aquatic ecosystem. Indiana, northern long-eared, and tricolored bats forage extensively on insects, and many insects have aquatic larvae. These bat species could potentially be affected if aquatic habitat quality is reduced by construction siltation and/or subsequent infiltration of roadway contaminants (e.g., salt, lubricants, fuels, herbicides, and pesticides) into nearby aquatic resources, such as Piney Creek by reducing availability of a primary food source. Mitigation of impacts to the aquatic ecosystem is discussed in Section 7.0.

Secondary development will likely further impact Indiana bat, northern long-eared bat, and tricolored bat habitat in the area. Additional forest clearing, noise, and pavement could deter bats from using these areas in the future. The effects of secondary residential development are difficult to predict because this type of development is heavily dependent on outside factors such as the economy and population growth.

Along with residential development, economic development growth from the proposed action is anticipated. The goals of the proposed action are to provide avenues for economic development through access to locations that were previously difficult to reach. This infrastructure is key to the development of the region's industrial and commercial resource competitiveness, allowing for a more diversified regional economy.

## 4.3 Cumulative Effects

Cumulative effects are effects from future activities that are reasonably certain to occur within the Action Area and thereby, contribute to the effects to the species.

Historically, commercial timbering activities around the large mine-cave have also taken place. According to the 2006 BA for the Proposed Action, two companies (Coastal Lumber Company and Allegheny Wood Products) had been timbering the tracts near the mine for many years. However, both companies were said to have used



sustainable harvesting practices, and one company (Allegheny Wood Products) sold their tract of land in 2005. Therefore, because these commercial timbering areas were select cut and Allegheny Wood Products sold their property, the potential for past and future impacts due to commercial timbering operations would be minimal.

According to the 2006 BA for the Proposed Action, a small windmill farm (Meyersdale Wind Farm) containing 20 windmills is located in the northern portion of the Proposed Action Area to the east of Hunsrick Summit. While much attention has been focused on bat kills at wind farms, it should be noted that most bat species being killed and collected at wind farm locations (Hoary bats, red bats, and silver haired bats) are not species that typically inhabit the large mine-cave. There is no confirmation of the loss of any Indiana bats, northern long-eared bats, or tricolored bats at the Meyersdale wind farm. Based on this information, it appears that the Meyersdale wind farm would not be likely to cumulatively negatively affect the potential of the large mine-cave as a hibernaculum.

MD SHA is planning a 0.79-acre park-and-ride facility along the southern edge of the Proposed Action Area. This project is located on the corner of Chestnut Ridge Road and U.S. Route 40 (National Pike) on the west side of U.S. Route 219. This site is not habitat for bats because it's a maintained herbaceous area with young, planted trees and ornamental shrubs that were planted less than four years ago as revegetation of the temporary construction area, utilized for constructing this section of U.S. Route 219. The MD SHA park-and-ride project would not likely have a cumulative impact of bats given the lack of bat habitat within the park-and-ride project area prior to its development.

## 5.0 DETERMINATION OF EFFECTS

Based on the preceding analysis, the Proposed Action, as defined in Section 1.3, "may affect and is likely to adversely affect" the Indiana bat, northern long-eared bat, or tricolored bat. These impacts are not likely to jeopardize the existence of the Indiana bat, northern long-eared bat, or tricolored bat. Adverse collective impacts on the protected bat species habitat are anticipated resulting from past use of the area, proposed construction, and establishment of a new highway.

The determination of "*May affect, likely to adversely affect*" is based upon:

- Previous impacts to potential roosting habitat (forest) through direct timber harvest. A review of the parcels in the vicinity of the Project indicates that Coastal Timberland Co currently owns approximately 1400 acres in Maryland and 400 acres in Pennsylvania.
- The Proposed Action would have a direct permanent effect on approximately 16% (nearly 400 acres) of the suitable summer habitat (forest habitat) in the Proposed Action Area.
- The Proposed Action would have an indirect permanent effect on approximately 2% of the total forested land within a 5-mile radius (29,809 acres) of the Proposed Action Area that is potentially used by the protected bat species.
- The Proposed Action will directly affect three known hibernacula with Alternatives 3 and 4 only. No known hibernacula are directly affected with Alternatives 1 and 2.
- The Proposed Action Area will directly affect, at minimum, one identified rocky habitat feature.
- Blasting, pile driving, and other ground-disturbing activities may affect hibernating northern long-eared bats, Indiana bats, and tricolored bats.
- The Proposed Action will have no direct or indirect effect on the known hibernaculum, large mine-cave.
- No known maternity roosts exist in the Proposed Action Area, but those most likely to possess maternity roost trees have been avoided to the fullest extent possible.

## 6.0 AVOIDANCE, MINIMIZATION AND CONSERVATION MEASURES

Removal of buildings and trees would occur between October 1 and March 31 to avoid harming roosting bats. Trees in the immediate area of the proposed Piney Creek Bridge would remain as long as possible to provide cover for the bats traveling through the corridor. **Table 7** below summarizes timing windows of the avoidance and minimization measures.

A blasting plan would be prepared by the contractor to DEP and PGC guidelines and submitted to the USFWS, PGC, and PennDOT for review and approval prior to the commencement. All blasting will be monitored with sound and seismographic equipment and monitoring points will be coordinated with the USFWS and PGC. Seismographs would be installed in proximity to known hibernacula to allow for monitoring of the ground vibration. As blasting gets closer to any known hibernacula, it would be possible to alter the blasting to ensure vibrations are below established thresholds (WVDEP 2006). Blasting will not be permitted within one mile to the north and south of the Piney Creek bridge during the winter hibernation period from October 31 to March 31. The Pennsylvania Department of Transportation will maintain a record of each blast for at least five years. If a solution cavity were encountered, the hole will be sealed with cement grout, and USFWS and PGC will be notified.

The Proposed Action will directly affect three known hibernacula (2005-19, 2005-27, and 2005-28) with Alternatives 3 and 4. To minimize potential adverse effects to hibernating bats, emergence surveys would be completed immediately prior to proposed direct effects (i.e. night prior) and, if feasible and practical, exclusionary measures would be taken. Subsequently, impacts to the known hibernacula would follow time of year restrictions (i.e., demolition during the summer months) to ensure that the Indiana bat, northern long-eared bat and tricolored bat would not be utilizing the feature and therefore minimize and/or avoid direct impacts to these bat species. Alternatives 1 and 2 will not have a direct effect on any hibernacula.

Construction equipment will be fitted with properly functioning mufflers to minimize noise impact. To minimize impacts to air quality, the contractor will comply with Pennsylvania Department of Environmental Protection Rules and Regulations, Title 25.

Where feasible, identified rocky habitats may be avoided. The LOD on the determined alternative may be altered, in the form of shifting or decreasing, to avoid potential impacts to the identified rocky habitat.

A planting plan will be developed in coordination with USFWS and PGC guidance, that supports safe highway design, for the vegetation in the vicinity of any known hibernacula within the proposed LOD.

In summary, these proposed measures would:

- Minimize potential harm to any roosting bats.
- Minimize potential harm to any known hibernacula due to noise and vibration.
- Where feasible, reduce LOD (area of direct effect) to avoid potential impacts to rocky habitats that may be utilized by roosting and/or hibernating bats.
- Minimize potential for a collapse or change in conditions that would affect airflow at any known hibernacula.
- Minimize harm by reducing the amount of forestland required to construct the Proposed Action.
- Increase potential for Proposed Action Area trees to be suitable for maternity roost by increasing solar exposure on the forest fringe.
- Avoid and minimize harm to hibernating bats within any known hibernacula.
- Maintain existing Riparian Buffers preserved around major stream corridors, where feasible.
- Erosion and Sediment Control Plans and Best Management Practices (BMPs): All parties involved will commit to the use of erosion and sediment controls (per state and federal regulations) and best management practices to reduce/eliminate sedimentation and/or run off from construction activities into nearby aquatic resources.

**Table 7. Timing Windows of Avoidance and Minimization Measures**

Avoidance and Minimization Measures	Time		Notes
	Start	End	
Mitigation Crediting, Erosion and Sediment Control Plans, and BMPs	-	-	Concurrent with the Start of Construction
Building and Tree Removal	October 1	March 31	Trees in the immediate area of the proposed Piney Creek Bridge would remain as long as possible.
Blasting	November 1	March 31	No Blasting or other related construction activities within ½ mile of any known hibernacula.

## 7.0 MITIGATION MEASURES

In understanding of the USFWS' and the PGC and DNR's position on the importance of the hibernacula and the potential for summer use of the Proposed Action Area, the FHWA, PennDOT, and SHA will commit, in the interest of environmental stewardship, to measures that promote recovery of the species. For these reasons, the following mitigation measures have been developed to.

The following measures will be implemented:

- Implementation of a Planting Plan: A planting plan will be developed, in coordination with the PGC and DNR guidance, that supports safe highway design and minimizes future roadway mortality, as bats will be able to fly above the roadway utilizing a higher canopy the plantings will provide.
- Impacts to rock outcrops: To offset unavoidable impacts to rocky outcroppings, FHWA/PennDOT/SHA, with input from bat experts, proposes to design, create and/or rebuild rock outcroppings that are conducive to bat roosting and potential hibernation. Although anticipated to be minor in occurrence, these impacts and coordination can occur during final design activities.
- PennDOT will provide pre-construction, two years of construction, and one-year post-construction monitoring of the large mine-cave opening. Monitoring results will be shared with PennDOT, SHA, FHWA, PGC, and the USFWS.
- To avoid harming or disturbing hibernating Indiana bats, northern long-eared bats and tricolored bats, all earth disturbance activities within 0.5 mile of any known hibernaculum [BCM 2005-01, BCM 2005-19, BCM 2005-27, BCM 2005-28 and Large Mine-Cave (Table 1)] will only occur from April 1 to November 15.
- Excavation will occur during daytime hours to avoid impacts during nighttime foraging.
- Tree cutting, clearing, grubbing will not occur during the active season from April 1 – November 15.
- An approved erosion, sedimentation, and pollution control plan will be implemented to avoid degradation of receiving waters.
- Lengths of stream crossing culvert structures will be minimized to the extent possible to reduce alteration to existing aquatic habitats that serve as potential habitats and flyways.

Additionally, the following mitigation options will be pursued to offset direct impacts to known hibernaculum and suitable forest habitat in the following order:

1. Large mine-cave Rights Purchase: PennDOT will investigate the amicable fee simple or perpetual easement purchase of the large mine-cave. The purchase would provide perpetual protection for bat species, as well as providing the PGC and the USFWS with secured access for research and study needs. Following construction, PennDOT will look to transfer the property to PGC or a willing third party for perpetual conservation and protection.

Should the purchase of the large mine-cave rights be unsuccessful:

2. FHWA and PennDOT anticipate offsetting direct forest removal through purchasing credits from a Service-approved conservation credit banking entity.
3. Artificial Roost structures (i.e., BrandenBark, bat boxes): To introduce additional roosting habitat, PennDOT will purchase and install four artificial roost structures, designed to the PGC/USFWS requirements, at locations designated by the USFWS and the PGC.

## **8.0 EFFECT DETERMINATIONS**

The preceding analysis was based on the best available information, including compiled studies by the Project Team in accordance with USFWS and PGC protocols. The analysis of the Proposed Action's impact on the Indiana bat, northern long-eared bat, and tricolored bat result in a "may affect, likely to adversely affect" finding. Various conservation measures are offered, as discussed previously, to help aid in the recovery of the species under 7(a)(1).

## 9.0 REFERENCES

- Barbour, Roger W. and Wayne H. Davis. 1969. *Bats of America*. University Press of Kentucky, 1979.
- Bat Conservation and Management, Inc (BCM). 2005. Abandoned Mine Investigations for the US 6219, Section 019 Highway Improvement Project, August 27 – October 1, 2005
- BCM. 2013. Fall Bat Harp Trapping and Acoustic Surveys. U.S. Route 219 Improvements Project, S.R. 6219, Section 020 Somerset County, Pennsylvania, September 30 – October 2, 2013.
- BCM. 2014a. 2014 Route 219 Meyersdale to I-68 Summer Bat Survey. Garrett County, MD and Somerset County, PA 17 July – 5 August 2014. Published October 2014.
- BCM. 2014b. 2014 Route 219 Fall Bat Harp Trapping and Abandoned Mine/Rocky Habitat Assessment. U.S. Route 219 Improvements Project, S.R. 6219, Section 019 Somerset County, Pennsylvania and Garrett County, Maryland October 2 – 12, 2014. Published December 2014.
- BCM. 2022a. US 6219, Section 050 Transportation Improvement Project Meyersdale, PA To Old Salisbury Road, MD Summer Bat Acoustic Survey. Somerset County, Pennsylvania; Garrett County, Maryland. June 3 - August 16, 2022
- BCM. 2022b. US 6219, Section 050 Transportation Improvement Project Meyersdale, PA to Old Salisbury Road, MD, 2022 Fall Bat Capture Hibernacula Use Assessment. Somerset County, Pennsylvania. September 21 – October 26, 2022
- BCM. 2023a. US 6219, Section 050 Transportation Improvement Project Meyersdale, PA to Old Salisbury Road, MD., 2023 Bat Hibernacula Habitat Assessment. Somerset County, Pennsylvania; Garrett County, Maryland. February 15- April 26, 2023.
- BCM. 2023b. US 6219, Section 050 Transportation Improvement Project Meyersdale, PA To Old Salisbury Road, MD. 2023 Fall Bat Capture Hibernacula Use Assessment. Somerset County, Pennsylvania. September 19 – October 3, 2023.
- Bureau of Ocean Energy Management (BOEM). 2020. Vineyard Wind 1 Offshore Wind Energy Project Biological Assessment.
- Johnson, et. Al. 2024. Widespread Use of Rocky Outcrops by Hibernating Bats in Ohio and Pennsylvania, Journal of North American Bat Research, Volume 2, No 2., 2024.
- Kurta, Allen and Murray, Susan W. 2022. Philopatry and Migration of Banded Indiana Bats (*Myotis sodalis*) and Effects of Radio Transmitters, Journal of Mammalogy, Volume 83, Issue 2, May 2002, Pages 585–589.
- L. Robert Kimball & Associates. 2009. Mist Net Survey for the Indiana Bat (*Myotis sodalis*) for the Proposed US 219 Improvement Project SR 6219 Section 020 Meyersdale to Somerset, Somerset County, Pennsylvania.
- Markosky Engineering Group, Inc. (Markosky). 2023. Terrestrial Habitat Assessment for US 6219, Section 050 Transportation Improvement Project, Meyersdale, PA to Old Salisbury Road, MD. 19 July 2023.
- McCormick Taylor Engineering Company (McCormick Taylor). U.S. 219, Section 019 Meyersdale, Somerset County, Pennsylvania to I-68 in Garrett County, Maryland Transportation Improvement Project Indiana bat Biological Assessment. June 2006.
- Maryland Department of Transportation State Highway Administration. 2022. Natural Resources Code § 5-103 (2022)- Reforestation Law. Administered by Maryland Department of Natural Resources Forest Service.

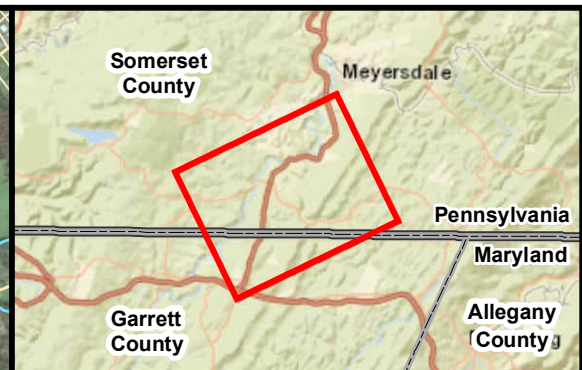
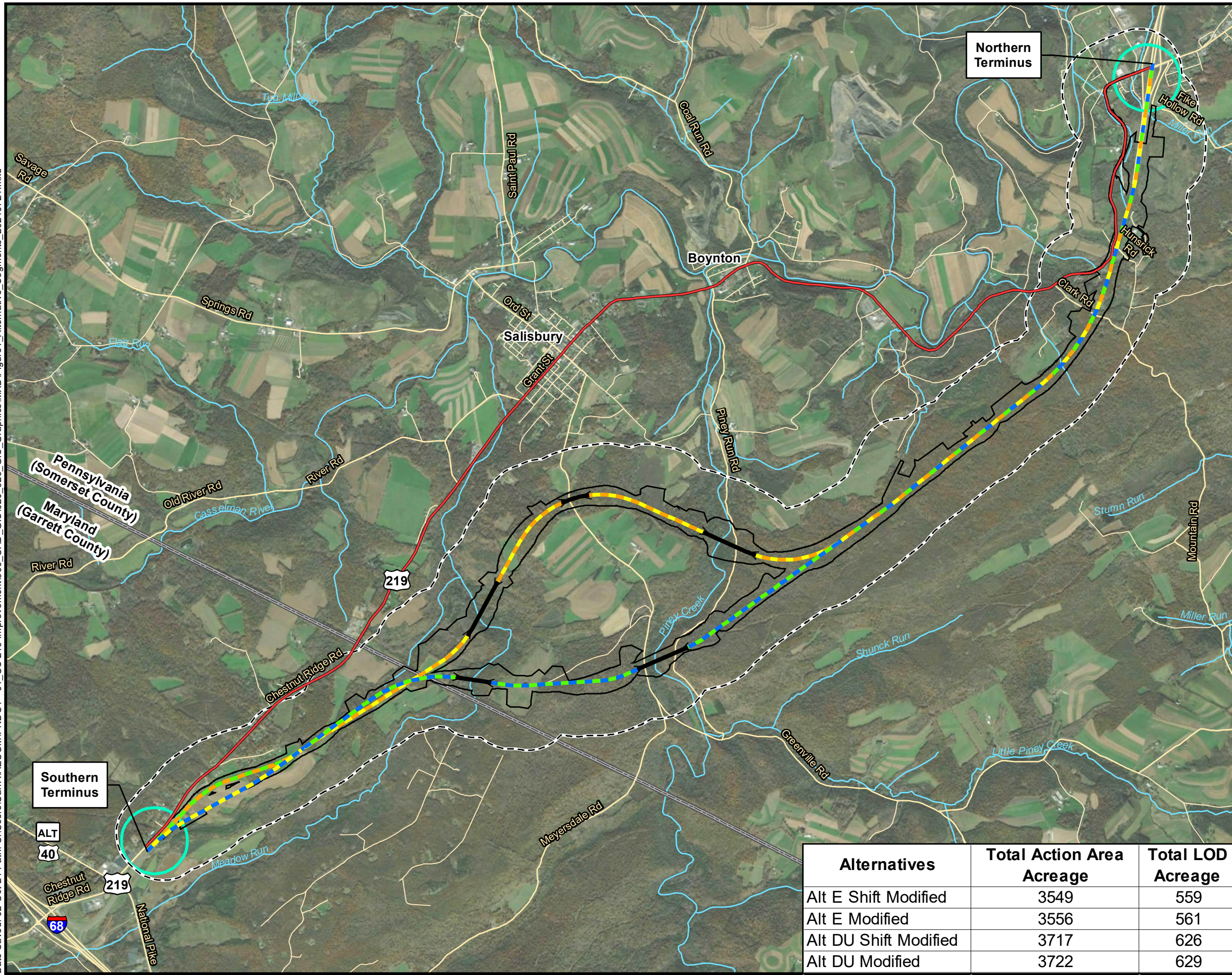
- PennDOT. 1999. Needs Analysis, US 219, I-68 (Maryland) to Somerset, Pennsylvania.
- Russell, Amy L., Calvin M. Butchkoski, Leslie Saidak, and Gary F. McCracken. 2009. "Road-killed bats, highway design, and the commuting ecology of bats." *Endangered Species Research*, vol. 8, 2009, pp. 49–60, <https://doi.org/10.3354/esr00121>.
- Skelly and Loy, Inc. 2012. U.S. Route 219 Improvements Project S.R. 6219, Section 020, Bat Hibernaculum Investigations Final Report. Published December 31, 2012.
- Summers, J.L., J.P. White, H.M. Kaarakka, S. E. Hygnstrom, B. S. Sedinger, J. Riddle, T. Van Deelen, and C. Yahnke. 2022. Influence of underground mining with explosives on a hibernating bat population. *Wiley Conservation Science and Practice*. 11 pp.
- Turner, Gregory, DeeAnn Reeder and Jeremy Coleman. 2011. A Five-year Assessment of Mortality and Geographic Spread of White-Nose Syndrome in North American Bats, with a Look at the Future. Update of White-Nose Syndrome in Bats. *Bat Research News*. 52. 13-27.
- U.S. Fish and Wildlife Service (USFWS). 2004. Indiana bat, *Myotis sodalis*. Published July 2004.
- USFWS. 2006. Threatened and Endangered Species, Indiana Bat (*Myotis sodalis*).
- USFWS. 2008. Section 7 Technical Assistance, Summary of Indiana Bat Ecology. Midwest Region Endangered Species. Updated on March 4, 2008.
- USFWS. 2016. Programmatic Biological Opinion on Final 4(d) Rule for Northern Long-Eared Bat and Activities.
- USFWS. 2022b. Endangered and Threatened Wildlife and Plants; Endangered Species Status for Northern Long-Eared Bat. *Federal Register*/Vol. 87, No 229. Released on November 30, 2022.
- USFWS. 2022c. Endangered and Threatened Wildlife and Plants; Endangered Species Status for Tricolored Bat. *Federal Register*/Vol. 87, No 177. Released on September 14, 2022.
- USFWS. 2022d. Northern Long-Eared Bat (*Myotis septentrionalis*). Environmental Conservation Online System (ECOS).
- USFWS. 2022e. Threatened and Endangered Species, Tricolored bat, *Perimyotis subflavus*.
- West Virginia Department of Environmental Protection. 2006. Report of Potential Effects of Surface Mine Blasts upon Bat Hibernaculum By: West Virginia Department of Environmental Protection, Office of Explosives and Blasting. December 31, 2006.
- Winhold, Lisa and Allen Kurta. 2006. Aspects of Migration by the Endangered Indiana Bat, *Myotis sodalis*. 47. 1-6.

## APPENDIX A

### Figures



Date Saved: 02-Oct-24 Path: C:\Users\Carr\AECOM\PNDOT - 01\_US 219 Improvement\900\_CAD\_GIS\920\_929\_GIS\_Graphics\MXD\Figure1\_Alternative\_Segments\_20240724.mxd



**LEGEND:**

- Alternative 1 - E-Shift Modified
- Alternative 2 - E Modified
- Alternative 3 -DU-Shift Modified
- Alternative 4 - DU Modified
- Action Area
- Modified Limit of Disturbance
- Proposed Bridge

0 1,500 3,000 6,000 Feet

N

Alternatives	Total Action Area Acreage	Total LOD Acreage
Alt E Shift Modified	3549	559
Alt E Modified	3556	561
Alt DU Shift Modified	3717	626
Alt DU Modified	3722	629

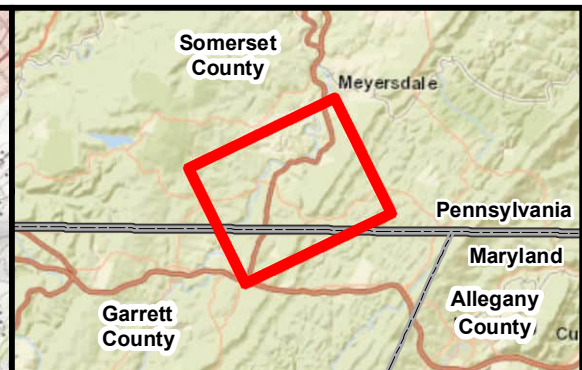
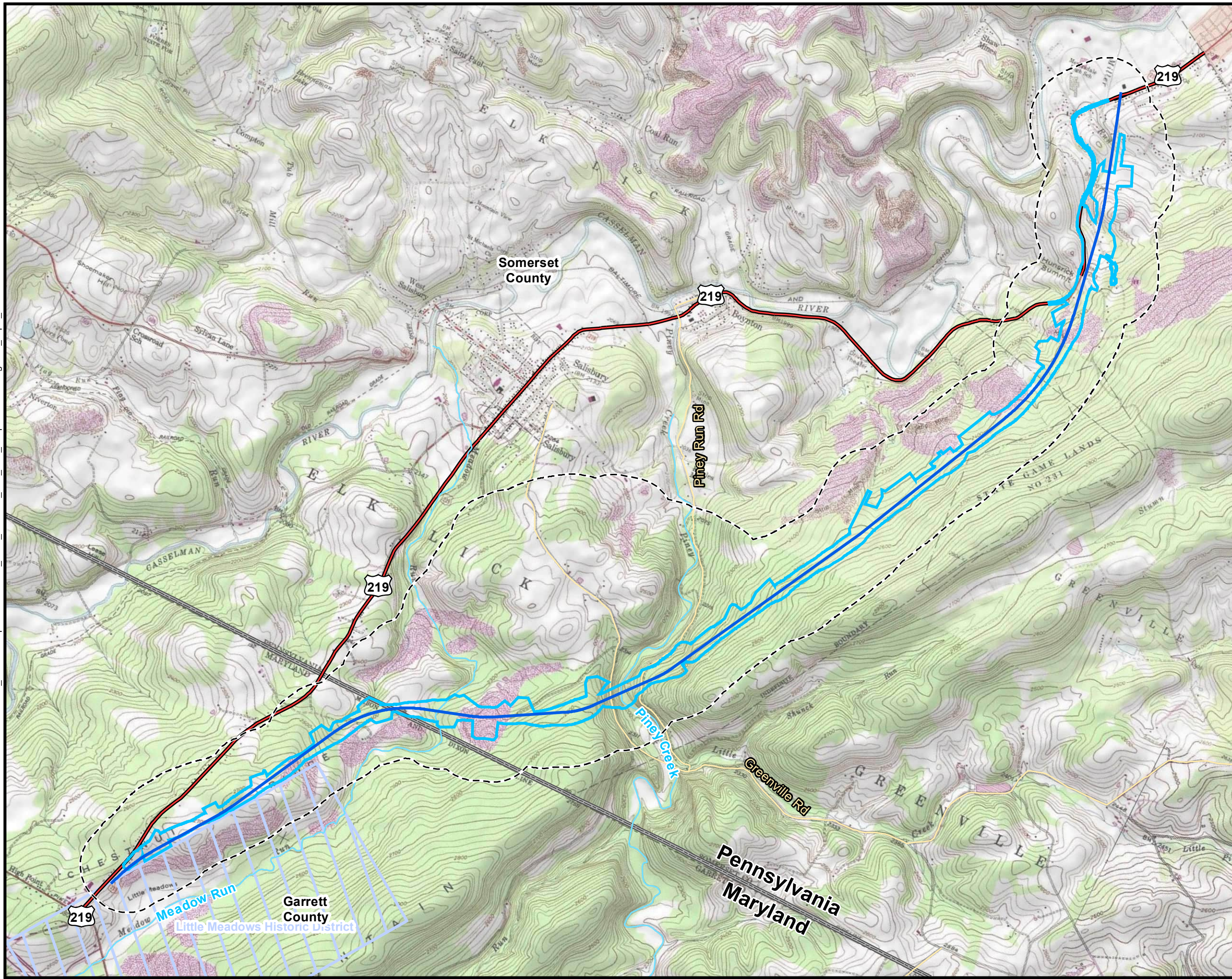
US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 1  
ALTERNATIVES MAP

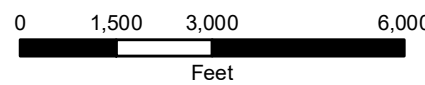
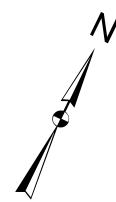
**AECOM**



Date Saved: 02-Oct-24 Path: C:\Users\Car\AECOM\PNDOT - 01\_US 219 Improvement\900\_CAD\_GIS\920\_929\_GIS\_Graphics\MXD\Figure2\_Topo\_20240724.mxd



- LEGEND:**
- Alternative 1 - E-Shift Modified
  - Alternative 1 - E-Shift Modified Limit of Disturbance
  - Action Area
  - Little Meadows Historic District
  - County Boundary
  - State Boundary



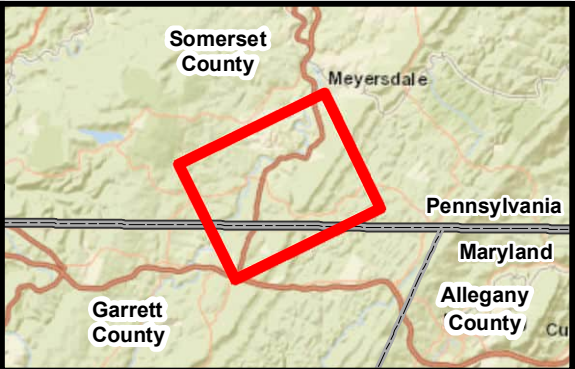
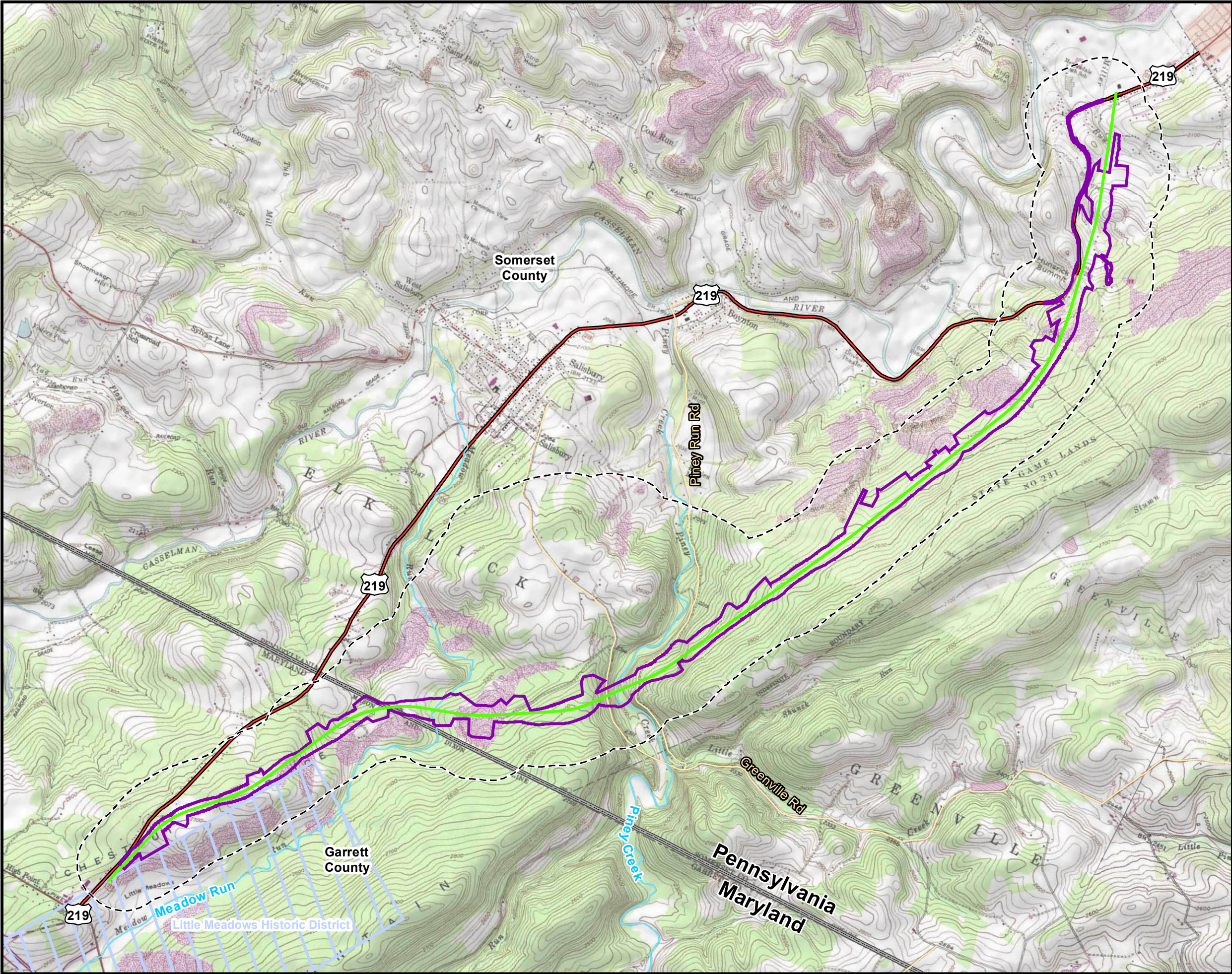
US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 2A  
TOPOGRAPHIC MAP  
ALTERNATIVE 1 - E-SHIFT MODIFIED  
**AECOM**

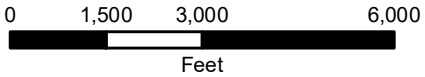
BASE MAP SOURCE: ArcGIS Online, USA Topo Maps



Date Saved: 02-Oct-24 Path: C:\Users\Car\AECOM\PNDOT - 01\_US 219 Improvement\900\_CAD\_GIS\920\_929\_GIS\_Graphics\MXD\Figure2\_Topo\_20240724.mxd



- LEGEND:**
- Alternative 2 - E Modified
  - Alternative 2 - E Modified Limit of Disturbance
  - Action Area
  - Little Meadows Historic District
  - County Boundary
  - State Boundary



US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

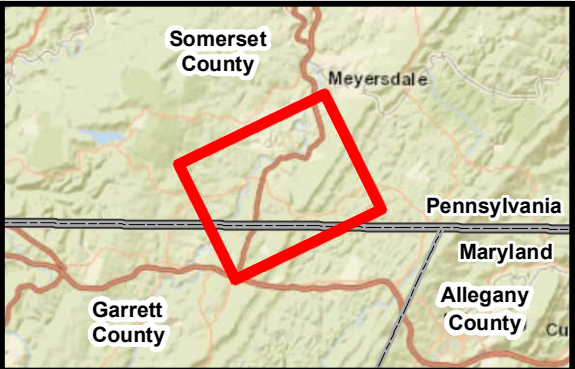
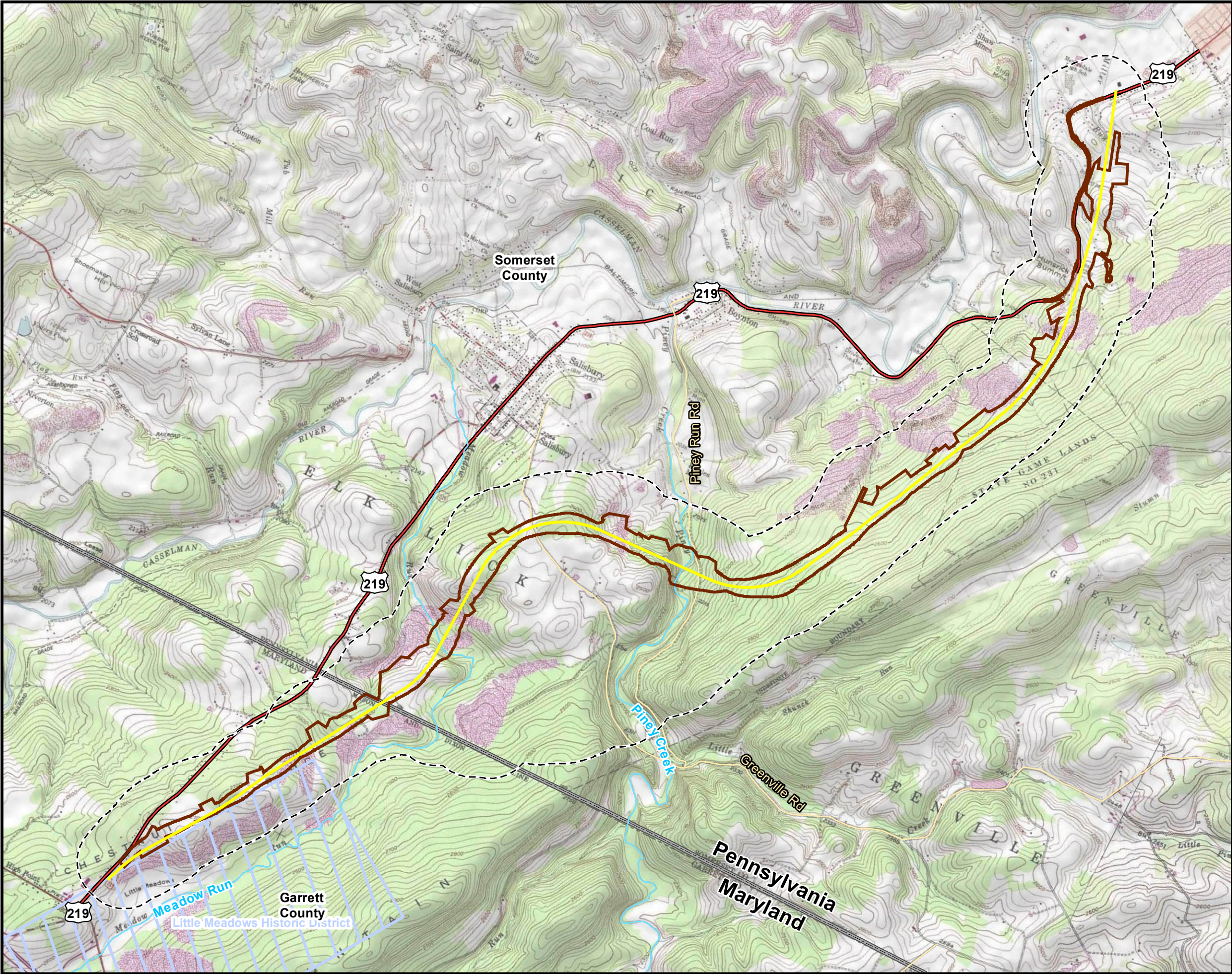
FIGURE 2B  
TOPOGRAPHIC MAP  
ALTERNATIVE 2 - E MODIFIED



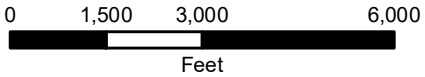
BASE MAP SOURCE: ArcGIS Online, USA Topo Maps



Date Saved: 02-Oct-24 Path: C:\Users\CarriA\ECOMP\NDOT - 01\_US 219 Improvement\900\_CAD\_GIS\920\_929\_GIS\_Graphics\MXD\Figure2\_Topo\_20240724.mxd



- LEGEND:**
- Alternative 3 - DU-Shift Modified
  - Alternative 3 - DU-Shift Modified Limit of Disturbance
  - Action Area
  - Little Meadows Historic District
  - County Boundary
  - State Boundary

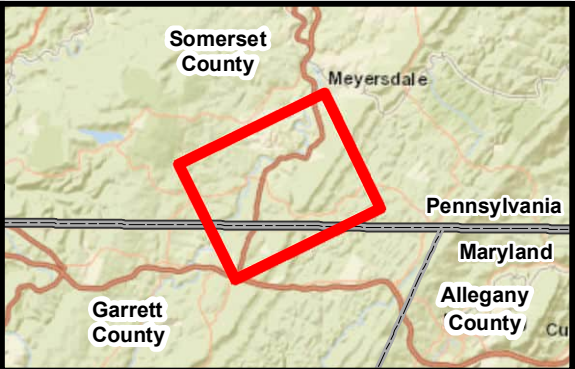
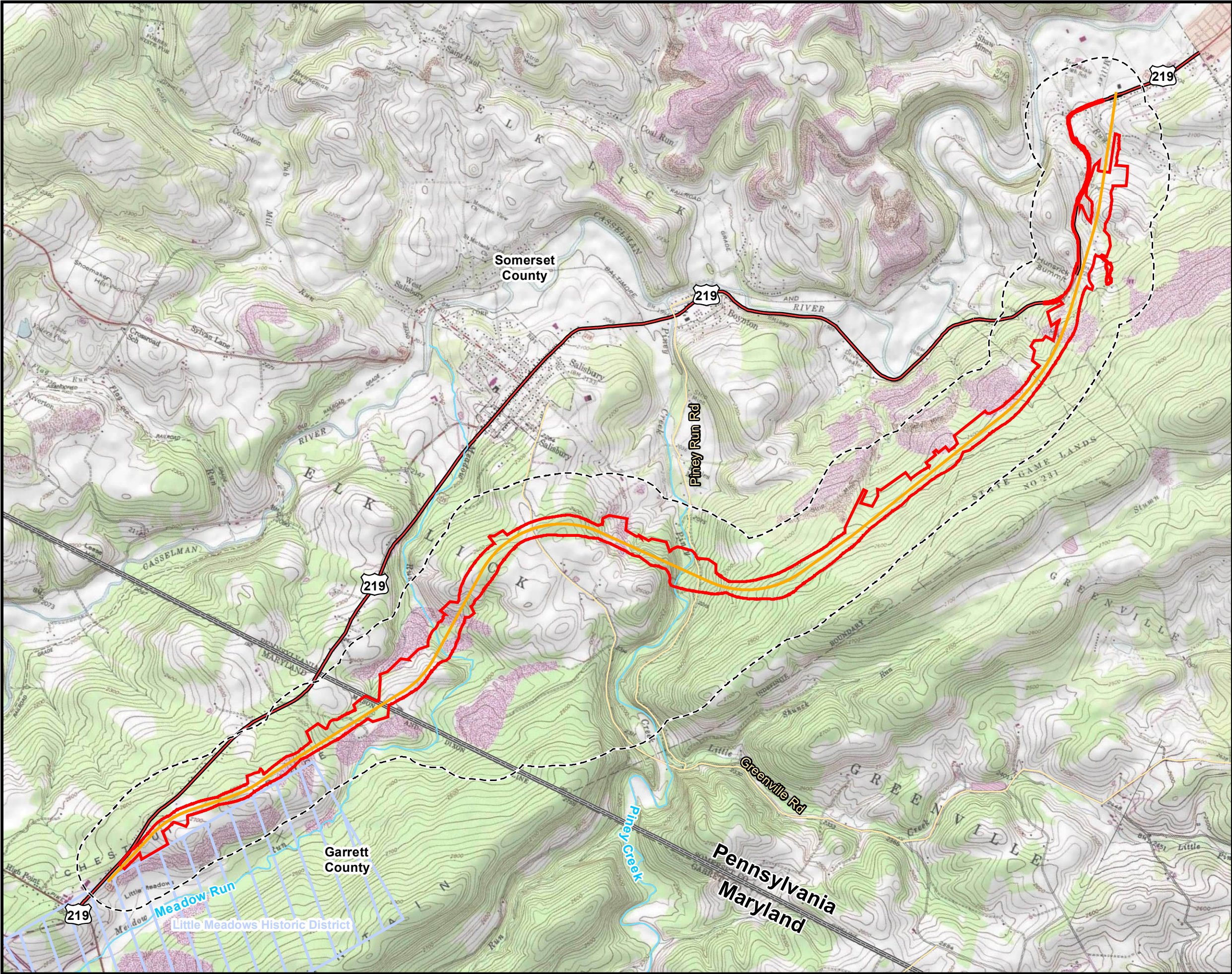


US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

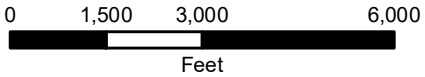
FIGURE 2C  
TOPOGRAPHIC MAP  
ALTERNATIVE 3 - DU-SHIFT MODIFIED  
**AECOM**

BASE MAP SOURCE: ArcGIS Online, USA Topo Maps





- LEGEND:**
- Alternative 4 - DU Modified
  - Alternative 4 - DU Modified Limit of Disturbance
  - Action Area
  - Little Meadows Historic District
  - County Boundary
  - State Boundary



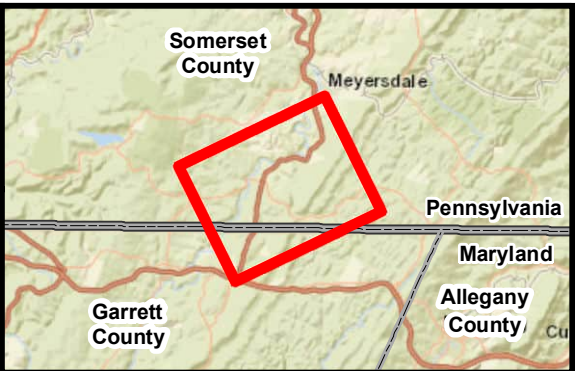
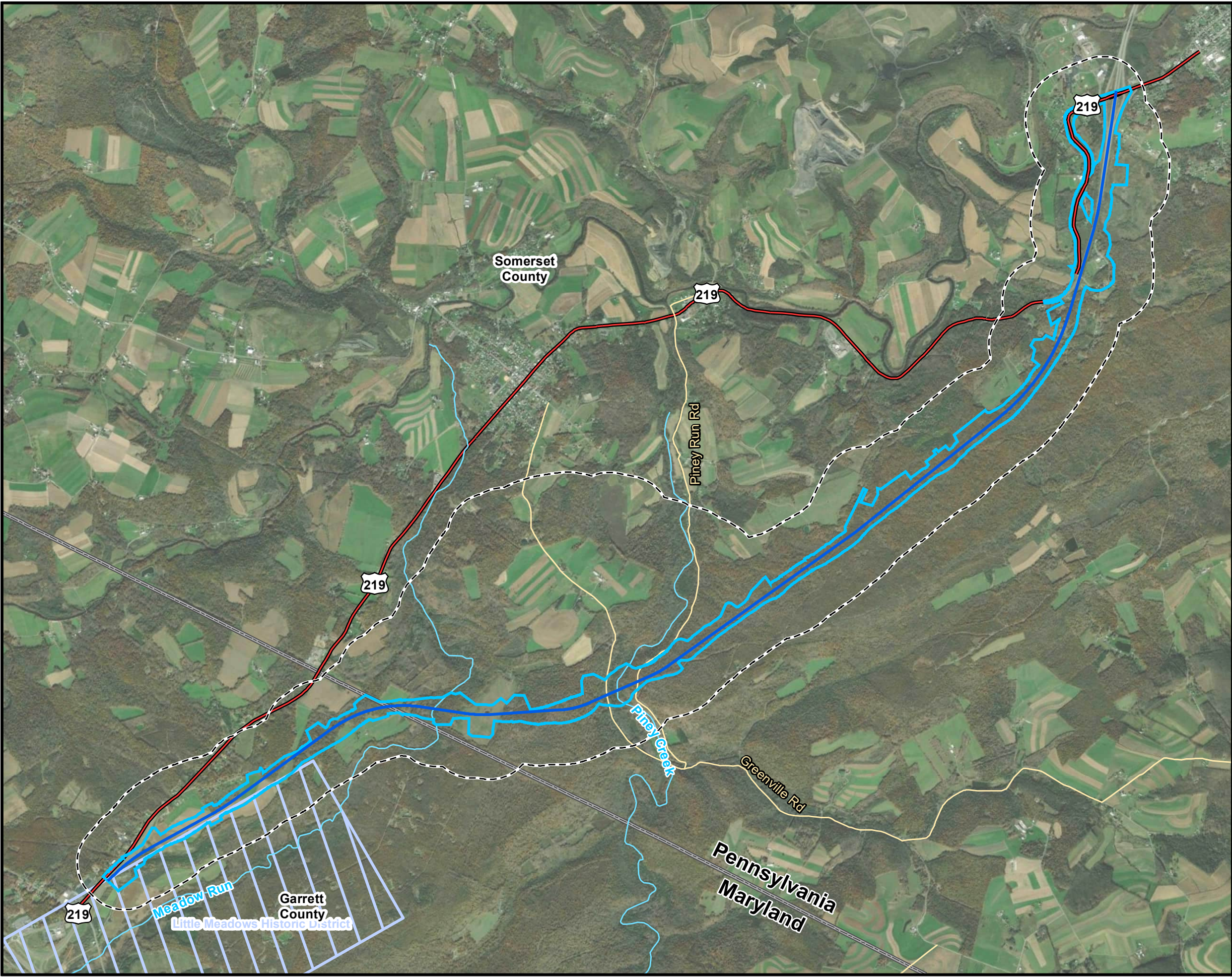
US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 2D  
TOPOGRAPHIC MAP  
ALTERNATIVE 4 - DU MODIFIED





Date Saved: 02-Oct-24 Path: C:\Users\Carr\AECOM\PNDOT - 01\_US 219 Improvement\900\_CAD\_GIS\920\_929\_GIS\_Graphics\MXD\Figure3\_Aerial\_20240724.mxd



- LEGEND:**
- Alternative 1 - E-Shift Modified
  - Alternative 1 - E-Shift Modified Limit of Disturbance
  - Action Area
  - Little Meadows Historic District
  - County Boundary
  - State Boundary



0 1,500 3,000 6,000  
Feet

US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

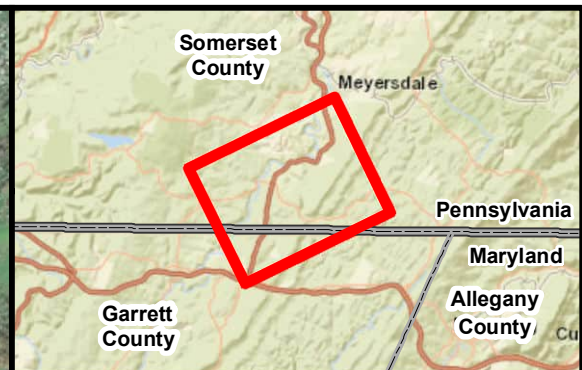
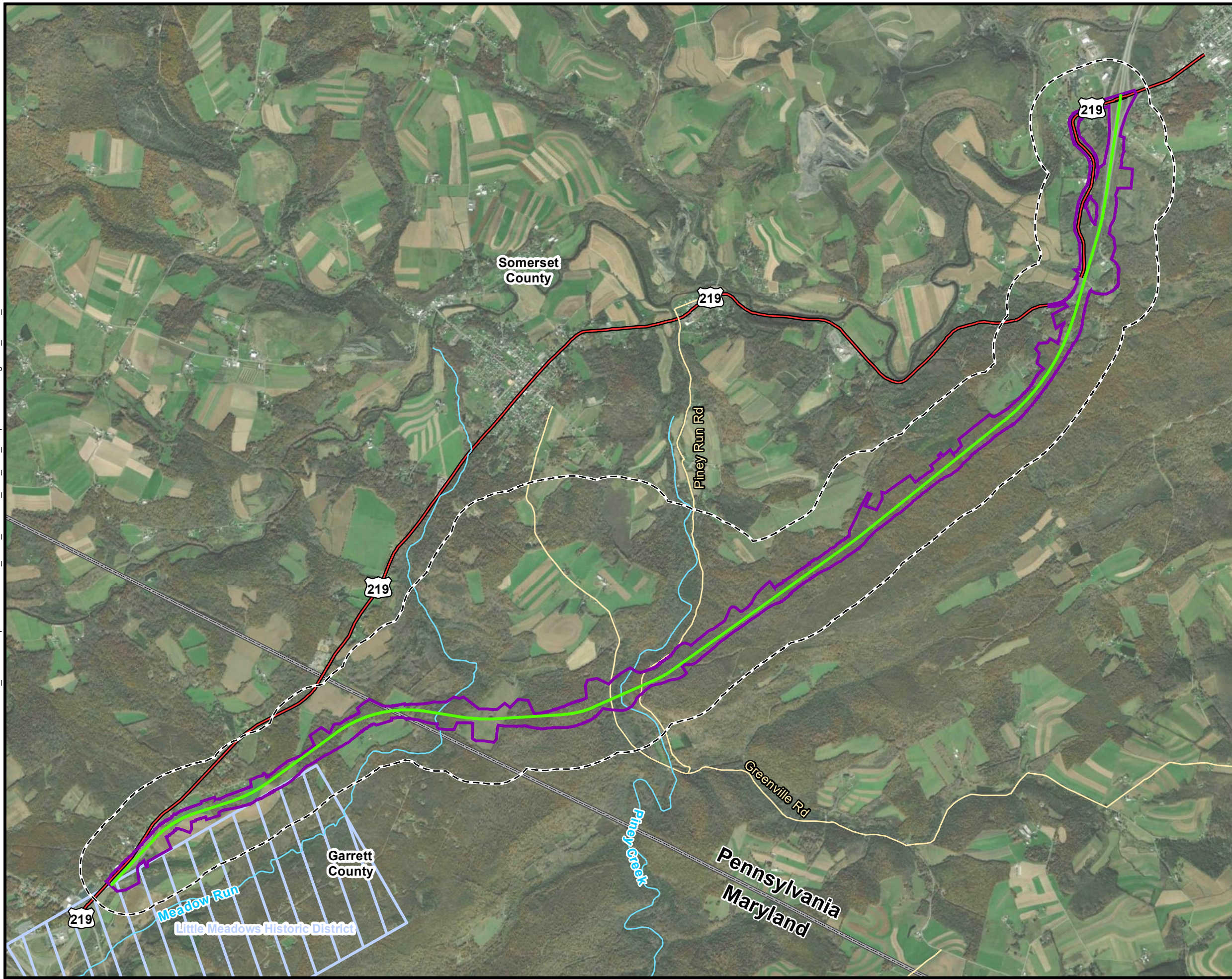
FIGURE 3A  
AERIAL MAP  
ALTERNATIVE 1 - E-SHIFT MODIFIED

**AECOM**

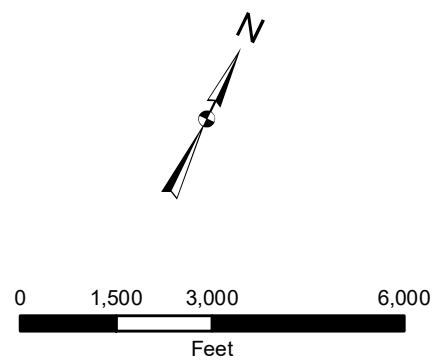
BASE MAP SOURCE: ArcGIS Online, USA Topo Maps



Date Saved: 02-Oct-24 Path: C:\Users\Carr\AECOM\PNDOT - 01\_US 219 Improvement\900\_CAD\_GIS\920\_929\_GIS\_Graphics\MXD\Figure3\_Aerial\_20240724.mxd



- LEGEND:**
- Alternative 2 - E Modified
  - Alternative 2 - E Modified Limit of Disturbance
  - Action Area
  - Little Meadows Historic District
  - County Boundary
  - State Boundary



US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

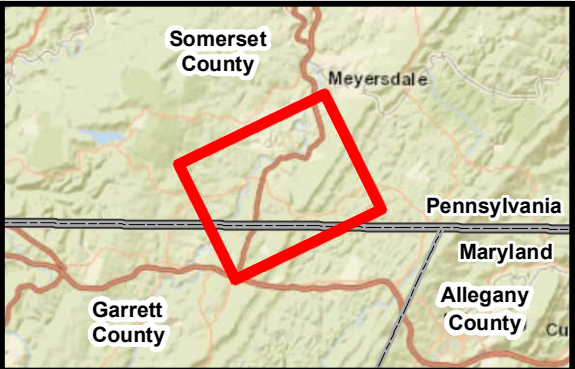
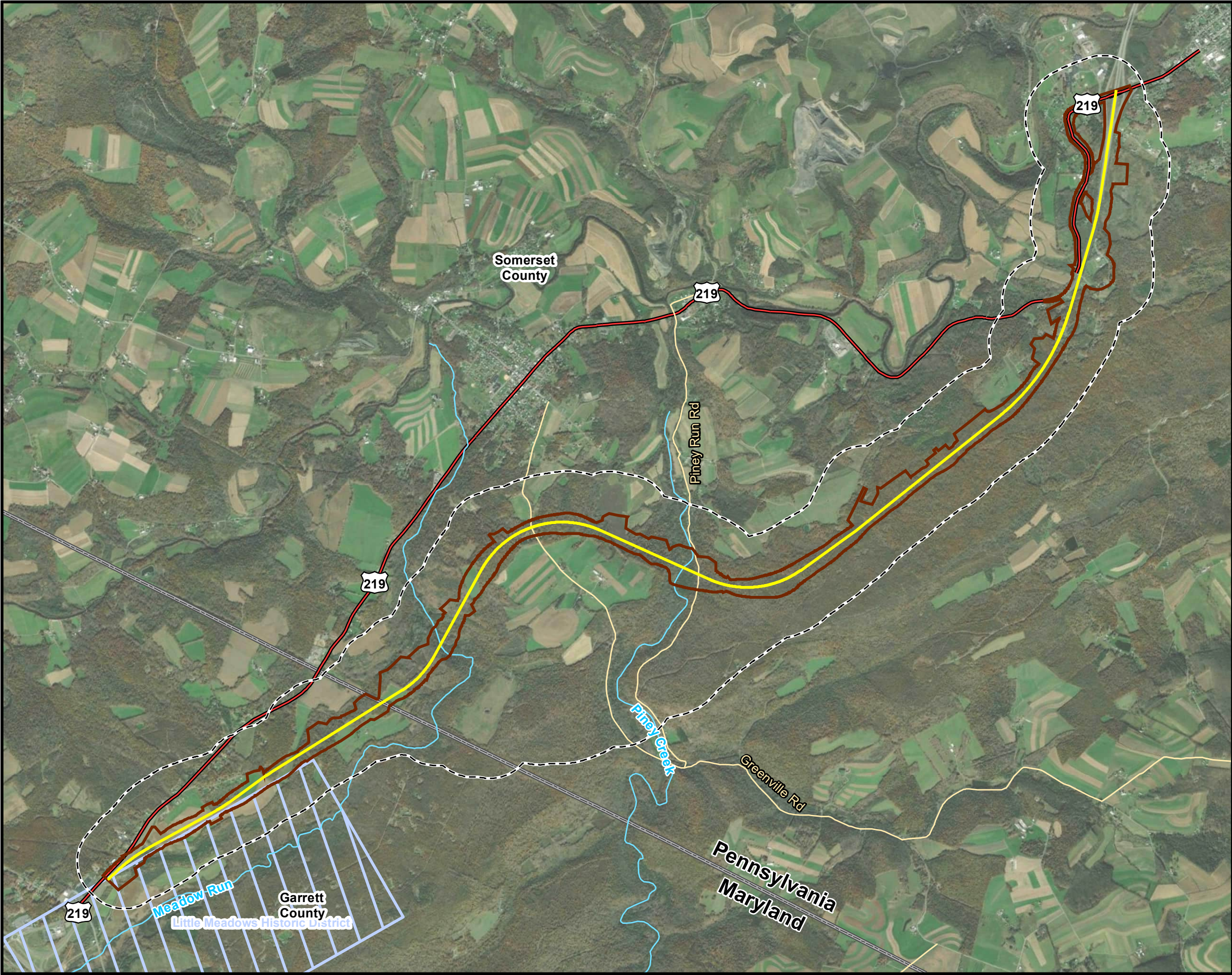
FIGURE 3B  
AERIAL MAP  
ALTERNATIVE 2 - E MODIFIED

**AECOM**

BASE MAP SOURCE: ArcGIS Online, USA Topo Maps



Date Saved: 02-Oct-24 Path: C:\Users\Carr\AECOM\PNDOT - 01\_US 219 Improvement\900\_CAD\_GIS\920\_929\_GIS\_Graphics\MXD\Figure3\_Aerial\_20240724.mxd



- LEGEND:**
- Alternative 3 - DU-Shift Modified
  - Alternative 3 - DU-Shift Modified Limit of Disturbance
  - Action Area
  - Little Meadows Historic District
  - County Boundary
  - State Boundary



0 1,500 3,000 6,000  
Feet

US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

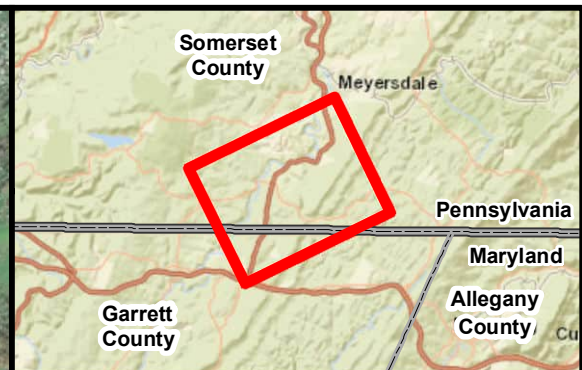
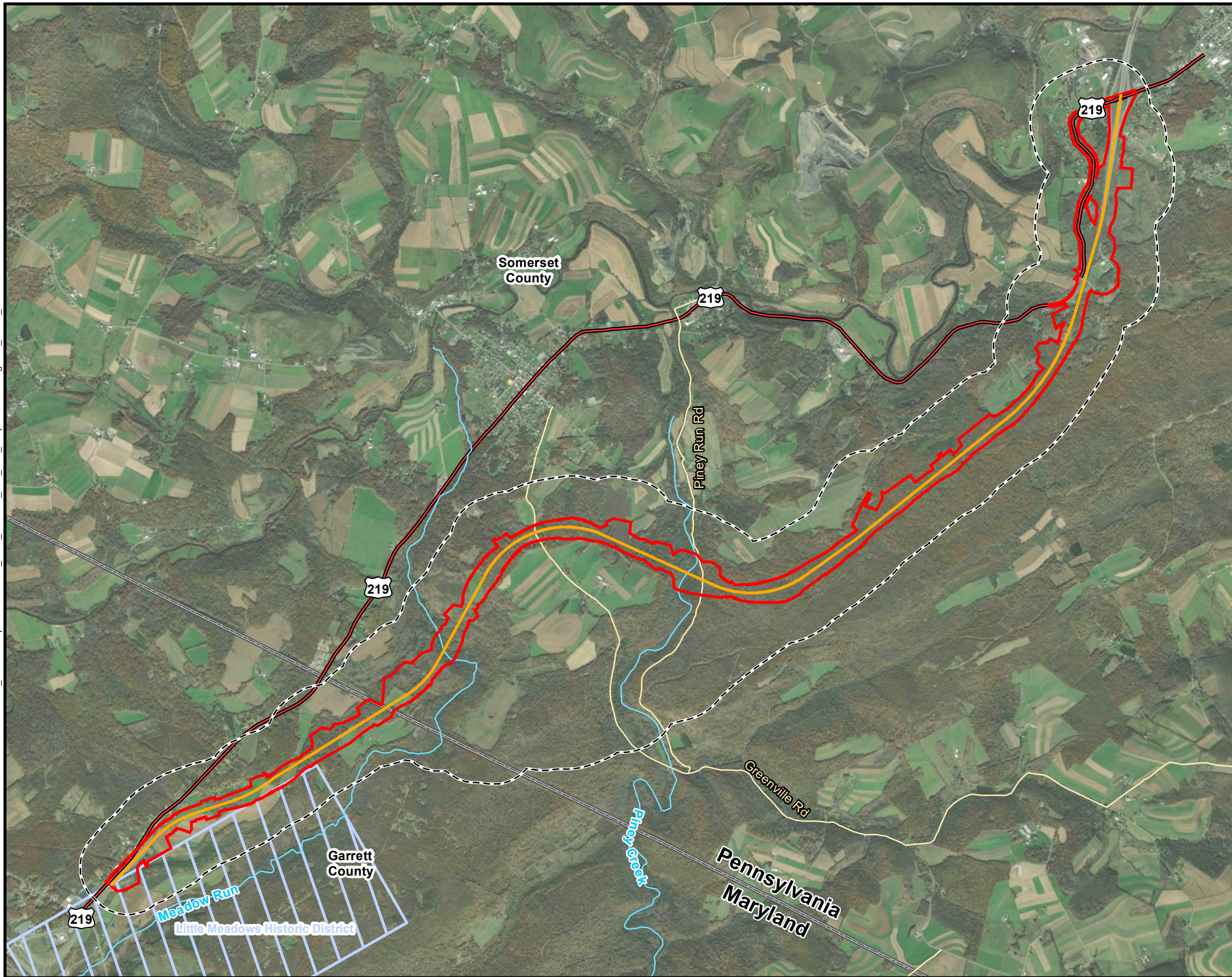
FIGURE 3C  
AERIAL MAP  
ALTERNATIVE 3 - DU-SHIFT MODIFIED

**AECOM**

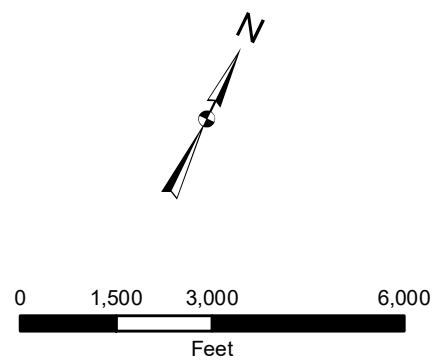
BASE MAP SOURCE: ArcGIS Online, USA Topo Maps



Date Saved: 02-Oct-24 Path: C:\Users\Carr\AECOM\PNDOT - 01\_US 219 Improvement\900\_CAD\_GIS\920\_929\_GIS\_Graphics\MXD\Figure3\_Aerial\_20240724.mxd



- LEGEND:**
- Alternative 4 - DU Modified
  - Alternative 4 - DU Modified Limit of Disturbance
  - Action Area
  - Little Meadows Historic District
  - County Boundary
  - State Boundary



US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

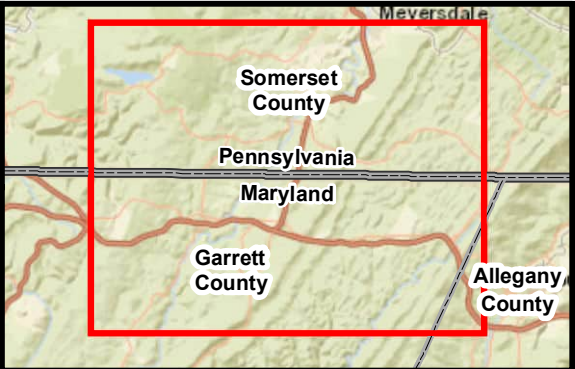
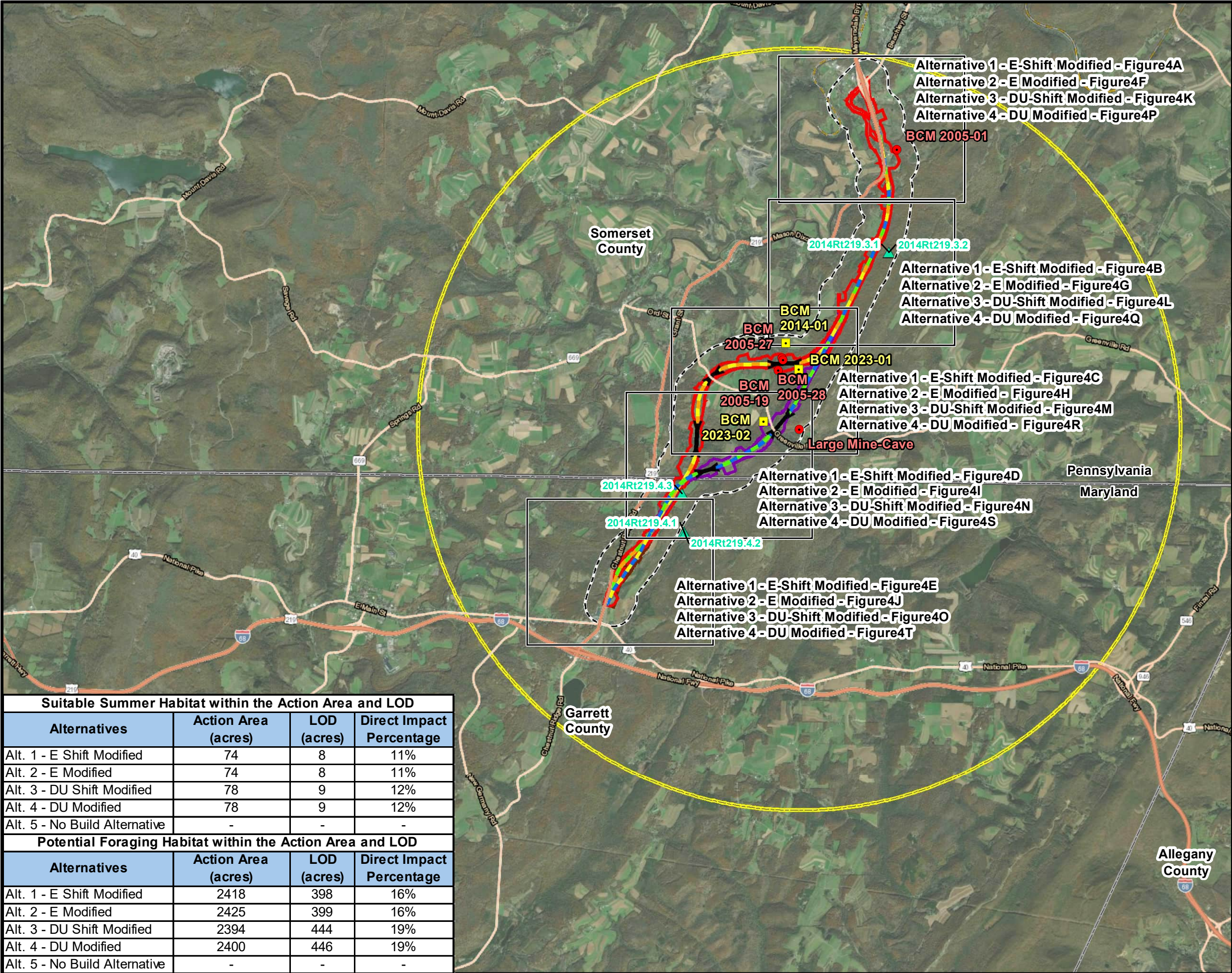
FIGURE 3D  
AERIAL MAP  
**ALTERNATIVE 4 - DU MODIFIED**

**AECOM**

BASE MAP SOURCE: ArcGIS Online, USA Topo Maps



Date Saved: 02-Oct-24 Path: C:\Users\Carr\AECOM\IPNDOT - 01\_US 219 Improvement\900\_CAD\_GIS\920\_929\_GIS\_Graphics\MXD\Figure4\_Sheet\_Index\_20240724.mxd



**LEGEND:**

- Known Hibernaculum
- Potential Hibernaculum
- Roost Location
- Alternative 1 - E-Shift Modified
- Alternative 2 - E Modified
- Alternative 3 - DU-Shift Modified
- Alternative 4 - DU Modified
- Large Mine-Cave 5-Mile Radius
- Action Area
- Proposed Bridge
- Alternative 1 - E-Shift Modified Limit of Disturbance
- Alternative 2 - E Modified Limit of Disturbance
- Alternative 3 - DU-Shift Modified Limit of Disturbance
- Alternative 4 - DU Modified Limit of Disturbance
- Sheet Index
- County Boundary
- State Boundary

0 0.625 1.25 2.5  
Miles

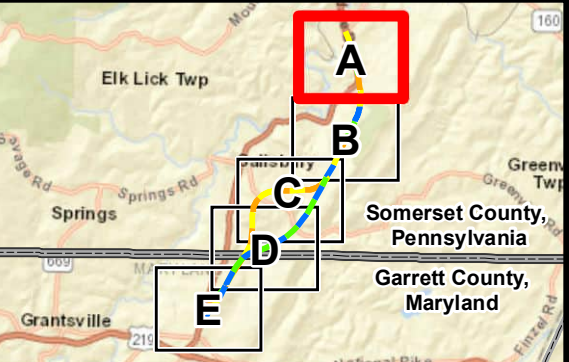
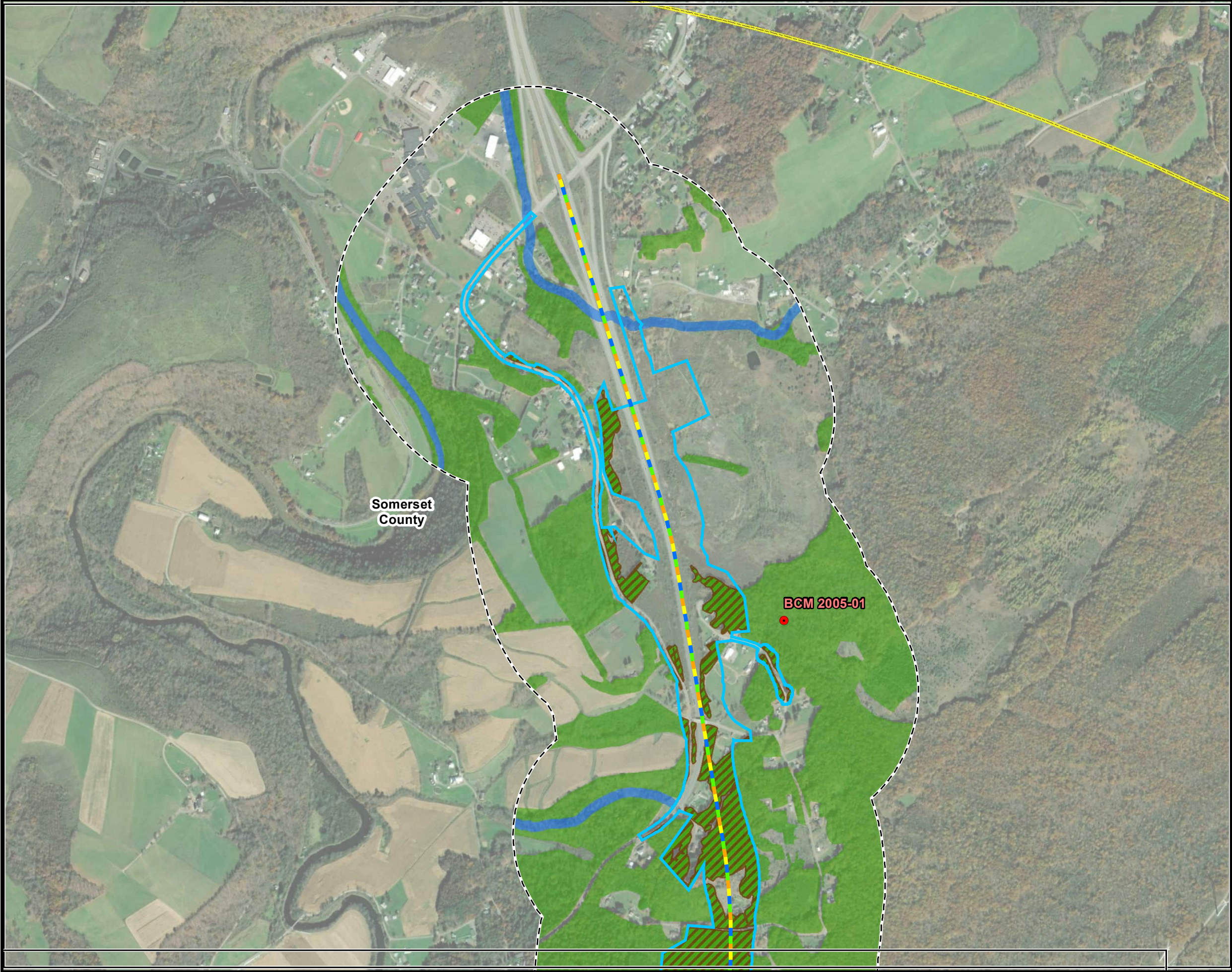
Suitable Summer Habitat within the Action Area and LOD			
Alternatives	Action Area (acres)	LOD (acres)	Direct Impact Percentage
Alt. 1 - E Shift Modified	74	8	11%
Alt. 2 - E Modified	74	8	11%
Alt. 3 - DU Shift Modified	78	9	12%
Alt. 4 - DU Modified	78	9	12%
Alt. 5 - No Build Alternative	-	-	-
Potential Foraging Habitat within the Action Area and LOD			
Alternatives	Action Area (acres)	LOD (acres)	Direct Impact Percentage
Alt. 1 - E Shift Modified	2418	398	16%
Alt. 2 - E Modified	2425	399	16%
Alt. 3 - DU Shift Modified	2394	444	19%
Alt. 4 - DU Modified	2400	446	19%
Alt. 5 - No Build Alternative	-	-	-

US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

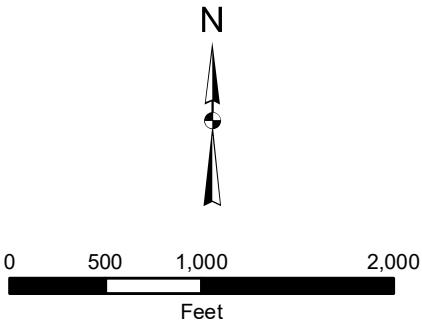
FIGURE 4  
FORESTED HABITAT MAP  
SHEET INDEX

**AECOM**





- LEGEND:**
- Known Hibernaculum
  - Alternative 1 - E-Shift Modified
  - Alternative 2 - E Modified
  - Alternative 3 - DU-Shift Modified
  - Alternative 4 - DU Modified
  - Action Area
  - Potential Foraging Habitat
  - Forested Habitat
  - Tree Removal
  - Alternative 1 - E-Shift Modified Limit of Disturbance
  - Large Mine-Cave 5-Mile Radius
  - Sheet Index
  - County Boundary
  - State Boundary



US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 4A  
FORESTED HABITAT MAP  
ALTERNATIVE 1 - E-SHIFT MODIFIED





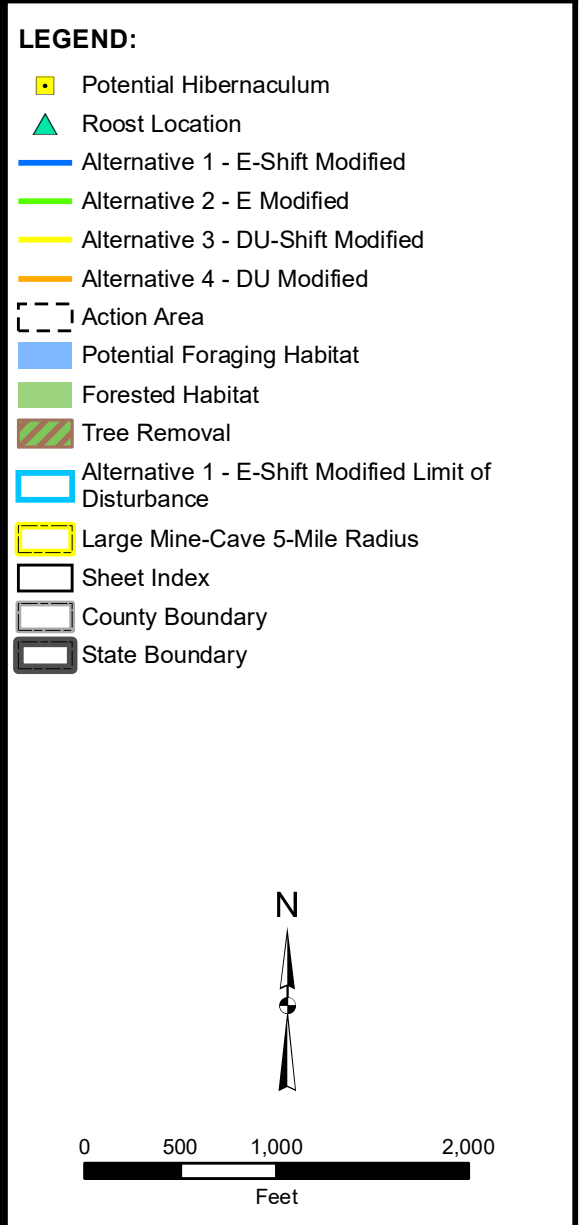


FIGURE 4B  
FORESTED HABITAT MAP  
ALTERNATIVE 1 - E-SHIFT MODIFIED



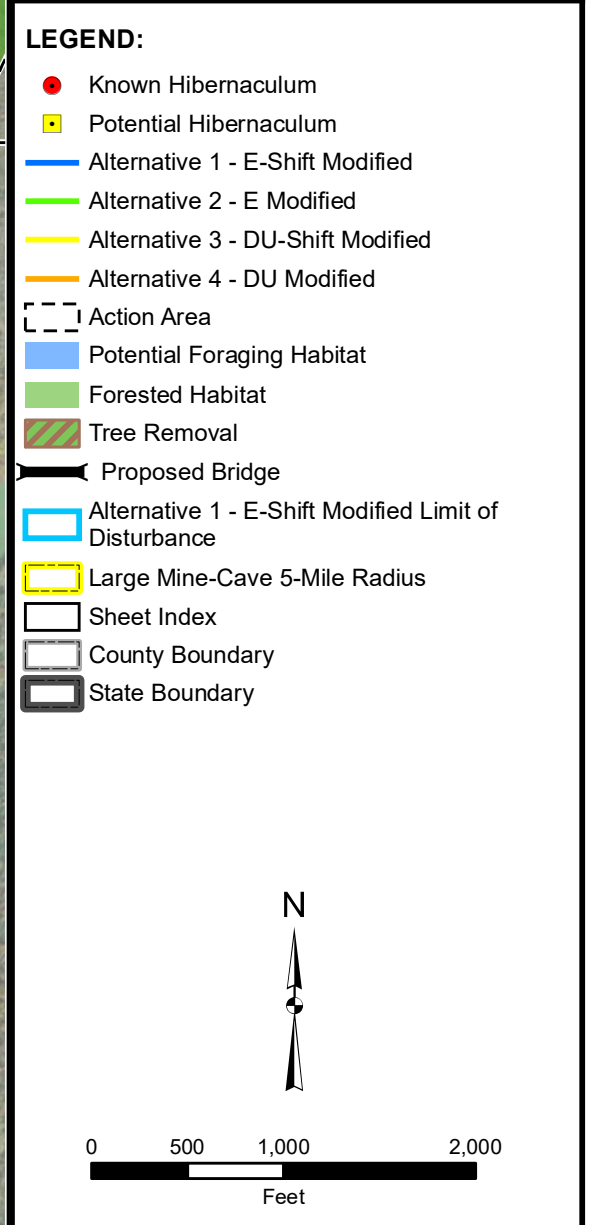
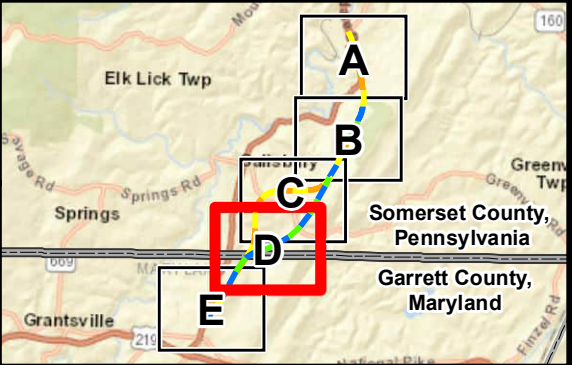
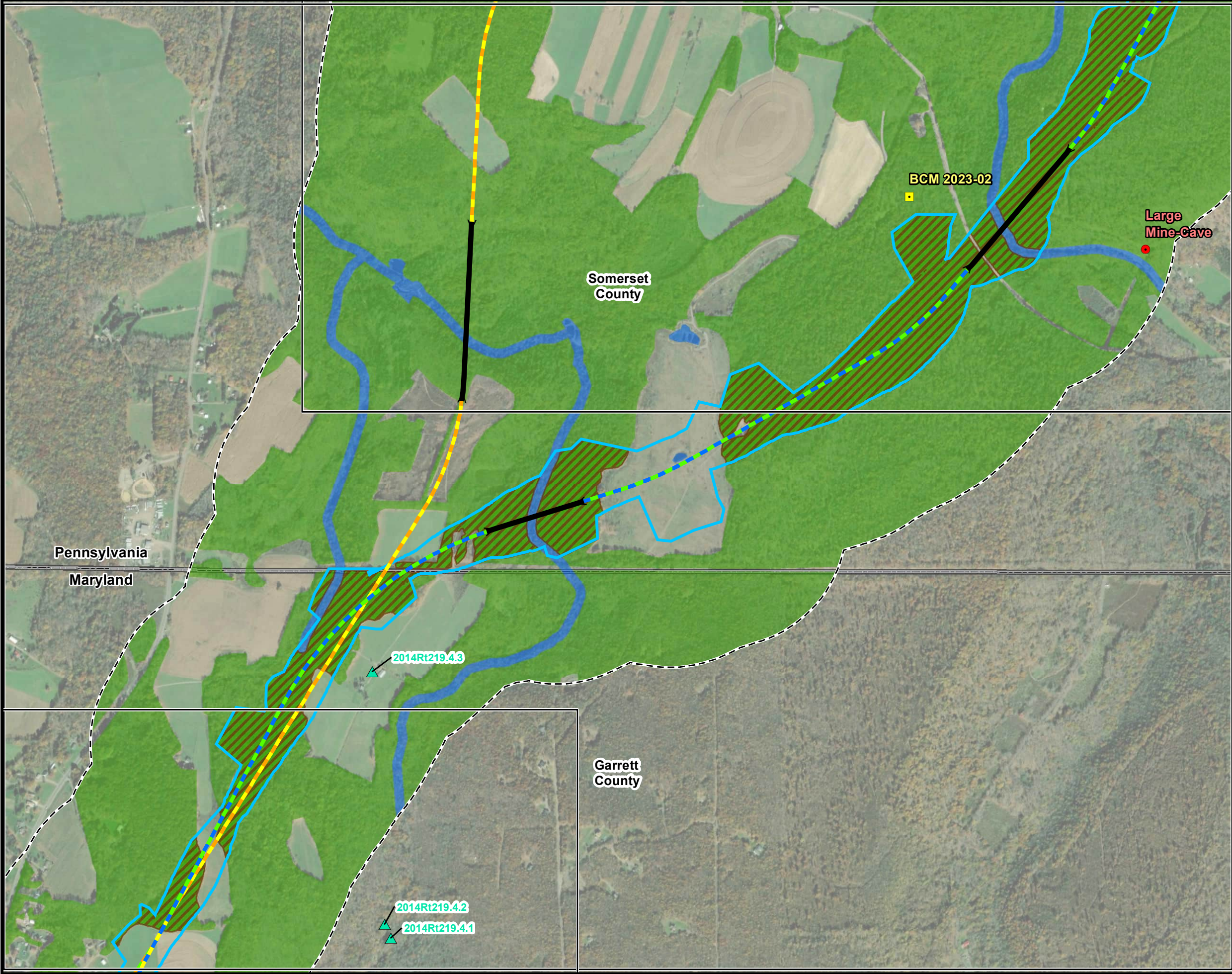
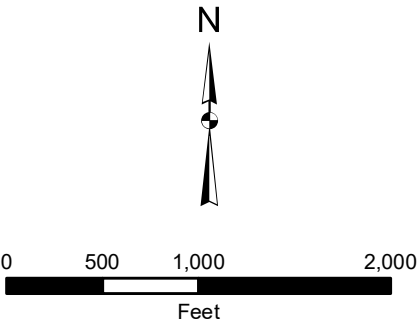


FIGURE 4C  
FORESTED HABITAT MAP  
ALTERNATIVE 1 - E-SHIFT MODIFIED





- LEGEND:**
- Known Hibernaculum
  - Potential Hibernaculum
  - Roost Location
  - Alternative 1 - E-Shift Modified
  - Alternative 2 - E Modified
  - Alternative 3 - DU-Shift Modified
  - Alternative 4 - DU Modified
  - Action Area
  - Potential Foraging Habitat
  - Forested Habitat
  - Tree Removal
  - Proposed Bridge
  - Alternative 1 - E-Shift Modified Limit of Disturbance
  - Large Mine-Cave 5-Mile Radius
  - Sheet Index
  - County Boundary
  - State Boundary

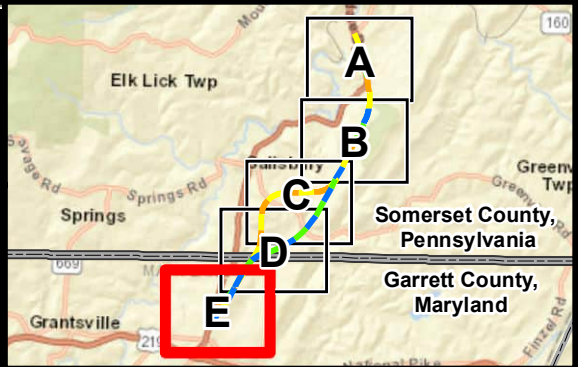
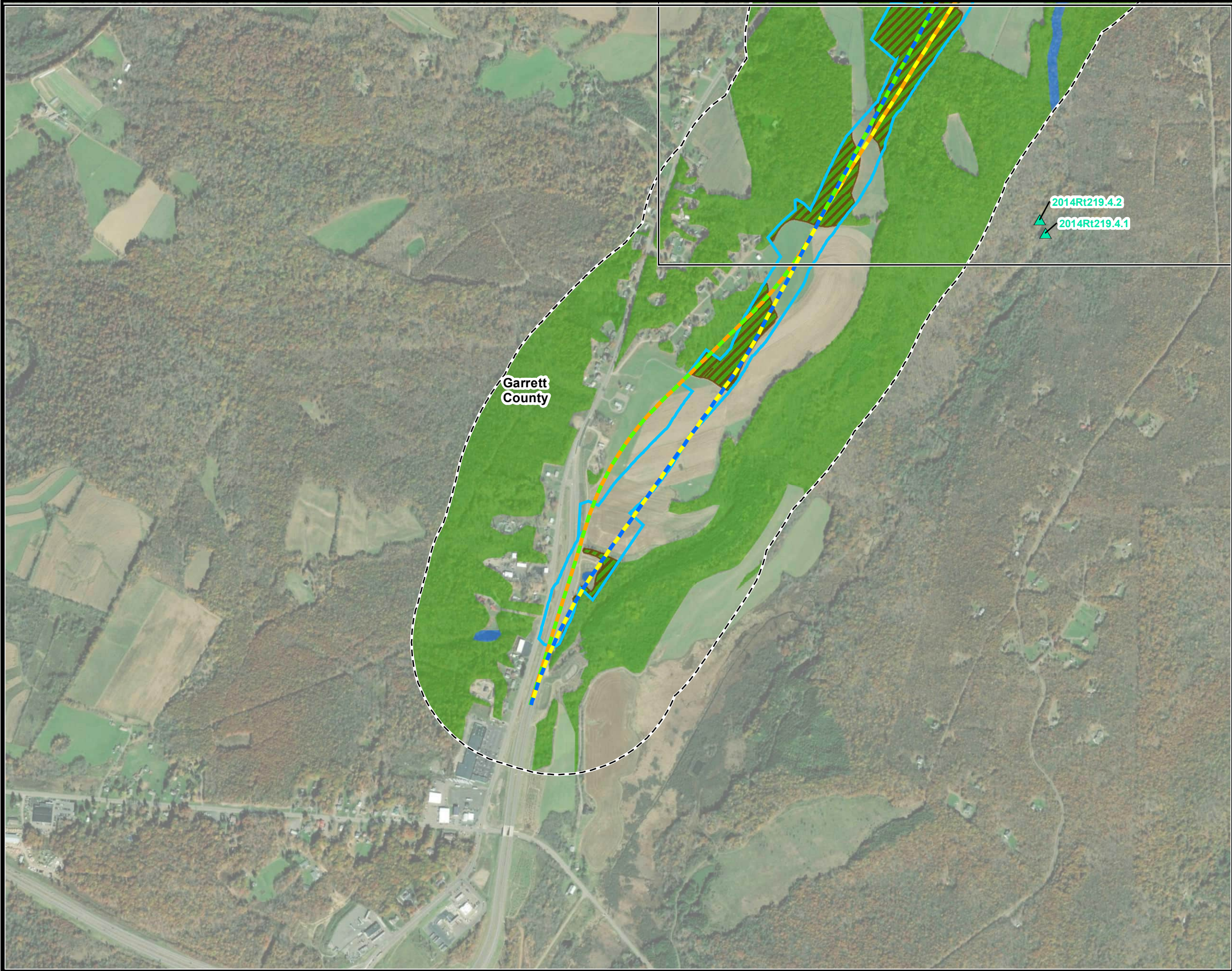


US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

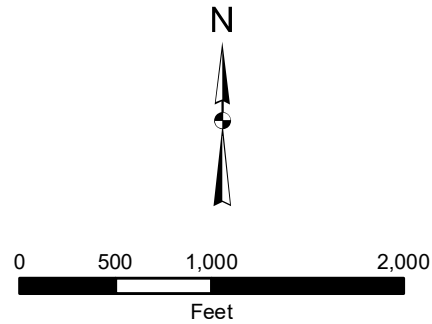
FIGURE 4D  
FORESTED HABITAT MAP  
ALTERNATIVE 1 - E-SHIFT MODIFIED







- LEGEND:**
- ▲ Roost Location
  - Alternative 1 - E-Shift Modified
  - Alternative 2 - E Modified
  - Alternative 3 - DU-Shift Modified
  - Alternative 4 - DU Modified
  - - - Action Area
  - Potential Foraging Habitat
  - Forested Habitat
  - Tree Removal
  - Alternative 1 - E-Shift Modified Limit of Disturbance
  - Large Mine-Cave 5-Mile Radius
  - Sheet Index
  - County Boundary
  - State Boundary

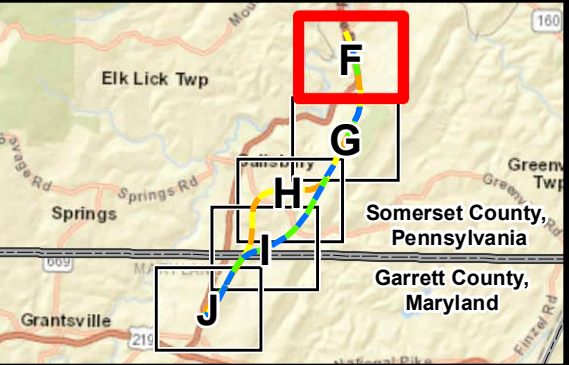
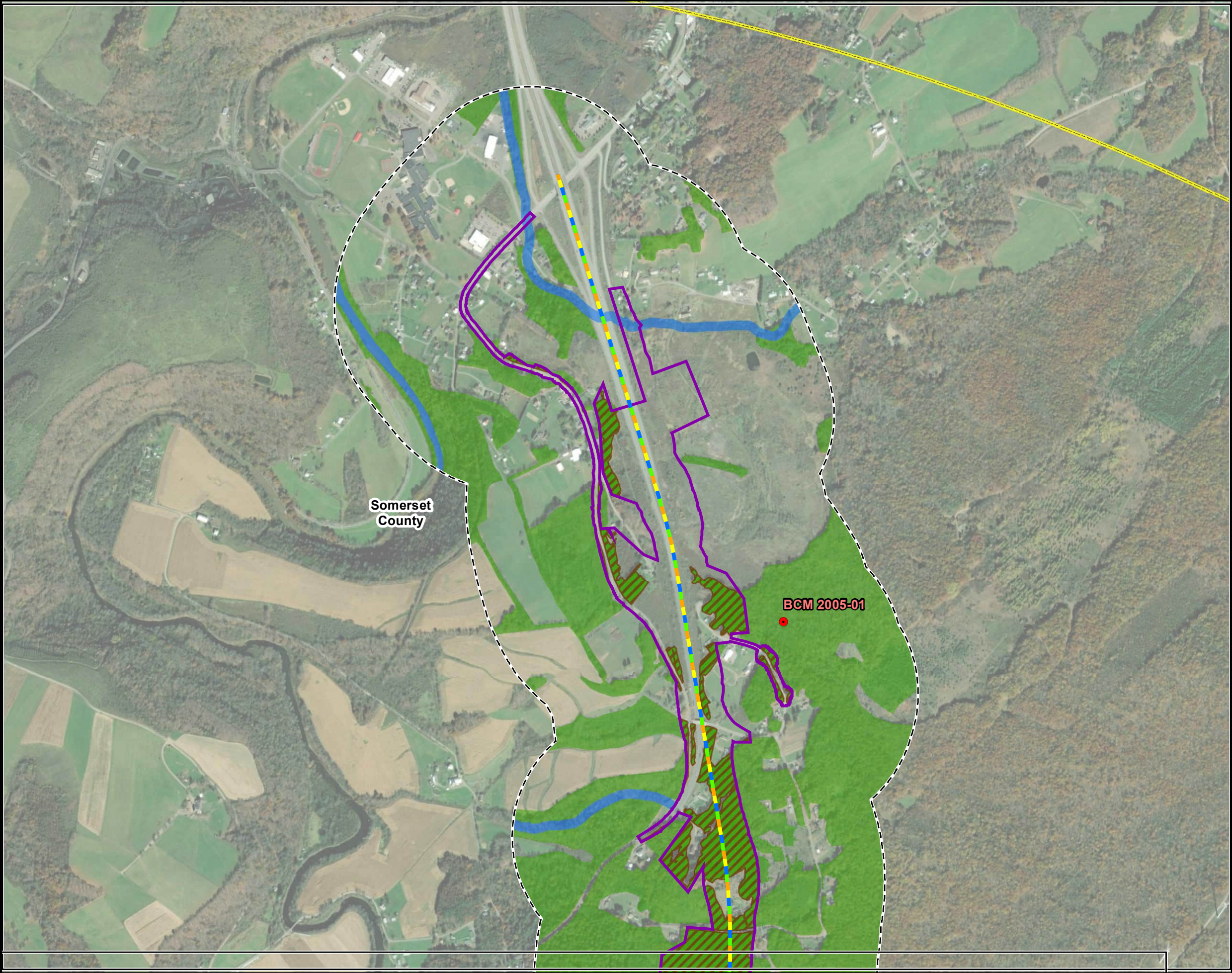


US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 4E  
FORESTED HABITAT MAP  
ALTERNATIVE 1 - E-SHIFT MODIFIED  
**AECOM**

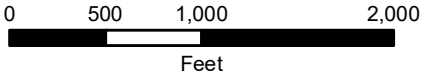


Date Saved: 02-Oct-24 Path: C:\Users\Carr\AECOM\PNDOT - 01\_US 219 Improvement\900\_CAD\_GIS\920\_929\_GIS\_Graphics\MXD\Figure4\_Forested\_Habitat\_20240724.mxd



**LEGEND:**

- Known Hibernaculum
- Alternative 1 - E-Shift Modified
- Alternative 2 - E Modified
- Alternative 3 - DU-Shift Modified
- Alternative 4 - DU Modified
- Action Area
- Potential Foraging Habitat
- Forested Habitat
- Tree Removal
- Alternative 2 - E Modified Limit of Disturbance
- Large Mine-Cave 5-Mile Radius
- Sheet Index
- County Boundary
- State Boundary



US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 4F  
FORESTED HABITAT MAP  
ALTERNATIVE 2 - E MODIFIED

**AECOM**

BASE MAP SOURCE: ArcGIS Online, World Imagery



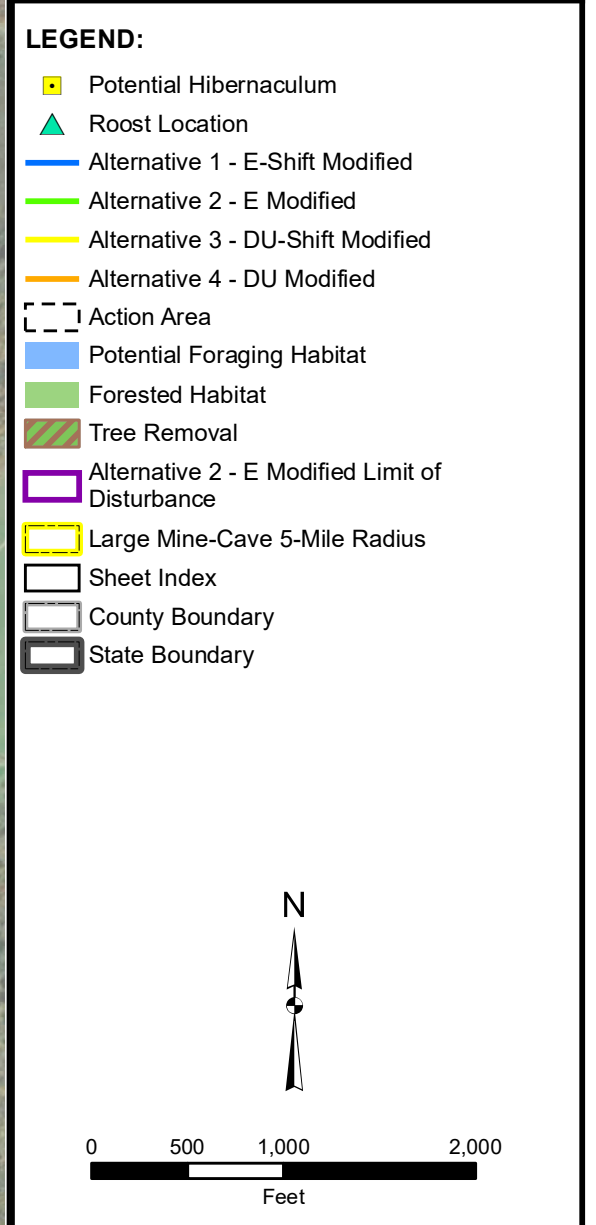
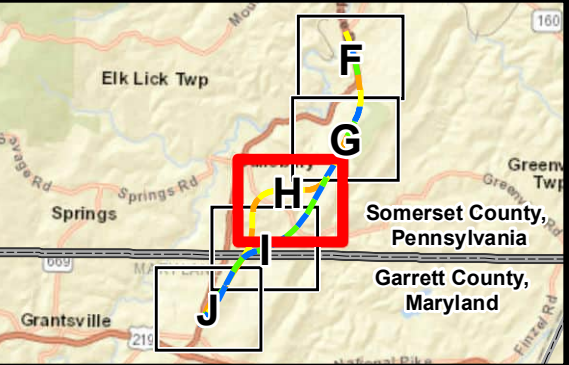
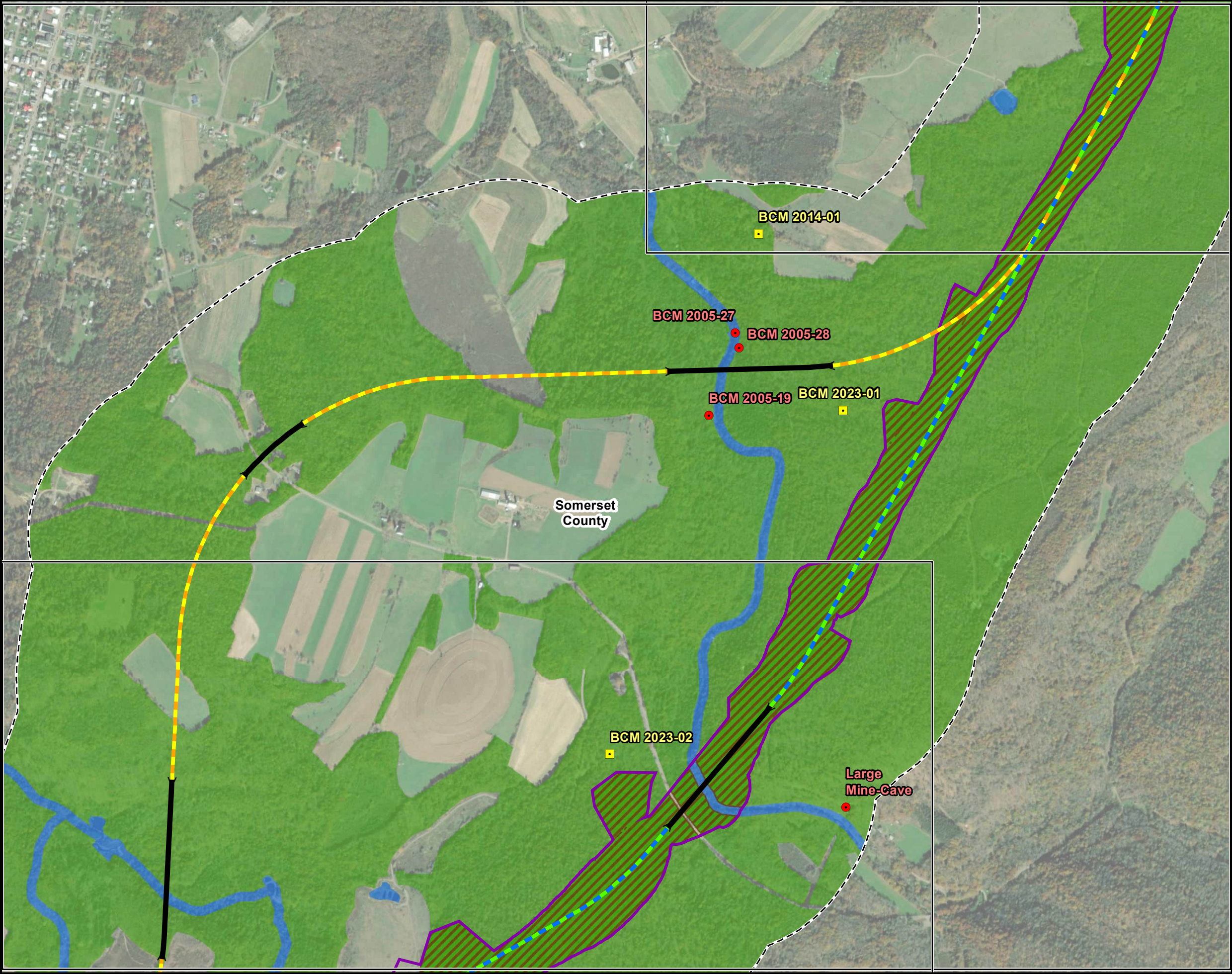


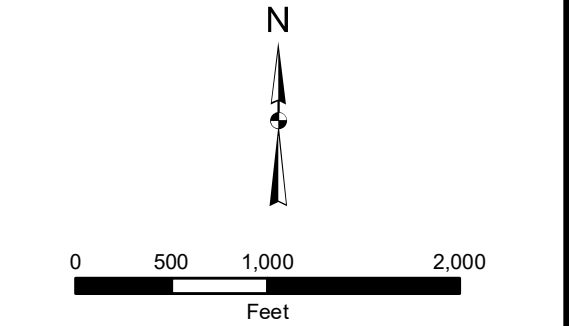
FIGURE 4G  
FORESTED HABITAT MAP  
ALTERNATIVE 2 - E MODIFIED





**LEGEND:**

- Known Hibernaculum
- Potential Hibernaculum
- Alternative 1 - E-Shift Modified
- Alternative 2 - E Modified
- Alternative 3 - DU-Shift Modified
- Alternative 4 - DU Modified
- Action Area
- Potential Foraging Habitat
- Forested Habitat
- Tree Removal
- Proposed Bridge
- Alternative 2 - E Modified Limit of Disturbance
- Large Mine-Cave 5-Mile Radius
- Sheet Index
- County Boundary
- State Boundary



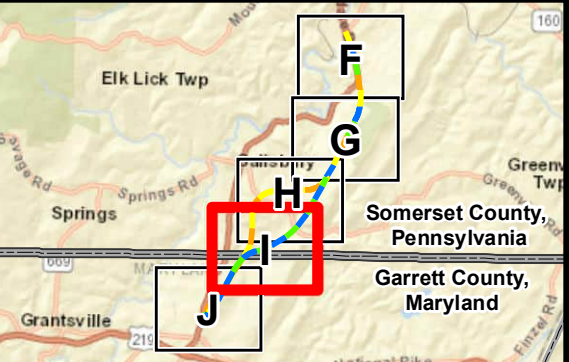
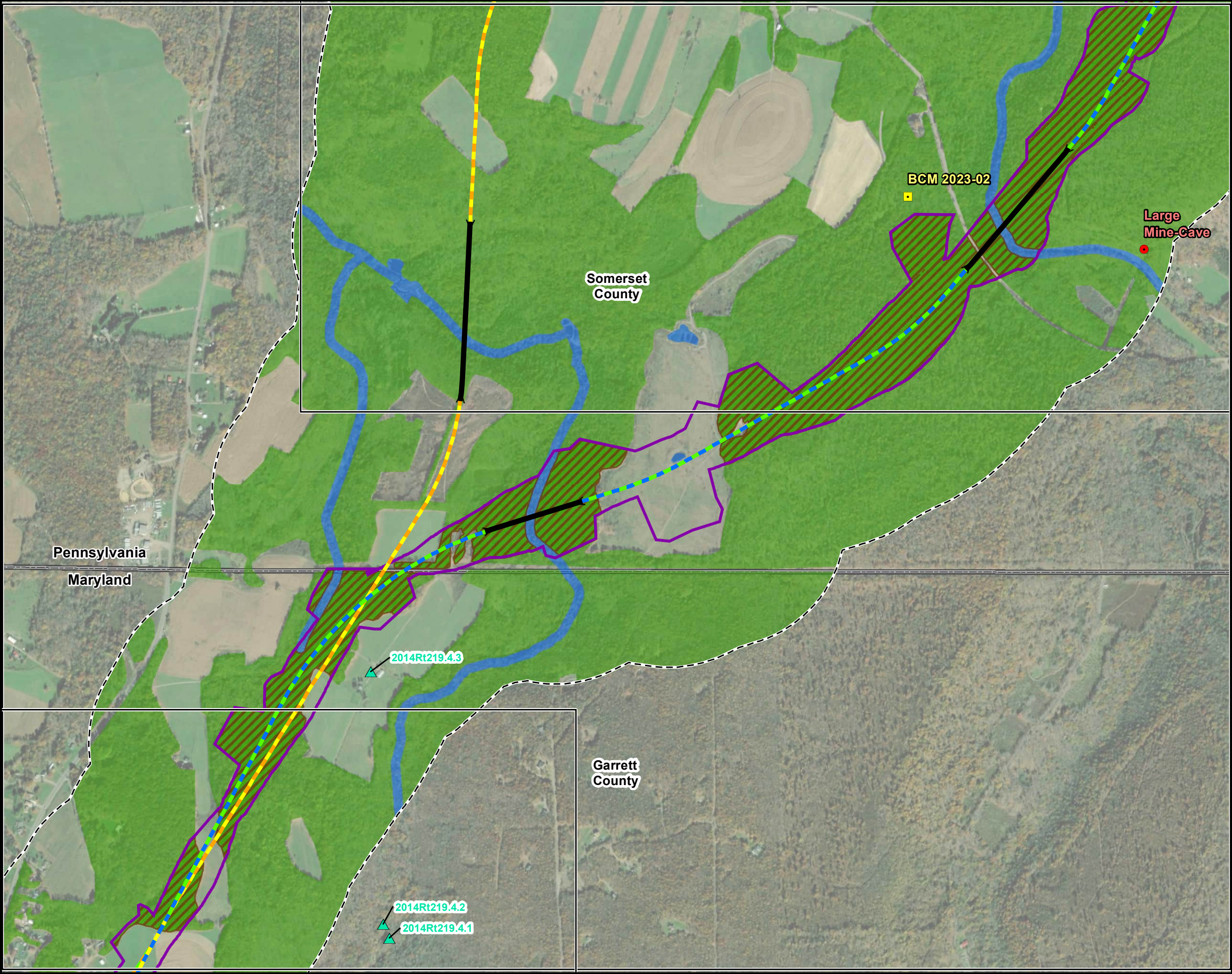
US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 4H  
FORESTED HABITAT MAP  
ALTERNATIVE 2 - E MODIFIED

**AECOM**

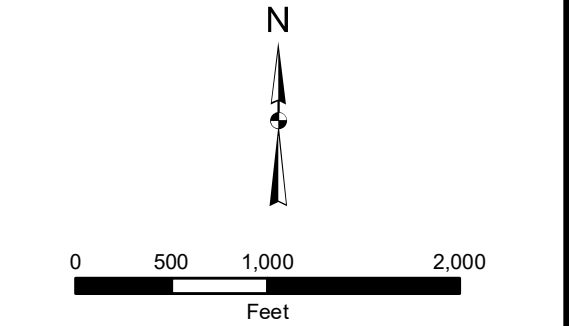


Date Saved: 02-Oct-24 Path: C:\Users\Carr\AECOM\PNDOT - 01\_US 219 Improvement\900\_CAD\_GIS\920\_929\_GIS\_Graphics\MXD\Figure4\_Forested\_Habitat\_20240724.mxd



**LEGEND:**

- Known Hibernaculum
- Potential Hibernaculum
- Roost Location
- Alternative 1 - E-Shift Modified
- Alternative 2 - E Modified
- Alternative 3 - DU-Shift Modified
- Alternative 4 - DU Modified
- Action Area
- Potential Foraging Habitat
- Forested Habitat
- Tree Removal
- Proposed Bridge
- Alternative 2 - E Modified Limit of Disturbance
- Large Mine-Cave 5-Mile Radius
- Sheet Index
- County Boundary
- State Boundary



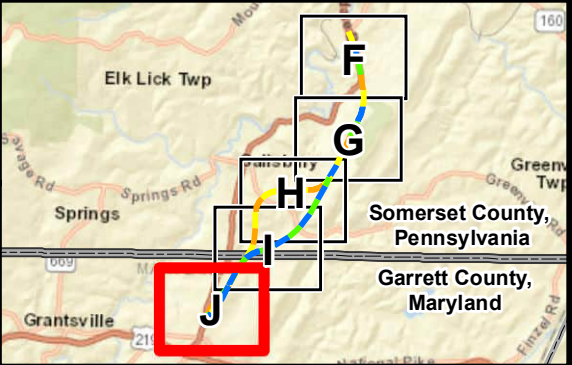
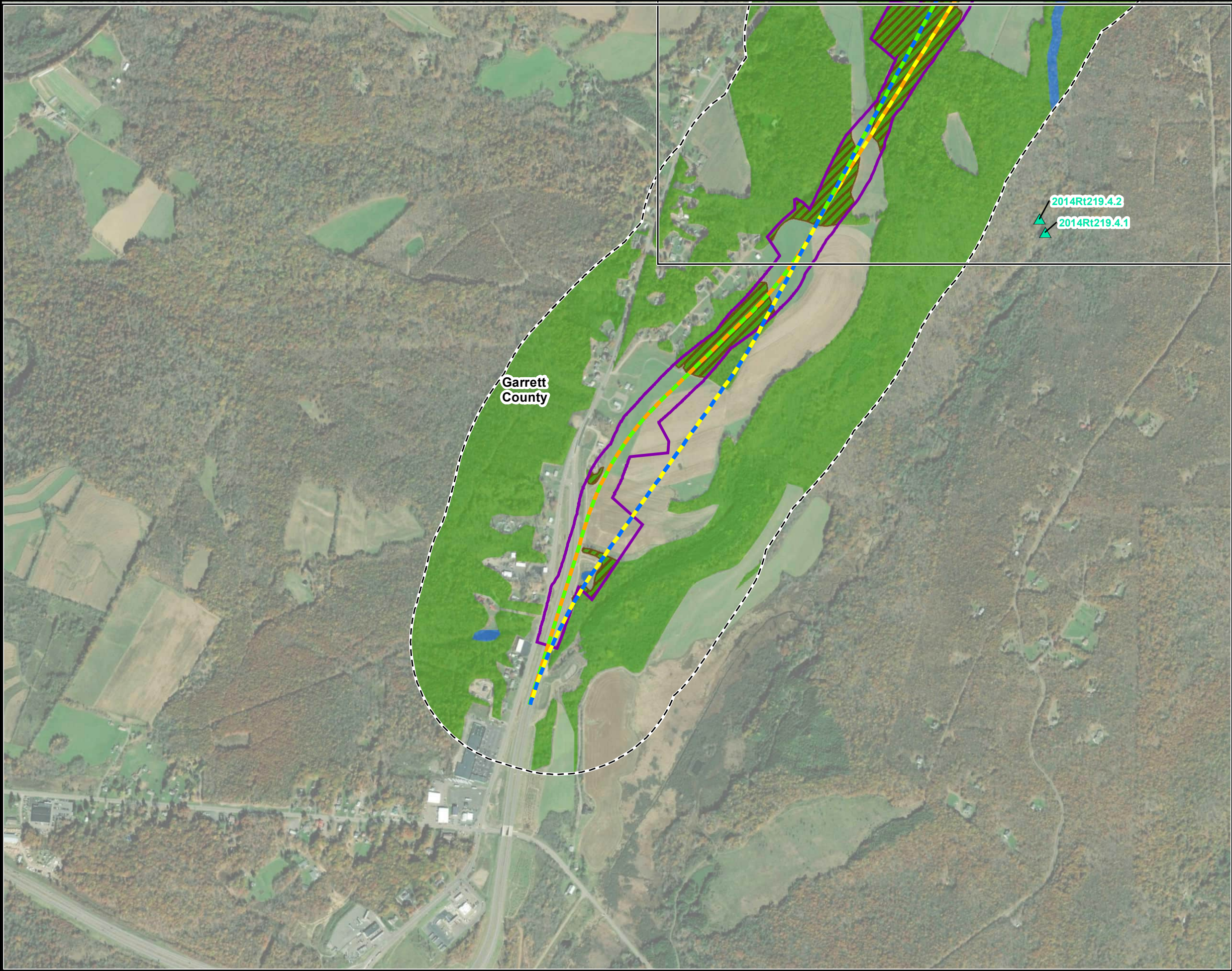
US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 4I  
FORESTED HABITAT MAP  
ALTERNATIVE 2 - E MODIFIED

**AECOM**

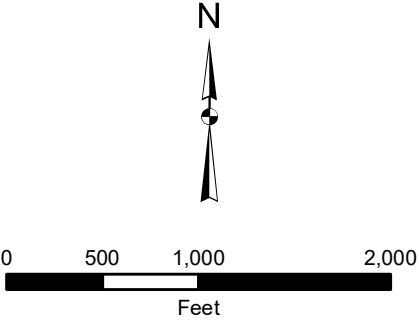
BASE MAP SOURCE: ArcGIS Online, World Imagery





**LEGEND:**

- ▲ Roost Location
- Alternative 1 - E-Shift Modified
- Alternative 2 - E Modified
- Alternative 3 - DU-Shift Modified
- Alternative 4 - DU Modified
- - - Action Area
- Potential Foraging Habitat
- Forested Habitat
- Tree Removal
- Alternative 2 - E Modified Limit of Disturbance
- - - Large Mine-Cave 5-Mile Radius
- Sheet Index
- County Boundary
- State Boundary

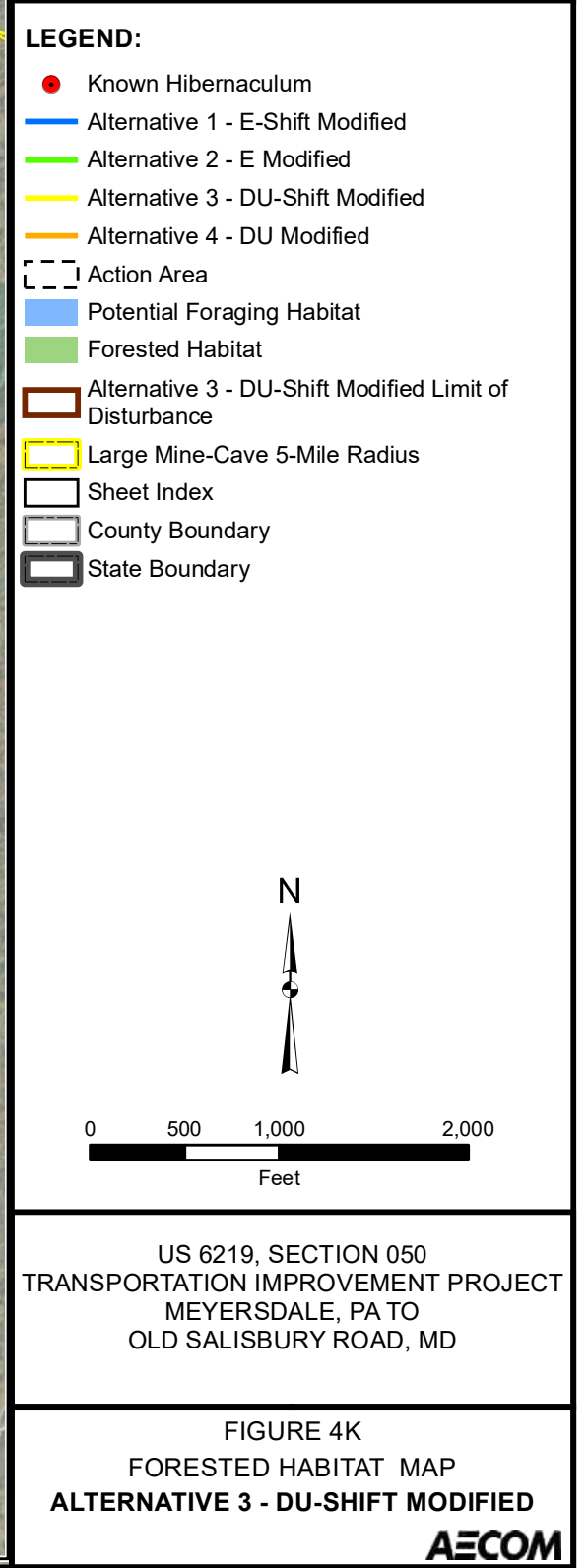


US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 4J  
FORESTED HABITAT MAP  
ALTERNATIVE 2 - E MODIFIED

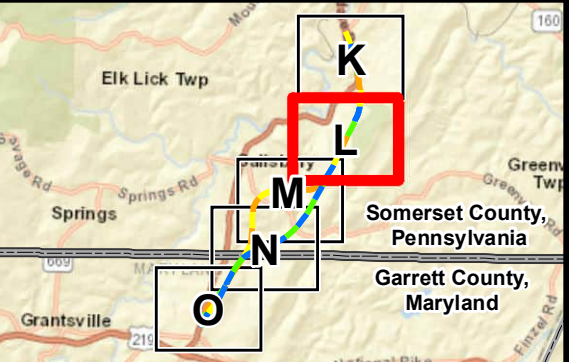
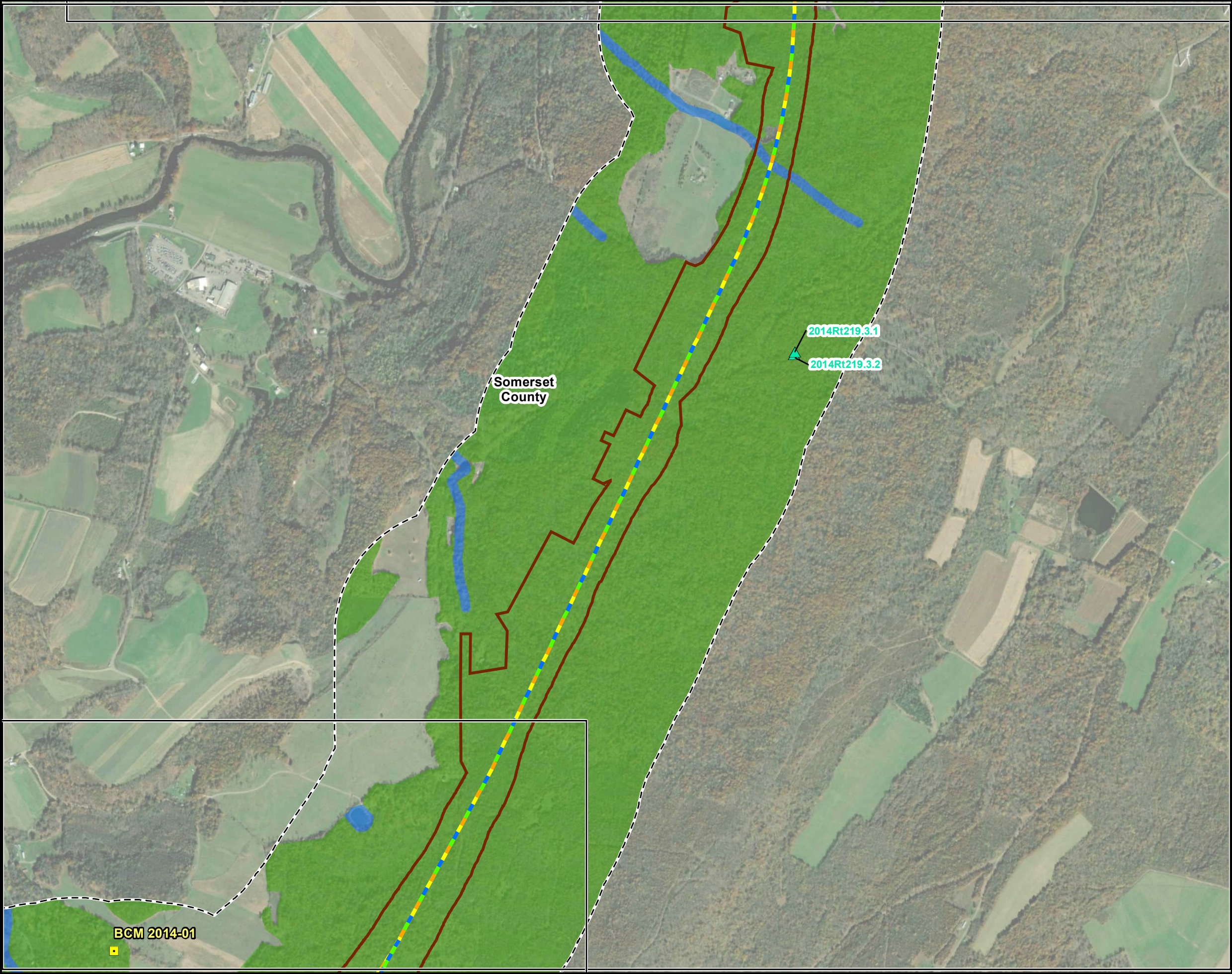








Date Saved: 02-Oct-24 Path: C:\Users\Carr\AECOM\PNDOT - 01\_US 219 Improvement\900\_CAD\_GIS\920\_929\_GIS\_Graphics\MXD\Figure4\_Forested\_Habitat\_20240724.mxd



**LEGEND:**

- Potential Hibernaculum
- Roost Location
- Alternative 1 - E-Shift Modified
- Alternative 2 - E Modified
- Alternative 3 - DU-Shift Modified
- Alternative 4 - DU Modified
- Action Area
- Potential Foraging Habitat
- Forested Habitat
- Alternative 3 - DU-Shift Modified Limit of Disturbance
- Large Mine-Cave 5-Mile Radius
- Sheet Index
- County Boundary
- State Boundary

N

0 500 1,000 2,000  
Feet

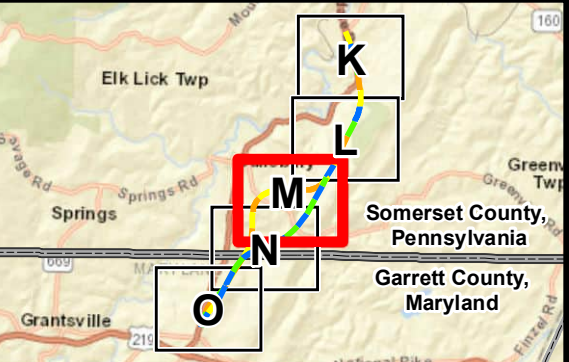
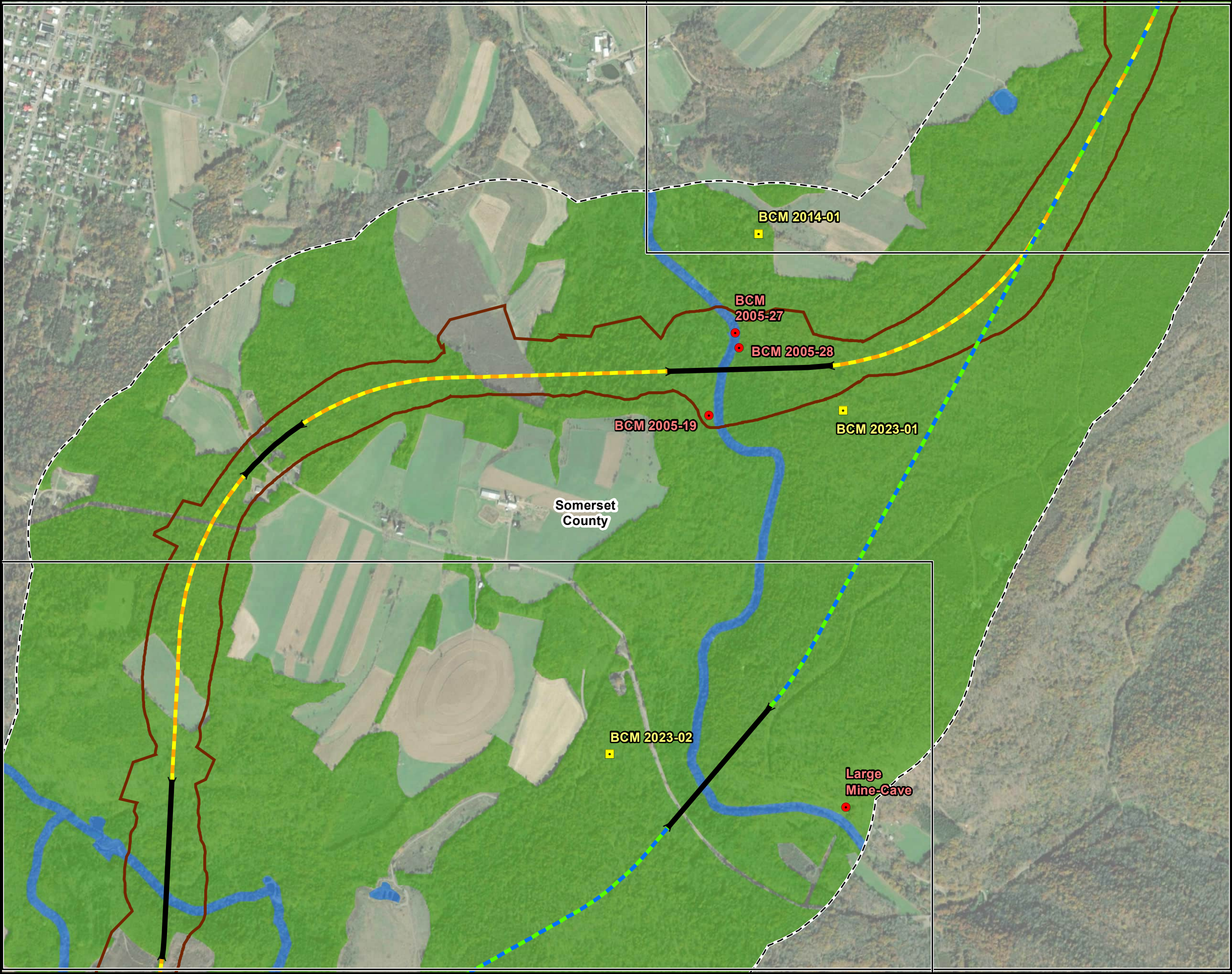
US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 4L  
FORESTED HABITAT MAP  
ALTERNATIVE 3 - DU-SHIFT MODIFIED

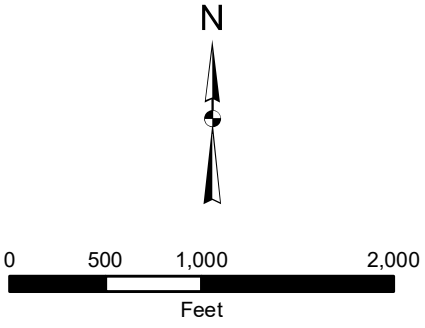
**AECOM**

BASE MAP SOURCE: ArcGIS Online, World Imagery





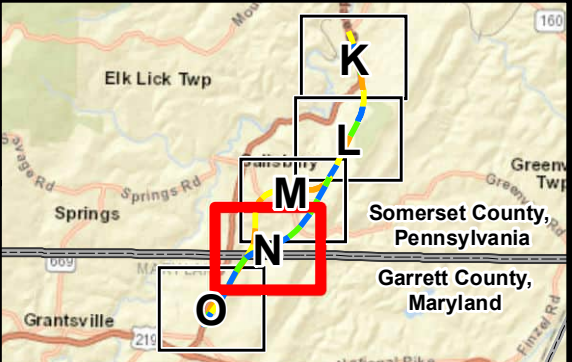
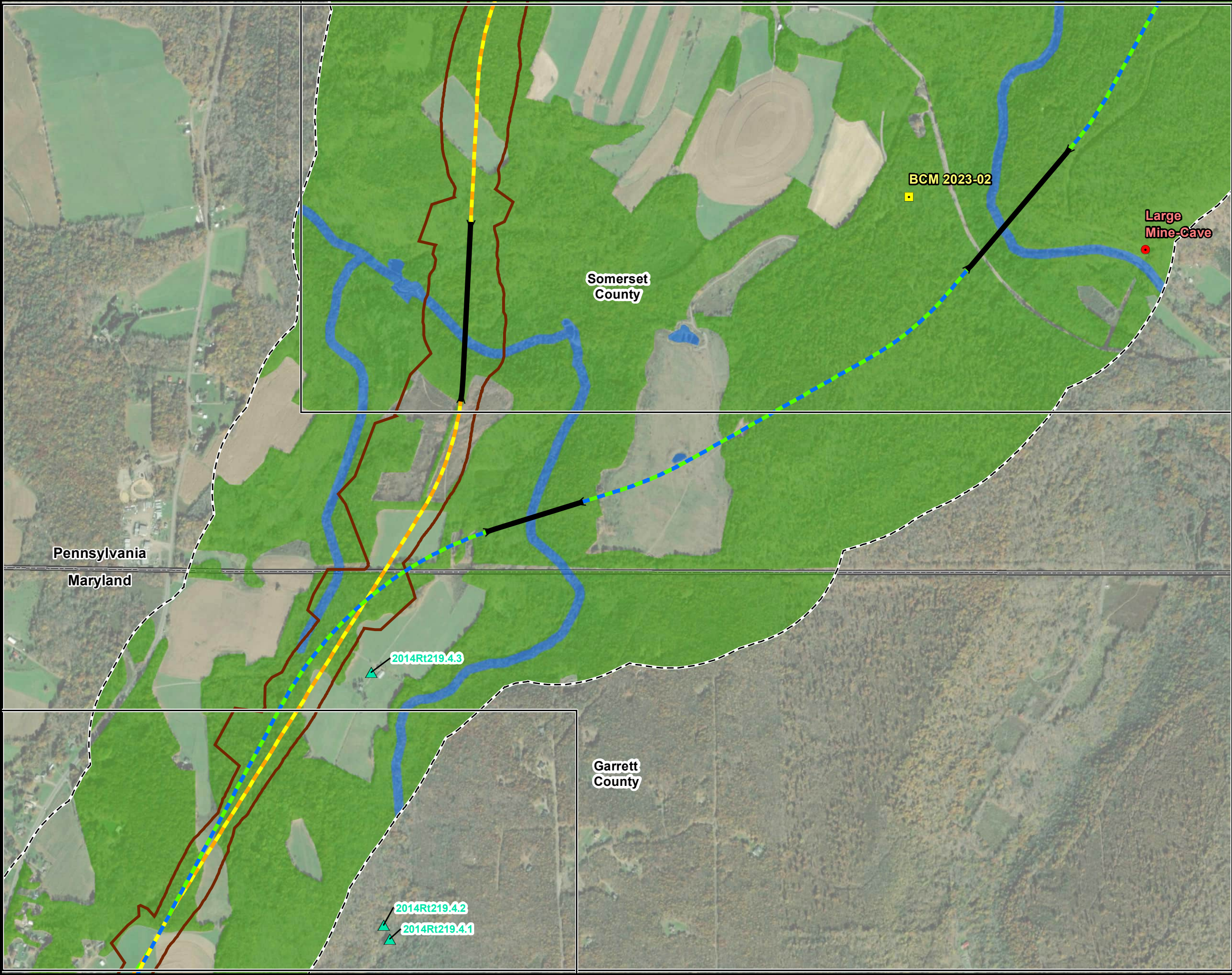
- LEGEND:**
- Known Hibernaculum
  - Potential Hibernaculum
  - Alternative 1 - E-Shift Modified
  - Alternative 2 - E Modified
  - Alternative 3 - DU-Shift Modified
  - Alternative 4 - DU Modified
  - Action Area
  - Potential Foraging Habitat
  - Forested Habitat
  - Proposed Bridge
  - Alternative 3 - DU-Shift Modified Limit of Disturbance
  - Large Mine-Cave 5-Mile Radius
  - Sheet Index
  - County Boundary
  - State Boundary



US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

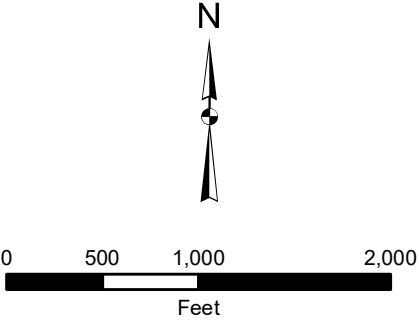
FIGURE 4M  
FORESTED HABITAT MAP  
ALTERNATIVE 3 - DU-SHIFT MODIFIED  
**AECOM**





**LEGEND:**

- Known Hibernaculum
- Potential Hibernaculum
- Roost Location
- Alternative 1 - E-Shift Modified
- Alternative 2 - E Modified
- Alternative 3 - DU-Shift Modified
- Alternative 4 - DU Modified
- Action Area
- Potential Foraging Habitat
- Forested Habitat
- Proposed Bridge
- Alternative 3 - DU-Shift Modified Limit of Disturbance
- Large Mine-Cave 5-Mile Radius
- Sheet Index
- County Boundary
- State Boundary

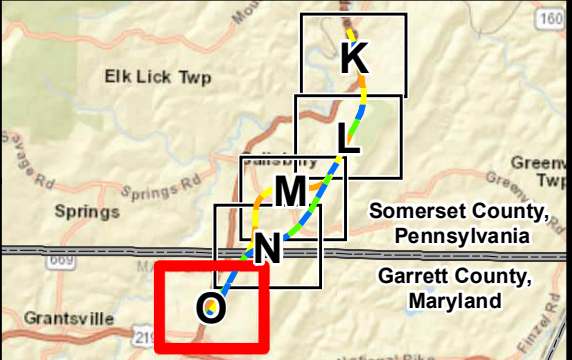
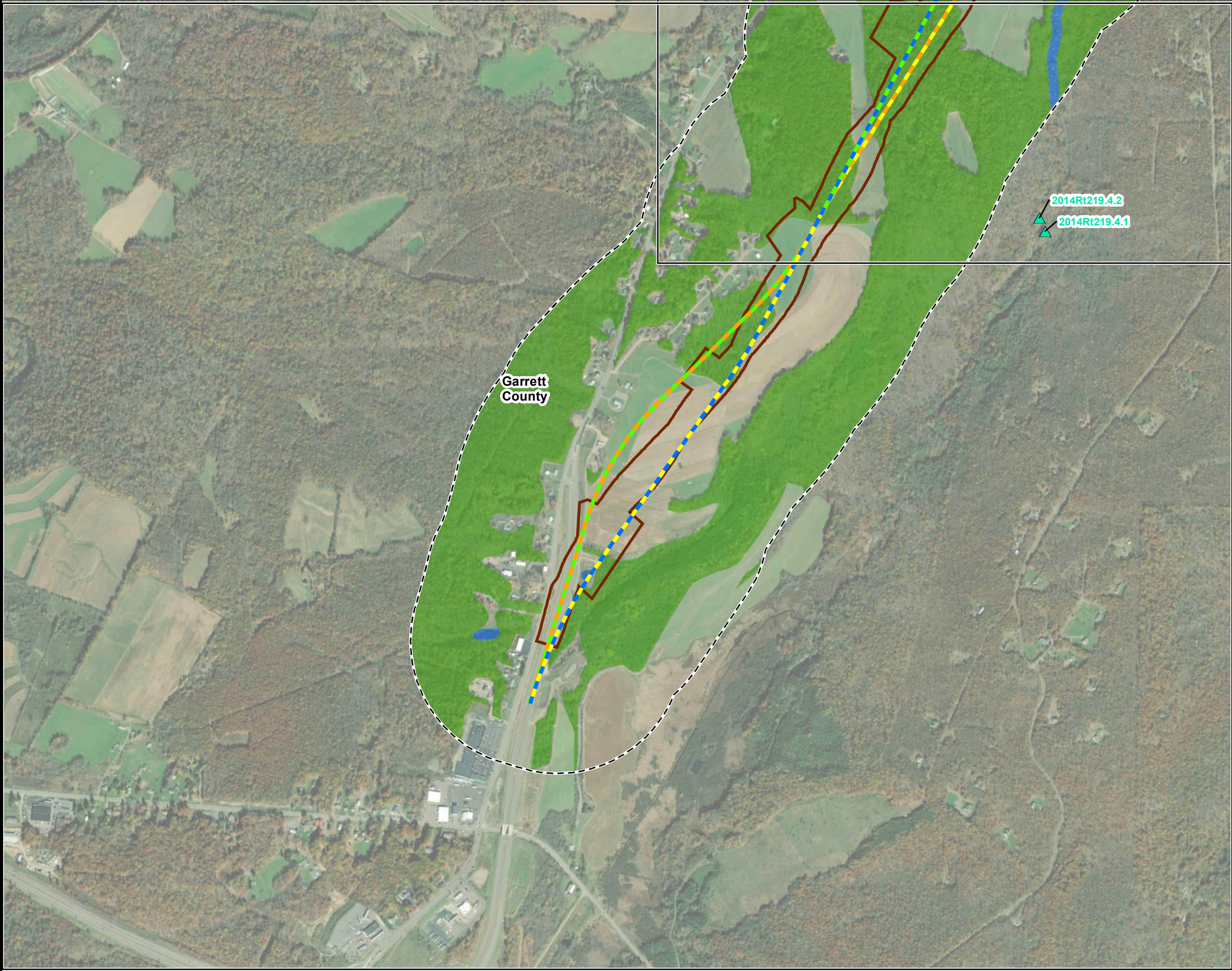


US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

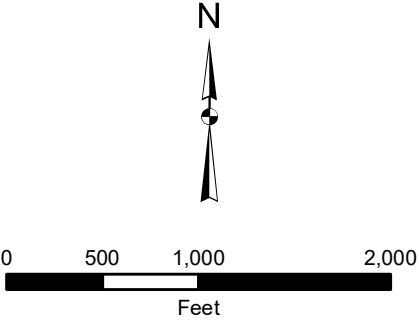
FIGURE 4N  
FORESTED HABITAT MAP  
ALTERNATIVE 3 - DU-SHIFT MODIFIED

**AECOM**





- LEGEND:**
- ▲ Roost Location
  - Alternative 1 - E-Shift Modified
  - Alternative 2 - E Modified
  - Alternative 3 - DU-Shift Modified
  - Alternative 4 - DU Modified
  - - - Action Area
  - Potential Foraging Habitat
  - Forested Habitat
  - Alternative 3 - DU-Shift Modified Limit of Disturbance
  - - - Large Mine-Cave 5-Mile Radius
  - Sheet Index
  - County Boundary
  - State Boundary

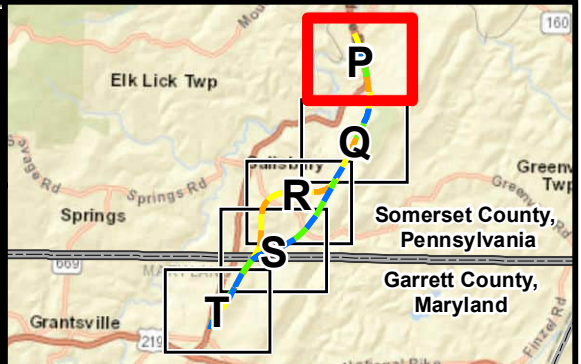
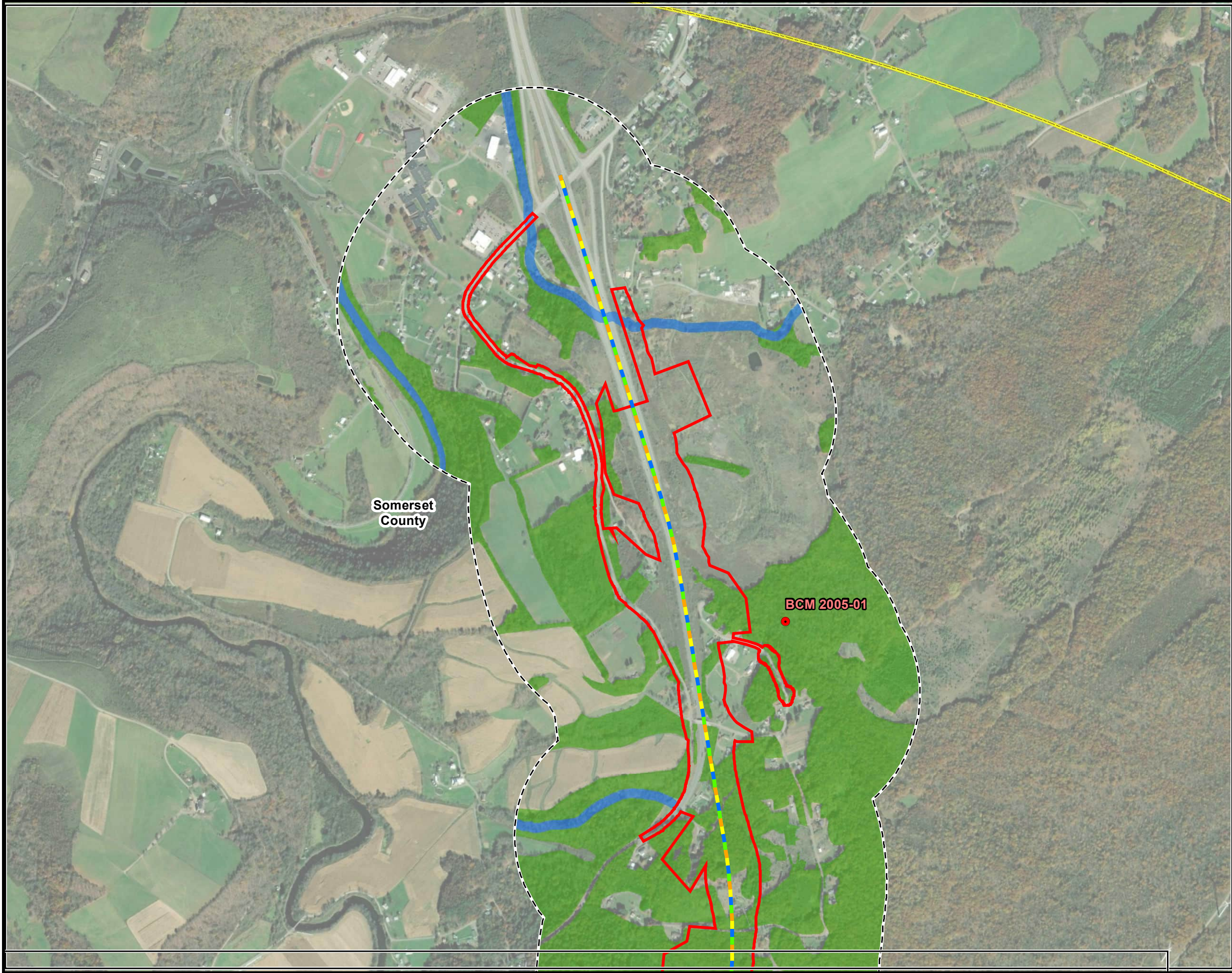


US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

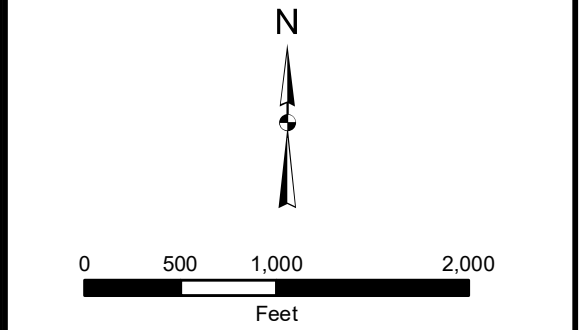
FIGURE 40  
FORESTED HABITAT MAP  
ALTERNATIVE 3 - DU-SHIFT MODIFIED

**AECOM**





- LEGEND:**
- Known Hibernaculum
  - Alternative 1 - E-Shift Modified
  - Alternative 2 - E Modified
  - Alternative 3 - DU-Shift Modified
  - Alternative 4 - DU Modified
  - Action Area
  - Potential Foraging Habitat
  - Forested Habitat
  - Alternative 4 - DU Modified Limit of Disturbance
  - Large Mine-Cave 5-Mile Radius
  - Sheet Index
  - County Boundary
  - State Boundary

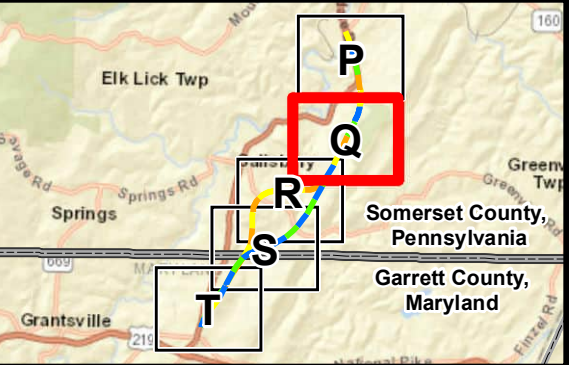
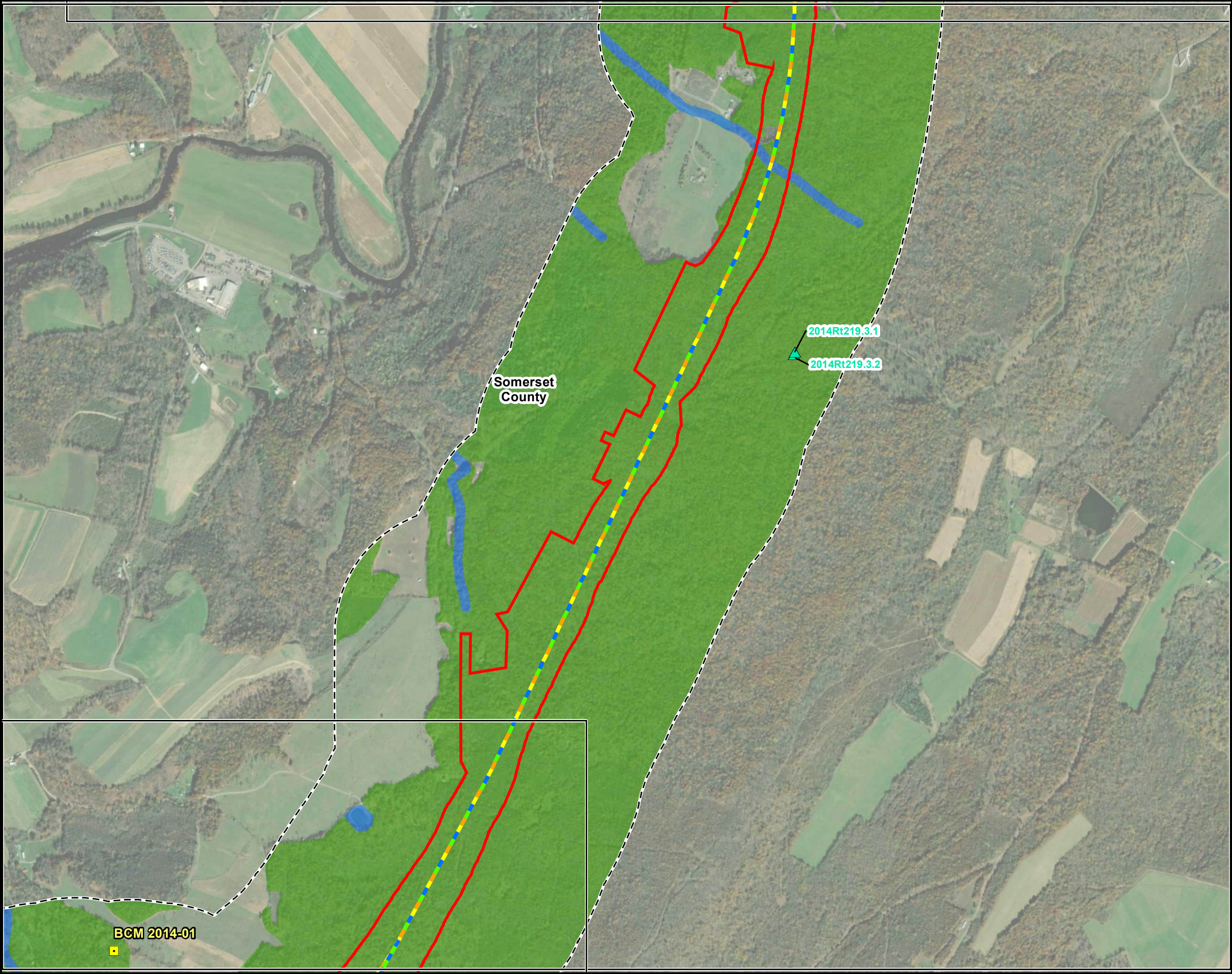


US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

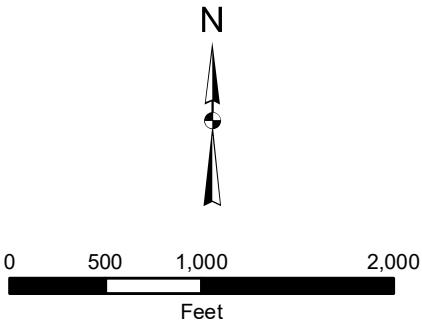
FIGURE 4P  
FORESTED HABITAT MAP  
ALTERNATIVE 4 - DU MODIFIED  
**AECOM**



Date Saved: 02-Oct-24 Path: C:\Users\Carr\AECOM\PNDOT - 01\_US 219 Improvement\900\_CAD\_GIS\920\_929\_GIS\_Graphics\MXD\Figure4\_Forested\_Habitat\_20240724.mxd



- LEGEND:**
- Potential Hibernaculum
  - Roost Location
  - Alternative 1 - E-Shift Modified
  - Alternative 2 - E Modified
  - Alternative 3 - DU-Shift Modified
  - Alternative 4 - DU Modified
  - Action Area
  - Potential Foraging Habitat
  - Forested Habitat
  - Alternative 4 - DU Modified Limit of Disturbance
  - Large Mine-Cave 5-Mile Radius
  - Sheet Index
  - County Boundary
  - State Boundary



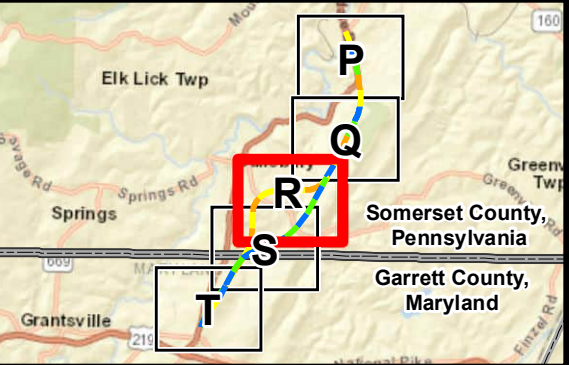
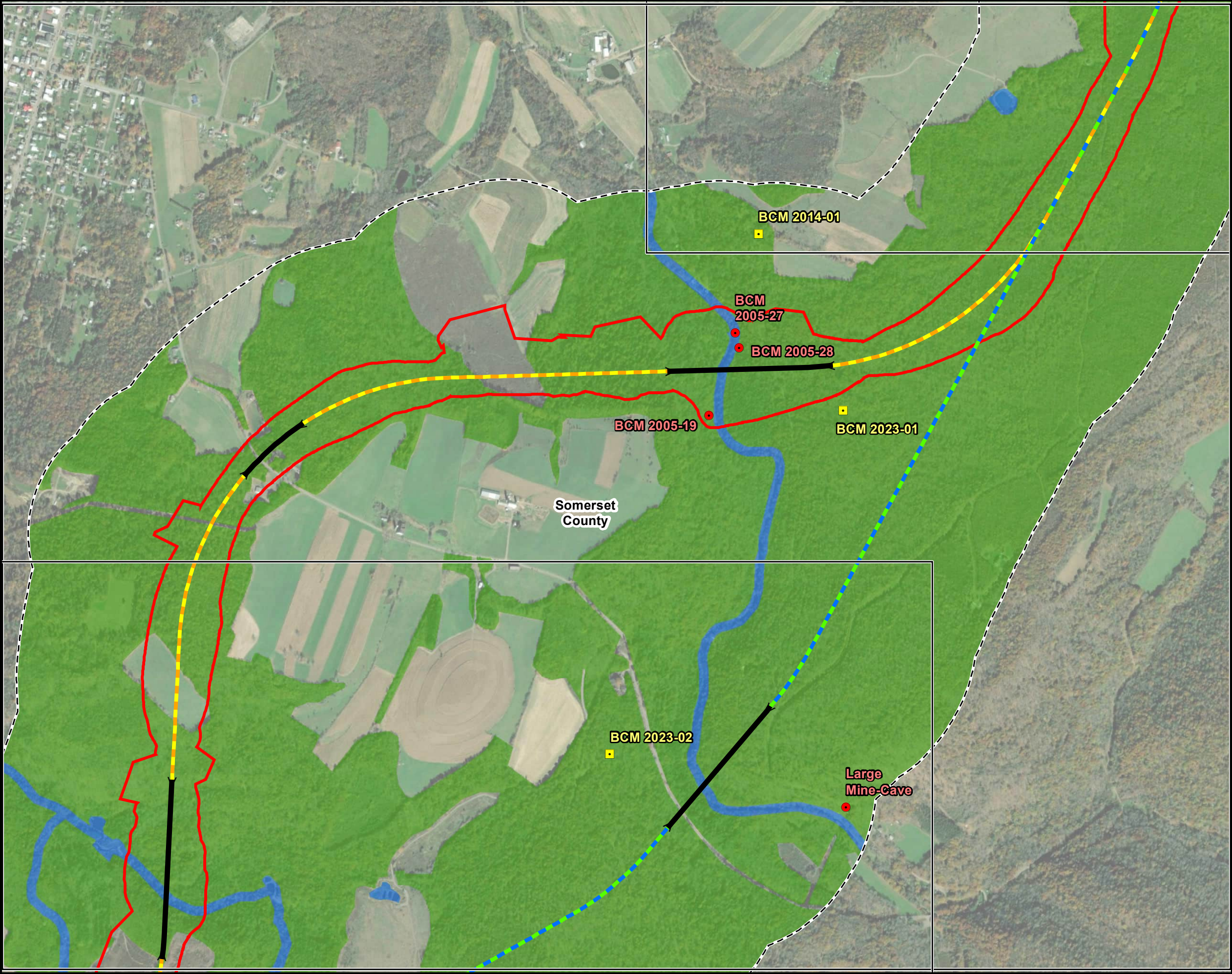
US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 4Q  
FORESTED HABITAT MAP  
ALTERNATIVE 4 - DU MODIFIED  
**AECOM**

BASE MAP SOURCE: ArcGIS Online, World Imagery

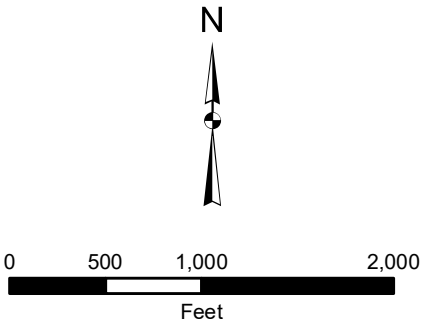


Date Saved: 02-Oct-24 Path: C:\Users\Carr\AECOM\PNDOT - 01\_US 219 Improvement\900\_CAD\_GIS\920\_929\_GIS\_Graphics\MXD\Figure4\_Forested\_Habitat\_20240724.mxd



**LEGEND:**

- Known Hibernaculum
- Potential Hibernaculum
- Alternative 1 - E-Shift Modified
- Alternative 2 - E Modified
- Alternative 3 - DU-Shift Modified
- Alternative 4 - DU Modified
- - - Action Area
- Potential Foraging Habitat
- Forested Habitat
- Proposed Bridge
- Alternative 4 - DU Modified Limit of Disturbance
- Large Mine-Cave 5-Mile Radius
- Sheet Index
- County Boundary
- State Boundary



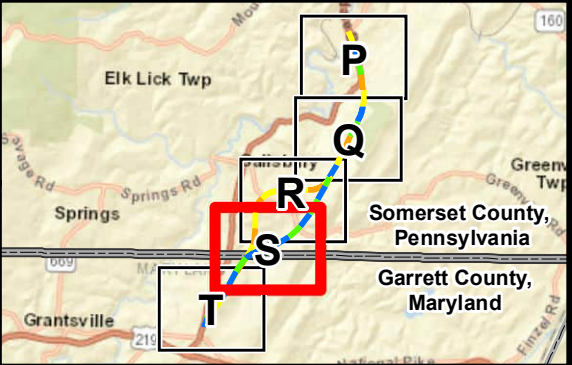
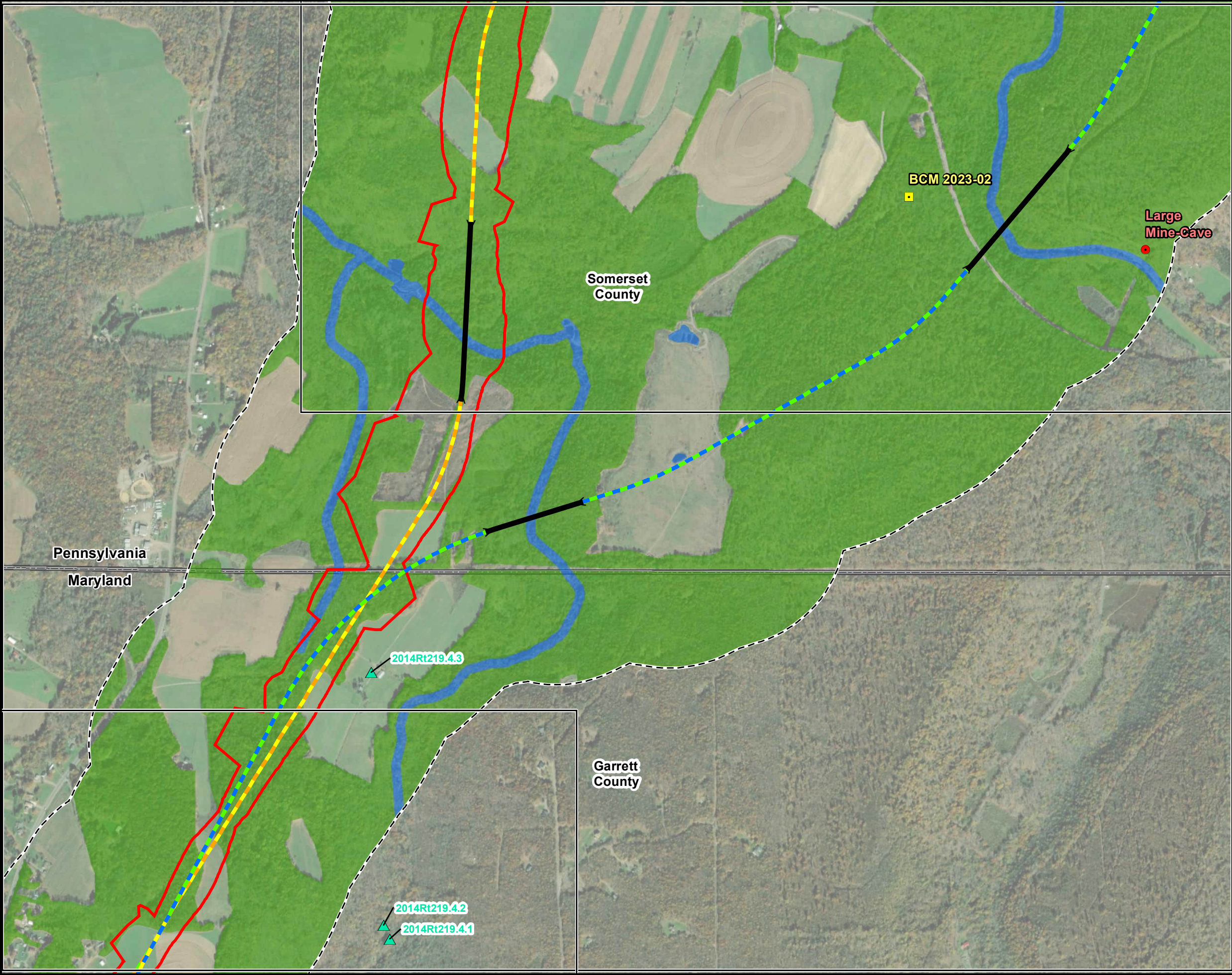
US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 4R  
FORESTED HABITAT MAP  
ALTERNATIVE 4 - DU MODIFIED

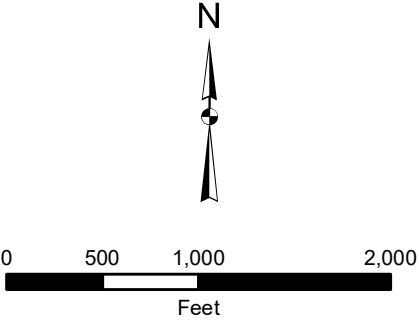


BASE MAP SOURCE: ArcGIS Online, World Imagery





- LEGEND:**
- Known Hibernaculum
  - Potential Hibernaculum
  - Roost Location
  - Alternative 1 - E-Shift Modified
  - Alternative 2 - E Modified
  - Alternative 3 - DU-Shift Modified
  - Alternative 4 - DU Modified
  - Action Area
  - Potential Foraging Habitat
  - Forested Habitat
  - Proposed Bridge
  - Alternative 4 - DU Modified Limit of Disturbance
  - Large Mine-Cave 5-Mile Radius
  - Sheet Index
  - County Boundary
  - State Boundary

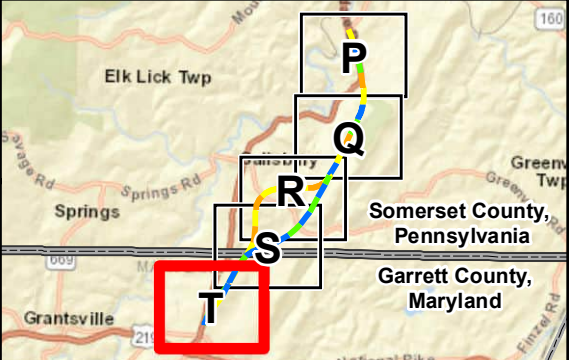
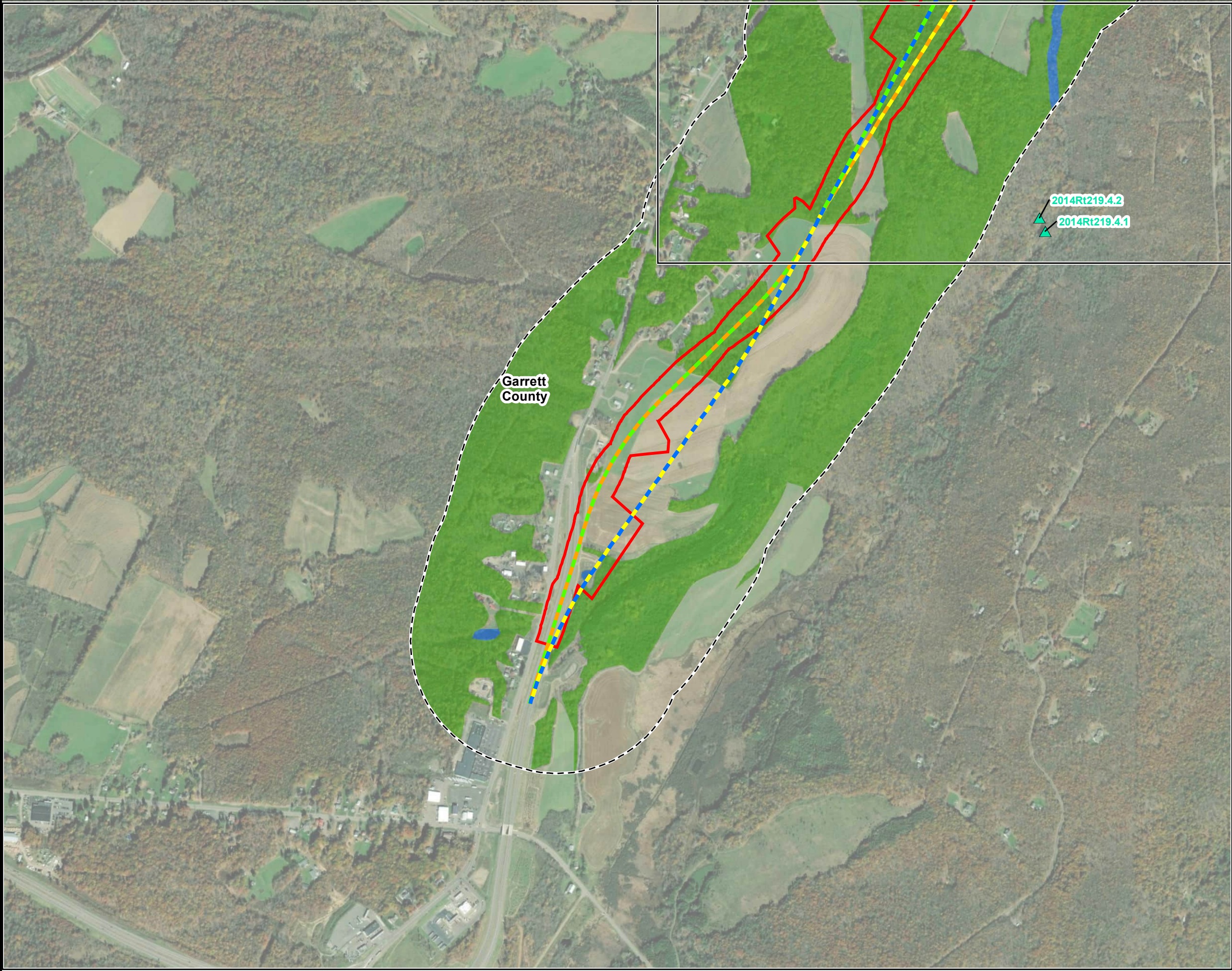


US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

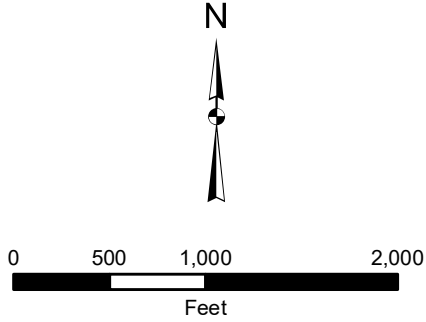
FIGURE 4S  
FORESTED HABITAT MAP  
ALTERNATIVE 4 - DU MODIFIED







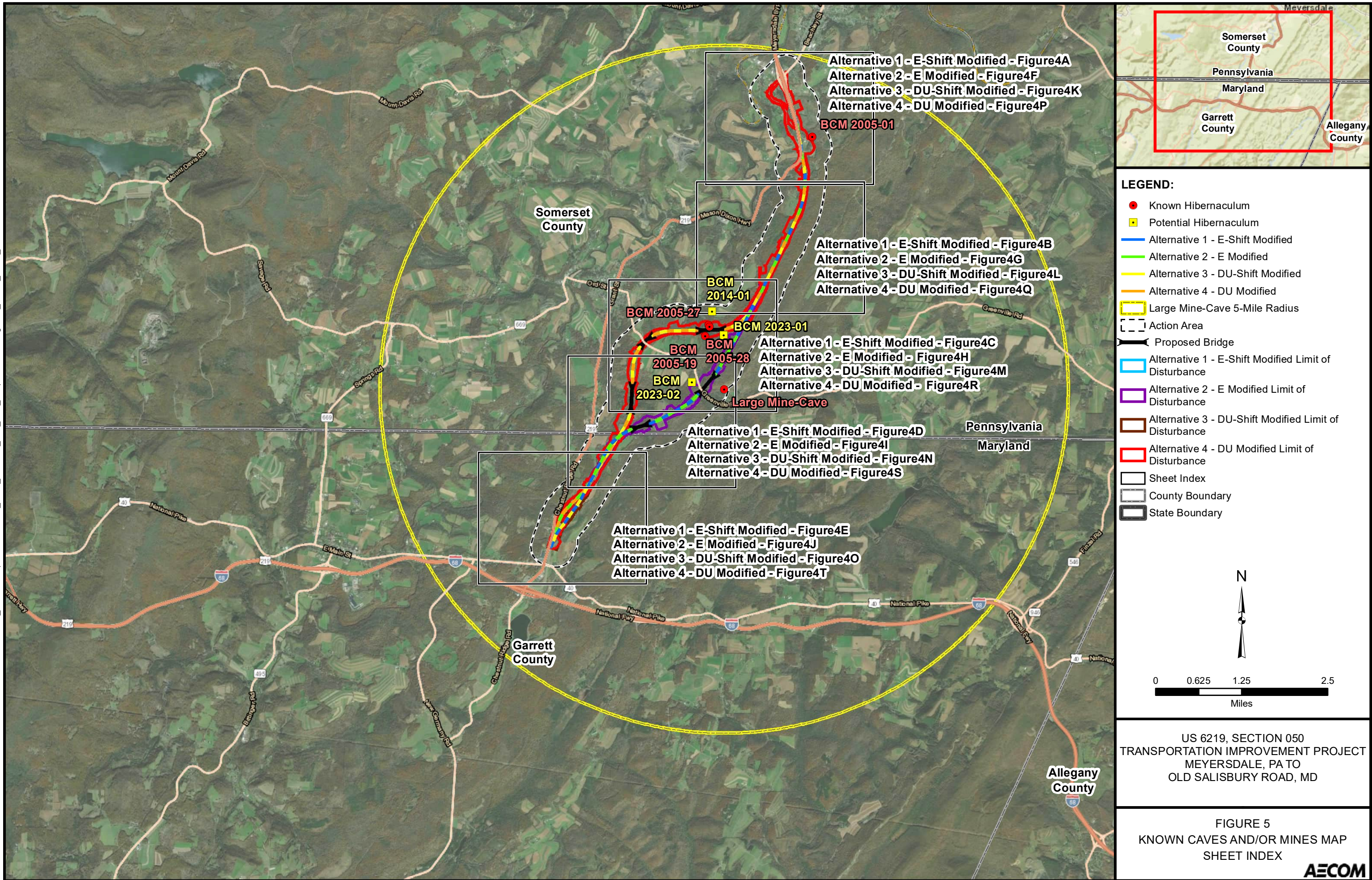
- LEGEND:**
- ▲ Roost Location
  - Alternative 1 - E-Shift Modified
  - Alternative 2 - E Modified
  - Alternative 3 - DU-Shift Modified
  - Alternative 4 - DU Modified
  - - - Action Area
  - Potential Foraging Habitat
  - Forested Habitat
  - ▭ Alternative 4 - DU Modified Limit of Disturbance
  - ▭ Large Mine-Cave 5-Mile Radius
  - ▭ Sheet Index
  - ▭ County Boundary
  - ▭ State Boundary



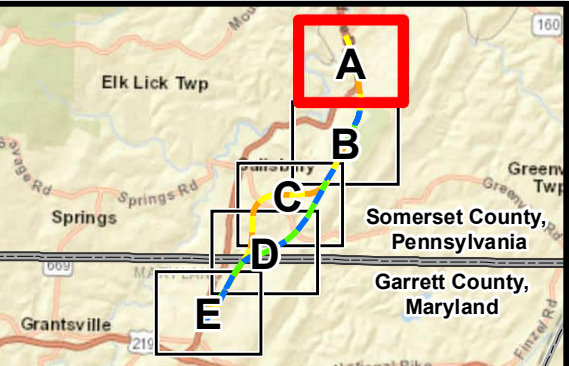
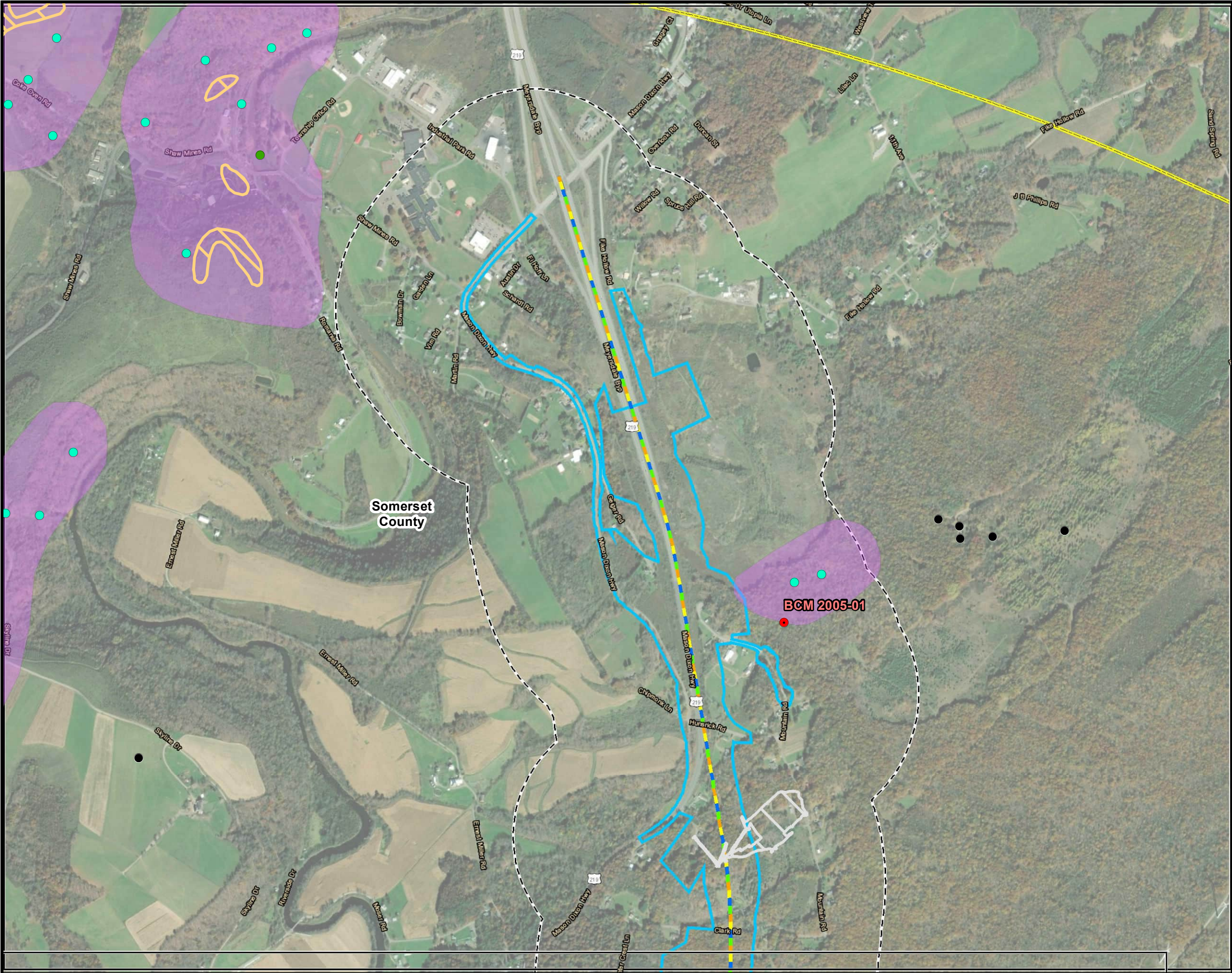
US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 4T  
FORESTED HABITAT MAP  
ALTERNATIVE 4 - DU MODIFIED  
**AECOM**







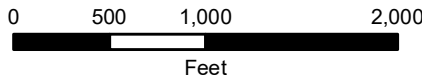


**LEGEND:**

- Abandoned Mine Land (PADEP)
- Reclamation Completed Mine (PADEP)
- Coal Mining Operation (PADEP)
- Known Hibernaculum
- Abandoned Mine Inventory (PADEP)
- Abandoned Mine Inventory Site (PADEP)
- Digitized Mined Area (PADEP)

**Route**

- Alternative 1 - E-Shift Modified
- Alternative 2 - E Modified
- Alternative 3 - DU-Shift Modified
- Alternative 4 - DU Modified
- Action Area
- Alternative 1 - E-Shift Modified Limit of Disturbance
- Large Mine-Cave 5-Mile Radius
- Sheet Index
- County Boundary
- State Boundary

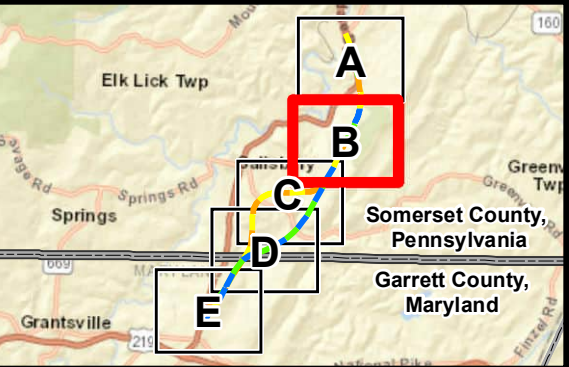
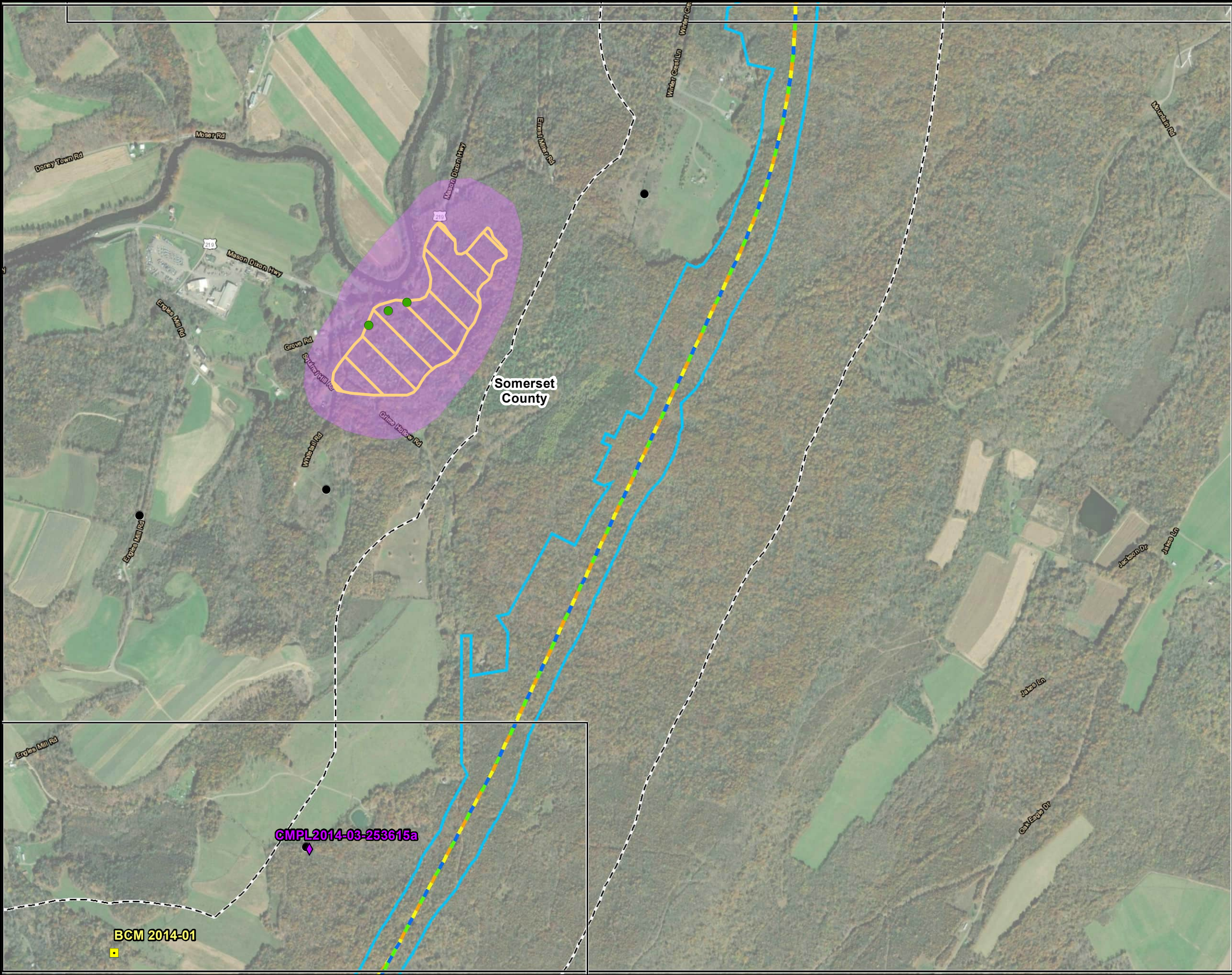


US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 5A  
KNOWN CAVES AND/OR MINES MAP  
ALTERNATIVE 1 - E-SHIFT MODIFIED







**LEGEND:**

- Reclamation Completed Mine (PADEP)
- Coal Mining Operation (PADEP)
- Potential Hibernaculum
- ◆ Rocky Habitats (BCM, 2014)
- ▭ Abandoned Mine Inventory (PADEP)
- ▭ Abandoned Mine Inventory Site (PADEP)

**Route**

- Alternative 1 - E-Shift Modified
- Alternative 2 - E Modified
- Alternative 3 - DU-Shift Modified
- Alternative 4 - DU Modified

--- Action Area

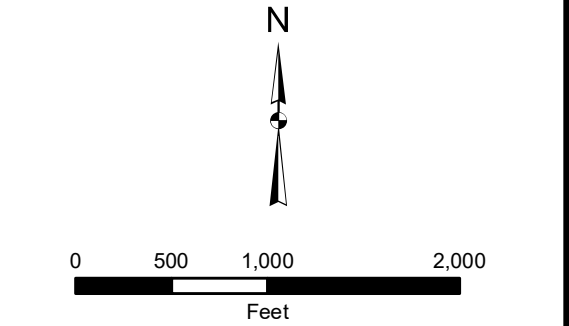
▭ Alternative 1 - E-Shift Modified Limit of Disturbance

▭ Large Mine-Cave 5-Mile Radius

▭ Sheet Index

▭ County Boundary

▭ State Boundary

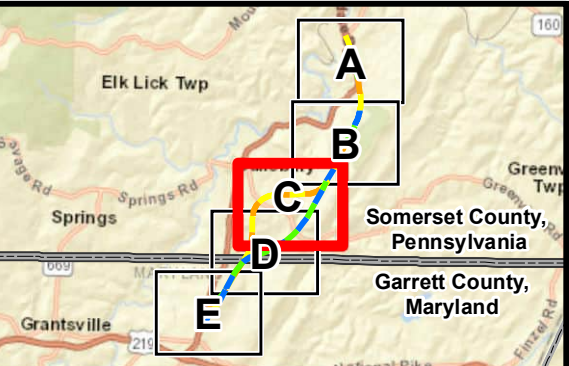
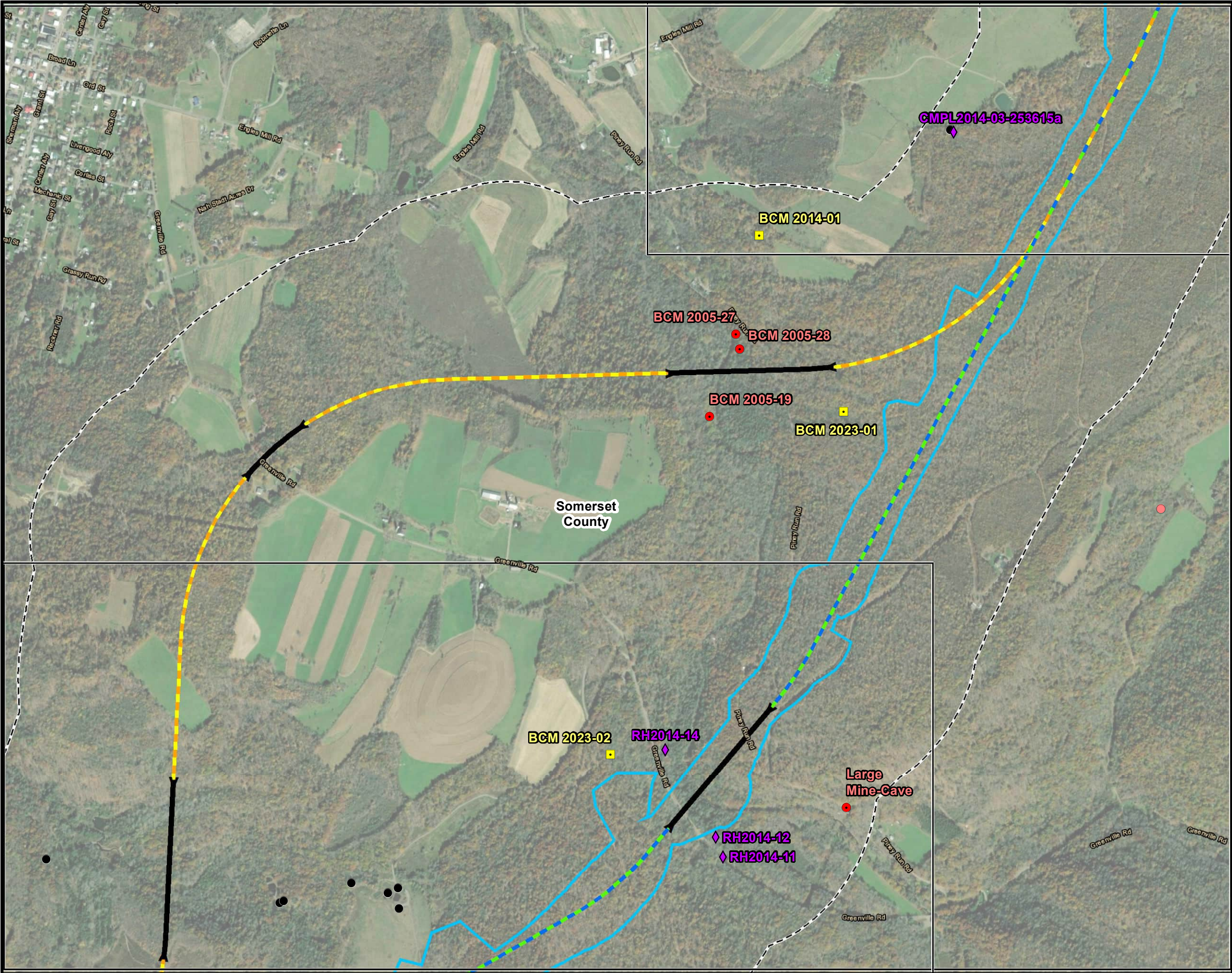


US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 5B  
KNOWN CAVES AND/OR MINES MAP  
ALTERNATIVE 1 - E-SHIFT MODIFIED

**AECOM**



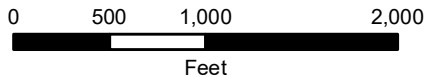


**LEGEND:**

- Industrial Mineral Mining Operation (PADEP)
- Coal Mining Operation (PADEP)
- Known Hibernaculum
- Potential Hibernaculum
- Rocky Habitats (BCM, 2014)

**Route**

- Alternative 1 - E-Shift Modified
- Alternative 2 - E Modified
- Alternative 3 - DU-Shift Modified
- Alternative 4 - DU Modified
- Action Area
- Alternative 1 - E-Shift Modified Limit of Disturbance
- Proposed Bridge
- Large Mine-Cave 5-Mile Radius
- Sheet Index
- County Boundary
- State Boundary

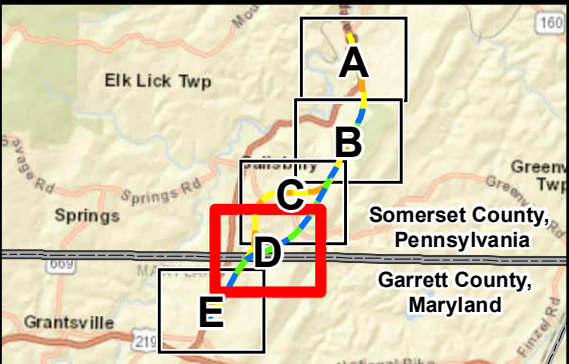
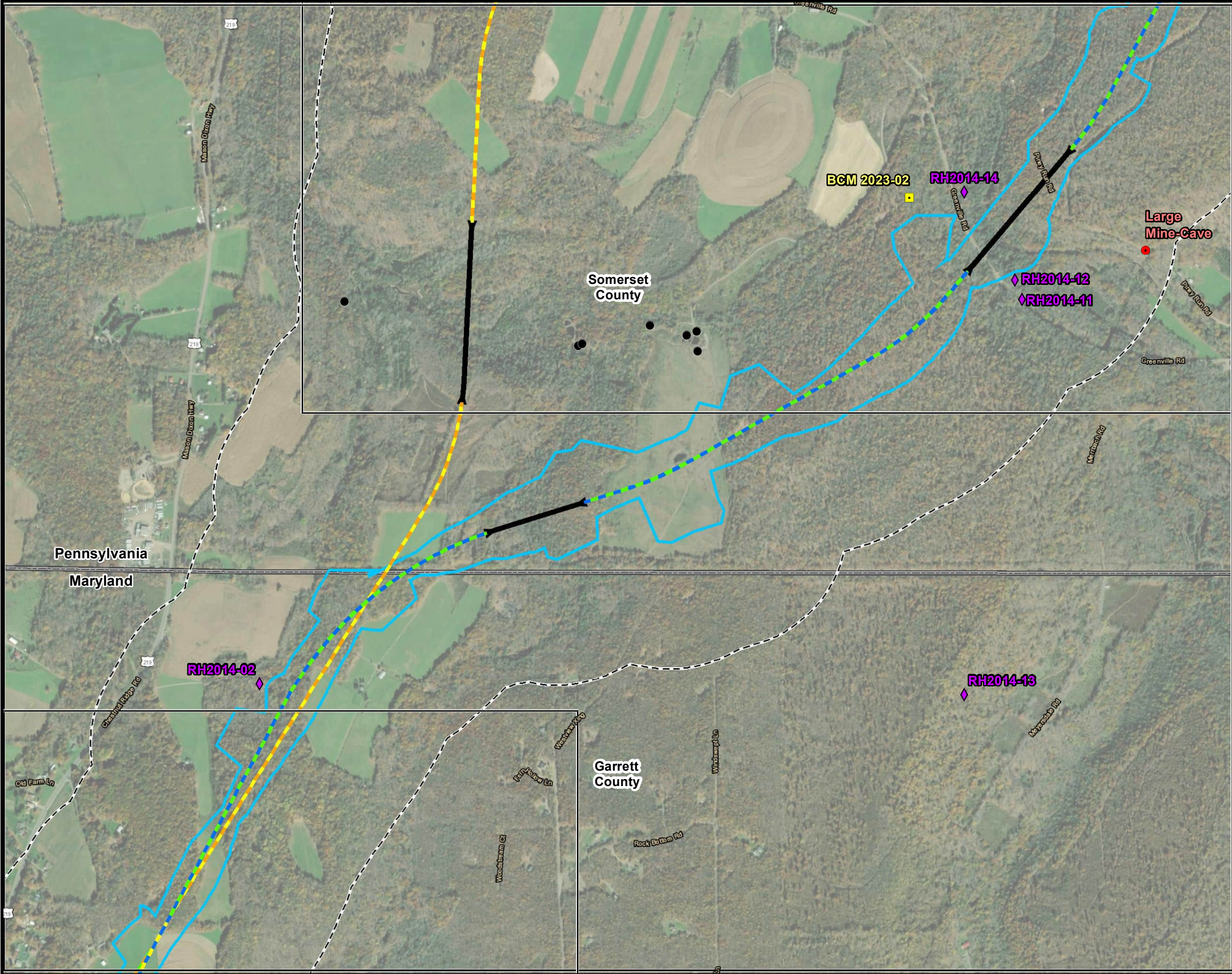


US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

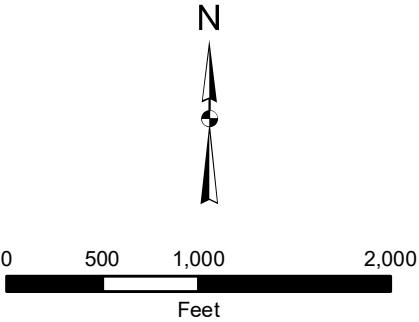
FIGURE 5C  
KNOWN CAVES AND/OR MINES MAP  
ALTERNATIVE 1 - E-SHIFT MODIFIED







- LEGEND:**
- Coal Mining Operation (PADEP)
  - Known Hibernaculum
  - Potential Hibernaculum
  - ◆ Rocky Habitats (BCM, 2014)
- Route**
- Alternative 1 - E-Shift Modified
  - Alternative 2 - E Modified
  - Alternative 3 - DU-Shift Modified
  - Alternative 4 - DU Modified
- - - Action Area
  - Alternative 1 - E-Shift Modified Limit of Disturbance
  - ▬ Proposed Bridge
  - Large Mine-Cave 5-Mile Radius
  - Sheet Index
  - County Boundary
  - State Boundary

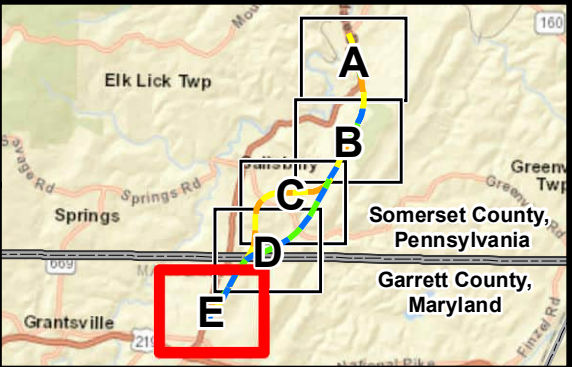
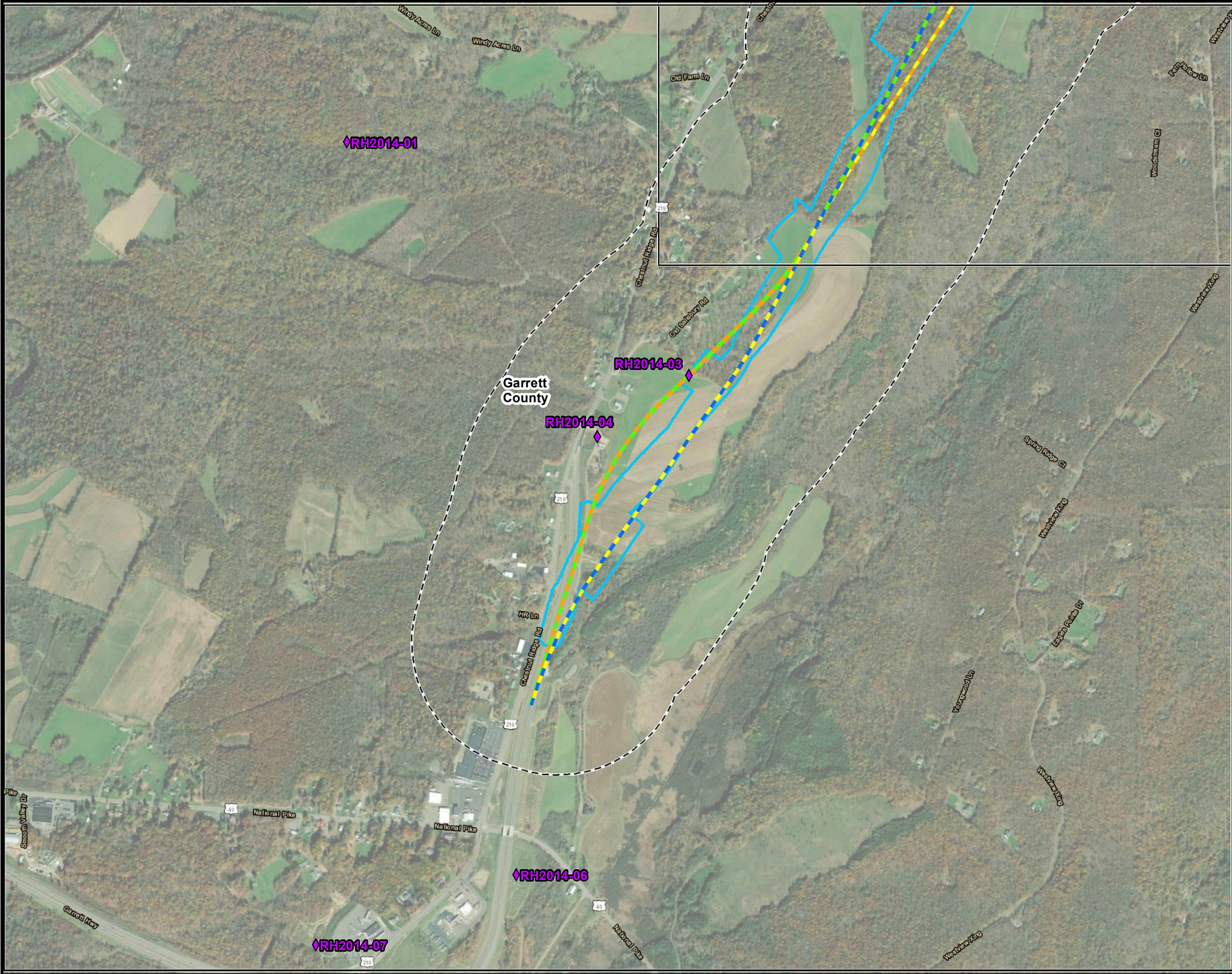


US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

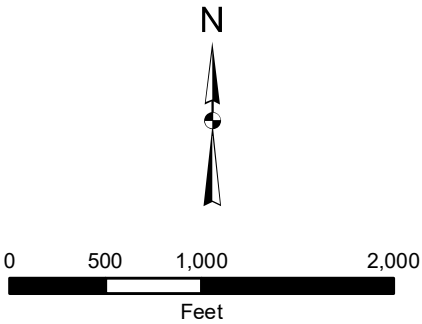
FIGURE 5D  
KNOWN CAVES AND/OR MINES MAP  
ALTERNATIVE 1 - E-SHIFT MODIFIED

**AECOM**





- LEGEND:**
- Rocky Habitats (BCM, 2014)
  - Route**
    - Alternative 1 - E-Shift Modified
    - Alternative 2 - E Modified
    - Alternative 3 - DU-Shift Modified
    - Alternative 4 - DU Modified
  - Action Area
  - Alternative 1 - E-Shift Modified Limit of Disturbance
  - Large Mine-Cave 5-Mile Radius
  - Sheet Index
  - County Boundary
  - State Boundary

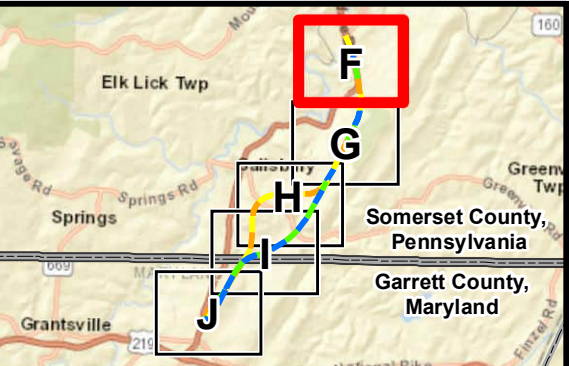
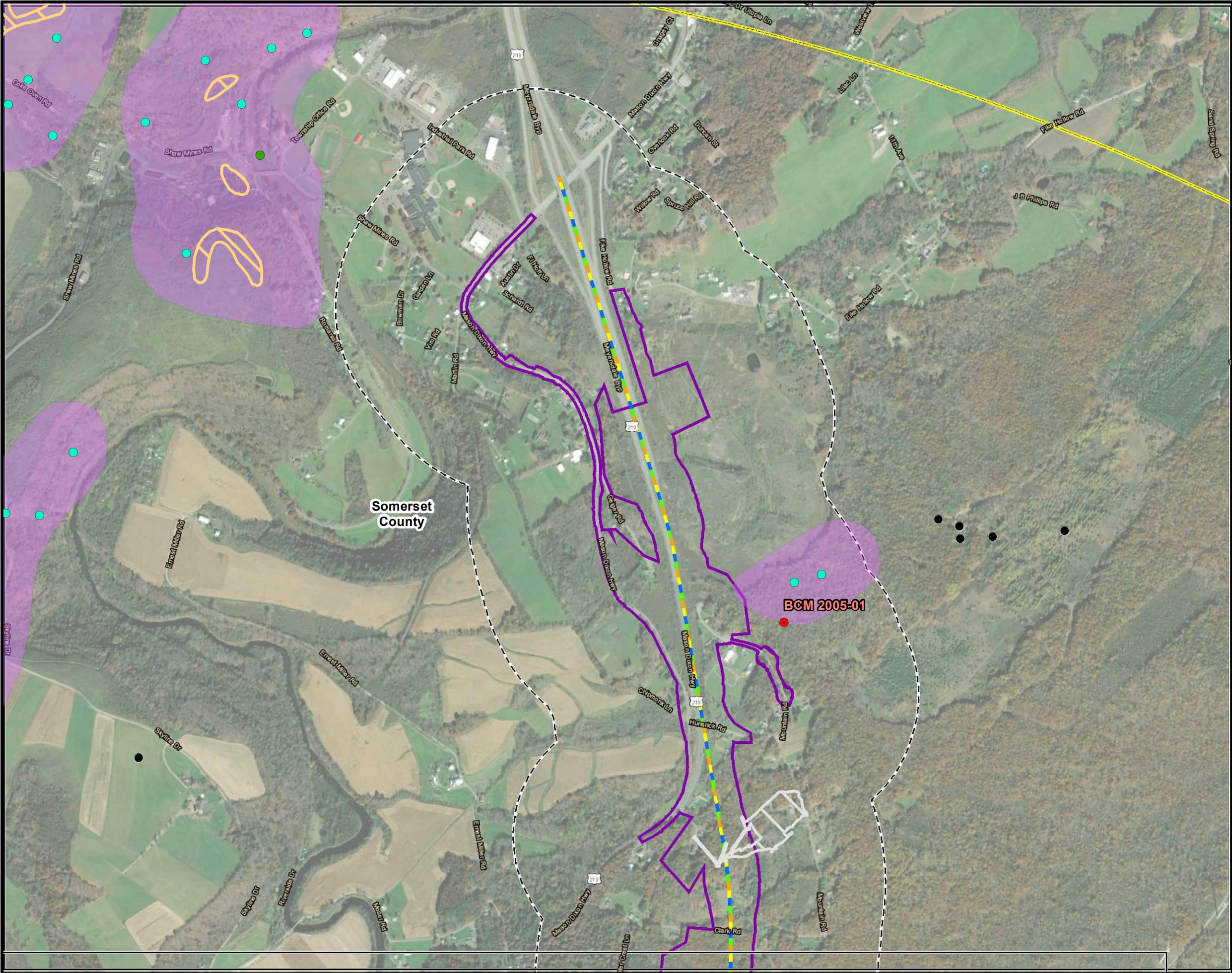


US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 5E  
KNOWN CAVES AND/OR MINES MAP  
ALTERNATIVE 1 - E-SHIFT MODIFIED







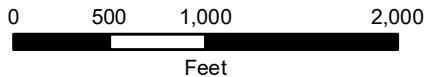
**LEGEND:**

- Abandoned Mine Land (PADEP)
- Reclamation Completed Mine (PADEP)
- Coal Mining Operation (PADEP)
- Known Hibernaculum
- Abandoned Mine Inventory (PADEP)
- Abandoned Mine Inventory Site (PADEP)
- Digitized Mined Area (PADEP)

**Route**

- Alternative 1 - E-Shift Modified
- Alternative 2 - E Modified
- Alternative 3 - DU-Shift Modified
- Alternative 4 - DU Modified

- Action Area
- Alternative 2 - E Modified Limit of Disturbance
- Large Mine-Cave 5-Mile Radius
- Sheet Index
- County Boundary
- State Boundary



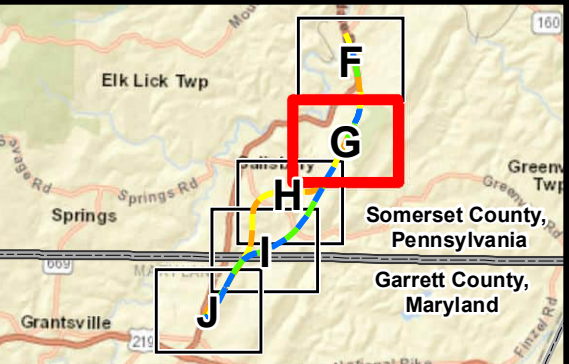
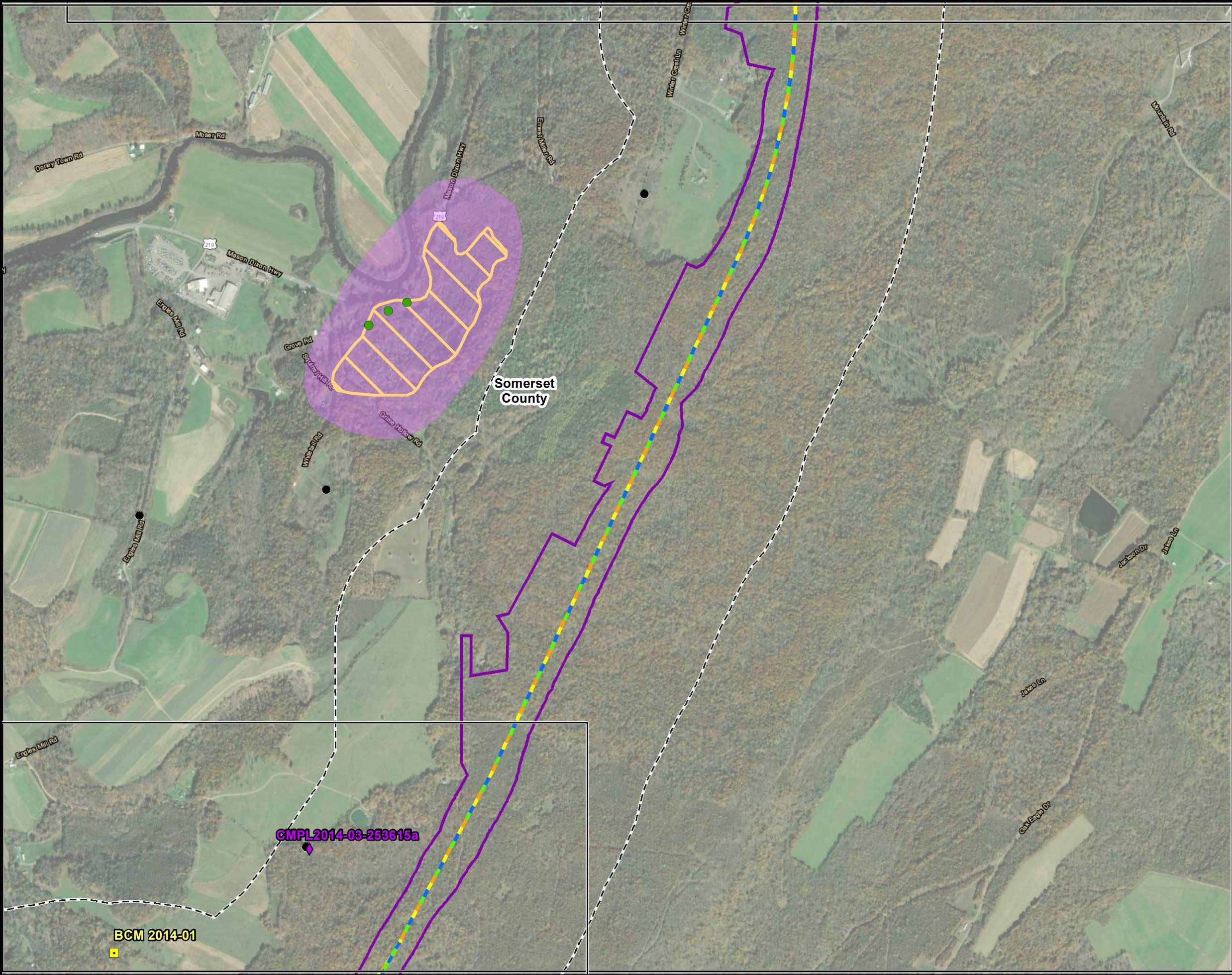
US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 5F  
KNOWN CAVES AND/OR MINES MAP  
ALTERNATIVE 2 - E MODIFIED





Date Saved: 24-Jul-24 Path: C:\Users\Carr\AECOM\PNDOT - 01\_US 219 Improvement\900\_CAD\_GIS\920\_929\_GIS\_Graphics\MXD\Figure5\_Known Caves\_and Mines\_20240724.mxd



**LEGEND:**

- Reclamation Completed Mine (PADEP)
- Coal Mining Operation (PADEP)
- Potential Hibernaculum
- ◆ Rocky Habitats (BCM, 2014)
- ▭ Abandoned Mine Inventory (PADEP)
- ▭ Abandoned Mine Inventory Site (PADEP)

**Route**

- Alternative 1 - E-Shift Modified
- Alternative 2 - E Modified
- Alternative 3 - DU-Shift Modified
- Alternative 4 - DU Modified

--- Action Area

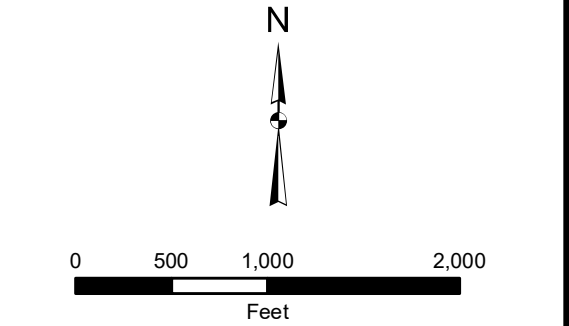
▭ Alternative 2 - E Modified Limit of Disturbance

▭ Large Mine-Cave 5-Mile Radius

▭ Sheet Index

▭ County Boundary

▭ State Boundary

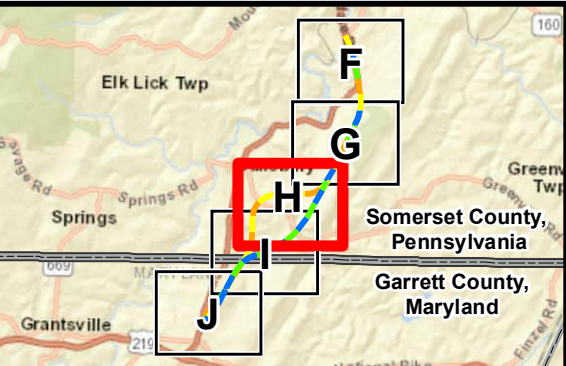
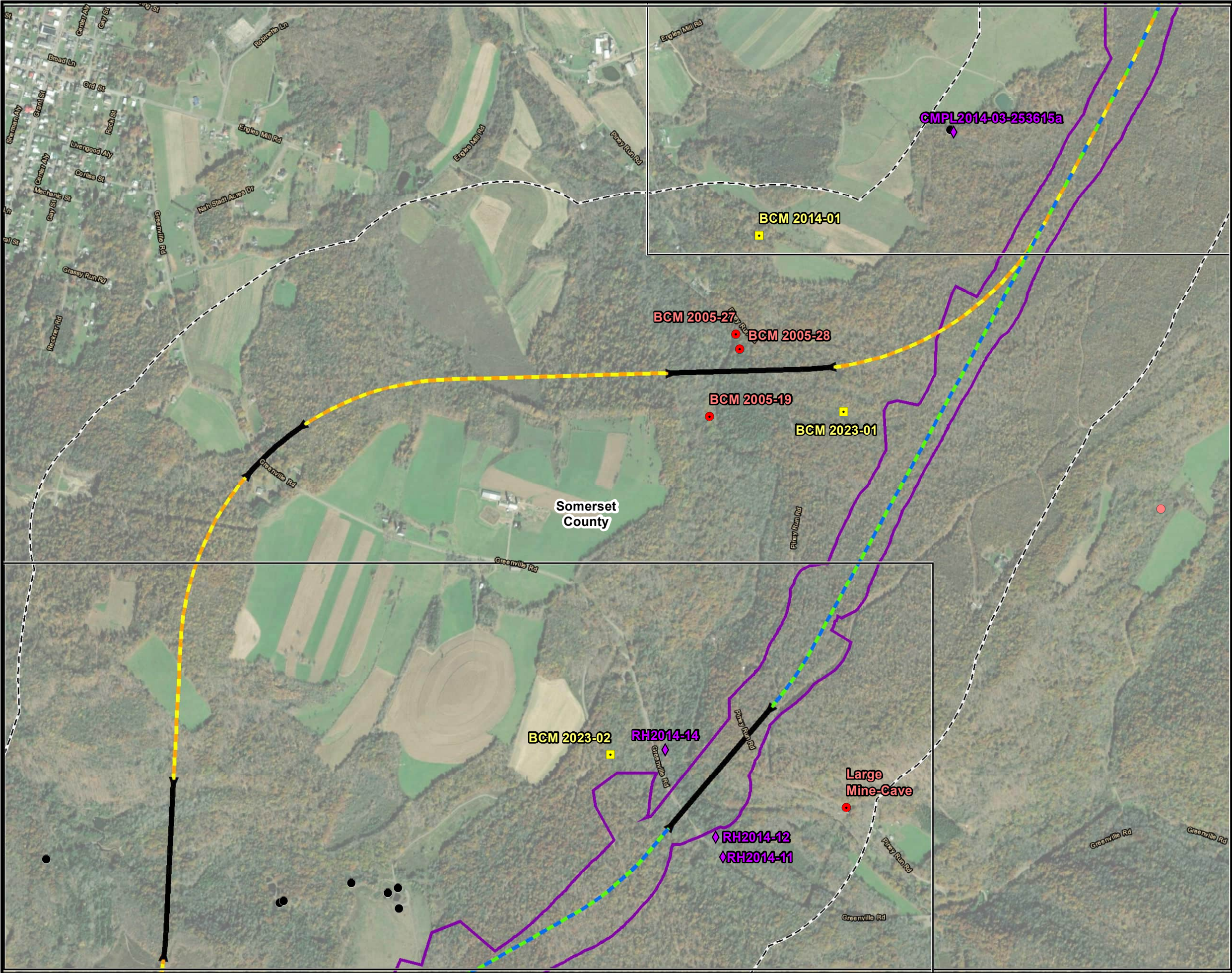


US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 5G  
KNOWN CAVES AND/OR MINES MAP  
ALTERNATIVE 2 - E MODIFIED

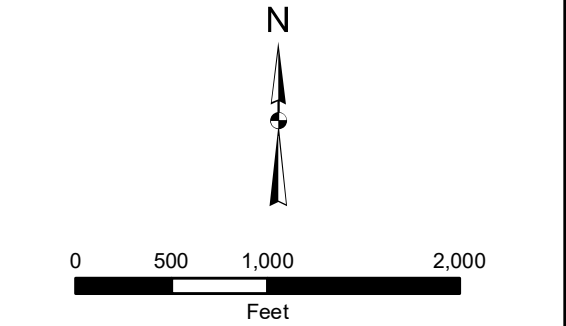
**AECOM**





**LEGEND:**

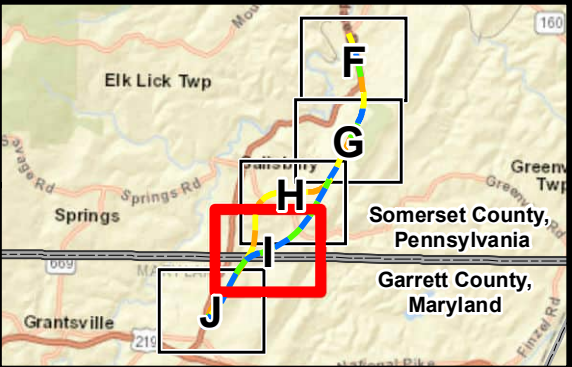
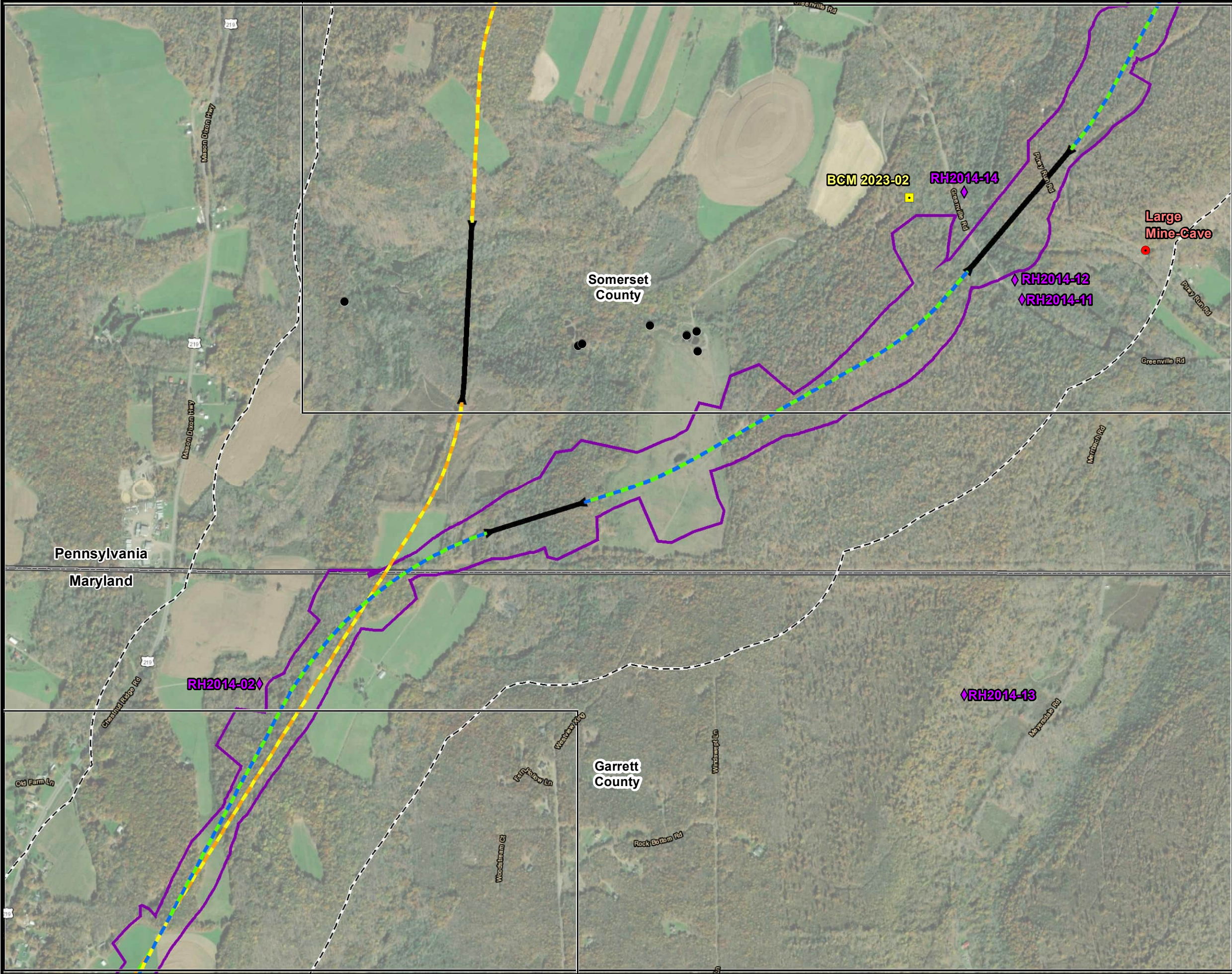
- Industrial Mineral Mining Operation (PADEP)
  - Coal Mining Operation (PADEP)
  - Known Hibernaculum
  - Potential Hibernaculum
  - Rocky Habitats (BCM, 2014)
- Route**
- Alternative 1 - E-Shift Modified
  - Alternative 2 - E Modified
  - Alternative 3 - DU-Shift Modified
  - Alternative 4 - DU Modified
  - Action Area
  - Alternative 2 - E Modified Limit of Disturbance
  - Proposed Bridge
  - Large Mine-Cave 5-Mile Radius
  - Sheet Index
  - County Boundary
  - State Boundary



US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 5H  
KNOWN CAVES AND/OR MINES MAP  
ALTERNATIVE 2 - E MODIFIED  
**AECOM**





**LEGEND:**

- Coal Mining Operation (PADEP)
- Known Hibernaculum
- Potential Hibernaculum
- ◆ Rocky Habitats (BCM, 2014)

**Route**

- Alternative 1 - E-Shift Modified
- Alternative 2 - E Modified
- Alternative 3 - DU-Shift Modified
- Alternative 4 - DU Modified

--- Action Area

— Alternative 2 - E Modified Limit of Disturbance

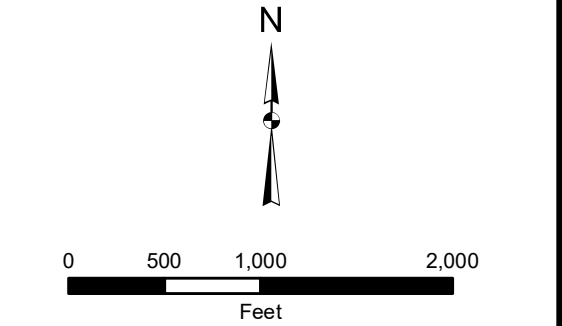
— Proposed Bridge

— Large Mine-Cave 5-Mile Radius

— Sheet Index

— County Boundary

— State Boundary

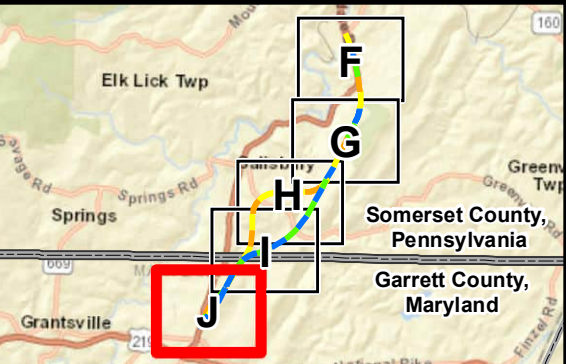
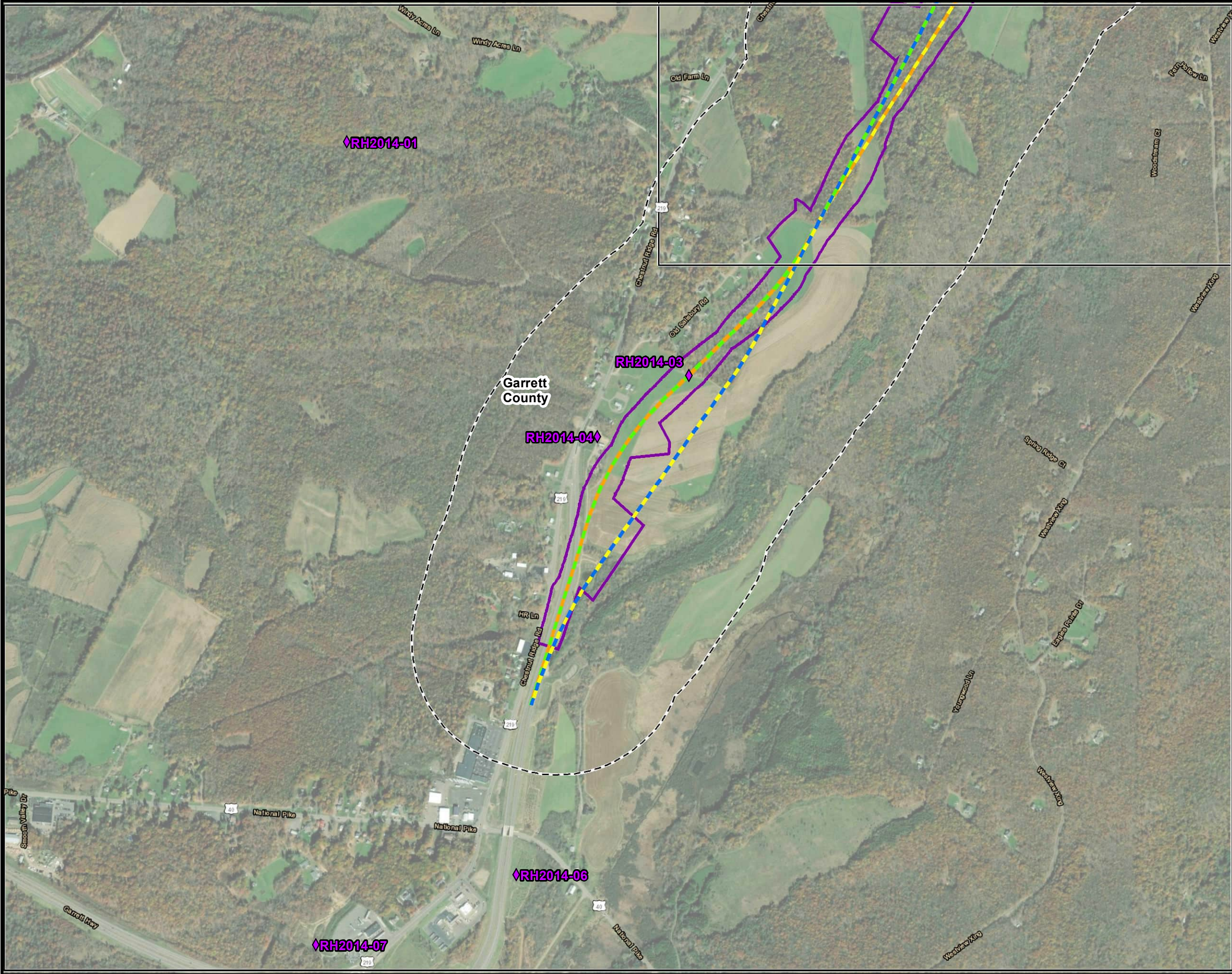


US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 5I  
KNOWN CAVES AND/OR MINES MAP  
ALTERNATIVE 2 - E MODIFIED

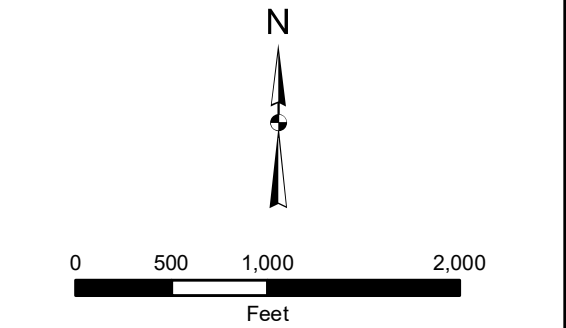
**AECOM**





**LEGEND:**

- ◆ Rocky Habitats (BCM, 2014)
- Route**
  - Alternative 1 - E-Shift Modified
  - Alternative 2 - E Modified
  - Alternative 3 - DU-Shift Modified
  - Alternative 4 - DU Modified
- Action Area
- Alternative 2 - E Modified Limit of Disturbance
- Large Mine-Cave 5-Mile Radius
- Sheet Index
- County Boundary
- State Boundary

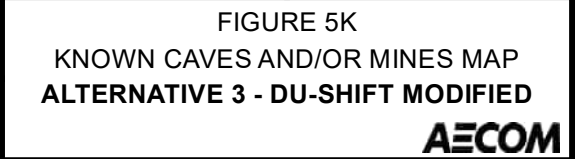


US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

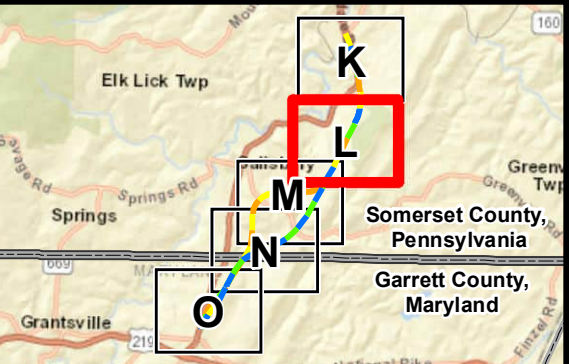
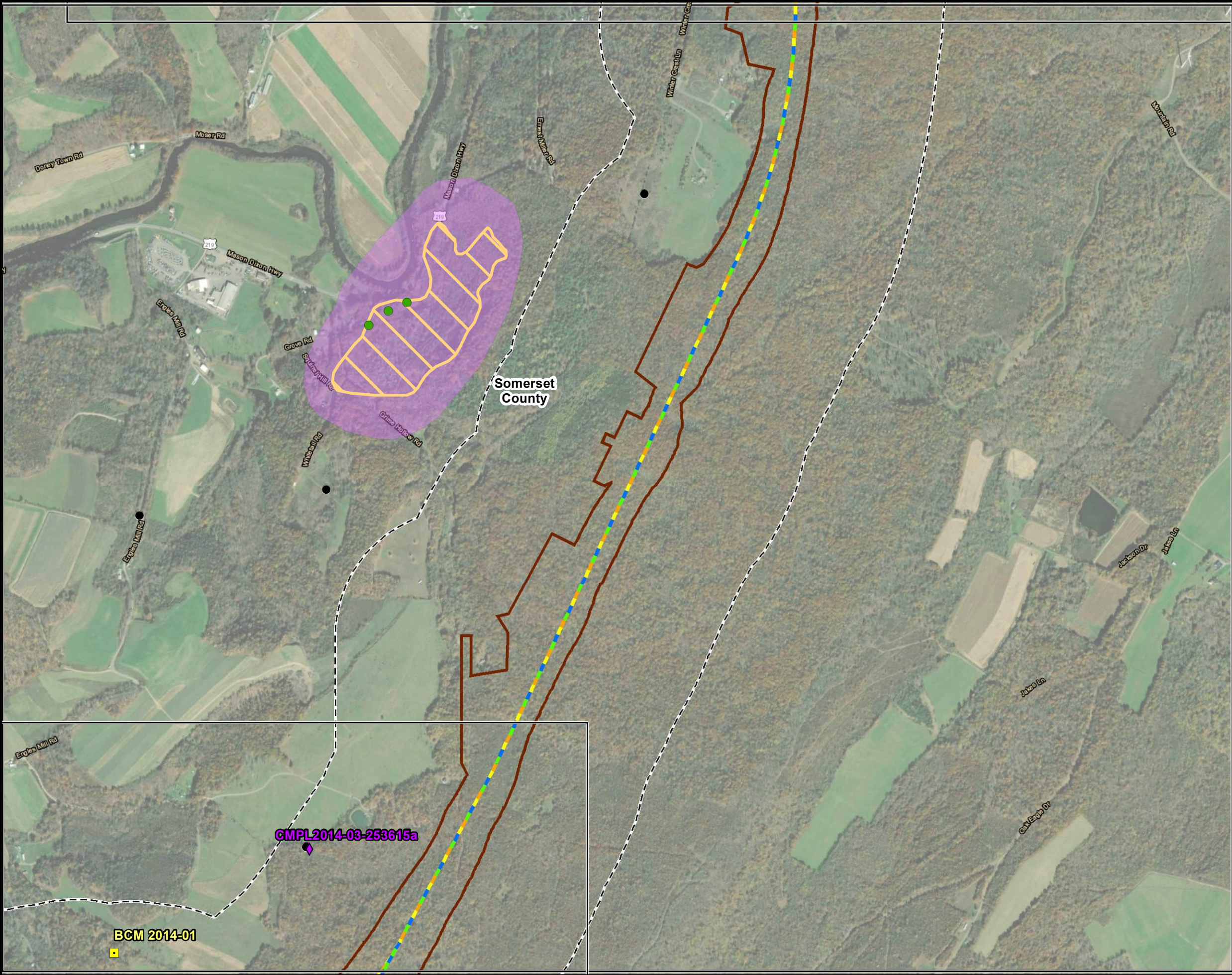
FIGURE 5J  
KNOWN CAVES AND/OR MINES MAP  
ALTERNATIVE 2 - E MODIFIED

**AECOM**









**LEGEND:**

- Reclamation Completed Mine (PADEP)
- Coal Mining Operation (PADEP)
- Potential Hibernaculum
- ◆ Rocky Habitats (BCM, 2014)
- ▭ Abandoned Mine Inventory (PADEP)
- ▭ Abandoned Mine Inventory Site (PADEP)

**Route**

- Alternative 1 - E-Shift Modified
- Alternative 2 - E Modified
- Alternative 3 - DU-Shift Modified
- Alternative 4 - DU Modified

--- Action Area

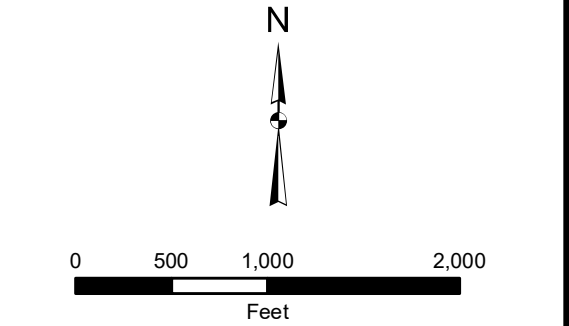
▭ Alternative 3 - DU-Shift Modified Limit of Disturbance

▭ Large Mine-Cave 5-Mile Radius

▭ Sheet Index

▭ County Boundary

▭ State Boundary

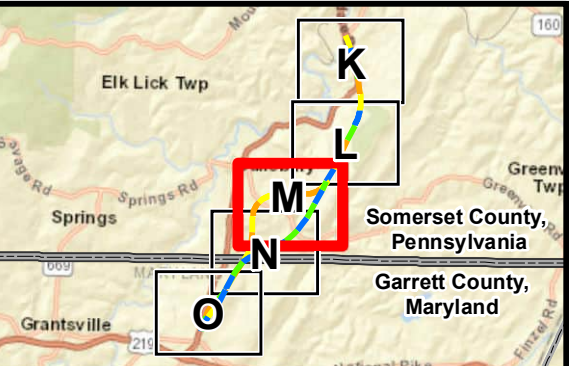
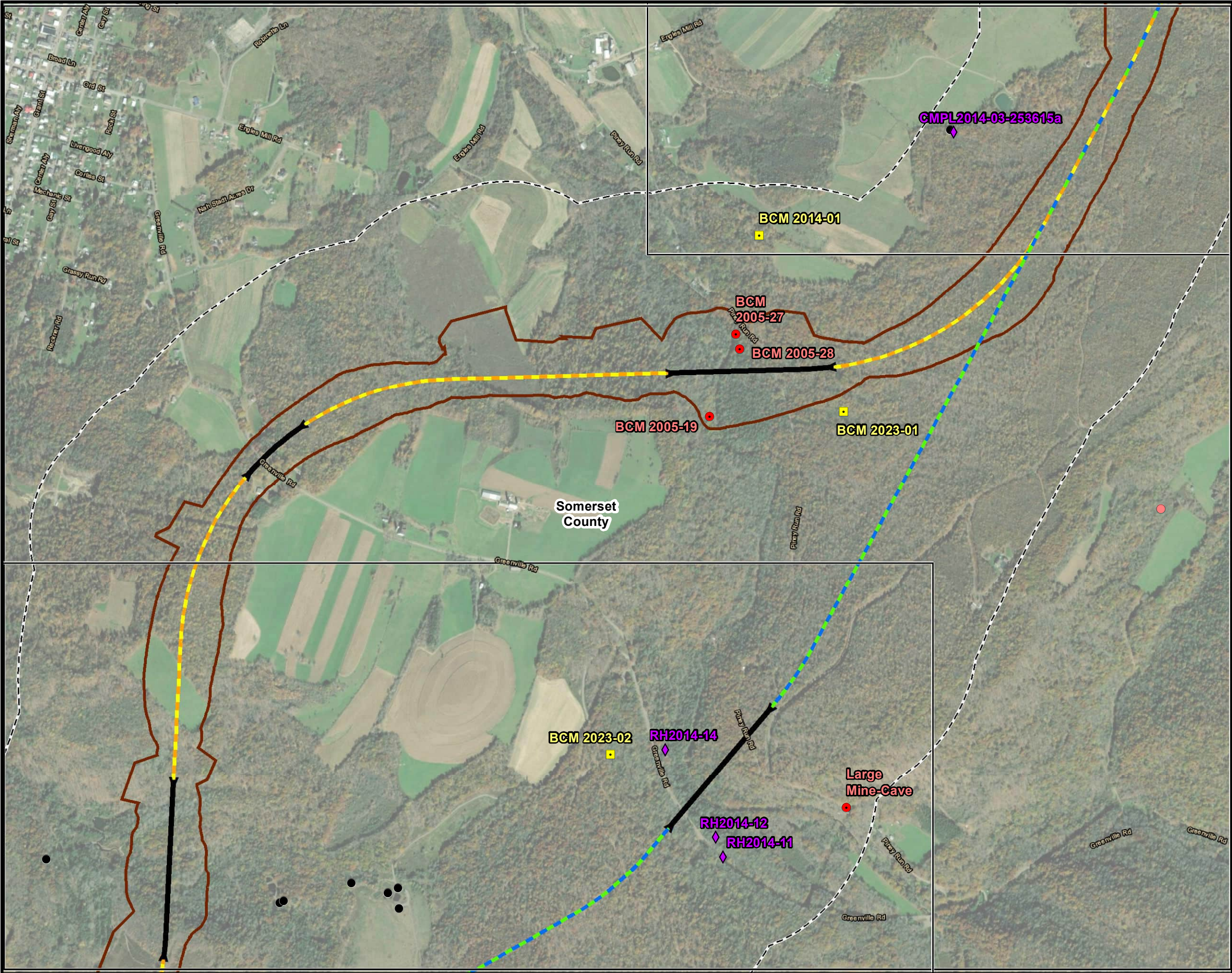


US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 5L  
KNOWN CAVES AND/OR MINES MAP  
ALTERNATIVE 3 - DU-SHIFT MODIFIED

**AECOM**



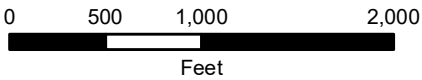


**LEGEND:**

- Industrial Mineral Mining Operation (PADEP)
- Coal Mining Operation (PADEP)
- Known Hibernaculum
- Potential Hibernaculum
- Rocky Habitats (BCM, 2014)

**Route**

- Alternative 1 - E-Shift Modified
- Alternative 2 - E Modified
- Alternative 3 - DU-Shift Modified
- Alternative 4 - DU Modified
- Action Area
- Alternative 3 - DU-Shift Modified Limit of Disturbance
- Proposed Bridge
- Large Mine-Cave 5-Mile Radius
- Sheet Index
- County Boundary
- State Boundary

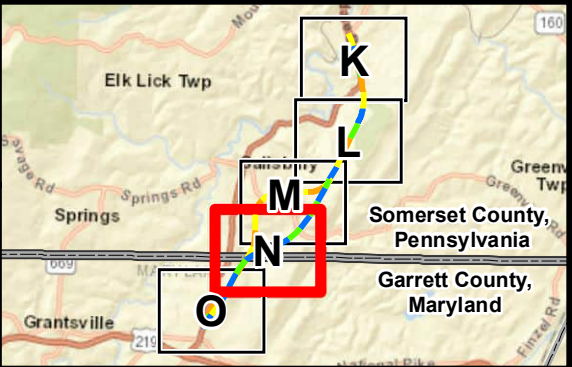
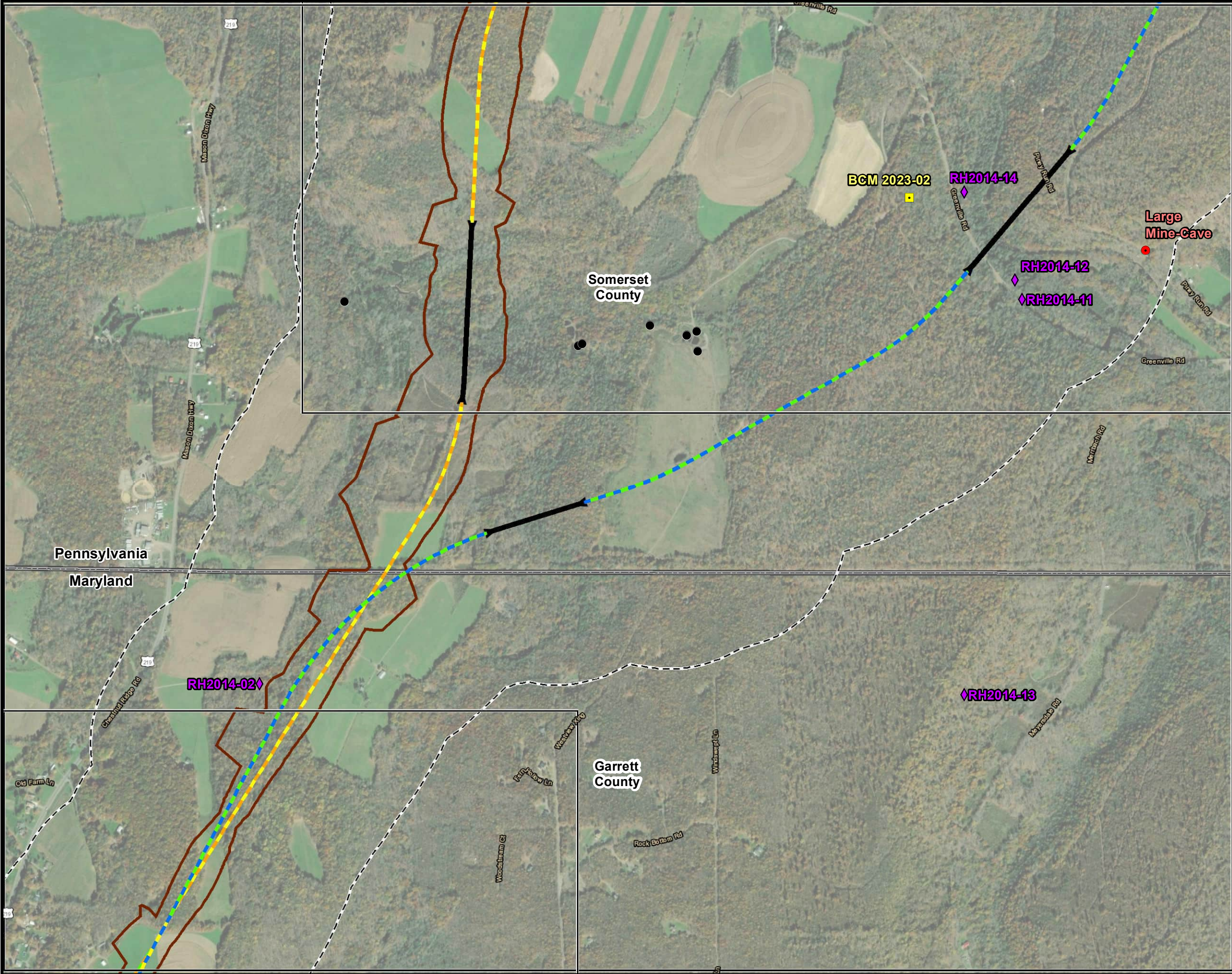


US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 5M  
KNOWN CAVES AND/OR MINES MAP  
ALTERNATIVE 3 - DU-SHIFT MODIFIED

**AECOM**





**LEGEND:**

- Coal Mining Operation (PADEP)
- Known Hibernaculum
- Potential Hibernaculum
- ◆ Rocky Habitats (BCM, 2014)

**Route**

- Alternative 1 - E-Shift Modified
- Alternative 2 - E Modified
- Alternative 3 - DU-Shift Modified
- Alternative 4 - DU Modified

--- Action Area

— Alternative 3 - DU-Shift Modified Limit of Disturbance

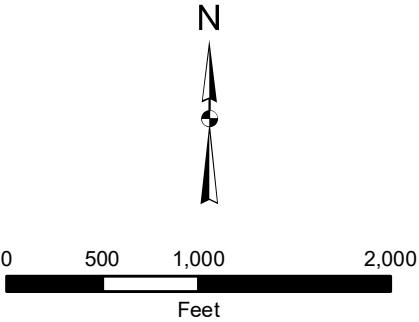
— Proposed Bridge

— Large Mine-Cave 5-Mile Radius

— Sheet Index

— County Boundary

— State Boundary

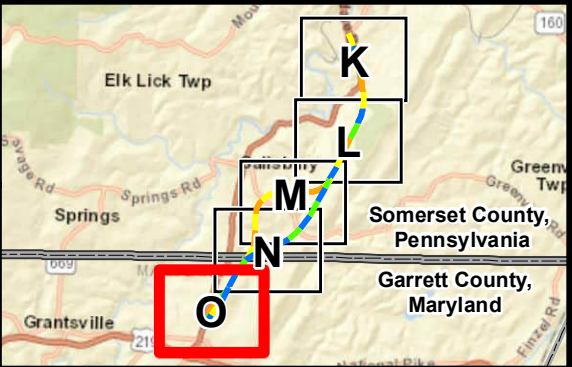
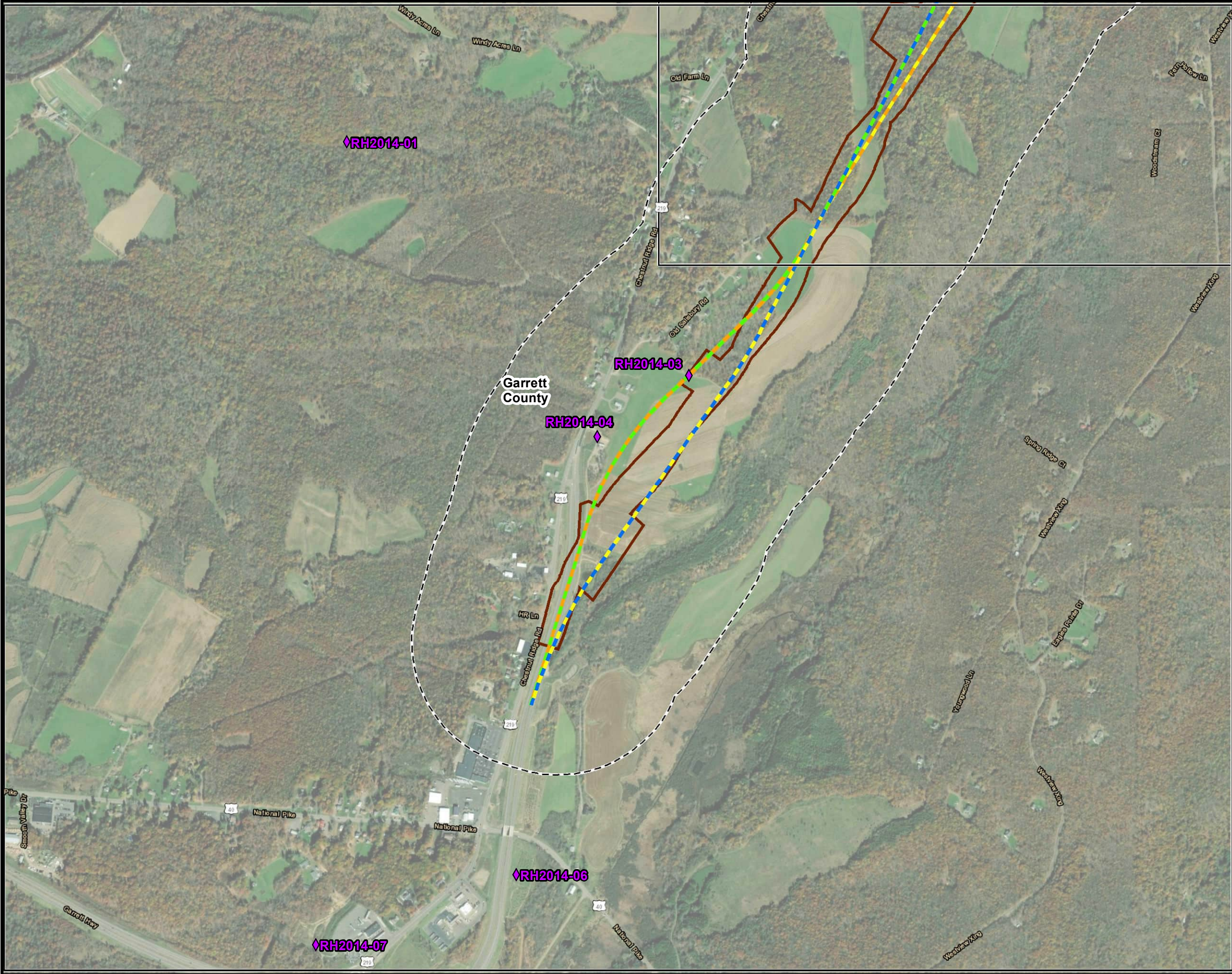


US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 5N  
KNOWN CAVES AND/OR MINES MAP  
ALTERNATIVE 3 - DU-SHIFT MODIFIED

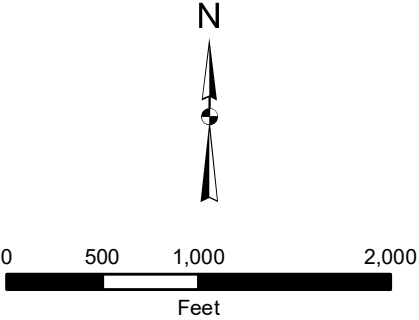
**AECOM**





**LEGEND:**

- Rocky Habitats (BCM, 2014)
- Route**
  - Alternative 1 - E-Shift Modified
  - Alternative 2 - E Modified
  - Alternative 3 - DU-Shift Modified
  - Alternative 4 - DU Modified
- Action Area
- Alternative 3 - DU-Shift Modified Limit of Disturbance
- Large Mine-Cave 5-Mile Radius
- Sheet Index
- County Boundary
- State Boundary

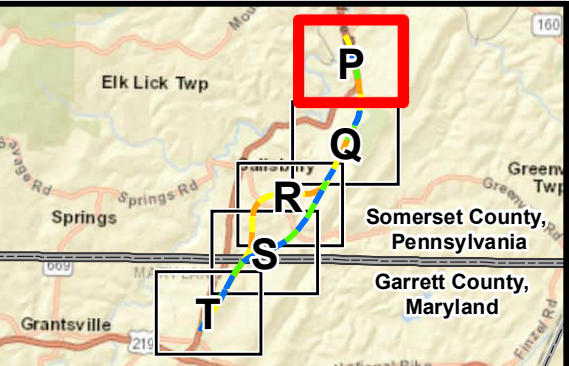
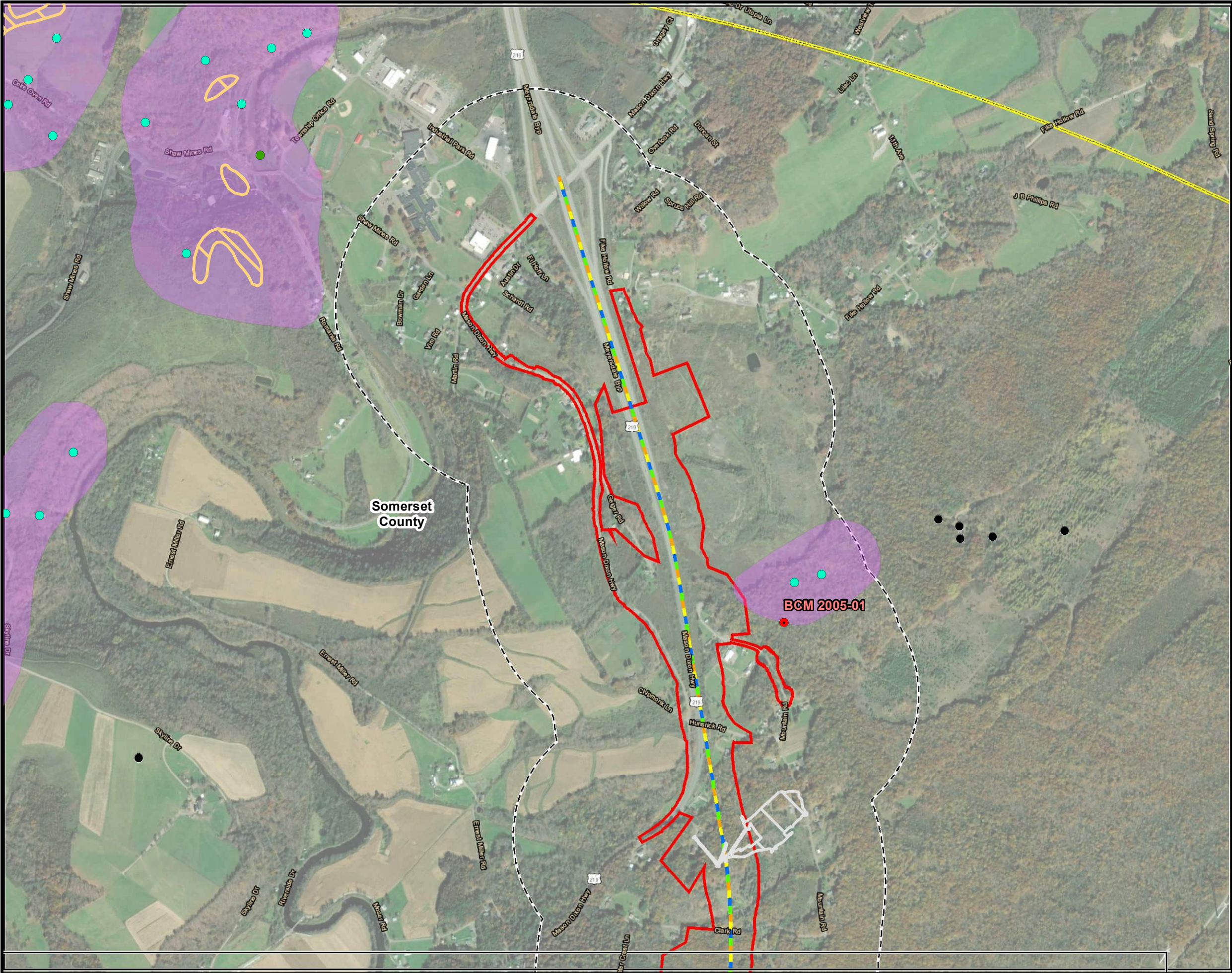


US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 50  
KNOWN CAVES AND/OR MINES MAP  
ALTERNATIVE 3 - DU-SHIFT MODIFIED







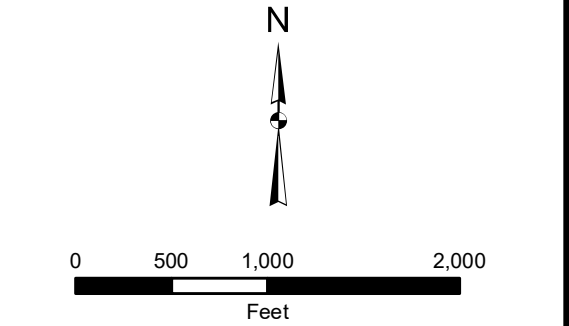
**LEGEND:**

- Abandoned Mine Land (PADEP)
- Reclamation Completed Mine (PADEP)
- Coal Mining Operation (PADEP)
- Known Hibernaculum
- Abandoned Mine Inventory (PADEP)
- Abandoned Mine Inventory Site (PADEP)
- Digitized Mined Area (PADEP)

**Route**

- Alternative 1 - E-Shift Modified
- Alternative 2 - E Modified
- Alternative 3 - DU-Shift Modified
- Alternative 4 - DU Modified

- Action Area
- Alternative 4 - DU Modified Limit of Disturbance
- Large Mine-Cave 5-Mile Radius
- Sheet Index
- County Boundary
- State Boundary

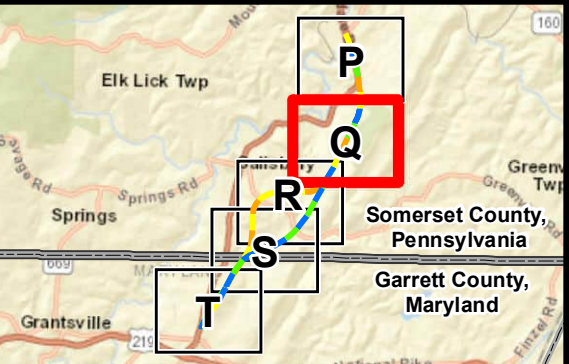
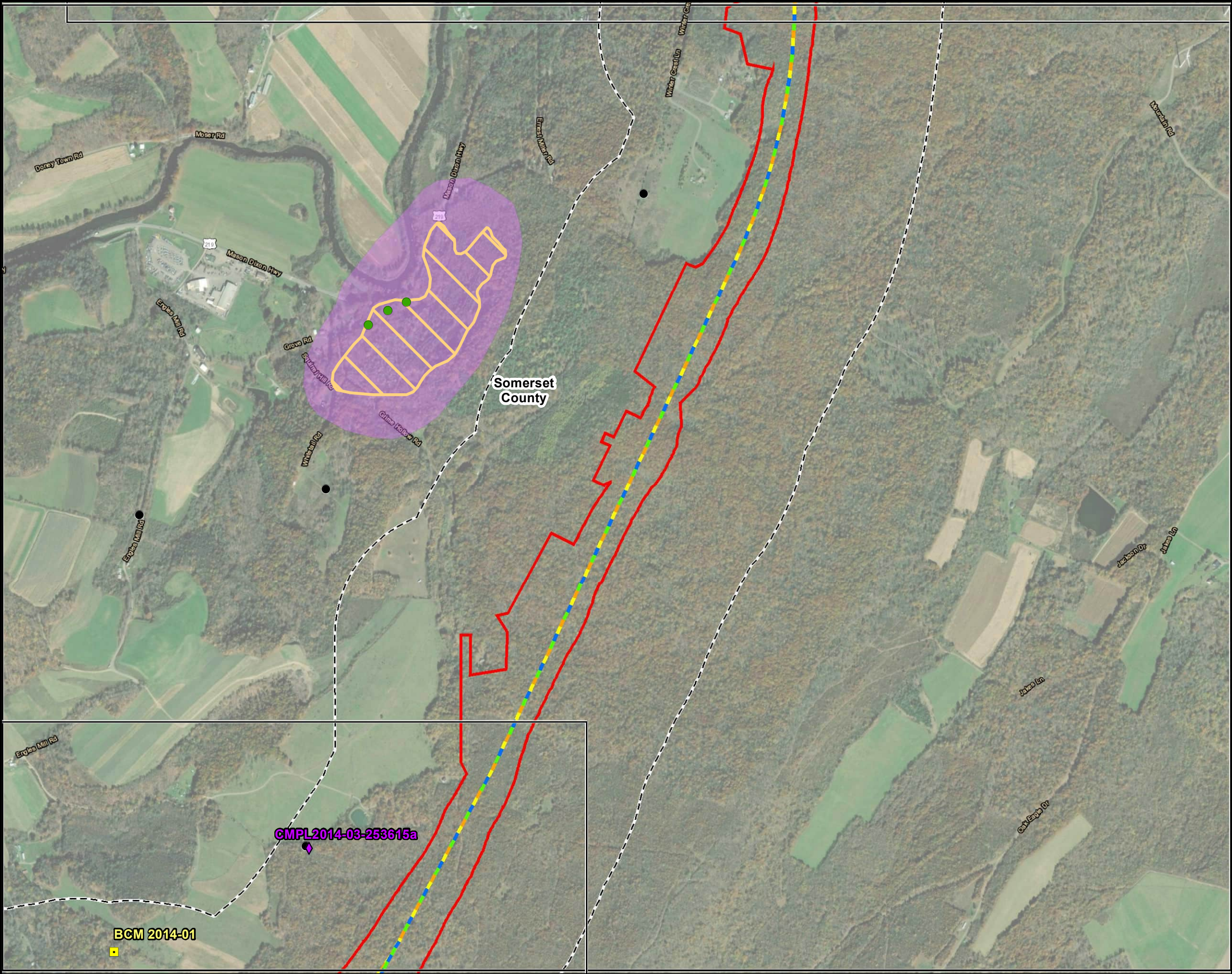


US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 5P  
KNOWN CAVES AND/OR MINES MAP  
ALTERNATIVE 4 - DU MODIFIED

**AECOM**





**LEGEND:**

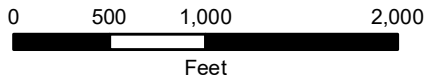
- Reclamation Completed Mine (PADEP)
- Coal Mining Operation (PADEP)
- Potential Hibernaculum
- ◆ Rocky Habitats (BCM, 2014)
- Abandoned Mine Inventory (PADEP)
- Abandoned Mine Inventory Site (PADEP)

**Route**

- Alternative 1 - E-Shift Modified
- Alternative 2 - E Modified
- Alternative 3 - DU-Shift Modified
- Alternative 4 - DU Modified

**Action Area**

- Alternative 4 - DU Modified Limit of Disturbance
- Large Mine-Cave 5-Mile Radius
- Sheet Index
- County Boundary
- State Boundary

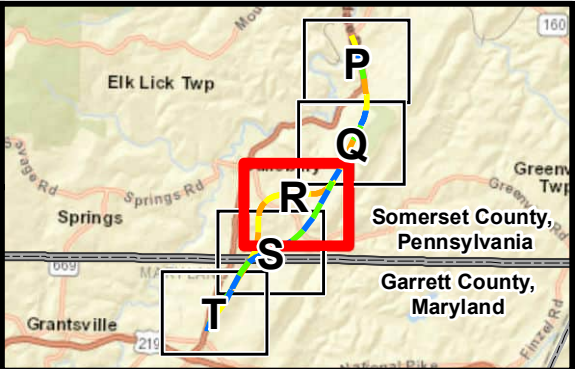
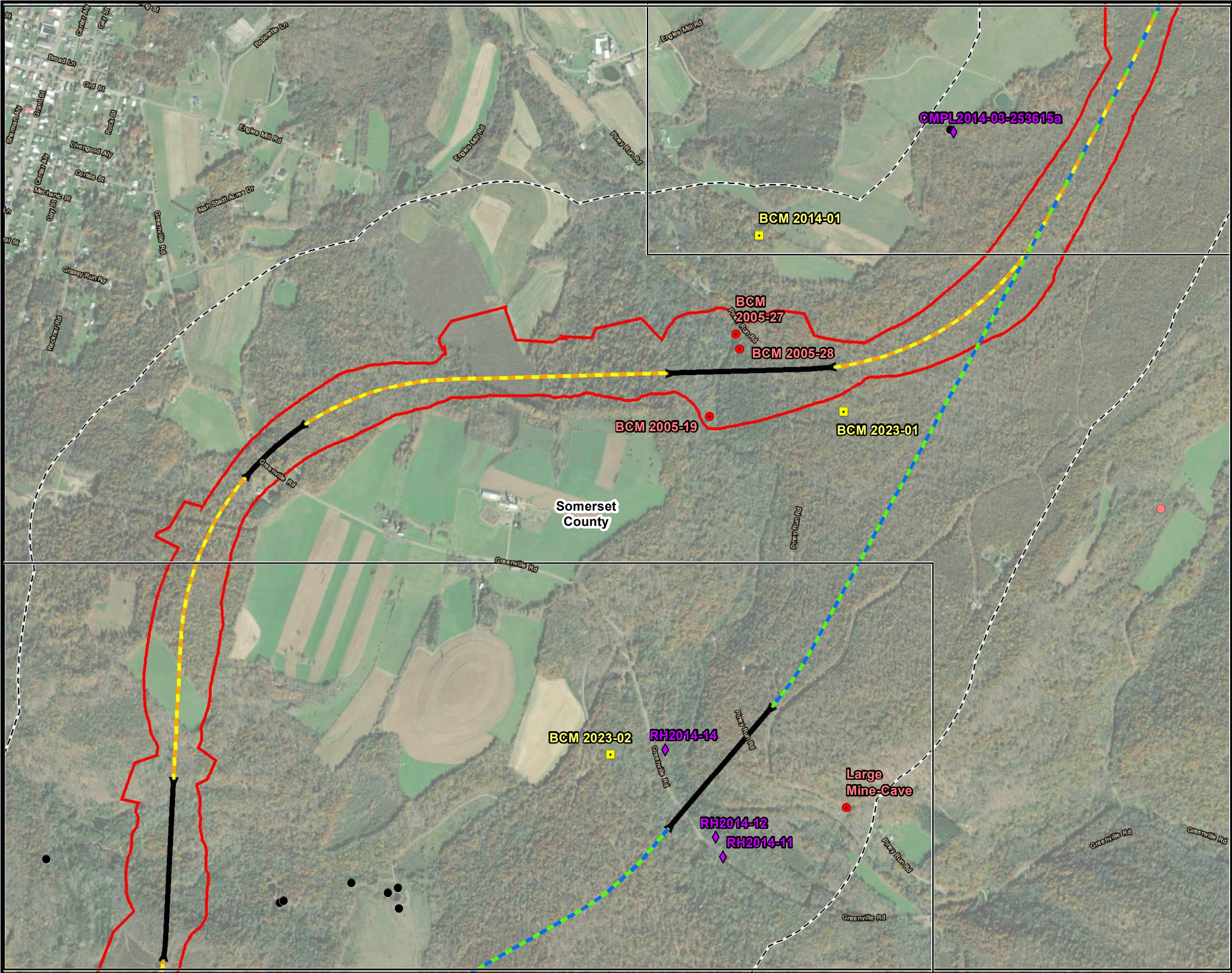


US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 5Q  
KNOWN CAVES AND/OR MINES MAP  
ALTERNATIVE 4 - DU MODIFIED







**LEGEND:**

- Industrial Mineral Mining Operation (PADEP)
- Coal Mining Operation (PADEP)
- Known Hibernaculum
- Potential Hibernaculum
- Rocky Habitats (BCM, 2014)

**Route**

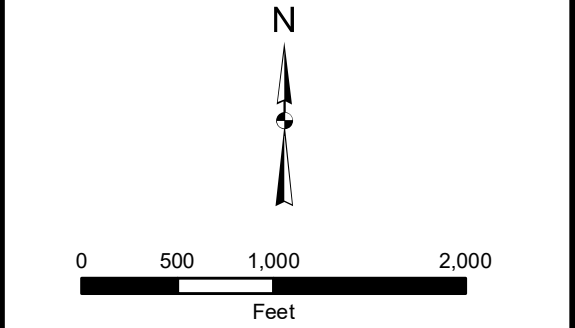
- Alternative 1 - E-Shift Modified
- Alternative 2 - E Modified
- Alternative 3 - DU-Shift Modified
- Alternative 4 - DU Modified

**Action Area**

- Alternative 4 - DU Modified Limit of Disturbance

**Proposed Bridge**

- Large Mine-Cave 5-Mile Radius
- Sheet Index
- County Boundary
- State Boundary

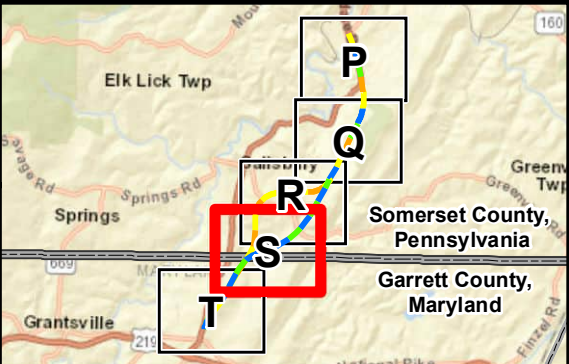
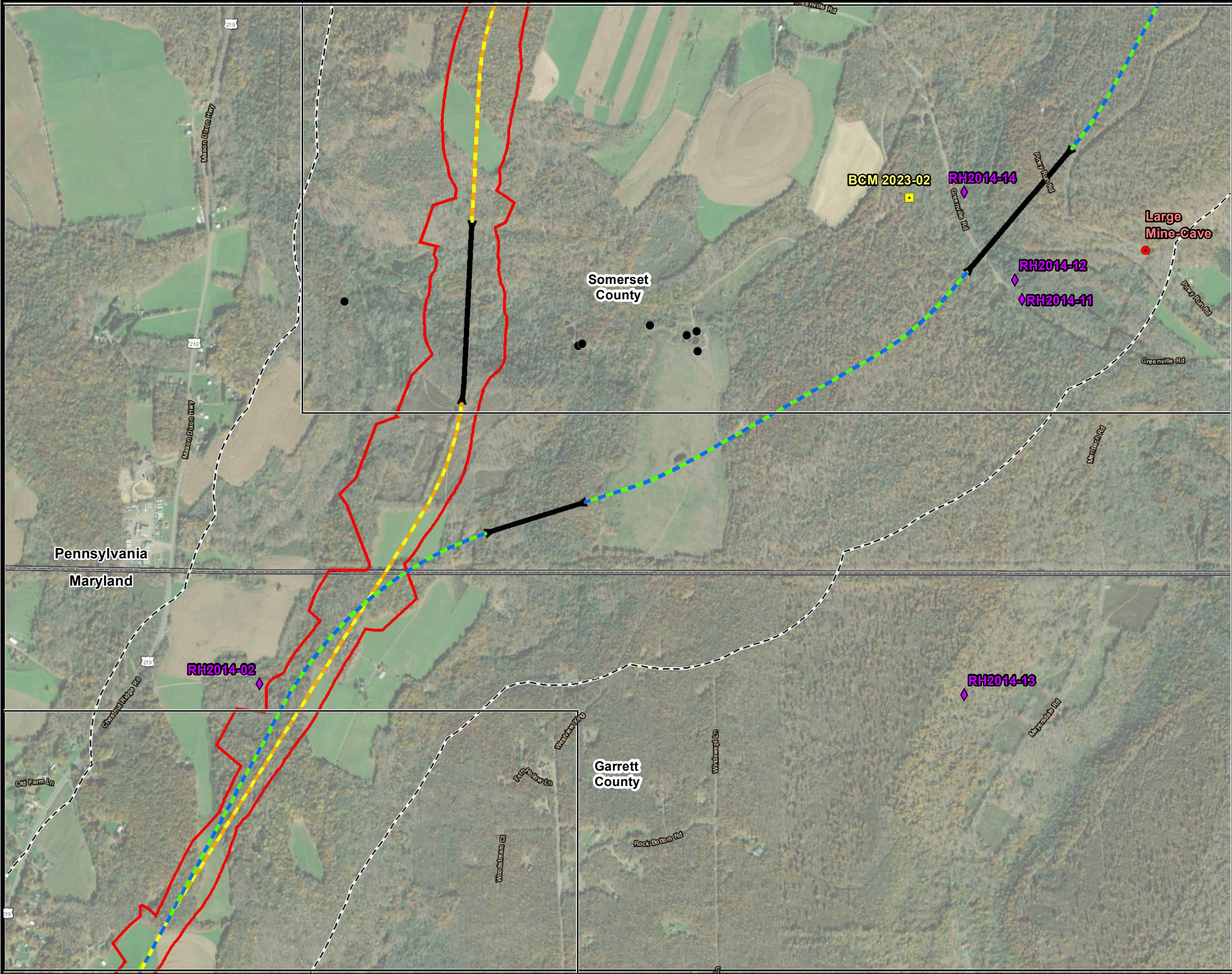


US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

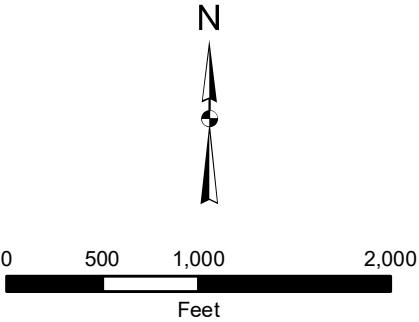
FIGURE 5R  
KNOWN CAVES AND/OR MINES MAP  
ALTERNATIVE 4 - DU MODIFIED

**AECOM**





- LEGEND:**
- Coal Mining Operation (PADEP)
  - Known Hibernaculum
  - Potential Hibernaculum
  - ◆ Rocky Habitats (BCM, 2014)
- Route**
- Alternative 1 - E-Shift Modified
  - Alternative 2 - E Modified
  - Alternative 3 - DU-Shift Modified
  - Alternative 4 - DU Modified
- Action Area
- Alternative 4 - DU Modified Limit of Disturbance
- Proposed Bridge
- Large Mine-Cave 5-Mile Radius
- Sheet Index
- County Boundary
- State Boundary

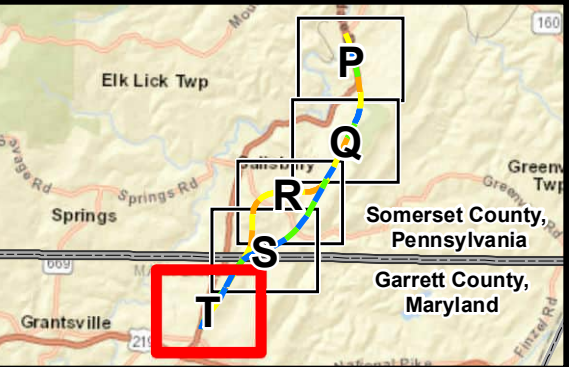
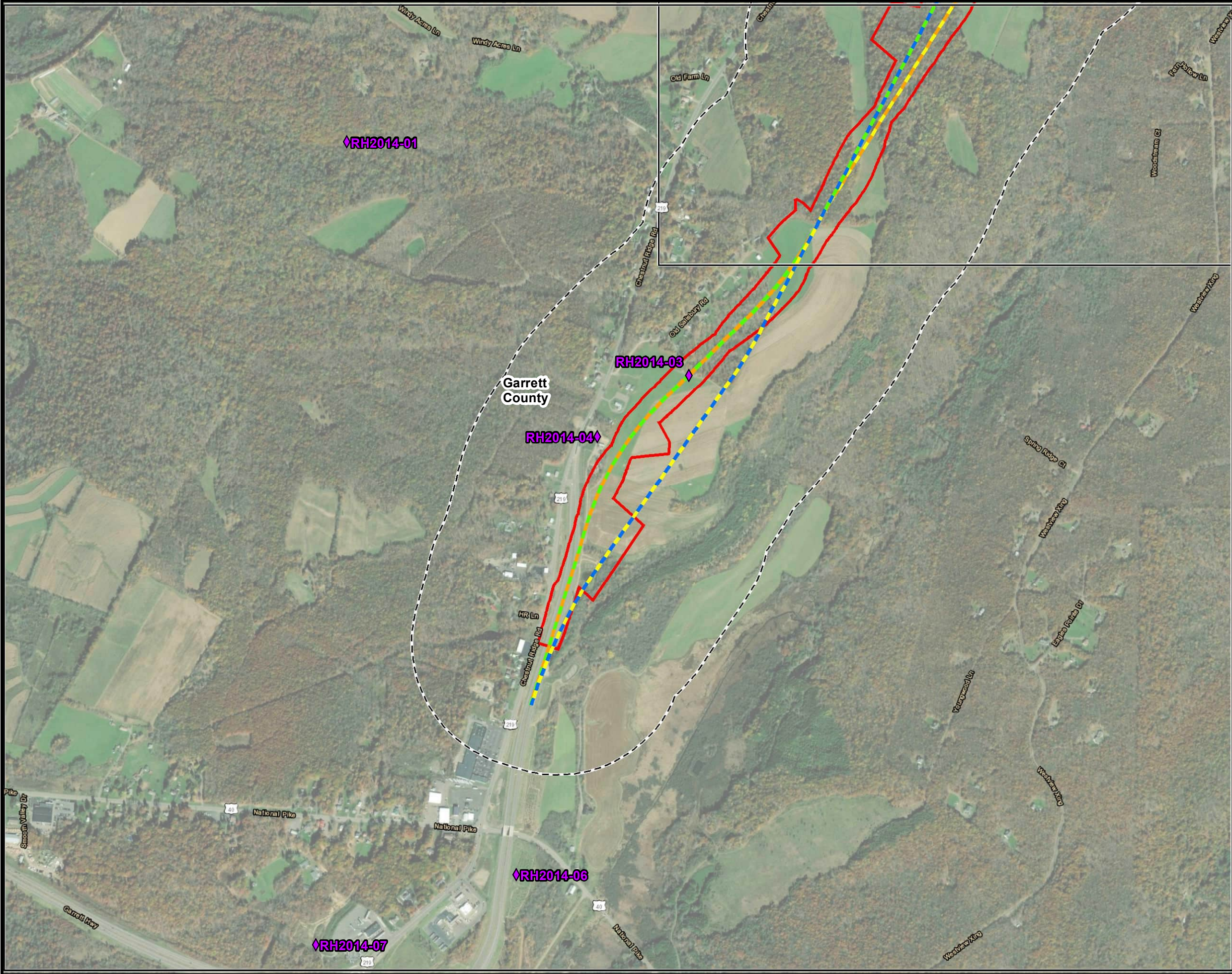


US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 5S  
KNOWN CAVES AND/OR MINES MAP  
ALTERNATIVE 4 - DU MODIFIED

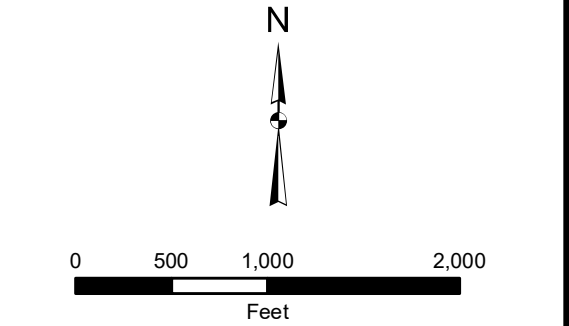
**AECOM**





**LEGEND:**

- Rocky Habitats (BCM, 2014)
- Route**
  - Alternative 1 - E-Shift Modified
  - Alternative 2 - E Modified
  - Alternative 3 - DU-Shift Modified
  - Alternative 4 - DU Modified
- Action Area
- Alternative 4 - DU Modified Limit of Disturbance
- Large Mine-Cave 5-Mile Radius
- Sheet Index
- County Boundary
- State Boundary



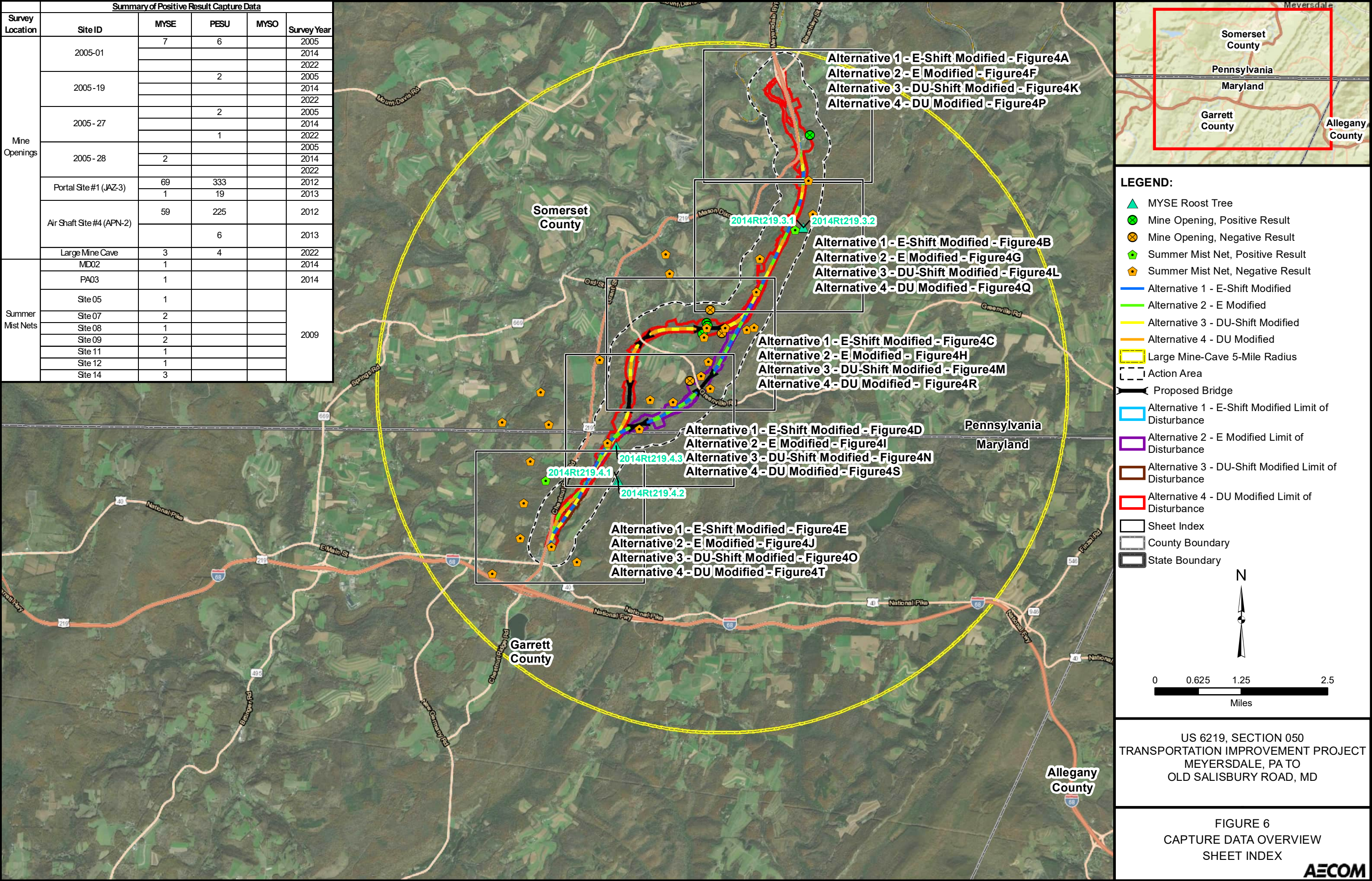
US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 5T  
KNOWN CAVES AND/OR MINES MAP  
ALTERNATIVE 4 - DU MODIFIED  
**AECOM**

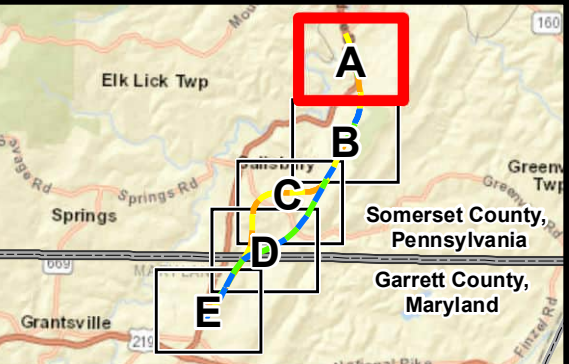
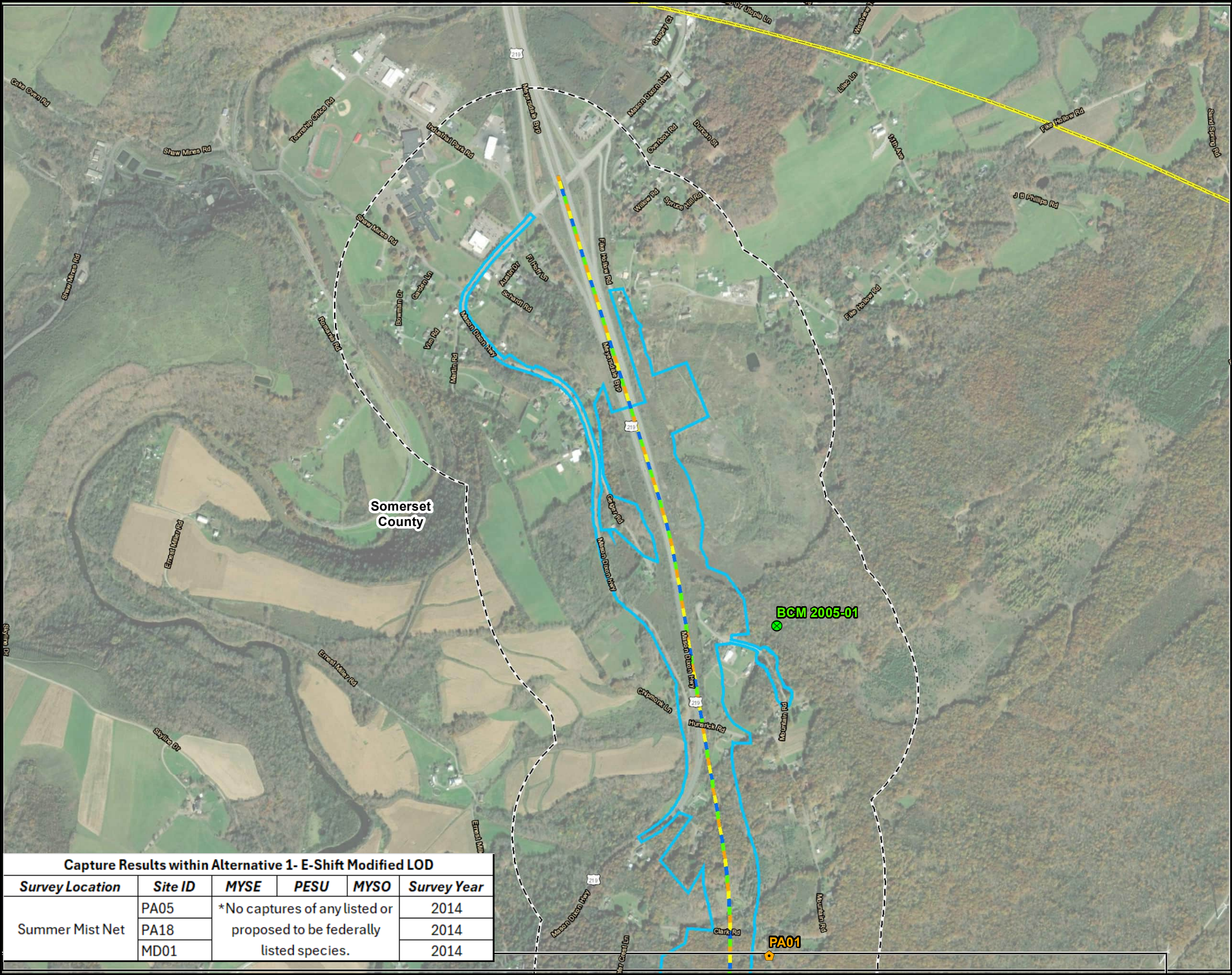


Date Saved: 01-Oct-24 Path: C:\Users\Carr\AECOM\IPNDOT - 01\_US 219 Improvement\900\_CAD\_GIS\920\_929\_GIS\_Graphics\MXD\Figure6\_Sheet\_Index\_20241001.mxd

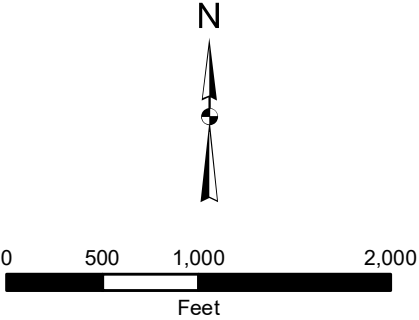
Summary of Positive Result Capture Data					
Survey Location	Site ID	MYSE	PESU	MYSO	Survey Year
Mine Openings	2005-01	7	6		2005
					2014
					2022
	2005-19		2		2005
					2014
					2022
	2005-27		2		2005
					2014
			1		2022
	2005-28	2			2005
					2014
					2022
Summer Mist Nets	Portal Site #1 (JAZ-3)	69	333		2012
		1	19		2013
	Air Shaft Site #4 (APN-2)	59	225		2012
			6		2013
	Large Mine Cave	3	4		2022
	MD02	1			2014
	PA03	1			2014
	Site 05	1			2009
	Site 07	2			
	Site 08	1			
	Site 09	2			
	Site 11	1			
	Site 12	1			
	Site 14	3			







- LEGEND:**
- Capture Data**
- Mine Opening, Positive Result
  - Summer Mist Net, Negative Result
- Route**
- Alternative 1 - E-Shift Modified
  - Alternative 2 - E Modified
  - Alternative 3 - DU-Shift Modified
  - Alternative 4 - DU Modified
- Action Area
- Alternative 1 - E-Shift Modified Limit of Disturbance
- Large Mine-Cave 5-Mile Radius
- Sheet Index
- County Boundary
- State Boundary

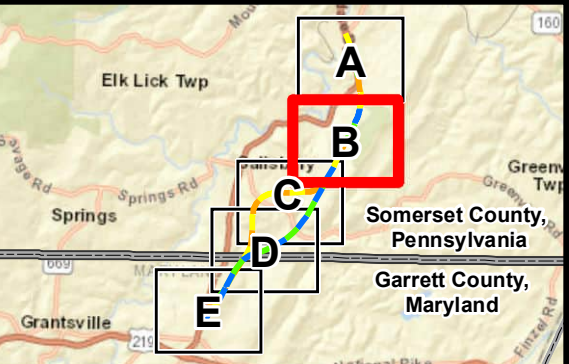
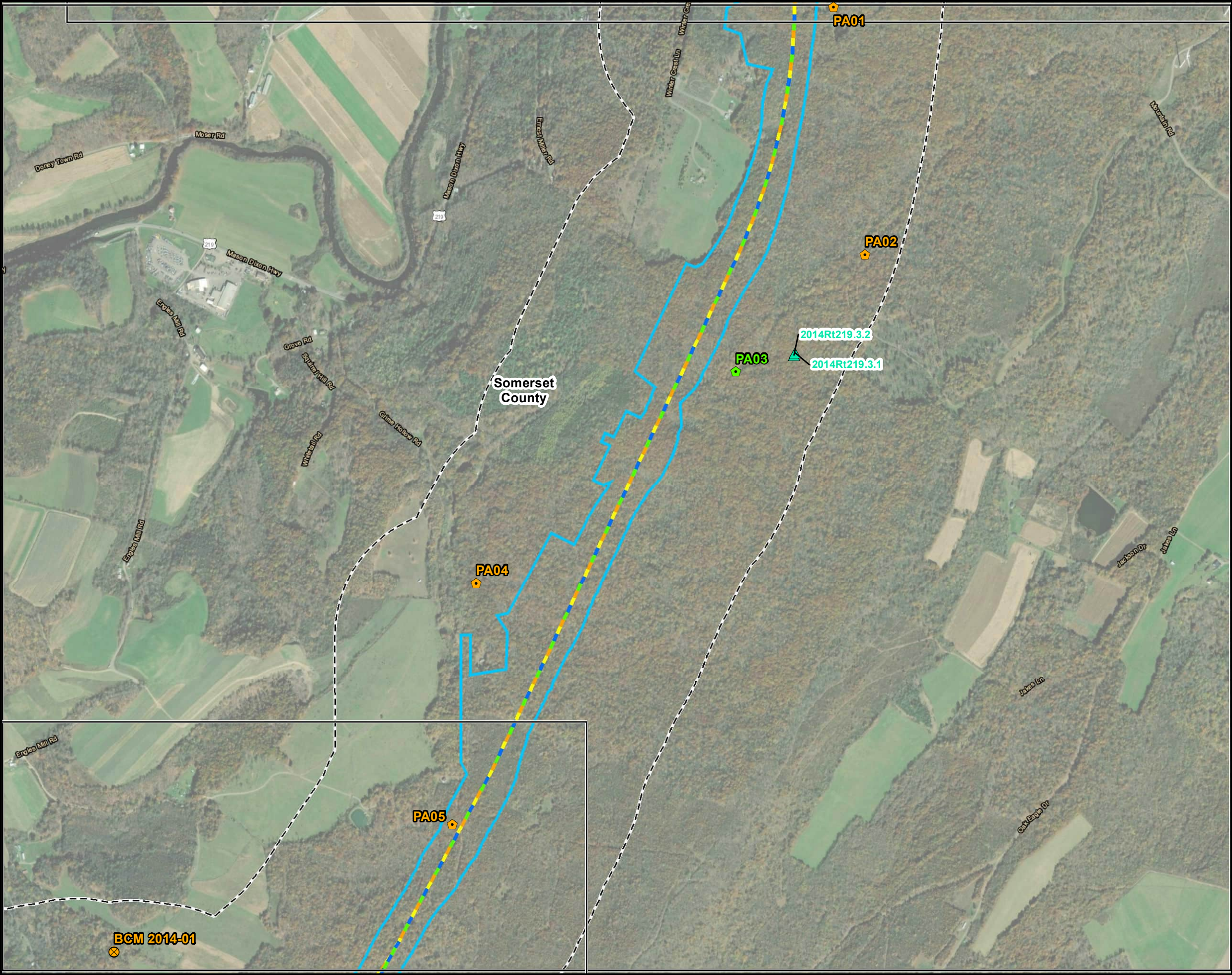


US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 6A  
CAPTURE DATA OVERVIEW  
ALTERNATIVE 1 - E-SHIFT MODIFIED

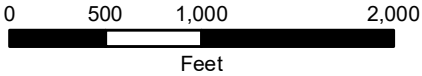






**LEGEND:**

- MYSE Roost Tree
- Capture Data**
  - Mine Opening, Negative Result
  - Summer Mist Net, Positive Result
  - Summer Mist Net, Negative Result
- Route**
  - Alternative 1 - E-Shift Modified
  - Alternative 2 - E Modified
  - Alternative 3 - DU-Shift Modified
  - Alternative 4 - DU Modified
- Action Area
- Alternative 1 - E-Shift Modified Limit of Disturbance
- Large Mine-Cave 5-Mile Radius
- Sheet Index
- County Boundary
- State Boundary

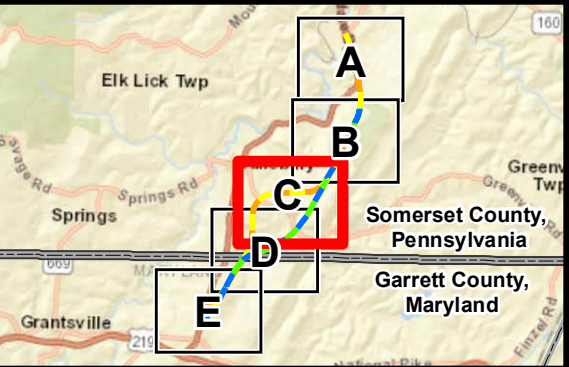
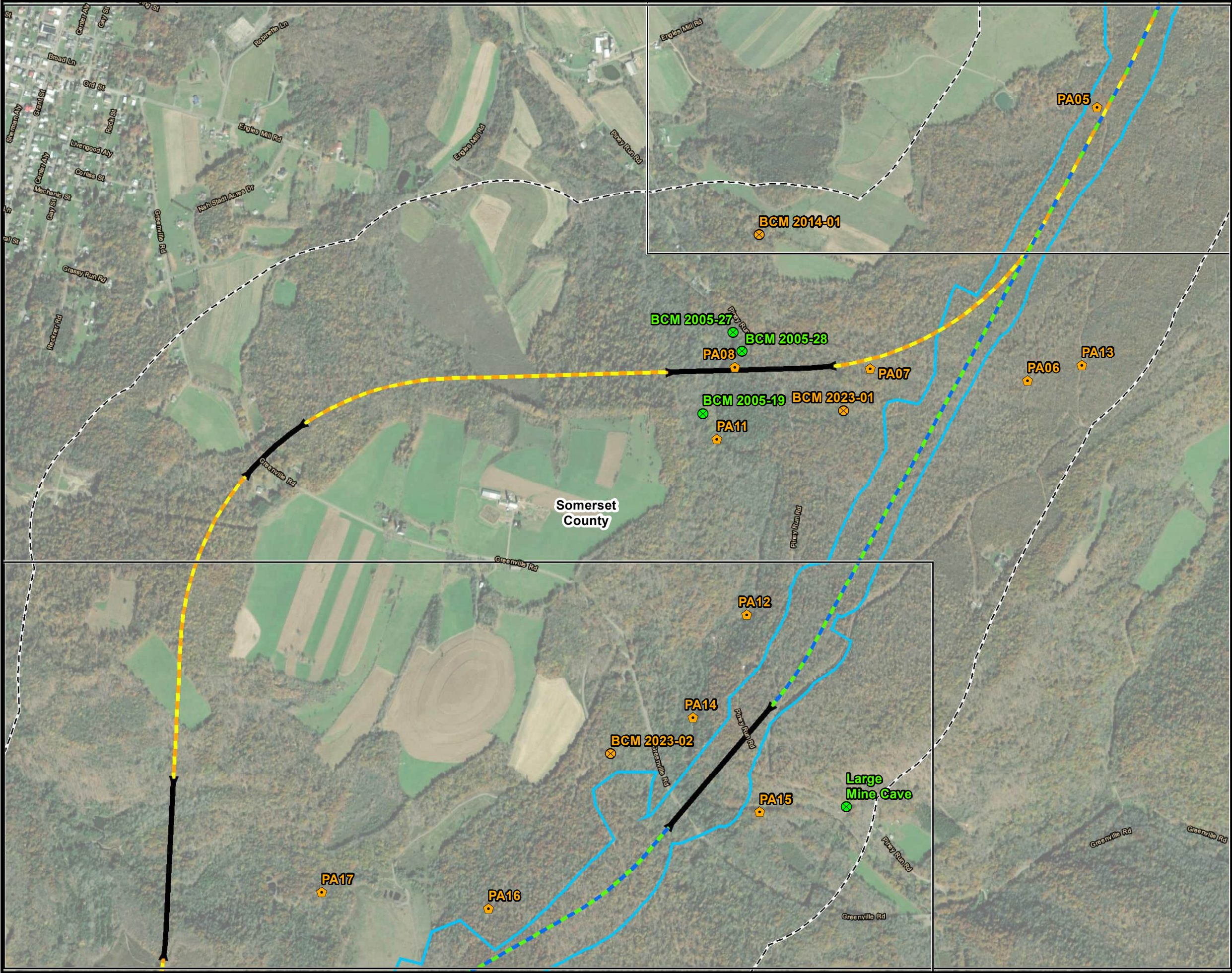


US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 6B  
CAPTURE DATA OVERVIEW  
ALTERNATIVE 1 - E-SHIFT MODIFIED







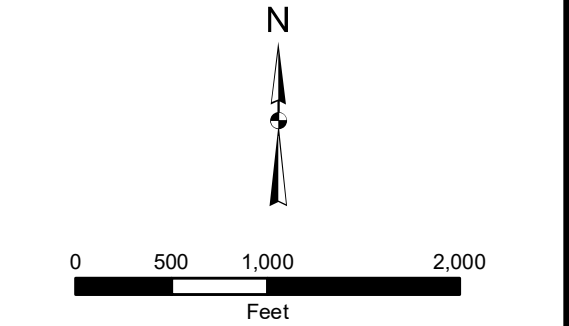
**LEGEND:**

**Capture Data**

- Mine Opening, Positive Result (Green circle with cross)
- Mine Opening, Negative Result (Orange circle with cross)
- Summer Mist Net, Negative Result (Orange pentagon)

**Route**

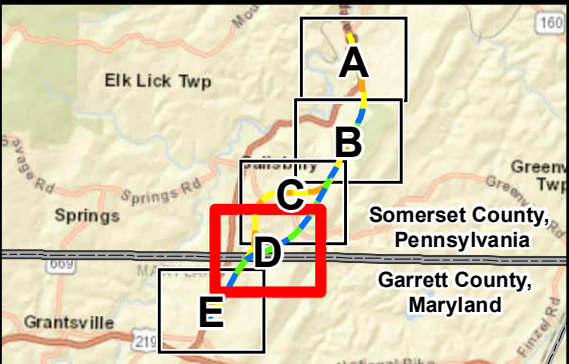
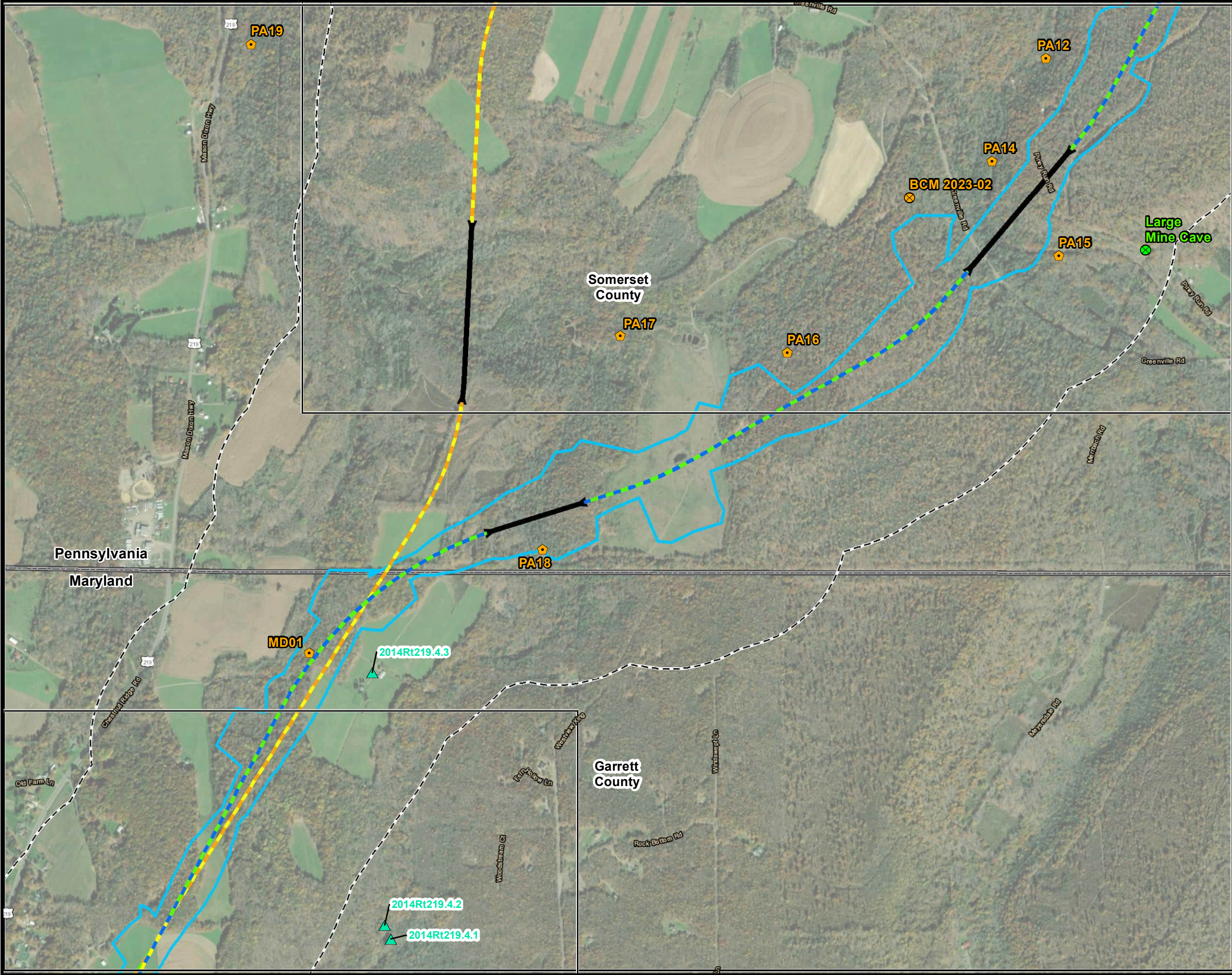
- Alternative 1 - E-Shift Modified (Blue line)
- Alternative 2 - E Modified (Green line)
- Alternative 3 - DU-Shift Modified (Yellow line)
- Alternative 4 - DU Modified (Orange line)
- Action Area (Dashed line)
- Alternative 1 - E-Shift Modified Limit of Disturbance (Blue outline)
- Proposed Bridge (Thick black line)
- Large Mine-Cave 5-Mile Radius (Yellow rectangle)
- Sheet Index (White rectangle)
- County Boundary (Grey rectangle)
- State Boundary (Thick grey rectangle)



US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

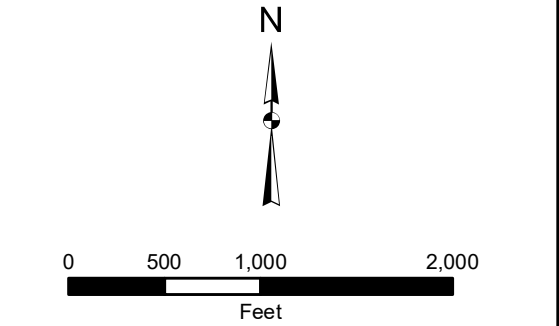
FIGURE 6C  
CAPTURE DATA OVERVIEW  
ALTERNATIVE 1 - E-SHIFT MODIFIED  
**AECOM**





**LEGEND:**

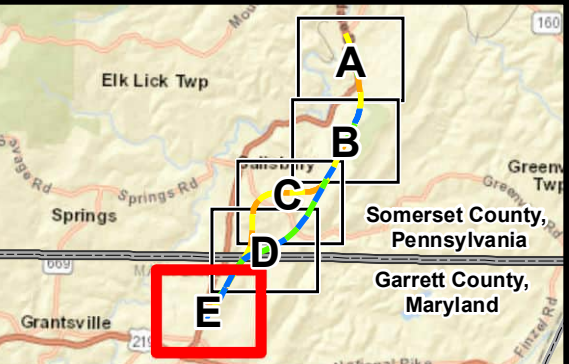
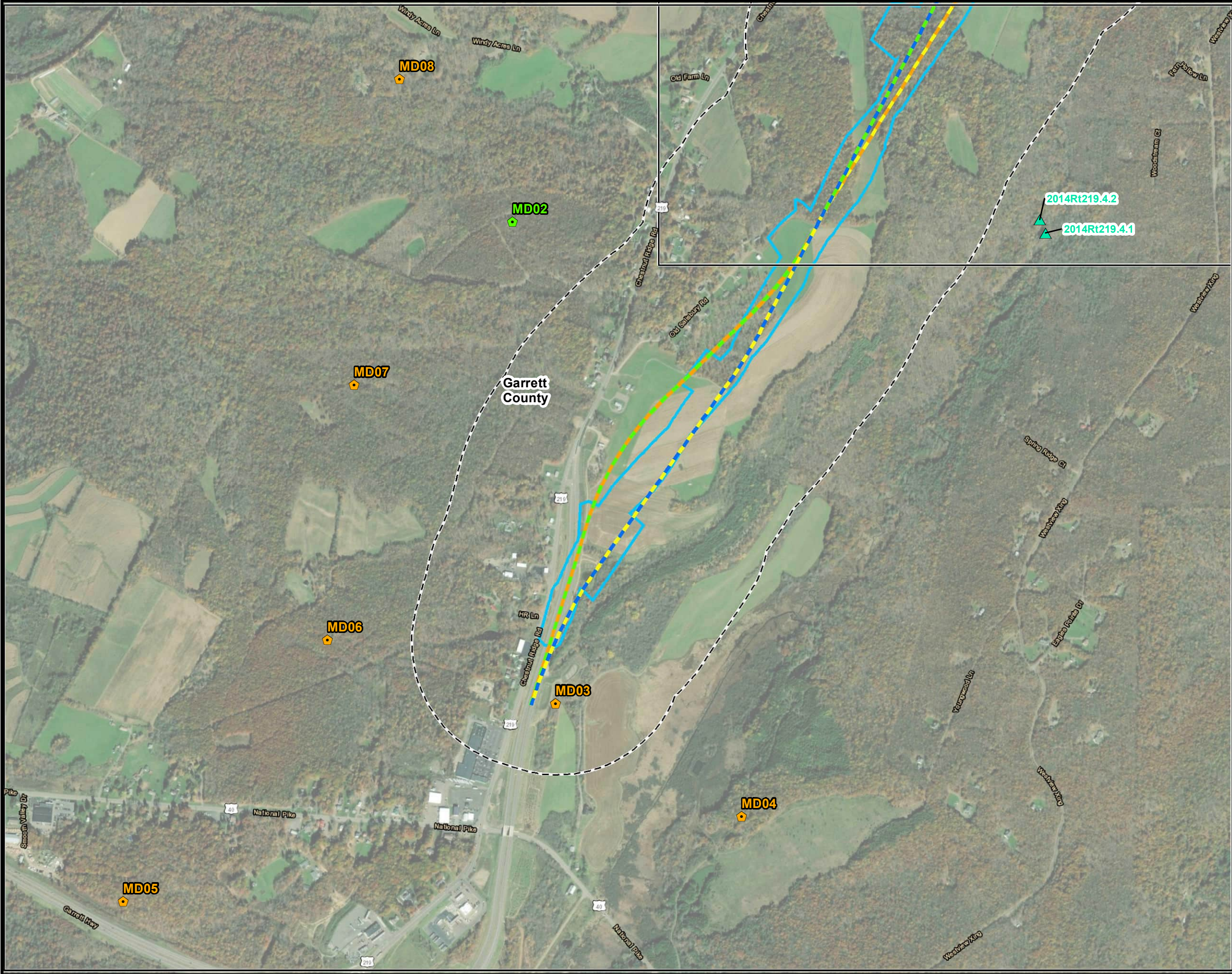
- MYSE Roost Tree
- Capture Data**
  - Mine Opening, Positive Result
  - Mine Opening, Negative Result
  - Summer Mist Net, Negative Result
- Route**
  - Alternative 1 - E-Shift Modified
  - Alternative 2 - E Modified
  - Alternative 3 - DU-Shift Modified
  - Alternative 4 - DU Modified
- Action Area
- Alternative 1 - E-Shift Modified Limit of Disturbance
- Proposed Bridge
- Large Mine-Cave 5-Mile Radius
- Sheet Index
- County Boundary
- State Boundary



US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

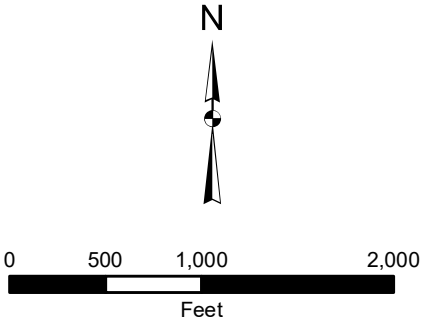
FIGURE 6D  
CAPTURE DATA OVERVIEW  
ALTERNATIVE 1 - E-SHIFT MODIFIED  
**AECOM**





**LEGEND:**

- ▲ MYSE Roost Tree
- Capture Data**
  - ◆ Summer Mist Net, Positive Result
  - ◇ Summer Mist Net, Negative Result
- Route**
  - Alternative 1 - E-Shift Modified
  - Alternative 2 - E Modified
  - Alternative 3 - DU-Shift Modified
  - Alternative 4 - DU Modified
- Action Area
- Alternative 1 - E-Shift Modified Limit of Disturbance
- Large Mine-Cave 5-Mile Radius
- Sheet Index
- County Boundary
- State Boundary

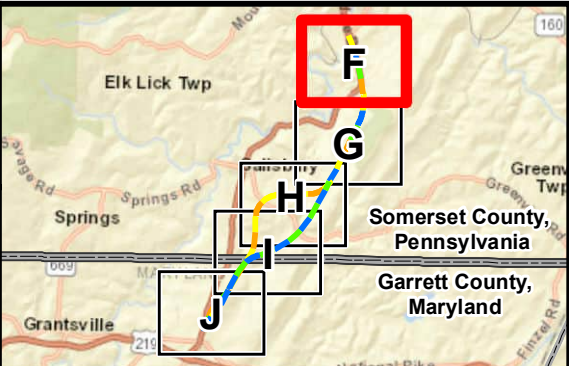
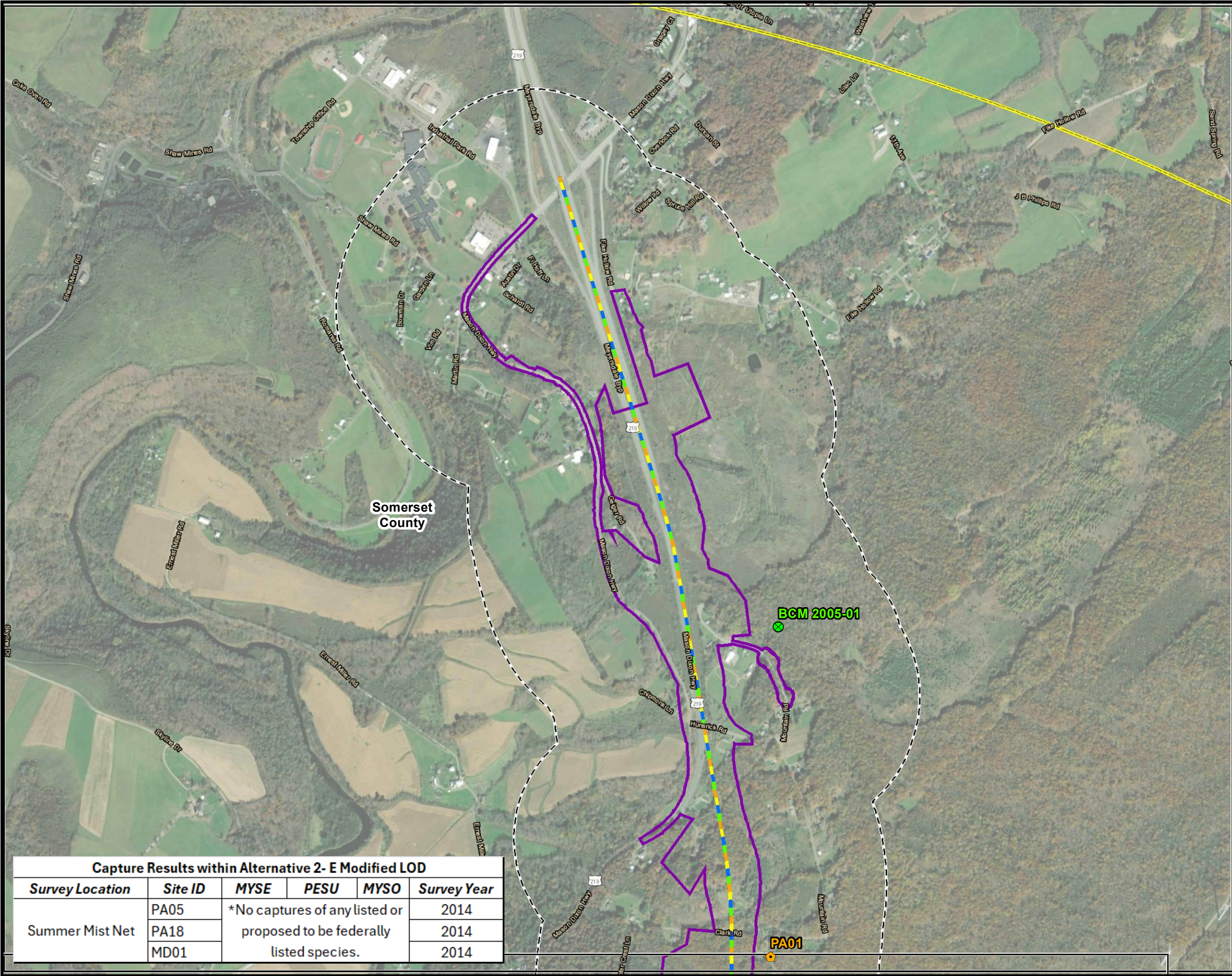


US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 6E  
CAPTURE DATA OVERVIEW  
ALTERNATIVE 1 - E-SHIFT MODIFIED







**LEGEND:**

**Capture Data**

- Mine Opening, Positive Result
- Summer Mist Net, Negative Result

**Route**

- Alternative 1 - E-Shift Modified
- Alternative 2 - E Modified
- Alternative 3 - DU-Shift Modified
- Alternative 4 - DU Modified

--- Action Area

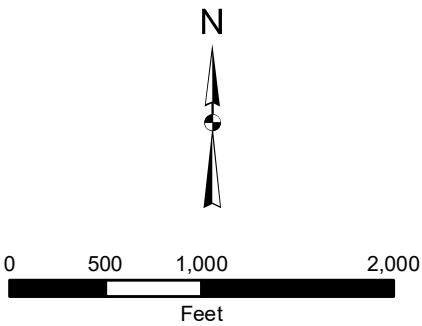
Alternative 2 - E Modified Limit of Disturbance

Large Mine-Cave 5-Mile Radius

Sheet Index

County Boundary

State Boundary



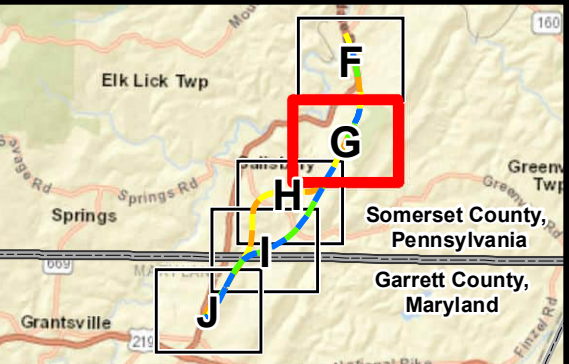
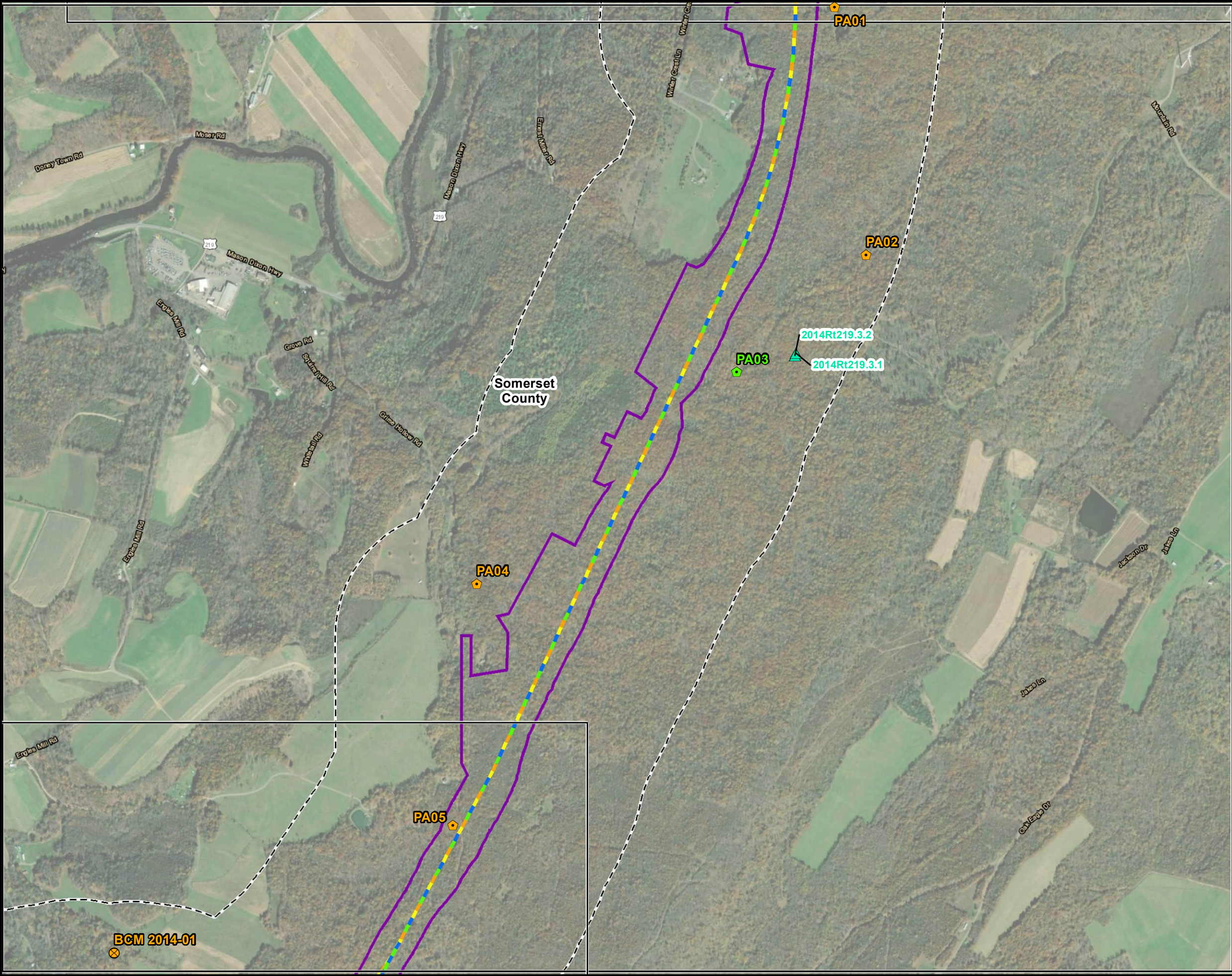
Capture Results within Alternative 2- E Modified LOD					
Survey Location	Site ID	MYSE	PESU	MYSO	Survey Year
Summer Mist Net	PA05	*No captures of any listed or proposed to be federally listed species.			2014
	PA18				2014
	MD01				2014

US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 6F  
CAPTURE DATA OVERVIEW  
ALTERNATIVE 2 - E MODIFIED

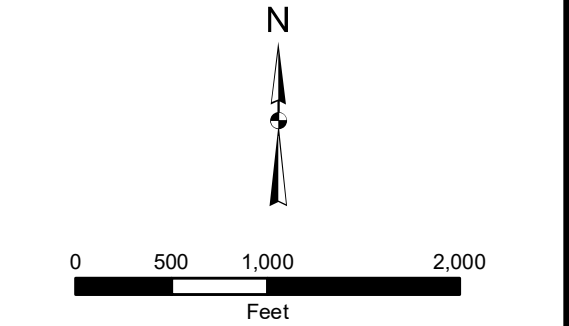






**LEGEND:**

- MYSE Roost Tree
- Capture Data**
  - Mine Opening, Negative Result
  - Summer Mist Net, Positive Result
  - Summer Mist Net, Negative Result
- Route**
  - Alternative 1 - E-Shift Modified
  - Alternative 2 - E Modified
  - Alternative 3 - DU-Shift Modified
  - Alternative 4 - DU Modified
- Action Area
- Alternative 2 - E Modified Limit of Disturbance
- Large Mine-Cave 5-Mile Radius
- Sheet Index
- County Boundary
- State Boundary

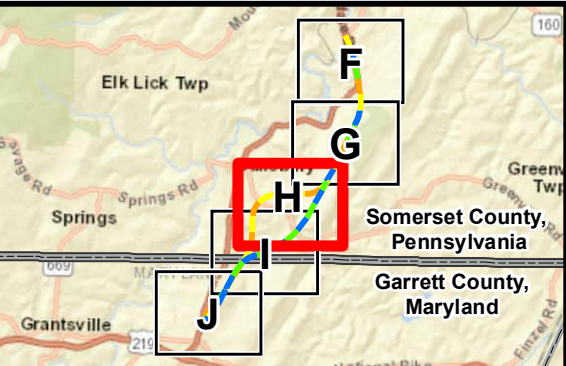
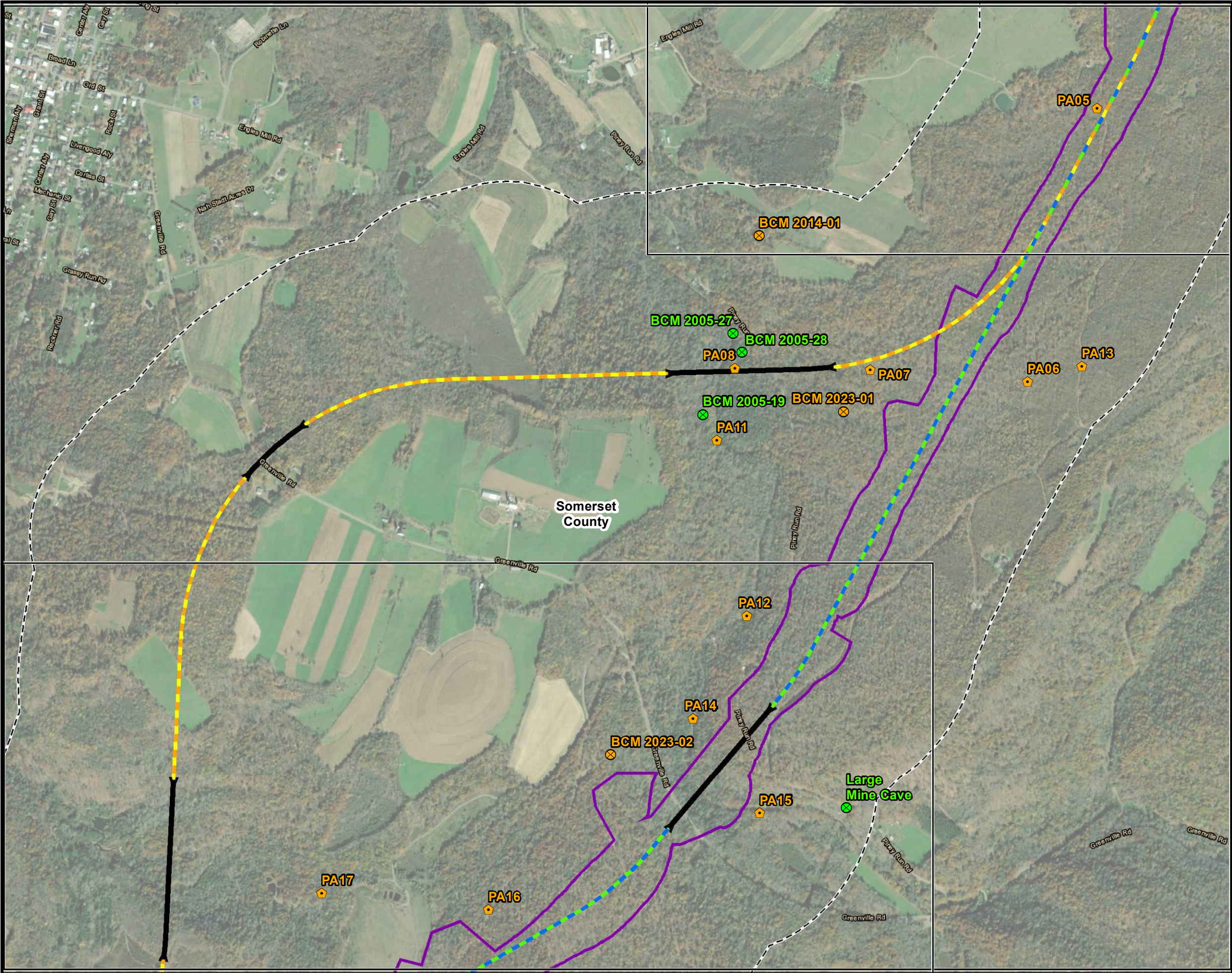


US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 6G  
CAPTURE DATA OVERVIEW  
ALTERNATIVE 2 - E MODIFIED  
**AECOM**



Date Saved: 02-Oct-24 Path: C:\Users\Carr\AECOM\IPNDOT - 01\_US 219 Improvement\900\_CAD\_GIS\920\_929\_GIS\_Graphics\MXD\Figure6\_CapturedData\_20241001.mxd



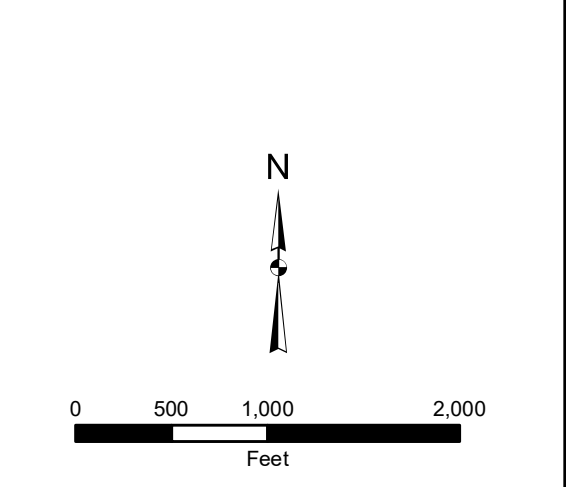
**LEGEND:**

**Capture Data**

- Mine Opening, Positive Result (Green circle with cross)
- Mine Opening, Negative Result (Orange circle with cross)
- Summer Mist Net, Negative Result (Orange pentagon)

**Route**

- Alternative 1 - E-Shift Modified (Blue line)
- Alternative 2 - E Modified (Green line)
- Alternative 3 - DU-Shift Modified (Yellow line)
- Alternative 4 - DU Modified (Orange line)
- Action Area (Dashed line)
- Alternative 2 - E Modified Limit of Disturbance (Purple line)
- Proposed Bridge (Thick black line)
- Large Mine-Cave 5-Mile Radius (Yellow rectangle)
- Sheet Index (White box)
- County Boundary (Thin grey line)
- State Boundary (Thick grey line)



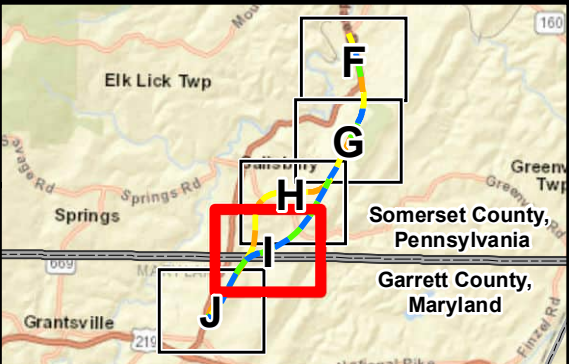
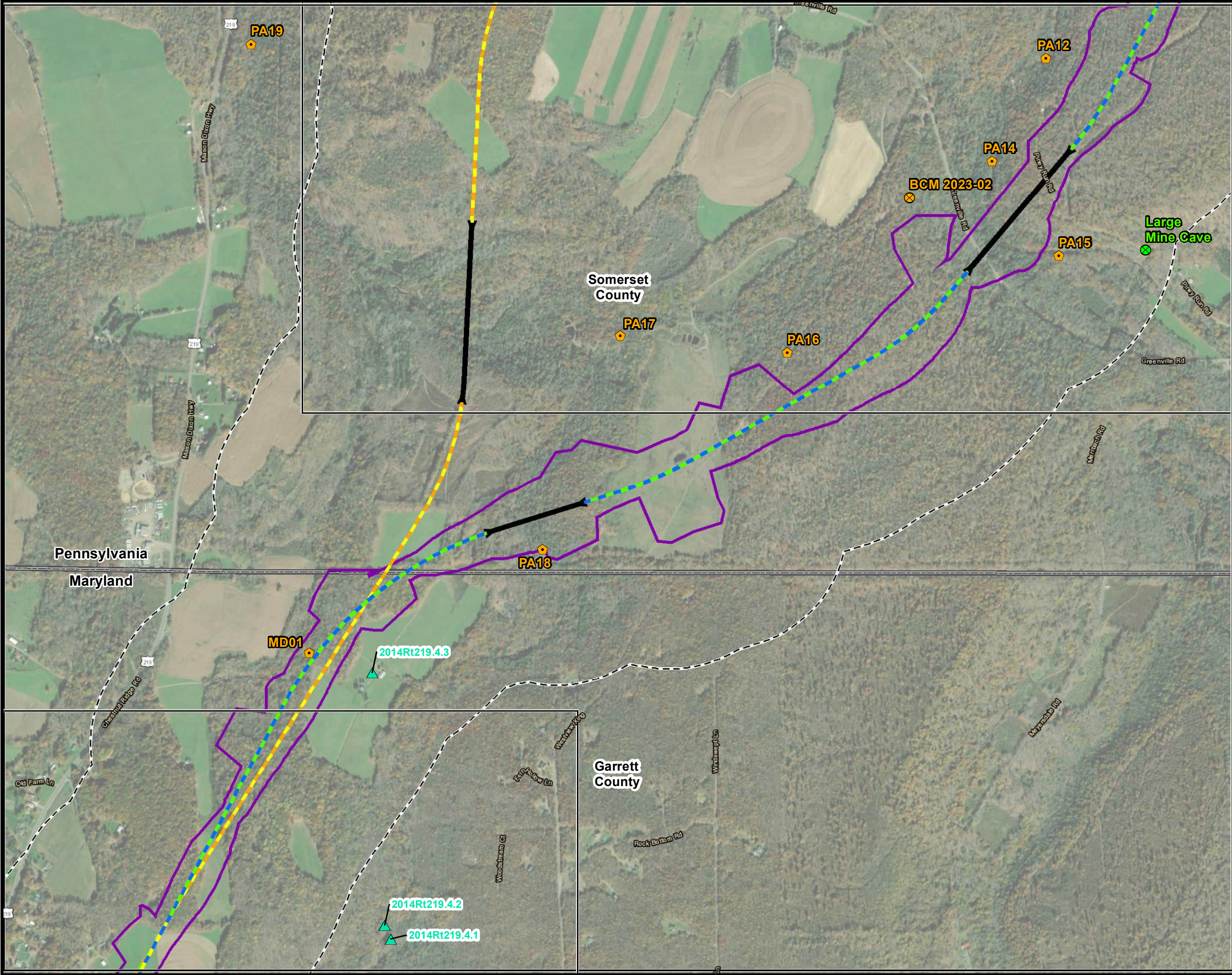
US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 6H  
CAPTURE DATA OVERVIEW  
ALTERNATIVE 2 - E MODIFIED

**AECOM**

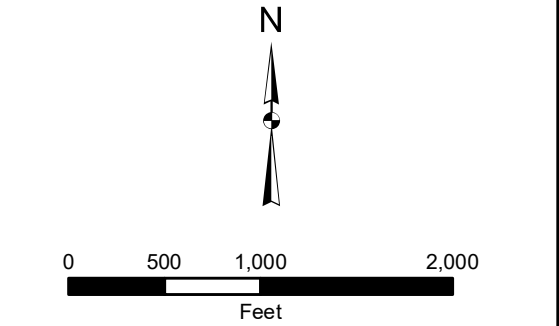
BASE MAP SOURCE: ArcGIS Online, World Imagery and Transportation Data





**LEGEND:**

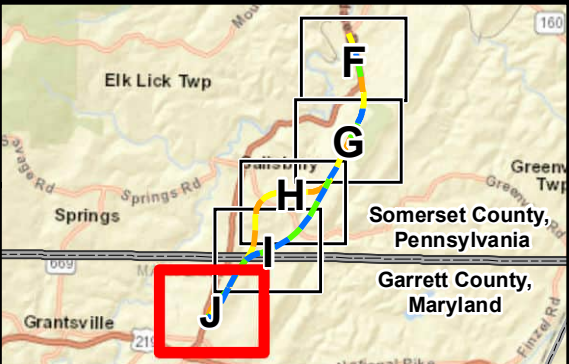
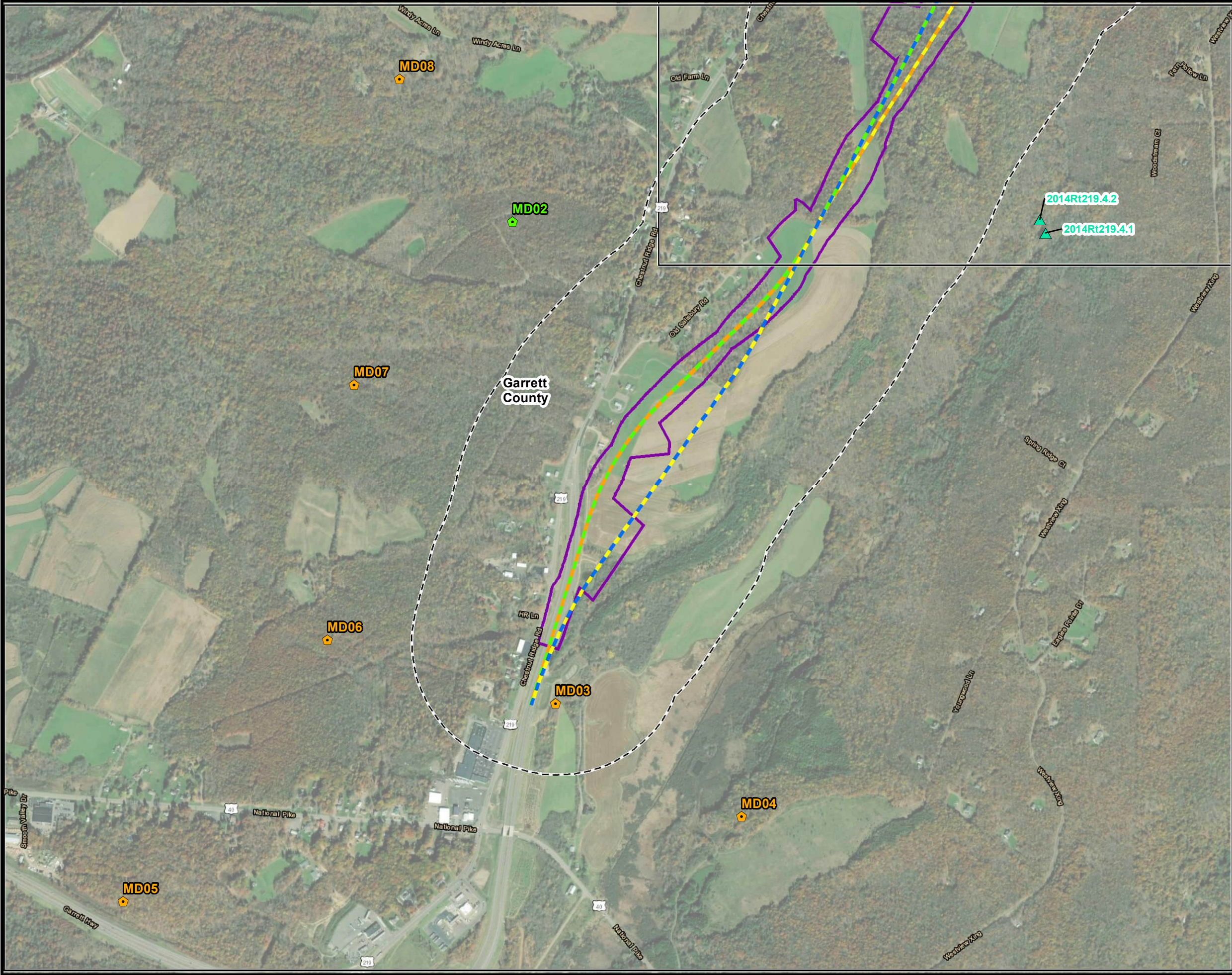
- ▲ MYSE Roost Tree
- Capture Data**
  - ⊗ Mine Opening, Positive Result
  - ⊗ Mine Opening, Negative Result
  - ⬠ Summer Mist Net, Negative Result
- Route**
  - Alternative 1 - E-Shift Modified
  - Alternative 2 - E Modified
  - Alternative 3 - DU-Shift Modified
  - Alternative 4 - DU Modified
- Action Area
- Alternative 2 - E Modified Limit of Disturbance
- Proposed Bridge
- ⬠ Large Mine-Cave 5-Mile Radius
- ⬠ Sheet Index
- ⬠ County Boundary
- ⬠ State Boundary



US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

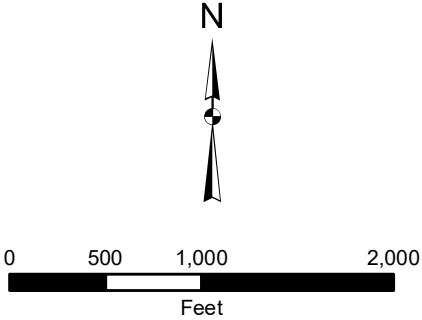
FIGURE 6I  
CAPTURE DATA OVERVIEW  
ALTERNATIVE 2 - E MODIFIED  
**AECOM**





**LEGEND:**

- ▲ MYSE Roost Tree
- Capture Data**
  - ◆ Summer Mist Net, Positive Result
  - ⬠ Summer Mist Net, Negative Result
- Route**
  - Alternative 1 - E-Shift Modified
  - Alternative 2 - E Modified
  - Alternative 3 - DU-Shift Modified
  - Alternative 4 - DU Modified
- Action Area
- Alternative 2 - E Modified Limit of Disturbance
- Large Mine-Cave 5-Mile Radius
- Sheet Index
- County Boundary
- State Boundary

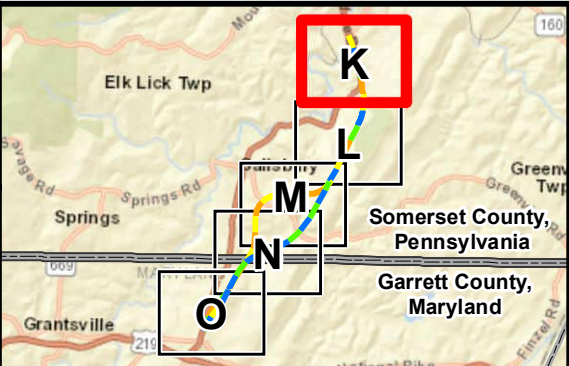
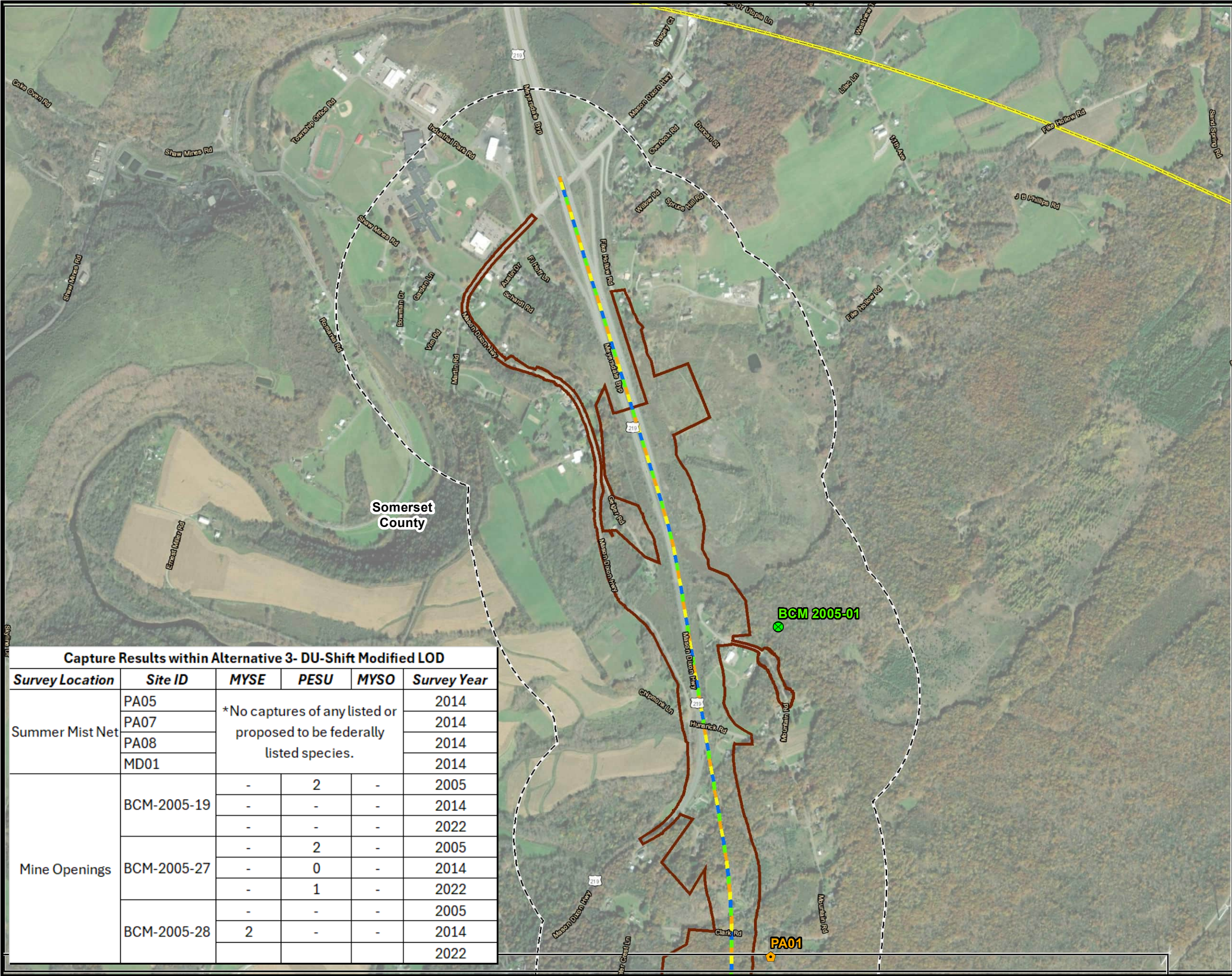


US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 6J  
CAPTURE DATA OVERVIEW  
ALTERNATIVE 2 - E MODIFIED







**LEGEND:**

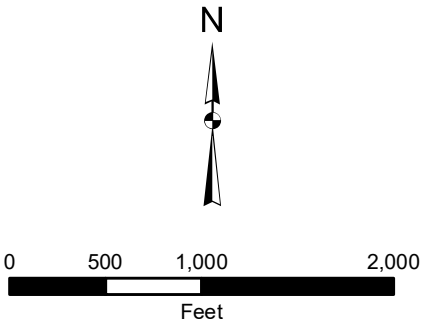
**Capture Data**

- Mine Opening, Positive Result
- Summer Mist Net, Negative Result

**Route**

- Alternative 1 - E-Shift Modified
- Alternative 2 - E Modified
- Alternative 3 - DU-Shift Modified
- Alternative 4 - DU Modified

- Action Area
- Alternative 3 - DU-Shift Modified Limit of Disturbance
- Large Mine-Cave 5-Mile Radius
- Sheet Index
- County Boundary
- State Boundary



Capture Results within Alternative 3- DU-Shift Modified LOD					
Survey Location	Site ID	MYSE	PESU	MYSO	Survey Year
Summer Mist Net	PA05	*No captures of any listed or proposed to be federally listed species.			2014
	PA07				2014
	PA08				2014
	MD01				2014
Mine Openings	BCM-2005-19	-	2	-	2005
		-	-	-	2014
		-	-	-	2022
	BCM-2005-27	-	2	-	2005
		-	0	-	2014
		-	1	-	2022
	BCM-2005-28	-	-	-	2005
		2	-	-	2014
					2022

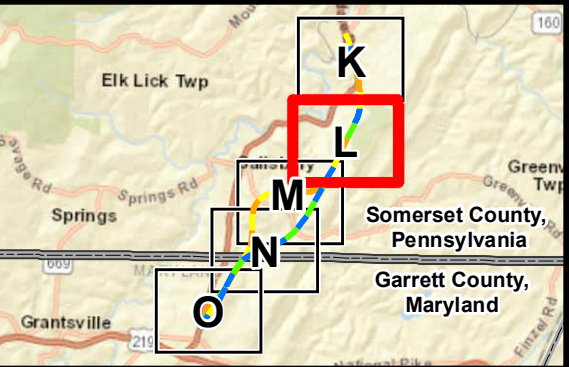
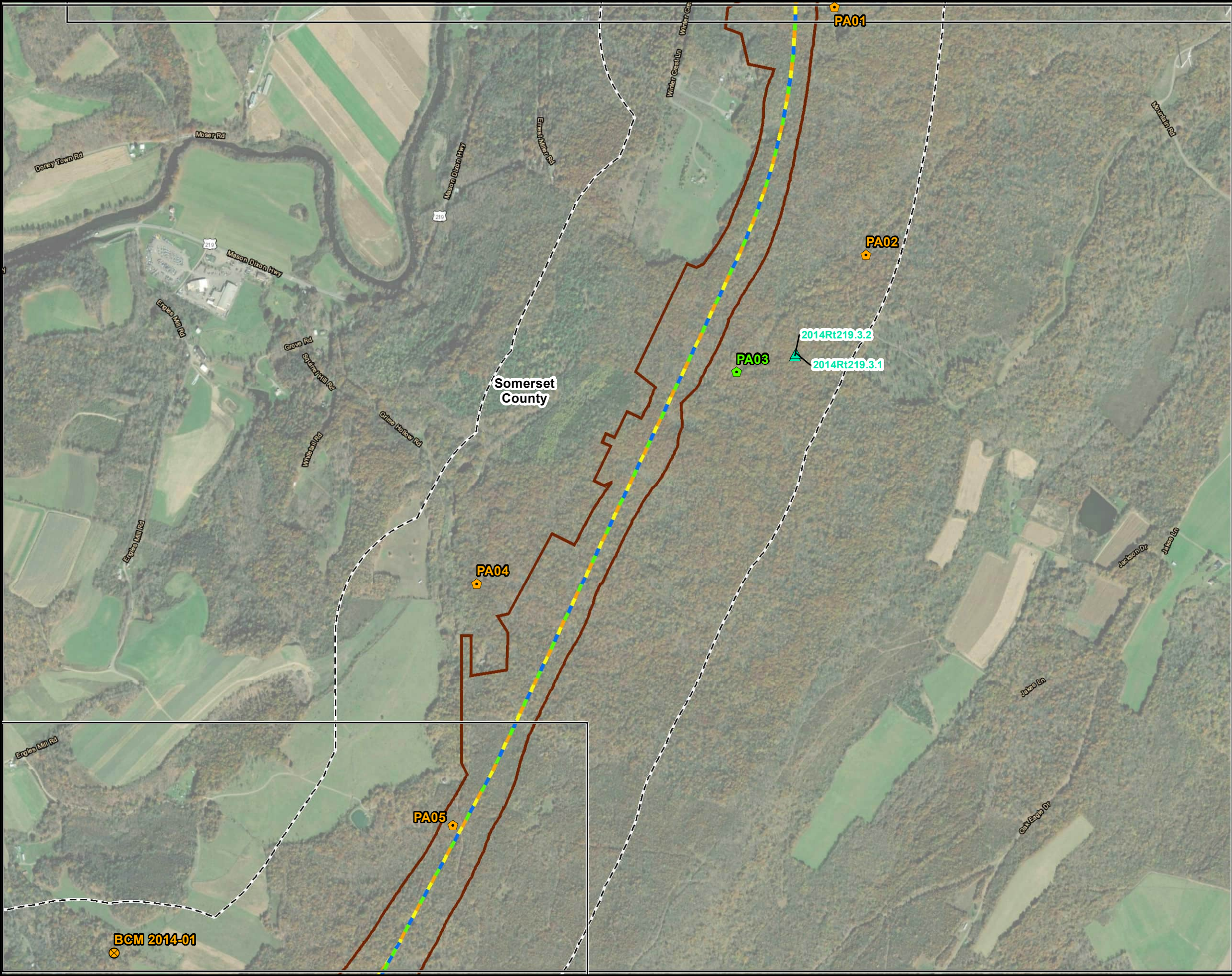
US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 6K  
CAPTURE DATA OVERVIEW  
ALTERNATIVE 3 - DU-SHIFT MODIFIED

**AECOM**

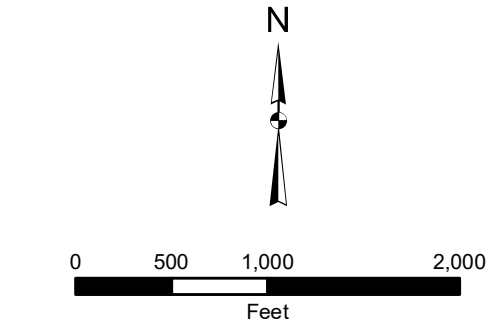


Date Saved: 02-Oct-24 Path: C:\Users\Carr\AECOM\IPNDOT - 01\_US 219 Improvement\900\_CAD\_GIS\920\_929\_GIS\_Graphics\MXD\Figure6\_CapturedData\_20241001.mxd



**LEGEND:**

- MYSE Roost Tree
- Capture Data**
  - Mine Opening, Negative Result
  - Summer Mist Net, Positive Result
  - Summer Mist Net, Negative Result
- Route**
  - Alternative 1 - E-Shift Modified
  - Alternative 2 - E Modified
  - Alternative 3 - DU-Shift Modified
  - Alternative 4 - DU Modified
- Action Area
- Alternative 3 - DU-Shift Modified Limit of Disturbance
- Large Mine-Cave 5-Mile Radius
- Sheet Index
- County Boundary
- State Boundary



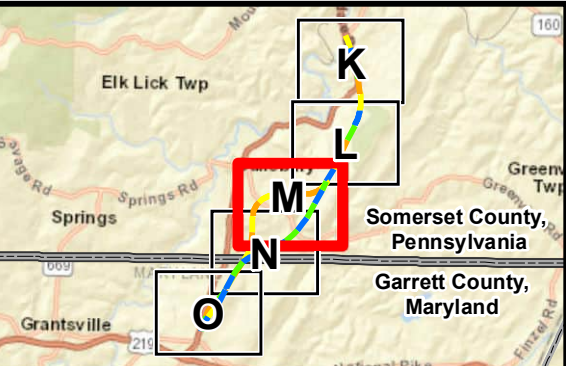
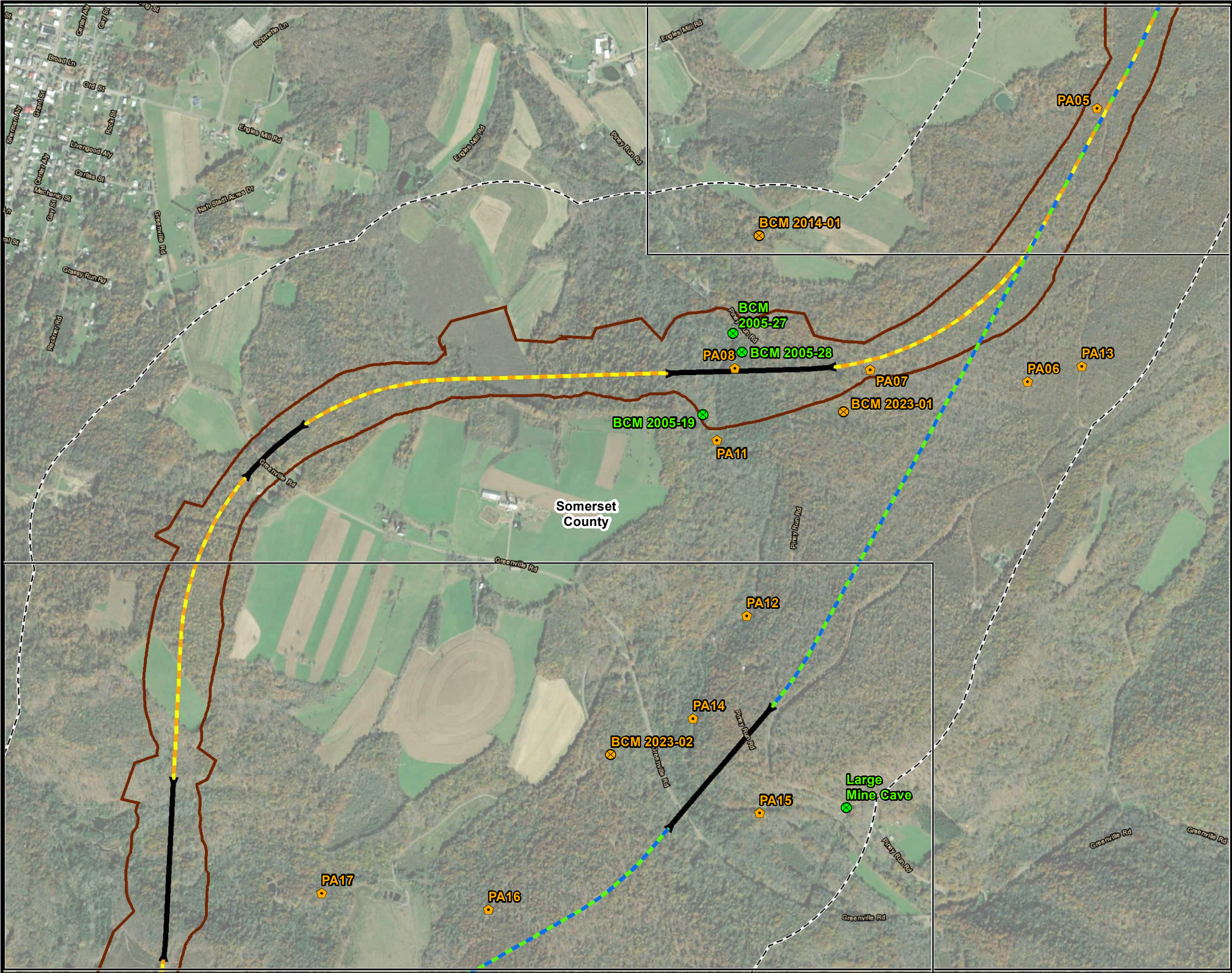
US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 6L  
CAPTURE DATA OVERVIEW  
ALTERNATIVE 3 - DU-SHIFT MODIFIED

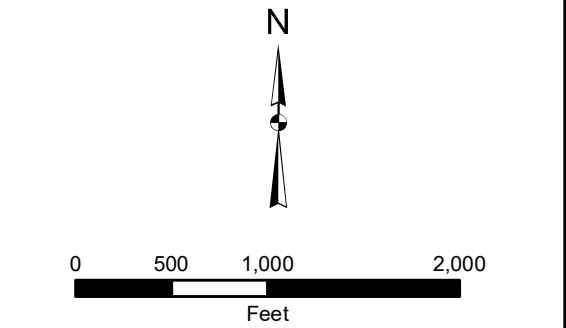
**AECOM**



Date Saved: 02-Oct-24 Path: C:\Users\Carr\AECOM\IPNDOT - 01\_US 219 Improvement\900\_CAD\_GIS\920\_929\_GIS\_Graphics\MXD\Figure6\_CapturedData\_20241001.mxd



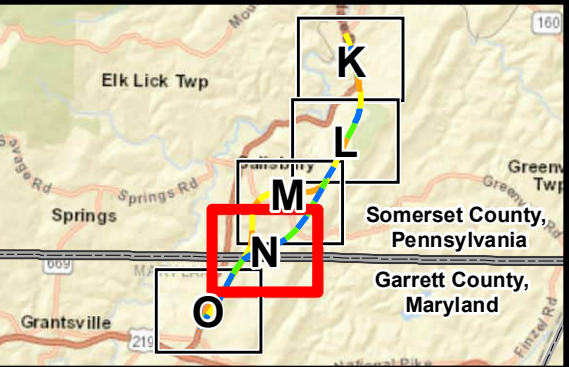
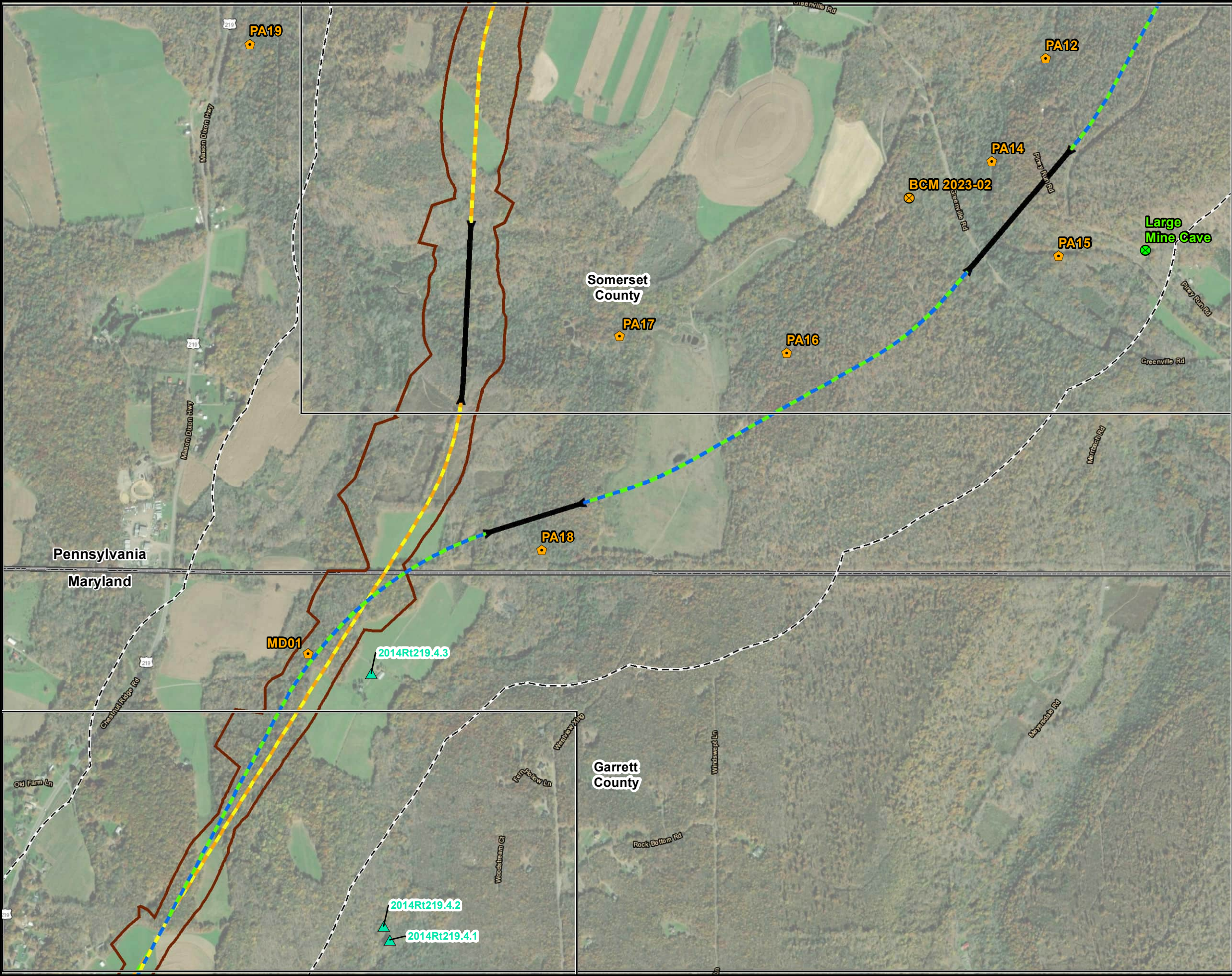
- LEGEND:**
- Capture Data**
- Mine Opening, Positive Result
  - Mine Opening, Negative Result
  - Summer Mist Net, Negative Result
- Route**
- Alternative 1 - E-Shift Modified
  - Alternative 2 - E Modified
  - Alternative 3 - DU-Shift Modified
  - Alternative 4 - DU Modified
  - Action Area
  - Alternative 3 - DU-Shift Modified Limit of Disturbance
  - Proposed Bridge
  - Large Mine-Cave 5-Mile Radius
  - Sheet Index
  - County Boundary
  - State Boundary



US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

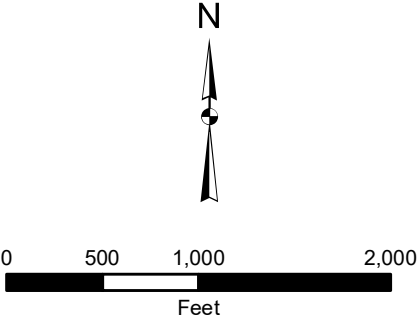
FIGURE 6M  
CAPTURE DATA OVERVIEW  
ALTERNATIVE 3 - DU-SHIFT MODIFIED  
**AECOM**





**LEGEND:**

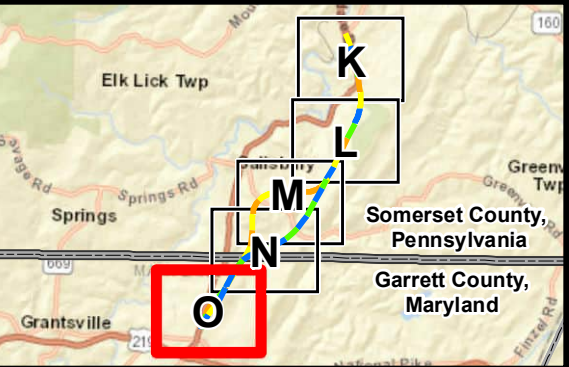
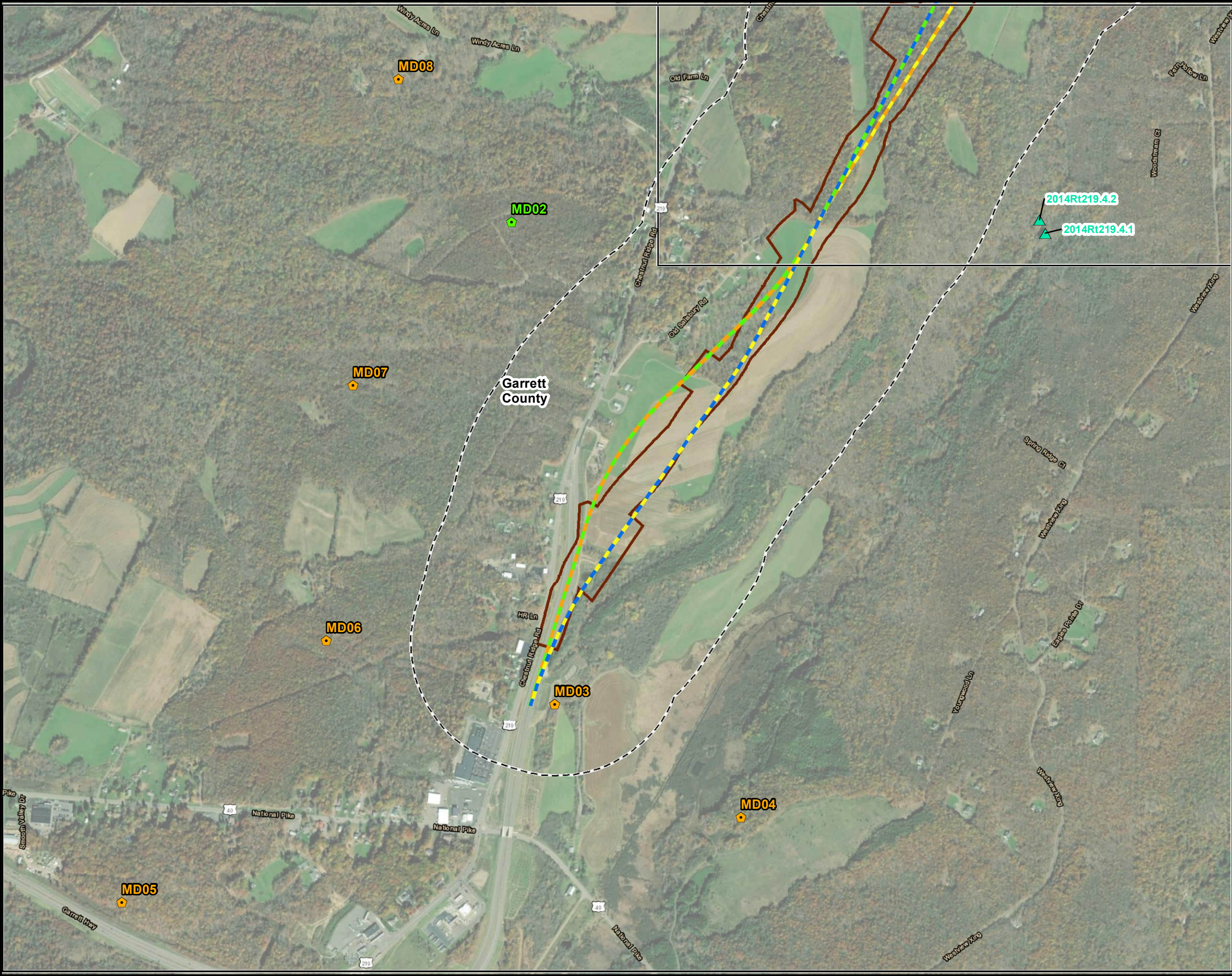
- MYSE Roost Tree
- Capture Data**
  - Mine Opening, Positive Result
  - Mine Opening, Negative Result
  - Summer Mist Net, Negative Result
- Route**
  - Alternative 1 - E-Shift Modified
  - Alternative 2 - E Modified
  - Alternative 3 - DU-Shift Modified
  - Alternative 4 - DU Modified
- Action Area
- Alternative 3 - DU-Shift Modified Limit of Disturbance
- Proposed Bridge
- Large Mine-Cave 5-Mile Radius
- Sheet Index
- County Boundary
- State Boundary



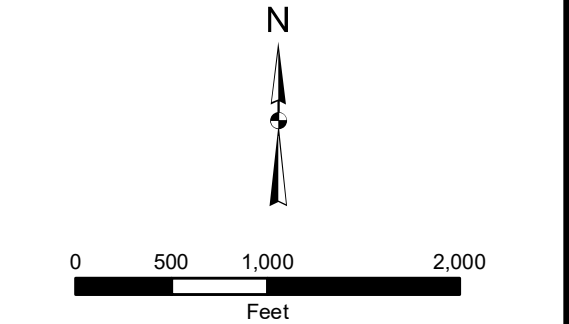
US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 6N  
CAPTURE DATA OVERVIEW  
ALTERNATIVE 3 - DU-SHIFT MODIFIED  
**AECOM**





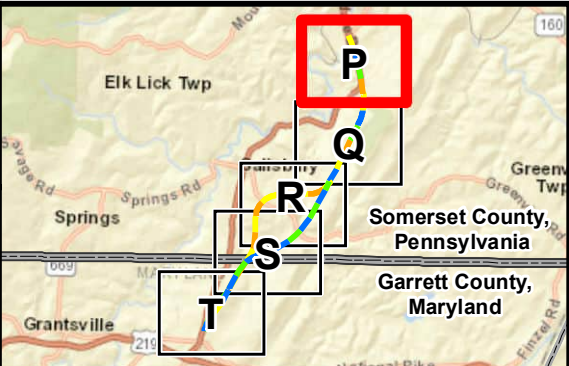
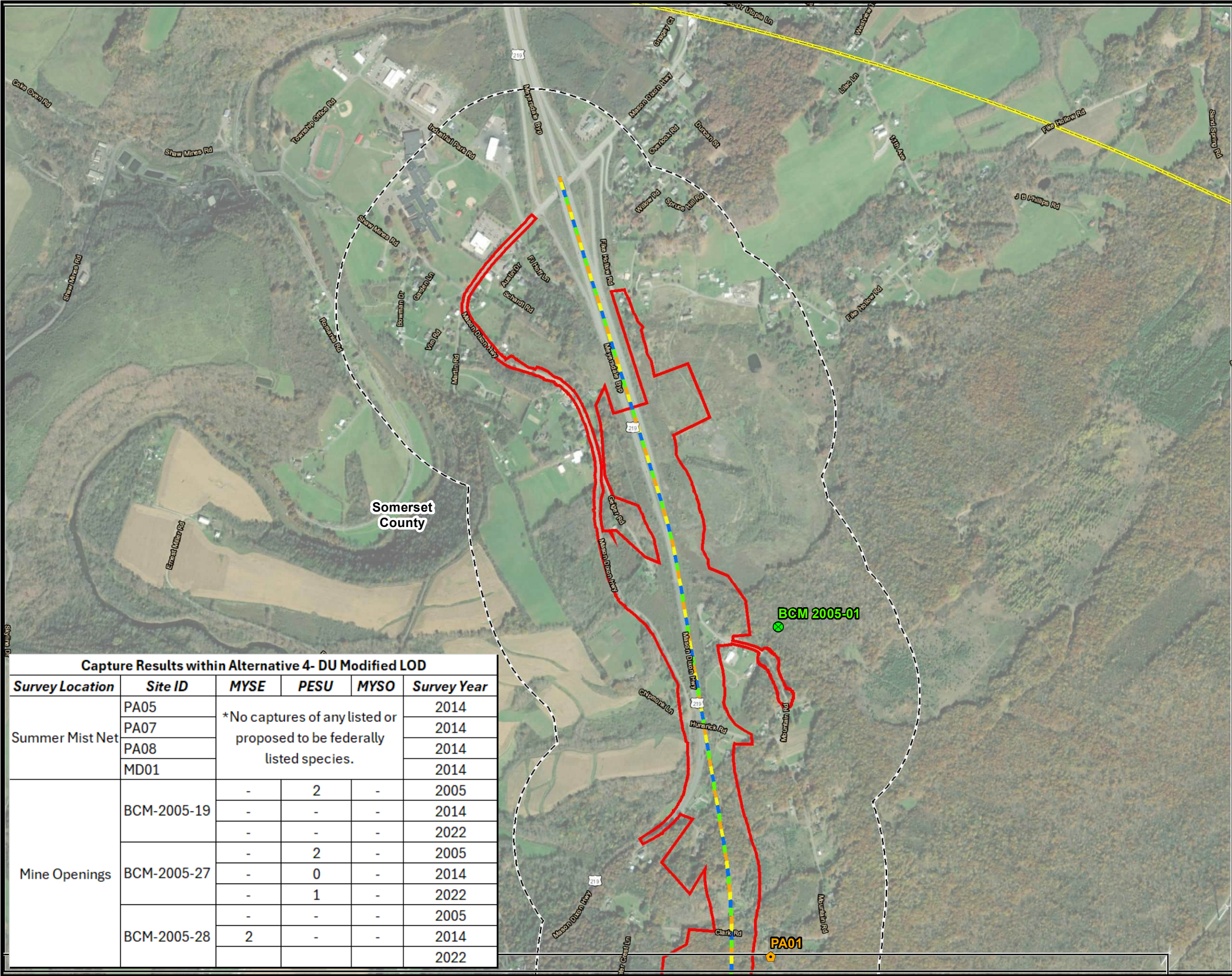
- LEGEND:**
- MYSE Roost Tree
  - Capture Data**
    - Summer Mist Net, Positive Result
    - Summer Mist Net, Negative Result
  - Route**
    - Alternative 1 - E-Shift Modified
    - Alternative 2 - E Modified
    - Alternative 3 - DU-Shift Modified
    - Alternative 4 - DU Modified
  - Action Area
  - Alternative 3 - DU-Shift Modified Limit of Disturbance
  - Large Mine-Cave 5-Mile Radius
  - Sheet Index
  - County Boundary
  - State Boundary



US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 60  
CAPTURE DATA OVERVIEW  
ALTERNATIVE 3 - DU-SHIFT MODIFIED  
**AECOM**





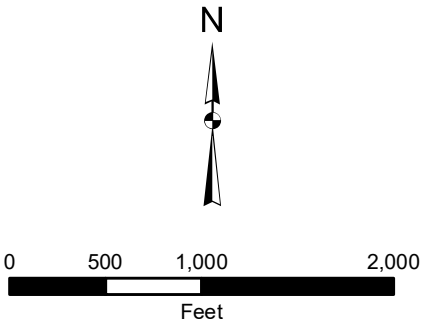
**LEGEND:**

**Capture Data**

- Mine Opening, Positive Result
- Summer Mist Net, Negative Result

**Route**

- Alternative 1 - E-Shift Modified
- Alternative 2 - E Modified
- Alternative 3 - DU-Shift Modified
- Alternative 4 - DU Modified
- Action Area
- Alternative 4 - DU Modified Limit of Disturbance
- Large Mine-Cave 5-Mile Radius
- Sheet Index
- County Boundary
- State Boundary



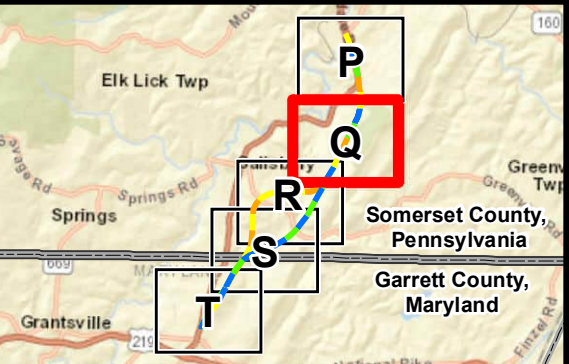
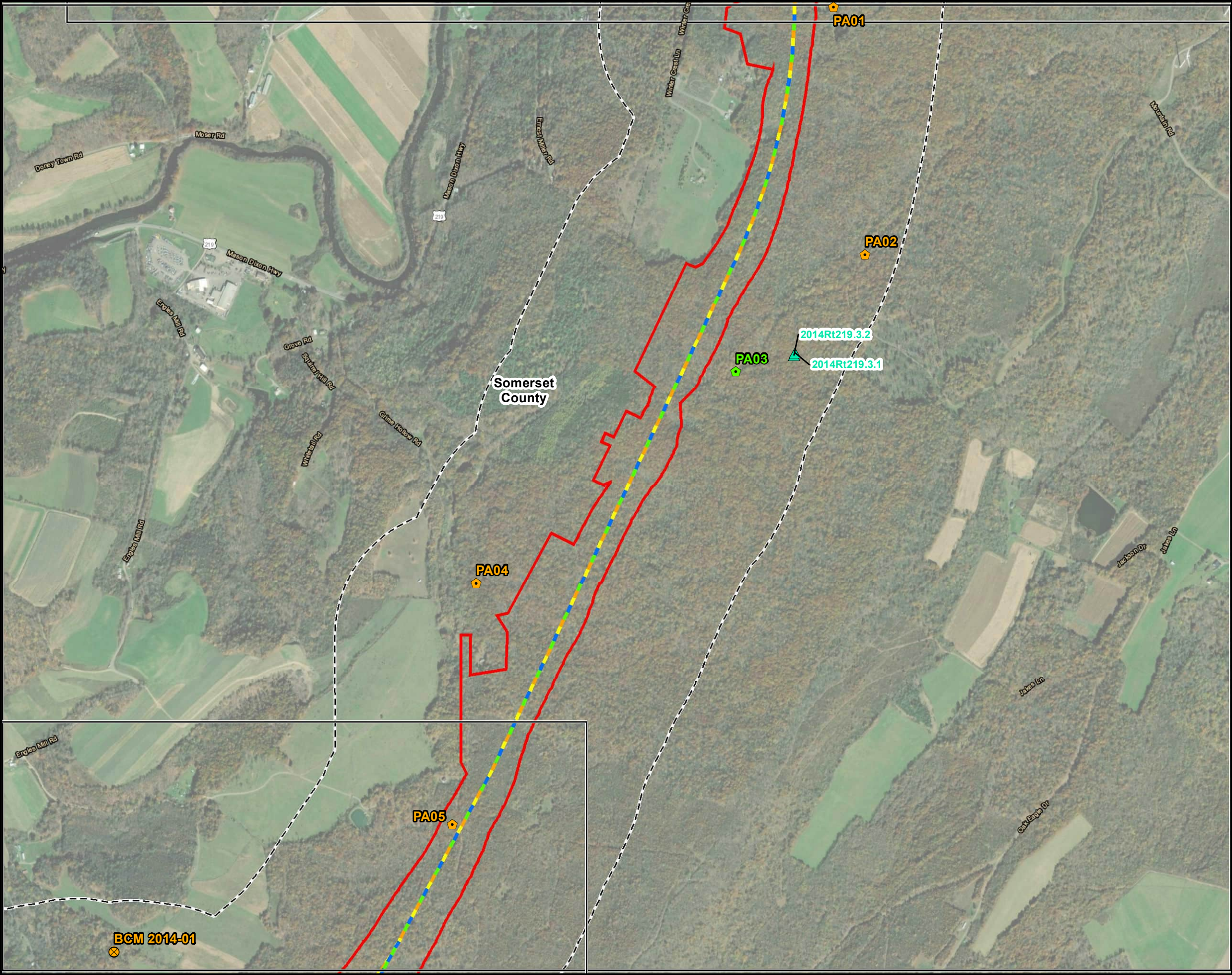
Capture Results within Alternative 4- DU Modified LOD					
Survey Location	Site ID	MYSE	PESU	MYSO	Survey Year
Summer Mist Net	PA05	*No captures of any listed or proposed to be federally listed species.			2014
	PA07				2014
	PA08				2014
	MD01				2014
Mine Openings	BCM-2005-19	-	2	-	2005
		-	-	-	2014
		-	-	-	2022
	BCM-2005-27	-	2	-	2005
		-	0	-	2014
		-	1	-	2022
	BCM-2005-28	-	-	-	2005
		2	-	-	2014
					2022

US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 6P  
CAPTURE DATA OVERVIEW  
ALTERNATIVE 4 - DU MODIFIED

**AECOM**





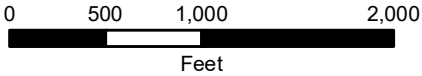
**LEGEND:**

- MYSE Roost Tree
- Capture Data**
  - Mine Opening, Negative Result
  - Summer Mist Net, Positive Result
  - Summer Mist Net, Negative Result

**Route**

- Alternative 1 - E-Shift Modified
- Alternative 2 - E Modified
- Alternative 3 - DU-Shift Modified
- Alternative 4 - DU Modified

- Action Area
- Alternative 4 - DU Modified Limit of Disturbance
- Large Mine-Cave 5-Mile Radius
- Sheet Index
- County Boundary
- State Boundary



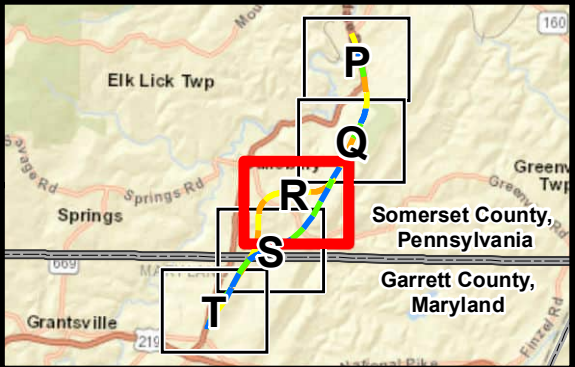
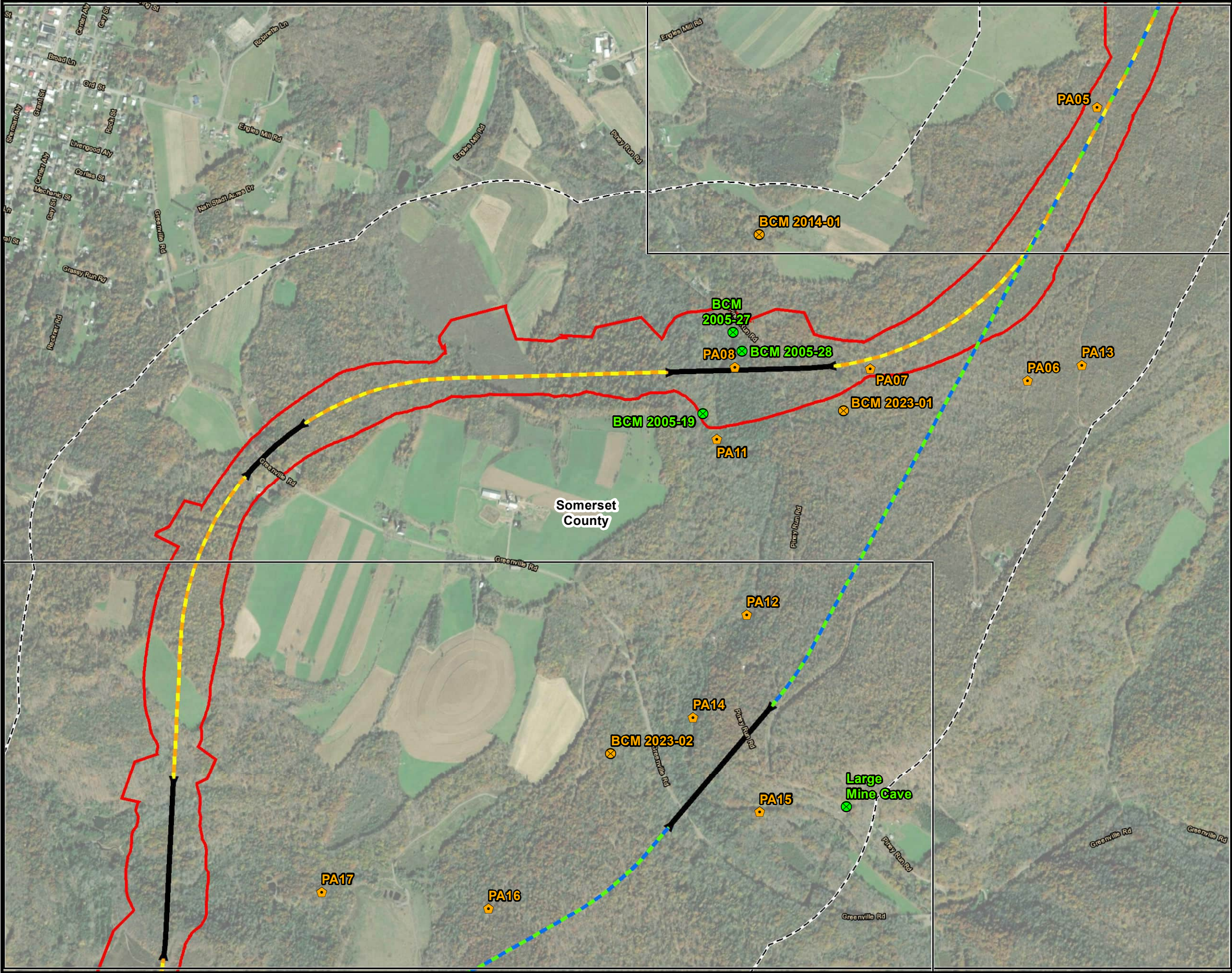
US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 6Q  
CAPTURE DATA OVERVIEW  
ALTERNATIVE 4 - DU MODIFIED





Date Saved: 02-Oct-24 Path: C:\Users\Carr\AECOM\IPNDOT - 01\_US 219 Improvement\900\_CAD\_GIS\920\_929\_GIS\_Graphics\MXD\Figure6\_CapturedData\_20241001.mxd



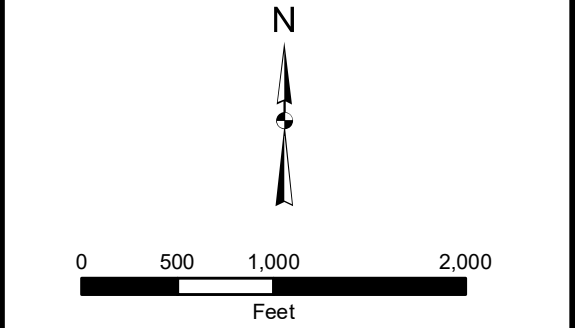
**LEGEND:**

**Capture Data**

- Mine Opening, Positive Result
- Mine Opening, Negative Result
- Summer Mist Net, Negative Result

**Route**

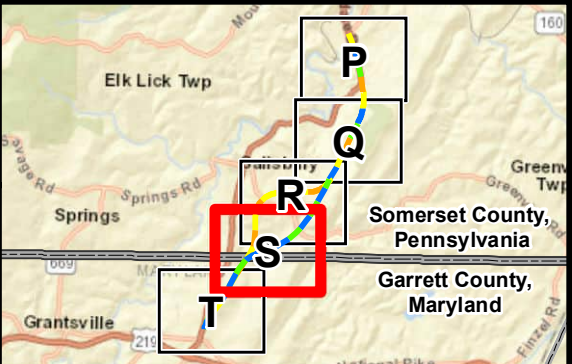
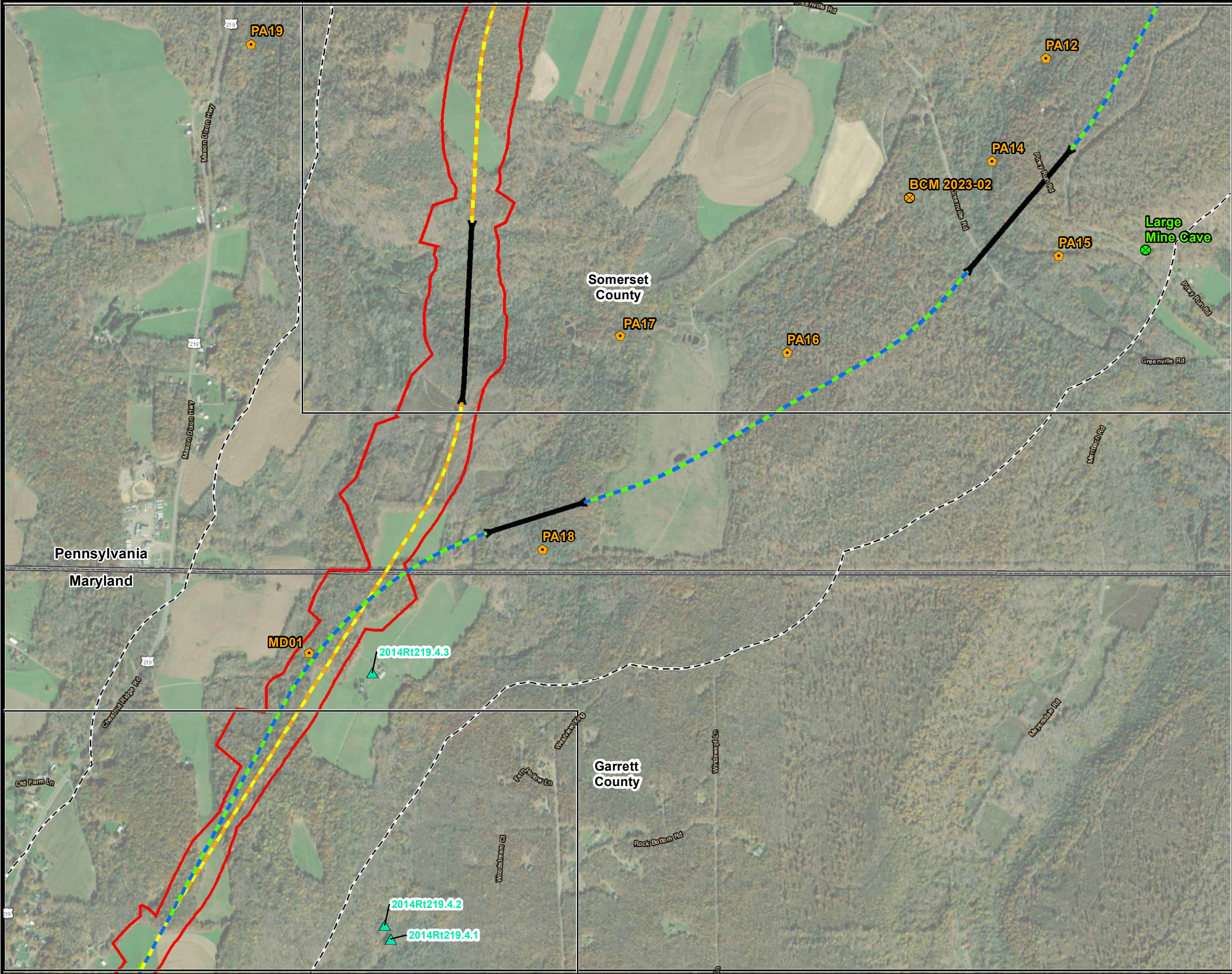
- Alternative 1 - E-Shift Modified
- Alternative 2 - E Modified
- Alternative 3 - DU-Shift Modified
- Alternative 4 - DU Modified
- Action Area
- Alternative 4 - DU Modified Limit of Disturbance
- Proposed Bridge
- Large Mine-Cave 5-Mile Radius
- Sheet Index
- County Boundary
- State Boundary



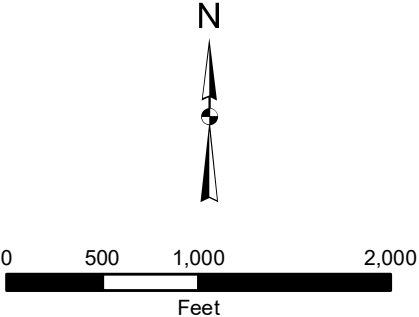
US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 6R  
CAPTURE DATA OVERVIEW  
ALTERNATIVE 4 - DU MODIFIED  
**AECOM**





- LEGEND:**
- MYSE Roost Tree
  - Capture Data**
    - Mine Opening, Positive Result
    - Mine Opening, Negative Result
    - Summer Mist Net, Negative Result
  - Route**
    - Alternative 1 - E-Shift Modified
    - Alternative 2 - E Modified
    - Alternative 3 - DU-Shift Modified
    - Alternative 4 - DU Modified
  - Action Area
  - Alternative 4 - DU Modified Limit of Disturbance
  - Proposed Bridge
  - Large Mine-Cave 5-Mile Radius
  - Sheet Index
  - County Boundary
  - State Boundary

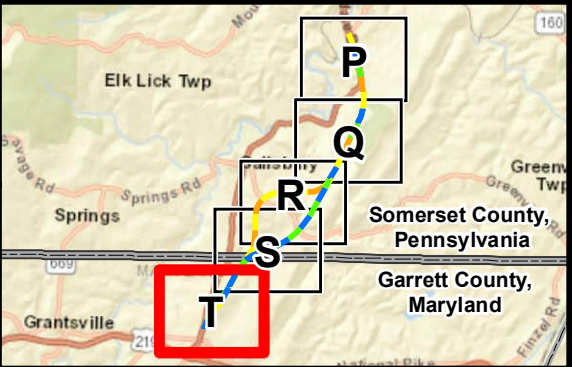
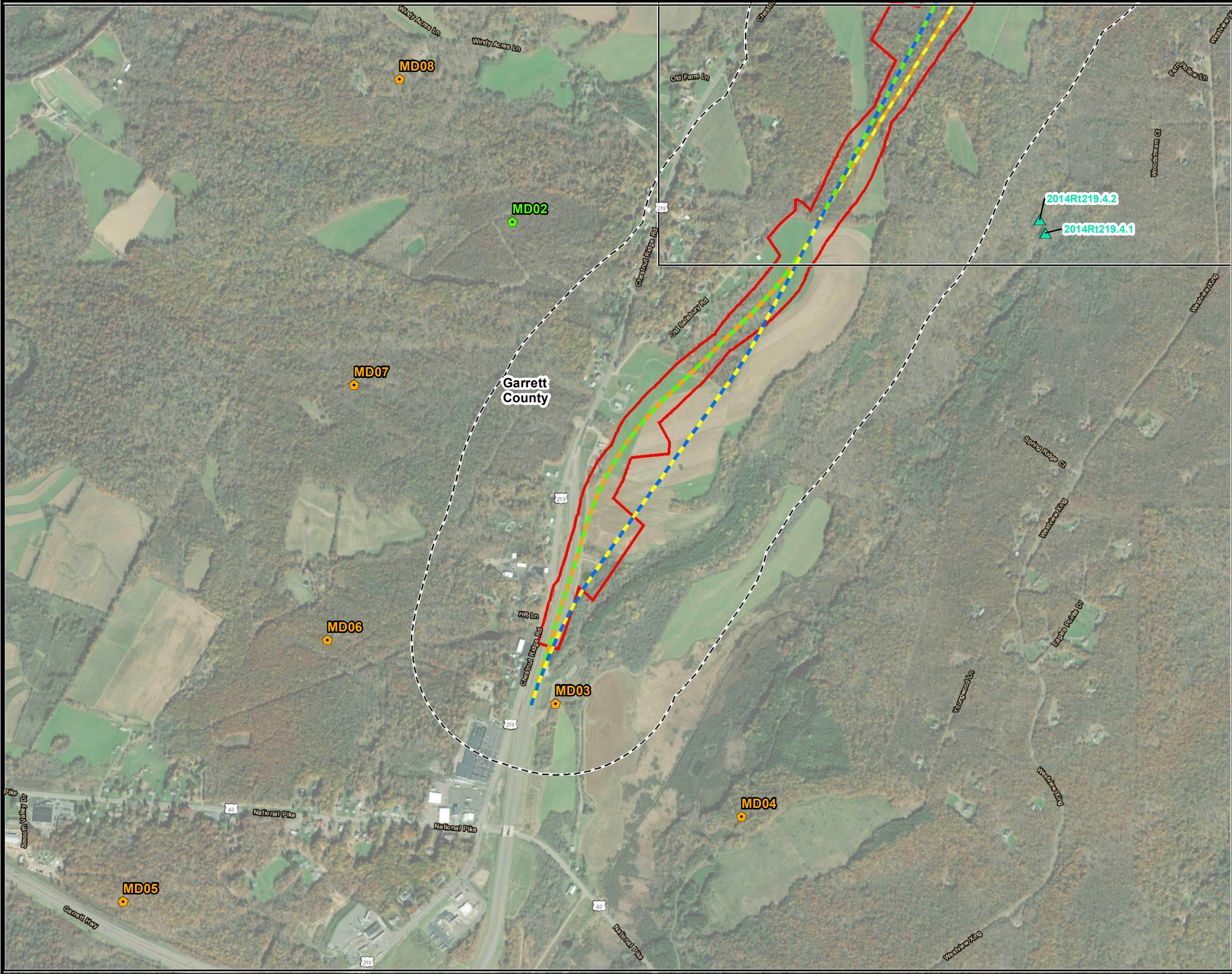


US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 6S  
CAPTURE DATA OVERVIEW  
ALTERNATIVE 4 - DU MODIFIED

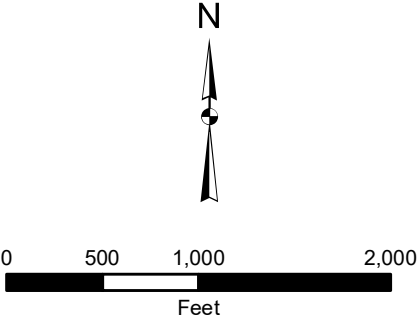






**LEGEND:**

- MYSE Roost Tree
- Capture Data**
  - Summer Mist Net, Positive Result
  - Summer Mist Net, Negative Result
- Route**
  - Alternative 1 - E-Shift Modified
  - Alternative 2 - E Modified
  - Alternative 3 - DU-Shift Modified
  - Alternative 4 - DU Modified
- Action Area
- Alternative 4 - DU Modified Limit of Disturbance
- Large Mine-Cave 5-Mile Radius
- Sheet Index
- County Boundary
- State Boundary



US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

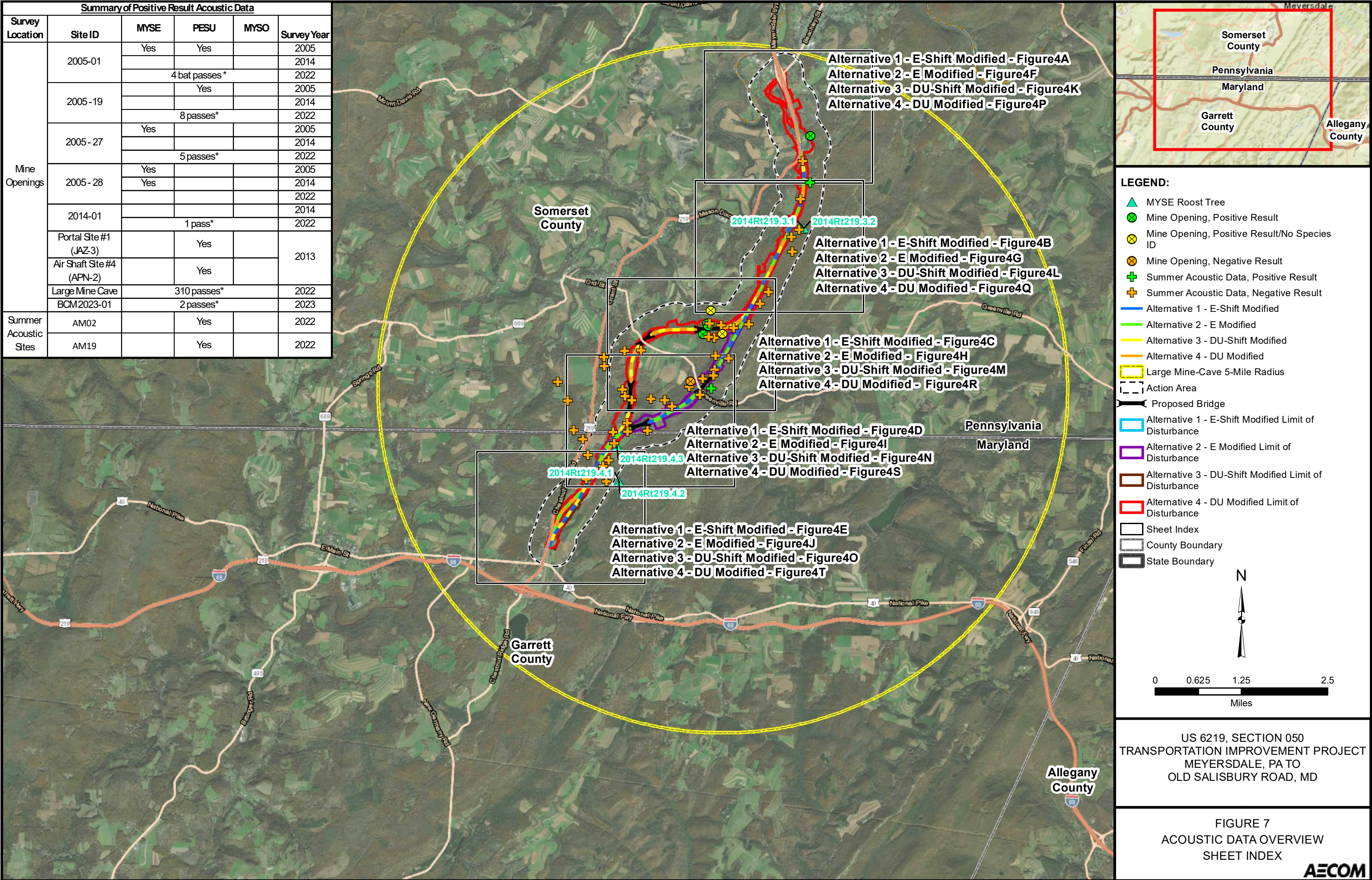
FIGURE 6T  
CAPTURE DATA OVERVIEW  
ALTERNATIVE 4 - DU MODIFIED



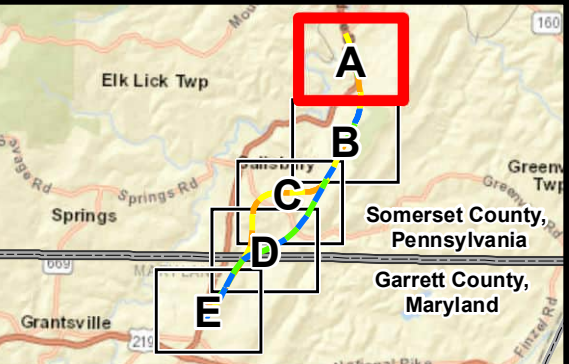
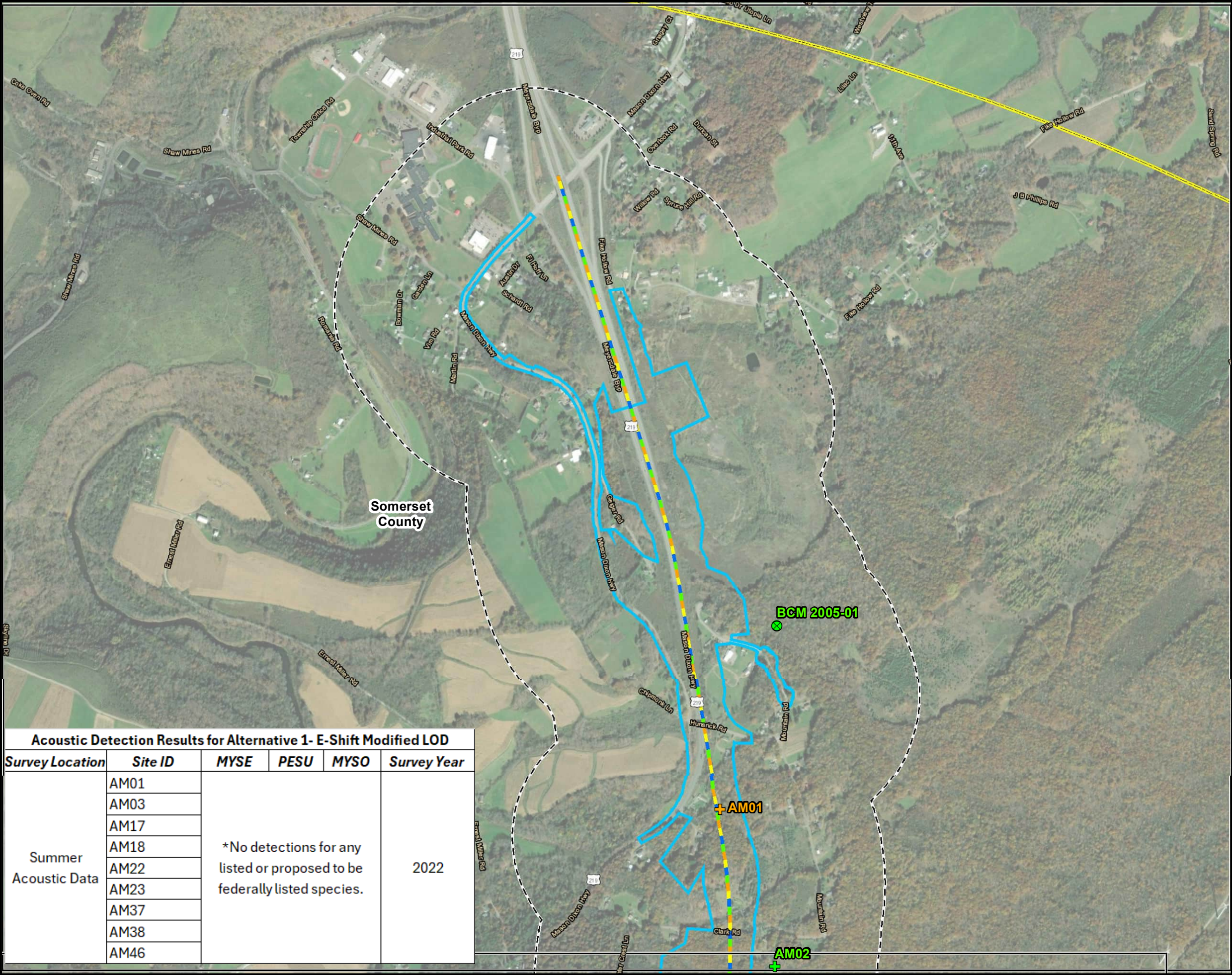


Date Saved: 02-Oct-24 Path: C:\Users\Carr\AECOM\IPNDOT - 01\_US 219 Improvement\900\_CAD\_GIS\920\_929\_GIS\_Graphics\MXD\Figure7\_Sheet\_Index\_20241001.mxd

Summary of Positive Result Acoustic Data					
Survey Location	Site ID	MYSE	PESU	MYSO	Survey Year
Mine Openings	2005-01	Yes	Yes		2005
					2014
		4 bat passes*			2022
	2005 - 19		Yes		2005
					2014
		8 passes*			2022
	2005 - 27	Yes			2005
					2014
		5 passes*			2022
	2005 - 28	Yes			2005
		Yes			2014
					2022
	2014-01				2014
		1 pass*			2022
	Portal Site #1 (JAZ-3)		Yes		2013
	Air Shaft Site #4 (APN-2)		Yes		
	Large Mine Cave	310 passes*			2022
	BCM2023-01	2 passes*			2023
Summer Acoustic Sites	AM02		Yes		2022
	AM19		Yes		2022







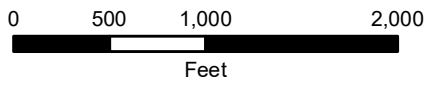
**LEGEND:**

**Acoustic Data**

- Mine Opening, Positive Result
- Summer Acoustic Data, Positive Result
- Summer Acoustic Data, Negative Result

**Route**

- Alternative 1 - E-Shift Modified
- Alternative 2 - E Modified
- Alternative 3 - DU-Shift Modified
- Alternative 4 - DU Modified
- Action Area
- Alternative 1 - E-Shift Modified Limit of Disturbance
- Large Mine-Cave 5-Mile Radius
- Sheet Index
- County Boundary
- State Boundary



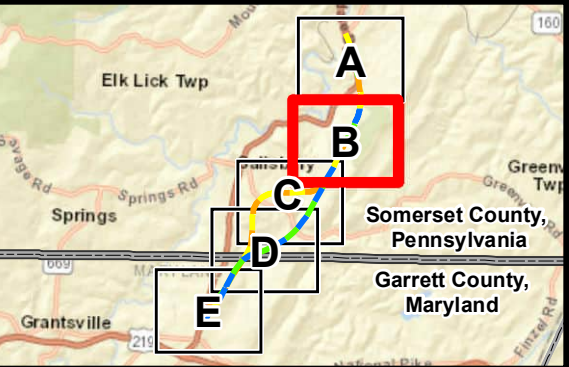
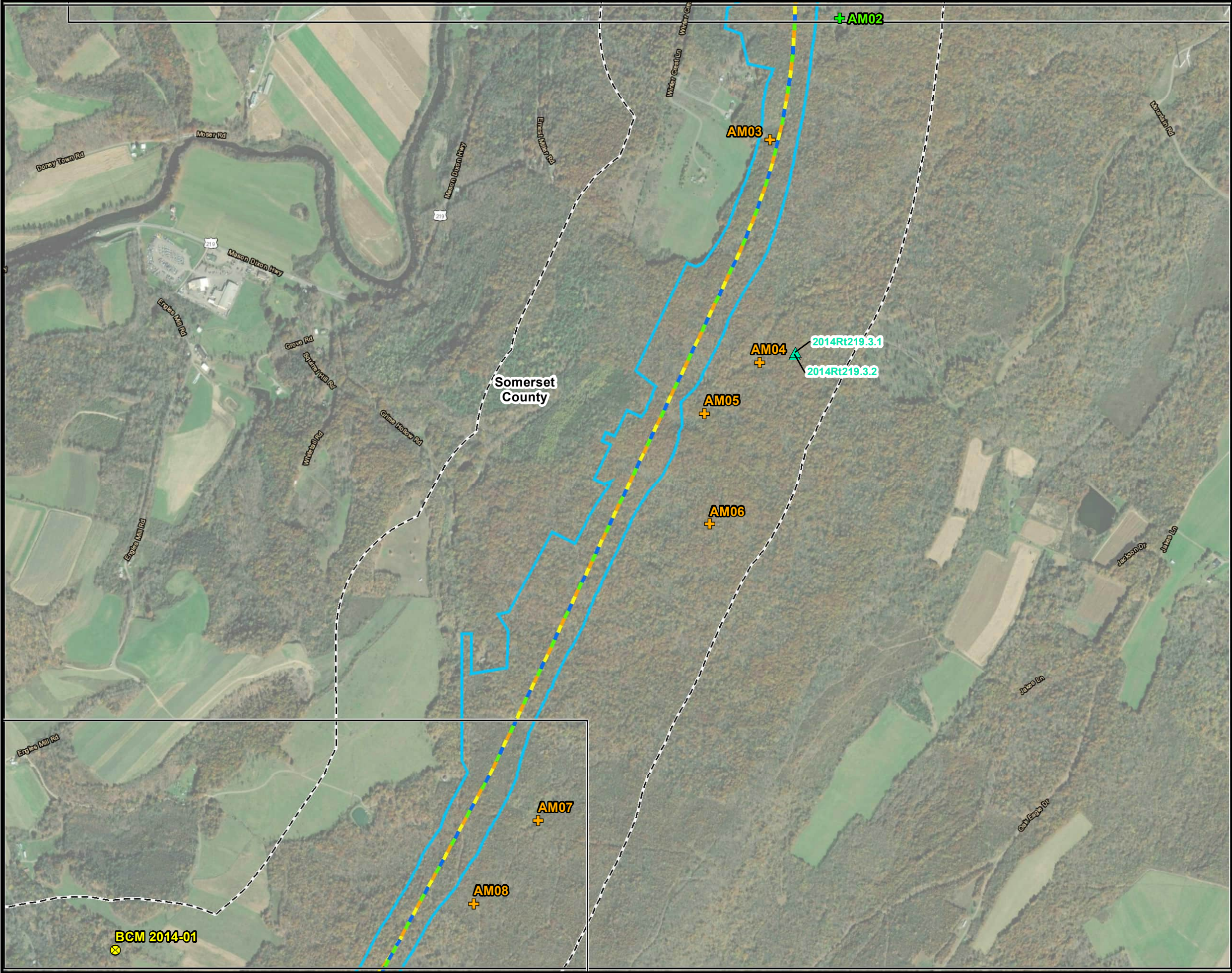
Acoustic Detection Results for Alternative 1- E-Shift Modified LOD					
Survey Location	Site ID	MYSE	PESU	MYSO	Survey Year
Summer Acoustic Data	AM01	*No detections for any listed or proposed to be federally listed species.			2022
	AM03				
	AM17				
	AM18				
	AM22				
	AM23				
	AM37				
	AM38				
	AM46				

US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 7A  
ACOUSTIC DATA OVERVIEW  
ALTERNATIVE 1 - E-SHIFT MODIFIED

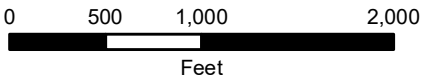






**LEGEND:**

- ▲ MYSE Roost Tree
- Acoustic Data**
  - ⊗ Mine Opening, Positive Result/No Species ID
  - ⊕ Summer Acoustic Data, Positive Result
  - ⊕ Summer Acoustic Data, Negative Result
- Route**
  - Alternative 1 - E-Shift Modified
  - Alternative 2 - E Modified
  - Alternative 3 - DU-Shift Modified
  - Alternative 4 - DU Modified
- Action Area
- Alternative 1 - E-Shift Modified Limit of Disturbance
- Large Mine-Cave 5-Mile Radius
- Sheet Index
- County Boundary
- State Boundary



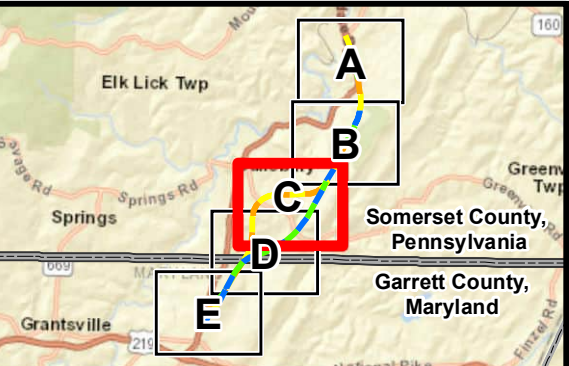
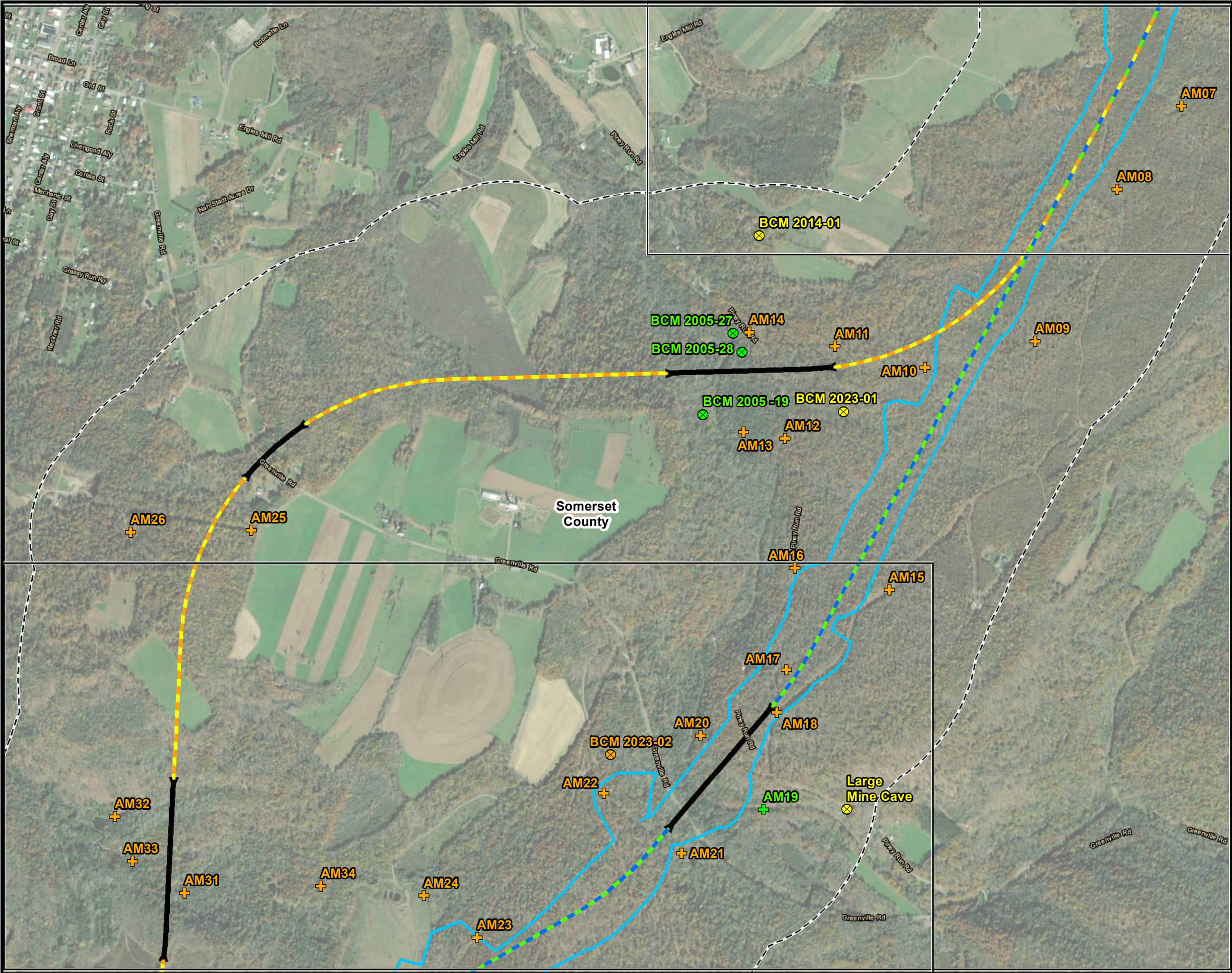
US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 7B  
ACOUSTIC DATA OVERVIEW  
ALTERNATIVE 1 - E-SHIFT MODIFIED





Date Saved: 02-Oct-24 Path: C:\Users\Carr\AECOM\IPNDOT - 01\_US 219 Improvement\900\_CAD\_GIS\920\_929\_GIS\_Graphics\MXD\Figure7\_AcousticData\_20241001.mxd



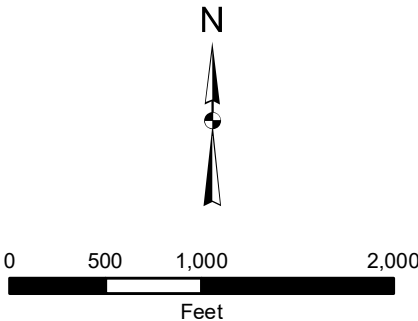
**LEGEND:**

**Acoustic Data**

- Mine Opening, Positive Result
- Mine Opening, Positive Result/No Species ID
- Mine Opening, Negative Result
- Summer Acoustic Data, Positive Result
- Summer Acoustic Data, Negative Result

**Route**

- Alternative 1 - E-Shift Modified
- Alternative 2 - E Modified
- Alternative 3 - DU-Shift Modified
- Alternative 4 - DU Modified
- Action Area
- Alternative 1 - E-Shift Modified Limit of Disturbance
- Proposed Bridge
- Large Mine-Cave 5-Mile Radius
- Sheet Index
- County Boundary
- State Boundary

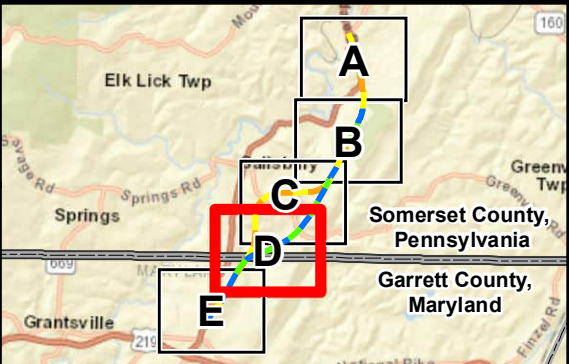
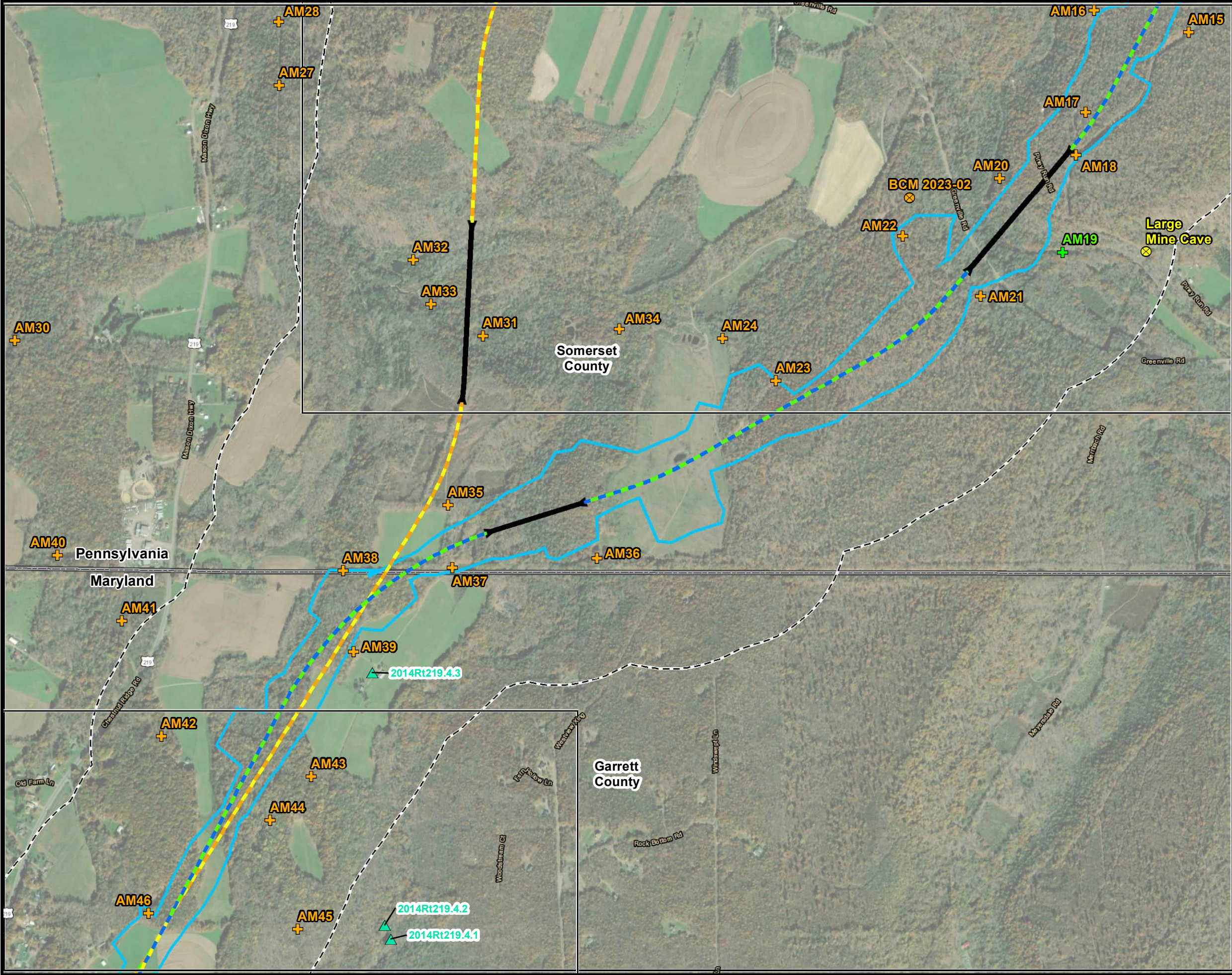


US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 7C  
ACOUSTIC DATA OVERVIEW  
ALTERNATIVE 1 - E-SHIFT MODIFIED

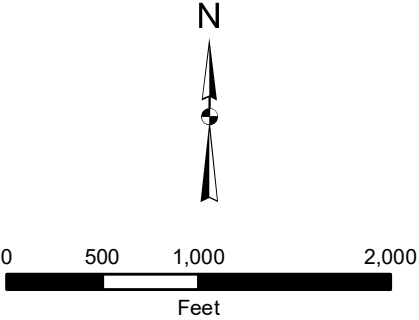
**AECOM**





**LEGEND:**

- ▲ MYSE Roost Tree
- Acoustic Data**
  - ⊗ Mine Opening, Positive Result/No Species ID
  - ⊗ Mine Opening, Negative Result
  - ⊕ Summer Acoustic Data, Positive Result
  - ⊕ Summer Acoustic Data, Negative Result
- Route**
  - Alternative 1 - E-Shift Modified
  - Alternative 2 - E Modified
  - Alternative 3 - DU-Shift Modified
  - Alternative 4 - DU Modified
- Action Area
- Alternative 1 - E-Shift Modified Limit of Disturbance
- ▬ Proposed Bridge
- Large Mine-Cave 5-Mile Radius
- Sheet Index
- County Boundary
- ▬ State Boundary

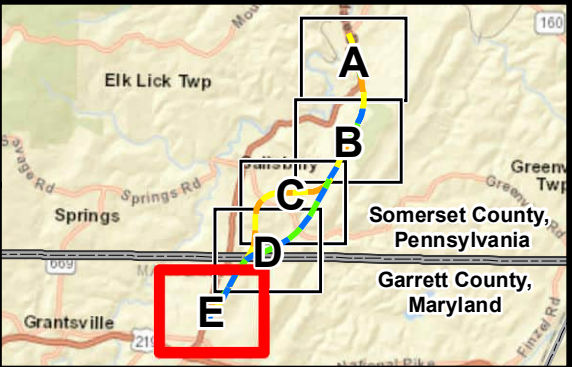
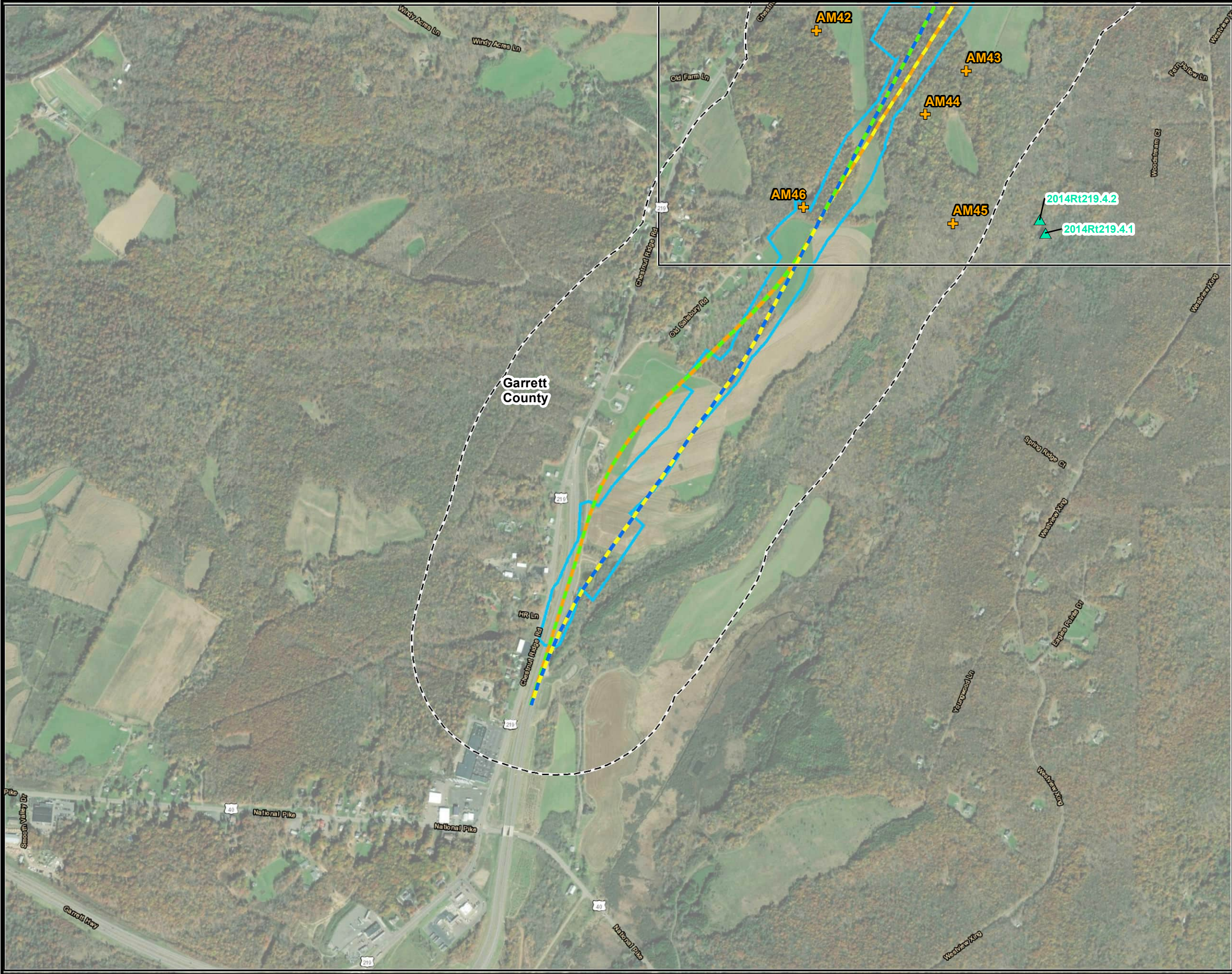


US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 7D  
ACOUSTIC DATA OVERVIEW  
ALTERNATIVE 1 - E-SHIFT MODIFIED

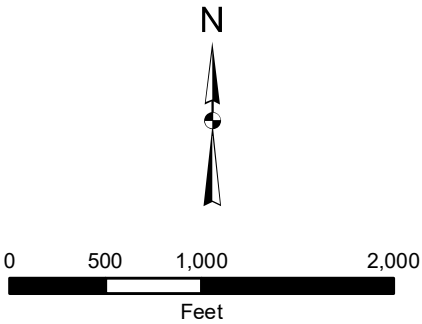
**AECOM**





**LEGEND:**

- ▲ MYSE Roost Tree
- Acoustic Data**
  - ⊕ Summer Acoustic Data, Negative Result
- Route**
  - Alternative 1 - E-Shift Modified
  - Alternative 2 - E Modified
  - Alternative 3 - DU-Shift Modified
  - Alternative 4 - DU Modified
- Action Area
- Alternative 1 - E-Shift Modified Limit of Disturbance
- Large Mine-Cave 5-Mile Radius
- Sheet Index
- County Boundary
- State Boundary

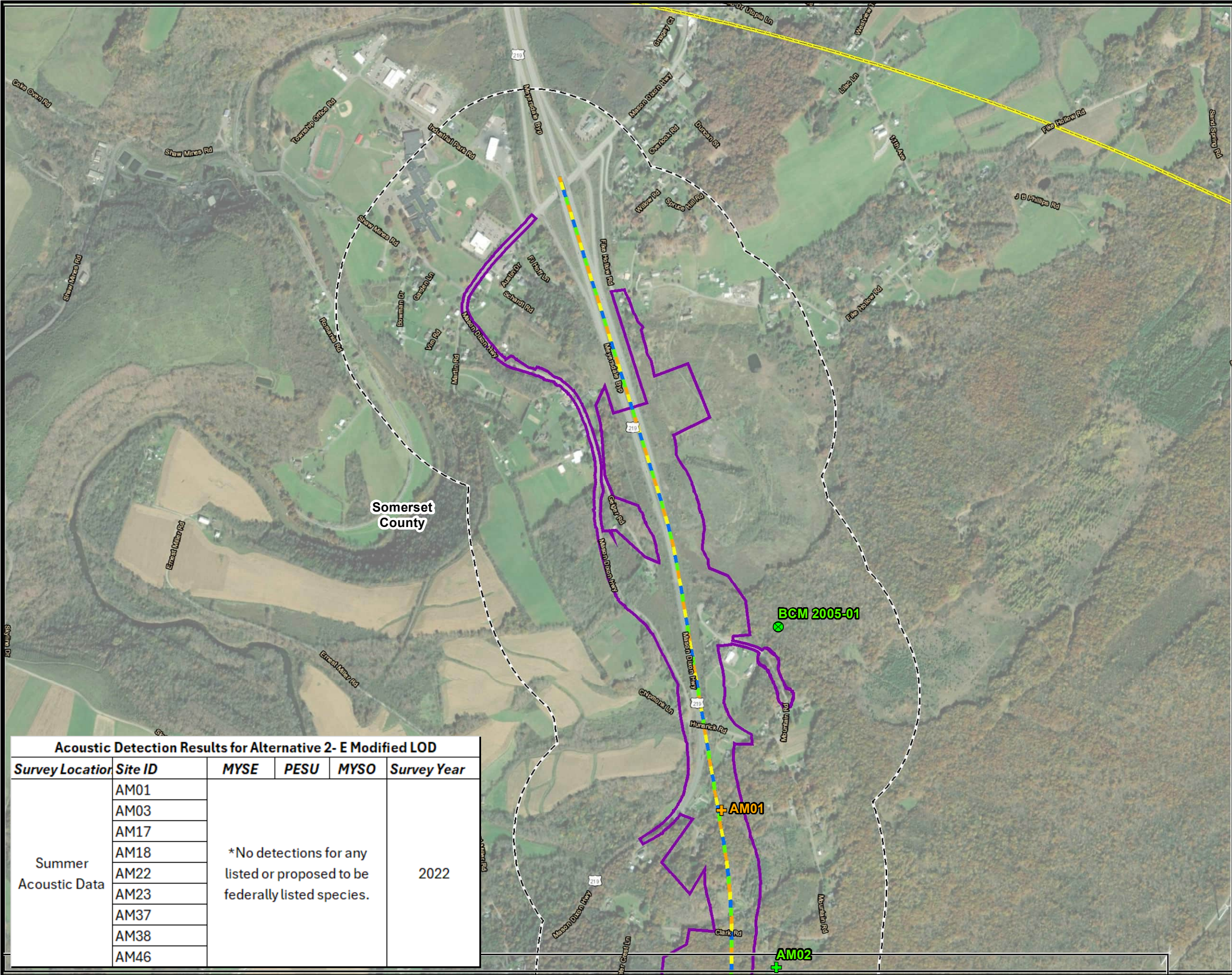


US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

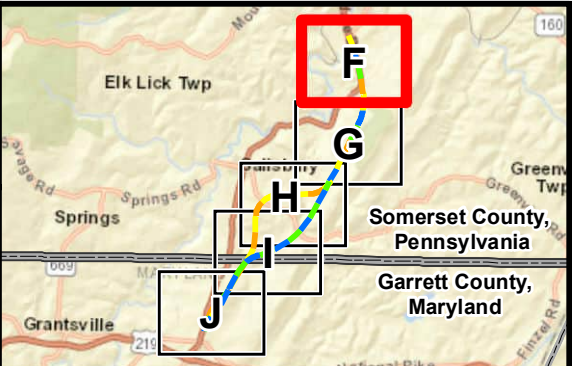
FIGURE 7E  
ACOUSTIC DATA OVERVIEW  
ALTERNATIVE 1 - E-SHIFT MODIFIED



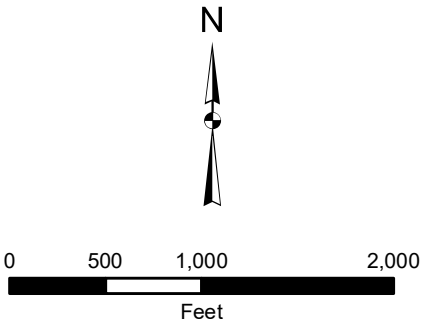




Acoustic Detection Results for Alternative 2- E Modified LOD					
Survey Location	Site ID	MYSE	PESU	MYSO	Survey Year
Summer Acoustic Data	AM01	*No detections for any listed or proposed to be federally listed species.			2022
	AM03				
	AM17				
	AM18				
	AM22				
	AM23				
	AM37				
	AM38				
	AM46				



- LEGEND:**
- Acoustic Data**
- Mine Opening, Positive Result
  - Summer Acoustic Data, Positive Result
  - Summer Acoustic Data, Negative Result
- Route**
- Alternative 1 - E-Shift Modified
  - Alternative 2 - E Modified
  - Alternative 3 - DU-Shift Modified
  - Alternative 4 - DU Modified
- Action Area
- Alternative 2 - E Modified Limit of Disturbance
- Large Mine-Cave 5-Mile Radius
- Sheet Index
- County Boundary
- State Boundary

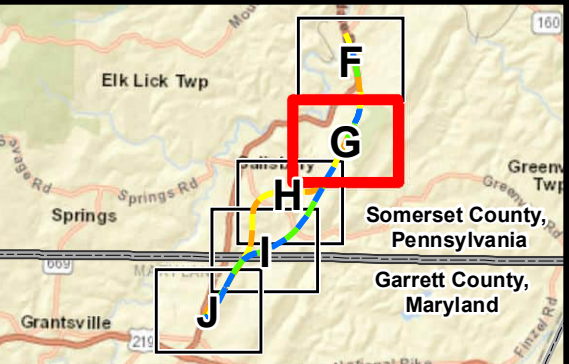
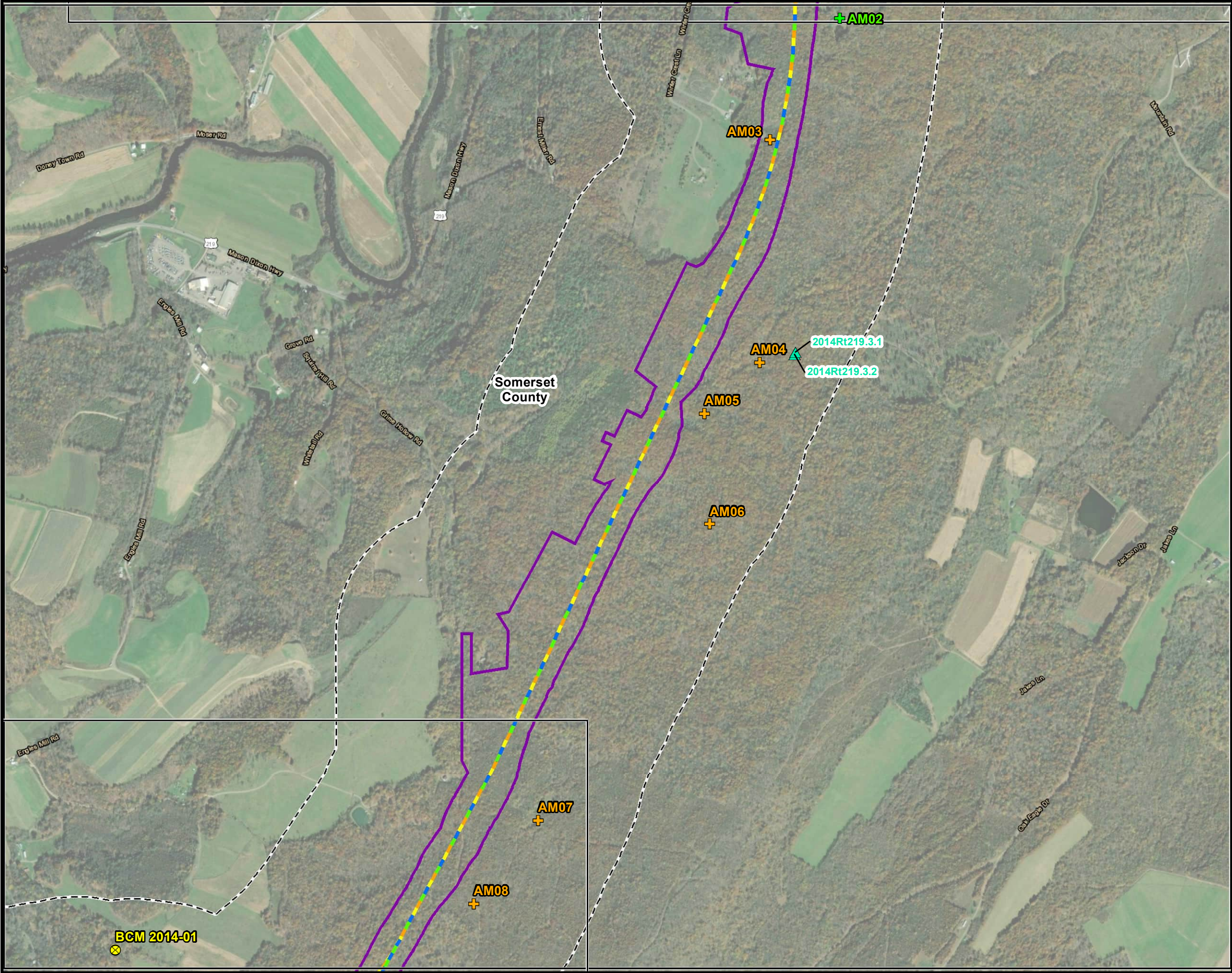


US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 7F  
ACOUSTIC DATA OVERVIEW  
ALTERNATIVE 2 - E MODIFIED

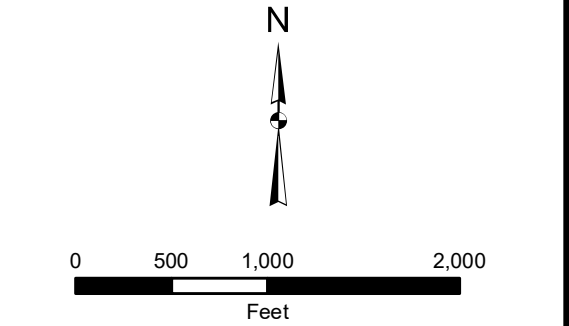






**LEGEND:**

- MYSE Roost Tree
- Acoustic Data**
  - Mine Opening, Positive Result/No Species ID
  - Summer Acoustic Data, Positive Result
  - Summer Acoustic Data, Negative Result
- Route**
  - Alternative 1 - E-Shift Modified
  - Alternative 2 - E Modified
  - Alternative 3 - DU-Shift Modified
  - Alternative 4 - DU Modified
- Action Area
- Alternative 2 - E Modified Limit of Disturbance
- Large Mine-Cave 5-Mile Radius
- Sheet Index
- County Boundary
- State Boundary



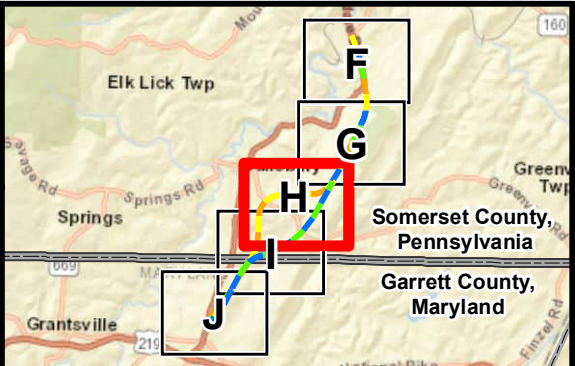
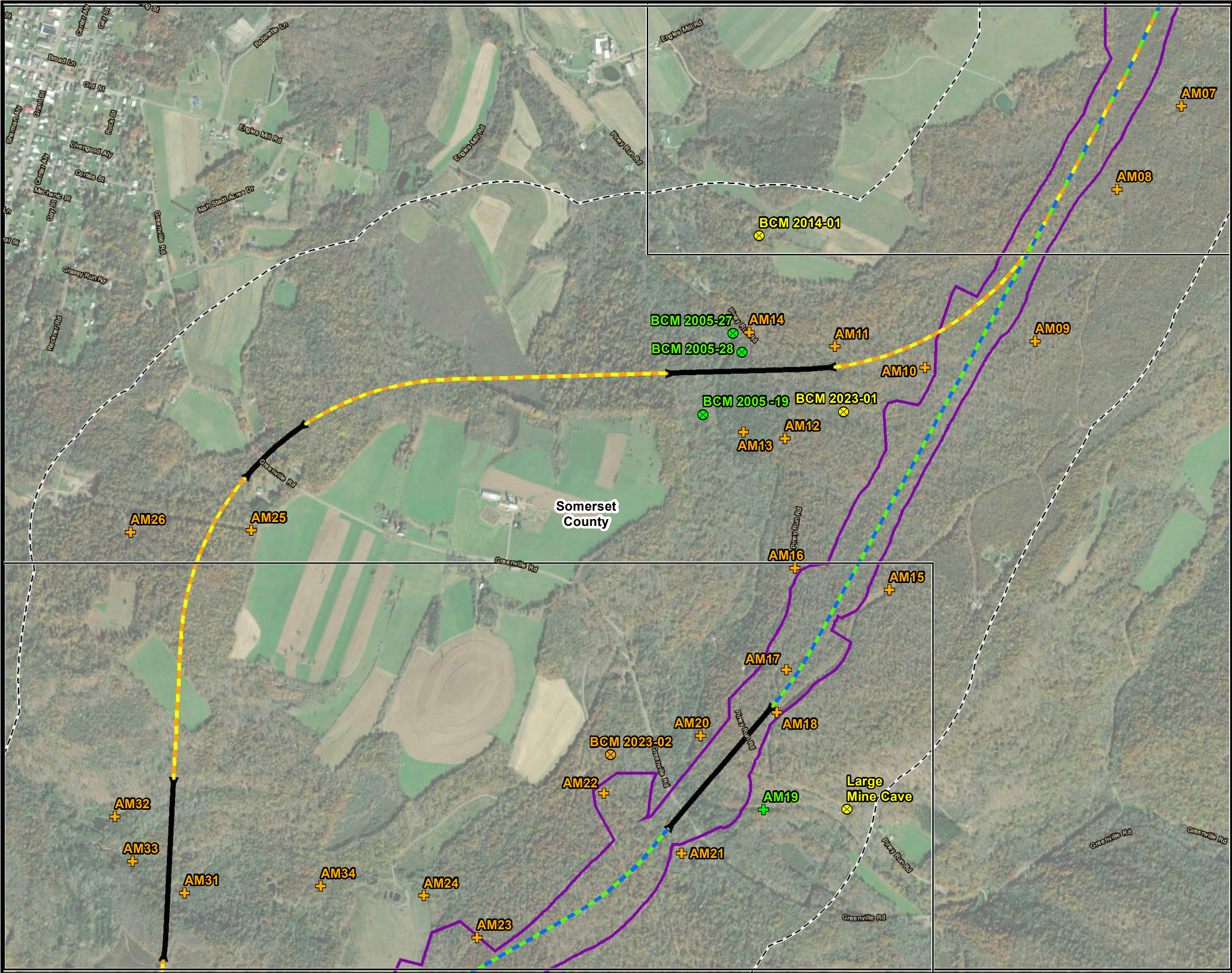
US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 7G  
ACOUSTIC DATA OVERVIEW  
ALTERNATIVE 2 - E MODIFIED

**AECOM**



Date Saved: 02-Oct-24 Path: C:\Users\Carr\AECOM\IPNDOT - 01\_US 219 Improvement\900\_CAD\_GIS\920\_929\_GIS\_Graphics\MXD\Figure7\_AcousticData\_20241001.mxd



**LEGEND:**

**Acoustic Data**

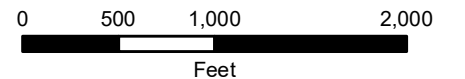
- Mine Opening, Positive Result
- Mine Opening, Positive Result/No Species ID
- Mine Opening, Negative Result
- Summer Acoustic Data, Positive Result
- Summer Acoustic Data, Negative Result

**Route**

- Alternative 1 - E-Shift Modified
- Alternative 2 - E Modified
- Alternative 3 - DU-Shift Modified
- Alternative 4 - DU Modified

- Action Area
- Alternative 2 - E Modified Limit of Disturbance
- Proposed Bridge
- Large Mine-Cave 5-Mile Radius
- Sheet Index
- County Boundary
- State Boundary

N



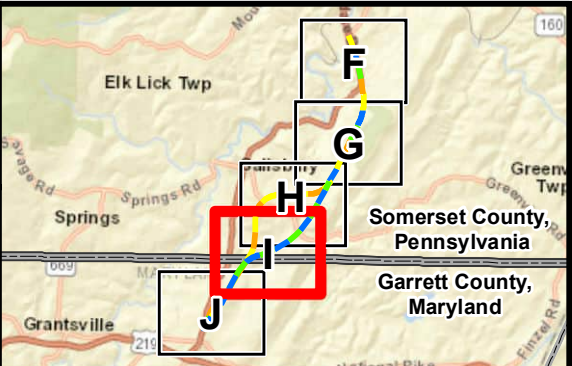
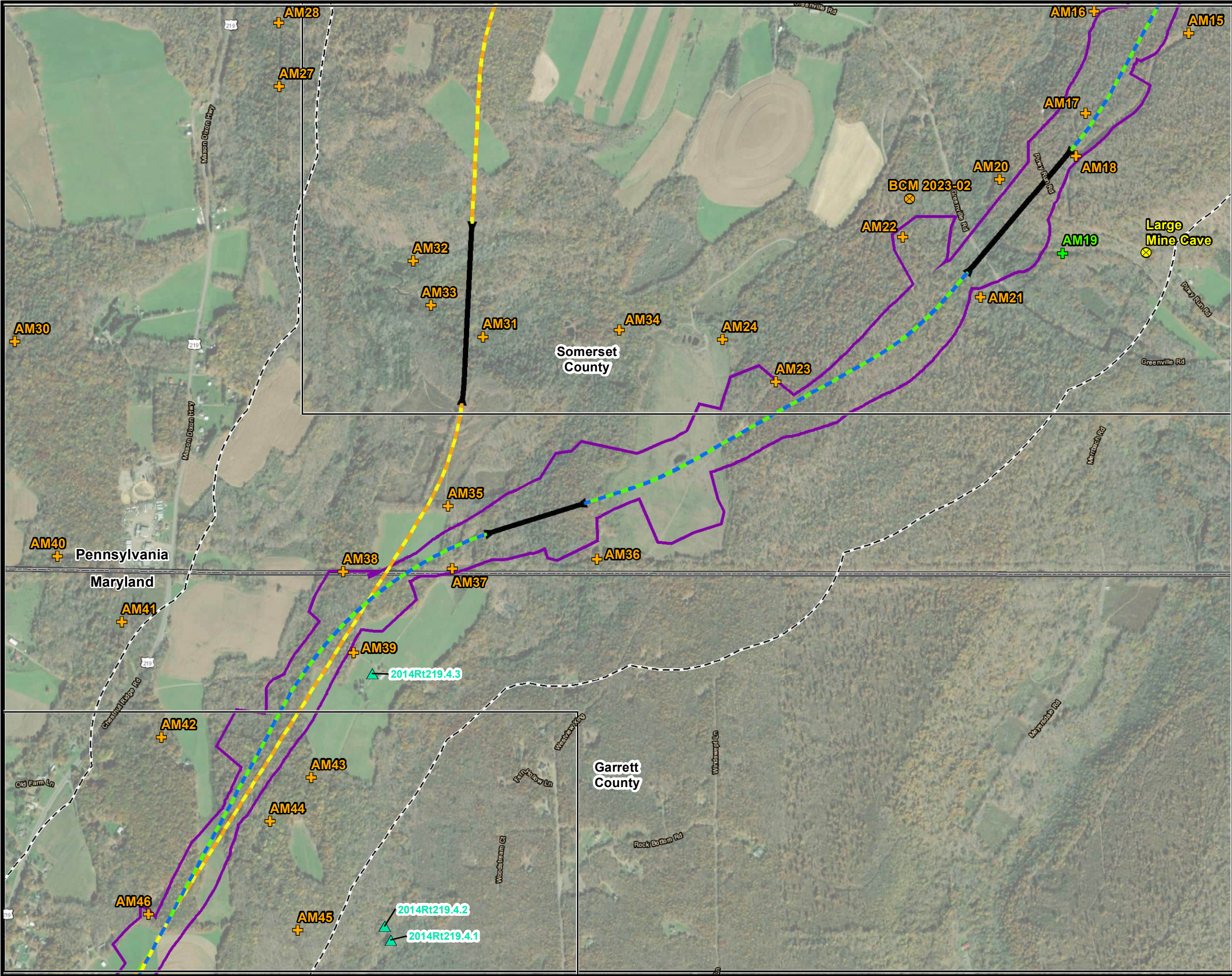
US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 7H  
ACOUSTIC DATA OVERVIEW  
ALTERNATIVE 2 - E MODIFIED

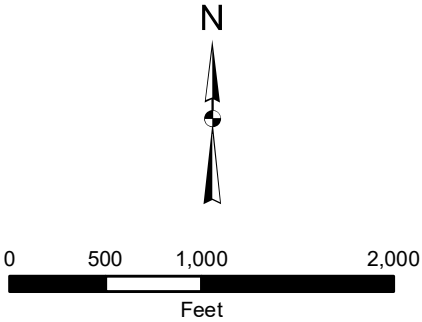
**AECOM**

BASE MAP SOURCE: ArcGIS Online, World Imagery and Transportation





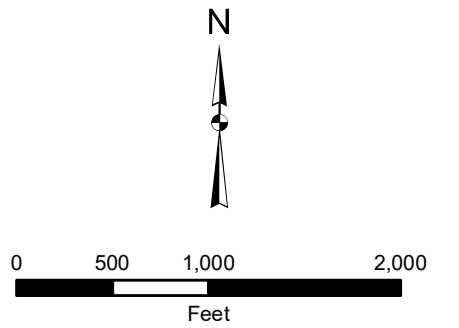
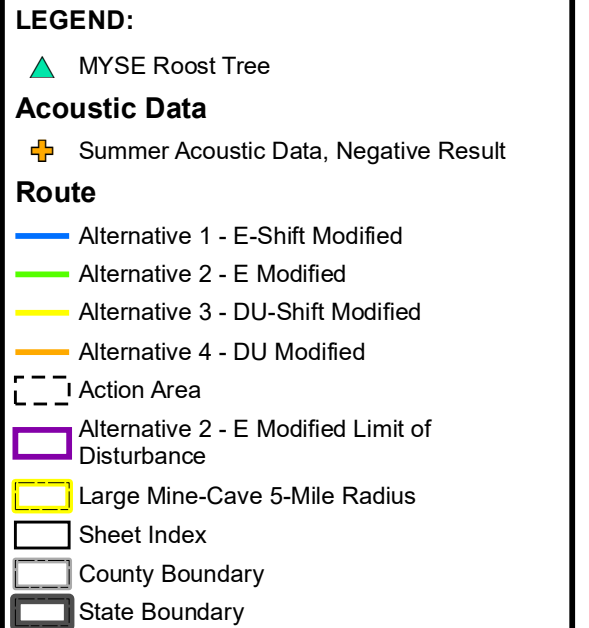
- LEGEND:**
- MYSE Roost Tree
  - Acoustic Data**
    - Mine Opening, Positive Result/No Species ID
    - Mine Opening, Negative Result
    - Summer Acoustic Data, Positive Result
    - Summer Acoustic Data, Negative Result
  - Route**
    - Alternative 1 - E-Shift Modified
    - Alternative 2 - E Modified
    - Alternative 3 - DU-Shift Modified
    - Alternative 4 - DU Modified
  - Action Area
  - Alternative 2 - E Modified Limit of Disturbance
  - Proposed Bridge
  - Large Mine-Cave 5-Mile Radius
  - Sheet Index
  - County Boundary
  - State Boundary



US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 7I  
ACOUSTIC DATA OVERVIEW  
ALTERNATIVE 2 - E MODIFIED

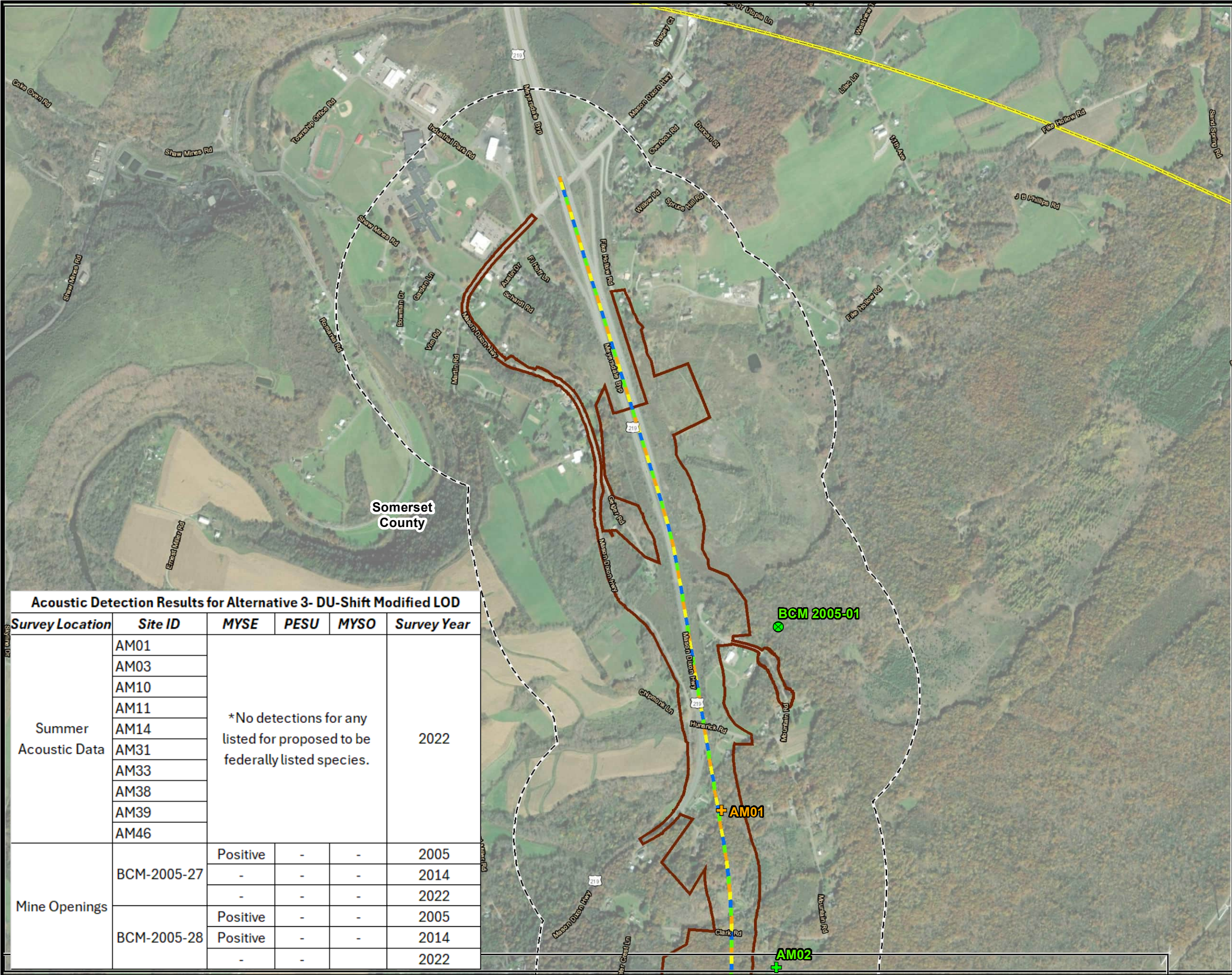




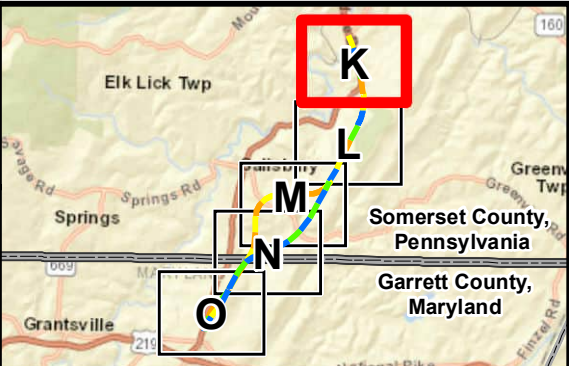
US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 7J  
ACOUSTIC DATA OVERVIEW  
**ALTERNATIVE 2 - E MODIFIED**





Acoustic Detection Results for Alternative 3- DU-Shift Modified LOD					
Survey Location	Site ID	MYSE	PESU	MYSO	Survey Year
Summer Acoustic Data	AM01	*No detections for any listed for proposed to be federally listed species.			2022
	AM03				
	AM10				
	AM11				
	AM14				
	AM31				
	AM33				
	AM38				
	AM39				
	AM46				
Mine Openings	BCM-2005-27	Positive	-	-	2005
		-	-	-	2014
		-	-	-	2022
	BCM-2005-28	Positive	-	-	2005
		Positive	-	-	2014
		-	-	-	2022



**LEGEND:**

**Acoustic Data**

- Mine Opening, Positive Result
- ⊕ Summer Acoustic Data, Positive Result
- ⊕ Summer Acoustic Data, Negative Result

**Route**

- Alternative 1 - E-Shift Modified
- Alternative 2 - E Modified
- Alternative 3 - DU-Shift Modified
- Alternative 4 - DU Modified

--- Action Area

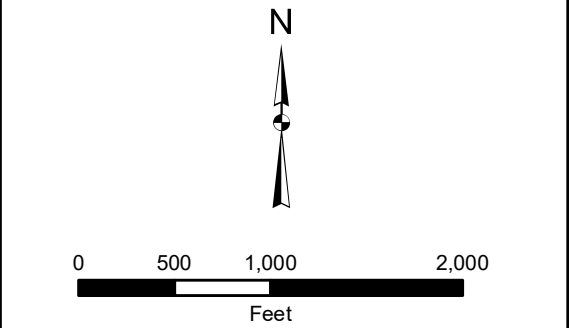
▭ Alternative 3 - DU-Shift Modified Limit of Disturbance

▭ Large Mine-Cave 5-Mile Radius

▭ Sheet Index

▭ County Boundary

▭ State Boundary



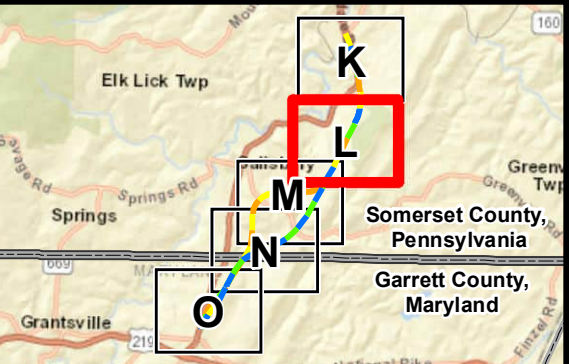
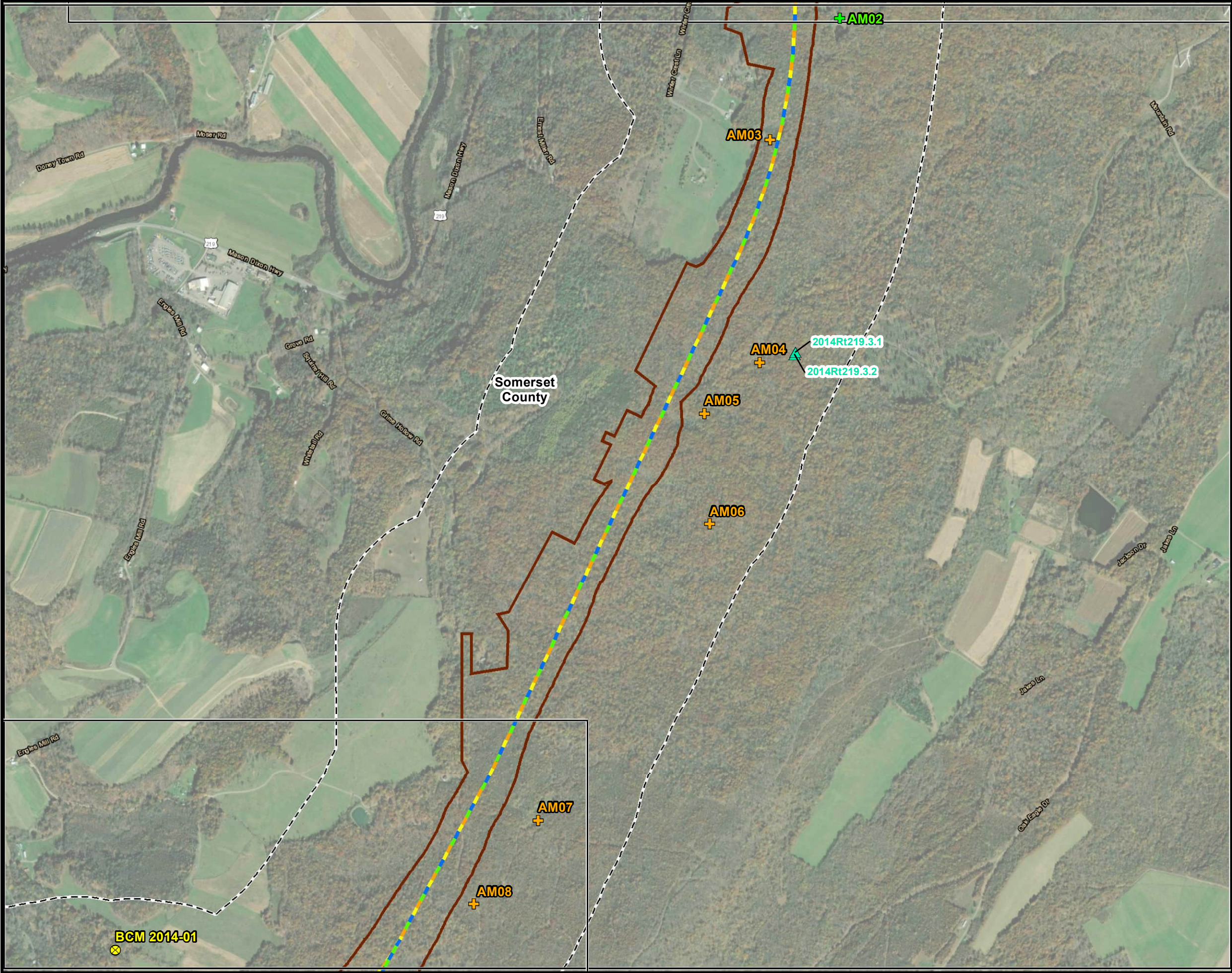
US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 7K  
ACOUSTIC DATA OVERVIEW  
ALTERNATIVE 3 - DU-SHIFT MODIFIED

**AECOM**

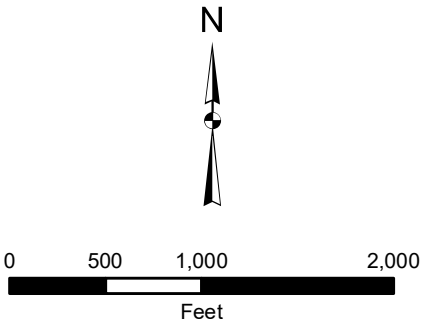


Date Saved: 02-Oct-24 Path: C:\Users\Carr\AECOM\IPNDOT - 01\_US 219 Improvement\900\_CAD\_GIS\920\_929\_GIS\_Graphics\MXD\Figure7\_AcousticData\_20241001.mxd



**LEGEND:**

- MYSE Roost Tree
- Acoustic Data**
  - Mine Opening, Positive Result/No Species ID
  - Summer Acoustic Data, Positive Result
  - Summer Acoustic Data, Negative Result
- Route**
  - Alternative 1 - E-Shift Modified
  - Alternative 2 - E Modified
  - Alternative 3 - DU-Shift Modified
  - Alternative 4 - DU Modified
- Action Area
- Alternative 3 - DU-Shift Modified Limit of Disturbance
- Large Mine-Cave 5-Mile Radius
- Sheet Index
- County Boundary
- State Boundary

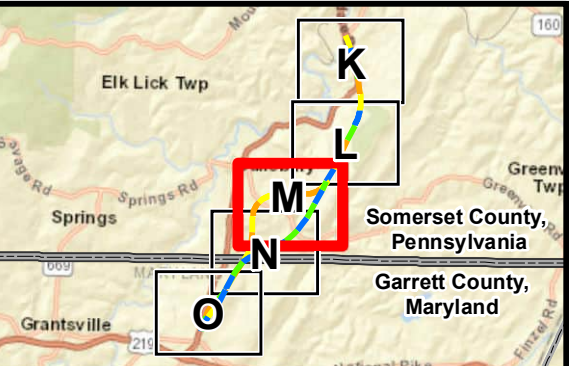
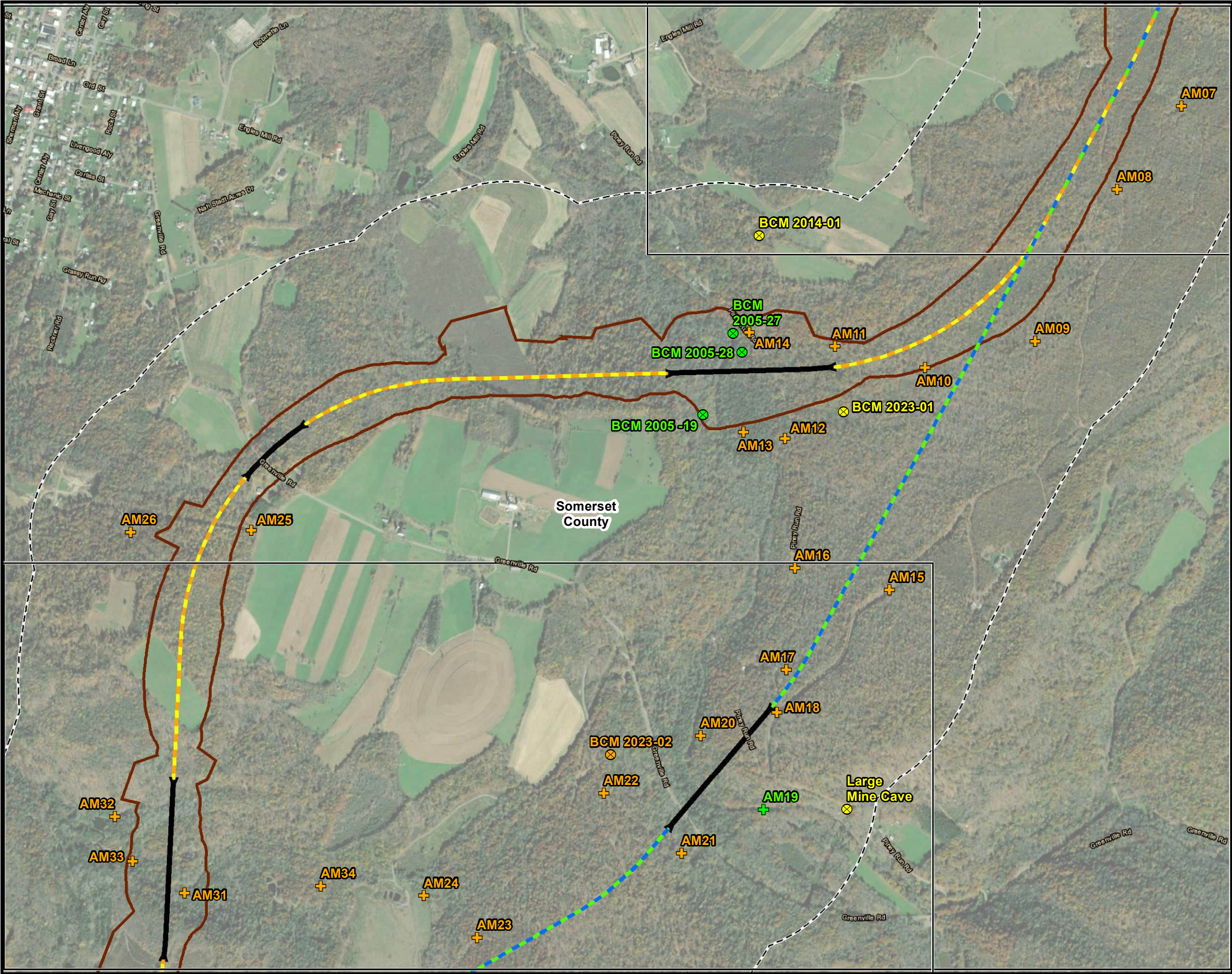


US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 7L  
ACOUSTIC DATA OVERVIEW  
ALTERNATIVE 3 - DU-SHIFT MODIFIED

**AECOM**





**LEGEND:**

**Acoustic Data**

- Mine Opening, Positive Result
- Mine Opening, Positive Result/No Species ID
- Mine Opening, Negative Result
- Summer Acoustic Data, Positive Result
- Summer Acoustic Data, Negative Result

**Route**

- Alternative 1 - E-Shift Modified
- Alternative 2 - E Modified
- Alternative 3 - DU-Shift Modified
- Alternative 4 - DU Modified

--- Action Area

— Alternative 3 - DU-Shift Modified Limit of Disturbance

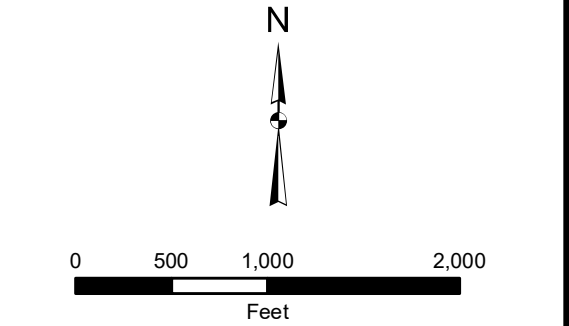
— Proposed Bridge

Large Mine-Cave 5-Mile Radius

Sheet Index

County Boundary

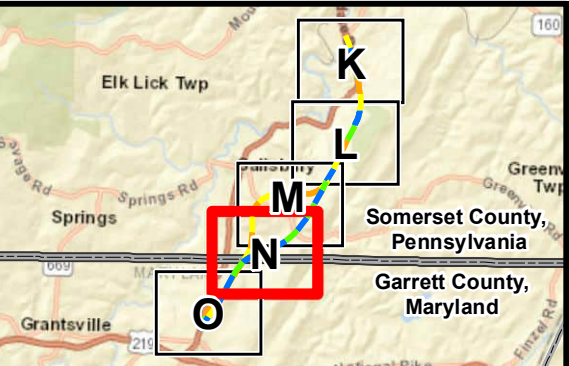
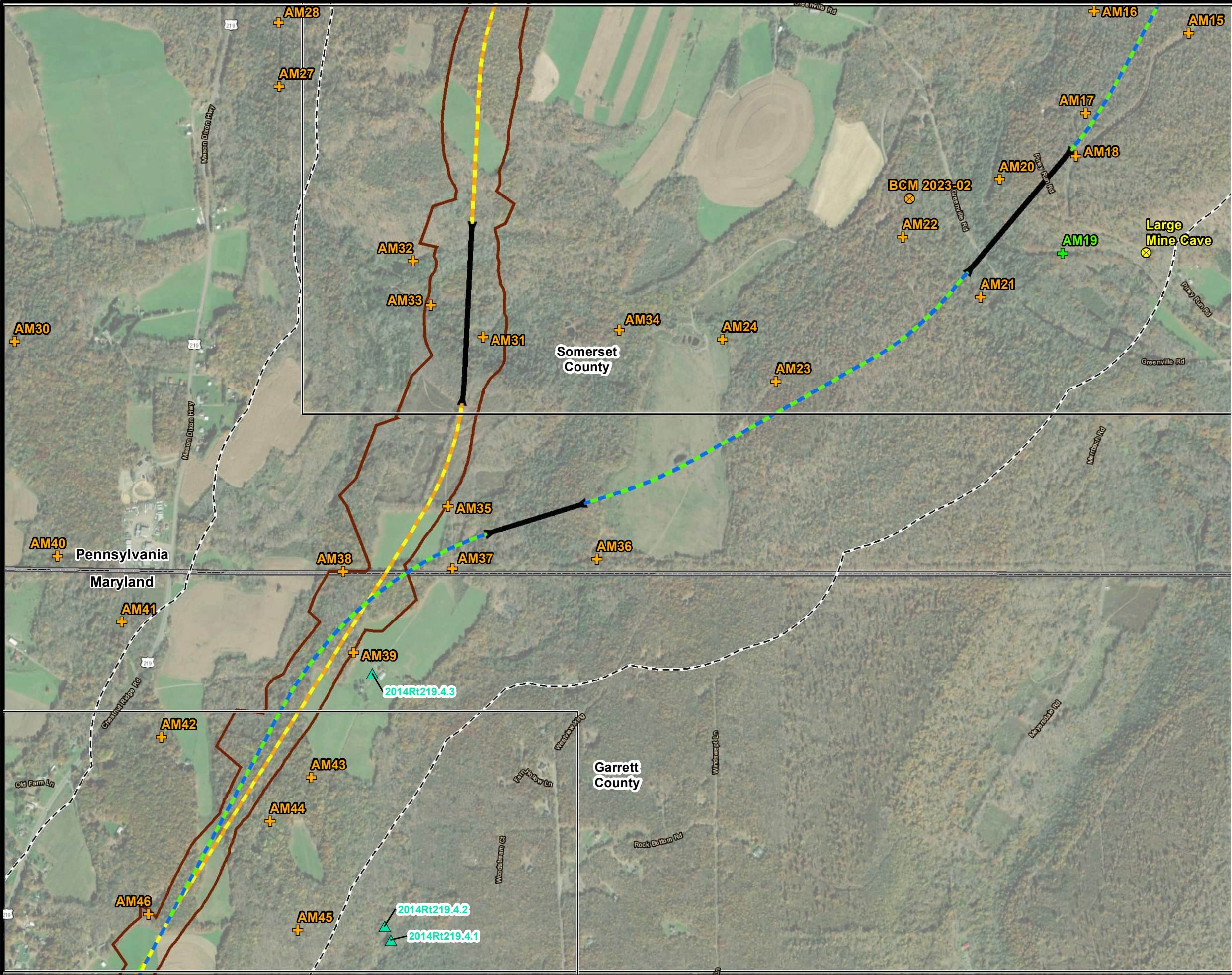
State Boundary



US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

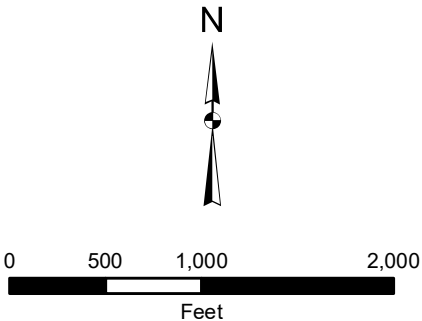
FIGURE 7M  
ACOUSTIC DATA OVERVIEW  
ALTERNATIVE 3 - DU-SHIFT MODIFIED  
**AECOM**





**LEGEND:**

- ▲ MYSE Roost Tree
- Acoustic Data**
  - ⊗ Mine Opening, Positive Result/No Species ID
  - ⊗ Mine Opening, Negative Result
  - ⊕ Summer Acoustic Data, Positive Result
  - ⊕ Summer Acoustic Data, Negative Result
- Route**
  - Alternative 1 - E-Shift Modified
  - Alternative 2 - E Modified
  - Alternative 3 - DU-Shift Modified
  - Alternative 4 - DU Modified
- Action Area
- Alternative 3 - DU-Shift Modified Limit of Disturbance
- Proposed Bridge
- - - Large Mine-Cave 5-Mile Radius
- Sheet Index
- County Boundary
- State Boundary

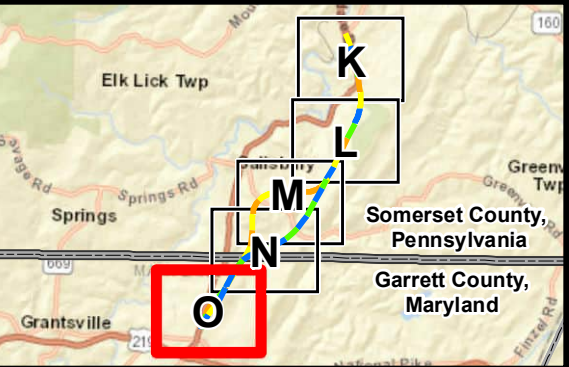
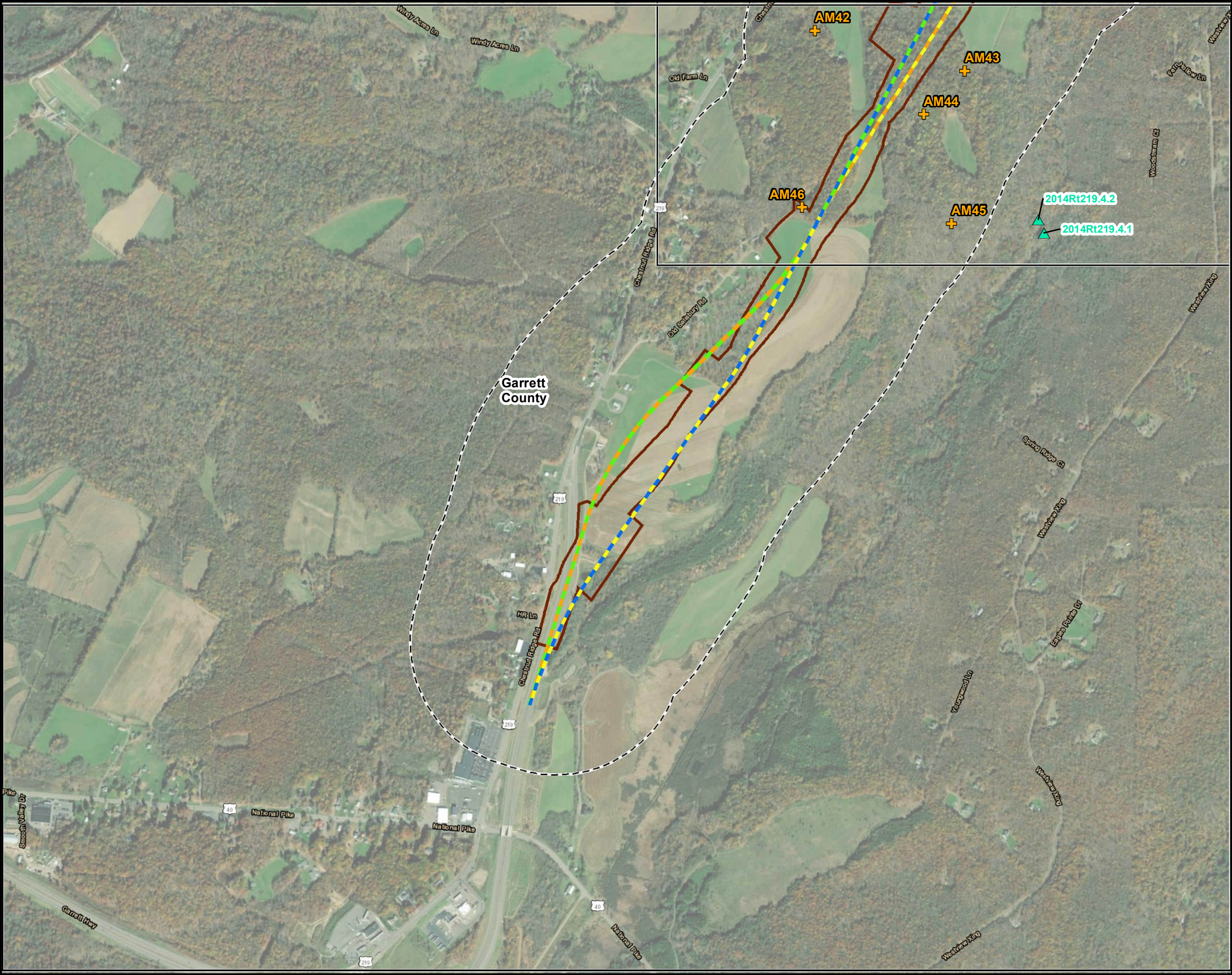


US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 7N  
ACOUSTIC DATA OVERVIEW  
ALTERNATIVE 3 - DU-SHIFT MODIFIED

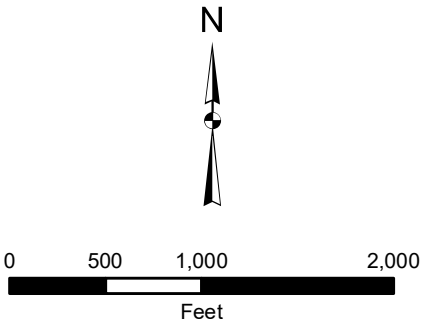
**AECOM**





**LEGEND:**

- ▲ MYSE Roost Tree
- Acoustic Data
  - ⊕ Summer Acoustic Data, Negative Result
- Route
  - Alternative 1 - E-Shift Modified
  - Alternative 2 - E Modified
  - Alternative 3 - DU-Shift Modified
  - Alternative 4 - DU Modified
- Action Area
- Alternative 3 - DU-Shift Modified Limit of Disturbance
- Large Mine-Cave 5-Mile Radius
- Sheet Index
- County Boundary
- State Boundary

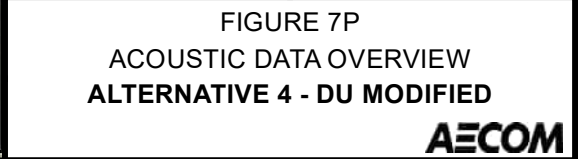


US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

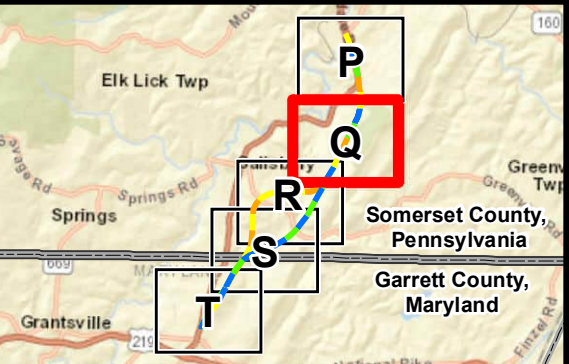
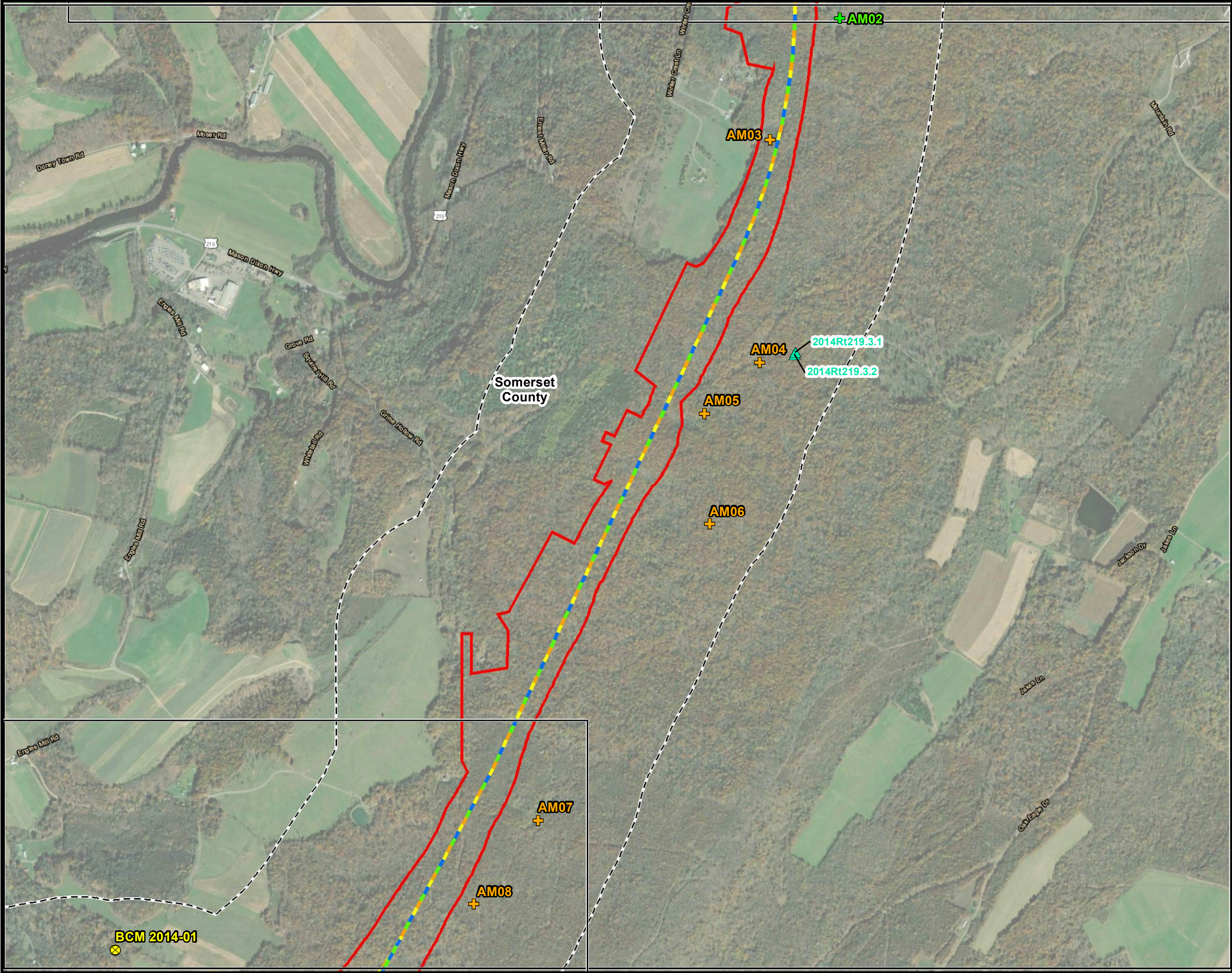
FIGURE 70  
ACOUSTIC DATA OVERVIEW  
ALTERNATIVE 3 - DU-SHIFT MODIFIED

**AECOM**



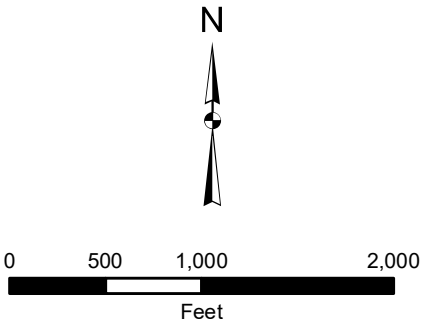






**LEGEND:**

- MYSE Roost Tree
- Acoustic Data**
  - Mine Opening, Positive Result/No Species ID
  - Summer Acoustic Data, Positive Result
  - Summer Acoustic Data, Negative Result
- Route**
  - Alternative 1 - E-Shift Modified
  - Alternative 2 - E Modified
  - Alternative 3 - DU-Shift Modified
  - Alternative 4 - DU Modified
- Action Area
- Alternative 4 - DU Modified Limit of Disturbance
- Large Mine-Cave 5-Mile Radius
- Sheet Index
- County Boundary
- State Boundary



US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 7Q  
ACOUSTIC DATA OVERVIEW  
ALTERNATIVE 4 - DU MODIFIED

**AECOM**



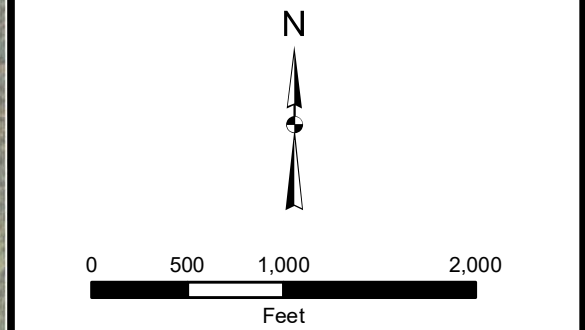
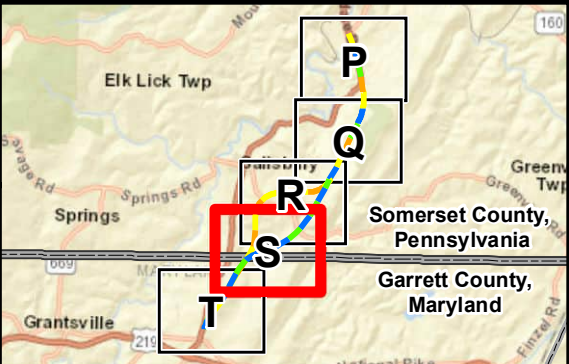
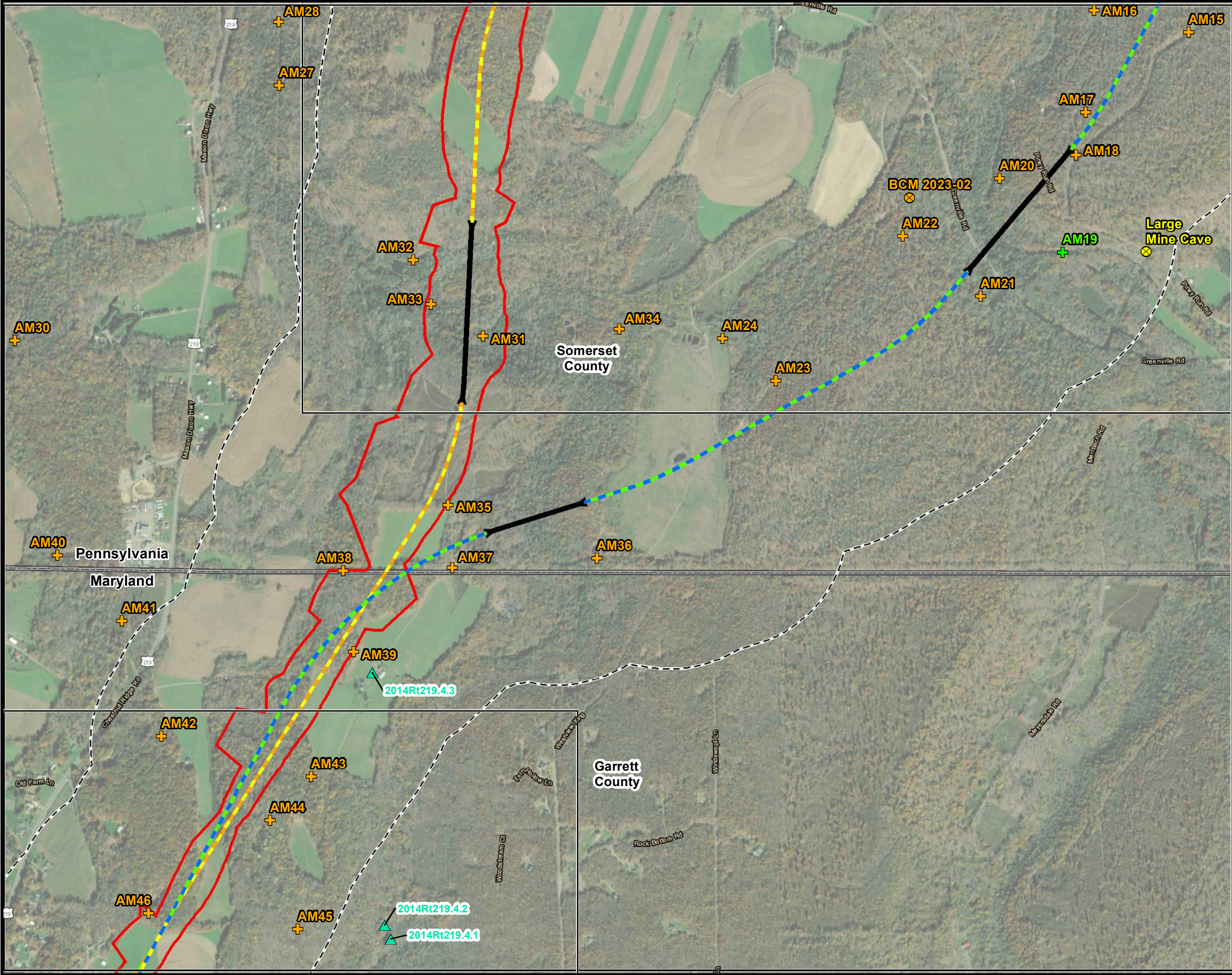


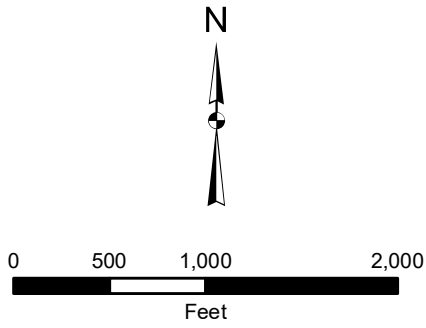
FIGURE 7R  
ACOUSTIC DATA OVERVIEW  
ALTERNATIVE 4 - DU MODIFIED





**LEGEND:**

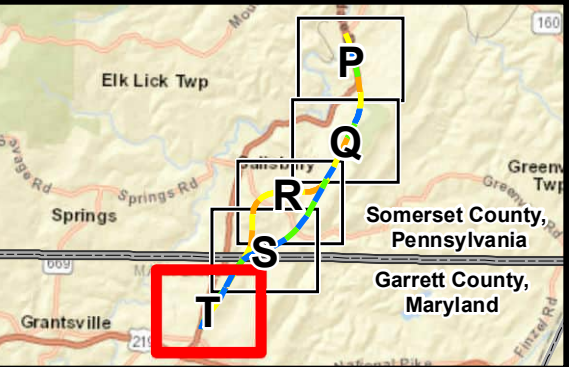
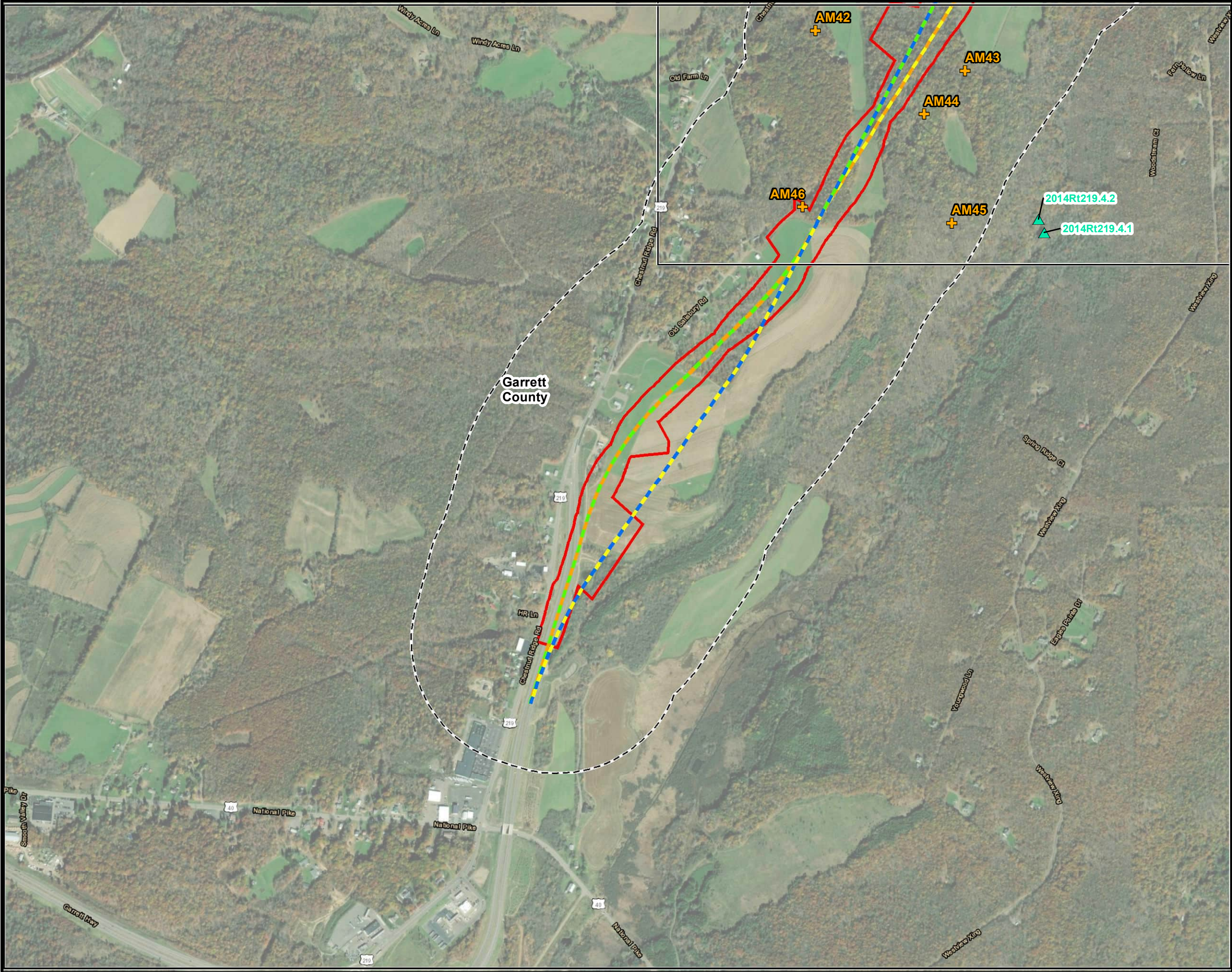
- ▲ MYSE Roost Tree
- Acoustic Data**
  - ⊗ Mine Opening, Positive Result/No Species ID
  - ⊗ Mine Opening, Negative Result
  - ⊕ Summer Acoustic Data, Positive Result
  - ⊕ Summer Acoustic Data, Negative Result
- Route**
  - Alternative 1 - E-Shift Modified
  - Alternative 2 - E Modified
  - Alternative 3 - DU-Shift Modified
  - Alternative 4 - DU Modified
- Action Area
- ▭ Alternative 4 - DU Modified Limit of Disturbance
- ▬ Proposed Bridge
- ▭ Large Mine-Cave 5-Mile Radius
- ▭ Sheet Index
- ▭ County Boundary
- ▭ State Boundary



US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

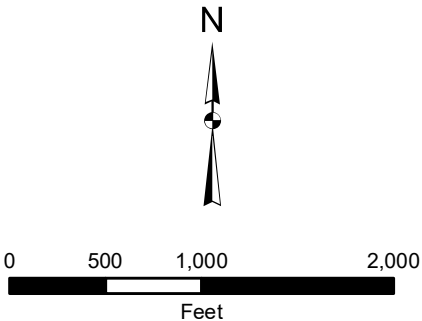
FIGURE 7S  
ACOUSTIC DATA OVERVIEW  
ALTERNATIVE 4 - DU MODIFIED  
**AECOM**





**LEGEND:**

- ▲ MYSE Roost Tree
- Acoustic Data**
  - ⊕ Summer Acoustic Data, Negative Result
- Route**
  - Alternative 1 - E-Shift Modified
  - Alternative 2 - E Modified
  - Alternative 3 - DU-Shift Modified
  - Alternative 4 - DU Modified
- - - Action Area
- ▭ Alternative 4 - DU Modified Limit of Disturbance
- ▭ Large Mine-Cave 5-Mile Radius
- ▭ Sheet Index
- ▭ County Boundary
- ▭ State Boundary



US 6219, SECTION 050  
TRANSPORTATION IMPROVEMENT PROJECT  
MEYERSDALE, PA TO  
OLD SALISBURY ROAD, MD

FIGURE 7T  
ACOUSTIC DATA OVERVIEW  
ALTERNATIVE 4 - DU MODIFIED

**AECOM**



**APPENDIX B**  
**Agency Coordination and Correspondence**





# United States Department of the Interior

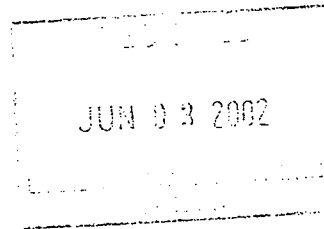
## FISH AND WILDLIFE SERVICE

Pennsylvania Field Office  
315 South Allen Street, Suite 322  
State College, Pennsylvania 16801-4850



May 30, 2002

Attilio Squillario  
L. Robert Kimball & Associates  
615 West Highland Avenue  
P.O. Box 1000  
Ebensburg, PA 15931



Dear Mr. Squillario:

This responds to your letter of May 6, 2002, requesting information about federally listed and proposed endangered and threatened species within the area affected by the proposed transportation improvement project (SR 6219, Section 019) to be located in Somerset County, Pennsylvania. The following comments are provided pursuant to the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) to ensure the protection of endangered and threatened species.

The proposed project is located within the range of the Indiana bat (*Myotis sodalis*), a species that is federally listed as endangered. Due to the close proximity of the project area to a known Indiana bat hibernaculum (i.e., within five miles), removal of trees and forested areas within the project area could result in the direct take of roosting Indiana bats, which could be injured or killed when trees are cut. Studies have found that forested areas located within five miles of hibernacula provide important foraging and roosting habitat for Indiana bats, especially during the fall and spring, when bats are building up their fat reserves prior to and after hibernation. In addition, female maternity colonies and individual male bats may be found in the vicinity of hibernacula throughout the summer months.

To avoid the direct take of Indiana bats, tree cutting activities should be carried out from November 16 to March 31, during which time bats are hibernating. If any timber cutting is necessary from April 1 to November 15, the following trees greater than or equal to five inches diameter breast height (d.b.h.) should not be cut or physically disturbed (e.g., while harvesting any adjacent trees) in order to avoid killing or injuring roosting Indiana bats: 1) dead or dying trees and snags (including lightning struck trees) with exfoliating bark; 2) live trees (such as shagbark and shellbark hickory) which have exfoliating or defoliating bark in the trunk or branches; and 3) trees or snags that have characteristics typical of roost sites for Indiana bats (i.e., have exfoliating or defoliating bark, or contain cracks, crevices, or holes that could be used by the species as a potential roost). Tree clearing from November 16 to March 31 may proceed without these restrictions.

Attilio S.  
Ed Jones  
C. Sunday

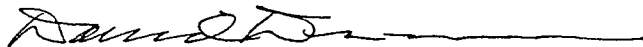


Based on a review of the project information, including the size of the project area and the anticipated effects on forested habitat, the Service has determined that the proposed project will not have a significant adverse effect on overall habitat quality for the Indiana bat. Therefore, if a seasonal restriction on tree cutting is implemented to avoid the direct take of Indiana bats, construction of the proposed project is not likely to adversely affect this species. If you are unable to implement the above measures to avoid adverse effects, however, further consultation with this office will be necessary.

This response relates only to endangered and threatened species under our jurisdiction based on an office review of the proposed project's location. No field inspection of the project area has been conducted by this office. Consequently, this letter is not to be construed as addressing other Service concerns under the Fish and Wildlife Coordination Act or other authorities.

If you have any questions regarding this matter, please contact Robert Anderson of my staff at 814-234-4090.

Sincerely,

A handwritten signature in dark ink, appearing to read "David Densmore", followed by a horizontal line.

David Densmore  
Supervisor



4715-01  
10.6

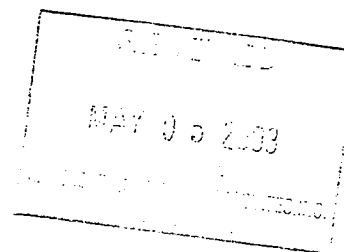


## United States Department of the Interior

FISH AND WILDLIFE SERVICE  
Chesapeake Bay Field Office  
177 Admiral Cochrane Drive  
Annapolis, MD 21401



April 1, 2003



Mr. Stephen G. Toki, Jr.  
L Robert Kimball & Associates, Inc.  
615 West Highland Avenue  
P.O. Box 1000  
Edensburg, PA 15931

RE: *Environmental Review US 219, Section 019, Meyersdale, PA to I-68, MD  
Garrett County, MD*

Dear Mr. Toki:

This serves as an amendment to our letter, dated February 11, 2003, responding to your request for information on the presence of species which are federally listed or proposed for listing as endangered or threatened within the vicinity of the above referenced project area. We have reviewed the information you enclosed, along with additional information obtained from the U.S. Fish and Wildlife Service Pennsylvania Field Office, and are providing comments in accordance with Section 7 of the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*).

The proposed project is within the range of the federally endangered Indiana bat (*Myotis sodalis*). An Indiana bat hibernaculum exists within the state of Pennsylvania and is located approximately one-mile from the Maryland state border. In addition, Indiana bats are known to utilize forested areas within five-miles of their hibernacula. Based on this information and the map you provided we have determined that the project study area is within the range of this species. The subsequent recommendations reflect those made by the Pennsylvania Field Office in their May 2002 letter to your office.

To avoid direct take of Indiana bats, tree cutting activities should be carried out from November 16 to March 31, during which time bats are hibernating. If any timber cutting is necessary from April 1 to November 15, the following trees greater than or equal to five inches diameter breast height (d.b.h.) should not be cut or physically disturbed (e.g., while harvesting any adjacent trees) in order to avoid killing or injuring roosting Indiana bats: 1) dead or dying trees and snags (including lightning struck trees) with exfoliating bark; 2) live trees (such as shagbark and shellbark hickory) which have exfoliating or defoliating bark in the trunk or branches; and 3) trees or snags that have characteristics typical of roost sites for Indiana bats (i.e., have exfoliating or defoliating bark, or contain cracks, crevices, or holes that could be used by the species as a

Toki  
allaher  
Lacey  
Foster  
Cresday



potential roost). Tree clearing from November 16 to March 31 may proceed without these restrictions.

Based on a review of the project information, including the size of the project area and the anticipated effects on the forested habitat, the Service has determined that the proposed project will not have a significant adverse effect on overall habitat quality for the Indiana bat. Therefore, if a seasonal restriction on tree cutting is implemented to avoid the direct take of Indiana bats, construction of the proposed project is not likely to adversely affect this species. If you are unable to implement the above measures to avoid adverse effects, however, further consultation with the Pennsylvania Field Office will be necessary.

Except for occasional transient individuals, no other federally proposed or listed endangered or threatened species are known to exist within the project impact area. Should project plans change, or if additional information on the distribution of listed or proposed species becomes available, this determination may be reconsidered.

This response relates only to federally protected threatened or endangered species under our jurisdiction. For information on the presence of other rare species, you should contact Lori Byrne of the Maryland Wildlife and Heritage Division at (410) 260-8573.

An additional concern of the Service is wetlands protection. Federal and state partners of the Chesapeake Bay Program have adopted an interim goal of no overall net loss of the Basin's remaining wetlands, and the long term goal of increasing the quality and quantity of the Basin's wetlands resource base. Because of this policy and the functions and values wetlands perform, the Service recommends avoiding wetland impacts. All wetlands within the project area should be identified, and if construction in wetlands is proposed, the U.S. Army Corps of Engineers, Baltimore District, should be contacted for permit requirements. They can be reached at (410) 962-3670.

We appreciate the opportunity to provide information relative to fish and wildlife issues, and thank you for your interests in these resources. If you have any questions or need further assistance, please contact Mary Ratnaswamy at 410-573-4541.

Sincerely,

A handwritten signature in cursive script that reads "Mary Ratnaswamy".

Mary J. Ratnaswamy, Ph.D.

Program Supervisor, Threatened and Endangered Species





# United States Department of the Interior

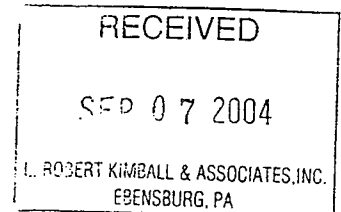
## FISH AND WILDLIFE SERVICE

Pennsylvania Field Office  
315 South Allen Street, Suite 322  
State College, Pennsylvania 16801-4850



September 2, 2004

L. Robert Kimball & Associates  
ATTN: Stephen G. Toki, Jr.  
615 West Highland Ave., P.O. Box 1000  
Ebensburg, PA 15931



Dear Mr. Toki:

This responds to your letter of June 11, 2004, requesting comments on the potential effects that three alternative alignments for the proposed Route 219 Transportation Improvement Project (Meyersdale Bypass) in Somerset County, Pennsylvania, may have on the federally listed, endangered Indiana bat (*Myotis sodalis*). We previously commented on the potential impacts of this project on threatened and endangered species in a May 30, 2002, letter. The following comments are provided pursuant to the Endangered-Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) to ensure the protection of endangered and threatened species.

At the time of our May 30 letter, we did not know that Alternatives AE and D would come within 1000 feet of a known hibernaculum for the Indiana bat, nor that the alternatives could potentially affect over 300 acres of forested habitat. Consequently, we did not request bat surveys at that time. However, due to the anticipated impacts of the project on forest habitat, and the proximity of two alternatives to a known hibernaculum, a bat survey of all three alternatives should be conducted between May 15 and August 15 by a qualified, Fish and Wildlife Service-approved biologist (see enclosed list) using the enclosed survey guidelines. Survey results should be submitted to the Service for review and concurrence. Should Indiana bats be found during the surveys, further consultation with the Service will be necessary, including the submission of detailed project plans, and an analysis of alternatives to avoid and minimize adverse effects.

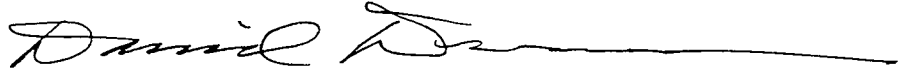
During a presentation at the July 28 Agency Coordination Meeting, it was requested that we concur on dropping Alternative A, and selecting Alternative AE as the recommended preferred alternative for the draft environmental impact statement. Alternative A passes approximately one mile away from the Indiana bat hibernaculum, although it would have similar impacts to forest as the other two alternatives. Therefore, Alternative A should not be dropped from detailed analysis in the draft statement, since it may avoid or minimize impacts to the Indiana bat by passing a greater distance from the hibernaculum. Furthermore, until we evaluate the results of bat surveys, forest habitat conditions, and terrain near the hibernaculum, we will not be able to make a determination on the potential adverse effects any of the alternatives may have on Indiana bats. Therefore, we cannot concur with either dropping Alternative A or selecting Alternative AE as the recommended preferred alternative at this time.

He  
ity  
rider  
Sunday



If you have any questions regarding these comments, please contact Richard McCoy of my staff at 814-234-4090 ext. 232.

Sincerely,

A handwritten signature in black ink, appearing to read "David Densmore", followed by a long horizontal line extending to the right.

David Densmore  
Supervisor



OK'd  
10/04

## MEETING SUMMARY MEMORANDUM

**PROJECT:** U.S. 219, Section 019  
**JOB NO.:** 4715-01  
**DATE:** October 4, 2004  
**TIME:** 1:00 p.m.  
**PURPOSE:** Indiana Bat  
**LOCATION:** Traditions Restaurant, Bat hibernaculum, Alternative E crossing of Piney Run Road

### ATTENDEES:

Rick McCoy, United States Fish and Wildlife Service (US FWS)  
Bob Anderson, USFWS  
Karyn Vandervoort, Federal Highway Administration (FHWA)  
Cal Butchkoski, Pennsylvania Game Commission (PGC)  
Kevin Mixon, PGC  
Greg Turner, PGC  
Jeannine Tardiff, PGC  
Dave Sherman, P.E., Pennsylvania Department of Transportation (PennDOT), District 9  
Stu Kehler, PennDOT District 9  
Scott Hammond, PennDOT District 9  
Greg Kough, P.E., PennDOT Central Office  
Dawn Noel, P.E., McCormick Taylor, Inc.

The meeting began at Traditions Restaurant with brief introductions. Dave Sherman then briefly outlined the Alternatives D, E, and AE, explaining that Alternative A is not being studied any further.

Dawn Noel presented a map that showed the area of potential Indiana Bat roosting habitat within the project area based on land use data collected to Anderson Level II classifications. This area amounts to almost 6,600 acres. The presented map also showed the potential areas of Indiana Bat roosting habitat within each of the alternatives. Alternative D would impact the most potential roosting habitat at 367 acres, Alternative AE the second most at 323 acres, and Alternative E the least at 265 acres. Noel mentioned that the important point is that the project, no matter which alternative is selected, would impact only around 5 percent of the available roosting habitat in the project area. The map also delineated an area along the AE and E Alternative alignments that has been selective cut by Allegheny Wood Products, all oaks, hickories, and cherries have been removed. USFWS stated that this area has not been designated as critical habitat for Indiana bats under the Endangered Species Act. [RMA1]

Noel then presented a cross section of the project area extending from just east of the Indiana Bat hibernaculum (abandoned mine) to the closest point on the alignments of Alternative E and Alternative AE. This cross section shows the road at an elevation



approximately 40 feet above that of the mine opening. Additionally, the road is situated around the hillside from the mine. Noel stated that this hillside orientation would effectively work as a natural noise and vibration barrier between the mine and the proposed highway.

It was noted that the proposed alignments of Alternative AE and E are not on the top of the ridge. The ridge top elevation is approximately 2,800 feet with the road elevations of AE and E averaging around 2,340 feet near Piney Creek.

Cal Butchkoski stated that this hibernaculum is part of a reclamation project in Pennsylvania being designed to assist in the recovery of the Indiana bat. Butchkoski stated that this mine has a fairly unique condition within the state in that it contains areas of low temperatures (38 to 45 degrees Fahrenheit) and moderate temperatures (-in the low 50 degree ranges). Butchkoski mentioned that the 40-degree temperature range is ideal for the Indiana Bat while the higher temperatures are appropriate for other hibernating species of bat such as the eastern pipistrelle. Butchkoski stated that this hibernaculum is one of only five in the Commonwealth that contain all six species of hibernating bat and is only one of 13 that roost Indiana bats. It was also stated that the importance of this hibernaculum is not what it contains now, but its potential as habitat for the Indiana bat as well as the other PA bat species. Butchkoski stated that it's important to move forward, not backward in regards to management of wildlife within the Commonwealth.

Butchkoski mentioned that fall is the time for the bats to mate and prepare for winter hibernation. They expend a lot of energy at this time and need to forage heavily to put on "winter weight." Much of this occurs around the hibernacula, so surrounding habitat is vital. Butchkoski stated that this is very important because, due to the low reproduction rate (one young per year), the bats must avoid any type of predation or population decline.

The main areas of concern identified for bats at the meeting were: roosting habitat (winter and summer), foraging habitat around the mine, areas for maternity colonies and travel corridors.

It was stated that the hibernaculum in the project area is mainly a winter roosting area. The bats in the colony are tied to the winter roosting area for the winter, but most are probably transient animals that migrate to other locations in the summer. Telemetry work on both migrating bats and those replenishing fat reserves before entering the mine for hibernation would provide better information on foraging areas around the mine and migration routes to summer habitats.

Butchkoski mentioned several studies that have and are being conducted on artificial roosting habitat (bat boxes, bat condos). Bats are using these structures for roosting in lieu of trees and some instances of the structures being used for maternity spots have



been documented. He also noted that other agencies, such as PennDOT should begin incorporating these structures into project designs on a routine basis.

It was stated that the Indiana bats have been known to use small woodlots within farming areas as well as large unbroken swaths of forested, indicating that the bats are somewhat adaptable. Most maternity sites are in forested lowland areas rather than ridge tops.

Butchkoski mentioned that one study documents the male Indiana bats foraging areas lay within 2.5 kilometers of the hibernaculum during the fall return period. This is important for the bats to put on fat reserves after migrating to the site and before entering to hibernate. Butchkoski stated that his main concern with this project is impact to foraging habitat within this 2.5-kilometer area. Most foraging areas are within deciduous forest. Deciduous forests are prime foraging habitats for bats beginning/ending migrations to/from the site in the fall and spring

It was also stated that Indiana bat maternity colonies have recently been found <50km from hibernation sites. However, Indiana bats are known to migrate up to 520km from these sites. Butchkoski also stated that maternity areas would most likely be found in - deciduous forest areas in low elevations. Butchkoski mentioned that finding a maternity colony in this area for Indiana bats using this mine is unlikely since the Indiana bats are just beginning to populate this mine. However, Indiana bats could be migrating to summer habitats in the area from other hibernacula. Butchkoski theorized that this could be a reason for the occasional detection of Indiana bats at the mine as they are beginning to become familiar with the site.

Additional studies were discussed to allow the PGC and USFWS collect additional information on the bat such as mist net surveys or telemetry surveys. Butchkoski stated that, given the apparent low densities, it would be difficult to detect Indiana bats in the area with mist netting surveys. It was also noted that, again given the low densities of Indiana bats within the mine, that capturing Indiana bats at the mine entrances during the spring and fall swarms would be difficult.

Greg Turner stated that telemetry surveys would be preferred in order to help delineate foraging habitat in the project area. It was stated that the initial (first feeding) foraging habitat would be along the stream corridors, then as temperatures dropped along the streams the bats would move up the warmer vegetated slopes (second feeding). Butchkoski stated that much of the later feedings occur on the warmer ridge tops. Telemetry studies would help identify travel corridors – where the bats go when they leave the mine, where they forage and the routes they use back to the mine. It was mentioned that telemetry studies conducted in the spring and then in the fall would provide the best information.

PGC stated that obtaining an average height (elevation above ground) for bat foraging is a very difficult task. Video recording, light tagging and radar systems can be used, but these systems are expensive and time consuming. Butchkoski mentioned that the myotis



species, including the Indiana Bat, tend to be "tied" to the tree canopies when foraging or traveling; therefore if the road and bridge would be above the canopy there would be less concern with road kill.

It was mentioned that studies have also shown bats foraging along transportation/utility corridors in the area between the cleared and the forested areas. This is thought to potentially increase bat kills along roadways.

Rick McCoy stated that the USFWS requested mist net studies along all three alignments (Alternatives D, AE/E and A) to help determine where the more suitable habitat areas are located. McCoy stated that knowledge of the types and maturity of trees in an area is important to understanding the bats' behaviors. Noel responded that using the existing GIS for this project and the Anderson Level III data that has been collected, a breakdown can be provided for each alignment showing the types of forest cover and sizes of trees within each alignment that will be impacted. The USFWS requested this information.

Several different mitigation measures were discussed including:

- Timbering restrictions
- Designing the bridge over Piney Creek to provide roosting habitat (i.e., open box beams)
- Installing artificial/man-made roosting structures on or near the bridge abutments where abutments are in and above the tree canopy.
- A conservation easement around the bat hibernaculum to preserve vital foraging habitat and provide for some roosting trees (i.e. hickory).
- Remove additional tree cover along the road right-of-way to keep the bats back from the roadway, thereby reducing road-kill potential. However, this requires identifying travel corridors. A highway bisecting travel corridors requires additional mitigation measures.

The PGC is conducting mist net surveys tonight and tomorrow evening to help expand the information they have pertaining to a winter count of the bats. It was noted, that given the small sample period (due to other manpower demands) the chance of capturing Indiana bats will be small.

Concerns over blasting were also discussed. It was stated that the geotechnical analysis has not been completed yet, so it is unknown whether blasting will be required. Turner mentioned that the impacts of blasting could be reduced by not conducting blasting during the hibernation season. Additionally, placing blast sensors in the cave to help monitor potential vibration impacts would be useful, per the PGC. Bob Anderson and Kevin Mixon both mentioned that on previous projects methods of conducting the blasting in a non-intrusive way have been evaluated (such as types and sizes of charges, positioning of explosives, etc...) It was stated that blasting issues can be coordinated and mitigation measures for blasting documented in the Environmental Impact Statement (EIS).



The project schedule was discussed. It was stated that a Pre-Draft EIS is anticipated in January, with circulation of a Draft EIS in the spring of 2005, and a Record of Decision in late 2005 or early 2006. Additionally, it was noted that construction would probably not be completed for 5 to 10 years.

It was noted that the next step is for FHWA/PennDOT to respond to the USFWS September 2, 2004 letter. Bob Anderson stated that if FHWA feels additional studies are not needed, a memo documenting why the studies are not needed and what is being proposed in lieu of studies should be sent to USFWS.[RMA2]

The meeting adjourned around 4:30 p.m.

**ITEMS RECEIVED/DELIVERED:** Map with Alternatives D, E, and AE showing potential roosting Habitat based on Anderson II and III, timbering area, and acreages of existing roosting habitat and Amount that would be impacted by each alternative.

---

**REQUIRED ACTION:** FHWA/PennDOT Memo to USFWS

---

**DISTRIBUTION:**

D. Sherman
S. Hammond
S. Kehler
G. Kough
K. Vandervoort
B. Cossaboon
D. Hoover

**McCORMICK TAYLOR, INC.**

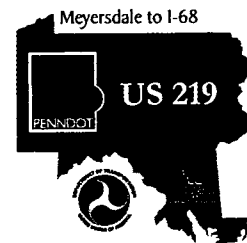
**BY:** D. Noel

**TITLE:** Environmental Manager

---

**PAGE:** 4                      **Of** 4





## MEMORANDUM OF MEETING

**DATE:** January 20, 2005 - FINAL

**MEETING DATE:** December 21, 2004

**PLACE:** Federal Highway Administration  
Harrisburg, PA

**TIME:** 9:00 a.m.

**SUBJECT:** US 219 Meyersdale to I-68  
Status Meeting

**ATTENDEES:** See Attached Sheet

---

1. Karyn Vandervoort explained that today's meeting is a follow up to the October field view. FHWA wants to discuss some conservation measures that PennDOT and FHWA are willing to offer for the Indiana Bat. Karyn quickly reviewed the agenda, which includes discussing the data gaps, the knowns, potential actions, and conservation measures.
2. One of the data gaps is how many Indiana bats are in the cave. Karyn noted that from what she remembers there has only been one bat identified in five years. However, the condition of the cave is optimal hibernacula. Cal Butchkoski stated that the Pennsylvania Game Commission (PGC) is not saying that it is a significant hibernacula; however, the conditions are optimal given that Hell Hole is located 60 miles to the south in West Virginia and Canoe Creek is located to the north. There are known Indiana bat populations in both of these caves. Karyn noted that the other unknowns at this time are flight patterns and the exact location of foraging and roosting habitats.
3. Cal Butchkoski stated that bat identification is done every other year. One Indiana bat was identified in this cave in 1999. There were none identified in 2001 and one was identified in 2003. They are not sure if the same bat was identified in 1999 and 2003. Carol Copeyon asked if the bats were tagged. Cal stated that no, they are not tagged during the identification process. The



identification process is conducted in the winter and it would be too disruptive to tag them at that time. Cal noted that five other species of bats utilize the Salisbury mine cave for a total of six.

4. Carol Copeyon asked how certain the PCG is that this is a complete count versus just a survey of the bats. Cal Butchkoski stated that the PCG is 90% certain that this is a complete survey. No surveys ever complete. I'd say we're sampling at least 90% of the bats. Carol stated that one Indiana bat was confirmed in 2003. She asked how many of the bats he feels went uncounted. Cal stated that in Canoe Creek, 9-10 out of the 700-800 bats that were identified were Indiana bats.
5. Carol Copeyon asked Cal Butchkoski whether the mine was likely to support 10s, 100s or 1000s of I-bats, considering the winter survey was not likely to be a complete count. Cal responded 10s.
6. Carol asked why areas >10% slopes were used in identifying the foraging habitat. Deb Hoover explained that this was a parameter provided to them from the previous field view meeting. Carol stated that for future foraging habitat identification, just show the forested areas and don't use a slope.
7. Cal Butchkoski explained that the maternity sites are not tied to the hibernacula. Some of the radio tracking work done in New York was able to track bats 25-30 miles away from the hibernacula. Males can be found just about anywhere in the forested habitat. The females need the warmer conditions for embryo and milk development.
8. Carol Copeyon asked if a summer survey was every conducted. She stated that a summer survey was conducted in Indiana and they found quite a few males in the cave, which was unexpected.
9. Karyn Vandervoort wanted to review the potential harm or harassment factor to the Indiana bat in relation to Alternatives E and AE. Blasting will be required in the area of Piney Creek. There is going to be a bridge crossing the steep ravine over Piney Creek. The bridge is going to be about 145' from the existing surface to the bottom of the bridge structure. There is a concern regarding the vibration from the blasting reaching the mine and disturbing the bats. Kevin Mixon sent the project team a vibration study report prepared by Vibra-Tech on another mining job that was close to bat hibernacula. Karyn noted that Vibra-Tech is also on the Team for this project. Based on the information assimilated from the recent boring work and the geological research conducted for this project, the Team feels that shear waves induced by blasting for roadway excavations should have negligible or no adverse impact on the hibernacula for the following reasons:



- The frequency spectrum of blasting-induced shear waves is relatively high with low amplitude. It is the amplitude and not the frequency that will have the greatest impact on the walls of the abandoned limestone mine. Since the waves will be of low amplitude, their effect should be minimal.
- Blasting-induced seismic waves generally propagate on a horizontal plane. With the significant elevation difference between the proposed road grade at the base of the excavation and the elevation of the abandoned mine below the roadway or the elevation of the abandoned mine entrance, the effect should again be minimal.
- Seismic wave propagation in bedrock is attenuated by the presence of discontinuities (joints, fractures, bedding planes, etc.) in the bedrock. With the significant stratigraphic elevation difference in bedrock between the Pottsville group rocks at the base of the excavation and the Mauch Chunk formation rocks at the abandoned limestone mine, the effect should again be minimal.
- Finally, special provisions will be incorporated in the construction contract to limit the peak particle velocity at the hibernacula to levels consistent with current PaDEP guidelines. The site-specific blasting plan prepared by the contractor must be reviewed and approved by both PaDEP and PennDOT prior to any blasting, and vibration monitoring will be required at critical locations, including the hibernacula.

10. Carol Copeyon requested that the mine be mapped. Cal Butchkoski noted that the main passages shoot off to the north. The vertical passages tend to go south.

11. Karyn Vandervoort distributed three impact tables for both the foraging and roosting habitat areas. She noted that Alternative D has the greatest impact to the roosting habitat areas. Carol Copeyon asked why 2.5-kilometer radius was used to tally the impacts. Cal noted that 2.5-kilometer is referenced in Munsell's guide. Carol asked if the 2.5-kilometer is the maternity habitat area? The response was no, it is not the maternity habitat area. Carol said the effects analysis should consider the potential presence of an I-bat maternity colony in the action area. The roosting and foraging habitat for maternity colonies is generally contained within about a 2-mile radius (but this does not mean that all forested habitat within a 2-mile radius is used for foraging and roosting). Foraging areas for individual I-bats, assuming a foraging range of 125-250 acres. Will any forested habitat be permanently protected to minimize the effects of permanent forest loss?

The analysis should also consider the effects of the potential removal of I-bat maternity roost trees (e.g. seasonal restriction as a project minimization measure). The effects analysis should consider the effects of the project on the



foraging habitat supporting the hibernating bat population as well. This analysis should consider the 5-mile radius around the hibernaculum, and the effects of forest habitat loss within that radius (compare pre- and post-project forest cover within the 5-mile radius).

12. Karyn explained that two parcels just to the west of the hibernacula that fall within Alternative E and AE are either timbered or will be timbered. They will be doing selective cutting, presumably removing the larger trees. However, when you look at the rest of the project area, and the area to the east of the hibernacula, most of that will remain forested. Carol asked for the contact information for both parcels.
13. The Biological Assessment (BA) should discuss the different types of the species' habitat and how the project will affect those parcels.
14. The topic of road mortality was discussed. The bridge is going to be approximately 145' feet high. The trees range anywhere from 20' to 80' in height. Given that information, would there be mortality as a result of the moving vehicles? Considering the lay of the land, where do you project that the bats would be flying? It was noted that telemetry studies may have to be completed with surrogate species to determine where the bats would be flying. Another question was posed, where are the bats going to cross the highway? The majority of bats are going to cross where it is forested. It was noted that the wider the highway cut, the more likely they are to dive down into the cut and then back up into the forest once they are across. A possible mitigation measure could be to tighten up the slope. Once the borings are done and based on the results, the slopes may be able to be reduced to 1:1 or 1½ :1. The elevation of the bridge could possibly be raised to 180' in order to reduce the cut section width.
15. Karyn presented some additional possible mitigation measures including clearing restrictions, which would be imposed September to March. Carol Copeyon stated that typical seasonal timbering restrictions within 5-miles of a hibernaculum are from November 16 to March 31.
16. Other prudent conservation easements to work on include a conservation easement, which would be entered into with the current landowner. The current agreement has a 30-day termination clause. This easement could be for the cave itself and the path back to the cave. If possible, the Team could see if he would be willing to expand the area to include a buffer around the cave. If he is not willing to enter into an agreement, the Team could talk to other landowners to see if other areas could be purchased as part of right-of-way and left forested.
17. Additional mitigation could be blasting restrictions within the area closest to the hibernacula and done during the summer. A buffer should also be added around the cave, which would also adhere to the blasting restrictions.



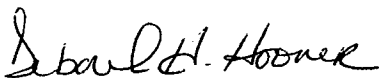
18. Bat boxes, built to PCG specifications, could be purchased and erected within the project area or arrangements could be made with private landowners to construct them on their properties, mainly along stream banks. These boxes seem to be successful in the Canoe Creek area. The aluminum type boxes are preferred. It was suggested that the boxes be placed to direct the bats from the cave to the stream (under the bridge) to encourage a safer travel corridor.
19. It was recommended that as many trees be kept as possible; however, maternity roosts should not be promoted next to the highway.
20. Karyn asked if the PCG and USFWS liked the conservation measures presented and if those are employed, could it be concluded that there will be No Affect to the Indiana bat? It was stated that since the species is already in the project area, a BA is required under section 7 of the Endangered Species Act because the US 219 Meyersdale to I-68 project is a "major construction activity" (50 CFR § 402.12 (b))...
21. Post-construction commitments could be made as well, such as looking for road kill in the spring and fall, three times per week. Walks should be done when the pups are out, which is the last half of June. The identification of road kill, or lack therefore, would substantiate the premise that more than the one (1) observed I-bat is present and if it/they are using the area of the proposed road crossing as their flight path. Currently, based on known information, the I-bat population is scant, and the BA will be written as such. However, if through up-coming studies and post-construction observation of road kill it is determined that the population is more plentiful, FHWA may opt to reinstate consultation with the USFWS to adjust conditions as presented in the BA.
22. It was noted the FHWA will be requesting concurrence on their opinion from the USFWS when the BA is submitted.

The meeting adjourned around 11:00 a.m.

23. Following the meeting, it was noted that all mine openings within the project area need to be viewed to see if it is a potential hibernacula. If it is, it will have to be surveyed to determine if they may be suitable bat hibernacula.

Prepared by:

McCORMICK TAYLOR



Deborah H. Hoover  
Project Coordinator



***US 219 Meyersdale to I-68  
Sign-In  
December 7, 2004***



**Name:**

Greg Kough  
Thomas Prestash  
David Sherman  
Scott Hammond  
Robert Anderson  
Carol Copeyon  
Kevin Mixon  
Greg Turner  
Cal Butchkoski  
Dave Cough  
Karyn Vandervoort  
Deborah Hoover

**Representing:**

PennDOT BOD  
PennDOT District 9-0  
PennDOT District 9-0  
PennDOT District 9-0  
US Fish and Wildlife Service  
US Fish and Wildlife Service  
Pennsylvania Game Commission  
Pennsylvania Game Commission  
Pennsylvania Game Commission  
Federal Highway Administration  
Federal Highway Administration  
McCormick Taylor, Inc.





## **U.S. 219, Section 019**

**Meyersdale, Somerset County, Pennsylvania  
to  
I-68 in Garrett County, Maryland  
Transportation Improvement Project**

# **Indiana bat Biological Assessment**

**Prepared for:**

**Federal Highway Administration**

**Pennsylvania Department of Transportation  
Engineering District 9-0**

**and**

**Maryland State Highway Administration**

**Prepared by:**

**McCormick  
Engineers & Planners  
Since 1946 Taylor**

**In Association with:**

**Bat Conservation and Management, Inc.  
Geo-Mechanics, Inc.  
L. Robert Kimball, Inc.  
and  
DMJM Harris, Inc.**

**June 2006**



**TABLE OF CONTENTS**

<b>I.</b>	<b>OVERVIEW .....</b>	<b>1</b>
A.	Purpose & Need .....	1
B.	Informal Consultation Activities.....	3
<b>II.</b>	<b>PROJECT DESCRIPTION .....</b>	<b>3</b>
<b>III.</b>	<b>DESCRIPTION OF PROJECT ACTION AREA .....</b>	<b>4</b>
A.	Introduction.....	4
1.	Description.....	4
2.	Presence of Indiana bat .....	5
<b>IV.</b>	<b>ENDANGERED SPECIES AND HABITAT OCCURRENCE.....</b>	<b>6</b>
A.	Indiana bat Biology.....	6
B.	Indiana bat occurrence in the Project Area .....	8
1.	Hibernaculum.....	8
2.	Foraging Habitat .....	12
3.	Roosting Habitat .....	12
4.	Maternity Roost Habitat.....	13
5.	Migration Paths .....	13
<b>V.</b>	<b>EFFECTS OF PROPOSED ACTION .....</b>	<b>14</b>
A.	Direct.....	14
1.	Timber Removal .....	14
2.	Blasting .....	14
3.	Noise .....	15
B.	Indirect Effects.....	16
1.	Windmills.....	16
2.	Previous Commercial Timbering Operations .....	16
C.	Cumulative.....	17
1.	Timber Removal .....	17
2.	Residential Developments .....	17
3.	Summary of Cumulative Effects.....	17
D.	Effects Conclusion .....	18
<b>VI.</b>	<b>CONSERVATION MEASURES.....</b>	<b>18</b>
A.	Measures to Minimize Harm & Harassment .....	18
1.	Timber Restrictions and Impact Minimization .....	18
2.	Blasting Restrictions .....	19
3.	Other Measures .....	19
B.	Effects of Proposed Measures.....	20
C.	Measures to Benefit or Promote Species Recovery .....	20
1.	Habitat Enhancement and Protection.....	20
2.	Bat Boxes/Condos & Tree Girdling.....	21



**TABLE OF CONTENTS**

<b>VII. MITIGATION MEASURES.....</b>	<b>21</b>
A. Recommended Mitigation Measures .....	21
1. Monitoring .....	21
2. Bridge Design .....	21
3. Terrestrial Planting Plans.....	21
B. Mitigation Measures Considered and Dismissed.....	22
1. Bridge Design .....	22
<b>VIII. CONCLUSION .....</b>	<b>22</b>
<b>IX. REFERENCES.....</b>	<b>23</b>

**FIGURES**

Figure 1: Project Location Map

Figure 2: Alternatives and Hibernaculum

Figure 3: Indiana bat Hibernacula and Summer sites in Pennsylvania

Figure 4: [REDACTED] Location

Figure 5: [REDACTED] Map

Figure 6: Surveyed Mine Locations

Figure 7: Stratigraphic Column

Figure 8: Mine Purchase/Perpetual Easement

**TABLES**

Table 1: Foraging Habitat and Roosting Area Potential Impacts

**APPENDICES**

Appendix A: Coordination and Correspondence

Appendix B: Design Plans for Ecologically Best Balanced Alternative

Appendix C: Abandoned Mine Investigations

Appendix D: Underground Coal Mining Maps

Appendix E: Core Borings

Appendix F: Blasting Assessment



## I. OVERVIEW

The Federal Highway Administration (FHWA) along with the Pennsylvania Department of Transportation (PennDOT) and the Maryland State Highway Administration (MD SHA) have initiated preliminary engineering and environmental clearance studies for Section 019 of U.S. 219. Section 019 extends 13 kilometers (eight miles) from the southern end of the Meyersdale Bypass in Somerset County, Pennsylvania to Interstate 68 (I-68) in Garrett County, Maryland. The study area encompasses portions of Elk Lick and Summit Townships in Somerset County, Pennsylvania and the northeastern corner of Garrett County, Maryland. *See Figure 1, Project Location Map.*

During the 1990's, FHWA and PennDOT completed the U.S. 219 Project Need Analysis that evaluated transportation needs of U.S. 219 between I-68 in Maryland and Somerset, Pennsylvania. This study revealed numerous deficiencies along the entire corridor. Two sections of U.S. 219, one north and one south of Meyersdale, remain as two-lane facilities. Currently, the section north of Meyersdale is undergoing preliminary design and environmental studies as a separate project. Section 019, the link between Meyersdale and I-68 in Maryland, is the subject of this study. As the last link to Interstate 68 in Maryland, this section of U.S. 219 is recognized as a key improvement project.

The northern terminus for this project is the southern end of the existing four-lane, limited access, Meyersdale Bypass. The southern terminus is near the existing I-68 and U.S. 219 interchange. As stated in the project needs section that follows, the project termini were selected in order to address deficiencies along this section of U.S. 219 and to resolve a system continuity issue. Support for the southern project terminus also stems from the 2001 North-South Appalachia Corridor Feasibility Study, discussed in more detail in the following section of this document. This study showed that the U.S. 219 corridor from I-68 to the Pennsylvania Turnpike had the greatest potential to benefit the region economically. This proposed project, along with PennDOT's U.S. 219 project north of Meyersdale, would complete the four-lane, limited access highway from I-68 to the Pennsylvania Turnpike (I-76).

### A. Purpose & Need

The March 1999 report, "Needs Analysis, U.S. Route 219, I-68 (MD) to Somerset, Pennsylvania," summarizes the needs for this project. The Needs Analysis evaluated existing and future traffic congestion, traffic movement patterns, existing roadway geometric constraints, accidents, system linkage and continuity, socioeconomic characteristics, and economic development potential of the study corridors. FHWA and the Pennsylvania and federal resource agencies granted needs concurrence in April of 1999. The following summary includes the needs as they pertain to this section of U.S. 219:

- ✓ Forty-three percent of the 39 total roadway segments on U.S. 219 have accident rates that exceed the statewide average accident rate. Seven of these roadway segments (18 percent) on U.S. 219 have accident rates that are more than twice the statewide accident rate.
- ✓ Current and future transportation demands result in deficient levels of service for most of U.S. 219.



- ✓ Numerous roadway geometric features on U.S. 219 do not meet current design standards concerning lane and shoulder width, vertical grade, horizontal curvature, and sight distance.
- ✓ Deficient levels of service, geometric constraints, and lack of passing zones along U.S. 219 result in increased travel times and delays.
- ✓ The two-lane section of U.S. 219 represents a less efficient system linkage for motorists traveling between the four-lane section of U.S. 219 [and] the PA Turnpike (I-70/I-76) in Somerset, PA and I-68 in Maryland.
- ✓ U.S. 219 does not provide adequate access to the surrounding municipalities and is a significant contributing factor in limiting economic development.

Based on the identified transportation needs, the purpose of the project is to:

- ✓ Improve the level of safety for motorists traveling on U.S. 219.
- ✓ Improve the level of service on U.S. 219.
- ✓ Improve the system linkage between I-68, the Meyersdale Bypass, the [existing] four-lane section of U.S. 219, and the PA Turnpike.
- ✓ Provide safe and efficient access for the southern Somerset County [and Garrett County] region in order to improve economic development potential.

Additionally, current and future deficient levels of service exist particularly north of Salisbury, Pennsylvania, primarily due to existing geometric deficiencies. There is also a system continuity issue requiring consistency with the adjoining four-lane limited access roadways to the north (Meyersdale Bypass) and south (Interstate 68).

The Appalachian Regional Commission (ARC) supports improvements to the U.S. 219 corridor as a vital transportation link needed to improve economic and social conditions in the Appalachian Region. U.S. 219 is one of ARC's priority corridors, Corridor N, on their Appalachian Development Highway System (ADHS). ARC intends the ADHS to be a system of interstate type highways linking the Appalachian Region to the rest of the U.S. and Canada. A 1960s era ARC study found that the Nation's Interstate Highway System has mostly bypassed the Appalachian Region. This isolation hinders the economic and social development of the Region.

The 2001 North-South Appalachia Corridor Feasibility Study evaluated the potential economic development support generated by highway improvements in Appalachia. Pennsylvania, Maryland, West Virginia, and Virginia jointly completed the study. Four corridors from I-66 in the south to the Pennsylvania Turnpike were evaluated, with I-68 dividing the corridors into northern and southern corridors. The study identified two corridors, one each of the southern and northern corridors, as having the greatest potential to benefit Appalachian economic development. The selected northern corridor was U.S. 219 from I-68 to the Pennsylvania Turnpike. The study found that improvements to U.S. 219 would support between 2,400 and 2,600 new jobs in Pennsylvania, the highest percentage (8 percent) of job growth of the four northern corridors. Upgrade to a four-lane facility was the recommended improvement.



## **B. Informal Consultation Activities**

Coordination with the natural resource agencies, including the United States Fish and Wildlife Service (USFWS) and the Pennsylvania Game Commission (PGC) began in 2002 and has continued throughout the project to obtain information on the presence of threatened and endangered species within the project area. Information received from the USFWS indicated that the Indiana bat, a federally endangered species, is known to exist in the project area. Further coordination identified a known hibernaculum ( [REDACTED] ) near the project area.

An April 1, 2003 letter from the USFWS Chesapeake Bay Field Office and a May 30, 2002 letter from the USFWS Pennsylvania Field Office indicated that avoidance be undertaken through timber restrictions. A September 2, 2004 letter from the USFWS State College Field Office requested discretionary surveys to provide better information by which to assess potential impacts.

As a result of the written correspondence, a field view (October 4, 2004) and meeting (December 21, 2004) were held with the USFWS and PGC. The USFWS requested that the [REDACTED] be mapped and that other known mine/cave openings in the project area be assessed for their potential as Indiana bat habitat. *See Appendix A, Coordination and Correspondence.* The following pages document the results of these studies and summarize the project's potential to impact the Indiana bat.

## **II. PROJECT DESCRIPTION**

An alternatives development and evaluation process completed for this project defined and analyzed a broad range of transportation improvement alternatives. The alternatives were developed, analyzed, and advanced or not advanced based on consideration of their ability to meet project needs; success in balancing environmental impacts with engineering requirements; and input received from the Citizen's Advisory Committee (CAC), the public, Section 106 Consulting Parties, environmental/cultural resource agencies, and public officials.

A range of preliminary alternatives including the No-Build Alternative, Transportation System Management (TSM) Alternative, Upgrade Alternative, and alternatives on new alignment were developed and evaluated. The following discussion describes the alternatives (Alternatives D, E, and AE) that were carried forward into more detailed studies. *See Figure 2, Alternatives and Hibernaculum.*

Alternative D would begin at Hunsrick Summit and follow along the western side of Meadow Mountain until Engles Mills. At that point, Alternative D would travel in a southwesterly direction across the Piney Creek Valley and cross over U.S. 219 just to the south of Salisbury. Once it crosses over U.S. 219, it proceeds in a southerly – southeasterly direction to I-68.

Alternative E would start at Hunsrick Summit and follow the western side of Meadow Mountain in Pennsylvania. At the Pennsylvania/Maryland border, Alternative E would travel in a southwesterly direction east of existing U.S. 219. This alternative would tie into I-68 just east of the existing interchange with U.S. 219.



Alternative AE follows the same alignment as the northern section of Alternative E from Hunsrick Summit to approximately the state line. At the state line, Alternative AE diverges from Alternative E and heads westward, crossing existing U.S. 219 just south of the state line. The alignment then follows Alternative D south to I-68.

For the connection to I-68 two interchange types were considered. Option 1 would be a system-to-system flyover ramp type interchange. Option 2 would be a closed-loop ramp type interchange. Both interchange types provide full-directional, freeway-to-freeway service. The difference in impacts from the two interchange options, in regards to overall potential effect on the Indiana bat, are negligible and therefore, impacts are not separated by interchange type.

<b>Table 1: Foraging Habitat and Roosting Area Potential Impacts</b>							
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>
<b>Alternative</b>	<b>Total Estimated Foraging Area Impacted Hectares (Acres)</b>	<b>% Of total Foraging area in Project Area*</b>	<b>Total Estimated Forest Land Impacted Hectares (Acres)</b>	<b>% Of total forest land in Project Area*</b>	<b>Estimated Forest Land that would require replacement in MD Hectares (Acres)</b>	<b>Net loss of forestland Hectares (Acres)</b>  <i>Column 4 minus column 6</i>	<b>% Of total forest land in Project Area*</b>
<b>D</b>	194 (480)	5%	123 (304)	5%	45 (110)	79 (194)	3%
<b>E</b>	152 (375)	4%	84 (208)	3%	29 (72)	55 (136)	2%
<b>AE</b>	148 (366)	4%	99 (244)	4%	42 (105)	56 (139)	2%
*Project Area is 4,658 hectares (11,510 acres) in size and contains 2,662 hectares (6,580 acres) of forestland and an estimated 4,129 hectares (10,203 acres) of foraging area. Foraging area for this purpose included: agricultural land, rangeland, and forestland.							

Table 1 shows that Alternative E has the potential to impact the least amount of forestland and approximately the same amount of foraging habitat as Alternative AE. Based on this, and because Alternative E would also have the least potential to impact wetlands and streams, Alternative E is considered to be the ecologically best-balanced alternative. Alternative E is the alternative discussed in this Biological Assessment. *See Appendix B: Design Plans for Ecologically Best Balanced Alternative.*

### III.DESCRPTION OF PROJECT ACTION AREA

#### A. Introduction

##### 1. Description

The proposed project area is mostly undeveloped forest land and agricultural areas interspersed with scattered residential development and barren lands, including commercially timbered areas and previously surface-mined areas. The project area has been heavily surface- and deep-mined for both coal and limestone. Several abandoned mines exist in or near the project area, including



the [REDACTED] an abandoned limestone mine located just east of the project area and north of Piney Creek. [REDACTED] is a known hibernaculum for bats, including the Indiana bat.

The project area is contained within the Casselman River drainage basin. Two major sub basins exist in the project area: Meadow Run and Piney Creek. Meadow Run begins south of I-68 in Maryland and travels in a northerly direction into Pennsylvania where it heads westward to its confluence with the Casselman River. Piney Creek crosses through Pennsylvania in an east to west direction joining the Casselman River north of the Borough of Salisbury near the town of Boynton.

The most likely travel corridor for the Indiana bats between the [REDACTED] and the most likely foraging habitat would be the riparian forest corridor along Piney Creek. This riparian forest is avoided by the use of a bridge structure that would be 53 meters (175 feet) high and 457 meters (1,500 feet) long, spanning the entire width of the Piney Creek gorge/ravine. Both approach ends of the bridge would be in steep cuts. The steep approach cuts combined with the height of the bridge and the known fact that the bats tend to fly no higher than 30 meters (100 feet) above the ground, which would be 53 meters (175 feet) below the bridge superstructure, no direct adverse effect to the species is anticipated.

## **2. Presence of Indiana bat**

According to the species list received from the USFWS at the beginning of the proposed project, the Indiana bat, a federally listed endangered mammal, is known to exist in the project area. No Critical Habitat exists in the project area.

Based on biennial bat identification surveys conducted by the PGC, a known Indiana bat hibernaculum exists in the project vicinity. In 1999, then again in 2003, one bat was identified in the [REDACTED] which is located just east of the project area along Piney Creek. *See Figure 2.* Subsequent surveys conducted in 2004/2005 identified three Indiana bats in the [REDACTED]

While the mine does not currently appear to have a large population of Indiana bats, it does possess a fairly unique condition within Pennsylvania. [REDACTED] contains areas of low temperature, 3 to 7 degrees Celsius (38 to 45 degrees Fahrenheit) and moderate temperatures, low 10 degrees Celsius (50 degrees Fahrenheit range). The 4-degree Celsius (40-degree Fahrenheit) temperature range is considered ideal for Indiana bats. PGC has stated the [REDACTED] is part of a Pennsylvania reclamation project that is being designed to assist in the recovery of the Indiana bat. Therefore, based on PGC information, it is understood that the importance of [REDACTED] is not solely what it now contains, but for its future potential.

Based on the presence of a known hibernaculum, the project area would be utilized as foraging habitat for Indiana bats during the fall and spring swarms. The presence of the Indiana bat in the project area during the summer for roosting, foraging and for maternity habitat has not been proven or documented.



#### IV. ENDANGERED SPECIES AND HABITAT OCCURRENCE

##### A. Indiana bat Biology

The Indiana bat (*Myotis sodalis*) was officially listed as an endangered species on March 11, 1967 (32 FR 4001) under the Endangered Species Preservation Act of October 15, 1966 [80 Stat. 926; 16 U.S.C. 668aa(c)]. The Indiana bat has been found throughout much of the eastern United States from Oklahoma, Iowa, and Wisconsin, east to Vermont and south to northwestern Florida. The USFWS reports a population of approximately 380,000 individuals, which is a decline of about 60 percent since 1960 (USFWS 1999). Both summer and winter habitat losses are believed to be contributing factors.

Indiana bats primarily use trees in the summer. Summer habitat includes riparian, bottomland or upland forests, old fields, and pastures. Reproductive female Indiana bats usually form small maternity colonies under exfoliating bark of trees during the summer months (Whitaker and Hamilton 1998). Mating occurs in autumn as the bats enter the hibernaculum and females store the sperm through the winter. Fertilization occurs in the spring as the bats are leaving the hibernaculum. Females arrive at summer maternity sites in mid April to late May and give birth to a single pup in mid June to early July. The young are able to fly by mid July to early August.

In general, it appears that large trees with exfoliating bark and exposure to extensive solar radiation (Menzel et al. 2001) are preferred maternity roosts. Choosing maternity roosts with high solar exposure increases the roost temperature, which may decrease the time of fetal development and juvenile growth (Callahan et al. 1997). Studies have shown that Indiana bats prefer roosting temperatures of around 100 degrees. Most roosts are within one kilometer (0.6 mile) of water. Roosting habitat appears to be best in forested areas with canopy closure between sixty and eighty percent. Males are less selective and will use trees of almost any size as roosts, as long as the trees have loose bark or cavities to roost in or under (Kiser and Elliott 1996). Males and non-reproductive females seek cooler roosts than females in maternity colonies to conserve energy. Females in maternity colonies use multiple roosts, but typically have at least one primary roost. Several secondary roosts can be present within the vicinity of these primary roosts (Gardner et al. 1991; Callahan et al. 1997). Primary roosts are typically standing dead trees (snags) with solar exposure. Alternate roosts included live and dead trees located in more shaded locations. The use of alternate roosts may be influenced by weather and the ephemeral qualities of preferred roosting trees, as roost trees are only suitable for use before all the bark falls off or the tree falls (Kurta et al 1996; Callahan et al. 1997). Because of the ephemeral qualities of roost trees, the Indiana bats often move among roosts in a season and when roosts become unavailable from year to year. Lactating (nursing) females are more likely to use particular roosts consistently than non-reproductive females and males; however, documented information, as presented, shows that the bats have the ability to adapt to changes in roost availability.

In Pennsylvania, only one summer maternity site has been documented and is located within the attic of a decommissioned country church at Canoe Creek State Park, Blair County (Butchkoski and Hassinger 2002). This is the only known maternity roost in Pennsylvania. Indiana bats from the church at Canoe Creek concentrated foraging to wooded areas, similar to those studied



elsewhere (Brack 1983; Gardner et al. 1991; LaVal et al. 1977). Within the foraging range,  $\leq 4.5$  kilometers (2.8 miles), of radio tagged bats, there were large amounts of riparian and lakeside forests and forested mountainsides. Despite availability of such wooded areas, Indiana bats restricted foraging to the largest, about 1,300 hectares (3,212 acres), areas of upland forest with slopes less than ten degrees (Butchkoski and Hassinger 2002). Foraging by some bats occurred up to 4.5 kilometers (2.8 miles) from the church (Butchkoski and Hassinger 2002), a distance that appears greater than previously reported. Most Indiana bats studied in Illinois foraged within two kilometers (1.2 miles) of their roosts (Gardner et al. 1991), and Indiana bats in Michigan reportedly foraged at sites within 3.5 kilometers (2.2 miles) of their roost tree (Murray 1999). Female and juvenile Indiana bats tend to forage in the airspace near the foliage of riparian and floodplain trees. The males tend to forage the densely wooded area at the top of trees and over floodplain ridges and hillsides forests. Indiana bats usually forage within the airspace from 1.8 to 30 meters (six to 100 feet) above ground level. Even though this information suggests that a 4.0 kilometer (2.5 mile) radius is the usual extent of foraging areas, the USFWS and PGC identified the area within an eight-kilometer (five-mile) radius of a hibernaculum as the most important foraging habitat. Therefore, this analysis evaluated the potential for impact to habitat within at least 8-kilometers (5-miles) of the hibernaculum.

The winter habitat of Indiana bats closely follows regions of well-developed limestone caverns within the bats' range. These underground shelters serve as hibernacula and are categorized as Priority 1, 2, or 3 in the USFWS Indiana bat Recovery Plan Draft (USFWS, 1999). These categories are based on recorded Indiana bat numbers since 1960. More than 85 percent of the range wide population occupies nine Priority 1 hibernacula (hibernation sites with a recorded population of more than 30,000 bats since 1960, although two of these currently have extremely low numbers of bats). Indiana, Kentucky, and Missouri each contain three Priority 1 hibernacula. Priority 2 hibernacula (recorded population between 500 and 30,000 bats since 1960) are known to exist in the aforementioned states, along with Arkansas, Illinois, New York, Ohio, Pennsylvania, Tennessee, Virginia, and West Virginia. Priority 3 hibernacula with recorded populations of less than 500 bats or records of single hibernating individuals have been reported in 17 states, including all of those mentioned.

Indiana bat hibernacula have noticeable airflow (Henshaw 1965) and standard temperature ranges. Tuttle and Kennedy (1999) hypothesized that Indiana bats prefer unique hibernacula with the lowest nonfreezing temperatures possible. In the bats core range, midwinter cave temperatures of two to five degrees Celsius (36 to 41 degrees Fahrenheit) were reported for Indiana bat roost sites (Hall 1962; Henshaw 1965; Henshaw and Folk 1966; Thomson 1982). By placing temperature data loggers within hibernacula, Tuttle and Kennedy (1999) reported an over winter range of -8.3 to 12.1 degrees Celsius (17.1 to 55.6 degrees Fahrenheit) from 15 important hibernacula in Kentucky, Illinois, Indiana, Missouri, Tennessee, and Virginia. An analysis of temperature and population trends for some of these caves revealed population increases in four of six caves where winter temperatures ranged from 3 to 7.2 degrees Celsius (37.4 to 45 degrees Fahrenheit) and population declines in all four caves/mines where winter temperatures exceeded 8.1 degrees Celsius (46.7 degrees Fahrenheit) or were less than 0 degrees Celsius (32 degrees Fahrenheit) (Tuttle and Kennedy 1999). Warmer temperatures may increase metabolic rates and cause premature fat depletion during the hibernation period (Richter et al. 1993). Stable midwinter temperatures of 1 to 10 degrees Celsius (34 to 50 degrees Fahrenheit) may represent a



thermal threshold for hibernacula occupancy by the Indiana bat (Clawson 1984). A recent examination of long-term data suggests that a range of 3 to 6 degrees Celsius (37 to 43 degrees Fahrenheit) may be ideal for the species (USFWS 1999). Only a small percentage of available hibernacula provide these unique temperatures. As stated, the [REDACTED] provides temperatures within this range.

Pennsylvania has no recorded Priority 1 hibernacula. One Priority 2 hibernacula, the Hartman Limestone mine, is located at Canoe Creek State Park, in Blair County, Pennsylvania. During the biennial PGC survey in February 2001, 604 Indiana bats were counted in this mine. *See Figure 3, Indiana bat Hibernacula and Summer sites in Pennsylvania.* Priority 3 hibernacula in Pennsylvania include two abandoned anthracite coal mines in Luzerne County, two limestone caves in Mifflin County, one limestone cave in Blair County, one abandoned railroad tunnel and one abandoned limestone mine ([REDACTED] in Somerset County, one abandoned limestone mine in Armstrong/Butler Counties, and one abandoned limestone mine in Lawrence County. Current records (post 1994) for Indiana bats in Pennsylvania include two summer mist net captures in/near the Allegheny National Forest, the attic maternity site at Canoe Creek State Park, and the ten previously mentioned hibernacula.

## **B. Indiana bat occurrence in the Project Area**

### ***1. Hibernaculum***

#### ***a) Known locations***

The [REDACTED] is an abandoned limestone mine in the Wymps Gap limestone member of the Mississippian age Mauch Chunk formation. The mine is located in Somerset County in southwestern Pennsylvania. It is situated just east of the U.S. 219, Section 019, project area, about 0.8 kilometers (0.5 mile) north of the Mason-Dixon Line. *See Figure 2.*

During the summer of 2005, a survey of the [REDACTED] was completed to map the existing passageways ([REDACTED]). The mine was mapped using distance measurements, compass bearings and degree slope measurements in every passageway. A sketch of the passageways was also made. Numerous natural cave passages have been dissected by the mining operation and all passageways, including both natural cave passages and mine passages, have been explored. [REDACTED]

As indicated on the mapping, none of the passageways travel in a direction toward Alternative E. All passageways are generally north-south in direction and parallel Alternative E.

#### ***b) Potential locations (Other Mine Openings)***

In the late summer of 2005, 28 additional locations were investigated for the potential presence of bats. *See Figure 6, Surveyed Mine Locations and Appendix C: Abandoned Mine Investigations.* The USFWS State College Office and the PGC collectively developed the protocols used for this evaluation. The fieldwork included analysis of large and small openings. The small openings were evaluated for potential to lead into a large cavern by physical



monitoring of airflow into or out of the opening. Visual inspections of the area inside the opening were conducted where possible. The 28 investigated locations were known locations of mine openings (all bituminous coal mines). No known cave openings exist in the project area; however, as stated, portions of the passages within [REDACTED] appear to be natural cave passageways. No other mine openings are known to exist in the project area. Ten of the sites contained no evidence of the historic entrances and nine of the sites had collapsed openings. Five of the sites had been obliterated by surface mine reclamation. The remaining four sites (mines 1, 19, 27 and 28) had the potential to contain bats. Mines 1, 27 and 28 appeared to have relatively stable entrances, while Mine 19 had a partially collapsed entrance. Harp traps were used at the four mine sites for two nights each in September and October of 2005, per USFWS protocol. Acoustic monitoring was also performed during this time.

The results of the harp traps found 29 bats at Mine 1, four at Mine 19, two at Mine 27 and zero at Mine 28. *See Figure 6.* None of the captured bats were threatened or endangered species. As less than 40 or 50 bats were caught in any of the mines, no gating is recommended, per USFWS protocol. No evidence collected at any of these mines suggested usage by any threatened and endangered species, including the Indiana bat. Mine 1 is located at the northern end of the project area approximately 335 meters (1,100 feet) east of existing US 219 and Alternative E. Mines 19, 27 and 28 are located near Piney Creek approximately 640 meters (2,100 feet) west of Alternative E. Alternative E would not have the potential to directly impact any of these mines.

Bat species identified at these mines included the Little brown bat (*Myotis lucifugus*), Northern long-ear (*Myotis septentrionalis*), and Eastern pipistrelles (*Pipistrellus subflavus*).

### ***c) Fall Swarm and Spring Emergence***

During the fall (October and November) and spring (April and May) emergence from the [REDACTED], there would be heightened Indiana bat activity in the project area due to intense foraging to store and/or recover fat reserves. At this time, the bats would be very active traveling between the mine and foraging/day roosting areas. Because the mine opening is located 427 meters (1,400 feet) horizontally from the roadway centerline (335 meters (1,100 feet) from top of cut) and 18 meters (60 feet) vertically from the proposed alternatives, no direct impact would occur to the bats as they emerge from or enter the mine. Also, because the most likely travel corridor to foraging and roosting areas for the bats once they leave the mine would be the riparian forest corridor along Piney Creek, including the area from six to 30 meters (100 feet) above the ground level, it is expected that the bats would travel under the 53 meters (175 feet) high by 457 meters (1,500 feet) long proposed bridge over Piney Creek. Therefore, the bats traveling between the mine and roosting/foraging habitat would not be impacted; nor would road kill be expected to occur due to the height and length of the proposed bridge structure. No adverse impact is expected to occur to the Indiana bat during either the fall swarm or the spring emergence.

There is also the potential that male Indiana bats use the [REDACTED] during the summer as a roost; however, because the mine would not be impacted by the project, no effect would occur.



**d) Hibernaculum Mapping**

As stated, during an October 2004 field view and at a January 2005 meeting, the USFWS requested that the hibernaculum [REDACTED] be mapped. [REDACTED]. The intent of mapping the mine was to determine:

- The cave's orientation
- Depth of passages in regards to proposed roadway elevations
- The number of natural or man-made passages
- The spatial distance between passages and the proposed road.
- The potential for collapse that would result in diminished airflow
- The potential for climate changes

**Request:**      **Orientation of the abandoned limestone mine's passages**

**Response:** [REDACTED]

on the [REDACTED]

**Request:**      **Depth of passages below the surface relative to the proposed road**

**Response:**      There has been some debate over whether the [REDACTED] is located in the Loyalhanna limestone or the Wymys Gap limestone. Project geologists have determined that the mine is located in the Wymys Gap limestone; therefore, considering the bedrock dip in this portion of the project area (about 104 meters per kilometer (550 feet per mile) from southeast to northwest), the Wymys Gap limestone (contained within the Mauch Chunk group of rocks), in the area of the Alternative E centerline, would be about 61 meters (200 feet) below the proposed roadway grade. The proposed roadway excavations would occur exclusively in the stratigraphically higher Pennsylvania age Pottsville group of rocks. Based on the current alignment of [REDACTED], the maximum excavation depth in the area nearest to the mine would be around six meters (20 feet) at the roadway centerline. The ground elevation of the mine entrance is about 18 meters (60 feet) lower in elevation than the proposed excavations for [REDACTED]. As stated the Wymys Gap limestone would be about 61 meters (200 feet) below the proposed road grade and the Loyalhanna limestone would be even lower in that it occurs at a lower stratigraphic position than the Wymys Gap limestone. *See Figure 7, Stratigraphic Column.* Also, as stated none of the passages are located any closer than [REDACTED]

**Request:**      **Number of other natural or man-made passages**



**Response:** [REDACTED] contains 2,573 meters (8,443 feet) of mine passages. The mining operation intersected a significant natural solution cave and 212 meters (697 feet) of cave remnants were mapped. *See Figure 5.*

**Request:** Spatial distance between the passages and the proposed road

**Response:** [REDACTED]

**Request:** Potential for a collapse that would diminish airflow

**Response:** Any shear waves induced by blasting for roadway excavations would have negligible or no adverse impact on the hibernaculum. The following information supports the statement that blasting will have no adverse impact on [REDACTED] and no potential to cause a collapse:

- The frequency spectrum of blasting-induced shear waves is relatively high with low amplitude. The amplitude, not the frequency, would have the greatest impact on cave and mine walls. Since the waves would be of low amplitude, their effect would be minimal.
- Blasting-induced seismic waves generally propagate on a horizontal plane. With the significant elevation difference between the proposed road grade at the base of the excavation and the elevation of the abandoned mine below the roadway, their effect would be minimal.
- Seismic wave propagation in bedrock is attenuated by the presence of discontinuities (joints, fractures, bedding planes, etc.) in the bedrock. With the significant stratigraphic elevation difference in bedrock between the Pottsville Group rocks at the base of proposed excavations for [REDACTED] and the Mauch Chunk formation rocks (this formation contains the Wymys Gap limestone) at the mine, the effect would be minimal.
- Finally, special provisions will be incorporated into the construction contract to limit the peak particle velocity at the hibernaculum to levels consistent with current PGC guidelines. The site-specific blasting plan prepared by the contractor would be reviewed and approved by PennDOT, USFWS, and PGC prior to any blasting. Vibration monitoring would be required at critical locations, including the hibernaculum ([REDACTED]).

Based on this information the proposed project would not have the potential to cause a collapse at or within the mine that would diminish airflow.

**Request:** Potential for climate changes



**Response:** Based on the provided information, the proposed project would not have the potential to impact the [REDACTED] therefore, the proposed project would not have the potential to cause any climate changes within the mine.

As requested, the abandoned mine was mapped to aid in answering the above question. The mine is oriented in a [REDACTED]

[REDACTED] None of the passages is closer to the proposed road than [REDACTED]. Based on the results of the mine survey, the proposed project and its construction activities (blasting) will not disrupt the conditions of the mine that make it suitable habitat for the Indiana bat.

## ***2. Foraging Habitat***

As stated in the Indiana bat Biology section, Indiana bats tend to prefer large tracts of contiguous forest and riparian forest corridors as foraging habitat. Upland slopes and ridges with slopes of less than 10 percent are also used for foraging; however, in this analysis, based on coordination with USFWS, the 10 percent slope data was ignored and potential impacts were quantified for all forested habitat.

A map was prepared showing forested areas, streams, and other water bodies within the U.S. 219 project area. [REDACTED]

Alternative E would acquire less than 4% of the estimated total available potential Indiana bat foraging habitat in the project area. An impact of this amount would not be expected to cause any adverse impacts on the Indiana bat due to the loss of a relatively small amount of foraging area when compared to what is available in the Project Area. Portions of this impacted habitat would be replaced by the project through no-net-loss wetland mitigation and reforestation on an acre-for-acre basis in Maryland, even further reducing the potential for an adverse impact. Additionally, approximately 22,035 hectares (54,450 acres) of protected suitable forest habitat is within or adjacent to the project area, 182 hectares (450 acres) in State Game Lands No. 231 and 21,854 hectares (54,000 acres) in Savage River State Forest.

## ***3. Roosting Habitat***

As stated, ideal roosting habitat for the Indiana bat appears to be live and dead standing trees (snags) with loose, exfoliating bark that receive some direct sunlight. Due to the species' preference for trees that receive direct sunlight, trees located within dense canopies are not preferred. For this reason, some disturbance to forested areas can be acceptable, as the disturbance can provide more small forest openings and canopy gaps, which can promote optimal roosting habitat. The proposed project would help to "open-up" the forest canopy potentially promoting optimal Indiana bat roosting habitat.

It is unknown whether any Indiana bats summer in the project area. However, since the potential does exist for Indiana bats to be utilizing the project area as summer habitat, due to the presence



of what has been described by the PGC as an “ideal hibernaculum,” the Project Team is assuming that roosting habitat may exist and may be impacted by the project. However, based on the information provided in Table 1, with Alternative E 3% of the total forestland (not only roosting trees) available in the Project Area would be impacted. Additionally, due to Maryland Reforestation Laws, 29 hectares (72 acres) of forestland would be replaced with Alternative E, resulting in a permanent net impact of about 2% of the total forestland in the project area. The Maryland Reforestation Plan would include the use of tree species that are preferred by the Indiana bat, including Shagbark Hickories, and would be designed with input from the USFWS. An impact of only 2% of the total existing forestland would not be expected to cause any adverse impacts on the Indiana bat, should they be present in or utilize the area for summer roosting, due to the loss of a relatively small amount of forestland when compared to what is available in the Project Area and due to the bats inherent ability to adapt to loss of roost trees.

#### ***4. Maternity Roost Habitat***

Maternity roosts are very similar to general roosting habitat, in that live and dead trees with exfoliating bark that are exposed to sunlight are preferred. Maternity roost trees generally receive a high amount of sunlight, either because they are larger (greater than 12 inches in diameter) canopy trees or are located near forest edges or openings.

Indiana bats have also been documented to use artificial structures as maternity roosts. The first maternity colony documented to use an artificial structure was at Canoe Creek in Blair County, Pennsylvania, which is also the only known maternity colony in Pennsylvania. Since the discovery of the Canoe Creek Maternity colony, three other maternity colonies have been discovered utilizing artificial structures.

Due to the difficulty detecting maternity activity, most maternity colonies may never be known. It is unknown whether any maternity colonies exist in the U.S. 219 project area; however, it is assumed that the potential exists for a maternity colony to be present. The most likely locations for a maternity colony, based on best available information, would appear to be on the edge of forested areas and along cleared (agricultural) fields, as these areas would provide the most trees exposed to direct sunlight; however, as stated, no known maternity colonies exist in the project area. Alternative E has been located as far to the western edge of the forest as possible to avoid dissecting large forest tracts; however, the extreme edge of the forest has also been avoided to minimize impact to the area immediately at the forest edge along cleared fields. Due to this, all measures possible at this time, based on best available data, have been taken to avoid potential maternity roost locations. Additionally, as stated, the proposed project would help to open-up the forest canopy exposing more trees to sunlight, potentially promoting maternity habitat.

#### ***5. Migration Paths***

Little information is available on the migration paths of the Indiana bats when traveling between summer and winter habitats. However, the few bats that have been tracked have all traveled in an easterly/southeasterly direction between their winter and summer habitats. Based on best available information, it appears that, at least for the reproducing female bats, they move out of the cold, higher elevations to warmer lowlands. Assuming this, females would be heading to the



nearest, largest tract of warm climate within 322 kilometers (200 miles) or so of the [REDACTED]. In the case of the [REDACTED], the most likely place would appear to be the Potomac River valley to the east of Cumberland, Maryland. If, as it appears, the bats are migrating in a southeasterly direction, no adverse impact would occur to migration routes, as the proposed highway is located west of the existing hibernaculum.

## V. EFFECTS OF PROPOSED ACTION

### A. Direct

#### 1. *Timber Removal*

The proposed project would result in the removal of approximately 84 hectares (208 acres) of forestland, with Alternative E. This would result in a take representing around 3% of the total forested land in just the project area. With Alternative E, 29 hectares (72 acres) of this land would be replaced acre for acre in Maryland to comply with Maryland's Reforestation Laws. Reforestation of this amount of land would result in a net loss of just 2% of the existing forestland in the project area. *See Table 1.* As stated previously, the removal of this relatively small amount of forestland, when compared to what is available in just the Project Area alone, would not be expected to cause an adverse impact on the Indiana bat. Additionally, when considering that over 81,871 hectares (202,300 acres) of forestland is available in the Casselman River Watershed, which surrounds the hibernaculum within 16 kilometers (10 miles), less than 0.10% of the forestland available would be impacted. Therefore, no adverse effect is anticipated.

Also, it should be noted that two protected areas of forest each with considerable amounts of habitat for the species, [REDACTED]. Savage River State Forest is located in Garrett County, Maryland, just [REDACTED] and contains over 21,854 hectares (54,000 acres) of protected forestland. State Game Land No. 231 is [REDACTED] contains over 182 hectares (450 acres) of protected forest.

#### 2. *Blasting*

[REDACTED] Based on the current alignment of Alternative E, the maximum excavation depth in the area nearest to the mine would be around 6 meters (20 feet) at the roadway centerline. However, [REDACTED]

[REDACTED] The ground elevation of the mine entrance is about 18 meters (60 feet) lower in elevation than the proposed excavation for Alternative E. The mine is located in the Wymys Gap limestone, considering the bedrock dip in this portion of the project area (about 104 meters per kilometer (550 feet per mile) from southeast to northwest), the Wymys Gap limestone, in the area of the Alternative E centerline, would be about 61 meters (200 feet) below the proposed roadway grade. The proposed roadway excavation (about 6 meters (20 feet) maximum in the area of Piney Creek) would occur exclusively in the stratigraphically higher Pennsylvania age Pottsville group of rocks. Also,



based on the mine survey results, the mine passageways all trend in a slightly northeast – southwest direction parallel to the proposed alignment of Alternative E.

On the basis of this information, and as stated previously, any shear waves induced by blasting for roadway excavations would have negligible or no adverse impact on the hibernaculum.

The PGC has provided information on project specific blasting guidelines that were prepared on another project that was in close proximity to a hibernacula (PGC Memorandum dated December 9, 2004). In the memorandum, the PGC requested the following information:

- 1) Underground coal mining maps in the vicinity of [REDACTED] [limestone mine]. *See Appendix D, Underground Coal Mining Maps* for the only available maps.
- 2) A geological map showing area coal seams [limestone formations]. *See Figure 7, Stratigraphic Column.*
- 3) Proposed design plans for the Ecologically Best-Balanced Alternative, starting 1.6 kilometers (one mile) north of Piney Creek and extending for 3.2 kilometers (two miles). *See Appendix B.*
- 4) Boring information for the Ecologically Best-Balanced Alternative. *See Appendix E, Core Borings.*
- 5) An assessment pertaining to the amount of blasting that might occur and the potential to conduct earthmoving/blasting activities outside of the bat hibernation time frame (October 30 to March 31). *See Appendix F, Blasting Assessment.*

### 3. Noise

Typically when conducting a noise analysis for a proposed highway project, noise impacts to sensitive land uses are evaluated at distances up to 305 meters (1,000 feet) horizontally from the edge of the proposed highway. Alternative E at the closest point on its centerline would be 427 meters (1,400 feet) horizontally from the [REDACTED]. At the closest top of cut point, Alternative E would be [REDACTED] from the mine. At these distances, predicted noise levels would not differ substantially, if at all, from existing noise levels. Additionally, several factors contribute to there being no change in noise levels at the mine from existing to predicted future conditions, including: the fact that the Piney Creek bridge approaches on Alternative E would be in a 6 meter (20 feet) deep cut, a 12 meter (40 feet) high knoll exists between the proposed location of Alternative E and the mine, and the fact that the mine opening is 18 meters (60 feet) lower in elevation than the proposed grade of Alternative E. The combination of these factors, along with the horizontal distance from the mine, would result in no substantial change in noise levels at the mine from the existing to the predicted future condition. It should also be noted that existing noise levels at the mine are already influenced by highway noise from both Greenville Road and Piney Run Road, which are located about 427 meters (1,400 feet) and 15 meters (50 feet), respectively, from the mine. It is understood that the traffic volumes on these roads are lower than those predicted for Alternative E; however, the



point is that a new type of noise source would not be imposed on the hibernaculum, as the mine's surroundings are already influenced by traffic noise. Based on Alternative E's horizontal and vertical distance from the mine and the influence of topography, no impacts due to noise would occur at the [REDACTED] as a result of this project.

Highway traffic noise along the alignment of Alternative E may be predicted to cause a temporary change in the behavior of Indiana bats that utilize the corridor for foraging and roosting habitat. However, as stated earlier, no studies have documented use of the project area by the bats as roosting habitat. It is assumed that the project area is utilized as foraging habitat during the fall and spring swarm. The most likely corridor that the bats utilize for travel to foraging areas is the Piney Creek valley, which would be 53 meters (175 feet) below the proposed roadway. Due to the distance below the proposed roadway, no long-term effects on the bats travel to foraging areas would be anticipated due to noise from Alternative E. Because studies have shown that the bats can adapt their behavior to changing conditions, that bats have been documented to utilize areas near existing roadway corridors as habitat, and the bats would be most likely to use the corridor during the evening hours when traffic is reduced and therefore noise is reduced, no substantial long-term impact is anticipated on the Indiana bats' behavior within the proposed Alternative E corridor. It is anticipated that the most likely time for a temporary noise impact would be during construction activities. Proposed minimization measures, as discussed in a following section, would reduce the severity of a temporary construction noise impact.

## **B. Indirect Effects**

### ***1. Windmills***

A small windmill farm (Meyersdale wind farm) containing 20 windmills is located in the northern portion of the project area to the east of Hunsrick Summit. While much attention has been focused recently on bat kills at wind farms, it should be noted that the majority of bat species being killed and collected at wind farm locations (Hoary bats, Red bats, and Silver haired bats) are not species that typically inhabit the [REDACTED]. There is no confirmation of the loss of any Indiana bats at the Meyersdale wind farm. Based on this information, it appears that the Meyersdale wind farm would not have any indirect effect on the species nor would it be likely to indirectly negatively effect the potential of the [REDACTED] as a hibernaculum.

### ***2. Previous Commercial Timbering Operations***

Two companies are known to have been or currently are conducting commercial timbering operations in the vicinity of the [REDACTED]. Coastal Lumber Company owns a parcel of land to the southeast of the mine location in Maryland and Allegheny Wood Products owned a parcel of land just north – northwest of the mine location in Somerset County. Both companies utilize sustainable harvesting practices and have been timbering these tracts for many years (the exact length of time that the timbering has been occurring would not be divulged by either company). Allegheny Wood Products recently, within the last two years, timbered the parcel they owned, shown as the "Select Harvest Area" on *Figure 2*, and then recently (end 2005) sold the property. Based on information received from Allegheny Wood Products and on visual observations of the



site, trees that have been removed include oaks and hickories; small trees, such as maples, still remain on the property. It does not appear that Coastal Lumber has harvested their property within the last few years and whether they intend to harvest any time in the near future could not be determined. Because these commercial timbering areas are/have been select cut and Allegheny Wood Products has sold their property, the potential for past and future impacts, due to commercial timbering, would be minimal.

## **C. Cumulative**

### ***1. Timber Removal***

As stated previously, Alternative E would result in the removal of 3% of the total existing forestland located within the project area (after the required reforestation in Maryland, 2% of the total forest cover would be displaced), all of which is within eight kilometers (five miles) of [REDACTED]. Over 2,600 hectares (6,400 acres) of existing forestland would remain in the project area. Additionally, 29 hectares (72 acres) of land in Maryland would be reforested to comply with the state's Reforestation Laws. This reforestation would include the use of Indiana bat preferred species, such as Shagbark hickories. Additionally, seasonal timbering restrictions would be enforced, which would avoid a direct take of any roosting Indiana bats.

### ***2. Residential Developments***

A residential development is potentially proposed for the previously harvested Allegheny Wood Products parcel near the [REDACTED]. Preliminary information suggests that the developer plans to place between 20 and 100 residential lots on this parcel. Based on conversations and a meeting with the developer, large, wooded lots are planned. The initial concept for the property is to develop it as a "recreational" subdivision. As the plan is to remove as few mature trees as possible, this development would be expected to cause temporary minimal impact on the bat and no long-term adverse impact.

The Highlands Residential community is a developing site on Meadow Mountain just south of the [REDACTED] in Maryland. The development contains approximately 314 hectares (775 acres), which are being developed for residential use. This development does have the potential to contribute to cumulative impacts to potential Indiana bat habitat; however, many lots are developed and others have been cleared, but not yet built upon. It also appears that the lots in the Highlands are being developed by removing as few trees as possible. As studies have shown an increase in Indiana bats in [REDACTED] during the period before and after tree clearing in the Highlands, no long term adverse effects are anticipated on the Indiana bat.

### ***3. Summary of Cumulative Effects***

The proposed project may contribute to minimal cumulative impacts to potential Indiana bat roosting habitat, but not to the point that an adverse effect is likely to occur. This is due to minimal past impacts to forests in the project area; avoiding a direct impact to the known hibernaculum ([REDACTED]) which is the only known confirmed Indiana bat habitat in the project area; permanent removal of only 2% of the forest land in the project area; timbering



restrictions, which would avoid a direct take of any roosting bats; avoidance of the areas that would be more highly utilized during both roosting and foraging, including forest edges, open fields, and riparian corridors; Maryland reforestation, which would result in improved habitat for the Indiana bat through the planting of select tree species; and, minimal predicted future impact to forest land. The most likely travel corridor in the project area, the riparian forest along Piney Creek, would also be avoided by the use of a high-level [53 meters (175 feet high)] bridge structure crossing the entire Piney Creek gorge.

#### **D. Effects Conclusion**

Based on the preceding analysis, the proposed project “may affect,” but is “not likely to adversely affect” the Indiana bat. This finding is based on:

1. The proposed project will have no effect on the hibernaculum ( [REDACTED] either directly or indirectly (i.e. due to blasting or noise).
2. No other known habitats (i.e. hibernacula, summer roosting sites, or maternity colonies) have been identified in the project area.
3. The proposed project would permanently impact less than 4% of the total foraging area potentially utilized by Indiana bats in the project area.
4. The project would permanently affect only 2% of potential roosting habitat (forest land) available to the Indiana bat in the project area.
5. No known maternity roosts exist in the project area, but those areas most likely to be used as maternity roost (forest edges and cleared agricultural fields) have been avoided to the extent possible.
6. Based on best available data, migratory paths tend to be to the southeast from known hibernacula. No hibernacula are known to exist northwest of the project area; therefore, it appears unlikely that migratory paths would be bisected.
7. Less than 0.10% of the forestland within 16.1 kilometers (10 miles) of the project area would be impacted.
8. The proposed bridge over Piney Creek would provide a more than adequate travel corridor under the structure for bats moving between the hibernaculum and foraging areas; thereby avoiding adverse effects due to road kill.
9. Only minimal cumulative impacts are predicted, based on available data.

As stated, Alternative E is the ecologically best-balanced alternative; however, as shown on Table 1 the impacts from Alternatives D and AE would be comparable to Alternative E, in regards to the Indiana bat. Therefore, with any of the proposed alternatives, the project still “may affect,” but is “not likely to adversely affect” the Indiana bat.

### **VI. CONSERVATION MEASURES**

#### **A. Measures to Minimize Harm & Harassment**

##### ***1. Timber Restrictions and Impact Minimization***



Demolition of buildings within the project area (three with Alternative E) and tree removal would occur between October 30 and March 31 to avoid harming potential roosting bats. Trees in the immediate area of the proposed bridge over Piney Creek would be marked and remain as long as possible during construction to provide cover for the bats traveling through this corridor. These trees would be removed as the construction of the proposed bridge dictates.

## **2. *Blasting Restrictions***

As stated previously, a blasting plan would be prepared by the contractor to PGC guidelines and submitted to the USFWS, PGC, and PennDOT for review and approval prior to the commencement of any blasting activities.

All blasts would be monitored with seismographic and sound equipment. PennDOT would maintain a record of each blast for at least five years. Monitoring points would be coordinated with USFWS and PGC.

Extreme care would be taken when drilling for blasting. If open solution cavities were encountered, the hole would be sealed with cement grout and the PGC notified.

Seismographs would be installed in the area of the hibernacula as early as possible prior to any blasting or earth moving activity being conducted within close proximity to the hibernacula. This would allow monitoring of the ground vibration due to blasting at distances where there should be little or no ground movement in the hibernacula. As blasting gets closer to the hibernacula, it would be possible to alter the blasting to ensure vibrations stay below thresholds established in coordination with PGC.

Blasting would not be permitted in the area 1.6 kilometers (one mile) to the north and south of the proposed Piney Creek bridge during the winter hibernation period from October 30 to March 31.

## **3. *Other Measures***

It was determined that Context Sensitive Design measures could be implemented to minimize impacts, yet still meet the project needs and address sound engineering design. As such, the roadway typical section was narrowed in the area of the Piney Creek bridge crossing, which reduced impacts to forestland in the area near the hibernaculum.

Construction of Alternative E would help to expose more trees on the forest fringe to sunlight, increasing the likelihood that the remaining trees would be suitable as general roosts and maternity roosts.

Construction equipment would be well maintained and fitted with properly functioning mufflers to minimize noise impacts.

The contractor would comply with Pennsylvania Department of Environmental Protection Rules and Regulations, Title 25, to minimize impacts to air quality.



Vegetation in the vicinity of the mine will be based on a planting plan approved by the Pennsylvania Game Commission and that does not preclude safe highway design.

Construction activities would only be permitted from one hour after dawn to one-half hour before sunset from April 1 to May 15 (spring swarm) and September 15 to October 30 (fall swarm) in the vicinity of the mine.

## **B. Effects of Proposed Measures**

These proposed measures to minimize hard and harassment would:

- Minimize the potential for harm to any roosting bats.
- Minimize potential for harm to the hibernaculum due to noise and vibration.
- Minimize potential for a collapse or change in conditions that would affect airflow at the hibernaculum.
- Minimize harm by reducing the amount of forestland required to construct the project.
- Increase the potential for use of the project area trees as a maternity roost by increasing the amount of solar exposure to trees on the forest fringe.
- Minimize harm from construction activities to foraging bats during the fall and spring swarms.
- Minimize potential harm to hibernating bats within the [REDACTED]

## **C. Measures to Benefit or Promote Species Recovery**

As stated previously few Indiana bats have been found in the hibernaculum ([REDACTED]) that is located near the project area and no available information has been found documenting that Indiana bats utilize the project area for summer roosting. Based on the information collected, the proposed project would have no adverse effect on the Indiana bat. However, in understanding of the USFWS/PGC position on the importance of the hibernaculum and the potential for summer use of the project area, FHWA, PennDOT and MDSHA will commit, in the interest of environmental stewardship, to measures that promote recovery of the species. The team realizes that there is an opportunity to help the species through protecting a recognized hibernaculum. As colonies of Indiana bats shift due to natural causes or man-induced interference, protection of the hibernaculum also helps support alternate habitat for the species. For these reasons, the following conservation measures are offered.

### ***1. Habitat Enhancement and Protection***

#### Mine Purchase

PennDOT would investigate the possibility of purchasing the 3 hectares (8 acre) [REDACTED] and the existing 61 meters (200 feet) long access road to the mine from Piney Run Road. *See Figure 8, Mine Purchase/Perpetual Easement.* If the existing landowner were agreeable, the mine and an entranceway would be purchased and donated to the PGC or willing third party for perpetual protection of and continuation of Indiana bat research in the hibernaculum.



### Perpetual Easement

If the landowner were not agreeable to a fee simple purchase, then PennDOT would investigate the possibility of purchasing a perpetual easement of 3.3 hectares (8.2 acre) surrounding the mine and the entranceway. *See Figure 8.* This would provide the PGC and USFWS with secured access and perpetual protection of the hibernaculum, which would be an improvement over the current agreement for access to the mine that includes a 30-day termination clause with the property owner.

## ***2. Bat Boxes/Condos & Tree Girdling***

PennDOT will purchase and install two bat boxes at locations designated by the USFWS and PGC, and amiable to property owners, to introduce additional roosting habitat. Bat boxes and condos would be designed to the PGC/USFWS requirements. Additionally, PennDOT will girdle up to 10 trees within their right-of-way (under the proposed Piney Creek bridge) to promote suitable natural habitat.

## **VII. MITIGATION MEASURES**

### **A. Recommended Mitigation Measures**

#### ***1. Monitoring***

FHWA through PennDOT would provide funding to the Pennsylvania Game Commission in the amount of \$75,000 to monitor the effectiveness of the conservation measures and any mitigation measures in conserving the Indiana bat population. The funding would be provided to support monitoring for one pre-construction year, one construction year, and one year of post-construction monitoring. Monitoring will consist of temperature and airflow measurements in the [REDACTED] along with identification and observation of roost trees within the highway footprint, and observation of artificial roost structures. Monitoring results will be shared with PennDOT, MD SHA, FHWA, and USFWS.

#### ***2. Bridge Design***

Various design concepts could be incorporated into the plan for the bridge crossing of Piney Creek to either promote habitat or to encourage travel over the bridge. The bridge could be designed to allow for bat habitat within the structure, either within the abutments or within the bridge beams. The Texas DOT has used similar concepts for other bat species with great success.

Additionally, high mast lighting could be utilized on the bridge structure to promote travel by the bats over the bridge.

#### ***3. Terrestrial Planting Plans***

A planting plan for the cut areas on both approaches to the Piney Creek bridge structure could be prepared in coordination with the PGC and USFWS to replace vegetation removed by the excavation for Alternative E.



## **B. Mitigation Measures Considered and Dismissed**

### ***1. Bridge Design***

The proposed bridge structure over Piney Creek would be 53 meters (175 feet) high by 457 meters (1,500 feet) long. Because the most likely travel corridor to foraging and roosting areas for the bats once they leave the mine would be the riparian forest corridor along Piney Creek, within the area from six to 30 meters (100 feet) above the ground level, it is expected that the bats would travel under the proposed Piney Creek bridge. For this reason, high mast lighting on the bridge, which would attempt to draw bats over the structure, is no longer being considered. A concern with the high mast lighting is that the lights would draw the bats to the travel way negating the benefits of the high level bridge that would encourage travel under the structure.

Additionally, the measure to construct the bridge in a manner to promote habitat use has been dismissed. Again, the concern is that this measure would draw bats to the bridge, potentially placing them in more harm than a bridge constructed to discourage use as bat habitat. As stated, because the proposed structure is so high and long, the bats would tend to avoid the bridge area, flying under it closer to the ground surface. For these reason, any measures that would encourage the bats to fly toward the bridge area are no longer under consideration.

## **VIII. CONCLUSION**

The preceding analysis was based on the best available information, including some information compiled by studies conducted by the Project Team in accordance with USFWS and PGC protocols. The analysis of the proposed project's impact on the Indiana bat, including minimization measures that will be taken to avoid or reduce direct impacts, result in a "may affect", but "not likely to adversely affect" finding. Because FHWA, PennDOT, and MD SHA understand the importance of the [REDACTED] in the recovery of the Indiana bat, various conservation measures are offered, as discussed previously, to help aid in the recovery of the species under 7(a) (1). The studies conducted by the Project Team, along with the minimization measures, conservation measures, and mitigation measures are efforts by the project proponents to further Indiana bat recovery, based on the best available information at this time.



**IX. REFERENCES**

Bats in American Bridges: commonly asked questions, 1999 Bat Conservation International (BCI)

“Bats in the Belfry/Endangered Species Found at Church bought by WRCF,” Pa DCNR website

Blum, Justin, January 1, 2005; “Researchers Alarmed by Bat Deaths from Wind Turbine.” Washington Post Article

Brack, V., Jr. 1983. The non-hibernating ecology of bats in Indiana with emphasis on the endangered Indiana bat, *Myotis sodalis*. Ph.D. dissertation, Purdue University, West Lafayette, Indiana.

Butchkoski, C., and J.D. Hassinger, 2002. Ecology of a building maternity site. in A. Kurta and J. Kennedy, editors. The Indiana bat: biology and management of an endangered species (in press). Bat Conservation International, Austin, Texas, USA.

Callahan, E. V., R.D. Drobney, and R.L. Clawson. 1997. Selection of summer roosting sites by Indiana bats (*Myotis sodalis*) in Missouri. Journal of Mammalogy, 78(2):818-825.

Chenger, John; Harp Net surveys and [REDACTED] Survey and Mapping; 2005.

Clawson, R.L. 1984. Recovery efforts for the endangered Indiana bat (*Myotis sodalis*) and gray bat (*Myotis grisescens*). In: McCorm, W.C., ed. Proceedings of workshop on management of nongame species and ecological communities. Lexington, KY: University of Kentucky, Agricultural Experiment Station: 301-307.

Drobney, Ronald D. and Richard L. Clawson, “Indiana bats,” National Biological Service and Missouri Department of Conservation.

Forest Watch, “Forest Watch’s Scoping Comments on Green Mountain NF,” [www.forestwatch.org](http://www.forestwatch.org)

Gannon, M.R. and T.E. Blackburn, 2002. Telemetry Study of Bats in Pennsylvania with emphasis on the Indiana bat (*Myotis sodalis*). Final Report to USDA Forest Service, Warren, PA.

Gardner, J.E., J.D. Gardner, and J.E. Hoffmann, 1991. Summer roost selection and roosting behavior *Myotis sodalist* (Indiana bat) in Illinois. Final Report, Illinois Natural History Survey, Illinois Department of Conservation, Champaign, Illinois.

Hall, J.S. 1962. A life history and taxonomic study of the Indiana bat, *Myotis sodalist*. Gallery Publ. 12. Reading, PA: Reading Public Museum. 68 p.



Henshaw, R.E. 1965. Physiology of hibernation and acclimatization in two species of bats (*Myotis lucifugus* and *M. sodalis*). Dissertation Abstracts. 26:2837-2838.

Henshaw, R.E., G.E. Folk, 1966. Relation of thermoregulation to seasonally changing microclimate in two species of bats (*Myotis lucifugus* and *M. sodalis*). Physiological Zoology. 39: 223-236.

Kiser, J.D., C.L. Elliott. 1996. Foraging habitat, food habitats, and roost tree characteristics of the Indiana bat (*Myotis sodalis*) during autumn in Jackson County, Kentucky. Final Rep. E-2. Frankfort, KY: Kentucky Department of Fish and Wildlife Resources. 65 p.

Kurta, A., K.J. Williams, R. Mies, 1996. Ecological, behavioral, and thermal observations of a peripheral population of Indiana bats (*Myotis sodalis*). In: Barclay, R.M.R.; Brigham, R.M., eds. Bats and forest symposium; 1995 October 19-21; Victoria, BC. British Columbia Ministry of Forests: 102-117.

LaVal, K.L., R.L. Clawson, M.L. LaVal, and W. Caire. 1977. Foraging behavior and nocturnal activity patterns of Missouri bats, with emphasis on the endangered species *Myotis grisescens* and *Myotis sodalis*. Journal of Mammalogy 58: 593-599.

McCormick Taylor, Inc., October 4, 2004 field meeting with USFWS, PGC, PennDOT, FHWA, and McCormick Taylor, Inc.

McCormick Taylor, Inc., December 21, 2004 meeting with USFWS, PGC, FHWA, PennDOT, and McCormick Taylor, Inc.

Menzel, Michael A.; Jennifer M. Menzel; Timothy C. Carter; W. Mark Ford; and John W. Edwards; "Review of the Forest Habitat Relationship of the Indiana bat (*Myotis sodalis*);" United States Department of Agriculture, Forest Service, Northeastern Research Station; General Technical Report NE-284.

Murray, S.W. 1999. Diet and nocturnal activity patterns of the endangered Indiana bat, *Myotis sodalis*. M.S. thesis, Eastern Michigan University, Ypsilanti, Michigan.

Murray, S.W., and A. Kurta, 2004. Nocturnal activity of the endangered Indiana bat (*Myotis sodalis*). Journal of Zoology (London), 262:197-206.

Pennsylvania Game Commission, "Blasting Vibration Limits," Alexander Caverns, 2001.

Pennsylvania Game Commission, "Game Commission Goes Interstate to Trail Endangered Species."

Richter, A.R., Humphrey, S.R.; Cope, J.B.; Brack, V. 1993. Modified cave entrances: thermal effect on body mass and resulting decline of the endangered Indiana bat (*Myotis sodalis*). Conservation Biology. 7:407-415.



Thomson, C.E. 1982. *Myotis sodalis*. Mammalian Species. 163: 1-5.

Tuttle, M.D. and J. Kennedy, 1999. Indiana bat hibernation roost evaluation: phase II – results from the first annual cycle. Austin, TX: Bat Conservation International. 11 p.

USFWS, 1999. Indiana bat (*Myotis sodalis*) revised recovery plan, Agency Draft, Ft. Snelling, Minnesota, 53 p.

USFWS website, “USFWS Division of Endangered Species-Indiana bat”

USFWS, 2005. Biological Opinion, draft 7/7/05, Effects of the Canoe Creek Transportation Improvement Project on the Indiana bat, Blair County, Pennsylvania.

USGS site, “Indiana bats,” by Ronald D. Drobney and Richard L. Clawson

Whitaker, J.O.; Hamilton, W.J. 1998. Mammals of the eastern United States, Ithaca, NY: Cornell University Press, 583 p.



# FIGURES



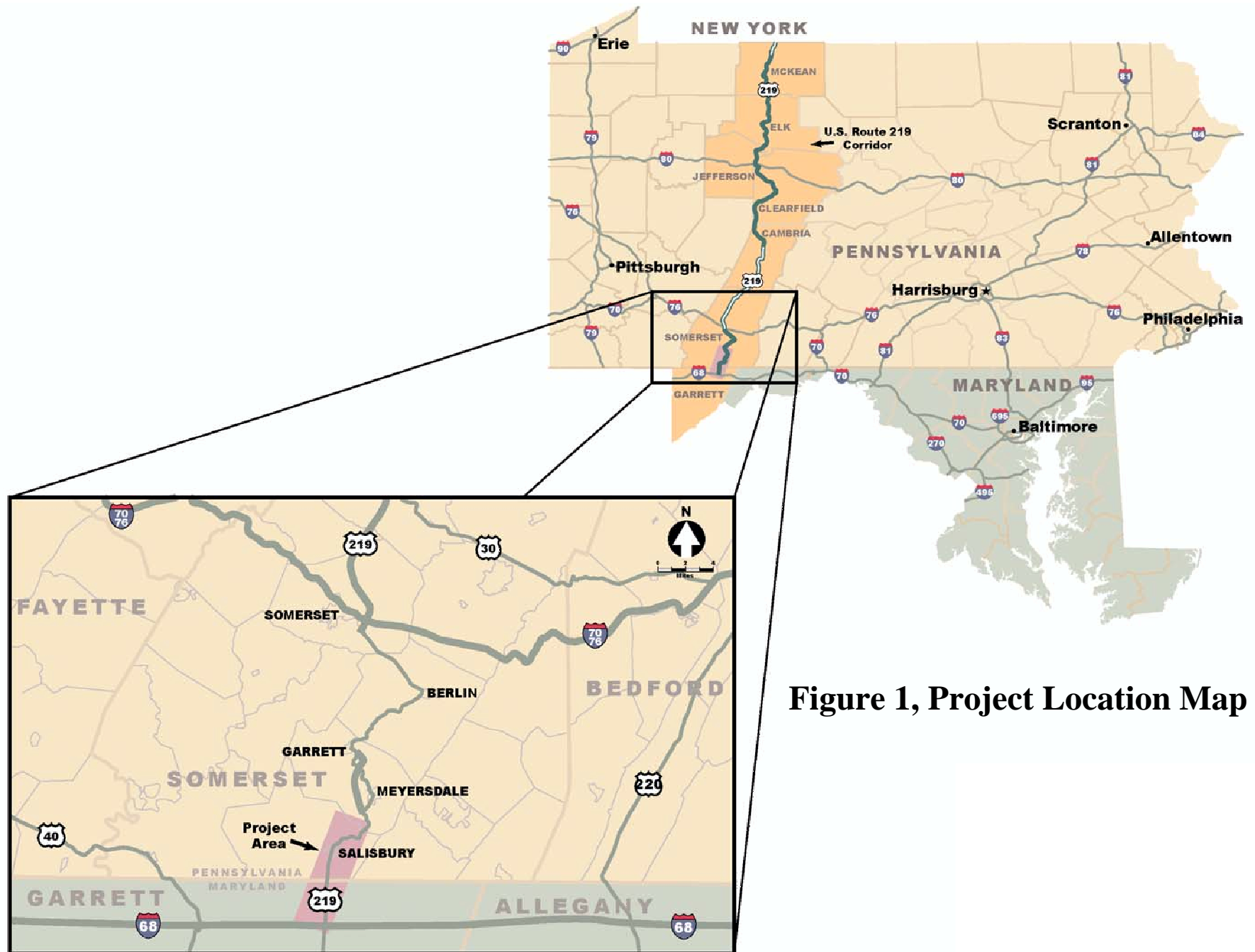
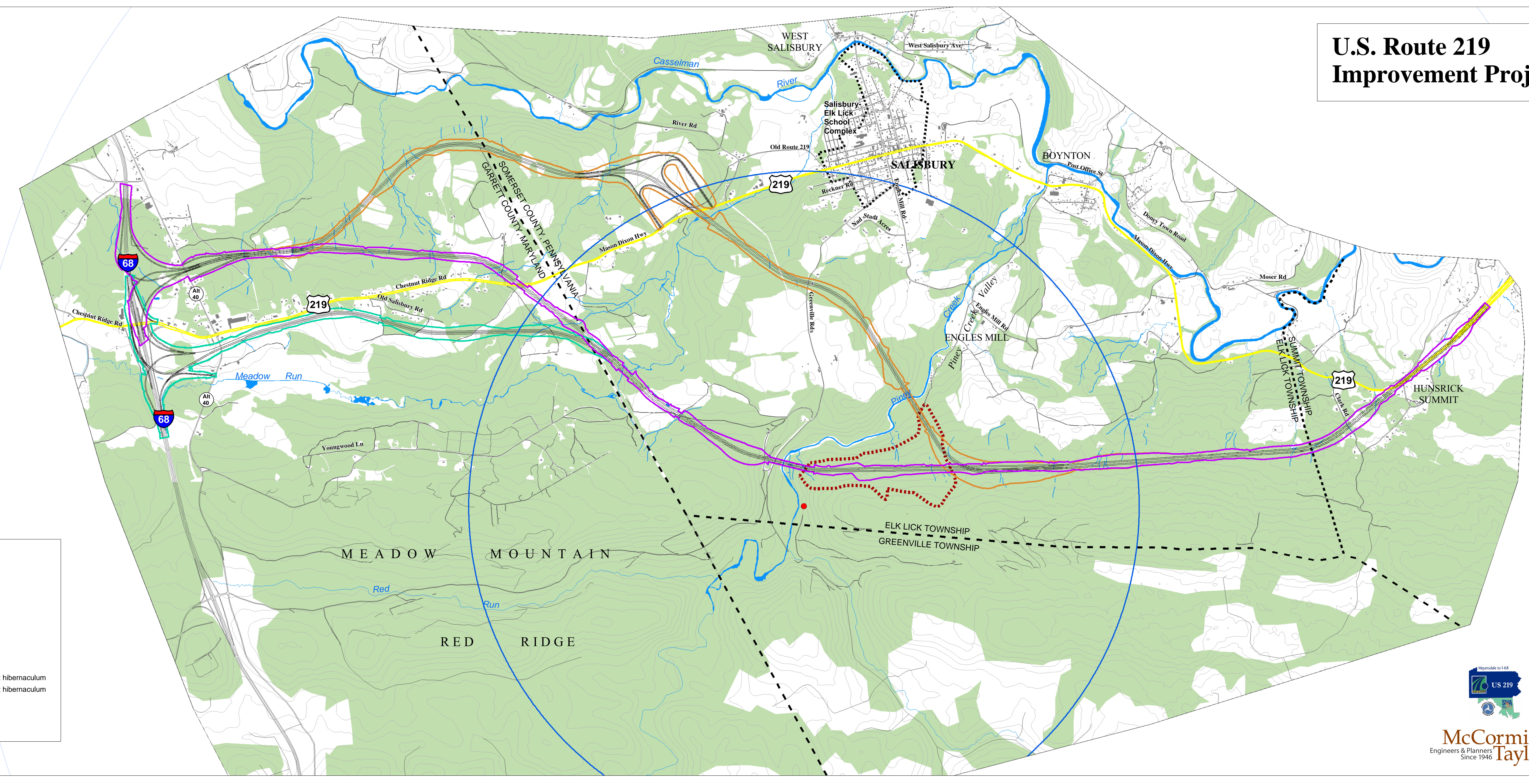
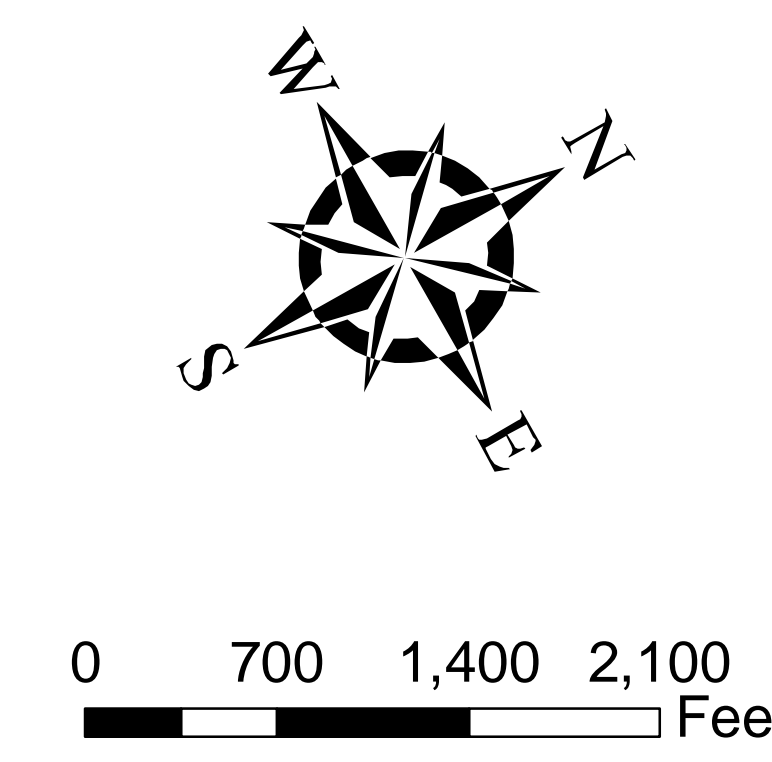


Figure 1, Project Location Map



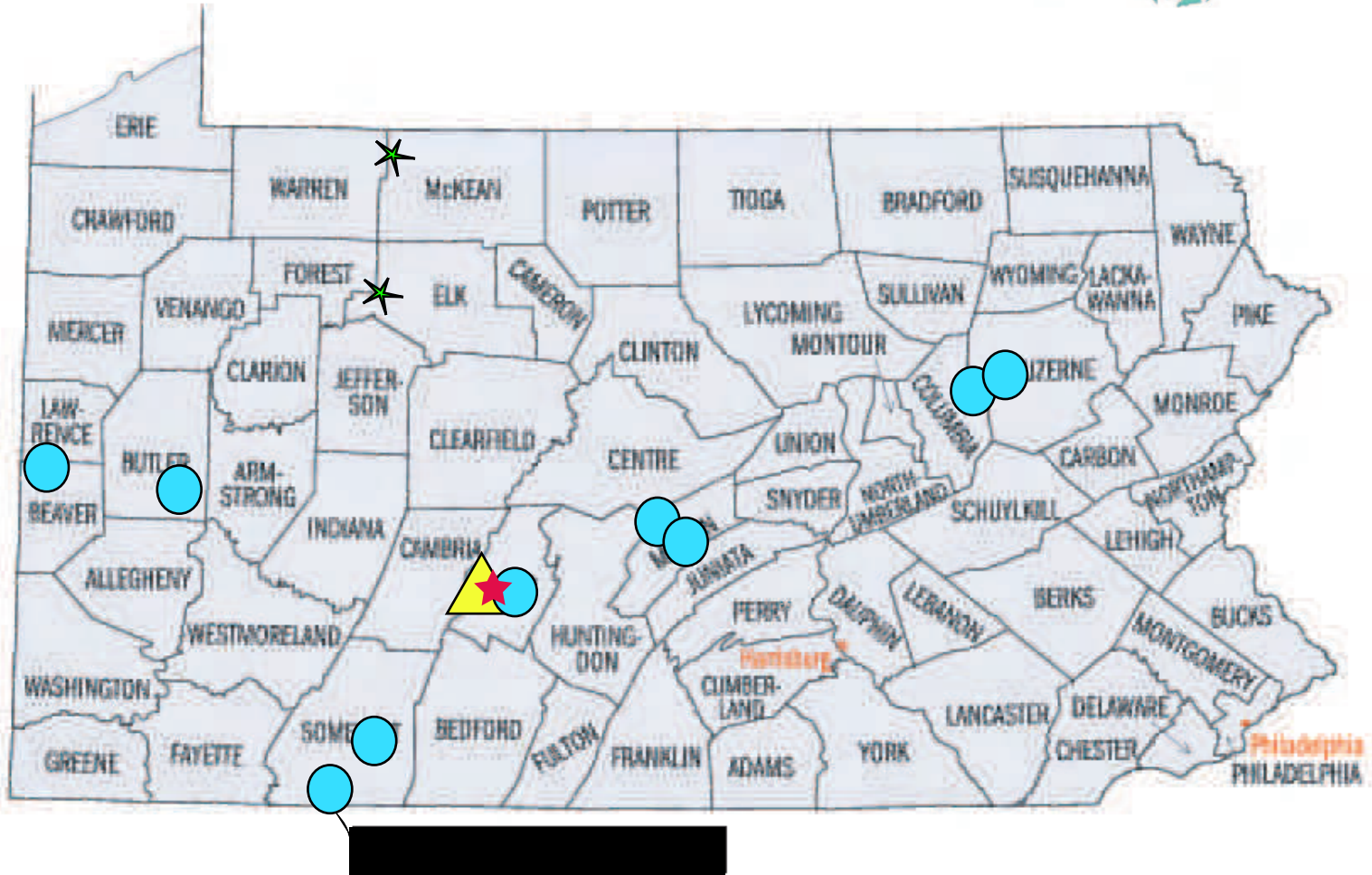
# U.S. Route 219 Improvement Project





**Legend**

- Alternative D
- Alternative E
- Alternative AE
- U.S. Route 219
- Streams
- Contours (50 ft)
- Bat Hibernaculum
- 2 mi radius around the bat hibernaculum
- 5 mi radius around the bat hibernaculum
- Select Harvest Area
- Forest





  
Priority 2  
Hibernacula

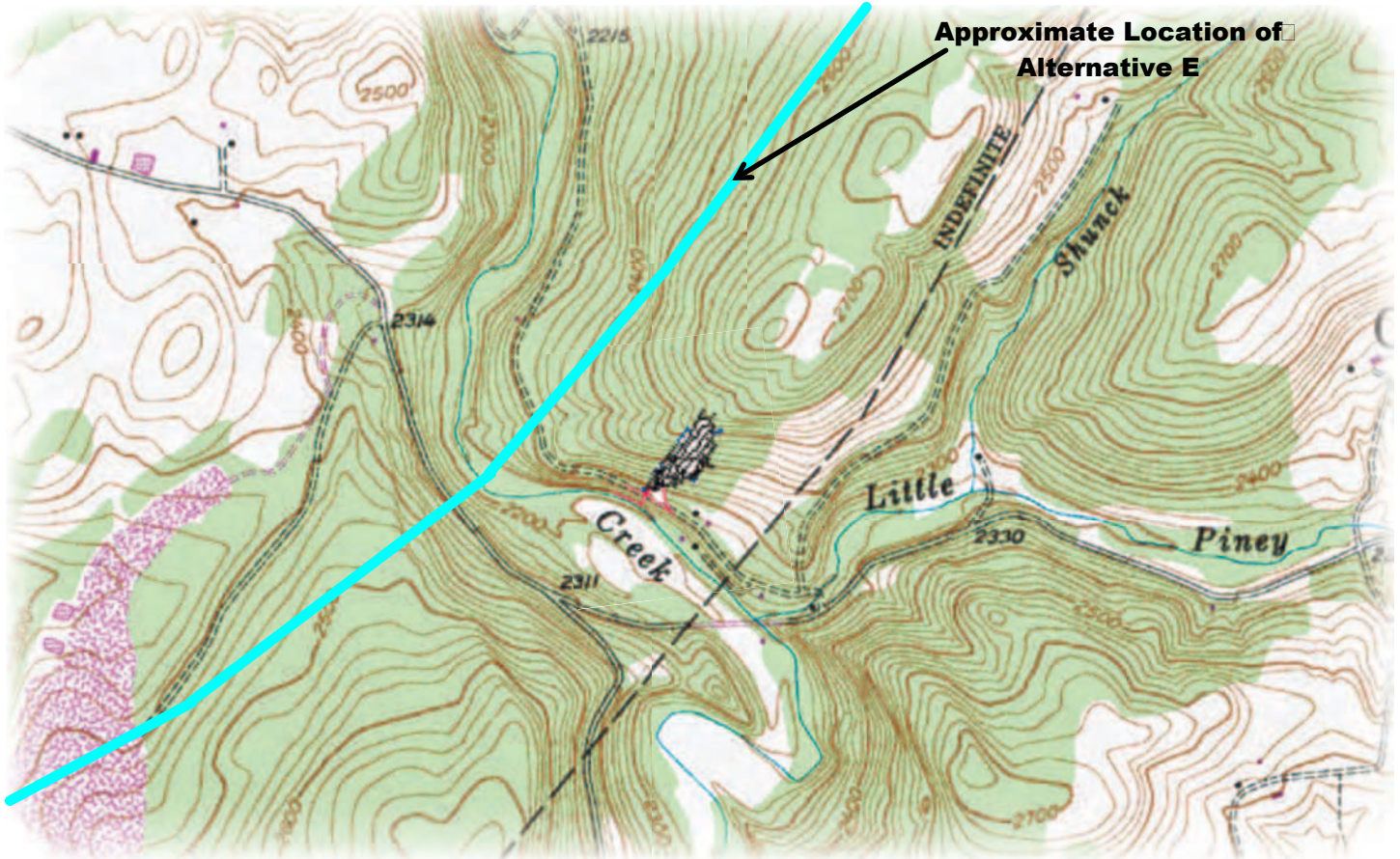
  
Priority 3  
Hibernacula

  
Summer  
Maternity Site

  
Summer Mist Net  
Captures (all  
males)

**Figure 3, Indiana bat Hibernacula and Summer sites in Pennsylvania**





Notes:

Total surveyed sections: 8,443' of mine passage, 697' of natural cave passage, and 1,713' of surface survey.

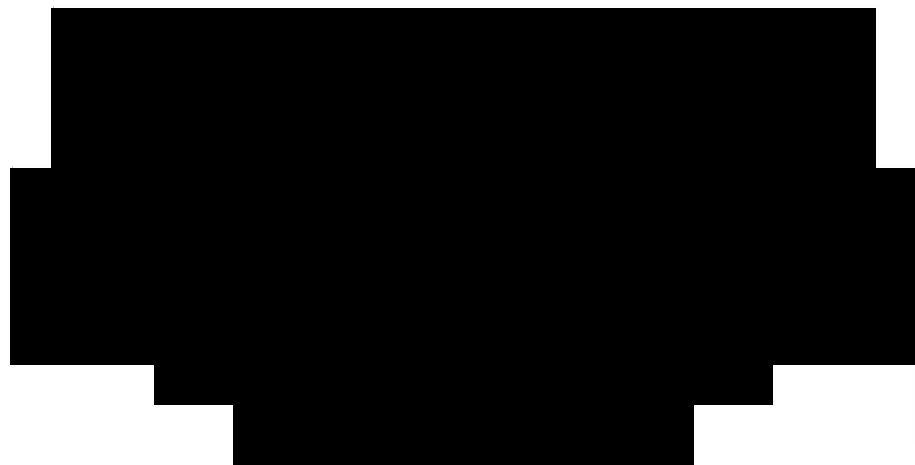
The location of the cave stream resurgence is suspected to be at the northwest end of the surface survey (depicted in red) on the north bank of Piney Creek.

Mine may not be properly depicted until entrance location coordinates are verified.

2003-2005 Survey by John Chenger, Beth Dillion, Kelsea Johnson, Merideth Johnson, Michael Kerns, Marcia Maslonek, Kevin Rhome, Mike Schirato, Kerry Speelman, and Julie Winner.

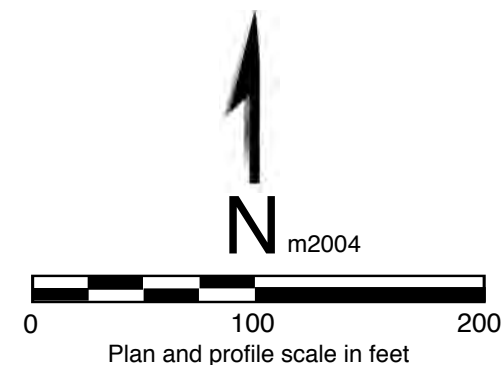
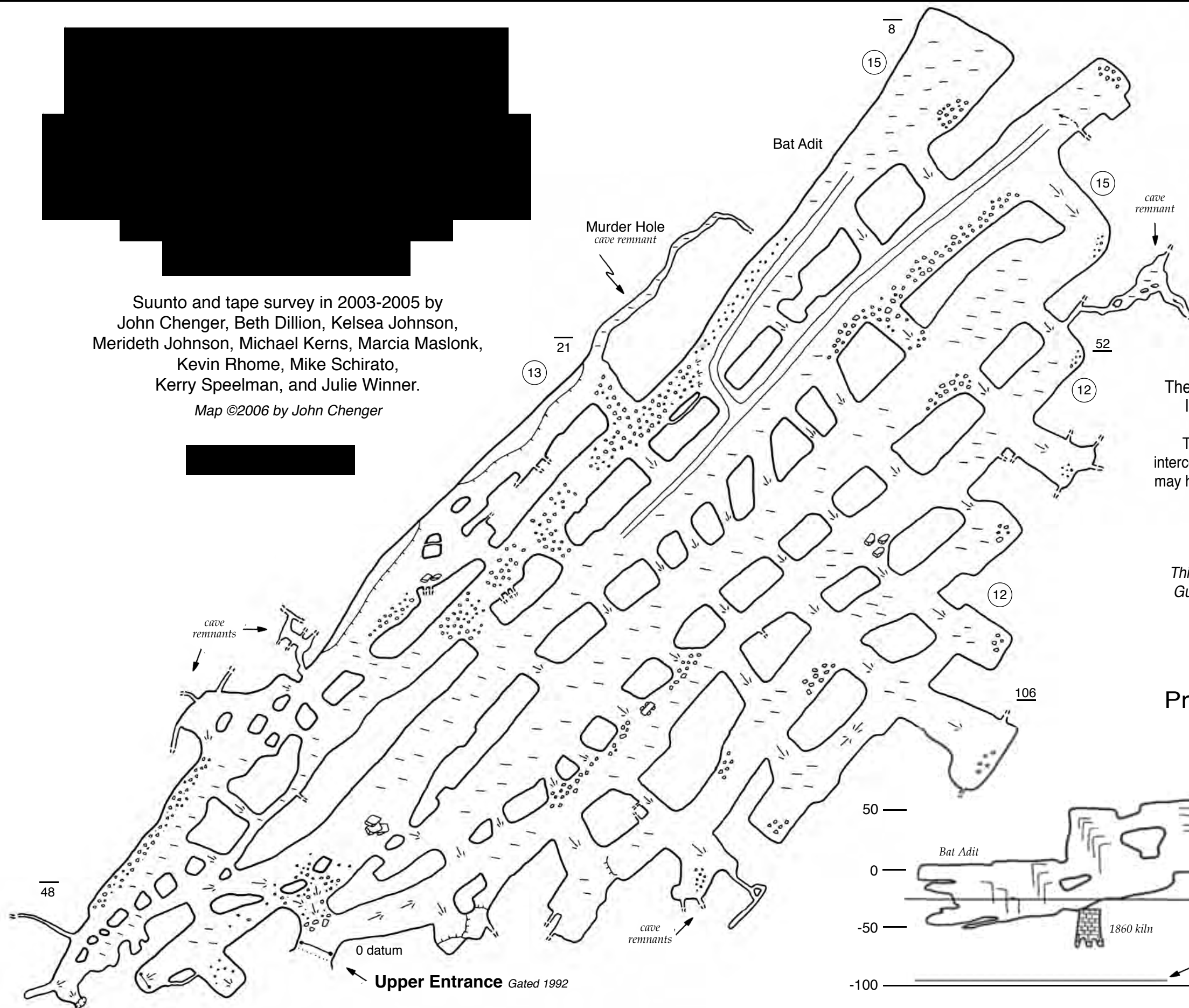
© 2005 Bat Conservation and Management, [REDACTED]





Suunto and tape survey in 2003-2005 by  
John Chenger, Beth Dillion, Kelsea Johnson,  
Merideth Johnson, Michael Kerns, Marcia Maslonk,  
Kevin Rhome, Mike Schirato,  
Kerry Speelman, and Julie Winner.

Map ©2006 by John Chenger



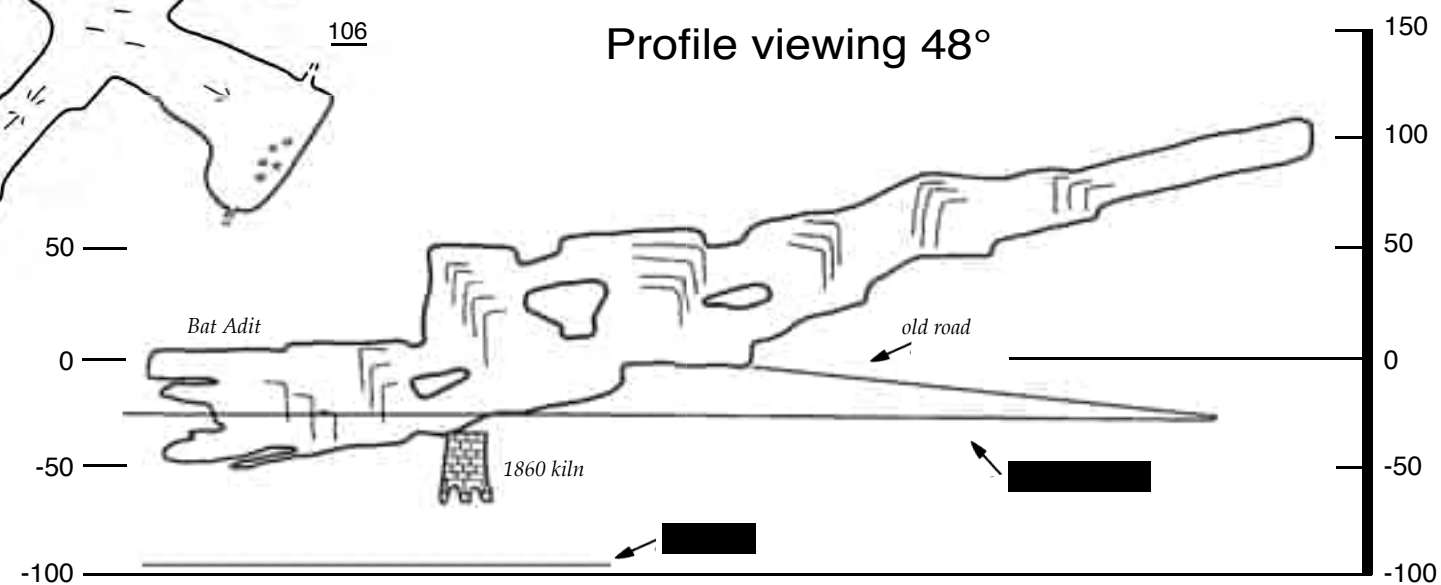
Upper Entrance  
0 Datum Elevation 2,360 feet  
U.S.G.S. Avilton 7.5' quadrangle

The [redacted] Cave is contained within the Wymps Gap limestone or the Mississippian Mauch Chunk formation.

This survey contains 8,443' of mine passages with additional interconnecting pillars sketched. The southwestern section of the mine may have been operating as early as 1860 while the relatively modern northwest end may date from the 1930's.

The mining operation intersected a significant natural solution cave and 697' of remnants were mapped.

*This mine is dedicated as a nature preserve through the efforts of Guy Wayne Hardesty and the Pennsylvania Game Commission.*





# U.S. Route 219 Improvement Project

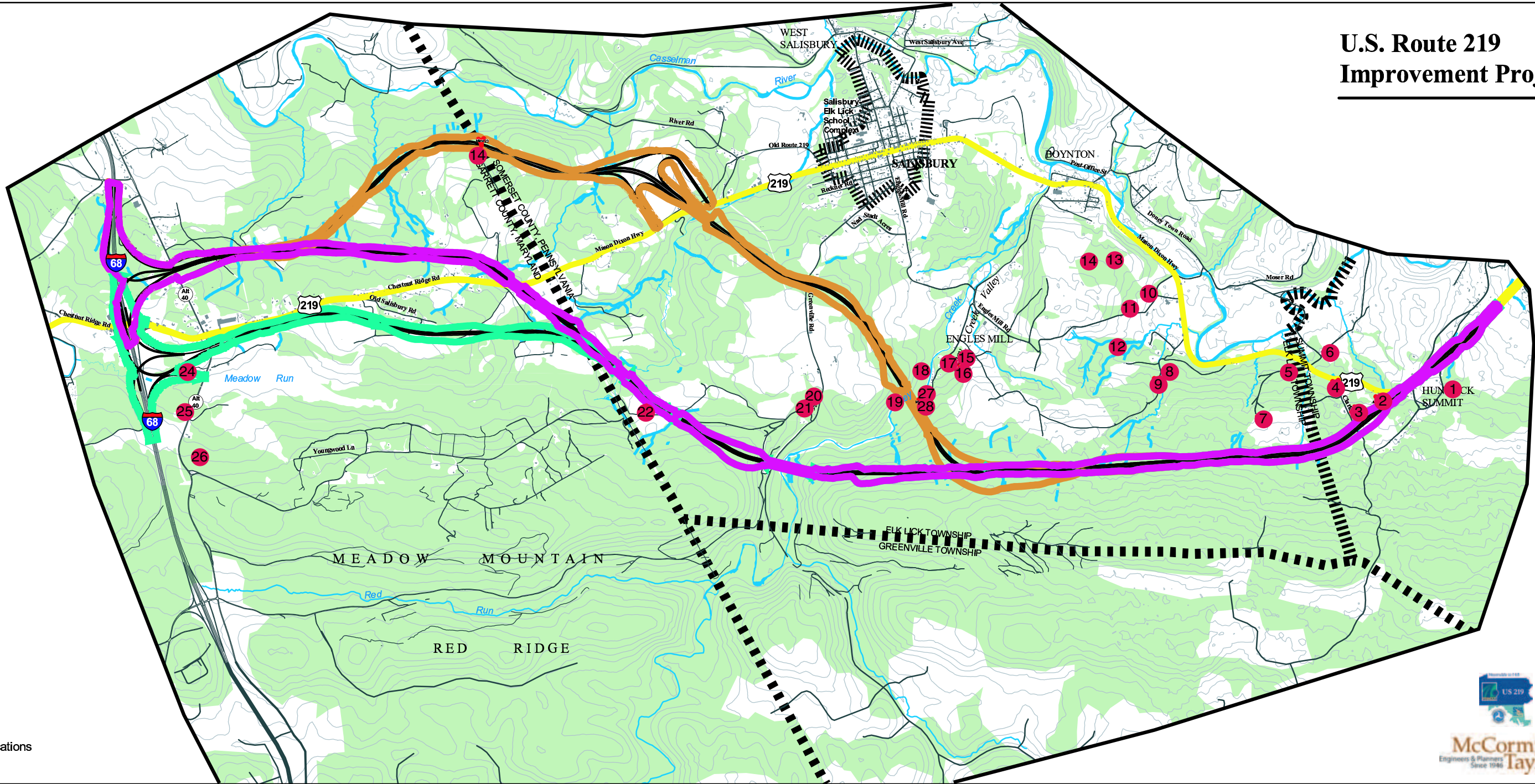
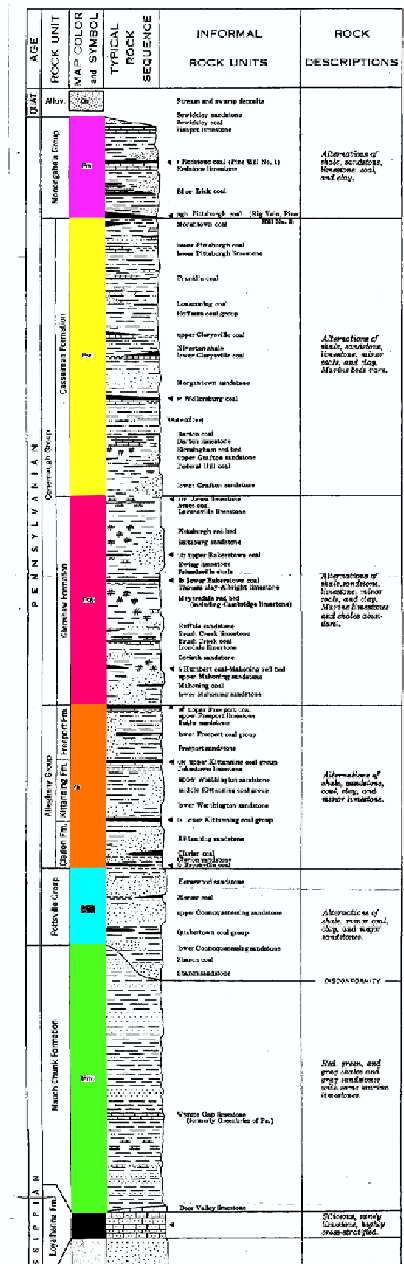


Figure 6 - Surveyed Mine Locations



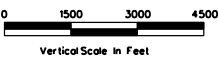
U.S. ROUTE 219  
IMPROVEMENT PROJECT



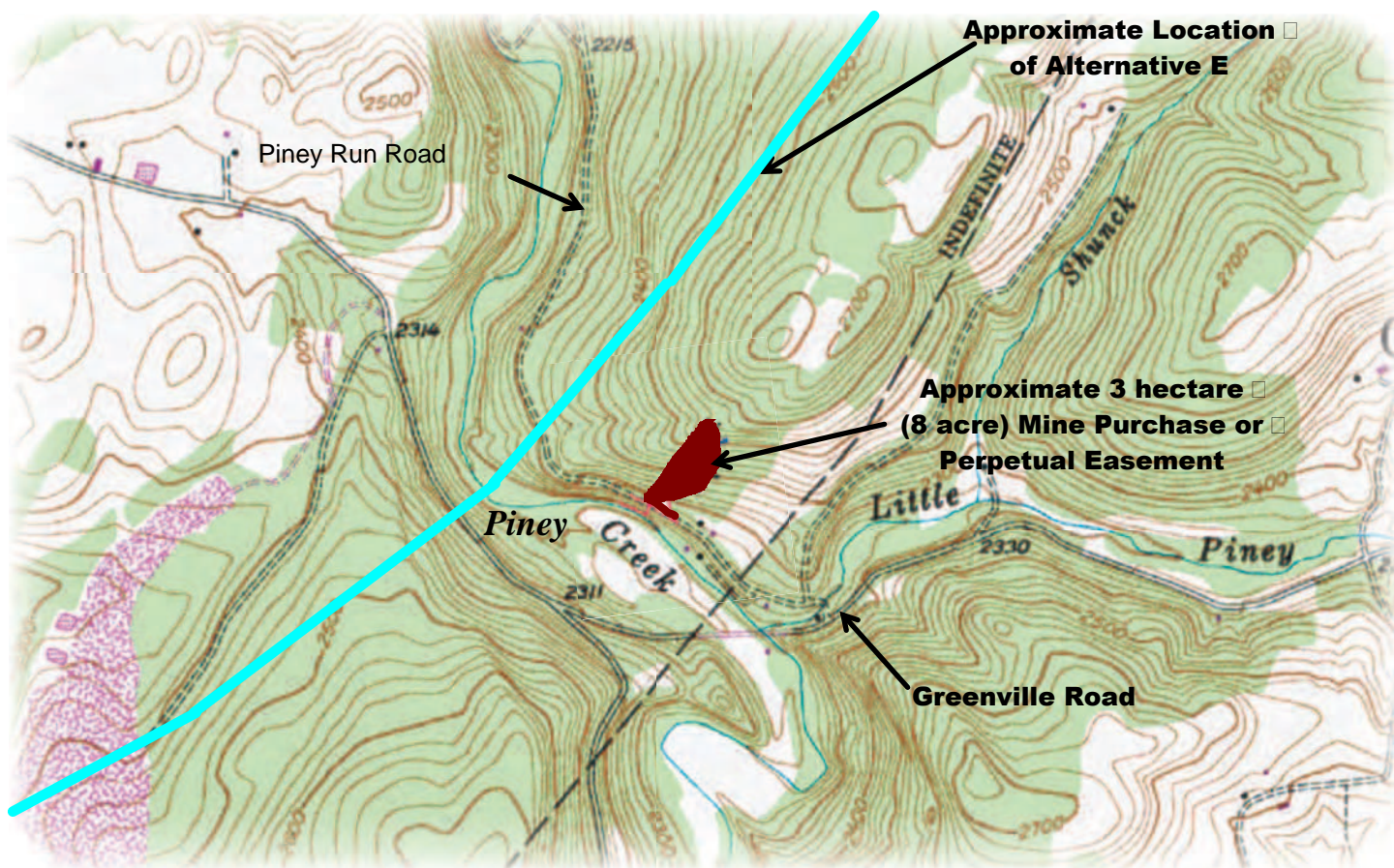
GEOLOGIC COLUMN

STRATAGRAPHIC COLUMN  
FIGURE 7

(DECEMBER 2005)







**Figure 8, Mine Purchase/Perpetual Easement**



# **APPENDIX A**

## **Coordination and Correspondence**





# United States Department of the Interior

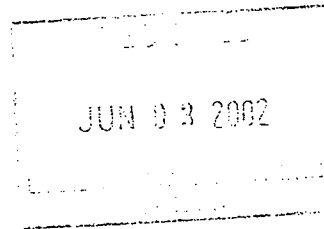
## FISH AND WILDLIFE SERVICE

Pennsylvania Field Office  
315 South Allen Street, Suite 322  
State College, Pennsylvania 16801-4850



May 30, 2002

Attilio Squillario  
L. Robert Kimball & Associates  
615 West Highland Avenue  
P.O. Box 1000  
Ebensburg, PA 15931



Dear Mr. Squillario:

This responds to your letter of May 6, 2002, requesting information about federally listed and proposed endangered and threatened species within the area affected by the proposed transportation improvement project (SR 6219, Section 019) to be located in Somerset County, Pennsylvania. The following comments are provided pursuant to the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) to ensure the protection of endangered and threatened species.

The proposed project is located within the range of the Indiana bat (*Myotis sodalis*), a species that is federally listed as endangered. Due to the close proximity of the project area to a known Indiana bat hibernaculum (i.e., within five miles), removal of trees and forested areas within the project area could result in the direct take of roosting Indiana bats, which could be injured or killed when trees are cut. Studies have found that forested areas located within five miles of hibernacula provide important foraging and roosting habitat for Indiana bats, especially during the fall and spring, when bats are building up their fat reserves prior to and after hibernation. In addition, female maternity colonies and individual male bats may be found in the vicinity of hibernacula throughout the summer months.

To avoid the direct take of Indiana bats, tree cutting activities should be carried out from November 16 to March 31, during which time bats are hibernating. If any timber cutting is necessary from April 1 to November 15, the following trees greater than or equal to five inches diameter breast height (d.b.h.) should not be cut or physically disturbed (e.g., while harvesting any adjacent trees) in order to avoid killing or injuring roosting Indiana bats: 1) dead or dying trees and snags (including lightning struck trees) with exfoliating bark; 2) live trees (such as shagbark and shellbark hickory) which have exfoliating or defoliating bark in the trunk or branches; and 3) trees or snags that have characteristics typical of roost sites for Indiana bats (i.e., have exfoliating or defoliating bark, or contain cracks, crevices, or holes that could be used by the species as a potential roost). Tree clearing from November 16 to March 31 may proceed without these restrictions.

Attilio S.  
Ed Jones  
C. Sunday

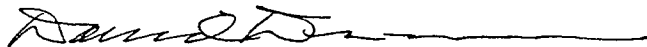


Based on a review of the project information, including the size of the project area and the anticipated effects on forested habitat, the Service has determined that the proposed project will not have a significant adverse effect on overall habitat quality for the Indiana bat. Therefore, if a seasonal restriction on tree cutting is implemented to avoid the direct take of Indiana bats, construction of the proposed project is not likely to adversely affect this species. If you are unable to implement the above measures to avoid adverse effects, however, further consultation with this office will be necessary.

This response relates only to endangered and threatened species under our jurisdiction based on an office review of the proposed project's location. No field inspection of the project area has been conducted by this office. Consequently, this letter is not to be construed as addressing other Service concerns under the Fish and Wildlife Coordination Act or other authorities.

If you have any questions regarding this matter, please contact Robert Anderson of my staff at 814-234-4090.

Sincerely,

A handwritten signature in dark ink, appearing to read "David Densmore", followed by a horizontal line.

David Densmore  
Supervisor



4715-01  
10.6

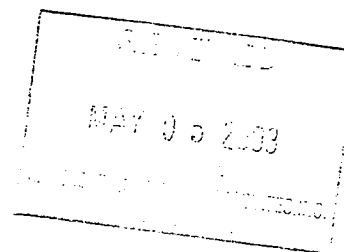


## United States Department of the Interior

FISH AND WILDLIFE SERVICE  
Chesapeake Bay Field Office  
177 Admiral Cochrane Drive  
Annapolis, MD 21401



April 1, 2003



Mr. Stephen G. Toki, Jr.  
L Robert Kimball & Associates, Inc.  
615 West Highland Avenue  
P.O. Box 1000  
Edensburg, PA 15931

RE: *Environmental Review US 219, Section 019, Meyersdale, PA to I-68, MD  
Garrett County, MD*

Dear Mr. Toki:

This serves as an amendment to our letter, dated February 11, 2003, responding to your request for information on the presence of species which are federally listed or proposed for listing as endangered or threatened within the vicinity of the above referenced project area. We have reviewed the information you enclosed, along with additional information obtained from the U.S. Fish and Wildlife Service Pennsylvania Field Office, and are providing comments in accordance with Section 7 of the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*).

The proposed project is within the range of the federally endangered Indiana bat (*Myotis sodalis*). An Indiana bat hibernaculum exists within the state of Pennsylvania and is located approximately one-mile from the Maryland state border. In addition, Indiana bats are known to utilize forested areas within five-miles of their hibernacula. Based on this information and the map you provided we have determined that the project study area is within the range of this species. The subsequent recommendations reflect those made by the Pennsylvania Field Office in their May 2002 letter to your office.

To avoid direct take of Indiana bats, tree cutting activities should be carried out from November 16 to March 31, during which time bats are hibernating. If any timber cutting is necessary from April 1 to November 15, the following trees greater than or equal to five inches diameter breast height (d.b.h.) should not be cut or physically disturbed (e.g., while harvesting any adjacent trees) in order to avoid killing or injuring roosting Indiana bats: 1) dead or dying trees and snags (including lightning struck trees) with exfoliating bark; 2) live trees (such as shagbark and shellbark hickory) which have exfoliating or defoliating bark in the trunk or branches; and 3) trees or snags that have characteristics typical of roost sites for Indiana bats (i.e., have exfoliating or defoliating bark, or contain cracks, crevices, or holes that could be used by the species as a

Toki  
allaher  
Lacey  
Foster  
Cresday



potential roost). Tree clearing from November 16 to March 31 may proceed without these restrictions.

Based on a review of the project information, including the size of the project area and the anticipated effects on the forested habitat, the Service has determined that the proposed project will not have a significant adverse effect on overall habitat quality for the Indiana bat. Therefore, if a seasonal restriction on tree cutting is implemented to avoid the direct take of Indiana bats, construction of the proposed project is not likely to adversely affect this species. If you are unable to implement the above measures to avoid adverse effects, however, further consultation with the Pennsylvania Field Office will be necessary.

Except for occasional transient individuals, no other federally proposed or listed endangered or threatened species are known to exist within the project impact area. Should project plans change, or if additional information on the distribution of listed or proposed species becomes available, this determination may be reconsidered.

This response relates only to federally protected threatened or endangered species under our jurisdiction. For information on the presence of other rare species, you should contact Lori Byrne of the Maryland Wildlife and Heritage Division at (410) 260-8573.

An additional concern of the Service is wetlands protection. Federal and state partners of the Chesapeake Bay Program have adopted an interim goal of no overall net loss of the Basin's remaining wetlands, and the long term goal of increasing the quality and quantity of the Basin's wetlands resource base. Because of this policy and the functions and values wetlands perform, the Service recommends avoiding wetland impacts. All wetlands within the project area should be identified, and if construction in wetlands is proposed, the U.S. Army Corps of Engineers, Baltimore District, should be contacted for permit requirements. They can be reached at (410) 962-3670.

We appreciate the opportunity to provide information relative to fish and wildlife issues, and thank you for your interests in these resources. If you have any questions or need further assistance, please contact Mary Ratnaswamy at 410-573-4541.

Sincerely,

A handwritten signature in cursive script that reads "Mary Ratnaswamy".

Mary J. Ratnaswamy, Ph.D.

Program Supervisor, Threatened and Endangered Species





# United States Department of the Interior

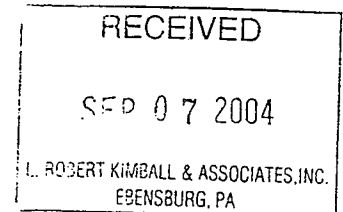
## FISH AND WILDLIFE SERVICE

Pennsylvania Field Office  
315 South Allen Street, Suite 322  
State College, Pennsylvania 16801-4850



September 2, 2004

L. Robert Kimball & Associates  
ATTN: Stephen G. Toki, Jr.  
615 West Highland Ave., P.O. Box 1000  
Ebensburg, PA 15931



Dear Mr. Toki:

This responds to your letter of June 11, 2004, requesting comments on the potential effects that three alternative alignments for the proposed Route 219 Transportation Improvement Project (Meyersdale Bypass) in Somerset County, Pennsylvania, may have on the federally listed, endangered Indiana bat (*Myotis sodalis*). We previously commented on the potential impacts of this project on threatened and endangered species in a May 30, 2002, letter. The following comments are provided pursuant to the Endangered-Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) to ensure the protection of endangered and threatened species.

At the time of our May 30 letter, we did not know that Alternatives AE and D would come within 1000 feet of a known hibernaculum for the Indiana bat, nor that the alternatives could potentially affect over 300 acres of forested habitat. Consequently, we did not request bat surveys at that time. However, due to the anticipated impacts of the project on forest habitat, and the proximity of two alternatives to a known hibernaculum, a bat survey of all three alternatives should be conducted between May 15 and August 15 by a qualified, Fish and Wildlife Service-approved biologist (see enclosed list) using the enclosed survey guidelines. Survey results should be submitted to the Service for review and concurrence. Should Indiana bats be found during the surveys, further consultation with the Service will be necessary, including the submission of detailed project plans, and an analysis of alternatives to avoid and minimize adverse effects.

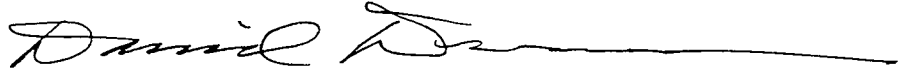
During a presentation at the July 28 Agency Coordination Meeting, it was requested that we concur on dropping Alternative A, and selecting Alternative AE as the recommended preferred alternative for the draft environmental impact statement. Alternative A passes approximately one mile away from the Indiana bat hibernaculum, although it would have similar impacts to forest as the other two alternatives. Therefore, Alternative A should not be dropped from detailed analysis in the draft statement, since it may avoid or minimize impacts to the Indiana bat by passing a greater distance from the hibernaculum. Furthermore, until we evaluate the results of bat surveys, forest habitat conditions, and terrain near the hibernaculum, we will not be able to make a determination on the potential adverse effects any of the alternatives may have on Indiana bats. Therefore, we cannot concur with either dropping Alternative A or selecting Alternative AE as the recommended preferred alternative at this time.

He  
ity  
rider  
Sunday



If you have any questions regarding these comments, please contact Richard McCoy of my staff at 814-234-4090 ext. 232.

Sincerely,

A handwritten signature in black ink, appearing to read "David Densmore", followed by a long horizontal line extending to the right.

David Densmore  
Supervisor



OKed  
10/04

## MEETING SUMMARY MEMORANDUM

**PROJECT:** U.S. 219, Section 019  
**JOB NO.:** 4715-01  
**DATE:** October 4, 2004  
**TIME:** 1:00 p.m.  
**PURPOSE:** Indiana Bat  
**LOCATION:** Traditions Restaurant, Bat hibernaculum, Alternative E crossing of Piney Run Road

### ATTENDEES:

Rick McCoy, United States Fish and Wildlife Service (US FWS)  
Bob Anderson, USFWS  
Karyn Vandervoort, Federal Highway Administration (FHWA)  
Cal Butchkoski, Pennsylvania Game Commission (PGC)  
Kevin Mixon, PGC  
Greg Turner, PGC  
Jeannine Tardiff, PGC  
Dave Sherman, P.E., Pennsylvania Department of Transportation (PennDOT), District 9  
Stu Kehler, PennDOT District 9  
Scott Hammond, PennDOT District 9  
Greg Kough, P.E., PennDOT Central Office  
Dawn Noel, P.E., McCormick Taylor, Inc.

The meeting began at Traditions Restaurant with brief introductions. Dave Sherman then briefly outlined the Alternatives D, E, and AE, explaining that Alternative A is not being studied any further.

Dawn Noel presented a map that showed the area of potential Indiana Bat roosting habitat within the project area based on land use data collected to Anderson Level II classifications. This area amounts to almost 6,600 acres. The presented map also showed the potential areas of Indiana Bat roosting habitat within each of the alternatives. Alternative D would impact the most potential roosting habitat at 367 acres, Alternative AE the second most at 323 acres, and Alternative E the least at 265 acres. Noel mentioned that the important point is that the project, no matter which alternative is selected, would impact only around 5 percent of the available roosting habitat in the project area. The map also delineated an area along the AE and E Alternative alignments that has been selective cut by Allegheny Wood Products, all oaks, hickories, and cherries have been removed. USFWS stated that this area has not been designated as critical habitat for Indiana bats under the Endangered Species Act. [RMA1]

Noel then presented a cross section of the project area extending from just east of the Indiana Bat hibernaculum (abandoned mine) to the closest point on the alignments of Alternative E and Alternative AE. This cross section shows the road at an elevation



approximately 40 feet above that of the mine opening. Additionally, the road is situated around the hillside from the mine. Noel stated that this hillside orientation would effectively work as a natural noise and vibration barrier between the mine and the proposed highway.

It was noted that the proposed alignments of Alternative AE and E are not on the top of the ridge. The ridge top elevation is approximately 2,800 feet with the road elevations of AE and E averaging around 2,340 feet near Piney Creek.

Cal Butchkoski stated that this hibernaculum is part of a reclamation project in Pennsylvania being designed to assist in the recovery of the Indiana bat. Butchkoski stated that this mine has a fairly unique condition within the state in that it contains areas of low temperatures (38 to 45 degrees Fahrenheit) and moderate temperatures (-in the low 50 degree ranges). Butchkoski mentioned that the 40-degree temperature range is ideal for the Indiana Bat while the higher temperatures are appropriate for other hibernating species of bat such as the eastern pipistrelle. Butchkoski stated that this hibernaculum is one of only five in the Commonwealth that contain all six species of hibernating bat and is only one of 13 that roost Indiana bats. It was also stated that the importance of this hibernaculum is not what it contains now, but its potential as habitat for the Indiana bat as well as the other PA bat species. Butchkoski stated that it's important to move forward, not backward in regards to management of wildlife within the Commonwealth.

Butchkoski mentioned that fall is the time for the bats to mate and prepare for winter hibernation. They expend a lot of energy at this time and need to forage heavily to put on "winter weight." Much of this occurs around the hibernacula, so surrounding habitat is vital. Butchkoski stated that this is very important because, due to the low reproduction rate (one young per year), the bats must avoid any type of predation or population decline.

The main areas of concern identified for bats at the meeting were: roosting habitat (winter and summer), foraging habitat around the mine, areas for maternity colonies and travel corridors.

It was stated that the hibernaculum in the project area is mainly a winter roosting area. The bats in the colony are tied to the winter roosting area for the winter, but most are probably transient animals that migrate to other locations in the summer. Telemetry work on both migrating bats and those replenishing fat reserves before entering the mine for hibernation would provide better information on foraging areas around the mine and migration routes to summer habitats.

Butchkoski mentioned several studies that have and are being conducted on artificial roosting habitat (bat boxes, bat condos). Bats are using these structures for roosting in lieu of trees and some instances of the structures being used for maternity spots have



been documented. He also noted that other agencies, such as PennDOT should begin incorporating these structures into project designs on a routine basis.

It was stated that the Indiana bats have been known to use small woodlots within farming areas as well as large unbroken swaths of forested, indicating that the bats are somewhat adaptable. Most maternity sites are in forested lowland areas rather than ridge tops.

Butchkoski mentioned that one study documents the male Indiana bats foraging areas lay within 2.5 kilometers of the hibernaculum during the fall return period. This is important for the bats to put on fat reserves after migrating to the site and before entering to hibernate. Butchkoski stated that his main concern with this project is impact to foraging habitat within this 2.5-kilometer area. Most foraging areas are within deciduous forest. Deciduous forests are prime foraging habitats for bats beginning/ending migrations to/from the site in the fall and spring

It was also stated that Indiana bat maternity colonies have recently been found <50km from hibernation sites. However, Indiana bats are known to migrate up to 520km from these sites. Butchkoski also stated that maternity areas would most likely be found in - deciduous forest areas in low elevations. Butchkoski mentioned that finding a maternity colony in this area for Indiana bats using this mine is unlikely since the Indiana bats are just beginning to populate this mine. However, Indiana bats could be migrating to summer habitats in the area from other hibernacula. Butchkoski theorized that this could be a reason for the occasional detection of Indiana bats at the mine as they are beginning to become familiar with the site.

Additional studies were discussed to allow the PGC and USFWS collect additional information on the bat such as mist net surveys or telemetry surveys. Butchkoski stated that, given the apparent low densities, it would be difficult to detect Indiana bats in the area with mist netting surveys. It was also noted that, again given the low densities of Indiana bats within the mine, that capturing Indiana bats at the mine entrances during the spring and fall swarms would be difficult.

Greg Turner stated that telemetry surveys would be preferred in order to help delineate foraging habitat in the project area. It was stated that the initial (first feeding) foraging habitat would be along the stream corridors, then as temperatures dropped along the streams the bats would move up the warmer vegetated slopes (second feeding). Butchkoski stated that much of the later feedings occur on the warmer ridge tops. Telemetry studies would help identify travel corridors – where the bats go when they leave the mine, where they forage and the routes they use back to the mine. It was mentioned that telemetry studies conducted in the spring and then in the fall would provide the best information.

PGC stated that obtaining an average height (elevation above ground) for bat foraging is a very difficult task. Video recording, light tagging and radar systems can be used, but these systems are expensive and time consuming. Butchkoski mentioned that the myotis



species, including the Indiana Bat, tend to be "tied" to the tree canopies when foraging or traveling; therefore if the road and bridge would be above the canopy there would be less concern with road kill.

It was mentioned that studies have also shown bats foraging along transportation/utility corridors in the area between the cleared and the forested areas. This is thought to potentially increase bat kills along roadways.

Rick McCoy stated that the USFWS requested mist net studies along all three alignments (Alternatives D, AE/E and A) to help determine where the more suitable habitat areas are located. McCoy stated that knowledge of the types and maturity of trees in an area is important to understanding the bats' behaviors. Noel responded that using the existing GIS for this project and the Anderson Level III data that has been collected, a breakdown can be provided for each alignment showing the types of forest cover and sizes of trees within each alignment that will be impacted. The USFWS requested this information.

Several different mitigation measures were discussed including:

- Timbering restrictions
- Designing the bridge over Piney Creek to provide roosting habitat (i.e., open box beams)
- Installing artificial/man-made roosting structures on or near the bridge abutments where abutments are in and above the tree canopy.
- A conservation easement around the bat hibernaculum to preserve vital foraging habitat and provide for some roosting trees (i.e. hickory).
- Remove additional tree cover along the road right-of-way to keep the bats back from the roadway, thereby reducing road-kill potential. However, this requires identifying travel corridors. A highway bisecting travel corridors requires additional mitigation measures.

The PGC is conducting mist net surveys tonight and tomorrow evening to help expand the information they have pertaining to a winter count of the bats. It was noted, that given the small sample period (due to other manpower demands) the chance of capturing Indiana bats will be small.

Concerns over blasting were also discussed. It was stated that the geotechnical analysis has not been completed yet, so it is unknown whether blasting will be required. Turner mentioned that the impacts of blasting could be reduced by not conducting blasting during the hibernation season. Additionally, placing blast sensors in the cave to help monitor potential vibration impacts would be useful, per the PGC. Bob Anderson and Kevin Mixon both mentioned that on previous projects methods of conducting the blasting in a non-intrusive way have been evaluated (such as types and sizes of charges, positioning of explosives, etc...) It was stated that blasting issues can be coordinated and mitigation measures for blasting documented in the Environmental Impact Statement (EIS).



The project schedule was discussed. It was stated that a Pre-Draft EIS is anticipated in January, with circulation of a Draft EIS in the spring of 2005, and a Record of Decision in late 2005 or early 2006. Additionally, it was noted that construction would probably not be completed for 5 to 10 years.

It was noted that the next step is for FHWA/PennDOT to respond to the USFWS September 2, 2004 letter. Bob Anderson stated that if FHWA feels additional studies are not needed, a memo documenting why the studies are not needed and what is being proposed in lieu of studies should be sent to USFWS.[RMA2]

The meeting adjourned around 4:30 p.m.

**ITEMS RECEIVED/DELIVERED:** Map with Alternatives D, E, and AE showing potential roosting Habitat based on Anderson II and III, timbering area, and acreages of existing roosting habitat and Amount that would be impacted by each alternative.

---

**REQUIRED ACTION:** FHWA/PennDOT Memo to USFWS

---

**DISTRIBUTION:**

D. Sherman
S. Hammond
S. Kehler
G. Kough
K. Vandervoort
B. Cossaboon
D. Hoover

**McCORMICK TAYLOR, INC.**

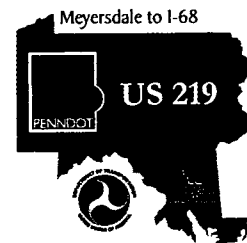
**BY:** D. Noel

**TITLE:** Environmental Manager

---

**PAGE:** 4                      **Of** 4





## MEMORANDUM OF MEETING

**DATE:** January 20, 2005 - FINAL

**MEETING DATE:** December 21, 2004

**PLACE:** Federal Highway Administration  
Harrisburg, PA

**TIME:** 9:00 a.m.

**SUBJECT:** US 219 Meyersdale to I-68  
Status Meeting

**ATTENDEES:** See Attached Sheet

---

1. Karyn Vandervoort explained that today's meeting is a follow up to the October field view. FHWA wants to discuss some conservation measures that PennDOT and FHWA are willing to offer for the Indiana Bat. Karyn quickly reviewed the agenda, which includes discussing the data gaps, the knowns, potential actions, and conservation measures.
2. One of the data gaps is how many Indiana bats are in the cave. Karyn noted that from what she remembers there has only been one bat identified in five years. However, the condition of the cave is optimal hibernacula. Cal Butchkoski stated that the Pennsylvania Game Commission (PGC) is not saying that it is a significant hibernacula; however, the conditions are optimal given that Hell Hole is located 60 miles to the south in West Virginia and Canoe Creek is located to the north. There are known Indiana bat populations in both of these caves. Karyn noted that the other unknowns at this time are flight patterns and the exact location of foraging and roosting habitats.
3. Cal Butchkoski stated that bat identification is done every other year. One Indiana bat was identified in this cave in 1999. There were none identified in 2001 and one was identified in 2003. They are not sure if the same bat was identified in 1999 and 2003. Carol Copeyon asked if the bats were tagged. Cal stated that no, they are not tagged during the identification process. The



identification process is conducted in the winter and it would be too disruptive to tag them at that time. Cal noted that five other species of bats utilize the Salisbury mine cave for a total of six.

4. Carol Copeyon asked how certain the PCG is that this is a complete count versus just a survey of the bats. Cal Butchkoski stated that the PCG is 90% certain that this is a complete survey. No surveys ever complete. I'd say we're sampling at least 90% of the bats. Carol stated that one Indiana bat was confirmed in 2003. She asked how many of the bats he feels went uncounted. Cal stated that in Canoe Creek, 9-10 out of the 700-800 bats that were identified were Indiana bats.
5. Carol Copeyon asked Cal Butchkoski whether the mine was likely to support 10s, 100s or 1000s of I-bats, considering the winter survey was not likely to be a complete count. Cal responded 10s.
6. Carol asked why areas >10% slopes were used in identifying the foraging habitat. Deb Hoover explained that this was a parameter provided to them from the previous field view meeting. Carol stated that for future foraging habitat identification, just show the forested areas and don't use a slope.
7. Cal Butchkoski explained that the maternity sites are not tied to the hibernacula. Some of the radio tracking work done in New York was able to track bats 25-30 miles away from the hibernacula. Males can be found just about anywhere in the forested habitat. The females need the warmer conditions for embryo and milk development.
8. Carol Copeyon asked if a summer survey was every conducted. She stated that a summer survey was conducted in Indiana and they found quite a few males in the cave, which was unexpected.
9. Karyn Vandervoort wanted to review the potential harm or harassment factor to the Indiana bat in relation to Alternatives E and AE. Blasting will be required in the area of Piney Creek. There is going to be a bridge crossing the steep ravine over Piney Creek. The bridge is going to be about 145' from the existing surface to the bottom of the bridge structure. There is a concern regarding the vibration from the blasting reaching the mine and disturbing the bats. Kevin Mixon sent the project team a vibration study report prepared by Vibra-Tech on another mining job that was close to bat hibernacula. Karyn noted that Vibra-Tech is also on the Team for this project. Based on the information assimilated from the recent boring work and the geological research conducted for this project, the Team feels that shear waves induced by blasting for roadway excavations should have negligible or no adverse impact on the hibernacula for the following reasons:



- The frequency spectrum of blasting-induced shear waves is relatively high with low amplitude. It is the amplitude and not the frequency that will have the greatest impact on the walls of the abandoned limestone mine. Since the waves will be of low amplitude, their effect should be minimal.
- Blasting-induced seismic waves generally propagate on a horizontal plane. With the significant elevation difference between the proposed road grade at the base of the excavation and the elevation of the abandoned mine below the roadway or the elevation of the abandoned mine entrance, the effect should again be minimal.
- Seismic wave propagation in bedrock is attenuated by the presence of discontinuities (joints, fractures, bedding planes, etc.) in the bedrock. With the significant stratigraphic elevation difference in bedrock between the Pottsville group rocks at the base of the excavation and the Mauch Chunk formation rocks at the abandoned limestone mine, the effect should again be minimal.
- Finally, special provisions will be incorporated in the construction contract to limit the peak particle velocity at the hibernacula to levels consistent with current PaDEP guidelines. The site-specific blasting plan prepared by the contractor must be reviewed and approved by both PaDEP and PennDOT prior to any blasting, and vibration monitoring will be required at critical locations, including the hibernacula.

10. Carol Copeyon requested that the mine be mapped. Cal Butchkoski noted that the main passages shoot off to the north. The vertical passages tend to go south.

11. Karyn Vandervoort distributed three impact tables for both the foraging and roosting habitat areas. She noted that Alternative D has the greatest impact to the roosting habitat areas. Carol Copeyon asked why 2.5-kilometer radius was used to tally the impacts. Cal noted that 2.5-kilometer is referenced in Munsell's guide. Carol asked if the 2.5-kilometer is the maternity habitat area? The response was no, it is not the maternity habitat area. Carol said the effects analysis should consider the potential presence of an I-bat maternity colony in the action area. The roosting and foraging habitat for maternity colonies is generally contained within about a 2-mile radius (but this does not mean that all forested habitat within a 2-mile radius is used for foraging and roosting). Foraging areas for individual I-bats, assuming a foraging range of 125-250 acres. Will any forested habitat be permanently protected to minimize the effects of permanent forest loss?

The analysis should also consider the effects of the potential removal of I-bat maternity roost trees (e.g. seasonal restriction as a project minimization measure). The effects analysis should consider the effects of the project on the



foraging habitat supporting the hibernating bat population as well. This analysis should consider the 5-mile radius around the hibernaculum, and the effects of forest habitat loss within that radius (compare pre- and post-project forest cover within the 5-mile radius).

12. Karyn explained that two parcels just to the west of the hibernacula that fall within Alternative E and AE are either timbered or will be timbered. They will be doing selective cutting, presumably removing the larger trees. However, when you look at the rest of the project area, and the area to the east of the hibernacula, most of that will remain forested. Carol asked for the contact information for both parcels.
13. The Biological Assessment (BA) should discuss the different types of the species' habitat and how the project will affect those parcels.
14. The topic of road mortality was discussed. The bridge is going to be approximately 145' feet high. The trees range anywhere from 20' to 80' in height. Given that information, would there be mortality as a result of the moving vehicles? Considering the lay of the land, where do you project that the bats would be flying? It was noted that telemetry studies may have to be completed with surrogate species to determine where the bats would be flying. Another question was posed, where are the bats going to cross the highway? The majority of bats are going to cross where it is forested. It was noted that the wider the highway cut, the more likely they are to dive down into the cut and then back up into the forest once they are across. A possible mitigation measure could be to tighten up the slope. Once the borings are done and based on the results, the slopes may be able to be reduced to 1:1 or 1½ :1. The elevation of the bridge could possibly be raised to 180' in order to reduce the cut section width.
15. Karyn presented some additional possible mitigation measures including clearing restrictions, which would be imposed September to March. Carol Copeyon stated that typical seasonal timbering restrictions within 5-miles of a hibernaculum are from November 16 to March 31.
16. Other prudent conservation easements to work on include a conservation easement, which would be entered into with the current landowner. The current agreement has a 30-day termination clause. This easement could be for the cave itself and the path back to the cave. If possible, the Team could see if he would be willing to expand the area to include a buffer around the cave. If he is not willing to enter into an agreement, the Team could talk to other landowners to see if other areas could be purchased as part of right-of-way and left forested.
17. Additional mitigation could be blasting restrictions within the area closest to the hibernacula and done during the summer. A buffer should also be added around the cave, which would also adhere to the blasting restrictions.



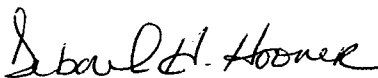
18. Bat boxes, built to PCG specifications, could be purchased and erected within the project area or arrangements could be made with private landowners to construct them on their properties, mainly along stream banks. These boxes seem to be successful in the Canoe Creek area. The aluminum type boxes are preferred. It was suggested that the boxes be placed to direct the bats from the cave to the stream (under the bridge) to encourage a safer travel corridor.
19. It was recommended that as many trees be kept as possible; however, maternity roosts should not be promoted next to the highway.
20. Karyn asked if the PCG and USFWS liked the conservation measures presented and if those are employed, could it be concluded that there will be No Affect to the Indiana bat? It was stated that since the species is already in the project area, a BA is required under section 7 of the Endangered Species Act because the US 219 Meyersdale to I-68 project is a "major construction activity" (50 CFR § 402.12 (b))...
21. Post-construction commitments could be made as well, such as looking for road kill in the spring and fall, three times per week. Walks should be done when the pups are out, which is the last half of June. The identification of road kill, or lack therefore, would substantiate the premise that more than the one (1) observed I-bat is present and if it/they are using the area of the proposed road crossing as their flight path. Currently, based on known information, the I-bat population is scant, and the BA will be written as such. However, if through up-coming studies and post-construction observation of road kill it is determined that the population is more plentiful, FHWA may opt to reinstate consultation with the USFWS to adjust conditions as presented in the BA.
22. It was noted the FHWA will be requesting concurrence on their opinion from the USFWS when the BA is submitted.

The meeting adjourned around 11:00 a.m.

23. Following the meeting, it was noted that all mine openings within the project area need to be viewed to see if it is a potential hibernacula. If it is, it will have to be surveyed to determine if they may be suitable bat hibernacula.

Prepared by:

McCORMICK TAYLOR



Deborah H. Hoover  
Project Coordinator



***US 219 Meyersdale to I-68  
Sign-In  
December 7, 2004***



**Name:**

Greg Kough  
Thomas Prestash  
David Sherman  
Scott Hammond  
Robert Anderson  
Carol Copeyon  
Kevin Mixon  
Greg Turner  
Cal Butchkoski  
Dave Cough  
Karyn Vandervoort  
Deborah Hoover

**Representing:**

PennDOT BOD  
PennDOT District 9-0  
PennDOT District 9-0  
PennDOT District 9-0  
US Fish and Wildlife Service  
US Fish and Wildlife Service  
Pennsylvania Game Commission  
Pennsylvania Game Commission  
Pennsylvania Game Commission  
Federal Highway Administration  
Federal Highway Administration  
McCormick Taylor, Inc.





U. S. DEPARTMENT  
OF TRANSPORTATION

Pennsylvania Division

4715  
228 Walnut Street, Room 508  
Harrisburg, PA 17101-1720

Federal Highway  
Administration

In reply refer to:  
HEV-PA

U.S. 219, Meyersdale to I-68  
Somerset County, Pennsylvania and  
Garrett County, Maryland

Mr. David Densmore, Supervisor  
U.S. Fish and Wildlife Service  
315 South Allen Street, Suite 322  
State College, PA 16801-4850

Dear Mr. Densmore:

The Federal Highway Administration (FHWA) Pennsylvania Division, as the lead Federal agency, in cooperation with the Pennsylvania Department of Transportation (PennDOT) and Maryland State Highway Administration (MD SHA) is proposing improvements to U.S. 219 in Somerset County, Pennsylvania and Garrett County, Maryland. The proposal is for a four-lane limited access highway stretching approximately eight (8) miles south of Somerset near Hunsrick Summit to I-68 south of Salisbury.

According to the species list received from the U.S. Fish and Wildlife Service (FWS) at the on-set of project development, the Indiana bat, a federally listed threatened species, is known to exist within the study area. No Critical Habitat exists in the project area. As the prospective action may affect the listed species, FHWA entered into early consultation with the FWS. The enclosed information addresses your request for additional information. Pointedly, the information addresses inquiries with regard to:

- Orientation of the abandoned limestone mine's passages
- Depth of passages below the surface relative to the proposed road
- Number of other natural or man-made passages
- Spatial distance between the passages and the proposed road
- Potential collapse that would diminish airflow
- Potential for climate changes





As noted on our January 23, 2006 letter to your office, FHWA has determined that the proposed project will have an effect on the species and will be submitting a Biological Assessment (BA) to the FWS. The BA will evaluate the potential effects of the proposed action on the Indiana bat and determine whether the effect is adverse or beneficial and whether to enter into formal consultation.

If you have any questions, please contact Karyn Vandervoort at (717) 221-2276 or [karyn.vandervoort@fhwa.dot.gov](mailto:karyn.vandervoort@fhwa.dot.gov).

Sincerely yours,

James A. Cheatham  
Division Administrator

Enclosures

ec: M. Ratnaswamy, FWS Chesapeake Bay Field Office w/enclosure  
D. King, FHWA MD Division Office  
S. Rajan, MD SHA project manager w/enclosure  
D. Sherman, PennDOT project manager w/ enclosure  
K. Mixon, PA Game Commission  
G. Kough, PennDOT HQAD

S:\FY2006\Feb\US219 I-68 USFWS.kev.doc





The following are responses to the USFWS request for information on the Salisbury Mine. The intent of the mapping of the abandoned limestone mine was to determine:

**Request:** Orientation of the abandoned limestone mine's passages

**Response:**

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

**Request:** Depth of passages below the surface relative to the proposed road

**Response:** There has been some debate over whether the [REDACTED] is located in the Loyalhanna limestone or the Wymps Gap limestone. Project geologists believe that the mine is located in the Wymps Gap limestone; therefore, considering the bedrock dip in this portion of the project area (about 550 feet per mile from southeast to northwest), the Wymps Gap limestone (contained within the Mauch Chunk group of rocks), in the area of the Alternatives E and AE centerline, would be about 200 feet below the proposed roadway grade. The proposed roadway excavations would occur exclusively in the stratigraphically higher Pennsylvania age Pottsville group of rocks. Based on the current alignments of Alternatives E and AE (the alternatives that are closest to the mine), the maximum excavation depth in the area nearest to the mine would be around 20 feet at the roadway centerline. The ground elevation of the mine entrance is about 60 feet lower in elevation than the proposed excavations for Alternatives E and AE. As stated the Wymps Gap limestone would be about 200 feet below the proposed road grade and the Loyalhanna limestone would be even lower in that it occurs at a lower stratigraphic position than the Wymps Gap limestone. Also, as stated none of the passages are located any closer than 1,100 feet horizontally from the proposed road.

**Request:** Number of other natural or man-made passages

**Response:** [REDACTED] contains 8,443 feet of mine passages. The mining operation intersected a significant natural solution cave and 697 feet of cave remnants were mapped.

**Request:** Spatial distance between the passages and the proposed road



**Response:**

alignments.

**Request:** Potential collapse that would diminish airflow

**Response:** Any shear waves induced by blasting for roadway excavations would have negligible or no adverse impact on the hibernaculum. The following information supports the statement that blasting will have no adverse impact on [REDACTED]

- The frequency spectrum of blasting-induced shear waves is relatively high with low amplitude. The amplitude, not the frequency, would have the greatest impact on cave and mine walls. Since the waves would be of low amplitude, their effect would be minimal.
- Blasting-induced seismic waves generally propagate on a horizontal plane. With the significant elevation difference between the proposed road grade at the base of the excavation and the elevation of the abandoned mine below the roadway or the elevation of the abandoned mine entrance, their effect would be minimal.
- Seismic wave propagation in bedrock is attenuated by the presence of discontinuities (joints, fractures, bedding planes, etc.) in the bedrock. With the significant stratigraphic elevation difference in bedrock between the Pottsville Group rocks at the base of proposed excavations for Alternatives E and AE and the Mauch Chunk formation rocks (this formation contains the Wymps Gap limestone) at the mine, the effect would be minimal.
- Finally, special provisions will be incorporated into the construction contract to limit the peak particle velocity at the hibernaculum to levels consistent with current Pennsylvania Department of Environmental Protection (PA DEP) guidelines. The site-specific blasting plan prepared by the contractor would be reviewed and approved by both PennDOT and PA DEP prior to any blasting. Vibration monitoring would be required at critical locations, including the hibernaculum (Salisbury Mine).

Based on this information the proposed project would not have the potential to cause a collapse at or within the mine that would diminish airflow.

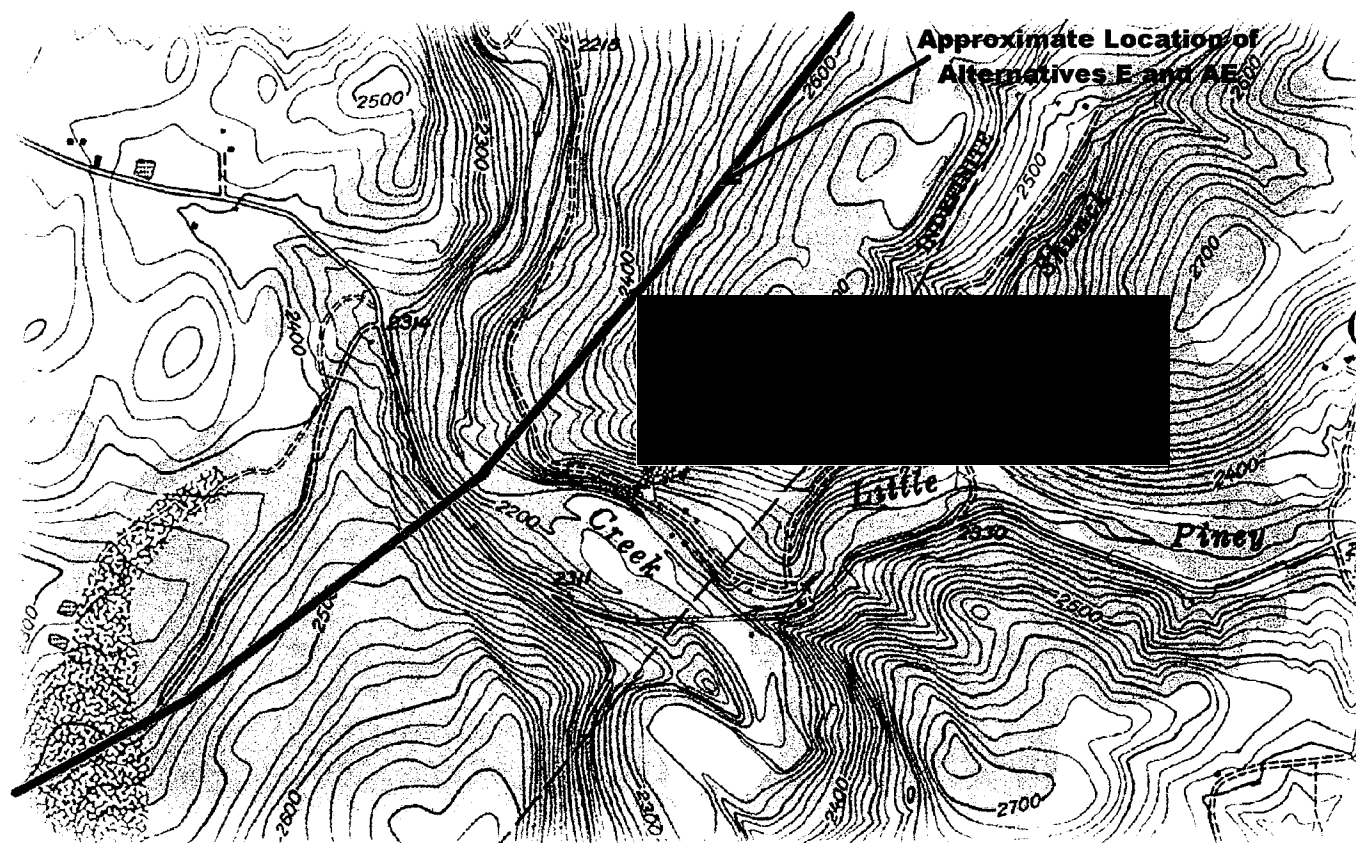
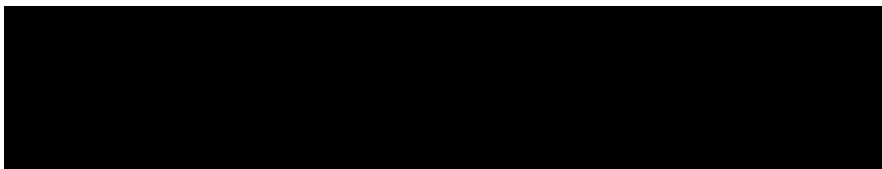
**Request:** Potential for climate changes

**Response:** Based on the provided information, the proposed project would not have the potential to impact the [REDACTED] therefore, the proposed project would not have the potential to cause any climate changes within the mine.









Notes:

Total surveyed sections: 8,443' of mine passage, 697' of natural cave passage, and 1,713' of surface survey.

The location of the cave stream resurgence is suspected to be at the northwest end of the surface survey (depicted in red) on the north bank of Piney Creek.

Mine may not be properly depicted until entrance location coordinates are verified.

2003-2005 Survey by John Chenger, Beth Dillion, Kelsea Johnson, Merideth Johnson, Michael Kerns, Marcia Maslonek, Kevin Rhome, Mike Schirato, Kerry Speelman, and Julie Winner.

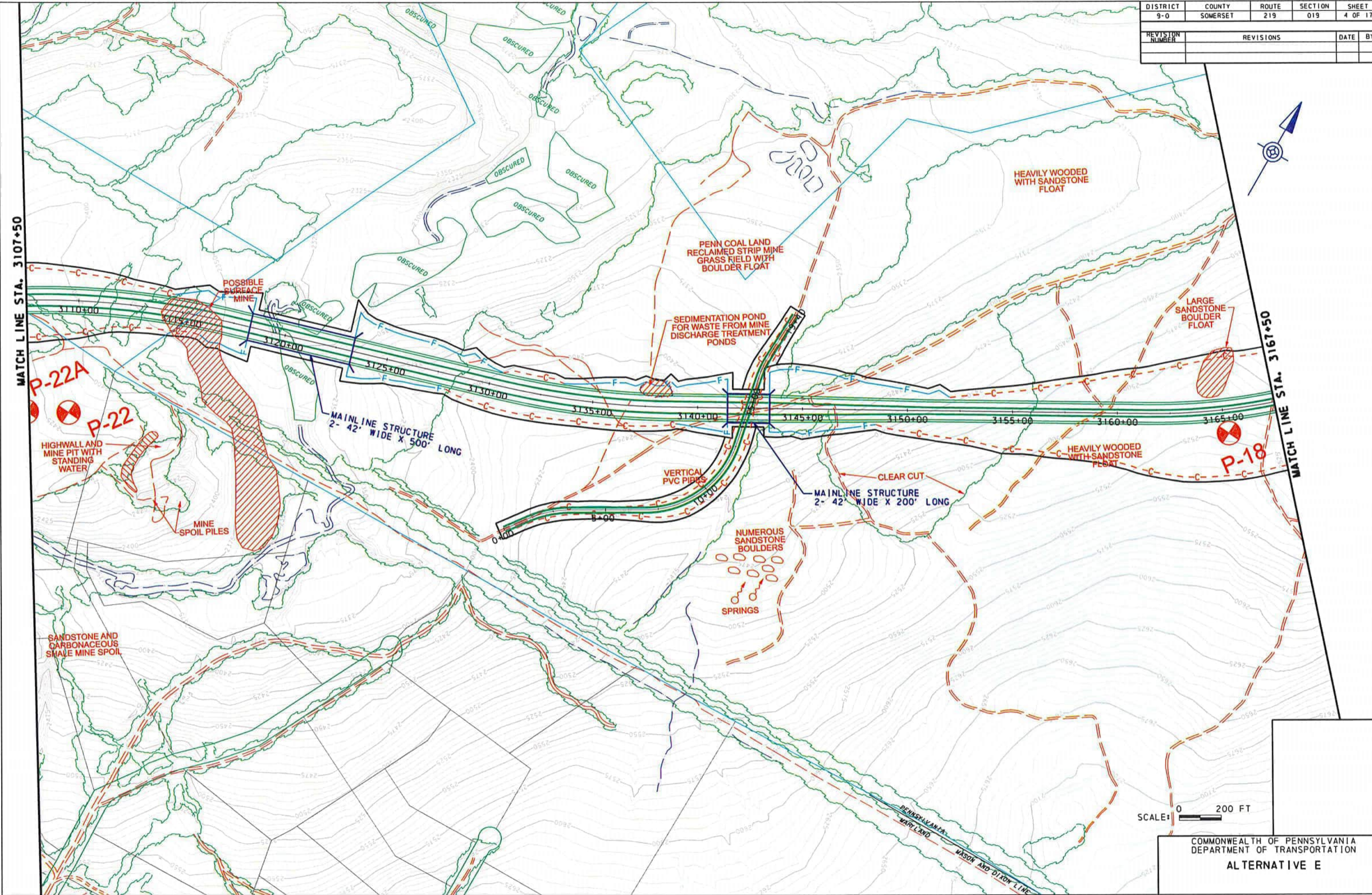
© 2005 Bat Conservation and Management, Inc.



**APPENDIX B**  
**Design Plans for Ecologically**  
**Best Balanced Alternative**



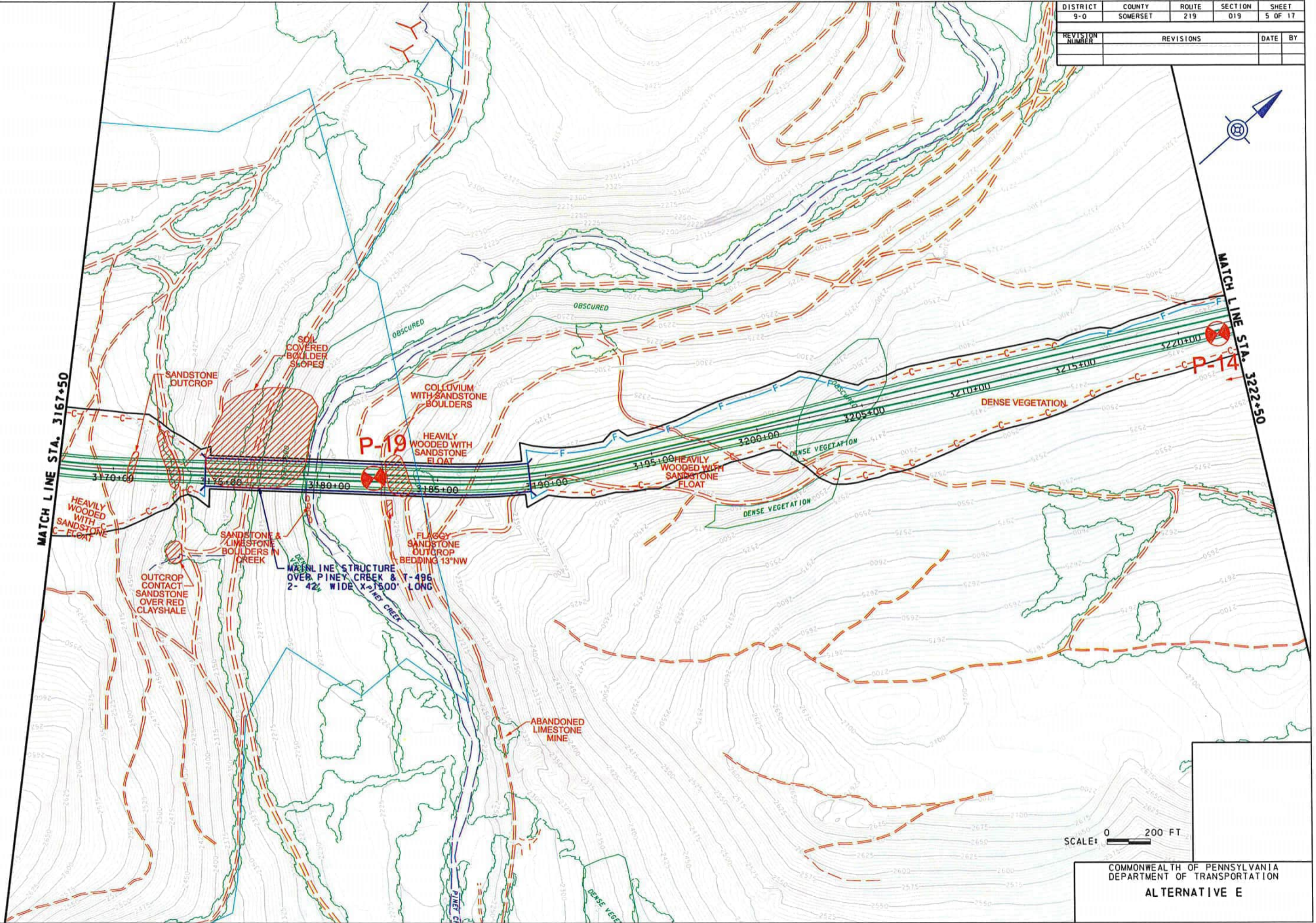
DISTRICT	COUNTY	ROUTE	SECTION	SHEET	
9-0	SOMERSET	219	019	4 OF 17	
REVISION NUMBER	REVISIONS			DATE	BY



COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF TRANSPORTATION  
ALTERNATIVE E



DISTRICT	COUNTY	ROUTE	SECTION	SHEET
9-0	SOMERSET	219	019	5 OF 17
REVISION NUMBER	REVISIONS		DATE	BY



SCALE: 0 200 FT

COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF TRANSPORTATION  
ALTERNATIVE E



**APPENDIX C**  
**Abandoned Mine**  
**Investigations**



---

Somerset County, Pennsylvania • Garrett County, Maryland

# **Abandoned Mine Investigations for the U.S. 6219, Section 019 Highway Improvement Project**



August 27 - October 1, 2005  
Bat Conservation and Management, Inc.  
*Carlisle, Pennsylvania*

---







# Abandoned Mine Investigations for the U.S. 6219, Section 019 Highway Improvement Project

August 27 - October 1, 2005

Prepared for:  
Pennsylvania Department of Transportation  
Maryland State Highway Administration  
Federal Highway Administration

Prepared by:  
Bat Conservation and Management, Inc.  
220 Old Stone House Road, Carlisle, Pennsylvania 17013  
717-241-2228 (office and fax) 814-442-4246 (cell)  
[www.batmanagement.com](http://www.batmanagement.com)

## Participating Personnel

### Project Principal:

John Chengler  
*Bat Conservation and Management, Inc.*

### Surveyors:

John Chengler  
*Bat Conservation and Management, Inc.*

Kevin Rhome  
*Bat Conservation and Management, Inc.*

### Photography by:

John Chengler

### Report Prepared by:

John Chengler







# Abandoned Mine Investigations for the U.S. 6219, Section 019 Highway Improvement Project

## Contents

---

I	Participants
IV	General Sampling Location
1	Overview
6	Assessment and Sampling Procedure
7	Site Summary
12	Discussion
14	Brief Natural History of Local Species
20	Appendix I: PGC Abandoned Mine Protocol
22	Appendix II: Trapping Data Sheets

## Tables

6	Table 1: Abandoned Mine Feature Coordinates
12	Table 2: Capture Totals
13	Table 3: Capture and Acoustic File Totals

## Figures

IV	Figure 1: General Sampling Locations
2	Figure 2: Overview of U.S. Route 219 Alternatives
3	Figure 3: Mine Feature Map, Southern Portion
4	Figure 4: Mine Feature Map, Northern Portion
4	Figure 5: Mine Feature Map, Central Portion
7	Figure 6: Mine 1
8	Figure 7: Mine 4
8	Figure 8: Mine 9
10	Figure 9: Mine 20, 21
10	Figure 10: Mine 26
14	Figure 11: Big brown bat
14	Figure 12: Eastern pipistrelle bat
15	Figure 13: Red bat
15	Figure 14: Hoary bat
16	Figure 15: Indiana bat
16	Figure 16: Indiana bat
17	Figure 17: Little brown bat
17	Figure 18: Northern long-eared bat
18	Figure 19: Silver-haired bat
19	Figure 20: Eastern small-footed bat

*Cover:  
Mine #1 during assessment survey*



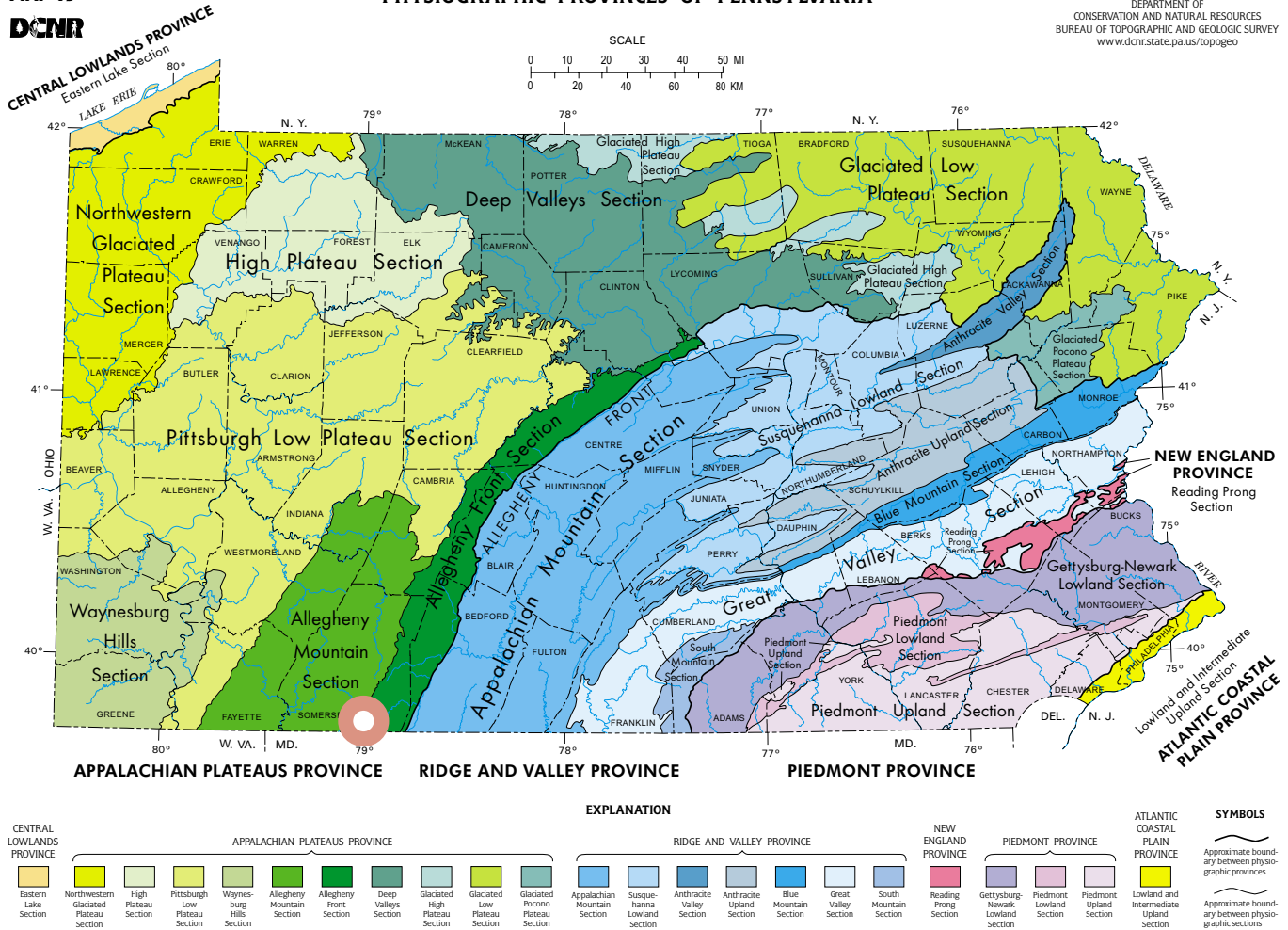
# General Sampling Locations

MAP 13

**DCNR**

## PHYSIOGRAPHIC PROVINCES OF PENNSYLVANIA

COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF  
CONSERVATION AND NATURAL RESOURCES  
BUREAU OF TOPOGRAPHIC AND GEOLOGIC SURVEY  
www.dcnr.state.pa.us/topogeo



Compiled by W. D. Sevon. Fourth Edition, 2000.

## Route 6219 Improvement Project, Somerset County Pennsylvania

Figure 1



# Overview

The Route 6219 Improvement Project is located in Garrett County, Maryland and Somerset County, Pennsylvania. The project consists of the construction of approximately 9 miles of four-lane limited access highway south from Meyersdale, Pennsylvania bypassing the borough of Salisbury to the east before linking with I-68 south of the Pennsylvania state line (Figures 1 and 2). The project is located within the known range of the endangered Indiana bat (*Myotis sodalis*). The United States Fish and Wildlife Service (USFWS) State College Office requested surveys for potential Indiana bat hibernacula near the project area. Additional time sensitive surveys would be necessary to determine bat use should potential habitat occur.

The federally endangered Indiana bat forms summer nursery colonies in woodland habitat. Only one summer nursery colony (Blair County) and two summer bachelor colonies (Bedford County) are known in Pennsylvania. In September and October this species migrates and winters in caves and abandoned mines that provide an appropriate environment for efficient hibernation. Indiana bats spend only a fraction of their life cycle in and around cave/mine entrances. During spring and fall they may make use of entrances in a variety of ways including swarming and mating, entering or exiting hibernation, staging, or as stopovers during migration. In Pennsylvania, the animal is known to occur in very low numbers at hibernacula identified in

Armstrong, Beaver, Bedford, Blair, Butler, Centre, Fayette, Huntingdon, Luzerne, Mifflin, and Somerset counties. This survey began as abandoned deep mines were identified within the project area using Pennsylvania Geological Survey atlases depicting mine adits. Two additional adits were reported to Bat Conservation and Management, Inc. (BCM) by local landowners. In total, 28 abandoned adits were located within the study area (Table 1).

Each of these sites was field verified and then evaluated to determine the suitability of the site for use by Indiana bats. The protocols used for this evaluation were developed collectively by the USFWS State College Office, and the Pennsylvania Game Commission (PGC). As these features were field identified, characteristics such as entrance configuration, airflow, and entrance formation were the main factors used to determine bat suitability.

All sites that were determined to be potential bat habitat were sampled for bat activity in the fall of 2005. No state or federally threatened or endangered species were sampled at any sites. The Northern long eared bat (*Myotis septentrionalis*) represented 27% of the all bats captured and is listed in Pennsylvania as a species of special concern.



# U.S. Route 219 Improvement Project Alternatives Retained for Detailed Study with Deep Mines

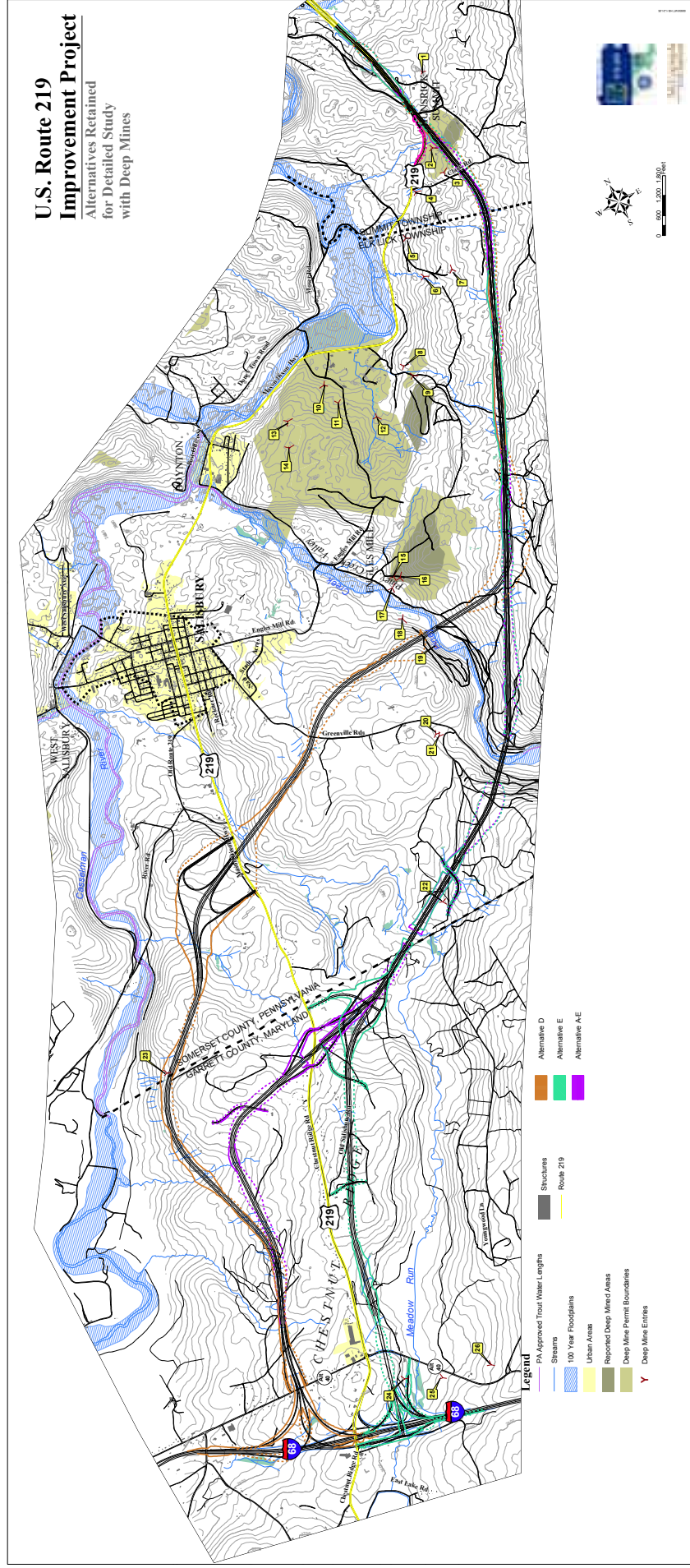


Figure 2. Overview of the U.S. Route 6219 improvement project alternatives.



# Mine Feature Summary

Ten sites were searched for, but no evidence of the historic entrance was found. Most often this involved areas where subtle indications of mining activity abound but no distinctive portal was obvious. Some have been filled in by the landowner, or are now part of an active strip mine. Others may have been minor workings initially and have since been consumed by the forest.

Nine sites were found to have collapsed entrances. These have no entrance of any size, but enough mining evidence remains nearby that surveyors were confident in their assumptions on what was the historic drift entrance. Natural slumping has been a main closure culprit, but more recently landowners may be backfilling open holes on their property for development or safety concerns.

Thin coal layers exist throughout the project area. Gentle local geology has made these layers readily available to modern quarry techniques without need of expensive, less efficient deep mining operations. At the time of operation, mineral companies were not necessarily required to seal portal entrances after the workings were abandoned. It is now common for enterprising mineral companies to revisit historic deep mine workings, removing all traces of these works as well as several less valuable underlying coal layers. These modern surface mine operations are then reclaimed and replanted.

Five sites were discovered to have been obliterated by this type of operation. These sites are now located in presently reclaimed land, offering no structure whatsoever for overwintering bats.

Three sites (Mine 1, 27, and 28) appeared to exhibit relatively stable entrances, although some are likely only a fraction of the original dimensions.

One partially collapsed site was found, Mine 19. This entrance is found at the top of an earthen mound near the ceiling of the historic portal. As soil slumps or is dumped over the drift entrance, only a thin layer covers the entrance at roof level unless a more engineered approach is taken to close the entrance. Small entrances may be excavated and used by raccoons, ground hogs, porcupines, fox, and other wildlife. This entrance is likely to remain the same in the foreseeable future, though it may be only a fraction of the original dimensions. All species of Pennsylvania cave dwelling bats prefer the largest openings possible, allowing for maneuvering and predator evasion. Entrance passages that remain tiny over a long length are also much less attractive to bats than sites with very short, simple entrance constrictions.

In all, 4 sites (Mine 1, 19, 27, and 28) were determined to possess some combination of characteristics to warrant further investigation for bat use.



*Figure 3.  
Mine feature map,  
southern portion.*



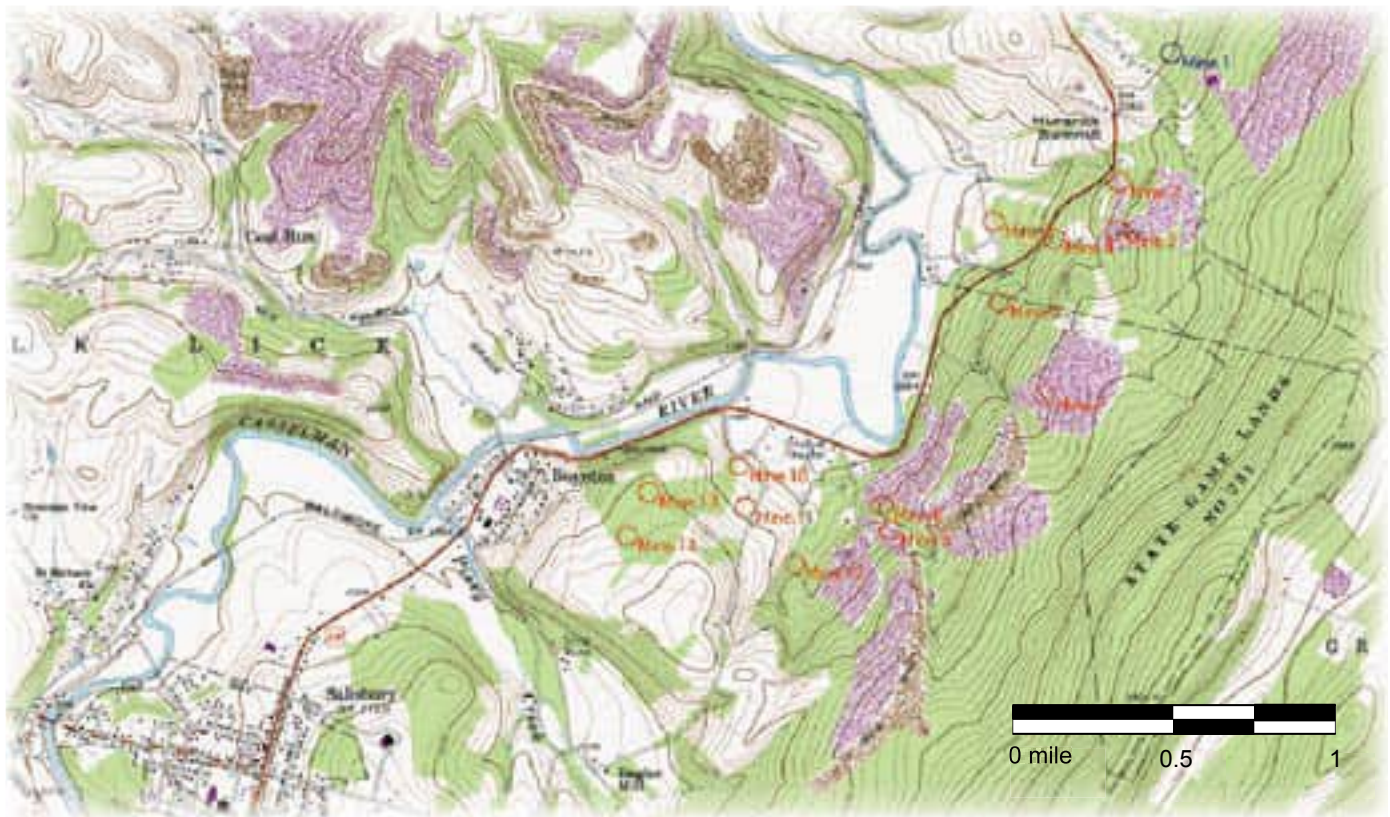


Figure 4. Mine feature map, northern portion.



Figure 5. Mine feature map, central portion.



# Assessment and Sampling Procedure

Twenty-eight sites were visited and assessed (Figures 3, 4, and 5). No site entrances were found in original working condition. Only four sites (1, 19, 27, and 28) might be humanly traversed for any distance without significant entrance modification. Hard rocks mines can sometimes be safely entered, but entering coalmines typically represents an unacceptable safety risk. Therefore, a survey method that does not require entering the mine is employed. Autumn is a time when mine entrances are most likely to be used by bats. Four sites were determined to be extensive enough to require sampling. A minimum of two nights of sampling effort is typical of the level of effort used to sample mine portals. In addition, the U.S. Fish and Wildlife Service (USFWS) Field Office in Pennsylvania and the Pennsylvania Game Commission (PGC) expect that an acoustic monitoring device be used for at least one hour between 10 PM and midnight during trapping.

## Harp Trapping

Harp trapping involves placing frames threaded with two vertical layers of monofilament line in or near the entrance of a hibernacula. Bats attempting to pass through the trap are captured either by colliding with the exterior of the lines or by entering the space between the layers. Once captured, they flutter down into a catch bag where they are held until removed for identification. This method of sampling is much less stressful to and safer for the animals than being tangled during mist net sampling. Two trap sizes were used during this project, a 3.5'x3' version and larger 6'x7' trap both manufactured by BCM.

Sampling typically begins 30 minutes before dusk and continues at least 5 hours. The site night is considered complete if the weather is not unseasonably cold (the temperature remains above 50°F for the first two hours of sampling) and there is no significant precipitation. Fall weather can be variable with nights that cool significantly. This is normal for the season and bats are attuned to the season. Bats often remain active for a period under these conditions in the fall at attractants such as mine entrances. Systems of cold and wet weather sometimes last for several days, and sampling can be rendered ineffective. BCM sampled when the weather was appropriate and did not encounter unusual weather during this survey.

Data collected at each site included trap and detector placement, weather, and general habitat information. Data collected on bats included species, sex, weight, forearm length, and net capture information. Age classification was determined when possible by the degree of ossification of the epiphyseal plates in the finger bones. Neither the USFWS nor the PGC requested banding of any captured bats. Photographs of each site were archived.

## Acoustic Sampling

BCM incorporated a modern acoustic “bat detector” to compliment the traditional harp trap capture techniques during this project. Bat detectors provide information that often allows species identification to be made. At the minimum these devices gauge the level of activity at a site regardless of species. Bat detectors are typically employed as a supplement to other sampling efforts or when safety situations are faced. If the entrance is so unstable or unsafe as to prevent trapping, a bat detector may be used without other sampling methods. Pettersson 240x bat detectors were set up on each night of the project to passively record high-frequency echolocation calls of free flying bats, which later were reviewed and sorted to species when possible.

A bat detector microphone is sensitive to sound beyond the range of human hearing. The circuitry within the detector converts the input into signals audible to the human ear and broadcasts it over a small speaker. Like birds, reptiles, and amphibians, humans hear best at frequencies below five kilohertz (kHz); most of our conversations are conducted below three kHz. A bat detector permits the recording of sounds in the 10 kHz to 200 kHz range, including those of other mammals and many insects. One D240x ultrasonic detector (Pettersson Elektronik® AB, Sweden) was used to record bat calls near each sample site. The D240x device uses a time expansion method to analyze ultrasound. The time expansion method is similar to making a tape recording of a sound and then playing it back at a lower speed, however digital techniques are used to store the signal instead of a high-speed tape recorder. Even though this is not a real-time conversion method, it offers a number of important advantages. Since the signal is stretched out in time, it is possible to hear details of the sound not audible with other methods (e.g., a technician can actually hear frequency differences within one short pulse or between different pulses). Time expansion is also the only technique that preserves all amplitude and harmonic characteristics of the original signal, making time expanded signals ideal for sound analysis in the laboratory.

The D240x devices were set to record 1.7-second call sequences that contained up to 10 bat calls in a sequence. Upon detecting ultrasound, the D240x device was set to stop recording and immediately play back the captured sound 10x slower than real time, which takes just under 20 seconds. The detector's sound output was recorded into a portable digital recorder, an iRiver model iFP-795, and later downloaded to computers running SonoBat bat call analysis software (SonoBat®, Arcata, California). A bat lingering near the detector may generate more than one call sequence file depending on speed, proximity, direction,



and amplitude. While file totals do not necessarily represent individual numbers of bats, the file totals can give a rough comparison of bat activity between sites in this project.

Atmospheric absorption reduces the operational range of echolocation in air and appears to limit its effectiveness to a maximum of about 15.2-meters (50 feet). Only the few bat species that emit very low frequency echolocation calls are able to reach even this distance. Laboratory studies with big brown bats (covering frequencies of 60-30 kHz) have shown that these animals are quite “near-sighted,” first detecting a 2.0-centimeter (0.75 inch) sphere at approximately 4.9-meters (16 feet). As a result, bat detectors only record bat calls that are close to the sampling station. Nevertheless it is generally assumed that bat detectors will detect some bat species that would not be captured in even the most elaborate mist net set.

A single detector/recording unit was located near the extreme edges of each harp trap site each night, for a total of six detector-nights. Each detector set-up was stationary

and automated to collect passive recordings for the entire duration of the trapping effort at each site.

Files that were generated by the acoustic system were manually identified and sorted for preliminary species identification based on known call characteristics. The unknown calls were individually compared with a library of known reference samples. These reference samples were recorded throughout the summer and fall of 2004 and 2005 with the identical equipment used for the monitoring survey. This reference library contains multiple recordings of all bat species commonly found in the northeastern United States, including rare and endangered species. The library is supplemented by additional reference calls of hoary bats and eastern red bats from Dr. Joseph M. Szewczak, Humboldt State University, Arcata CA. Call analysis, especially of calls recorded in a passive manner, is not an exact science due to the animals’ abilities to vary their echolocation calls and the subjective nature of identification, and not all call sequences recorded can be unequivocally identified to species.

**Table 1: Mine Feature Coordinates**

Mine	Longitude	Latitude
1	79d 1m 42.46s	39d 47m 7.74s
2	79d 1m 53.53s	39d 46m 46.43s
3	79d 1m 54.08s	39d 46m 38.43s
4	79d 2m 7.14s	39d 46m 37.35s
5	79d 2m 18.90s	39d 46m 26.71s
6	79d 2m 20s	39d 46m 40s
7	79d 2m 9.13s	39d 46m 11.82s
8	79d 2m 43.40s	39d 45m 53.63s
9	79d 2m 41.91s	39d 45m 49.68s
10	79d 3m 13.94s	39d 45m 59.95s
11	79d 3m 12.36s	39d 45m 53.42s
12	79d 3m 2.12s	39d 45m 44.20s
13	79d 3m 32.91s	39d 45m 55.81s
14	79d 3m 37.34s	39d 45m 48.61s

Mine	Longitude	Latitude
15	79d 3m 25.74s	39d 45m 0.11s
16	79d 3m 23.70s	39d 44m 58.94s
17	79d 3m 28.40s	39d 44m 57.37s
18	79d 3m 30.37s	39d 44m 47.95s
19	79d 3m 24.71s	39d 44m 36.12s
20	79d 3m 40.54s	39d 44m 13.08s
21	79d 3m 39.80s	39d 44m 12.05s
22	79d 4m 9.29s	39d 43m 28.41s
23	79d 6m 14.08s	39d 43m 22.81s
24	79d 5m 50.16s	39d 41m 29.39s
25	79d 5m 37.11s	39d 41m 24.24s
26	79d 5m 18.35s	39d 41m 20.77s
27	79d 3m 20.83	39d 44m 44.61s
28	79d 3m 19.55s	39d 44m 42.62s



# Site Summary

## Mine 1

A foot search was conducted for this site on August 28, 2005. An empty shell of a block building is located in the open forest 300' from the road. A small stream flows past this foundation. Following the water upstream leads to an obvious coal mine entrance 6' wide and 3' high. An old mine cart is in front of the mine, more than half buried in the sediment outflow from the drift. A strong draft of wind can be felt emerging from the drift and cold air can be felt over 100' away. A passage can be seen trending east at least 50'. Remnants of a rail line and mine-related foundations are nearby. Total time on site searching: 50 minutes. John Chenger, Kevin Rhome

The mine was surveyed on September 17 and 18, 2005 by John Chenger. A 6'x7' harp trap was placed parallel with the entrance dripline, and essentially filled the entrance area flyway. Temperatures under clear skies each night ranged between 68°F and 55°F. Twenty-seven (27) bats were captured including 14 little brown bats (*Myotis lucifugus*), 7 Northern long-eared (*Myotis septentrionalis*), and 6 Eastern pipistrelles (*Pipistrellus subflavus*).

A Pettersson 240x bat detector and an Iriver digital recorder were placed along the stream about 50' from the entrance pointing upwards. The detector was not placed at the entrance because the device would have been overwhelmed with multiple call sequences in each file. On September 17 the detector was active between 10 PM and midnight and recorded 45 call sequences. Files were sorted and 37 were attributed to Eastern pipistrelles and 8 attributed to Northern Long-ear bats. On September 18

the recorder was operating between 7:00 and midnight. Eighty-five (85) files were generated including 40 attributed to Eastern pipistrelles, 18 to Northern long-ear bats, and 17 little brown bats. Ten files are of some undetermined *Myotis* species. The detector was monitoring approximately 7 hours averaging about 18 call sequence per hour.

## Mine 2

A foot search was conducted for this site on August 28, 2005. The forest immediately behind a mobile home was searched. The homeowner was aware of previous mining activity but did not know of an actual entrance. There are a few old rails from tracks nearby. No entrance or other mining evidence was immediately apparent. Total time on site searching: 35 minutes. John Chenger, Kevin Rhome

## Mine 3

A foot search was conducted for this site on August 28, 2005. The area of the reported mine has been reclaimed and is presently a meadow containing immature trees. No entrance was apparent. Total time on site searching: 40 minutes. John Chenger, Kevin Rhome

## Mine 4

A foot search was conducted on August 28, 2005. An old outbuilding is visible from the road. Just southeast of this structure a 20' deep collapsed trench can be followed 300' southeast through thick hemlocks ending in a blind valley. There are timbers visible in the bottom of the trench, along with old rail remnants. No open portals were found in this area. Time on site searching: 70 minutes. John Chenger, Kevin Rhome

## Mine 5

A foot search was conducted for this site on October 1, 2005. A fragment of an old rail line and a concrete structure are found at this location. No entrance was apparent. Total time on site searching: 30 minutes. Kevin Rhome

## Mine 6

A foot search was conducted for this site on August 28, 2005. The reported mine location is in a small woodlot between a mobile home and a public road. The homeowner was unaware of previous mining activity. No entrance or mining evidence was immediately apparent. Total time on site searching: 40 minutes. John Chenger, Kevin Rhome



Figure 6. Mine 1 during harp trap sampling



### Mine 7

A search was conducted on October 1, 2005. This land has been strip mined and reclaimed. Presently the land where an entrance was is now a meadow. No open portals were found in this area. Time on site searching: 30 minutes. Kevin Rhome

### Mine 8

A search was conducted on October 1, 2005. Upon entering the forest, spoil piles are evident. Moving past the piles northeast, the land has been strip mined and reclaimed. No open portals were found in this area. Time on site searching: 30 minutes. Kevin Rhome

### Mine 9

A search was conducted on October 1, 2005. On the south side of the road is a collapsed trench/adit containing timber remnants. An old fan house is located in the trench and another related outbuilding foundation is immediately to the west. A small stream emerges from the workings and covers much of the bottom of the trench. A very small 2' wide, 1' high hole can be found under a tree at the east end of the trench. This leads to a very small chamber which was formed by slump action caused by the stream action and does not lead into any workings. No airflow was observed. No open portals were found in this area. Time on site searching: 100 minutes. John Chenger, Kevin Rhome



*Figure 7. Mine 4 site investigation*

### Mine 10

A foot search was conducted on August 28, 2005. A steeply sided, forested blind valley is located at the reported mine location. No open portals were found in this area, although the odd topography suggest past mine use. Time on site searching: 30 minutes. John Chenger, Kevin Rhome

### Mine 11

A search was conducted on October 1, 2005. This location is within an open deciduous forest with relatively high visibility. No open portals were found in this area. Time on site searching: 30 minutes. John Chenger, Kevin Rhome

### Mine 12

A search was conducted on October 1, 2005. The area is located in open deciduous forest. No open portals were found in this area. Time on site searching: 40 minutes. Kevin Rhome

### Mine 13

A search was conducted on October 1, 2005. This location is in open deciduous forest with relatively high visibility. A cornfield is nearby. The mine location was at an intersection of two old roads where an old clearing has become overgrown with brush. No open portals were found in this area. Time on site searching: 60 minutes. John Chenger



*Figure 8. Mine 9 site investigation*



### **Mine 14**

A search was conducted on October 1, 2005. This location is in open deciduous forest with relatively high visibility. Several cornfields are nearby. The mine location was in open woods with low slope. A number of trees were blown down. No open portals were found in this area. Time on site searching: 60 minutes. John Chenger

### **Mine 15**

A foot search was conducted on August 28, 2005. This is one reported entrance in a small group of three. A large, obvious spoil pile is immediately encountered east of Piney Run Road within deciduous forest. From the top of the spoil pile, there are a number of adit traces and sinks located within 500 feet to the southeast. There is another parallel level of similar old development traces approximately 75 feet higher in elevation. A few hundred feet northeast of Mine 15 there is small brick foundation next to what appears to have been one of the better entrances but now is merely an old collapsed trench. Just beyond this to the north, the forest gives way to pasture which appears to be a reclaimed strip mine which is not depicted on the USGS Meyersdale/Avilton 7.5 minute topographic map. No open portals were found in this area. Time on site searching: 90 minutes. John Chenger, Kevin Rhome

### **Mine 16**

A foot search was conducted on August 28, 2005. This is one reported entrance in a small group of three. A large, obvious spoil pile is immediately encountered east of Piney Run Road within deciduous forest. From the top of the spoil pile, there are a number of adit traces and sinks located within 500 feet to the southeast. There is another parallel level of similar old development traces approximately 75 feet higher in elevation. A few hundred feet northeast of Mine 15 there is small foundation next to what appears to be an old collapsed trench. Just beyond this the forest gives way to pasture that appears to be a reclaimed strip mine not depicted on the USGS Meyersdale/Avilton 7.5 minute topographic map. No open portals were found in this area. Time on site searching: 90 minutes. John Chenger, Kevin Rhome

### **Mine 17**

A foot search was conducted on August 28, 2005. This is one reported entrance in a small group of three. A large, obvious spoil pile is immediately encountered east of Piney Run Road within deciduous forest. From the top of the spoil pile, there are a number of adit traces and sinks located within 500 feet to the southeast. There is another parallel level of similar old development traces approximately 75

feet higher in elevation. A few hundred feet northeast of Mine 15 there is small foundation next to what appears to be an old collapsed trench. Just beyond this the forest gives way to pasture that appears to be a reclaimed strip mine not depicted on the USGS Meyersdale/Avilton 7.5 minute topographic map. No open portals were found in this area. Time on site searching: 90 minutes. John Chenger, Kevin Rhome

### **Mine 18**

A foot search was conducted on August 28, 2005. This entrance was reportedly located on the west bank of Piney Creek, directly behind several private residences. Homeowners indicated no knowledge of a mine in that location, but instead reported on Mine 19, 27, and 28. The area was searched regardless of the landowner reports and no open portals were found in this area. No evidence of previous mining activity was immediately apparent. Time on site searching: 20 minutes. Kevin Rhome

### **Mine 19**

A foot search was conducted on September 30, 2005. This entrance is located 75' above the west bank of Piney Creek. Locals also refer to the mine entrance as "panther hole." The drift is on a very steep hillside without old road traces. The entrance is largely collapsed and only a 3' high, 4' wide crawlway remains. The crawl slopes down over rubble and the passage cannot be estimated beyond. No airflow was apparent. No other evidence of previous mining activity was visible. Time on site searching: 120 minutes. John Chenger, Kevin Rhome

The mine was surveyed on September 30 and October 1, 2005 by John Chenger and Kevin Rhome. A 6'x7' harp trap was placed parallel with the entrance dripline, and essentially filled the entrance area flyway. Temperatures under clear skies each night ranged between 62°F and 42°F. Four bats were captured including 2 little brown bats, and 2 Eastern pipistrelles.

A Pettersson 240x bat detector and an Iriver digital recorder were placed at the entrance pointing upwards. The detector was placed 20' from the entrance, pointing at the entrance. On September 30 the detector was active between 8 PM and midnight and recorded 3 call sequences attributed to Eastern pipistrelles. On October 1 the recorder was operating between 8:00 and midnight. Three files were generated attributed to the big brown bat (*Eptesicus fuscus*). The detector was monitoring approximately 8 hours and averaged less than 1 call sequence per hour.



### Mine 20

A foot search was conducted on August 27, 2005. This is one of two entrances reported in relatively open deciduous forest. Coal spoil piles are located north of a gravel road. There is mining evidence in this entire woodlot consisting of at least 7 traces of trenches and 2 entrance drifts that now end in blind valleys. No open portals were found in this area. Time on site searching: 60 minutes. *John Cheng*

### Mine 21

A foot search was conducted on August 27, 2005. This is one of two entrances reported in relatively open deciduous forest. Coal spoil piles are located north of a gravel road. There is mining evidence in this entire woodlot consisting of at least 7 traces of trenches and 2 entrance drifts that now end in blind valleys. No open portals were found in this area. Time on site searching: 60 minutes. *John Cheng*

### Mine 22

A search was conducted on October 1, 2005. This land has been strip mined and reclaimed. Presently the land where an entrance was is now a meadow. No open portals were found in this area. Time on site searching: 45 minutes. *John Cheng*

### Mine 23

A search was conducted on October 2, 2005. This site is located within a few hundred feet of a utility right-of-way. Mining traces include a built up earthen work area leading into a small blind valley. A smaller collapse feature is just inside the treeline on the north side of the right-of-way, downhill of the larger working. No open portals were found in this area. Time on site searching: 90 minutes. *John Cheng, Kevin Rhome*



Figure 9. Old road leading into a blind valley near Mine 20 and 21.

### Mine 24

A foot search was conducted for this site on August 28, 2005. The topography has been significantly altered by the construction of an I-68 exit ramp at the location of the reported entrance. No entrance or mining evidence was immediately apparent. Total time on site searching: 35 minutes. *Kevin Rhome*

### Mine 25

A foot search was conducted on August 28, 2005. A patch of forest adjacent to a recycling center and US 40 Alternate was searched. From the recycling center, a few small depressions are located near US 40 Alternate in the brush. The slope and forest cover increases to the northeast and no other features are notable. Total time on site searching: 35 minutes. *John Cheng*

### Mine 26

A foot search was conducted on August 28, 2005. The area is located in a gently sloping, open deciduous forest littered with small fragments of sandstone. Small, shallow depressions are located 600 feet due west of the reported mine location within sight of a garage. Additional depressions are just northeast of the garage. All depressions are only traces of previous development. No portal was found. Total time on site searching: 90 minutes. *John Cheng, Kevin Rhome*

### Mine 27

A foot search was conducted on August 27, 2005. This entrance is located on the east bank of Piney Creek, approximately 15 feet above the stream. The entrance is 12' wide and 5' high. The passage can be seen to extend at least 40' trending northeast. Time on site searching: 60 minutes. *John Cheng*



Figure 10. Depression in the vicinity of the Mine 26 location.



The mine was surveyed on September 30 and October 1, 2005 by John Chenger and Kevin Rhome. A 6'x7' harp trap was placed parallel with the entrance dripline, and essentially filled the entrance area flyway. Temperatures under clear skies each night ranged between 62°F and 42°F. Two Eastern pipistrelles were captured.

A Pettersson 240x bat detector and an Iriver digital recorder were placed on a ledge overlooking the entrance. On September 30 the detector was active between 8:15 PM and 11:30 PM and recorded 2 call sequences attributed to Northern long-eared bats. On October 1 the recorder was operating between 9:30 PM and 11:30 PM. No files were generated containing bat calls on this night. The detector was monitoring approximately 5 hours and averaged less than 1 call sequence per hour.

### **Mine 28**

A foot search was conducted on August 27, 2005. This entrance is located 75' from the east bank of Piney Creek, approximately 20 feet above the stream. The entrance is

8' wide and 3' high. The passage can be seen to extend at least 40' trending northeast. Cold air can be felt emerging from the entrance. Several bat droppings were found on a large rock under the dripline. Access to the portal was improved by using earth to form a raised platform in front of the entrance. Another entrance may have existed 100' south where a seep emerges from a slump in the hillside. Time on site searching: 60 minutes. *John Chenger*

The mine was surveyed on September 30 and October 1, 2005 by John Chenger and Kevin Rhome. A 3'x4' harp trap was placed perpendicular with the entrance dripline. The mine entrance was then covered with plastic. Temperatures under clear skies each night ranged between 62°F and 42°F. Two Eastern pipistrelles were captured.

A Pettersson 240x bat detector and an Iriver digital recorder were placed on a ledge overlooking the entrance. On September 30 the detector was active between 8:15 PM and 11:30 PM and recorded 2 call sequences attributed to Northern long-eared bats. On October 1 the recorder was operating between 9:15 PM and 11:30 PM. No files were generated containing bat calls on this night. The detector was monitoring approximately 5 hours and averaged less than 1 call sequence per hour.



# Discussion

Data collected by Bat Conservation and Management, Inc. included mine portal assessment, harp trapping, and acoustic monitoring. This data suggests that none of these portals presently provides habitat suitable for large numbers of bats of any species.

Four potential hibernacula (Mines 1, 19, 27 and 28) were sampled for bat use under the PGC Abandoned Mine Assessment Protocol (Appendix I) in fall of 2005. Thirty-three (33) bats were captured including 16 little brown bats, 10 Eastern pipistrelles, and 7 Northern long-eared bats. Acoustic detectors deployed at each site also identified big brown bats (*Eptesicus fuscus*) at Mine 19 (Table 3).

Harp trapping provided no evidence that the four portals (Mines 1, 19, 27 and 28) receive usage by species listed as threatened or endangered. If present, threatened and endangered species such as the Indiana bat and Eastern small-footed bat (*Myotis leibii*) occur in such low numbers or infrequently that the USFWS sampling protocol failed to reveal them during the sample period.

Almost 27% of the individuals captured were Northern long-eared bats, which are listed as a Pennsylvania species of special concern by the Pennsylvania Biological Survey (PABS). This classification covers taxa that could be appropriate candidates for Endangered or Threatened classifications (based on information received by the PABS), but for which no conclusive data on biological vulnerability and threats to their survival exist to support

those listings. This category also includes species for which current data indicates that the species is uncommon but secure in Pennsylvania. This category realizes the potential threats to species' populations or habitats and/or includes the need for further research and field study to change or ascertain the status of taxa. Identified candidate species are placed in one of three categories to reflect their general biological status. The Northern long-ear is presently listed as a candidate rare species. This category includes species existing only in one or a few restricted geographical areas or habitats within Pennsylvania, or occurring in low numbers over a relatively broad area of the Commonwealth. More recent data from across the state suggests that the species is more abundant and widespread than previously thought. Presently some biologists are considering proposing to remove the Northern long-ear from this category (Calvin Butchkoski, personal communication). This category has no legislative authority.

Bats must constantly seek alternative sites for hibernation to remain viable in the long term. Certain abandoned mines provide the ideal stable temperature and humidity requirements required by six species of Pennsylvania's bats, including the federally endangered Indiana bat. A hibernacula site such as Mine 1 that does exhibit a degree of bat activity today may become more heavily used in the future assuming the internal environment be ideal. Therefore should development encroach upon this site some years in the future it could be re-evaluated for bat use and managed if necessary.

**Table 2: Capture Totals**

Species		Mine 1	Mine 19	Mine 27	Mine 28	Totals		
						M	F	Total
<i>Myotis lucifugus</i>	M	12	2	0	0	14		16
	F	2	0	0	0		2	
<i>Myotis septentrionalis</i>	M	4	0	0	0	4		7
	F	3	0	0	0		3	
<i>Pipistrellus subflavus</i>	M	4	2	2	0	8		10
	F	2	0	0	0		2	
Totals		27	4	2	0	26	7	33
		33				33		33



### Table 3: Capture and Acoustic File Totals

Species	Mine 1		Mine 19		Mine 27		Mine 28	
	Net	Acoustic	Net	Acoustic	Net	Acoustic	Net	Acoustic
<i>Eptesicus fuscus</i>	0	0	0	3	0	0	0	0
<i>Myotis (unclassified)</i>	0	11	0	0	0	0	0	0
<i>Myotis lucifugus</i>	14	21	2	0	0	0	0	0
<i>Myotis septentrionalis</i>	7	21	0	0	0	2	0	2
<i>Pipistrellus subflavus</i>	6	71	2	3	2	0	0	0
<b>Total:</b>	<b>27</b>	<b>124</b>	<b>4</b>	<b>6</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>2</b>

*Acoustic file counts do not represent individual numbers of bats.*



# Brief Natural History of Local Bat Species

## Big Brown Bat

*Eptesicus fuscus*

No federal listing

Weight: 14 - 21 grams (0.5 - 0.7 ounce)

Wingspan: 32 - 40 centimeters (13 - 16 inches)

Distribution: From southern Canada through southern North America into South America, including many islands in the Caribbean.

These bats are closely associated with humans and are familiar to more people in the United States than any other species of bat. Most summer roosts are in attics, barns, bridges, or other man-made structures, where colonies of a few to several hundred individuals gather to form maternity colonies. They move into caves, mines, and other underground structures to hibernate only during the coldest weather. Where most of these bats winter remains unknown. It emerges at dusk and flies a steady, nearly straight course at a height of 6 - 10 meters (20 - 33 feet) in route to foraging areas. Its large size and steady flight make it readily recognizable. Apparently, some individuals use the same feeding ground each night, for a bat can sometimes be seen following an identical feeding pattern on different nights. After feeding, the bat flies to a night roost to rest; favored night roosts include garages, breezeways, and porches of houses. These bats consume beetles, ants,

flies, mosquitoes, mayflies, stoneflies, and other insects. Mating occurs in autumn and winter, females store sperm, and fertilization takes place in spring. In the eastern United States, big brown bats usually bear twins in early June. In the western United States, usually only one baby is born each year. It is common throughout most of its range.



Figure 11: Big Brown Bat

## Eastern Pipistrelle Bat

*Pipistrellus subflavus*

Weight: 6 - 8 grams (0.2 - 0.3 ounce)

Wingspan: 21 - 26 centimeters (8 - 10 inches) Distribution: eastern Canada, most of the eastern United States, southward through eastern Mexico to Central America

Caves, mines, and rock crevices are used as hibernation sites in winter, and occasionally as night roosts in summer. These bats rarely occur in buildings, and apparently most roost in trees in summer. This species inhabits more caves in eastern North America than any other species of bats, usually hanging singly in warmer parts of the cave. An individual may occupy a precise spot in a cave on consecutive winters; it usually has several spots in which it hangs, shifting from one to another during the winter. This bat emerges from its daytime retreat early in the evening. It is a weak flier and so small that it may be mistaken for a large moth. Eastern pipistrelle bats usually are solitary, although occasionally in late summer four or five will appear about a single tree. The flight is erratic, and the foraging area is small. It often forages over waterways and forest edges and eats moths, beetles, mosquitoes, true bugs, ants, and other insects. Mating occurs in autumn, sperm

is stored during winter, and fertilization takes place in spring. These bats usually bear twins in late spring or early summer. Babies are born hairless and pink with eyes closed, and they are capable of making clicking sounds that may aid their mothers in locating them. They grow rapidly and can fly within a month. This species is common throughout its range.



Figure 12: Eastern Pipistrelle



## Eastern Red Bat

*Lasiurus borealis*

No federal listing

Weight: 9 - 15 grams (0.3 - 0.5 ounce)

Wingspan: 28 - 33 centimeters (11 - 13 inches),

Distribution: Southern Canada, the eastern United States (except the Florida Peninsula), and northeastern Mexico.

Eastern red bats spend daylight hours hanging in foliage of trees. They usually hang by one foot, giving them the appearance of dead leaves. Although these bats seldom enter caves for any distance, they often swarm about cave entrances in autumn. In colder parts of their range, they may migrate south in winter or hibernate in hollow trees or leaf litter. These bats are almost completely furred, except for the ears and parts of the wings, and they can respond to subfreezing temperatures by increasing their metabolism. Predators include several kinds of birds, especially blue jays. Eastern red bats emerge early in the evening and often fly on warm winter afternoons. They forage regularly over the same territory on successive nights. They commonly feed beneath street lights. Eastern red bats consume moths, crickets, flies, mosquitoes, true bugs, beetles, cicadas, and other insects. Eastern red bats mate in flight during August and September, sperm is stored over winter, and females give birth to one to four babies

(average is 3.2) during late spring or early summer. Pups are born hairless, with the eyes closed, and they cling to the fur of their mother with their teeth, thumbs, and feet. It is common throughout most of its range, except for the New England states where it seems to be more infrequent.



Figure 13: Eastern Red Bat

## Hoary Bat

*Lasiurus cinereus*

No federal listing

Weight: 25 - 30 grams (0.9 - 1.1 ounces)

Wingspan: 34 - 41 centimeters (13 - 16 inches)

Distribution: Southern Canada through most of South America, including Hawaii, Iceland, Bermuda, and the Dominican Republic.

Hoary bats are one of America's largest and most handsome bats. With their long, dense, white-tipped fur, they have a frosted, or hoary, appearance. They spend their summer days concealed in the foliage of trees where they choose a leafy site well covered above but open from underneath, generally 3-5 meters (10-17 feet) above the ground usually on the edge of a clearing. Hoary bats don't emerge to feed until after dark, but during migration, they may be seen soon after sundown. They sometimes make round trips of up to 24 miles on the first foraging flight of the night, then make several shorter trips, returning to the day roost about an hour before sunrise. Because they rarely enter houses and spend the daylight hours well concealed, humans rarely have an opportunity to see these bats. Northern populations make long seasonal migrations to and from warmer winter habitats. The sexes apparently are segregated throughout most of the summer range; males are uncommon in the eastern United States at this time. Hoary bats may fly during late afternoon on warm days in winter. Their swift and direct flight pattern and large size

make them readily identifiable on the wing in most parts of the range. Moths, true bugs, mosquitoes, and other insects may be captured as food. Hoary bats bear two pups in mid-May, June or early July. The young cling to the mother through the day, but are left clinging to a twig or leaf while she forages at night. Although widespread throughout North America, hoary bats are not often captured. The Hawaiian subspecies, *L. c. semotus* (Hawaiian hoary bat) is considered endangered.



Figure 14: Hoary Bat



# Indiana Bat

## *Myotis sodalis*

Federally endangered

Weight: 6 - 9 grams (0.2 - 0.3 ounce)

Wingspan: 24 - 28 centimeters ( 9 - 11 inches)

Distribution: Appalachian Mountains from northern New York to the cave region of Tennessee, Alabama, and Georgia.

Includes mid western states west of the Appalachians to Iowa, Missouri, and Arkansas.

The Indiana bat was one of the first bat species in the United States to be recognized as endangered by the U.S. Fish and Wildlife Service Endangered Species Act. This listing was largely due to declines recorded at winter hibernation sites in caves, which until very recently, were the only known roosts for this species. The Indiana bat's distribution includes cave regions and, during summer, areas relatively near cave regions in the eastern United States. Indiana bats usually hibernate in large dense clusters of up to several thousand individuals in sections of the hibernation cave or mine where temperatures average 3°- 6°C (38°- 43°F) and with relative humidities of 66-95%. They hibernate from October to April, depending on climactic conditions. Females depart hibernation sites before males and arrive at summer maternity roosts in mid-April and mid-May. Human disturbance and alteration of hibernation caves, loss of summer roosting and foraging habitat due to deforestation, and pesticide poisoning have all contributed to the decline of the Indiana myotis. Despite protection at overwintering sites, Indiana bat populations continue to decrease in several portions of their range, indicating disturbance or loss of summer habitat. Because these bats are roosting mainly under exfoliating bark, their summer roosts are short-lived. A continually emerging mosaic of multi-aged trees needs to become available from year to year which can serve as roost sites. Moreover, like many cavity or crevice dwelling bats, Indiana myotis switch roosts often throughout the summer maternity season. Maternity colonies appear to have at least one "primary roost" that is used by the majority of the colony. Over a dozen different "alternate roosts" may be used by portions of the colony intermittently. One reason for this roost switching may be due to differing thermoregulatory needs at different stages of the reproductive process for individuals or as a result of environmental deviations from normal climatic patterns. Bats may also switch roosts due to increased parasite loads or unstable food resources brought on by drought or unusually heavy rains.

One pup is born in June and is raised under loose tree bark, and more recently in certain buildings, usually near wooded stream side habitat. The summer roost of adult males often is near maternity roosts, but where most spend the day is unknown. Others remain near the hibernation site and a few males are found in caves during the summer.

Between early August and mid-September, Indiana bats arrive near their hibernation sites and engage in swarming and mating activity. Swarming at cave entrances continues unto mid or late October. During this time, fat reserves are built up for hibernation. When pregnant, females eat soft bodied insects; they eat moths when lactating, and moths, beetles, and hard-bodied insects after lactation. Foraging areas are typically within five miles of the summer roost. Males also eat a variety of insects. Life spans of nearly 14 years have been documented. The present total population of this species is fewer than 360,000 with more than 85% hibernating at only nine locations in Missouri, Indiana, and Kentucky making them extremely vulnerable to destruction.



Figure 15. Indiana Bat



Figure 16. Indiana Bat



## Little Brown Bat

*Myotis lucifugus*

No federal listing

Weight: 7 - 14 grams (0.3 - 0.5 ounce)

Wingspan: 22 - 27 centimeters (9 - 11 inches)

Distribution: Widely from central Alaska to central Mexico.

The little brown bat usually hibernates in caves and mines. During summer, it often inhabits buildings, usually 100° F attics, where females form nursery colonies of hundreds or even thousands of individuals. Where most males spend the summer is unknown, but they likely are solitary and scattered in a variety of roost types. Colonies usually are close to a lake or stream. This species seems to prefer to forage over water but also forages among trees in rather open areas. When foraging, it may repeat a set hunting pattern around houses or trees within a few miles of its roost. It eats insects, including gnats, crane flies, beetles, wasps, and moths. Insects usually are captured with a wing tip, immediately transferred into a scoop formed by the forwardly curled tail and interfemoral membrane, and then grasped with the teeth. Mating occurs in autumn but also may occur during the hibernation period. One baby is born in May, June, or early July. When the mother is at

rest during the day, she keeps the baby beneath a wing. Life span may be more than 20 years. This species is one of the most common bats throughout much of the northern United States and Canada but is scarce or only locally common in the southern part of its range. A subspecies found in the southwestern United States, *M. l. occultus* (Arizona bat), is considered to be of special concern.



Figure 17. Little Brown Bat

## Northern Long-eared Bat

*Myotis septentrionalis*

No federal listing

Weight: 6 - 9 grams (0.2 - 0.3 ounce)

Wingspan: 23 - 27 centimeters (9 - 11 inches)

Distribution: Includes southern Canada and the central and eastern United States southward to northern Florida.

Northern long-eared bats hibernate in parts of caves and mines that are relatively cool and moist, where the air is still. Hibernation may begin as early as August and may last for 8 - 9 months in northern latitudes. In summer, they roost by day in a variety of shelters, including buildings and under tree bark, shutters, bat houses, and bridges. At night they commonly use caves as night roosts. Recent trapping and internal surveys suggest they may use caves as stopover points during migration more so than actual hibernation. Northern long-eared bats seem much more solitary in their habits than other members of genus *Myotis*, and they generally are found singly or in small groups containing up to 100 individuals. Although they frequently hang in the open, they seem to prefer tight crevices and holes. Sometimes only the nose and ears are visible, but they can be distinguished from most other species of *Myotis* by their long ears. These bats forage mainly on forested hillsides and ridges rather than in stream side and floodplain forests. They consume a variety of small night-flying insects. Presumably most mating occurs in autumn

prior to hibernation. Apparently small nursery colonies are formed in June and July where pregnant females give birth to one baby. Mothers may be able to retrieve their young that fall from roost sites. Life span may be more than 18 years. This species is common over much of its range, but does not occur in large concentrations.



Figure 18. Northern Long-eared bat.



## Silver-haired Bat

*Lasionycteris noctivagans*

No federal listing

Weight: 8 - 11 grams (0.3 - 0.4 ounces)

Wingspan: 27 - 32 centimeters (11 - 13 inches)

Distribution: From southern Alaska and Canada through most of the United States and northern Mexico.

Silver-haired bats are among the most common bats in forested areas of America, most closely associated with coniferous or mixed coniferous and deciduous forest types, especially in areas of Old Growth. They form maternity colonies almost exclusively in tree cavities or small hollows. And like many forest-roosting bats, silver-haired bats will switch roosts throughout the maternity season. Because silver-haired bats are dependent upon roosts in Old



Growth areas, managing forests for diverse age structure and maintaining forested corridors are important to these bats. It is estimated that these bats require snag densities of at least 21 per hectare and often forest management practices have fallen far short of this figure. Unlike many bat species, silver-haired bats also appear to hibernate mainly in forested areas, though they may be making long migrations from their summer forest to a winter forest site. Typical hibernation roosts for this species include small tree hollows, beneath exfoliating bark, in wood piles, and in cliff faces. Occasionally silver-haired bats will hibernate in cave entrances, especially in northern regions of their range. Like big brown bats, the silver-haired bats have been documented to feed on many insects perceived as pest species to humans and/or agriculture and forestry. Even though they are highly dependent upon Old Growth forest areas for roosts, silver-haired bats feed predominantly in disturbed areas, sometimes at tree-top level, but often in small clearings and along roadways or water courses. Though their diets vary widely, these bats feed chiefly on small, soft-bodied insects. Silver-haired bats have been known to take flies, midges, leafhoppers, moths, mosquitoes, beetles, crane flies, lacewings, caddis flies, ants, crickets, and occasional spiders. Although once suggested to be the most abundant mammal in the northeast US, it is rarely captured in the summer.

*Figure 19: Silver-haired Bat*



# Eastern Small-footed Bat

## *Myotis leibii*

No federal listing; state listed threatened in NH, VT, NY, PA, MD

Weight: 3 - 5 grams (0.1 - 0.2 ounces)

Wingspan: 21 - 25 centimeters (8 - 10 inches)

Distribution: Appalachian Mountain range, including cave areas of western Kentucky, Missouri, and southeast Iowa.

Population trends of the small-footed *Myotis* remain largely unknown due to the secretive nature of this species during its winter hibernation. Although historically known from only a few sites, recent discoveries have substantially increased the number of sites at which it occurs. Populations of bats found at these sites remain very low and in many cases, only one or two bats are seen. It is because of the very low numbers of bats found during the hibernacula censuses and the many unknown factors concerning its biology that this species remains classified as threatened throughout most of its range.

The small-footed bat is the smallest bat in the Northeast. It's little more than 3½ inches long, including a 1½-inch tail. It is most often recognized by its short, black forearms (less than 1½ inches) and small feet (less than a half-inch). While its coloration is comparable to the more common little brown bat, a distinctive characteristic is the black facial mask that spreads from the base of each ear across its face.

Little is known about the biology and natural history of the small-footed *Myotis*. It appears to enter into hibernation later than other bat species and is generally found in low numbers. While other bats, such as the little brown bat, form large clusters, this small bat remains solitary or in crevices with fewer than a dozen others during the hibernating season. One young is produced a year, although one record for twins has been recorded. It is often found hibernating closer to the entrances of caves and mines than other bats and generally alone. This could be because they're often overlooked during census counts because of their use of small, tight crevices in the walls and ceilings and sometimes among the rocks on the hibernacula's floor.

There is little to no information on the summer feeding habits of the small-footed *Myotis*. Summer records of this species remain rare with only a few being captured in mist nets. It is thought that they may form small maternity roosts in crevices along rock outcrops, under boulders, quarries, and sometimes buildings.

As with other species of hibernating bats, control of winter disturbances is seen as a big factor influencing the small-footed bat's survival. As virtually nothing is known about the summer habitat of these bats, foraging and day roost studies should become a priority as technology becomes available to study them.



Figure 20: Hibernating Eastern Small-footed Bats



# Appendix I: PGC Abandoned Mine Protocol

Commonwealth of Pennsylvania  
Pennsylvania Game Commission, Bureau of Wildlife Management  
Wildlife Diversity Section  
2001 Elmerton Avenue, Harrisburg, PA 17110-9797

## **Protocol for Assessing Abandoned Mines/Caves for Bat Surveys**

In general, openings can be dismissed from bat surveys when:

1. There is only one horizontal opening less than 6 inches in diameter and no or very little airflow is detected.
2. Vertical shafts <1 foot in diameter.
3. Passage continues less than 50 feet and terminates with no fissures that bats can access.
4. Mines that are prone to flooding, collapsed shut and completely sealed, or otherwise inaccessible to bats.
5. Openings, which have occurred recently (within 1 year) due to subsidence.

*Additional notes: Bats can access mines via old open buildings such as a fan house. Foliage and other vegetation in front of mine openings do not stop use by bats. They can navigate through foliage. Collapsed entrances with multiple crevices between boulders etc. are accessible to bats and should be sampled. Collapses completely sealed with fine soil are of course inaccessible to bats.*

## **Sampling Dates, Times and Temperature Criteria**

1. Spring sampling will be conducted between: April 10 thru May 10
2. Fall sampling will be conducted between: September 15 thru October 31
3. Sampling will start 1/2 hour before sunset and continue for at least 5 hours.
4. Weather must provide for:
  - a. Temperatures  $\geq 50^{\circ}\text{F}$  ( $10^{\circ}\text{C}$ ) for first 2 hours of sampling and not fall below  $35^{\circ}\text{F}$  ( $1.6^{\circ}\text{C}$ ) by midnight.
  - b. At least 3 hours free of heavy rain and thunderstorms.
5. Sampling will be conducted on two evenings. If no captures occur and no bat activity is noted with a bat detector on the first evening during acceptable weather conditions, sampling can be suspended for the site.
6. The shining of lights, and noise will be kept to a minimum with no smoking around the sample site. The use of radios, campfires, running vehicles, punk sticks, citronella candles and other disturbances will not be permitted within 300 feet of site during surveys.
7. Before conducting surveys, local residents and/or law enforcement agencies should be informed of the scheduled nighttime activities.



## **Equipment**

*No equipment, litter or other debris will be left unattended at site that could result in the capture or entanglement of any animals. Any equipment stored at site between sampling sessions will be clearly labeled with contact information.*

**Harp Trap:** Place in front of opening and block surrounding space with plastic sheeting or bird netting. Traps should be tended at least once per hour. When the catch rate is high (>25 bats per hour) or during inclement weather, traps should be tended more frequently.

**Mist Nets:** 50 denier, 38mm mesh. Place in front or around opening. Nets need to be monitored closely and checked at least once every 20 minutes. At sites with a heavy bat swarm, the net may need to be monitored continuously.

**Bat Detector:** A bat detector should be on site to monitor bat activity when trapping or netting. Bat passes should be monitored and tallied for at least one hour after 10pm. Bat tallies should be reported along with the time sampled. Reporting format will be: Start and end time for 1-hour sample period and bat passes for that hour.

**Other:** In situations where it is too dangerous to approach an entrance, bat detectors and/or night vision/infrared recording devices may be used to monitor and record bat activity to determine bat use of the site. Bat activity in or around the entrance can be monitored by counting bat passes with a bat detector, or night vision/infrared video tapes can be made providing actual counts of bats entering the opening. As with trapping, monitoring should be conducted for 5 hours. Reporting format will be: Start and end time for 1-hour sample period and bat passes for that hour.

## **Reporting**

In addition to reports for the client, the Pennsylvania Game Commission requires copies of the report as part of the vendor's permitting requirement. To simplify data entry, mandatory sampling summary forms are also required by the PA Game Commission for bat surveys within the Commonwealth. If the vendor did not receive a copy of the data form with the permit, they can be obtained by contacting the:

Pennsylvania Game Commission  
Bureau of Law Enforcement, Technical Services Division  
2001 Elmerton Avenue, Harrisburg, PA 17110-9797  
717/787-5740

## **INTERIOR WINTER HIBERNACULA SURVEYS**

Sites that are determined to be safe for entry to conduct winter counts (primarily caves & stable hard rock mines) will be coordinated with the PA Game Commission, Wildlife Diversity Section and scheduled for interior surveys between January 1 and March 10. Contact information for the Wildlife Diversity Section is:

PA Game Commission  
Bureau of Wildlife Management, Wildlife Diversity Section  
2001 Elmerton Avenue, Harrisburg, PA 17110-9797  
(717) 787-5529



# Appendix III: Data Sheets

## Notes and key to abbreviations used on data sheets

### Instructions

All information must be completed each night. Partially complete forms will not be accepted. Completed forms are to be turned in to the Team Leader each morning.

**PROJECT:** Name of the entire survey project.

**SITE#:** The number given to every trap site in a separate geographic location. Site # remains the same regardless of how many nights are spent at the same location.

**DATE:** Pre-midnight date which trapping began.

**LONGITUDE/LATITUDE:** Coordinates from a GPS receiver.

**LD. BY:** USFWS qualified person identifying bats at this site.

**MOON AFFECT:** Was moon present during survey? If so what phase? Was moonlight illuminating nets? Note times.

**NUMBER OF NETS/TRAPS:** Description of nets, e.g. A: 3Hx9m, B: 2Hx6m, C: 1Hx9mx12m "L" configuration.

**SKY CONDITIONS:** General weather conditions and temperature in °F, at start, middle, and end of sampling times.

**WIND CONDITIONS:** Use Beauford scale and note time.

**SITE DESCRIPTION:** A general overview of the site, e.g. "Shallow stream with long pools surrounded by deciduous forest with maple, oak, and beech. A small clearing and residence is nearby."

**ANDERSON III CODE:** Use Level III codes and percentages within 1KM of site. Percentages should total 100%.

**DISTURBANCE CODE:** List up to three of the most significant disturbances within 500 meters. Include distance to disturbance.

### Common name:

Little brown  
Big brown  
Pipistrelle  
Northern longear  
Smallfooted  
Indiana  
Red  
Hoary  
Silver haired  
Townsend's Big-eared  
Rafinesque's Big-eared  
Evening

### Species:

*Myotis lucifugus*  
*Eptesicus fuscus*  
*Pipistrellus subflavus*  
*Myotis septentrionalis*  
*Myotis leibii*  
*Myotis sodalis*  
*Lasiurus borealis*  
*Lasiurus cinereus*  
*Lasionycteris noctivagans*  
*Corynorhinus townsendii*  
*Corynorhinus rafinesquii*  
*Nycticeius humeralis*

### Reproductive condition:

NR= Non Reproductive  
PG= Pregnant  
L= Lactating  
PL= Post Lactating  
SCR= Scrotal

### Age:

A: Adult  
J: Juvenile

### Anderson Classification Codes first and second level categories

- 1 **Urban or Built-Up Land**
- 11 Residential
- 12 Commercial Services
- 13 Industrial
- 14 Transportation, Communications
- 15 Industrial and Commercial
- 16 Mixed Urban or Built-Up Land
- 17 Other Urban or Built-Up Land
- 2 **Agricultural Land**
- 21 Cropland and Pasture
- 22 Orchards, Groves, Vineyards, Nurseries
- 23 Confined Feeding Operations
- 24 Other Agricultural Land
- 3 **Rangeland**
- 31 Herbaceous Rangeland
- 32 Shrub and Brush Rangeland
- 33 Mixed Rangeland
- 4 **Forest Land**
- 41 Deciduous Forest Land
- 42 Evergreen Forest Land
- 43 Mixed Forest Land
- 5 **Water**
- 51 Streams and Canals
- 52 Lakes
- 53 Reservoirs
- 54 Bays and Estuaries
- 6 **Wetland**
- 61 Forested Wetlands
- 62 Non forested Wetlands
- 7 **Barren Land**
- 72 Beaches
- 73 Sandy Areas Other than Beaches
- 74 Bare Exposed Rock
- 75 Strip Mines, Quarries, and Gravel Pits
- 76 Transitional Areas
- 77 Mixed Barren Land

### Disturbance Codes and Key

PROXIMITY	TYPE	
1 Disturbance on site	A Dumping	H Unimproved roads
	B Party spot	I Recreation area
2 Disturbance within 100 meters of site	C Buildings	J Mining
	D Agriculture	K Fire
	E Utility rights-of-way	L Clearcut
3 Disturbance 100-500 meters of site	F Railroad rights-of-way	M Insect defoliation
	G Improved roads	N No disturbance

### Beauford Wind Scale Codes and Key

Code	Speed(m/sa)	Description	Land Condition	Comfort
0	0 - 0.5	Calm	Smoke rises	No noticeable wind
1	0.5 - 1.5	Light air	Smoke drifts vertically	
2	1.6 - 3.3	Light breeze	Leaves rustle	Wind felt on face
3	3.4 - 5.4	Gentle breeze	Wind extends	Hair disturbed, clothing flaps
4	5.5 - 7.9	Moderate breeze	Small branches in motion	Hair disarranged, raises dust & loose
5	8.0 - 10.7	Fresh breeze	Small trees w/leaf begin to sway	Force of wind felt on body
6	10.8 - 13.8	Strong breeze	Whistling in telegraph wires large branches in motion	Umbrellas used with difficulty
7	13.9 - 17.1	Near gale	Whole trees in motion	Inconvenience in walking
8	17.2 - 20.7	Gale	Twigs broken from trees	Progress impeded/difficult in gusts

DO NOT WRITE IN MARGINS OF DATA SHEETS



# Bat Survey Data Form

Bat Conservation and Management, Inc. • 814-442-4348

Project: <u>Salisbury 219</u>	County: <u>Summit</u>	Site #: <u>1</u>	Night #: <u>1</u>	Site Name: <u>Myad P1</u>	Date: <u>9-17-05</u>
Latitude: <u>39 47 7.75</u>	Longitude: <u>79 01 42.46</u>	Datum: <u>NAD83</u>	Elevation: <u>2200</u> <small>(sea level)</small>	DBF: <u>S. Chong</u>	
Observer: <u>S. Chong</u>	Actual net open time: <u>7:00</u>		Actual net close time: <u>12:00</u>		
Day Condition: <u>8:00 68°F CLEAR</u>	Night Condition: <u>Clear</u>		Moon phase: <u>0</u>		
Moon effect: <u>Full moon - moon covered upper half canopy</u>					
Number of nettraps: <u>A) 6'x7' HARP TRAP B) Preceder 200</u>					
Site Description: <u>Stable AOT with stream running. Stream is steady.</u>					
<u>Sitting the entrance shot: 6' wide, 5' high. Priority. Not randomly</u>					
<u>located at open time. Foundation of old mining building immediately across</u>					
<u>Railroad forming up.</u>					
Anderson Level II					
Disturbance codes					
Remarks: <u>Subsided stream running.</u>					
<u>Cold air enveloping can be felt</u>					
<u>100' away. Preceder 30' High open-High Tiger</u>					
<u>into clear Knobs 1.7 Sec- 10:00-12:00</u>					
<u>50' from entrance. Priority up</u>					

Sketch of site per net setup (number of nets) (not shown)

# Bat Survey Data Form

Bat Conservation and Management, Inc. • 814-442-4348

Page 1 of 1

Time	Comment	Age	Sex	Reproductive Condition	Weight (gms)	Forearm Length	Above ground	Net Set	Band	Comments
8:30	Myaduc	A	F	NR	8.6					
8:30	Myaduc	A	F	NR	8.1					
8:30	Myaduc	A	M	NR	5.1					
8:30	Myaduc	A	M	SCR	9.4					
8:50	PipSub	A	M	SCR	4.7					
8:50	Myaduc	A	M	SCR	6.7					
8:50	Myaduc	A	M	SCR	6.8					
8:50	Myaduc	A	F	NR	9.4					
8:50	Myaduc	A	M	SCR	9.1					
9:20	Myaduc	A	F	NR	8.4					
9:20	Myaduc	A	F	NR	9.7					
9:20	Myaduc	A	M	SCR	6.7					
9:20	PipSub	A	F	NR	8.6					
10:15	Myaduc	A	M	SCR	5.2					
10:15	Myaduc	A	M	SCR	6.9					
10:15	Myaduc	A	M	SCR	6.7					
10:15	PipSub	A	F	NR	6.8					
12:00	PipSub	A	M	NR	6.9					
12:00	Myaduc	A	M	NR	7.6					
12:00	PipSub	A	M	SCR	6.9					



## Bat Conservation and Management, Inc. • 814-442-4248

Foundation  
Ruins

## Flat Conservation and Management, Inc. • 814-443-8340

Page 1 of 1

[illegible]



## Bat Conservation and Management, Inc. • 814-443-0346

[illegible]



# Bat Survey Data Form

Bat Conservation and Management, Inc. • 814-442-4246

Project: <u>Salt Spring 216</u>	County: <u>Somerset</u>	Site #: <u>2</u>	Night #: <u>2</u>	Site Name: <u>Mine 19</u>	Date: <u>10-1-05</u>
Latitude: <u>39 44' 21.12</u>	Longitude: <u>79 03 29.71</u>	Datum: <u>NAD83</u>	Elevation: <u>2200</u> feet	ID By: <u>J. Chapp</u>	
Observers: <u>J. Chapp</u>	Actual net open time: <u>6:30 pm</u>		Actual net close time: <u>11:30 pm</u>		
Day Conditions: <u>16:30 pm, 62°F, Clear</u>	Night Conditions: <u>9:30, 59°F, Clear</u>		Day Conditions: <u>11:30 pm, 50°F, Clear</u>		
Wind Description:					
Moon effect: <u>only moonlight</u>					
Number of nettraps: <u>1. 1/11 Hap Trap Bi Peterson Bat Detector # 10</u>					
Site Description: <u>Horizontal mine entrance along a rock face. Hap trap is set parallel to mine entrance. Bat detector set along rock facing up and out away from mine entrance. ↑ = uphill ↓ = Downhill</u>					
Anderson Level I:	<u>7410</u>	<u>4110</u>	<u>51130m</u>		
Disturbance codes:	<u>J 11</u>	<u>H 13</u>	<u>B 13</u>		
Remarks: <u>no bats captured</u>					

Site sketch (not our labels match "number of nets" field above)

# Bat Survey Data Form

Bat Conservation and Management, Inc. • 814-442-4246

Project: <u>Salt Spring 219</u>	County: <u>Somerset</u>	Site #: <u>3</u>	Night #: <u>1</u>	Site Name: <u>Mine 28</u>	Date: <u>9-30-05</u>
Latitude: <u>39 44 42.63</u>	Longitude: <u>79 03 19.55</u>	Datum: <u>NAD83</u>	Elevation: <u>2160</u> feet	ID By: <u>J. Chapp</u>	
Observers: <u>J. Chapp</u>	Actual net open time: <u>6:00</u>		Actual net close time: <u>12:00</u>		
Day Conditions: <u>6:30 6:30 Clear</u>	Night Conditions: <u>9:30 45°F Clear</u>		Day Conditions: <u>12:00 42°F Clear</u>		
Wind Description: <u>1 Light</u>	Night Conditions: <u>1 Light</u>		Day Conditions: <u>0</u>		
Moon effect: <u>only moonlight</u>					
Number of nettraps: <u>A 3'x4' Hap Trap Bi Peterson 240w</u>					
Site Description: <u>6'x3' mine entrance along Ping Creek. Trap placed perpendicular to entrance. Entrance sealed with plastic. 240w placed in front of trap.</u>					
Anderson Level I:					
Disturbance codes:					
Remarks: <u>Perseus 240w Street: 8115 and 1130</u>					
<u>NO BATS</u>					

Site sketch (not our labels match "number of nets" field above)



# Bat Survey Data Form

Bat Conservation and Management, Inc. • 814-443-4246

Project: <u>Saturday 9/19</u>	County: <u>Somerset</u>	Site # <u>3</u>	Night # <u>2</u>	Site Name: <u>Mine 28</u>	Date: <u>10-1-05</u>
Latitude: <u>39 44 42.62</u>	Longitude: <u>79 03 19.55</u>	Datum: <u>NAD83</u>	Elevation: <u>2160</u> <small>feet MSL</small>	ID By: <u>S. Chappell</u>	
Observer: <u>S. Chappell</u>				Actual net open time: <u>600</u>	Actual net close time: <u>1200</u>
Sky Conditions: <u>62% cloud 6:00</u>	Wind Description: <u>1 Light</u>		Moon effect: (specify waxing, full, or waning) <u>N/A</u>		
Number of nettraps: (specify net and bait type and configuration) <u>A: 3'x4' HARP TRAP B: Prosser 240x</u>					
Site Description: (see permanent record data; cover contents, surrounding habitat, dominant species) <u>6'x2.5' coal mine entrance along Army Creek. Spots are visible and some clouds on the nearby. Trap placed parallel with entrance entire entrance sealed with plastic. 240x placed on ground in front of trap pointing skyward</u>					
Anderson Level II:					
Disturbance codes:					
Remarks: (see record book and log; other notes, etc.) <u>240x START 9:30</u>					
<u>END 11:30</u>					
<u>NO BATS CAPTURED</u>					

Site sketch (net and traps match "number of rats" field above)

# Bat Survey Data Form

Bat Conservation and Management, Inc. • 814-443-4246

Project: <u>Saturday 9/19</u>	County: <u>Somerset</u>	Site # <u>4</u>	Night # <u>1</u>	Site Name: <u>Mine 27</u>	Date: <u>9-30-05</u>
Latitude: <u>39 44 44.61</u>	Longitude: <u>79 03 20.83</u>	Datum: <u>NAD83</u>	Elevation: <u>2160</u> <small>feet MSL</small>	ID By: <u>S. Chappell</u>	
Observer: <u>S. Chappell</u>				Actual net open time: <u>600</u>	Actual net close time: <u>1200</u>
Sky Conditions: <u>6:30 to 2°F clear</u>	Wind Description: <u>1 Light</u>		Moon effect: (specify waxing, full, or waning) <u>N/A</u>		
Number of nettraps: (specify net and bait type and configuration) <u>A: 6'x7' HARP TRAP B: Prosser 240x</u>					
Site Description: (see permanent record data; cover contents, surrounding habitat, dominant species) <u>12'x3.5' mine entrance along Army Creek. Trap placed parallel with entrance and 300y. Ground with plastic directed placed on ledge overlooking entrance</u>					
Anderson Level II:					
Disturbance codes:					
Remarks: (see record book and log; other notes, etc.) <u>Bat 240x START 8:15</u>					
<u>END 11:30</u>					
<u>NO BATS</u>					

Site sketch (net and traps match "number of rats" field above)



Project: <u>Ind. A. 219</u>	County: <u>San Diego</u>	Site # <u>4</u>	Height <u>2</u>	Site Name: <u>Mine 27</u>	Date: <u>10-1-05</u>
Latitude: <u>39 44 44.61</u>	Longitude: <u>79 03 30.83</u>	Date: <u>11/02/04</u>	Elevation: <u>2140</u>	By: <u>Ji Chang</u>	
Observer: <u>Ji Chang</u>			Actual net open time: <u>600</u>	Actual net close time: <u>1200</u>	
Sky Conditions: <u>700 67% clear</u>	Wind Sample: <u>1</u>		Wind: <u>1200 50% clear</u>		
Wind Description: <u>1</u>	Wind: <u>1</u>		Wind: <u>1</u>		
Moon effect: <u>very weak (high tide)</u>					
Number of photographs: <u>A: 6x7" Hand Trip B: Periscope 240x</u>					
Site Description: <u>12' x 2.5' min. distance along. Any. Cont. The Plant</u>					
Parallel with surface of. 50m. clear with Plastic. Distance					
Pass or large cylinder. Export					
Anderson Level 0	1	1	1	1	1
Disturbance codes:	1	1	1	1	1
Remarks: <u>2400 SSS: 9:15</u>					
<u>MO 1130</u>					

SIDE SKETCH (not all labels match "number of mine" field above)

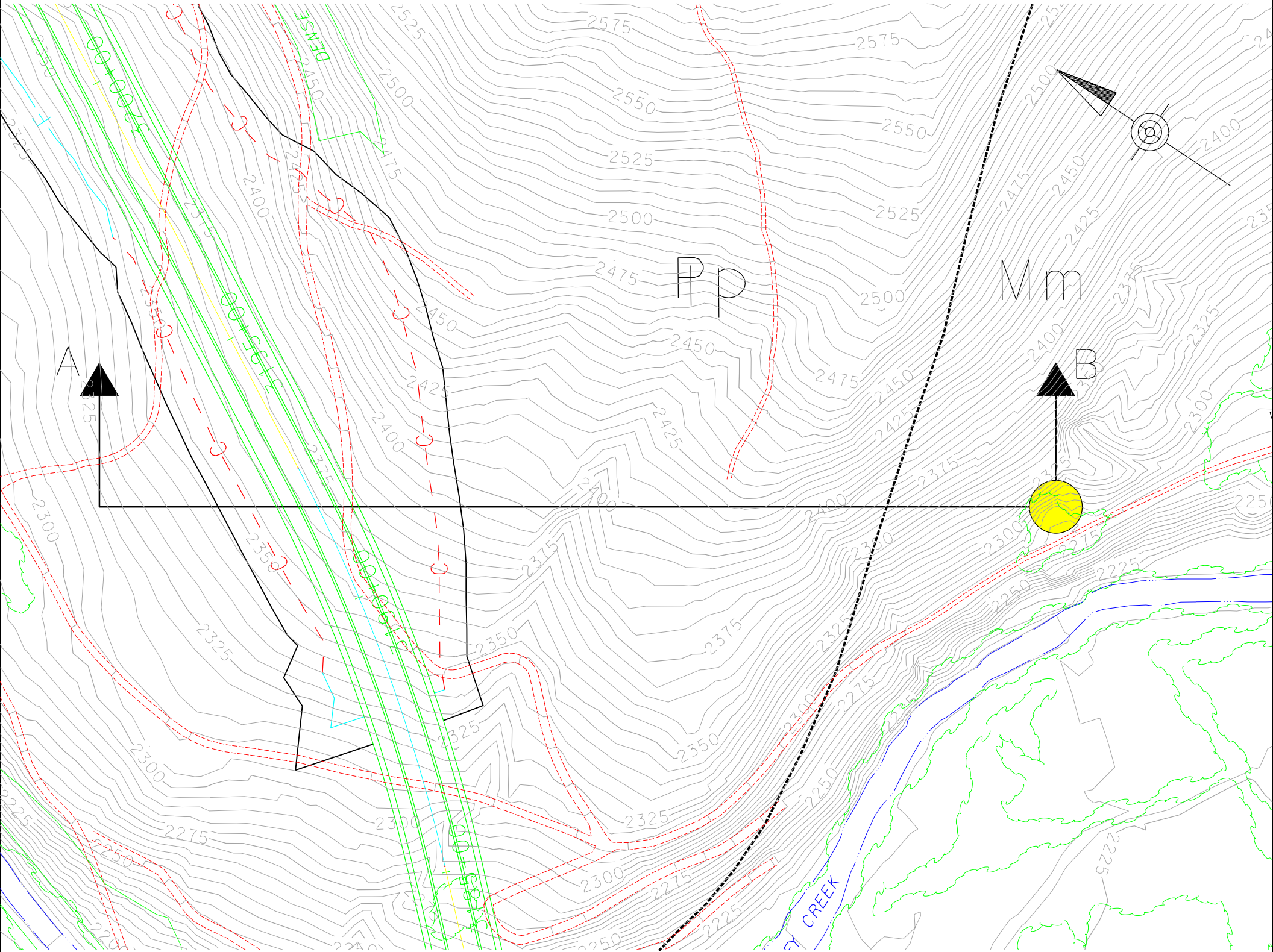
[illegible]



**APPENDIX D**  
**Underground Coal Mining**  
**Maps**



U.S. ROUTE 219  
IMPROVEMENT PROJECT

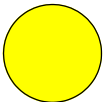


PLAN

LEGEND



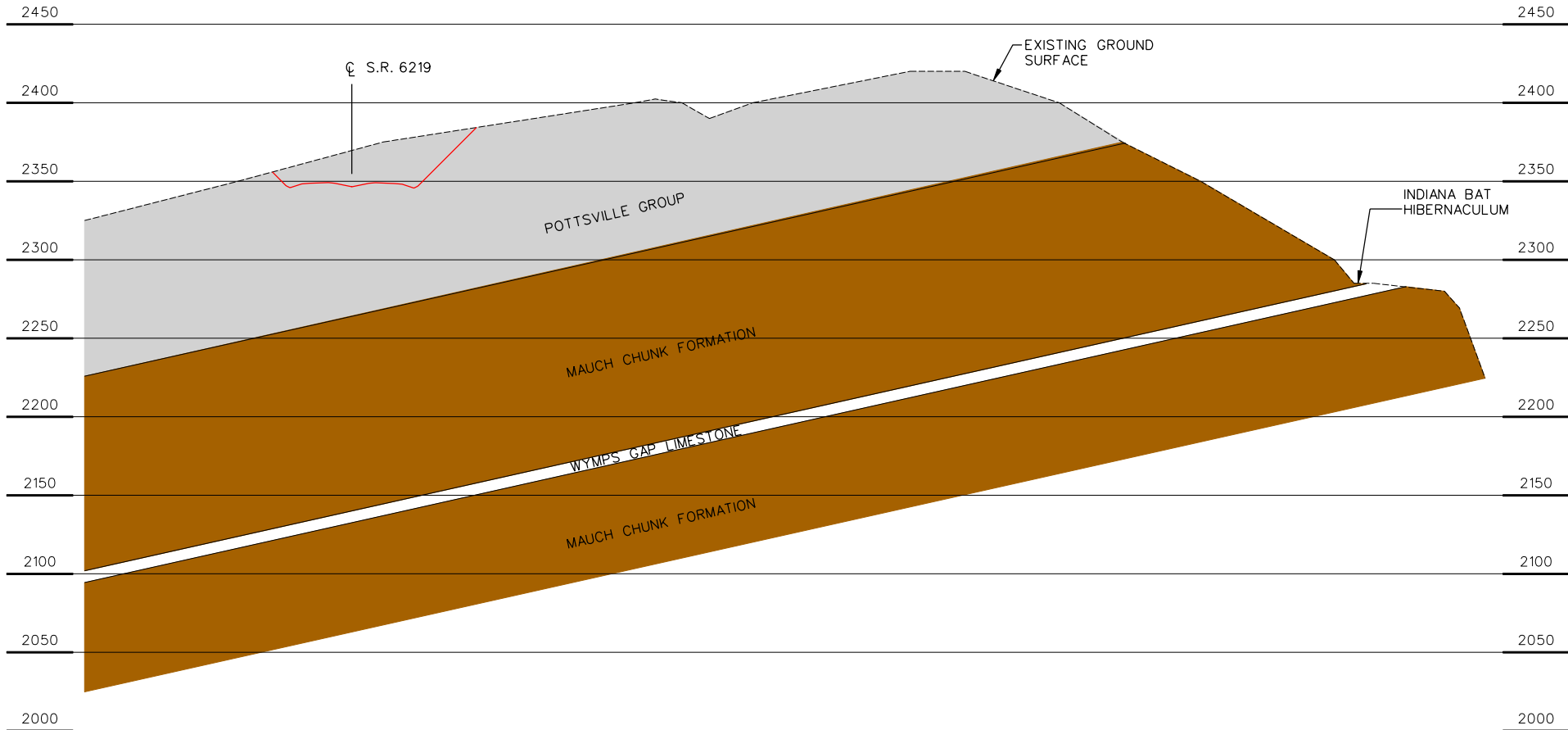
PENNYSYLVANIAN  
POTTSVILLE GROUP



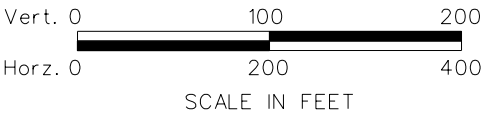
INDIANA BAT  
HIBERNACULUM



MISSISSIPPIAN  
MAUCH CHUNK



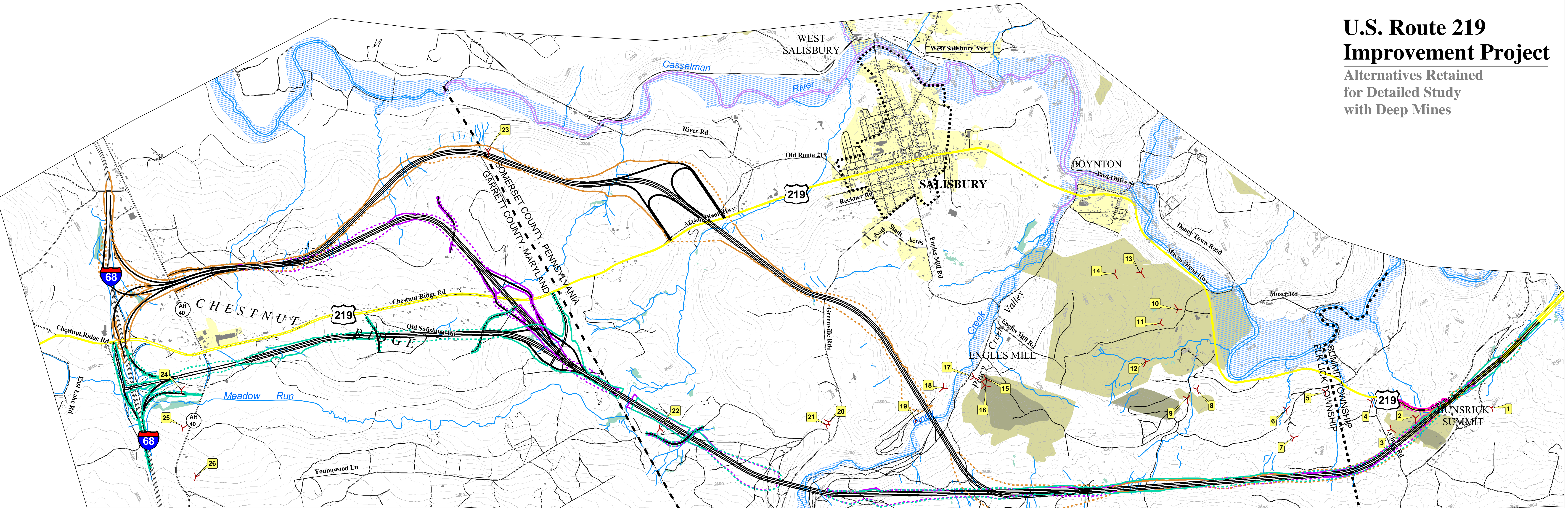
STRUCTURE SECTION ALONG LINE A-B





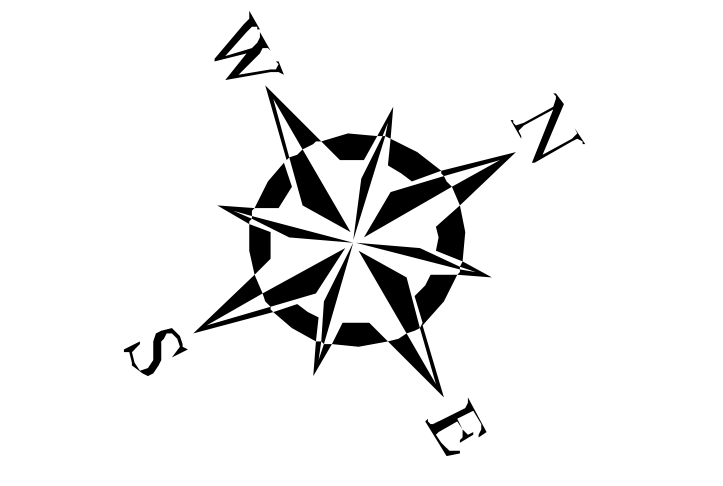
# U.S. Route 219 Improvement Project

Alternatives Retained for Detailed Study with Deep Mines



### Legend

- |                                 |            |                 |
|---------------------------------|------------|-----------------|
| PA Approved Trout Water Lengths | Structures | Alternative D   |
| Streams                         | Route 219  | Alternative E   |
| 100 Year Floodplains            |            | Alternative A-E |
| Urban Areas                     |            |                 |
| Reported Deep Mined Areas       |            |                 |
| Deep Mine Permit Boundaries     |            |                 |
| Deep Mine Entries               |            |                 |



0 600 1,200 1,800 Feet



03033 MT PER 1-21-16



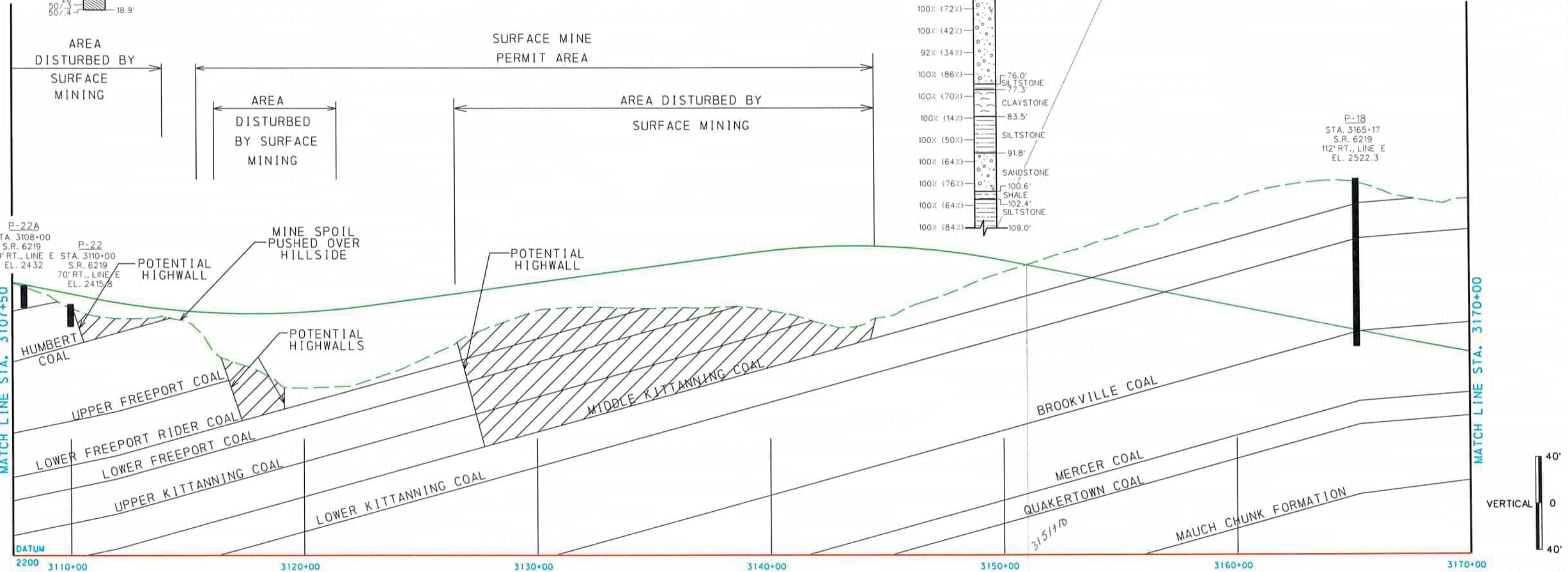
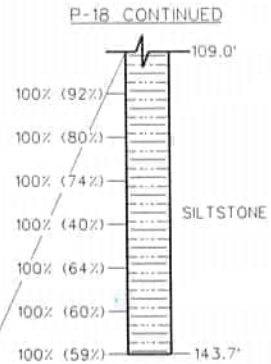
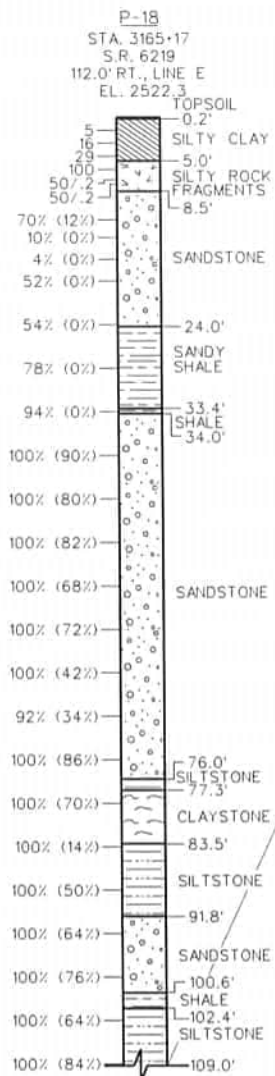
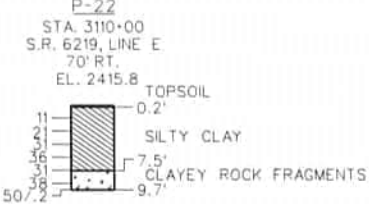
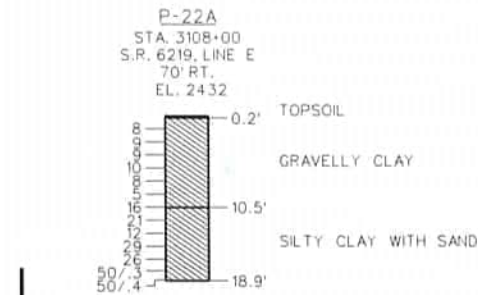
# **APPENDIX E**

## **Core Borings**



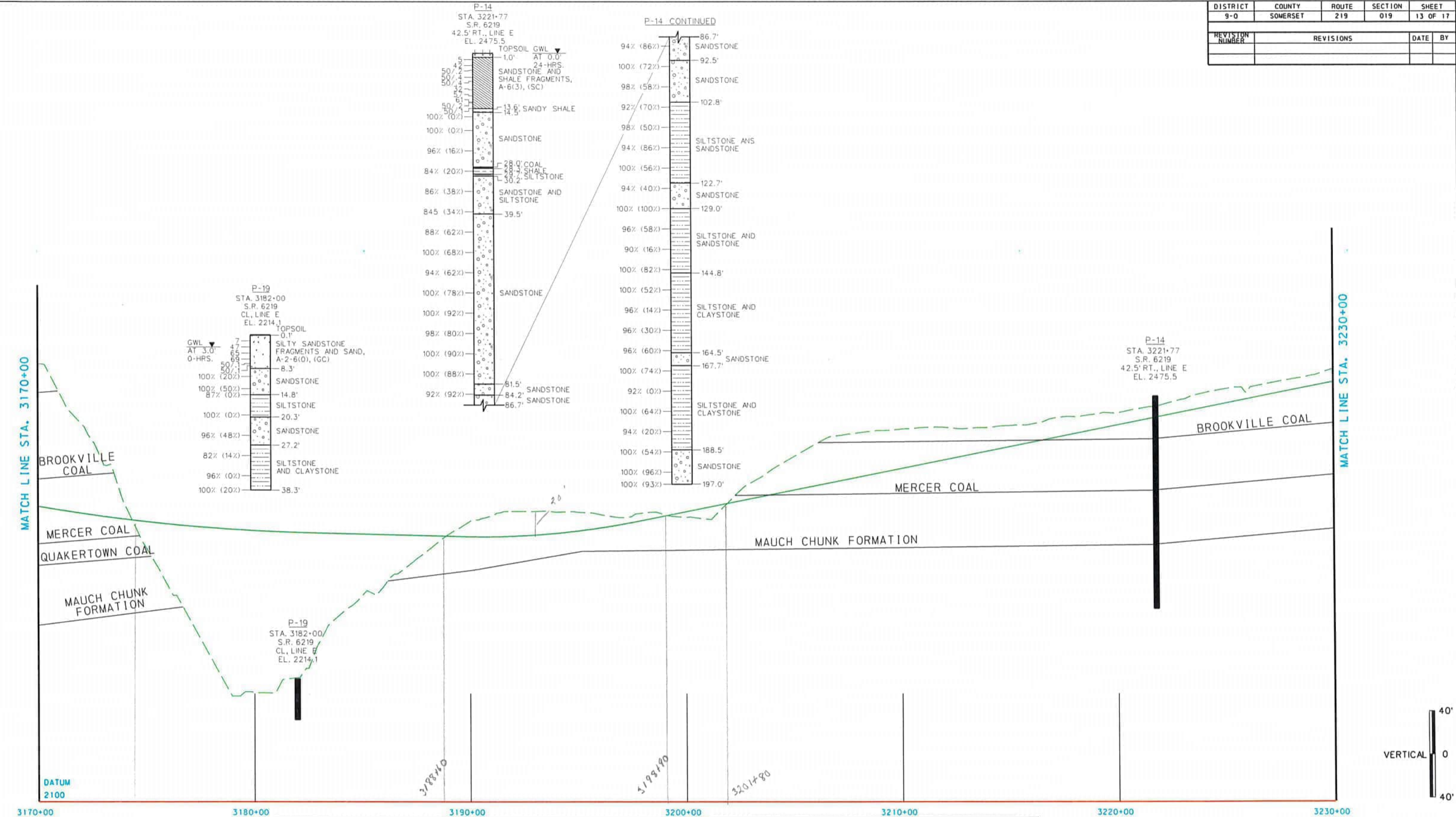
DISTRICT	COUNTY	ROUTE	SECTION	SHEET	
9-0	SOMERSET	219	019	12 OF 17	
REVISION NUMBER	REVISIONS			DATE	BY

STATION	OFFSET	DEPTH	SOIL LAB NO.	BORING NO.	LABORATORY TEST RESULTS										C.B.R.	FROST GROUP	PENNDOT		
					MOISTURE (%)				AASHTO-99		GRADATION (% AASHTO)						CLASSIFICATION		
					L.L.	P.L.	P.I.	N.W.C.	OPT MOIST	MAX. D.DEN.	AGGR.	C.S.	FINE SAND	SILT&CLAY			0.02 MM	AASHTO	UNIFIED
3165+17	112' RT.	0.2-4.5'	P-18-1	P-18	34	23	11	16.7			27	6	14	53	52		F-4	A-6(4)	CL
3110+00	70' RT.	1.5-7.5'	P-22-1	P-22	38	26	12	18.7			21	10	6	63	57		F-4	A-6(6)	ML
3108+00	70' RT.	4.5-9.0'	P-22A-1	P-22A	37	26	11	14.2			45	14	8	33	29		F-3	A-2-6(0)	SM





DISTRICT	COUNTY	ROUTE	SECTION	SHEET	
9-0	SOMERSET	219	019	13 OF 17	
REVISION NUMBER	REVISIONS			DATE	BY



STATION	OFFSET	DEPTH	SOIL LAB NO.	BORING NO.	LABORATORY TEST RESULTS										C.B.R.	FROST GROUP	PENNDOT CLASSIFICATION		
					MOISTURE (%)				AASHTO-99		GRADATION (% AASHTO)						TEST DATA FROM		
					L.L.	P.L.	P.I.	N.W.C.	OPT. MOIST	MAX. D.DEN.	AGGR.	C.S.	FINE SAND	SILT & CLAY			0.02 MM	AASHTO	UNIFIED
3221+17	43' RT.	6.0-12.2'	P-14-1	P-14	33	22	11	9.6			27	16	8	49	33		F-3	A-6(3)	SC
3182+00	CL	1.5-7.1'	P-19-1	P-19	28	17	11	6.6			53	8	14	25	19		F-1	A-2-6(0)	GC

COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF TRANSPORTATION  
**E PROFILE**



# **APPENDIX F**

## **Blasting Assessment**



## Blasting Assessment

Based on preliminary core boring information, it is likely that blasting will be required for the US 219, Section 019, transportation improvement project. One of the most likely locations where blasting may be required is for the 100 feet deep cut located south of the proposed Alternative E structure over Piney Creek. Preliminary information suggests that the rock in this area is sandstone that possesses moderate to high Rock Quality Designation (RQD) values. The rock in this area most likely will require blasting for excavation. This area is located southwest of the hibernaculum and south of Piney Creek. No passageways in [REDACTED] extent south of Piney Creek.

As stated within the text of the Biological Assessment, any shear waves induced by blasting for roadway excavations would have negligible or no adverse impact on the hibernaculum. The following information supports the statement that blasting will have no adverse impact on [REDACTED]

- The frequency spectrum of blasting-induced shear waves is relatively high with low amplitude. The amplitude, not the frequency, would have the greatest impact on cave and mine walls. Since the waves would be of low amplitude, their effect would be minimal.
- Blasting-induced seismic waves generally propagate on a horizontal plane. With the significant elevation difference between the proposed road grade at the base of the excavation and the elevation of the abandoned mine below the roadway, their effect would be minimal.
- Seismic wave propagation in bedrock is attenuated by the presence of discontinuities (joints, fractures, bedding planes, etc.) in the bedrock. With the significant stratigraphic elevation difference in bedrock between the Pottsville Group rocks at the base of proposed excavations for Alternative E and the Mauch Chunk formation rocks (this formation contains the Wymys Gap limestone) at the mine, the effect would be minimal.
- Finally, special provisions will be incorporated into the construction contract to limit the peak particle velocity at the hibernaculum to levels consistent with current PGC guidelines. The site-specific blasting plan prepared by the contractor would be reviewed and approved by PennDOT, USFWS, and PGC prior to any blasting. Vibration monitoring would be required at critical locations, including the hibernaculum ([REDACTED])

Based on this information the proposed project would not have the potential to impact the [REDACTED] due to blasting activities. However, to ensure that no concerns exist, a blasting plan will be prepared for the project and would include restrictions in the area of [REDACTED] on blasting and earthmoving activities during the October 30 to March 31 critical time period for the Indiana bat.





U. S. DEPARTMENT  
OF TRANSPORTATION

Pennsylvania Division

4715  
228 Walnut Street, Room 508  
Harrisburg, PA 17101-1720

Federal Highway  
Administration

In reply refer to:  
HEV-PA

U.S. 219, Meyersdale to I-68  
Somerset County, Pennsylvania and  
Garrett County, Maryland

Mr. David Densmore, Supervisor  
U.S. Fish and Wildlife Service  
315 South Allen Street, Suite 322  
State College, PA 16801-4850

Dear Mr. Densmore:

The Federal Highway Administration (FHWA) Pennsylvania Division, as the lead Federal agency, in cooperation with the Pennsylvania Department of Transportation (PennDOT) and Maryland State Highway Administration (MD SHA) is proposing improvements to U.S. 219 in Somerset County, Pennsylvania and Garrett County, Maryland. The proposal is for a four-lane limited access highway stretching approximately eight (8) miles south of Somerset near Hunsrick Summit to I-68 south of Salisbury.

According to the species list received from the U.S. Fish and Wildlife Service (FWS) at the on-set of project development, the Indiana bat, a federally listed threatened species, is known to exist within the study area. No Critical Habitat exists in the project area. As the prospective action may affect the listed species, FHWA entered into early consultation with the FWS. The enclosed information addresses your request for additional information. Pointedly, the information addresses inquiries with regard to:

- Orientation of the abandoned limestone mine's passages
- Depth of passages below the surface relative to the proposed road
- Number of other natural or man-made passages
- Spatial distance between the passages and the proposed road
- Potential collapse that would diminish airflow
- Potential for climate changes





As noted on our January 23, 2006 letter to your office, FHWA has determined that the proposed project will have an effect on the species and will be submitting a Biological Assessment (BA) to the FWS. The BA will evaluate the potential effects of the proposed action on the Indiana bat and determine whether the effect is adverse or beneficial and whether to enter into formal consultation.

If you have any questions, please contact Karyn Vandervoort at (717) 221-2276 or [karyn.vandervoort@fhwa.dot.gov](mailto:karyn.vandervoort@fhwa.dot.gov).

Sincerely yours,

James A. Cheatham  
Division Administrator

Enclosures

ec: M. Ratnaswamy, FWS Chesapeake Bay Field Office w/enclosure  
D. King, FHWA MD Division Office  
S. Rajan, MD SHA project manager w/enclosure  
D. Sherman, PennDOT project manager w/ enclosure  
K. Mixon, PA Game Commission  
G. Kough, PennDOT HQAD

S:\FY2006\Feb\US219 I-68 USFWS.kev.doc





The following are responses to the USFWS request for information on the Salisbury Mine. The intent of the mapping of the abandoned limestone mine was to determine:

**Request:** Orientation of the abandoned limestone mine's passages

**Response:**

**Request:** Depth of passages below the surface relative to the proposed road

**Response:** There has been some debate over whether the [REDACTED] is located in the Loyalhanna limestone or the Wymps Gap limestone. Project geologists believe that the mine is located in the Wymps Gap limestone; therefore, considering the bedrock dip in this portion of the project area (about 550 feet per mile from southeast to northwest), the Wymps Gap limestone (contained within the Mauch Chunk group of rocks), in the area of the Alternatives E and AE centerline, would be about 200 feet below the proposed roadway grade. The proposed roadway excavations would occur exclusively in the stratigraphically higher Pennsylvania age Pottsville group of rocks. Based on the current alignments of Alternatives E and AE (the alternatives that are closest to the mine), the maximum excavation depth in the area nearest to the mine would be around 20 feet at the roadway centerline. The ground elevation of the mine entrance is about 60 feet lower in elevation than the proposed excavations for Alternatives E and AE. As stated the Wymps Gap limestone would be about 200 feet below the proposed road grade and the Loyalhanna limestone would be even lower in that it occurs at a lower stratigraphic position than the Wymps Gap limestone. Also, as stated none of the passages are located any closer than 1,100 feet horizontally from the proposed road.

**Request:** Number of other natural or man-made passages

**Response:** [REDACTED] contains 8,443 feet of mine passages. The mining operation intersected a significant natural solution cave and 697 feet of cave remnants were mapped.

**Request:** Spatial distance between the passages and the proposed road



**Response:**

alignments.

**Request: Potential collapse that would diminish airflow**

**Response:** Any shear waves induced by blasting for roadway excavations would have negligible or no adverse impact on the hibernaculum. The following information supports the statement that blasting will have no adverse impact on [REDACTED]

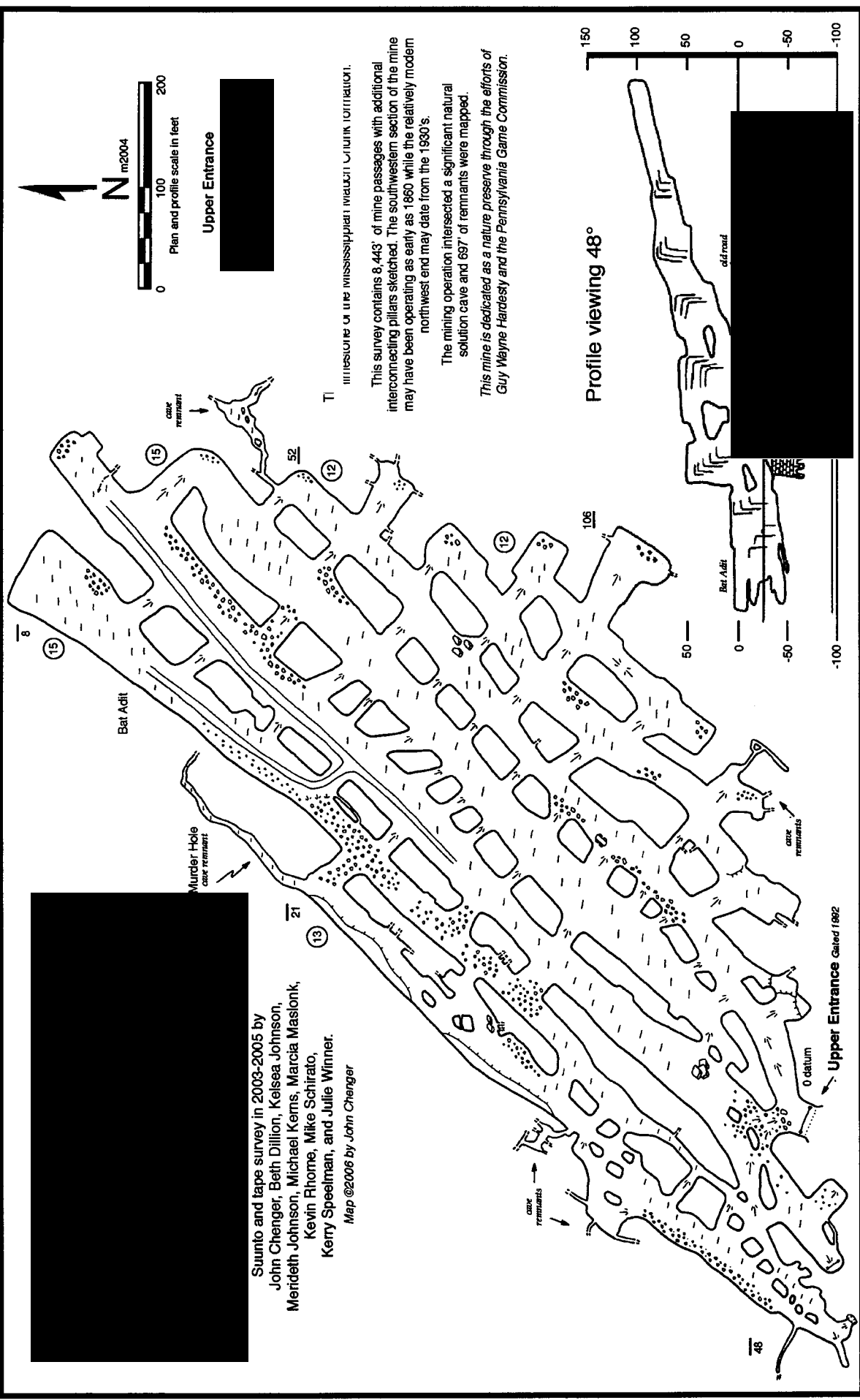
- The frequency spectrum of blasting-induced shear waves is relatively high with low amplitude. The amplitude, not the frequency, would have the greatest impact on cave and mine walls. Since the waves would be of low amplitude, their effect would be minimal.
- Blasting-induced seismic waves generally propagate on a horizontal plane. With the significant elevation difference between the proposed road grade at the base of the excavation and the elevation of the abandoned mine below the roadway or the elevation of the abandoned mine entrance, their effect would be minimal.
- Seismic wave propagation in bedrock is attenuated by the presence of discontinuities (joints, fractures, bedding planes, etc.) in the bedrock. With the significant stratigraphic elevation difference in bedrock between the Pottsville Group rocks at the base of proposed excavations for Alternatives E and AE and the Mauch Chunk formation rocks (this formation contains the Wymps Gap limestone) at the mine, the effect would be minimal.
- Finally, special provisions will be incorporated into the construction contract to limit the peak particle velocity at the hibernaculum to levels consistent with current Pennsylvania Department of Environmental Protection (PA DEP) guidelines. The site-specific blasting plan prepared by the contractor would be reviewed and approved by both PennDOT and PA DEP prior to any blasting. Vibration monitoring would be required at critical locations, including the hibernaculum (Salisbury Mine).

Based on this information the proposed project would not have the potential to cause a collapse at or within the mine that would diminish airflow.

**Request: Potential for climate changes**

**Response:** Based on the provided information, the proposed project would not have the potential to impact the [REDACTED] therefore, the proposed project would not have the potential to cause any climate changes within the mine.





0 100 200  
Plan and profile scale in feet

Upper Entrance

Suunto and tape survey in 2003-2005 by  
John Chenger, Beth Dillon, Kelsea Johnson,  
Merideth Johnson, Michael Kerns, Marcia Maslonk,  
Kevin Rhorne, Mike Schirato,  
Kerry Speelman, and Julie Winner.  
Map ©2006 by John Chenger

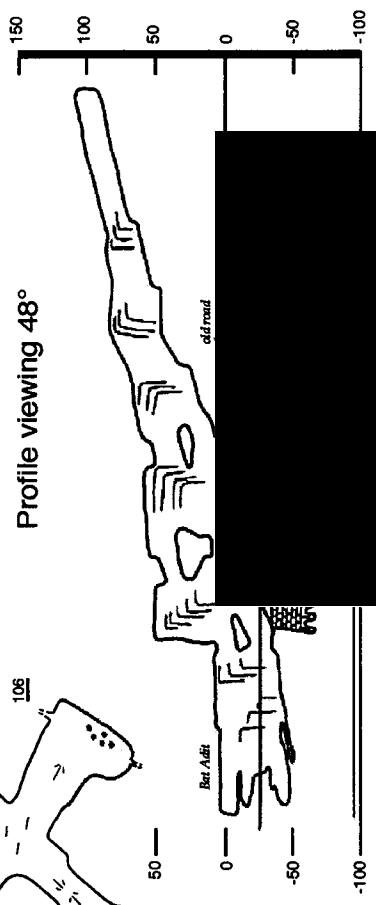
Measure of the Mississippiian (Mauch Chunk) formation.

This survey contains 8,443' of mine passages with additional  
interconnecting pillars sketched. The southwestern section of the mine  
may have been operating as early as 1860 while the relatively modern  
northwest end may date from the 1930's.

The mining operation intersected a significant natural  
solution cave and 697' of remnants were mapped.

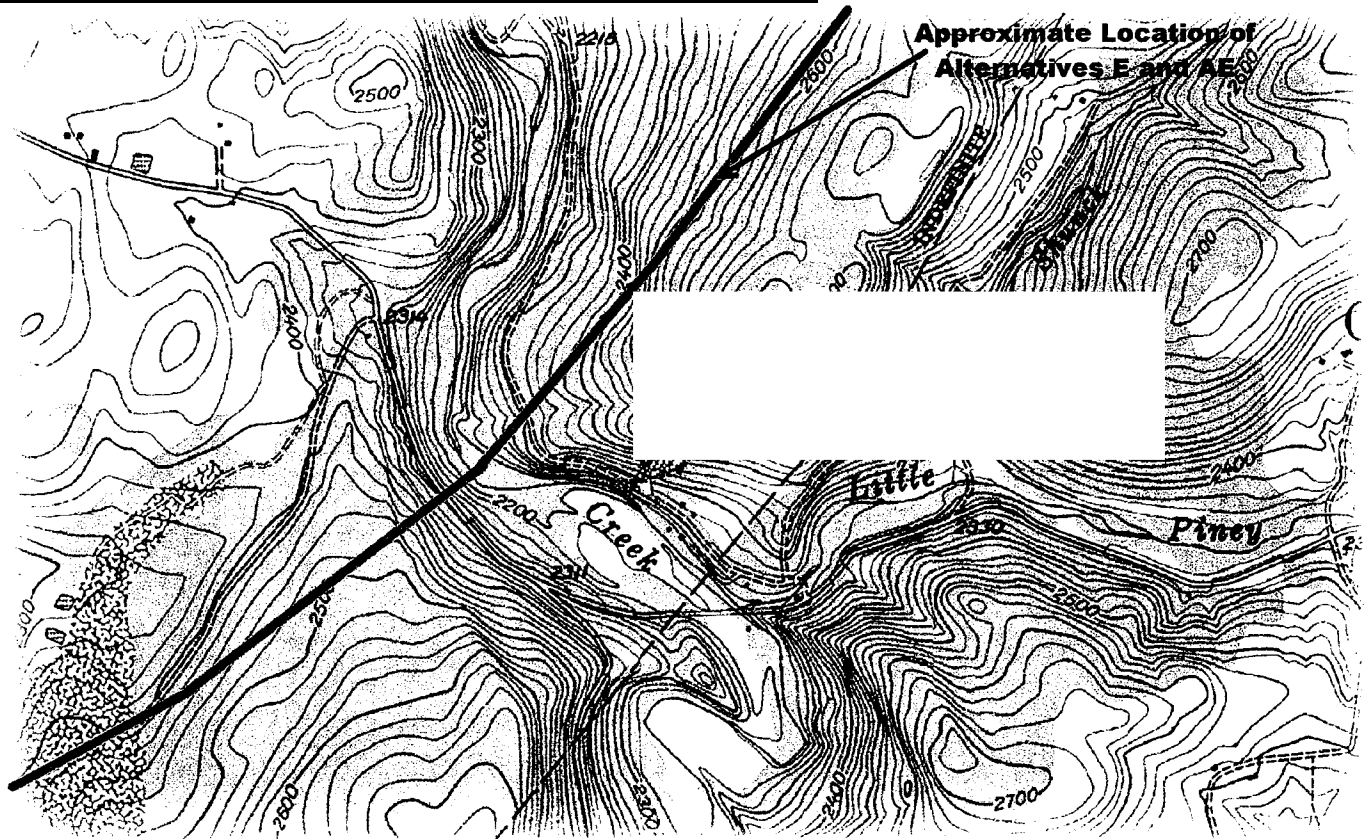
This mine is dedicated as a nature preserve through the efforts of  
Guy Wayne Hardesty and the Pennsylvania Game Commission.

Profile viewing 48°



Upper Entrance Gated 1992





Notes:

Total surveyed sections: 8,443' of mine passage, 697' of natural cave passage, and 1,713' of surface survey.

The location of the cave stream resurgence is suspected to be at the northwest end of the surface survey (depicted in red) on the north bank of Piney Creek.

Mine may not be properly depicted until entrance location coordinates are verified.

2003-2005 Survey by John Chenger, Beth Dillion, Kelsea Johnson, Merideth Johnson, Michael Kerns, Marcia Maslonek, Kevin Rhome, Mike Schirato, Kerry Speelman, and Julie Winner.

© 2005 Bat Conservation and Management, Inc.





# United States Department of the Interior

FISH AND WILDLIFE SERVICE

Pennsylvania Field Office

315 South Allen Street, Suite 322

State College, Pennsylvania 16801-4850



October 2, 2007

Mr. James A. Cheatham  
Division Administrator  
Federal Highway Administration  
228 Walnut Street, Room 558  
Harrisburg, PA 17101-1720

RE: USFWS Project #2007-1091

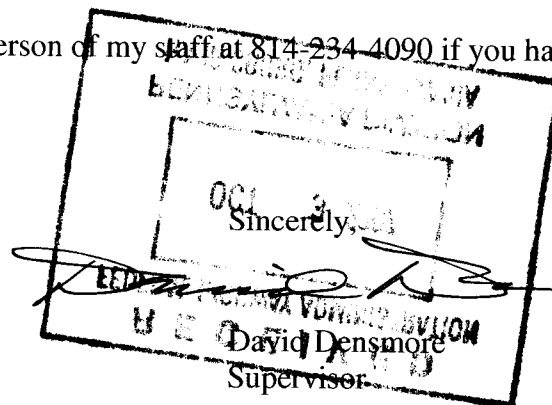
Dear Mr. Cheatham:

Enclosed is the Fish and Wildlife Service's biological opinion on the effects of the proposed U.S. 6219, Section 019 Transportation Improvement Project (Meyersdale, Somerset County, Pennsylvania to I-68 in Garrett County, Maryland) on the Indiana bat (*Myotis sodalis*), a species that is federally listed as endangered. We are providing this to the Federal Highway Administration in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

This biological opinion is based on information provided in the June 2006 biological assessment, the February 20, 2007, amendment to the biological assessment, telephone conversations, meetings, site visits, and other sources of information. A complete administrative record of this consultation is on file at this office.

*Please use the above-referenced USFWS project tracking number in any future correspondence regarding this project.*

Please contact Robert Anderson of my staff at 814-234-4090 if you have any questions or require further assistance.



Enclosure



# **BIOLOGICAL OPINION**

## **The Effects of the U.S. 6219, Section 019, Transportation Improvement Project on the Indiana bat (*Myotis sodalis*)**

**Somerset County, Pennsylvania and Garrett County, Maryland**

**Submitted to the Federal Highway Administration**

October 2, 2007

U.S. Fish and Wildlife Service  
Pennsylvania Field Office  
315 South Allen Street, Suite 322  
State College, Pennsylvania 16801



## Table of Contents

CONSULTATION HISTORY .....	1
<b>BIOLOGICAL OPINION .....</b>	<b>2</b>
DESCRIPTION OF THE PROPOSED ACTION .....	2
Project Description.....	2
Avoidance and Minimization Measures .....	4
Conservation Measures .....	5
Action Area.....	6
STATUS OF THE SPECIES .....	6
Species Description.....	8
Status of the Indiana bat within its Range .....	16
Status of the Indiana Bat in Pennsylvania.....	18
Previous Incidental Take Authorizations.....	19
ENVIRONMENTAL BASELINE.....	20
[REDACTED] .....	20
Foraging and Roosting (Spring, Summer and Fall) .....	21
EFFECTS OF THE ACTION .....	23
Effect on [REDACTED] and Hibernating Bats .....	23
Effects of U.S. 6219 Project Conservation Measures.....	33
CUMULATIVE EFFECTS .....	34
CONCLUSION.....	35
<b>INCIDENTAL TAKE STATEMENT .....</b>	<b>36</b>
AMOUNT OR EXTENT OF TAKE .....	37
EFFECT OF THE TAKE.....	39
REASONABLE AND PRUDENT MEASURES.....	39



TERMS AND CONDITIONS .....	39
CONSERVATION RECOMMENDATIONS.....	44
REINITIATION NOTICE .....	45
LITERATURE CITED .....	46



## CONSULTATION HISTORY

DATE	EVENT/ACTION
May 30, 2002	Fish and Wildlife Service responds to a May 6, 2002, letter from Attilio Squillario of L. Robert Kimball and Associates, requesting information regarding federally listed endangered, threatened, or proposed species in the U.S. 6219 Transportation Improvement Project study area. The Service notified the project proponents that Indiana bats were known to hibernate in the project area and recommended seasonal restrictions on tree-cutting.
February 3, 2003	Service receives a January 31, 2003, letter from A.D. Marble and Company, representing FHWA and PennDOT, and requesting information regarding environmental and cultural resources described on submitted maps depicting project alignments under consideration.
February 18, 2003	Peter Dodds of A.D. Marble and Company contacted the Service to request that their February 3, 2003, letter be disregarded due to an incorrect depiction of the study area.
June 14, 2004	Service receives a June 11, 2004, letter from Stephen Toki of L. Robert Kimball and Associates, requesting updated information regarding federally listed endangered, threatened, or proposed species in the U.S. 6219 Transportation Improvement Project study area, and providing a map depicting the three alignments under consideration.
July 28, 2004	Agency Coordination Meeting held to present alternatives under consideration for the U.S. 6219 Transportation Improvement Project, and request concurrence on Alternative E as the Recommended Preferred Alternative
September 2, 2004	Service responds to the letter of June 11, 2004, from Stephen Toki, and recommends that bat surveys be conducted due to the proximity of two of the proposed alignments to a known Indiana bat hibernaculum, and the extent of forest removal being considered.
October 4, 2004	Site visit held between the Service, FHWA, PennDOT, Maryland State Highway Administration, and their consultants, to discuss the project's effects on Indiana bats.
December 21, 2004	Meeting held between the Service, FHWA, and PennDOT to discuss the project's effects on Indiana bats.
September 25, 2006	Service receives FHWA's September 22, 2006, request for concurrence that the project is "not likely to adversely affect" federally listed species. FHWA requests that formal consultation be initiated if the Service cannot concur with FHWA's effects determination.
October 31, 2006	Service responds that they cannot concur with FHWA's conclusion regarding effects expected from the project. Service requests additional information needed to initiate formal consultation.
November 8, 2006	Meeting held between the Service and FHWA to discuss the project's effects on Indiana bats.



February 26, 2007	Service receives FHWA's February 20, 2007, letter providing requested additional information, and requesting initiation of formal consultation on the project.
May 27, 2007	90-day formal consultation period concluded.
July 25, 2007	Service requests a 45-day extension of formal consultation period to September 8, 2007.
August 21, 2007	FHWA acknowledges receipt of Service request for extension.
October 2, 2007	Final biological opinion completed and delivered to FHWA.

## **BIOLOGICAL OPINION**

### **DESCRIPTION OF THE PROPOSED ACTION**

U.S. Route 219 runs for 535 miles (861 km) from West Seneca, New York, at Interstate 90 to Rich Creek, Virginia, at U.S. Route 460. It passes through the States of New York, Pennsylvania, Maryland, West Virginia, and Virginia. The proposed project is a new, limited-access, four-lane highway section of U.S. 219 (also referred to as U.S. 6219) in portions of Elk Lick and Summit Townships in Somerset County, Pennsylvania, and in the northeastern corner of Garrett County, Maryland. The roadway alignment passes through predominantly forested and agricultural areas interspersed with residential developments and abandoned surface mines. The project is within the Casselman River watershed, and includes the Meadow Run and Piney Creek sub-basins.

#### **Project Description**

The proposed project is called U.S. 6219, Section 019, Meyersdale, Pennsylvania, to I-68 Maryland Transportation Improvement Project (U.S. 6219 Project). The multiple project purposes are to:

1. improve the level of safety for vehicles traveling on U.S. 219;
2. improve the level of service on U.S. 219;
3. improve the system linkage between I-68 and the completed portion of the existing four-lane Meyersdale Bypass and Pennsylvania Turnpike; and



4. provide a safe and efficient access to southern Somerset County, Pennsylvania, and Garrett County, Maryland, to improve economic development potential.

To meet the above needs, a new, limited-access, four-lane highway section is proposed to extend for approximately eight miles (13 kilometers) from the southern end of the Meyersdale Bypass in Somerset County, Pennsylvania, to Interstate 68 (I-68) in Garrett County, Maryland. The proposed project (described as “Alternative E” in the assessment) would start at Hunsrick Summit and follow the western side of Meadow Mountain in Pennsylvania, at an elevation of approximately 2,400 feet above sea level. The new roadway would cross the Piney Creek valley. At the Pennsylvania/Maryland border, the alignment would become more southwesterly, eventually tying into a new I-68 interchange just east of the existing interchange with U.S. 219. The proposed project schedule calls for right-of-way acquisition between 2009 and 2011, followed by a two-year construction period from 2012 to 2014.

The highway will have a standard width of 130 feet; however, in the vicinity of the Piney Creek crossing in Pennsylvania, and along the entire section of the highway in Maryland, the roadway will be narrowed to 100 feet to reduce the project footprint. This section of U.S. 6219 is about eight miles long, and the 100- to 130-foot-wide roadway alignment accounts for approximately 96 to 125 acres that will be permanently converted to pavement, median, or shoulder. The Federal Highway Administration (FHWA), Pennsylvania Department of Transportation (PennDOT), and Maryland State Highway Administration (MDSHA), hereinafter referred to as the project proponents, estimate that the project will require clearing of 375 acres of habitat described as “agricultural land, rangeland, and forestland” (also described as *foraging area impact* in the assessment), including 208 acres of forest. The additional acreage of land disturbance, beyond that needed for the road, is based on the preliminary engineering estimates of the area of cut and fill needed to maintain the desired road grade. For example, just south of the Piney Creek Bridge, a road cut approximately 100 feet deep and 600 feet wide is proposed.

In addition to terrestrial habitat impacts, the project will affect wetlands and streams. Of the 31 stream crossings, 16 are over ephemeral streams, while the largest crossing is over Piney Creek (described below). The project will disturb five acres of wetland, and result in 13 residential displacements.

*Piney Creek Bridge.* The bridge proposed over Piney Creek will be approximately 1,500 feet long and 175 feet high. It will span the Piney Creek Valley and adjacent Greenville and Piney Run Roads. The bridge will be 130 feet wide, with reduced shoulder and median widths. If shown to be feasible during geotechnical investigations, the road cut through the ridge at the bridge approach will be narrowed. The normal road width through this section will be 130 feet, resulting in an approximately 150-foot wide gap in the natural vegetative canopy. The highway from Station 3150+00 to Station 3200+00, which is approximately one mile to the north and south of Piney Creek, and near Salisbury Mine, will be narrowed to 100 feet. This would be achieved through steeper maximum roadway grades (from 4 percent to 6 percent) and reduced median and shoulder widths. Despite the reductions in road width, the project designs included in the assessment show that a substantial roadway cut of 500 to 600 feet will remain at the bridge approaches. The bridge and right-of-way in the immediate vicinity of the structure will cross approximately five acres of forest habitat, some of which will remain forested.



*I-68 Interchange.* Two different interchange designs are proposed for connection with I-68. The proposed location is approximately two miles east of the existing I-68/U.S. 219 interchange. The interchange would require a 1,500-foot long, two-lane access road to existing U.S. 219.

#### Avoidance and Minimization Measures

The following measures have been incorporated into the project description; these measures are expected to minimize impacts of the proposed roadway construction on Indiana bats. The Fish and Wildlife Service has analyzed the effects of the proposed action based on the assumption that all avoidance measures will be implemented. More detailed descriptions of these measures are provided in the biological assessment (in part, on pages 18 to 21, and in the February 2007 Addendum).

1. The proposed timber restrictions in the amended assessment are “from March 31 to November 16 in the vicinity of the mine (hibernaculum)” which “approximates a five mile radius around the hibernaculum”. “All other timbering along the proposed alignment would occur from October 30 to March 31.” Based on other statements related to forest and building removal in the assessment, we interpret this to mean that timber-cutting and building demolition within five miles [REDACTED] in Indiana bat hibernaculum) will only occur after November 15 and prior to March 31, during which time Indiana bats are expected to be hibernating, thereby avoiding injury to roosting Indiana bats during the warmer season.
2. Trees under the proposed Piney Creek bridge will remain until their removal is necessary for bridge construction, thereby maintaining riparian tree cover for a flight path.
3. A blasting plan will be prepared in accordance with Pennsylvania Game Commission (PGC) guidelines, and submitted to the Service and PGC for review and approval prior to any blasting activities.
4. No blasting will occur within one mile north or south of [REDACTED] between October 30 and March 31.
5. In coordination with the Service and PGC, all blasting will be monitored with seismographic and sound equipment in the area of [REDACTED]. Blasting will be altered to ensure that vibrations stay below thresholds established by PGC.
6. No construction activities will occur within 2.5 miles of [REDACTED] from one-half hour before sunset to one hour after dawn, from September 15 to November 16, when Indiana bats are believed to be engaged in fall swarming in the vicinity of [REDACTED].
7. The typical roadway width will be narrowed by 30 feet (to 100 feet) from just under one mile to the north and south of Piney Creek (in the area of the [REDACTED]), to reduce crossing distance for any Indiana bats crossing over the bridge or roadway in this area.
8. Vegetation within the right-of-way beneath the bridge over Piney Creek, and the additional 10 acres of buffer (as described in the *On-site Measures* below) in the vicinity of the mine, will be based on a planting plan approved by PGC that does not hinder safe highway design.



9. Up to \$75,000 is committed to monitor the effectiveness of conservation measures. The proposed monitoring consists of measuring air temperature and airflow in [REDACTED] identification and observation of roost trees with the highway footprint, and observation of artificial roost structures for three years (one pre-construction year, one construction year, and one year post-construction).

### Conservation Measures

Conservation measures represent actions pledged in the project description that the action agency or the applicant will implement to further the species' recovery. Such measures may be tasks recommended in the species' recovery plan, should be closely related to the action, and should be achievable within the authority of the action agency or applicant. The beneficial effects of conservation measures are taken into consideration in the Service's conclusion of jeopardy or non-jeopardy to the listed species, and in the analysis of incidental take. Such measures, however, must minimize adverse effects to listed species within the action area in order to be factored into the Service's analyses.

#### *On-site Measures:*

1. In coordination with the Service and PGC, two bat boxes will be erected in the project area, and up to 10 trees girdled under the proposed Piney Creek bridge, to promote roosting habitat.
2. In addition to the five acres of forest habitat included in the normal right-of-way directly beneath the Piney Creek Bridge, an additional 20 acres would be purchased and placed in a conservation easement, including 10 acres to the east of the bridge and 10 acres to the west of the bridge. This would serve as added buffer for the riparian habitat, and preserve riparian areas that the project proponents assume will be used as an Indiana bat travel corridor beneath U.S. 6219.

#### *Off-site Measures:*

1. The project proponents will attempt to acquire [REDACTED] if the private property owner is determined to be a willing seller. Failing this, they will attempt to extend the 20-acre conservation easement along Piney Creek, including the mine, through an agreement in perpetuity held between the property owner, PennDOT, and the Pennsylvania Game Commission. If purchase of the mine or expansion of the conservation easement that incorporates the mine are not achievable, the project proponents offer no other alternative conservation measure.
2. Mitigation being conducted to offset other resource losses may also eventually benefit Indiana bats. This includes 1) conservation of a 17-acre herbaceous meadow approximately two miles from [REDACTED] 2) preservation of a 540-acre Meadow Run fen approximately [REDACTED] in Maryland, and 3) replanting of 50 acres of land in Maryland, as required by the Maryland Reforestation Law to offset forest removal along that part of the roadway in Maryland.



## Action Area

The proposed project will include construction, operation, and maintenance of a new section of limited-access highway. The “action area” is defined by regulation as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action [50 CFR §402.02]. The action area is not limited to the “footprint” of the action, nor is it limited by the federal agency’s authority. The U.S. 6219 project is a long, linear project that cuts across waterways, forests, agricultural land, residential areas, and barren land. Indiana bats are known to hibernate in a cave/defunct limestone mine complex known as S [REDACTED] which is located approximately 1,100 feet east of the proposed roadway (Figure 1).

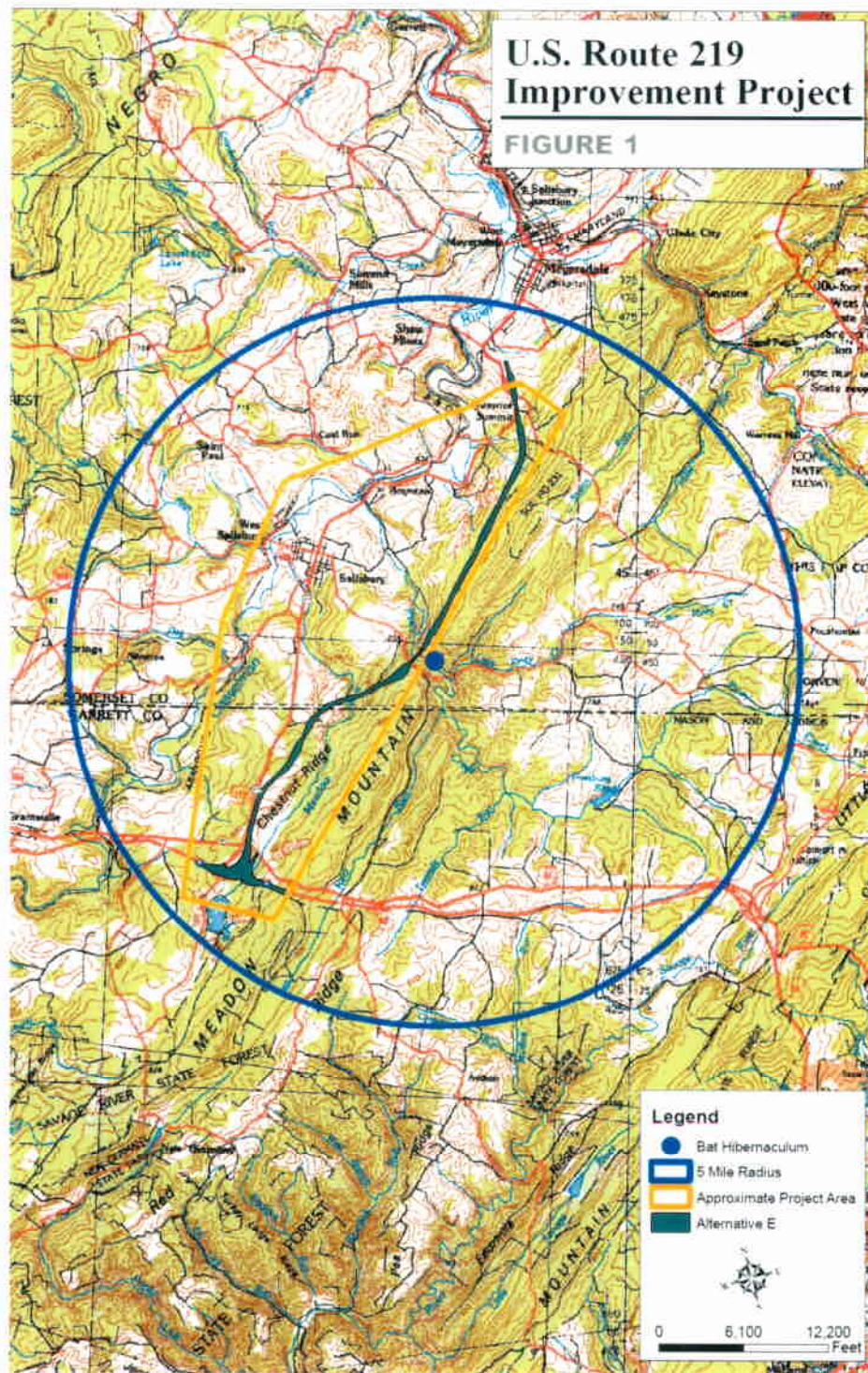
The action area includes the paved roadway surface, median, developed roadway shoulders, maintained road-cut slopes, and areas that are affected by roadway-induced noise, runoff, invasive species, and changes in vegetation patterns. Forman and Deblinger (2000) found that the ecological effects area along a studied section of Massachusetts Route 2 was highly irregular. In that study, the habitat area affected by the road was documented to average just over 990 feet wide on each side of the road; however, sensitive forest-interior bird populations were reduced at more than twice this distance, up to 2,100 feet from the road. Indiana bats are ecologically similar to forest-interior bird species in that they depend on forest habitat for foraging and roosting, although their home ranges may be significantly larger. For the purpose of this opinion, we have defined the action area as 1,500 feet on each side of the pavement (*i.e.*, the mean of the two distances above).

Much of the roadway alignment contains forested land that is potentially suitable as Indiana bat maternity foraging and roosting habitat. The disturbances occurring within the action area may overlap maternity colony foraging and roosting habitat that is centered up to two miles away on either side of the roadway. In addition, the action area nearly bisects the five-mile radius around [REDACTED]. As a consequence, potential Indiana bat maternity, summer roosting, spring staging and migration, fall swarming, and fall foraging and roosting areas could be affected through direct alteration, fragmentation, or isolation induced by the new roadway, and subsequent traffic use, as explained in the *Effects of the Action* section below.

## STATUS OF THE SPECIES

The Service listed the Indiana bat (*Myotis sodalis*) as endangered pursuant to the Endangered Species Preservation Act on March 11, 1967 (32 *Federal Register* 4001). Listing was warranted based primarily on large-scale habitat loss and degradation, especially at winter hibernation sites, and significant population declines. Critical habitat for the Indiana bat was designated on September 24, 1976, and consisted of 11 caves and two mines in West Virginia, Tennessee, Kentucky, Illinois, Indiana, and Missouri (41 FR 41914). Approximately 75 percent of the Indiana Bat population is thought to hibernate in the 13 hibernacula designated as critical habitat. The original recovery plan for the species (USFWS 1983) identified winter disturbance as a factor in the species decline, and ranks hibernacula based upon Indiana bat population sizes at the various sites. Hibernacula are designated as Priority 1, 2, or 3. Priority 1 hibernacula are sites with a recorded population >30,000 Indiana bats in a given survey since 1960 (although two of these sites currently have extremely low numbers of bats); Priority 2 hibernacula have





**Figure 1.** Map depicting the location of [REDACTED] (“Bat Hibernaculum”); the 5-mile habitat radius likely used by the associated Indiana bats for swarming, staging, foraging, and roosting; the proposed roadway alignment (“Alternative E”); and the area studied by the project proponents for alignment selection. Figure adapted from FHWA’s February 20, 2007, amended biological assessment.



recorded populations >500 but <30,000 Indiana bats in a given survey since 1960; and Priority 3 hibernacula have <500 bats (USFWS 1983).

### Species Description

The Indiana bat is a temperate, insectivorous, migratory bat that hibernates in mines and caves in the winter, and summers in wooded areas. The species was first differentiated from the related little brown bat (*Myotis lucifugus*), and described as a new species by Miller and Allen (1928), based on museum specimens collected in 1904 from Wyandotte Cave in Crawford County, Indiana. Because of the relatively recent recognition of the species, historic population characteristics have been reconstructed from early historical accounts and the study of bat remains in caverns in the eastern United States. Indiana bats appear to have been “one of the most common mammals in the Eastern United States” (Tuttle *et al.* 2004).

### Life History

The Indiana bat’s annual life cycle consists of hibernation, spring migration, birthing (parturition), raising of young by females (lactation), fall migration, mating (swarming), and hibernation. Each of these critical stages in this complex cycle is integral to the species survival and recovery. The following discussion provides a general overview of the life cycle of the Indiana bat.

Mortality between birth and weaning has been estimated at eight percent (Humphrey *et al.* 1977). Humphrey and Cope (1977) determined that female survivorship in an Indiana population of Indiana bats was 76 percent for ages one to six years, and 66 percent for ages six to 10 years; for males, survivorship was 70 percent for ages one to six years, and 36 percent for ages six to 10 years. The maximum ages for banded individuals were 15 years for females and 14 years for males. There are limited data available regarding current or historical survival rates for this species.

*Winter – Hibernation.* Hibernation facilitates survival during winter when prey (*i.e.*, insects) is unavailable. Indiana bats cluster and hibernate on cave and mine ceilings. Clusters of bats protect central individuals from temperature change and reduce sensitivity to disturbance. A majority of bats of both sexes hibernate by the end of November (by mid-October in northern areas) (Hall 1962; LaVal and LaVal 1980), but hibernacula populations have been observed to increase throughout the fall and even into early January (Clawson *et al.* 1980). Generally, Indiana bats hibernate from October through April (Hall 1962; LaVal and LaVal 1980), depending upon local weather conditions. Indiana bats often hibernate in the same hibernaculum with other species of bats, and are occasionally observed clustered with or adjacent to other species, including gray bats (*M. grisescens*), Virginia big-eared bats (*Plecotus townsendii virginianus*), little brown bats, and northern long-eared bats (Myers 1964; LaVal and LaVal 1980; Kurta and Teramino 1994).

The Indiana bat requires specific roost sites in caves or mines that attain appropriate temperatures for hibernation (Tuttle and Taylor 1994). In southern parts of the bat’s range, hibernacula trap large volumes of cold air, and the bats hibernate where resulting rock temperatures drop. In northern parts of the range, however, the bats avoid the coldest sites. In



both cases, the bats choose roosts with a low risk of freezing. Ideal sites are 50° F or below when the bats arrive in October and November. Early studies identified a preferred mid-winter temperature range of 39-46° F, but a recent examination of long-term data suggests that a slightly lower and narrower range of 37-43° F is more suitable for this species (Hall 1962; LaVal and LaVal 1980; LaVal *et al.* 1976). Only a small percentage of available caves meet this specialized requirement. Stable low temperatures allow the bats to maintain a low rate of metabolism and conserve fat reserves through the winter until spring (Humphrey 1978; Richter *et al.* 1993).

*Spring – Emergence, Staging and Migration.* Female Indiana bats emerge first from hibernation in late March or early April, followed by the males (Hall 1962). The timing of annual emergence varies across the species range, depending on latitude and annual weather conditions; however, most Indiana bats have left their hibernacula by late April (Hall 1962). Indiana bats in the [REDACTED] hibernaculum in northeastern New York have been observed to move in clusters towards the entrance as they ready for emergence in early April (S. von Oettingen, USFWS, personal communication). Males from the same hibernaculum have been observed leaving as late as the end of May. Approximately 200 miles south of the [REDACTED] at the Mt. Hope mine complex in New Jersey, peak spring emergence of females was documented in early April. No females were captured in mid-April and only a single female was captured at the end of April. Emergence of males peaked at the end of April (USFWS 2000). Exit counts from several hibernacula in southern Pennsylvania and [REDACTED] in Tucker County, West Virginia, suggest that peak emergence from hibernation is mid-April for these two areas (Butchkoski and Hassinger 2002a).

Although Indiana bats mate in the fall, egg fertilization and gestation do not begin until spring. Shortly after emerging from hibernation, females become pregnant via delayed fertilization from sperm stored in their reproductive tracts through the winter (Hall 1962; Cope and Humphrey 1977; LaVal and LaVal 1980; Ransome 1990). The period after hibernation but prior to spring migration is typically referred to as *staging*. During this staging period, which can last for as little as one day or as long as a few weeks, most female Indiana bats emerge and forage near their hibernaculum before migrating to their previous summer maternity areas to give birth and raise young. Data collected during a two-year spring migration study tracking females to their summer roost sites in the Lake Champlain valley of New York, and in a separate Vermont study, suggest that females do not remain in the area surrounding the hibernaculum after emerging from hibernation, but leave for summer habitat soon after emergence (Britzke *et al.* 2004).

Data indicate that the area within an approximate five-mile radius of a hibernaculum is important foraging and roosting habitat for the Indiana bat in the spring and fall, although males have been found almost 10 miles from hibernacula (USDA 2000). Indiana bat roost trees used in the spring and fall are similar in physical structure to those selected during the summer. Little or no information is available to determine habitat use and needs for the Indiana bat during migration.

In the core of their range, most pregnant Indiana bats migrate north for the summer (Gardner and Cook 2002), and exhibit a stronger homing tendency along a north-south axis, rather than east-west (Gardner and Cook 2002; NatureServe 2004). In the northeastern part of their range, Indiana bats have been documented to migrate in other directions. In the Lake Champlain Valley of New York and Vermont, female Indiana bats migrated east and southeast to their summer



habitat. In Pennsylvania, Indiana bats migrated south-southeast to their summer habitat (Butchkoski and Hassinger 2002a).

Females dispersing from a Kentucky hibernaculum in the spring moved 4 to 10 miles within 10 days of emergence, eventually traveling more than 300 miles from the hibernaculum to the maternity area (Gardner *et al.* 1996; Gardner and Cook 2002). However, maternity colonies have also been located within 2 to 25 miles of hibernacula (Butchkoski and Hassinger 2002a; Britzke *et al.* 2004). As previously discussed, migration is stressful for pregnant Indiana bats, particularly in the spring when their fat reserves and food supplies are low. In the northeastern part of their range, female Indiana bats that migrate shorter distances maximize energy reserves by arriving at their summer habitat quickly (Britzke *et al.* 2004).

Colder spring temperatures in the northeast sometimes force the bats into temporary torpor, although some females were observed switching roosts when nighttime temperatures were below freezing. Cold temperatures also increase the likelihood of mortality. Adult mortality is thought to be highest in late March and April (Tuttle and Stevenson 1977). Springtime temperatures were unusually cold during a 2002 spring emergence study in New York, and two Indiana bats were found dead in or near their roosts (Britzke *et al.* 2004).

Less is known about the male migration pattern, but many males summer near hibernacula (Whitaker and Brack 2002). Some males disperse throughout the range and roost individually or in small numbers in the same types of trees and in the same areas as females.

*Summer – Roosting and Maternity Colony Formation.* Upon emergence from hibernation in the spring, the specific summer roosting behavior differs between males (and non-reproductive females) and reproductively active females, although actual roosting habitat is similar (Gardner *et al.* 1991b).

Some adult male Indiana bats form colonies in caves in summer, but most are solitary and roost in trees, often remaining near hibernacula to roost and forage in mature forest. Movements of 2.5 to 10 miles have been reported in Kentucky, Missouri, and Virginia (Gumbert *et al.* 2002; Hobson and Holland 1995; 3D/International 1996), while other males leave the area entirely. Solitary roosting Indiana bats do not appear to be as selective of roosts (*e.g.*, they may use smaller trees with fewer crevices, less exfoliating bark, *etc.*) as are reproductively active females attempting to rear young.

In contrast to males and non-reproductively active females, pregnant females migrate to specific locations to group into maternity colonies. Females begin to arrive in their maternity habitat as early as April 15 in Illinois (Gardner *et al.* 1991a, Brack 1983). Indiana bats were found at known maternity areas by March 29 at a site in Indiana (J. Whitaker, Indiana State University, personal communication). Humphrey *et al.* (1977) determined that Indiana bats first arrived at their maternity roost in Indiana in early May, with substantial numbers arriving in mid-May. The colonial behavior of the species likely reduces thermoregulatory costs, which in turn increases the amount of energy available for birthing and the raising of young (Barclay and Harder 2003). The number of bats comprising a maternity colony is difficult to determine because colony members are often dispersed among various roosts (Kurta, in press). While most of the documented maternity colonies have contained 100 or fewer adult bats (Harvey 2002), as



many as 384 bats have been reported emerging from one maternity roost tree in Indiana (L. Pruitt, USFWS, personal communication). Based on results from 12 studies compiled by Kurta (in press), the mean maximum emergence count after young began to fly is 119 bats. This information suggests 60-70 adults in a primary roost and a similar number of young at any one time.

Indiana bats exhibit site fidelity to their traditional summer maternity areas. This life history strategy is thought to provide an advantage to the species by increasing the probability of successful reproduction. Evidence of philopatry (the tendency of a migrating animal to return to a specific location to breed or feed) is based on the documentation of female Indiana bats returning to the same general area to establish maternity colonies from year-to-year (Humphrey *et al.* 1977; Gardner *et al.* 1991a, b; Callahan *et al.* 1997; Indianapolis Airport Authority 2003, 2004; Kurta and Murray 2002; Butchkoski and Hassinger 2002b; Gardner *et al.* 1991a, Gardner *et al.* 1996), and to the same roost tree as long as that tree is available.

The occurrence of Indiana bats in any particular location within the range of the species may be governed by the availability of suitable roost structures, primarily standing dead or live trees with loose bark (Carter 2003; Kurta *et al.* 2002; Kurta *et al.* 1993a; 3D/E 1995; Gardner *et al.* 1991b). The suitability of any tree as a roost site is determined by 1) its condition (dead or alive); 2) the quantity of loose bark; 3) the tree's solar exposure and location in relation to other trees; and 4) the tree's spatial relationship to water sources and foraging areas. Indiana bats utilize interstitial spaces within trees, or parts of trees, as roost sites. For example, roosts have been found in tree cavities or hollow portions of tree boles (Gardner *et al.* 1991a; Kurta *et al.* 1993b); a crevice in the top of a lightning-struck tree (Gardner *et al.* 1991a); and splintered, broken tree tops (Kurta, *et al.* 1996; Callahan *et al.* 1997; Gardner *et al.* 1991b; Garner and Gardner 1992). The often dead or damaged conditions of roost trees indicate that suitable roosts are ephemeral resources. Indiana bats are probably not dependent on the continued suitability of a specific tree, as long as adequate roosting opportunities are available nearby. Indiana bats have been documented to have the ability to relocate after the loss of a roost tree (Kurta *et al.* 2002).

Indiana bats select roost trees based on structural characteristics, diameter of the tree, solar exposure, and position in the canopy (Kurta *et al.* 2002; 3D/E 1995). Maternity roost trees throughout the species' range apparently share these characteristics. Roost tree structure is probably more important than the tree species in determining whether a tree is a suitable roost site (Farmer *et al.* 1997). Maternity roosts are generally found in dead or dying trees with exfoliating bark, or live trees of species with exfoliating or shaggy bark, such as hickories and white oaks.

Occasionally, female Indiana bats have been observed to roost in crevices or tree cavities, but maternity colonies are rarely found in these situations (Menzel *et al.* 2001). Maternity roost trees generally receive a high amount of solar exposure, either because they are larger canopy trees, or are located near forest edges or openings (Callahan *et al.* 1997; Menzel *et al.* 2001). Solar exposure at northeastern maternity colonies may be a more important factor in roost tree selection than for colonies in the southern part of the range.

Indiana bat maternity roosts can be described as "primary" or "alternate," depending upon the proportion of maternity colony members using the roost site (Callahan *et al.* 1997; Kurta *et al.*



1996). Most primary roosts are found in large, dead trees, generally ranging in size from 12.2 to 29.9 inches dbh (3D/E 1995). Maternity colonies have at least one primary roost (up to five have been identified for a single colony in Vermont) used by the majority of the bats throughout the summer. Primary roosts must be able to provide a roosting site for many female Indiana bats with young. Primary roosts are often located in openings or at the edge of forest stands, while alternate roosts can be in the open or in the interior of forest stands. Thermoregulatory needs are likely to be a contributing factor in roost site selection, and primary roosts are generally in locations where they can be warmed by solar radiation, thus providing a favorable microclimate for growth and development of young.

Alternate roosts tend to be more shaded, frequently are within forest stands, and are selected when temperatures are above normal or during periods of precipitation. Shagbark hickories seem to be particularly good alternate roosts because they provide cooler roost conditions during periods of high heat, and their tight bark shields bats from rainfall (Callahan *et al.* 1997). In Vermont, maternity roosts ranged from 19 inches to 36 inches dbh (Palm 2003, Britzke *et al.* 2004). Alternate roost trees also tend to be large, mature trees, but the range in size is somewhat wider than that of primary roosts (7.1 to 32.7 inches dbh) (3D/E 1995). A colony's alternate roost trees are typically used less frequently, and by smaller numbers of bats.

A variety of suitable roosts are needed within a colony's summer range for the colony to continue to exist. Gardner *et al.* (1991), and Garner and Gardner (1992) suggested the optimal density of potential roost trees within an area is 6.9 per acre in uplands, and 10.9 per acre in floodplains. Most roost trees may be habitable for only 2 to 8 years (depending on the species and condition of the roost tree) under natural conditions. Gardner *et al.* (1991b) evaluated 39 roost trees and found that 31 percent were no longer suitable the following summer, and 33 percent of those remaining were unavailable by the second summer. The presence of live, large-diameter trees within a forested area is important to the long-term sustainability of the area as Indiana bat habitat, since these trees will eventually die and develop the characteristics of primary maternity roosts.

Humphrey *et al.* (1977) observed that each night after the sunset peak of foraging activity, the bats left the foraging areas without returning to the day roosts, which indicated the use of "night" roosts. When young are present, but not yet volant (capable of flight), the female bats will return occasionally throughout the night, presumably to care for the young.

Maternity colony movements among multiple roosts, particularly from primary roosts to alternate roosts, seem to depend on weather changes, particularly in solar radiation (Humphrey *et al.* 1977) or precipitation. Maternity movement between primary roosts from season to season is dependent upon roost availability. Kurta *et al.* (1993a) suggests movement between roosts is an adaptation for dealing with roost sites that have ephemeral qualities such as loose bark. The bat that is aware of alternate roost sites is more likely to survive the sudden, unpredictable destruction of its present roost than the bat that has never identified such an alternative (Kurta *et al.* 2002; Kurta and Murray 2002).

The coordinated relocation of a maternity colony is only known to occur in a slow, methodical manner, into familiar habitat (Kurta *et al.* 2002). In a Michigan study, the focal point of a maternity colony's activity shifted 1.24 miles over a three-year period after the primary roost tree



fell. The area that bats shifted into had been previously used by a single radio-tracked female for roosting during the summer prior to loss of the primary roost tree (Kurta *et al.* 2002). This is consistent with a number of other situations where the primary roost tree of a maternity colony had been lost and the bats moved to nearby roosts but retained the same commuting corridors and foraging areas (Humphrey 1977; USFWS 2002). Although Carter (2003) recognizes that female Indiana bats are faithful to a colony site, he suggests that, in the long term, Indiana bat maternity colonies must be “nomadic” because of their dependence on an ephemeral resource. Despite this theory, there is no evidence to suggest that bats are able to adapt to a sudden, abrupt loss of familiar gathering places and familiar roosting and foraging habitat. The availability and quality of adjacent habitat is also important to the maintenance of a maternity colony (USFWS 2004c).

After grouping into maternity colonies, females give birth to a single offspring in June or early July (Easterla and Watkins 1969, Humphrey *et al.* 1977). Belwood (2002) documented asynchronous births among members of a colony resulting in great variation in size of juveniles (newborn to almost adult size young) in the same colony. In Indiana, lactating females have been recorded from June 10 to July 29 (Whitaker and Brack 2002). Young Indiana bats are capable of flight within a month of birth. Young born in early June have been observed to be flying as early as the first week of July (Clark *et al.* 1987), others from mid- to late July.

When young become capable of flight (early to late July), the maternity colony begins to disperse from the primary maternity roost(s). Bats become less gregarious and the colony utilizes more alternate roosts, possibly because there is no longer a need for the adult females to cluster to assist with thermoregulation and nurture the young (Indianapolis Airport Authority 2003, 2004). The use of primary maternity roosts diminishes, though the bats stay in the area prior to migrating back to their respective hibernacula.

*Summer – Foraging.* After Indiana bats emerge from hibernation, fat stores become further depleted as they migrate to their summer maternity areas. Fat stores in most bat species decline rapidly during hibernation (Fleming and Eby 2003), and migration can subsequently use between 10 and 25 percent of a bats’ body weight in fat reserves (Fleming and Eby 2003). Upon arrival at summer maternity habitat, bats must restore their body weight and increase their food intake to prepare for giving birth. Reproductively active bats need to elevate this biosynthesis to support pregnancy and lactation (Speakman and Thomas 2003). For example, basal metabolism of pregnant and lactating brown long-eared bats (*Plecotus auritus*) is nearly double that of non-reproducing individuals (Speakman and Thomas 2003). Furthermore, the foraging efficiency of bats declines during pregnancy, which is a time when energy demands increase (Barclay and Harder 2003). Female little brown bats spend 66 percent of their daily energy on foraging (Barclay and Harder 2003).

Streams, associated floodplain forests, and bodies of water (*e.g.*, ponds, wetlands, reservoirs) are preferred foraging habitats for pregnant and lactating Indiana bats, some of which have been observed to fly up to 1.5 miles from upland roosts (Gardner *et al.* 1991b). In riparian areas, Indiana bats primarily forage near riparian and floodplain trees (*e.g.*, sycamore [*Platanus occidentalis*], cottonwoods [*Populus* spp.], black walnut [*Juglans nigra*], black willow [*Salix nigra*], and oaks [*Quercus* spp.]), and along forest edges on the floodplain (Belwood 1979; Cope *et al.* 1978; Humphrey *et al.* 1977; Clark *et al.* 1987; Gardner *et al.* 1991b). Within floodplain



forests where Indiana bats forage, canopy closures range from 30 to 100 percent (Gardner *et al.* 1991b). Cope *et al.* (1978) characterized woody vegetation within a width of at least 30 yards of a stream as excellent foraging habitat. Indiana bats also forage within the canopy of upland forests, over clearings with early successional vegetation (*e.g.*, old fields), along the borders of croplands, along wooded fencerows, and over farm ponds in pastures (Clark *et al.* 1987; Gardner *et al.* 1991b). Seidman and Zabel (2001) documented the use of intermittent and perennial streams by bats to forage. While this did not include Indiana bats, four of the seven species studied were of the genus *Myotis*. Sparks *et al.* (in press) suggest that in heavily forested landscapes, the edges of open spaces provide important foraging habitats.

Linear distances between roosts and foraging areas for females ranged from between 0.3 mile to 5.2 miles, although most distances were less than half that maximum distance (Murray and Kurta 2004; Sparks *et al.* in press). The maximum distance listed above was reported for one individual at a colony in Indiana. However, when 41 bats from this colony were tracked, the mean distance between roosting and foraging areas was 1.86 miles. Given the large and variable range of this species, large differences in home ranges would be expected, and the variations in distances to foraging areas might be due to differences in habitat type, interspecific competition, and landscape terrain.

Roosts occupied by individuals ranged from 0.33 mile to more than 1.6 miles from preferred foraging habitat, but are generally within 1.2 miles of water (*e.g.*, stream, lake, pond, natural or man-made depression). In Illinois, the mean nightly foraging distance from a roost ranged from 0.34 mile to 0.65 mile (Garner and Gardner 1992). Average foraging areas for individual Indiana bats varied from approximately 70 acres (juvenile males) to over 525 acres (post-lactating adult females) (A. King, personal communication). The extent of foraging area used by an Indiana bat maternity colony has been reported to range from a linear strip of creek vegetation 0.5 mile in length (Belwood 1979; Cope *et al.* 1978; Humphrey *et al.* 1977), to a foraging area 0.75 mile in length, within which bats flew over the river or around riverside trees. The mean foraging area of three individual, reproductive female Indiana bats was 128 acres (pregnant), 232 acres (lactating), and 526 acres (post-lactating) (Garner and Gardner 1992). In Illinois, foraging area for a lactating female was reported to be 850 acres, while a post-lactating female that had been subject to timbering activities used 625 acres (Gardner *et al.* 1991a, b).

Maternity colonies have often been found within forests that are streamside ecosystems or are otherwise within 0.6 mile of permanent streams. Garner and Gardner (1992) suggested that suitable Indiana bat roosting and foraging habitat will be within 0.62 mile of water. Indiana bat roosts in Illinois were less than 0.68 mile from perennial streams (Gardner *et al.* 1991). Kurta *et al.* (2002) found that 38 roosts in Michigan were on average  $0.409 \pm 0.36$  mile from lakes or ponds and  $0.258 \pm 0.45$  mile from perennial streams. These water sources and associated forested riparian habitat not only provide drinking water and food, but also serve as flight corridors to suitable foraging habitat. A telemetry study in Illinois found most maternity roosts within 1640 feet of a perennial or intermittent stream (Hofmann 1996). Bats in Illinois selected roosts near intermittent streams and far from paved roads (Garner and Gardner 1992).

Sparks *et al.* (in press) suggest that the perfect foraging habitat for the Indiana bat would include forested streams interspersed with grasslands, croplands, or shrublands. 3D/E (1995) identified essential summer habitat as including at least 30 percent forested cover on a landscape scale.



Farmer *et al.* (1997) indicated that optimal summer habitat has 20 to 60 percent forest cover, and that areas with less than five percent forest cover are not suitable for Indiana bats.

Because most Indiana bats caught in mist-nets are captured over streams and other flyways at heights greater than six feet (Gardner *et al.* 1989), it is believed that Indiana bats usually forage and fly within an air space from six to 100 feet above ground level (Humphrey *et al.* 1977), although because sampling at more than 100 feet above ground level is uncommon, predicted flight heights maybe an artifact of sampling.

Indiana bats feed solely on aquatic and terrestrial flying insects (Brack and LaVal 1985; Kurta and Whitaker 1998; Belwood 1979; USFWS 1983). They are habitat generalists and their selection of prey items reflects the environment in which they forage (LaVal and LaVal 1980). Because of the large and variable distribution of the Indiana bat (Gardner and Cook 2002; Brack *et al.* 2002), it is not surprising that differences in foraging habitat have been recorded between different parts of the summer range, or between bats in maternity habitat and those near hibernacula. For example, in the southern part of the range, terrestrial prey (moths and beetles) are more common in the tree canopy where Indiana bats have been observed to forage, predominantly near treetops (Brack and LaVal 1985). In the northern part of the range, where foraging areas are more limited to riparian zones, aquatic prey dominates the diet.

Diet varies seasonally and variation is observed among individuals of differing age, sex, and reproductive status (Belwood 1979). It is likely that Indiana bats use a combination of both selective and opportunistic feeding to their advantage (Brack and LaVal 1985). Reproductively active females and juveniles exhibit greater dietary diversity than males and non-reproductively active adult females, perhaps due to higher energy demands. Studies in some areas have found that reproductively active females eat more aquatic insects than do juveniles or adult males (Kurta and Whitaker 1998), and this may be the result of habitat differences (Brack and LaVal 1985). Differences in habitat availability and competition with other species may be two explanations for such seasonal or geographic differences in selection of foraging habitat (Sparks *et al.*, in press). Preliminary analysis of data collected in Pennsylvania (Butchkoski and Hassinger 2002a), Missouri (Romme *et al.* 2002), and Indiana (Sparks *et al.*, in press) show no clear association between size of foraging area and sex, age, or reproductive class. It is apparent that Indiana bats show fidelity to foraging areas between years by bats in different reproductive classes (Sparks *et al.*, in press).

Drinking water is essential when bats actively forage. Throughout most of the summer range, Indiana bats frequently forage along riparian corridors and obtain water from streams. However, ponds and water-filled road ruts in the forest uplands are also very important water sources for Indiana bats.

*Fall – Swarming.* Indiana bats begin to return to their respective hibernacula as early as August. Females from the same maternity colony do not necessarily go to the same hibernaculum. Breeding takes place and fat reserves are replenished as bats congregate at hibernacula and prepare for hibernation. Racey (1982) notes that a particular ratio of fat to lean mass is normally necessary for puberty and the maintenance of female reproductive activity in mammals. He suggests further that the variation in the age of puberty in bats is due to nutritional factors, possibly resulting from the late birth of young and their failure to achieve threshold body weight



in their first autumn. Once puberty is achieved, reproductive rates frequently reach 100 percent among healthy bats of the family Vespertilionidae, and young, healthy female bats can mate in their first autumn as long as their prey base is sufficient to allow them to reach a particular fat to lean mass ratio. Limited mating activity occurs throughout the winter and in late April as the bats leave hibernation (Hall 1962).

In the fall, male Indiana bats tend to roost and forage in upland and ridgetop forests, but also forage in valley and riparian forests. Movements of 1.8 to 4.2 miles from hibernacula have been reported in Kentucky and Missouri (Kiser and Elliott 1996; 3D/International 1996).

Upon arrival at hibernation caves in August through September, Indiana bats "swarm," a behavior in which "large numbers of bats fly in and out of cave entrances from dusk to dawn, while relatively few roost in the caves during the day" (Cope and Humphrey 1977). Very little is known about behavior and habitat use by Indiana bats during the fall, and what little is known is based primarily on observations of males.

Swarming continues for several weeks (August through October) and mating occurs during the latter part of this period. Fat supplies are replenished as the bats forage prior to hibernation. Indiana bats tend to hibernate in the same cave around which they swarm (LaVal *et al.* 1976), although swarming has occurred in caves other than those in which the bats hibernated (Cope and Humphrey 1977). Male Indiana bats sometimes make several stops at multiple caves during the fall swarming period. During swarming, males remain active over a longer period of time at cave entrances than do females (LaVal and LaVal 1980), probably to mate with the females as they arrive. The time of highest swarming activity in Indiana and Kentucky has been documented as early September (Cope and Humphrey 1977). After mating, females enter directly into hibernation.

During the fall, when Indiana bats swarm and mate at their hibernacula, male bats roost in trees nearby during the day and fly to the cave at night. In Kentucky, Kiser and Elliott (1996) found male Indiana bats roosting primarily in dead trees on upper slopes and ridgetops within 1.5 miles of their hibernaculum. During September in West Virginia, male Indiana bats roosted within 3.5 miles in trees near ridgetops, and often switched roost trees from day to day (Ford, *et al.* 2002). Fall roost trees tend to be exposed to sunshine rather than shaded (Menzel *et al.* 2001).

#### Status of the Indiana bat within its Range

Due to the colonial nature of Indiana bats, conducting censuses of hibernating bats is the most reliable method of tracking population/distribution trends range-wide, and provides a good representation of the overall population status and distribution. As such, winter distribution of the Indiana bat is well documented.

Between 1960 and 2004, a 56 percent population decline was documented (Clawson 2002). A variety of factors have contributed to the range-wide Indiana bat population decline, including flooding and ceiling collapse in winter hibernacula (USFWS 1983). This often resulted in adverse changes to the hibernaculum microclimate by affecting temperature and humidity. Other documented causes of Indiana bat decline include 1) blocking cave entrances or installing gates that do not allow for bat ingress and egress, or disrupt cave airflow; and 2) human disturbance



during hibernation. These events resulted in either die-off during hibernation due to freezing, or starvation as the higher temperatures increased the bats' metabolism. This can result in the burning of limited fat reserves that are required for the bats to survive hibernation and successfully emerge in the spring. Indiana bats do not have the ability to awake from hibernation, leave the cave, forage for additional sustenance, and return to the cave to complete hibernation. If fat reserves are not sufficient, they will starve.

Because of the importance of hibernacula to Indiana bats, protection of hibernacula has always been a management priority. Despite the protection of approximately half of the major known hibernacula (Currie 2002), range-wide population declines continue. In the last fifteen years, appropriately constructed bat gates have been correctly installed at cave entrances, allowing for protection of hibernating bats and restoration of the microclimate. Although most of these efforts were completed by 1990 and resulted in some recolonization of traditional hibernacula, there have not been corresponding overall population increases (Clawson 2002). Possible reasons for this may be due to the species' low reproductive capacity, since it takes much longer than 10 to 20 years to show population gains, or other environmental factors that continue to adversely affect the species. A hypothesis for population declines is that warmer winter temperatures have resulted in less conducive micro-habitat conditions (warmer temperatures) at hibernacula, particularly in the southern part of the species range (R. Clawson, Missouri Department of Conservation, personal communication).

It should be noted that hibernating populations in northern portions of the species range appear to be stable or increasing, while hibernating populations in the south are decreasing. However, because of the migratory behavior of this species and other reasons described below, it is not prudent to differentiate between different geographical ranges with regard to wintering populations. The range-wide decline has led scientists to conclude that additional information on Indiana bat summer habitat is needed (3D/E 1995).

In contrast to hibernacula, relatively few Indiana bat maternity colonies have been documented. The location of most maternity colonies will likely remain unknown due to the difficulty in detecting maternity activity for the Indiana bat. This places these colonies at risk when land use practices, such as timber harvesting and development, are carried out. Therefore, another likely cause for the species decline is reductions in the size or number of maternity colonies due to habitat loss.

Land use practices have been identified as a suspected cause in the decline of the Indiana bat, particularly because habitat in the Indiana bats' maternity range has changed dramatically from pre-settlement conditions. The majority of old-growth forests have been harvested, and remaining forests fragmented to varying degrees. In addition, fires have been suppressed, prairies have been replaced with agricultural systems, native plants have been replaced with exotics, and plant community diversity has been reduced. These changes reduce the quantity and quality of suitable roosting habitat, and the diversity and abundance of insects on which Indiana bats prey (USFWS 1983; Kurta and Murray 2002; Kurta *et al.* 2002; McCracken 1988; Racey and Entwistle 2003).

In addition to changes in Indiana bat summer habitat over time, there is also an increased risk of pesticide contamination (Clark *et al.* 1987; Clawson 1987; Garner and Gardner 1992; Callahan *et*



*al.* 1997; 3D/E 1995; O'Shea and Clark 2002; Kurta and Murray 2002). Insecticides have been known or suspected as the cause of a number of bat die-offs in North America, including endangered gray bats in Missouri (Mohr 1972; Reidinger 1972; Clark and Prouty 1976; Clark *et al.* 1978). The insect diet and longevity of bats also exposes them to persistent organochlorine chemicals that may bioaccumulate in body tissue and cause sub-lethal effects, such as impaired reproduction (O'Shea and Clark 2002).

### Status of the Indiana Bat in Pennsylvania

In Pennsylvania, Indiana bats use a variety of subterranean areas for hibernation, including limestone caves, mines (limestone, anthracite coal), and a tunnel. Potential summer habitat occurs throughout Pennsylvania, and maternity colonies have been recently documented in four counties.

*Hibernating Population.* There are 17 known Indiana bat hibernacula in Pennsylvania. The largest concentration of hibernating Indiana bats is found in the J.D. Hartman Mine, Blair County. This is the State's only Priority 2 hibernaculum, and it currently supports about 1,000 Indiana bats representing 90 percent of Pennsylvania's hibernating Indiana bat population (PGC 2002, 2003). The winter Indiana bat population trend in Pennsylvania differs from the range-wide trend, in that Pennsylvania numbers appear to be stable or increasing. The increase at these sites apparently followed efforts to prevent disturbance through gating and, in some cases, by implementing predator control measures.

*Summer Population.* Four Indiana bat maternity colonies have been identified in Pennsylvania. They occur in Blair, Bedford, Berks, and Greene Counties. The Blair County site was identified in 1997 near Canoe Creek State Park. The Bedford and Berks County sites were located during spring migration telemetry studies, which tracked bats exiting a tunnel in Somerset County (2007) and an abandoned coal mine in Luzerne County (2006), respectively. The Greene County site was found during mist-netting in 2007.

In the spring of 2005, the Pennsylvania Game Commission placed transmitters on six female Indiana bats emerging from the [REDACTED]. Two of these bats were successfully tracked to destinations in Carroll County, Maryland, where roost-tree exit counts have confirmed the presence of a maternity colony at each of the two sites. The two Maryland sites are approximately 84 and 92 miles, respectively, to the southeast of the [REDACTED] (C. Butchkoski, Pennsylvania Game Commission, personal communication).

While some spring telemetry studies have led to the discovery of maternity colonies, others have not. In the spring of 2000, four Indiana bats were tracked from a railroad tunnel used as a hibernaculum in Somerset County. These bats were lost when transmitter power stopped, although one female bat was tracked eastward for 60 miles before being lost (Sanders and Cheng 2000). In 2007, Indiana bats were tracked from a limestone mine in Armstrong County. These bats traveled southwest, around Pittsburgh, before being lost in the West Virginia panhandle on a trajectory to southern Ohio or Kentucky (C. Butchkoski, personal communication).



Individual male Indiana bats have also been captured during mist-net surveys at two sites in or near the Allegheny National Forest. However, mist-netting in subsequent years failed to locate Indiana bats at either location.

#### Previous Incidental Take Authorizations

All previously issued Service biological opinions involving the Indiana bat have been non-jeopardy. These formal consultations have involved 1) the Forest Service for activities implemented under various Land and Resource Management Plans on National Forests in the eastern United States, 2) the Federal Highway Administration for various transportation projects, 3) the U.S. Army Corps of Engineers (Corps) for various water-related projects, and 4) the Department of Defense for operations at several different military installations. Additionally an incidental take permit has been issued under section 10 of the Endangered Species Act to an Interagency Taskforce for expansion and related development at the Indianapolis Airport in conjunction with the implementation of a habitat conservation plan.

It is important to note that in many of these consultations, survey information was lacking. As federal agencies are not required to conduct surveys, often the Service relied on a host of factors in helping the federal agency determine whether Indiana bats may be present. To ensure the federal agency and the Service met the mandate of section 7(a)(2), if the best available data indicated that Indiana bats may be present, the assumption was made that a maternity colony (in most instances) occurred within the action area. Although this approach meets the intent of Congress and the Endangered Species Act of 1973, it likely resulted in an overestimate of the number of individuals or colonies that may have been affected by federal actions.

Nearly all National Forests within the range of the Indiana bat have requested formal consultation at the programmatic level. Approximately 95 percent of previously authorized habitat loss on National Forests has not been a permanent loss. Rather, it has been varying degrees of temporary loss (short-term and long-term) as a result of timber management activities. Conservation measures implemented by the Forest Service as part of the proposed action, as well as reasonable and prudent measures provided by the Service to minimize the impact of the annual allowable take for each of the National Forests, have ensured an abundance of available remaining Indiana bat roosting and foraging habitat on all National Forests, and the persistence of any known or newly discovered maternity colonies.

The remaining incidental take statements have been issued to other federal agencies, including the Federal Highway Administration. Unlike those issued for National Forest land and Resource Management Plans, some of these projects were certain to affect habitat known to be occupied. To minimize the effects of the projects, the action agencies agreed to implement various conservation measures. These included seasonal clearing restrictions to avoid disturbing female Indiana bats and young; protection of all known primary and alternate roost trees with appropriate buffers; retention of adequate roosting and foraging habitat to sustain critical life history requirements of Indiana bats in the future; permanent protection of habitat; and habitat enhancement or creation measures to provide future roosting and foraging habitat.

With the exception of three (Fort Knox, Great Smoky Mountains National Park, and Laxare East and Black Castle Contour Coal Mining Projects), none of these biological opinions and



associated incidental take statements anticipated the loss of a maternity colony or hibernaculum. We believe most of the take exempted to date has resulted in short-term effects to Indiana bat habitat and in limited circumstances, Indiana bat maternity colonies. As many of these consultations necessarily made assumptions about Indiana bat presence, we are uncertain of the actual number of maternity colonies exposed to environmental impacts of federal actions throughout the species' range, but we believe the actual number is likely less than what we have assumed. Furthermore, although not definitive, monitoring of several maternity colonies pre- and post-project implementation preliminarily suggests that our standard conservation measures, when employed in concert, appear to be effective in minimizing adverse effects on the affected maternity colonies.

## ENVIRONMENTAL BASELINE

The environmental baseline includes the past and present impacts of all federal, State, or private actions and other human activities in an action area, the anticipated impacts of all proposed federal projects in an action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions that are contemporaneous with the consultation in process (50 CFR 402.02).

[REDACTED] (Winter)

[REDACTED] is a defunct limestone mine cut into a natural cave system formed in the limestone of the Mississippian Mauch Chunk Formation. The entrance is located approximately half a mile north of the Pennsylvania/Maryland state border. It is the hibernaculum for a small number of Indiana bats. [REDACTED] is a privately-owned Priority 3 hibernaculum (*i.e.*, <500 bats), and is one of 17 identified Indiana bat hibernacula in Pennsylvania, eight of which are in limestone mines.

The PGC has monitored Indiana bat use of [REDACTED] by conducting mid-winter counts of the bats in 1986, 1991, 1999, and in March 2005. In 1986, only 315 bats of all species were counted, and no Indiana bats were recorded. [REDACTED] two entrances were gated in October 1992 by PGC and volunteers from the Loyalhanna Grotto, with partial funding from the Service to limit access to the Mine. In addition to three Indiana bats counted in 2005, more than 2000 other bats were counted (Pennsylvania Game Commission, unpublished data). The mine is used by all six cave-hibernating bat species in Pennsylvania, which in addition to the Indiana bat, also includes a small number of eastern small-footed myotis (*Myotis leibii*), a species that is listed as threatened by the Commonwealth of Pennsylvania (Pennsylvania Game Commission, unpublished data). Based on this diversity, [REDACTED] is listed by the Pennsylvania Biological Survey as one of two *Important Mammal Areas* in Somerset County (Western Pennsylvania Conservancy 2005).

Due to the complex nature of the mine and cave passages, only about 90 percent of the mine is accessible. It is estimated that up to 15,000 bats hibernate here (Western Pennsylvania Conservancy 2005), including perhaps a few dozen Indiana bats (C. Butchkoski, Pennsylvania Game Commission, personal communication). The inaccessibility of part of the mine may, in part, account for the fluctuations in survey numbers of the overall bat population, particularly if bats move into or out of the less visible areas from year to year. However, even considering the



fluctuations, it appears that the bat population, including the number of Indiana bats, has increased following gating. From the limited available data, it appears that the small Indiana bat hibernating population in Salisbury Mine is stable, if not gradually increasing.

In addition to [REDACTED] the assessment describes a 2005 study of 28 additional mine openings in the project area. These were assessed for bat use as part of the U.S. 6219 project. Only four of these mines appeared to have potential for bat use. Harp traps set at the entrances of these four mine openings resulted in the capture of up to 29 bats, and the higher numbers may indicate a fairly large hibernating bat population. An opening identified as “mine 1” is located approximately 1,000 feet east of the northern-most section of the proposed roadway alignment. Twenty-six bats representing three species were collected at this opening, including little brown bats (*Myotis lucifugus*), long-eared bats (*Myotis septentrionalis*), and eastern pipistrelles (*Pipistrellus subflavus*). No Indiana bat activity was documented at Mine 1, but at low densities detection would be unlikely with limited sampling. Because Indiana bats have not been documented at this location, no avoidance measures have been proposed, although if this mine is occupied by Indiana bats, the effects of roadway construction and operation would be similar to those expected at [REDACTED]

#### Foraging and Roosting (Spring, Summer and Fall)

Aside from harp traps placed at four mine openings in the study area described above, there appears to have been no past efforts to assess Indiana bat activity in the action area during spring emergence/migration or fall swarming at [REDACTED]. In the absence of direct documentation of Indiana bats in the area (e.g., mist net or radio-telemetry survey data), the project proponents are assuming that the species is in the action area all year. This assumption is supported by data from other sites in Pennsylvania, where survey data indicate Indiana bats may migrate large distances from a hibernaculum in the spring (e.g., more than 70 miles) or may remain relatively close to the hibernaculum, establishing maternity colonies only a few miles away (e.g., approximately one mile from the hibernaculum in Blair County, and approximately 10 miles from the hibernaculum in Bedford County). These colonies include bats from the nearby hibernaculum, but may also include individuals that migrated from more distant hibernacula, perhaps as far as 300 miles away.

*Spring – Habitat Use and Migration.* Relatively little is known about habitat use by Indiana bats during the spring and fall periods. Pre- and post-hibernation activity is expected to occur within five to 10 miles of a hibernaculum (USFWS 1983; Romme *et al.* 2002), an area that for the [REDACTED] hibernaculum encompasses the entire proposed U.S. 6219 project. Those bats leaving the hibernaculum in early spring probably stay relatively near the mine until migration and then quickly leave the area. Since 2001, spring radio-tracking of female Indiana bats leaving several different Pennsylvania hibernacula have documented that individuals tend to quickly leave the area of the hibernaculum, unless their maternity habitat is nearby.

Some adult males use mature forests near their hibernacula for roosting and foraging from spring through fall. Other male bats have been found to leave the hibernaculum area completely (USFWS 1999b). Male Indiana bats have been found to use the same summer habitat in subsequent years (USFWS 1999b).



*Summer – Maternity Colonies.* There have been no surveys completed in the action area to identify maternity colonies; therefore, there is no direct information regarding potential colony size, location, or land use. The best scientific and commercially available information regarding maternity colonies in central Pennsylvania come from two nearby maternity colonies, one associated with the Hartman Mine (Canoe Creek) hibernaculum in Blair County and the other associated with the Pennsylvania Turnpike Tunnel hibernaculum in Somerset County. Both of these hibernacula, and associated maternity colonies, are in an ecological setting that is similar to the setting of the action area. These hibernacula and [REDACTED] are situated in the Appalachian Ridge and Valley Province, with the hibernacula located on the ridge face and the maternity colony in the adjacent valley. While some female Indiana bats from Hartman Mine and the Turnpike Tunnel remain in the vicinity to establish nearby maternity colonies, it is not clear if individuals from other hibernacula join these colonies. Indiana bats that hibernate in [REDACTED] may similarly remain in the valley adjacent to the mine and be joined by individuals migrating to the Casselman River Valley from other locations during the summer. Based on the above information it is reasonable to presume that a maternity colony may be present in the project area.

*Summer – Non-maternity Habitat Use.* During summer months, it is likely that some males that hibernate in [REDACTED] remain near the mine and forage in riparian areas (including Piney Creek, Meadow Run, the Casselman River and wetlands associated with these systems), pastures, forests, and on ridge tops. Male Indiana bats generally travel between 1.2 and 2.6 miles from their summer roosts to summer foraging areas (USFWS 1999b), and have a minimum foraging area of about 400 acres, surrounding a higher use area of 115 acres (Kiser and Elliott 1996). Roost trees are expected to be primarily dead snags; however, live shagbark hickory and pignut hickory (*Carya glabra*) trees have been recorded as roost trees. Male Indiana bats have been found to roost singly during autumn in scarlet oak (*Quercus coccinea*), Virginia pine (*Pinus virginiana*), red maple (*Acer rubrum*), shagbark hickory, and red oak. These trees ranged in diameter from 4.6 to 26 inches, with an average diameter of 13 inches, and had bark coverage ranging from 1 to 100 percent. However, the majority of roost trees had bark coverage of at least 60 percent (Kiser and Elliott 1996). During the fall, male bats have been observed to forage in upland, ridgetop forest as well as valley and riparian forest areas (USFWS 1999b).

*Fall – Habitat Use.* There have been no direct observations of fall foraging, swarming, or roosting activity in the action area. Therefore, the following discussion is based on observations made regarding the species habitat use and behaviors in other locations, since this represents *the best scientific and commercially available information*.

Habitat use during the fall probably varies somewhat from year to year due to weather conditions, prey availability, and the proximity and quality of available roosts. Early in the period, the bats are likely to have a larger range and spend little time day-roosting in the mine. As cooler temperatures become more common, the animals are likely to become more dependent on [REDACTED], particularly females that enter hibernation soon after mating. During October, male Indiana bats have been observed to travel 0.89 to 1.5 miles from the hibernaculum to forage (Kiser and Elliott 1996), although a male Indiana bat in Pennsylvania was observed to travel approximately nine miles from its hibernaculum to foraging areas (C. Butchkoski, PGC, personal communication).



During cool weather, warmer air rises in the evening, thereby providing a seasonal temperature refuge at higher elevations that can support insect populations for a longer period into the fall. Indiana bats, particularly males that remain active later in the season, are thought to use the ridgetops and higher slopes increasingly through the fall (LaVal and LaVal 1980; C. Butchkoski, PGC, personal communication). This effect would be most pronounced near landscape features that tend to absorb and later slowly release heat, as compared to other surrounding habitat. Unfortunately, neither mist-netting nor radio-tracking has been conducted following the maternity period to determine where foraging and roosting habitat is located for local resident Indiana bats or bats returning in the fall.

## EFFECTS OF THE ACTION

"Effects of the action" refers to the direct and indirect effects of an action on listed species or critical habitat, together with the effects of other activities interrelated and interdependent with that action, which will be added to the environmental baseline. The Endangered Species Act defines indirect effects as those caused by the proposed action and that are later in time, but are still reasonably certain to occur (50 CFR §402.02). Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration.

The effects of the action depend, to a great extent, on the reaction of Indiana bats to changes in their environment. Most of the effects of the U.S. 6219 project are indirect effects, occurring after construction and while the new road is in operation. Below we have deconstructed the U.S. 6219 project into its various components, and outlined the anticipated direct and indirect impacts and their effects on Indiana bats. Where the project proponents have proposed relevant Indiana bat avoidance and minimization measures, these are listed in italics and considered herein.

### Effect on Salisbury Mine and Hibernating Bats

[REDACTED] nearly bisecting the potential foraging and roosting habitat within five miles of the hibernaculum (Figure 1). Construction of the proposed project will require blasting to create the desired road grade. The assessment indicates that this may require earth excavation of 100 feet or more, depending on the location along the alignment. Using explosives to blast through rock in karst areas can disturb or kill bats swarming, hibernating or staging in nearby caves and mines. Blasting may cause cave and mine ceilings to collapse, which could directly kill hibernating bats or trap them inside. Blasting that results in partial cave or mine collapse would also alter the airflow patterns and microclimates, which could make the cave unsuitable as an Indiana bat hibernaculum. Suitable mine/cave hibernacula are a non-renewable resource in limited supply.

Investigations conducted as part of the development of the biological assessment indicate the passageways of the mine/cave complex generally run parallel to the new roadway alignment. None of the identified passageways run beneath the proposed roadway alignment. The assessment concludes that any shear waves induced by blasting during road construction will have negligible or no adverse impact on the hibernaculum, which is located slightly more than 1,000 feet from the limit of earth disturbance. Shear waves will be monitored as described in



Appendix F of the biological assessment, with prior plan approval by PennDOT, PGC, and the Service.

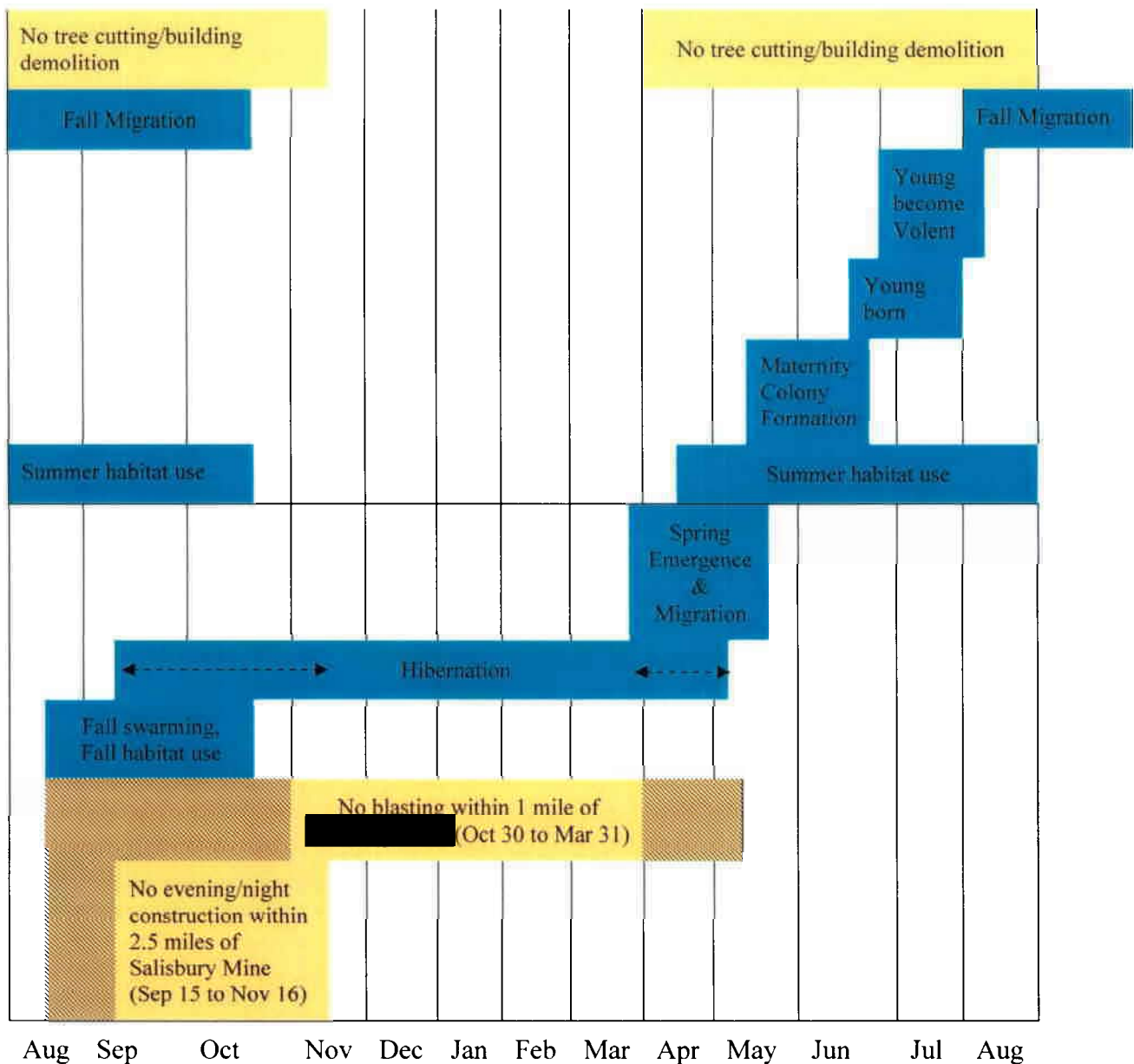
To minimize impacts to hibernating bats, seasonal blasting restrictions will be used. The project proponents have committed to *no blasting within one mile north or south of [REDACTED] between October 30 and March 31*. These seasonal blasting restrictions do not encompass the entire period that bats are likely to be present in or near [REDACTED]. As described above, Indiana bats are likely to begin returning to the mine in August to engage in fall swarming. During this period, bats are expected to fly in and out of the hibernaculum, and roost and forage in nearby forests within approximately five miles of the mine entrance. As the season progresses, the bats are expected to day roost closer to the mine entrance, and begin roosting in the mine as colder nights become more frequent.

The project proponents have committed that *no construction activities will occur within 2.5 miles of [REDACTED] from one-half hour before sunset to one hour after dawn from September 15 to November 16*, when Indiana bats are believed to be engaged in fall swarming in the vicinity of [REDACTED]. Again, this seasonal restriction fails to encompass the entire period fall bat activity is likely to be centered on [REDACTED] and does not extend to the entire habitat area where Indiana bats are likely to be active during the period covered (see Figure 2).

Based the commitment to control blasting according to PGC guidelines, and to monitor the effect of blasting on [REDACTED] we anticipate that bats hibernating between November 1 and March 31 will experience minimal or no direct effects from roadway construction. No construction is proposed during the night (*i.e.*, one-half hour before sunset to one hour after dawn) from September 15 to November 16 within 2.5 miles of [REDACTED] thus reducing the direct effect of construction on fall swarming, foraging, and night-roosting near the mine entrance. However, the proposed blasting restrictions are not likely to avoid harm or harassment of any Indiana bats that roost or forage near blasting from spring through early fall within five miles of the mine, nor those that forage and roost farther than 2.5 miles from the mine. Blasting near day roosting bats may disturb the animals enough that they have to relocate. These effects may be temporary in nature, causing bats to move away from the disturbance, or may result in avoidance or abandonment of foraging or roosting areas during the period of blasting.

Individual Indiana bats may enter, and remain in, the hibernaculum prior to October 30, particularly during colder than normal years. As depicted in Figure 2, Indiana bats may enter the hibernaculum as early as September. Bats that enter hibernation in September or October, when the proposed seasonal blasting restriction will not be in effect, may be disturbed when blasting occurs in the vicinity of the mine. Blasting within a mile of the mine may cause the bats to awaken and relocate within the mine. As a result, they would expend energy reserves unnecessarily, leading to an increased risk of mortality or reduced reproductive fitness. It is also possible that blasting in September and October will cause some bats to abandon [REDACTED] as their hibernaculum. Relocation to an alternate site late in the season will increase the risk of mortality if the bats are unable to locate an another hibernaculum, or if they are unable to restore lost energy reserves prior to re-entering hibernation at a new location.





**Figure 2.** The annual life cycle of the Indiana bat (depicted in blue), and proposed seasonal avoidance measures (depicted in orange without shading). Dotted arrows indicate periods when Indiana bats transition to and from hibernation; this is influenced by local weather conditions. Diagonal shading indicates time periods when project activities will be undertaken without seasonal restrictions that would minimize adverse effects on Indiana bats.



Seasonal restrictions on blasting within one mile of the hibernaculum would end March 31. As with blasting and construction in September and October, blasting and construction in April and early May might harass or harm Indiana bats in the mine, which is particularly likely during a colder than normal spring season. Blasting in proximity to the mine (*i.e.*, within one mile) may prematurely induce the bats to move within the mine, causing them to expend valuable energy reserves. These animals may fail to reproduce successfully or fail to reach maternity colonies later in the spring, dying enroute. The bats may also abandon Salisbury Mine when outside weather is harsh and increased risk of mortality is likely.

The biological assessment concludes that the predicted noise levels at the mine due to roadway operation “would not differ substantially, if at all, from the existing noise levels” and would not affect Indiana bats. Although there are existing secondary roads within 1,000 feet of [REDACTED] these are limited use roads compared to the proposed U.S. 6219, and therefore have substantially different vehicle use patterns and environmental effects than would the proposed limited-access interstate highway. Indiana bats appear capable of becoming habituated to the nearby presence of traffic in at least some settings, and during particular life history stages.

With the exception of the Pennsylvania Turnpike, we could find no examples of major roadways in proximity to the entrance to known Indiana bat hibernacula. At the Pennsylvania Turnpike site, the hibernaculum entrance is situated above a tunnel, and traffic noise comes from one direction and is limited in duration as traffic either approaches or leaves the area under the hibernaculum entrance. The entrance to this hibernaculum is located above the roadway before it enters a tunnel and is therefore located at one edge of the predicted five-mile foraging and roosting area. Although little information is available regarding bat flight paths from the tunnel, the bats entering and leaving the hibernaculum can avoid crossing the highway in several directions. The presence of the U.S. 6219 project, passing approximately 1,100 feet from the entrance to [REDACTED] may have limited effects on Indiana bats utilizing [REDACTED] during spring staging and fall swarming if suitable foraging and roosting habitat remain available. However, if the species is unable to become habituated to the presence of the roadway, significant and permanent loss of this habitat may result. If the area surrounding [REDACTED] becomes unavailable during the spring and fall, those bats unable to find alternate hibernacula will likely die.

#### Effect on Bats During Summer and Fall

*Loss of Foraging and/or Roosting Habitat.* The proposed roadway alignment will physically remove four percent (375 acres) of the potential foraging and roosting habitat within a five-mile radius of Salisbury Mine. The biological assessment concludes that this only represents a small amount of habitat loss relative to what is present in the area. The assessment further concludes that this amount of foraging habitat loss would not be expected to cause any adverse impacts on the Indiana bat, and that highway construction will “open-up” the forest canopy, potentially promoting optimal Indiana bat roosting habitat. Finally, the assessment concludes that mitigation required by the State of Maryland to compensate for forest removal (*i.e.*, planting of 72 acres of trees to replace lost forest habitat) will reduce the long-term forest loss due to the project to two percent within five miles of [REDACTED]. The project proponents speculate that this level of forest loss would “not be expected to cause any adverse impacts on the Indiana bat.” When considering the indirect effects of the project on bats associated with [REDACTED] we



considered the impact of road operation near the mine entrance, and the impact the road would have on bats that may need to traverse the road in spring or fall.

Removal of a roost tree or building roost while Indiana bats are present would likely result in direct killing, injuring, or harassing of individuals or a colony. To avoid this potential, the project proponents propose to remove potential roost trees and buildings within the U.S. 6219 project area when the bats are hibernating. Therefore, *no forest clearing or building removal will occur between March 31 and November 16 within five miles of [REDACTED]* (includes the entire alignment). Based on these seasonal restrictions, we do not anticipate any direct Indiana bat mortality from felling of the trees or removal of buildings.

The degree to which roads influence the availability of potential roosting habitat is not clearly understood, and few examples exist of major roadways passing near Indiana bat hibernacula. Garner and Gardner (1992) report that Indiana bats select roosts near intermittent streams and far from paved roads, particularly adult females (pregnant, lactating, post-lactating) who rarely roosted within 1,640 feet of a paved road in Illinois, as compared to juveniles and males. However, in Michigan, Kurta *et al.* (2002) found no difference between roost trees and random points in distance to roads of any type. At the Indianapolis Airport, Indiana bats occur in an urban/suburb landscape near interstate highways, high volume secondary roads, and residential streets (D. Sparks, Indiana University, personal communication). In Pennsylvania, the primary maternity roost structure for the Canoe Creek maternity colony is located approximately 0.4 mile from the roadway, and alternate day roosts were found 1,000 to 3,000 feet from the nearest road. The hibernaculum at Hartman Mine in Blair County is more than a mile from S.R. 22. In nearby Bedford County, an Indiana bat hibernaculum is located within 1,000 feet of the Pennsylvania Turnpike.

Bridge and road construction is likely to increase local disturbance due to noise, and the presence of activity to which bats have not become habituated. Most identified Indiana bat roosts are located away from roadways. During construction, day-roosting bats near construction areas are likely to relocate to avoid construction-related noise and activity. *The construction contractor will be required to ensure that equipment is maintained properly and has functioning mufflers to minimize noise. The contractor will also be required to follow Pennsylvania Department of Environmental Protection Rules and Regulations, Title 25, to minimize air quality effects.* The noise during construction is likely to result in harassment to one or more Indiana bats; however, this effect is expected to be temporary and localized.

*Fragmentation/Isolation of Foraging and/or Roosting Habitat.* The biological assessment concluded that only four percent of potential foraging habitat will be lost within the roadway footprint (only two percent, long-term). This estimate is only meaningful if one presumes that all potentially available habitat within five miles of [REDACTED] is used by Indiana bats. Although Indiana bats have been observed traveling five miles or more between their hibernaculum and foraging and roosting habitat, it is unlikely that the species uses all potentially suitable habitat. Similarly, it is unlikely that the species disperses evenly over habitat within five miles of a hibernaculum.

The entrance to [REDACTED] is located above the valley floor on the slope of Meadow Mountain. The mine entrance is positioned between the proposed roadway and summit of



Meadow Mountain. The proposed roadway will pass to the west of the mine entrance, nearly bisecting habitat within a five-mile radius of the hibernaculum. Indiana bats that hibernate in [REDACTED] and currently forage or roost in habitat to the west of the proposed road alignment will either have to traverse the road or become separated from nearly 50 percent (approximately 25,000 acres) of the total area within five miles of the mine. If they cross the road, but fail to cross under the proposed bridge, their risk of mortality will increase due to collisions with vehicles. If they abandon foraging and roosting habitat due to the presence of the new road, they will have to establish themselves in other suitable habitat and potentially face increased competition with other bats adopting the same strategy. This may lead to decreased reproductive success or an increased risk of mortality.

A minimum threshold, or optimum amount of fall swarming, foraging, and roosting habitat has yet to be defined for Indiana bats. However, we assume that Indiana bats are more likely to have their foraging and roosting needs met if their hibernacula are immediately surrounded by large, relatively undisturbed contiguous tracts of mature and over-mature forest, as opposed to small, highly fragmented woodlots interspersed with agriculture, commercial, and residential areas. Because the U.S. 6219 project is linear in shape, loss of forest habitat in any particular area important to the bats is minimized as compared to the effects that might be anticipated due to clearing of large blocks of forest. However, the gap that the road will create in the forest canopy has the potential to act as a barrier, separating the mine from roosting and foraging areas, as well as separating roosting and foraging areas currently located on opposite sides of the roadway.

The assessment concludes that Indiana bats will be able to cross safely along the Piney Creek riparian corridor by passing under the bridge proposed over the creek and Greenville and Piney Run Roads. Any bats that fail to cross under the bridge at the desired location must either fly over the highway, forage on Meadow Mountain, or cross the mountain to forage and roost in the opposite valley, assuming that habitat on the ridge and in the eastern valley is suitable and accessible to the species.

Landscape connectivity is the degree to which the landscape facilitates animal movement and other ecological flows (Forman *et al.* 2003). The effect of a road acting as a barrier will likely take several wildlife generations to be observed (Forman *et al.* 2003). Those animals not able or willing to cross the road will be forced to use less desirable habitat, which in turn may reduce reproductive vigor and success. Ultimately, increased mortality will result. Such effects will be difficult to detect, since the adult may survive but fail to reproduce successfully. Ensuring habitat connectivity between roosting and foraging areas is necessary to maintain suitable habitat conditions for Indiana bats. *Permanently protected plantings along stream corridors* will have a secondary, long-term benefit to water quality, since the plantings will provide a vegetated buffer that will reduce runoff and associated sedimentation from adjoining roadways, commercial/industrial developments, and agricultural areas. In the long term, mitigation plantings will provide a diverse woodland that is well stocked with species of trees that are known to provide Indiana bat roosting habitat.

Many species of bat, including the Indiana bat, follow tree-lined travel corridors (sometimes only a single tree in width) to reach foraging habitat, rather than cross wide, open areas (Carter 2003; Chenger 2003; Gardner *et al.* 1991b; Murray and Kurta 2004). Indiana bats roosting at the Indianapolis Airport sometimes appear to cross a multi-lane interstate highway, but may actually



be passing under the approximately 50-foot high interstate highway bridge, following the forested stream corridor in the sparsely forested, low topographic relief landscape (D. Sparks, Indiana University, personal communication). Bach *et al.* (2004) provided observations that document bats of several species traveling under bridges to cross roadways in Germany; however, no information was provided regarding the landscape conditions, locations of bat roosts and foraging areas, or, significantly, whether bats also crossed over the roadway surface as well. Kiser *et al.* (2002) documented Indiana bats night-roosting under bridges in Indiana.

There have been no observations made regarding current Indiana bat (or surrogate bat species) travel patterns to and from Salisbury Mine. There have also been no studies to identify important spring and fall foraging and roosting areas. During both fall and spring, Indiana bat travel corridors, roosting patterns, and foraging habitat are likely shifting or adjusting in response to seasonal changes. If the bats behave as the project proponents hope, the long-term effects on the Indiana bat due to the presence and operation of the U.S. 6219 project may be minimal. However, those Indiana bats that do not both perceive and use the safe passage under the Piney Creek bridge will experience an increased risk of mortality from vehicle strikes if they cross over the road. They may also avoid crossing and becoming restricted to the eastern side of the roadway and to Meadow Mountain. Any bats that fail to reach suitable foraging areas may be unable to forage sufficiently prior to entering winter hibernation, and will subsequently die or experience reduced reproductive success.

The U.S. 6219 project is a limited-access highway that will have a new effect on Indiana bats that hibernate, roost, and forage in the vicinity of the road. This is an area dominated by forest, with some low-use, rural roadways, and the proposed highway represents a substantial change in the landscape. If the bats do not habituate to the presence of the highway and ongoing disturbance associated with highway operation, they may abandon the site as a hibernaculum. Chronic individual and population effects on Indiana bats in response to highway-induced effects (*e.g.*, noise, air quality changes, and invasive plant introduction) have not been investigated and cannot be ruled out. The actual behavioral response of the bats to the presence of the proposed road and, therefore, the resulting extent of effects to Indiana bats associated with Salisbury Mine, are difficult to predict. These effects could range from temporary and not measurable to significant alterations in behavior and survival.

As described above under *Environmental Baseline – Maternity Colonies*, no surveys have been conducted in the action area to identify maternity colonies. Therefore, the best scientific and commercially available information are that 1) Indiana bats maintain maternity colonies in central Pennsylvania forests; 2) suitable roosting and foraging habitat occur in the action area; and 3) maternity colonies have been identified within 10 miles of two other central Pennsylvania hibernacula (Blair County, and just north of the action area in Somerset County) within an ecological setting similar to the action area. Based on this information, it is reasonable to presume that a maternity colony may be present in the project area.

The U.S. 6219 project may indirectly affect any Indiana bat maternity colonies located in the vicinity of the road corridor. The seasonal restriction on tree-cutting and building removal will avoid mortality due to those project effects. The effect of habitat loss will be similar to that discussed in relation to the hibernaculum. The actual acreage of forest removal from any individual maternity colony's foraging and roosting habitat is an important factor to consider, but



in terms of Indiana bat viability, it is not just the amount of forest that influences the fitness of Indiana bats but also the function of the habitat. For example, the loss of a single tree could have substantial impacts if alternative roosts are not available, while the loss of multiple acres of forest may have only minimal impact if a sufficient amount of suitable alternate habitat is accessible. The paramount factors are the specific ecological functions that the area serves for Indiana bats, such as travel corridor, roosting habitat, or foraging habitat.

The assessment concludes that because the proposed roadway alignment avoids the forest edges, the opening created in the tree canopy will expose the forest interior to sunlight and consequently promote maternity roosts in exposed trees. Indiana bat management, rather than promoting forest openings, seeks to enhance habitat in the long term by providing forest habitat, improving connectivity among blocks of existing habitat, and creating larger blocks of forest habitat. We believe that increased maternity activity adjacent to the U.S. 6219 project is unlikely in any case because Indiana bats appear to avoid roosting near roadways. Further, attempting to induce roosting near an interstate highway, if successful, may result in increased Indiana bat mortality. This threat would extend not only to resident individuals, but also to future generations and new colonizers, potentially creating a population sink. Indiana bats are not expected to roost in isolated trees (*i.e.*, trees that are not part of, or connected to, a larger forested area via a tree-lined linear flight corridor) (Murray and Kurta 2004; Gardner *et al.* 1991b; Verboom and Huitema 1997; Carter 2003; Cheng 2003; Winhold *et al.* 2005).

As was described above, the conclusion in the biological assessment is that Indiana bats that must cross the roadway will do so by traveling along Piney Creek, and they will fly under the new 175-foot high and 1,500-foot long bridge spanning Piney Creek and two adjacent roads. This pathway is potentially available to those bats whose foraging and roosting areas are located close to [REDACTED]. This travel corridor may also be available to any maternity colonies whose habitat spans the roadway within approximately two miles of the bridge. Individual Indiana bats whose home ranges are not in proximity to the Piney Creek bridge are unlikely to detect this crossing. Even if they did detect the crossing, they are not likely to use it due to the increased energetic costs associated with a longer commuting distance to use the bridge.

Once forest clearing is completed, maternity colony foraging and roosting habitat may no longer be available due to fragmentation, or it may be reduced in quality and/or quantity when the bats return the following spring. The effects on bats are anticipated to be minimal when maternity habitat lies entirely or largely outside of the U.S. 6219 project corridor. A maternity colony whose home range areas are only marginally fragmented by the road corridor may be able to shift their foraging and roosting habitat to avoid the most severe effects of the presence of the roadway, and not have to cross the road during the maternity season. However, Indiana bats with a significant amount of maternity habitat on each side of the proposed alignment will probably be forced to use habitat on only one side of the alignment. Indiana bats in this situation will be disconnected from habitat due to the project (*i.e.*, loss of a suitable travel corridor), and can be expected to expend an increased amount of energy to establish new commuting patterns and/or home ranges. Due to the species site fidelity, members of maternity colonies that lose habitat at this level may continue to attempt to roost and forage in the vicinity despite the existence of insufficient habitat and the presence of the highway. Bats in this scenario could be harmed due to displacement from their home range, thereby incurring decreased fitness and reproductive success, and increased mortality. The potential range of effects on any maternity



colonies present in the action area will, therefore, range from temporary and transient to significant and permanent.

If the bats fail to travel along pathways that the project proponent hopes for, the result may be increased mortality from vehicle collisions, loss of vigor resulting from increased travel distance, or refusal to cross the roadway. Any bats traveling along the length of new roadway to get to the bridge crossing are at increased risk of a vehicle collision, and some will be traveling substantially greater distances as opposed to direct routes from roosting to foraging habitat that are present now. There are variable risks to the bats that follow each of the routes that involve increased risk of being hit by traffic, or substantially increased travel distance and energy expenditure.

The rate of wildlife successfully crossing a road decreases significantly with the upgrade of the road to accommodate greater traffic volume (Barnett *et al.* 1978; Reijnen *et al.* 1995; Mumme *et al.* 2000). Forman *et al.* (2003) found that the effect of road mortality on wildlife populations increases one or two generations after the road has been in place, and that animal mortality on roads is largely determined by the interactions between the structure of the road, structure of the nearby landscape, driver behavior and animal behavior.

The ability of an animal to avoid a traffic collision influences road mortality. Several investigators report that road and traffic experience reduces the probability of an individual animal being killed on the road; juveniles and inexperienced adults undergo a higher rate of mortality than experienced adults. Mumme *et al.* (1999) found that Florida scrub jays that immigrated to nesting areas near the road had a very high mortality rate during the first two years, but this dropped to equal the rate of birds not nesting near the road by the third year. A significant factor in the ability of an animal to avoid a traffic collision is the relative rate of traffic speed and animal speed. Slower traffic allows more time between when an animal perceives a vehicle as a threat and engages in avoidance behavior. Birds are more often hit by vehicles traveling at speeds of 50 mph or greater compared to those traveling less than 50 mph (Dhindsa *et al.* 1988; Erritzoe 2002). Indiana bats fly at about 10 mph (Butchkoski and Hassinger 2002a) between foraging areas and the maternity roost, and are a maneuverable species adapted to foraging in and over dense vegetation. Studies with captive bats have shown that they can avoid colliding with moving objects more successfully than stationary ones, presumably because their foraging habits program them to detect moving objects (Jen and McCarty 1978). However, as vehicle speed increases, bats are less likely to perceive a distant but rapidly approaching vehicle as a threat, and are less likely to have sufficient reaction time to avoid a collision once the threat is perceived. The proposed limited-access highway is likely to have posted speeds of 55 miles per hour or above. In addition, Lode (2000) found that wildlife deaths increased exponentially with increased traffic volume.

In summary, the risk factors most likely to influence bat mortality include traffic volume, traffic speed, the bats' flight behavior relative to the road and road-side vegetation, and the bats' need to cross the U.S. 6219 project corridor over the road rather than under the Piney Creek bridge. The proposed project will introduce traffic of a significantly increased volume and speed to the action area, and will nearly bisect habitat within a five-mile radius of [REDACTED] with a potentially impassable barrier. The Piney Creek bridge would only be available to any Indiana bat maternity colonies within approximately two miles of the bridge, because it wouldn't be energetically



feasible for colonies further than this to use the bridge location as a travel corridor. Therefore, if any colonies have home ranges divided by the project, habitat on the opposite side of the road will most likely be lost. We expect that few Indiana bats engaged in local foraging and roosting activity will attempt to cross over the roadway due to the 130- to 500-foot-wide expanse of paved or mowed habitat; therefore, the risk of individuals of the species being struck by vehicles and being killed is small and likely discountable<sup>1</sup>, based on the documented avoidance the species exhibits to crossing open areas, and the relatively low population density of Indiana bats that might need to cross. In contrast, Indiana bats migrating past the action area from other hibernacula are likely to do so well above the roadway, and are not expected to be at risk of predation or vehicle strikes above baseline conditions.

*Water Quality.* There will likely be temporary air and water quality changes during construction due to earth disturbance, associated runoff, and use of construction vehicles. Siltation resulting from construction may temporarily reduce aquatic insect abundance in Piney Creek, Meadow Run, and unnamed ephemeral tributaries to these streams. Spills of hazardous materials and soil erosion could occur during construction, and degrade the quality of both surface and ground water. Water quality effects on Indiana bats may be caused by alteration of the flying insect prey-base due to changes in the aquatic insect community, degradation of drinking water quality, and a less favorable environment in the hibernaculum if groundwater is degraded. The potential for adverse water quality impacts may be highest at the bridge crossing of Piney Creek and Meadow Run.

Surface water quality is an element that was not considered in the assessment, but one that may be degraded by the project. Implementation of the project will require the filling or alteration of wetlands and stream habitat by relocating or diverting streams through drainage structures. Sediment, herbicides, and other contaminants could affect water quality through erosion, vegetation management, and accidental spills during any phase of a project, from construction to operation. Insects associated with these aquatic habitats make up part of the diet of the Indiana bat; therefore, a change in water quality can affect the prey base of the species. Decreases in water quality through contamination and the destruction of wetlands and stream habitats may reduce the availability of aquatic insects, and reduce the availability or quality of suitable drinking sources.

Adverse effects on Indiana bats due to reductions in aquatic insect prey and drinking water sources could range from insignificant to a significantly impaired ability to feed. Of course, the level of impact on individual bats will vary depending upon the magnitude and duration of water quality impacts, and the availability of suitable foraging and drinking opportunities in the surrounding landscape. Moreover, the diet of Indiana bats is not restricted to aquatic insects, since they also forage on terrestrial insects. Their diet also appears to vary across the species range, as well as seasonally and with age, sex and reproductive-status (Murray and Kurta 2002; Belwood 1979).

---

<sup>1</sup> Discountable effects are those that are extremely unlikely to occur. Based on best judgment, a person would not: (1) be able to meaningfully measure, detect, or evaluate insignificant effects; or (2) expect discountable effects to occur.



Finally, substantial roadway cut and fill area proposed appears to be situated in the Pottsville Formation, which is typically composed of sandstone, shale, and coal, with limited calcareous deposits. Road building activities moving the large volumes of rock proposed can have an effect similar to coal mining. The Pottsville Formation has been responsible for production of acid mine drainage, and has the potential for acid production in the action area (Pennsylvania Geological Survey 2005). We anticipate that the response of Indiana bats exposed to decreased water quality will range from no response, to a temporary modification of foraging patterns, to avoidance. Acid drainage that enters the groundwater could also affect conditions in the hibernaculum. Although we anticipate that temporary reductions in water quality will not cause a decrease in fitness of individual Indiana bats, production of acidic drainage from cut and fill areas could result in reduced reproductive vigor or mortality.

#### Effects of U.S. 6219 Project Conservation Measures

In coordination with the Service and PGC, the project proponents propose to *construct two bat boxes in the project area, and girdle up to 10 trees under the proposed Piney Creek bridge* to promote roosting habitat. Evidence of Indiana bats using artificial structures is extremely limited, with only three cases of documented use by adult females (C. Butchkoski, PGC, personal communication). In these cases, bat boxes were installed in forest habitat near natural water sources where known roost trees or foraging areas were present. Indiana bat use of these structures was not noted for many years after installation (Carter 2002; Indianapolis Airport Authority 2004; Butchkoski and Hassinger 2002b; Kurta, in press). At the Six Points Interchange project in Indiana, approximately 3,000 artificial structures of various designs were installed to mitigate the loss of potential roost trees. The bats took between 9 and 10 years to begin using the bat boxes, and most of the structures were never used (D. Sparks, Indiana University, personal communication).

The assessment did not conclude that roost trees are limiting in the action area, nor that Indiana bat habitat would be enhanced by the creation of potential roost trees under the Piney Creek bridge. Based on the small number of trees involved, the beneficial effects of girdling trees to create roost trees are expected to be negligible.

Compensatory mitigation is being conducted to offset other resource losses, and some of this mitigation may also eventually benefit Indiana bats, including purchase of a 17-acre herbaceous meadow approximately two miles from [REDACTED] and the 540-acre Meadow Run fen approximately three miles south in Maryland. In addition, 72 acres of new forest will be created as required by the Maryland Reforestation Law to offset forest removal along the roadway. These habitats may eventually provide some foraging or roosting habitat, but they are not equivalent to large blocks of forest habitat needed by Indiana bats in areas under greatest threat from the project, which is the immediate vicinity of [REDACTED]. In addition, it will be decades before the 72 acres of new forest matures to the point that it will become suitable roosting and foraging habitat.

The project proponents will *attempt* to acquire [REDACTED] if the private property owner is determined to be a willing seller. Failing that, they state that they will *attempt* to extend the 20-acre conservation easement along Piney Creek to include the entrance to [REDACTED] through a conservation easement held in perpetuity between the property owner, PennDOT and the



Pennsylvania Game Commission. Aside from moving the alignment away from [REDACTED] long-term protection of the mine and surrounding forest habitat for swarming, foraging and roosting is the measure most likely to benefit Indiana bats. While most direct effects resulting from the U.S. 6219 project appear to have been avoided, indirect effects may be significant, particularly if the bats fail to use the passage under the Piney Creek bridge. The use of this passage is in large part contingent upon maintaining a forested corridor along Piney Creek; however, the project proponents do not have control over forest management options in this corridor unless purchase or easement of the corridor is accomplished.

Overall, the conservation measures proposed either do not fulfill a habitat need, or their implementation is speculative (*i.e.*, they may not occur) and cannot be factored into the effects analysis for the U.S. 6219 project.

### CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Endangered Species Act.

A number of residential developments are planned in the action area over the next 20 years. Although one of the stated project purposes is to spur economic development, the project proponents maintain that development will occur regardless of the project, and that development resulting due to the project will occur near interchanges to the north and south. Regardless of whether such development is induced by the presence of the new road, or coincidental, the effects of these non-federal actions must be considered with respect to the project.

Most of the forest lands within the action area are privately owned and vulnerable to timber extraction and other activities that may degrade or destroy habitat suitable for Indiana bats. The project proponents noted several residential developments, including one in proximity to [REDACTED]. The largest new growth area is the anticipated Highlands Residential Development to the east of the proposed new I-68 interchange in Maryland and extending to near the Pennsylvania border. The RJR Construction Residential Development project to the north of this is on 775 acres of land immediately adjacent to [REDACTED]. The assessment concludes that this 20- to 100-lot development would attempt to preserve forest as a “recreational subdivision”. Additional construction is expected near Meyersdale to the north, and near Salisbury, Pennsylvania, and Grantsville, Maryland.

Commercial and private timber harvesting and other tree-clearing is likely to continue, in addition to that which would be removed during construction of the U.S. 6219 project. The likely result is the loss, degradation and fragmentation of foraging and roosting habitat. Loss of additional forest near [REDACTED] to forestry and proposed residential developments, in addition to the presence of the U.S. 6219 Project, has the potential to significantly degrade bat habitat outside of [REDACTED] and hinder further recovery of Indiana bats at this site.



Finally, the roadway will increase access to the area. [REDACTED] in private ownership, with access granted to spelunkers and others. Repeated human disturbance of hibernating bats will also degrade habitat within the mine.

## CONCLUSION

After reviewing the current status of the Indiana bat, the environmental baseline for the action area, the effects of the proposed U.S. 6219 project, and the cumulative effects, it is the Service's biological opinion that the U.S. 6219 project, as proposed, is not likely to jeopardize the continued existence of the Indiana bat.

Critical habitat for this species has been designated at 11 caves and two mines in West Virginia, Tennessee, Kentucky, Illinois, Indiana, and Missouri. However, this action does not affect those areas. Consequently, no destruction or adverse modification of critical habitat is anticipated.

As indicated in the consultation history, the FHWA initially requested the Service's concurrence that the U.S. 6219 project was not likely to adversely affect Indiana bats. We were unable to agree with that determination due to 1) the proximity of the proposed roadway to a known Indiana bat hibernaculum, 2) the uncertainty regarding the potential project effects on any maternity colonies near or in the action area, and 3) seasonal restrictions during construction that only partially encompass the expected activity area or period when the species is likely to be present. The FHWA also did not estimate any incidental take of Indiana bats in their biological assessment, and through a series of assumptions regarding Indiana bat behavior and distribution, did not identify any aspects of the project that are likely to result in take of the species. The assumptions in the biological assessment are summarized below:

- Construction, operation, and maintenance of the proposed roadway section will have no effect on the suitability of [REDACTED] as an Indiana bat hibernaculum due to seasonal blasting restrictions, and tree and building removal restrictions that avoid direct take of Indiana bats.
- Construction, operation, and maintenance of the proposed roadway section will not create a barrier to Indiana bat travel corridors for bats moving to and from [REDACTED] to foraging and roosting habitat during spring or fall because the bats will use the riparian corridor under the Piney Creek Bridge.
- Construction, operation, and maintenance of the proposed roadway section may result in the removal of one roost tree in the project footprint. This may disturb (harass) the species. However, Indiana bat maternity colony activity along the roadway corridor has been avoided by avoiding forest edges and cleared agricultural fields and because suitable habitat exists elsewhere in the action area. Further, the bats will relocate to alternate habitat and utilize a travel corridor at Piney Creek bridge.
- Permanent loss of 375 acres of potential Indiana bat foraging habitat, including 208 acres due to forest clearing, will be offset by protection of 25 acres of habitat in the vicinity of the Piney Creek bridge to ensure long term protection of the travel corridor under U.S. 6219, Section 19. Additional mitigation required for other aspects of the project will



secure habitat that may eventually be suitable for Indiana bats in the action area, including the planned creation of 72 acres of forest in Maryland.

Many aspects of these assumptions are plausible, if perhaps optimistic. As considered under *Effects of the Action*, equally plausible scenarios are conceivable that would result in significant adverse affects to Indiana bats, resulting not only in take of the species, but also potentially eliminating it from [REDACTED] and maternity habitat. For the effects analysis presented in their biological assessment to remain valid, it is incumbent on the project proponents to ensure that their assumptions are realized through the implementation of conservation measures needed to support the assumptions, as confirmed through monitoring.

The U.S. 6219 project will permanently convert 375 acres of suitable Indiana bat foraging habitat, 208 acres of which is forested and suitable for roosting during the spring, summer, and fall. We anticipate that any Indiana bats that use this habitat will be harmed or harassed. There is currently no commitment to implement meaningful minimization and mitigation measures that might offset the indirect effects of habitat loss, and ensure long-term conservation of the species in the area. Therefore, we cannot factor these measures into the analysis of project effects.

Due to the seasonal restrictions on tree felling and building removal, we believe no reproductive females or young will be directly exposed to tree-felling activities or building demolition. Reproductive females returning to summer maternity ranges disturbed by the project may be indirectly affected, but as assumed in the assessment, if only a single roost tree is removed, we believe that the responses to this indirect exposure will be stress that leads to only a short delay in parturition.

Indiana bats engaged in fall swarming between August and October may be harassed or harmed by blasting within a mile of [REDACTED] and these individuals may temporarily or permanently avoid the area. The loss of [REDACTED] as an important hibernaculum would be significant for bat conservation in Pennsylvania. However, if the bats behave as the project proponents anticipate, we do not expect any perceivable losses. This depends on the bats finding and using safe passage under the Piney Creek Bridge to access sufficient suitable roosting and foraging habitat near the mine.

As such, we also do not anticipate any measurable reductions in the reproduction, numbers, or distribution of the species rangewide. Therefore, we believe the proposed action is not reasonably expected to appreciably reduce the likelihood of survival and recovery of the species.

### **INCIDENTAL TAKE STATEMENT**

Sections 4(d) and 9 of the Endangered Species Act, as amended, prohibit taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct) of listed species of fish or wildlife without a special exemption. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Harass is defined as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is any take of listed animal species



that results from, but is not the purpose of, carrying out an otherwise lawful activity conducted by the federal agency or the applicant. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered a prohibited taking provided that such taking is in compliance with the terms and conditions of this incidental take statement.

Because incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity, this Incidental Take Statement is valid only upon receipt by the applicant of all appropriate authorizations and permits from Federal, State and local permitting authorities. These permits/authorizations may include, but are not limited to, a permit under section 404 of the Clean Water Act from the Corps of Engineers; a section 401 Water Quality Certification and a Chapter 105 Dam Safety and Encroachment Permit from the Pennsylvania Department of Environmental Protection; and approved Erosion and Sedimentation Control Plans from the Somerset County Conservation District. It is incumbent upon the Service to make it clear to the FHWA and the applicant that the incidental take statement (along with its exemption from the section 9 prohibitions of the Endangered Species Act) is valid only upon receipt of all required permits and authorizations.

The measures described below are non-discretionary, and must be undertaken by the FHWA so that they become binding conditions of any funding, permits, and/or approvals, as appropriate, issued to PennDOT for the exemption in section 7(o)(2) to apply. The FHWA has a continuing duty to regulate the activity covered by this incidental take statement. If the FHWA 1) fails to require PennDOT, MDSHA, and their contractors to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit, authorization, or funding document; and/or 2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the FHWA, PennDOT and MDSHA must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR §402.14(I)(3)].

#### AMOUNT OR EXTENT OF TAKE

We anticipate that incidental take of the Indiana bat will be difficult to detect and quantify for the following reasons: 1) individuals are small; 2) Indiana bats form small (*i.e.*, 50 or fewer, to 100 individuals), widely dispersed colonies under loose bark or in cavities of trees; 3) only a portion of the Indiana bat population is likely to be visible during hibernaculum counts among thousands of bats of other species; 4) finding dead or injured specimens is unlikely; 5) the areal extent and density of the species' spring, summer, and fall population in the action area is unknown; and 6) some habitat, including the hibernaculum, is under private ownership, making monitoring the bat population dependent on access.

The Service anticipates that take in the form of harm and harassment (as defined in 50 CFR §17.3) will occur as a result of the direct and indirect effects of the proposed action. Due to the nature of the project, effects are not limited to the period of construction, but become permanent and ongoing with operation of the road. The extent of take will depend on the location of foraging and roosting habitat for Indiana bats associated with [REDACTED] and any maternity colony in the area.



Blasting and construction during the non-hibernation season could kill bats roosting in proximity to the disturbance, but we believe that this is unlikely because other disturbances prior to blasting are likely to drive the bats farther away. Blasting is likely to force any roosting bats, including any maternity colony present, to find an alternate roost, and may force the bats to abandon a roost in the area. Relocation to less suitable habitat may be a repeated occurrence on subsequent nights until that stage of construction is complete. This is expected to harm and harass all Indiana bats roosting near blasting and construction, potentially resulting in lower reproductive success, reduced vigor, and reduced individual survival.

The removal of approximately 375 acres of potential Indiana bat foraging habitat, including 208 acres of potential roosting habitat, will be permanent when it is converted to roadway pavement and associated cut and fill slopes. We expect that this conversion will result in take in the form of harm for all Indiana bats that had depended upon this habitat for use in spring, summer, or fall.

Tree and building removal associated with road construction may result in alteration of roosting and/or feeding activities by the bats (*i.e.*, the bats may have to fly farther to forage, or seek alternate roosts) or may disrupt travel corridors to the extent that the bats are forced to abandon the area altogether. All Indiana bats, whether engaged in spring staging, fall swarming, or maternity colony activity that fail to use the Piney Creek riparian corridor to access their foraging and roosting habitat to the west of the road will need to find alternate accessible habitats that don't require crossing the new road. Bats that both fail to use the Piney Creek bridge corridor and fail to find habitats to the east of the road will likely experience reduced reproduction or reduced survival.

As discussed in the "Cumulative Effects" section of this opinion, additional forest habitat in and around the action area, particularly near [REDACTED], is expected to be lost due to future development and timber operations. These effects, in combination with the road, may continue to alter viable Indiana bat travel corridors and access to available habitat. Failure to maintain suitable travel corridor habitat under the Piney Creek bridge would result in loss of more than 25,000 acres west of the proposed roadway, substantially increasing the adverse effects of the project beyond what was considered in the biological assessment. While this could result in the loss of [REDACTED] as a hibernaculum, we anticipate that either the travel corridor under the bridge will be used, or bats will adjust their foraging and roosting areas in response to the new road. *Therefore, while individuals associated with the hibernaculum will likely be harmed or harassed during road construction and operation, we do not anticipate the project will cause a reduction in the size of the Indiana bat hibernating population at [REDACTED]*

Monitoring to determine take of individual bats within the extensive area surrounding the U.S. 6219 project is a complex and difficult task. Ongoing monitoring of the Indiana bat hibernating population at [REDACTED] along with the overall bat population in the mine, will provide important information about the amount of take, and the effectiveness of minimization and conservation measures. In addition, monitoring of travel corridors and summer habitat in the project area will identify the degree of effects on maternity colonies, and bats using the area for spring and fall foraging and roosting.



Although, to the best of our knowledge, no Indiana bat maternity colony or individual Indiana bats have been incidentally taken in the action area to date, incidental take of this species can be anticipated due to the loss of roost trees, loss of usable travel corridors, and fragmentation of foraging and roosting habitat due to the road. We believe that if a maternity colony or roosting individual is present in an area proposed for timber harvest, blasting, construction, or other disturbance, loss of suitable roosting habitat would result in incidental take of Indiana bats. *However, while some take of individuals associated with a maternity colony is possible, we do not anticipate the project will result in loss or a significant reduction in the size of a maternity colony.*

Critical habitat for the Indiana bat has been designated at hibernacula in Illinois, Indiana, Kentucky, Missouri, Tennessee and West Virginia; however, this action does not affect these areas, and no destruction or adverse modification of critical habitat is anticipated.

## EFFECT OF THE TAKE

In the accompanying biological opinion, the Service determined that the level of expected take due to the U.S. 6219 Project is not likely to result in jeopardy to the Indiana bat, or destruction or adverse modification of critical habitat.

## REASONABLE AND PRUDENT MEASURES

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize incidental take of Indiana bats, and ensure that the assumptions made by the project proponents regarding the effectiveness of project minimization and conservation measures are realized:

1. The project proponents proposed to implement avoidance and minimization measures as part of the proposed action (these measures are hereby incorporated by reference). These measures, including those recognized to maintain, improve, or enhance its habitat, shall be implemented to protect the Indiana bat. These non-discretionary measures include, but are not limited to the terms and conditions outlined in this opinion.
2. The Federal Highway Administration shall monitor Indiana bats before and during construction, and during operation of the U.S. 6219, Section 019 project to identify areas that are used by the Indiana bat and to quantify the amount and type of take. All conservation measures, mitigation efforts, research, and any related problems will be monitored and clearly communicated to the Service on an annual basis.
3. The effects of roadway maintenance activities on federally listed species were not evaluated or considered in this opinion. Therefore, consult with the Service prior to implementing any future maintenance activities that may directly or indirectly affect any federally listed species, including Indiana bats or their habitat (*e.g.*, forest clearing, *etc.*).

## TERMS AND CONDITIONS

To be exempt from the prohibitions of section 9 of the Act, FHWA must comply with the following terms and conditions, which implement the reasonable and prudent measures described



above, and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary:

1. The FHWA, PennDOT, MSHA, and their agents and contractors will implement all proposed avoidance and minimization measures to reduce adverse effects to the Indiana bat. These obligations include, but are not limited to:
  - A. During the bidding process, prospective project contractors will be notified regarding the presence of endangered species in the project area and the special provisions necessary to protect them. The selected contractor(s) will be instructed on the importance of the natural resources in the project area and the need to ensure proper implementation of the avoidance and minimization procedures.
  - B. To avoid increased take of Indiana bats through degradation of surface and groundwater quality, ensure that rock removed during road cut and fill operations is not pyretic. Pyretic rock can produce acidic runoff, resulting in stream and groundwater degradation in the action area.
  - C. Extend the blasting restriction to encompass a greater portion of the fall swarming period, as well as the hibernation period, so that no blasting occurs within one mile of Salisbury Mine between September 1 and March 31.
  - D. Extend the construction restriction to encompass the entire fall swarming period, so that no construction activities occur within 2.5 miles of [REDACTED] from one-half hour before sunset to one hour after dawn from August 1 to November 16.
  - E. The level of effects on Indiana bats described in the assessment, and considered in this opinion, depend on bats associated with [REDACTED] being able to use habitat around the mine and along Piney Creek under the proposed bridge. Therefore, permanent conservation of these areas is integral to the project, as it will ensure take does not exceed that estimated in the biological assessment and this opinion.
    - i) In addition to the five-acre right-of-way under the bridge, and 10 acres of upstream and downstream buffers, protect travel corridors to ensure the U.S. 6219 project does not eliminate [REDACTED] as an Indiana bat hibernaculum.
    - ii) Permanently protect 208 acres of forest habitat within one mile of [REDACTED] to ensure that suitable forested travel corridor, foraging habitat, and roosting habitat are available to partially offset habitat lost due to construction.
    - iii) To reduce the need for future disturbance in what the project proponents have identified as a key bat crossing area, utilize materials in the construction of the Piney Creek bridge that do not require maintenance sandblasting or painting.
  - F. Monitoring in and around [REDACTED] will be done during all blasting events that are within one mile of the mine/cave complex and identified subterranean passages. Access to the mine and cave complex will require entry to private property. Ensure that access is possible through fee simple purchase, conservation easement, or lease.



- i) The monitoring protocol must be submitted to the Service for review and approval at least three months prior to blasting, and include specify vibration monitoring devices that will be used. It will also include the number and estimated location of all monitoring devices, as well as the threshold level of vibration above which disturbance will be assumed.
  - ii) If monitoring reveals any effects on the mine/cave complex, the Service will be notified and blasting will immediately cease, since this represents an effect not considered in this biological opinion.
- 2. It is anticipated, based on the analysis presented in this biological opinion, that foraging and roosting areas currently used by Indiana bats will be destroyed, degraded, and fragmented. Bats will be displaced from current foraging and roosting areas. These impacts will result in reduced survival, reproduction, and fitness of individual bats, but are not anticipated to reduce the overall size of the hibernaculum or eliminate a maternity colony. Monitoring studies have the potential to identify these effects. A plan for surveying, monitoring, and reporting on the Indiana bat within and adjacent to the project area shall be developed and conducted in consultation with the Service.

The purpose of the monitoring plan is to 1) ensure compliance with the established level of incidental take; 2) assess the effectiveness of RPMs and conservation measures over time; 3) determine the need for adjustments to management of Indiana bat habitat; and 4) evaluate the response of bats to the disturbance that will occur in the project area. The monitoring plan shall be designed to meet these minimum specifications and include mist-netting, telemetry, emergence counts, and reporting of results.

- A. For each of the monitoring events described below, site-specific survey protocols will be submitted to the Service for review and approval at least three months prior to the survey. Surveys for Indiana bats will be performed by Service-approved, qualified personnel who are thoroughly briefed on the techniques to be used. These personnel will survey the area utilizing methods approved by the Service based on habitat access (*e.g.*, either internal mine counts or by mist-netting accessible habitat). All bats located shall be identified to species, recorded, and released.
- B. Conduct mid-winter counts of bats hibernating in [REDACTED] to monitor Indiana bat use of this hibernaculum. Counts will be conducted one year immediately prior to construction (anticipated to occur 2010/2011), the winter during construction (anticipated to occur 2012/2013), and every other year for 10 years post-roadway construction (*i.e.*, five post-construction monitoring events).
  - i) Mid-winter bat counts will be performed by PGC staff, or by Service- and PGC-approved, qualified personnel who are thoroughly briefed on the techniques to be used in accordance with methods approved by the Service and PGC. Within 30 days of each survey event, provide the Service and PGC with a report detailing the following: date of survey, names of surveyors, percent of hibernaculum surveyed, and number of each bat species found.



- ii) Access to the mine and cave complex will require entry to private property. Ensure that access is possible through fee simple purchase, conservation easement, or lease.
  - iii) If monitoring reveals the action has affected Indiana bats in a manner or to an extent not considered in this opinion, FHWA will reinitiate consultation. *This trigger for reinitiation will be met if 1) two consecutive mid-winter counts document a decline in the Indiana bat hibernating population, or 2) a 20 percent decline in the total number of bats of all species is documented.* Other monitoring data may also form the basis for reinitiation.
- C. Document whether Piney Creek bridge is serving as a travel corridor, as predicted, by monitoring Indiana bats (or surrogate *Myotis* species) during the fall to identify travel corridors between the mine, and roosting and foraging areas. This will be done one year prior to construction, and again two to four years after road construction (2014 to 2018).
- i) The project proponents shall conduct telemetry studies during fall swarming to identify, characterize, and map current foraging areas, roost trees, and home ranges, as well as determine bat use of, and movement between, these areas.
- D. No less than one year prior to starting construction, conduct mist-netting during the summer maternity season following the most current Service guidelines. Mist-netting will be done along the roadway corridor to determine the location of maternity roosts and foraging habitat to ensure the level of take estimated in the biological assessment, and in this opinion, is not exceeded. If any Indiana bats are captured during mist-netting, more detailed monitoring will be necessary to identify travel corridors, roost trees, roosting habitat, and foraging habitat, as detailed below:
- i) When Indiana bats weighing 6.5 grams or more are captured during mist-netting surveys they shall be fitted with a radio transmitter. Telemetry studies will prioritize tracking of female Indiana bats, although tracking of males and juveniles may also be conducted.
  - ii) The bats will be tracked as long as the signal can be detected. Roost trees will be identified and mapped during daylight hours and used as starting points for the next night's tracking. Triangulation methods will be used to establish bat locations during night tracking.
  - iii) Because monitoring must be geared to evaluating the response of bats to the project at both the individual and colony level, mist-netting and telemetry work will be designed to track as many different bats as possible (at least four per sampling period). Mist-netting and tracking will be conducting during three sampling periods within the maternity season: pregnancy (May 15 to June 15); lactation (June 15 to July 15); and post-lactation/juvenile volancy (July 15 to August 15).
  - iv) Upon identification of a roost tree, document its location (latitude and longitude), and record site-specific data relative to the roost tree and roosting area. For each tree containing a roost used by an Indiana bat, record the tree species, height, diameter at breast height (dbh), condition (alive or dead), aspect, elevation, and percentage of



exfoliating bark. Also include distances from the roost tree to other roosts used by the bat(s), distance to the nearest perennial and intermittent stream, and distance to the edge of tree-clearing. Percent canopy closure above roost trees and habitat cover type near each roost will also be recorded. Roost trees shall be marked in a manner sufficient to identify the trees in the field, but not obvious enough that the mark is conspicuous to passers-by.

- E. All Indiana bats captured in spring, summer and fall shall be fitted with a numbered, lightweight band. Follow the most current banding procedures approved by the Pennsylvania Game Commission.
  - F. Other data collected on captured bats shall include species, age, sex, right forearm length, weight, and reproductive condition. Capture specifics such as vertical location in the net, flight direction, and time of capture shall also be recorded. Detailing photographs of each captured Indiana bat will be taken, including close-ups of the face, toe hairs, and keeled calcar. All bats shall be released at the net site unharmed in compliance with procedures designated by the Indiana bat recovery team, or other Service protocols.
  - G. Reports documenting the above efforts will be prepared and submitted to the Service's Pennsylvania Field Office and the Pennsylvania Game Commission within six months of completion of monitoring. The report shall include an introduction, methods section, results section, conclusion and/or summary, and any relevant supplementary information (*e.g.*, names and qualifications of surveyors). The methods section should describe the survey protocol used. The results section should include the total number of individuals of each bat species found; date found; water and air temperatures; river stage; total number of Indiana bats found; data regarding non-endangered bats, particularly those species such as the little brown bat that have similar behaviors; maps or figures showing project features; maps of mist-net locations, roost trees, roosting habitat, foraging habitat, and travel corridors; dates of surveys; and names of surveyors.
- 3. Operation and maintenance of the U.S. 6219 project over its expected life represents an ongoing potential effect on the Indiana bat. A plan should be developed to limit this effect.
  - 4. The Service's Pennsylvania Field Office and Region 5 Division of Law Enforcement are to be notified within 24 hours should any endangered or threatened species be found dead or injured as a direct or indirect result of the implementation of this project. Notification must include the date, time, and location of the carcass, and any other pertinent information. Any dead bats located within a project area, regardless of species, should be immediately reported to PGC and the Pennsylvania Field Office [(814) 234-4090], and subsequently transported (frozen or on ice) to the latter office. No attempt should be made to handle any live bat, regardless of its condition; report bats that appear to be sick or injured to the Pennsylvania Field Office, who will make a species determination on any dead or moribund bats. Notification must also be made to the following Service office at least two weeks prior to blasting activities:
    - State College, Pennsylvania Field Office (Attn: Endangered Species Specialist); 315 South Allen Street, Suite 322, State College, PA 16801 (telephone: 814-234-4090).



5. If this project is not completed by 2018, FWHHA will reinitiate consultation with the Service to re-evaluate project impacts on the Indiana bat, and to determine the appropriateness of the reasonable and prudent measures contained in this biological opinion.

The Service believes that all Indiana bats associated with the Salisbury Mine hibernaculum will be harmed or harassed due to road construction and operation. However, due to the project minimization and conservation measures, and the expectation that Indiana bats will adjust their habitat use in response to the road, we do not believe this level of take will reduce the size of the Indiana bat hibernating population at [REDACTED]

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The federal agency must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

#### CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

1. In coordination with the Pennsylvania Field Office of the Fish and Wildlife Service, purchase or otherwise protect Indiana bat habitat, including hibernacula, identified maternity habitat, and fall habitat in the vicinity of hibernacula in Pennsylvania.
2. Develop a programmatic transportation conservation plan that facilitates FHWA and PennDOT participation with ongoing Pennsylvania Game Commission, Pennsylvania Turnpike Commission, and Service efforts to identify Indiana bat summer habitat via radio-tracking bats departing for spring migration.
3. Work with the Service to develop national guidelines for addressing Indiana bat conservation associated with FHWA projects within the range of the Indiana bat.
4. Batch all segments of the S.R. 219 Corridor Improvement Project into a single consultation to comprehensively evaluate and address effects on Indiana bats.

The Service should be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, and requests notification of the implementation of any conservation recommendations.



## REINITIATION NOTICE

This concludes formal consultation on the SR 6219, Section 19 project. As is provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.



## LITERATURE CITED

- Bach, L., P. Burkhardt, H. J. Limpens. 2004. Tunnels as a possibility to connect bat habitats. *Mammalia*. 68: 411-420.
- Barclay, R.M.R., and L.D. Harder. 2003. Life histories of bats: life in the slow lane. Pages 209-256. *In* T.H. Kunz and M.B. Fenton (eds.), *Bat ecology*. University of Chicago Press; Chicago, Illinois. Bat Conservation International. 2004. *Tadarida brasiliensis*, Mexican free-tailed bat. Bat Conservation International, Austin, Texas. Available <http://www.batcon.org/discover/species/tbrasil.html>. (Accessed 12 May 2004).
- Belwood, J.J. 1979. Feeding ecology of an Indiana bat community with emphasis on the endangered Indiana bat, *Myotis sodalis*. Gainesville, FL: University of Florida. 104 p. M.S. thesis.
- Belwood, J. J. 2002. Endangered bats in suburbia: observations and concerns for the future. *In* Kurta A., and J. Kennedy, eds. *The Indiana bat: biology and management of an endangered species*. Bat Conservation International, Austin, Texas. Black Castle Mining Company. 2003. General Location Map.
- Brack, V., Jr. 1983. The nonhibernating ecology of bats in Indiana with emphasis on the endangered Indiana bat, *Myotis sodalis*. Ph.D. dissertation, Purdue Univ., West Lafayette, Ind. 280 pp.
- Brack, V. W. and R.K. LaVal. 1985. Food habits of the Indiana bat in Missouri. *Journal of Mammalogy*. 66: 308-315.
- Brack, V. Jr., C.W. Stihler, R.J. Reynolds, C.M. Butchkoski, and C.S. Hobson. 2002. Effect of climate and elevation on distribution and abundance in the midwestern United States. *In* Kurta A., and J. Kennedy, eds. *The Indiana bat: biology and management of an endangered species*. Bat Conservation International, Austin, Texas.
- Britzke, E.R., A.C.Hicks, S.L. von Oettingen, and S.R. Darling. 2004. Description of spring roosting ecology of female Indiana bats in the Lake Champlain Valley of Vermont and New York. In review.
- Butchkoski C.M. and J.D. Hassinger. 2002a. Indiana Bat Telemetry Studies. Project Annual Job Report. Pennsylvania Game Commission.
- Butchkoski, C. M. and J.D. Hassinger. 2002b. Ecology of a maternity colony roosting in a building. *In* Kurta A., and J. Kennedy, eds. *The Indiana bat: biology and management of an endangered species*. Bat Conservation International, Austin, Texas.
- Callahan, E.V. 1993. Indiana bat summer habitat requirements. Unpublished M.S. thesis, University of Missouri. Columbia, Missouri. 74 p.
- Callahan. E.V., R.D. Drobney, and R.L. Clawson. 1997. Selection of summer roosting sites by Indiana bats (*Myotis sodalis*) in Missouri. *Journal of Mammalogy*. 78: 818-825.



- Carter, T.C. 2002. Bat houses for conservation of endangered Indiana myotis. The Bat House Researcher. 10: 1-5.
- Carter, T.C. 2003. Summer habitat use of roost trees by the endangered Indiana bat (*Myotis sodalis*) in the Shawnee National Forest of southern Illinois. Unpublished Ph.D. dissertation. Department of Zoology in the Graduate School, Southern Illinois University. Carbondale, Illinois.
- Chenger, J. 2003. Iowa Army Ammunition Plant 2003 Indiana bat investigations. Unpublished report. Iowa Army Ammunition Plant, Middletown, Iowa.
- Clark, D.R., Jr., and R.M. Prouty. 1976. Organochloride residues in three bat species from four localities in Maryland and West Virginia, 1973. Pesticide Monitoring Journal. 10: 44-53.
- Clark, B.K., J.B. Bowles, and B.S. Clark. 1987. Summer status of the endangered Indiana bat in Iowa. American Midland Naturalist. 118: 32-39.
- Clawson, R.L. 1987. Indiana Bats: Down for the Count. Endangered Species Technical Bulletin. Vol. XII No. 9.
- Clawson, R.L. 2002. Trends in population size and current status. In Kurta A., and J. Kennedy, eds. The Indiana bat: biology and management of an endangered species. Bat Conservation International, Austin, Texas.
- Clawson, R.L. 15 April 2004. Personal communication. Wildlife Biologist. Missouri Department of Conservation. Columbia, Missouri.
- Clawson, R.L., R.K. LaVal, M.L. LaVal and W. Caire. 1980. Clustering Behavior of the Hibernating *Myotis Sodalis* in Missouri. Journal of Mammalogy. 61: 245-253.
- Cope, J.B., A.R. Richter, and D.A. Searly. 1978. A survey of bats in Big Blue Lake project area in Indiana. U.S. Army Corps of Engineers. 51p.
- Cope, J.B., and S.R. Humphrey. 1977. Spring and autumn swarming behavior in the Indiana bat, *Myotis sodalis*. Journal of Mammalogy 58: 93-5.
- Currie, R. 2002. Response to Gates at Hibernacula. In Kurta A., and J. Kennedy, eds. The Indiana bat: biology and management of an endangered species. Bat Conservation International, Austin, Texas.
- Dhindsa, M.S., J.S. Sandhu, H.S. Toor. 1988. Roadside birds in Punjab (India): relation to mortality from vehicles. Environmental Conservation 15, 303-310.
- Easterla, D.A., and L.C. Watkins. 1969. Pregnant *Myotis sodalis* in northwestern Missouri. Journal of Mammalogy. 50: 372-373.
- Erritzoe, J. 2002. Bird Traffic casualties and road quality for breeding birds. A summary of existing papers with a bibliography. [www.birdresearch.dk](http://www.birdresearch.dk)



- Farmer, A., B. Cade, and D. Stauffer. 1997. A habitat suitability index model for the Indian bat (*Myotis sodalis*). Unpublished report prepared for U.S. Department of Interior, Geological Survey, Mid-Continent Ecological Science Center, Fort Collins, Colorado. 4p.
- Fleming, T.H., and P. Eby. 2003. Ecology of bat migration. Pages 156-208. *In* T.H. Kunz and M.B. Fenton (eds.), *Bat ecology*. University of Chicago Press; Chicago, Illinois.
- Ford, W.M., J.M. Menzel, M.A. Menzel, and J.W. Edwards. 2002. Summer roost-tree selection by a male Indiana bat on the Fernow Experimental Forest. USDA Forest Service Research Note NE-378. 7p.
- Forman, R.T.T. and R.D. Deblinger. 2000. The Ecological road-effect zone of a Massachusetts (U.S.A) suburban highway. *Conservation Biology*. 14:36-46.
- Forman, R.T.T., Sperling, D., Bissonette, J.A., Clevenger, A.P., Cutshall, C.D., Dale, V.H., Fahrig, L., France, R., Goldman, C.R., Heanue, K. Jones, J.A., Swanson, F.J., Turrentine, T., and Winter, T.C. (2003): *Road Ecology: Science and Solutions*. Washington: Island Press.
- Gardner, J.E., and E.A. Cook. 2002. Seasonal and geographic distribution and quantification of potential summer habitat. *In* Kurta A., and J. Kennedy, eds. *The Indiana bat: biology and management of an endangered species*. Bat Conservation International, Austin, Texas. 253p.
- Gardner, J.E., J.D. Garner, and J.E. Hofmann. 1989. A portable mist netting system for capturing bats with emphasis on *Myotis sodalis* (Indiana Bat). *Bat Research News*. 30: 1-7.
- Gardner, J.E., J.D. Garner, and J.E. Hofmann. 1991a. Summary of *Myotis sodalis* summer habitat studies in Illinois: with recommendations for impact assessment. Unpublished report prepared for Indiana/Gray bat Recovery Team Meeting, Columbia, Missouri, March 1991. 28p.
- Gardner, J.E., J.D. Garner, and J.E. Hofmann. 1991b. Summer roost selection and roosting behavior of *Myotis sodalis* (Indiana bat) in Illinois. Unpublished report prepared for U.S. Department of Interior, Fish and Wildlife Service, Region 3, Twin Cities, Minnesota. 56p.
- Gardner, J.E., J.E. Hofmann, and J.D. Garner. 1996. Summer distribution of the federally endangered Indiana bat (*Myotis sodalis*) in Illinois. *Transactions of the Illinois State Academy of Science*. 89: 187-196.
- Garner, J.D., and J.E. Gardner. 1992. Determination of summer distribution and habitat utilization of the Indiana bat (*Myotis sodalis*) in Illinois. Unpublished report prepared for Illinois Department of Conservation, Division of Natural Heritage, and Illinois Natural History Survey, Center for Biogeographic Information. 23p.
- Gumbert, M.W., J.M. O'Keefe, and J.R. MacGregor. 2002. Roost fidelity in Kentucky. Pages 143-152 *In* Kurta A., and J. Kennedy, eds. *The Indiana bat: biology and management of an endangered species*. Bat Conservation International, Austin, Texas. 253p.



- Hall, J.S. 1962. A life history and taxonomic study of the Indiana bat (*Myotis sodalis*). Reading Public Museum and Art Gallery Scientific Publications Number 12. Reading, Pennsylvania.
- Harvey, M.J. 2002. Status and ecology in the southern United States. In Kurta A., and J. Kennedy, eds. The Indiana bat: biology and management of an endangered species. Bat Conservation International, Austin, Texas.
- Hobson, C. S., and N. J. Holland. 1995. Post-hibernation movement and foraging habitat of a male Indiana bat, *Myotis sodalis* (Chiroptera: Vespertilionidae), in West Virginia. *Brimleyana* 23: 95-101.
- Hofmann, J. 1996. Indiana bats in Illinois. Illinois Natural History Survey. Available: <http://www.inhs.uiuc.edu/chf/pub/surveyreports/mar-apr96/bats.html> (Accessed: April 20, 2004.)
- Humphrey, S.R. 1978. Status, winter habitat and management of the endangered Indiana bat, *Myotis sodalis*. *Florida Scientist*. 41: 65-76.
- Humphrey, S.R., A.R. Richter and J.B. Cope. 1977. Summer habitat and ecology of the endangered Indiana bat, *Myotis sodalis*. *Journal of Mammalogy*. 58: 334-346.
- Humphrey, S.R., and J.B. Cope. 1977. Survival Rates of the Endangered Indiana Bat, *Myotis sodalis*. *Journal of Mammalogy*. Volume 58. No. 1. Pp. 32-36.
- Indianapolis Airport Authority. 2003. Habitat conservation plan report for monitoring year 2002.
- Indianapolis Airport Authority. 2004. Habitat conservation plan report for monitoring year 2003.
- Jeager, J.A.G, J. Bowman, J. Brennan, L. Fahrig, D. Bert, J. Bouchard, N. Charbonneau, K. Frank, B. Gruber, K.T. von Toschanowitz. 2005. Predicting when animal populations are at risk from roads:and interactive model of road avoidance behavior. *Ecological Modelling* 185:329 – 348.
- Jen, P.H.S. and J.K. McCarty. 1978. Bats avoid moving objects more successfully than stationary ones. *Nature* 275:743-744.
- King, A. 12 February 2004. Personal communication. Biologist. U.S. Fish and Wildlife Service, Bloomington, Indiana Ecological Services Field Office. Bloomington, IN.
- Kiser, J.D., and C.L. Elliott. 1996. Foraging habitat, food habits, and roost tree characteristics of the Indiana bat (*Myotis sodalis*) during autumn in Jackson County, Kentucky. Unpublished report prepared for Kentucky Department of Fish and Wildlife Resources, Nongame Program, Frankfort, Kentucky. 65 p.
- Kiser, J.D., J.R. MacGregor, H.D. Bryan, and A. Howard. 2002. Use of concrete bridges as nightroosts. In Kurta A., and J. Kennedy, eds. The Indiana bat: biology and management of an endangered species. Bat Conservation International, Austin, Texas.



- Kurta, A. In Press. Roosting Ecology and Behavior of Indiana Bats (*Myotis sodalis*) in Summer. *In* The Proceedings of the Indiana bat and coal mining: a technical interactive forum (K.C. Vories and A. Harrington, eds.). Office of Surface Mining, U.S. Department of the Interior, Alton, Illinois.
- Kurta, A. and J.O. Whitaker. 1998. Diet of the endangered Indiana bat (*Myotis sodalis*) on the northern edge of its range. *American Midland Naturalist*. 140: 280-286.
- Kurta, A. and S.W. Murray. 2002. Philopatry and migration of banded Indiana bats (*Myotis sodalis*) and effects of radio transmitters. *Journal of Mammalogy*. 83: 585-589.
- Kurta, A., and J.A. Teramino. 1994. A novel hibernaculum and noteworthy records of the Indiana bat and eastern pipistrelle (Chiroptera: Vespertilionidae). *American Midland Naturalist*. 132: 410-413.
- Kurta, A., D. King, J.A. Teramino, J.M. Stribley, and K.J. Williams. 1993a. Summer roosts of the endangered Indiana bat (*Myotis sodalis*) on the northern edge of its range. *American Midland Naturalist*. 129: 132-138.
- Kurta, A., J. Kath, E.L. Smith, R. Foster, M.W. Orrick, and R. Ross. 1993b. A maternity roost of the endangered Indiana bat (*Myotis sodalis*) in an unshaded, hollow, Sycamore tree (*Platanus occidentalis*). *American Midland Naturalist*. 130: 405-407.
- Kurta, A., K.J. Williams, and R. Mies. 1996. Ecological, behavioral, and thermal observations of a peripheral population of Indiana bats (*Myotis sodalis*). Pages 102-117 *In* R.M.R. Barclay and R.M. Brigham, eds. *Bats and Forest Symposium*. Research Branch, British Columbia Ministry of Forests, Victoria, British Columbia, Canada.
- Kurta, A., S.W. Murray, and D.H. Miller. 2002. Roost selection and movements across the summer landscape. *In* Kurta A., and J. Kennedy, eds. *The Indiana bat: biology and management of an endangered species*. Bat Conservation International, Austin, Texas.
- LaVal, R.K., and M.L. LaVal. 1980. Ecological studies and management of Missouri bats, with emphasis on cave-dwelling species. Terr. Ser. 8. Missouri Department of Conservation, Jefferson City, Missouri. 53 p.
- LaVal, R.K., R.L. Clawson, W. Caire, L.R. Wingate, and M.L. LaVal. 1976. An evaluation of the status of Myotine bats in the proposed Meramec Park Lake and Union Lake project areas, Missouri. Special Report. U.S. Army Corps of Engineers, St. Louis, MO. 136p.
- Lode', T. 2000. Effect of a motorway on mortality and isolation of wildlife populations. *Ambio* 29:163-166
- McCracken, G.F. 1988. Who's Endangered and What Can We Do? *Bats*. 6:5-9.
- Menzel, M.A., J.M. Menzel, T.C. Carter, W.M. Ford and J.W. Edwards. 2001. Review of the forest habitat relationships of the Indiana bat (*Myotis sodalis*). Gen. Tech. Rep. NE 284.



Newton Square, PA. U.S. Department of Agriculture, Forest Service, Northeastern Research Station. 21p.

- Mohr, C. E. 1972. The status of threatened species of cave-dwelling bats. *Bull. Nat. Speleol. Soc.* 34: 33-47.
- Mumme, M.L., S.J. Schoech, G.E. Woolfended, and J.W. Fitzpatrick. 2000. Life and death in the fast lane: Demographic consequences of road mortality in the Florida scrub-jay. *Conservation Biology* 14:501-12.
- Murray, S.W., and A. Kurta. 2004. Nocturnal activity of the endangered Indiana bat (*Myotis sodalis*). *Journal of Zoology*. 262: 197-206.
- NatureServe. 2004. NatureServe Explorer: An online encyclopedia of life [web application]. Version 3.0. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: April 15, 2004 ).
- O'Shea, T.J., and D.R. Clark, Jr. 2002. An overview of contaminants in bats, with special reference to insecticides and the Indiana bat. *In* Kurta A., and J. Kennedy, eds. *The Indiana bat: biology and management of an endangered species*. Bat Conservation International, Austin, Texas.
- Palm, J. 2003. Indiana bat (*Myotis sodalis*) summer roost tree selection and habitat use in the Champlain Valley of Vermont. M.S. thesis. Antioch New England Graduate School. Keene, New Hampshire.
- Pennsylvania Geological Survey, 2005, Geologic units containing potentially significant acid-producing sulfide minerals: Pennsylvania Geological Survey, 4th ser., Open-File Report OFMI 05-01.1, 9 p., Portable Document Format (PDF) file.
- Pruitt, L. Personal communication. Biologist. U.S. Fish and Wildlife Service, Bloomington, Indiana Ecological Services Field Office. Bloomington, IN.
- Racey, P.A. 1982. Ecology of bat reproduction. *In* *Ecology of Bats*. Edited by T.H. Kunz. Plenum Press. New York.
- Racey, P.A., and A.C. Entwistle. 2003. Conservation ecology of bats. Pages 680-744. *In* T.H. Kunz and M.B. Fenton (eds), *Bat ecology*. University of Chicago Press; Chicago, Illinois.
- Ransome, Roger. 1990. *The Natural History of Hibernating Bats*. Christopher Helm Publishers; London, England.
- Reidinger, R.F. 1972. Factors influencing Arizona bat population levels. Tempe, AZ: University of Arizona. 172 p. Ph.D. dissertation.
- Reijnen, R.; R. Foppen; C. Ter Braak; J. Thissen. 1995. The effects of car traffic on breeding bird populations in woodland; III. Reduction of density in relation to the proximity of main roads. *Journal of Applied Ecology* 32: 187-202.



- Richter, A.R., S.R. Humphrey, J.B Cope, and V. Brack. 1993. Modified cave entrances: thermal effect on body mass and resulting decline of the endangered Indiana bats (*Myotis sodalis*). *Conservation Biology*. 7: 407-415.
- Romme, R.C., A.B. H.R. A. King, T. Glueck, and K. Tyrell. 2002. Home range near hibernaculum in spring and summer. In Kurta A., and J. Kennedy, *eds*. The Indiana bat: biology and management of an endangered species. Bat Conservation International, Austin, Texas.
- Sanders, C. and Chengler, J., 2002. Allegheny Mountain Transportation Improvement Project: South Penn Tunnel *Myotis sodalis* Study. Report to Pennsylvania Turnpike Commission, Bat Conservation and Management. 63 pp.
- Seidman, V. M., and C. J. Zabel. 2001. Bat Activity Along Intermittent Streams In Northwestern California. *Journal of Mammalogy*. 82(3):738-747.
- Sparks, D.W. February 1, 2005. Personnel communication. Indiana State University, Bloomington Indiana.
- Sparks, D.W., John O. Whitaker, Jr., and Christopher M. Ritzi. Foraging Ecology of the Endangered Indiana Bat. *Journal of Mammalogy*. In press.
- Speakman, J.R., and D.W. Thomas. 2003. Physiological ecology and energetics of Bats. Pages 430-492 *In* Kunz, T.H., and M.B. Fenton. 2003. *Bat Ecology*. University of Chicago Press; Chicago, Illinois.
- Thomas, D.W. and D. Cloutier. 1992. Evaporative water loss by hibernating little brown bats, *Myotis lucifugus*. *Physiol. Zoology*. 65: 443-456.
- 3D/International, Environmental Group. 1995. Literature summary and habitat suitability index model: components of summer habitat for the Indiana bat, *Myotis sodalis*. Unpublished report submitted to Indiana Department of Natural Resources, Division of Natural Resources, Bloomington, Indiana. 190p.
- 3D/International, Environmental Group. 1996. Biological assessment of the master plan and ongoing mission. Unpublished report prepared for U.S. Army Engineer Center and Fort Leonard Wood, Missouri.
- Tuttle, M.D., and D.A.R. Taylor. 1994. Bats and mines. Research Publication No. 2. Bat Conservation International. Austin, TX. 42p.
- Tuttle, M.D., and D.E. Stevenson. 1977. An analysis of migration as a mortality factor in the gray bat based on public recoveries of banded bats. *American Midland Naturalist*. 97: 235-240.
- Tuttle, M.D., and D.E. Stevenson. 1978. Variation in the cave environment and its biological implications. Pages 108-21 *In* R. Zuber, *et al.* (editors). National Cave Management Symposium Proceedings, 1977, Big Sky, Montana.



- Tuttle, M.D., M.B. Fenton, and E. Bernard. 2004. Ecological role of bats in forest ecosystems. 2nd Bats and Forests Symposium and Workshop, March 9-12, 2004. Hot Springs, Arkansas.
- U.S. Fish and Wildlife Service. 1983. Recovery plan for the Indiana bat. Ft. Snelling, Minnesota.
- U.S. Fish and Wildlife Service. 1995. Biological opinion on the effects construction of raw water reservoir on Sugar Creek in Williamson and Johnson Counties, Illinois, on the Indiana bat (*Myotis sodalis*). Unpublished report prepared for U.S. Army Corps of Engineers, Louisville District, Louisville, Kentucky.
- U.S. Fish and Wildlife Service. 1998. Biological opinion on the construction and operation of the multi-purpose training range (MPTR) at the Camp Atterbury Army National Guard Training Site. Edinburgh, Indiana. 21p.
- U.S. Fish and Wildlife Service. 1999a. Biological opinion of the application for an incidental take permit for the federally endangered Indiana bat (*Myotis sodalis*) for impacts of forest management and other activities to the gray bat, bald eagle, Indiana bat, and mead's milkweed on the Mark Twain National Forest, Missouri. 101p.
- U.S. Fish and Wildlife Service. 1999b. Agency Draft Indiana Bat (*Myotis sodalis*) Revised Recovery Plan. Fort Snelling, MN: U.S. Department of Interior, Fish and Wildlife Service, Region 3. 53 p.
- U.S. Fish and Wildlife Service. 1999c. Biological opinion for the proposed streambank stabilization at the Yano Range and upgrade of the Wilcox Tank Range at Fort Knox, Kentucky. 18p.
- U.S. Fish and Wildlife Service. 1999d. Biological opinion for the agricultural pesticide application practices at the Newport Chemical Depot at Newport, Indiana. 25p.
- U.S. Fish and Wildlife Service. 2000. A survey for the federally listed endangered Indiana bat (*Myotis sodalis*), Picatinny Arsenal, Morris County, New Jersey. Unpublished report prepared for U.S. Army Tank, Automotive and Armaments Command, Armament Research Development and Engineering Center. Picatinny Arsenal, Morris County, New Jersey.
- U.S. Fish and Wildlife Service. 2002. Biological opinion of the application for an incidental take permit for the federally endangered Indiana bat (*Myotis sodalis*) for the Six Points Road interchange and associated development. Bloomington Field Office. Bloomington, Indiana. 35p.
- U.S. Fish and Wildlife Service. 2003. Biological Opinion on the Construction, Operation, and Maintenance of Alternative 3C of Interstate 69 (I-69) from Indianapolis to Evansville for the Federally Endangered Indiana Bat (*Myotis sodalis*) and the Federally Threatened Bald Eagle (*Haliaeetus leucocephalus*) traversing portions of Gibson, Warrick, Pike, Daviess, Greene, Monroe, Morgan, Johnson, and Marion Counties, Indiana. Submitted to the Federal Highway Administration.



- U.S. Fish and Wildlife Service. 2005. Biological Opinion on the impacts of the Laxare East and Black Castle contour coal mining projects on the Indiana bat. West Virginia Field Office, Elkins, West Virginia. 138 pp. plus figures.
- Von Oettingen, S. 2004. Personal communication. Biologist. U.S. Fish and Wildlife Service, New England Field Office. Concord, New Hampshire.
- Western Pennsylvania Conservancy. 2005. Somerset County Natural Heritage Survey. Report prepared for the Somerset County Planning Commission, Somerset PA. Accessed via the internet at [www.paconserve.org](http://www.paconserve.org).
- Whitaker, J.O., Jr. 2 April 2004. Personal communication. Professor. Indiana State University. Terre Haute, Indiana.
- Whitaker, J.O., Jr., and V. Brack, Jr. 2002. Distribution and summer ecology in Indiana. *In* Kurta A., and J. Kennedy, eds. The Indiana bat: biology and management of an endangered species. Bat Conservation International, Austin, Texas.



**US 219 IMPROVEMENT PROJECT, SR 6219 SECTION 020**  
**(USFWS Project #2007-2430)**  
**ADDENDUM to the**

***US 219 IMPROVEMENT PROJECT, SR 6219 SECTION 019***  
***INDIANA BAT (MYOTIS SODALIS) BIOLOGICAL ASSESSMENT***  
***(JUNE 2006, as Amended February 2007)***  
***USFWS Project #2007-1091***

US 219 Improvement Project  
SR 6219 Section 020 Meyersdale to Somerset  
Somerset County, Pennsylvania

*Prepared For:*



And

U.S. Department of Transportation



December 2010  
Revised January 2011



## Table of Contents

I.	Overview .....	1
A.	Purpose and Need.....	1
B.	Informal Consultation Activities.....	2
II.	Project Description.....	4
III.	Description of the Project Action Area .....	5
A.	Introduction .....	5
1.	Description .....	5
2.	Presence of the Indiana Bat .....	6
IV.	Endangered Species and Habitat Occurrence.....	7
A.	Indiana Bat Biology .....	7
B.	Indiana Bat Occurrence in the Project Area .....	8
1.	Hibernaculum.....	8
2.	Foraging Habitat.....	9
3.	Roosting Habitat .....	9
4.	Maternity Roost Habitat .....	10
5.	Migration Paths.....	10
V.	Effects of Proposed Action.....	11
A.	Direct.....	11
1.	Timber Removal .....	11
2.	Wetland and Stream Impacts .....	11
3.	Blasting.....	12
4.	Noise .....	12
B.	Indirect Effects .....	13
1.	Interchanges .....	13
C.	Cumulative .....	14
1.	Windfarms.....	14
2.	Previous Commercial Timbering Operations .....	14
3.	White Nose Syndrome .....	15



Addendum to the US 219 Improvement Project, SR 6219, Section 019, Indiana bat Biological Assessment  
for SR 6219, Section 020, Somerset County, Pennsylvania

4.	Summary of Cumulative Effects .....	15
VI.	Conservation Measures .....	16
A.	Measures to Avoid and Minimize Harm & Harassment .....	16
1.	Timber Restrictions .....	16
2.	Impact Minimization .....	16
B.	Measures to Benefit or Promote Species Recovery .....	18
1.	Habitat Enhancement and Protection .....	18
2.	Additional Measures .....	18
VII.	Mitigation Measures .....	18
A.	Recommended Mitigation Measures .....	18
1.	Reforestation .....	18
2.	Wetland Mitigation .....	19
3.	Riparian Buffers .....	19
VIII.	Determination of Effects .....	19
IX.	Conclusion .....	20
X.	References .....	21

Appendix A      Figures

Appendix B      Indiana bat Correspondence (Section 020)



Addendum to the US 219 Improvement Project, SR 6219, Section 019, Indiana bat Biological Assessment for SR 6219, Section 020, Somerset County, Pennsylvania

## I. Overview

The Federal Highway Administration (FHWA) along with the Pennsylvania Department of Transportation (PennDOT), Engineering District 9-0, and the Maryland State Highway Administration (MD SHA) have been advancing improvements for two sections of U.S. 219 in Somerset County, Pennsylvania and Garrett County, Maryland. Section 019 extends approximately 13 kilometers (eight miles) from the southern end of the Meyersdale Bypass in Somerset County, Pennsylvania to Interstate 68 (I-68) in Garrett County, Maryland. Section 020 extends approximately 16 kilometers (10 miles) from the northern end of the Meyersdale Bypass to the southern end of existing US 219 just southeast of Somerset, PA. See Figure 1, Regional Setting, in Appendix A.

A Biological Assessment was submitted to the United States Fish and Wildlife Service (USFWS) in June 2006 for Section 019. This Biological Assessment was supplemented with an amendment in February 2007. In October of 2007 the USFWS issued their Biological Opinion on the Section 019 project (USFWS Project #2007-1091), which stated that the proposed Section 019 project was not likely to jeopardize the continued existence of the Indiana Bat (*Myotis sodalis*). Since the time of the Biological Opinion, Section 019, the link between Meyersdale and I-68 in Maryland, has been placed on-hold indefinitely due to a lack of funding.

Unlike Section 019, PennDOT is proceeding with design and construction of Section 020. Through informal consultation with the USFWS on Section 020, it has been determined that the Biological Assessment prepared for Section 019 should be amended to include Section 020 and that consultation should be reinitiated between the USFWS and FHWA.

This report serves as the addendum to the June 2006 Biological Assessment to include Section 020 (USFWS Project #2007-2430) and the request to reinitiate consultation.

### A. Purpose and Need

The March 1999 report, "Needs Analysis, U.S. Route 219, I-68 (MD) to Somerset, Pennsylvania," summarizes the needs for the US 219, Sections 019 and 020 projects. The Needs Analysis evaluated existing and future traffic congestion, traffic movement patterns, existing roadway geometric constraints, accidents, system linkage and continuity, socioeconomic characteristics, and economic



Addendum to the US 219 Improvement Project, SR 6219, Section 019, Indiana bat Biological Assessment for SR 6219, Section 020, Somerset County, Pennsylvania

development potential of the study corridors. FHWA and the Pennsylvania and federal resource agencies granted needs concurrence in April of 1999.

## **B. Informal Consultation Activities**

Informal consultation activities conducted for Section 019 are documented in the June 2006, *US 219, Section 019, Indiana bat Biological Assessment* as amended in February 2007.

The following is a summary of Informal Consultation Activities conducted for Section 020:

- The initial Pennsylvania Natural Diversity Inventory (PNDI) request for the Section 020 project was made in March 2001.
- An Agency Field View was conducted in May 2001.
- In July 2001, the United States Fish and Wildlife Service (USFWS) determined that the project area was within the range of the federally endangered Indiana Bat.
- In an April 2003 letter, the USFWS stated that if a seasonal restriction on tree cutting was implemented, construction of the project would not be likely to affect the Indiana Bat.
- Correspondence from the USFWS on November 8, 2007 indicated that the Service was not able to concur that the proposed project would have no effect on Indiana bats since a preference for mist netting surveys or timber harvesting restrictions was not indicated. Furthermore, the Service indicated that in light of additional and new information a mist netting survey should be conducted by a qualified Service approved biologist. The USFWS stated that in 2004, only one maternity colony was documented in PA. In 2005, 2006, and 2007, surveys documented additional maternity colonies in northern Maryland and central and southwestern Pennsylvania.; the closest was in Bedford County.
- A formal response, reiterating FHWA's commitment to the proposed seasonal timber harvest restrictions was prepared by the FHWA and submitted to the USFWS on December 19, 2007.



Addendum to the US 219 Improvement Project, SR 6219, Section 019, Indiana bat Biological Assessment for SR 6219, Section 020, Somerset County, Pennsylvania

- The USFWS indicated within a January 14, 2008 correspondence letter that the Service could not concur with the “determination that seasonal tree removal restrictions, alone, will adequately avoid all adverse effects if an Indiana bat maternity colony is present within the action area.”
- As a result of this verbal consultation, the FHWA indicated within their January 31, 2008 letter to the USFWS that PennDOT would conduct a mist netting survey in accordance USFWS guidelines using a qualified surveyor. The letter reiterated an understanding that in the absence of a confirmed species, the USFWS will issue a No Effect finding for the proposed action. If individual Indiana bats are captured as a result of survey efforts, the FHWA will consult with the Service regarding FHWA’s assessment of effect.
- The final “Mist Net Survey for the Indiana Bat (*Myotis sodalis*); US 219 Improvement Project; SR 6219 Section 020 Meyersdale to Somerset, Somerset County, Pennsylvania (March 2009)” was submitted to USFWS in March 2009. No Indiana bats were captured during the field survey that occurred at 16 sites from July 14 to August 11, 2008.
- In a letter dated April 20, 2009, the USFWS responded to the survey concluding that the construction of the project may affect, but is not likely to adversely affect the Indiana Bat. The letter added that the determination was valid for two years. At this point, PennDOT proceeded with right-of-way acquisition for the Section 020 project.
- Due to permitting requirements and the length of time that had passed since the last PNDI request for the project, a request for updated information related to threatened and endangered species in the project area was sent to the agencies on May 25, 2010.
- On June 23, 2010, the USFWS rescinded their previous conclusion, due to new information, and recommended that consultation be reinitiated, and that the Biological Opinion previously issued for the Section 019 Meyersdale to I-68 project be amended to include the Section 020 project. The letter also recommended measures to avoid, minimize, and compensate for adverse impacts to the Indiana Bat. New research indicates that adult male bats are utilizing habitat up to 10 miles (formerly thought to be 5 miles) from hibernacula for roosting and foraging during spring, summer, and fall.



Addendum to the US 219 Improvement Project, SR 6219, Section 019, Indiana bat Biological Assessment for SR 6219, Section 020, Somerset County, Pennsylvania

- On September 29, 2010, PennDOT and FHWA made a formal presentation of the SR 6219, Sections 019 and 020 projects to USFWS. The presentation focused on Section 020, as Section 019 was indefinitely put on hold in 2008. Information presented included project impacts and avoidance, minimization, conservation, and mitigation measures that were being included in the Section 020 project due to the possible presence of the Indiana bat in the project area.

This report serves as the amendment to the Biological Assessment for the Section 019 project to add the Section 020 project and upon transmittal and formal request from FHWA serves as a request to reinstitute formal consultation on the US 219 Improvement Projects.

Refer to Appendix B for Correspondence related to the Indiana Bat.

## II. Project Description

The Project Description for Section 019 is documented in the June 2006, *US 6219, Section 019, Indiana bat Biological Assessment* as amended in February 2007. See the figures in Appendix A for information about the Section 019 and the Section 020 project areas.

The Section 020 project involves the construction of a 16 kilometer (10 mile), four-lane limited access highway connecting the northern end of the Meyersdale Bypass to the southern end of existing US 219 located southeast of Somerset, PA. The study area includes portions of Somerset, Brothersvalley, Summit, and Black Townships and the Boroughs of Somerset, and Garrett. The Section 020 project is a joint venture between the FHWA and PennDOT Engineering District 9-0.

Detailed project information, including environmental features and resources, can be found in the December 2005 Final Environmental Impact Statement (FEIS) and November 2006 Record of Decision (ROD) prepared for the Section 020 project. Alternative C-1 was identified within the ROD as the selected build alternative by the FHWA.



Addendum to the US 219 Improvement Project, SR 6219, Section 019, Indiana bat Biological Assessment for SR 6219, Section 020, Somerset County, Pennsylvania

---

## III. Description of the Project Action Area

### A. Introduction

#### 1. Description

The Description of the Project Action Area for Section 019 is documented in the June 2006, *US 6219, Section 019, Indiana bat Biological Assessment* as amended in February 2007.

The Section 020 project area is located in the southwestern portion of Pennsylvania and situated between the towns of Somerset and Meyersdale, Somerset County. Ranging from 607 to 762 meters (2,000 and 2,500 feet) above mean sea level, the project study area relief characteristics vary from the north to the south. The northern portion of the project study area is located on a gently rolling plateau while the southern portion is located in mountainous terrain with steep relief. Both portions of the study area are within the Allegheny Mountains section of the Appalachian Plateaus physiographic province (Pennsylvania Department of Conservation and Natural Resources, 2000). Negro Mountain is located to the west of the study area and Meadow Mountain is located to the east of the study area. Drainage originating from the project study area provides flow to the Casselman River and ultimately the Ohio River. Named sub-watersheds of the Casselman River present within the project study area include, from south to north: Blue Lick Creek, Swamp Creek, Buffalo Creek, Piney Run, Wilson Creek, Laurel Run, and Kimberly Run.

Overall, the project study area's land cover / land use is rural in nature and indicative of the historic natural resource driven economy. The land use / land cover components include forestland, agricultural land, mine land, and one prison (State Correctional Institution) with rural residential homes interspersed along the existing roadway network. The forestland has been intensively harvested and consists of second and third growth stands as well as uneven aged select cut stands. Numerous farmsteads are present throughout the project study area on ridge tops and ridge sides. Three reclaimed coal strip mines as well as one abandoned deep mine and surface mine are present. Approximately 52% of the land is in forest cover types, while approximately 18% is in agricultural cover types. An additional 3% consists of successional rangeland, fallow fields, and water bodies. Numerous wetlands, small streams and ponds, and several larger streams and wetlands also lie within or in close proximity to the project



Addendum to the US 219 Improvement Project, SR 6219, Section 019, Indiana bat Biological Assessment for SR 6219, Section 020, Somerset County, Pennsylvania

corridor and are included in these cover types. The remainder of cover types includes mine lands, waste areas, transportation facilities, or other developed cover types.

## 2. Presence of the Indiana Bat

Since the Indiana bat's original listing and since standardized winter surveys began in the early 1980's, the Indiana bat's overall population decreased precipitously until an increasing population trend began in 2003 (364,060 bats) and continued through 2007 (468,181 bats). During this time, based on information available on USFWS' website, there was a net increase in forest land within the range of the Indiana bat, particularly in the Northeast. However, the 2009 rangewide estimate (387,835 bats) shows a sharp decline in the Indiana bat's rangewide population (from the USFWS estimates revised April 23, 2010). The reason for this decline is unknown; however, the decline corresponds with the discovery and spread of White Nose Syndrome, discussed in more detail in the cumulative impacts section of this addendum.

A discussion on the Indiana bat presence in the Section 019 project area is contained in the June 2006, US 6219, Section 019, Indiana bat Biological Assessment as amended in February 2007.

The Section 020 project area is located within 16 kilometers (10 miles) of two known Indiana bat hibernacula, one in southern Somerset County ( ) and the other in the mid-eastern part of Somerset County (Allegheny Tunnel). A third hibernaculum, Hipple Cave, is located over 61 kilometers (38 miles) to the east in Bedford County, Pennsylvania. Mist net surveys, conducted from July 14 to August 11, 2008 within the Section 020 project area to assess the presence of maternity colonies, resulted in no documented evidence of use for maternity colonies. However, due to the close proximity of two hibernacula, it can be assumed the Indiana bats use the area during the spring, early and late summer, and fall for foraging and roosting. The nearest documented maternity colony is located in Blair County (Canoe Creek State Park) over 105 kilometers (65 miles) to the north and east of the Section 020 project. Based on the 2008 mist net survey, no Indiana bat maternity colonies are known to exist in the Section 020 project area. The main concern for the Indiana bat in the Section 020 area is potential loss of foraging and roosting habitat.



Addendum to the US 219 Improvement Project, SR 6219, Section 019, Indiana bat Biological Assessment for SR 6219, Section 020, Somerset County, Pennsylvania

---

## IV. Endangered Species and Habitat Occurrence

### A. Indiana Bat Biology

A detailed discussion on the Indiana bat biology is contained in the June 2006, *US 6219, Section 019, Indiana Bat Biological Assessment* as amended in February 2007 and is incorporated herein by reference.

A February 10, 2010 Indiana Bat brochure by the Pennsylvania Game Commission (PGC) provides updated information on the Indiana bat. The flyer states that the Indiana bat is known to hibernate in 18 sites in 11 Pennsylvania counties. Approximately 1,000 Indiana bats hibernate in Pennsylvania, based on USFWS estimates. Additionally, nine Indiana bat summer maternity sites have been found in seven Pennsylvania counties and mist net captures have occurred in four counties. It was also estimated in the PGC brochure that the maximum migration distance from hibernacula to summer habitats is about 515 kilometers (320 miles). Habitats in closer proximity are likely utilized closer to the times of fall swarming (pre-hibernation) and following spring emergence. Male bats are less selective in their choice of roosting trees than females, which are known to be in their selection of maternity roosts.

The 2007 *Indiana Bat (Myotis sodalis) Draft Recovery Plan: First Revision* provided the following information about the Indiana bat:

- The bats have a low reproductive rate of only one young per year per reproductive female bat and the juvenile mortality rate is high (50% in the first year).
- The Indiana bat is adaptable to new roosts as all roosts eventually become unusable; however, loss of multiple roosts at one time is a stress on the bats from which they do not easily recover.
- The bat prefers to roost in dead trees on upper slopes and ridgetops near their winter hibernacula. They seem to prefer ash, hickory, maple, elm, poplar, and oak trees.
- Bats in the northern range tended to hunt more in wetlands or above streams and ponds than bats in the more western and southern parts of the Indiana bat's range. The most important foraging areas overall though appear to be forested areas, streams/ponds, and riparian corridors. The bat appears to forage more in closed to semi-open forested habitats and forest edges; typically not within the forest canopy.



Addendum to the US 219 Improvement Project, SR 6219, Section 019, Indiana bat Biological Assessment for SR 6219, Section 020, Somerset County, Pennsylvania

- Proximity to water sources and the connectivity (wooded travel corridors) between forest patches are important for the Indiana bat.
- The minimum diameter of roost trees is 6.3 centimeters (2.5 inches), with an average diameter of 41 to 61 centimeters (16 to 24 inches).
- The minimum height of roost trees is about 3 meters (10 feet) for alternate roosts and 3.6 meters (12 feet) for primary roosts; however, the absolute height of the tree is less important than the height relative to the surrounding trees.
- The Indiana bat can expand its winter distribution by colonizing suitable habitat as it becomes available within and beyond its current range.
- Maternity colonies appear to be less abundant in the Mideast part of the range than in the Midwest; possibly due to the cooler and wetter climate that has more temperature variations.

## **B. Indiana Bat Occurrence in the Project Area**

A detailed discussion on the Indiana bat hibernacula, habitat, and migration paths is contained in the June 2006, *US 6219, Section 019, Indiana Bat Biological Assessment* as amended in February 2007 and is incorporated herein by reference. The following relates specifically to the Section 020 project area.

Of note, related to the occurrence of the Indiana bat in the Section 020 project area, no Indiana bats, or other bat species federally or state listed as threatened or endangered, were captured as a result of mist net survey efforts conducted at 16 sites in the Section 020 corridor from July 14 to August 11, 2008. However, it should be noted that the timing of this survey was targeted at determining whether there was a presence of a maternity colony.

### **1. Hibernaculum**

The Section 020 project area is within 11 kilometers (7 miles) of an Indiana bat hibernaculum to the south (██████████ – discussed in detail in the referenced Biological Assessment) and about 16 kilometers (10 miles) from another hibernaculum to the east (Allegheny Tunnels); both hibernacula are in Somerset County. Refer to Figure 2 Relative Distance of US 219 Section 020 Alternative to Indiana Bat (Myotis sodalist) Hibernacula in Appendix A. A third hibernaculum, Hipple Cave, is about 61 kilometers (38 miles) east of the project in Bedford County, Pennsylvania. Allegheny Tunnel is state-owned Priority



Addendum to the US 219 Improvement Project, SR 6219, Section 019, Indiana bat Biological Assessment for SR 6219, Section 020, Somerset County, Pennsylvania

3 hibernaculum. Hipple Cave is Priority 3 and [REDACTED] is Priority 4 both are under private ownership. The three hibernacula are not considered critical habitat for the species; however, all three are important to the recovery of the species.

The Section 020 project will have no direct effects on any hibernacula; however, the relative proximity (within 10 miles) to two known hibernacula suggests the potential presence of Indiana bats in the project area for foraging and roosting.

## 2. Foraging Habitat

Information provided in USFWS' June 23, 2010 letter suggests that forest lands within 10 miles of an Indiana bat hibernacula provide foraging and roosting areas for the Indiana bat, especially during the fall and spring when fat reserves are being built up prior to or following hibernation. Because the Section 020 project area is within 10 miles of two different hibernacula it would be anticipated that the forest land in the project area may be utilized for foraging by Indiana bats.

The proposed Section 020 project will impact approximately 7.01 hectares (17.33 acres) of wetlands, 93.2 hectares (230 acres) of forest, and 640 meters (2,100 linear feet) of perennial and intermittent streams. There are approximately 2,577 hectares (6,211 acres) of wetlands and 185,145 hectares (446,200 acres) of forest within Somerset County, and 75,639 meters (248,160 linear feet) of perennial and intermittent streams within the Casselman River Watershed in Pennsylvania. The project impacts amount to approximately 0.3% of existing wetlands and 0.05% of forestland within Somerset County, and 0.8% of streams in the Pennsylvania portion of the Casselman River Watershed.

## 3. Roosting Habitat

As discussed in the previous section on foraging habitat, because the Section 020 project area is within 10 miles of known hibernacula, it would be anticipated that forest land in the project area may be utilized as roosting habitat by Indiana bats. The proposed Section 020 project Environmental Impact Statement indicated that the project would impact approximately 23 hectares (56 acres) of shagbark hickory areas. It is known that the Indiana bat will utilize more than just shagbark hickory for roosting; therefore, it can be assumed that the impacts to potential roosting habitat is 93.2 hectares (230 acres), which is the amount of forestland impacted by the project.



Addendum to the US 219 Improvement Project, SR 6219, Section 019, Indiana bat Biological Assessment for SR 6219, Section 020, Somerset County, Pennsylvania

## 4. Maternity Roost Habitat

Based on available information, the only known maternity colony for Indiana bats near the project area is located about 105 kilometers (65 miles) east in Blair County, Pennsylvania. Additionally, based on the results of the 2008 mist net survey conducted in the project area; there are no maternity colonies utilizing the forest habitat within the Section 020 project corridor. The USFWS concurred with this conclusion in their letter dated June 23, 2010. Therefore the Section 020 project will have no direct impacts on any Indiana bat maternity colonies.

## 5. Migration Paths

As stated in the referenced Biological Assessment, little information is available on the migration paths of the Indiana bats when traveling between summer and winter habitats. However, the few bats that have been tracked have all traveled in an easterly/southeasterly direction between their winter and summer habitats. Based on best available information, it appears that, at least for the reproducing female bats, they move out of the cold, higher elevations to warmer lowlands. Assuming this, females would be heading to the nearest, largest tract of warm climate within 515 kilometers (320 miles) or so of the nearest hibernacula. The most likely place would appear to be the Potomac River valley to the east of Cumberland, Maryland. If, as it appears, the bats are migrating in a southeasterly direction, no substantial Indiana bat migration routes would be anticipated through the Section 020 project area, as the proposed Section 020 project area is located west of most known Pennsylvania hibernaculum. Two Priority<sup>1</sup> 3 and one Priority 4 hibernacula are known to exist in Westmoreland and Fayette Counties; over 48 to 96 kilometers (30 to 60 miles) west of the project area. Each of these hibernacula reportedly contain less than 11 Indiana bats per site. Based on this information substantial migration of Indiana bats through the project area is not anticipated. Therefore, no direct impact would be anticipated to any migration routes.

---

<sup>1</sup> Indiana bat hibernacula were assigned priority numbers based on the number of Indiana bats they contained. Priority 3 contribute less to recovery and long-term conservation of *M. sodalis*. Priority 3 hibernacula have current or observed historic populations of 50-1,000 bats. Priority 4 are the least important to recovery and long-term conservation of *M. sodalis*. Priority 4 hibernacula typically have current or observed historic populations of fewer than 50 bats.



Addendum to the US 219 Improvement Project, SR 6219, Section 019, Indiana bat Biological Assessment for SR 6219, Section 020, Somerset County, Pennsylvania

---

## V. Effects of Proposed Action

A detailed discussion on the effects of the proposed Section 019 project is contained in the June 2006, US 6219, Section 019, *Indiana bat (Myotis sodalis) Biological Assessment* as amended in February 2007.

### A. Direct

#### 1. Timber Removal

The proposed Section 020 project will impact approximately 93.2 hectares (230 acres) of forest; about 0.05% of the total forest land available in Somerset County [based on information in the January 2006 *Natural Heritage Inventory for Somerset County* – 446,200 acres of forest cover in the county]. Tree removal will be restricted to the timeframe from November 15 to March 31 during the hibernation period, which will avoid direct impacts to any Indiana bats. The loss of timber from the project area may also affect the Indiana bats summer / fall foraging activities; however, substantial areas of preserved forestland and replanted / naturally revegetated forestland are proposed for the project area, as discussed in the Mitigation Measures section of this Addendum. The preservation of this forestland and, particularly, the replanting / natural revegetation of forested areas within the project area will reduce the direct impact of the loss of forest land. Due to the proposed mitigation of forestland and the small amount of county forestland that will be impacted, it is anticipated that the Section 020 project may affect the Indiana bat, but should have no long term substantial impacts, as the bat is, based on USFWS information, adaptable to the loss of habitat when additional habitat is available.

#### 2. Wetland and Stream Impacts

As stated, the proposed Section 020 project will impact approximately 7.01 hectares (17.33 acres) of wetlands. Based on the 2001 *Casselman River Watershed Conservation Plan* there are 6,211 acres of wetlands within Somerset County; the proposed Section 020 project will impact only 0.3% of the existing wetlands in the county.

The wetland impacts will be mitigated on site at a minimum 1:1 ratio, with the overall replacement being at greater than 1:1. Therefore, there will be no net loss of wetlands within the project corridor. Due to the mitigation of wetland impacts and the small amount of overall wetlands on a county basis



Addendum to the US 219 Improvement Project, SR 6219, Section 019, Indiana bat Biological Assessment for SR 6219, Section 020, Somerset County, Pennsylvania

that would be impacted, the Section 020 will have no impact on the Indiana bat from loss of wetland habitat.

The proposed Section 020 project will permanently impact [i.e., the streams will not be available for use by the Indiana bat due to culverts or low-level bridges] approximately 640 meters (2,100 linear feet) of perennial and intermittent streams. This impact is due to three proposed box culverts and several smaller circular culverts, all of which will make the culverted sections of the stream unavailable for use by the Indiana bat. Within the Casselman River Watershed, in Pennsylvania, there are approximately 47 miles of streams [based on the 2001 *Casselman River Watershed Conservation Plan*]; the project will permanently impact [out of use for the Indiana bat] about 0.8% of the total streams within the Pennsylvania portion of the Casselman River Watershed. Based on the small amount of total stream length within the watershed alone that will be permanently out of use for the bat due to the project, the Section 020 should have no substantial impact on the Indiana bat due to loss of stream habitat.

### 3. Blasting

Blasting will be conducted for the Section 020 project; however, unlike the Section 019 project there are no hibernacula within a close enough proximity to the Section 020 project that blasting would be likely to disturb hibernating bats. As a further precaution, blasting will occur only in the summer, after tree removal in the cleared areas, which will further reduce the potential for a direct impact to any roosting bats. Direct impacts to foraging bats from blasting operations are not anticipated as blasting would be conducted during daylight hours outside of the normal time frame for bat foraging activities; however, temporary disturbances may occur. No substantial impacts to the Indiana bat from blasting operations are anticipated as no hibernacula are present in the project area, blasting will be limited to the summer months after tree removal, and blasting will be short term in nature compared to the overall project length.

### 4. Noise

Noise impacts to the Indiana bat are most prevalent near hibernacula, due to the potential to cause additional arousal of hibernating bats, which then leads to unanticipated loss of fat stores at a time when sufficient forage is not available to replenish the fat stores. The Section 020 project is located



Addendum to the US 219 Improvement Project, SR 6219, Section 019, Indiana bat Biological Assessment for SR 6219, Section 020, Somerset County, Pennsylvania

approximately 16 kilometers (10 miles) from any known hibernacula; therefore, no substantial direct impacts due to noise are anticipated.

The project may temporarily displace summer / fall roosting bats due to temporary construction noise; however, because the impacts would be anticipated during the summer / fall months after tree removal and when forage is available, no substantial long-term impact to the Indiana bat is anticipated from construction noise due to the Section 020 project.

The Indiana bats appear to tolerate highway noise, as several known hibernacula and maternity colonies are located within relatively close proximate to major highways (i.e. Canoe Creek mine and church in Blair County is located only meters (several hundred feet) from U.S. 22. Therefore, no long term impacts due to highway noise are anticipated in the Section 020 project area.

## **B. Indirect Effects**

### **1. Interchanges**

Indirect effects from the Section 020 project would be limited to secondary development at proposed interchange locations. The proposed highway will be constructed as a limited access facility and will only provide access to surrounding land at the interchange locations. Therefore, no secondary or indirect development / effects would occur along the new highway's mainline.

Three interchanges will be constructed / reconstructed with the Section 020 project. The existing interchange at the southern end of the existing US 219 four-lane (northern end of the proposed project) will be reconstructed to a full interchange between the new US 219 and the old SR 219. A new interchange will be constructed at Mud Pike near the center of the project area. Finally, the existing interchange on the Meyersdale Bypass (southern end of the Section 020 project area) will be reconstructed for access to Meyersdale.

The northern most interchange will be located within existing State Gamelands No. 50 and the State Correctional Institute property. Due to the location of the interchange within a preserved State Gameland and another state-owned property, no secondary or indirect development is anticipated at this interchange area.



Addendum to the US 219 Improvement Project, SR 6219, Section 019, Indiana bat Biological Assessment for SR 6219, Section 020, Somerset County, Pennsylvania

The area surrounding the southern interchange at Meyersdale is already developed with residential, commercial, industrial, and institutional land uses. No substantial developments or changes in land use would be anticipated to occur at this interchange location.

The central interchange with Mud Pike is located within an undeveloped agricultural / forested area in Black and Brothersvalley Townships, Somerset County, PA. No public services, such as public water / sanitary sewer, are available in this area. The closest location for public water/sewer would be Somerset, which is 11 kilometers (7 miles) to the north. It is unlikely that this interchange area would develop into a commercial or industrial use area, due to lack of facilities / services. The potential exists for some residential development due to the new access provided by the interchange; however, any residential developments in this area would most likely be low density on large lots with most trees / vegetation remaining as currently exists. The likelihood of residential development being low density / large lot is again due to the lack of public services; on-lot water and septic would need to be provided, which would require larger lots.

Loss of substantial forested areas and other indirect impacts from secondary development occurring after the construction of the Section 020 project is unlikely.

## C. Cumulative

### 1. Windfarms

There has been no documented mortality of Indiana bats at windfarms to date, based on information contained in the *2007 Draft Recovery Plan*; however, the impact from windfarms remains a concern to the USFWS. Without documented information on the impact of windfarms on Indiana bats there can be no determination made as to how windfarms contribute to potential cumulative impacts.

### 2. Previous Commercial Timbering Operations

No commercial timbering operations are known to exist within the Section 020 project area. Available information suggests that commercial timbering has not occurred in the project area since the late 19th Century. Therefore, no cumulative effects due to commercial timbering are anticipated.



Addendum to the US 219 Improvement Project, SR 6219, Section 019, Indiana bat Biological Assessment for SR 6219, Section 020, Somerset County, Pennsylvania

### 3. White Nose Syndrome

White Nose Syndrome (WNS) was first documented in February 2006 in Howes Cave, New York. Since its first documentation, WNS has killed more than 1 million bats in the Northeast. A newly described fungus, *Geomyces destructans*, grows at low temperatures (5-10°C) and high levels of humidity (>90%) and is closely associated with WNS. While the fungus typically first appears on the nose, it can also be found on the wing and tail membranes or in the fur. Bats with WNS have a decline in body fat and are aroused more than normal. The frequent arousal of bats leads to a depletion of stored fats reserves. Bats have been observed flying across the winter landscape during the day presumably in search of food and often perish. There has also been a shift observed with regards to the location of the roosting bats. They have been found hibernating in unusually cold areas or close to hibernacula entrances.

Despite impressive gains in the Indiana bat's rangewide population between 2001 and 2007, WNS poses a new threat to the species' status. Because bats typically only have one offspring per year and first year mortality is approximately 50%, the population of bats would not be expected to recover quickly, if adversely affected by WNS. Research into the impacts to bats from WNS and ways to mitigate the impacts continues, including collaboration with scientists from Europe where WNS is also found, but does not seem to be affecting bats in the same way as in the United States and Canada.

### 4. Summary of Cumulative Effects

The proposed project may contribute to minimal cumulative impacts to potential Indiana bat foraging and roosting habitat, but not to the point that an adverse effect is likely to occur.

Direct impacts to the Indiana bat in the form of take will be avoided by seasonal (November 15 to March 31) timbering.

Approximately 0.1% of the total forested area within Somerset County will be impacted; this number would be reduced once mitigation is considered.

No substantial loss in wetland habitat will be realized as a result of the projects.

Travel corridors within the project areas will be preserved by high-level bridges and maintenance of a minimum 15 meter (50 feet) wooded riparian buffer.



Addendum to the US 219 Improvement Project, SR 6219, Section 019, Indiana bat Biological Assessment for SR 6219, Section 020, Somerset County, Pennsylvania

Substantial forest fragmentation has been minimized for both projects by paralleling the forested edge / fringe agricultural areas to the extent possible.

Secondary development effects will be minimized by the limited access nature of both highways and the limited amount of new interchanges (no new interchanges in the Section 019 project area; one new interchange near Mud Pike in the Section 020 project area).

While the Section 020 project is not anticipated to contribute substantially to cumulative impacts to the Indiana bat, a significant and worrisome threat to the bat is White Nose Syndrome. The proposed project will not increase or lessen the effects of White Nose Syndrome.

## VI. Conservation Measures

The Conservation Measures described in the following section are for the Section 020 project only. Conservation Measures for the Section 019 project are contained in the June 2006, *US 6219, Section 019, Indiana bat (Myotis sodalis) Biological Assessment* as amended in February 2007. The measures for the Section 019 project will be completed / implemented if that project eventually moves forward.

### A. Measures to Avoid and Minimize Harm & Harassment

#### 1. Timber Restrictions

Seasonal restrictions on tree-cutting within the project area will be included in the construction documents and implemented during construction. Tree cutting will only be permitted during the time frame from November 15 to March 31 of any year. This avoidance measure will avoid a direct lethal “take” of Indiana bats.

#### 2. Impact Minimization

Adjustments have been made to the project design to avoid and reduce to the minimum possible impacts on forested habitat, particularly around wetlands and riparian corridors. Specific measures that have been taken to reduce / minimize forested impacts include:

- The Section 020 project was designed to parallel the forest edge to the extent possible to avoid fragmenting the existing forested area. The exception is the area at the southern end of the existing 4-lane roadway at Somerset, PA. Due to the location of the end of the existing 4-lane



Addendum to the US 219 Improvement Project, SR 6219, Section 019, Indiana bat Biological Assessment for SR 6219, Section 020, Somerset County, Pennsylvania

within a forested area and the need to connect at this location, some fragmenting of existing forest will occur at the northern end of the project area.

- Relocation of storm water management basins and interchanges outside of wetland areas and forested areas, where possible.
- Balanced the placement of storm water management basins between forested and agricultural land and land that is / would be already disturbed (i.e., either previously disturbed by the Section 020 project – ramp infields, etc. – or disturbed due to surface mining, etc.).
- Reduced the median width from 18 meters to 16 meters (60 feet to 36 feet), which reduced the overall footprint of the roadway.
- A requirement will be included in the construction document that the contractor is only permitted to clear the area required for construction of the new road and associated features, no other clearing (i.e., for staging areas, construction storage, etc.) will be permitted.
- A 15 meter (50 feet) wide buffer has been retained on each side of streams and un-impacted wetland areas.
- Forested travel corridors were located throughout the project area and maintained to the extent possible specifically:
  - Bridges over the unnamed tributary to the Casselman River, Swamp Creek, and Buffalo Creek will maintain the forested riparian corridors.
  - The alignment was located to parallel, not transect, large contiguous forested habitat, which limits forest fragmentation.
- Co-location of project features – where possible, storm water basins were located within ramp infields, utilities were relocated within areas of right-of-way already disturbed for construction of the new roadway, etc.
- As part of the Integrated Pest Management Program, no hazardous or restricted use pesticides will be utilized for the project or follow-up maintenance of the project; any pesticides that are used must be approved for use by the Environmental Protection Agency and applied by certified and licensed applicators (Pennsylvania Pesticides Act). Careful consideration to minimize the use of approved herbicides along the corridor will be conducted annually by PennDOT's licensed pesticide applicators.



Addendum to the US 219 Improvement Project, SR 6219, Section 019, Indiana bat Biological Assessment for SR 6219, Section 020, Somerset County, Pennsylvania

---

## **B. Measures to Benefit or Promote Species Recovery**

### **1. Habitat Enhancement and Protection**

Approximately 8.7 hectares (21.5 acres) of existing PennDOT right-of-way within the northern portion of the project area will be turned over to the PGC for permanent protection. This area is currently forested with a variety of tree species and was previously part of State Gamelands (SGL) No. 50, located along the northern end of the project area. The transfer will result in a net gain to SGL No. 50. The current size of SGL No. 50 is 1,295 hectares (3,200 acres).

PennDOT is also working to transfer the 28.7 hectare (71 acre) Louie-Beech wetland site, located in Somerset Township, Somerset County, approximately 2.4 kilometers (1.5 miles) north of the Section 020 project area, to a public non-profit agency for permanent preservation. This area would be allowed to mature and revegetate naturally, providing additional Indiana bat habitat.

An additional area (38.5 acres) of forested right-of-way acquired at the southern end of the project area in the 1970's will also be preserved in some manner by PennDOT.

### **2. Additional Measures**

PennDOT will construct a permanent "Living Snow Fence" on PennDOT right-of-way in an area that is currently agricultural land and may be subject to drifting snow. This snow fence will be designed to include tree and vegetative species that will provide additional foraging habitat for the Indiana bat.

## **VII. Mitigation Measures**

The Mitigation Measures described in the following section are for the Section 020 project only. Mitigation Measures for the Section 019 project are contained in the June 2006, *US 6219, Section 019, Indiana bat (Myotis sodalis) Biological Assessment* as amended in February 2007. The measures for the Section 019 project will be completed / implemented if that project eventually moves forward.

## **A. Recommended Mitigation Measures**

### **1. Reforesting**

Approximately 57.2 hectares (140.5 acres) within the project right-of-way will be re-forested with a variety of native species or allowed to revegetate naturally, with particular attention given to those



---

Addendum to the US 219 Improvement Project, SR 6219, Section 019, Indiana bat Biological Assessment for SR 6219, Section 020, Somerset County, Pennsylvania

species preferred by the Indiana bat. A wetland mitigation and terrestrial bank will be created from approximately 37 hectares (90.5 acres) to be preserved in perpetuity by a PennDOT transfer to the PA Game Commission. The remaining 20.2 hectares (50 acres) will be preserved in state right-of-way.

## **2. Wetland Mitigation**

As stated previously, wetlands that are impacted by the project will be mitigated at a minimum 1:1 ratio. The result will be a no net loss of wetland habitat within the project area and possibly an overall increase in available wetland habitat.

## **3. Riparian Buffers**

As part of the commitments made due to impacts to the Swamp Creek Valley Historic District, a 15 meter (50 feet) wide buffer will be preserved along the major stream corridors within the project area. This includes an unnamed tributary to the Casselman River, Swamp Creek, and Buffalo Creek. These streams will each be spanned by the proposed Section 020 roadway with elevated and wide bridge structures that will maintain the forested corridor along the streams for the Indiana bat.

## **VIII. Determination of Effects**

The proposed avoidance and minimization measures will result in no direct take of any Indiana bats due to timbering. Additionally, no impact due to pesticide use during construction or maintenance of the proposed projects will occur. The proposed minimization measures have resulted in the smallest highway footprint possible that will meet the project needs. Impacts to forestland from the project may have an impact on the Indiana bat, but the impact is not anticipated to be substantial. As discussed in the following sections, impacts to wetlands will be mitigated, and no substantial loss of Indiana bat use of stream habitat on a county basis will occur; therefore, no substantial effects are anticipated due to wetland and stream impacts. The project does have the potential to temporarily harass any Indiana bats utilizing the project area during construction due to temporary construction noise and short-term blasting operations; however, this will be minimized as discussed in this document.

Based on the preceding analysis, the proposed project “may affect,” but is “not likely to adversely affect” the Indiana bat.



Addendum to the US 219 Improvement Project, SR 6219, Section 019, Indiana bat Biological Assessment  
for SR 6219, Section 020, Somerset County, Pennsylvania

## **IX. Conclusion**

The preceding analysis was based on the best available information, including some information compiled by studies conducted by the Project Team in accordance with USFWS and PGC protocols. The analysis of the proposed Section 020 project's impact on the Indiana bat, including minimization measures that will be taken to avoid or reduce direct impacts, result in a "may affect", but "not likely to adversely affect" finding. Because FHWA and PennDOT understand the importance of forested foraging and roosting habitat in the recovery of the Indiana bat, various conservation measures are offered, as discussed previously, to help aid in the recovery of the species under 7(a) (1). The studies conducted by the Project Team, along with the minimization measures, conservation measures, and mitigation measures are efforts by the project proponents to further Indiana bat recovery, based on the best available information at this time.



Addendum to the US 219 Improvement Project, SR 6219, Section 019, Indiana bat Biological Assessment for SR 6219, Section 020, Somerset County, Pennsylvania

## X. References

Pennsylvania Department of Transportation and the Federal Highway Administration, *Needs Analysis, U.S. Route 219, I-68 (MD) to Somerset, Pennsylvania*, March 1999.

Pennsylvania Department of Transportation and the Federal Highway Administration, *FINAL Environmental Impact Statement / FINAL Section 4(f) Evaluation, SR 6219, Section 020, Somerset County, Pennsylvania*, December 2005.

Pennsylvania Department of Transportation and the Federal Highway Administration, *Record of Decision, SR 6219, Section 020, Somerset County, Pennsylvania*, November 2006.

Pennsylvania Department of Transportation and the Federal Highway Administration, *US 6219, Section 019, Indiana Bat Biological Assessment*, June 2006, as amended in February 2007.

Pennsylvania Department of Transportation and the Federal Highway Administration, *Final Environmental Impact Statement Re-Evaluation Report and FHWA response letter, US 219 Improvement Project, Meyersdale to Somerset, PA, SR 6219, Section 020, Somerset County, Pennsylvania*; August and September 2008.

Pennsylvania Department of Transportation and the Federal Highway Administration, *Mist Net Survey for the Indiana Bat (Myotis sodalis); US 219 Improvement Project; SR 6219 Section 020 Meyersdale to Somerset, Somerset County, Pennsylvania*; March 2009.

Pennsylvania Game Commission, *Indiana Bat (Myotis sodalis)*, flyer February 10, 2010.

Reeder, DeeAnn. 2010. *Ask the Experts: DeeAnn Reeder on bat research*. Posted February 4, 2010. Bucknell University, Lewisburg, PA.

Somerset County Conservation. *Casselman River Watershed Conservation Plan*. December 2001.

United States Fish and Wildlife Service, *Indiana Bat (Myotis sodalis) Draft Recovery Plan, First Revision*, April 2007.

United States Fish and Wildlife Service, *Indiana Bat (Myotis sodalis) 5-Year Review, Summary and Evaluation*, September 2009.



Addendum to the US 219 Improvement Project, SR 6219, Section 019, Indiana bat Biological Assessment for SR 6219, Section 020, Somerset County, Pennsylvania

United States Fish and Wildlife Service, *2009 Rangewide Population Estimate for the Indiana Bat (Myotis sodalis) by USFWS Region*, Revised April 23, 2010.

United States Fish and Wildlife Service, *A National Plan for Assisting States, Federal Agencies, and Tribes in Managing White-Nose Syndrome in Bats - Draft*, October 21, 2010. Accessed on October 27, 2010 at [www.fws.gov/whitenosesyndrome](http://www.fws.gov/whitenosesyndrome).

United States Fish and Wildlife Service. *Indiana Bat (Myotis sodalis) 5-Year Review: Summary and Evaluation*. U.S. Fish and Wildlife Services, Midwest Region – Region 3. 27 pp. September 2009.

United States Fish and Wildlife Service. Press Release - *National Wildlife Refuge System closes caves to slow spread of white-nose syndrome*. September 13, 2010.

United States Geological Survey. *White-Nose Syndrome Threatens the Survival of Hibernating Bats in North America*. USGS Fort Collins Science Center.

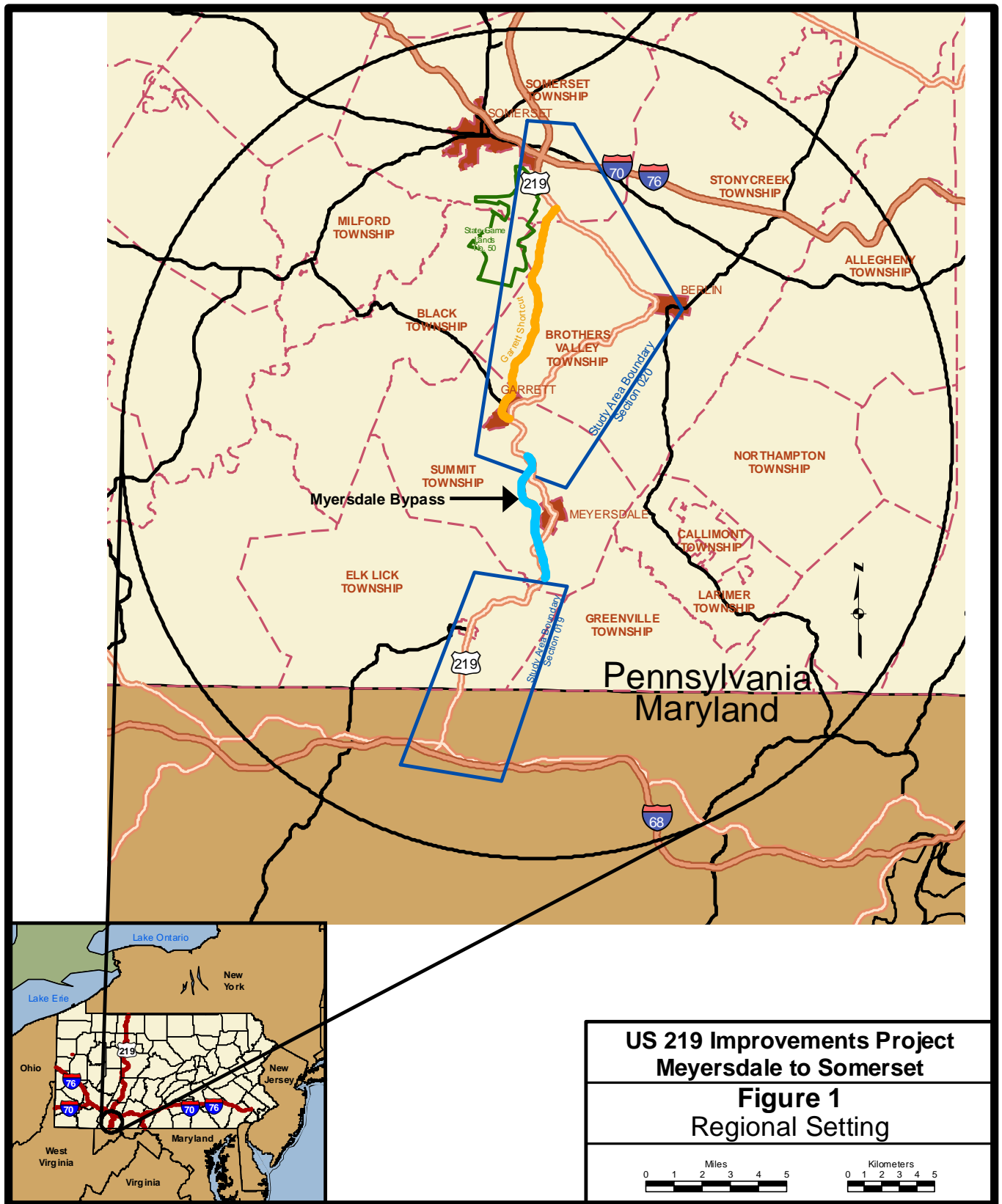
Western Pennsylvania Conservancy. *Somerset County Natural Heritage Inventory*. January 2006.



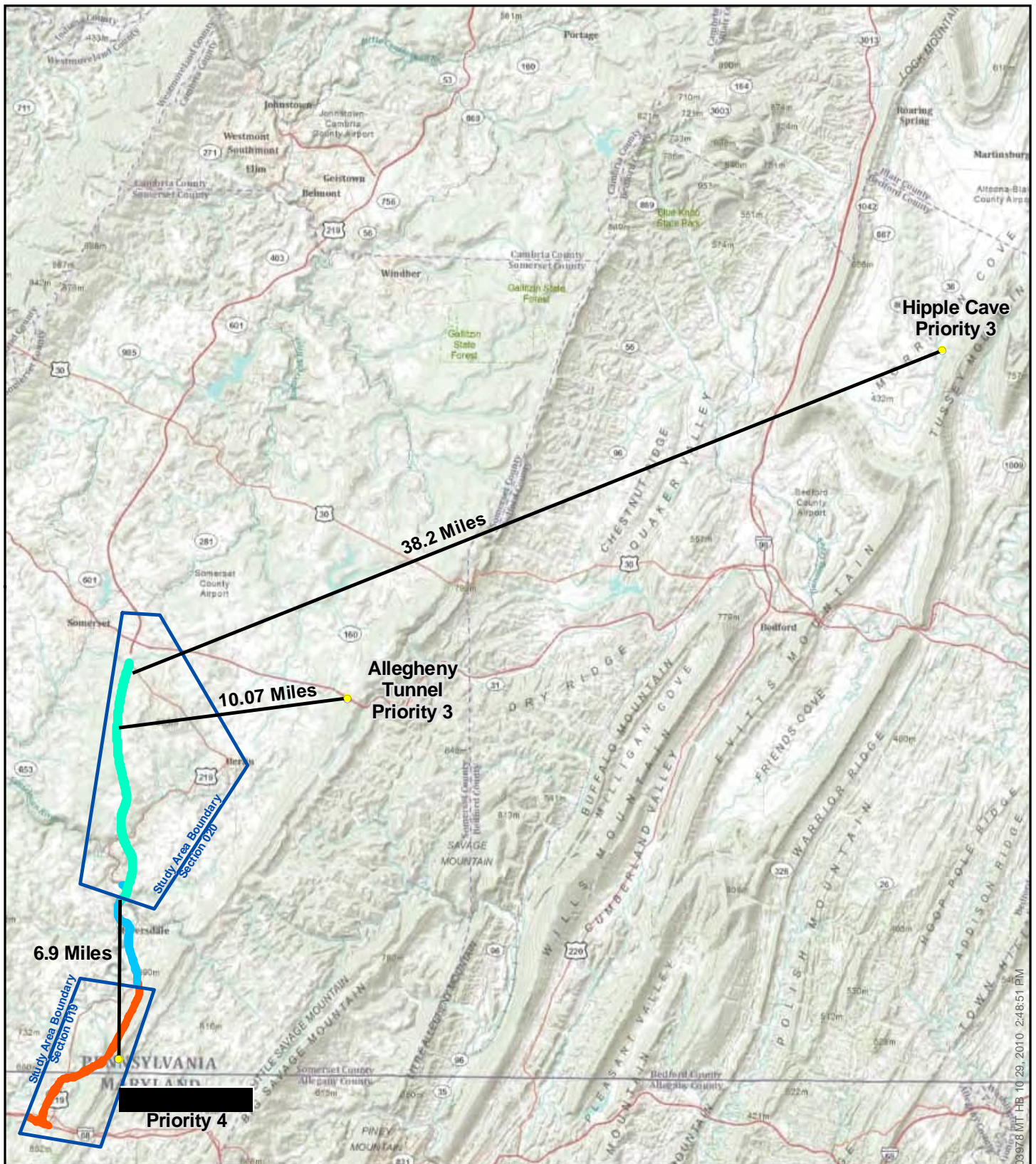
# **APPENDIX A**

## **FIGURES**



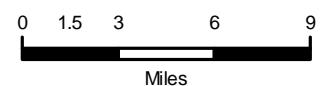






**Figure 2**

**Relative Distance of US 219  
Section 020 Alternative to  
Indiana Bat (*Myotis sodalist*) Hibernacula**





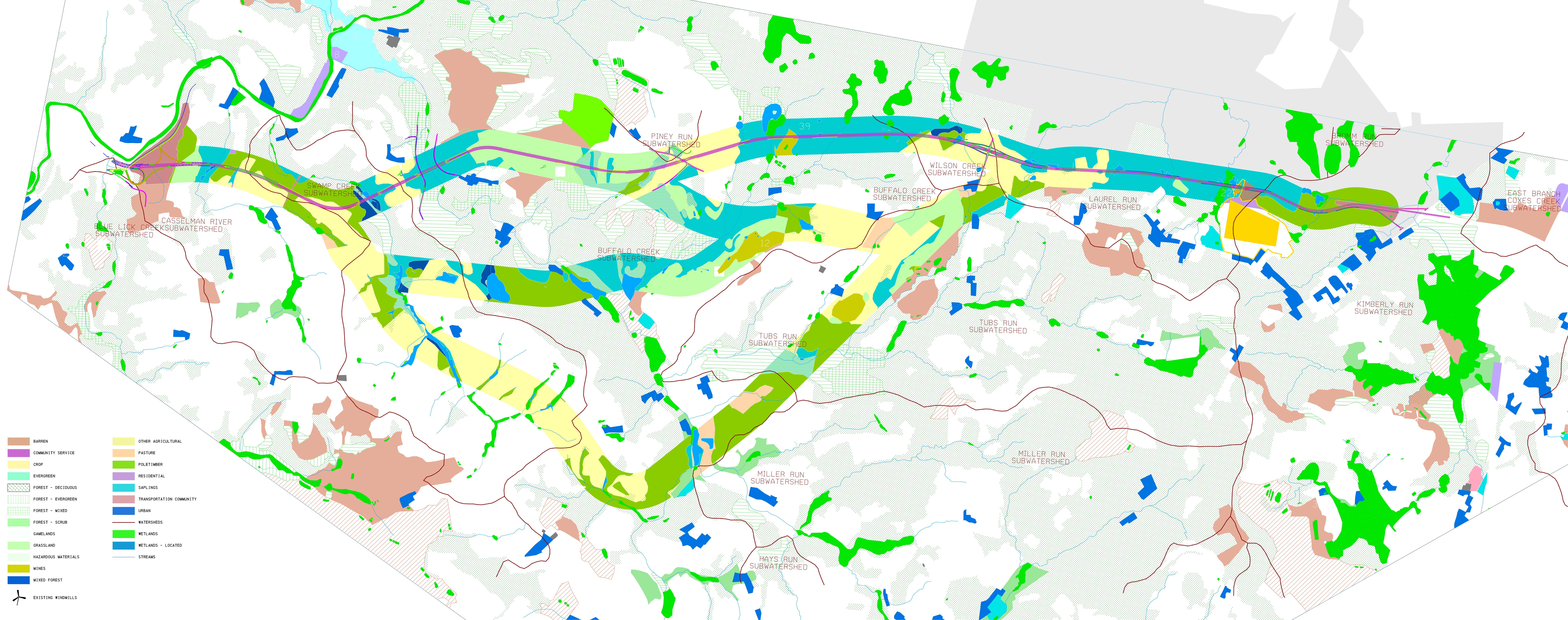


Figure 3 Land Cover Map



**APPENDIX B**

**INDIANA BAT CORRESPONDENCE**

**SR 6219, Section 020**  
**Meyersdale to Somerset**  
**Somerset County, PA**



Correspondence for the Section 019 project is contained in: *US 6219, Section 019, Indiana Bat Biological Assessment*, June 2006, as amended in February 2007

Correspondence for the Section 020 project up to April 2009 is contained in Appendix A – Agency Coordination of the “Mist Net Survey for the Indiana Bat (*Myotis sodalis*); US 219 Improvement Project; SR 6219 Section 020 Meyersdale to Somerset, Somerset County, Pennsylvania (March 2009)”





# United States Department of the Interior

FISH AND WILDLIFE SERVICE  
Pennsylvania Field Office  
315 South Allen Street, Suite 322  
State College, Pennsylvania 16801-4850



April 20, 2009

Thomas A. Prestash  
Pennsylvania Department of Transportation  
1620 North Juniata Street  
Hollidaysburg, PA 16648-1080

RE: USFWS Project # 2007-2430

Dear Mr. Prestash:

Thank you for your March 26, 2009, letter and survey report entitled *Mist Net Survey for the Indiana Bat for the Proposed U.S. 219 Improvement Project, SR 6219 Section 020 Meyersdale to Somerset, Somerset County, Pennsylvania*, which provided the Fish and Wildlife Service with additional information regarding the subject project in Allegheny and Washington Counties, Pennsylvania. The following comments are provided pursuant to the Endangered Species Act (Act) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) to ensure the protection of endangered and threatened species.

In response to our January 14, 2008, request, a mist-net survey was conducted along the proposed roadway corridor by Steve Pernick of L. Robert Kimball and Associates. The survey occurred from July 14 to August 11, 2008, following guidelines provided in the Service's 2007 draft Indiana Bat Recovery Plan. The project area extends 16 kilometers, with an estimated right-of-way area of 330 acres. The corridor was divided into 16 sites encompassing the anticipated direct and indirect project effect areas. No suitable forest habitat was found between Sites 5 and 6 (a distance of 3.4 kilometers); therefore, no mist-net sites were included in this area. Trapping was conducted for at least two net-nights per site.

A total of 140 individual bats representing four species were captured, but no Indiana bats were captured. A single mine airshaft has been identified in the project area; however, the Pennsylvania Game Commission determined this feature does not provide suitable bat hibernation habitat. Since no other mine openings or caves have been identified along this corridor, there appear to be no potential hibernacula present.



Indiana bat hibernaculum and maternity colony activity are known to be present within ten miles to the east and within eight miles to the south of the roadway corridor. While the proximity of Indiana bat activity to the project area suggests the species may be seasonally present, the results of the 2008 mist-net survey suggest that there are no concentrated maternity populations utilizing forest habitat within the proposed U.S. 219 corridor between Meyersdale and Somerset. In their letter of March 11, 2009, the Federal Highway Administration reiterated their commitment to remove trees for the proposed project corridor between October 1 to March 31. This avoidance measure will substantially reduce the risk of take for any migrating and transient Indiana bats that may be seasonally present.

Based on our review of the above information, we conclude that construction of this project may affect, but is not likely to adversely affect the Indiana bat.

This determination is valid for two years from the date of this letter. If the proposed project has not been fully implemented prior to this, an additional review by this office will be necessary. Should project plans change, or if additional information on listed or proposed species becomes available, this determination may be reconsidered.

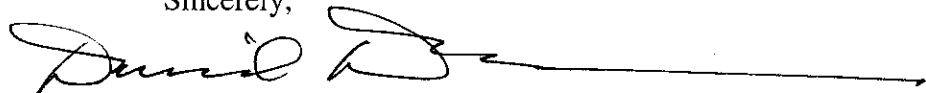
If the mist-net survey did not include all potential habitat in all areas that will be directly or indirectly affected by the proposed project and project-associated features (*e.g.*, cut and fill slopes, access ramps, stormwater features, sedimentation basins, or other features) expand the scope of the survey to include these areas. Submit the results of any expanded mist-net investigation to our office for review so that we can confirm whether the above determination is still valid.

This response relates only to endangered or threatened species under our jurisdiction, and is not to be construed as addressing potential Service concerns under the Fish and Wildlife Coordination Act or other authorities.

*To avoid potential delays in reviewing your project, please use the above-referenced USFWS project tracking number in any future correspondence regarding this project.*

Please contact Robert Anderson at 814-234-4090 if you have any questions or require further assistance regarding this matter.

Sincerely,

A handwritten signature in black ink, appearing to read "David Densmore", followed by a long horizontal line extending to the right.

David Densmore  
Supervisor

**RECEIVED**

APR 21 2009





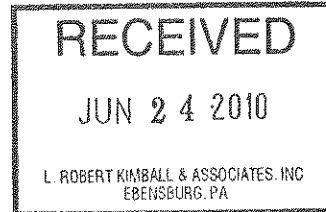
# United States Department of the Interior

FISH AND WILDLIFE SERVICE  
Pennsylvania Field Office  
315 South Allen Street, Suite 322  
State College, Pennsylvania 16801-4850



June 23, 2010

John R. Gustkey  
L.R. Kimball  
615 West Highland Avenue  
P.O. Box 1000  
Ebensburg, PA 15931-1048



RE: USFWS Project # 2007-2430

Dear Mr. Gustkey:

Thank you for your May 25, 2010, letter requesting updated information regarding the proposed U.S. 219 Improvement Project, (S.R. 6219 Section 020) from Meyersdale to Somerset, Somerset County, Pennsylvania. The proposed project is located within the range of the Indiana bat (*Myotis sodalis*), a species that is federally listed as endangered. The following comments are provided pursuant to the Endangered Species Act (Act) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) to ensure the protection of endangered and threatened species.

In our April 20, 2009, letter to Thomas Prestach of the Pennsylvania Department of Transportation, we concurred with the results of a mist-net survey that failed to capture Indiana bats during the sampling period from July 14 to August 11, 2008. In that letter we also considered the presence of an Indiana bat hibernaculum and maternity colony within ten miles to the east and a hibernaculum within eight miles to the south of the roadway corridor. We concluded that while the proximity of Indiana bat activity suggests the species may migrate through the project area, the results of the mist-net survey suggest there are no maternity colonies utilizing forest habitat within the proposed U.S. 219 corridor between Meyersdale and Somerset. We also considered the Federal Highway Administration's commitment to remove trees between October 1 and March 31, commenting that this would substantially reduce the risk of take for any migrating or transient Indiana bats.

Since that time, new information has become available regarding Indiana bat habitat use and requirements in Pennsylvania. Recent radio-telemetry studies have shown that forest lands within 10 miles of Indiana bat hibernacula (rather than five miles), provide essential foraging and roosting areas for bats, especially during the fall and spring, when bats are building up their fat reserves prior to and after hibernation (Butchkoski and Turner 2007, Chenger and Sanders 2007). Male Indiana bats tend to summer in the vicinity of their hibernacula, so regardless of maternity colony presence or absence, adult males are likely to be present in forests and some adjacent fields, meadows, emergent wetlands, riparian corridors and shrub-lands near hibernacula during



the spring, summer and fall months. From late August through mid-November, Indiana bats concentrate their roosting and foraging activities within a 10-mile radius of their hibernacula (e.g., caves, abandoned mines) to mate and build up fat reserves to take them through the winter hibernating period, when food is not available.

While the timing and sampling effort of the completed mist nest survey followed appropriate guidelines for detecting maternity activity, negative results from this summer sampling effort do not discount the species presence during other seasons. As discussed above, due to the presence of this project within 10 miles of Indiana bat hibernacula, it is likely that suitable habitat in the project area is used by Indiana bats associated with these hibernacula, particularly during the spring and fall.

The project right-of-way is approximately 330 acres, a large portion of which is forested. Tree-cutting and land-clearing in the project area will reduce habitat availability and may affect Indiana bats. Due to the anticipated impacts of the project on forest habitat in proximity to known hibernacula, seasonal tree-cutting restrictions alone fail to address adverse effects that may arise from habitat loss and fragmentation. Because this project is receiving federal funding through the Federal Highway Administration, provisions of section 7 of the Endangered Species Act apply. In cases where adverse effects on federally listed species cannot be avoided, formal consultation with the Service is necessary to avoid potential violations of section 9 (prohibiting the “take” of listed species), pursuant to the consultation provisions detailed in section 7 of the Act and its implementing regulations (50 CFR 402.14).

PennDOT and the Administration previously completed formal consultation for the Meyersdale to I-68 section of the U.S. 219 Project (S.R. 6219, section 019). Considering the extent of habitat removal that will result from the two proposed sections of the U.S. 219 Improvement Project, we recommend that consultation be reinitiated, and the biological opinion amended to include consideration of potential take of Indiana bats along the Somerset to Meyersdale section. Further, we recommend that the project include measures to avoid, minimize, and compensate for adverse impacts, including, but not limited to the following:

1. Seasonal restriction on tree-cutting. Any tree-clearing must be done between November 15 and March 31. This avoidance measure is necessary to avoid direct “take” of Indiana bats.
2. Configure the project to avoid and minimize impacts on forest habitat, particularly in and around wetlands and riparian areas.
3. Configure the project to avoid and minimize impacts on suitable roost trees.
4. Retain at least a 50-foot forested buffer on each side of streams and around wetlands.
5. Retain forested travel corridors.
6. Co-locate project features (e.g., roads and utility lines) and cluster project features to



reduce forest clearing.


7. Re-forest cleared areas with a variety of native tree species preferred by Indiana bats (list available from the Service). One of these species must be shagbark hickory. Species selection will be determined by site-specific characteristics (soil moisture, sun exposure, *etc.*) and availability. Trees should be planted at approximately equal rates. Monitor re-planted areas and conduct supplemental tree planting to ensure tree-stocking success is a minimum of 400 live woody stems per acre.
8. Avoid or minimize the use of pesticides and herbicides.
9. Partially compensate for the permanent loss of forest habitat by permanently conserving forest habitat for the affected Indiana bat populations. Various tools are available to achieve permanent protection of habitat, including a) acquiring or otherwise providing protection to Indiana bat habitat in fee simple or through permanent conservation easements, b) buying credits from an approved Indiana bat conservation bank, and c) making an in-lieu-fee contribution to the Indiana Bat Conservation Fund (IBCF).

This response relates only to endangered or threatened species under our jurisdiction, and is not to be construed as addressing potential Service concerns under the Fish and Wildlife Coordination Act or other authorities.

*To avoid potential delays in reviewing your project, please use the above-referenced USFWS project tracking number in any future correspondence regarding this project.*

Please contact Robert Anderson at 814-234-4090 if you have any questions or require further assistance regarding this matter.

Sincerely,



 Clinton Riley  
Field Office Supervisor

#### Literature Cited

Butchkoski C. and G. Turner. 2007. Indiana bat (*Myotis sodalis*) summer roost investigations. Pennsylvania Game Commission, Bureau of Wildlife Management, Research Division – Project Annual Job Report. 21 pp.

Chenger J. and S. Sanders. 2007. South Penn Tunnel Fall 2007 Indiana Bat Telemetry. Report prepared for Shaffer Mountain Wind, LLC and Airtricity, Inc. 48 pp.





U. S. DEPARTMENT  
OF TRANSPORTATION

**Federal Highway  
Administration**

Pennsylvania Division

**MAR 29 2011**

228 Walnut Street, Room 508  
Harrisburg, PA 17101-1720

In reply refer to:  
HPD-PA

Somerset County, Pennsylvania  
US 6219, Section 020  
Meyersdale to Somerset  
US 219 Improvement Project

Mr. Clint Riley, Supervisor  
U.S. Fish and Wildlife Service  
315 South Allen Street, Suite 322  
State College, PA 16801-4850

Dear Mr. Riley:

The Federal Highway Administration (FHWA) in accordance with 50 CFR Section 402.14(c) is submitting this notification to initiate formal consultation for the above referenced project. Along with this request to initiate formal consultation, and in accordance with 50 CFR 402.12(j), FHWA is initiating formal consultation concurrently with the submission of the enclosed Biological Assessment (BA), dated March 2011.

A BA was submitted to the United States Fish and Wildlife Service (USFWS) in June 2006 for the US 6219, Section 019 (USFWS Project #2007-2430) project. This BA was supplemented with an amendment in February 2007. In October 2007, the USFWS issued their Biological Opinion (BO) on the Section 019 project (USFWS Project #2007-1091), which stated that the proposed Section 019 project was not likely to jeopardize the continued existence of the Indiana Bat.

Since the time of the BO, Section 019 has been placed indefinitely on-hold due to a lack of funding. However, Section 020 is proceeding through design and construction. Per informal consultation with the USFWS on Section 020, the BA prepared for Section 019 is being amended to include Section 020 and that formal consultation should be reinitiated between USFWS and FHWA.





In accordance with 50 CFR 402.12(j), please reply within 30 days stating whether or not the Service concurs with the findings of the biological assessment. Should the Service disagree with the findings in the BA, the specific time requirements in 50 CFR 402.14(e) will apply (formal consultation completed within 90 days from receipt of this letter and a Biological Opinion delivered within 45 days following completion of formal consultation).

Please provide any correspondence or direct any questions concerning the proposed project to Dan Walston at 717-221-2290.

Sincerely yours,



*for* Keith M. Lynch  
Program Development, Director

Enclosure

ec: R. VanKirk, PennDOT HQAD  
M. Lombard, PennDOT EQAD  
A. Zawisa, PennDOT 2-0  
J. Pruss, PennDOT 9-0  
A. Squillario, PennDOT 9-0





**US 219 IMPROVEMENT PROJECT, SR 6219 SECTION 020**  
**(USFWS Project #2007-2430)**  
**ADDENDUM to the**

***US 219 IMPROVEMENT PROJECT, SR 6219 SECTION 019***  
***INDIANA BAT (MYOTIS SODALIS) BIOLOGICAL ASSESSMENT***  
***(JUNE 2006, as Amended February 2007)***  
***USFWS Project #2007-1091***

US 219 Improvement Project  
SR 6219 Section 020 Meyersdale to Somerset  
Somerset County, Pennsylvania

*Prepared For:*



And

U.S. Department of Transportation



December 2010  
Revised January 2011  
Revised March 2011



## Table of Contents

I.	Overview .....	1
A.	Purpose and Need.....	1
B.	Informal Consultation Activities.....	2
II.	Project Description.....	4
III.	Description of the Project Action Area .....	5
A.	Introduction .....	5
1.	Description .....	5
2.	Presence of the Indiana Bat .....	6
IV.	Endangered Species and Habitat Occurrence.....	7
A.	Indiana Bat Biology .....	7
B.	Indiana Bat Occurrence in the Project Area.....	8
1.	Hibernaculum.....	8
2.	Foraging Habitat.....	9
3.	Roosting Habitat .....	9
4.	Maternity Roost Habitat .....	10
5.	Migration Paths.....	10
V.	Effects of Proposed Action.....	11
A.	Direct.....	11
1.	Timber Removal .....	11
2.	Wetland and Stream Impacts .....	11
3.	Blasting.....	12
4.	Noise .....	12
B.	Indirect Effects .....	13
1.	Interchanges .....	13
C.	Cumulative .....	14
1.	Windfarms.....	14
2.	Previous Commercial Timbering Operations .....	14
3.	White Nose Syndrome .....	15



Addendum to the US 219 Improvement Project, SR 6219, Section 019, Indiana bat Biological Assessment  
for SR 6219, Section 020, Somerset County, Pennsylvania

4.	Summary of Cumulative Effects.....	15
VI.	Conservation Measures .....	16
A.	Measures to Avoid and Minimize Harm & Harassment .....	16
1.	Timber Restrictions .....	16
2.	Impact Minimization .....	16
B.	Measures to Benefit or Promote Species Recovery .....	18
1.	Habitat Enhancement and Protection .....	18
2.	Additional Measures .....	18
VII.	Mitigation Measures .....	18
A.	Recommended Mitigation Measures .....	18
1.	Reforestation.....	18
2.	Wetland Mitigation.....	19
3.	Riparian Buffers.....	19
VIII.	Incidental Take .....	19
IX.	Determination of Effects.....	21
X.	Conclusion.....	21
XI.	References .....	23

Appendix A     Figures

Appendix B     Indiana bat Correspondence (Section 020)



Addendum to the US 219 Improvement Project, SR 6219, Section 019, Indiana bat Biological Assessment for SR 6219, Section 020, Somerset County, Pennsylvania

## I. Overview

The Federal Highway Administration (FHWA) along with the Pennsylvania Department of Transportation (PennDOT), Engineering District 9-0, and the Maryland State Highway Administration (MD SHA) have been advancing improvements for two sections of U.S. 219 in Somerset County, Pennsylvania and Garrett County, Maryland. Section 019 extends approximately 13 kilometers (eight miles) from the southern end of the Meyersdale Bypass in Somerset County, Pennsylvania to Interstate 68 (I-68) in Garrett County, Maryland. Section 020 extends approximately 16 kilometers (10 miles) from the northern end of the Meyersdale Bypass to the southern end of existing US 219 just southeast of Somerset, PA. See Figure 1, Regional Setting, in Appendix A.

A Biological Assessment was submitted to the United States Fish and Wildlife Service (USFWS) in June 2006 for Section 019. This Biological Assessment was supplemented with an amendment in February 2007. In October of 2007 the USFWS issued their Biological Opinion on the Section 019 project (USFWS Project #2007-1091), which stated that the proposed Section 019 project was not likely to jeopardize the continued existence of the Indiana Bat (*Myotis sodalis*). Since the time of the Biological Opinion, Section 019, the link between Meyersdale and I-68 in Maryland, has been placed on-hold indefinitely due to a lack of funding.

Unlike Section 019, PennDOT is proceeding with design and construction of Section 020. Through informal consultation with the USFWS on Section 020, it has been determined that the Biological Assessment prepared for Section 019 should be amended to include Section 020 and that consultation should be reinitiated between the USFWS and FHWA.

This report serves as the addendum to the June 2006 Biological Assessment to include Section 020 (USFWS Project #2007-2430) and the request to reinitiate consultation.

### A. Purpose and Need

The March 1999 report, "Needs Analysis, U.S. Route 219, I-68 (MD) to Somerset, Pennsylvania," summarizes the needs for the US 219, Sections 019 and 020 projects. The Needs Analysis evaluated existing and future traffic congestion, traffic movement patterns, existing roadway geometric constraints, accidents, system linkage and continuity, socioeconomic characteristics, and economic



Addendum to the US 219 Improvement Project, SR 6219, Section 019, Indiana bat Biological Assessment for SR 6219, Section 020, Somerset County, Pennsylvania

development potential of the study corridors. FHWA and the Pennsylvania and federal resource agencies granted needs concurrence in April of 1999.

## **B. Informal Consultation Activities**

Informal consultation activities conducted for Section 019 are documented in the June 2006, *US 219, Section 019, Indiana bat Biological Assessment* as amended in February 2007.

The following is a summary of Informal Consultation Activities conducted for Section 020:

- The initial Pennsylvania Natural Diversity Inventory (PNDI) request for the Section 020 project was made in March 2001.
- An Agency Field View was conducted in May 2001.
- In July 2001, the United States Fish and Wildlife Service (USFWS) determined that the project area was within the range of the federally endangered Indiana Bat.
- In an April 2003 letter, the USFWS stated that if a seasonal restriction on tree cutting was implemented, construction of the project would not be likely to affect the Indiana Bat.
- Correspondence from the USFWS on November 8, 2007 indicated that the Service was not able to concur that the proposed project would have no effect on Indiana bats since a preference for mist netting surveys or timber harvesting restrictions was not indicated. Furthermore, the Service indicated that in light of additional and new information a mist netting survey should be conducted by a qualified Service approved biologist. The USFWS stated that in 2004, only one maternity colony was documented in PA. In 2005, 2006, and 2007, surveys documented additional maternity colonies in northern Maryland and central and southwestern Pennsylvania.; the closest was in Bedford County.
- A formal response, reiterating FHWA's commitment to the proposed seasonal timber harvest restrictions was prepared by the FHWA and submitted to the USFWS on December 19, 2007.



Addendum to the US 219 Improvement Project, SR 6219, Section 019, Indiana bat Biological Assessment for SR 6219, Section 020, Somerset County, Pennsylvania

- The USFWS indicated within a January 14, 2008 correspondence letter that the Service could not concur with the “determination that seasonal tree removal restrictions, alone, will adequately avoid all adverse effects if an Indiana bat maternity colony is present within the action area.”
- As a result of this verbal consultation, the FHWA indicated within their January 31, 2008 letter to the USFWS that PennDOT would conduct a mist netting survey in accordance USFWS guidelines using a qualified surveyor. The letter reiterated an understanding that in the absence of a confirmed species, the USFWS will issue a No Effect finding for the proposed action. If individual Indiana bats are captured as a result of survey efforts, the FHWA will consult with the Service regarding FHWA’s assessment of effect.
- The final “Mist Net Survey for the Indiana Bat (*Myotis sodalis*); US 219 Improvement Project; SR 6219 Section 020 Meyersdale to Somerset, Somerset County, Pennsylvania (March 2009)” was submitted to USFWS in March 2009. No Indiana bats were captured during the field survey that occurred at 16 sites from July 14 to August 11, 2008.
- In a letter dated April 20, 2009, the USFWS responded to the survey concluding that the construction of the project may affect, but is not likely to adversely affect the Indiana Bat. The letter added that the determination was valid for two years. At this point, PennDOT proceeded with right-of-way acquisition for the Section 020 project.
- Due to permitting requirements and the length of time that had passed since the last PNDI request for the project, a request for updated information related to threatened and endangered species in the project area was sent to the agencies on May 25, 2010.
- On June 23, 2010, the USFWS rescinded their previous conclusion, due to new information, and recommended that consultation be reinitiated, and that the Biological Opinion previously issued for the Section 019 Meyersdale to I-68 project be amended to include the Section 020 project. The letter also recommended measures to avoid, minimize, and compensate for adverse impacts to the Indiana Bat. New research indicates that adult male bats are utilizing habitat up to 10 miles (formerly thought to be 5 miles) from hibernacula for roosting and foraging during spring, summer, and fall.



Addendum to the US 219 Improvement Project, SR 6219, Section 019, Indiana bat Biological Assessment for SR 6219, Section 020, Somerset County, Pennsylvania

- On September 29, 2010, PennDOT and FHWA made a formal presentation of the SR 6219, Sections 019 and 020 projects to USFWS. The presentation focused on Section 020, as Section 019 was indefinitely put on hold in 2008. Information presented included project impacts and avoidance, minimization, conservation, and mitigation measures that were being included in the Section 020 project due to the possible presence of the Indiana bat in the project area.

This report serves as the amendment to the Biological Assessment for the Section 019 project to add the Section 020 project and upon transmittal and formal request from FHWA serves as a request to reinitiate formal consultation on the US 219 Improvement Projects.

Refer to Appendix B for Correspondence related to the Indiana Bat.

## II. Project Description

The Project Description for Section 019 is documented in the June 2006, *US 6219, Section 019, Indiana bat Biological Assessment* as amended in February 2007. See the figures in Appendix A for information about the Section 019 and the Section 020 project areas.

The Section 020 project involves the construction of a 16 kilometer (10 mile), four-lane limited access highway connecting the northern end of the Meyersdale Bypass to the southern end of existing US 219 located southeast of Somerset, PA. The study area includes portions of Somerset, Brothersvalley, Summit, and Black Townships and the Boroughs of Somerset, and Garrett. The Section 020 project is a joint venture between the FHWA and PennDOT Engineering District 9-0.

Detailed project information, including environmental features and resources, can be found in the December 2005 Final Environmental Impact Statement (FEIS) and November 2006 Record of Decision (ROD) prepared for the Section 020 project. Alternative C-1 was identified within the ROD as the selected build alternative by the FHWA.



Addendum to the US 219 Improvement Project, SR 6219, Section 019, Indiana bat Biological Assessment for SR 6219, Section 020, Somerset County, Pennsylvania

---

## III. Description of the Project Action Area

### A. Introduction

#### 1. Description

The Description of the Project Action Area for Section 019 is documented in the June 2006, *US 6219, Section 019, Indiana bat Biological Assessment* as amended in February 2007.

The Section 020 project area is located in the southwestern portion of Pennsylvania and situated between the towns of Somerset and Meyersdale, Somerset County. Ranging from 607 to 762 meters (2,000 and 2,500 feet) above mean sea level, the project study area relief characteristics vary from the north to the south. The northern portion of the project study area is located on a gently rolling plateau while the southern portion is located in mountainous terrain with steep relief. Both portions of the study area are within the Allegheny Mountains section of the Appalachian Plateaus physiographic province (Pennsylvania Department of Conservation and Natural Resources, 2000). Negro Mountain is located to the west of the study area and Meadow Mountain is located to the east of the study area. Drainage originating from the project study area provides flow to the Casselman River and ultimately the Ohio River. Named sub-watersheds of the Casselman River present within the project study area include, from south to north: Blue Lick Creek, Swamp Creek, Buffalo Creek, Piney Run, Wilson Creek, Laurel Run, and Kimberly Run.

Overall, the project study area's land cover / land use is rural in nature and indicative of the historic natural resource driven economy. The land use / land cover components include forestland, agricultural land, mine land, and one prison (State Correctional Institution) with rural residential homes interspersed along the existing roadway network. The forestland has been intensively harvested and consists of second and third growth stands as well as uneven aged select cut stands. Numerous farmsteads are present throughout the project study area on ridge tops and ridge sides. Three reclaimed coal strip mines as well as one abandoned deep mine and surface mine are present. Approximately 52% of the land is in forest cover types, while approximately 18% is in agricultural cover types. An additional 3% consists of successional rangeland, fallow fields, and water bodies. Numerous wetlands, small streams and ponds, and several larger streams and wetlands also lie within or in close proximity to the project



Addendum to the US 219 Improvement Project, SR 6219, Section 019, Indiana bat Biological Assessment for SR 6219, Section 020, Somerset County, Pennsylvania

corridor and are included in these cover types. The remainder of cover types includes mine lands, waste areas, transportation facilities, or other developed cover types.

## 2. Presence of the Indiana Bat

Since the Indiana bat's original listing and since standardized winter surveys began in the early 1980's, the Indiana bat's overall population decreased precipitously until an increasing population trend began in 2003 (364,060 bats) and continued through 2007 (468,181 bats). During this time, based on information available on USFWS' website, there was a net increase in forest land within the range of the Indiana bat, particularly in the Northeast. However, the 2009 rangewide estimate (387,835 bats) shows a sharp decline in the Indiana bat's rangewide population (from the USFWS estimates revised April 23, 2010). The reason for this decline is unknown; however, the decline corresponds with the discovery and spread of White Nose Syndrome, discussed in more detail in the cumulative impacts section of this addendum.

A discussion on the Indiana bat presence in the Section 019 project area is contained in the June 2006, US 6219, Section 019, Indiana bat Biological Assessment as amended in February 2007.

The Section 020 project area is located within 16 kilometers (10 miles) of two known Indiana bat hibernacula, one in southern Somerset County ( ) and the other in the mid-eastern part of Somerset ( ). A third hibernaculum, ( ) is located over 61 kilometers (38 miles) to the east in Bedford County, Pennsylvania. Mist net surveys, conducted from July 14 to August 11, 2008 within the Section 020 project area to assess the presence of maternity colonies, resulted in no documented evidence of use for maternity colonies. However, due to the close proximity of two hibernacula, it can be assumed the Indiana bats use the area during the spring, early and late summer, and fall for foraging and roosting. The nearest documented maternity colony is located in Blair County (Canoe Creek State Park) over 105 kilometers (65 miles) to the north and east of the Section 020 project. Based on the 2008 mist net survey, no Indiana bat maternity colonies are known to exist in the Section 020 project area. The main concern for the Indiana bat in the Section 020 area is potential loss of foraging and roosting habitat.



Addendum to the US 219 Improvement Project, SR 6219, Section 019, Indiana bat Biological Assessment for SR 6219, Section 020, Somerset County, Pennsylvania

---

## IV. Endangered Species and Habitat Occurrence

### A. Indiana Bat Biology

A detailed discussion on the Indiana bat biology is contained in the June 2006, *US 6219, Section 019, Indiana Bat Biological Assessment* as amended in February 2007 and is incorporated herein by reference.

A February 10, 2010 Indiana Bat brochure by the Pennsylvania Game Commission (PGC) provides updated information on the Indiana bat. The flyer states that the Indiana bat is known to hibernate in 18 sites in 11 Pennsylvania counties. Approximately 1,000 Indiana bats hibernate in Pennsylvania, based on USFWS estimates. Additionally, nine Indiana bat summer maternity sites have been found in seven Pennsylvania counties and mist net captures have occurred in four counties. It was also estimated in the PGC brochure that the maximum migration distance from hibernacula to summer habitats is about 515 kilometers (320 miles). Habitats in closer proximity are likely utilized closer to the times of fall swarming (pre-hibernation) and following spring emergence. Male bats are less selective in their choice of roosting trees than females, which are known to be in their selection of maternity roosts.

The 2007 *Indiana Bat (Myotis sodalis) Draft Recovery Plan: First Revision* provided the following information about the Indiana bat:

- The bats have a low reproductive rate of only one young per year per reproductive female bat and the juvenile mortality rate is high (50% in the first year).
- The Indiana bat is adaptable to new roosts as all roosts eventually become unusable; however, loss of multiple roosts at one time is a stress on the bats from which they do not easily recover.
- The bat prefers to roost in dead trees on upper slopes and ridgetops near their winter hibernacula. They seem to prefer ash, hickory, maple, elm, poplar, and oak trees.
- Bats in the northern range tended to hunt more in wetlands or above streams and ponds than bats in the more western and southern parts of the Indiana bat's range. The most important foraging areas overall though appear to be forested areas, streams/ponds, and riparian corridors. The bat appears to forage more in closed to semi-open forested habitats and forest edges; typically not within the forest canopy.



Addendum to the US 219 Improvement Project, SR 6219, Section 019, Indiana bat Biological Assessment for SR 6219, Section 020, Somerset County, Pennsylvania

- Proximity to water sources and the connectivity (wooded travel corridors) between forest patches are important for the Indiana bat.
- The minimum diameter of roost trees is 6.3 centimeters (2.5 inches), with an average diameter of 41 to 61 centimeters (16 to 24 inches).
- The minimum height of roost trees is about 3 meters (10 feet) for alternate roosts and 3.6 meters (12 feet) for primary roosts; however, the absolute height of the tree is less important than the height relative to the surrounding trees.
- The Indiana bat can expand its winter distribution by colonizing suitable habitat as it becomes available within and beyond its current range.
- Maternity colonies appear to be less abundant in the Mideast part of the range than in the Midwest; possibly due to the cooler and wetter climate that has more temperature variations.

## **B. Indiana Bat Occurrence in the Project Area**

A detailed discussion on the Indiana bat hibernacula, habitat, and migration paths is contained in the June 2006, *US 6219, Section 019, Indiana Bat Biological Assessment* as amended in February 2007 and is incorporated herein by reference. The following relates specifically to the Section 020 project area.

Of note, related to the occurrence of the Indiana bat in the Section 020 project area, no Indiana bats, or other bat species federally or state listed as threatened or endangered, were captured as a result of mist net survey efforts conducted at 16 sites in the Section 020 corridor from July 14 to August 11, 2008. However, it should be noted that the timing of this survey was targeted at determining whether there was a presence of a maternity colony.

### **1. Hibernaculum**

The Section 020 project area is within 11 kilometers (7 miles) of an Indiana bat hibernaculum to the south (██████████ – discussed in detail in the referenced Biological Assessment) and about 16 kilometers (10 miles) from another hibernaculum to the east (██████████); both hibernacula are in Somerset County. Refer to Figure 2 Relative Distance of US 219 Section 020 Alternative to Indiana Bat (*Myotis sodalist*) Hibernacula in Appendix A. A third hibernaculum, Hipple Cave, is about 61 kilometers (38 miles) east of the project in Bedford County, Pennsylvania. Allegheny Tunnel is state-owned Priority



Addendum to the US 219 Improvement Project, SR 6219, Section 019, Indiana bat Biological Assessment for SR 6219, Section 020, Somerset County, Pennsylvania

3 hibernaculum. Hipple Cave is Priority 3 and [REDACTED] is Priority 4 both are under private ownership. The three hibernacula are not considered critical habitat for the species; however, all three are important to the recovery of the species.

The Section 020 project will have no direct effects on any hibernacula; however, the relative proximity (within 10 miles) to two known hibernacula suggests the potential presence of Indiana bats in the project area for foraging and roosting.

## 2. Foraging Habitat

Information provided in USFWS' June 23, 2010 letter suggests that forest lands within 10 miles of an Indiana bat hibernacula provide foraging and roosting areas for the Indiana bat, especially during the fall and spring when fat reserves are being built up prior to or following hibernation. Because the Section 020 project area is within 10 miles of two different hibernacula it would be anticipated that the forest land in the project area may be utilized for foraging by Indiana bats.

The proposed Section 020 project will impact approximately 7.01 hectares (17.33 acres) of wetlands, 93.2 hectares (230 acres) of forest, and 640 meters (2,100 linear feet) of perennial and intermittent streams. There are approximately 2,577 hectares (6,211 acres) of wetlands and 185,145 hectares (446,200 acres) of forest within Somerset County, and 75,639 meters (248,160 linear feet) of perennial and intermittent streams within the Casselman River Watershed in Pennsylvania. The project impacts amount to approximately 0.3% of existing wetlands and 0.05% of forestland within Somerset County, and 0.8% of streams in the Pennsylvania portion of the Casselman River Watershed.

## 3. Roosting Habitat

As discussed in the previous section on foraging habitat, because the Section 020 project area is within 10 miles of known hibernacula, it would be anticipated that forest land in the project area may be utilized as roosting habitat by Indiana bats. The proposed Section 020 project Environmental Impact Statement indicated that the project would impact approximately 23 hectares (56 acres) of shagbark hickory areas. It is known that the Indiana bat will utilize more than just shagbark hickory for roosting; therefore, it can be assumed that the impacts to potential roosting habitat is 93.2 hectares (230 acres), which is the amount of forestland impacted by the project.



Addendum to the US 219 Improvement Project, SR 6219, Section 019, Indiana bat Biological Assessment for SR 6219, Section 020, Somerset County, Pennsylvania

## 4. Maternity Roost Habitat

Based on available information, the only known maternity colony for Indiana bats near the project area is located about 105 kilometers (65 miles) east in Blair County, Pennsylvania. Additionally, based on the results of the 2008 mist net survey conducted in the project area; there are no maternity colonies utilizing the forest habitat within the Section 020 project corridor. The USFWS concurred with this conclusion in their letter dated June 23, 2010. Therefore the Section 020 project will have no direct impacts on any Indiana bat maternity colonies.

## 5. Migration Paths

As stated in the referenced Biological Assessment, little information is available on the migration paths of the Indiana bats when traveling between summer and winter habitats. However, the few bats that have been tracked have all traveled in an easterly/southeasterly direction between their winter and summer habitats. Based on best available information, it appears that, at least for the reproducing female bats, they move out of the cold, higher elevations to warmer lowlands. Assuming this, females would be heading to the nearest, largest tract of warm climate within 515 kilometers (320 miles) or so of the nearest hibernacula. The most likely place would appear to be the Potomac River valley to the east of Cumberland, Maryland. If, as it appears, the bats are migrating in a southeasterly direction, no substantial Indiana bat migration routes would be anticipated through the Section 020 project area, as the proposed Section 020 project area is located west of most known Pennsylvania hibernaculum. Two Priority<sup>1</sup> 3 and one Priority 4 hibernacula are known to exist in Westmoreland and Fayette Counties; over 48 to 96 kilometers (30 to 60 miles) west of the project area. Each of these hibernacula reportedly contain less than 11 Indiana bats per site. Based on this information substantial migration of Indiana bats through the project area is not anticipated. Therefore, no direct impact would be anticipated to any migration routes.

---

<sup>1</sup> Indiana bat hibernacula were assigned priority numbers based on the number of Indiana bats they contained. Priority 3 contribute less to recovery and long-term conservation of *M. sodalis*. Priority 3 hibernacula have current or observed historic populations of 50-1,000 bats. Priority 4 are the least important to recovery and long-term conservation of *M. sodalis*. Priority 4 hibernacula typically have current or observed historic populations of fewer than 50 bats.



Addendum to the US 219 Improvement Project, SR 6219, Section 019, Indiana bat Biological Assessment for SR 6219, Section 020, Somerset County, Pennsylvania

---

## V. Effects of Proposed Action

A detailed discussion on the effects of the proposed Section 019 project is contained in the June 2006, US 6219, Section 019, *Indiana bat (Myotis sodalis) Biological Assessment* as amended in February 2007.

### A. Direct

#### 1. Timber Removal

The proposed Section 020 project will impact approximately 93.2 hectares (230 acres) of forest; about 0.05% of the total forest land available in Somerset County [based on information in the January 2006 *Natural Heritage Inventory for Somerset County* – 446,200 acres of forest cover in the county]. Tree removal will be restricted to the timeframe from November 15 to March 31 during the hibernation period, which will avoid direct impacts to any Indiana bats. The loss of timber from the project area may also affect the Indiana bats summer / fall foraging activities; however, substantial areas of preserved forestland and replanted / naturally revegetated forestland are proposed for the project area, as discussed in the Mitigation Measures section of this Addendum. The preservation of this forestland and, particularly, the replanting / natural revegetation of forested areas within the project area will reduce the direct impact of the loss of forest land. Due to the proposed mitigation of forestland and the small amount of county forestland that will be impacted, it is anticipated that the Section 020 project may affect the Indiana bat, but should have no long term substantial impacts, as the bat is, based on USFWS information, adaptable to the loss of habitat when additional habitat is available.

#### 2. Wetland and Stream Impacts

As stated, the proposed Section 020 project will impact approximately 7.01 hectares (17.33 acres) of wetlands. Based on the 2001 *Casselman River Watershed Conservation Plan* there are 6,211 acres of wetlands within Somerset County; the proposed Section 020 project will impact only 0.3% of the existing wetlands in the county.

The wetland impacts will be mitigated on site at a minimum 1:1 ratio, with the overall replacement being at greater than 1:1. Therefore, there will be no net loss of wetlands within the project corridor. Due to the mitigation of wetland impacts and the small amount of overall wetlands on a county basis



Addendum to the US 219 Improvement Project, SR 6219, Section 019, Indiana bat Biological Assessment for SR 6219, Section 020, Somerset County, Pennsylvania

that would be impacted, the Section 020 will have no impact on the Indiana bat from loss of wetland habitat.

The proposed Section 020 project will permanently impact [i.e., the streams will not be available for use by the Indiana bat due to culverts or low-level bridges] approximately 640 meters (2,100 linear feet) of perennial and intermittent streams. This impact is due to three proposed box culverts and several smaller circular culverts, all of which will make the culverted sections of the stream unavailable for use by the Indiana bat. Within the Casselman River Watershed, in Pennsylvania, there are approximately 47 miles of streams [based on the 2001 *Casselman River Watershed Conservation Plan*]; the project will permanently impact [out of use for the Indiana bat] about 0.8% of the total streams within the Pennsylvania portion of the Casselman River Watershed. Based on the small amount of total stream length within the watershed alone that will be permanently out of use for the bat due to the project, the Section 020 should have no substantial impact on the Indiana bat due to loss of stream habitat.

### 3. Blasting

Blasting will be conducted for the Section 020 project; however, unlike the Section 019 project there are no hibernacula within a close enough proximity to the Section 020 project that blasting would be likely to disturb hibernating bats. As a further precaution, blasting will occur only in the summer, after tree removal in the cleared areas, which will further reduce the potential for a direct impact to any roosting bats. Direct impacts to foraging bats from blasting operations are not anticipated as blasting would be conducted during daylight hours outside of the normal time frame for bat foraging activities; however, temporary disturbances may occur. No substantial impacts to the Indiana bat from blasting operations are anticipated as no hibernacula are present in the project area, blasting will be limited to the summer months after tree removal, and blasting will be short term in nature compared to the overall project length.

### 4. Noise

Noise impacts to the Indiana bat are most prevalent near hibernacula, due to the potential to cause additional arousal of hibernating bats, which then leads to unanticipated loss of fat stores at a time when sufficient forage is not available to replenish the fat stores. The Section 020 project is located



Addendum to the US 219 Improvement Project, SR 6219, Section 019, Indiana bat Biological Assessment for SR 6219, Section 020, Somerset County, Pennsylvania

approximately 16 kilometers (10 miles) from any known hibernacula; therefore, no substantial direct impacts due to noise are anticipated.

The project may temporarily displace summer / fall roosting bats due to temporary construction noise; however, because the impacts would be anticipated during the summer / fall months after tree removal and when forage is available, no substantial long-term impact to the Indiana bat is anticipated from construction noise due to the Section 020 project.

The Indiana bats appear to tolerate highway noise, as several known hibernacula and maternity colonies are located within relatively close proximity to major highways (i.e. Canoe Creek mine and church in Blair County is located only meters (several hundred feet) from U.S. 22. Therefore, no long term impacts due to highway noise are anticipated in the Section 020 project area.

## **B. Indirect Effects**

### **1. Interchanges**

Indirect effects from the Section 020 project would be limited to secondary development at proposed interchange locations. The proposed highway will be constructed as a limited access facility and will only provide access to surrounding land at the interchange locations. Therefore, no secondary or indirect development / effects would occur along the new highway's mainline.

Three interchanges will be constructed / reconstructed with the Section 020 project. The existing interchange at the southern end of the existing US 219 four-lane (northern end of the proposed project) will be reconstructed to a full interchange between the new US 219 and the old SR 219. A new interchange will be constructed at Mud Pike near the center of the project area. Finally, the existing interchange on the Meyersdale Bypass (southern end of the Section 020 project area) will be reconstructed for access to Meyersdale.

The northern most interchange will be located within existing State Gamelands No. 50 and the State Correctional Institute property. Due to the location of the interchange within a preserved State Gameland and another state-owned property, no secondary or indirect development is anticipated at this interchange area.



Addendum to the US 219 Improvement Project, SR 6219, Section 019, Indiana bat Biological Assessment for SR 6219, Section 020, Somerset County, Pennsylvania

The area surrounding the southern interchange at Meyersdale is already developed with residential, commercial, industrial, and institutional land uses. No substantial developments or changes in land use would be anticipated to occur at this interchange location.

The central interchange with Mud Pike is located within an undeveloped agricultural / forested area in Black and Brothersvalley Townships, Somerset County, PA. No public services, such as public water / sanitary sewer, are available in this area. The closest location for public water/sewer would be Somerset, which is 11 kilometers (7 miles) to the north. It is unlikely that this interchange area would develop into a commercial or industrial use area, due to lack of facilities / services. The potential exists for some residential development due to the new access provided by the interchange; however, any residential developments in this area would most likely be low density on large lots with most trees / vegetation remaining as currently exists. The likelihood of residential development being low density / large lot is again due to the lack of public services; on-lot water and septic would need to be provided, which would require larger lots.

Loss of substantial forested areas and other indirect impacts from secondary development occurring after the construction of the Section 020 project is unlikely.

## C. Cumulative

### 1. Windfarms

There has been no documented mortality of Indiana bats at windfarms to date, based on information contained in the *2007 Draft Recovery Plan*; however, the impact from windfarms remains a concern to the USFWS. Without documented information on the impact of windfarms on Indiana bats there can be no determination made as to how windfarms contribute to potential cumulative impacts.

### 2. Previous Commercial Timbering Operations

No commercial timbering operations are known to exist within the Section 020 project area. Available information suggests that commercial timbering has not occurred in the project area since the late 19th Century. Therefore, no cumulative effects due to commercial timbering are anticipated.



Addendum to the US 219 Improvement Project, SR 6219, Section 019, Indiana bat Biological Assessment for SR 6219, Section 020, Somerset County, Pennsylvania

### 3. White Nose Syndrome

White Nose Syndrome (WNS) was first documented in February 2006 in Howes Cave, New York. Since its first documentation, WNS has killed more than 1 million bats in the Northeast. A newly described fungus, *Geomyces destructans*, grows at low temperatures (5-10°C) and high levels of humidity (>90%) and is closely associated with WNS. While the fungus typically first appears on the nose, it can also be found on the wing and tail membranes or in the fur. Bats with WNS have a decline in body fat and are aroused more than normal. The frequent arousal of bats leads to a depletion of stored fats reserves. Bats have been observed flying across the winter landscape during the day presumably in search of food and often perish. There has also been a shift observed with regards to the location of the roosting bats. They have been found hibernating in unusually cold areas or close to hibernacula entrances.

Despite impressive gains in the Indiana bat's rangewide population between 2001 and 2007, WNS poses a new threat to the species' status. Because bats typically only have one offspring per year and first year mortality is approximately 50%, the population of bats would not be expected to recover quickly, if adversely affected by WNS. Research into the impacts to bats from WNS and ways to mitigate the impacts continues, including collaboration with scientists from Europe where WNS is also found, but does not seem to be affecting bats in the same way as in the United States and Canada.

### 4. Summary of Cumulative Effects

The proposed project may contribute to minimal cumulative impacts to potential Indiana bat foraging and roosting habitat, but not to the point that an adverse effect is likely to occur.

Direct impacts to the Indiana bat in the form of take will be avoided by seasonal (November 15 to March 31) timbering.

Approximately 0.1% of the total forested area within Somerset County will be impacted; this number would be reduced once mitigation is considered.

No substantial loss in wetland habitat will be realized as a result of the projects.

Travel corridors within the project areas will be preserved by high-level bridges and maintenance of a minimum 15 meter (50 feet) wooded riparian buffer.



Addendum to the US 219 Improvement Project, SR 6219, Section 019, Indiana bat Biological Assessment for SR 6219, Section 020, Somerset County, Pennsylvania

Substantial forest fragmentation has been minimized for both projects by paralleling the forested edge / fringe agricultural areas to the extent possible.

Secondary development effects will be minimized by the limited access nature of both highways and the limited amount of new interchanges (no new interchanges in the Section 019 project area; one new interchange near Mud Pike in the Section 020 project area).

While the Section 020 project is not anticipated to contribute substantially to cumulative impacts to the Indiana bat, a significant and worrisome threat to the bat is White Nose Syndrome. The proposed project will not increase or lessen the effects of White Nose Syndrome.

## VI. Conservation Measures

The Conservation Measures described in the following section are for the Section 020 project only. Conservation Measures for the Section 019 project are contained in the June 2006, *US 6219, Section 019, Indiana bat (Myotis sodalis) Biological Assessment* as amended in February 2007. The measures for the Section 019 project will be completed / implemented if that project eventually moves forward.

### A. Measures to Avoid and Minimize Harm & Harassment

#### 1. Timber Restrictions

Seasonal restrictions on tree-cutting within the project area will be included in the construction documents and implemented during construction. Tree cutting will only be permitted during the time frame from November 15 to March 31 of any year. This avoidance measure will avoid a direct lethal “take” of Indiana bats.

#### 2. Impact Minimization

Adjustments have been made to the project design to avoid and reduce to the minimum possible impacts on forested habitat, particularly around wetlands and riparian corridors. Specific measures that have been taken to reduce / minimize forested impacts include:

- The Section 020 project was designed to parallel the forest edge to the extent possible to avoid fragmenting the existing forested area. The exception is the area at the southern end of the existing 4-lane roadway at Somerset, PA. Due to the location of the end of the existing 4-lane



within a forested area and the need to connect at this location, some fragmenting of existing forest will occur at the northern end of the project area.

- Relocation of storm water management basins and interchanges outside of wetland areas and forested areas, where possible.
- Balanced the placement of storm water management basins between forested and agricultural land and land that is / would be already disturbed (i.e., either previously disturbed by the Section 020 project – ramp infields, etc. – or disturbed due to surface mining, etc.).
- Reduced the median width from 18 meters to 16 meters (60 feet to 36 feet), which reduced the overall footprint of the roadway.
- A requirement will be included in the construction document that the contractor is only permitted to clear the area required for construction of the new road and associated features, no other clearing (i.e., for staging areas, construction storage, etc.) will be permitted.
- A 15 meter (50 feet) wide buffer has been retained on each side of streams and un-impacted wetland areas.
- Forested travel corridors were located throughout the project area and maintained to the extent possible specifically:
  - Bridges over the unnamed tributary to the Casselman River, Swamp Creek, and Buffalo Creek will maintain the forested riparian corridors.
  - The alignment was located to parallel, not transect, large contiguous forested habitat, which limits forest fragmentation.
- Co-location of project features – where possible, storm water basins were located within ramp infields, utilities were relocated within areas of right-of-way already disturbed for construction of the new roadway, etc.
- As part of the Integrated Pest Management Program, no hazardous or restricted use pesticides will be utilized for the project or follow-up maintenance of the project; any pesticides that are used must be approved for use by the Environmental Protection Agency and applied by certified and licensed applicators (Pennsylvania Pesticides Act). Careful consideration to minimize the use of approved herbicides along the corridor will be conducted annually by PennDOT's licensed pesticide applicators.



Addendum to the US 219 Improvement Project, SR 6219, Section 019, Indiana bat Biological Assessment for SR 6219, Section 020, Somerset County, Pennsylvania

## **B. Measures to Benefit or Promote Species Recovery**

### **1. Habitat Enhancement and Protection**

Approximately 8.7 hectares (21.5 acres) of existing PennDOT right-of-way within the northern portion of the project area will be turned over to the PGC for permanent protection. This area is currently forested with a variety of tree species and was previously part of State Gamelands (SGL) No. 50, located along the northern end of the project area. The transfer will result in a net gain to SGL No. 50. The current size of SGL No. 50 is 1,295 hectares (3,200 acres).

PennDOT is also working to transfer the 28.7 hectare (71 acre) Louie-Beech wetland site, located in Somerset Township, Somerset County, approximately 2.4 kilometers (1.5 miles) north of the Section 020 project area, to a public non-profit agency for permanent preservation. This area would be allowed to mature and revegetate naturally, providing additional Indiana bat habitat.

An additional area (38.5 acres) of forested right-of-way acquired at the southern end of the project area in the 1970's will also be preserved in some manner by PennDOT.

### **2. Additional Measures**

PennDOT will construct a permanent "Living Snow Fence" on PennDOT right-of-way in an area that is currently agricultural land and may be subject to drifting snow. This snow fence will be designed to include tree and vegetative species that will provide additional foraging habitat for the Indiana bat.

## **VII. Mitigation Measures**

The Mitigation Measures described in the following section are for the Section 020 project only. Mitigation Measures for the Section 019 project are contained in the June 2006, *US 6219, Section 019, Indiana bat (Myotis sodalis) Biological Assessment* as amended in February 2007. The measures for the Section 019 project will be completed / implemented if that project eventually moves forward.

## **A. Recommended Mitigation Measures**

### **1. Reforesting**

Approximately 57.2 hectares (140.5 acres) within the project right-of-way will be re-forested with a variety of native species or allowed to revegetate naturally, with particular attention given to those



Addendum to the US 219 Improvement Project, SR 6219, Section 019, Indiana bat Biological Assessment for SR 6219, Section 020, Somerset County, Pennsylvania

species preferred by the Indiana bat. A wetland mitigation and terrestrial bank will be created from approximately 37 hectares (90.5 acres) to be preserved in perpetuity by a PennDOT transfer to the PA Game Commission. The remaining 20.2 hectares (50 acres) will be preserved in state right-of-way.

## 2. Wetland Mitigation

As stated previously, wetlands that are impacted by the project will be mitigated at a minimum 1:1 ratio. The result will be a no net loss of wetland habitat within the project area and possibly an overall increase in available wetland habitat.

## 3. Riparian Buffers

As part of the commitments made due to impacts to the Swamp Creek Valley Historic District, a 15 meter (50 feet) wide buffer will be preserved along the major stream corridors within the project area. This includes an unnamed tributary to the Casselman River, Swamp Creek, and Buffalo Creek. These streams will each be spanned by the proposed Section 020 roadway with elevated and wide bridge structures that will maintain the forested corridor along the streams for the Indiana bat.

## VIII. Incidental Take

Sections 4(d) and 9 of the Endangered Species Act, as amended, prohibit taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct) of listed species of fish or wildlife without a special exemption. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Harass is defined as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is any take of listed animal species that results from, but is not the purpose of, carrying out an otherwise lawful activity conducted by the federal agency or the applicant.

We anticipate that incidental take of the Indiana bat will be difficult to detect and quantify for the following reasons: 1) individuals are small; 2) Indiana bats form small (i.e., 50 or fewer, to 100 individuals), widely dispersed colonies under loose bark or in cavities of trees; 3) only a portion of the Indiana bat population is likely to be visible during hibernaculum counts among thousands of bats of



Addendum to the US 219 Improvement Project, SR 6219, Section 019, Indiana bat Biological Assessment for SR 6219, Section 020, Somerset County, Pennsylvania

other species; 4) finding dead or injured specimens is unlikely; 5) the areal extent and density of the species' spring, summer, and fall population in the action area is unknown; and 6) some habitat, including the hibernaculum, is under private ownership, making monitoring the bat population dependent on access.

PennDOT anticipates that take in the form of harm and harassment (as defined in 50 CFR §17.3) will occur as a result of the direct and indirect effects of the proposed action. Due to the nature of the project, effects are not limited to the period of construction, but become permanent and ongoing with operation of the road. The extent of take will depend on the location of foraging and roosting habitat for Indiana bats. Blasting and construction during the non-hibernation season could kill bats roosting in proximity to the disturbance, but we believe that this is unlikely because other disturbances prior to blasting are likely to drive the bats farther away. Blasting is likely to force any roosting bats to find an alternate roost, and may force the bats to abandon a roost in the area. Relocation to less suitable habitat may be a repeated occurrence on subsequent nights until that stage of construction is complete. This is expected to harm and harass all Indiana bats roosting near blasting and construction, potentially resulting in lower reproductive success, reduced vigor, and reduced individual survival.

The removal of approximately 230 acres of forestland (potential Indiana bat foraging and roosting habitat) will be permanent when it is converted to roadway pavement and associated cut and fill slopes. We expect that this conversion will result in take in the form of harm for all Indiana bats that had depended upon this habitat for use in spring, summer, or fall.

Tree and building removal associated with road construction may result in alteration of roosting and/or feeding activities by the bats (i.e., the bats may have to fly farther to forage, or seek alternate roosts) or may disrupt travel corridors to the extent that the bats are forced to abandon the area altogether.

To the best of our knowledge, no Indiana bat maternity colony or individual Indiana bats have been incidentally taken in the action area to date, incidental take of this species can be anticipated due to the loss of roost trees, loss of usable travel corridors, and fragmentation of foraging and roosting habitat due to the road. We believe that if a maternity colony or roosting individual is present in an area proposed for timber harvest, blasting, construction, or other disturbance, loss of suitable roosting habitat would result in incidental take of Indiana bats. *However, while some take of individuals*



Addendum to the US 219 Improvement Project, SR 6219, Section 019, Indiana bat Biological Assessment for SR 6219, Section 020, Somerset County, Pennsylvania

*associated with a maternity colony is possible, we do not anticipate the project will result in loss or a significant reduction in the size of a maternity colony.*

Critical habitat for the Indiana bat has been designated at hibernacula in Illinois, Indiana, Kentucky, Missouri, Tennessee, and West Virginia; however, this action does not affect these areas, and no destruction or adverse modification of designated critical habitat will occur.

## **IX. Determination of Effects**

The proposed avoidance and minimization measures will result in no direct take of any Indiana bats due to timbering. Additionally, no impact due to pesticide use during construction or maintenance of the proposed projects will occur. The proposed minimization measures have resulted in the smallest highway footprint possible that will meet the project needs. Impacts to forestland from the project may have an impact on the Indiana bat, but the impact is not anticipated to be substantial. As discussed in the previous sections, impacts to wetlands will be mitigated, and no substantial loss of Indiana bat use of stream habitat on a county basis will occur; therefore, no substantial effects are anticipated due to wetland and stream impacts. Take in the form of harm/harassment will occur due to the loss of roosting and foraging habitat. This impact will be reduced by the reforestation conservation measures that are proposed; however, the 230 acres of forestland required to construct the new roadway will be permanently removed from use by the bat and therefore some take is anticipated. The project does have the potential to harass any Indiana bats utilizing the project area during construction due to temporary construction noise and short-term blasting operations; however, this will be minimized as discussed in this document.

Based on the preceding analysis, the proposed project “may affect,” and is “likely to adversely affect” the Indiana bat.

## **X. Conclusion**

The preceding analysis was based on the best available information, including some information compiled by studies conducted by the Project Team in accordance with USFWS and PGC protocols. The analysis of the proposed Section 020 project’s impact on the Indiana bat, including minimization measures that will be taken to avoid, reduce, or offset take, results in a “may affect, likely to adversely affect” finding. Because FHWA and PennDOT understand the importance of forested foraging and



Addendum to the US 219 Improvement Project, SR 6219, Section 019, Indiana bat Biological Assessment  
*for* SR 6219, Section 020, Somerset County, Pennsylvania

roosting habitat in the recovery of the Indiana bat, various conservation measures are offered, as discussed previously, to help aid in the recovery of the species under 7(a) (1). The studies conducted by the Project Team, along with the minimization measures, conservation measures, and mitigation measures are efforts by the project proponents to further Indiana bat recovery, based on the best available information at this time.



Addendum to the US 219 Improvement Project, SR 6219, Section 019, Indiana bat Biological Assessment for SR 6219, Section 020, Somerset County, Pennsylvania

## **XI. References**

Pennsylvania Department of Transportation and the Federal Highway Administration, *Needs Analysis, U.S. Route 219, I-68 (MD) to Somerset, Pennsylvania*, March 1999.

Pennsylvania Department of Transportation and the Federal Highway Administration, *FINAL Environmental Impact Statement / FINAL Section 4(f) Evaluation, SR 6219, Section 020, Somerset County, Pennsylvania*, December 2005.

Pennsylvania Department of Transportation and the Federal Highway Administration, *Record of Decision, SR 6219, Section 020, Somerset County, Pennsylvania*, November 2006.

Pennsylvania Department of Transportation and the Federal Highway Administration, *US 6219, Section 019, Indiana Bat Biological Assessment*, June 2006, as amended in February 2007.

Pennsylvania Department of Transportation and the Federal Highway Administration, *Final Environmental Impact Statement Re-Evaluation Report and FHWA response letter, US 219 Improvement Project, Meyersdale to Somerset, PA, SR 6219, Section 020, Somerset County, Pennsylvania*; August and September 2008.

Pennsylvania Department of Transportation and the Federal Highway Administration, *Mist Net Survey for the Indiana Bat (Myotis sodalis); US 219 Improvement Project; SR 6219 Section 020 Meyersdale to Somerset, Somerset County, Pennsylvania*; March 2009.

Pennsylvania Game Commission, *Indiana Bat (Myotis sodalis)*, flyer February 10, 2010.

Reeder, DeeAnn. 2010. *Ask the Experts: DeeAnn Reeder on bat research*. Posted February 4, 2010. Bucknell University, Lewisburg, PA.

Somerset County Conservation. *Casselman River Watershed Conservation Plan*. December 2001.

United States Fish and Wildlife Service, *Indiana Bat (Myotis sodalis) Draft Recovery Plan, First Revision*, April 2007.

United States Fish and Wildlife Service, *Indiana Bat (Myotis sodalis) 5-Year Review, Summary and Evaluation*, September 2009.



Addendum to the US 219 Improvement Project, SR 6219, Section 019, Indiana bat Biological Assessment for SR 6219, Section 020, Somerset County, Pennsylvania

United States Fish and Wildlife Service, *2009 Rangewide Population Estimate for the Indiana Bat (Myotis sodalis) by USFWS Region*, Revised April 23, 2010.

United States Fish and Wildlife Service, *A National Plan for Assisting States, Federal Agencies, and Tribes in Managing White-Nose Syndrome in Bats - Draft*, October 21, 2010. Accessed on October 27, 2010 at [www.fws.gov/whitenosesyndrome](http://www.fws.gov/whitenosesyndrome).

United States Fish and Wildlife Service. *Indiana Bat (Myotis sodalis) 5-Year Review: Summary and Evaluation*. U.S. Fish and Wildlife Services, Midwest Region – Region 3. 27 pp. September 2009.

United States Fish and Wildlife Service. Press Release - *National Wildlife Refuge System closes caves to slow spread of white-nose syndrome*. September 13, 2010.

United States Geological Survey. *White-Nose Syndrome Threatens the Survival of Hibernating Bats in North America*. USGS Fort Collins Science Center.

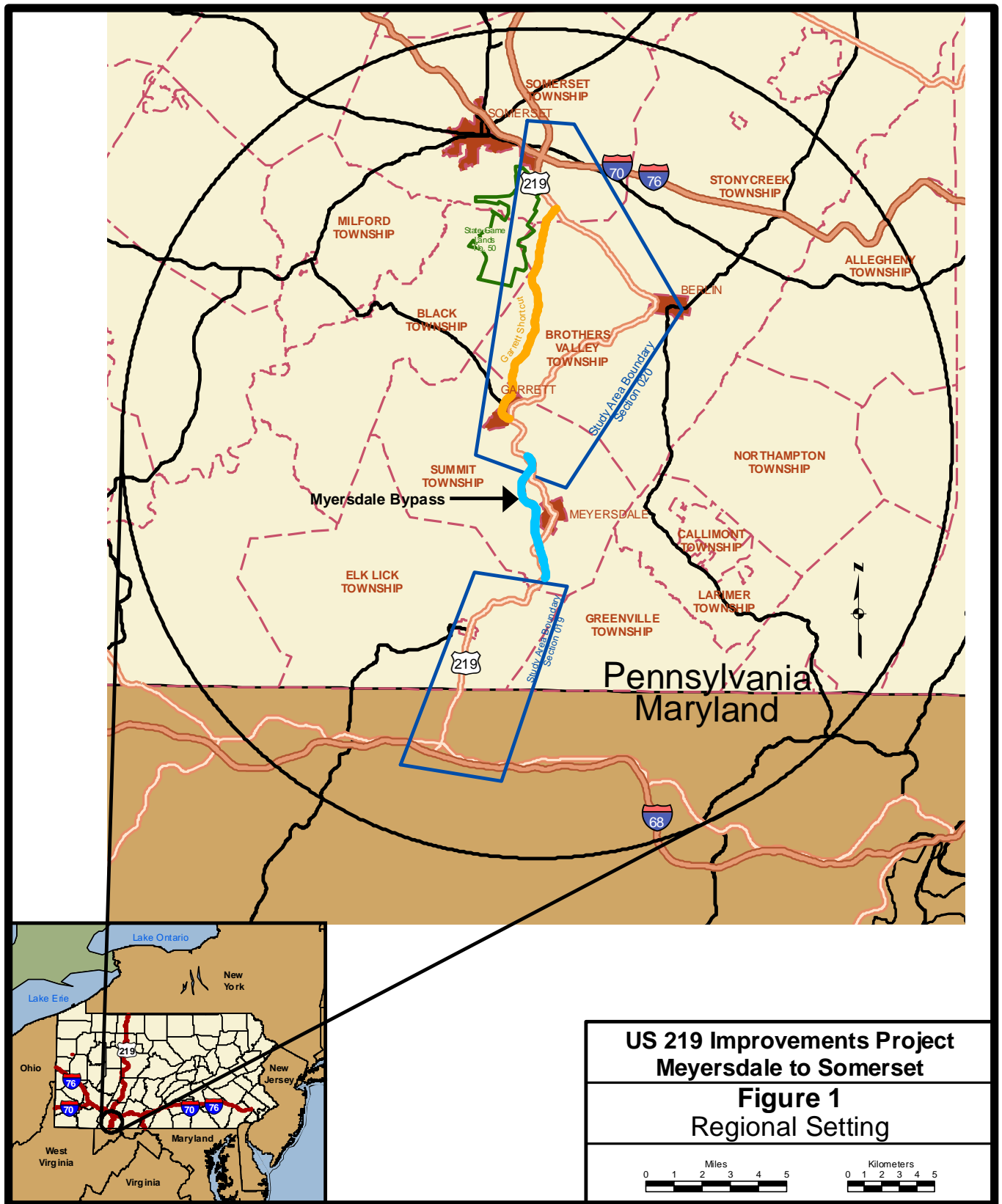
Western Pennsylvania Conservancy. *Somerset County Natural Heritage Inventory*. January 2006.



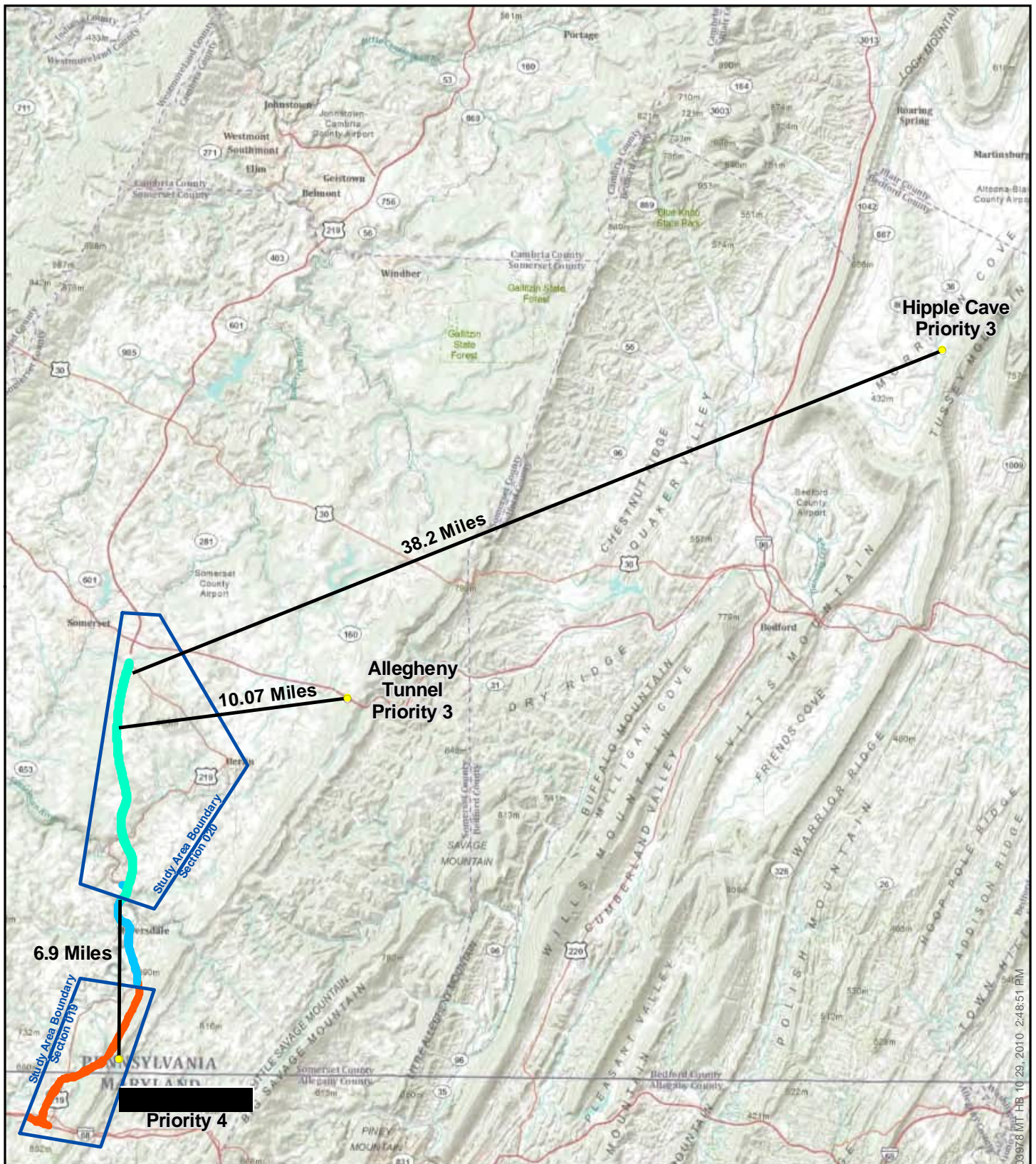
# **APPENDIX A**

## **FIGURES**



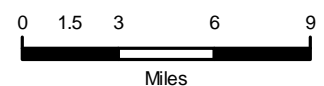






**Figure 2**

**Relative Distance of US 219  
Section 020 Alternative to  
Indiana Bat (*Myotis sodalist*) Hibernacula**





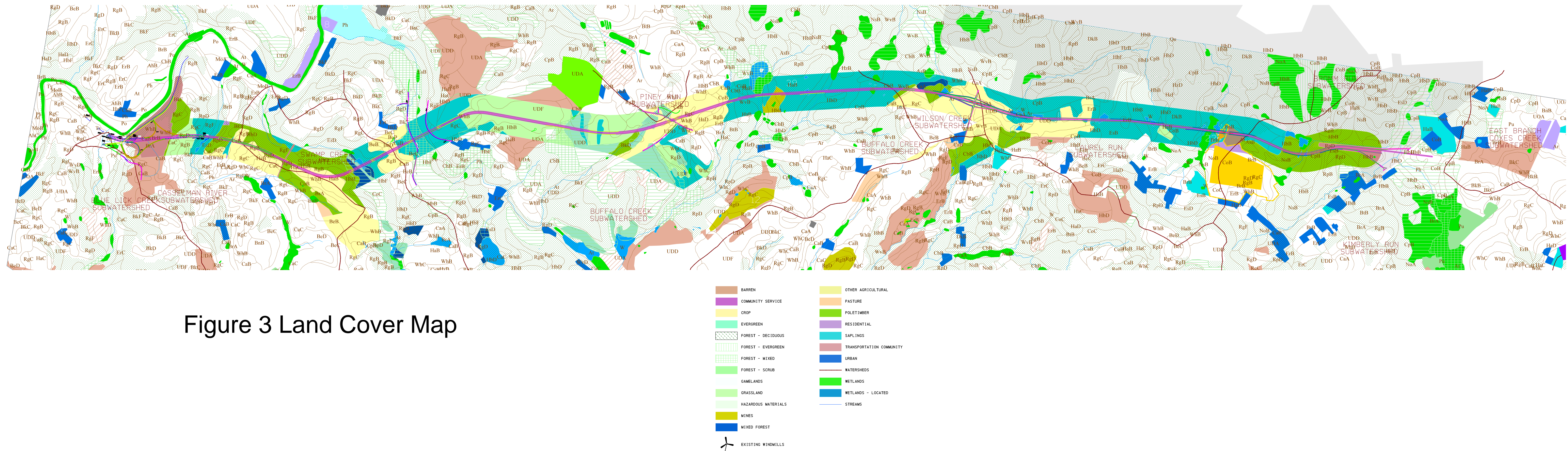


Figure 3 Land Cover Map



**APPENDIX B**

**INDIANA BAT CORRESPONDENCE**

**SR 6219, Section 020**  
**Meyersdale to Somerset**  
**Somerset County, PA**



Correspondence for the Section 019 project is contained in: *US 6219, Section 019, Indiana Bat Biological Assessment*, June 2006, as amended in February 2007

Correspondence for the Section 020 project up to April 2009 is contained in Appendix A – Agency Coordination of the “Mist Net Survey for the Indiana Bat (*Myotis sodalis*); US 219 Improvement Project; SR 6219 Section 020 Meyersdale to Somerset, Somerset County, Pennsylvania (March 2009)”





# United States Department of the Interior

FISH AND WILDLIFE SERVICE  
Pennsylvania Field Office  
315 South Allen Street, Suite 322  
State College, Pennsylvania 16801-4850



April 20, 2009

Thomas A. Prestash  
Pennsylvania Department of Transportation  
1620 North Juniata Street  
Hollidaysburg, PA 16648-1080

RE: USFWS Project # 2007-2430

Dear Mr. Prestash:

Thank you for your March 26, 2009, letter and survey report entitled *Mist Net Survey for the Indiana Bat for the Proposed U.S. 219 Improvement Project, SR 6219 Section 020 Meyersdale to Somerset, Somerset County, Pennsylvania*, which provided the Fish and Wildlife Service with additional information regarding the subject project in Allegheny and Washington Counties, Pennsylvania. The following comments are provided pursuant to the Endangered Species Act (Act) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) to ensure the protection of endangered and threatened species.

In response to our January 14, 2008, request, a mist-net survey was conducted along the proposed roadway corridor by Steve Pernick of L. Robert Kimball and Associates. The survey occurred from July 14 to August 11, 2008, following guidelines provided in the Service's 2007 draft Indiana Bat Recovery Plan. The project area extends 16 kilometers, with an estimated right-of-way area of 330 acres. The corridor was divided into 16 sites encompassing the anticipated direct and indirect project effect areas. No suitable forest habitat was found between Sites 5 and 6 (a distance of 3.4 kilometers); therefore, no mist-net sites were included in this area. Trapping was conducted for at least two net-nights per site.

A total of 140 individual bats representing four species were captured, but no Indiana bats were captured. A single mine airshaft has been identified in the project area; however, the Pennsylvania Game Commission determined this feature does not provide suitable bat hibernation habitat. Since no other mine openings or caves have been identified along this corridor, there appear to be no potential hibernacula present.



Indiana bat hibernaculum and maternity colony activity are known to be present within ten miles to the east and within eight miles to the south of the roadway corridor. While the proximity of Indiana bat activity to the project area suggests the species may be seasonally present, the results of the 2008 mist-net survey suggest that there are no concentrated maternity populations utilizing forest habitat within the proposed U.S. 219 corridor between Meyersdale and Somerset. In their letter of March 11, 2009, the Federal Highway Administration reiterated their commitment to remove trees for the proposed project corridor between October 1 to March 31. This avoidance measure will substantially reduce the risk of take for any migrating and transient Indiana bats that may be seasonally present.

Based on our review of the above information, we conclude that construction of this project may affect, but is not likely to adversely affect the Indiana bat.

This determination is valid for two years from the date of this letter. If the proposed project has not been fully implemented prior to this, an additional review by this office will be necessary. Should project plans change, or if additional information on listed or proposed species becomes available, this determination may be reconsidered.

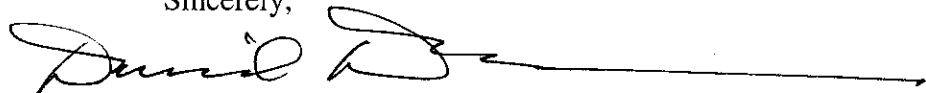
If the mist-net survey did not include all potential habitat in all areas that will be directly or indirectly affected by the proposed project and project-associated features (*e.g.*, cut and fill slopes, access ramps, stormwater features, sedimentation basins, or other features) expand the scope of the survey to include these areas. Submit the results of any expanded mist-net investigation to our office for review so that we can confirm whether the above determination is still valid.

This response relates only to endangered or threatened species under our jurisdiction, and is not to be construed as addressing potential Service concerns under the Fish and Wildlife Coordination Act or other authorities.

*To avoid potential delays in reviewing your project, please use the above-referenced USFWS project tracking number in any future correspondence regarding this project.*

Please contact Robert Anderson at 814-234-4090 if you have any questions or require further assistance regarding this matter.

Sincerely,

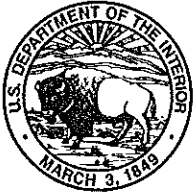
A handwritten signature in black ink, appearing to read "David Densmore", followed by a long horizontal line extending to the right.

David Densmore  
Supervisor

**RECEIVED**

APR 21 2009





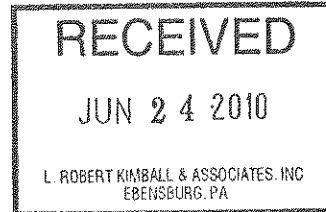
# United States Department of the Interior

FISH AND WILDLIFE SERVICE  
Pennsylvania Field Office  
315 South Allen Street, Suite 322  
State College, Pennsylvania 16801-4850



June 23, 2010

John R. Gustkey  
L.R. Kimball  
615 West Highland Avenue  
P.O. Box 1000  
Ebensburg, PA 15931-1048



RE: USFWS Project # 2007-2430

Dear Mr. Gustkey:

Thank you for your May 25, 2010, letter requesting updated information regarding the proposed U.S. 219 Improvement Project, (S.R. 6219 Section 020) from Meyersdale to Somerset, Somerset County, Pennsylvania. The proposed project is located within the range of the Indiana bat (*Myotis sodalis*), a species that is federally listed as endangered. The following comments are provided pursuant to the Endangered Species Act (Act) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) to ensure the protection of endangered and threatened species.

In our April 20, 2009, letter to Thomas Prestach of the Pennsylvania Department of Transportation, we concurred with the results of a mist-net survey that failed to capture Indiana bats during the sampling period from July 14 to August 11, 2008. In that letter we also considered the presence of an Indiana bat hibernaculum and maternity colony within ten miles to the east and a hibernaculum within eight miles to the south of the roadway corridor. We concluded that while the proximity of Indiana bat activity suggests the species may migrate through the project area, the results of the mist-net survey suggest there are no maternity colonies utilizing forest habitat within the proposed U.S. 219 corridor between Meyersdale and Somerset. We also considered the Federal Highway Administration's commitment to remove trees between October 1 and March 31, commenting that this would substantially reduce the risk of take for any migrating or transient Indiana bats.

Since that time, new information has become available regarding Indiana bat habitat use and requirements in Pennsylvania. Recent radio-telemetry studies have shown that forest lands within 10 miles of Indiana bat hibernacula (rather than five miles), provide essential foraging and roosting areas for bats, especially during the fall and spring, when bats are building up their fat reserves prior to and after hibernation (Butchkoski and Turner 2007, Chenger and Sanders 2007). Male Indiana bats tend to summer in the vicinity of their hibernacula, so regardless of maternity colony presence or absence, adult males are likely to be present in forests and some adjacent fields, meadows, emergent wetlands, riparian corridors and shrub-lands near hibernacula during



the spring, summer and fall months. From late August through mid-November, Indiana bats concentrate their roosting and foraging activities within a 10-mile radius of their hibernacula (e.g., caves, abandoned mines) to mate and build up fat reserves to take them through the winter hibernating period, when food is not available.

While the timing and sampling effort of the completed mist nest survey followed appropriate guidelines for detecting maternity activity, negative results from this summer sampling effort do not discount the species presence during other seasons. As discussed above, due to the presence of this project within 10 miles of Indiana bat hibernacula, it is likely that suitable habitat in the project area is used by Indiana bats associated with these hibernacula, particularly during the spring and fall.

The project right-of-way is approximately 330 acres, a large portion of which is forested. Tree-cutting and land-clearing in the project area will reduce habitat availability and may affect Indiana bats. Due to the anticipated impacts of the project on forest habitat in proximity to known hibernacula, seasonal tree-cutting restrictions alone fail to address adverse effects that may arise from habitat loss and fragmentation. Because this project is receiving federal funding through the Federal Highway Administration, provisions of section 7 of the Endangered Species Act apply. In cases where adverse effects on federally listed species cannot be avoided, formal consultation with the Service is necessary to avoid potential violations of section 9 (prohibiting the “take” of listed species), pursuant to the consultation provisions detailed in section 7 of the Act and its implementing regulations (50 CFR 402.14).

PennDOT and the Administration previously completed formal consultation for the Meyersdale to I-68 section of the U.S. 219 Project (S.R. 6219, section 019). Considering the extent of habitat removal that will result from the two proposed sections of the U.S. 219 Improvement Project, we recommend that consultation be reinitiated, and the biological opinion amended to include consideration of potential take of Indiana bats along the Somerset to Meyersdale section. Further, we recommend that the project include measures to avoid, minimize, and compensate for adverse impacts, including, but not limited to the following:

1. Seasonal restriction on tree-cutting. Any tree-clearing must be done between November 15 and March 31. This avoidance measure is necessary to avoid direct “take” of Indiana bats.
2. Configure the project to avoid and minimize impacts on forest habitat, particularly in and around wetlands and riparian areas.
3. Configure the project to avoid and minimize impacts on suitable roost trees.
4. Retain at least a 50-foot forested buffer on each side of streams and around wetlands.
5. Retain forested travel corridors.
6. Co-locate project features (e.g., roads and utility lines) and cluster project features to



reduce forest clearing.


7. Re-forest cleared areas with a variety of native tree species preferred by Indiana bats (list available from the Service). One of these species must be shagbark hickory. Species selection will be determined by site-specific characteristics (soil moisture, sun exposure, *etc.*) and availability. Trees should be planted at approximately equal rates. Monitor re-planted areas and conduct supplemental tree planting to ensure tree-stocking success is a minimum of 400 live woody stems per acre.
8. Avoid or minimize the use of pesticides and herbicides.
9. Partially compensate for the permanent loss of forest habitat by permanently conserving forest habitat for the affected Indiana bat populations. Various tools are available to achieve permanent protection of habitat, including a) acquiring or otherwise providing protection to Indiana bat habitat in fee simple or through permanent conservation easements, b) buying credits from an approved Indiana bat conservation bank, and c) making an in-lieu-fee contribution to the Indiana Bat Conservation Fund (IBCF).

This response relates only to endangered or threatened species under our jurisdiction, and is not to be construed as addressing potential Service concerns under the Fish and Wildlife Coordination Act or other authorities.

*To avoid potential delays in reviewing your project, please use the above-referenced USFWS project tracking number in any future correspondence regarding this project.*

Please contact Robert Anderson at 814-234-4090 if you have any questions or require further assistance regarding this matter.

Sincerely,



 Clinton Riley  
Field Office Supervisor

#### Literature Cited

Butchkoski C. and G. Turner. 2007. Indiana bat (*Myotis sodalis*) summer roost investigations. Pennsylvania Game Commission, Bureau of Wildlife Management, Research Division – Project Annual Job Report. 21 pp.

Chenger J. and S. Sanders. 2007. South Penn Tunnel Fall 2007 Indiana Bat Telemetry. Report prepared for Shaffer Mountain Wind, LLC and Airtricity, Inc. 48 pp.





# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

Pennsylvania Field Office  
315 South Allen Street, Suite 322  
State College, Pennsylvania 16801-4850



August 29, 2011

Keith Lynch, Division Administrator  
Federal Highway Administration  
228 Walnut Street, Room 508  
Harrisburg, PA 17101-1720

RE: USFWS Project #2007-2430

Dear Mr. Lynch:

This letter constitutes an amendment to the Fish and Wildlife Service's October 2, 2007, *Biological Opinion on the Effects of the U.S. 6219, Section 019, Transportation Improvement Project on the Indiana bat (Myotis sodalis) Somerset County, Pennsylvania and Garrett County, Maryland*. This amendment is issued in response to your letter of March 29, 2011, in which you requested reinitiation of consultation and modification of our biological opinion regarding S.R. 6219 Section 019 (I-68, Maryland to Meyersdale), to include an additional section of the U.S. 219 project from Meyersdale to Somerset (*i.e.*, S.R. 6219, Section 020) .

### CONSULTATION HISTORY

This amendment is based on the following events and information:

July 17 and December 4, 2001	The Service responded to a March 12, 2001, list request indicating the project area is in the range of the Indiana bat and within several miles of two known Indiana bat hibernacula, but that more information was needed about the project in order to make an informed effect determination, or evaluate the need for species surveys.
April 17, 2003	The Service requested additional information regarding identified, but unsurveyed, mine openings identified in a December 2002 report entitled <i>U.S. 219 Improvement Project, Meyersdale to Somerset, Vegetation and Wildlife Summary Report</i> . Due to the proposed clearing of 180 to 200 acres of forest, the Service also recommended either a seasonal restriction on tree cutting or a mist net survey to determine if an Indiana maternity colony activity existed in the action area.



August 6, 2004	The Service responded to a July 8, 2004, request for updated threatened and endangered species information by reiterating the April 17 recommendations.
January 4, 2005	The Service reiterated the April 17, 2003, recommendations in comments provided to the Federal Highway Administration regarding the draft Environmental Impact Statement for this project.
November 8, 2007	<p>The Service responded to a July 23, 2007, request for updated information regarding threatened and endangered species, as the Administration's 2005 final Environmental Impact Statement neither committed to a seasonal restriction on tree cutting or mist-net surveys. Further, the Service provided new information that suggested tree removal restrictions may not adequately avoid take of Indiana bats, especially in consideration of the extent of forest removal proposed along the S.R. 6219 corridor (Section 020 and Section 019, combined), that exceeded 700 acres. Based on the level of habitat alteration and the new information regarding Indiana bat maternity colony activity in Pennsylvania, the Service could not concur with the Administration's determination that the project may affect but was not likely to adversely affect Indiana bats. Therefore, the Service recommended that either surveys be completed to determine if Indiana bat maternity colonies are present in the Section 020 action area, or that the Administration assume presence and reinitiate formal consultation regarding Section 019 to also consider Section 020.</p>
December 17, 2007	<p>The Administration provided the Service with additional information regarding possible project affects resulting from construction of S.R. 6219 Section 020, to which on January 14, 2008, we responded that we again could not concur that forest removal restrictions alone would avoid take of Indiana bats based on new information about Indiana bat occurrence in Pennsylvania, new understanding about the effects of roads on Indiana bats, and the extent of habitat alteration in sections 19 and 20 of S.R. 6219 combined.</p>
March 26, 2009	<p>PennDOT provided the Service with a copy of a report entitled <i>Mist Net Survey for the Indiana Bat for the Proposed U.S. 219 Improvement Project, SR 6219 Section 020 Meyersdale to Somerset, Somerset County, Pennsylvania</i>, describing the results of July and August 2008 mist net surveys that failed to capture Indiana bats. Based upon 1) the mist-net survey results, 2) additional information that suggested the mine shafts near the project were not suitable bat hibernacula, 3) the distance to known Indiana bat hibernacula, and 4) the project proponents commitment to implement forest removal restrictions, in our letter of April 20, 2009, we concurred that the construction of S.R. 6219 Section 020 was not likely to adversely affect Indiana bats.</p>



June 23, 2010	We responded to a May 25, 2010, request for updated information regarding threatened and endangered species, with new information regarding the extent of Indiana bat foraging and roosting behavior within swarming habitat. Recent telemetry studies have documented Indiana bats using forest habitat substantially farther from hibernacula than had been previously assumed (10-11 miles). The proposed S.R. 6219 Section 020 alignment is within 10 miles of two known Indiana bat hibernacula; therefore, Indiana bat absence cannot be supported in light of the best available scientific information. The letter of June 23 provided detailed measures that included not only seasonal forest removal restrictions to avoid take, but also measures to minimize and partially offset anticipated adverse effects with a recommendation that the Administration initiate formal consultation.
September 29, 2010	The Service and PennDOT representatives met to discuss the current project design and conservation measures being developed for the <i>Biological Assessment</i> .
December 15, 2010	In response to PennDOT's request of November 1, 2010, the Service responded that land conveyed to the Pennsylvania Game Commission can only be considered a benefit to Indiana bat conservation if long-term forest management for this species is conveyed with the land parcel.
April 1, 2011	The Administration provided the <i>Biological Assessment</i> to the Service and requested reinitiation of formal consultation regarding the effects of the S.R. 6219 Section 019 project to include Section 020.
May 9, 2011	The Service acknowledged initiation of formal consultation
August 29, 2011	The Service provided the Administration with an amended biological opinion.

## **Project Description**

The project description for the S.R. 6219, Section 019 project is appended to include Section 020, which involves the construction of 10 miles of new, limited-access, four-lane highway extending from an existing highway section south of Somerset, Pennsylvania to Meyersdale, Pennsylvania. This may eventually connect with Section 019, extending U.S. 219 to Interstate 68 in Maryland. The 2005 Final Environmental Impact Statement (FEIS) details the project description for Section 020, while the November 2006 Record of Decision (ROD) identified Alternative C-1 as the build alternative.

The basic design of Section 020 is similar to that considered in Section 019; however, three interchanges are proposed. New or reconfigured interchanges are proposed in the vicinity of Mud Pike in Black and Brothersvalley Townships; at the northern terminus of the project, south



of Somerset; and at the existing Meyersdale interchange, which will be reconfigured at the southern terminus of Section 020.

The primary land uses in the action area include timber production, coal mining, agriculture, and oil and gas development. Active and reclaimed strip mines are evident in the western part of the action area, while agriculture is dominant east of the Allegheny Front, where forest cover is highly fragmented. The portion of the action area that overlaps the project footprint is predominantly forested, and some areas are used for timber production. The Section 020 project is expected to result in disturbance of approximately 400 acres, including the removal of 230 acres of forest across the linear project area.

Project minimization measures include a seasonal restriction on tree cutting, and forest conservation. Forest removal is proposed to occur only from November 15 to March 31 to avoid directly killing any Indiana bats that may be roosting in the trees. The permanent loss of 230 acres of forest will be partially offset by the conservation of 60 acres of land, including 1) the transfer of 21.5 acres of existing forest land in the northern portion of the project area to the Pennsylvania Game Commission, and 2) the conservation by PennDOT of 38.5 acres of forested right-of-way in the southern portion of the project area. The 21.5-acre parcel that is transferred to the Pennsylvania Game Commission is expected to become part of the 3,200-acre State Game Lands 50. Addition acreage will be allowed to mature and revegetate naturally, or will be planted, including 71 acres known as the “Louie-Beech wetland site” that may be transferred to, and preserved by, a non-profit agency and may eventually result in suitable Indiana bat roosting and foraging habitat if mature forest is allowed to develop. Finally, 140.5 acres of temporarily-cleared right-of-way will be planted in native species or allowed to revegetate naturally. This includes 90.5 acres of wetland and terrestrial mitigation bank will be preserved in some manner, and 50 acres will be preserved as forested, or re-forested, right-of-way. Some of this land may eventually mature into forest habitat that could be utilized by Indiana bats for roosting and foraging.

### **Status of the Indiana bat in Pennsylvania**

There are currently 18 known Indiana bat hibernacula in Pennsylvania, distributed among ten counties, including Armstrong, Beaver, Blair, Centre, Fayette, Huntingdon, Lawrence, Luzerne, Mifflin and Somerset. These hibernacula include limestone caves, mines (limestone, anthracite coal), and an abandoned railroad tunnel. In the Indiana Bat Draft Recovery Plan (USFWS 2007), Indiana bat hibernacula are assigned priority numbers on the basis of winter population sizes and to protect essential hibernation sites across the species’ range. Priority numbers range from Priority 1, which are considered to be essential to recovery and long-term conservation of the Indiana bat to Priority 4, which are less important to recovery and long-term conservation, and typically have current or observed historic populations of fewer than 50 Indiana bats.

The total known Indiana bat hibernating population in Pennsylvania was estimated to be 1,038 bats in 2007 (USFWS 2010), with the largest concentration being found in the J.D. Hartman Mine (a.k.a. Canoe Creek hibernaculum) in Blair County. This is the State’s only Priority 2 hibernaculum, with Indiana bat population counts ranging from approximately 600 to 800 over the past decade. There are three Priority 3 (P3) hibernacula in Pennsylvania with extant populations, but only two of them (*i.e.*, South Penn Railroad Tunnel and Long Run Mine) currently support Indiana bat populations exceeding 100 bats.



An emerging threat not considered in the 2008 biological opinion is white-nose syndrome (WNS), a malady of unknown origin that is killing cave-dwelling bats in unprecedented numbers in the northeastern United States. This affliction was first documented at four sites in eastern New York in the winter of 2006-07, but photographic evidence emerged subsequently of apparently affected bats at an additional site, Howe's Cave, collected the previous winter in February 2006. Data suggest that a newly identified fungus (*Geomyces destructans*) (Gargas *et al.* 2009) is responsible, at least in part, for the impacts and mortality associated with WNS (Blehert *et al.* 2009).

White-nose syndrome was first detected in eastern Pennsylvania during the winter of 2008-2009, and by 2011, it had been documented across much of the State (PGC 2009). In April 2010, WNS was documented at the Hartman Mine hibernaculum, where the total bat population (of all species combined) had declined by 50 percent, from approximately 30,000 to 15,000 bats. Although the Pennsylvania Game Commission did not attempt a full assessment and count of bats during this survey, they did not observe any clinical signs of WNS on the 82 Indiana bats that were observed (C. Butchkoski, Pennsylvania Game Commission, *in litt.* 2010). By 2011, WNS had been confirmed at all but one of Pennsylvania's Indiana bat hibernacula.

Despite all of the unanswered questions about WNS, there are now five years of population monitoring data which provide valuable insights into the effects of WNS. Considering WNS has been affecting hibernating bat populations for the longest in New York (since February 2006), data from that State may provide the best indication of the effects of this disease on bats, including Indiana bats. By 2010, all known Indiana bat hibernacula in New York had been documented with WNS. However, the effects of WNS on Indiana bats varied between affected hibernacula. Some Indiana bat hibernating populations have declined by 92 to 100%, while counts of Indiana bats at other WNS-affected New York hibernacula have declined to a lesser extent (Hicks *et al.* 2008, Turner *et al.* 2011). For example, there has been a 21% decline at the Barton Hill Mine, and a 77% decline at Glen Park Cave (Turner *et al.* 2011).

### **Status of the Indiana bat the action area**

The status of Indiana bats in the amended action area (inclusive of Section 020) is similar to that discussed in the biological opinion for the S.R. 6219, Section 019 project. The proposed project is located within the Indiana bat Appalachian Mountains Recovery Unit (RU), which made up 7.0% of the range-wide Indiana bat population in 2009. Between 2001 and 2009, the hibernating population in this RU increased from 16,384 to 27,458. However, populations in this RU are expected to decline precipitously over the next few years due to WNS, which has been documented throughout most of this RU.

As was the case in the project area considered for S.R. 6219, Section 019, summer mist-net surveys conducted during July and August 2008 in Section 020 failed to capture Indiana bats. These data suggest that Indiana bat maternity colonies are not present, but late summer and fall use of the project area by Indiana bats of both sexes may occur during the swarming period. Male Indiana bats tend to summer in the vicinity of their hibernacula, so regardless of maternity colony presence, adult males are likely to be present in forests near hibernacula during the spring, summer and fall months. Adults and juveniles of both sexes will be present in forests near hibernacula in late summer and fall. However, the timing and sampling effort expended



during mist net surveys are not likely to detect the more diffuse populations of Indiana bats that are not part of an active maternity colony. Male Indiana bats are most common in areas near hibernacula (Gardner and Cook 2002) but because they typically roost solitarily in the summer, they are less likely to be detected by mist-netting than adult females, which tend to occur in high-density maternity colonies.

Approximately 2.7 miles of the proposed new roadway is within 10 miles of the [REDACTED] that was also considered in the original Section 019 biological opinion due to the close proximity of that roadway section passing by the mine. Approximately half (5 miles) of the preferred Section 020 alignment is also within the known swarming radius (11.1 miles radius) of the South Penn Railroad Tunnel. This tunnel, which is located to the east of the project area, had a hibernating population of 139 Indiana bats during the 2009 census, and is a priority 3 (P3) hibernacula. Site-specific studies have found Indiana bats foraging and roosting up to 11.1 miles from the South Penn Tunnel during the fall. With 8 miles of the proposed roadway within these swarming habitat radii swarming bats and their habitat could be affected by roadway construction and operation. As described above, forests and woodlots in the vicinity of hibernacula provide important foraging and roosting habitat for Indiana bats, especially during the fall and spring, when bats are building up their fat reserves prior to and after hibernation. During the non-hibernating period, Indiana bats roost and forage in forest habitat. To a lesser extent, the foraging bats also use a variety of adjacent fields, meadows, emergent wetlands, riparian corridors and shrub-lands. From late August through mid-November, they concentrate their roosting and foraging activities in the vicinity of their hibernacula (e.g., caves, abandoned mines) to build up fat reserves to take them through the winter hibernating period, when food is not available. Because the SR 6219 corridor is located within the swarming radius of two Indiana bat hibernacula, suitable habitat in the project area may be used by Indiana bats.

## EFFECTS OF THE ACTION

The Biological Assessment concludes that the proposed S.R. 6219, Section 020 project may result in harm and harassment of Indiana bats due to the loss of 230 acres of forest. Other assumptions in the *Biological Assessment* are summarized below:

- Construction, operation, and maintenance of the proposed roadway section will not create a barrier to Indiana bat travel corridors for bats moving to and from [REDACTED] or the South Penn Tunnel to foraging and roosting habitat east of the roadway because the bats will use the riparian corridors under roadway bridges.
- The total project area includes approximately 486 acres (Kimball 2008) with an estimated removal of 230 acres of forest, much of which is potential Indiana bat foraging and roosting habitat (*Biological Assessment*, Section IV, B.2., p. 9). This will be offset by protection of 21.5 acres of habitat that will be turned over to the Pennsylvania Game Commission to become part of State Game Lands 50 along with 38.5 acres of existing right-of-way that will "...be preserved in some manner by PennDOT" (*Biological Assessment*, Section VI, B.1., p. 18).
- Additional mitigation required for other aspects of the project will secure habitat that may eventually be suitable for Indiana bats in the action area, including the 71-acre "Louie-



Beech wetland mitigation site; 140.5 acres of right-of-way that may be planted or become reforested naturally, including a 90.5-acre wetland mitigation and terrestrial bank.

The effects of construction and use of SR 6219, Section 020 on Indiana bats are similar to those considered for Section 019, and these previously-described effects are hereby incorporated by reference. However, unlike Section 019, which is proposed to pass within 1,100 feet of the [REDACTED] hibernaculum, the distance between Section 020 and the two hibernacula (approximately 7 miles from [REDACTED] and 10 miles from the South Penn Tunnel) suggest that no disturbance to either the hibernacula or hibernating bats is likely. Construction of Section 020 will result in the loss 230 acres of forest that is suitable for both foraging and roosting during the spring, summer, and fall. The Administration and PennDOT have committed to remove trees only when the bats are typically hibernating; therefore, direct take of Indiana bats is unlikely to occur during land clearing and construction. However, we concur that any Indiana bats that use this habitat will be harmed or harassed due to the permanent loss of their habitat and the need to adjust to these habitat losses, particularly swarming habitat, and swarming and migrating Indiana bats. Take resulting from the roadway will most likely involve adult males that remain in the vicinity of the hibernacula during the spring, summer, and fall. It is difficult to predict how many adult males will be killed over the life of the project because their number and distribution within the action area are not fully known. We anticipate that take of adult males will be relatively low because adult males tend to occur solitarily in widely-dispersed home ranges across the landscape.

The project will result in the loss of 230 acres of forest land, much of which will be permanently converted to highway and maintained right-of-way. This change in landuse will have comparable effects to those considered in the Section 019 biological opinion, which evaluates the removal of 208 acres of forest cover within the total disturbance area of 375 acres. The two completed project segments combined will result in 438 acres of forest removal. The effects of the action depend, to a great extent, on the reaction of Indiana bats to changes in their environment. While most of the habitat impacts will occur during site preparation, most of the effects likely to result in take of the species will occur after construction, during road operation and maintenance. Although forest clearing during site preparation may not represent an appreciable reduction in the amount or quality of foraging habitat on a county-wide percentage of forest, individual Indiana bats will have to adjust to this habitat loss by adjusting the size or configuration of their foraging areas. Indiana bats using the affected forest areas for foraging will have alternative foraging habitat available within the action area, but they will likely have to shift or expand their foraging ranges into areas previously unused by them to make up for the loss of foraging habitat. The impact of shifting flight patterns and foraging areas will vary from bat to bat. Bats that fail to cross the considerably widened roadway will lose substantially more forested habitat than is actually disturbed during construction. Habitat fragmentation will be greatest if the bats that hibernate in [REDACTED] and the South Penn Tunnel fail to cross the completed S.R. 6219, and the intervening Meyersdale Bypass that combined will essentially bisect Somerset County and State Game Lands 50. The project proponents are hopeful that travel corridors will be utilized at stream crossings where 50-foot forested riparian corridors will be retained; however, unless these are contiguous with adjacent forest areas, these travel corridors may not be accessible to or used by bats that forage and travel locally.

Operation of the new roadway will introduce traffic of a significantly increased volume and speed to the action area. This may result in increased mortality due to vehicle collisions, but is



perhaps more likely to alter the bats' flight behavior relative to the road and road-side vegetation for bats that need to cross the U.S. 6219 project corridor over the road.

Compensatory mitigation is being conducted to offset other resource losses, such as to wetlands, State Game Lands, and portions of private property that will become landlocked by the new road. Some of this mitigation was described in the *Biological Assessment* (Section X, p. 22) as a conservation benefit to the Indiana bat under section 7(a)(1) of the Act. These areas may eventually benefit Indiana bats if maintained in a forested condition, but only if the conserved acreage is accessible to the bats that utilize two hibernacula positioned east of the project area. Other land parcels, such as portions of the 71-acre "Louie-Beech wetland site", may be planted in a manner that will eventually serve as forest habitat, but reforested land will not be available as foraging or roosting habitat for several decades. The habitat conservation that is described in the *Biological Assessment* would only partially offset Indiana bat habitat loss resulting from the project, and there is no commitment to ensure the long-term habitat protection or management of these areas consistent with the conservation of the Indiana bat. Therefore, as with the section 019 project, we cannot factor habitat conservation measures into the analysis of project effects.

As discussed above, the proposed project is most likely to affect male Indiana bats, which tend to occur as solitary individuals in widely dispersed home ranges across the landscape. The loss of male Indiana bats will affect the population unit(s) to which they belong – namely the hibernating population at the [REDACTED] and/or South Penn Railroad Tunnel. Without knowing how many Indiana bats will be killed or injured over the life of the project, it would be challenging to model the effects of their mortality on these hibernating populations. However, we would expect that the loss of Indiana bats would reduce the size and resilience of the hibernating population, particularly in light of the increased mortality rates resulting from white-nose syndrome. Road-related mortality would be expected to reduce the ability of the hibernating population to grow and potentially recover from the effects of WNS. However, if road-related mortality rates are low (*e.g.*, a small number of individuals over many years of road operation), the magnitude of this effect may not appreciably reduce the size of the hibernating population.

## CONCLUSION

Critical habitat for the Indiana bat has been designated at 11 caves and two mines in West Virginia, Tennessee, Kentucky, Illinois, Indiana, and Missouri. However, this action does not affect those areas. Consequently, no destruction or adverse modification of critical habitat is anticipated.

WNS is present in much of this RU, including in the action area at both the [REDACTED] and the South Penn Tunnel hibernacula. As a result, we expect hibernating populations of Indiana bats throughout the RU to experience population declines similar to those in New York and New England. A 90% population decline due to WNS would leave an estimated 2700 Indiana bats within a RU spanning six states. Assuming some level of immunological or behavioral resistance is present or develops among survivors, recovery will have the best chance of success where the largest number of survivors persist and congregate to breed. This suggests that both the RU and range-wide population would begin recovering from WNS at a very limited number of focal areas where surviving individuals can congregate to breed. While surviving individuals associated with smaller hibernacula, such as the [REDACTED] cannot be discounted, a 90%



population reduction due to WNS would leave such hibernacula with fewer individuals. However, a 90% decline at larger hibernacula (with larger starting populations) such as the South Penn Tunnel, would likely leave a larger number of survivors, increasing the likelihood of successful swarming and breeding.

Considering WNS survivors from larger hibernacula will most likely form the core populations necessary for the species survival and recovery, actions that reduce the numbers or reproduction of these individuals are of particular concern. The ability of the species to survive and recover in this RU will depend on some level of species' resistance to WNS and/or the implementation of recovery actions to reduce the risk of WNS. In either case, this means keeping survivors of WNS alive so they can breed. The proposed action is expected to slightly reduce the numbers of bats associated with two hibernacula. The affected South Penn Tunnel is one of only 10 hibernacula of comparable size (P3) in the entire RU supporting a hibernating population of more than 100 bats. Construction and operation of a four-lane U.S. 219 will harm or harass WNS survivors, most likely adult males that remain in the vicinity of the two hibernacula. In the presence of WNS, road related mortality would be expected to remove some of these surviving, and apparently resistant, individuals. The additive mortality resulting from the presence of the new road would somewhat reduce the ability of the hibernating population to recover from the effects of WNS. However, road-related mortality rates will likely be relatively low, because adult males tend to occur solitarily in widely-dispersed home ranges. In addition, because remaining males can mate with several females, and males from other hibernacula can immigrate into the area, we believe it is possible that resistance will continue to develop over time. The combined result should allow the hibernating population at the South Penn Tunnel and [REDACTED] to persist in the presence of the new roadway.

The Indiana bat is facing an unprecedented and high degree of threat due to WNS, such that extinction is a real possibility in the near future. WNS is poorly understood and we currently have very limited ability to alleviate this threat. The urgent conservation need is to increase the species' survival and reproduction in order to stabilize and then reverse this population decline. Rather than increasing survival and reproduction, however, the proposed project will reduce the species' numbers.

In summary, the loss of individual Indiana bats that are members the South Penn Tunnel and [REDACTED] hibernacula will directly affect the hibernating populations to which these bats belonged. The proposed project will introduce a potential and persistent source of additive mortality to a landscape occupied by an Indiana bats. Mortality will be reduced if the bats find and use safe passage under the new highway bridges to access sufficient suitable roosting and foraging habitat, portions of which will be preserved adjacent to and on the opposite side of Section 020 from both [REDACTED] and South Penn Tunnel Indiana bat hibernacula. No maternity colony activity was evident in Section 020 or Section 019; therefore, the number of affected individual bats is expected to be low, and primarily include adult males. While both WNS and the proposed project are expected to increase Indiana bat mortality rates and reduce hibernating populations, nonetheless the proposed project is not expected to result in additive mortality at a level that would reduce appreciably the reproduction and numbers of the Indiana bat. Therefore, the Service has concluded the proposed project is not likely to jeopardize the continued existence of the species.



## INCIDENTAL TAKE STATEMENT

FHWA and PennDOT did not estimate incidental take of Indiana bats in their *Biological Assessment* for Section 020, so this take statement is based entirely on the Service's Effects Analysis. The incidental take statement in the 2008 biological opinion is hereby appended to include incidental take resulting from the loss of an additional 230 forested acres of potential Indiana bat foraging and roosting habitat, some of which will be permanent lost when it is converted to roadway pavement and associated cut and fill slopes. We expect that this habitat loss will result in take in the form of harm or harassment for all Indiana bats that had depended upon this habitat for use in spring, summer or fall. Roadway operation is also expected to result in take in the form of mortality due to vehicle collisions. Take resulting from habitat loss and fragmentation is expected to occur in the first year following habitat removal, and continue through the first year of road operation as the Indiana bats adjust to the presence of the new roadway. This risk of road mortality is expected to continue at a lower level as long as the road is in operation, which we considered over the next 30 years. The risk of collision will be reduced by maintaining forest riparian corridors under the bridge structure. In addition, the anticipated reduction in population density of bats associated with the [REDACTED] and South Penn Tunnel as a result of WNS suggests that over the next several decades population density will be low and relatively few collisions are likely.

Total take is expected to be minimal. The actual level of incidental take will be difficult to detect or quantify for the following reasons: 1) the population density of Indiana bats in the action area is expected to be diffuse and seasonally present; 2) individuals (juveniles and adults) are small and cryptic making them difficult to locate; 3) finding dead or injured specimens is unlikely; 4) losses in the hibernating population due to highway construction and operation may be exacerbated by, and difficult to separate from, declines resulting from WNS.

## REASONABLE AND PRUDENT MEASURES and TERMS AND CONDITIONS

Several Terms and Conditions in the biological opinion are specific to Section 019 (*i.e.*, pre-construction mist-netting surveys, monitoring direct effects in [REDACTED] and conservation actions near the proposed Piney Creek Bridge) and are not applicable to Section 020. However, in addition to the Reasonable and Prudent Measures and implementing Terms and Conditions described in the biological opinion, the following is required in order to be exempt from the prohibitions of section 9 of the Act.

For the preserved and reforested land to be beneficial to Indiana bats and partially offset the adverse effects of the project, long-term protection and management must be consistent with Indiana bat forest conservation and management goals. For the effects analysis presented in the *Biological Assessment* to remain valid, it is incumbent on the project proponents to ensure that their assumptions are realized through the implementation of conservation measures needed to support the above assumptions, as confirmed through monitoring.

**Term and Condition 1.G.** The project proponents will address the long-term habitat needs of the Indiana bat through on-site reforestation (see "a" below), permanent protection of off-site forest (see "b" below), or both, combining to at least 230 acres of Indiana bat forest habitat. Land parcels described in the *Biological Assessment* may be included in this conservation acreage.



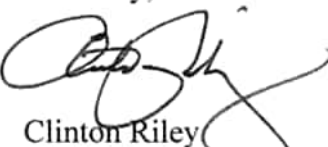
a. Forest habitat restored and protected must provide for the long-term needs of the Indiana bat. To accomplish this, reforestation will occur by replanting with at least six different tree species listed in Attachment A. At least four “exfoliating bark” tree species will be planted and equal at least 40% of the stems per acre. No more than 20% of any one species will be included in the planting mixture, and no more than 50 stems per acre of black locust will be planted. Success will be measured as 400 live woody stems per acre. Forest restoration will be implemented in accordance with the methods detailed in the Forest Reclamation Advisories published by the Appalachian Regional Reforestation Initiative (<http://arri.osmre.gov/FRA.htm>). Following reforestation, the project proponents will manage the property as described in the *Biological Assessment* (Section VII, A.1 p. 18 - 19.) consistent with the goal of conserving Indiana bat roosting and foraging habitat.

b. Acres protected off-site will be forest appropriate for Indiana bat roosting and foraging, and will be permanently protected and placed in conservation ownership prior to forest clearing related to construction. Land parcels described in the *Biological Assessment* will be included in this conservation acreage only to the extent to which these lands are already in a forested condition.

- The conservation acreage, including its location and quality, are subject to review and approval by the Service’s Pennsylvania Field Office.
- The conservation acreage will be placed in the ownership of a conservation entity (e.g., Pennsylvania Game Commission, conservation organization or PennDOT in areas of retained right-of-way) that is both able and willing to protect and manage the habitat in perpetuity for Indiana bats. The recipient (proposed owner) of the conservation acreage is subject to Service review and approval. Conservation lands will be deed-restricted to ensure the land owner holds, protects, maintains and manages the lands in perpetuity for the primary conservation benefit of the Indiana bat, with any habitat management subject to a Fish and Wildlife Service-approved management plan.
- The Service and Pennsylvania Game Commission, and their representatives, will have access to conservation lands for future research and monitoring.

If you have any questions regarding this matter, please contact Robert Anderson of this office at 814-234-4090.

Sincerely,



Clinton Riley  
Field Office Supervisor

Enclosure



## References cited

- Blehert, D.S., A.C. Hicks, M. Behr, C.U. Meteyer, B.M. Berlowski-Zier, E.L. Buckles, J.T.H. Coleman, S.R. Darling, A. Gargas, R. Niver, J.C. Okoniewski, R.J. Rudd, and W.B. Stone. 2009. Bat white-nose syndrome: an emerging fungal pathogen? *Science* 323:227.
- Gardner, J.E. and E.A. Cook. 2002. Seasonal and geographic distribution and quantification of potential summer habitat. Pp. 9-20 *in* A. Kurta and J. Kennedy (eds.), *The Indiana bat: biology and management of an endangered species*. Bat Conservation International, Austin, TX.
- Gargas, A., M.T. Trest, M. Christensen, T.J. Volk, and D.S. Blehert. 2009. *Geomyces destructans* sp. nov. associated with bat white-nose syndrome. *Mycotaxon* 108:147-154.
- Hicks, A.C., C.J. Herzog, R.I. von Linden, S.R. Darling, and J.T.H. Coleman. 2008. White-Nose Syndrome, field observations from the first two winters. *Proceedings of the first national White-Nose Syndrome meeting*, Albany, New York, 9-11 June, 2008.
- L. Robert Kimball and Associates, Inc. 2008. Final Environmental Impact Statement Re-Evaluation Report. Prepared for the Federal Highway Administration. 18 pp. plus tables and figures.
- Pennsylvania Game Commission. 2009 . Wildlife Diversity Program 2009 Report. Pennsylvania Game Commission, Bureau of Wildlife Management. 16 pp.
- Turner, G.G., D.M. Reeder, and J.T.H. Coleman. 2011. A five-year assessment of mortality and geographic spread of white-nose syndrome in North American bats and a look to the future. *Bat Research News* 52(2): 13-27.
- U.S. Fish and Wildlife Service. 2007. Indiana Bat (*Myotis sodalis*) Draft Recovery Plan: First Revision. U.S. Fish and Wildlife Service, Fort Snelling, MN. 258 pp.



## TREE SPECIES LIST FOR INDIANA BAT HABITAT RESTORATION

<i>Acer rubrum</i>	red maple
<i>Acer saccharum</i>	sugar maple
<i>Carya cordiformis</i>	bitternut hickory
<i>Carya glabra</i>	pignut hickory
<i>Carya laciniosa</i>	shellbark hickory
<i>Carya ovata</i>	shagbark hickory
<i>Carya tomentosa</i>	mockernut hickory
<i>Fraxinus americana</i>	white ash
<i>Fraxinus nigra</i>	black ash
<i>Fraxinus pennsylvanica</i>	green ash
<i>Platanus occidentalis</i>	sycamore
<i>Populus deltoides</i>	eastern cottonwood
<i>Quercus alba</i>	white oak
<i>Quercus coccinea</i>	scarlet oak
<i>Quercus prinus</i>	chestnut oak
<i>Quercus rubra</i>	northern red oak
<i>Quercus velutina</i>	black oak
<i>Robinia pseudoacacia</i>	black locust
<i>Sassafras albidum</i>	sassafras
<i>Ulmus americana</i>	American elm
<i>Ulmus rubra</i>	slippery elm

Planting plans should include at least six of the tree species listed above, one of which must be shagbark hickory. To promote diversity, no more than 15 percent of any one tree species shall be included in planting plans.





# United States Department of the Interior



## FISH AND WILDLIFE SERVICE

Pennsylvania Field Office  
315 South Allen Street, Suite 322  
State College, Pennsylvania 16801-4850

January 31, 2013

Keith Lynch, Division Administrator  
Federal Highway Administration  
228 Walnut Street, Room 508  
Harrisburg, PA 17101-1720

RE: USFWS Project #2007-2430

Dear Mr. Lynch:

This letter constitutes an amendment to the Fish and Wildlife Service's (Service) October 2, 2007, *Biological Opinion on the Effects of the U.S. 6219, Section 019, Transportation Improvement Project on the Indiana bat (Myotis sodalis) Somerset County, Pennsylvania and Garrett County, Maryland*, as amended on August 29, 2011, to include S.R. 6219, Section 020 (Meyersdale to Somerset). This is issued in response to your letter of January 3, 2013 (which we received on January 7, 2013), in which you requested reinitiation of consultation and a modification of our August 29 biological opinion, due to an increase in the area of proposed forest removal and changes in proposed avoidance and minimization measures for S.R. 6219, Section 020. Along with your request for reinitiation, you transmitted a December 2012 report entitled, *U.S. Route 219 Improvement Project, S.R. 6219, Section 020, Bat Hibernaculum Investigations, Final Report* by Skelly and Loy, Inc. to meet the Federal Highway Administration's (Administration) section 7(a)(2) responsibility to use the best scientific and commercial data available in the formal consultation process and to insure its action will not jeopardize the continued existence of a listed species.

This amendment relates solely to Section 20 of the S.R. 6219 project. Unless specifically noted, this amendment is intended to supplement, rather than replace the previously issued and amended biological opinion, dated October 2, 2007 and August 29, 2011. Consequently, this amendment is to be implemented in conjunction with the previously-issued opinion and amendment.

### Consultation History

The following consultation history summarizes significant consultation events that have occurred since issuance of the previous biological opinion amendment on August 29, 2011.

August 30, 2011	The Service provided its amended biological opinion to the Administration regarding the effect of the S.R. 6219, Section 020 project on Indiana bats.
-----------------	---



November 28, 2011	The Pennsylvania Department of Transportation (PennDOT) acknowledged receipt of the August 8, 2011, biological opinion and described the plan to fulfill the terms and conditions included in that opinion.
December 28, 2011	The Service provided an example of deed restriction language that, if included in land transfer agreements, would ensure long term habitat protection in accordance with the terms and conditions of the biological opinion.
June 15, 2012	An anonymous letter was received by the Service describing a large mine portal between Fogletown Road and Buffalo Creek that was discovered in 2007 but never investigated as a possible Indiana bat hibernaculum. Bats were reported leaving the mine in February 2012. The Service undertook efforts to verify the claims therein.
July 13, 2012	A telephone conference call was convened to discuss the S.R. 6219 project status. During the meeting the Service requested an update regarding the actual extent of forest clearing proposed, which was variously described in project documents as 230 acres, 240 acres and 339 acres. The Service expressed concern that proposed avoidance and minimizations and the terms and conditions of the biological opinion did not appear to have been met. During the meeting, the Service requested confirmation that all described mine features that appear on Pennsylvania Department of Environmental Protection (PADEP) abandoned mine maps had been investigated. None were disclosed as being observed at that time.
July 13 to July 20, 2012	The Service made a series of phone calls to past and current PennDOT and L.R. Kimball staff involved with the S.R. 6219 Section 020 project to inquire about the presence of any mine openings not described in the 2011 biological assessment or other project documents. Responses ranged from denial of knowledge of such mine features to detailed descriptions of a mine opening observed between Fogletown Road and Buffalo Creek.
July 19, 2012	A Service biologist conducted a site visit to the area of mine openings reported on PADEP abandoned mine maps and observed an abandoned mine portal located near the proposed right-of-way/temporary access limit for the proposed roadway. This portal has habitat characteristics typical of potential bat hibernacula and did not resemble any opening described in the biological assessment or project environmental documents.



July 20 to July 27, 2012	The Service, PennDOT, and Administration engaged in a series of electronic mail messages and telephone exchanges to ensure that the project avoidance, minimization and conservation measures would be achieved and the terms and conditions of the biological opinion would be implemented.
August 1, 2012	The Service requested a meeting with the federal action agencies (the Administration and U.S. Army Corps of Engineers) to discuss concerns that the project may affect Indiana bats in a manner not considered in the biological opinion due to the presence of abandoned mine openings in the action area that had not been investigated for bat use or Indiana bat presence.
August 9, 2012	The Service met with the Administration to convey information in our files about the presence of additional mine openings in the project action area.
August 13, 2012	The Service provided the Administration with information regarding the additional potential Indiana bat hibernaculum that had been documented in the project action area and requested a meeting to discuss how to proceed.
August 28, 2012	The Service met with the Administration, PennDOT, and their consultant to discuss options to assess the action area for the presence of Indiana bats and the status of the biological opinion and the possible need to reinstate formal section 7 consultation.
September 11, 2012	The Service provided a technical assistance letter to the Administration detailed the minimal effort that would be needed assess the project area for potential hibernacula, investigate openings for bat use, and determine if Indiana bats may be present.
September 13 to September 19, 2012	A series of telephone calls and electronic mail messages were exchanged between the Service, Administration, PennDOT, and their consultants, to determine appropriate survey effort and surveyor qualifications necessary to implement the survey protocols.
September 24, 2012 to October 23, 2012	Weekly telephone conference calls were held between the Administration, PennDOT, and their consultants, describing the results of the cave and mine portal investigations; the status of land transfers proposed in the biological assessment; and bat survey results. The Service and Pennsylvania Game Commission (PGC) provided minor modifications regarding survey conditions due to the unseasonable cool survey period.
December 10, 2012	The Administration and PennDOT requested that the Service expedite review of S.R. 6219 Section 020 documents related to the Endangered Species Act.



January 7, 2013

The Service receives the Administration's January 3, 2013, request to reinitiate formal consultation with their amended biological assessment describing changes in the project description and a final report describing the results of fall 2012 hibernacula and bat surveys.

### **Revised Project Description**

The S.R. 6219, Section 020, project involves the construction of 10 miles of new, limited-access, four-lane highway extending from an existing highway section south of Somerset, Pennsylvania to Meyersdale, Pennsylvania, with a new interchange in the vicinity of Mud Pike in Black and Brothersvalley Townships. The project description is essentially the same as that considered in our August 29, 2011, amended biological opinion. The action area, (*i.e.*, all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action) is described in the biological assessment as extending 1500 feet from the proposed edge of pavement, which encompasses in excess of 3,600 acres that is currently in a variety of land uses including mines, agriculture, rural residential and forest. The estimated area of direct forest removal needed to accommodate construction has, however, been increased from 230 acres to 270 acres to account for staging areas and temporary access roads (page 9 of the December 2012 biological assessment). An additional 50 acres of forest may be removed if necessary by the construction contractor to allow for disposal of material generated during road bed excavation.

### **Avoidance, Minimization and Conservation Measures**

Avoidance and minimization is proposed through a variety of measures, including a seasonal tree cutting restriction (tree cutting to only occur between November 15 and March 31 to avoid directly killing any Indiana bats that may be roosting in the trees) and compensatory mitigation. The purpose of compensatory mitigation is to partially offset the loss of forest habitat resulting from project construction.

While the former project description included a combination of on-site and off-site reforestation and forest preservation actions within and along the right-of-way, the December 2012 amended biological assessment proposes an alternative measure to minimize take within the 3,600 acre action area. Under the revised project description, PennDOT will provide an in-lieu-fee contribution to the Indiana Bat Conservation Fund (IBCF) for direct removal of 270 acres of forest. Based on the amount and location of forest impacts, PennDOT has committed to contribute \$829,951.92 to the IBCF. The IBCF is used solely for real property acquisition and permanent Indiana bat habitat protection at locations that achieve a significant conservation benefit to Indiana bats. In the biological assessment, PennDOT has also committed the contractor to implementing mitigation measures for up to 50 acres of forest impacts resulting from the contractor's selection and use of waste and borrow areas. Such mitigation will also take the form of an in-lieu-fee contribution to the IBCF consistent with the ultimate level of anticipated impact, which will be no greater than 50 acres.

### **Status of the Indiana bat the action area**

As described in the 2007 biological opinion (as amended in 2011), Indiana bats hibernate during the winter months in caves or mines (winter hibernacula). Each spring, the females emerge from



the hibernacula and migrate to summer (maternity) habitat consisting of hardwood forests. Maternity colonies formed in these areas typically roost under the exfoliating bark of dead trees or loose bark of living trees. The migration of males is variable within a wider range of summer habitats. Some males stay in the vicinity of their hibernacula during the summer months, while others migrate longer distances.

In our letter of April 20, 2009, we concurred with the results of July and August 2008 mist-net surveys that failed to detect Indiana bat maternity activity in the S.R. 6219, Section 020 action area. Based on the negative mist-net survey results, Indiana bat maternity colonies are not likely to occur in the project area. Therefore, take of female Indiana bats and their young is not expected to occur during the summer maternity season. While mist-net surveys are fairly reliable in documenting the presence of maternity colonies, which represent a high-density assemblage of bats, these surveys are much less reliable in documenting the presence of male Indiana bats, which occur at very low densities across the summer landscape. In particular, male Indiana bats tend to use forest habitat close to their hibernacula throughout the spring, summer and fall. Consequently, while the negative mist-net survey results are a good indication that maternity colonies are not present in the project area, they do not discount the presence of male Indiana bats during the spring, summer and fall, considering the proximity of this project to two known Indiana bat hibernacula (approximately 6 and 11 miles, respectively). Nor do mist-net surveys discount the presence of female Indiana bats, which are present in the vicinity of hibernacula in the spring and fall. Both male and female Indiana bats are at risk of take during the spring, summer and fall due to the proposed project activities. Due to the proximity of the S.R. 6219, Section 020 roadway corridor to two known Indiana bat hibernacula, incidental take of Indiana bats was authorized through the 2011 amended biological opinion as indirectly measured by the acres of affected forest habitat.

The status of Indiana bats in the S.R. 6219, Section 019 (Meyersdale to I-64) and Section 020 action areas has likely declined from that considered in our previous biological opinion. A fungal disease known as "white-nose syndrome" (WNS) was documented in south-central Pennsylvania during the winter of 2010/2011. The two known Indiana bat hibernacula near the action area (Salisbury Mine and South Penn Tunnel), as well as other local bat hibernacula, where likely infected at that time. L.R. Kimball environmental staff reported a mine opening observed during project wetland investigations along Fogletown Road in 2007 and in August 2010, Kimball staff reported seeing two bats flying near this mine opening (L.R. Kimball 2010). As noted in our letter of September 11, 2012, a bat was observed flying from a mine portal that drains to a wetland (identified by the project Joint Permit Application as "W84" and in the BA as "Portal JAZ-3") located between Fogletown Road and Buffalo during February 2010 (Steve Toki, previously of L.R. Kimball, personal communication, July 17, 2012). WNS drives infected bats out of hibernation mid-winter, before temperatures and prey (*i.e.*, insects) can support bats on the landscape.

In response to our letter of September 11, 2012, the Administration and PennDOT expanded the previous cave and mine portal investigation. Two natural caves referred to as "Martz Rockshelter" and "Martz Rockshelter No. 2", are recorded in the action area, but were reported to have been closed during construction of S.R. 6129 south of Garret and are not longer extant (Skelly and Loy 2012). Extensive coal mine workings, including several very large underground coal mine complexes, are present beneath and extend far beyond the south section of the proposed roadway alignment. Through a combination of document and field reconnaissance, an



investigation was conducted to identify passages that may be utilized by bats as hibernacula. The investigated area extends laterally 1,500 feet from the proposed edge of pavement to encompass the area anticipated to be exposed to the direct and indirect effects resulting from construction and operation of the new limited-access highway. Within this area, field reconnaissance was completed in selected locations where existing mines and mine features have been recorded. Mine features beyond 1,500 feet from the proposed edge of pavement were not further investigated. Twenty-seven openings were identified, of which Julie Zeyzus, a biologist recognized by the Service as a qualified Indiana bat surveyor determined that five have characteristics suggesting they could be utilized by bats based on criteria described in the 2012 PGC Protocol for Assessing Bat Use of Potential Hibernacula. Based upon the information provided in the survey report we concur that 22 of the identified openings do not appear to have habitat conditions typically present at bat hibernacula. The five potential hibernacula were further investigated to assess bat use.

Three of the five openings (referred to as “Highwall PJD-2a”, “Highwall PJD-2b”, and “Pipe JAZ-2”) were not conducive for harp trapping and mist nets, so acoustic detectors and infra-red camcorders were used to evaluate bat activity near these features. No bat activity was detected during sampling conducted between September 20, 2012, and October 4, 2012. Acceptable weather conditions (i.e., nights with suitable weather conditions as described in the sampling protocol) occurred during four sample nights at “Highwall PJD-2a” and two sample nights at “Pipe JAZ-2”. During the same period, acoustic detectors and infrared camcorders documented bat activity on two nights in the area of “Highwall PJD-2b” over the course of five acceptable samples. The bat(s) recorded at “Highwall PJD-2b” were not captured during three nights of mist netting effort and could not be identified with certainty based solely upon three nights of recorded vocalizations and one infrared video recording. Bat activity at “highwall PJD-2b” was minimal; and the rock crevice habitat at this location may not represent a mine hibernaculum entrance. Rock crevices are typically utilized by eastern small-footed bat but would be atypical of Indiana bat habitat.

Harp traps were established at the other two openings, referred to as “Portal JAZ-3” and “Air Shaft APN-2”. Trapping was conducted for a minimum of 15 nights between September 20, 2012, and October 19, 2012. The unseasonably cold weather during the sampling period curtailed or precluded trapping on several nights. In total, 488 bats were captured at Portal JAZ-3 (23 additional bats were captured on nights that did not meet weather criteria for the entire sampling period) and 292 bats were captured at Air Shaft APN-2. The total number of bats captured per night peaked between October 3 and 5. Weather conditions for several days before and after this period precluded effective trapping. Bats captured at Portal JAZ-3 included five of the six cave-hibernating bat species that occur in Pennsylvania: 69 northern long-eared bats (*Myotis septentrionalis*), 100 little brown bats (*Myotis lucifugus*), 333 tricolored bats (*Perimyotis subflavus*), 7 big brown bats (*Eptesicus fuscus*), and 2 eastern small-footed bats (*Myotis leibii*). Bats captured at Air Shaft APN-2 included 59 northern long-eared bats, 26 little brown bats, and 225 tricolored bats. Of 100 bats banded at Portal JAZ-3, 16 were recaptured. Of 49 bats banded at Air Shaft APN-2, 11 were recaptured at this portal. Five bats that were originally banded at Air Shaft APN-2 were also recaptured at Portal JAZ-3, which is 1.4 miles from Air Shaft APM-2 and on opposite sides of the proposed roadway alignment. Because the bat species present mate prior to hibernation, bats may visit multiple hibernacula during fall swarming. Due to the limited scope of this study, it is not known whether bats from other nearby hibernacula such as Salisbury Mine and the South Penn Tunnel interact with bats at Portal JAZ-3 and Air Shaft APN-2.



However, as Indiana bats have been found to frequent multiple hibernacula during fall swarming and to switch hibernacula from year-to-year, it is likely that one or both of the investigated openings have been and may continue to be frequented by Indiana bats.

As noted above, current bat populations at both Portal JAZ-3 and Air Shaft APN-2 have likely been reduced substantially due to the 2010/2011 arrival of white-nose syndrome. Population monitoring at 42 hibernacula in the northeast and mid-Atlantic states documented a 98% decline in northern long-eared bats, 91% decline in little brown bats, 75% decline in tricolored bats, 72% decline in Indiana bats, 41% decline in big brown bats, and 12% decline in eastern small-footed bats (Turner *et al.* 2011). Pennsylvania's Indiana bat hibernating population is expected to decline by an average of 70%, with the decline at individual sites ranging from 20 to 100%.

The 2012 survey included multiple nights of sampling with the expectation that the sampling effort would be adequate to detect Indiana bats if the species is present. Indiana bats are known to have narrower habitat preferences than some other cave-hibernating species (Brack 2007), so they are found at relatively few hibernacula range-wide. The failure to capture Indiana bats suggests that this species was absent from these two hibernacula during the 2012 sample period or occurs at a low abundance that is not likely to be detected with the survey effort extended. Based on these survey results, the effects of the S.R. 6219 Section 020 project appear to be limited to loss of habitat for Indiana bats utilizing [REDACTED] and South Penn Tunnel, where the species was documented prior to 2012.

### **Effects of the Action**

The effects of the S.R. 6219, Section 019 and Section 020 project were detailed in our 2007 biological opinion (as amended in 2011). Because it appears that no Indiana bat maternity colonies are present (based upon the 2008 mist net survey), and the recent hibernacula surveys failed to detect additional Indiana bat hibernating locations in the action area, the effects of the project are likely to be similar to those previously described. The additional 90 acres of forest removal contemplated in the revised project description increases the area of habitat disturbance and the potential that Indiana bats will be harmed and harassed in the manner described in 2011 amended biological opinion.

Alternative minimization measures to those described in the March 2011, biological assessment are proposed in the December 2012, amended biological assessment. These minimization measures are designed to reduce the effects of direct forest removal through use of an in-lieu-fee program known as the IBCF. However, preserving existing forest habitat does not replace habitat lost due to roadway construction, and the species will experience a net loss in habitat. The proposed mitigation via an IBCF contribution is, therefore, expected to only partially offset the effects of the immediate, permanent habitat loss that will result from the project's anticipated forest removal. These direct habitat losses in addition to the habitat area affected by indirect effects associated with the presence of a new highway (*e.g.*, habitat fragmentation, noise, invasive species introduction) exceed the acres for which conservation is proposed.

Conditions for use of the IBCF require that funds be used to acquire lands that meet long-term protection and management objectives consistent with Indiana bat conservation. The conservation actions accomplished through IBCF acquisitions minimize adverse effects resulting



from the project with Indiana bat management plans and recovery goals developed cooperatively by the PGC and the Service.

### **Incidental Take Statement**

The incidental take statement in the 2011 amended biological opinion is hereby amended to include incidental take resulting from the direct loss of up to an additional 90 acres of forest that is suitable for Indiana bat foraging and roosting, for a total of up to 320 acres of direct forest impacts associated with the construction and operation of S.R. 6219, Section 020. Most of this forest habitat will be permanently lost when it is converted to roadway pavement and associated cut and fill slopes. Fifty acres are proposed to accommodate potential waste and borrow areas selected by the construction contractor. Some areas may naturally revert to forest and other areas may be intentionally reforested. However, these areas will not be available for Indiana bat roosting for several decades. Indiana bats will also be harmed indirectly in larger 3,600 acres action area beyond the acres of forest removal due to habitat fragmentation resulting from roadway presence and operation. The actual level of incidental take due to these indirect effects will be difficult to detect or quantify without extensive tracking efforts because individual Indiana bats are small and nocturnal and therefore difficult to locate. Some may habituate and avoid the road but adopt less suitable habitat. Finding dead or injured Indiana bats is unlikely due to predators and scavengers.

With respect to S.R. 6219, Section 20, the Reasonable and Prudent Measures, as well as Term and Condition 1.G. from the biological opinion amendment of August 29, 2011 are replaced in their entirety with the Reasonable and Prudent Measures and Term and Condition 1.G. below.

### **REASONABLE AND PRUDENT MEASURES and TERMS AND CONDITIONS**

Several Terms and Conditions in the biological opinion of October 2, 2007 are specific to Section 019 (*i.e.*, pre-construction mist-netting surveys, monitoring direct effects in [REDACTED] and conservation actions near the proposed Piney Creek Bridge) and are not applicable to Section 020. Term and Condition 1.G. is in addition to the Reasonable and Prudent Measures and implementing Terms and Conditions described in the 2007 biological opinion, as amended in 2011. To be exempt from the prohibitions of section 9 of the Endangered Species Act, the Administration, PennDOT and their contractors must comply with the terms and conditions, which carry out the reasonable and prudent measures including the revised Term and Condition 1.G. below. The terms and conditions are non-discretionary.

**Term and Condition 1.G.** The project proponents will minimize adverse effects on Indiana bats through the implemented of conservation measures, as detailed below.

- a. Implement project conservation measures and mitigation measures, as detailed in Addendum 2 to the S.R. 6219, Section 20 biological assessment (pages 13-15).
- b. During the bidding process, prospective project contractors will be notified regarding the presence of endangered species in the project area and the special provisions necessary to protect them. The successful contractor(s) will be instructed on the importance of the natural resources in the project area and the need to ensure proper implementation of the tree-cutting restrictions, erosion and



sedimentation controls, and spill avoidance/remediation practices. The following conditions (language) will be included in all construction and demolition contracts awarded for project implementation:

- Endangered species are present in the project area and there is a risk of unauthorized take (Endangered Species Act section 9 violation) if the Terms and Conditions of the Service's 2007 biological opinion (as amended in 2011 and 2013) are not closely followed.
  - Trees will only be cut from November 15 to March 31.
  - Develop and implement a Conservation District approved erosion and sedimentation control plan to limit discharge of all sources of project-related erosion and sedimentation, including, but not limited to, construction of roads and access roads, roadway approaches, staging areas, etc. to preserve water quality.
  - As proposed in the biological assessment, preserve a 50 foot riparian corridor on streams in the project area including an unnamed Casselman River tributary, Buffalo Creek, and Swamp Creek.
  - The Service will be notified immediately of any failures of erosion and sedimentation control measures or spills of hazardous materials.
  - No project-related or project-generated materials, waste, or fill will be deposited in areas that would result in forest clearing unless minimized and offset through the conservation of existing, currently unprotected forest via an in-lieu-fee program that conserves forest habitat for Indiana bats as described Term and Condition 1.G.d.
  - No project-related or project-generated materials, waste, or fill will be deposited in areas that would result in sedimentation to any streams in the action area or areas providing habitat to Indiana bats.
- c. As noted in PennDOT's Addendum 2 to the S.R. 6219, Section 20 Biological Assessment, "PennDOT will contribute to the Indiana Bat Conservation Fund for the 270 acres of impacted forest area." PennDOT provided the Service with a *Calculation Sheet for Indiana Bat Habitat Compensation* which uses a combination of 1:1 and 1.5:1 mitigation ratios, resulting in 369.36 compensation acres for 270 acres of affected forest habitat. At the Somerset County rate of \$2,247/acre, PennDOT will contribute \$829,951.92 to the IBCF. Documentation of the IBCF deposit will be provided to the Service within 10 days of the initiation of tree cutting associated with the S.R. 6219, Section 20 project.
- d. As noted in PennDOT's Addendum 2 to the S.R. 6219, Section 20 Biological Assessment, the construction contractor may impact up to 50 acres of forest in the project area due to use of waste and borrow sites. In the Biological Assessment,



PennDOT has committed the contractor to compensate for impacts to forest habitat. To ensure this occurs, PennDOT will implement the following measures:

- Include language in the construction contract specifying that the contractor will 1) minimize impacts to forests, woodlots and trees when selecting and using waste and borrow sites; 2) report to PennDOT and the Service the acres of forest, woodlots and trees to be affected by waste and borrow sites; 3) in coordination with the Service, compensate for impacts to forests, woodlots and trees using the *Calculation Sheet for Indiana Bat Habitat Compensation* (available from the Service's Pennsylvania Field Office); and 4) documentation of the IBCF deposit will be provided to the Service within 10 days of the initiation of tree cutting associated with the S.R. 6219, Section 20 project.
- Include language in the construction contract specifying that the contractor will implement a seasonal restriction on tree cutting – specifically noting that all tree cutting will occur between November 15 and March 31.
- Provide the Service with contact information for the contractor responsible for waste and borrow sites.
- Ensure the contractor fulfills the terms of the contract specific to reporting and compensating for forest impacts.

### **Conservation Recommendations**

Conservation recommendations are the Services' non-binding suggestions resulting from formal or informal consultation that: (1) identify discretionary measures the project proponents can take to minimize or avoid the adverse effects of a proposed action on listed or proposed species, candidate species, or to designated or proposed critical habitat; (2) identify studies, monitoring, or research to develop new information on listed, proposed or candidate species, or to designated or proposed critical habitat; and (3) include suggestions on how the Service can assist species conservation, as part of their action and in furtherance of their authorities under section 7(a)(1) of the Act [50 CFR §402.02].

During hibernacula trapping studies two significant bat hibernacula were documented. These mine portals represent significant winter habitat for bats that range widely during other seasons. Included are three bat species of federal concern, the northern long-eared bat, little brown bat, and eastern small-footed bat. Two of these species have experienced significant population declines since the white-nose syndrome epidemic began and the status of each is being considered with respect to section 4 (Listing) of the Act.

Species of federal concern are species that may be elevated to candidate or listed status pending further review by the Service. Candidate species are species for which the Service currently has substantial information on file to support the appropriateness of proposing to list as threatened or endangered. Both candidate species and species of federal concern are known to be facing various threats, and have usually suffered substantial population declines and/or habitat loss.



Although these species receive no regulatory protection under the federal Endangered Species Act, the Service strongly encourages federal agencies and other planners to consider these species when planning and implementing their projects. Efforts to conserve these species now may preclude the need to list them as endangered or threatened under the Act in the future.

The Service has identified the following actions that, if undertaken by PennDOT and/or the Administration, would further the conservation and assist in the recovery of the Indiana bat and other bat species of concern:

1. In order to minimize adverse affects to the hibernacula where the northern long-eared bat, little brown bat, and eastern small-footed bat were captured (mine portal "JAZ-3", also referred to "Portal Site #1") from micro-climate alteration due to forest loss near the opening we reiterate the recommendation of the PGC to not remove trees within at least 330 feet of "Portal Site #1".
2. In order to avoid and minimize take to hibernating bats of special concern, we reiterate PGC's recommendation that no blasting, removal of mine passages, or grouting should occur within 1,500 feet of the hibernaculum entrances (mine portal or air shaft), or at the proposed Buffalo Creek bridge structures between November 15 and March 31.
3. Forest clearing and grouting of the abandoned mines has the potential to drastically alter local micro-climate making habitat above and below ground unsuitable for the bat species dependent on these features. The project proponents speculate that the project as proposed will not significantly alter hibernaculum suitability. To monitor continued use by bats during and immediately following construction of S.R. 6219 Section 020 we recommend annual trapping at both the mine portal and air shaft hibernacula entrances each fall during construction and for one year post-construction. Trapping should follow PGC trapping protocols.

To be kept informed of actions minimizing or avoiding adverse effects, or benefiting listed species, candidate species, species of concern, or their habitats, the Service requests notification of the implementation of the conservation recommendations that are carried out.



## REINITIATION NOTICE

This concludes formal consultation on the actions outlined in the Administration's, January 3, 2013, request for initiation of formal consultation. As written in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law), and if (1) the amount or extent of incidental take is exceeded; (2) new information reveals the agency action may affect listed species or critical habitat in a manner or to an extent not considered in this BO; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this BO; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

The documentation of Indiana bats at new locations in the action area (*i.e.*, other than South Penn Tunnel or Salisbury Mine), is an example of new information that would trigger reinitiation of consultation.

If you have any questions regarding this matter, please contact Robert Anderson of this office at 814-234-4090.

Sincerely,



FOR David A. Stilwell  
Acting Field Office Supervisor



## References cited

- Brack, V., 2007. Temperatures and Locations Used by Hibernating Bats, Including *Myotis sodalis* (Indiana Bat), in a Limestone Mine: Implications for Conservation and Management. Environmental Management, Volume 40, Issue 5, pp.739-746.
- L.R. Kimball. 2010. S.R. 6219 Section 020 (Meyersdale to Somerset) Final Design, ECMS Agreement No. E00958, MPMS No. 23620, Indiana Bat Meeting – Administration. Administration Office Harrisburg. Memorandum from John A. Vitez, Project Manager, L.R. Kimball to Thomas A. Prestash, District Executive. September 8, 2010. 2 pages.
- Skelly and Loy. 2012. U.S. Route 210 Improvements Project, S.R. 6219, Section 020, Bat Hibernaculum Investigations, Final Report. Prepared for Pennsylvania Department of Transportation, Engineering District 9-0. December 2012. 48 pages plus figures and appendices.
- Turner, G.G., D.M. Reeder, and J.T.H. Coleman. 2011. A five-year assessment of mortality and geographic spread of white-nose syndrome in North American bats and a look to the future. Bat Research News 52(2): 13-27.





June 27, 2014

Ryan VanKirk, P.E.  
Pennsylvania Department of Transportation  
Highway Design Technology Section  
400 North Street  
Keystone Commonwealth Building  
Harrisburg, PA 17105-3161

Re: Somerset County  
S.R. 6219, Section 020  
US 219 Improvement Project (Somerset to Meyersdale)

Dear Mr. VanKirk:

Please find Addendum 3 to the Biological Assessment (BA) for the US 219 Improvement Project (S.R. 6219, Section 020) in Somerset County posted on FHWA ESA BA Webtool <http://www.environment.fhwa.dot.gov/ESAWebTool/Site/Login.aspx>. The document was reviewed by the Environmental Policy and Development Section of the Bureau of Project Delivery. Please forward to the Federal Highway Administration with a request that they submit BA Addendum3 to the United States Fish and Wildlife Service (USFWS) and concurrently initiate formal conferencing under Section 7 of the Endangered Species Act. In the interest of expediting this priority, hard copies for the Federal Highway Administration (FHWA), USFWS and Pennsylvania Game Commission (PGC) use are being submitted under separate cover direct to FHWA by the District; similarly, a copy is being transmitted for your file.

On January 31, 2013 the USFWS issued an Amended Biological Opinion addressing the effects of Section 020 of the US 219 Improvement Project on the federally endangered Indiana bat (*Myotis sodalis*). On October 2, 2013 the USFWS published notice proposing to list as federally endangered the northern long-eared bat (*Myotis septentrionalis*). Addendum 3 to the Biological Assessment addresses the effect of the project on this proposed species. The action will not jeopardize the proposed northern long-eared bat; however, it is likely that this species will be federally listed prior to project completion. It is therefore prudent to assure that a conference opinion is received from USFWS prior to listing to avoid project delay or a construction shutdown. USFWS has indicated that conference opinions may be readily updated to biological opinions for this species upon listing. Once listed, the action of the US 219 Improvement Project may affect, and is likely to adversely affect the northern long-eared bat.



Ryan VanKirk, P.E.  
Pennsylvania Department of Transportation  
Highway Design Technology Section  
Page 2  
June 27, 2014

Conservation measures to reduce effects and offset the take of Indiana bats, previously incorporated into the project design, also reduce effects and offset take of Northern long-eared bats. District 9-0 is committed to implementing the conservation measures as detailed in the January 31, 2013 Amended Biological Opinion to minimize the effect of the project on these bat species.

Please contact Attilio Squillario, Environmental Planner, at (814) 696-7116 or via e-mail at [asquillari@pa.gov](mailto:asquillari@pa.gov) or Gregory Illig, P.E., at (814) 696-7179 or e-mail at [gillig@pa.gov](mailto:gillig@pa.gov), if you have questions regarding this request.

Sincerely,



Thomas A. Prestash, P.E.  
District Executive  
Engineering District 9-0

090/AS/bac



bcc: T. A. Prestash, P.E., District Executive, 9-0  
J. C. Ciprich, P.E., Sr. Civil Engineer Manager  
B. J. Brumbaugh, P.E., ADE Construction  
T. R. Yocum, Environmental Manager  
G. M. Illig, P.E., Civil Engineer Manager  
M. Lombard, EPDS  
T. Zawisa, EPDS  
T. Helsel, SR 6219, Section 020 Project Manager  
Joseph B. Fay Construction  
D. Davis, EADS  
Hunt Valley Environmental



**US 219 IMPROVEMENT PROJECT, SR 6219 SECTION 020**

**(USFWS Project #2007-2430)**

**ADDENDUM 3 to the**

***US 219 IMPROVEMENT PROJECT, SR 6219 SECTION 019 INDIANA***

***BAT (MYOTIS SODALIS) BIOLOGICAL ASSESSMENT***

***(JUNE 2006, as Amended February 2007, March 2011 and December 2012)***

***USFWS Project #2007-1091***

US 219 Improvement Project  
SR 6219 Section 020 Meyersdale to Somerset  
Somerset County, Pennsylvania



District 9-0, Hollidaysburg, Pennsylvania

And

U.S. Department of Transportation



June 2014



## Table of Contents

<b>I.</b>	<b>Overview .....</b>	<b>1</b>
<b>II.</b>	<b>Project Description .....</b>	<b>4</b>
<b>III.</b>	<b>Consultation History .....</b>	<b>4</b>
<b>IV.</b>	<b>Federally Proposed and Listed Species and Designated Critical Habitat .....</b>	<b>6</b>
<b>V.</b>	<b>Description of the Project Action Area .....</b>	<b>8</b>
	<b>A. Indiana Bat Occurrence in the Project Action Area .....</b>	<b>8</b>
	<b>B. Northern Long-eared Bat Occurrence in the Project Action Area .....</b>	<b>9</b>
<b>VI.</b>	<b>Effects of Proposed Action .....</b>	<b>12</b>
<b>VII.</b>	<b>Incidental Take .....</b>	<b>15</b>
<b>VIII.</b>	<b>Conclusion .....</b>	<b>16</b>
<b>IX.</b>	<b>References .....</b>	<b>17</b>

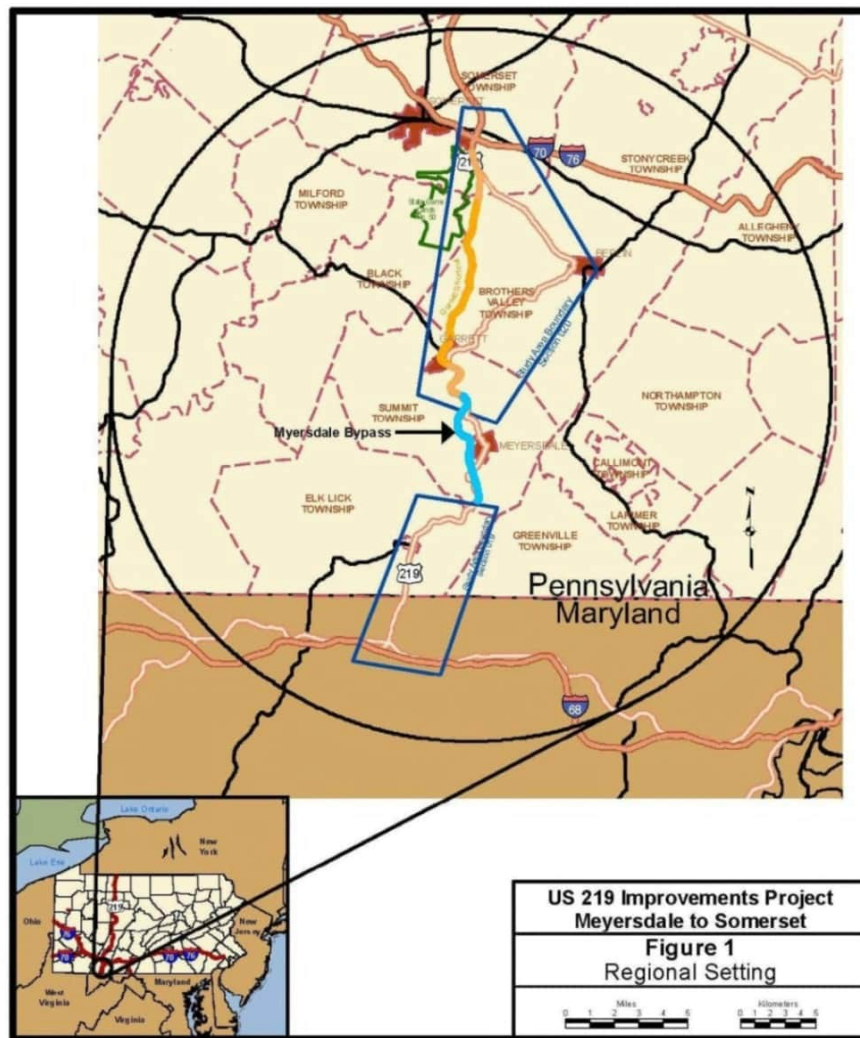
Appendix A Indiana Bat Correspondence (Section 020) January 2013 to June 2014

Appendix B *Fall Bat Harp Trapping and Acoustic Surveys U.S. Route 219 Improvements  
Project, S.R. 6219, Section 020, Somerset County, Pennsylvania September  
30 – October 2, 2013, Bat Conservation Management January 2013*



## I. Overview

The Federal Highway Administration (FHWA) along with the Pennsylvania Department of Transportation (PennDOT), Engineering District 9-0, and the Maryland State Highway Administration (MD SHA) have been advancing improvements for two sections of U.S. 219 in Somerset County, Pennsylvania and Garrett County, Maryland. Section 020, addressed in this Addendum to the Biological Assessment (BA), extends approximately 10 miles from the northern end of the Meyersdale Bypass to the southern end of existing US 219 just southeast of Somerset, PA. See Figure 1, Regional Setting. The project is currently in construction and many of the construction activities including tree removal and geotechnical/mine stabilization measures have been completed.



The US 219 IMPROVEMENT PROJECT, SR 6219 SECTION 020 (USFWS Project #2007-2430) is a Federal and State funded highway transportation improvement project and as such constitutes a Federal Action. This third addendum to the BA, prepared by the Federal Highway Administration (FHWA) in conjunction with the Pennsylvania Department of Transportation (PennDOT) as its non-Federal representative, addresses the proposed action in compliance with Section 7(c) of the Endangered Species Act (ESA) of 1973, as amended. Section 7(a)(2) of the ESA requires that, through consultation with the U.S. Fish and Wildlife Service (USFWS), federal actions do not jeopardize the continued existence of any threatened, endangered, or proposed species or result in the destruction or adverse modification of critical habitat.

On October 2, 2013 the USFWS proposed to list as a Federal Proposed Endangered Species, the Northern Long-eared bat (*Myotis septentrionalis*), hereinafter referred to as NLEB. Occurrences of this species within the project action area were documented during the mist net (2009), hibernacula (2012) and fall trapping (2013) surveys undertaken for the project. USFWS anticipates a listing decision for the Northern Long-eared bat on or about April 2, 2015. Given the pending listing, this addendum to the Biological Assessment is intended to relate solely to Section 020 of the SR 6219 project and serves to address effects of this project section on the NLEB.

The lead federal agency for the Section 7 consultation for the US 219 IMPROVEMENT PROJECT, SR 6219 SECTION 020 (USFWS Project #2007-2430) is FHWA through the provision of federal funding. The U.S. Army Corps of Engineers through the issuance of a 404 Permit is also a federal action agency on this project. Formal consultation was previously conducted to address the effect of the SR 6219, Section 020 action on the Indiana Bat (*Myotis sodalis*), determined to result in a May Effect, Likely to Adversely Effect. This consultation is documented in the Supplemental Biological Opinion for the project issued by the USFWS on January 31, 2013. Updated project information is provided in this Addendum to the BA but this information does not result in a change to the effect as previously determined or the Incidental take Statement previously issued by the USFWS for the Indiana bat. It is herein determined that the project also May Effect and is Likely to Adversely Affect the NLEB, should the species be listed. The FHWA and its designated non-federal representative, PennDOT request and anticipate USFWS issuance of a Conference Opinion/Supplemental Biological Opinion for the Northern Long-eared bat, if required.



Primary Agencies and Contacts associated with the US 219 IMPROVEMENT PROJECT, SR 6219 SECTION 020 are as follows:

Agency	Contact	Project Role	E-mail	Phone
Federal Highway Administration	Cory Donahue Jonathan Crum	Lead Federal Action Agency	<a href="mailto:Cory.donahue@dot.gov">Cory.donahue@dot.gov</a> <a href="mailto:Jonathan.Crum@fhwa.dot.gov">Jonathan.Crum@fhwa.dot.gov</a>	717-221- 717-221-3735
U.S. Army Corps of Engineers	Mike Dombroskie	Other Federal Action Agency	<a href="mailto:Mike.Dombroskie@usace.army.mil">Mike.Dombroskie@usace.army.mil</a>	814-235-0571
PennDOT District 9-0	Gregory Illig, P.E. Attilio Squillario	Designated Non-Federal Representative	<a href="mailto:gillig@pa.gov">gillig@pa.gov</a> <a href="mailto:asquillari@pa.gov">asquillari@pa.gov</a>	814-696-7179 814-696-7116
L.R. Kimball	John Vitez, P.E. John Gustkey	NEPA & Engineering Consultant	<a href="mailto:John.Vitez@Kimballcorp.com">John.Vitez@Kimballcorp.com</a> <a href="mailto:John.Gustkey@Kimballcorp.com">John.Gustkey@Kimballcorp.com</a>	814-472-7700
EADS	J. Dain Davis Carlos Escalante	Environmental Consultant	<a href="mailto:ddavis@eadsgroup.com">ddavis@eadsgroup.com</a> <a href="mailto:cescalante@eadsgroup.com">cescalante@eadsgroup.com</a>	
Hunt Valley Environmental, LLC	Andrew Dzurko	Environmental Consultant - Construction	<a href="mailto:AndrewD@hvenv.com">AndrewD@hvenv.com</a>	
PennDOT-EPDS	Toni Zawisa	Lead BA Addendum 3 Preparer/Non-Federal Representative	<a href="mailto:azawisa@pa.gov">azawisa@pa.gov</a>	814-765-0588
PennDOT - HDTS	Ryan Vankirk	Designated Non-Federal Representative	<a href="mailto:rvankirk@pa.gov">rvankirk@pa.gov</a>	717-705-1338

## II. Project Description

The March 1999 report, "Needs Analysis, U.S. Route 219, I-68 (MD) to Somerset, Pennsylvania," summarizes the needs for the US 219, Sections 019 and 020 projects. The Needs Analysis evaluated existing and future traffic congestion, traffic movement patterns, existing roadway geometric constraints, accidents, system linkage and continuity, socioeconomic characteristics, and economic development potential of the study corridors. FHWA and the Pennsylvania and federal resource agencies granted needs concurrence in April of 1999.

The Project Description for Section 020 remains as described in the January 31, 2013 Amendment to the USFWS October 2, 2007 *Biological Opinion on the Effects of the US 6219, Section 019 Transportation Improvement Project on the Indiana bat (Myotis sodalis) Somerset County, Pennsylvania and Garrett County, Maryland*, as previously amended on August 29, 2011 and January 31, 2013; however it should be noted that many of the construction activities have been completed including most of the necessary tree removal and the geotechnical mine stabilization measures. The referenced description follows:

*The S.R. 6219, Section 020, project involves the construction of 10 miles of new, limited-access, four-lane highway extending from an existing highway section south of Somerset, Pennsylvania to Meyersdale, Pennsylvania, with a new interchange in the vicinity of Mud Pike in Black and Brothersvalley Townships. The project description is essentially the same as that considered in our August 29, 2011, amended biological opinion. The action area, (i.e., all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action) is described in the biological assessment as extending 1500 feet from the proposed edge of pavement, which encompasses in excess of 3,600 acres that is currently in a variety of land uses including mines, agriculture, rural residential and forest. The estimated area of direct forest removal needed to accommodate construction has, however, been increased from 230 acres to 270 acres to account for staging areas and temporary access roads (page 9 of the December 2012 Biological Assessment). An additional 50 acres of forest may be removed if necessary by the construction contractor to allow for disposal of material generated during road bed excavation.*

The project description as described in *US 219 IMPROVEMENT PROJECT, SR 6219 SECTION 020 (USFWS Project #2007-2430) ADDENDUM 2, December 2012*, prepared prior to construction, had not provided locations for the additional waste disposal areas that might be required by the construction contractor. Some of these locations have since been identified and PennDOT, its contractors and the USFWS have consulted regarding additional effects. All of these additional areas were found to be in compliance with the terms and conditions of the Supplemental Biological Opinion (January 2013). These locations are additions to the project description for the consultation.

The project design as described in *US 219 IMPROVEMENT PROJECT, SR 6219 SECTION 020 (USFWS Project*



#2007-2430) ADDENDUM 2, December 2012, included necessary mine stabilization measures, as determined through geotechnical studies conducted by HDR Engineering, Inc. and detailed in the *Mining Investigation and Recommendations Report*. These stabilization measures were required to assure safe and stable conditions for the construction of Pier 4 and Abutment 2 and included potential blasting, over excavation and grouting. The grouting activity was further defined as encompassing an area 105' x 160' at Abutment 2 and an area 70' x 140' under pier 4. It was estimated that the necessary grouting would result in grout of an estimated 0.06% of the entire Upper Kittaning mine workings with no impacts on the main shaft or the associated air shaft from the proposed grouting or overexcavation activities. Blasting, grouting and removal of mine passages associated with the project within 1,500 feet of the entrance to Portal #1 (a.k.a. Portal JAZ-3) and in the vicinity of the Buffalo Creek Bridge Structures was completed between April 1 and November 14 as described in BA Addendum 2. Forest removal associated with the project within 1,000 feet of Portal # 1 as described in BA Addendum 2 is 95% complete and occurred between November 15 and March 31 and the remaining tree removal, if required will also occur in compliance with this seasonal restriction. Annual trapping during construction at Portal #1 and Air Shaft #4 was initiated during the fall of 2013 to monitor effects of construction disturbances on the hibernaculum. Further details are included in Appendices A, C and the following tables.

**CONSTRUCTION INVENTORY AS OF JUNE 10, 2014**

MINE PORTAL "JAZ-3", also referred to as PORTAL SITE #1			
TREE REMOVAL*			
TIME FRAME	WITHIN 175 FEET	WITHIN 330 FEET	WITHIN 1,000 FEET
PREVIOUSLY REMOVED	0.00 ACRES	0.85 ACRES	12.16 ACRES
TO BE REMOVED	0.00 ACRES	0.00 ACRES	0.66 ACRES
BLASTING, GROUTING, AND REMOVAL OF MINE PASSAGES**			
TIME FRAME	WITHIN 1,500 FEET		
PREVIOUSLY COMPLETED	ALL BLASTING, GROUTING AND ANTICIPATED REMOVAL OF MINE PASSAGES HAS BEEN COMPLETED.		
TO BE COMPLETED	NONE ANTICIPATED		

"AIR SHAFT APN-2"			
TREE REMOVAL*			
TIME FRAME	WITHIN 175 FEET	WITHIN 330 FEET	WITHIN 1,000 FEET
PREVIOUSLY REMOVED	0.00 ACRES	0.00 ACRES	0.00 ACRES
TO BE REMOVED	0.00 ACRES	0.00 ACRES	0.00 ACRES
BLASTING, GROUTING, AND REMOVAL OF MINE PASSAGES**			
TIME FRAME	WITHIN 1,500 FEET		
PREVIOUSLY COMPLETED	NONE		
TO BE COMPLETED	NONE ANTICIPATED		

BUFFALO CREEK BRIDGE STRUCTURES	
BLASTING, GROUTING, AND REMOVAL OF MINE PASSAGES**	
TIME FRAME	WITHIN 1,500 FEET
PREVIOUSLY COMPLETED	ALL BLASTING, GROUTING AND ANTICIPATED REMOVAL OF MINE PASSAGES HAS BEEN COMPLETED.
TO BE COMPLETED	NONE ANTICIPATED.

TREE REMOVAL FOR PROJECT SITE*	
PREVIOUSLY REMOVED	234.19 ACRES
TREES TO BE REMOVED	UP TO 35.81 ACRES

\* COMPLETED BETWEEN NOVEMBER 15 AND MARCH 31.

\*\* COMPLETED BETWEEN APRIL 1 AND NOVEMBER 14.



The project design included adjustments to avoid and reduce impacts on forested habitat, particularly in wetlands and riparian corridors. These measures were detailed in the *US 219 Improvement Project, SR 6219 Section 020 (USFWS Project #2007-2430) ADDENDUM, Revised March 2011*. A seasonal tree cutting restriction, permitting tree cutting only between November 15 and March 31, was incorporated in the project. The conservation measures detailed in the tables that follow are also incorporated in the project. Compensation, through contribution to the Indiana Bat Conservation Fund (IBCF), was provided for impacts to all forest habitats, regardless of tree species composition or successional stage.

<b>Conservation Measure &amp; Mitigation Measure Summary</b>	
<b>U.S. 219 Section 020</b>	
<b>Conservation Measures</b>	
Living Snow Fence (additional foraging habitat)	
Annual trapping/monitoring at Portal #1 and Air Shaft#4 during and post construction (initiated in 2013)	
<b>Mitigation Measures</b>	
Contribution to the Indiana Bat Habitat Conservation Fund	270.0 acres
50 feet wide Riparian Buffer preserved around major stream corridors, where feasible	
TOTAL:	270.0 acres*
Estimated \$ to Indiana Bat Habitat Conservation Fund (Based on IBCF Form)	\$829,951.92
<p>* As mentioned up to an additional 50 acres may be used by the contractor for waste areas. This 50 acres is not being included in the current payment to the Indiana Bat Habitat Conservation Fund, as it is not known how much of it will be used or if the contractor will waste in the project area since PennDOT cannot designate where a contractor obtains borrow or wastes material. If the contractor impacts any or all of this 50 acres in an area that would cause an impact to the Indiana Bat, the contractor will be responsible at that time for mitigation.</p>	

Additional contributions to the IBCF have been included as part of the action to address forest impacts associated with waste/borrow, access roads and stormwater facilities. These contributions are as follows:

SR6219 Somerset to Meyersdale Waste Site Forested Impacts Tracking Table				
Waste Site	Total Acres (ac)	Forested Acres (ac)	Impacted Forested Acres (ac)	Compensation Cost (Impacted Forested Acres x \$,2247.00)
Nixon Waste Site	19.3	1.0	1.0	\$ 2,247.00
1970s ROW Waste Site	13.0	2.2	2.2	\$ 4,943.40
Petenbrink Waste Site	45.2	1.1	1.1	\$ 2,471.70
Realignment Area	11.2	2.6	2.6	\$ 5,842.20
Jenkins Waste Site	30.8	9.3	9.3	\$ 20,897.10
Total =	<b>119.5</b>	<b>16.2</b>	<b>16.2</b>	<b>\$ 36,401.40</b>



### III. Consultation History

A Biological Assessment was submitted to the United States Fish and Wildlife Service (USFWS) in June 2006 for Section 019. This Biological Assessment was supplemented with an amendment in February 2007. In October of 2007 the USFWS issued their Biological Opinion on the Section 019 project (USFWS Project #2007-1091), which stated that the proposed Section 019 project was not likely to jeopardize the continued existence of the Indiana Bat (*Myotis sodalis*). The Biological Assessment prepared for Section 019 was amended (*US 219 IMPROVEMENT PROJECT, SR 6219 SECTION 020 (USFWS Project #2007-2430) ADDENDUM, Revised March 2011*) to include Section 020. Consultation was then reinitiated between the USFWS and FHWA; and a subsequent (August 28, 2011) Biological Opinion was issued. Further design modifications to Section 20, as well as, information related to previously undocumented mine portals and their use as hibernacula for bat species occurred resulting in an additional amendment to the consultation (*US 219 IMPROVEMENT PROJECT, SR 6219 SECTION 020 (USFWS Project #2007-2430) ADDENDUM2, December 2012*). The USFWS issued a Supplemental Biological Opinion on January 31, 2013.

The Northern Long-eared bat (*Myotis septentrionalis*), proposed endangered, hereinafter referred to as NLEB, was documented to be present within the project action area during the mist net (2009), hibernacula (2012) and fall trapping (2013) surveys undertaken for the project. USFWS anticipates a listing decision for the NLEB on or about October 2, 2014. Given the pending listing, this addendum to the Biological Assessment is intended to relate solely to Section 020 of the SR 6219 project and serves to address effects of this project section on the NLEB. The SR 6219, Section 020 action May Effect and is Likely to Adversely Affect the NLEB.

PennDOT proceeded with construction lettings for SR 6219, Section 020 on XXXX and advanced the necessary stabilization grouting and timber cutting as separate contracts. These construction activities were completed ahead of construction of the highway which is presently underway. Construction is not anticipated to reach completion until XXXX.

Operating within the terms and conditions of the January 31, 2013 Supplemental Biological Opinion, PennDOT and its contractors have consulted on additional forest impacts necessary for borrow/waste, access road and stormwater facilities associated with the project. The USFWS has reviewed the information provided regarding these additional forest impacts and has determined that they are consistent with Term and Condition 1.G of the USFWS Biological Opinion (2013). Correspondence associated with updated impact and effect information resulting from additional forest impacts and relevant to effects on both the Indiana and NLEB has been included in Appendix A.

Informal consultation activities are documented in the June 2006, *US 219, Section 019, Indiana Bat Biological Assessment* as amended in February 2007, the *US 219 Improvement Project, SR 6219 Section 020 (USFWS Project #2007-2430) ADDENDUM, Revised March 2011* and the *US 219 IMPROVEMENT PROJECT, SR 6219 SECTION 020 (USFWS Project #2007-2430) ADDENDUM, December 2012*.

The following is a summary of Consultation Activities conducted for Section 020 since the January 31, 2013 Amended Biological Opinion:

Letters and Memorandums (Letters/Memos are contained in Appendix A, Correspondence)

- January 2013 the *Fall Bat Harp Trapping and Acoustic Surveys U.S. Route 219 Improvements Project, S.R. 6219, Section 020, Somerset County, Pennsylvania September 30 – October 2, 2013, Bat Conservation Management* was submitted to the USFWS (report contained in Appendix B).
- February 7, 2013 letter from First Commonwealth Advisors to PA Game Commission advising that deposit to the Indiana Bat Conservation Fund (IBCF) account in the amount of \$829,951.92 had been made.
- June 10, 2013 letter from USFWS to FHWA providing updated species occurrence information for the Indiana bat as found during survey activities at a mine (Casselman River hibernaculum) approximately 2.5 miles west of the US Route 219 Improvements Project.
- June 20, 2013 letter from FHWA to USFWS PA Field Office concurring in USFWS determination that the avoidance and minimization measures included in the January 31, 2013 Supplemental Biological Opinion sufficiently protect the Indiana Bat found in at the Casselman River hibernaculum.
- May 2, 2014 letter from USFWS to Hunt Valley Environmental, LLC acknowledging an additional 4 acres of forest habitat impacts and additional compensatory contribution to the IBCF associated with a borrow/waste site as consistent with Term and Condition 1.G. of the Biological Opinion.



#### IV. Federally Proposed and Listed Species and Designated Critical Habitat

The following references provide the pertinent information regarding the life history, status and threats to continued existence for the Indiana and Northern Long-eared bats.

[U.S. Fish and Wildlife Service \(USFWS\). 2007. Indiana Bat \(\*Myotis sodalis\*\) Draft Recovery Plan: First Revision. U.S. Fish and Wildlife Service, Fort Snelling, MN. 258 pp.](#)

U.S. Fish and Wildlife Service. 2012a. Biological Opinion: Effects of the South Valley Parkway (S.R. 3046, Section 301) Transportation Project on the Indiana Bat, Luzerne County, Pennsylvania. U.S. Fish and Wildlife Service State College, PA. 57 pp.

U.S. Fish and Wildlife Service. 2012b. Biological Opinion: Effects of the Canoe Creek Transportation Improvement Project on the Indiana Bat Blair County, Pennsylvania. U.S. Fish and Wildlife Service State College, PA. 92 pp.

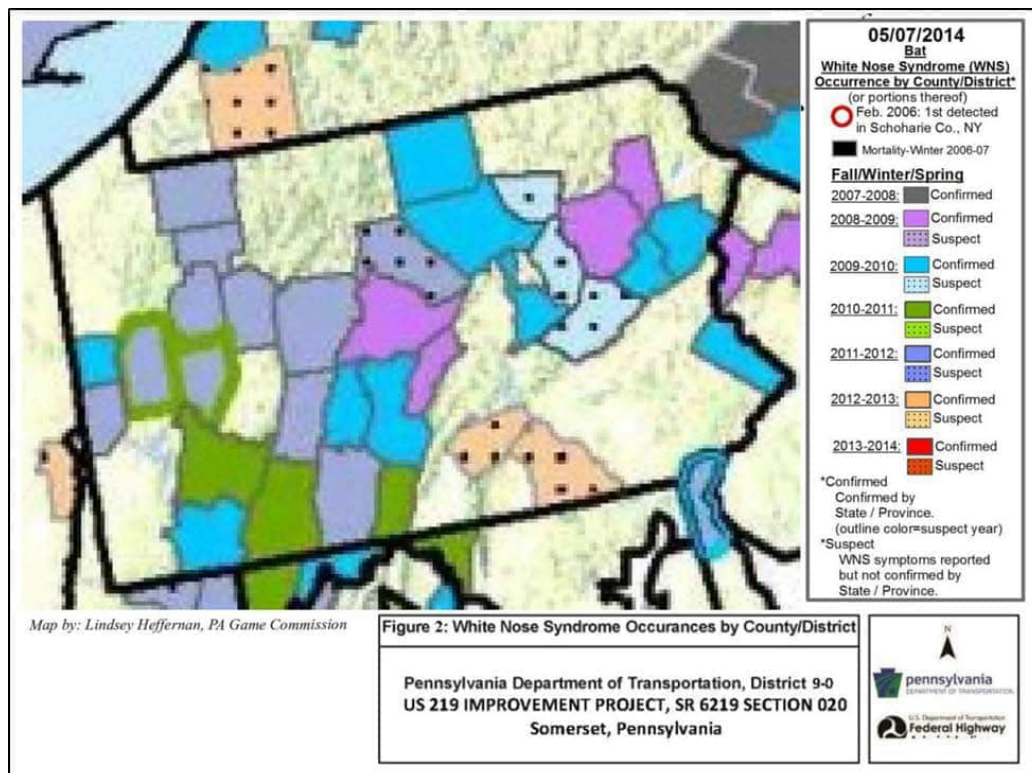
U.S. Fish and Wildlife Service. 2014. Northern Long-Eared Bat Interim Conference and Planning Guidance. U.S. Fish and Wildlife Service Region 5. 66 pp.

A detailed discussion on Indiana Bat biology is contained in the June 2006, *US 6219, Section 019, Indiana Bat Biological Assessment* as amended in February 2007 and is incorporated herein by reference.

Updated information on Indiana Bat biology is contained in the *US 219 Improvement Project, SR 6219 Section 020 (USFWS Project #2007-2430) ADDENDUM, Revised March 2011* and is incorporated herein by reference.

In general, the Indiana and NLEB species predominantly utilize similar winter, swarming, foraging and maternity habitats and the two species are frequently found to co-utilize these habitats. Northern long-eared bats, however, tend to be a more generalist species when compared to Indiana bats in selection of roost trees. They will select trees of lesser dbh ( $\geq 3$ " dbh as compared to  $\geq 5$ " dbh for Indiana bats), will utilize conifers and generally select trees with greater amount of canopy cover. Northern long-eared bats maintain a tighter home range with swarming habitat generally within a 5-mile radius of a known hibernacula and foraging distances of approximately 1.5 miles from roost trees (as compared to 10 miles and 2.5 miles for Indiana bats).

The greatest threat currently to Indiana and Northern Long-eared bats is white nose syndrome (WNS) caused by the fungus *Pseudogymnoascus destructans*. USFWS reports a 98% decline in Northern Long-eared bats in the Northeast and Mid-Atlantic States (Biological Opinion, 2013). Recently, the PGC developed an updated WNS occurrence map (Figure 2). This graphic depicts that hibernacula in Somerset County, Pennsylvania had been confirmed to be infected by WNS during 2010 – 2011. Given the decimation of bat populations regionally due to WNS infection, conservation focus relevant to the project action area is on the conservation and protection of life requisite supporting habitats so that sickened and struggling bats are not further harmed by additional stressors and further that in the event that individuals of these species survive the WNS outbreak adequate habitat is available to support recovery.





## V. Description of the Project Action Area

The Description of the Project Action Area for Section 020 is documented in the *US 219 Improvement Project, SR 6219 Section 020 (USFWS Project #2007-2430) ADDENDUM, Revised March 2011* and in the *U.S. Route 219 Improvements Project, S.R. 6219, Section 020, Bat Hibernaculum Investigations Final Report, December 2012* (appended to the December 2012 Biological Assessment Addendum 2). The Action Area was further described in the January 31, 2013 Amended Biological Opinion as extending 1500 feet from the proposed edge of pavement, encompassing in excess of 3,600 acres and to include up to an additional 50 acres of forest removal as necessary during construction by the contractor for purposes of disposal of material generated during excavation activities associated with the project. The contractor has identified areas for disposal and provided the USFWS documentation in respect to location and forest impacts. This information is included in Appendix A. Modification to the project brought about through value engineering during final design resulted in a slight shift in the Action Area for which additional consultation with the USFWS occurred. The value engineering did not result in any expansion to the Action Area as defined in the Amended Biological Opinion.

### A. Indiana Bat Occurrence in the Project Action Area

A detailed discussion on the Indiana Bat hibernacula, habitat, and migration paths is contained in the June 2006, *US 6219, Section 019, Indiana Bat Biological Assessment* as amended in February 2007 and March 2011 and is incorporated herein by reference.

No Indiana Bats were captured as a result of 2008 mist net surveys conducted for the US 219, SR 6219, Section 020 Project (see March 2011 Addendum). Based on available information, the only known maternity colony for Indiana Bats near the project area is located about 65 miles east in Blair County, Pennsylvania. Additionally, based on the results of the 2008 mist net survey conducted in the project area; there are no maternity colonies utilizing the forest habitat within the Section 020 project corridor. The USFWS concurred with this conclusion in their letter dated June 23, 2010. Therefore, the Section 020 project will have no direct impacts on any Indiana Bat maternity colonies. No new information has become available since the March 2011 addendum to result in a change to this conclusion.

During September and October 2012, portal reconnaissance and hibernacula surveys were conducted per the 2012 Pennsylvania Game Commission (PGC) *Protocol for Assessing Bat Use of Potential Hibernacula*, the September 11, 2012 technical assistance letter from USFWS and continued coordination with USFWS and the PA Game Commission, to ascertain the potential for hibernacula and possible use by Indiana Bats. The results are summarized in *U.S. Route 219 Improvements Project, S.R. 6219, Section 020, Bat Hibernaculum Investigations Final Report, December 2012* (appended to the December 2012 Biological Assessment Addendum 2). Twenty-seven potential portal openings were evaluated

during the field investigations. Five of these openings were found to be in the project action area and to meet the 2012 PA Game Commission protocol and were then surveyed in accordance with the protocol. Two of these portals (Portal #1 and Air Shaft # 4) and one additional site, a highwall (Highwall Site # 3), were found to be used by bats; however, no Indiana Bats were trapped at any of the sites.

To monitor the continued viability of Portal #1 and Air Shaft #4 as winter habitat for Pennsylvania bat species, and in the interest of conservation of state and federally listed bat species in the project area, additional fall trapping and acoustic surveys were conducted during 2013. The report summarizing the results, *Fall Bat Harp Trapping and Acoustic Surveys U.S. Route 219 Improvements Project, S.R. 6219, Section 020, Somerset County, Pennsylvania September 30 – October 2, 2013, Bat Conservation Management January 2013*, is attached to this document in Appendix B. No Indiana bats were trapped at either of the sites during this survey effort.

As discussed in the March 2011 Addendum, the Section 020 project area is within the swarming radius (10-mile radius) of two known Indiana Bat hibernaculum ( [REDACTED] and South Penn Tunnels). On June 10, 2013, the USFWS provided notice to the FHWA of the collection of an Indiana bat during the survey of a mine located approximately 2.5 miles west of the S.R. 6219, Section 020 project area, adding a third known Indiana Bat hibernaculum swarming radius known as the Casselman River Hibernaculum. The Section 020 project will have no direct effects on these hibernacula; however, the relative proximity to three known Indiana bat hibernacula suggests the potential presence of Indiana Bats in the project area for foraging and roosting. In correspondence (Appendix A), the USFWS determined that avoidance and minimization measures as described in the Supplemental Biological Opinion (January 2013) provided sufficient protection for the newly confirmed Indiana bat winter habitat at the Casselman River Hibernaculum.

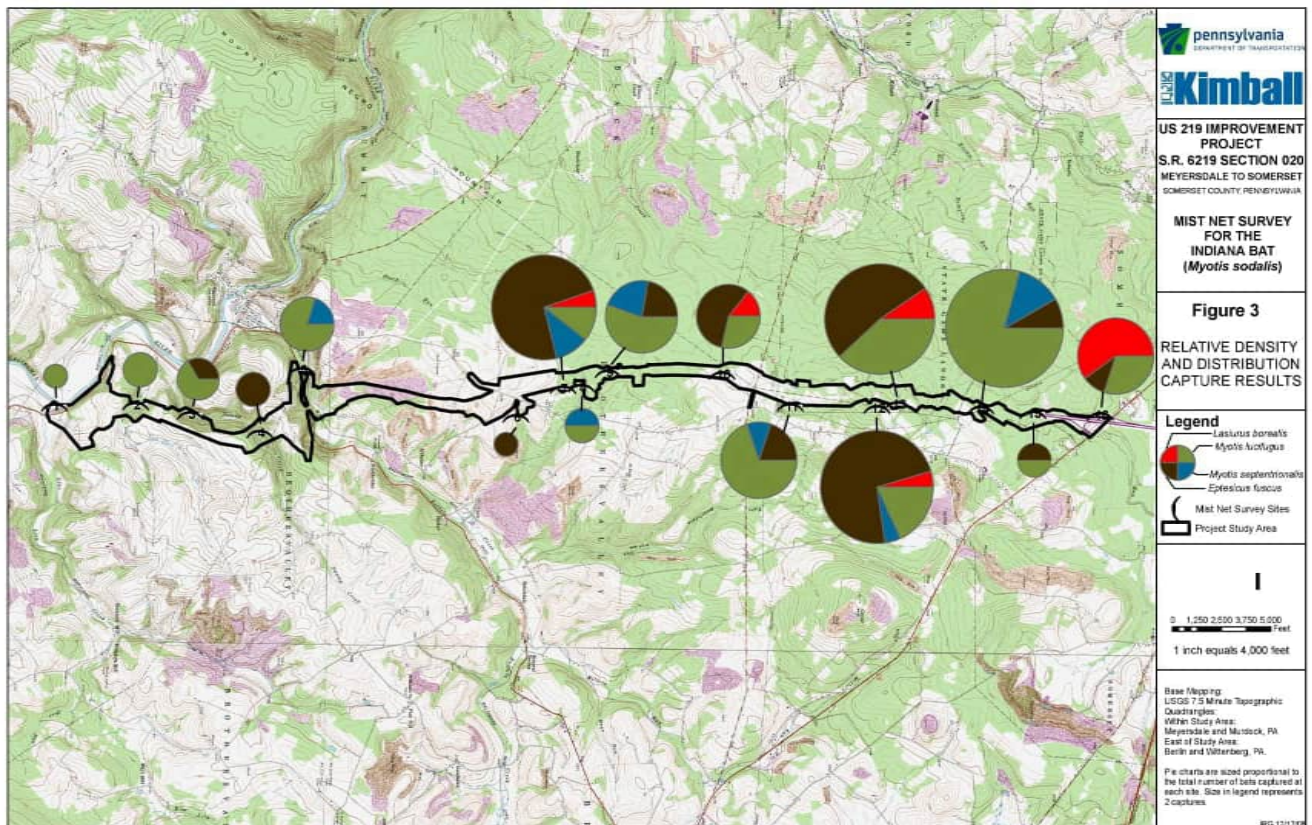
The proposed Section 020 project will impact approximately 18.95 acres of wetlands, 270 acres of forest, and 7,738 linear feet of perennial and intermittent streams. In addition to 270 acres of forest impact required for the construction of the project, up to an additional 50 acres of forest impact may occur as a result of the contractor's borrow/waste sites. The contractor is ultimately responsible for selection of waste/borrow sites and consequently will be responsible for mitigation for these sites, as needed.

## **B. Northern Long-eared Bat Occurrence in the Project Action Area**

Winter, swarming, roosting and foraging habitats for the Northern long-eared bat occur within the project action area.



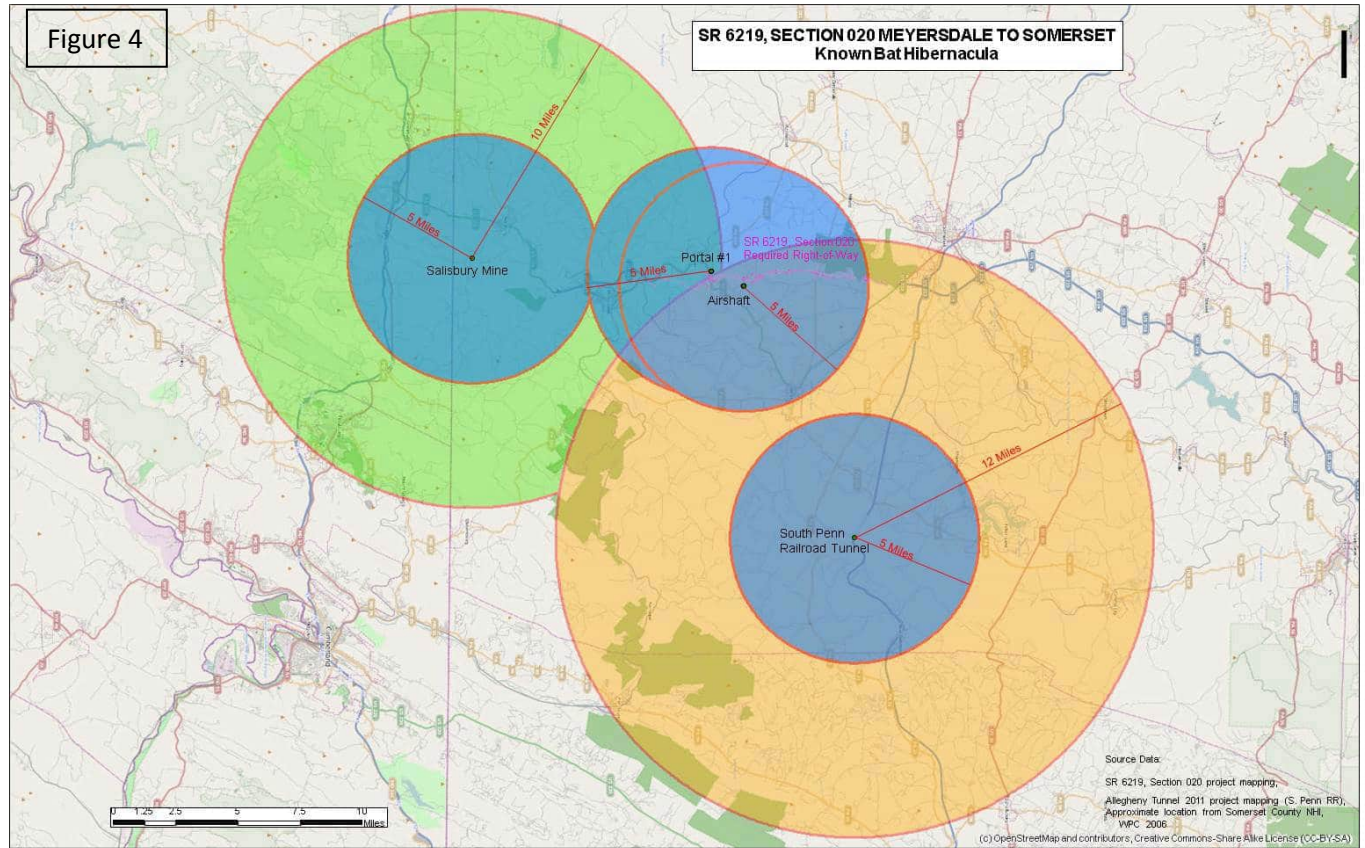
As detailed in *Mist Net Survey for the Indiana Bat (*Myotis sodalis*) for the proposed US 219 Improvement Project SR 6219, Section 020 Meyersdale to Somerset, Somerset County, Pennsylvania March 2009*, Northern long-eared bats (*Myotis septentrionalis*) were captured during the mist net surveys conducted from July 14 to August 11, 2008. Eleven Northern long-eared bat captures occurred, representing approximately 8% of the total bat captures during the survey. Females of the species exhibiting signs of recent reproductive activity were captured during the survey. *Myotis septentrionalis* captures occurred at mist net sites 5, 7, 8, 9, 11, 12 and 14. One capture occurred at site 5 located at Buffalo Creek characterized as a perennial stream and wetland environment bordered by successional rangelands associated with past mining and logging activity. Sites 8 and 9, resulting in 3 total captures were located at the interface of a strip mine with herbaceous rangeland and forest cover types. The remaining 7 captures occurred at sites where net sets were placed to target flight corridors in closed canopy roads, trails and utility corridors with moderate density mixed- aged forest and agricultural components proximal to ponds. As evidenced by these survey results foraging and roosting habitats for the Northern long-eared bat are present in the project action area. Figure 3 provides additional distribution information as taken from the mist net survey.



During September and October 2012, portal reconnaissance and hibernacula surveys were conducted per the 2012 Pennsylvania Game Commission (PGC) *Protocol for Assessing Bat Use of Potential Hibernacula*, the September 11, 2012 technical assistance letter from USFWS and continued coordination with USFWS and the PA Game Commission, to ascertain the potential for hibernacula and possible use by Indiana Bats. The results are summarized in *U.S. Route 219 Improvements Project, S.R. 6219, Section 020, Bat Hibernaculum Investigations Final Report, December 2012* (appended to the December 2012 Biological Assessment Addendum 2). Twenty-seven potential portal openings were evaluated during the field investigations. Five of these openings were found to be in the project action area and to meet the 2012 PA Game Commission protocol and were then surveyed in accordance with the protocol. Two of these portals (Portal #1 and Air Shaft # 4) and one additional site, a highwall (Highwall Site # 3), were found to be used by bats. Northern long-eared bats were captured 14 out of 15 nights at both Portal Site # 1 and Air Shaft # 4 during the survey. These locations represent known winter habitats for the Northern Long-eared bats and as depicted on Figure 4, habitats within a five mile-radius of these locations is considered swarming habitat.

To monitor the continued viability of Portal #1 and Air Shaft #4 as winter habitat for Pennsylvania bat species, and in the interest of conservation of state and federally listed bat species in the project area, additional fall trapping and acoustic surveys were conducted during 2013. The report summarizing the results, *Fall Bat Harp Trapping and Acoustic Surveys U.S. Route 219 Improvements Project, S.R. 6219, Section 020, Somerset County, Pennsylvania September 30 – October 2, 2013, Bat Conservation Management January 2013*, is attached to this document in Appendix B. A single Northern Long-eared bat capture, at Portal # 1, occurred during this 3-day survey and no acoustic calls attributed to this species were detected.





## VI. Effects of Proposed Action

The effects of the proposed Section 020 project as described in the Supplemental Biological Opinion of January 31, 2013 on the Indiana bat (*Myotis sodalis*) remain unchanged. Additional forest impacts for borrow/waste, access roads and stormwater facilities have been consulted on as detailed in correspondence found in Appendix A. USFWS has concurred that these additional impacts are within the additional 50 acres of allowable forest impacts and consistent with Term and Condition 1.G of the Biological Opinion.

Given similarity in habitat usage, direct and indirect effects of the US 219 Transportation Improvements Project, S.R. 6219, Section 020 on swarming, foraging and roosting habitat within the project action area for the proposed federally endangered Northern Long-eared bat (*Myotis septentrionalis*) will be the same as those described for the Indiana bat within the 2013 Supplemental Biological Opinion. As such the avoidance, minimization, conservation and mitigation measures as provided within the project description relevant to the Indiana bat are also applicable to the Northern long-eared bat. Tree removal associated with the entire project is 87% complete at the time of initiation of conferencing/consultation for the NLEB. All tree removal has been and will continue to be conducted between November 15 and March 31.

The previously described project activities undertaken (and complete at the time of this writing) associated with mine stabilization necessary to support Pier 4 and Abutment 2 including blasting, overexcavation and grouting were considered previously in consultation with the USFWS in respect to effects on the Indiana bat. Since the affected hibernaculum, Portal # 1 (a.k.a. Portal JAZ-3) was not found to be utilized by Indiana bats, these activities were not considered to have a direct effect. Portal # 1 (JAZ-3) is a known Northern long-eared bat hibernaculum and as such these activities may have resulted in a direct effect on this federally proposed species, however, all activities were completed prior to species listing. The effect of blasting, grouting and over excavation may have resulted in modifications to air flow, moisture, temperature or other microclimate requirements. Temperature modifications of a few degrees, potentially resulting from changes in air flow may make a hibernaculum less suitable resulting in reduced overwintering success or potentially create disturbances that render a hibernaculum unsuitable. Blasting, drilling and noises from construction activities undertaken while bats are hibernating may result in premature arousal and may result in lethal effects, therefore all of these construction activities were completed between April 1 and November 14. Bats exposed to WNS are more vulnerable to microclimate and construction disturbance effects.

In as much as completion of the activities resulting in direct effect to the species during winter hibernation occurred prior to this consideration of the proposed federally endangered Northern long-eared bat, the project proponents assume that the hibernaculum may still be utilized by bat species in the future.



Through construction completion, any additional blasting, drilling, pile driving or similar activities that could disturb hibernating bats, if required, will be conducted from April 1 to November 14 when it is expected that bats are not hibernating.

All Indirect, interrelated, interdependent and cumulative effects as described previously in *US 219 Improvement Project, SR 6219 Section 020 (USFWS Project #2007-2430) ADDENDUM, Revised March 2011, US 219 IMPROVEMENT PROJECT, SR 6219 SECTION 020 (USFWS Project #2007-2430) ADDENDUM 2, December 2012* and the January 31, 2013 Supplemental Biological Opinion remain relevant, unchanged and are incorporated by reference. Primarily, indirect effects will occur as the result of habitat fragmentation and temporal losses as areas, not permanently lost as a result of conversion to highway use, naturally return to forest habitat.

As described herein, the S.R. 6219, Section 020 project, May Effect and is Likely to Adversely Affect the proposed endangered Northern Long-eared bat.

## VII. Incidental Take

Sections 4(d) and 9 of the Endangered Species Act, as amended, prohibit taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct) of listed species of fish or wildlife without a special exemption. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Harass is defined as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is any take of listed animal species that results from, but is not the purpose of, carrying out an otherwise lawful activity conducted by the federal agency or the applicant.

An Incidental Take Statement was issued for the Indiana Bat with the January 31, 2013 Supplemental Biological Opinion. Take for the Indiana Bat was described in terms of number of acres of forest habitat loss associated with the construction and operation of S.R. 629, Section 020. An Incidental Take total of up to 320 acres of direct forest impacts was permitted with issuance of the Supplemental Biological Opinion for this species.

We anticipate that incidental take of the Northern Long-eared Bat will be difficult to detect and quantify for the following reasons: 1) individuals are small; 2) Northern Long-eared Bats form small (i.e., 50 or fewer, to 100 individuals), widely dispersed colonies under loose bark or in cavities of trees; 3) only a portion of the Northern Long-eared population is likely to be visible during hibernaculum counts among thousands of bats of other species; 4) finding dead or injured specimens is unlikely; 5) the areal extent and density of the species' spring, summer, and fall population in the action area is unknown; and 6) some habitat, including the closest hibernacula, is under private ownership, making monitoring the bat population dependent on access.

PennDOT anticipates that take of Northern Long-eared bats in the form of harm and harassment (as defined in 50 CFR §17.3) will occur as a result of the direct and indirect effects of the proposed action. Due to the nature of the project, effects are not limited to the period of construction, but become permanent and ongoing with operation of the road.

Forest impacts associated with the construction and operation of S.R. 629, Section 020 as enumerated for the Indiana bat result in a total of up to 320 acres of direct forest impacts. These same impacts are applicable to the Northern Long-eared bat. Project activities which might have impacted hibernaculum utilized by NLEB were complete prior to species listing and consultation.



## VIII. Conclusion

The preceding analysis was based on the best available information, including some information compiled by studies conducted by the Project Team in accordance with USFWS and PGC protocols. The analysis of the proposed Section 020 project's impact on the Northern Long-eared bat, including minimization measures that will be taken to avoid, reduce, or offset take, results in a "May Effect, Likely to Adversely Affect" finding. Because FHWA and PennDOT understand the importance of forested foraging and roosting habitat in the recovery of the NLEB, various conservation measures are offered, as discussed previously, to help aid in the recovery of the species under 7(a) (1). The studies conducted by the Project Team, along with the minimization measures, conservation measures, and mitigation measures are efforts by the project proponents to further Northern Long-eared bat recovery, based on the best available information at this time.

## IX. References

Pennsylvania Department of Transportation and the Federal Highway Administration, *Needs Analysis, U.S. Route 219, I-68 (MD) to Somerset, Pennsylvania*, March 1999.

Pennsylvania Department of Transportation and the Federal Highway Administration, *FINAL Environmental Impact Statement / FINAL Section 4(f) Evaluation, SR 6219, Section 020, Somerset County, Pennsylvania*, December 2005.

Pennsylvania Department of Transportation and the Federal Highway Administration, *Record of Decision, SR 6219, Section 020, Somerset County, Pennsylvania*, November 2006.

Pennsylvania Department of Transportation and the Federal Highway Administration, *US 6219, Section 019, Indiana Bat Biological Assessment*, June 2006, as amended in February 2007.

Pennsylvania Department of Transportation and the Federal Highway Administration, *US 219 Improvement Project, SR 6219, Section 020 (USFWS Project #2007-2430) Addendum, revised March 2011*.

Pennsylvania Department of Transportation and the Federal Highway Administration, *Final Environmental Impact Statement Re-Evaluation Report and FHWA response letter, US 219 Improvement Project, Meyersdale to Somerset, PA, SR 6219, Section 020, Somerset County, Pennsylvania*; August and September 2008.

Pennsylvania Department of Transportation and the Federal Highway Administration, *Mist Net Survey for the Indiana Bat (*Myotis sodalis*); US 219 Improvement Project; SR 6219 Section 020 Meyersdale to Somerset, Somerset County, Pennsylvania*; March 2009.

Pennsylvania Game Commission, *Indiana Bat (*Myotis sodalis*), White Nose Syndrome (WNS) Occurrence by County/District May 7, 2014*.

United States Fish and Wildlife Service, *Indiana Bat (*Myotis sodalis*) Draft Recovery Plan, First Revision*, April 2007.

United States Fish and Wildlife Service, *Indiana Bat (*Myotis sodalis*) 5-Year Review, Summary and Evaluation*, September 2009.

United States Fish and Wildlife Service, *2009 Rangewide Population Estimate for the Indiana Bat (*Myotis sodalis*) by USFWS Region*, Revised April 23, 2010.

U.S. Fish and Wildlife Service. 2007 (as amended). *Biological Opinion on the Effects of the U.S. 219, Section 019, Transportation Improvement Project on the Indiana Bat (*Myotis sodalis*) Somerset County, Pennsylvania and Garrett County, Maryland*.

U.S. Fish and Wildlife Service. 2014. *Northern Long-Eared Bat Interim Conference and Planning Guidance*. U.S. Fish and Wildlife Service Region 5. 66 pp.

United States Geological Survey. *White-Nose Syndrome Threatens the Survival of Hibernating Bats in North America*. USGS Fort Collins Science Center.



US 219 IMPROVEMENT PROJECT, SR 6219 SECTION 020

# Appendix A

Correspondence (Section 020) January 2013 to June 2014

**From:** Squillario, Attilio S

**Sent:** Tuesday, December 03, 2013 1:19 PM

**To:** Librandi Mumma, Tracey; [robert\\_m\\_anderson@fws.gov](mailto:robert_m_anderson@fws.gov)

**Cc:** [cory.donahue@dot.gov](mailto:cory.donahue@dot.gov); [kathy.dimpsey@dot.gov](mailto:kathy.dimpsey@dot.gov); Illig, Gregory M; Greenland, Vince; Pruss, James T; Yocum, Thomas R; Helsel, Thomas; Fawver, Gary; '[ddavis@eadsgroup.com](mailto:ddavis@eadsgroup.com)' ([ddavis@eadsgroup.com](mailto:ddavis@eadsgroup.com)); Carlos Escalante ([cescalante@eadsgroup.com](mailto:cescalante@eadsgroup.com)); [rkruise@eadsgroup.com](mailto:rkruise@eadsgroup.com); Vankirk, Ryan; Prestash, Thomas; Squillario, Attilio S

**Subject:** 2013 Bat Survey (SR 6219, Section 020)

Tracey/Bob:

Please see the attached report for the results of the survey conducted for this year, the first year of Construction. If you have any comments concerning the attachment, please let me know.

Thanks,

**Attilio Squillario** | Environmental Planner  
PA Department of Transportation | Engineering District 9-0  
1620 N. Juniata Street | Hollidaysburg PA 16648  
Phone: 814.696.7116 | Fax: 814.696.7152  
[www.dot.state.pa.us](http://www.dot.state.pa.us)

<SR6219\_2013-fall-trapping-report\_PGC-comments\_1-7-14.pdf>





February 7, 2013

PA. Game Commission  
Attention: Jacquelyn K. Dattisman  
2001 Elmerton Avenue  
Harrisburg, PA 17110-9797

Faxed to: 717-787-6957

Re: Consol PA. Coal Indiana Bat Escrow Account Number 710621004

Dear Ms. Dattisman:

Please be advised, I am in receipt of a check in the amount of \$829,951.92, personally delivered from the Pennsylvania Department of Transportation. The proceeds of this transaction have been deposited to the above listed account.

If I may provide further service, please contact me at 724-463-6580; you may also contact Jan Sears at 724-463-5734. Thank you for your continued confidence in First Commonwealth Bank – Trust.

Sincerely,

Brenda Alabran  
Vice President  
Senior Trust Officer

BA/js

Cc: Pennsylvania Department of Transportation

With Wealth Teams in PITTSBURGH • DUBOIS • GREENSBURG • INDIANA • WEXFORD

First Commonwealth Advisors is a registered trademark of First Commonwealth Bank for investment management, trust and fiduciary services and for investment advisory services provided by First Commonwealth Financial Advisors, a registered investment advisory affiliate. Securities, insurance products and certain other advisory services are offered through Essex National Securities, Inc., member FINRA/SIPC and on SEC registered investment advisor, which is not affiliated with this financial institution. Certain insurance products are offered through First Commonwealth Insurance Agency, a licensed insurance affiliate.

NOT Guaranteed by the Bank NOT FDIC Insured NOT a Deposit NOT Insured by any Federal Government Agency May Lose Value including Loss of Principal



# United States Department of the Interior



FISH AND WILDLIFE SERVICE  
Pennsylvania Field Office  
315 South Allen Street, Suite 322  
State College, Pennsylvania 16801-4850

June 10, 2013

Keith Lynch, Division Administrator  
Federal Highway Administration  
228 Walnut Street, Room 508  
Harrisburg, PA 17101-1720

RE: USFWS Project #2007-2430

Dear Mr. Lynch:

We are writing to let you know we have received new information regarding species considered in the U.S. Fish and Wildlife Service's (Service) October 2, 2007, *Biological Opinion on the Effects of the U.S. 6219, Section 019, Transportation Improvement Project on the Indiana bat (Myotis sodalis) Somerset County, Pennsylvania and Garrett County, Maryland*, as amended on August 29, 2011, to include S.R. 6219, Section 020, and amended again on January 31, 2013. Consideration of this information by the Federal Highway Administration (FHWA) is important because it relates to the referenced S.R. 6219 project and associated biological opinion, as amended (BO).

On February 8, 2013, we received a report that an Indiana bat (*Myotis sodalis*) was collected during the survey of a [REDACTED] project area. Because this information is new to the Service, it was not considered during effects analysis and development of the BO. We now know the bat swarming radius for this hibernaculum extends over the action area of S.R. 6219, Section 020. Limited information about the survey date, location, survey efficiency, or configuration of the mine was included in the initial data received; however, a total of 221 bats, representing five species, were counted. This represents a decrease in overall abundance since 2010, when 691 bats were counted. No Indiana bats were detected in 2010. The Indiana bat captured in 2013 tested positive for white-nose syndrome under ultraviolet light.

On March 19, 2013, we met with mine representatives to discuss the hibernaculum and new Indiana bat occurrence. At that meeting, we learned that the hibernaculum, which is adjacent to the Casselman River, is directly connected to an active underground and surface limestone quarry located approximately 2.23 miles northwest of Garrett, Pennsylvania.



As outlined in the BO, the FHWA and Pennsylvania Department of Transportation have agreed to avoid directly killing roosting Indiana bats by removing trees when the bats are hibernating (*i.e.*, tree cutting will occur only between November 16 and March 31). Additionally, the BO provides that the effects of forest removal will be partially offset through a contribution to the Indiana bat Conservation Fund. Because no direct or indirect Indiana bat hibernaculum disturbance was proposed, the incidental take statement in the BO is based on the surrogate measure of direct loss of up to 370 acres of forest habitat that may be used by Indiana bats for foraging and roosting. This acreage represents the total amount of forest habitat to be removed by the project. There is no additional forest removal anticipated within the swarming radius of the Casselman River hibernaculum or elsewhere.

The Reinitiation Notice at the conclusion of the biological opinion cited 50 CFR §402.16, stated that reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law), and if (1) the amount or extent of incidental take is exceeded; (2) new information reveals the agency action may affect listed species or critical habitat in a manner or to an extent not considered in this BO; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this BO; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

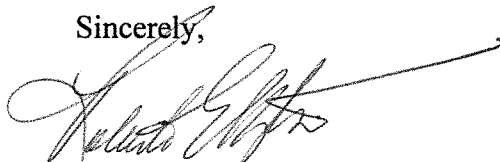
The biological opinion [REDACTED] *at new locations in the action area (i.e., [REDACTED] is an example of new information that would trigger reinitiation of consultation.*

The documentation of an Indiana bat at the Casselman River hibernaculum constitutes new information; however, the effects of the project at the new location are likely the same as those already considered in the BO. The entire S.R. 6219, Section 020 project area lies within the swarming radius of the Casselman River hibernaculum; however, it was also encompassed wholly within the swarming radius of both hibernacula already considered in the BO. As with previously considered hibernacula, protective measures described in the BO (*i.e.*, time-of-year restrictions on forest removal) should mean the project also will avoid directly killing Indiana bat within the swarming radius of the Casselman River hibernaculum. Additionally, the effects of all forest removal, which includes forest removal within the swarming radius of the Casselman River hibernaculum, were partially offset through a contribution to the Indiana bat Conservation Fund. Hence, unless impacts not yet considered are identified, the avoidance and minimization measures already established for the S.R. 6219, Section 020 project also may be sufficiently protective of Indiana bat at the Casselman River hibernaculum.

We recommend that you consider the above information with respect to conclusions made in FHWA's biological assessment and the BO, including the Incidental Take Statement. You should also consider any direct disturbance of the limestone mine not previously considered, but which may occur as a result of S.R. 6219 roadway construction or operation, and whether the conditions in the Reinitiation Notice require additional consultation.

If you have any questions regarding this matter, please contact Robert Anderson of this office at (814) 234-4090.

Sincerely,

A handwritten signature in black ink, appearing to read "Roberta E. Hylton", with a long, sweeping horizontal line extending to the right.

Roberta E. Hylton  
Acting Field Office Supervisor

cc: USACE  
DEP  
PennDOT - Greg Illig, Gary Fawver





U. S. DEPARTMENT  
OF TRANSPORTATION

Pennsylvania Division

228 Walnut Street, Room 508  
Harrisburg, PA 17101-1720

Federal Highway  
Administration

JUN 20 2013

In reply refer to:

HPD-PA

US 219 Improvement Project  
S.R. 6219, Section 020  
Myersdale to Somerset  
Somerset County, Pennsylvania  
New Information Relating to the Indiana Bat

Roberta E. Hylton  
Acting Field Office Supervisor  
United States Fish and Wildlife Service  
State College, Pennsylvania

ATTN: Bob Anderson

Dear Ms. Hylton:

The Federal Highway Administration Pennsylvania Division (FHWA) is in receipt of your letter dated June 10, 2013 notifying us of new information regarding the collection of an Indiana bat (*Myotis sodalis*) d [REDACTED] 6219, Section 020 project area. We are in agreement that the avoidance and minimization measures already established in the Biological Opinion (January 2013) should sufficiently protect the Indiana bat at the Casselman River hibernaculum.

In consideration of the above, FHWA does not believe that the new information warrants reinitiation of formal consultation. Please contact Jon Crum at (717) 221-3735 or [Jonathan.Crum@dot.gov](mailto:Jonathan.Crum@dot.gov) with any questions or with any additional information relevant to the project.

Sincerely,

Keith Lynch  
Director of Program Development

cc: Bob Anderson, USFWS  
Allen Edris, USACE  
Alyssa Baxter-Barkley, PADEP  
Gary Fawver, PENNDOT  
Greg Illig, PENNDOT 9-0  
Jon Crum, FHWA





# United States Department of the Interior



## FISH AND WILDLIFE SERVICE

Pennsylvania Field Office  
315 South Allen Street, Suite 322  
State College, Pennsylvania 16801-4850

May 2, 2014

Andrew Dzurko  
Hunt Valley Environmental, LLC  
634 Hunt Valley Circle  
New Kensington, PA 15068

RE: USFWS Project #2007-2430  
SR 219 Borrow/Waste site 540+00 to 559+00

Dear Mr. Dzurko:

This responds to your email of March 11, 2014, requesting information about fish and wildlife resources within the area affected by the proposed borrow/waste site from Station 540+00 to 559+00Rt/Lt for the State Route 6219-20A project. The borrow/waste site is located in Somerset Township, Somerset County, Pennsylvania. The following comments are provided pursuant to the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) to ensure the protection of endangered and threatened species.

The proposed project will affect and additional 4 acres of forested habitat in the vicinity of a known Indiana bat hibernaculum. Pursuant to the Biological Opinion (BO) of October 2, 2007, and the Amendment to the BO dated January 31, 2013, for the SR 6219 project, the contractor, Joseph B. Fey, has agreed to compensate for impacts to the additional forested lands on the proposed waste site via payment into the Indiana Bat Conservation Fund (4 acres at about \$2,247 per acre for a total of \$8,988.00), as required by project permits. The Service has reviewed the information provided, and found it to be consistent with Term and Condition 1.G of the Service's BO.

Additionally, please remember, also pursuant to Term and Condition 1.G in the Amended BO, the contractor remains responsible for implementing a seasonal restriction on tree cutting. Any tree-cutting activities as part of this project should be carried out from October 15 to March 31, during which time bats are hibernating or concentrated near their hibernacula. This seasonal restriction on tree cutting applies to trees that are greater than or equal to 5 inches in diameter at breast height (d.b.h). Where possible, retain shagbark hickory trees, dead and dying trees, and large diameter trees (greater than 12 inches d.b.h.) to serve as roost trees for bats. Where possible, also retain forested riparian corridors and forested wetlands.

Please contact Jennifer Kagel of my staff at 814-234-4090 if you have any questions or require further assistance.

Sincerely,

A handwritten signature in black ink, appearing to read "Lora L. Zimmerman", followed by a long, sweeping horizontal line that extends to the right.

Lora L. Zimmerman  
Field Office Supervisor

cc:

PADEP – Barkley

Corps – Edris

PGC – Librandi Mumma

PGC – Broucek

EADS – Davis

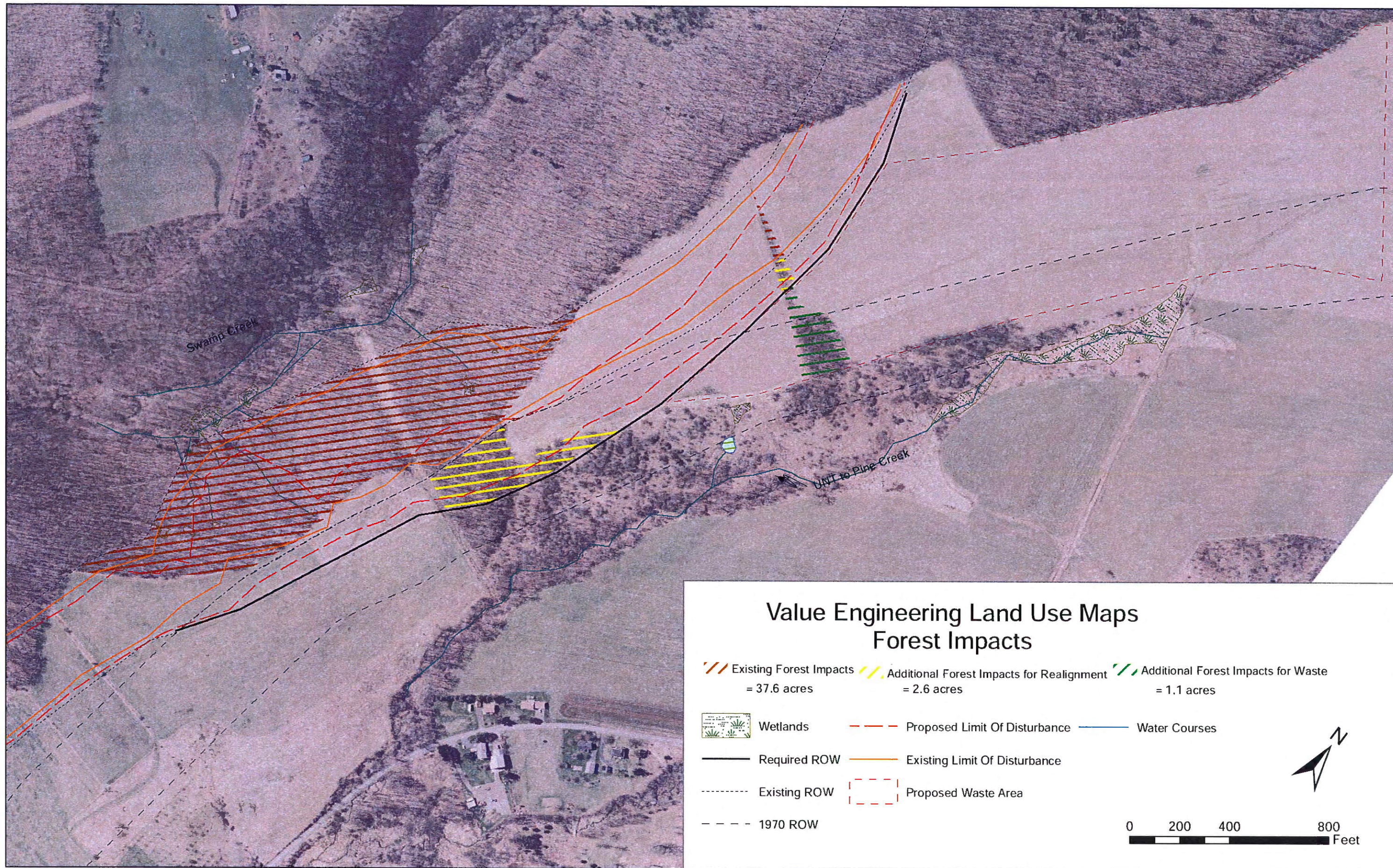
PennDOT – Squillario



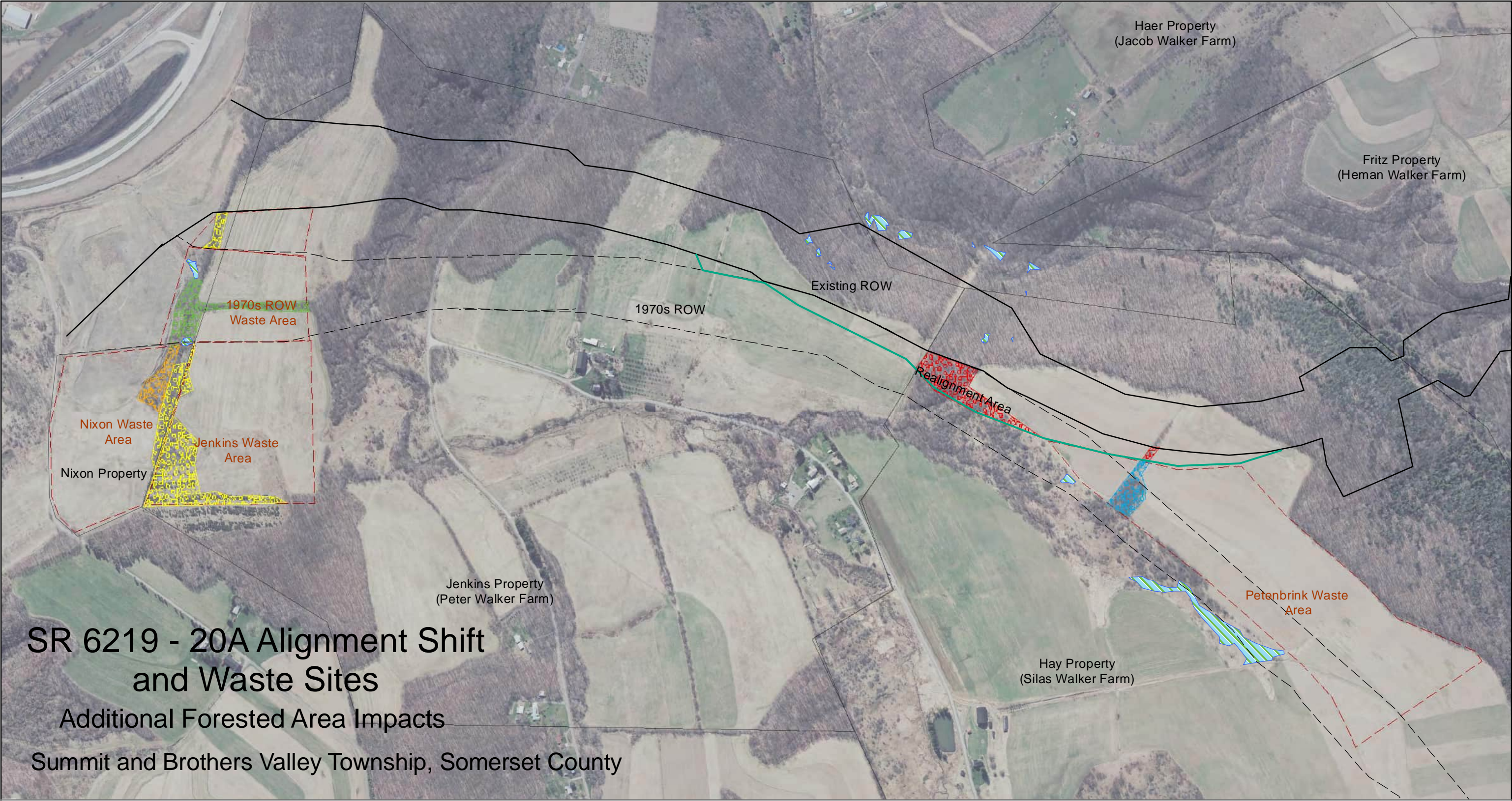
**SR6219 Somerset to Meyersdale  
Waste Site Forested Impacts Tracking Table**

Waste Site	Total Acres (ac)	Forested Acres (ac)	Impacted Forested Acres (ac)	Compensation Cost <small>(Impacted Forested Acres x \$,2247.00)</small>
Nixon Waste Site	19.3	1.0	1.0	\$ 2,247.00
1970s ROW Waste Site	13.0	2.2	2.2	\$ 4,943.40
Petenbrink Waste Site	45.2	1.1	1.1	\$ 2,471.70
Realignment Area	11.2	2.6	2.6	\$ 5,842.20
Jenkins Waste Site	30.8	9.3	9.3	\$ 20,897.10
Total =	<b>119.5</b>	<b>16.2</b>	<b>16.2</b>	<b>\$ 36,401.40</b>





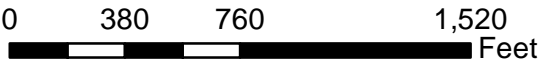
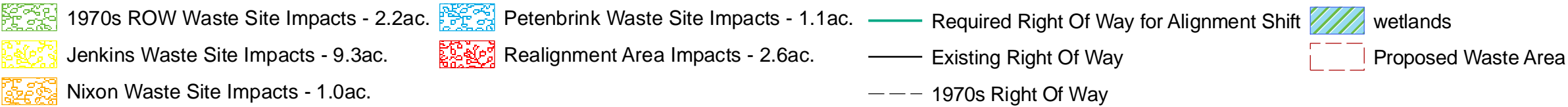




# SR 6219 - 20A Alignment Shift and Waste Sites

Additional Forested Area Impacts

Summit and Brothers Valley Township, Somerset County





**CALCULATION SHEET FOR  
INDIANA BAT HABITAT COMPENSATION  
(revised 5/17/12)**

USFWS Project # 2007-2430 Date 11-14-13  
 Project Name: SR 6219-020 Meyersdale to Somerset  
 Project Location (township and county): Summit Township, Somerset County  
 Project Type: SR6219 Realignment and Petenbrink Site DEP permit #   
 Hibernaculum and/or Maternity Colony Affected: Hibernaculum

**Table 1. Calculation of Compensation Acres**

IMPACT TYPE	IMPACT ACRES	MULTIPLIER <sup>1</sup>	COMPENSATION ACRES
<b>Summer Habitat Loss<sup>2</sup></b>			
Known maternity habitat		1.5	
Known non-maternity habitat		1.0	
Potential habitat <sup>3</sup>		0.5	
<b>Swarming Habitat Loss<sup>4</sup></b>			
P2 or P3		1.5	
P4	3.7	1.0	3.7
<b>Overlapping Habitat Loss<sup>5</sup></b>			
Known maternity and swarming habitat occur together: choose highest multiplier from above (maternity or swarming) for the impact, and add 1.0 to the multiplier			

<sup>1</sup> Multiplier provides for a PARTIAL offset of habitat impacts and assumes permanent habitat protection will occur in accordance with the *Indiana Bat Mitigation Guidance for Pennsylvania*. A substantially higher multiplier would be needed to fully offset habitat impacts.

<sup>2</sup> Loss of known summer habitat assumes such loss will occur when bats are NOT present (i.e., between October 15 and March 31).

<sup>3</sup> For coal mining projects having forest impacts  $\geq 40$  acres, applicants can either conduct mist-net surveys in accordance with the Service's survey guidelines OR assume presence of Indiana bats. When assuming presence, a seasonal restriction will apply, along with a 0.5:1 compensation ratio for forest impacts. Non-coal projects are evaluated on a case-by-case basis.

<sup>4</sup> Swarming habitat is suitable habitat in the vicinity of an Indiana bat hibernaculum (generally 10-20 miles). Loss of swarming habitat assumes such loss will occur when bats are NOT present (i.e., between November 15 and March 31).

<sup>5</sup> Loss of summer and swarming habitat assumes such loss will occur when bats are NOT present (i.e., between October 15 and March 31).



**Table 2. Calculation of Deposit when using the Indiana Bat Conservation Fund**

<b>Location of Impact (County)</b>	<b>Compensation Acres (from Table 1)</b>	<b>Cost/Acre<sup>6</sup></b>	<b>IBCF Deposit<sup>7</sup></b>
Adams		TBD	
Armstrong/Butler		\$2,060	
Beaver/Lawrence		\$2,320	
Bedford		TBD	
Berks		TBD	
Blair		TBD	
Centre		TBD	
Fayette		\$1,519	
Greene		\$1,223	
Huntingdon		TBD	
Luzerne		\$3,716	
Mifflin		TBD	
Pike		\$8,100	
Somerset	3.7	\$2,247	8313.90
Washington		\$2,760	
York		TBD	
Other areas (not listed above)		TBD	

**NOTE:** Deposits to the IBCF are due prior to permit issuance. Provide documentation of the deposit to the USFWS and the permitting agency (*e.g.*, PA DEP). An escrow account has been set up at the following institution to receive IBCF deposits.<sup>8</sup>

First Commonwealth Bank – Trust Division  
Attn: Brenda Alabran  
614 Philadelphia Street  
P.O. Box 698  
Indiana, Pennsylvania 15701  
724-463-6580 (phone)

Designate the deposit for: Indiana Bat Conservation Fund (Acct #710621004)

.....  
**USFWS USE ONLY**

Recovery Focus Area to be credited: \_\_\_\_\_

<sup>6</sup> Cost/acre subject to change, based on a periodic re-evaluation of land comparable values by the Pennsylvania Game Commission. Cost per acre reflects land cost per acre, plus 20% for expenses associated with land acquisition (*e.g.*, comparable values search, title search, transfer taxes, land survey, recording fees, *etc.*).

<sup>7</sup> Multiply the number of Compensation Acres by the Cost/Acre to determine the amount to be submitted to the Indiana Bat Conservation Fund.

<sup>8</sup> If you choose to set up an escrow account at another institution, do so in coordination with the Pennsylvania Game Commission.

**CALCULATION SHEET FOR  
INDIANA BAT HABITAT COMPENSATION  
(revised 5/17/12)**

USFWS Project # 2007-2430 Date 1-21-14  
 Project Name: SR 6219-020 Meyersdale to Somerset - Jenkins Waste Site  
 Project Location (township and county): Summit Twps. Somerset County  
 Project Type: waste site DEP permit #   
 Hibernaculum and/or Maternity Colony Affected: Hibernaculum

**Table 1. Calculation of Compensation Acres**

IMPACT TYPE	IMPACT ACRES	MULTIPLIER <sup>1</sup>	COMPENSATION ACRES
<b>Summer Habitat Loss<sup>2</sup></b>			
Known maternity habitat		1.5	
Known non-maternity habitat		1.0	
Potential habitat <sup>3</sup>		0.5	
<b>Swarming Habitat Loss<sup>4</sup></b>			
P2 or P3		1.5	
P4	9.3	1.0	9.3
<b>Overlapping Habitat Loss<sup>5</sup></b>			
Known maternity and swarming habitat occur together: choose highest multiplier from above (maternity or swarming) for the impact, and add 1.0 to the multiplier			

<sup>1</sup> Multiplier provides for a PARTIAL offset of habitat impacts and assumes permanent habitat protection will occur in accordance with the *Indiana Bat Mitigation Guidance for Pennsylvania*. A substantially higher multiplier would be needed to fully offset habitat impacts.

<sup>2</sup> Loss of known summer habitat assumes such loss will occur when bats are NOT present (i.e., between October 15 and March 31).

<sup>3</sup> For coal mining projects having forest impacts  $\geq 40$  acres, applicants can either conduct mist-net surveys in accordance with the Service's survey guidelines OR assume presence of Indiana bats. When assuming presence, a seasonal restriction will apply, along with a 0.5:1 compensation ratio for forest impacts. Non-coal projects are evaluated on a case-by-case basis.

<sup>4</sup> Swarming habitat is suitable habitat in the vicinity of an Indiana bat hibernaculum (generally 10-20 miles). Loss of swarming habitat assumes such loss will occur when bats are NOT present (i.e., between November 15 and March 31).

<sup>5</sup> Loss of summer and swarming habitat assumes such loss will occur when bats are NOT present (i.e., between October 15 and March 31).



**Table 2. Calculation of Deposit when using the Indiana Bat Conservation Fund**

<b>Location of Impact (County)</b>	<b>Compensation Acres (from Table 1)</b>	<b>Cost/Acre<sup>6</sup></b>	<b>IBCF Deposit<sup>7</sup></b>
Adams		TBD	
Armstrong/Butler		\$2,060	
Beaver/Lawrence		\$2,320	
Bedford		TBD	
Berks		TBD	
Blair		TBD	
Centre		TBD	
Fayette		\$1,519	
Greene		\$1,223	
Huntingdon		TBD	
Luzerne		\$3,716	
Mifflin		TBD	
Pike		\$8,100	
Somerset	9.3	\$2,247	20,897.10
Washington		\$2,760	
York		TBD	
Other areas (not listed above)		TBD	

**NOTE:** Deposits to the IBCF are due prior to permit issuance. Provide documentation of the deposit to the USFWS and the permitting agency (*e.g.*, PA DEP). An escrow account has been set up at the following institution to receive IBCF deposits.<sup>8</sup>

First Commonwealth Bank – Trust Division  
Attn: Brenda Alabran  
614 Philadelphia Street  
P.O. Box 698  
Indiana, Pennsylvania 15701  
724-463-6580 (phone)

Designate the deposit for: Indiana Bat Conservation Fund (Acct #710621004)

.....  
**USFWS USE ONLY**

Recovery Focus Area to be credited: \_\_\_\_\_

<sup>6</sup> Cost/acre subject to change, based on a periodic re-evaluation of land comparable values by the Pennsylvania Game Commission. Cost per acre reflects land cost per acre, plus 20% for expenses associated with land acquisition (*e.g.*, comparable values search, title search, transfer taxes, land survey, recording fees, *etc.*).

<sup>7</sup> Multiply the number of Compensation Acres by the Cost/Acre to determine the amount to be submitted to the Indiana Bat Conservation Fund.

<sup>8</sup> If you choose to set up an escrow account at another institution, do so in coordination with the Pennsylvania Game Commission.

**CALCULATION SHEET FOR  
INDIANA BAT HABITAT COMPENSATION  
(revised 5/17/12)**

USFWS Project # 2007-2430 Date 11-13-13  
 Project Name: SR 6219-020 Meyersdale to Somerset  
 Project Location (township and county): Summit Township, Somerset County  
 Project Type: Nixon Waste Site DEP permit #   
 Hibernaculum and/or Maternity Colony Affected: Hibernaculum

**Table 1. Calculation of Compensation Acres**

IMPACT TYPE	IMPACT ACRES	MULTIPLIER <sup>1</sup>	COMPENSATION ACRES
<b>Summer Habitat Loss<sup>2</sup></b>			
Known maternity habitat		1.5	
Known non-maternity habitat		1.0	
Potential habitat <sup>3</sup>		0.5	
<b>Swarming Habitat Loss<sup>4</sup></b>			
P2 or P3		1.5	
P4	3.2	1.0	3.2
<b>Overlapping Habitat Loss<sup>5</sup></b>			
Known maternity and swarming habitat occur together: choose highest multiplier from above (maternity or swarming) for the impact, and add 1.0 to the multiplier			

<sup>1</sup> Multiplier provides for a PARTIAL offset of habitat impacts and assumes permanent habitat protection will occur in accordance with the *Indiana Bat Mitigation Guidance for Pennsylvania*. A substantially higher multiplier would be needed to fully offset habitat impacts.

<sup>2</sup> Loss of known summer habitat assumes such loss will occur when bats are NOT present (i.e., between October 15 and March 31).

<sup>3</sup> For coal mining projects having forest impacts  $\geq 40$  acres, applicants can either conduct mist-net surveys in accordance with the Service's survey guidelines OR assume presence of Indiana bats. When assuming presence, a seasonal restriction will apply, along with a 0.5:1 compensation ratio for forest impacts. Non-coal projects are evaluated on a case-by-case basis.

<sup>4</sup> Swarming habitat is suitable habitat in the vicinity of an Indiana bat hibernaculum (generally 10-20 miles). Loss of swarming habitat assumes such loss will occur when bats are NOT present (i.e., between November 15 and March 31).

<sup>5</sup> Loss of summer and swarming habitat assumes such loss will occur when bats are NOT present (i.e., between October 15 and March 31).



**Table 2. Calculation of Deposit when using the Indiana Bat Conservation Fund**

<b>Location of Impact (County)</b>	<b>Compensation Acres (from Table 1)</b>	<b>Cost/Acre<sup>6</sup></b>	<b>IBCF Deposit<sup>7</sup></b>
Adams		TBD	
Armstrong/Butler		\$2,060	
Beaver/Lawrence		\$2,320	
Bedford		TBD	
Berks		TBD	
Blair		TBD	
Centre		TBD	
Fayette		\$1,519	
Greene		\$1,223	
Huntingdon		TBD	
Luzerne		\$3,716	
Mifflin		TBD	
Pike		\$8,100	
Somerset	3.2	\$2,247	7190.40
Washington		\$2,760	
York		TBD	
Other areas (not listed above)		TBD	

**NOTE:** Deposits to the IBCF are due prior to permit issuance. Provide documentation of the deposit to the USFWS and the permitting agency (*e.g.*, PA DEP). An escrow account has been set up at the following institution to receive IBCF deposits.<sup>8</sup>

First Commonwealth Bank – Trust Division  
Attn: Brenda Alabran  
614 Philadelphia Street  
P.O. Box 698  
Indiana, Pennsylvania 15701  
724-463-6580 (phone)

Designate the deposit for: Indiana Bat Conservation Fund (Acct #710621004)

.....  
**USFWS USE ONLY**

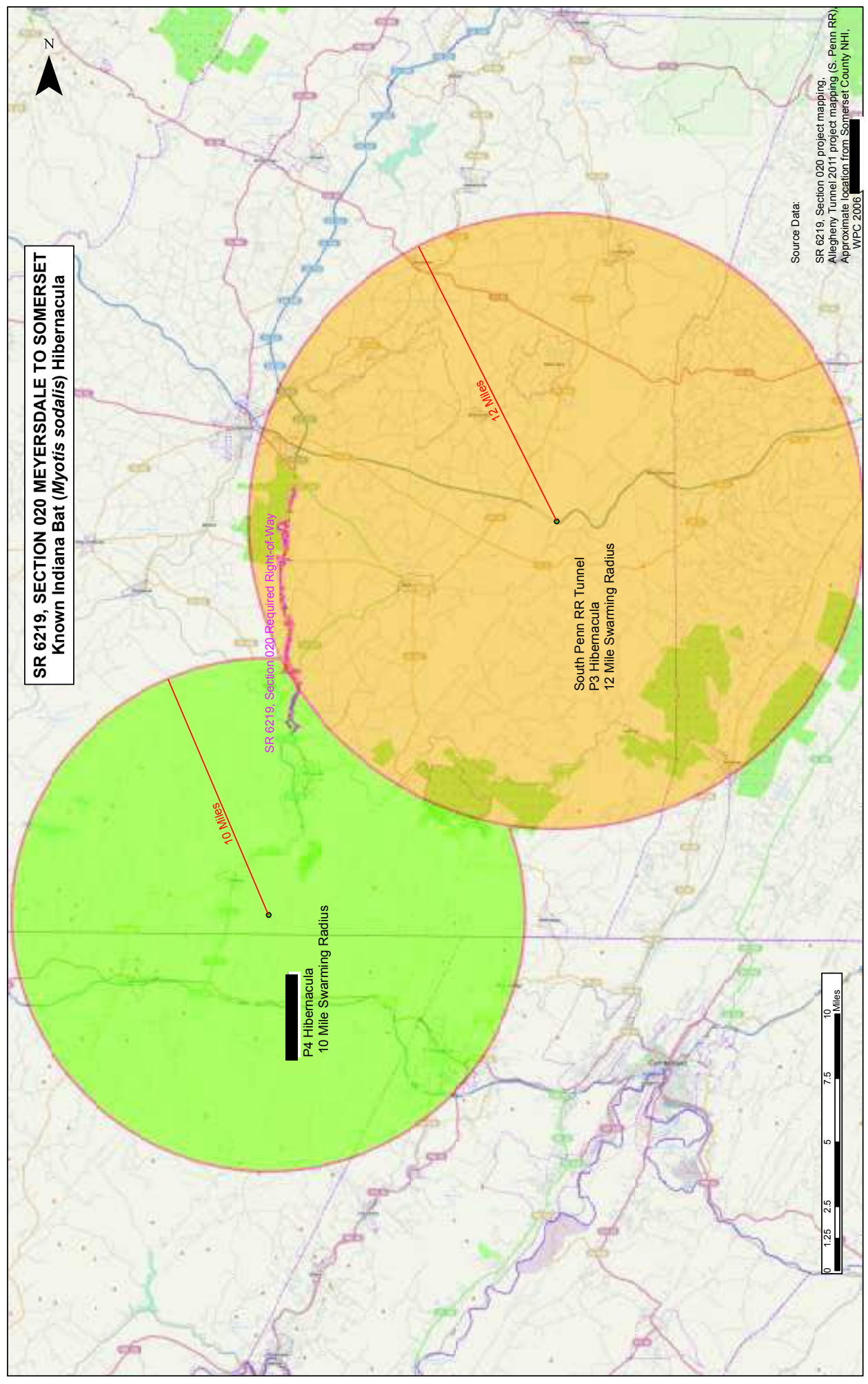
Recovery Focus Area to be credited: \_\_\_\_\_

<sup>6</sup> Cost/acre subject to change, based on a periodic re-evaluation of land comparable values by the Pennsylvania Game Commission. Cost per acre reflects land cost per acre, plus 20% for expenses associated with land acquisition (*e.g.*, comparable values search, title search, transfer taxes, land survey, recording fees, *etc.*).

<sup>7</sup> Multiply the number of Compensation Acres by the Cost/Acre to determine the amount to be submitted to the Indiana Bat Conservation Fund.

<sup>8</sup> If you choose to set up an escrow account at another institution, do so in coordination with the Pennsylvania Game Commission.

**SR 6219, SECTION 020 MEYERSDALE TO SOMERSET**  
**Known Indiana Bat (*Myotis sodalis*) Hibernacula**



Source Data:

SR 6219, Section 020 project mapping,  
Allegheny Tunnel 2011 project mapping (S. Penn RR),  
Approximate location from Somerset County NHI,  
WPC 2006



US 219 IMPROVEMENT PROJECT, SR 6219 SECTION 020

# Appendix B

Fall Bat Harp Trapping and Acoustic Surveys U.S. Route 219 Improvements  
Project, S.R. 6219, Section 020, Somerset County, Pennsylvania September 30 –  
October 2, 2013, Bat Conservation Management

# FALL BAT HARP TRAPPING AND ACOUSTIC SURVEYS

*U.S. Route 219 Improvements Project, S.R. 6219, Section 020  
Somerset County, Pennsylvania, September 30 – October 2, 2013*



Site 1 - Portal

**Bat Conservation and Management, Inc.**  
*Carlisle, Pennsylvania*



# Fall Bat Harp Trapping & Acoustic Surveys U.S. 219 Improvements Project S.R. 6219, Section 020 Somerset County, PA

Prepared by:  
Bat Conservation and Management, Inc.  
*220 Old Stone House Road North, Carlisle, Pennsylvania 17015*  
*Office and Fax: (717) 241-2228*  
*Cellular: (814) 442-4246*  
*[www.batmanagement.com](http://www.batmanagement.com)*

**Project Principal:**  
John Chenger  
*Bat Conservation and Management, Inc.*

**Surveyors:**  
John Chenger  
Todd Sinander  
Doug Raybuck

**Photography by:**  
John Chenger

**Report Prepared by:**  
John Chenger  
October 2013

<b>INTRODUCTION.....</b>	<b>1</b>
<b>METHODS .....</b>	<b>1</b>
CAPTURE SURVEY.....	1
ACOUSTIC SURVEY.....	2
VISUAL RECORDING SURVEY.....	5
<b>RESULTS.....</b>	<b>5</b>
CAPTURE SURVEY RESULTS .....	5
ACOUSTIC SURVEY RESULTS .....	6
VISUAL RECORDING RESULTS.....	7
<b>LITERATURE CITED .....</b>	<b>8</b>
<b>FIGURES .....</b>	<b>9</b>
FIGURE 1. SURVEY LOCATION: SITE 1 PORTAL, SOMERSET COUNTY, PA.....	9
FIGURE 2. SURVEY LOCATION: SITE 4 AIRSHAFT, SOMERSET COUNTY, PA .....	10
<b>TABLES.....</b>	<b>11</b>
TABLE 1. SURVEY SITE COORDINATES, MONITORING RESULTS, AND HABITAT DESCRIPTIONS.....	11
TABLE 2. ACOUSTIC SUMMARY WITH HOURLY BREAKDOWNS OF ACTIVITY AT SURVEY SITES. ....	11
TABLE 3. BAT CAPTURE TOTALS .....	12
TABLE 4. REPRODUCTIVE CONDITION OF CAPTURED BATS.....	12
TABLE 5. ANNUAL CAPTURE SUMMARY COMPARISON.....	12
<b>APPENDIX A.....</b>	<b>13</b>
REPRESENTATIVE MIST NET SITE PHOTOGRAPHS.....	13
<i>Site 1 – Portal.....</i>	<i>13</i>
<i>Site 4 – Airshaft.....</i>	<i>14</i>
<b>APPENDIX B.....</b>	<b>15</b>
SITE SURVEY DATA SHEETS .....	15



## Introduction

The U.S. 219 Improvements Project, S.R. 6219, Section 020 is located between Somerset and Meyersdale, PA in Somerset County. The project concerns the construction of approximately 10 miles (16 km) of new highway. Surveys conducted by Skelly and Loy in 2012 within the project area found two bat hibernacula.

A Pennsylvania Natural Diversity Inventory (PNDI) letter from the Pennsylvania Game Commission (PGC) dated January 10, 2013 to the Pennsylvania Department of Transportation (PennDOT) required that certain measures be taken by PennDOT to avoid and minimize impacts of the project to the Pennsylvania state threatened eastern small-footed myotis (*Myotis leibii*). One of the measures to be taken required that the two hibernacula identified in 2012 be surveyed during fall swarming for each year of construction (estimated to occur for 5 years; from 2013-2017) and for at least one year post-construction (estimated to occur in 2018) following the PGC trapping protocol. These efforts have become ever more important as the deadly White-nosed syndrome (WNS) fungus continues to have severe effects on remaining populations of Pennsylvania's hibernating bat species. Therefore this annual monitoring has the potential to provide important population surveillance data for the management of these at-risk animals.

This report summarizes the results of the first year of fall swarming trapping surveys as required in the January 10, 2013 PNDI letter from the PGC. The surveys were conducted utilizing harp trapping, thermal image video recording, and acoustic survey methods. Results confirm that this site remains a vital over-wintering habitat resource for several Pennsylvania bat species.

## Methods

### Capture Survey

Surveys were conducted from 30 September – 2 October 2013 at two locations (Table 1 and Figures 1 and 2). Both locations were surveyed for three nights with one harp trap, and an acoustic bat detector (Table 1). In addition, bat activity was observed using a thermal imaging video camera for one night at Site 1. Capture and acoustic surveys began 30 minutes prior to sunset and continued for a minimum of five hours. The survey night was considered valid if the temperature remained above 50°F (10°C) for the first two hours of sampling and did not fall below 35°F (1.6°C) by midnight and if a minimum of three hours of the survey were free of heavy rain, thunderstorms, and/or high winds.

Harp trapping involved placing frames threaded with two vertical layers of monofilament line at the portal entrance. Bats attempting to pass through the trap were captured either by colliding with the lines or by entering the space between the frames. Once their forward flight momentum is reduced by contact with the lines, they flutter down into a catch bag where they are held until physical removal for identification. This method of sampling is designed for use at roosts where the potential for catching large numbers of bats during a short time is likely and is more appropriate than mist-netting, which requires that each individual bat be carefully untangled (Tuttle 1974). Two harp trap sizes (Bat Conservation and Management, Inc., Carlisle, PA) were used for this project, a small trap measuring 3 feet square (1 meter square) and a large trap measuring 6 feet x 7 feet (1.8 x 2.1 meters). The harp traps were placed to best cover the entrances of each hibernacula, and then the remaining space surrounding the traps was obstructed using bird netting to maintain natural airflow in and out of the sites, while funneling the bats into the trap. The harp traps were checked a minimum of every 30 minutes for captured bats.

Photographs were taken at each survey site (Appendix A) and the weather conditions during sampling, and general habitat information were recorded (Appendix B). Each captured bat was identified to species and then metrics including sex, age, and reproductive status were determined (Appendix B). Age classification was determined by degree of ossification of the epiphyseal plates of the finger bones (Brunet-Rossinni and Wilkinson 2009). The reproductive condition of females was noted by inspection of the mammary glands and of males by the inspecting for spermatozoa in the epididymis (Racey 2009).

## Acoustic Survey

Surveying for bats can be a labor-intensive process, especially when harp traps are used to physically capture individuals to confirm species identification. In recent years, the collection of acoustic recordings of ultrasonic bat echolocation calls has been determined to be an effective, and efficient way to document many bat species, without the disturbance caused by physical capture efforts (Ahlén and Baagoe 1999; Biscardi et al. 2004; Duchamp et al. 2006; and Gannon and Sherwin 2004). Many bat species are easy to distinguish amongst based on their echolocation call types alone (Barclay 1999). And, in areas with depauperate *Myotis* species fauna, documentation of *Myotis* species bats is often more efficient using acoustic recording rather than deploying physical capture methods (Ford et al. 2011).



A Pettersson D500X bat detector (Pettersson Elektronik, Uppsala, Sweden) was placed within 23 feet (7 meters) of each portal entrance. Detector microphones were placed 6.5 feet (2 meters) or higher above the ground and orientated towards the largest volume of airspace directly in front of the entrance for each site surveyed. Each detector was stationary and programmed to record for at least five hours, beginning at ½ hour before local sunset. Recorded echolocation calls were post-processed using SonoBat call analysis software (SonoBat, Arcata, CA). This process attributed meta-data from the survey effort to each recording, while preserving the date-time stamp when each recording was made forming a permanent record of each echolocation call recorded during the inventory. Recorded bat passes were tallied for each mine portal in one-hour increments beginning at ½ hour before sunset and continuing for five hours.

Unlike capture surveys, results from acoustic surveys indicate *indices* of bat activity, not *absolute numbers of individuals* present on the landscape. For example, when results report 40 “bat passes” at a site, it does not mean that there were 40 individual bats echolocating over the microphones. There could have been a single bat making 40 passes throughout the night, or 40 individuals each making a single pass, or anything in between. But when results are compared from site to site at a parcel, or from night to night, or between parcels, relative activities can be determined, especially when total monitoring time is consistent between sites, or accounted for with an appropriate multiplier.

Nevertheless, acoustics provide an efficient survey tool for assessing a three-dimensional area of habitat, as in this survey. The obvious advantage of acoustic monitoring is that bats that may not be captured using harp traps, that cover a two-dimensional space, may be recorded acoustically. But, because the D500x detectors system is extremely sensitive and may record bats even some distance behind the microphone, interloping species will be recorded during acoustic surveys at entrances that are not necessarily entering or exiting the site. And, due to fundamental differences in hardware among manufacturers, it is virtually impossible to compare results of surveys unless temporal, spatial, and/or hardware variations are accounted for from night to night and/or site to site.

All acoustic recordings collected were also analyzed using the SonoBat automatic classifier (North-northeast version) allowing species classifications to be determined by the computer, along with metrics to assign confidence to the decisions. It should be noted that any automated classification software can render inaccurate results in many situations especially when recording bats performing behaviors that result in: inspection calls (e.g., approach phase), attack calls (e.g. acquisition or feeding-buzz), social calls or directives between species and among individuals, and call variations due to multiple individual bats in the same airspace. Moreover, the use of stationary microphones to record mobile bats on

the wing often results in poor, out of range recordings that are picked up by microphones on a tangent or off-axis to the best volume of microphone detection. Therefore, all recordings are manually reviewed to attempt to identify if any of these situations existed and classifications for those recordings were amended or eliminated from consideration when reporting species results.

During the manual vetting process, each recording was verified to probable species or species group, based on the results from the automated classification and the visual inspection of the spectrogram (i.e., the call frequency and intensity vs. time display) associated with the entire call sequence. John Chenger performed all manual vetting of the recordings collected during this effort. He has over 20-years of experience with collecting and analyzing bat echolocation calls from North American bat species, and over 7-years of experience using SonoBat software for these types of analyses.

When recordings were confidently assigned to species (defined for the purposes of this survey as having  $\geq 5$  fully-formed, high-quality call pulses in a sequence that received a discriminant probability classification to species of  $\geq 0.95$ ) recordings were labeled with a four-character species identification code, comprised of the first two letters of the genus and species designation for each bat (e.g., for *Eptesicus fuscus*, the species code is EPFU).

But, because bats exhibit considerable plasticity in their vocalizations, and there can be considerable overlap in call parameters among species, this can potentially result in a recording from one species exhibiting parameters that match the expected parameter space of another species. When this occurs, it results in an ambiguous classification between one or more species. For example, *Myotis lucifugus* and *Myotis sodalis* have largely overlapping data-spaces for the vast-majority of their call parameters and only rarely will produce dis-ambiguous call types. When these species **did not** produce sufficiently dis-ambiguous call types, the classification was considered to be indeterminate and identified as LUSO, indicating a dis-ambiguous *Myotis lucifugus*/*Myotis sodalis*. In fact, many *Myotis* species will produce call types that can completely share data-space with each other, and no confident consensus can be made between them. In this situation, the recording will be simply identified as MYUN for “*Myotis* species unknown.” Finally, many times a recording will contain a “fragmentary” sequence of bat echolocation pulses, either as the bat moves in and out of the volume of detection for the microphone, or as it speeds by the microphone, and fewer than 5 fully formed call pulses are recorded. In these instances, it is clear that a bat was present, but not enough content is available in the recording to render a species determination. For these cases, the recording was identified as either LFUK to indicate a bat of unknown species below  $\sim 35$  kHz (e.g., *Eptesicus fuscus*, big brown bat; *Lasionycteris noctivagans*, silver-haired bat; or *Lasiurus cinereus*, hoary bat), and similarly HFUK indicates an unknown bat species above  $\sim 35$  kHz (e.g., *Lasiurus borealis*, eastern red bat;



*Myotis leibii*, eastern small-footed myotis, *M. lucifugus*, little brown myotis; *M. septentrionalis*, northern myotis; *M. sodalis*, Indiana myotis; or *Perimyotis subflavus*, tri-colored bat).

## Visual Recording Survey

A final survey method was deployed during this project specifically to identify bats actually using the site entrances while creating the least amount of disturbance at the site. Because bats have body temperatures approaching 100°F (37°C) and if they fly into or out of the AMLFs where the air temperature is significantly cooler, thermal imaging video can easily identify any bats actively using the sites (Gillam et al. 2010 and Hirstov et al. 2010). Thus thermal imaging video recording is an ideal survey tool for this application. It also brings a fourth inventory and monitoring method to the survey, thus helping to eliminate bias inherent in just a single capture method (Larsen et al. 2007) and significantly increase the chances of documenting occupancy, especially during a short survey window as in this project.

During this project, thermal infrared video was collected simultaneously with acoustic recordings while also conducting the physical capture efforts on the first capture night at Site 1 Portal. A FLIR/Indigo Systems thermal infrared camera (FLIR Systems Inc., Wilsonville, OR) was positioned so the field of view covered the approach to the mine feature. All video was manually observed determine bat activity and behavior in real time. These visual observations were supplementing, not in lieu of, other bat activity assessment methods.

## Results

### Capture Survey Results

Harp traps were set in the entrances of each of two (2) hibernation sites for a period of three (3) nights each. Trapping began ½ hour before sundown and lasted for five (5) hours each night for a total of 15-trap hours per site, and 30-trap hours total for the entire survey period. A total of 26 bats of 2 species were captured during this survey effort: 1 northern myotis (*Myotis septentrionalis*), and 25 tri-colored bats (*Perimyotis subflavus*; Table 3). Of the 26 bats, 42% (n=11) were female and 58% (n=15) were male (Table 3). All of the captured bats were non-reproductive adults with the exception of 1 juvenile female and 1 scrotal male (Table 4). Overall, the captured bats were non-reproductive adults with the exception of one scrotal male and one juvenile female.

Site 1, the main Portal had the most captures (75% of the bats captured during this survey), with both species (*Myotis septentrionalis* and *Perimyotis subflavus*) and 20 individuals (1.73 bats per trap-hour). Site 4, the airshaft, had just 1 species (*P. subflavus*) and 6 individuals (0.4 bats per trap-hour). Previous capture efforts at these two sites in 2012 returned greater species diversity (5 species) and captures per trap-hour (2-4 bats per trap-hour), perhaps due to a longer survey period (15-nights, over 30-days) and/or less WNS affects in 2012 at these sites. Weather conditions in 2013 remained within PGC trapping parameters found in Protocol for Assessing Bat Use of Potential Hibernacula 9/10/12 throughout the 3-day survey period. Results of the 2012 and 2013 capture surveys are summarized in Table 5 of this report.

## Acoustic Survey Results

Bat detectors were deployed near the entrances of each of two (2) hibernation sites for a period of three (3) nights each. Monitoring began ½ hour before sundown and lasted for eight (8) hours on nights 1 and 2, and five (6) hours on night 3 for a total of 22-detector hours at each site and 44-detector hours for the entire survey period. A total of 197 bat passes from four (4) confidently identified species, and three (3) ambiguous species-guilds were recorded. Species with confidently identified recordings included: *Eptesicus fuscus*, big brown bat (0.5%); *Lasionycteris noctivagans*, silver-haired bat (1%); *Myotis leibii*, eastern small-footed myotis (1%), and *Perimyotis subflavus*, tri-colored bat (23%). Additionally, ambiguous call-sequences were recorded for high-frequency species (13%) and low-frequency species (11%) and bat passes that could not be identified to any species or guild (50.5%).

Site 1, the main portal, had the most activity with 155 bat passes (79% of the activity recorded during this survey), with the greatest amount of species diversity. This site had an average of approximately 7 bat passes per hour for the 22 survey hours and averaged 50 bat passes per night. This site also returned two confident recordings from the Pennsylvania state threatened species, *Myotis leibii*, the eastern small-footed bat. Site 4, the airshaft had less activity and less species diversity. There was an average of just 2 bat passes per hour for the 22 survey hours, and 14 bat passes per night for the three survey nights at this site. A complete summary of the confidently identified species at each site is noted in Table 1 and hourly activity summaries for each survey night at each site is noted in Table 2 of this report.

Acoustic activity at the two sites investigated during this survey is consistent with activity around hibernacula at this time of year. More recordings were collected in the later hours of monitoring than during the earlier hours of monitoring, which is typical, as bats tend to arrive at hibernacula after 2230h during the fall swarming period. The bulk of the species identified during the acoustic survey are species known to use underground rock



resources as over-wintering habitat. The scant recordings from *Lasionycteris noctivagans*, a “tree bat” only rarely associated with overwintering in rocky habitats, likely represent either interloping individuals, or curious individuals checking out the site as they are occasionally known to do.

## Visual Recording Results

A number of visual observations of bats entering or exiting portals were witnessed during this survey on 9/30/13 at Site 1 Portal, and is noted in Table 1. This is further evidence that bats are actively using the feature surveyed during this project, and that conclusions from the acoustic results are correct. Bat activity near these sites represents occupancy of the site and not incidental interlopers. Recording conditions outside both sites are ideal for capturing evidence of bat use, with a large field of view through which relatively warm bats are easy to distinguish from the relatively cold background of the hibernacula entrances, with little interference from rocks, vegetation, or other structures that will return disruptive heat-signatures.

Overall, the results of this 2013 bat-detection survey indicate that these previously identified hibernation sites remain important over-wintering habitat for several Pennsylvania bat species, including *Myotis septentrionalis*, and *Perimyotis subflavus*, two species which have been hit hardest by WNS affects, with the former currently under petition by the U.S. Fish and Wildlife Service (FWS) for endangered species listing. Additionally, confirmed acoustic records from the Pennsylvania state threatened species *Myotis leibii* at the Site 1 portal further strengthen recommendations for continued protection and management of this site for bat habitat. As per PGC protocols, recommendations for the installation of bat-friendly gates at one or both of these sites are warranted. Additional mitigation involving the alteration, stabilization, and management of the entrances to these sites may be required, though comments on procedures or protocols for these activities are beyond the scope of the information collected during this survey and will require additional site investigation and study.

## Literature Cited

- Ahlén, L. and H.J. Baagoe, 1999. Use of ultrasound detectors for bat studies in Europe: experiences from field identification, surveys, and monitoring. *Acta Chiropterologica*. 1:137-150.
- Barclay, R.M.R. 1999. Bats are not birds: a cautionary note on using echolocation calls to identify bats. *Journal of Mammalogy*. 80: 290-296.
- Biscardi, S., J. Orprecio, M.B. Fenton, A. Tsoar, and J.M. Ratcliffe. 2004. Data, sample sizes and statistics affect the recognition of species of bats by their echolocation calls. *Acta Chiropterologica*, 6(2): 347-363.
- Brunet-Rossinni, A. K., and G. S. Wilkinson. 2009. Methods for age estimation and the study of senescence in bats. Pages 315–325 in *Ecological and Behavioral Methods for the Study of Bats, Second Edition* (T.H. Kunz and S. Parsons, eds.). The Johns Hopkins University Press, Baltimore, Maryland.
- Cope, J.B., and S.R. Humphrey, 1977. Spring and Autumn Swarming Behavior in the Indiana Bat, *Myotis sodalis*. *Journal of Mammalogy* 58(1): 93-95.
- Duchamp, J.E., M. Yates, R. Muzika, and R.K. Swihart. 2006. Estimating probabilities of detection for bat echolocation calls: An application of the double observer method. *Wildlife Society Bulletin*. 34(2): 408-412.
- Flaquer, C., I. Torre, and A. Arrizabalaga. 2007. Comparison of sampling methods for inventory of bat communities. *Journal of Mammalogy*. 88:526-563.
- Fischer, J., J. Stott, B.S. Law, M.D. Adams, and R. I. Forrester. 2009. Designing effective habitat studies: quantifying multiple sources of variability in bat activity. *Acta Chiropterologica*. 11(1): 127-137.
- Ford, W.M., E.R. Britzke, C.A. Dobony, J.L. Rodrigues, J.B. Johnson. 2011. Patterns of acoustical activity of bat prior to and following white-nose syndrome occurrence. *Journal of Fish and Wildlife Management*. 2(2): 125-134.
- Gannon, W.L., and R.E. Sherwin. Are acoustic detectors a “silver bullet” for assessing habitat use by bats? Pages 38-45. In: Brigham, R.M., E.K.V. Kalko, G. Jones, S. Parsons, H.J.G.A. Limpens (Eds.) 2004. *Bat Echolocation Research: Tools, Techniques, and Analysis. (Proceedings of the Bat Echolocation Symposium and Tutorial April 15-17, 2002)* Bat Conservation International, Austin, TX. 167 pages.
- Gillam E.H., et al. 2010. Echolocation behavior of Brazilian free-tailed bats during dense emergence flights. *Journal of Mammalogy*, 9(4): 967-975.
- Hirstov, N.I., et al. 2010. Seasonal variation in colony size of Brazilian free-tailed bats at Carlsbad Cavern based on thermal imaging. *Journal of Mammalogy*, 9(1): 183-192.
- Racey, P. A. 2009. Reproductive assessment of bats. Pages 249-264 in *Ecological and Behavioral Methods for the Study of Bats, Second Edition* (T. H. Kunz and S. Parsons, eds.). The Johns Hopkins University Press, Baltimore, Maryland.
- Tuttle, Merlin D. 1974. An improved trap for bats. *Journal of Mammalogy*. 55(2): 475-477.



## Figures



**Figure 1.** Survey location: Site 1 Portal, Somerset County, PA



**Figure 2.** Survey location: Site 4 Airshaft, Somerset County, PA



## Tables

**Table 1.** Survey site coordinates, monitoring results, and habitat descriptions.

NAD 27 datum	Latitude/ Longitude	Survey Method(s)	Physical Captures	Acoustic Activity*	Identified Bat Calls*	Visual Observations	Remarks
Site 1 Portal	39° 52' 21.1'' 79° 02' 56.2''	1– 3' Harp Trap, 1– D500x, 1– Thermal Camera	1– MYSE 19- PESU	155	(1) EPFU (1) LANO (2) MYLE 32 (PESU)	240 minutes; ~1 to 2 bats intermittently between 2000-2330	11'w x 4'h portal located ~50' below road with knee deep stream and strong breeze emerging. Large ceiling collapse 100' inside portal. Trap hung in entrance drip line surrounded by plastic netting. D500x placed 30' from entrance with external mic 2.5m above ground orientated into open space approaching portal.
Site 4 Shaft	39° 53' 31.0'' 79° 02' 20.4''	1– 6' Harp Trap, 1– D500x	6- PESU	42	(1) LANO (13) PESU	n/a	Airshaft located on forested slope ~150' from gravel driveway in large tract of open forest. Shaft inside a small brick building drops ~30' to horizontal tunnel. Detector placed ~1.5m above ground, 3m from building, with mic pointed into open space approaching shaft.

**Abbreviations used in this table:** **EPFU** = *Eptesicus fuscus* (big brown bat), **LANO** = *Lasionycteris noctivagans* (silver-haired bat), **MYLE** = *Myotis leibii* (eastern small-footed myotis), **PESU** = *Perimyotis subflavus* (tri-colored bat).

\* Acoustic Activity identified only recordings identified as “bat calls,” with a “bat call” described as any recording containing at least one obvious bat echolocation pulse. Identified Bat Calls include all recordings expertly (manually) vetted and attributed to species or species guild. It does not indicate absolute number of bats. Acoustic data represent 44 hours of recording conducted over 3 nights beginning 30 minutes before sunset at the two sites.

**Table 2.** Acoustic summary with hourly breakdowns of activity at survey sites.

SITE	Survey Date: 30 September							Survey Date: 1 October							Survey Date: 2 October						AVE. bat passes	TOTAL bat passes
	1 <sup>st</sup> hr	2 <sup>nd</sup> hr	3 <sup>rd</sup> hr	4 <sup>th</sup> hr	5 <sup>th</sup> hr	6 <sup>th</sup> hr	7/8 <sup>th</sup> hr	1 <sup>st</sup> hr	2 <sup>nd</sup> hr	3 <sup>rd</sup> hr	4 <sup>th</sup> hr	5 <sup>th</sup> hr	6 <sup>th</sup> hr	7/8 <sup>th</sup> hr	1 <sup>st</sup> hr	2 <sup>nd</sup> hr	3 <sup>rd</sup> hr	4 <sup>th</sup> hr	5 <sup>th</sup> hr	6 <sup>th</sup> hr		
Site 1	0	6	15	19	14	4	0	3	7	40	20	0	3	0	1	1	6	14	0	2	7.1/hr.	155
Site 1 Totals	58							73							24						51.7/night	
Site 4	0	0	4	20	1	0	0	0	1	0	1	6	0	2	0	1	0	0	3	3	1.9/hr.	42
Site 4 Totals	25							10							7						14/night	
GRAND TOTAL																					4.5/hr.	197

Totals represent total number of bat passes per hour/per survey night; averages represent total number of bat passes per hour/night for the monitoring period. Grand total represents the total number of bat passes from all sites with an average number of bat passes per hour for all 44-hours of monitoring.

**Table 3.** Bat capture totals

	<i>Myotis septentrionalis</i>				<i>Perimyotis subflavus</i>				TOTALS				SITE TOTALS
	Female		Male		Female		Male		Female		Male		
	Ad	Juv	Ad	Juv	Ad	Juv	Ad	Juv	Ad	Juv	Ad	Juv	
Site 1	1	-	0	-	7	1	11	-	9	-	11	-	20
Site 4	0	-	0	-	2	-	4	-	2	-	4	-	6
Totals	1	-	0	-	9	1	15	-	11	-	15	-	26
	1				25				26				

**Scientific names used in this table:** *Myotis septentrionalis* (northern myotis), *Perimyotis subflavus* (tri-colored bat).

**Abbreviations used in this table:** Ad = adult; Juv = juvenile.

**Table 4.** Reproductive condition of captured bats

	MYOSEP			PERSUB			TOTALS		
	Female		Male	Female		Male	Female		Male
	NR	SCR	NR	NR	SCR	NR	NR	SCR	NR
Site 1	1	0	0	8	0	11	9	0	11
Site 4	0	0	0	2	1	3	2	1	3
Totals	1	0	0	10	1	14	11	1	14
	1			25			26		

**Abbreviations used in this table:** MYOSEP = *Myotis septentrionalis*; PERSUB = *Perimyotis subflavus*;

F = female, M = male, NR = non-reproductive, SCR = scrotal.

**Table 5.** Annual Capture Summary Comparison

		EPTFUS	MYOLEI	MYOLUC	MYOSEP	PERSUB	TOTALS	EFFICIENCY
2012	Site1	7	2	100	69	333	511	32.5
	Site2	-	-	26	59	225	311	19.4
2012 Totals		7	2	126	128	558	822	26
2013	Site1	-	-	-	1	19	20	6.7
	Site2	-	-	-	-	6	6	2
2013 Totals		-	-	-	1	25	26	4.3

**Abbreviations used in this table:** EPTFUS = *Eptesicus fuscus*, MYOLEI = *Myotis leibii*, MYOLUC = *Myotis lucifugus*,

MYOSEP = *Myotis septentrionalis*; PERSUB = *Perimyotis subflavus*;

Efficiency numbers are calculated as: bats captured per valid survey night



# Appendix A

## Representative Mist Net Site Photographs



Site 1 – Portal

Landscape photo showing 3' harp trap and acoustic detector (above)  
Cropped photo showing 3' harp trap (below)





Site 4 – Airshaft

Landscape photo showing 6' harp trap and acoustic detector (above)  
Cropped photo showing 6' harp trap (below)





# Appendix B

## Site Survey Data Sheets

### Instructions

All information must be completed each night. Partially complete forms will not be accepted. Completed forms are to be turned in to the Team Leader each morning.

**PROJECT:** Name of the entire survey project.

**NET#:** The number given to every trap site in a separate geographic location. Site # remains the same regardless of how many nights are spent at the same location.

**DATE:** Pre-midnight date which trapping began.

**LONGITUDE/LATITUDE:** Coordinates from a GPS receiver.

**L.D. BY:** USFWS qualified person identifying bats at this site.

**MOON AFFECT:** Was moon present during survey? If so what phase? Was moonlight illuminating nets? Note dates.

**NUMBER OF NETS/TRAPS:** Description of nets, e.g. A: 30x9m, B: 30x6m, C: 18x6m, 12m "L" configuration.

**SKY CONDITIONS:** General weather conditions and temperature in °F, at start, middle, and end of sampling times.

**WIND CONDITIONS:** Use Beaufort scale and note time.

**SITE DESCRIPTION:** A general overview of the site, e.g. "Shallow stream with long pools surrounded by deciduous forest with maple, oak, and hush. A small clearing and residence is nearby."

**ANDERSON III CODE:** Use Level III codes and percentages within 1KM of site. Percentages should total 100%.

**DISTURBANCE CODE:** List up to three of the most significant disturbances within 500 meters. Include distance to disturbance.

### Common name:

Little brown

Big brown

Pipistrelle

Northern longear

Smallfooted

Indiana

Red

Hoary

Silver haired

Townsend's Big-eared

Rafinesque's Big-eared

Evening

### Species:

*Myotis lucifugus*

*Eptesicus fuscus*

*Pipistrellus subflavus*

*Myotis septentrionalis*

*Myotis grisescens*

*Myotis subulatus*

*Lasiurus borealis*

*Lasiurus cinereus*

*Lasiurus cinereus*

*Corynorhinus townsendii*

*Corynorhinus rafinesquii*

*Nyctalus hammondi*

### Reproductive condition:

NR= Not Reproductive

PG= Pregnant

PL= Post Lactating

SC= Scatol

### Age:

A= Adult

J= Juvenile

### Anderson Classification Codes first and second level categories

- 1 Urban or Built-Up Land
- 11 Residential
- 12 Commercial Services
- 13 Industrial
- 14 Transportation, Communications
- 15 Industrial and Commercial
- 16 Mixed Urban or Built-Up Land
- 17 Other Urban or Built-Up Land
- 2 Agricultural Land
- 21 Cropland and Pasture
- 22 Orchards, Groves, Vineyards, Nurseries
- 23 Cropland Fending Operations
- 24 Other Agricultural Land
- 3 Rangeland
- 31 Herbaceous Rangeland
- 32 Shrub and Bush Rangeland
- 33 Mixed Rangeland
- 4 Forest Land
- 41 Deciduous Forest Land
- 42 Evergreen Forest Land
- 43 Mixed Forest Land
- 5 Water
- 51 Streams and Canals
- 52 Lakes
- 53 Reservoirs
- 54 Bays and Estuaries
- 6 Wetland
- 61 Forested Wetlands
- 62 Non Forested Wetlands
- 7 Barren Land
- 71 Barren
- 72 Sandy Areas Other than Beaches
- 73 Bare Exposed Rock
- 74 Strip Mines, Quarries, and Gravel Pits
- 75 Troughed Areas
- 76 Troughed Areas
- 77 Mixed Barren Land

Disturbance Codes and Key		
PROXIMITY	TYPE	
1 (Disturbance on site)	A. Dumping	M. Unimproved roads
2 (Disturbance within 100 meters of site)	B. Party area	N. Recreation area
3 (Disturbance 100-500 meters of site)	C. Buildings	J. Mining
4 (Disturbance 500-1000 meters of site)	D. Agriculture	K. Fire
5 (Disturbance 1001-5000 meters of site)	E. Utility right-of-way	L. Closures
6 (Disturbance 5000+ meters of site)	F. Railroad right-of-way	M. Forest defoliation
	G. Improved roads	N. No disturbance

Beaufort Wind Scale Codes and Key			
Code	Speed (Knots)	Description	Land Condition
0	0-0.5	Calm	Smoke rises
1	0.5-1.5	Light air	Smoke drifts vertically
2	1.5-3.5	Light breeze	Leaves rustle
3	3.5-5.5	Gentle breeze	Wind ripples
4	5.5-7.5	Moderate breeze	Small branches in motion
5	7.5-10.7	Fresh breeze	Small trees and shrubs sway
6	10.7-13.8	Strong breeze	Winds to shaggy trees
7	13.8-17.1	Near gale	Winds to shaggy trees
8	17.1-20.7	Gale	Winds to shaggy trees

DO NOT WRITE IN MARGINS OF DATA SHEETS

**Note:** The pipistrelle is now designated as the tri-colored bat (*Perimyotis subflavus*).

BAT NETTING/TRAPPING SITE SURVEY RECORD

Page 1 of 2

1. Survey Date: 9-30-13 2. Company Name: Bat Conservation & Management  
3. Bat Identifier: J. Chung 4. Assistant: C. Escalante, Jo Sinclair  
5. Site Name and/or Number: SR6219 Section 020 Site 1  
6. Site is (circle one): hibernation site summer habitat  
7a. If hibernation site circle one: limestone mine, coal mine, limestone cave, sandstone cave, RR tunnel,  
other structure, describe: \_\_\_\_\_  
7b. If summer habitat, describe area being sampled (e.g. forested stream or forest clearing with stream)  
\_\_\_\_\_  
8. County: Somerset 9. T.E. Quad: Myrtle Dale

10. When was GWHG established? 1988 1990

Bats (circle one): NADP (Preliminary, NADEL, WGS84, Other: \_\_\_\_\_)

12. Ownership and Access: (Who owns site or controls access? Give name and address.) Contact Penn DOT  
District 2-2 Environmental Manager, Tam Voorn (412) 696-3224

13. Time (military) & Temperature: Start Time 1920 h Stop Time 2335 h Total Minutes 315  
Start Temp. 15.2 °C End Temp. 13.1 °C moon up: 100% for summer netting

14. General Weather (circle one): Clear Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;  
(marked during survey) Steady Rain; Thunderstorm; Snow; Other: \_\_\_\_\_

15. General Wind Conditions (circle one): Calm Breezy (Leaves Rustling); Windy (Tree Swaying)

16. Capture Setup at Site:

Net #	Type	Count	Dimensions	Description	TOTAL AREA (sq. m)
1	Trap	1	1m x 1.2m	1m x 1.2m	1.2m <sup>2</sup>

Total Capture Area: 1.2 sq. m



(Site Survey Record - Continued) Site Name/No.: SR 6219 Section 020 Site 1 Date: 9-30-13

17. Describe habitat 100 m around site: (topography and vegetation including dominant tree species.)  
Highland/ Piedmont near entrance to 50' Sider Road with 50% mowing. Ponds  
with water, cattails and other emergent vegetation. Pond is 11' wide x 4' high.  
But ditches around marshy area. Road, Pine, Birch, Alder, Honey-suckle

18. Was reproductive status checked? ☒ YES / ☐ NO (if "NO" only enter numbers in Total column)

**CAPTURE RESULTS**

Species	Number of Adult Females				No. Juv. Fem.	Total No. Fem.	Number of Adult Males		No. Juv. Males	Total No. Males	Species Total
	NR	PG	L	PL			SCR	NR			
<i>Lasiurus borealis</i>	2					2				2	2
<i>Myotis lucifugus</i>											
<i>Myotis septentrionalis</i>											
<i>Myotis grisescens</i>											
<i>Myotis velox</i>											
<i>Myotis subulatus</i>											
<i>Eptesicus fuscus</i>											
<i>Peromyscus subulatus</i>	4					4	3			3	10
<i>Lasiurus borealis</i>											
<i>Lasiurus borealis</i>											
<i>Lasiurus borealis</i>											
<i>Lasiurus borealis</i>											
<i>Lasiurus borealis</i>											
Other - specify:											
Other - specify:											
Reproductive Status: NR = nonreproductive, PG = pregnant, L = lactating, PL = post lactating, SCR = sexual/reproductive status *Complete Measurement and Capture Data Form for all: (1) <i>Myotis subulatus</i> , (7) <i>Myotis lucifugus</i> , (3) bats you are banding or band receptacles, (4) radio-tagged bats and (5) bat species not usually found in PA.											Grand Total  10

19. BAT DETECTORS & OTHER MONITORING DEVICES: Tables of bat passes/hour. One to 1 hour required for habitat bat  
telemetry surveys. Monitor one hour after 22:00 hrs when trapping/testing bats and 1 hour when only monitoring with bat detectors, night  
vision or lighted device before one can see bat winged/bats. Use the procedures & equipment used in contracts.

1 <sup>st</sup> hour	2 <sup>nd</sup> hour	3 <sup>rd</sup> hour	4 <sup>th</sup> hour	5 <sup>th</sup> hour
Start Time: 1830	Start Time: 1931	Start Time: 2031	Start Time: 2131	Start Time: 2231
End Time: 1930	End Time: 2030	End Time: 2130	End Time: 2230	End Time: 2330
Tables: 1	Tables: 6	Tables: 12	Tables: 19	Tables: 4

20. REMARKS:

13° C AT 10:30

BAT NETTING/TRAPPING SITE SURVEY RECORD

Page 1 of 2

1. Survey Date: 12/1/13 2. Company Name: Bat Conservation & Management  
3. Bat Identifier: Todd Sander 4. Assistant: A. S. Harris, Z. Long, D. Davis  
(Please write full name)

5. Site Name and/or Number: SR6219 Section 020 Site 1

6. Site is (circle one): Hibernation site summer habitat

7a. If hibernation site circle one: limestone cave, old mine limestone cave, sandstone cave, RR tunnel,  
other structure, describe - \_\_\_\_\_

7b. If summer habitat, describe area being sampled (e.g. forest stream or forest clearing with stream):  
\_\_\_\_\_

8. County: Somerset 9. Twp/Quad: Marsdale

12. Ownership and Access: (Who owns the or controls access? Give name and address) Central Penn DOT  
District 7-2 Environmental Mgmt. Team York (844) 696-7224

13. Time (month) & Temperature: Start Time 1830 h Stop Time 2235 h Total Minutes 305  
Start Temp 16.1 °C End Temp 10.4 °C (must stop if < 10° for summer netting)

14. General Weather (circle one): Clear Partly Cloudy, Mostly Cloudy, Cloudy, Drizzle, Intermittent Rain,  
(marked morning clearing periods of rain) Steady Rain, Thunderstorms, Snow, Other: \_\_\_\_\_

15. General Wind Conditions (circle one): Calm Breeze (Leaves Rustling), Windy (Trees Swaying)

16. Capture Setup at Site:

Set #	Type	Count	Dimensions	Description	TOTAL AREA (m <sup>2</sup> )
1	<u>Net</u>	1	<u>1m x 1.2m</u>	<u>Inside dip net on right side</u>	<u>1.2m<sup>2</sup></u>

Total Capture Area: 1.2 m<sup>2</sup>





BAT SETTING/TRAPPING SITE SURVEY RECORD

Page 1 of 2

1. Survey Date: 5/2/13 2. Company Name: Bat Conservation + Management

3. Bat Identifier: Todd Sander 4. Assistant: C. Escalante

5. Site Name and/or Number: SR 6219 Section 020 Site 1

6. Site is (circle one): hibernation site summer habitat

7a. If hibernation site circle one: limestone mine, coal mine, limestone cave, sandstone cave, RR tunnel,  
other structure, describe: \_\_\_\_\_

7b. If summer habitat, describe area being sampled (e.g. forest stream or forest clearing with stream):  
\_\_\_\_\_

8. County: Somerset 9. T.S. Quad: Myrddale

12. Ownership and Access: (Who owns site or controls access? Give name and address) Contact PennDOT  
District 7-D Environmental Manager, Tom Yarrow (Dir), 696-7224

13. Time (minutes) & Temperature: Start Time 1825 h Stop Time 2330 h Total Minutes 305  
Start Temp. 18.3 °C End Temp. 12.0 °C (must say 1 °C for summer settings)

14. General Weather (circle one): Clear Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;  
(report exactly during  
period of survey) Steady Rain; Thunderstorms; Snow; Other: \_\_\_\_\_

15. General Wind Conditions (circle one): Calm Breezy (Leaves Rustling); Windy (Trees Swaying);

16. Capture Setup at Site:

Set #	Type	Catch	Dimensions	Description	TOTAL AREA (sq m)
1	Net	1	12m x 2.1m	hinged over road	25.2 sq m
1	trap	1	1m x 1.2m	Inside dripping on right side	1.2 m <sup>2</sup>

Total Capture Area: 1.2 sq m





BAT NETTING/TRAPPING SITE SURVEY RECORD

Page 1 of 2

1. Survey Date: 09/30/13 2. Company Name: Bat Conservation & Management  
3. Bat Identifier: Doug Rayback 4. Assistant: \_\_\_\_\_  
5. Site Name and/or Number: SR6 219 Section 020 Site 4  
6. Site is (circle one): hibernation site summer habitat  
7a. If hibernation site (circle one): limestone mine, coal mine, limestone cave, sandstone cave, RR tunnel,  
other structure, describe: Abandoned air shaft  
7b. If summer habitat, describe area being sampled (e.g., forested stream or forest clearing with stream)  
8. County: Somerset & Twp: Murdochs  
10. Was site GPS'd (required)? (YES) NO

datum (circle one): NAD27 (preferred), NAD83, WGS84, Other: \_\_\_\_\_

12. Ownership and Access: (Who owns site or controls access? Give name and address.) Contact Penn DOT  
District 9-2 Environmental Manager, Tom Vocum (814) 691-2224  
13. Time (milli) & Temperature: Start Time 1830 h Stop Time 2230 h Total Minutes 300  
Start Temp. 14.2 °C End Temp. 12.7 °C (use one; 15V for summer surveys)  
14. General Weather (circle one): Clear Partly Cloudy, Mostly Cloudy, Cloudy, Drizzle, Intermittent Rain,  
(respond during periods of rain) Steady Rain, Thunderstorm, Snow, Other: \_\_\_\_\_  
15. General Wind Conditions (circle one): Calm Breezy (Leaves Rustling), Windy (Tree Swaying)  
16. Capture Setup at Site:

Net #	Type	Count	Dimensions	Description	TOTAL AREA (sq m)
1	Trap	1	1.8m x 1.8m	placed at air shaft adance	3.2 sq m

Total Capture Area: 3.2 sq m





BAT NETTING/TRAPPING SITE SURVEY RECORD

Page 1 of 2

1. Survey Date: 10/01/13 2. Company Name: Bat Conservation & Management  
3. Bat Identifier: Doug Raybuck & Assistant: \_\_\_\_\_  
(Remember to include) SR6219 Section 020 Site 4  
4. Site Name and/or Number: SR6219 Section 020 Site 4  
5. Site is (circle one): hibernation site summer habitat  
6a. If hibernation site circle one: limestone mine, coal mine, limestone cave, sandstone cave, RR tunnel,  
other structure, describe: Abandoned Air Shaft  
6b. If summer habitat, describe area being sampled (e.g. forested stream or forest clearing with canopy)  
\_\_\_\_\_  
7. County: Somerset 8. US Quad: Murdoch

Bottom circle one: WADSWORTH, NADW, WADW, Other: \_\_\_\_\_

9. Ownership and Access: (If the owner site or controls access? Give name and address) Contact PennDOT  
District 9-0 Environmental Manager, Tom Yocum, (610) 686-2224  
10. Time (military) & Temperature: Start Time 1830 h Stop Time 2330 h Total Minutes 300  
Start Temp 16.6 °C End Temp 13.3 °C (max temp: 30°C for summer survey)  
11. General Weather (circle one): Clear, Partly Cloudy, Mostly Cloudy, Cloudy, Drizzle, Intermittent Rain,  
(occasional evening during periods of rain) Steady Rain, Thunderstorms, Snow, Other: \_\_\_\_\_  
12. General Wind Conditions (circle one): Calm, Breezy (Leaves Rustling), Windy (Trees Swaying)  
13. Capture Setup at Site:

Set #	Type	Count	Dimensions	Description	TOTAL AREA (sq. m)
1	<u>Half trap</u>	1	1.8m x 1.8m	Placed at air shaft entrance	3.24 sq. m

Total Capture Area: 3.24 sq. m





BAT NETTING/TRAPPING SITE SURVEY RECORD

Page 1 of 2

1. Survey Date: 10/02/13 2. Company Name: Bat Conservation & Management  
3. Bat Identifier: Doug Rapp 4. Assistant: \_\_\_\_\_  
5. Site Name and/or Number: SR6219 Section 020 Site 4  
6. Site is (circle one): Hibernation site summer habitat  
7a. If hibernation site circle one: limestone mine, coal mine, limestone cave, sandstone cave, RR tunnel,  
other structure, describe: Abandoned air shaft  
7b. If summer habitat, describe area being sampled (e.g. forested stream or forest clearing with stream).  
8. County: Somerset 9. US Quad: Mundock  
10. Was site GPS'd (required)? Yes - NO

Datum (circle one): NAD83 (Preferred) NAD83, WGS84, Other: \_\_\_\_\_

12. Ownership and Access: (If no owner site or controls access? Give name and address) Control Penn DOT  
District 9-0 Environmental Manager, Tom Vossler, (814) 624-7224  
13. Time (millies) & Temperature: Start Time 1830 h Stop Time 2310 h Total Minutes 300  
Start Temp 16.8 °C End Temp 11.7 °C (read only 13°C for summer settings)  
14. General Weather (circle one): Clear Partly Cloudy, Mostly Cloudy, Cloudy, Drizzle, Intermittent Rain,  
(temporal season during periods of rain) Steady Rain, Thunderstorms, Snow, Other: \_\_\_\_\_  
15. General Wind Conditions (circle one): Calm Breezy (Leaves Rustling), Windy (Trees Swinging).  
16. Capture Setup at Site:

Set #	Type	Count	Dimensions	Description	TOTAL AREA (sq m)
1	Net	1	1.5m x 1.5m	placed at air shaft entry	2.2 sq m
1	Hand Trap	1	18cm x 18cm	placed at air shaft entry	3.2 sq m

Total Capture Area: 3.2 sq m sq m





**pennsylvania**

DEPARTMENT OF TRANSPORTATION

www.dot.state.pa.us

July 3, 2014

Ms. Renee Sigel  
Federal Highway Administration  
228 Walnut Street, Room 508  
Harrisburg, PA 17101-1720  
Attention: Mr. Jonathan P. Crum  
Ms. Kathy Dimpsey

Dear Ms. Sigel:

Enclosed for your review and concurrence is Addendum #3 to the Biological Assessment (BA) for SR 6219, Section 020, Improvement Project in Somerset County. This addendum is located on the FHWA ESA WebTool –

<http://www.environment.fhwa.dot.gov/ESAWebTool/Site/Login.aspx>.

This Addendum to the BA addresses the effect on the northern long-eared bat (*Myotis septentrionalis*), which is currently being proposed to be added to the federally endangered list.

Therefore, we request your concurrence on this Addendum, and for your office to submit the BA Addendum #3 to the United States Fish and Wildlife Service (USFWS), and initiate formal conferencing under Section 7 of the Endangered Species Act. Also, PennDOT's District 9-0 Office, under separate cover, has sent out hard copies of the Addendum to your office for your use in submitting the Addendum to the USFWS and the Pennsylvania Game Commission.

Please direct any comments or questions to Ryan VanKirk at 717-705-1338.

Sincerely,

A handwritten signature in black ink, appearing to read "Melissa J. Batula".

Melissa J. Batula, P.E.

Chief

for  
Highway Delivery Division  
Bureau of Project Delivery



Ms. Renee Sigel  
Division Administrator  
Federal Highway Administration  
July 3, 2014  
Page 2

Concurrence \_\_\_\_\_ Date \_\_\_\_\_  
FHWA Division Administration

Enclosure

4822/RRV/ses/fhwasmrsetcosr6219sec020070314

cc: C. Donahue, FHWA  
A. C. Zawisa, District 2-0  
A. S. Squillario, District 9-0  
D. J. Azzato, P.E., 7<sup>th</sup> Floor, CKB  
R. R. VanKirk, P.E., 7<sup>th</sup> Floor, CKB



June 27, 2014

Ryan VanKirk, P.E.  
Pennsylvania Department of Transportation  
Highway Design Technology Section  
400 North Street  
Keystone Commonwealth Building  
Harrisburg, PA 17105-3161

Re: Somerset County  
S.R. 6219, Section 020  
US 219 Improvement Project (Somerset to Meyersdale)

Dear Mr. VanKirk:

Please find Addendum 3 to the Biological Assessment (BA) for the US 219 Improvement Project (S.R. 6219, Section 020) in Somerset County posted on FHWA ESA BA Webtool <http://www.environment.fhwa.dot.gov/ESAWebTool/Site/Login.aspx>. The document was reviewed by the Environmental Policy and Development Section of the Bureau of Project Delivery. Please forward to the Federal Highway Administration with a request that they submit BA Addendum 3 to the United States Fish and Wildlife Service (USFWS) and concurrently initiate formal conferencing under Section 7 of the Endangered Species Act. In the interest of expediting this priority, hard copies for the Federal Highway Administration (FHWA), USFWS and Pennsylvania Game Commission (PGC) use are being submitted under separate cover direct to FHWA by the District; similarly, a copy is being transmitted for your file.

On January 31, 2013 the USFWS issued an Amended Biological Opinion addressing the effects of Section 020 of the US 219 Improvement Project on the federally endangered Indiana bat (*Myotis sodalis*). On October 2, 2013 the USFWS published notice proposing to list as federally endangered the northern long-eared bat (*Myotis septentrionalis*). Addendum 3 to the Biological Assessment addresses the effect of the project on this proposed species. The action will not jeopardize the proposed northern long-eared bat; however, it is likely that this species will be federally listed prior to project completion. It is therefore prudent to assure that a conference opinion is received from USFWS prior to listing to avoid project delay or a construction shutdown. USFWS has indicated that conference opinions may be readily updated to biological opinions for this species upon listing. Once listed, the action of the US 219 Improvement Project may affect, and is likely to adversely affect the northern long-eared bat.



Ryan VanKirk, P.E.  
Pennsylvania Department of Transportation  
Highway Design Technology Section  
Page 2  
June 27, 2014

Conservation measures to reduce effects and offset the take of Indiana bats, previously incorporated into the project design, also reduce effects and offset take of Northern long-eared bats. District 9-0 is committed to implementing the conservation measures as detailed in the January 31, 2013 Amended Biological Opinion to minimize the effect of the project on these bat species.

Please contact Attilio Squillario, Environmental Planner, at (814) 696-7116 or via e-mail at [asquillari@pa.gov](mailto:asquillari@pa.gov) or Gregory Illig, P.E., at (814) 696-7179 or e-mail at [gillig@pa.gov](mailto:gillig@pa.gov), if you have questions regarding this request.

Sincerely,



for

Thomas A. Prestash, P.E.  
District Executive  
Engineering District 9-0

090/AS/bac



U. S. DEPARTMENT  
OF TRANSPORTATION

Federal Highway  
Administration

Pennsylvania Division

JUL 18 2014

228 Walnut Street, Room 508  
Harrisburg, PA 17101-1720

In reply refer to:

HPD-PA

Somerset County, Pennsylvania  
US 219 Improvement Project  
S.R. 6219, Section 020  
Meyersdale to Somerset  
Request for Formal Conference

USFWS Project #2007-2430

Lora Zimmerman  
Field Service Supervisor  
U.S. Fish and Wildlife Service  
315 South Allen Street, Suite 322  
State College, PA 16801-4850

ATTN: Bob Anderson

Dear Ms. Zimmerman:

The Federal Highway Administration (FHWA), in coordination with the Pennsylvania Department of Transportation (PennDOT) and the Maryland State Highway Administration (MD SHA), have been advancing improvements to two sections of the U.S. 219 in Somerset County, Pennsylvania and Garrett County, Maryland. Section 019 is currently under development and Section 020 is currently under construction. Associated with the proposed project are potential effects to the Federally-listed endangered Indiana bat (*Myotis sodalis*). A Biological Opinion (December 2012) was issued by your office for potential effects to the species.

On October 2, 2013 the U.S. Fish and Wildlife Service (USFWS) proposed the listing of the Northern Long-eared Bat (*Myotis septentrionalis*) as Federally Endangered. The Northern Long-eared Bat is historically known within the region and FHWA has determined that the S.R. 6219, Section 020 Project *May Affect and Is Likely to Adversely Affect* the species. Because the project is not likely to be completed before the listing of the species (anticipated April 2015), a Biological Assessment Addendum (BAA) has been prepared to evaluate the project's potential effects on the species. FHWA is therefore requesting Formal Conference for the Northern Long-eared Bat. Note that the Addendum and request for conference is for the Section 020 project only.

Enclosed for your review is a hardcopy of the BAA. The document is also available on the FHWA ESA Webtool at <http://www.environment.fhwa.dot.gov/ESAWebTool/Default.aspx>.



Should you have any questions or need additional information, please contact Jon Crum at (717) 221-3735 or [Jonathan.Crum@dot.gov](mailto:Jonathan.Crum@dot.gov).

Sincerely,

A handwritten signature in black ink, appearing to read 'K. Lynch', written in a cursive style.

Keith Lynch  
Director of Program Development

Enclosure

ec: David Azzato, P.E., PENNDOT  
Ryan Vankirk, P.E., PENNDOT  
Toni Zawisa, PENNDOT  
Attilio Squillario, PENNDOT 9-0  
Cory Donahue, FHWA  
Kathy Dimpsey, FHWA



# United States Department of the Interior



## FISH AND WILDLIFE SERVICE

Pennsylvania Field Office  
315 South Allen Street, Suite 322  
State College, Pennsylvania 16801-4850

September 25, 2014

Keith Lynch  
Federal Highway Administration  
228 Walnut Street, Room 558  
Harrisburg, PA 17101-1720

RE: Service Project #2007-2430

Dear Mr. Lynch:

This letter responds to your July 18, 2014, request for formal conference on the effects of the proposed northern long-eared bat (NLEB; *Myotis septentrionalis*) from the S.R. 6219, Section 020, project located in Somerset County, Pennsylvania. This conference opinion is based on information you provided in your biological assessment addendum (BAA; dated June 2014) as well as other information available in our files and is provided in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended, (16 U.S.C. 1531 *et seq.*).

A Biological Assessment was submitted to the United States Fish and Wildlife Service (Service) in June 2006 for Section 019. This Biological Assessment was supplemented with an amendment in February 2007. In October of 2007 the Service issued their Biological Opinion on the Section 019 project (Service Project #2007-1091), which stated that the proposed Section 019 project was not likely to jeopardize the continued existence of the Indiana Bat (*Myotis sodalis*). The Biological Assessment prepared for Section 019 was amended (*US 219 IMPROVEMENT PROJECT, SR 6219 SECTION 020 (Service Project #2007-2430) ADDENDUM, Revised March 2011*) to include Section 020. Consultation was then reinitiated between the Service and FHWA, and a subsequent (August 28, 2011) Amended Biological Opinion was issued. Further design modifications to Section 20, as well as information related to previously undocumented mine portals and their use as hibernacula for bat species, resulted in an additional amendment to the consultation (*US 219 IMPROVEMENT PROJECT, SR 6219 SECTION 020 (Service Project #2007-2430) ADDENDUM 2, December 2012*). The Service issued a Supplemental Biological Opinion on January 31, 2013.

The NLEB was proposed for listing as an endangered species on October 2, 2013. No critical habitat has been proposed at this time. Species proposed for listing are not afforded protection



under the Act; however, as soon as a listing becomes effective, the prohibition against jeopardizing its continued existence and “take”<sup>1</sup> applies regardless of an action’s stage of completion. Therefore, to avoid significant project delays the Service recommends that the effect of the project on NLEBs, and their habitat, be considered during the proposed project planning and design. Conferencing is a process of early interagency cooperation involving informal and/or formal discussions between the action agency and the Service pursuant to section 7(a)(4) of the Act regarding the likely impact of an action on proposed species or proposed critical habitat. The conference process is discretionary for all other effect determinations besides jeopardy/adverse modification. However, it is in the best interest of the species, and our federal partners to consider the value of voluntary conservation measures in a conference opinion that are not likely to cause jeopardy, but are likely to adversely affect the NLEB.

#### Description of the proposed action

The S.R. 6219, Section 020, project involves the construction of 10 miles of new, limited-access, four-lane highway extending from an existing highway section south of Somerset, Pennsylvania to Meyersdale, Pennsylvania, with a new interchange in the vicinity of Mud Pike in Black and Brothersvalley Townships. The project description is essentially the same as that considered in our August 29, 2011, Amended Biological Opinion. The action area, (*i.e.*, all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action) is described in the biological assessment as extending 1500 feet from the proposed edge of pavement, which encompasses in excess of 3,600 acres that is currently in a variety of land uses including mines, agriculture, rural residential and forest. The estimated area of direct forest removal needed to accommodate construction has, however, been increased from 230 acres to 270 acres to account for staging areas and temporary access roads (page 9 of the December 2012 Biological Assessment). An additional 50 acres of forest may be removed if necessary by the construction contractor to allow for disposal of material generated during road bed excavation.

A seasonal tree cutting restriction, permitting tree cutting only between November 15 and March 31, was incorporated in the project. Additional conservation measures also incorporated in the project include living snow fence, annual trapping and monitoring at some sites during and post construction, and a 50-foot riparian buffer around major streams corridors, where feasible. Compensation, through contribution to the Indiana Bat Conservation Fund (IBCF), was provided for impacts to all forest habitats, regardless of tree species composition or successional stage. A complete description of the proposed action can be found in the Biological Opinion for this project.

---

<sup>1</sup> As defined in the Act, take means “. . . to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct.” “Harm” in the definition of take means an act which kills or injures wildlife. Such act may include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering (50 CFR part 17.3). “Harass” means an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering.

### NLEB Range

The NLEB is found in the United States from Maine to North Carolina on the Atlantic Coast, westward to eastern Oklahoma and north through the Dakotas, extending southward to parts of southern states from Georgia to Louisiana, even reaching into eastern Montana and Wyoming. In Canada it is found from the Atlantic Coast westward to the southern Yukon Territory and eastern British Columbia. Historically, the species has been found in greater abundance in the northeast and portions of the Midwest and Southeast, and has been more rarely encountered along the western edge of the range.

### NLEB Winter Habitat and Ecology

Suitable winter habitat (hibernacula) for the NLEB includes underground caves and cave-like structures (*e.g.* abandoned or active mines, railroad tunnels). These hibernacula typically have large passages with significant cracks and crevices for roosting; relatively constant, cool temperatures (0-9 degrees Celsius) and with high humidity and minimal air currents. Specific areas where they hibernate have very high humidity, so much so that droplets of water are often seen on their fur. Within hibernacula, surveyors find them in small crevices or cracks, often with only the nose and ears visible. NLEBs will typically hibernate between mid-fall through mid-spring each year. There may be other landscape features being used by NLEB during the winter that have yet to be documented.

### NLEB Summer Habitat and Ecology

During summer NLEBs roost singly or in colonies in cavities, underneath bark, crevices, or hollows of both live and dead trees and/or snags with a diameter at breast height (dbh) of three inches or greater. Males and non-reproductive females may also roost in cooler places, like caves and mines. This bat seems opportunistic in selecting roosts, using tree species based on presence of cavities or crevices or presence of peeling bark. NLEBs have also been occasionally found roosting in structures like barns and sheds (particularly when suitable tree roosts are unavailable). NLEB emerge at dusk to forage in upland and lowland woodlots and tree-lined corridors, feeding on insects, which they catch while in flight using echolocation. This species also feeds by gleaning insects from vegetation and water surfaces.

Suitable summer habitat for NLEB consists of a wide variety of forested/wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, old fields and pastures. This includes forests and woodlots containing potential roosts (*i.e.*, live trees and/or snags greater than or equal to 3 inches dbh that have exfoliating bark, cracks, crevices, and/or cavities), as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. Individual trees may be considered suitable habitat when they exhibit characteristics of suitable roost trees and are within 1,000 feet of other forested/wooded habitat. NLEB has also been observed roosting in human-made structures, such as buildings, barns, bridges, and bat houses; therefore, these structures should also be considered potential summer



habitat. NLEBs typically occupy their summer habitat from mid-May through mid-August each year and the species may arrive or leave some time before or after this period.

NLEB maternity habitat is defined as suitable summer habitat used by juveniles and reproductive (pregnant, lactating, or post-lactating) females. NLEB home ranges, consisting of maternity, foraging, roosting, and commuting habitat, typically occur within three miles of a documented capture record or a positive identification of NLEB from properly deployed acoustic devices, or within 1.5 miles of a known suitable roost tree.

#### Suitable NLEB roost trees

Suitable NLEB roosts are trees (live, dying, dead, or snag) with a dbh of 3 inches or greater that exhibits any of the following characteristics: exfoliating bark, crevices, cavity, or cracks. Isolated trees are considered suitable habitat when they exhibit the characteristics of a suitable roost tree and are less than 1,000 feet from the next nearest suitable roost tree within a woodlot, or wooded fencerow.

#### NLEB Spring staging/Fall swarming Habitat and Ecology

Suitable spring staging/fall swarming habitat for the NLEB consists of the variety of forested/wooded habitats where they roost, forage, and travel, which is most typically within 5 miles of a hibernaculum. This includes forested patches as well as linear features such as fencerows, riparian forests and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. Isolated trees are considered suitable habitat when they exhibit the characteristics of a suitable roost tree and are less than 1,000 feet from the next nearest suitable roost tree, woodlot, or wooded fencerow. NLEBs typically occupy their spring staging/fall swarming habitat from early April to mid-May and mid-August to mid-November.

#### NLEB Migration

As with many other bat species, NLEBs migrate between their winter hibernacula and summer habitat. The spring migration period likely runs from mid-March to mid-May, with fall migration likely between mid-August and mid-October. Overall, NLEB is not considered to be a long-distance migrant (typically 40-50 miles) although known migratory distances vary greatly between 5 and 168 miles.

#### Potential Threats and Impacts to NLEB

No other threat is as severe and immediate for the NLEB as the disease, white-nose syndrome (WNS). If this disease had not emerged, it is unlikely the NLEB population would be declining so dramatically. Since symptoms were first observed in New York in 2006, WNS has spread rapidly in bat populations from the Northeast to the Midwest and the Southeast. Population numbers of NLEB have declined by 99 percent in the Northeast, which along with Canada, has been considered the core of the species' range. The degree of mortality attributed to WNS in the Midwest and Southeast is currently undetermined. Although there is uncertainty about how

WNS will spread through the remaining portions of the species' range, it is expected to spread throughout the United States. In general, the Service believes that WNS has reduced the redundancy and resiliency of the species.

Although significant NLEB population declines have only been documented due to the spread of WNS, other sources of mortality could further diminish the species' ability to persist as it experiences ongoing dramatic declines. Specifically, declines due to WNS have significantly reduced the number and size of NLEB populations in some areas of its range. This has reduced these populations to the extent that they may be increasingly vulnerable to other stressors that they may have previously had the ability to withstand. These impacts could potentially be seen on two levels. First, individual NLEBs sickened or struggling with infection by WNS may be less able to survive other stressors. Second, NLEB populations impacted by WNS, with smaller numbers and reduced fitness among individuals, may be less able to recover making them more prone to extirpation.

Land-clearing, especially of forested areas, may adversely affect NLEB by killing, injuring or harassing roosting bats, and by removing or reducing the quality of foraging and roosting habitat. Due to the close proximity of the project area to two known NLEB hibernaculum, removal of trees and forested areas within the project area could result in the direct take of roosting NLEB, which could be injured or killed when trees are cut. Forested areas near hibernacula provide important foraging and roosting habitat for NLEB, especially during the fall and spring, when bats are building up their fat reserves prior to and after hibernation. In addition, female maternity colonies and individual male bats may be found in the vicinity of hibernacula throughout the summer months. Further, loss of clean water sources (e.g., fill, degradation of water quality), could reduce NLEB drinking sources, foraging habitat and/or prey.

#### Action Area

The Description of the Project Action Area for Section 020 is documented in the *US 219 Improvement Project, SR 6219 Section 020 (Service Project #2007-2430) ADDENDUM, Revised March 2011* and in the *U.S. Route 219 Improvements Project, S.R. 6219, Section 020, Bat Hibernaculum Investigations Final Report, December 2012* (appended to the December 2012 Biological Assessment Addendum 2). The Action Area was further described in the January 31, 2013, Supplemental Biological Opinion as extending 1500 feet from the proposed edge of pavement, encompassing in excess of 3,600 acres, and includes up to an additional 50 acres of forest removal, as necessary during construction by the contractor, for purposes of disposal of material generated during excavation activities associated with the project. The contractor has identified areas for disposal and provided the Service documentation with respect to location and forest impacts. This information is included in Appendix A of the BAA. Modification to the project, brought about through value engineering during final design, resulted in a slight shift in the Action Area for which additional consultation with the Service occurred. The value engineering did not result in any expansion to the Action Area, as defined in the Supplemental Biological Opinion.

Winter, swarming, roosting and foraging habitats for NLEB occur within the project action area.



### Effects of the action

The effects of the proposed Section 020 project, as described in the Supplemental Biological Opinion of January 31, 2013, on the Indiana bat (*Myotis sodalis*), remain unchanged. Additional forest impacts for borrow and waste, access roads, and stormwater facilities have been consulted on, as detailed in correspondence found in Appendix A of the BAA. The Service concurred that these additional impacts are within the additional 50 acres of allowable forest impacts and are consistent with Term and Condition 1.G of the Supplemental Biological Opinion.

Given similarity in habitat usage, direct and indirect effects of the US 219 Transportation Improvements Project, S.R. 6219, Section 020 on swarming, foraging, and roosting habitat within the project action area for the proposed federally endangered NLEB will be the same as those described for the Indiana bat within the 2013 Supplemental Biological Opinion. As such, the avoidance, minimization, conservation, and mitigation measures as provided within the project description relevant to the Indiana bat are also applicable to the NLEB. Tree removal associated with the entire project was 87% complete at the time of initiation of conferencing/consultation for the NLEB. All tree removal has been, and will continue to be, conducted between November 15 and March 31.

The previously described project activities undertaken (and complete at the time of this writing) associated with mine stabilization necessary to support Pier 4 and Abutment 2, including blasting, over-excavation, and grouting were considered previously in consultation with the Service with respect to effects on the Indiana bat. Since the affected hibernaculum, Portal # 1 (a.k.a. Portal JAZ-3) was not found to be utilized by Indiana bats, these activities were not considered to have a direct effect. Portal # 1 (JAZ-3) is a known NLEB hibernaculum, and as such, these activities may have resulted in a direct effect on this federally proposed species; however, all activities were completed prior to species listing. The effect of blasting, grouting; and over-excavation may have resulted in modifications to air flow, moisture, temperature, or other microclimate requirements. Temperature modifications of a few degrees, potentially resulting from changes in air flow, may make a hibernaculum less suitable. Because bats exposed to WNS are more vulnerable to microclimate and construction disturbance effects, these changes may result in reduced overwintering success or potentially create disturbances that render a hibernaculum unsuitable. Blasting, drilling, and noises from construction activities undertaken while bats are hibernating may result in premature arousal and may result in lethal effects; therefore, all of these construction activities were planned to be completed between April 1 and November 14.

Many activities resulting in direct effect to the species during winter hibernation occurred prior to this consideration of the proposed federally endangered NLEB; however, the project proponents assume that the hibernaculum may still be utilized by bat species in the future. Through construction completion, any required blasting, drilling, pile driving, or similar activities that could disturb hibernating bats will be conducted between April 1 to November 14, when it is expected that bats are not hibernating.

All indirect, interrelated, interdependent, and cumulative effects, as described previously in US 219 Improvement Project, SR 6219 Section 020 (Service Project #2007-2430) ADDENDUM, Revised March 2011; US 219 IMPROVEMENT PROJECT, SR 6219 SECTION 020 (Service Project #2007-2430) ADDENDUM 2, December 2012; and the January 31, 2013 Supplemental Biological Opinion, remain relevant, unchanged, and are incorporated by reference. Primarily, indirect effects will occur as the result of habitat fragmentation and temporal losses as areas, not permanently lost as a result of conversion to highway use, naturally return to forest habitat.

These activities will likely result in both direct and indirect effects to NLEB, as previously discussed in the 2013 Supplemental Biological Opinion. Therefore, based on a review of the project information, including the location of the project area, the anticipated effects on forested habitat, and the avoidance; minimization; and mitigation measures that will be implemented for this project, our conference opinion is that the SR 6219 Section 020 project may adversely affect the NLEB, but will not jeopardize its continued existence.

#### Reasonable and Prudent Measures and Terms and Conditions

Although take of a proposed species is not prohibited under the Act, the reasonable and prudent measures and subsequent non-discretionary terms and conditions in the Biological Opinion were found to avoid, minimize and mitigate impacts on the Indiana bat. In as much as Indiana Bat and NLEB utilize essentially the same habitats within the project area and share similar natural history, the Service believes the reasonable and prudent measures and subsequent terms and conditions in the 2007 Biological Opinion, amended in 2011, and subsequent 2013 Supplemental Biological Opinion, are also applicable to NLEB as well. Here, the Service is reiterating the addition of I.G. which carries out the reasonable and prudent measures in the Biological Opinion.

I.G. The project proponents will minimize adverse effects on Indiana bats and NLEBs through the implemented of conservation measures, as detailed below.

- a. Implement project conservation measures and mitigation measures, as detailed in Addendum 2 to the S.R. 6219, Section 20 biological assessment (pages 13-15).
- b. During the bidding process, prospective project contractors will be notified regarding the presence of endangered species in the project area and the special provisions necessary to protect them. The successful contractor(s) will be instructed on the importance of the natural resources in the project area and the need to ensure proper implementation of the tree-cutting restrictions, erosion and sedimentation controls, and spill avoidance/remediation practices. The following conditions (language) will be included in all construction and demolition contracts awarded for project implementation:
  - i. Endangered species are present in the project area and there is a risk of unauthorized take (Endangered Species Act section 9 violation) if the Terms and Conditions of the Service's 2007 Biological Opinion (as amended in 2011 and 2013) are not closely followed.



- ii. Include language in the construction contract specifying that the contractor will implement a seasonal restriction on tree cutting – specifically noting that all tree cutting will occur between November 15 to March 31.
  - iii. Develop and implement a Conservation District Approved erosion and sedimentation control plan to limit discharge of all sources of project-related sedimentation and erosion, including, but not limited to, construction of roads and access roads, roadway approaches, staging areas, etc. to preserve water quality.
  - iv. As proposed in the biological assessment, preserve a 50 foot riparian corridor on streams in the project area including an unnamed Casselman River tributary, Buffalo Creek, and Swamp Creek.
  - v. The Service will be notified immediately of any failures of erosion and sedimentation control measures or spills of hazardous materials.
  - vi. No project-related or project-generated materials, waste, or fill will be deposited in areas that would result in forest clearing unless minimized and offset through the conservation of existing, currently unprotected forest via an in-lieu-fee program that conserves forest habitat for Indiana bats and NLEB (incidentally) as described Term and Condition 1.G.d.
  - vii. No project-related or project-generated materials, waste, or fill will be deposited in areas that would result in sedimentation to any streams in the action area or areas providing habitat to Indiana bats or NLEB.
- c. As noted in PennDOT's Addendum 2 to the S.R. 6219, Section 20 Biological Assessment, "PennDOT will contribute to the Indiana Bat Conservation Fund for the 270 acres of impacted forest area." PennDOT provided the Service with a *Calculation Sheet for Indiana Bat Habitat Compensation* which uses a combination of 1:1 and 1.5:1 mitigation ratios, resulting in 369.36 compensation acres for 270 acres of affected forest habitat. At the Somerset County rate of \$2,247/acre, PennDOT will contribute \$829,951.92 to the Indiana Bat Conservation Fund (IBCF). Documentation of the IBCF deposit will be provided to the Service within 10 days of the initiation of tree cutting associated with the S.R. 6219, Section 20 project.
- d. As noted in PennDOT's Addendum 2 to the S.R. 6219, Section 20 Biological Assessment, the construction contractor may impact up to 50 acres of forest in the project area due to use of waste and borrow sites. In the Biological Assessment, PennDOT has committed the contractor to compensate for impacts to forest habitat. To ensure this occurs, PennDOT will implement the measures:
- i. Include language in the construction contract specifying that the contractor will 1) minimize impacts to forests, woodlots and trees when selecting and using waste and borrow sites; 2) report to PennDOT and the Service the acres

- of forest, woodlots and trees to be affected by waste and borrow sites; 3) in coordination with the Service, compensate for impacts to forests, woodlots and trees using the *Calculation Sheet for Indiana Bat Habitat Compensation* (available from the Service's Pennsylvania Field Office); and 4) provide documentation of the IBCF deposit to the Service and PennDOT within 10 days of the initiation of tree cutting associated with the S.R. 6219, Section 20 project.
- ii. Include language in the construction contract specifying that the contractor will implement a seasonal restriction on tree cutting – specifically noting that all tree cutting will occur between November 15 and March 31.
  - iii. Provide the Service with contact information for the contractor responsible for waste and borrow sites.
  - iv. Ensure the contractor fulfills the terms of the contract specific to reporting and compensating for forest impacts.
- e. In order to protect the NLEB hibernacula from degradation and micro-climate alteration due to forest loss near Portal #1 (Portal JAZ-3).
- i. Do not remove trees within 175 feet of the mine opening.
  - ii. To the greatest extent practicable, avoid all additional tree removal between 175 and 1,000 feet from Portal #1. Unavoidable tree cutting will only occur between November 15 and March 31.
  - iii. In order to monitor take, inform the Service of any additional tree removal within 1,000 feet of Portal #1 within 48 hours of removal.
- f. No additional blasting, removal of mine passages, or grouting should occur within 1,500 feet of the hibernaculum entrances (mine portal or air shaft) or at the proposed Buffalo Creek bridge structures between November 15 and March 31.
- g. In order to verify the project proponent's assumption that construction activities associated with the SR 6219 Section 020 project will not adversely affect the identified NLEB hibernacula, complete fall trapping of both the mine portal and air shaft entrances to the hibernacula be conducted each fall during construction and for one year post-construction. Trapping should be in accordance to PGC recommendations of January 10, 2103.

### **Conservation Recommendations**

Conservation recommendations are the Services' non-binding suggestions resulting from formal or informal consultation that: (1) identify discretionary measures the project proponents can take to minimize or avoid the adverse effects of a proposed action on listed or proposed species,



candidate species, or to designated or proposed critical habitat; (2) identify studies, monitoring, or research to develop new information on listed, proposed or candidate species, or to designated or proposed critical habitat; and (3) include suggestions on how the Service can assist species conservation, as part of their action and in furtherance of their authorities under section 7(a)(1) of the Act [50 CFR §402.02].

During hibernacula trapping studies two significant bat hibernacula were documented. These mine portals represent significant winter habitat for bats that range widely during other seasons. Included are two additional bat species of federal concern, the little brown bat and eastern small-footed bat. These species have also experienced significant population declines since the white-nose syndrome epidemic.

Species of concern are species that may be elevated to candidate or listed status pending further review by the Service. Candidate species are species for which the Service currently has substantial information on file to support the appropriateness of proposing to list as threatened or endangered. Both candidate species and species of concern are known to be facing various threats, and have usually suffered substantial population declines and/or habitat loss. Although these species receive no regulatory protection under the federal Endangered Species Act, the Service strongly encourages federal agencies and other planners to consider these species when planning and implementing their projects. Efforts to conserve these species now may preclude the need to list them as endangered or threatened under the Act in the future.

The Service has identified the following actions that, if undertaken by PennDOT and/or the FHWA, would further the conservation and assist in the recovery of the Indiana bat and other bat species of concern:

- Work with the Service to develop guidelines for addressing Indiana bat and NLEB issues associated with roadway projects in Pennsylvania.
- Develop and participate in educational and outreach efforts on Indiana bats and NLEB.
- Develop conservation banking as an option to protect essential Indiana bat and NLEB foraging, roosting, and hibernation habitats.

To be kept informed of actions minimizing or avoiding adverse effects, or benefiting listed species, candidate species, species of concern, or their habitats, the Service requests notification of the implementation of the conservation recommendations that are carried out.

#### Reinitiation notice

This concludes formal conference on the actions outlined in the information presented with the Federal Highway Administration's July 18, 2014, request for initiation of formal conference. If the NLEB becomes federally listed under the Act, this conference opinion can be converted to a may affect, [DECISSION ERROR CORRECTED] and is likely to adversely affect [DECISSION ERROR CORRECTED], decision. If so, the reinitiation triggers in the 2013 Supplemental Biological Opinion would also be applicable to NLEB.

A complete administrative record of this consultation is on file in this office. *Please use the above-referenced Service project tracking number in any future correspondence regarding this project.*

If you have any questions regarding this matter, please contact Bob Anderson of my staff at 814-234-4090.

Sincerely,

A handwritten signature in black ink, appearing to read "Lora L. Zimmerman", with a stylized flourish at the end.

Lora L. Zimmerman  
Field Office Supervisor

cc:  
DEP  
USACE  
PGC  
PennDOT





U.S. Department  
of Transportation

Federal Highway  
Administration

**Maryland Division**

December 23, 2016

FHWA Maryland Division Office  
10 South Howard Street, Suite 2450  
Baltimore, Maryland 21201  
(410) 962-4440

In Reply Refer To:  
HDA-MD

U.S. Department of the Interior  
Fish and Wildlife Service  
Chesapeake Bay Field Office  
177 Admiral Cochrane Drive  
Annapolis, Maryland 21401

Re: Re-initiation of Section 7 Consultation for Indiana and Northern Long-eared Bat  
US 219 Improvement Project from I-68 to Old Salisbury Road  
Garrett County, Maryland

Dear Mr. Clark:

The Maryland Department of Transportation's State Highway Administration (SHA) is proposing a breakout project in Maryland within the limits of a previously coordinated eight-mile long project on US 219 from Meyersdale, Somerset County, Pennsylvania to I-68 in Garrett County, Maryland (US 219 Corridor). The 1.4-mile long breakout project (breakout project) is on US 219 from I-68 to Old Salisbury Road (**Attachment 1 – Vicinity Map**).

The US 219 Corridor project was known as Section 019 in the 2000s when the Pennsylvania Department of Transportation was the lead state agency. The study area for the bi-state project includes the Salisbury Mine hibernaculum. A biological assessment to address potential US 219 Corridor project effects to the federally endangered Indiana bat (*Myotis sodalist*) was completed in June 2006. The Pennsylvania Field Office of the U.S. Fish and Wildlife Service (USFWS) issued a Biological Opinion (BO) in October 2007 which determined that the project is not likely to jeopardize the continued existence of the Indiana bat, but that incidental take of Indiana bats is likely. The Incidental Take Statement issued with the BO outlined non-discretionary reasonable and prudent measures that the project must follow to minimize the extent of take.

The following represents a timeline of the primary actions that have occurred since the 2007 BO:

August 29, 2011	USFWS issues an amended BO to the FHWA regarding the effect of the SR 6219, Section 020 project on the Indiana bat. (This project is north of the US 219 Corridor and is currently under construction in Pennsylvania.)
December 2012	Skelly & Loy, Inc. submits a new report entitled <i>U.S. Route 219 Improvement Project, S.R. 6219, Section 020, Bat Hibernaculum Investigations, Final Report</i> .

January 31, 2013	USFWS issues a supplement to the August 29, 2011 amended BO based on FHWA notification of changes to the proposed SR 6219, Section 020 project and the results of the 2012 hibernaculum survey.
October 2014	Bat Conservation and Management, Inc. conducts a new summer bat survey within the entire US 219 Corridor project and submits a report entitled <i>2014 Route 219 Meyersdale to I-68 Summer Bat Survey</i> .
December 2014	Bat Conservation and Management, Inc. conducts a new hibernacula study within the entire US 219 Corridor project and submits a report entitled <i>2014 Route 219 Fall Bat Harp Trapping and Abandoned Mine / Rocky Habitat Assessment</i> .
April 2015	Northern Long-eared Bat ( <i>Myotis septentrionalis</i> ) is listed under the Endangered Species Act 4(d) rule by the USFWS as a threatened species.
January 2016	USFWS issues a Programmatic BO that addresses range-wide effects on the northern long-eared bat (NLEB) under the 4(d) rule. This programmatic BO identifies specific activities that are prohibited or exempted from take provisions of the 4(d) rule.
July 2016	FHWA acknowledges the US 219 Corridor Planning and Environmental Linkages study and its recommended breakout project.
August 2016	SHA initiates the US 219 breakout project. Informal consultation with the Chesapeake Bay Field Office as the lead USFWS office begins.

The USFWS Chesapeake Bay Field Office, after coordination with the Pennsylvania Field Office, determined that the US 219 breakout project Section 7 consultation would require an amendment to the original 2007 BO and not a new consultation. Therefore, this letter serves as a request to reinstate consultation between the FHWA and the USFWS, and to provide updated project and resource information to the USFWS.

Specific information provided in this letter includes:

- a description of the US 219 breakout project in Maryland,
- the action area limit for the breakout project,
- an update on the status of the Indiana bat and NLEB in the action area,
- potential effects of the project on the Indiana bat and NLEB, and
- specific conservation measures to be implemented by the project to minimize any potential effects on the listed bat species.

Based on this information, the FHWA has determined that the proposed activity may affect, but is not likely to adversely affect, the Indiana bat and NLEB, and that for the NLEB, the activities as documented below, are covered under the terms of incidental take under the 4(d) rule. Our supporting analysis is provided below.



## **Proposed Project**

The SHA has prepared an Alternatives Retained for Detailed Study (ARDS) report for the proposed US 219 breakout project. Based on the evaluation and screening process described in the ARDS report, Alternative 1 (No-Build) and three build alternatives (Alternative 2, Alternative 3, and Alternative 4) are being retained for detailed study. Alternative 1 is being carried forward to provide a baseline for comparison of the other alternatives, while Alternatives 2, 3 and 4 are being carried forward because they meet the Purpose and Need for the project. Each of the build alternatives retained would support local and regional economic growth, efficient highway operations for development, and community access; improve safety by addressing geometric deficiencies on existing US 219; and support the long term economic development goals of the ADHS by completing a link that supports the ultimate completion of ADHS Corridor N. A detailed description and map of the proposed limits of each of the retained build alternatives is included as **Attachment 2 – ARDS**.

## **Description of the Action Area**

The action area is defined as “all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action” (50CFR§402.02). The USFWS 2007 BO identified the action area limits as being 1,500 feet on each side of the proposed highway pavement. Based on this guidance, **Attachment 3 – Action Area Map** depicts the limits of the US 219 breakout project action area.

## **Habitat within the Action Area**

Land use within the project action area includes forest; meadow; agriculture; residential, commercial, and industrial development; and wetlands and other waters of the U.S. Forest habitat within the action area covers approximately 528 acres or nearly 50 percent of the action area. These forests occur on uplands, wetlands, and along riparian corridors. The largest, contiguous patches of forest occur to the southeast of the I-68/US 219 interchange and west of US 219 north of US 40. The large forested area west of US 219 and north of US 40 is part of the proposed Casselman Farm Development project, while forests southeast of the I-68/US 219 interchange include portions of the Savage River State Forest.

Forest stands within the proposed limits of disturbance (LOD) of the three build alternatives are primarily dominated by maple (red and sugar), black cherry, and ash. These stands also contain lesser components of oaks, hickories, birch, locust, beech, and pine depending upon stand age, slope aspect, and degree of disturbance. The most mature stands within the project LOD, which have experienced less recent disturbance, also contain fewer invasive species. These more mature forest stands generally occur as smaller patches located:

- east of US 219 and north of I-68 adjacent to the Pilot Travel Center,
- east of US 219 at the northern end of the project area, and
- north of I-68 just west of US 219.

## USFWS Listed Species in the Action Area

### Northern Long-eared Bat

A description of the NLEB and its associated habitat is provided in detail within the Programmatic BO. Bat studies conducted within the US 219 Corridor study area during summer and early fall 2014 by Bat Conservation and Management, Inc. (**Attachment 4 – BCM 2014 Summer and Fall Trapping Studies**). The studies identified potential bat hibernacula and summer bat activity areas within the greater project area.

These studies also provided new information about the potential occurrence of NLEB within the limits of the current breakout project in Maryland. During the 2014 summer trapping study (between July 16 and August 5, 2014) eight (8) trapping sites were located within the Maryland portion of the project study area, including four (4) that were within or immediately adjacent to the project action area. A single post lactating adult NLEB female was captured in Maryland north of the project study area on August 4, 2014 (see **Attachment 3**).

[REDACTED] northeast of the intersection of [REDACTED] and [REDACTED]. The dominant tree species for this trap location were sugar maple and northern red oak. The female NLEB was tagged with a radio transmitter and tracked for six days during which the NLEB roosted by day under bark of two separate honey locust trees within a large forest tract east of the capture location, and was last tracked (August 10, 2014) to a barn structure to the north (**Attachment 3**).

### Indiana Bat

A detailed description of the status of the Indiana bat in the corridor project action area was provided by the USFWS in the 2007 BO. Additional information on the status of the Indiana bat was provided in 2011 and 2013 amendments to the 2007 BO, particularly with respect to additional summer maternity mist net surveys in 2008 and hibernacula surveys in the fall of 2012. The amendments also reference the likely project area declines in cave hibernating bats overall, as a result of the effects of the fungal disease white-nose syndrome.

As described above for the NLEB, additional summer trapping occurred throughout the US 219 Corridor project area, with no captures of Indiana bat recorded. A follow up hibernacula trapping and acoustic study was also carried out during the fall of 2014 at five sites, including three sites that lie within a mile north of the [REDACTED]. No Indiana bats were captured or recorded during this study. The 2013 amendment to the BO states that the population of the Indiana bat has likely declined since issuance of the 2007 BO because of effects of white-nose syndrome. However, the 2013 BO amendment indicates the likelihood that some Indiana bats remain in the project area, particularly within the [REDACTED] during winter hibernation. Therefore, the five-mile habitat radius from the [REDACTED] identified in the 2007 BO, would still be in effect since the Indiana bats could be using habitat within this radius for swarming, staging, foraging, or roosting. The US 219 breakout project falls within the five-mile habitat radius of the [REDACTED].



## Effects Determination

### *Northern Long-eared Bat*

Under terms of the programmatic BO final 4(d) rule for the NLEB, projects are excepted from incidental take if they meet the following:

- Within the white-nose syndrome zone, the project does not result in disturbance of NLEB within a hibernaculum.
- Tree removal occurs greater than 0.25 mile from a known hibernaculum.
- Tree removal occurs greater than 150 feet from a known maternity tree.

The US 219 break out project LOD lies nearly three miles from a known NLEB hibernaculum [REDACTED] and approximately 2,270 feet from a known NLEB capture site. No known NLEB maternity roosts occur within the action area. The captured NLEB was a post lactating female. This individual was fitted with a transmitter, as noted above, and tracked for six days. Two roost locations occurred 0.9 mile and 1.1 miles north and east of the northernmost LOD for the project. Based on this information, the proposed US 219 improvements would be covered under the USFWS programmatic BO.

### *Indiana Bat*

#### Hibernacula Modification

The closest known hibernaculum for the Indiana bat [REDACTED] lies nearly three miles northeast of the northernmost extent of the US 219 breakout project and over 2.5 miles from the project action area. No blasting is proposed for the construction of the breakout project. Therefore, the project will have no direct or indirect effect on the Salisbury Mine or Indiana bat or NLEB potentially using the hibernaculum.

#### Habitat Modification

As described in the original and amended project BOs, habitat for Indiana bat will be impacted through the cutting of forest for new road construction. As noted above, forest habitat comprises nearly 50 percent of the action area. Based on current design of the three retained build alternatives, impacts to forests would range from approximately 11 acres for the minor widening from Alternative 2, to between approximately 22 – 23 acres of forest impacts from Alternatives 3 and 4 respectively. Therefore, the worst case impact to forest habitat would amount to five (5) percent of the available forest within the action area. Forest impacts will primarily occur along the east side of existing US 219 impacting mature and early successional stands that are somewhat fragmented from more extensive forest stands in the area. While the project area is three miles south of the known Indiana bat hibernacula, the possibility exists that Indiana bats could roost within forest habitat proposed to be cleared for the project, although the likelihood is extremely low since the forests are close to the existing highway and its existing habitat disturbance.

Impacts to forests from the US 219 breakout project will be regulated under the Maryland Reforestation Law. Enacted in 1989 and amended in 1992, the Maryland Reforestation Law was created to preserve existing forested lands and protect Maryland forests from being cleared by

state-funded highway projects without replacement. Before in-kind forest replacement is considered, every reasonable effort must be made to minimize the cutting or clearing of trees. When prudent minimization efforts have been considered and one acre or more of forest clearing is still required, replacement of the forests must occur on a one-to-one basis. SHA will be required to locate state or publicly owned land of equivalent size to be reforested.

Because of the fixed nature of the corridor along an existing roadway, opportunities for avoidance and minimization of impacts to roadside forest and tree resources are somewhat limited. Efforts to minimize impacts to forests could include increasing the side slopes to a 2:1 ratio or using retaining walls to reduce the project footprint, and locating stormwater facilities in non-forested locations where possible. Unavoidable impacts to forest resources will be mitigated through acre-for-acre reforestation either within the immediate project right-of-way or within other MDOT/SHA-owned land.

### Water Quality

Surface water quality was not addressed in the original BA for the project, but was discussed in the USFWS 2007 BO. Construction of a build alternative will impact between approximately 230 and 3,500 linear feet of perennial and intermittent stream channels depending upon the selected alternative. While these impacts will involve the extension of existing culverts rather than the construction of new crossings, the stream impacts will result in the loss of aquatic biota and their habitat. Sediments and contaminants could also affect water quality during construction or operation of the project. Indiana bats feed in part on aquatic insects. However, the 2007 BO suggested that the impacts would likely not be significant given that upland insects are also part of the Indiana bat diet and the fact that there would likely be other sources of less polluted water available within the bat's foraging range. The 2007 BO also discusses potential acid mine drainage within areas with coal formations. This potential could also occur within the Maryland breakout project, causing additional water quality degradation.

To minimize impacts to surface water quality and macroinvertebrate communities, SHA proposes, where practicable, to bury all culvert extensions to allow formation of a natural channel bed within the culvert. Potential water quality impacts from construction would also be minimized substantially through strict adherence to mandated sediment and erosion control and stormwater management requirements. State-of-the-art sediment and erosion control procedures would be implemented in compliance with MDE regulations. Stormwater management will also be developed in compliance with all applicable MDE regulations and guidance and designed in accordance with MDE's *2000 Maryland Stormwater Design Manual* (MDE 2000) and the 2007 SWM Act, which requires the implementation of Environmental Site Design to the maximum extent practicable.

### **Cumulative Effects**

One large proposed development would be supported by the US 219 project, and would overlap the project action area. The Casselman Farm Development is a 340-acre proposed mixed use/industrial development located north of US 40 and west of US 219. The Casselman Farm Development Site is a proposed development located within an economic development area identified in Garrett County's Comprehensive Plan (2008) known as the Chestnut Ridge Development Corridor (CRDC). While the extent of the proposed development within the parcel is not known, greater than 90 percent of the parcel is forested, thus it is likely that forest impacts



would be extensive. Any upland forest impacts associated with the project would not be required to be mitigated, as Garrett County is not subject to the requirements of the Maryland Forest Conservation Act. Therefore, there would be a larger, permanent loss of forest cover within the action area resulting from this development. However, even with the additional loss of forest habitat, large, continuous stands of forest would remain east of US 219 where the NLEB was observed during the 2014 study.

### **Effects Conclusions**

Based on the analysis that all effects of the proposed action will be insignificant and/or discountable, and any potential effects will be mitigated through approved construction techniques, reforestation requirements, approved sediment and erosion control and stormwater management measures, and time of year tree cutting restrictions (described in Conservation Measures), the FHWA has determined that the construction of the US 219 Improvement Project from I-68 to Old Salisbury Road, may affect, but, is not likely to adversely affect, the Indiana bat or NLEB.

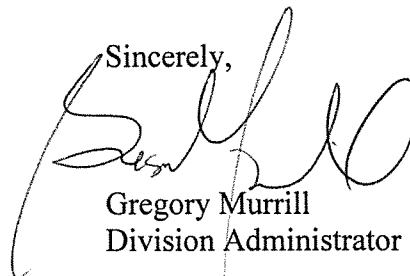
### **Conservation Measures**

The following conservation measures are proposed to offset any potential for unauthorized take of Indiana bat or NLEB:

- Acreage of forest cleared for the project will be replaced at a 1:1 ratio. Tree species used during the reforestation effort will include those appropriate for roosting habitat for Indiana bat and NLEB, as recommended in Appendix A of the 2011 Addendum to the 2007 BO.
- There will be a time of year tree clearing restriction between April 1 and November 14 to avoid any potential take of Indiana bat or NLEB potentially roosting in the area.
- Adherence to state-of-the-art sediment and erosion control practices and implementation of stormwater management will reduce the potential for water quality impacts and associated effects to aquatic insects.

We have used the best scientific and commercial data available to complete this analysis. We request your concurrence with this determination.

Sincerely,



Gregory Murrill  
Division Administrator



# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

Chesapeake Bay Field Office  
177 Admiral Cochrane Drive  
Annapolis, Maryland 21401  
<http://www.fws.gov/chesapeakebay>



March 2, 2017

Gregory Murrill  
Division Administrator  
U.S. Department of Transportation  
Federal Highway Administration  
Maryland Division Office  
10 South Howard Street, Suite 2450  
Baltimore, Maryland 21201

*Re: "Not Likely to Adversely Affect" determinations for the Indiana bat and northern long-eared bat for US 219 Improvement Project from I-68 to Old Salisbury Road in Garrett County, Maryland*

Dear Mr. Murrill:

The U.S. Fish and Wildlife Service (Service) has reviewed your letter with attachments dated December 23, 2016. The Service has evaluated the potential effects of this project to the endangered Indiana bat (*Myotis sodalis*) and threatened northern long-eared bat (*Myotis septentrionalis*). The comments provided below are in accordance with Section 7 of the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*).

The purpose of this proposed project is to provide transportation improvements that are responsive to planned economic development in Grantsville, MD. The State Highway Administration (SHA) is proposing a breakout project in Maryland within the limits of a previously coordinated 8-mile long project on US 219 from Meyersdale, Somerset County, Pennsylvania to I-68 in Garrett County, Maryland (US 219 Corridor). This 1.4-mile long breakout project is on US 219 from I-68 to Old Salisbury Road.

The SHA has prepared an Alternatives Retained for Detailed Study (ARDS) report for this proposed project and four alternatives are being retained for detailed study. Alternative 1 is the No-Build alternative and consists of taking no action to improve the existing transportation facilities. Alternative 2 proposes upgrading existing US 219 to a four-lane divided highway from the existing I-68 interchange to Old Salisbury Road requiring 11.6 acres of forest to be cleared. Alternative 3 proposes the construction of a four-lane dual highway that utilizes both the existing roadway and a new alignment from I-68 to Old Salisbury Road and maintains the existing I-68/US 219 interchange, and will require 22.2 acres of forest to be cleared. Alternative 4 proposes a new four-lane divided highway east of existing US 219, from I-68 to Old Salisbury Road, as well as modification of the existing I-68 interchange; and will require 23.1 acres of





forest to be cleared. For the purposes of this consultation, we evaluated Alternative 3 which would involve the most forest clearing of all of the alternatives.

### **Indiana bat**

The only Indiana bat hibernacula in the project area is the [REDACTED] [REDACTED] is approximately 3 miles from this proposed breakout project in Maryland. The [REDACTED] was last surveyed in 2005 and three Indiana bats were captured.

The most recent summer and fall bat surveys in the US 219 corridor were conducted in 2014 by Bat Conservation and Management, Inc. of Carlisle, Pennsylvania. These surveys are titled, "Route 219 Meyersdale to I-68 Summer Bat Survey" and "Route 219 Fall Bat Harp Trapping and Abandoned Mine/Rocky Habitat Assessment." According to the results of these two surveys, no Indiana bats were captured or detected acoustically in the US 219 corridor in 2014. The Service reviewed the 2014 summer and fall bat surveys and concurred with their results.

Although there were no captures or acoustic detections of Indiana bats, this proposed project is located in a swarming buffer, therefore requiring further Service review. Swarming habitat is important because prior to hibernation large numbers of bats fly in and out of cave entrances to mate and feed on insects to build up sufficient fat supplies to support metabolic processes during hibernation (Service 2007).

Approximately 27,303 acres of forested Indiana bat swarming habitat is within 5 miles of the [REDACTED] [REDACTED]. This proposed Maryland breakout project is located near the southern edge of the 5 mile swarming radius and is not close to the [REDACTED] [REDACTED].

Forest impacts for this proposed Maryland breakout project range from 11.6 to 23.1 acres. Clearing the maximum amount of forest for this proposed project (23.1 acres) would be a minimal impact on Indiana bat habitat within the project area because trees would be removed when bats are hibernating and forest is not limiting in the swarming buffer with over 27,000 acres of forested habitat.

### **Northern long-eared bat**

According to the results of the aforementioned surveys, one female northern long-eared bat was captured in Maryland and radio tracked to two different maternity roost trees. Both of these maternity roost trees are approximately 0.87 miles from this proposed breakout project in Maryland.

Additionally, Pennsylvania hibernacula site 2005-28, a mine, was surveyed on October 6-8, 2014. A 6-foot by 7-foot harp trap was placed parallel with the entrance drip line and plastic was used to fill the entrance area flyway. Two male northern long-eared bats were captured on October 6, 2014. This northern long-eared bat hibernacula is located in Pennsylvania and is approximately 3.34 miles from this proposed breakout project in Maryland.

According to the final 4(d) rule for the northern long-eared bat, in areas of the country impacted by white-nose syndrome (these areas include Maryland and Pennsylvania), incidental take is prohibited if tree removal activities occur within a quarter-mile of a hibernaculum or from activities that cut down or destroy known, occupied maternity roost trees, or any other trees within 150 feet of that maternity roost tree, during the pup-rearing season which is June 1 through July 31 (Federal Register Vol. 81, 2016). This project as proposed is exempt under the 4(d) rule because the two northern long-eared bat maternity roost trees are approximately 0.87 miles from this proposed breakout project and the northern long-eared bat hibernacula is approximately 3.34 miles from this proposed breakout project.

### **Conclusion**

While the federally endangered Indiana bat may occur in the project vicinity, this project as proposed is “not likely to adversely affect” the Indiana bat because the last known occurrence of the Indiana bat in the project area was in 2005 at the [REDACTED] which is approximately 3 miles from this proposed breakout project in Maryland; the 2014 summer and fall bat surveys that were conducted by Bat Conservation and Management, Inc. found no Indiana bats within the project area, including the proposed breakout project area in Maryland; this proposed breakout project is located at the southern-most edge of the Indiana bat swarming area; the Federal Highway Administration will restrict tree clearing between April 1 and November 14 to avoid any potential take of Indiana bat or northern long-eared bat potentially roosting in the area; and acreage of forest cleared for this proposed breakout project will be replaced at a 1:1 ratio by the Maryland State Highway Administration.

While the federally threatened northern long-eared bat may occur in the project vicinity, this project as proposed is “not likely to adversely affect” the northern long-eared bat because this proposed breakout project has forest clearing activities exempted under the 4(d) rule.

Any proposed highway project in the State of Pennsylvania that would connect to the proposed US 219 Improvement Project in Garrett County, Maryland would be subject to Section 7 consultation with the Service’s Pennsylvania Ecological Services Field Office in State College, Pennsylvania.

No other federally proposed or listed endangered or threatened species will be affected by this proposed project. Should project plans change, or if additional information on the distribution of listed or proposed species becomes available, this determination may be reconsidered.

We appreciate the opportunity to provide information relevant to threatened and endangered fish and wildlife resources. This Endangered Species Act determination does not exempt this project from obtaining all permits and approvals that may be required by other state or Federal agencies.



If you have any questions or concerns regarding this letter, please contact Trevor Clark of my Endangered Species staff at (410) 573-4527 or by email at [Trevor\\_Clark@fws.gov](mailto:Trevor_Clark@fws.gov).

Sincerely,

A handwritten signature in black ink, appearing to read 'G. LaRouche', with a stylized, cursive script.

Genevieve LaRouche  
Field Supervisor

cc: Karen Arnold, MDOT, State Highway Administration, Baltimore, Maryland  
Joy Liang, Federal Highway Administration, Baltimore, Maryland  
Lora Lattanzi, U.S. Fish and Wildlife Service, Pennsylvania Field Office

September 17, 2021

**MEMO**

**To:** Chris Homeister, PRD  
**From:** Lori Byrne, WHS  
**RE:** Environmental Review for US 6219-050: PA to Old Salisbury Road, Garrett and Allegany Counties, Maryland.

The western part of the study area includes part of the Casselman River, parts of which are designated as Wetlands of Special State Concern, and is known to support these RT&E species:

<u>Scientific Name</u>	<u>Common Name</u>	<u>State Status</u>
<i>Strophitus undulatus</i>	Creeper	In Need of Conservation
<i>Catostomus catostomus</i>	Longnose Sucker	Endangered Extirpated
<i>Noturus flavus</i>	Stonecat	Endangered
<i>Cryptobranchus alleganiensis</i>	Eastern Hellbender	Endangered
<i>Plethodon wehrlei</i>	Wehrle's Salamander	In Need of Conservation
<i>Luxilus chrysocephalus</i>	Striped Shiner	In Need of Conservation
<i>Regulus satrapa</i>	Golden-crowned Kinglet	Watchlist (breeding)
<i>Viola appalachiensis</i>	Appalachian Blue Violet	Watchlist
<i>Matteuccia struthiopteris</i>	Ostrich Fern	Rare
<i>Actaea podocarpa</i>	American Bugbane	Rare
<i>Valerianella chenopodifolia</i>	Goosefoot Cornsalad	Endangered
<i>Bromus nottowayanus</i>	Nottoway Brome	Watchlist
<i>Moehringia lateriflora</i>	Grove Sandwort	Endangered
<i>Schizachne purpurascens</i>	Purple Oat	Endangered
<i>Dirca palustris</i>	Eastern Leatherwood	Threatened
<i>Homalosorus pycnocarpus</i>	Glade Fern	Threatened

In the area of Meadow Mountain within the study area, there are records for these RT&E species:

<u>Scientific Name</u>	<u>Common Name</u>	<u>State Status</u>
<i>Epilobium leptophyllum</i>	Linear-leaved Willowherb	Rare
<i>Empidonax alnorum</i>	Alder Flycatcher	Rare (breeding)
<i>Erethizon dorsatum</i>	North American Porcupine	Watchlist



The eastern part of the study area includes a segment of Piney Creek, which is known to support these RT&E species:

<u>Scientific Name</u>	<u>Common Name</u>	<u>State Status</u>
<i>Amblyscirtes hegon</i>	Pepper and Salt Skipper	In Need of Conservation
<i>Strophitus undulatus</i>	Creeper	In Need of Conservation
<i>Luxilus chrysocephalus</i>	Striped Shiner	In Need of Conservation
<i>Phegopteris connectilis</i>	Northern Beechfern	Rare
<i>Epilobium leptophyllum</i>	Linear-leaved Willowherb	Rare
<i>Oryzopsis asperifolia</i>	Mountain-ricegrass	Threatened

Also, our remote analysis suggests that the forested area on this property contains Forest Interior Dwelling Bird habitat. Populations of many bird species which depend on this type of forested habitat are declining in Maryland and throughout the eastern United States.

ER# 2021.US219.ga/al



June 14, 2022

Sonja Jahrsdoerfer, Project Leader  
Jennifer Kagel  
United States Department of the Interior  
Fish and Wildlife Service  
Pennsylvania Field Office  
110 Radnor Road, Suite 101  
State College, PA 16801-4850

Re: USFWS Project #2022-0001474 (formerly #2021-1348)  
PNDI Receipt # 738552

Dear Ms. Jahrsdoerfer and Ms. Kagel:

The Pennsylvania Department of Transportation is in receipt of your February 17, 2022 letter that provided a compilation of recommendations from the U.S. Fish and Wildlife Service's (Service) Pennsylvania Field Office and the Chesapeake Bay Field Office regarding the proposed State Route (SR) 6219, Section 050, located in Somerset County, Pennsylvania, and Garrett County, Maryland.

This letter provides responses in a similar order as presented in the USFWS letter. Each USFWS recommendation is bolded and underlined. This letter was written to match the order the issues were presented and are presented as an underlined title prior to each response.

### **1) Fish and Wildlife Coordination Act**

*The first paragraph on Page 3 states that, "Based on the information presented at the Pennsylvania Agency Coordination Meeting and Maryland Interagency Review Meeting, many of the former alignments were eliminated, ostensibly due to the complexity of positioning the proposed alignments with the sections that have already been constructed. This is not keeping in the spirit of 23 CFR 771.111(f), #3, and is actually restricting consideration of alternatives for foreseeable transportation projects. Elimination of alignments that do not connect with the new road segments may actually be dictating where the new alignment should go. We request, in light of 23 CFR 771.111(f), #3, that FHWA, PennDOT, and MDSHA reevaluate all alignments solely on their own merit, and not with regard to those segments that are already constructed."*

#### **Overview –**

The Project Team believes that the proposed project will be keeping in the spirit of 23 CFR 771.111(f), #3. This will be accomplished by utilizing the vast history of studies completed for the project as well as the accumulation of updated project area



information, in addition to past and future public and agency cooperation. However, the project study area has changed since the evaluation in the PEL Study to the start of this Environmental Impact Statement (EIS). The southern terminus has changed since the construction of the newly built roadway in Maryland from the existing I-68 interchange to the Casselman Farm Development's entrance and connection back to existing US 219. It is not the intention of the Project Team to eliminate former alignments based solely on connection to the new terminus or to restrict consideration of other alternatives. Former alignments have and will be evaluated based upon meeting the project's Purpose and Need as well as their environmental, cultural and socio-economic impacts.

We present the following sections to further assist the USFWS's understanding of the current state of the proposed project. The following presents:

- Development of the Project's Purpose and Need, which was presented at the recent ACM.
- Alternative screening,
- The Maryland breakout project and the establishment of the southern logical termini
- A discussion of the currently proposed NEPA Study Alternatives and their origins

**Establishing the Project's Purpose and Needs and Alternative Screening** - The US 219, I-68 Maryland (MD) to Meyersdale Pennsylvania (PA) PEL Study consisted of three (3) screening stages with study alternatives either being dismissed from further study or advancing to the subsequent screening step. Figure 1 presents all the PEL considered alternatives.

The first step of the PEL screening process evaluated whether the alternatives would meet the PEL's Vision and Goals. At the start of the study in 2021, the project team re-examined the PEL Vision and Goals to evaluate and identify current project needs. The current project needs, very similar to the PEL Vision and Goals, are:

- The existing US 219 roadway network does not provide efficient mobility for trucks
- There are numerous roadway and geometric deficiencies present along the existing US 219 alignment which do not meet current design criteria and contribute to slower travel speeds through the corridor
- Existing US 219 does not provide the infrastructure needed to access the surrounding municipalities along with labor and business markets and is a contributing factor in limiting economic development to the Appalachian Region

**Step 1 Screening** - Alternatives were evaluated to determine whether they meet the project needs. The following alternatives were dismissed for the same reasons that they did not meet the PEL Vision and Goals:

- No-Build
- Upgrade Alternative

- TSM Alternative
- US 219 Citizen's Impact Group (Ridge Options)
- US 219 Western Alignment (Westerly)

**Step 2 Screening** - The second step of the PEL process screened alternatives for natural, cultural and socio-economic environmental impacts based on secondary data sources. Field views and updated secondary source information indicate that the project area has not significantly changed since the PEL Study. The impact numbers for those alternatives can be found at Chapter 6-12 in the 2016 US 219 PEL document. A summary of the reasons for dismissal are in the table below.

The following alternatives were found to have higher impacts than those alternatives that were advanced to Step 3 and as a result, those alternatives were not advanced.

- Alignment A
- Alignment B
- Alignment C
- Alignments USACE 1
- Alignment USACE 2
- USFWS Alignment
- Agency Alignment

ALIGNMENT	DESCRIPTION	REASONS FOR DISMISSAL
<b>A</b>	Suggested to avoid the mountain slope/ridge and stay closer to US 219 in attempt to reduce natural resource impacts	<ul style="list-style-type: none"> <li>• Greater impacts to productive agriculture and NHD streams than Alignment E, E-Shift, and AE</li> <li>• Would displace 10 residences</li> <li>• Anticipated adverse effect on 2 historic properties and would have greater potential for archaeology impacts</li> <li>• Bisects Garrett County Employment Center, possibly affecting future of a known proposed development</li> </ul>
<b>B</b>	Suggested to avoid the mountain slope/ridge and stay closer to US 219 and further from the Casselman River than Alignment A	<ul style="list-style-type: none"> <li>• One of the highest impacts to productive agriculture</li> <li>• Would require 11 residential and 7 commercial displacements</li> <li>• Would have the greatest NWI wetlands and NHD streams</li> <li>• Anticipated adverse effect to two historic properties and would have highest potential for pre-historic archaeology impacts</li> <li>• Encroach further into the Little Meadows historic site than any other alignment, apart from Alignment C</li> </ul>
<b>C</b>	Suggested to avoid all farmland in PA and most farmland in MD	<ul style="list-style-type: none"> <li>• Would require approximately 8 residential and 7 commercial displacements</li> <li>• Anticipated adverse effect on two historic properties</li> <li>• Encroaches further into the Little Meadows historic site than any other alignment</li> <li>• Would be closer than any other alignment to, and potentially impact, Meadow Run wetland complex within the Little Meadows historic site</li> </ul>
<b>USACE 1</b>	Connect the northern portion of A with the southern portion of E to avoid the mountain slope/ridge and stay away from the Salisbury mine	<ul style="list-style-type: none"> <li>• Would require 15 residential displacements</li> <li>• One of the highest productive agriculture impacts</li> <li>• Has Higher NHD streams and forestland impacts</li> <li>• Is anticipated to adversely affect two historic properties</li> </ul>
<b>USACE 2</b>	Combine portion of D, with southern portion of E, crossing between 2 large farms in PA	<ul style="list-style-type: none"> <li>• Would require 11 residential displacements</li> <li>• Greater impact to streams and forests than USACE1 Alignment</li> <li>• Likely have a direct impact on 3 potential bat hibernacula identified during the 2014 Fall Harp Net surveys</li> </ul>
<b>USFWS</b>	Combine northern portion of A with the southern portion of E to avoid the mountain slope/ridge in PA and terrestrial impacts	<ul style="list-style-type: none"> <li>• Would require 15 residential displacements</li> <li>• Anticipated adverse effect on two historic properties</li> <li>• Would inflict one of highest impacts to productive agriculture</li> <li>• Greater potential for forestland impacts</li> <li>• Higher potential for impact to NHD streams, when compared to other alignments Alignment E, E-Shift, and AE</li> <li>• Second largest area of NWI wetland impact (similar to USACE1 Alignment)</li> </ul>
<b>Agency</b>	Combine northern portion of A with E, south of the state border to keep the alignment further away from the Salisbury Mine while still allowing a crossing of US 219 in case a local access interchange was desired	<ul style="list-style-type: none"> <li>• Would have the highest impacts to productive agriculture, second highest impact to forestland</li> <li>• Would require 7 residential displacements</li> <li>• Anticipated adverse effect on 2 historic properties and would have greater potential for archaeology impacts</li> </ul>

**Step 3 Screening** - As a result of the Step 2 analysis, four alternatives advanced to Step 3 and were screened using more detailed data.

- Alignment D



- Alignment E
- Alignment E-shift
- Alignment AE

The PEL concluded that Alignments E and E-shift were considered reasonable and recommended to be evaluated in future NEPA Studies. However, at the time of the PEL study, adequate funding was not available to advance the project in its entirety. As a result, the team completed an evaluation to identify whether any stand-alone projects existed along the project alignments.

**The MD Breakout Project: Establishing Logical Termini** - The recently-constructed 1.4-mile MD project was identified in the PEL as a stand-alone project to move forward into NEPA based on its ability to:

- 1) address the PEL's local and regional economic goals,
- 2) provide a high-speed and safe truck connection to the proposed Casselman Farm Development, and
- 3) provide rational end points for both the transportation improvement and for the assessment of environmental impacts, consistent with FHWA's logical termini definition.

PEL identified that the MD 1.4-mile section both improves the existing I-68/US 219 interchange and best addresses the PEL's Project Vision and Goals by directly serving near future planned development (Casselman Farm Development Site) located in Garrett County MD's Smart Growth Priority Funding Area. This section was also found to be *"of sufficient length to address environmental matters on a broad scope and does not restrict consideration of alternatives for other reasonably foreseeable transportation improvements"* including the current study to complete the remaining 4-lane US 219 section between the Meyersdale Interchange in PA and the recently completed 1.4-mile MD Section.

After the PEL, MDOT SHA developed seven preliminary concepts and presented them at a public workshop on September 8, 2016 and an open house on September 9, 2016. Based on a preliminary analysis of the concepts, as well as public and agency input, SHA identified the No-Build and three build alternatives as its Alternatives Retained for Detailed Study (ARDS). A Joint Location/Design Public Hearing was held on February 6, 2017 to obtain public input on the alternatives under consideration. Following the public hearing, additional design modifications were made to Alternative 4. Based on the evaluation and comparison of the alternatives, including input from the public, Alternative 4 Modified was recommended as the MDOT SHA Preferred Alternative. This section received FHWA PACM/CE approval on July 18, 2018 and subsequently constructed.

On a regional level, the goals of the Appalachian Highway Development System (ADHS) are to generate economic development in previously isolated areas by supplementing the interstate system. Connecting the missing ADHS link between I-68 to the south and Meyersdale to the north is a critical step in bringing the goals and vision of the ADHS to fruition. Though the 1.4-mile roadway project did not fully complete ADHS Corridor N in Maryland, it provides a significant incremental improvement with both short-term benefits of supporting development of the CRDC and long-term benefits of a nearly completed ADHS.

The southern logical termini from the initial EIS and PEL has been reevaluated and revised to be the northern end of the newly constructed section of US 219 in MD. This newly identified logical termini is consistent with the current study's purpose of completing Corridor N of the Appalachian Development Highway System, to improve the system linkage in the region, to provide safe and efficient access for motorists traveling on US 219 and provide a transportation infrastructure to support economic development within the Appalachian Region.

Information regarding the southern logical termini was presented at the September 22, 2021, Joint ACM/IRM Meeting. It was explained that the project's southern logical terminus has been redefined subsequent to PEL based on the construction of the new MD 1.4-mile section.

### **Currently Proposed NEPA Study Alternatives (See Alignment Alternatives Board)-**

When the team reinitiated studies in 2021, it was determined that in order to adequately consider a full range of alternatives in the EIS given the change in terminus, it would be necessary to evaluate more than just Alignments E and E-shift. It made logical sense to first look at Alignments AE and D as they were the two alignments that made it to Step 3 of the PEL Evaluation. Since both of these alignments ended at I-68 west of the current interchange and bisected the Casselman Farm Development, both alignments needed to be modified to tie into the current southern terminus. Alignment AE was eliminated from further consideration to be studied in the EIS because it essentially became the same alignment as Alignment E and E-shift once modified to tie into the new southern logical termini. Alignment D, however, due to its more northerly east-to-west crossing of the study area provided multiple opportunities to combine with the southern portion of previously dismissed PEL alignments to tie into the new southern terminus.

The first of these combinations was with Agency Alternative which the team is now referring to as Alternative D/Agency (Alternative DA). This alignment uses the original D alignment to a point just west of where it crosses existing US 219 and then it essentially follows the Agency alignment back to the new southern terminus. The second combination was with the original USFWS and USACOE2 alignments, which is being referred to as Alternative D/USFWS/USACOE (Alternative DU). This alternative



again uses the northern portion of the D alignment but veers southeast of US 219 in the same proximity as the original USFWS and USACOE2 alignments on its way to the new southern terminus. Finally, since a shift for Alignment E was evaluated in the vicinity of Old Salisbury Road near the southern terminus, it is appropriate to study the same shift for Alternatives DA and DU.

As mentioned above, the team has updated all secondary source data and conducted field views within the project area and determined that no significant changes have occurred in the study area that would invalidate the findings from the 2016 PEL. Due to these advancements in the study, the project study area was revised from what was used in the PEL Study to what is shown on the graphic below (219 Study Area) which reflects our new logical southern terminus. None of the project area's natural, cultural and socio-economic environmental features have significantly changed since 2016 and would not significantly result in different impact quantities from the previously studied alternatives. Therefore, the team intends to carry Alternative DA, DA-Shift, DU, DU-Shift, E, E-Shift into the formal NEPA process. Additional studies will be completed on these alternatives to ultimately identify one preferred alternative. At this time, a preferred alternative has not been identified.

### **Summary:**

The 2016 PEL Study concluded with Alignments E and E-shift being recommended for advancement into the NEPA Phase.

The recently constructed 1.4-mile MD project was identified in PEL as a stand-alone project to move forward into NEPA. The July 18, 2018, Preferred Alternative/Conceptual Mitigation (PACM) Concurrence Package documents the impacts and mitigation from the constructed 1.4-mile roadway segment. For the US 219-050 project, the northern end of this newly constructed section in MD is the most logical terminus. Any other location along I-68 would introduce unnecessary additional environmental, cultural, and socio-economic impacts due to length and location as well as possibly not meeting the project purpose and need.

However, given the change in terminus, the project team feels it is essential to consider more alternatives than just Alternatives E and E-Shift during the NEPA Detailed Alternatives Phase and have developed 4 new alignments to be studied that utilizes both findings from the PEL and updated new resource data within the project study area. These alternatives have been described above and were presented at the recent ACM.

The PEL Study remains valid and PennDOT, MDOT SHA and FHWA are all in agreement with the new logical termini and the alternatives to advance into the EIS, including Alternatives E, E-Shift, DA, DA-Shift DU and DU-Shift. *If the USFWS has*

*information that may help to further develop the alignments under consideration, the team kindly requests that you share that information as soon as possible.*

**2) Wildlife Crossings and Habitat Connectivity**

The team agrees with your statement regarding wildlife crossings and habitat connectivity and plans to incorporate wildlife crossings into the design where appropriate. We appreciate the resources that you included with your letter.

**3) Barriers to Movement**

Information has been noted.

**4) Right-of-Way Fencing**

We appreciate the resource that you included with your letter. Where applicable, the Project Team will look to utilize fencing in consideration and inclusion of wildlife crossing facilities to maintain habitat connectivity.

**5) Acid-bearing rock**

PennDOT understands the concern for potential impacts from acid-bearing rock run-off and commits to implementing effective best mitigation measures consistent with best practices successfully implemented on recent past projects. Obtaining detailed borings generally occurs during final design stage of the project due to time, associated costs and the invasive nature of the numerous borings. As was done on SR 6219 Section 020, PennDOT will work with associated permitting and cooperating agencies to avoid and mitigate any potential impacts of acid-bearing rock.

**6) Pollinator Habitat**

PennDOT, MDOT SHA and FHWA will consider implementing conservation efforts into the project to increase habitat for the Monarch, regal fritillary, and frosted elfin butterflies; and the yellow-banded bumblebee. These efforts will need to be vetted through the project team including PennDOT and MDOT SHA's maintenance units to ensure that no undue or unintended maintenance consequences result from implementing certain conservation measures.

The team will keep an open line of communication with the USFWS on this issue and share the plans at the ACM and IRM meetings. We appreciate the resource that you included with your letter.

**7) Migratory Bird Treaty Act**

The team will work with the USFWS during the project design process to implement the recommended conservation measures that can be agreed upon by the team in cooperation with the USFWS.



**8) Endangered Species Act**

The Department is considering several different studies relatives to the bats. These studies include misting netting, refreshing the mine data from the 2005 Abandoned Mine Portal Study, trapping. The scope of work is ongoing, and the Project Team submitted the summer bat survey plan to the USFWS for comment. The fall bat survey plan will also be submitted for comment.

**9) Other species of concern**

The bat studies mentioned under Item 8 would also include the little brown bat and the tricolored bat.

No formal surveys for the spotted turtle or wood turtle are proposed at this time. The Team will look for the presence of spotted turtle and wood turtle during wetland and stream studies and will document any findings.

Sincerely,

*for* Thomas A. Prestash, P.E.  
District Executive  
Engineering District 9-0

Cc:

USFWS – Clark, Li; PGC – Guers, Tuner; KCI – Hoover; Stantec – George; Baker – Plitt; MD DNR – Gibson, Feller; FHWA – Crum; MDSHA - Maimone

From: Christine Hainzer <chainzer@markosky.com>  
Sent: Wednesday, May 24, 2023 3:07 PM  
To: Brad Fisher; Ben Stufft  
Subject: FW: Threatened & Endangered Species Review Process

**Christine Hainzer** | Division Assistant  
[chainzer@markosky.com](mailto:chainzer@markosky.com)

From: Li, Ray <[ray\\_li@fws.gov](mailto:ray_li@fws.gov)>  
Sent: Wednesday, May 24, 2023 2:56 PM  
To: Christine Hainzer <[chainzer@markosky.com](mailto:chainzer@markosky.com)>  
Cc: [ienweze@mdot.maryland.gov](mailto:ienweze@mdot.maryland.gov); Clark, Trevor <[trevor\\_clark@fws.gov](mailto:trevor_clark@fws.gov)>  
Subject: Fw: Threatened & Endangered Species Review Process

Chris -  
We've been coordinating directly with MD SHA (and FHWA) over the past year + on Section 7 issues for this project, and so didn't want to duplicate those efforts. IPaC (<https://ipac.ecosphere.fws.gov/>) is generally first step to determining what listed species might be in project action area, or is there a more specific question I can maybe help to address?  
Cheers,  
Ray

From: LaRouche, Genevieve <[Genevieve\\_LaRouche@fws.gov](mailto:Genevieve_LaRouche@fws.gov)>  
Sent: Monday, May 15, 2023 10:40 AM  
To: Jahrsdoerfer, Sonja SJ <[sonja\\_jahrsdoerfer@fws.gov](mailto:sonja_jahrsdoerfer@fws.gov)>; Li, Ray <[ray\\_li@fws.gov](mailto:ray_li@fws.gov)>  
Subject: Fw: Threatened & Endangered Species Review Process

Genevieve Pullis LaRouche, Field Office Supervisor  
U.S. Fish and Wildlife Service  
Chesapeake Bay Field Office  
Annapolis, Maryland 21401  
202.341.5882  
[genevieve\\_larouche@fws.gov](mailto:genevieve_larouche@fws.gov)

From: Chris Hainzer <[usfws@fws.gov](mailto:usfws@fws.gov)>  
Sent: Friday, May 12, 2023 7:08 PM  
To: LaRouche, Genevieve <[Genevieve\\_LaRouche@fws.gov](mailto:Genevieve_LaRouche@fws.gov)>  
Subject: Threatened & Endangered Species Review Process

U.S. FISH & WILDLIFE SERVICE

This email has been generated by the "send a message" contact form on your FWS.gov profile.

Submitted on Fri, 05/12/2023 - 23:08

Name Provided:  
Chris Hainzer

Email Provided:  
[chainzer@markosky.com](mailto:chainzer@markosky.com)

Subject  
Threatened & Endangered Species Review Process

Message  
Good Afternoon

Markosky Engineering Group, Inc. of Ligonier, PA is working on threatened and endangered species for the US 219 – Meyersdale, PA to Old Salisbury Road, MD project. We are inquiring of the Chesapeake Bay field Office of US Fish and Wildlife Service for their review process.

This project proposes construction of an 8.0 mile (6 miles in Pennsylvania and 2 miles in Maryland) four-lane limited access facility on new alignment from the end of the Meyersdale Bypass in Somerset County, Pennsylvania to the newly constructed portion of US 219 in Garrett County, Maryland. The study area extends approximately eight miles from the southern end of the Meyersdale Bypass in Somerset County, Pennsylvania south to US 40 in Garrett County, Maryland. The study area encompasses portions of Elk Lick and Summit Townships in Somerset County, Pennsylvania, and the northeastern corner of Garrett County, Maryland. The study area is mostly rural, with residential and small commercial facilities, as well as larger amounts of forested areas and farmland.



Please let me know what information you would need or what process we will need to take for this review process.

Thank you,  
Chris

Submitted from <https://www.fws.gov/staff-profile/genevieve-larouche>

---



# United States Department of the Interior

FISH AND WILDLIFE SERVICE  
Pennsylvania Field Office  
110 Radnor Road, Suite 101  
State College, Pennsylvania 16801-4850



August 10, 2023

Christine Hainzer  
Markosky Engineering  
3689 Route 711  
Ligonier, PA 15658

RE: USFWS Project #2022-0001474  
(formerly #2021-1348)  
PNDI# 738552 & 786952

Dear Mr. Hainzer:

Thank you for your email of May 12, 2023, which provided the U.S. Fish and Wildlife Service (Service) with information about the State Route 6219, Section 050 (Meyersdale to Maryland) Transportation project, located in Elk Lick and Summit Townships, Somerset County, Pennsylvania; and Garrett County, Maryland. The proposed project is located within the range of the federally endangered Indiana bat (*Myotis sodalis*) and northern long-eared bat (*Myotis septentrionalis*), and the tricolored bat (*Perimyotis subflavus*), a species that is proposed to be listed as endangered. The following comments are provided pursuant to the Endangered Species Act (Act) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) to ensure the protection of endangered and threatened species.

The Federal Highway Administration (FHWA), in conjunction with the Pennsylvania Department of Transportation (PennDOT) and Maryland State Highway Administration (MDSHA), proposes to construct a new 7-mile, limited-access section of SR 6219, from SR 219, Section 019 at Meyersdale, Pennsylvania, to Old Salisbury Road in Maryland. The project under consideration involves transportation routes to provide access to regional destinations to include Interstate 68 in Maryland and the Pennsylvania Turnpike (Interstate 76). Other goals of the project include facilitating economic development, and safety improvement for the SR 219 corridor. We previously provided comment by letter dated February 12, 2022. Comments generated in that letter with regard to the Migratory Bird Treaty Act (16 U.S.C. 703-712; Ch. 128; July 13, 1918; 40 Stat. 755, as amended) and the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.) remain valid.

Federally listed, and proposed-listed bat species occur in the project area. Given this fact, review of the available information indicates that this project is likely to adversely affect these bat



species. Under provisions of Section 7(a)(2) of the Act, a Federal agency (*i.e.*, FHWA) that authorizes, funds, or carries out activities must consult with the Service to ensure that its actions will not jeopardize the continued existence of any listed species. Formal consultation is therefore necessary for any project likely to adversely affect a listed species. Consequently, we recommend that FHWA prepare and submit a Biological Assessment (BA) for this project to comply with section 7(a)(2) of the Act.

In order to determine the extent of the effects of this project on these bat species, we will need additional information including, but not limited to: the extent and description of the project action area; a detailed description of the proposed activity; site plans; site photos; biological survey reports of the action area (*i.e.*, bat surveys); highway construction methods; the use, extent and placement of any bridges, and means of access; avoidance and minimization measures; other conservation measures; and proposed mitigation to offset project effects to bats and their habitat. This information can be included in a BA.

The tricolored bat is proposed to be listed as endangered. Therefore, we recommend including consideration of this species in a conference report. Please be advised that if the tricolored bat is listed as threatened or endangered, the FHWA and PennDOT will need to evaluate whether reinitiation of consultation to include this species is appropriate to convert the conference report to a biological opinion.

If you have any questions or concerns regarding this consultation, or questions as the action agency develops the BA, please contact Jennifer Kagel at 814-206-7451.

Sincerely,

A handwritten signature in cursive script that reads "Sonja Jahrsdoerfer".

Sonja Jahrsdoerfer  
Project Leader

cc:

PennDOT – Squillario, Donohoe

USFWS – Clark, Li

PGC – Guers, Turner

KCI - Hoover

Baker – James

MD DNR – Gibson, Feller

FHWA – Crum

MDSHA – Arnold

Emails:

[ndonahoe@pa.gov](mailto:ndonahoe@pa.gov)

[asquillari@pa.gov](mailto:asquillari@pa.gov)

[ray\\_li@fws.gov](mailto:ray_li@fws.gov)

[trevor\\_clark@fws.gov](mailto:trevor_clark@fws.gov)

[suguers@pa.gov](mailto:suguers@pa.gov)

[grturner@pa.gov](mailto:grturner@pa.gov)

[deb.hoover@kci.com](mailto:deb.hoover@kci.com)

[kjames@mbakerintl.com](mailto:kjames@mbakerintl.com)

[gwendolyn.gibson@maryland.gov](mailto:gwendolyn.gibson@maryland.gov)

[danj.feller@maryland.gov](mailto:danj.feller@maryland.gov)

[jonathan.crum@dot.gov](mailto:jonathan.crum@dot.gov)

[karnold@mdot.maryland.gov](mailto:karnold@mdot.maryland.gov)





# PENNSYLVANIA GAME COMMISSION

## BUREAU OF WILDLIFE MANAGEMENT

2001 ELMERTON AVENUE HARRISBURG, PA 17110-9797 | (717) 787-5529

May 16, 2023

Christine Hainzer  
Markosky Engineering Inc.  
3689 Route 711  
Ligonier, Pennsylvania 15658  
[chainzer@markosky.com](mailto:chainzer@markosky.com)

Project Search ID: PNDI-786952

PNDI Receipt: *project\_receipt\_us\_219\_meyersdale\_md\_786952\_FINAL\_1.pdf*

Re: US 219 Meyersdale to MD road project

Elk Lick and Summit Townships, Somerset County, PA

Dear Christine Hainzer,

Thank you for submitting the Pennsylvania Natural Diversity Inventory (PNDI) Environmental Review Receipt *project\_receipt\_us\_219\_meyersdale\_md\_786952\_FINAL\_1.pdf* for review. The Pennsylvania Game Commission (PGC) screened this project for potential impacts to species and resources of concern under PGC responsibility, which includes birds and mammals only.

### Potential Impact Anticipated

The PGC has received and thoroughly reviewed the information that you provided to this office, as well as PNDI data, and determined that potential impacts to federal and state endangered bat species, are associated with your project. These species and their status are identified in the table below.

Scientific Name	Common Name	PA Status	Federal Status
<i>Myotis sodalis</i>	Indiana Bat	ENDANGERED	ENDANGERED
<i>Myotis septentrionalis</i>	Northern Long-Eared Bat	ENDANGERED	ENDANGERED
<i>Myotis lucifungii</i>	Little Brown Bat	ENDANGERED	N/A
<i>Perimyotis subflavus</i>	Tri-colored Bat	ENDANGERED	N/A
<i>Myotis leibii</i>	Eastern Small-footed Bat	THREATENED	N/A
	Hibernaculum	SPECIAL CONCERN	N/A

### Next Steps

Indiana Bats and Northern Long-Eared Bats: Indiana Bats and Northern Long-eared Bats are federally listed species under the jurisdiction of the U.S. Fish and Wildlife Service. As a result, our agency defers comments on potential impacts to these two bat species to the U.S. Fish and Wildlife Service.

Little Brown Bats, Tri-colored Bats and Eastern Small-footed Bats: In an effort to avoid potential impacts to these two species, the following seasonal timber restriction is to be implemented: *All trees or dead snags*

*greater than 3 inches in diameter at breast height that need to be harvested to facilitate the project (including any access roads or off - R.O.W. work spaces) shall be cut between November 15<sup>th</sup> and March 31<sup>st</sup>.*

Hibernaculum studies are ongoing for this project. Once the surveys and report completed, the PGC can provide recommendations based on the study results.

In addition, the proposed project is located on **State Game Lands No. 231**. Please contact Mr. Matthew Lucas, Land Management Supervisor, at 724-238-9523 to discuss the project activities and coordinate obtaining the necessary approvals if your project will impact State Game Lands. It is recommended that you coordinate with Game Commission Staff early in your project planning process.

This response represents the most up-to-date summary of the PNDI data files and is valid for two (2) years from the date of this letter. An absence of recorded information does not necessarily imply actual conditions on site. Should project plans change or additional information on listed or proposed species become available, this determination may be reconsidered.

Should the proposed work continue beyond the period covered by this letter, please resubmit the project to this agency as an "Update" (including an updated PNDI receipt, project narrative and accurate map). If the proposed work has not changed and no additional information concerning listed species is found, the project will be cleared for PNDI requirements under this agency for two additional years.

This finding applies to impacts to birds and mammals only. To complete your review of state and federally-listed threatened and endangered species and species of special concern, please be sure that the U.S. Fish and Wildlife Service, the PA Department of Conservation and Natural Resources, and/or the PA Fish and Boat Commission have been contacted regarding this project as directed by the online PNDI ER Tool found at [www.naturalheritage.state.pa.us](http://www.naturalheritage.state.pa.us).

Sincerely,



Sue Guers  
Environmental Review Lead  
Bureau of Wildlife Management  
Phone: 717-787-4250, Extension 73412  
Fax: 717-787-6957  
E-mail: [suguers@pa.gov](mailto:suguers@pa.gov)

A PNHP Partner



SLG/slg



cc: Jennifer Kagel, US Fish and Wildlife Service  
Sze Wing Yu, US Fish and Wildlife Service  
Schnupp  
Williams  
Lovallo  
Turner  
Farabaugh  
Lucas  
Trusso



Wes Moore, Governor  
Aruna Miller, Lt. Governor  
Josh Kurtz, Secretary  
David Goshorn, Deputy Secretary

## Coordination Sheet for MD DNR Environmental Review Related to Project Locations

Date of Request:  
June 15, 2023

Name of Requestor:  
Nick Baumann

FMIS Number:  
SP123G4H

Project Name and Location:  
US 219 from Meyersdale, PA to Old Salisbury Rd, MD

PennDOT and MDOT SHA propose construction of an 8.0 mile (6 miles in Pennsylvania and 2 miles in Maryland) four-lane limited access facility on a new alignment from the end of the Meyersdale Bypass in Somerset County, Pennsylvania to the newly constructed portion of US 219 in Garrett County, Maryland. The study area extends approximately eight miles from the southern end of the Meyersdale Bypass in Somerset County, Pennsylvania south to US 40 in Garrett County, Maryland. The study area encompasses portions of Elk Lick and Summit Townships in Somerset County, Pennsylvania, and the northeastern corner of Garrett County, Maryland. The Borough of Salisbury, Pennsylvania is also located within the central portion of the study area. The study area is mostly rural, with residential and small commercial facilities, as well as larger amounts of forested areas and farmland.

### NAME OF STREAM(S) (and MDE Use Classification) WITHIN THE STUDY AREA:

Meadow Run (Use I)

Unnamed Tributary to Casselman River (Use I)

Unnamed Tributary to Casselman River (Use III)

---

### DNR RESPONSE:

  ✓   Generally, no instream work is permitted in Use I streams during the period of March 1 through June 15, inclusive, during any year.

  ✓   Generally, no instream work is permitted in Use III streams during the period of October 1 through April 30, inclusive, during any year.

### ADDITIONAL RESOURCES NOTES:

Nearby Maryland Biological Stream Survey (MBSS) stations in Meadow Run document the following summary of findings for fish: Blacknose Dace, Brown Bullhead, Creek Chub, Golden Shiner, Pumpkinseed, and White Sucker.

Nearby Maryland Biological Stream Survey (MBSS) stations in Casselman River document the following summary of findings for fish and mussels: Bluntnose Minnow, Brook Trout, Brown Trout, Central Stoneroller, Common Shiner, Creek Chub, Johnny Darter, Longnose Dace, Mottled Sculpin, Northern Hogsucker, Pumpkinseed, Rainbow Trout, River Chub, Rock Bass, Smallmouth Bass, Stonecat, Striped Shiner, White Sucker, and the mussel species *Strophitus undulatus* (Creeping).



There are records of Crayfish located nearby this project site, which are in Greatest Conservation Need. Species of greatest conservation need are those animals, both aquatic and terrestrial, that are at risk or are declining in Maryland. It is crucial that water quality and hydrology be maintained during all work at this site. We would like to emphasize the need to prevent any sediment or debris from reaching the creek at this location.

The Casselman River is stocked with adult trout during the spring season in the project area. Depending upon flow and in-stream conditions, small numbers of stocked trout may be found near the project site.

Brook Trout have been documented in the Casselman River watershed in the project area, and are a high priority species for protection and restoration because of widespread declines (e.g. water temp, habitat degradation, competition from exotics) throughout its native range. While not federal or state listed, DNR recommends conservation measures to avoid and minimize trout impacts and may be unlikely to grant waivers to stream closures.

Our analysis of the information provided also suggests that the forested area on or adjacent to the project site contains Forest Interior Dwelling Bird habitat. Populations of many Forest Interior Dwelling Bird Species (FIDS) are declining in Maryland and throughout the eastern United States. The conservation of FIDS habitat is strongly encouraged by the Department of Natural Resources.

The WHS would like to emphasize the need for maximizing sediment and erosion control with supplemental measures, and maximizing stormwater infiltration to avoid degrading the wetlands that support rare species along Meadow Run. Also of concern is the presence of the state and federally-listed northern long-eared bat (*Myotis septentrionalis*) in the immediate vicinity of the proposed LOD. Multiple roosts were documented in 2014 in the immediate vicinity of the proposed LOD. MD DNR will defer to USFWS regarding any need for further survey work. Once that determination is made, we will await the findings of additional survey work if requested by USFWS. If additional survey work is not required, we will coordinate with USFWS on the review of potential impacts to NLEB. Please copy WHS/Natural Heritage on correspondence and information exchanged with USFWS on NLEB. Please note that the take of listed state endangered animals is prohibited under Maryland's Nongame and Endangered Species Conservation Act.

#### ADDITIONAL COMMENTS ON BMPS:

For projects involving the use of grout, mortar or concrete in or near the stream channel, caution should be used to avoid significant instream pH changes (pH spikes) onsite and downstream; these spikes can potentially be caused by the curing processes of these materials if they come in contact with streamflow while curing. Care should also be taken in design and construction to maintain passage opportunities for aquatic life after project completion.

The project should be designed to maintain or enhance fish passage through the project area, particularly during low flow periods.


The project area may be within or adjacent to mapped wetland areas, impacts from the use of heavy equipment, disposal of excavated material, or other construction activities should be avoided to the extent possible. When there is no reasonable alternative to the adverse effects on wetlands or other aquatic or terrestrial habitat, the applicant shall be required to provide measures to mitigate, replace, or minimize the loss of habitat.

Existing stream channel and riparian vegetation should be preserved as much as possible to maintain aquatic habitat and provide shading to the stream as per the conditions stipulated in Code of Maryland Regulation (COMAR), "It is the policy of the State that riparian forest buffer adjacent to Class III waters shall be retained whenever possible to maintain the temperatures essential to meeting this criterion." (COMAR Sec.08.02.03-3).

Disturbance of the riparian corridor should be minimized to the greatest extent possible. Disturbed areas in the riparian corridor should be revegetated with native forest species to provide habitat and moderate potential temperature impacts. Areas designated for the access of heavy equipment and for the disposal of excavated material should avoid impacts to wetlands and/or mature forest vegetation.

The fisheries resources in the above area should be adequately protected by the instream work restrictions referenced above, stringent sediment and erosion control methods, and other Best Management Practices typically used for protection of stream resources.

MD DNR, Environmental Review Program signature

A handwritten signature in black ink, reading "Lindsey Sestak", is centered within a light gray rectangular box.

Lindsey Sestak

DATE: 10/04/2023



APPENDIX C  
Bat Survey Reports

---

Somerset County, Pennsylvania • Garrett County, Maryland

# **Abandoned Mine Investigations for the U.S. 6219, Section 019 Highway Improvement Project**



August 27 - October 1, 2005  
Bat Conservation and Management, Inc.  
*Carlisle, Pennsylvania*

---





# Abandoned Mine Investigations for the U.S. 6219, Section 019 Highway Improvement Project

August 27 - October 1, 2005

Prepared for:  
Pennsylvania Department of Transportation  
Maryland State Highway Administration  
Federal Highway Administration

Prepared by:  
Bat Conservation and Management, Inc.  
220 Old Stone House Road, Carlisle, Pennsylvania 17013  
717-241-2228 (office and fax) 814-442-4246 (cell)  
[www.batmanagement.com](http://www.batmanagement.com)

## Participating Personnel

### Project Principal:

John Chengler  
*Bat Conservation and Management, Inc.*

### Surveyors:

John Chengler  
*Bat Conservation and Management, Inc.*

Kevin Rhome  
*Bat Conservation and Management, Inc.*

### Photography by:

John Chengler

### Report Prepared by:

John Chengler





# Abandoned Mine Investigations for the U.S. 6219, Section 019 Highway Improvement Project

## Contents

---

<b>I</b>	Participants
<b>IV</b>	General Sampling Location
<b>1</b>	Overview
<b>6</b>	Assessment and Sampling Procedure
<b>7</b>	Site Summary
<b>12</b>	Discussion
<b>14</b>	Brief Natural History of Local Species
<b>20</b>	Appendix I: PGC Abandoned Mine Protocol
<b>22</b>	Appendix II: Trapping Data Sheets

## Tables

6	Table 1: Abandoned Mine Feature Coordinates
12	Table 2: Capture Totals
13	Table 3: Capture and Acoustic File Totals

## Figures

IV	Figure 1: General Sampling Locations
2	Figure 2: Overview of U.S. Route 219 Alternatives
3	Figure 3: Mine Feature Map, Southern Portion
4	Figure 4: Mine Feature Map, Northern Portion
4	Figure 5: Mine Feature Map, Central Portion
7	Figure 6: Mine 1
8	Figure 7: Mine 4
8	Figure 8: Mine 9
10	Figure 9: Mine 20, 21
10	Figure 10: Mine 26
14	Figure 11: Big brown bat
14	Figure 12: Eastern pipistrelle bat
15	Figure 13: Red bat
15	Figure 14: Hoary bat
16	Figure 15: Indiana bat
16	Figure 16: Indiana bat
17	Figure 17: Little brown bat
17	Figure 18: Northern long-eared bat
18	Figure 19: Silver-haired bat
19	Figure 20: Eastern small-footed bat

*Cover:  
Mine #1 during assessment survey*



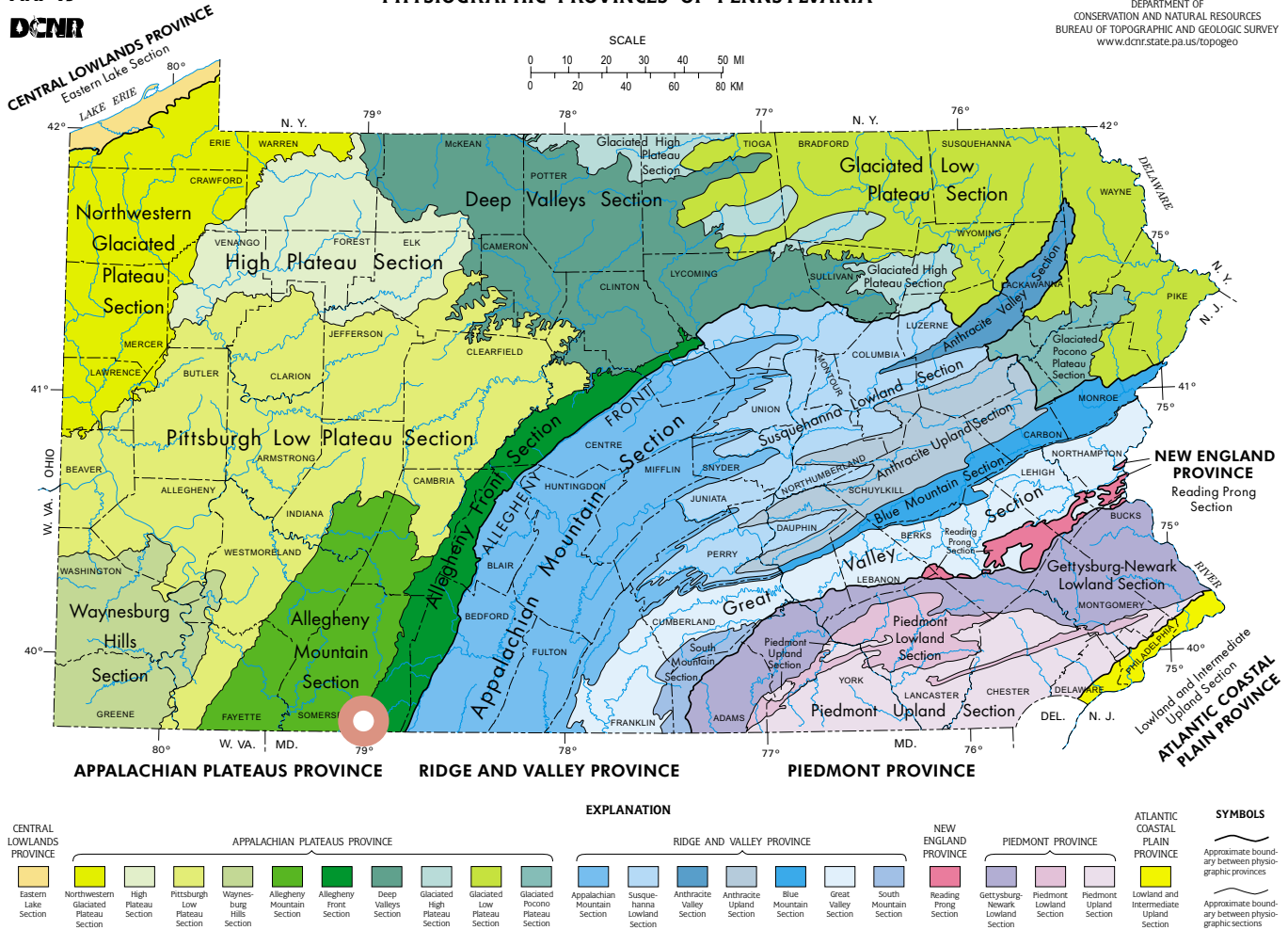
# General Sampling Locations

MAP 13

**DCNR**

## PHYSIOGRAPHIC PROVINCES OF PENNSYLVANIA

COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF  
CONSERVATION AND NATURAL RESOURCES  
BUREAU OF TOPOGRAPHIC AND GEOLOGIC SURVEY  
www.dcnr.state.pa.us/topogeo



Compiled by W. D. Sevon. Fourth Edition, 2000.

## Route 6219 Improvement Project, Somerset County Pennsylvania

Figure 1

# Overview

The Route 6219 Improvement Project is located in Garrett County, Maryland and Somerset County, Pennsylvania. The project consists of the construction of approximately 9 miles of four-lane limited access highway south from Meyersdale, Pennsylvania bypassing the borough of Salisbury to the east before linking with I-68 south of the Pennsylvania state line (Figures 1 and 2). The project is located within the known range of the endangered Indiana bat (*Myotis sodalis*). The United States Fish and Wildlife Service (USFWS) State College Office requested surveys for potential Indiana bat hibernacula near the project area. Additional time sensitive surveys would be necessary to determine bat use should potential habitat occur.

The federally endangered Indiana bat forms summer nursery colonies in woodland habitat. Only one summer nursery colony (Blair County) and two summer bachelor colonies (Bedford County) are known in Pennsylvania. In September and October this species migrates and winters in caves and abandoned mines that provide an appropriate environment for efficient hibernation. Indiana bats spend only a fraction of their life cycle in and around cave/mine entrances. During spring and fall they may make use of entrances in a variety of ways including swarming and mating, entering or exiting hibernation, staging, or as stopovers during migration. In Pennsylvania, the animal is known to occur in very low numbers at hibernacula identified in

Armstrong, Beaver, Bedford, Blair, Butler, Centre, Fayette, Huntingdon, Luzerne, Mifflin, and Somerset counties. This survey began as abandoned deep mines were identified within the project area using Pennsylvania Geological Survey atlases depicting mine adits. Two additional adits were reported to Bat Conservation and Management, Inc. (BCM) by local landowners. In total, 28 abandoned adits were located within the study area (Table 1).

Each of these sites was field verified and then evaluated to determine the suitability of the site for use by Indiana bats. The protocols used for this evaluation were developed collectively by the USFWS State College Office, and the Pennsylvania Game Commission (PGC). As these features were field identified, characteristics such as entrance configuration, airflow, and entrance formation were the main factors used to determine bat suitability.

All sites that were determined to be potential bat habitat were sampled for bat activity in the fall of 2005. No state or federally threatened or endangered species were sampled at any sites. The Northern long eared bat (*Myotis septentrionalis*) represented 27% of the all bats captured and is listed in Pennsylvania as a species of special concern.



# U.S. Route 219 Improvement Project Alternatives Retained for Detailed Study with Deep Mines

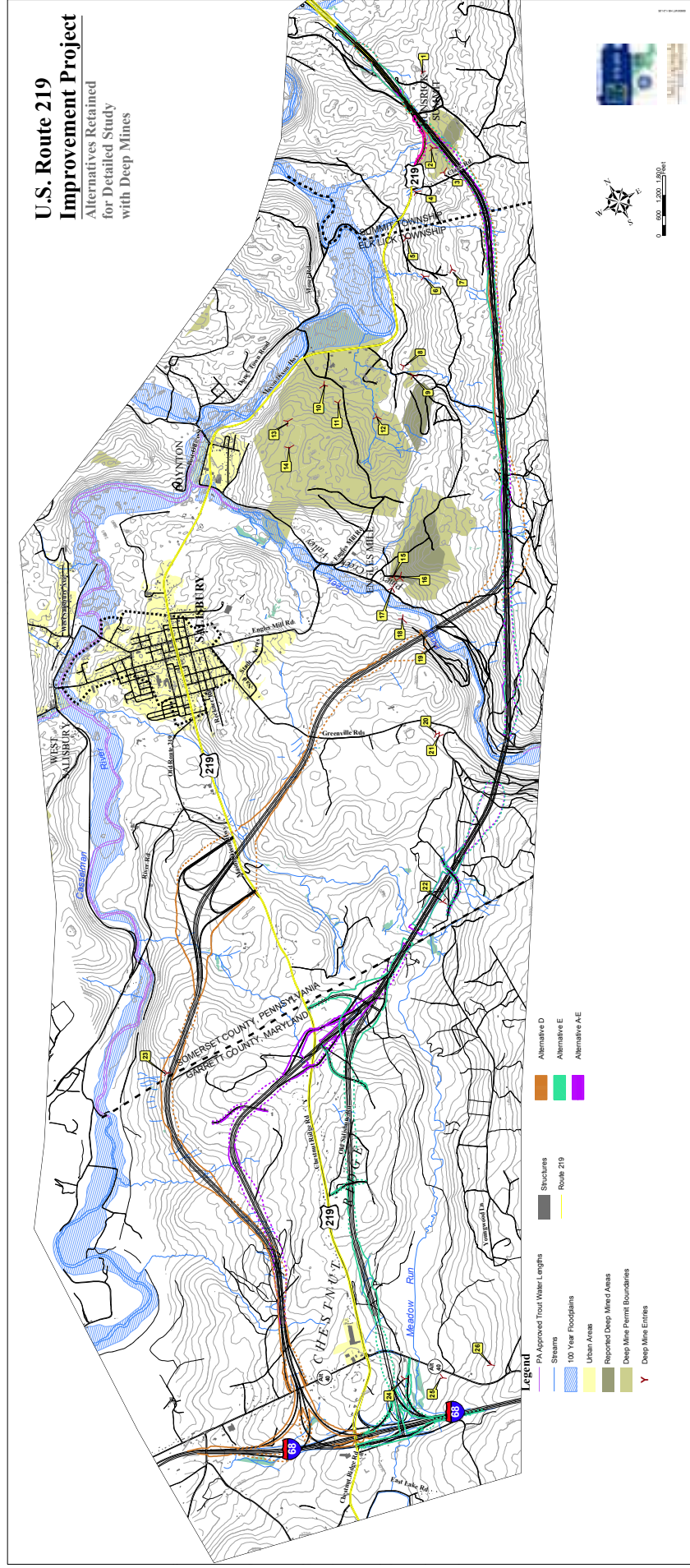


Figure 2. Overview of the U.S. Route 6219 improvement project alternatives.

# Mine Feature Summary

Ten sites were searched for, but no evidence of the historic entrance was found. Most often this involved areas where subtle indications of mining activity abound but no distinctive portal was obvious. Some have been filled in by the landowner, or are now part of an active strip mine. Others may have been minor workings initially and have since been consumed by the forest.

Nine sites were found to have collapsed entrances. These have no entrance of any size, but enough mining evidence remains nearby that surveyors were confident in their assumptions on what was the historic drift entrance. Natural slumping has been a main closure culprit, but more recently landowners may be backfilling open holes on their property for development or safety concerns.

Thin coal layers exist throughout the project area. Gentle local geology has made these layers readily available to modern quarry techniques without need of expensive, less efficient deep mining operations. At the time of operation, mineral companies were not necessarily required to seal portal entrances after the workings were abandoned. It is now common for enterprising mineral companies to revisit historic deep mine workings, removing all traces of these works as well as several less valuable underlying coal layers. These modern surface mine operations are then reclaimed and replanted.

Five sites were discovered to have been obliterated by this type of operation. These sites are now located in presently reclaimed land, offering no structure whatsoever for overwintering bats.

Three sites (Mine 1, 27, and 28) appeared to exhibit relatively stable entrances, although some are likely only a fraction of the original dimensions.

One partially collapsed site was found, Mine 19. This entrance is found at the top of an earthen mound near the ceiling of the historic portal. As soil slumps or is dumped over the drift entrance, only a thin layer covers the entrance at roof level unless a more engineered approach is taken to close the entrance. Small entrances may be excavated and used by raccoons, ground hogs, porcupines, fox, and other wildlife. This entrance is likely to remain the same in the foreseeable future, though it may be only a fraction of the original dimensions. All species of Pennsylvania cave dwelling bats prefer the largest openings possible, allowing for maneuvering and predator evasion. Entrance passages that remain tiny over a long length are also much less attractive to bats than sites with very short, simple entrance constrictions.

In all, 4 sites (Mine 1, 19, 27, and 28) were determined to possess some combination of characteristics to warrant further investigation for bat use.



Figure 3.  
Mine feature map,  
southern portion.



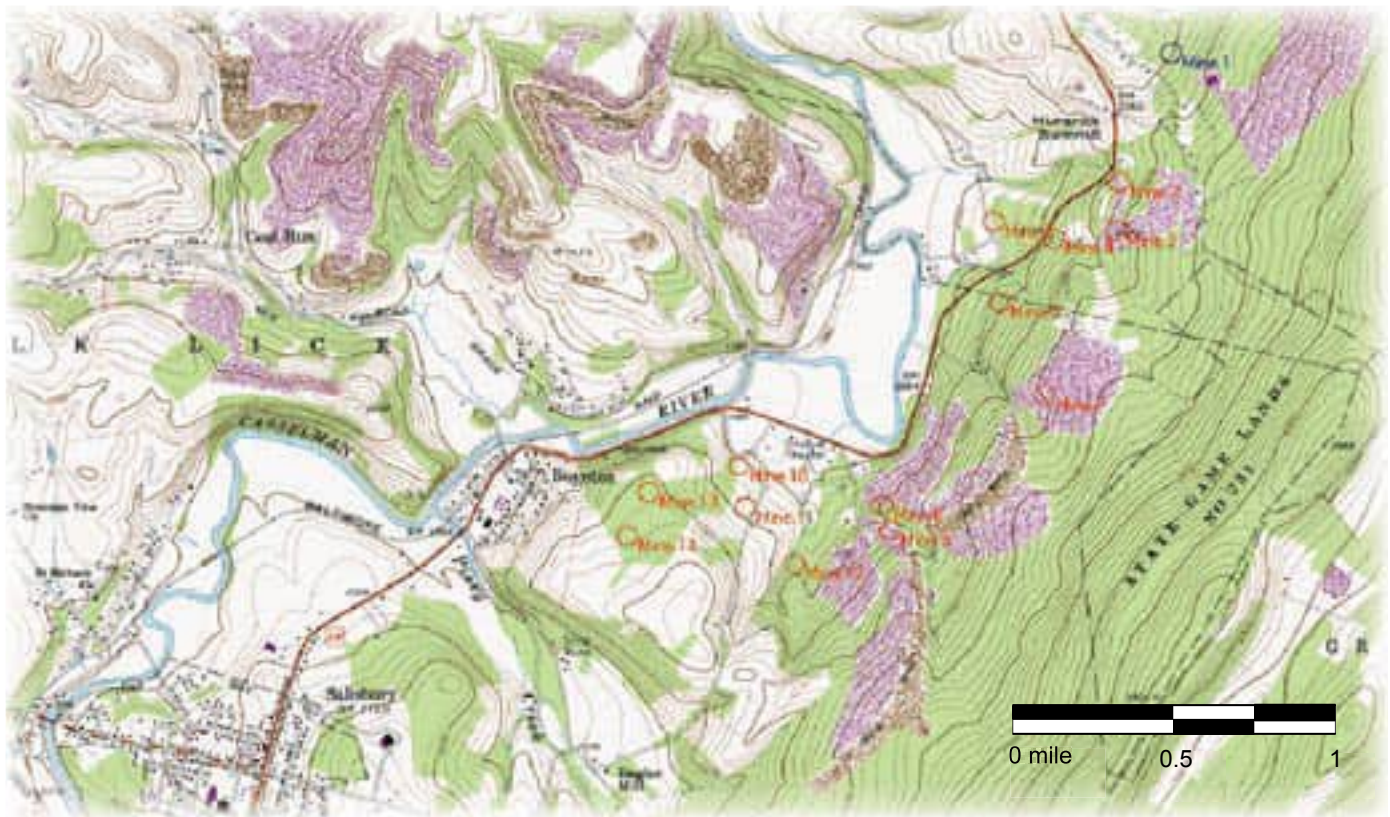


Figure 4. Mine feature map, northern portion.



Figure 5. Mine feature map, central portion.

# Assessment and Sampling Procedure

Twenty-eight sites were visited and assessed (Figures 3, 4, and 5). No site entrances were found in original working condition. Only four sites (1, 19, 27, and 28) might be humanly traversed for any distance without significant entrance modification. Hard rocks mines can sometimes be safely entered, but entering coalmines typically represents an unacceptable safety risk. Therefore, a survey method that does not require entering the mine is employed. Autumn is a time when mine entrances are most likely to be used by bats. Four sites were determined to be extensive enough to require sampling. A minimum of two nights of sampling effort is typical of the level of effort used to sample mine portals. In addition, the U.S. Fish and Wildlife Service (USFWS) Field Office in Pennsylvania and the Pennsylvania Game Commission (PGC) expect that an acoustic monitoring device be used for at least one hour between 10 PM and midnight during trapping.

## Harp Trapping

Harp trapping involves placing frames threaded with two vertical layers of monofilament line in or near the entrance of a hibernacula. Bats attempting to pass through the trap are captured either by colliding with the exterior of the lines or by entering the space between the layers. Once captured, they flutter down into a catch bag where they are held until removed for identification. This method of sampling is much less stressful to and safer for the animals than being tangled during mist net sampling. Two trap sizes were used during this project, a 3.5'x3' version and larger 6'x7' trap both manufactured by BCM.

Sampling typically begins 30 minutes before dusk and continues at least 5 hours. The site night is considered complete if the weather is not unseasonably cold (the temperature remains above 50°F for the first two hours of sampling) and there is no significant precipitation. Fall weather can be variable with nights that cool significantly. This is normal for the season and bats are attuned to the season. Bats often remain active for a period under these conditions in the fall at attractants such as mine entrances. Systems of cold and wet weather sometimes last for several days, and sampling can be rendered ineffective. BCM sampled when the weather was appropriate and did not encounter unusual weather during this survey.

Data collected at each site included trap and detector placement, weather, and general habitat information. Data collected on bats included species, sex, weight, forearm length, and net capture information. Age classification was determined when possible by the degree of ossification of the epiphyseal plates in the finger bones. Neither the USFWS nor the PGC requested banding of any captured bats. Photographs of each site were archived.

## Acoustic Sampling

BCM incorporated a modern acoustic “bat detector” to compliment the traditional harp trap capture techniques during this project. Bat detectors provide information that often allows species identification to be made. At the minimum these devices gauge the level of activity at a site regardless of species. Bat detectors are typically employed as a supplement to other sampling efforts or when safety situations are faced. If the entrance is so unstable or unsafe as to prevent trapping, a bat detector may be used without other sampling methods. Pettersson 240x bat detectors were set up on each night of the project to passively record high-frequency echolocation calls of free flying bats, which later were reviewed and sorted to species when possible.

A bat detector microphone is sensitive to sound beyond the range of human hearing. The circuitry within the detector converts the input into signals audible to the human ear and broadcasts it over a small speaker. Like birds, reptiles, and amphibians, humans hear best at frequencies below five kilohertz (kHz); most of our conversations are conducted below three kHz. A bat detector permits the recording of sounds in the 10 kHz to 200 kHz range, including those of other mammals and many insects. One D240x ultrasonic detector (Pettersson Elektronik® AB, Sweden) was used to record bat calls near each sample site. The D240x device uses a time expansion method to analyze ultrasound. The time expansion method is similar to making a tape recording of a sound and then playing it back at a lower speed, however digital techniques are used to store the signal instead of a high-speed tape recorder. Even though this is not a real-time conversion method, it offers a number of important advantages. Since the signal is stretched out in time, it is possible to hear details of the sound not audible with other methods (e.g., a technician can actually hear frequency differences within one short pulse or between different pulses). Time expansion is also the only technique that preserves all amplitude and harmonic characteristics of the original signal, making time expanded signals ideal for sound analysis in the laboratory.

The D240x devices were set to record 1.7-second call sequences that contained up to 10 bat calls in a sequence. Upon detecting ultrasound, the D240x device was set to stop recording and immediately play back the captured sound 10x slower than real time, which takes just under 20 seconds. The detector's sound output was recorded into a portable digital recorder, an iRiver model iFP-795, and later downloaded to computers running SonoBat bat call analysis software (SonoBat®, Arcata, California). A bat lingering near the detector may generate more than one call sequence file depending on speed, proximity, direction,



and amplitude. While file totals do not necessarily represent individual numbers of bats, the file totals can give a rough comparison of bat activity between sites in this project.

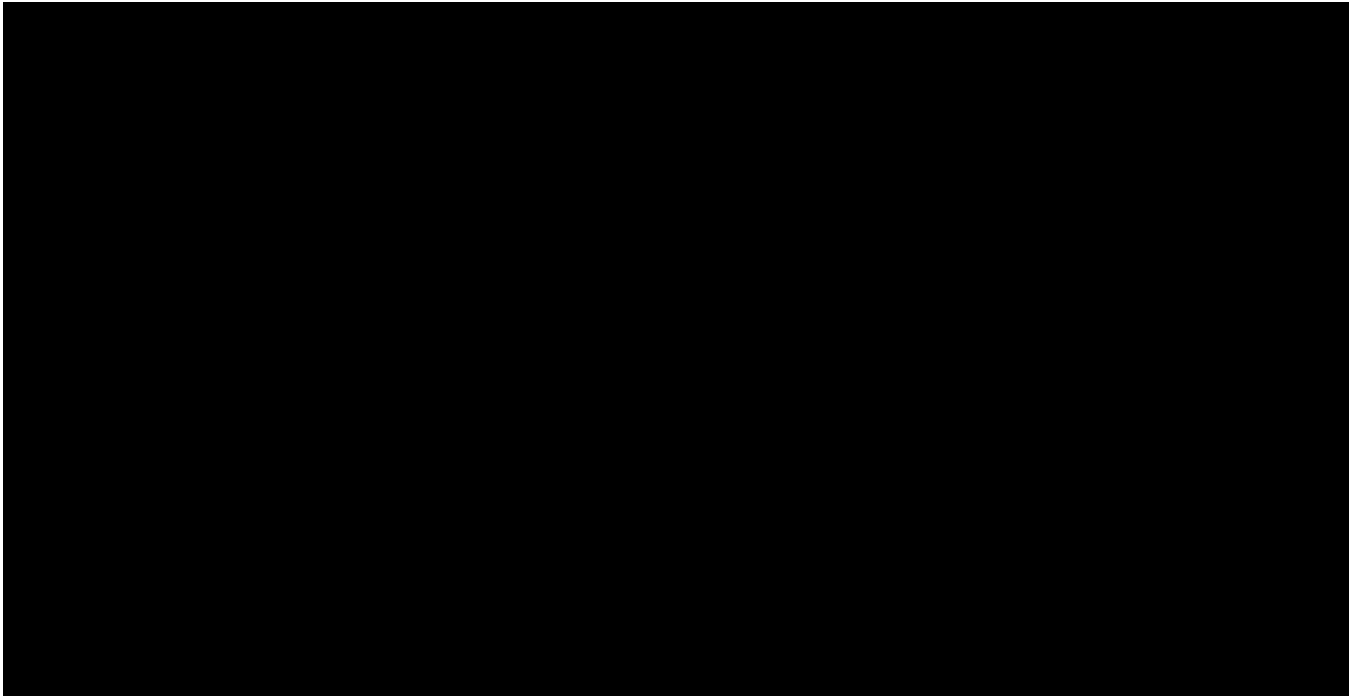
Atmospheric absorption reduces the operational range of echolocation in air and appears to limit its effectiveness to a maximum of about 15.2-meters (50 feet). Only the few bat species that emit very low frequency echolocation calls are able to reach even this distance. Laboratory studies with big brown bats (covering frequencies of 60-30 kHz) have shown that these animals are quite “near-sighted,” first detecting a 2.0-centimeter (0.75 inch) sphere at approximately 4.9-meters (16 feet). As a result, bat detectors only record bat calls that are close to the sampling station. Nevertheless it is generally assumed that bat detectors will detect some bat species that would not be captured in even the most elaborate mist net set.

A single detector/recording unit was located near the extreme edges of each harp trap site each night, for a total of six detector-nights. Each detector set-up was stationary

and automated to collect passive recordings for the entire duration of the trapping effort at each site.

Files that were generated by the acoustic system were manually identified and sorted for preliminary species identification based on known call characteristics. The unknown calls were individually compared with a library of known reference samples. These reference samples were recorded throughout the summer and fall of 2004 and 2005 with the identical equipment used for the monitoring survey. This reference library contains multiple recordings of all bat species commonly found in the northeastern United States, including rare and endangered species. The library is supplemented by additional reference calls of hoary bats and eastern red bats from Dr. Joseph M. Szewczak, Humboldt State University, Arcata CA. Call analysis, especially of calls recorded in a passive manner, is not an exact science due to the animals’ abilities to vary their echolocation calls and the subjective nature of identification, and not all call sequences recorded can be unequivocally identified to species.

**Table 1: Mine Feature Coordinates**



# Site Summary

## Mine 1

A foot search was conducted for this site on August 28, 2005. An empty shell of a block building is located in the open forest 300' from the road. A small stream flows past this foundation. Following the water upstream leads to an obvious coal mine entrance 6' wide and 3' high. An old mine cart is in front of the mine, more than half buried in the sediment outflow from the drift. A strong draft of wind can be felt emerging from the drift and cold air can be felt over 100' away. A passage can be seen trending east at least 50'. Remnants of a rail line and mine-related foundations are nearby. Total time on site searching: 50 minutes. John Chenger, Kevin Rhome

The mine was surveyed on September 17 and 18, 2005 by John Chenger. A 6'x7' harp trap was placed parallel with the entrance dripline, and essentially filled the entrance area flyway. Temperatures under clear skies each night ranged between 68°F and 55°F. Twenty-seven (27) bats were captured including 14 little brown bats (*Myotis lucifugus*), 7 Northern long-eared (*Myotis septentrionalis*), and 6 Eastern pipistrelles (*Pipistrellus subflavus*).

A Pettersson 240x bat detector and an Iriver digital recorder were placed along the stream about 50' from the entrance pointing upwards. The detector was not placed at the entrance because the device would have been overwhelmed with multiple call sequences in each file. On September 17 the detector was active between 10 PM and midnight and recorded 45 call sequences. Files were sorted and 37 were attributed to Eastern pipistrelles and 8 attributed to Northern Long-ear bats. On September 18

the recorder was operating between 7:00 and midnight. Eighty-five (85) files were generated including 40 attributed to Eastern pipistrelles, 18 to Northern long-ear bats, and 17 little brown bats. Ten files are of some undetermined *Myotis* species. The detector was monitoring approximately 7 hours averaging about 18 call sequence per hour.

## Mine 2

A foot search was conducted for this site on August 28, 2005. The forest immediately behind a mobile home was searched. The homeowner was aware of previous mining activity but did not know of an actual entrance. There are a few old rails from tracks nearby. No entrance or other mining evidence was immediately apparent. Total time on site searching: 35 minutes. John Chenger, Kevin Rhome

## Mine 3

A foot search was conducted for this site on August 28, 2005. The area of the reported mine has been reclaimed and is presently a meadow containing immature trees. No entrance was apparent. Total time on site searching: 40 minutes. John Chenger, Kevin Rhome

## Mine 4

A foot search was conducted on August 28, 2005. An old outbuilding is visible from the road. Just southeast of this structure a 20' deep collapsed trench can be followed 300' southeast through thick hemlocks ending in a blind valley. There are timbers visible in the bottom of the trench, along with old rail remnants. No open portals were found in this area. Time on site searching: 70 minutes. John Chenger, Kevin Rhome

## Mine 5

A foot search was conducted for this site on October 1, 2005. A fragment of an old rail line and a concrete structure are found at this location. No entrance was apparent. Total time on site searching: 30 minutes. Kevin Rhome

## Mine 6

A foot search was conducted for this site on August 28, 2005. The reported mine location is in a small woodlot between a mobile home and a public road. The homeowner was unaware of previous mining activity. No entrance or mining evidence was immediately apparent. Total time on site searching: 40 minutes. John Chenger, Kevin Rhome



Figure 6. Mine 1 during harp trap sampling



### Mine 7

A search was conducted on October 1, 2005. This land has been strip mined and reclaimed. Presently the land where an entrance was is now a meadow. No open portals were found in this area. Time on site searching: 30 minutes. Kevin Rhome

### Mine 8

A search was conducted on October 1, 2005. Upon entering the forest, spoil piles are evident. Moving past the piles northeast, the land has been strip mined and reclaimed. No open portals were found in this area. Time on site searching: 30 minutes. Kevin Rhome

### Mine 9

A search was conducted on October 1, 2005. On the south side of the road is a collapsed trench/adit containing timber remnants. An old fan house is located in the trench and another related outbuilding foundation is immediately to the west. A small stream emerges from the workings and covers much of the bottom of the trench. A very small 2' wide, 1' high hole can be found under a tree at the east end of the trench. This leads to a very small chamber which was formed by slump action caused by the stream action and does not lead into any workings. No airflow was observed. No open portals were found in this area. Time on site searching: 100 minutes. John Chenger, Kevin Rhome



*Figure 7. Mine 4 site investigation*

### Mine 10

A foot search was conducted on August 28, 2005. A steeply sided, forested blind valley is located at the reported mine location. No open portals were found in this area, although the odd topography suggest past mine use. Time on site searching: 30 minutes. John Chenger, Kevin Rhome

### Mine 11

A search was conducted on October 1, 2005. This location is within an open deciduous forest with relatively high visibility. No open portals were found in this area. Time on site searching: 30 minutes. John Chenger, Kevin Rhome

### Mine 12

A search was conducted on October 1, 2005. The area is located in open deciduous forest. No open portals were found in this area. Time on site searching: 40 minutes. Kevin Rhome

### Mine 13

A search was conducted on October 1, 2005. This location is in open deciduous forest with relatively high visibility. A cornfield is nearby. The mine location was at an intersection of two old roads where an old clearing has become overgrown with brush. No open portals were found in this area. Time on site searching: 60 minutes. John Chenger



*Figure 8. Mine 9 site investigation*

### **Mine 14**

A search was conducted on October 1, 2005. This location is in open deciduous forest with relatively high visibility. Several cornfields are nearby. The mine location was in open woods with low slope. A number of trees were blown down. No open portals were found in this area. Time on site searching: 60 minutes. John Chenger

### **Mine 15**

A foot search was conducted on August 28, 2005. This is one reported entrance in a small group of three. A large, obvious spoil pile is immediately encountered east of Piney Run Road within deciduous forest. From the top of the spoil pile, there are a number of adit traces and sinks located within 500 feet to the southeast. There is another parallel level of similar old development traces approximately 75 feet higher in elevation. A few hundred feet northeast of Mine 15 there is small brick foundation next to what appears to have been one of the better entrances but now is merely an old collapsed trench. Just beyond this to the north, the forest gives way to pasture which appears to be a reclaimed strip mine which is not depicted on the USGS Meyersdale/Avilton 7.5 minute topographic map. No open portals were found in this area. Time on site searching: 90 minutes. John Chenger, Kevin Rhome

### **Mine 16**

A foot search was conducted on August 28, 2005. This is one reported entrance in a small group of three. A large, obvious spoil pile is immediately encountered east of Piney Run Road within deciduous forest. From the top of the spoil pile, there are a number of adit traces and sinks located within 500 feet to the southeast. There is another parallel level of similar old development traces approximately 75 feet higher in elevation. A few hundred feet northeast of Mine 15 there is small foundation next to what appears to be an old collapsed trench. Just beyond this the forest gives way to pasture that appears to be a reclaimed strip mine not depicted on the USGS Meyersdale/Avilton 7.5 minute topographic map. No open portals were found in this area. Time on site searching: 90 minutes. John Chenger, Kevin Rhome

### **Mine 17**

A foot search was conducted on August 28, 2005. This is one reported entrance in a small group of three. A large, obvious spoil pile is immediately encountered east of Piney Run Road within deciduous forest. From the top of the spoil pile, there are a number of adit traces and sinks located within 500 feet to the southeast. There is another parallel level of similar old development traces approximately 75

feet higher in elevation. A few hundred feet northeast of Mine 15 there is small foundation next to what appears to be an old collapsed trench. Just beyond this the forest gives way to pasture that appears to be a reclaimed strip mine not depicted on the USGS Meyersdale/Avilton 7.5 minute topographic map. No open portals were found in this area. Time on site searching: 90 minutes. John Chenger, Kevin Rhome

### **Mine 18**

A foot search was conducted on August 28, 2005. This entrance was reportedly located on the west bank of Piney Creek, directly behind several private residences. Homeowners indicated no knowledge of a mine in that location, but instead reported on Mine 19, 27, and 28. The area was searched regardless of the landowner reports and no open portals were found in this area. No evidence of previous mining activity was immediately apparent. Time on site searching: 20 minutes. Kevin Rhome

### **Mine 19**

A foot search was conducted on September 30, 2005. This entrance is located 75' above the west bank of Piney Creek. Locals also refer to the mine entrance as "panther hole." The drift is on a very steep hillside without old road traces. The entrance is largely collapsed and only a 3' high, 4' wide crawlway remains. The crawl slopes down over rubble and the passage cannot be estimated beyond. No airflow was apparent. No other evidence of previous mining activity was visible. Time on site searching: 120 minutes. John Chenger, Kevin Rhome

The mine was surveyed on September 30 and October 1, 2005 by John Chenger and Kevin Rhome. A 6'x7' harp trap was placed parallel with the entrance dripline, and essentially filled the entrance area flyway. Temperatures under clear skies each night ranged between 62°F and 42°F. Four bats were captured including 2 little brown bats, and 2 Eastern pipistrelles.

A Pettersson 240x bat detector and an Iriver digital recorder were placed at the entrance pointing upwards. The detector was placed 20' from the entrance, pointing at the entrance. On September 30 the detector was active between 8 PM and midnight and recorded 3 call sequences attributed to Eastern pipistrelles. On October 1 the recorder was operating between 8:00 and midnight. Three files were generated attributed to the big brown bat (*Eptesicus fuscus*). The detector was monitoring approximately 8 hours and averaged less than 1 call sequence per hour.



### Mine 20

A foot search was conducted on August 27, 2005. This is one of two entrances reported in relatively open deciduous forest. Coal spoil piles are located north of a gravel road. There is mining evidence in this entire woodlot consisting of at least 7 traces of trenches and 2 entrance drifts that now end in blind valleys. No open portals were found in this area. Time on site searching: 60 minutes. *John Cheng*

### Mine 21

A foot search was conducted on August 27, 2005. This is one of two entrances reported in relatively open deciduous forest. Coal spoil piles are located north of a gravel road. There is mining evidence in this entire woodlot consisting of at least 7 traces of trenches and 2 entrance drifts that now end in blind valleys. No open portals were found in this area. Time on site searching: 60 minutes. *John Cheng*

### Mine 22

A search was conducted on October 1, 2005. This land has been strip mined and reclaimed. Presently the land where an entrance was is now a meadow. No open portals were found in this area. Time on site searching: 45 minutes. *John Cheng*

### Mine 23

A search was conducted on October 2, 2005. This site is located within a few hundred feet of a utility right-of-way. Mining traces include a built up earthen work area leading into a small blind valley. A smaller collapse feature is just inside the treeline on the north side of the right-of-way, downhill of the larger working. No open portals were found in this area. Time on site searching: 90 minutes. *John Cheng, Kevin Rhome*



Figure 9. Old road leading into a blind valley near Mine 20 and 21.

### Mine 24

A foot search was conducted for this site on August 28, 2005. The topography has been significantly altered by the construction of an I-68 exit ramp at the location of the reported entrance. No entrance or mining evidence was immediately apparent. Total time on site searching: 35 minutes. *Kevin Rhome*

### Mine 25

A foot search was conducted on August 28, 2005. A patch of forest adjacent to a recycling center and US 40 Alternate was searched. From the recycling center, a few small depressions are located near US 40 Alternate in the brush. The slope and forest cover increases to the northeast and no other features are notable. Total time on site searching: 35 minutes. *John Cheng*

### Mine 26

A foot search was conducted on August 28, 2005. The area is located in a gently sloping, open deciduous forest littered with small fragments of sandstone. Small, shallow depressions are located 600 feet due west of the reported mine location within sight of a garage. Additional depressions are just northeast of the garage. All depressions are only traces of previous development. No portal was found. Total time on site searching: 90 minutes. *John Cheng, Kevin Rhome*

### Mine 27

A foot search was conducted on August 27, 2005. This entrance is located on the east bank of Piney Creek, approximately 15 feet above the stream. The entrance is 12' wide and 5' high. The passage can be seen to extend at least 40' trending northeast. Time on site searching: 60 minutes. *John Cheng*



Figure 10. Depression in the vicinity of the Mine 26 location.

The mine was surveyed on September 30 and October 1, 2005 by John Chenger and Kevin Rhome. A 6'x7' harp trap was placed parallel with the entrance dripline, and essentially filled the entrance area flyway. Temperatures under clear skies each night ranged between 62°F and 42°F. Two Eastern pipistrelles were captured.

A Pettersson 240x bat detector and an Iriver digital recorder were placed on a ledge overlooking the entrance. On September 30 the detector was active between 8:15 PM and 11:30 PM and recorded 2 call sequences attributed to Northern long-eared bats. On October 1 the recorder was operating between 9:30 PM and 11:30 PM. No files were generated containing bat calls on this night. The detector was monitoring approximately 5 hours and averaged less than 1 call sequence per hour.

### **Mine 28**

A foot search was conducted on August 27, 2005. This entrance is located 75' from the east bank of Piney Creek, approximately 20 feet above the stream. The entrance is

8' wide and 3' high. The passage can be seen to extend at least 40' trending northeast. Cold air can be felt emerging from the entrance. Several bat droppings were found on a large rock under the dripline. Access to the portal was improved by using earth to form a raised platform in front of the entrance. Another entrance may have existed 100' south where a seep emerges from a slump in the hillside. Time on site searching: 60 minutes. *John Chenger*

The mine was surveyed on September 30 and October 1, 2005 by John Chenger and Kevin Rhome. A 3'x4' harp trap was placed perpendicular with the entrance dripline. The mine entrance was then covered with plastic. Temperatures under clear skies each night ranged between 62°F and 42°F. Two Eastern pipistrelles were captured.

A Pettersson 240x bat detector and an Iriver digital recorder were placed on a ledge overlooking the entrance. On September 30 the detector was active between 8:15 PM and 11:30 PM and recorded 2 call sequences attributed to Northern long-eared bats. On October 1 the recorder was operating between 9:15 PM and 11:30 PM. No files were generated containing bat calls on this night. The detector was monitoring approximately 5 hours and averaged less than 1 call sequence per hour.



# Discussion

Data collected by Bat Conservation and Management, Inc. included mine portal assessment, harp trapping, and acoustic monitoring. This data suggests that none of these portals presently provides habitat suitable for large numbers of bats of any species.

Four potential hibernacula (Mines 1, 19, 27 and 28) were sampled for bat use under the PGC Abandoned Mine Assessment Protocol (Appendix I) in fall of 2005. Thirty-three (33) bats were captured including 16 little brown bats, 10 Eastern pipistrelles, and 7 Northern long-eared bats. Acoustic detectors deployed at each site also identified big brown bats (*Eptesicus fuscus*) at Mine 19 (Table 3).

Harp trapping provided no evidence that the four portals (Mines 1, 19, 27 and 28) receive usage by species listed as threatened or endangered. If present, threatened and endangered species such as the Indiana bat and Eastern small-footed bat (*Myotis leibii*) occur in such low numbers or infrequently that the USFWS sampling protocol failed to reveal them during the sample period.

Almost 27% of the individuals captured were Northern long-eared bats, which are listed as a Pennsylvania species of special concern by the Pennsylvania Biological Survey (PABS). This classification covers taxa that could be appropriate candidates for Endangered or Threatened classifications (based on information received by the PABS), but for which no conclusive data on biological vulnerability and threats to their survival exist to support

those listings. This category also includes species for which current data indicates that the species is uncommon but secure in Pennsylvania. This category realizes the potential threats to species' populations or habitats and/or includes the need for further research and field study to change or ascertain the status of taxa. Identified candidate species are placed in one of three categories to reflect their general biological status. The Northern long-ear is presently listed as a candidate rare species. This category includes species existing only in one or a few restricted geographical areas or habitats within Pennsylvania, or occurring in low numbers over a relatively broad area of the Commonwealth. More recent data from across the state suggests that the species is more abundant and widespread than previously thought. Presently some biologists are considering proposing to remove the Northern long-ear from this category (Calvin Butchkoski, personal communication). This category has no legislative authority.

Bats must constantly seek alternative sites for hibernation to remain viable in the long term. Certain abandoned mines provide the ideal stable temperature and humidity requirements required by six species of Pennsylvania's bats, including the federally endangered Indiana bat. A hibernacula site such as Mine 1 that does exhibit a degree of bat activity today may become more heavily used in the future assuming the internal environment be ideal. Therefore should development encroach upon this site some years in the future it could be re-evaluated for bat use and managed if necessary.

**Table 2: Capture Totals**

Species		Mine 1	Mine 19	Mine 27	Mine 28	Totals		
						M	F	Total
<i>Myotis lucifugus</i>	M	12	2	0	0	14		16
	F	2	0	0	0		2	
<i>Myotis septentrionalis</i>	M	4	0	0	0	4		7
	F	3	0	0	0		3	
<i>Pipistrellus subflavus</i>	M	4	2	2	0	8		10
	F	2	0	0	0		2	
Totals		27	4	2	0	26	7	33
		33				33		33

### Table 3: Capture and Acoustic File Totals

Species	Mine 1		Mine 19		Mine 27		Mine 28	
	Net	Acoustic	Net	Acoustic	Net	Acoustic	Net	Acoustic
<i>Eptesicus fuscus</i>	0	0	0	3	0	0	0	0
<i>Myotis (unclassified)</i>	0	11	0	0	0	0	0	0
<i>Myotis lucifugus</i>	14	21	2	0	0	0	0	0
<i>Myotis septentrionalis</i>	7	21	0	0	0	2	0	2
<i>Pipistrellus subflavus</i>	6	71	2	3	2	0	0	0
<b>Total:</b>	<b>27</b>	<b>124</b>	<b>4</b>	<b>6</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>2</b>

*Acoustic file counts do not represent individual numbers of bats.*



# Brief Natural History of Local Bat Species

## Big Brown Bat

*Eptesicus fuscus*

No federal listing

Weight: 14 - 21 grams (0.5 - 0.7 ounce)

Wingspan: 32 - 40 centimeters (13 - 16 inches)

Distribution: From southern Canada through southern North America into South America, including many islands in the Caribbean.

These bats are closely associated with humans and are familiar to more people in the United States than any other species of bat. Most summer roosts are in attics, barns, bridges, or other man-made structures, where colonies of a few to several hundred individuals gather to form maternity colonies. They move into caves, mines, and other underground structures to hibernate only during the coldest weather. Where most of these bats winter remains unknown. It emerges at dusk and flies a steady, nearly straight course at a height of 6 - 10 meters (20 - 33 feet) in route to foraging areas. Its large size and steady flight make it readily recognizable. Apparently, some individuals use the same feeding ground each night, for a bat can sometimes be seen following an identical feeding pattern on different nights. After feeding, the bat flies to a night roost to rest; favored night roosts include garages, breezeways, and porches of houses. These bats consume beetles, ants,

flies, mosquitoes, mayflies, stoneflies, and other insects. Mating occurs in autumn and winter, females store sperm, and fertilization takes place in spring. In the eastern United States, big brown bats usually bear twins in early June. In the western United States, usually only one baby is born each year. It is common throughout most of its range.



Figure 11: Big Brown Bat

## Eastern Pipistrelle Bat

*Pipistrellus subflavus*

Weight: 6 - 8 grams (0.2 - 0.3 ounce)

Wingspan: 21 - 26 centimeters (8 - 10 inches) Distribution: eastern Canada, most of the eastern United States, southward through eastern Mexico to Central America

Caves, mines, and rock crevices are used as hibernation sites in winter, and occasionally as night roosts in summer. These bats rarely occur in buildings, and apparently most roost in trees in summer. This species inhabits more caves in eastern North America than any other species of bats, usually hanging singly in warmer parts of the cave. An individual may occupy a precise spot in a cave on consecutive winters; it usually has several spots in which it hangs, shifting from one to another during the winter. This bat emerges from its daytime retreat early in the evening. It is a weak flier and so small that it may be mistaken for a large moth. Eastern pipistrelle bats usually are solitary, although occasionally in late summer four or five will appear about a single tree. The flight is erratic, and the foraging area is small. It often forages over waterways and forest edges and eats moths, beetles, mosquitoes, true bugs, ants, and other insects. Mating occurs in autumn, sperm

is stored during winter, and fertilization takes place in spring. These bats usually bear twins in late spring or early summer. Babies are born hairless and pink with eyes closed, and they are capable of making clicking sounds that may aid their mothers in locating them. They grow rapidly and can fly within a month. This species is common throughout its range.



Figure 12: Eastern Pipistrelle

## Eastern Red Bat

*Lasiurus borealis*

No federal listing

Weight: 9 - 15 grams (0.3 - 0.5 ounce)

Wingspan: 28 - 33 centimeters (11 - 13 inches),

Distribution: Southern Canada, the eastern United States (except the Florida Peninsula), and northeastern Mexico.

Eastern red bats spend daylight hours hanging in foliage of trees. They usually hang by one foot, giving them the appearance of dead leaves. Although these bats seldom enter caves for any distance, they often swarm about cave entrances in autumn. In colder parts of their range, they may migrate south in winter or hibernate in hollow trees or leaf litter. These bats are almost completely furred, except for the ears and parts of the wings, and they can respond to subfreezing temperatures by increasing their metabolism. Predators include several kinds of birds, especially blue jays. Eastern red bats emerge early in the evening and often fly on warm winter afternoons. They forage regularly over the same territory on successive nights. They commonly feed beneath street lights. Eastern red bats consume moths, crickets, flies, mosquitoes, true bugs, beetles, cicadas, and other insects. Eastern red bats mate in flight during August and September, sperm is stored over winter, and females give birth to one to four babies

(average is 3.2) during late spring or early summer. Pups are born hairless, with the eyes closed, and they cling to the fur of their mother with their teeth, thumbs, and feet. It is common throughout most of its range, except for the New England states where it seems to be more infrequent.



Figure 13: Eastern Red Bat

## Hoary Bat

*Lasiurus cinereus*

No federal listing

Weight: 25 - 30 grams (0.9 - 1.1 ounces)

Wingspan: 34 - 41 centimeters (13 - 16 inches)

Distribution: Southern Canada through most of South America, including Hawaii, Iceland, Bermuda, and the Dominican Republic.

Hoary bats are one of America's largest and most handsome bats. With their long, dense, white-tipped fur, they have a frosted, or hoary, appearance. They spend their summer days concealed in the foliage of trees where they choose a leafy site well covered above but open from underneath, generally 3-5 meters (10-17 feet) above the ground usually on the edge of a clearing. Hoary bats don't emerge to feed until after dark, but during migration, they may be seen soon after sundown. They sometimes make round trips of up to 24 miles on the first foraging flight of the night, then make several shorter trips, returning to the day roost about an hour before sunrise. Because they rarely enter houses and spend the daylight hours well concealed, humans rarely have an opportunity to see these bats. Northern populations make long seasonal migrations to and from warmer winter habitats. The sexes apparently are segregated throughout most of the summer range; males are uncommon in the eastern United States at this time. Hoary bats may fly during late afternoon on warm days in winter. Their swift and direct flight pattern and large size

make them readily identifiable on the wing in most parts of the range. Moths, true bugs, mosquitoes, and other insects may be captured as food. Hoary bats bear two pups in mid-May, June or early July. The young cling to the mother through the day, but are left clinging to a twig or leaf while she forages at night. Although widespread throughout North America, hoary bats are not often captured. The Hawaiian subspecies, *L. c. semotus* (Hawaiian hoary bat) is considered endangered.



Figure 14: Hoary Bat



# Indiana Bat

## *Myotis sodalis*

Federally endangered

Weight: 6 - 9 grams (0.2 - 0.3 ounce)

Wingspan: 24 - 28 centimeters ( 9 - 11 inches)

Distribution: Appalachian Mountains from northern New York to the cave region of Tennessee, Alabama, and Georgia.

Includes mid western states west of the Appalachians to Iowa, Missouri, and Arkansas.

The Indiana bat was one of the first bat species in the United States to be recognized as endangered by the U.S. Fish and Wildlife Service Endangered Species Act. This listing was largely due to declines recorded at winter hibernation sites in caves, which until very recently, were the only known roosts for this species. The Indiana bat's distribution includes cave regions and, during summer, areas relatively near cave regions in the eastern United States. Indiana bats usually hibernate in large dense clusters of up to several thousand individuals in sections of the hibernation cave or mine where temperatures average 3°- 6°C (38°- 43°F) and with relative humidities of 66-95%. They hibernate from October to April, depending on climactic conditions. Females depart hibernation sites before males and arrive at summer maternity roosts in mid-April and mid-May. Human disturbance and alteration of hibernation caves, loss of summer roosting and foraging habitat due to deforestation, and pesticide poisoning have all contributed to the decline of the Indiana myotis. Despite protection at overwintering sites, Indiana bat populations continue to decrease in several portions of their range, indicating disturbance or loss of summer habitat. Because these bats are roosting mainly under exfoliating bark, their summer roosts are short-lived. A continually emerging mosaic of multi-aged trees needs to become available from year to year which can serve as roost sites. Moreover, like many cavity or crevice dwelling bats, Indiana myotis switch roosts often throughout the summer maternity season. Maternity colonies appear to have at least one "primary roost" that is used by the majority of the colony. Over a dozen different "alternate roosts" may be used by portions of the colony intermittently. One reason for this roost switching may be due to differing thermoregulatory needs at different stages of the reproductive process for individuals or as a result of environmental deviations from normal climatic patterns. Bats may also switch roosts due to increased parasite loads or unstable food resources brought on by drought or unusually heavy rains.

One pup is born in June and is raised under loose tree bark, and more recently in certain buildings, usually near wooded stream side habitat. The summer roost of adult males often is near maternity roosts, but where most spend the day is unknown. Others remain near the hibernation site and a few males are found in caves during the summer.

Between early August and mid-September, Indiana bats arrive near their hibernation sites and engage in swarming and mating activity. Swarming at cave entrances continues unto mid or late October. During this time, fat reserves are built up for hibernation. When pregnant, females eat soft bodied insects; they eat moths when lactating, and moths, beetles, and hard-bodied insects after lactation. Foraging areas are typically within five miles of the summer roost. Males also eat a variety of insects. Life spans of nearly 14 years have been documented. The present total population of this species is fewer than 360,000 with more than 85% hibernating at only nine locations in Missouri, Indiana, and Kentucky making them extremely vulnerable to destruction.



Figure 15. Indiana Bat



Figure 16. Indiana Bat

## Little Brown Bat

*Myotis lucifugus*

No federal listing

Weight: 7 - 14 grams (0.3 - 0.5 ounce)

Wingspan: 22 - 27 centimeters (9 - 11 inches)

Distribution: Widely from central Alaska to central Mexico.

The little brown bat usually hibernates in caves and mines. During summer, it often inhabits buildings, usually 100° F attics, where females form nursery colonies of hundreds or even thousands of individuals. Where most males spend the summer is unknown, but they likely are solitary and scattered in a variety of roost types. Colonies usually are close to a lake or stream. This species seems to prefer to forage over water but also forages among trees in rather open areas. When foraging, it may repeat a set hunting pattern around houses or trees within a few miles of its roost. It eats insects, including gnats, crane flies, beetles, wasps, and moths. Insects usually are captured with a wing tip, immediately transferred into a scoop formed by the forwardly curled tail and interfemoral membrane, and then grasped with the teeth. Mating occurs in autumn but also may occur during the hibernation period. One baby is born in May, June, or early July. When the mother is at

rest during the day, she keeps the baby beneath a wing. Life span may be more than 20 years. This species is one of the most common bats throughout much of the northern United States and Canada but is scarce or only locally common in the southern part of its range. A subspecies found in the southwestern United States, *M. l. occultus* (Arizona bat), is considered to be of special concern.



Figure 17. Little Brown Bat

## Northern Long-eared Bat

*Myotis septentrionalis*

No federal listing

Weight: 6 - 9 grams (0.2 - 0.3 ounce)

Wingspan: 23 - 27 centimeters (9 - 11 inches)

Distribution: Includes southern Canada and the central and eastern United States southward to northern Florida.

Northern long-eared bats hibernate in parts of caves and mines that are relatively cool and moist, where the air is still. Hibernation may begin as early as August and may last for 8 - 9 months in northern latitudes. In summer, they roost by day in a variety of shelters, including buildings and under tree bark, shutters, bat houses, and bridges. At night they commonly use caves as night roosts. Recent trapping and internal surveys suggest they may use caves as stopover points during migration more so than actual hibernation. Northern long-eared bats seem much more solitary in their habits than other members of genus *Myotis*, and they generally are found singly or in small groups containing up to 100 individuals. Although they frequently hang in the open, they seem to prefer tight crevices and holes. Sometimes only the nose and ears are visible, but they can be distinguished from most other species of *Myotis* by their long ears. These bats forage mainly on forested hillsides and ridges rather than in stream side and floodplain forests. They consume a variety of small night-flying insects. Presumably most mating occurs in autumn

prior to hibernation. Apparently small nursery colonies are formed in June and July where pregnant females give birth to one baby. Mothers may be able to retrieve their young that fall from roost sites. Life span may be more than 18 years. This species is common over much of its range, but does not occur in large concentrations.



Figure 18. Northern Long-eared bat.



## Silver-haired Bat

*Lasionycteris noctivagans*

No federal listing

Weight: 8 - 11 grams (0.3 - 0.4 ounces)

Wingspan: 27 - 32 centimeters (11 - 13 inches)

Distribution: From southern Alaska and Canada through most of the United States and northern Mexico.

Silver-haired bats are among the most common bats in forested areas of America, most closely associated with coniferous or mixed coniferous and deciduous forest types, especially in areas of Old Growth. They form maternity colonies almost exclusively in tree cavities or small hollows. And like many forest-roosting bats, silver-haired bats will switch roosts throughout the maternity season. Because silver-haired bats are dependent upon roosts in Old



Growth areas, managing forests for diverse age structure and maintaining forested corridors are important to these bats. It is estimated that these bats require snag densities of at least 21 per hectare and often forest management practices have fallen far short of this figure. Unlike many bat species, silver-haired bats also appear to hibernate mainly in forested areas, though they may be making long migrations from their summer forest to a winter forest site. Typical hibernation roosts for this species include small tree hollows, beneath exfoliating bark, in wood piles, and in cliff faces. Occasionally silver-haired bats will hibernate in cave entrances, especially in northern regions of their range. Like big brown bats, the silver-haired bats have been documented to feed on many insects perceived as pest species to humans and/or agriculture and forestry. Even though they are highly dependent upon Old Growth forest areas for roosts, silver-haired bats feed predominantly in disturbed areas, sometimes at tree-top level, but often in small clearings and along roadways or water courses. Though their diets vary widely, these bats feed chiefly on small, soft-bodied insects. Silver-haired bats have been known to take flies, midges, leafhoppers, moths, mosquitoes, beetles, crane flies, lacewings, caddis flies, ants, crickets, and occasional spiders. Although once suggested to be the most abundant mammal in the northeast US, it is rarely captured in the summer.

*Figure 19: Silver-haired Bat*

# Eastern Small-footed Bat

## *Myotis leibii*

No federal listing; state listed threatened in NH, VT, NY, PA, MD

Weight: 3 - 5 grams (0.1 - 0.2 ounces)

Wingspan: 21 - 25 centimeters (8 - 10 inches)

Distribution: Appalachian Mountain range, including cave areas of western Kentucky, Missouri, and southeast Iowa.

Population trends of the small-footed *Myotis* remain largely unknown due to the secretive nature of this species during its winter hibernation. Although historically known from only a few sites, recent discoveries have substantially increased the number of sites at which it occurs. Populations of bats found at these sites remain very low and in many cases, only one or two bats are seen. It is because of the very low numbers of bats found during the hibernacula censuses and the many unknown factors concerning its biology that this species remains classified as threatened throughout most of its range.

The small-footed bat is the smallest bat in the Northeast. It's little more than 3½ inches long, including a 1½-inch tail. It is most often recognized by its short, black forearms (less than 1½ inches) and small feet (less than a half-inch). While its coloration is comparable to the more common little brown bat, a distinctive characteristic is the black facial mask that spreads from the base of each ear across its face.

Little is known about the biology and natural history of the small-footed *Myotis*. It appears to enter into hibernation later than other bat species and is generally found in low numbers. While other bats, such as the little brown bat, form large clusters, this small bat remains solitary or in crevices with fewer than a dozen others during the hibernating season. One young is produced a year, although one record for twins has been recorded. It is often found hibernating closer to the entrances of caves and mines than other bats and generally alone. This could be because they're often overlooked during census counts because of their use of small, tight crevices in the walls and ceilings and sometimes among the rocks on the hibernacula's floor.

There is little to no information on the summer feeding habits of the small-footed *Myotis*. Summer records of this species remain rare with only a few being captured in mist nets. It is thought that they may form small maternity roosts in crevices along rock outcrops, under boulders, quarries, and sometimes buildings.

As with other species of hibernating bats, control of winter disturbances is seen as a big factor influencing the small-footed bat's survival. As virtually nothing is known about the summer habitat of these bats, foraging and day roost studies should become a priority as technology becomes available to study them.



Figure 20: Hibernating Eastern Small-footed Bats



# Appendix I: PGC Abandoned Mine Protocol

Commonwealth of Pennsylvania  
Pennsylvania Game Commission, Bureau of Wildlife Management  
Wildlife Diversity Section  
2001 Elmerton Avenue, Harrisburg, PA 17110-9797

## **Protocol for Assessing Abandoned Mines/Caves for Bat Surveys**

In general, openings can be dismissed from bat surveys when:

1. There is only one horizontal opening less than 6 inches in diameter and no or very little airflow is detected.
2. Vertical shafts <1 foot in diameter.
3. Passage continues less than 50 feet and terminates with no fissures that bats can access.
4. Mines that are prone to flooding, collapsed shut and completely sealed, or otherwise inaccessible to bats.
5. Openings, which have occurred recently (within 1 year) due to subsidence.

*Additional notes: Bats can access mines via old open buildings such as a fan house. Foliage and other vegetation in front of mine openings do not stop use by bats. They can navigate through foliage. Collapsed entrances with multiple crevices between boulders etc. are accessible to bats and should be sampled. Collapses completely sealed with fine soil are of course inaccessible to bats.*

## **Sampling Dates, Times and Temperature Criteria**

1. Spring sampling will be conducted between: April 10 thru May 10
2. Fall sampling will be conducted between: September 15 thru October 31
3. Sampling will start 1/2 hour before sunset and continue for at least 5 hours.
4. Weather must provide for:
  - a. Temperatures  $\geq 50^{\circ}\text{F}$  ( $10^{\circ}\text{C}$ ) for first 2 hours of sampling and not fall below  $35^{\circ}\text{F}$  ( $1.6^{\circ}\text{C}$ ) by midnight.
  - b. At least 3 hours free of heavy rain and thunderstorms.
5. Sampling will be conducted on two evenings. If no captures occur and no bat activity is noted with a bat detector on the first evening during acceptable weather conditions, sampling can be suspended for the site.
6. The shining of lights, and noise will be kept to a minimum with no smoking around the sample site. The use of radios, campfires, running vehicles, punk sticks, citronella candles and other disturbances will not be permitted within 300 feet of site during surveys.
7. Before conducting surveys, local residents and/or law enforcement agencies should be informed of the scheduled nighttime activities.

## **Equipment**

*No equipment, litter or other debris will be left unattended at site that could result in the capture or entanglement of any animals. Any equipment stored at site between sampling sessions will be clearly labeled with contact information.*

**Harp Trap:** Place in front of opening and block surrounding space with plastic sheeting or bird netting. Traps should be tended at least once per hour. When the catch rate is high (>25 bats per hour) or during inclement weather, traps should be tended more frequently.

**Mist Nets:** 50 denier, 38mm mesh. Place in front or around opening. Nets need to be monitored closely and checked at least once every 20 minutes. At sites with a heavy bat swarm, the net may need to be monitored continuously.

**Bat Detector:** A bat detector should be on site to monitor bat activity when trapping or netting. Bat passes should be monitored and tallied for at least one hour after 10pm. Bat tallies should be reported along with the time sampled. Reporting format will be: Start and end time for 1-hour sample period and bat passes for that hour.

**Other:** In situations where it is too dangerous to approach an entrance, bat detectors and/or night vision/infrared recording devices may be used to monitor and record bat activity to determine bat use of the site. Bat activity in or around the entrance can be monitored by counting bat passes with a bat detector, or night vision/infrared video tapes can be made providing actual counts of bats entering the opening. As with trapping, monitoring should be conducted for 5 hours. Reporting format will be: Start and end time for 1-hour sample period and bat passes for that hour.

## **Reporting**

In addition to reports for the client, the Pennsylvania Game Commission requires copies of the report as part of the vendor's permitting requirement. To simplify data entry, mandatory sampling summary forms are also required by the PA Game Commission for bat surveys within the Commonwealth. If the vendor did not receive a copy of the data form with the permit, they can be obtained by contacting the:

Pennsylvania Game Commission  
Bureau of Law Enforcement, Technical Services Division  
2001 Elmerton Avenue, Harrisburg, PA 17110-9797  
717/787-5740

## **INTERIOR WINTER HIBERNACULA SURVEYS**

Sites that are determined to be safe for entry to conduct winter counts (primarily caves & stable hard rock mines) will be coordinated with the PA Game Commission, Wildlife Diversity Section and scheduled for interior surveys between January 1 and March 10. Contact information for the Wildlife Diversity Section is:

PA Game Commission  
Bureau of Wildlife Management, Wildlife Diversity Section  
2001 Elmerton Avenue, Harrisburg, PA 17110-9797  
(717) 787-5529



# Appendix III: Data Sheets

## Notes and key to abbreviations used on data sheets

### Instructions

All information must be completed each night. Partially complete forms will not be accepted. Completed forms are to be turned in to the Team Leader each morning.

**PROJECT:** Name of the entire survey project.

**SITE#:** The number given to every trap site in a separate geographic location. Site # remains the same regardless of how many nights are spent at the same location.

**DATE:** Pre-midnight date which trapping began.

**LONGITUDE/LATITUDE:** Coordinates from a GPS receiver.

**LD. BY:** USFWS qualified person identifying bats at this site.

**MOON AFFECT:** Was moon present during survey? If so what phase? Was moonlight illuminating nets? Note times.

**NUMBER OF NETS/TRAPS:** Description of nets, e.g. A: 3Hx9m, B: 2Hx6m, C: 1Hx9mx12m "L" configuration.

**SKY CONDITIONS:** General weather conditions and temperature in °F, at start, middle, and end of sampling times.

**WIND CONDITIONS:** Use Beauford scale and note time.

**SITE DESCRIPTION:** A general overview of the site, e.g. "Shallow stream with long pools surrounded by deciduous forest with maple, oak, and beech. A small clearing and residence is nearby."

**ANDERSON III CODE:** Use Level III codes and percentages within 1KM of site. Percentages should total 100%.

**DISTURBANCE CODE:** List up to three of the most significant disturbances within 500 meters. Include distance to disturbance.

### Common name:

Little brown  
Big brown  
Pipistrelle  
Northern longear  
Smallfooted  
Indiana  
Red  
Hoary  
Silver haired  
Townsend's Big-eared  
Rafinesque's Big-eared  
Evening

### Species:

*Myotis lucifugus*  
*Eptesicus fuscus*  
*Pipistrellus subflavus*  
*Myotis septentrionalis*  
*Myotis leibii*  
*Myotis sodalis*  
*Lasiurus borealis*  
*Lasiurus cinereus*  
*Lasionycteris noctivagans*  
*Corynorhinus townsendii*  
*Corynorhinus rafinesquii*  
*Nycticeius humeralis*

### Reproductive condition:

NR= Non Reproductive  
PG= Pregnant  
L= Lactating  
PL= Post Lactating  
SCR= Scrotal

### Age:

A: Adult  
J: Juvenile

### Anderson Classification Codes first and second level categories

- 1 **Urban or Built-Up Land**
- 11 Residential
- 12 Commercial Services
- 13 Industrial
- 14 Transportation, Communications
- 15 Industrial and Commercial
- 16 Mixed Urban or Built-Up Land
- 17 Other Urban or Built-Up Land
- 2 **Agricultural Land**
- 21 Cropland and Pasture
- 22 Orchards, Groves, Vineyards, Nurseries
- 23 Confined Feeding Operations
- 24 Other Agricultural Land
- 3 **Rangeland**
- 31 Herbaceous Rangeland
- 32 Shrub and Brush Rangeland
- 33 Mixed Rangeland
- 4 **Forest Land**
- 41 Deciduous Forest Land
- 42 Evergreen Forest Land
- 43 Mixed Forest Land
- 5 **Water**
- 51 Streams and Canals
- 52 Lakes
- 53 Reservoirs
- 54 Bays and Estuaries
- 6 **Wetland**
- 61 Forested Wetlands
- 62 Non forested Wetlands
- 7 **Barren Land**
- 72 Beaches
- 73 Sandy Areas Other than Beaches
- 74 Bare Exposed Rock
- 75 Strip Mines, Quarries, and Gravel Pits
- 76 Transitional Areas
- 77 Mixed Barren Land

### Disturbance Codes and Key

PROXIMITY	TYPE	
1 Disturbance on site	A Dumping	H Unimproved roads
	B Party spot	I Recreation area
2 Disturbance within 100 meters of site	C Buildings	J Mining
	D Agriculture	K Fire
	E Utility rights-of-way	L Clearcut
3 Disturbance 100-500 meters of site	F Railroad rights-of-way	M Insect defoliation
	G Improved roads	N No disturbance

### Beauford Wind Scale Codes and Key

Code	Speed(m/sa)	Description	Land Condition	Comfort
0	0 - 0.5	Calm	Smoke rises	No noticeable wind
1	0.5 - 1.5	Light air	Smoke drifts vertically	
2	1.6 - 3.3	Light breeze	Leaves rustle	Wind felt on face
3	3.4 - 5.4	Gentle breeze	Wind extends	Hair disturbed, clothing flaps
4	5.5 - 7.9	Moderate breeze	Small branches in motion	Hair disarranged, raises dust & loose
5	8.0 - 10.7	Fresh breeze	Small trees w/leaf begin to sway	Force of wind felt on body
6	10.8 - 13.8	Strong breeze	Whistling in telegraph wires large branches in motion	Umbrellas used with difficulty
7	13.9 - 17.1	Near gale	Whole trees in motion	Inconvenience in walking
8	17.2 - 20.7	Gale	Twigs broken from trees	Progress impeded/difficult in gusts

DO NOT WRITE IN MARGINS OF DATA SHEETS

# Bat Survey Data Form

Bat Conservation and Management, Inc. • 814-442-4248

Project: <u>Salisbury 219</u>	County: <u>Summit</u>	Site #: <u>1</u>	Night #: <u>1</u>	Site Name: <u>Myad #1</u>	Date: <u>9-17-05</u>
Latitude: <u>39 47 7.75</u>	Longitude: <u>79 01 42.46</u>	Date: <u>9-17-05</u>	Elevation: <u>2200</u> <small>(m ft)</small>	Off: <u>S. Chough</u>	
Observer: <u>S. Chough</u>			Actual net open time: <u>7:00</u>	Actual net close time: <u>12:00</u>	
Day Condition: <u>8:00 68°F CLEAR</u>	Wind speed: <u>0</u>			Wind dir: <u>56°</u>	
Moist Description: <u>0</u>				<u>0</u>	
Moon effect: <u>Full moon - phase changed - upper canopy</u>					
Number of nettraps: <u>A) 6x7' Hawk Trap B) Proseal 240</u>					
Site Description: <u>Stable AOT with stream running. Stream is steady.</u>					
<u>Sitting the entrance shot: 6' wide, 5' high. Proseal. Not randomly</u>					
<u>located at open time. Foundation of old mining building immediately adjacent</u>					
<u>Railroad forming up.</u>					
Anderson Level II					
Disturbance codes					
Remarks: <u>Salisbury stream running.</u>					
<u>Cold air, everything can be felt</u>					
<u>100' away, Proseal 30' High open - High Tiger</u>					
<u>into lower kitchen 1.7 Sec - 10:00-12:00</u>					
<u>50' from entrance. Nothing up</u>					

Sketch of the trap layout showing dimensions and orientation. The sketch includes a central trap area with dimensions 11' x 11' and 11' x 11'. It also shows a 11' x 11' area to the left and a 11' x 11' area to the right. A box labeled 'Function 1' is shown with an arrow pointing to it. The text 'Sketch of trap set actually in use' is written at the bottom.

# Bat Survey Data Form


Bat Conservation and Management, Inc. • 814-442-4248

Page 1 of 1

Time	Commentary	Age	Sex	Reproductive Condition	Weight (gms)	Forearm Length	Alone ground	Net Set	Band	Comments
8:30	Myaduc	A	F	NR	8.6					
8:30	Myaduc	A	F	NR	8.1					
8:30	Myaduc	A	M	NR	5.1					
8:30	Myaduc	A	M	SCR	9.4					
8:50	PipSub	A	M	SCR	4.7					
8:50	Myaduc	A	M	SCR	6.7					
8:50	Myaduc	A	M	SCR	6.8					
8:50	Myaduc	A	F	NR	9.4					
8:50	Myaduc	A	M	SCR	9.1					
9:20	Myaduc	A	F	NR	8.4					
9:20	Myaduc	A	F	NR	9.7					
9:20	Myaduc	A	M	SCR	6.7					
9:20	PipSub	A	F	NR	8.6					
10:15	Myaduc	A	M	SCR	5.2					
10:15	Myaduc	A	M	SCR	6.9					
10:15	Myaduc	A	M	SCR	6.7					
10:15	PipSub	A	F	NR	6.8					
12:00	PipSub	A	M	NR	6.9					
12:00	Myaduc	A	M	NR	7.6					
12:00	PipSub	A	M	SCR	6.9					



## Bait Conservation and Management, Inc. • 814-443-4248



Foundation  
 Rains

Give suitable part and whole notes (number of parts) full answer

## Flat Conservation and Management, Inc. • 814-443-4340

[illegible]

Project: <u>Salisbury 21</u>	County: <u>Essex</u>	Site #: <u>2</u>	Height: <u>1</u>	Site Name: <u>mine 19</u>	Date: <u>9-30-05</u>
Latitude: <u>34 44 36.12</u>	Longitude: <u>79 03 24.71</u>	Day: <u>Nov 027</u>	Elevation: <u>2200</u> m ft m	ID #: <u>44444</u>	
Observer: <u>K. Khong</u>	Actual net open time: <u>6:00</u>		Actual net close time: <u>12:00</u>		
Day Conditions: <u>6:30 am, 62°F, Clear</u>	<u>9:30 am, 45°F, Clear</u>		<u>12:00 am, 42°F, Clear</u>		
Wind Description: <u>1 Light air</u>	<u>1 Light air</u>		<u>1 Light air</u>		
Moon effect: <u>None</u>					
Number of nettraps: <u>A: 66. Harp Trap B: Pilleron Bat Detector #10</u>					
Site Description (see previous sheets): <u>Horizontal mine opening along a rock face. Harp trap set parallel to mine opening. Bat detector set below mine opening about 20m.</u>					
Anderson Level II	<u>7410</u>	<u>4110</u>	<u>5110</u>		
Disturbance codes	<u>511</u>	<u>H13</u>	<u>B13</u>		
Remarks: <u>see above</u>					
<p>Sketch of site showing a rock face with a harp trap (A) and a bat detector (B) set below it, with forest on either side.</p>					
Site sketch and net layout sketch "number of nets" field above					

[illegible]



# Bat Survey Data Form

Bat Conservation and Management, Inc. • 814-442-4246

Project: <u>Salt Spring 216</u>	County: <u>Somerset</u>	Site #: <u>2</u>	Night #: <u>2</u>	Site Name: <u>Mine 19</u>	Date: <u>10-1-05</u>
Latitude: <u>39 44' 21.12</u>	Longitude: <u>79 03 29.71</u>	Date: <u>11/02/07</u>	Elevation: <u>2200</u> feet	ID By: <u>J. Chapp</u>	
Observers: <u>J. Chapp</u>	Actual net open time: <u>6:30 pm</u>		Actual net close time: <u>11:30 pm</u>		
Day Conditions: <u>6:30 pm, 62°F, Clear</u>	Night Conditions: <u>9:30, 59°F, Clear</u>		Day Conditions: <u>11:30 pm, 50°F, Clear</u>		
Wind Description:					
Moon effect: <u>only moon through trees</u>					
Number of nettraps: <u>1. 1/11 Hap Trap Bi Peterson Bat Detector # 10</u>					
Site Description: <u>mine entrance along a rock face. Hap trap is set parallel to mine entrance. Bat detector set along rock facing up and out away from mine entrance. ↑ = uphill ↓ = downhill</u>					
Anderson Level I:	<u>7410</u>	<u>4110</u>	<u>51130m</u>		
Disturbance codes:	<u>J 11</u>	<u>H 13</u>	<u>B 13</u>		
Remarks: <u>no bats captured</u>					

Site sketch (not our labels match "number of nets" field above)

# Bat Survey Data Form

Bat Conservation and Management, Inc. • 814-442-4246

Project: <u>Salt Spring 219</u>	County: <u>Somerset</u>	Site #: <u>3</u>	Night #: <u>1</u>	Site Name: <u>Mine 28</u>	Date: <u>9-30-05</u>
Latitude: <u>39 44 42.63</u>	Longitude: <u>79 03 19.55</u>	Date: <u>11/02/07</u>	Elevation: <u>2160</u> feet	ID By: <u>J. Chapp</u>	
Observers: <u>J. Chapp</u>	Actual net open time: <u>6:00</u>		Actual net close time: <u>12:00</u>		
Day Conditions: <u>6:30 Clear</u>	Night Conditions: <u>9:30 45°F Clear</u>		Day Conditions: <u>12:00 42°F Clear</u>		
Wind Description: <u>1 Light</u>	Night Conditions: <u>1 Light</u>		Day Conditions: <u>0</u>		
Moon effect: <u>only moon through trees</u>					
Number of nettraps: <u>A 3'x4' Hap Trap Bi Peterson 240w</u>					
Site Description: <u>6'x3' mine entrance along Pung Creek. Trap placed perpendicular to entrance. entrance sealed with plastic. 240w placed in front of trap</u>					
Anderson Level I:					
Disturbance codes:					
Remarks: <u>Perseus 240w SET: 8115</u>					
<u>END 1130</u>					
<u>NO BATS</u>					

Site sketch (not our labels match "number of nets" field above)

# Bat Survey Data Form

Bat Conservation and Management, Inc. • 814-443-4246

Project: <u>Salisbury 219</u>	County: <u>Somerset</u>	Site #: <u>3</u>	Night #: <u>2</u>	Site Name: <u>Mile 28</u>	Date: <u>10-1-05</u>
Latitude: <u>39 44 42.62</u>	Longitude: <u>79 03 19.55</u>	Datum: <u>NAD83</u>	Elevation: <u>2160</u> <small>feet MSL</small>	ID By: <u>S. Chappell</u>	
Observer: <u>S. Chappell</u>			Actual net open time: <u>600</u>	Actual net close time: <u>1200</u>	
Sky Conditions: <u>62% cloud 6:00</u>	Wind Description: <u>1 Light</u>		Moon effect: (specify waxing, full, or waning) <u>N/A</u>		
Number of nettraps: (list and include size and configuration) <u>A: 3'x4' HARP TRAP B: Anderson 240x</u>					
Site Description: (permanent features like cave entrance, surrounding habitat, dominant species) <u>6'x2.5' coal mine entrance along Army Creek. Spot and night AND some clouds on 12/12. Trap placed parallel with entrance. Entire entrance sealed with plastic. 240x placed on ground in front of trap putting skyward.</u>					
Anderson Level II:					
Disturbance codes:					
Remarks: (see record for net height, etc.) <u>240x START 9:30</u>					
<u>END 11:30</u>					
<u>NO BATS CAPTURED</u>					

Site sketch (not net labels match "number of rats" field above)

# Bat Survey Data Form

Bat Conservation and Management, Inc. • 814-443-4246

Project: <u>Salisbury 219</u>	County: <u>Somerset</u>	Site #: <u>4</u>	Night #: <u>1</u>	Site Name: <u>Mile 27</u>	Date: <u>9-30-05</u>
Latitude: <u>39 44 44.61</u>	Longitude: <u>79 03 20.83</u>	Datum: <u>NAD83</u>	Elevation: <u>2160</u> <small>feet MSL</small>	ID By: <u>S. Chappell</u>	
Observer: <u>S. Chappell</u>			Actual net open time: <u>600</u>	Actual net close time: <u>1200</u>	
Sky Conditions: <u>6:30 62°F cloud</u>	Wind Description: <u>1 Light</u>		Moon effect: (specify waxing, full, or waning) <u>N/A</u>		
Number of nettraps: (list and include size and configuration) <u>A: 6'x7' HARP TRAP B: Anderson 240x</u>					
Site Description: (permanent features like cave entrance, surrounding habitat, dominant species) <u>12'x3.5' mine entrance along Army Creek. Trap placed parallel with entrance and 300x placed with plastic. Direction placed on ledge overlooking entrance.</u>					
Anderson Level II:					
Disturbance codes:					
Remarks: (see record for net height, etc.) <u>B: 240x START 8:15</u>					
<u>END 11:30</u>					
<u>NO BATS</u>					

Site sketch (not net labels match "number of rats" field above)



Project: <u>Seal Island, 2019</u>		County: <u>San Diego</u>		Site #1: <u>4</u>	Height: <u>2</u>	Site Name: <u>Mine 27</u>	Date: <u>10-1-05</u>
Latitude: <u>39 44 44.61</u>		Longitude: <u>79 03 30.83</u>		Datum: <u>NAD83</u>		Elevation: <u>2140</u> <small>met</small>	Observer: <u>Ji Chang</u>
Observers: <u>Ji Chang</u>				Actual net open time: <u>600</u>		Actual net close time: <u>1200</u>	
Sky Conditions:	<u>700 62°F clear</u>		Wind Sample: <u>1</u>		Wind: <u>1200 50°F clear</u>		
Wind Description:	<u>1 45</u>		<u>1</u>		<u>1 45</u>		
Moon effect: <u>new moon (rough time)</u>							
Number of sightings: <u>1</u>							
Site Description (use previous entries): <u>A: 6' x 7' Hump Tent B: Perennials 240x</u>							
Site Description (use previous entries): <u>12' x 2.5' <sup>Crab</sup> <del>mine</del> entrance along Arroyo Creek. The plants</u>							
<u>Parallel with entrance are 50m cleared with plastic. Driveway</u>							
<u>Pass on large overhanging exterior</u>							
Anderson Level 0:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Disturbance codes:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Remarks: <u>see above</u>							
<u>12:00 SSB: 9:15</u>							
<u>MO 11:30</u>							

SIDE SKETCH (not all labels match "number of notes" field above)

[illegible]





# **Mist Net Survey for the Indiana Bat** *(Myotis sodalis)*

*for the proposed*

## **US 219 Improvement Project SR 6219 Section 020 Meyersdale to Somerset Somerset County, Pennsylvania**

*prepared for*



### **Pennsylvania Department of Transportation Engineering District 9-0**

Hollidaysburg, Pennsylvania

*and the*



### **U.S. Department of Transportation Federal Highways Administration**

*March 2009 ©*

# **MIST NET SURVEY FOR THE INDIANA BAT (*Myotis sodalis*)**

for the proposed

US 219 Improvement Project  
SR 6219, Section 020 Meyersdale to Somerset  
Somerset County, Pennsylvania

prepared for

Pennsylvania Department of Transportation  
Engineering District 9-0  
Hollidaysburg, Pennsylvania

U.S. Department of Transportation  
Federal Highways Administration

Prepared By:  
L. Robert Kimball & Associates  
615 West Highland Avenue  
Ebensburg, PA 15931

March 2009



## **Table of Contents**

	<u>Page</u>
I. Introduction	
A. Project Background	1
B. Description of Project Area	2
II. Methodology	
A. Site Selection	3
B. Mist Netting	4
III. Results	
A. Site Selection	5
B. Mist Netting	7
IV. Discussion	14
V. Conclusions	15
VI. List of Preparers	17

## **List of Charts and Graphs**

Site Capture Totals by Species	7
Gender Ratios	8
Percent Reproductive Females Among Adult Female Captures	9
Capture Height by Species	10
Cumulative Species Captures Over Time	11
Capture Productivity	12

## **List of Figures**

Figure 1 – Project Region

Figure 2 - Site Location

Figure 3 - Relative Density and Distribution Based on Capture Results

## **List of Appendices**

Appendix A – Agency Coordination

Appendix B – Protocols

Appendix C – Site Data Forms and Site Photographs

Appendix D – Representative Species Photographs



## **I. Introduction**

### **A. Project Background**

The US 219 Improvement Project (SR 6219, Section 020) entails the construction of a 16 kilometer, four-lane limited access highway connecting the northern end of the Meyersdale Bypass to the southern end of the existing US 219 located southeast of Somerset, PA. The study area includes Somerset, Brothersvalley, Summit, and Black Townships and the Boroughs of Somerset, and Garrett (Figure 1). This project is a joint venture between the Federal Highway Administration (FHWA) and the Pennsylvania Department of Transportation (PennDOT) Engineering District 9-0.

Detailed project information, including environmental features and resources, can be referenced within the December 2005 Final Environmental Impact Statement (FEIS) and November 2006 Record of Decision (ROD) prepared for this project. Alternative C-1 was identified within the ROD as the selected build alternative by the FHWA.

Coordination with the U.S. Fish and Wildlife Service (USFWS) regarding the federally endangered Indiana bat (*Myotis sodalis*) has been ongoing since the development of the EIS (Appendix A – Agency Coordination). The following provides a brief summary of correspondence as it specifically relates to coordination efforts conducted during final design.

Correspondence from the USFWS on November 8, 2007 indicated that the Service has not been able to concur that the proposed project would have no effect on Indiana bats since a preference for mist netting surveys or timber harvesting restrictions has not been indicated. Furthermore, the Service indicated that in light of additional and new information a mist netting survey should be conducted by a qualified Service approved biologist.

A formal response, reiterating FHWA's commitment to the proposed seasonal timber harvest restrictions was prepared by the FHWA and submitted to the USFWS on December 19, 2007.

The USFWS indicated within a January 14, 2008 correspondence letter that the Service could not concur with the "*determination that seasonal tree removal restrictions, alone, will adequately avoid all adverse effects if an Indiana bat maternity colony is present within the action area*".

Informal consultation was initiated between the FHWA and the USFWS on January 25, 2008.

As a result of this verbal consultation, the FHWA indicated within their January 31, 2008 letter to the USFWS that PennDOT conduct a mist netting survey in accordance USFWS

guidelines and using a qualified surveyor. The letter reiterated an understanding that in the absence of a confirmed species, the USFWS will issue a *No Effect* finding for the proposed action. If individual Indiana bats are captured as a result of survey efforts, the FHWA will consult with the Service regarding FHWA's assessment of effect.

This report presents the result of mist net surveys conducted for the federally endangered Indiana bat within the SR 6219 Section 020 project corridor during the summer 2008 mist net survey period.

## **B. Description of the Project Area**

The project area is located in the southwestern portion of Pennsylvania and situated between the towns of Somerset and Meyersdale, Somerset County. Ranging from 2,000 and 2,500 feet mean sea level, the project study area relief characteristics varies from the north to the south. The northern portion of the project study area is located on the gently rolling plateau while the southern portion is located in mountainous terrain with steep relief. Both portions of the study area are within the Allegheny Mountains section of the Appalachian Plateaus physiographic province (Pennsylvania Department of Conservation and Natural Resources, 2000). Negro Mountain is located to the west of the study area and Meadow Mountain is located to the east of the study area. Drainage originating from the project study area provides flow to the Casselman River and ultimately Ohio River. Named sub-watersheds of the Casselman River present within the project study area include, from south to north: Blue Lick Creek, Swamp Creek, Buffalo Creek, Piney Run, Wilson Creek, Laurel Run and Kimberly Run.

Overall, the project study area's land cover / land use is rural in nature and indicative of the historic natural resource driven economy. The land use / land cover components include forestland, agricultural land, mine land, one prison (Somerset Correctional Institution) with rural residential homes interspersed along the existing roadway network. The forestland has been intensively harvested and consists of second and third growth stands as well as uneven aged select cut stands. Numerous farmsteads are present throughout the project study area on ridge tops and ridge sides. Three reclaimed coal strip mines as well as one abandoned deep mine and surface mine are present. Approximately 52% of the land is in forest cover types, while approximately 18% is in agricultural cover types. An additional 3% consists of successional rangeland, fallow fields, and water bodies. Numerous wetlands, small streams and ponds, and several larger streams and wetlands also lie within or in close proximity to the project corridor and are included in these cover types. The remainder of cover types includes mine lands, waste areas, transportation facilities or other developed cover types.



## **II. Methodology**

At the request of the FHWA, PennDOT submitted Kimball's Work Plan to the USFWS for review and concurrence on 5/19/09. The USFWS stated on 5/19/09 via email that the Work Plan "...appears to be consistent with the Service's mist-netting protocols." Additionally, guidance and comment was also provided on the potential use of radio-telemetry tracking.

### **A. Site Selection**

An initial list of potential mist net sites was generated using ESRI Desktop ArcGIS 9.2 to identify areas having preferred habitat characteristics associated with the Indiana bat as identified in the *Indiana bat (Myotis sodalist) Recovery Plan: First Revision* (USFWS, April 2008) and the *Indiana Bat Mist Netting Guidelines* (USFWS 07/07). Using US Geological Survey 7.5" Quadrangle mapping of the project area, project topographic mapping, project land cover mapping, and project environmental features mapping layers, potential sites were identified by running a weighted land cover model in ArcGIS 9.2. The model utilized the following parameters: slopes less than 15%, forest habitat and composition, presence of water features, presence of logical flyways, and minimum spacing requirements (i.e. one site per kilometer for linear corridor projects).

Through site selection modeling and preliminary review of existing data with applied parameters (landcover, slope, water features, and intervals of approximately one kilometer), 15 potential sites were initially identified along the 16 kilometer project corridor. This number did not meet the target of 16 sites. Field investigations conducted in April of 2008 revealed that a few of these sites had been significantly altered (i.e., logged) and/or did not provide the potential netting opportunity as anticipated from modeling or preliminary review. Sites determined not to provide adequate opportunity for survey included sites where; expected travel corridors either did not provide sufficient opening size or lacked connectivity (e.g., grown-in or dead-end corridors), the travel corridor size was too large to effectively net, or the adjacent land uses consisted of barren lands and were determined to provide little in the way of foraging opportunities. Additionally, no suitable habitat for survey was identified in a 3.4 kilometer interval between Site 5 and Site 6.

As a result, additional field investigations were conducted in May and June of 2008 in order to identify other potentially suitable sites. Further site identification efforts were concentrated in the northern section of the project corridor due to the presence of ample available habitats which met the survey criteria. This resulted in the adjustment of several sites and the addition of another. The final result of site selection and adjustment was 16 sites believed to provide the highest probable netting success while best achieving the protocol-specified number of sites, and in consideration of site spacing (Figure 2).

## **B. Mist Netting**

The mist net survey was conducted in accordance with the PGC and USFWS protocol identified in the *Indiana Bat Mist Netting Guidelines* (USFWS 07/07) (Appendix B - Protocols). A qualified, USFWS-approved biologist (Steve Pernick) was present on site for each survey night to ensure proper handling and identification of all species captured.

Net sets were chosen to maximize the probability of Indiana bat capture at a given site. The number of nets deployed, net size, and set height used at each site depended on the physical characteristics and habitat features encountered at the site. A typical site consisted of three net sets: a quad or triple high set, a double high set, and a single net set. Where feasible, sets were placed along travel corridors such as access roads, ATV trails, or over streams through forest and extending from the ground (or top of herbaceous vegetation) into the canopy (or to a point of canopy closure or other overhead obstruction) to allow complete net coverage of the corridor. Netting efforts for each site, both by time and number of nets, met or exceeded USFWS protocol. An ultrasound detector (Pettersson D 100) was utilized to assess general bat activity at the sites and to confirm acceptability of the sites or assess the effect of weather conditions on bat activity levels. The survey effort was halted, and the time noted, if rain or wind appeared to affect bat activity based on visual observation and use of the ultrasound detector. The survey was restarted, and the time noted, when adverse conditions calmed and bat activity approximated pre-site-closure levels. Survey down-time was compensated for at the end of the survey night if down-time was generally less than one hour and conditions allowed. Otherwise, the lost time was accounted for at a later survey date. Additionally, an effort was made to schedule the separation of the first and second survey night by a minimum of one week to minimize acclimation to a given net set, the influence of weather, moon phase, prey composition variation, or other environmental or ecological factors which could affect the survey.

Upon capture, all bats were assessed as to species, age, weight, and reproductive condition. Age was determined as juvenile or adult for each individual as evidenced by either epiphyseal-diaphyseal fusion of the long bones in the wing or metacarpal-phalangeal joints in the hand. Reproductive condition of females was recorded as pregnant (based on abdominal palpation), lactating, post lactating, or non-reproductive. The reproductive condition of males was recorded as either scrotal (testes descended) or non-reproductive. Standard body measurements, including weight, ear, tragus, forearm, and hind foot, were also recorded. Additional data included time of capture, set captured in, and height of capture. Each capture was photographed (individual capture photographs are located in the Project Technical File) using either a portrait or profile that showed identifying characteristics. Additionally, a photograph of the calcar was taken on little brown bats if there was any variability with regards to other standard identifying



characteristics. Additional observations such as presence of parasites or physical abnormalities/injuries were also recorded. All data was recorded on a site specific PGC Form P-7008-M *Bat Measurement and Capture Data Form*.

In cooperation with studies being conducted at the Western Michigan University, hair and tissue samples were taken from little brown, northern long eared, and red bats. The collection of tissue and hair samples was conducted in accordance with approved protocols provided by the Western Michigan University. A copy of the protocol is included in Appendix B. Sample collections were logged using species and capture information corresponding with PGC Form P-7008-M *Bat Measurement and Capture Data Form*.

Upon completion of the examination, bats were released unharmed and without incident.

Site data, including a description of habitat, survey conditions, site set-up, and geographic coordinates were recorded on PGC Form P-70008-N/T *Bat Netting/Trapping Site Survey Record*. A corresponding site sketch was also completed for each site. Photographs of each net set at a given site were also taken.

Although the project team was prepared for radio telemetry tracking in the event that an Indiana bat was captured and met the protocol requirements for affixing a radio telemetry transmitter, no Indiana bats or other threatened or endangered species were captured. As a result, this report does not include further discussion of radio telemetry protocol methodology or results.

### **III. Results**

All site and capture data referenced or discussed in this report, including associated observations or factors potentially affecting the survey, were recorded on the corresponding PGC data forms (Appendix C – Site Data Forms and Site Photographs). Additionally, a site sketch, net set photographs, and detailed site mapping is included with the data set for each site within the appendix.

#### **A. Site Selection**

Through a combination of GIS modeling using existing data sources, and field investigation of the project corridor, 16 sites were selected for survey that appeared to provide the highest probable netting success while best achieving the protocol-specified number of sites, and in consideration of site spacing.

### Site descriptions

Although the sites share common characteristics due to the selection method; topography, land use and resource features along the project corridor vary significantly.

Site 1 is located near the southern terminus of the corridor along the Casselman River, near the confluence with Blue Lick Creek. The dominant land use is agriculture. Forested components occur along riparian zones and unutilized land (generally steep or unproductive). Net sets at this site included nets across a portion of the Casselman River as well as Blue Lick Creek.

Sites 2, 3, 4, and 5 are dominated by perennial streams with a few wetlands in steep-sided, forested valleys. Site 2 is located on Pine Creek, Site 3 and 4 are located on Swamp Creek and Site 5 on Buffalo Creek. Site 5 at Buffalo Creek also includes, and is bordered to the north by, successional rangelands associated with past mining and logging. Net sets at these sites generally targeted streams and wetlands.

Site 6 is dominated by agriculture with fragmented forested components along the edges of fields, streams, wetlands, and steep or unproductive slopes. The unnamed, first-order perennial stream is sustained by a groundwater spring. Net sets were located in forest breaks between fields and along the stream and wetland.

Sites 8 and 9 were located at opposite ends of a reclaimed strip mine at the interface of herbaceous rangeland cover and forest. Site 8 included a small pond in the reclaimed area and a small stream within the forest. Net sets targeted trails that could be utilized as flight corridors from the forest to the rangeland for foraging.

Sites 7, 10, 11, 12, 13, 14, 15, and 16 included a mix of forest and open agricultural components. The forest components at these sites consisted of larger tracts of mixed-aged, moderate density forest. Each of these sites also offered a variety of suitable flight corridors in the form of closed canopy roads/trails/gas lines. With the exception of Kimberly Run at Site 16, streams at these sites were generally first-order and too obstructed to serve as a flight corridor. Although ponds were located in the vicinity of several of these sites, they were in open environments. Net sets at these sites primarily targeted flight corridors to and from forest and open environments, and the noted ponds.

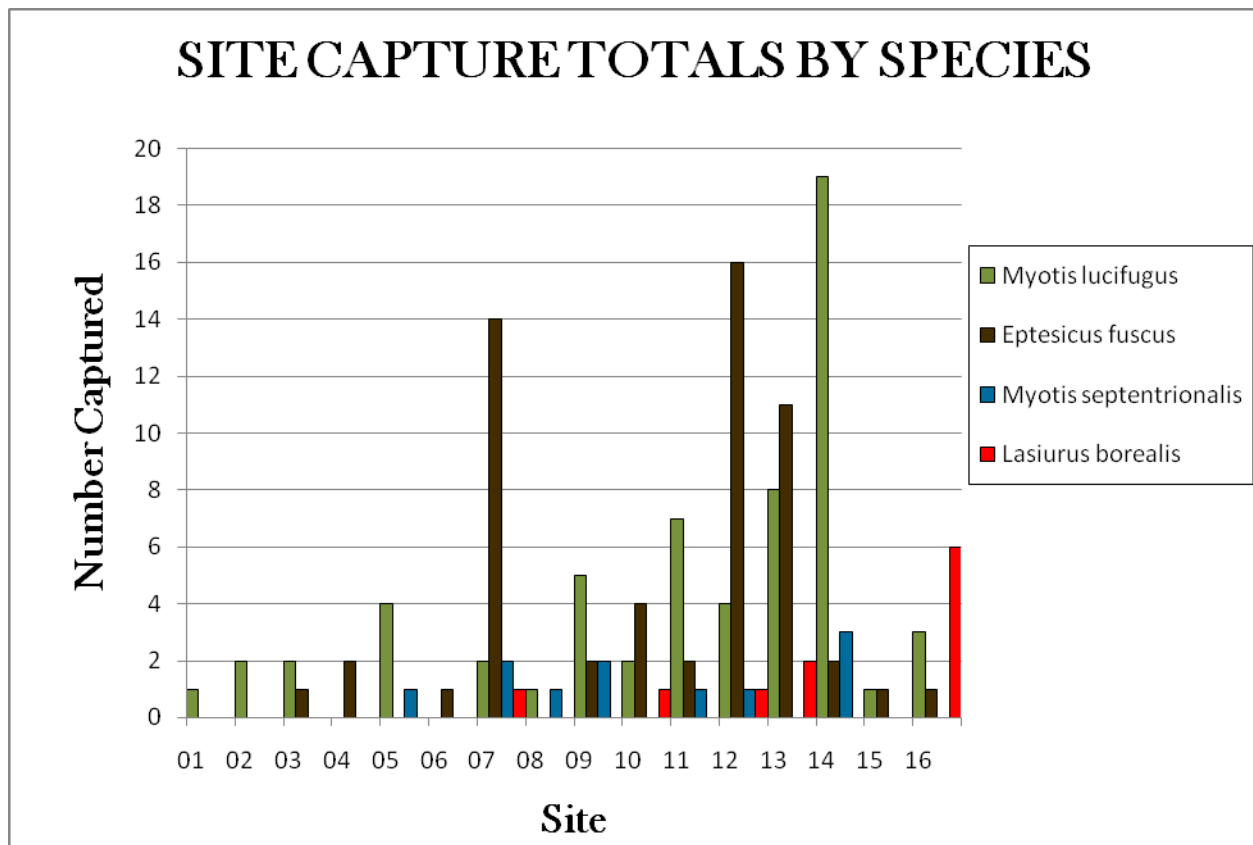
Site habitat descriptions, site diagram, net set configurations, and site photographs are included with the site data forms (PGC Form P-7008-N/T, *Bat Netting/Trapping Site Survey Record*).



## B. Mist Netting

No Indiana bats, or other bat species federally or state listed as threatened or endangered, were captured as a result of mist net survey efforts conducted at 16 sites from July 14 to August 11, 2008. The efforts resulted in the capture of 140 bats representing four species. Detailed site capture data was recorded on PGC Form P-70008-M, *Bat Measurement and Capture Data Form*. Additionally, representative photographs of each of the four species collected have been provided within this document (Appendix D – Representative Species Photographs).

The little brown bat (*Myotis lucifugus*) was the most prevalent species comprising approximately 44% (61 individuals) of the capture total, and was captured at 14 of the 16 sites (all but Site 4 and Site 6). Big brown bats (*Eptesicus fuscus*) followed at approximately 41% (57 individuals) and were captured at 12 of the 16 sites (all but Sites 1, 2, 5, and 8). The northern long eared bat (*Myotis septentrionalis*) and red bat (*Lasiurus borealis*) were equally represented at approximately 8% (11 individuals) per species. The northern long eared bat was captured at seven sites while the red bat was captured at five sites. Only Site 7 and Site 12 resulted in captures of all four species. These results are summarized by site on the following graph.

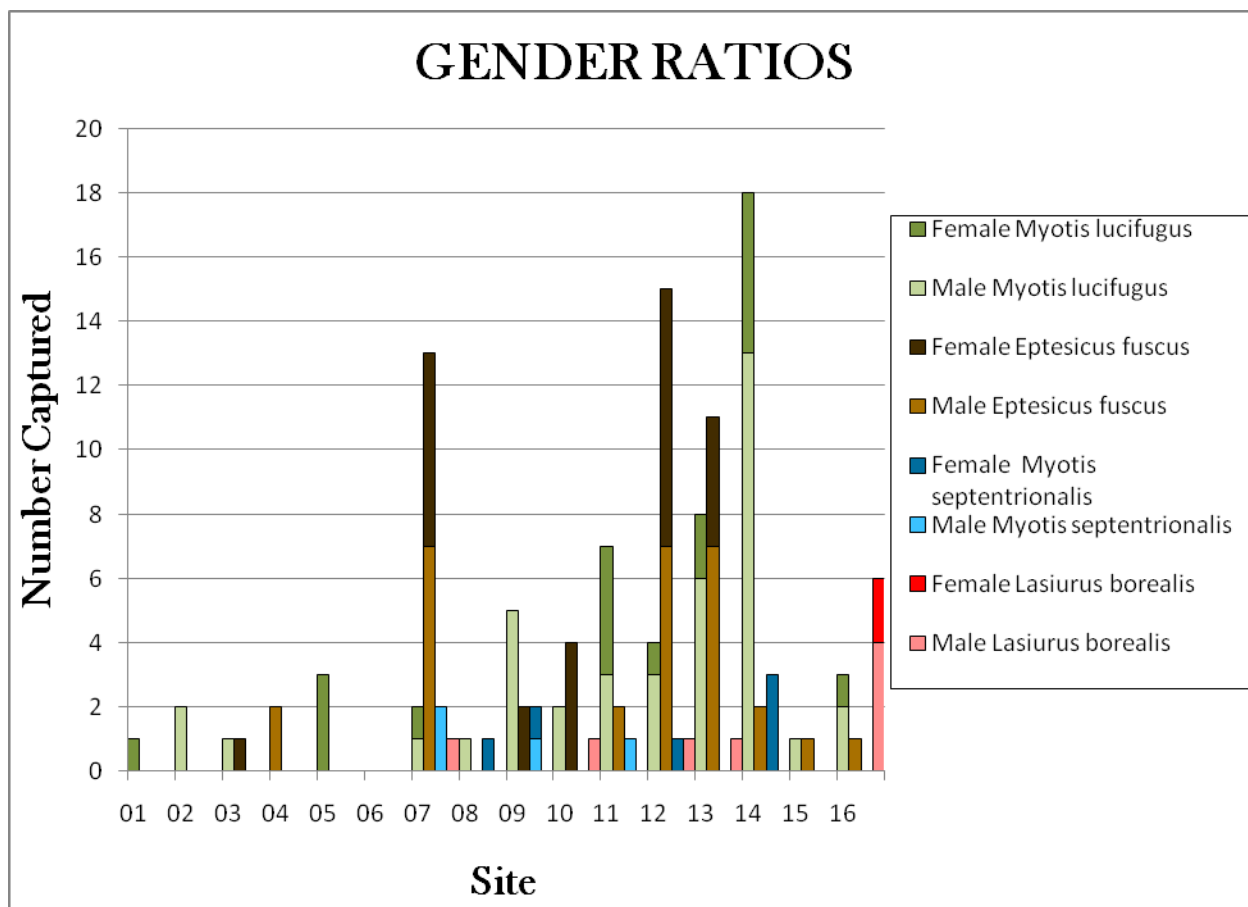


Eight bats were identified to species while still in the net, but escaped the net upon approach to handle or while another bat was being removed from the net (in the event of multiple captures during a given net check, species identification was performed prior to removal of individuals). As a result, detailed data could not be obtained from these escapees and is not reflected in tables or graphs representing information beyond species, capture time, and height of capture. The escapees included three little browns (Sites 3, 5, and 14), one northern long eared (Site 5), one red bat (Site 13), and three big browns (Sites 6, 7, and 12).

### Gender Ratios

A review of the capture totals results in a male to female ratio of approximately 1:1.5 for northern long ears, 2.2:1 for little browns, 1.2:1 for big browns, and 4:1 for red bats.

Although the ratios for the little brown and red bat appear skewed if reviewing only the capture totals, the proportion of males and females of a given species by site appeared to be within the normal range of variability among sites with an adequate sample size to compare. These results are shown on the accompanying graph. The late summer survey period, and in consideration of the potential for early migrating females, may also influence the gender ratio for red bats although no conclusions should be made from the small sample size obtained for this project.



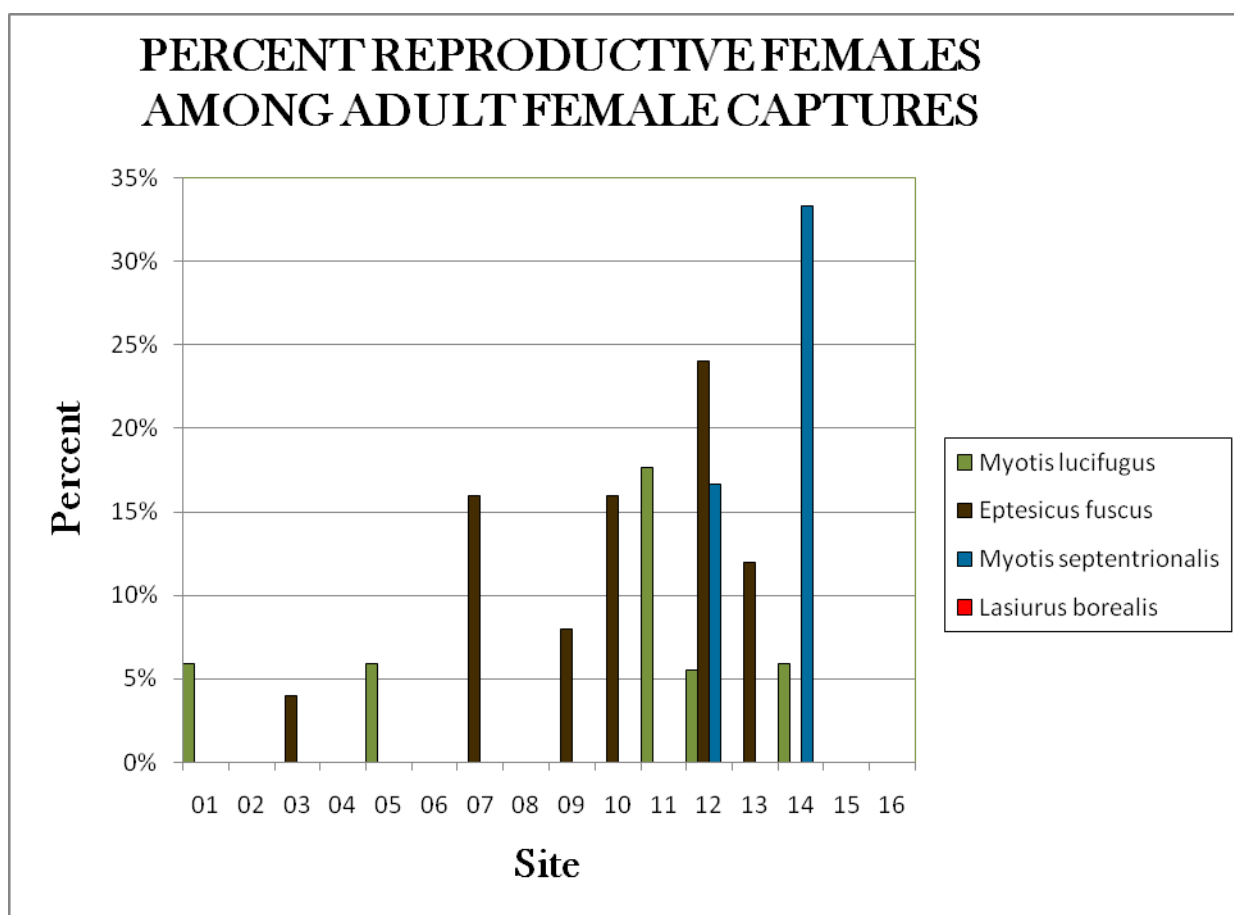


## Age

Age was recorded as either juvenile (young-of-year) or adult. Adults comprised approximately 91% of northern long ear, 93% of little brown, 91% of big brown, and 73% of red bat captures.

## Reproductive Condition

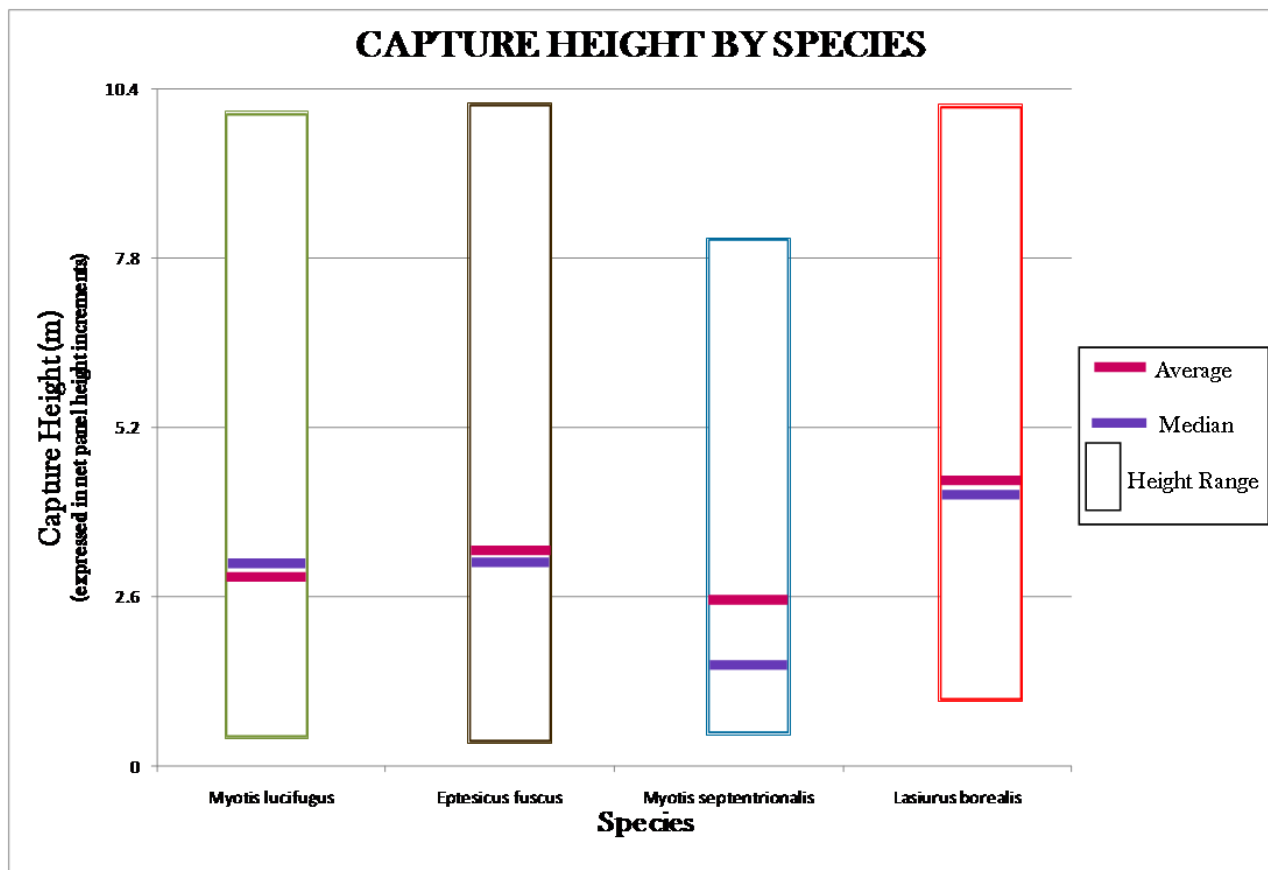
Of the adult females, approximately 50% of northern long ears, 44% of little browns, and 80% of big browns were noted to show signs of recent reproduction expressed as pregnant, lactating, or post lactating. Of the red bats captured (11), eight were adults and only one of the adults was female. The adult female was not observed to show traits of reproduction. The following graph displays the percentage of reproductive females among the adult female population, by site.



The poor representation of reproductive adult female red bats during this survey could either be attributed to lack of presence or capture success with reproductive female red bats, or simply an anomaly resulting from the small sample size. Although the presence of juvenile red bats would appear to indicate that reproductive females are present in the project area, little is currently understood regarding the seasonal movements and distribution of adults or juveniles of this migratory species.

## Capture Heights

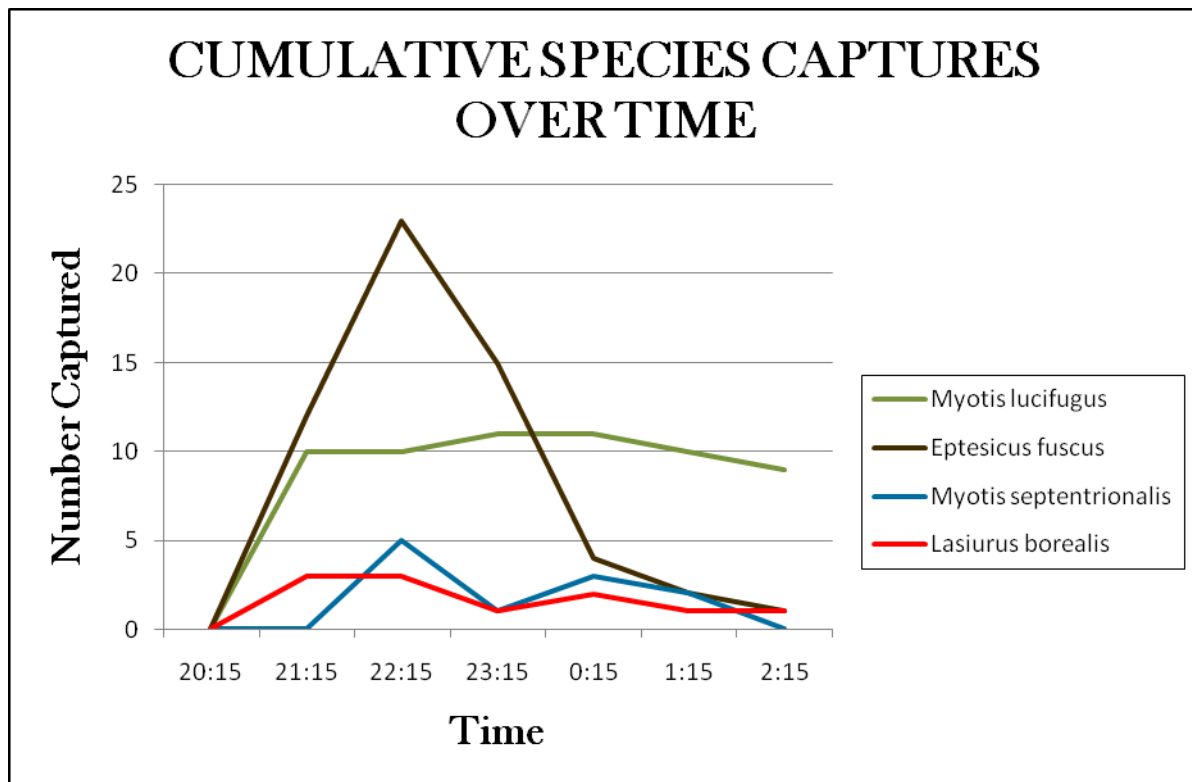
Although biased by site habitat, travel corridor configuration, and resultant net set, trends in capture height were found to be generally consistent with species behavioral accounts and ecological niche for each species. The following graph represents the cumulative capture heights of each species, including height range, and average and median capture height. Significant overlap of range, average, and median height was noted for little brown, big brown and red bats. Both the little brown and big brown are noted as habitat generalists, and this behavior contributes to their broad success in variable habitats such as several of the survey sites. Only the northern long eared bat displayed a distinct habitat preference, which translated to closed canopy conditions and generally narrow travel corridors with restrictions, for which it is more specialized to forage in. Where potential travel corridors provided opportunities for quad-height net sets (four 2.6 m high panels stacked to a height of 10.4 m), the highest net panel (from 7.8 to 10.4 m) was poorly represented in capture results for any of the species.





### Periods of Peak Activity and Captures

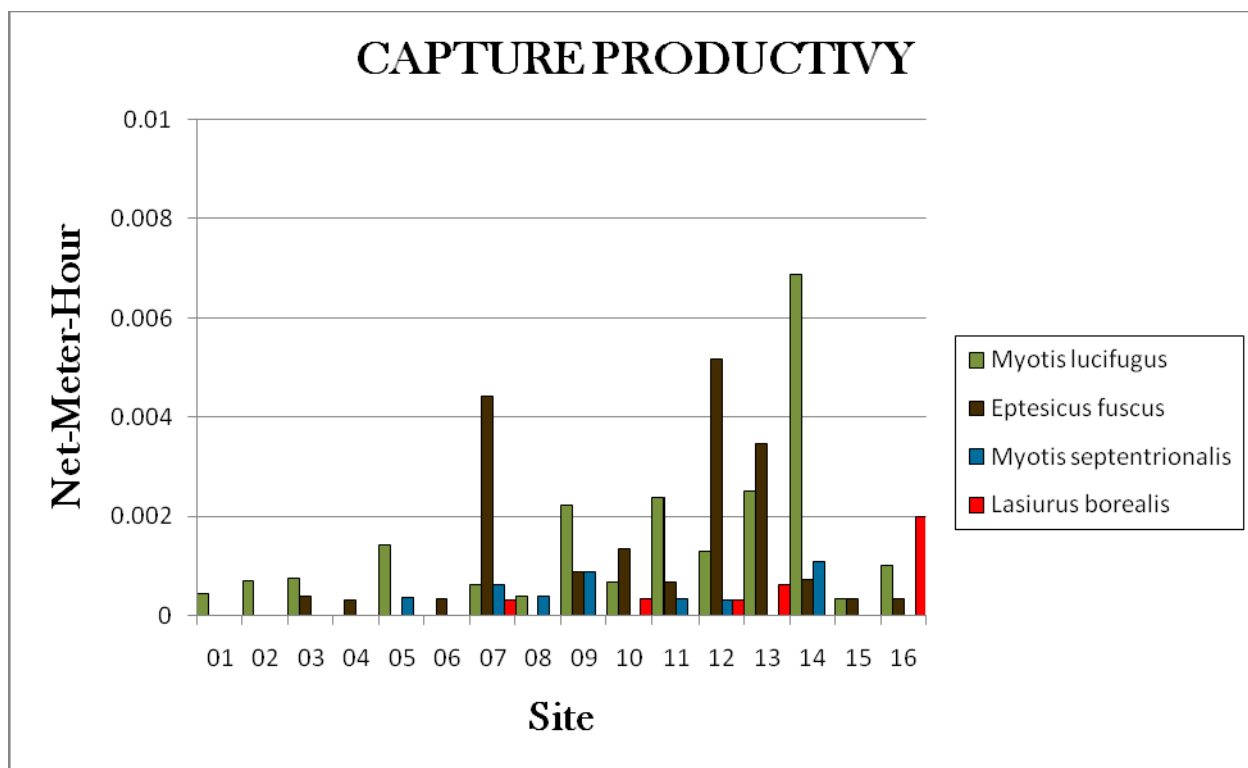
All species generally showed a peak in capture rate (which corresponds to foraging/travelling activity) within the first two hours following sunset. Little brown bat activity generally peaked in the first hour of survey and remained relatively consistent for the remainder of the night. Big brown bat activity peaked dramatically near the second hour of survey and then dropped at a similar rate for the following two hours before beginning a more gradual decline for the final few survey hours. The northern long eared bat and red bat generally demonstrated peak activity within the first two hours, followed by a decrease of approximately half the capture rate before stabilizing again and decreasing slightly for the remainder of the survey night. These results are summarized on the following graph.



*Note: This graph is based on actual capture time (EST) and does not fully reflect decreasing daylight over the course of the survey. The difference between sunset at the start of survey and end of survey is minus 27 minutes. However, the effect of decreasing daylight on activity is minimized graphically by portraying one hour intervals beginning at the earliest sunset occurring during course of the survey.*

### Capture Productivity/Effort

Capture productivity and effort of capture were evaluated by dividing the site captures by the area of site netting (square meters) multiplied by the time (hours) the nets are deployed. This measurement is shown in the following graph. Due to the similar size and number of net sets deployed at each survey site, the captures/net-meter-hour closely corresponds with total captures by site.



### Distribution and Density

The distribution and density of the bat captures within the study area (Figure 3) is highest along the central to northern portion of the project area where the alignment traverses a mix of forest and agriculture land uses along a broad portion of Negro Mountain. The highest capture rates for the *Myotis* genus occurred at these areas as well. This portion of the project area, and adjacent lands, also contains numerous small groundwater based ponds associated with agriculture or mining.

Sites in the southern portion of the project area, where land use is primarily agriculture except for steep forested valleys with moderate gradient perennial streams, resulted in significantly fewer captures compared to that of the northern portion of the project area even though the southern sites targeted the forested stream valleys.



### External Parasites

In the course of handling and cursory examination of captured bats during data collection, the presence of any external parasites was noted. Approximately 58% of big brown bats, 20% of little brown bats, and 9% of northern long ear bats, were found to harbor visible external parasites. The parasites encountered consisted of wing mites, bat fleas and bat bugs. Big browns were found to be parasitized exclusively by wing mites. Of the twelve little browns afflicted, ten were found to have only fleas, one had only wing mites, and one had both fleas and wing mites. The single northern long eared bat afflicted by parasites was observed to have both wing mites and a bat bug.

### Hair and Tissue Sample Collection

In cooperation with studies being conducted at the Western Michigan University on population genetic structure and phylogeography, hair and tissue samples were collected from six little brown bats and four red bats. A log of the sample collection is provided in Appendix C.

### Incidental Captures

Several animals, other than bats, were captured incidentally during the course of the mist net survey. These include seven southern flying squirrels (*Glaucomys volans*) (Site 4, 7{2}, 8, 10, 11, 13), a belted kingfisher (*Megaceryle alcyon*) (Site 3), and a ruby-throated humming bird (*Archilochus colubris*) (Site 2). The handling of incidental captures was minimized except to enable safe release of the animal from the netting. No data was collected on incidental captures other than to identify the species and photo-document the capture. All incidental captures were released without incidence.

*Note: The identification of the flying squirrels as species volans was based on cursory visual appearance of subtle identifying characteristics (primarily ventral and dorsal pelage color, and to a lesser extent size) differentiating it from the northern flying squirrel (Glaucomys sabrinus). A positive verification was not attempted through handling and closer inspection. A photograph of captured flying squirrels was taken if possible. Capture photographs representative of the species are included in Appendix D.*

## IV. Discussion

### Survey Site and Capture Considerations

Primary factors appearing to affect the capture of bats on this survey included available suitable habitat for survey and weather conditions. Site habitat descriptions, a site diagram, net-set configurations, site photographs, and site weather conditions are provided on, or as a supplement to, PGC Form P-7008-N/T, *Bat Netting/Trapping Site Survey Record*.

Survey sites were chosen within the previously studied Final Design Right-of-Way boundary, or immediately adjacent, where feasible. Habitats along the project corridor varied from steep, low-elevation, forested valleys to broad, high elevation forest/agriculture dominated mountaintop. Additional habitats included agriculturally dominated landscapes and reclaimed mine lands bordering the aforementioned habitats. Every attempt was made to locate the most productive habitats while accommodating the site spacing/number protocol guidelines. Although the most suitable habitat was chosen in any available area, suitable portions of the project area were sometimes found to be less desirable than that of surrounding lands beyond the study area. Low capture rates at several sites appear to be attributed to these reasons.

Sites 2, 3, 4, and 5, were located in steep forested valleys with moderate gradient perennial stream corridors. The lack of habitat diversity and suitable travel corridors connecting to adjacent diversified lands appeared to affect bat usage and activity levels at these sites. The potential travel corridors at these sites were generally less than 7 meters and consisted of the stream corridor or associated wetlands. Additionally, the lower elevation and confined topography of these sites resulted in lower nighttime temperatures than surrounding hilltops and elevated areas. Insect activity at these sites was observed to be correspondingly low. This condition may have been further pronounced due to lower than average seasonal temperatures during portions of the survey period. Temperatures were recorded approaching the 10°C protocol limit on several of the survey nights at these sights.

Where first site-night capture results at a given site were significantly less than anticipated, the set locations were re-evaluated for modification using observations of activity (both visual and interpreted from ultrasound detectors). The arrangement/location of net sets was adjusted at one site on the second night of survey in an attempt to refine the sets and increase captures. Minor adjustments to net size deployed, skew of the set, or number of nets were adjusted at several sites also. All site adjustments are documented on survey data forms and reflected in the site diagram accompanying each form.



The sites with the greatest captures occurred along broad elevated landforms with slopes less than 10% and near the interface of open land uses and contiguous, mixed-age, moderate density forest. Also characteristic of the sites with the highest capture rates and species diversity was travel corridors in the range of 7 to 10 meters wide (dirt access roads or gas lines), with canopy restrictions, that provide connectivity between forest and open habitat components, and a pond or moderate-low gradient stream within 0.5 kilometers.

Rain events, predominantly in the form of passing afternoon and evening showers proceeded several nights of survey. Additionally, showers were recorded on several survey nights and were compensated for during the survey. Both the time of the rain event and the effect on bat activity levels (interpreted from ultrasound detectors) was recorded on site data forms. The duration of inactive periods attributed to weather, and cumulatively less than an hour, was added to the survey night length to meet the minimum survey time requirements. If the weather appeared to compromise survey conditions for a period longer than could effectively be compensated for that night (generally longer than an hour), the survey was cancelled for the night and lost survey time was compensated for through additional survey at a later date.

## **V. Conclusions**

A mist net survey for the Indiana bat was conducted at 16 sites along the 16 kilometer study corridor in accordance with USFWS protocol. No Indiana bats, or other species federally or state listed as endangered or threatened, were captured as a result of these survey efforts.

A total of 140 bats, representing four species, were captured during the mist net survey. Fifty-two percent of captured bats were of the *Myotis* genus (both *lucifugus* and *septentrionalis*). The predominance of captures consisted of little brown and big brown bats (44% and 41% respectively). This result appears consistent with the habitats available for survey, which consisted primarily of fragmented forest habitats adjacent to or in the vicinity of agricultural operations.

Construction of the project will result in the loss of bat roosting and foraging habitat for species utilizing the project area. Forest impacts were calculated based upon spatial extent of the cover type determined via aerial photographs and field confirmations within Final Design Right-of-Way limits and are approximately 330 acres.

A mist net survey is an attempt to verify the presence or probable absence of a bat species, using standardized methods, procedures, and protocol, through survey of the species known preferred habitats. This survey completes the effort proscribed by the USFWS to reasonably ascertain that Indiana bats are not utilizing habitats in the project corridor and will not be directly impacted as a result of the proposed project construction.

Therefore, as result of these survey findings, no further mist net surveys are warranted. The results of this survey are valid for a period of two years. Additionally, as indicated through Informal consultation between the FHWA and the USFWS on January 25, 2008, and reflected by written FHWA correspondence with USFWS on January 31, 2008 (Appendix A), in the absence of a confirmed species findings by a qualified biologist using approved methods and protocols, it is anticipated that the USFWS will issue a *No Effect* finding for the proposed action.



## **VI. List of Preparers**

Steve J. Pernick  
Senior Natural Resources Specialist  
Pennsylvania State University  
1992, BS, Environmental Resource Management  
USACOE Certified Wetland Delineator WDCP93MD0910076B  
USFWS-Approved, Qualified Indiana Bat Surveyor  
16 years experience

Stephen G. Toki, Jr.  
Environmental Manager  
Indiana University of Pennsylvania  
1994, BS, Environmental Health / Minor Biology  
14 years experience

Mandy J. Painter Spangler  
Natural Resource Specialist  
Pennsylvania State University  
2003, BS, Wildlife and Fisheries Science  
5 years experience

John R. Gustkey, Jr.  
Natural Resource Specialist  
Shippensburg University  
2005, MS, Geoenvironmental Studies  
University of Pittsburgh at Johnstown  
2003, BA, Environmental Studies  
3 years experience

## **Additional Survey Participants**

Dennis J. McGraw  
Natural Resource Specialist  
Colorado State University  
1997, BS, Wildlife Biology  
TWS - Certified Wildlife Biologist  
11 years experience

Eric W. Lange  
Senior Environmental Specialist  
Pennsylvania State University  
1992, BS, Environmental Resource Management  
16 years experience

Kelly L. Eismont  
Environmental Scientist  
Slippery Rock University  
1998, BS Environmental Science  
7 years experience

Troy A. Gallaher P.G., R.E.P.A.  
Environmental Specialist  
University of Pittsburgh  
1985, BS, Geology  
Registered Professional Geologist, PA – PG000635G  
Registered Environmental Property Assessor - 1650  
23 years experience



**APPENDIX A**

**AGENCY COORDINATION**



# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

Pennsylvania Field Office  
315 South Allen Street, Suite 322  
State College, Pennsylvania 16801-4850



July 17, 2001

RECEIVED

Steven E. Pomeroy  
Greenhome & O'Mara, Inc.  
5000 Ritter Road  
Suite 102  
Mechanicsburg, PA 17055

Dear Mr. Pomeroy:

This responds to your letter of March 12, 2001, requesting information on federally listed threatened and endangered species in the vicinity of the proposed U.S. Route 219 Improvement Project located in Somerset County, Pennsylvania. Because the Federal Highway Administration has discretion over authorizing and funding the proposed project, and the Corps of Engineers may issue a federal permit for the discharge of fill material from the project into wetlands and streams, the following comments are provided pursuant to section 7 of the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*), which requires federal agencies to evaluate their actions with respect to any species that is listed as endangered or threatened.

The project area is within the range of the federally listed, endangered Indiana bat (*Myotis sodalis*). Indiana bats hibernate in caves and mines during the winter months (November through March), and use a variety of upland, wetland and riparian habitats during the spring, summer and fall. Indiana bats usually roost in dead or living trees with exfoliating bark, crevices or cavities, in upland or riparian areas. Tree species such as shagbark hickory, black birch, red and white oak, and sugar maple are also used. Land-clearing, especially of forested areas, may adversely affect Indiana bats by killing, injuring or harassing roosting bats, and by removing or reducing the quality of foraging and roosting habitat.

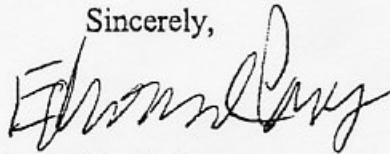
The project study area is within six miles of an Indiana bat hibernaculum to the south, and 14 miles from a second hibernaculum to the east. Therefore, additional informal consultation with the Service will be required as project plans are developed. For project alternatives carried forward for detailed evaluation in the draft environmental impact statement, please provide this office with a description of the forested areas affected by each alternative (i.e., size, species composition, structural diversity, landscape location) and estimated loss of forested habitat from each alternative. Depending upon the extent of forest impacts, a bat survey of the project area may be required for the selected alternative between May 15 and August 15 by a qualified, Service-approved biologist (see enclosed list) using the enclosed survey guidelines. Survey results should be submitted to the Service for review and concurrence.



In addition, if any natural caves or abandoned mines occur within the project area, it is possible that Indiana bats or other bat species may be using them during hibernation or potentially as summer roost sites. If potential Indiana bat hibernacula (i.e., caves or abandoned mines) occur within the project study area, they should be surveyed by a qualified biologist. Prior to conducting any survey, however, the Pennsylvania Game Commission should be contacted to determine whether or not they have surveyed the cave/mine in the past. If adequate surveys have been conducted in the recent past, this may preclude the need to conduct additional surveys. Survey results should be submitted to the Service for review and concurrence.

If you have any questions regarding these comments, please contact Richard McCoy of my staff at 814-234-4090.

Sincerely,



*for* David Densmore  
Supervisor

cc:

PFBC - Arway

PGC - McDowell

EPA - Okorn

Readers file

Project file

ES: PAFO:RMcCoy/rm:tp:7/17/01

filename: pomeroy.717



# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

Pennsylvania Field Office  
315 South Allen Street, Suite 322  
State College, Pennsylvania 16801-4850



April 17, 2003

RECEIVED

APR 21 2003

Steven E. Pomeroy  
Greenhorne & O'Mara, Inc.  
5000 Ritter Road, Suite 102  
Mechanicsburg, PA 17055

Dear Mr. Pomeroy:

This documents ongoing informal consultation regarding federally listed and proposed endangered and threatened species within the area affected by the proposed US 219 Improvement Project, Meyersdale to Somerset, located in Somerset County, Pennsylvania. The following comments are provided pursuant to the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) to ensure the protection of endangered and threatened species.

As we stated in our July 17, 2001, letter, the project area is within the range of the federally listed, endangered Indiana bat (*Myotis sodalis*). In a December 2002 report entitled *U.S. 219 Improvement Project, Meyersdale to Somerset, Vegetation and Wildlife Summary Report*, four mines were located in the project area, but all are sealed and, therefore, not available to for use by bats. An air shaft that appears to be associated with a mine between Fogletown Road and Buffalo Creek (near Althouse Road) is open, but has not been investigated for use by bats. Abandoned mines can support Indiana bats or other bat species that may use them during hibernation or potentially as summer roost sites. This airshaft should be surveyed by a qualified biologist to determine its potential to serve as an Indiana bat hibernaculum. Prior to conducting any survey, however, the Pennsylvania Game Commission should be contacted to determine whether or not they have surveyed the cave/mine in the past. If adequate surveys have been conducted in the recent past, this may preclude the need to conduct additional surveys. Survey results should be submitted to us for review and concurrence.

According to our review of the project information provided, it appears that between 180 and 200 acres of forested habitat will be affected by any of the proposed project alternatives. Therefore, land-clearing associated with the project may result in the death or injury of roosting Indiana bats if tree-cutting is conducted during the time of year when bats may be present (i.e., April 1 to September 30). Due to the potential for Indiana bats to occur within the project area, the Service recommends that measures be implemented to avoid killing or injuring them. This can be accomplished by carrying out timber-cutting activities from October 1 to March 31, during which time bats are hibernating or concentrated near their hibernacula.



If any timber cutting is necessary from April 1 to September 30, the following trees greater than or equal to five inches diameter breast height (d.b.h.) should not be cut or physically disturbed (e.g., while harvesting any adjacent trees): 1) dead or dying trees and snags (including lightning-struck trees) with exfoliating bark; 2) live trees (such as shagbark and shellbark hickory) which have exfoliating or defoliating bark on the trunk or branches; and 3) trees or snags that have characteristics typical of roost sites for Indiana bats (i.e., have exfoliating or defoliating bark, or contain cracks, crevices, or holes that could be used by the species as a potential roost). Tree-clearing from October 1 to March 31 may proceed without the above restrictions.

Based on a review of the information supplied to this office, the Service has determined that construction of the proposed project will not adversely modify overall habitat quality for the Indiana bat. Therefore, if a seasonal restriction on tree cutting is implemented, construction of the proposed project is not likely to adversely affect the Indiana bat or any other federally listed or proposed species.

If you are unable to adopt the timber-cutting restrictions detailed above, an Indiana bat survey should be conducted by a qualified surveyor (list enclosed) in accordance with the enclosed *Mist Netting Guidelines*. Survey results should be submitted to the Service for review and comment. Should Indiana bats be found during the survey, further consultation with the Service will be required.

Please advise this office as to whether you intend to conduct bat mist net surveys, or assume bats are present and implement a seasonal restriction on timber cutting. Should Indiana bats be found during the surveys of any mine openings, further consultation with the Service will be necessary, including the submission of detailed project plans, and an analysis of alternatives to avoid and minimize adverse effects.

This response relates only to endangered or threatened species under our jurisdiction based on an office review of the proposed project's location. No field inspection of the project area has been conducted by this office. Consequently, this letter is not to be construed as addressing potential Service concerns under the Fish and Wildlife Coordination Act or other authorities.

If you have any questions regarding this matter, please contact Robert Anderson of my staff at 814-234-4090.

Sincerely,

A handwritten signature in dark ink, appearing to read "David Densmore", followed by a long horizontal line extending to the right.

David Densmore  
Supervisor

Enclosures

# **FEDERALLY LISTED AND PROPOSED SPECIES THAT NO LONGER OCCUR IN PENNSYLVANIA**

<u>COMMON NAME</u>	<u>SCIENTIFIC NAME</u>	<u>STATUS**</u>	<u>FORMER DISTRIBUTION</u>
<b><u>MAMMALS</u></b>			
Canada lynx	<i>Lynx canadensis</i>	PT	north-central PA (Tioga Co.)
Delmarva Peninsula fox squirrel	<i>Sciurus niger cinereus</i>	E	mature forests of southeastern PA (Delaware and Chester Co.)
Eastern cougar	<i>Felis concolor cougar</i>	E	state-wide
Grey wolf	<i>Canis lupus</i>	E	state-wide
<b><u>MOLLUSKS</u></b>			
Fanshell*	<i>Cyprogenia stegaria</i>	E	Ohio River drainage
Orange pimpleback*	<i>Plethobasus striatus</i>	E	Ohio River drainage
Pink mucket pearly mussel*	<i>Lampsilis abrupta</i>	E	Ohio River drainage
Ring pink mussel*	<i>Obovaria retusa</i>	E	Ohio River drainage
Rough pigtoe*	<i>Pleurobema plenum</i>	E	Ohio River drainage
<b><u>INSECTS</u></b>			
American burying beetle	<i>Nicrophorus americanus</i>	E	state-wide
Karner blue butterfly	<i>Lycaeides melissa samuelis</i>	E	pine barrens, oak savannas (wild lupine habitat) (Wayne Co.)
Northeastern beach tiger beetle	<i>Cicindela dorsalis dorsalis</i>	T	along large rivers in southeastern PA
<b><u>PLANTS</u></b>			
Eastern prairie fringed orchid	<i>Platanthera leucophaea</i>	T	wet prairies, bogs (Crawford Co.)
Sensitive joint-vetch	<i>Aeschynomene virginica</i>	T	freshwater tidal marshes of Delaware river (Delaware and Philadelphia Co.)
Virginia spiraea*	<i>Spiraea virginiana</i>	T	along Youghiogheny River (Fayette Co.)
Smooth coneflower	<i>Echinacea laevigata</i>	E	serpentine barrens (Lancaster Co.)

Revised 10/19/00

\* It is possible that remnant populations of some of these species (indicated with an \*) may still occur in Pennsylvania, however, there have been no confirmed sightings of these species for over 70 years.

\*\* E = Endangered, T = Threatened, PT = Proposed Threatened

The following is a partial list of additional species that no longer occur in Pennsylvania: moose, bison, wolverine, passenger pigeon, Bachman's sparrow, greater prairie-chicken, olive-sided flycatcher, Bewick's wren, eastern tiger salamander, blue pike, butterfly mussel, Diana fritillary butterfly, precious underwing moth, deertoe mussel, marbled underwing moth, cobblestone tiger beetle, mountain clubmoss, crested yellow orchid, red milkweed, American barberry, small white lady's-slipper, etc, etc.



# INDIANA BAT MIST NETTING GUIDELINES

## RATIONALE

A typical mist net survey is an attempt to determine presence or probable absence of the species, it does not provide sufficient data to determine population size or structure. Following these guidelines will standardize procedures for mist netting. It will help maximize the potential for capture of Indiana bats at a minimum acceptable level of effort. Although the capture of bats confirms their presence, failure to catch bats does not absolutely confirm their absence. Netting effort as extensive as outlined below usually is sufficient to capture Indiana bats. However, there have been instances in which additional effort was necessary to detect the presence of the species.

## NETTING SEASON

May 15 - August 15

These dates define acceptable limits for documenting the presence of summer population of Indiana bats, especially maternity colonies. Several captures, including adult females and young of the year, indicate that a nursery colony is active in the area. Outside these dates, even when Indiana bats are caught, data should be carefully interpreted: If only a single bat is captured, it may be a transient or migratory individual.

## EQUIPMENT

Mist nets - Use the finest, lowest visibility mesh commercially available:

1. In the past, this was 1 ply, 40 denier monofilament - denoted 40/1
2. Currently, monofilament is not available and the finest on the market is 2 ply, 50 denier nylon - denoted 50/2
3. Mesh of approximately  $1 \frac{1}{2}$  ( $1 \frac{1}{4}$  -  $1 \frac{3}{4}$ ) in (~38 mm)

Hardware - No specific hardware is required. There are many suitable systems of ropes and/or poles to hold the nets. See NET PLACEMENT below for minimum net heights, habitats, and other netting requirements that affect the choice of hardware. The system of Gardner, *et al.* (1989) has met the test of time.

## NET PLACEMENT

Potential travel corridors such as streams or logging trails typically are the most effective places to net. Place the nets approximately perpendicular across the corridor. Nets should fill the corridor from side to side and from stream (or ground) level up to the overhanging canopy. A typical set is seven meters high consisting of three or more nets "stacked" on top one another and up to 20 m wide. (Different width nets may be purchased and used as the situation dictates.)

Occasionally it may be desirable to net where there is no good corridor. Take caution to get the nets up into the canopy. The typical equipment described in the section above may be inadequate for these situations, requiring innovation on the part of the observers.

## RECOMMENDED NET SITE SPACING:

Stream corridors - one net site per km of stream.

Non-corridor land tracts - two net sites per square km of forested habitat.

## MINIMUM LEVEL OF EFFORT

Netting at each site should consist of:

At least four net-nights (unless bats are caught sooner) (one net set up for one night = one net-night)

A minimum of two net locations at each site (at least 30m apart, especially in linear habitat such as a stream corridor)

A minimum of two nights of netting

Sample Period: begin at sunset; net for at least 5 hr

Each net should be checked approximately every 20 min

No disturbance near the nets, other than to check nets and remove bats

## WEATHER CONDITIONS

Severe weather adversely affects capture of bats. If Indiana bats are caught during weather extremes, it is probably because they are at the site and active despite inclement weather. On the other hand, if bats are not caught, it may be that there are bats at the site but they may be inactive due to the weather. Negative results combined with any of the following weather conditions throughout all or most of a sampling period are likely to require additional netting:

Precipitation

Temperatures below 10°C

Strong winds (Use good judgement: moving nets are more likely to be detected by bats.)

## MOONLIGHT

There is some evidence that small myotis bats avoid brightly lit areas, perhaps as predator avoidance. It is typically best to set nets under the canopy where they are out of the moon light, particularly when the moon is ½-full or greater.



## Qualified Indiana Bat Surveyors\*

list revised - 3/12/03

Dr. Virgil Brack, Jr.  
Environmental Solutions &  
Innovations  
781 Neeb Road  
Cincinnati, OH 45233  
513-451-1777  
513-451-3321 (fax)

John Macgregor  
Berea Ranger District  
Daniel Boone National Forest  
1835 Big Hill Road  
Berea, KY 40403  
606-745-3100

Dr. Karen Campbell  
Biology Department  
Albright College  
Reading, PA 19614  
610-921-2381

Hal Bryant  
Eco-Tech, Inc.  
P.O. Box 8  
Frankfort, KY 40602-0008  
502-695-8060  
502-695-8061 (fax)  
[myotis2000@aol.com](mailto:myotis2000@aol.com)

Chris Sanders  
Sanders Wildlife  
314 N. Pennsylvania Ave.  
PO Box 185  
Centre Hall, PA 16828-0185  
814-364-8776  
814-659-8257 (cell)  
[sanders@batgate.com](mailto:sanders@batgate.com)

Dr. Phillip Clem  
University of Charleston  
2300 MacCorkle Ave., SE  
Charleston, WV 25304  
304-357-4793

Tim Blackburn  
825 19<sup>th</sup> Street, 2<sup>nd</sup> Floor  
Altoona, PA 16601

Ryan Leiberher  
Skelly and Loy, Inc.  
2601 N. Front St.  
Harrisburg, PA 17110  
717-232-0593  
[rleiberher@skellyloy.com](mailto:rleiberher@skellyloy.com)

Dr. Lynn Robbins  
Southwest Missouri State  
University  
Biology Department  
901 South National  
Springfield, MO 65804  
417-836-5366

Robert F. Madej  
R.D. Zande & Associates  
1237 Dublin Road  
Columbus, OH 43215  
800-340-2743  
614-486-4387 (fax)

John Chenger  
Bat Conservation &  
Management  
220 Old Stone House Road  
Carlisle, PA 17013  
717-241-2228  
814-442-4246 (cell)

Dr. Michael Gannon  
Department of Biology  
Penn State University  
Altoona College  
3000 Ivyside Park  
Altoona, PA 16601-3760  
814-949-5210

Andrew King, Jeffrey Brown,  
Amy Henry, Russell  
Romme  
BHE Environmental, Inc.  
11733 Chesterdale Road  
Cincinnati, OH 45246  
513-326-1500  
513-326-1550 (fax)

James Hart  
The Vertebrate Museum  
Shippensburg University  
Shippensburg, PA 17257  
717-532-1145

David Wayland  
218 East Walnut Street  
Clearfield, PA 16830  
814-883-9994  
[dwayland@uplink.net](mailto:dwayland@uplink.net)

\* This list includes **INDIVIDUALS** who are qualified to conduct surveys for Indiana bats and identify this species in the field. This list may not include all individuals qualified to conduct such surveys. Inclusion of names on this list does not constitute endorsement by the U.S. Fish and Wildlife Service or any other U.S. Government agency. A scientific collecting permit will be required from the Pennsylvania Game Commission to sample for Indiana bats in Pennsylvania. Note that various survey and sampling techniques are used to detect, sample for, and monitor bats, including mist-netting, Anabat detection, radio-telemetry, harp-trapping and hibernacula surveys. Some individuals on this list may not be qualified to conduct all types of sampling.



# United States Department of the Interior



FISH AND WILDLIFE SERVICE  
Pennsylvania Field Office  
315 South Allen Street, Suite 322  
State College, Pennsylvania 16801-4850

November 8, 2007

RECEIVED

NOV 12 2007

L. ROBERT KIMBALL & ASSOCIATES INC  
EBENSBURG PA

Eric W. Lange  
L. Robert Kimball and Associates  
615 West Highland Avenue  
P.O. Box 1000  
Ebensburg, PA 15931

RE: USFWS Project #2007-2430

Dear Mr. Lange:

This responds to your letter of July 23, 2007, requesting updated information about federally listed and proposed endangered and threatened species within the area affected by the proposed U.S. 219 Improvement Project, Meyersdale to Somerset (S.R. 6219, Section 020), located in Somerset, Black, Brothers Valley, and Summit Townships, Somerset County, Pennsylvania. The proposed project is within the known range of the Indiana bat (*Myotis sodalis*), a species that is federally listed as endangered. The following comments are provided pursuant to the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) to ensure the protection of endangered and threatened species.

In our July 17, 2001, letter to Steven Pomeroy of Greenhorne and O'Mara, Inc., we provided information regarding two Indiana bat hibernacula known to occur near the project study area, and requested additional information about habitats that would be disturbed by the proposed new roadway. In our April 17, 2003, letter to Steven Pomeroy, we recommended that the project proponents conduct a mist-net survey to determine if Indiana bats use forest habitat along the proposed roadway alignment, or assume the species is present and implement measures to avoid killing roosting Indiana bats by removing trees between October 1 and March 31, when the species is expected to be elsewhere. In our August 6, 2004, letter to Shannon Miller of Greenhorne and O'Mara, we were unable to concur that the proposed project would have no effect on Indiana bats. We again recommended that either a survey for the species be conducted, or seasonal tree-cutting measures be incorporated into the project plans, and requested that we be informed regarding which option would be selected. The Federal Highway Administration's 2005 Final Environmental Impact Statement for this section of the U.S. 219 Improvement Project indicated that seasonal tree-cutting avoidance measures may be implemented.

E. Lange  
J. Vitez  
Ed Jones  
Genday



Your letter of July 23 once again identified the options of either surveying for Indiana bat presence or implementing seasonal restrictions, but did not commit to either option, nor make an effects determination regarding Indiana bats.

Since our 2004 correspondence, new information has become available regarding Indiana bat summer distribution in Pennsylvania. In 2004, we were aware that Indiana bats may roost in Pennsylvania forests; however, at that time only a single maternity colony (a reproductive group of female Indiana bats and their young) had been documented in the state. In 2005, 2006, and 2007, radio-tracking and mist-netting documented additional maternity colonies in northern Maryland and central and southwestern Pennsylvania. The closest of these is in adjacent Bedford County, where roosting and foraging activity has been documented approximately 10 miles to the east of the project area. Other than cave and mine opening assessments completed for the Meyersdale to Somerset section of U.S. 219, we are not aware of any Indiana bat surveys in the project area. However, the best available scientific and commercial data indicate that suitable roosting and foraging habitat is present in the action area, that maternity colonies have been documented in similar nearby habitat, and that some Indiana bats leaving nearby hibernacula in the spring remain in central Pennsylvania.

In addition to new information regarding Indiana bats in this area of Pennsylvania, we have also been informed of additional habitat removal related to the U.S. 219 Improvement Project. Since our 2004 letter regarding the Meyersdale to Somerset section of U.S. 219, a preferred alignment for the Meyersdale to I-68 section (S.R. 6219, section 019) has been identified. That new roadway section will also result in removal of a large area of foraging and roosting habitat in Somerset County. Combined, the development of these two sections of the U.S. 219 Improvement Project is expected to result in the removal of more than 700 acres of potential Indiana bat foraging habitat (identified as agricultural land, rangeland, and forestland), including approximately 400 acres of forest potentially suitable as Indiana bat roosting and maternity habitat.

As the species reproductive unit, maternity colonies are important for the recovery of Indiana bats. Because Indiana bat maternity colonies have been documented to exhibit site fidelity from year to year, extensive areas of forest removal and the creation of long, linear openings that the bats are resistant to cross may eliminate essential maternity habitat. This can occur through direct loss of forest, or through fragmentation if the species fails to cross cleared areas, thereby losing access to otherwise suitable habitat. Although seasonal tree removal restrictions avoid direct take of the species, this measure does not diminish the indirect effect of forest loss for Indiana bats returning to summer maternity areas in the spring following forest removal.

Project funding may lead to roadway proposals being divided into sections, and a number of similar individual actions within a given geographical area or segment of a comprehensive plan can be considered collectively. The Federal Highway Administration has already completed formal consultation regarding the effects of the S.R. 6219, section 019 project on Indiana bats. However, this does not relieve the Administration of the requirements for considering the effects of the U.S. 219 project as a whole.

Due to the anticipated impacts of the project on forest habitat, seasonal tree-cutting restrictions fail to address adverse affects that may arise from overall loss of habitat and habitat fragmentation. Consequently, we cannot concur that the Meyersdale to Somerset section of U.S. 219, section 020, is not likely to adversely affect Indiana bats.

Considering the extent of habitat removal resulting from the two proposed sections of the U.S. 219 Improvement Project, we again recommend that a bat survey of the project area be conducted between May 15 and August 15 by a qualified, Service-approved biologist (see enclosed list) using the enclosed *Indiana Bat Mist Netting Guidelines*. Survey results should be submitted to the Service for review and concurrence. Alternatively, the consultation for the Meyersdale to I-68 section of the U.S. 219 Project (S.R. 6219, section 019) could be reinitiated, and the biological opinion amended to include consideration of potential take of Indiana bats along the Somerset to Meyersdale section as well.

This response relates only to endangered or threatened species under our jurisdiction, and is not to be construed as addressing potential Service concerns under the Fish and Wildlife Coordination Act or other authorities.

*To avoid potential delays in reviewing your project, please use the above-referenced USFWS project tracking number in any future correspondence regarding this project.*

If you have any questions regarding this matter, please contact Robert Anderson of my staff at 814-234-4090.

Sincerely,

A handwritten signature in black ink, appearing to read "David Densmore", followed by a long horizontal line extending to the right.

- David Densmore  
Supervisor



**U.S. FISH AND WILDLIFE SERVICE**  
**Pennsylvania Field Office**

---

**QUALIFIED INDIANA BAT SURVEYORS**

The following list includes persons known by the U.S. Fish and Wildlife Service to have the skills and experience to conduct surveys for Indiana bats. Any individuals handling or conducting surveys for Indiana bats must first obtain a permit from the Pennsylvania Game Commission. All Indiana bat captures must be reported in writing to the Service and Commission within 72 hours. Indiana bat surveys should be overseen by a qualified surveyor, who should be present in the field at all times during the investigation. Mist-net surveys should be carried out in accordance with the Service's *Indiana Bat Mist Netting Guidelines*. If any Indiana bats are captured during mist-netting, a surveyor with bat telemetry experience should be prepared to place a transmitter on the bat(s) to identify roost trees and foraging habitat. Various sampling techniques, including mist-netting, Anabat detection, radio-telemetry, harp-trapping and hibernacula surveys, are used to detect and monitor bats. Some individuals on this list may not be qualified to conduct all types of sampling.

This information is not to be construed as an endorsement of individuals or firms by the Service or any of its employees. Persons not on this list, but who have documented experience in conducting scientific studies of, or successful searches for, Indiana bats may submit their qualifications to the Service for review. The submission must include documentation that the requestor has experience successfully locating and identifying Indiana bats in their hibernacula and their summer habitat. Additions to and deletions from this list are at the sole discretion of the Service. This list is subject to revision at any time without prior notice.

---

Chris Sanders, Jessica Kapp,  
Michael O'Mahony  
Sanders Environmental, Inc.  
314 N. Pennsylvania Ave.  
PO Box 185  
Centre Hall, PA 16828-0185  
814-364-8776; 814-659-8257 (cell)  
sanders@batgate.com

John Chenger, Matt Hopkins &  
Kevin Rhome  
Bat Conservation & Management  
220 Old Stone House Road  
Carlisle, PA 17015  
717-241-2228  
814-442-4246 (cell)

Dr. Virgil Brack, Jr.  
Environmental Solutions &  
Innovations  
781 Neeb Road  
Cincinnati, OH 45233  
513-451-1777  
513-451-3321 (fax)

Jeffrey Brown, Amy Henry &  
Russell Rommé  
BHE Environmental, Inc.  
11733 Chesterdale Road  
Cincinnati, OH 45246  
513-326-1500  
513-326-1550 (fax)

Hal Bryant  
Eco-Tech, Inc.  
P.O. Box 8  
Frankfort, KY 40602-0008  
502-695-8060  
502-695-8061 (fax)  
myotis2000@aol.com

Robert F. Madej  
R.D. Zande & Associates  
1237 Dublin Road  
Columbus, OH 43215  
800-340-2743  
614-486-4387 (fax)

Stacy Wolbert  
1004 Rocky Lane  
Stroudsburg, PA 18360  
814-360-1290  
stacy\_wolbert@yahoo.com

James Hart  
The Vertebrate Museum  
Shippensburg University  
Shippensburg, PA 17257  
717-532-1145

Dr. Karen Campbell  
Biology Department  
Albright College  
Reading, PA 19614  
610-921-2381

Neil Bossart  
Civil & Env. Consultants, Inc.  
333 Baldwin Road  
Pittsburgh, PA 15205  
412-429-2324  
nbossart@cecinc.com

John Macgregor  
Berea Ranger District  
Daniel Boone National Forest  
1835 Big Hill Road  
Berea, KY 40403  
606-745-3100

Dr. Lynn Robbins  
Southwest Missouri State Univ.  
Biology Department  
901 South National  
Springfield, MO 65804  
417-836-5366

Dr. Michael Gannon  
Department of Biology  
Penn State University  
Altoona College  
3000 Ivyside Park  
Altoona, PA 16601-3760  
814-949-5210

Tim Blackburn  
825 19<sup>th</sup> Street, 2<sup>nd</sup> Floor  
Altoona, PA 16601

Dr. Phillip Clem  
University of Charleston  
2300 MacCorkle Ave., SE  
Charleston, WV 25304  
304-357-4793

Ryan Leiberher  
Skelly and Loy, Inc.  
2601 N. Front St.  
Harrisburg, PA 17110  
717-232-0593  
rleiberher@skellyloy.com



# INDIANA BAT MIST NETTING GUIDELINES

## RATIONALE

A typical mist net survey is an attempt to determine presence or probable absence of the species, it does not provide sufficient data to determine population size or structure. Following these guidelines will standardize procedures for mist netting. It will help maximize the potential for capture of Indiana bats at a minimum acceptable level of effort. Although the capture of bats confirms their presence, failure to catch bats does not absolutely confirm their absence. Netting effort as extensive as outlined below usually is sufficient to capture Indiana bats. However, there have been instances in which additional effort was necessary to detect the presence of the species.

## NETTING SEASON

May 15 - August 15

These dates define acceptable limits for documenting the presence of summer population of Indiana bats, especially maternity colonies. Several captures, including adult females and young of the year, indicate that a nursery colony is active in the area. Outside these dates, even when Indiana bats are caught, data should be carefully interpreted: If only a single bat is captured, it may be a transient or migratory individual.

## EQUIPMENT

Mist nets - Use the finest, lowest visibility mesh commercially available:

1. In the past, this was 1 ply, 40 denier monofilament - denoted 40/1
2. Currently, monofilament is not available and the finest on the market is 2 ply, 50 denier nylon - denoted 50/2
3. Mesh of approximately  $1 \frac{1}{2}$  ( $1 \frac{1}{4}$  -  $1 \frac{3}{4}$ ) in (~38 mm)

Hardware - No specific hardware is required. There are many suitable systems of ropes and/or poles to hold the nets. See NET PLACEMENT below for minimum net heights, habitats, and other netting requirements that affect the choice of hardware. The system of Gardner, *et al.* (1989) has met the test of time.

## NET PLACEMENT

Potential travel corridors such as streams or logging trails typically are the most effective places to net. Place the nets approximately perpendicular across the corridor. Nets should fill the corridor from side to side and from stream (or ground) level up to the overhanging canopy. A typical set is seven meters high consisting of three or more nets "stacked" on top one another and up to 20 m wide. (Different width nets may be purchased and used as the situation dictates.)

Occasionally it may be desirable to net where there is no good corridor. Take caution to get the nets up into the canopy. The typical equipment described in the section above may be inadequate for these situations, requiring innovation on the part of the observers.

## RECOMMENDED NET SITE SPACING:

Stream corridors - one net site per km of stream.

Non-corridor land tracts - two net sites per square km of forested habitat  
(= 1 net site for every 123 acres of forested habitat)

## MINIMUM LEVEL OF EFFORT

Netting at each site should consist of:

At least four net-nights (unless bats are caught sooner) (one net set up for one night = one net-night)

A minimum of two net locations at each site (at least 30m apart, especially in linear habitat such as a stream corridor)

A minimum of two nights of netting

Sample Period: begin at sunset; net for at least 5 hr

Each net should be checked approximately every 20 min

No disturbance near the nets, other than to check nets and remove bats

## WEATHER CONDITIONS

Severe weather adversely affects capture of bats. If Indiana bats are caught during weather extremes, it is probably because they are at the site and active despite inclement weather. On the other hand, if bats are not caught, it may be that there are bats at the site but they may be inactive due to the weather. Negative results combined with any of the following weather conditions throughout all or most of a sampling period are likely to require additional netting:

- Precipitation
- Temperatures below 10°C
- Strong winds (Use good judgement: moving nets are more likely to be detected by bats.)

## MOONLIGHT

There is some evidence that small myotome bats avoid brightly lit areas, perhaps as predator avoidance. It is typically best to set nets under the canopy where they are out of the moon light, particularly when the moon is ½-full or greater.





U. S. DEPARTMENT  
OF TRANSPORTATION

Pennsylvania Division

228 Walnut Street, Room 508  
Harrisburg, PA 17101-1720

Federal Highway  
Administration

December 19, 2007

*In reply refer to:*  
HEV-PA

S.R. 6219, Section 20  
Improvements Project  
Somerset County, Pennsylvania  
USFWS Project #2007-2430

Mr. David Densmore, Supervisor  
U.S. Fish and Wildlife Service  
315 South Allen Street, Suite 322  
State College, PA 16901

Dear Mr. Densmore:

The Pennsylvania Department of Transportation (PennDOT) and the Federal Highway Administration (FHWA) are proposing roadway improvements in the vicinity of existing SR 6219 Section 020 in Somerset County, commonly referred to as the US 219 Improvement Project (Meyersdale to Somerset). In accordance with the Endangered Species Act, PennDOT on behalf of FHWA, requested information on the presence or absence of any Threatened or Endangered species beginning on March 12, 2001 and most recently on July 23, 2007. The project area was identified by the US Fish and Wildlife Service (USFWS) as being within the range of the federally listed endangered Indiana Bat (*Myotis sadalis*). The most recent correspondence from the Service on November 8, 2007 was prompted by the need to update the USFWS due to the expiration of the last period of consultation; over one year, in addition to seeking any new information on the species. It is noted that the USFWS response took in excess of three months to receive. The USFWS raised several points, and concluded that they could not concur with the not likely to adversely affect determination.

As stated in the letter, the FHWA was given two options for proceeding with the Section 7 consultation; if seasonal timber restrictions could not be incorporated into the project plans, then an Indiana Bat survey should be conducted. Upon receiving this recommendation from the USFWS initially in 2003, the project team proceeded with the development of the project, incorporating seasonal timber restriction into the project plans. The FHWA

**MOVING THE  
AMERICAN  
ECONOMY**



eventually selected an alternative based, in part, on USFWS's recommendation as documented in the Draft Environmental Impact Statement (DEIS, October, 2004); Final EIS (December, 2005); and subsequent Record of Decision (ROD, November, 2006), all of which were available to the USFWS.

The revised position of the USFWS expressed in your November 8, 2007 is shocking given previous agreements spanning the duration of project development. The penultimate correspondence between our offices indicated full acceptance of FHWA's determination and commitment for seasonal timber restriction, which augments normal project construction in an effort to not kill or harm the species. The USFWS, through the Department of Interior (DOI), provided comments on the DEIS, as recorded in the FEIS. Relative to the Indiana Bat, the USFWS only requested an investigation of an airshaft for suitable habitat in order to conclude its determination of effect. The following response was provided in the FEIS, "A field meeting with Kevin Mixon of the Pennsylvania Game Commission was conducted on March 25, 2003 determined the airshaft not suitable for bat habitat. Upon further consultation with Mr. Mixon, the USFWS declined a field view of the airshaft".

In the same letter, the USFWS recommended, thereby agreeing with, the seasonal timber restriction commitment made by PennDOT.

The selection of an alternative for construction (Alignment C-1) was based on that alternative having the least environmental harm to the environment, including habitat for Threatened and Endangered Species, particularly the Indiana Bat. Per the March 26, 2003 ACM discussion, and subsequent correspondence from the USFWS on the topic, the issue of potential effect to the Indiana Bat was thought to be put to rest. However, we recognize that no official letter was transmitted from FHWA to USFWS clearly stating the intent of constructing Alignment C-1, and our future actions with regard to the Indiana Bat. It was conveyed in the FEIS and the ROD.

Your November 8, 2007 letter notes six points, which we will respond to at this time:

- USFWS concludes there is new information regarding maternity roosts; maternity colonies have been documented in similar nearby habitat.

*The USFWS contends that new information suggests a "maternity colonies have been documented in similar nearby habitat"; however, goes onto to define nearby as being "10 miles east of the project area". Previous opinions from the USFWS note that a 2-mile radius around maternity roosts are cause for detailed investigations for potential foraging and maternity*





roosting activity; not 10-miles (USFWS December 21, 2004). As such, deciduous forests, specifically shagbark hickories which are attractive to the species for maternity roosts, were noted in the study area. The potential exists for maternity roosts to occur in the action area. Seasonal timber restrictions will avoid directly killing Indiana Bats while inhabiting the maternity roosts. The USFWS opines that the species has tree fidelity, and if felled, the potential maternity roosts trees would no longer exist causing the species to search for a new roost. The Selected Alternative has the least amount of impact to this habitat compared to all Build Alternatives presumably leaving ample substitute maternity roosts in and adjacent to the action area.

- USFWS concludes there is new information regarding foraging activities; some Indiana Bats leaving nearby hibernacula in the spring remain in central Pennsylvania.

*The DEIS and FEIS document that the Selected Alternative has the least forest land acreage impacted as compared to other Build Alternatives. Adequate habitat remains to supply life requisites for the species.*

- USFWS states that a preferred alignment has been identified for the US 219, Section 019 (Meyersdale to Maryland) project.

*A preferred alignment has not been identified for this project. The DEIS is currently being prepared and does not conclude with a preferred alignment. The DEIS will be circulated to the public and agencies for comment.*

- USFWS views the US 219, Section 19 project as a continuation of the US 219, Section 20 project rather than two distinct and separate projects.

*A preferred alignment has not been identified for the US 219, Section 019 project (Meyersdale to Maryland). The DEIS is being prepared. As currently written, the DEIS does not identify a preferred alignment. The US 219, Section 19 project is separated from the US 219, Section 20 project by approximately five miles of rolling forested terrain and farmland.*

- USFWS infers that FHWA did not take into account the indirect effect of habitat fragmentation through linear [road] openings, which the USFWS opines, the species is



resistant to cross and which ultimately eliminates access to essential maternity habitat.

*Based on best available data, it is inconclusive that bats are resistant to fly across linear openings (Biological Assessments: US 219, Section 19 and SR 22, Canoe Creek). Data from several sources, including data collected by the Pennsylvania Game Commission, evidence that bats do fly across linear openings and further, that linear openings do not eliminate passage between maternity roosts and foraging habitat..*

- USFWS states that a Preferred Alternative for the US 219, Section 019 project would remove additional roosting and foraging habitat, resulting in a combined 700 acres of foraging habitat destruction including 400 acres of roosting or maternity habitat.

*A preferred alignment has not been selected for the US 219, Section 019 project. However, we are advised of your concern with the potential cumulative effects of future roadway projects in the area on the species. As such, if and when the US 219, Section 019 project comes to fruition, we will consider re-analyzing the species condition at the time, in balance with the potential effect of known and non-speculative other actions likely to occur in the area, and re-engage the USFWS if necessary.*

- The USFWS recommends that mist netting be performed to allay questions of species presence versus absence, and the survey results be provided to the Service for review and concurrence.

*The FHWA has conducted numerous mist netting surveys across the Commonwealth, which all have been proven fruitless in positively determining presence of the species. Erring on the side of the species, the FHWA is presuming presence of the species in the US 219, Section 20 action area given presence of suitable habitat. As such, ground surveys were conducted to map forest types and locate mine airshafts to aid in determining the impacts of the build alternatives (see DEIS and FEIS). No airshafts were found to be suitable and the forest types were noted. The Selected Alternative has the least impact to suitable habitat. It is felt by this office that mist netting surveys would not produce conclusive results, thereby suspending USFWS's determination of effect.*





Notwithstanding the confirmed presence of this species, PennDOT will commit to restricted clearing and grubbing activities associated with the project. A seasonal timber restriction will be included in the contract specifications to be outside the March 31 through October 1 time period. It is believed that through this commitment the species will not be adversely affected and adequate habitat remains towards the species recovery. Unless otherwise advised in the next 30 days, the FHWA will proceed with the project given this long standing agreement as previously documented within the FEIS and ROD, and as discussed at meetings throughout the project's development.

Sincerely yours,

/s/ David W. Cough

David C. Lawton  
Acting Division Administrator

ec: Greg Kough, PennDOT HQAD  
Jim Pruss, PennDOT 9-0  
Tom Yocum, PennDOT 9-0  
Atillio Squillario, PennDOT 9-0  
Don Bole, DEP Southwest Region  
Scott Hans, USACE, Pittsburgh District

S:\FY2008\Dec\NoIbatSurvey.kev.doc



# United States Department of the Interior



## FISH AND WILDLIFE SERVICE

Pennsylvania Field Office  
315 South Allen Street, Suite 322  
State College, Pennsylvania 16801-4850

January 14, 2008

David Lawton  
U.S. Department of Transportation  
Federal Highway Administration – Pennsylvania Division  
228 Walnut Street, Room 508  
Harrisburg, PA 17101-1720

RE: USFWS Project #2007-2430

Dear Mr. Lawton:

Thank you for your letter of December 19, 2007, regarding the proposed U.S. 6219, Section 20 Improvements Project located in Somerset County, Pennsylvania. The project area is within the range of the federally listed endangered Indiana bat (*Myotis sodalis*). The following comments are provided pursuant to the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) to ensure the protection of endangered and threatened species.

Your letter summarizes aspects of past consultations between the Service and Administration regarding the U.S. 6219, Section 20 project and references “previous agreements”. We are unaware of any previous agreements, but assume you are referring to recommendations regarding avoidance measures, and biological conclusions regarding the effects of the project. Your July 23, 2007, request for updated information regarding the occurrence of federally listed threatened and endangered species reinitiated consultation on this project. When information regarding the effects of an action on a listed species remains the same, reinitiation can be expected to result in a similar biological conclusion. However, as detailed in our letter of November 8, 2007, our understanding of Indiana bat distribution and habitat use in central Pennsylvania has substantively changed in recent years with the discovery of previously unknown maternity colonies. This information, along with a better understanding of the potential effects of roads on bats and their use of habitat, has changed our assessment of risk due to the proposed project. Additionally, the effects of the proposed U.S. 6219, Section 020 project must be considered in context with other federal and non-federal actions in the area that may affect the species, one of which is the Administration’s proposed addition of U.S. 6219, Section 19, following “Alternative E”, as described in your February 2007 biological assessment.

We carefully considered the effects analysis presented in your letter of December 19 and we agree that additional information regarding Indiana bat behavior in the vicinity of roadways would be desirable. You speculate that the new roadway will not present a barrier to Indiana bat travel. Migrating Indiana bats appear to fly well above cover, and a new or existing road is not likely to present a barrier. However, during the maternity season, Murray and Kurta (2004) observed the species’ tendency to travel along tree canopy cover, even if only one tree in width,



to reach foraging areas, rather than cross large open areas such as wetlands or agricultural fields. Although roads were present in their study area, and these had to be crossed several times nightly by the bats in order to reach foraging and roosting habitat, Murray and Kurta (2004) did not discuss road crossing behavior, road width or tree cover adjacent to the roads. Based on these observations, it appears that when tree canopy is present and the opening to be crossed is relatively narrow, the bats will cross high, from canopy to canopy. However, as the gap widens, bats are more likely to cross low to the ground. You cite studies by the Pennsylvania Game Commission at Canoe Creek to support your determination that the proposed new road will not fragment habitat, but we note that those bats that cross S.R. 22 at Canoe Creek, often do so at traffic height, and are subject to increased mortality due to vehicle collisions. A similar scenario along U.S. 6219, Section 19, would constitute an adverse effect whether this take is in the form of harm, harassment, or directly mortality during roadway operation.

Federal agencies are required to provide the best scientific information available when assessing the effects of their actions to listed species and critical habitat [50 CFR 402.14(d)]. Surveys for these species are not required prior to assessing effects [50 CFR 402.12(f)]; however, because Federal agencies are required to consult if an action “may affect” listed species or designated critical habitat, gathering additional information is often advantageous for the action agency to make an informed effects determination and increase certainty. If the action is “likely to adversely affect” listed species, then the federal action agency must request initiation of formal consultation. When there is a difference in opinion regarding the conclusion made based on limited information, the Service will err on side of the species as described in the *Section 7 Consultation Handbook* (USFWS and NMFS 1998), which includes the following instructions for proceeding with consultation when there is an absence of conclusive scientific information:

*If the action agency... insists consultation be completed without the data or analyses requested, the biological opinion... should document that certain analyses or data were not provided and why that information would have been helpful in improving the data base for the consultation...The Services are then expected to provide the benefit of the doubt to the species concerned with respect to such gaps in the information base (H.R. Conf. Rep. No. 697, 96<sup>th</sup> Cong., 2<sup>nd</sup> Sess. 12 (1979)).*

As we stated in our letter of November 8, 2007, we cannot concur with your determination that seasonal tree removal restrictions, alone, will adequately avoid all adverse effects if an Indiana bat maternity colony is present in the action area.

This response relates only to endangered or threatened species under our jurisdiction based, on an office review of the proposed project's location. No field inspection of the project area has been conducted by this office. Consequently, this letter is not to be construed as addressing potential Service concerns under the Fish and Wildlife Coordination Act or other authorities.

*To avoid potential delays in reviewing your project, please use the above-referenced USFWS project tracking number in any future correspondence regarding this project.*

If you have any questions regarding this matter, please contact Robert Anderson of my staff at 814-234-4090.

Sincerely,

A handwritten signature in black ink, appearing to read "David Densmore", followed by a long horizontal line extending to the right.

David Densmore  
Supervisor

Literature Cited

Murray, S.W., and A. Kurta. 2004. Nocturnal activity of the endangered Indiana bat (*Myotis sodalis*). *Journal of Zoology*. 262: 197-206.





U. S. DEPARTMENT  
OF TRANSPORTATION

Pennsylvania Division

228 Walnut Street, Room 508  
Harrisburg, PA 17101-1720

Federal Highway  
Administration

January 31, 2008

In reply refer to:  
HEV-PA

Somerset County, Pennsylvania  
SR 6219, Section 020  
Improvements Project  
USFWS Project #2007-2430

Mr. David Densmore, Supervisor  
US Fish and Wildlife Service  
315 South Allen Street, Suite 322  
State College, PA 16901

Dear Mr. Densmore:

The Pennsylvania Department of Transportation (PennDOT) and the Federal Highway Administration (FHWA) are proposing roadway improvements in the vicinity of existing SR 6219, Section 020 in Somerset County, commonly referred to as the US 219 Improvement Project (Meyersdale to Somerset). In accordance with the Endangered Species Act, PennDOT on behalf of FHWA, requested information on the presence or absence of any Threatened or Endangered species beginning on March 12, 2001 and most recently on July 23, 2007. The project area was identified by the US Fish and Wildlife Service (USFWS) as being within the range of the federally listed endangered Indiana Bat (*Myotis sadalis*).

In letters dated November 8, 2007 and January 14, 2008, your office noted new biological information pertaining to the "potential presence of maternity roosts in the vicinity of the proposed project". This information, along with "a better understanding of the potential effects of roads on base and their use of habitat" changed the Service's assessment of risk. The letter states that the Service cannot concur with our determination of No Effect, and states that "seasonal tree removal restrictions alone will [not] adequately avoid all adverse effects if an Indiana bat maternity colony is present in the action area".

**MOVING THE  
AMERICAN  
ECONOMY**



Based on verbal consultation between our offices on January 25, the FHWA is requesting the PennDOT to conduct a mist netting survey in accordance with Indiana Bat Mist Netting Guidelines using a qualified surveyor. Upon completion of the survey, the FHWA will submit a report noting the findings and make a determination of the project's effect to the species. As discussed, the absence of the species as a result of the survey will conclude No Effect for the proposed action. If an Indiana bat is captured as a result of the mist netting survey, the FHWA will consult with the USFWS on our assessment of effect.

PennDOT will be submitting the survey plan for your review and comment in the near future. We anticipate a 30-day review of the survey plan with any questions directed to this office for further consultation.

If you have any questions, please contact Karyn Vandervoort at (717) 221-2276 or [karyn.vandervoort@fhwa.dot.gov](mailto:karyn.vandervoort@fhwa.dot.gov).

Sincerely yours,

/s/ Karyn Vandervoort

David C. Lawton  
Acting Division Administrator

ec: Greg Kough, PennDOT HQAD  
Jim Pruss, PennDOT 9-0  
Tom Yocum, PennDOT 9-0  
Atilio Squillario, PennDOT 9-0  
Don Bole, DEP Southwest Region  
Scott Hans, USACE, Pittsburgh District

S:\FY2008\Jan\6219-020 MistNetting.kev.doc



# **APPENDIX B**

## **PROTOCOLS**

# INDIANA BAT MIST NETTING GUIDELINES

## RATIONALE

A typical mist net survey is an attempt to determine presence or probable absence of the species, it does not provide sufficient data to determine population size or structure. Following these guidelines will standardize procedures for mist netting. It will help maximize the potential for capture of Indiana bats at a minimum acceptable level of effort. Although the capture of bats confirms their presence, failure to catch bats does not absolutely confirm their absence. Netting effort as extensive as outlined below usually is sufficient to capture Indiana bats. However, there have been instances in which additional effort was necessary to detect the presence of the species.

## NETTING SEASON

May 15 - August 15

These dates define acceptable limits for documenting the presence of summer population of Indiana bats, especially maternity colonies. Several captures, including adult females and young of the year, indicate that a nursery colony is active in the area. Outside these dates, even when Indiana bats are caught, data should be carefully interpreted: If only a single bat is captured, it may be a transient or migratory individual.

## EQUIPMENT

Mist nets - Use the finest, lowest visibility mesh commercially available:

1. In the past, this was 1 ply, 40 denier monofilament - denoted 40/1
2. Currently, monofilament is not available and the finest on the market is 2 ply, 50 denier nylon - denoted 50/2
3. Mesh of approximately  $1\frac{1}{2}$  ( $1\frac{1}{4}$  -  $1\frac{3}{4}$ ) in (~38 mm)

Hardware - No specific hardware is required. There are many suitable systems of ropes and/or poles to hold the nets. See NET PLACEMENT below for minimum net heights, habitats, and other netting requirements that affect the choice of hardware. The system of Gardner, *et al.* (1989) has met the test of time.

## NET PLACEMENT

Potential travel corridors such as streams or logging trails typically are the most effective places to net. Place the nets approximately perpendicular across the corridor. Nets should fill the corridor from side to side and from stream (or ground) level up to the overhanging canopy. A typical set is seven meters high consisting of three or more nets "stacked" on top one another and up to 20 m wide. (Different width nets may be purchased and used as the situation dictates.)

Occasionally it may be desirable to net where there is no good corridor. Take caution to get the nets up into the canopy. The typical equipment described in the section above may be inadequate for these situations, requiring innovation on the part of the observers.



## RECOMMENDED NET SITE SPACING:

Stream corridors - one net site per km of stream.

Non-corridor land tracts - two net sites per square km of forested habitat  
(= 1 net site for every 123 acres of forested habitat)

## MINIMUM LEVEL OF EFFORT

Netting at each site should consist of:

At least four net-nights (unless bats are caught sooner) (one net set up for one night = one net-night)

A minimum of two net locations at each site (at least 30m apart, especially in linear habitat such as a stream corridor)

A minimum of two nights of netting

Sample Period: begin at sunset; net for at least 5 hr

Each net should be checked approximately every 20 min

No disturbance near the nets, other than to check nets and remove bats

## WEATHER CONDITIONS

Severe weather adversely affects capture of bats. If Indiana bats are caught during weather extremes, it is probably because they are at the site and active despite inclement weather. On the other hand, if bats are not caught, it may be that there are bats at the site but they may be inactive due to the weather. Negative results combined with any of the following weather conditions throughout all or most of a sampling period are likely to require additional netting:

- Precipitation
- Temperatures below 10°C
- Strong winds (Use good judgement: moving nets are more likely to be detected by bats.)

## MOONLIGHT

There is some evidence that small myotis bats avoid brightly lit areas, perhaps as predator avoidance. It is typically best to set nets under the canopy where they are out of the moon light, particularly when the moon is ½-full or greater.

**From:** "Eric Britzke" <ebritzke@sbcglobal.net>  
**To:** "Northeast Bat Working Group" <nebwg-l@list.wpunj.edu>  
**Date:** 4/24/2008 12:03 PM  
**Subject:** [nebwg-l] bat samples  
**Attachments:** Hair and Tissue sampling protocol 2008.doc

Greetings,

Well it is time for another bat season. Before everyone starts venturing out into the woods, I wanted to make a request. As many of you know I (working with Susan Loeb and Maarten Vonhof) have several ongoing projects using hair and/or tissue samples from bats. In an effort to continue this work, we are seeking researchers that would be willing to collect hair and tissue samples for us. I have included a description of the samples requested below.

#### Description of Samples Requested

Please collect samples from any bat species (except *Eptesicus*) if you encounter them. Take two punches from the wing membrane of each individual, and store them in the same vial containing salt/DMSO.

Ideally, for each species, we are interested in getting tissue samples from 30-60 individuals of any species you capture (up to ~ 30 individuals of each sex), from each population (all sampling locations within a county (or a similar area) likely constitute a single population) during the time that bats are resident (during pregnancy and lactation in the summer, or during winter after swarming). However, for any migratory species (*Lasiurus*, *Lasionycteris*, *Perimyotis*) and both *Myotis sodalis* and *Myotis leibii*, we would like additional samples from any other time of year as well.

In any analyses of population structure, we need to be certain that the bats are resident, and if samples are collected outside of these times, then we can't be sure that the individuals haven't dispersed into that area from another (which would wash out any genetic signal of population differentiation that may be present in either season). However, for migratory species (*Lasiurus*, *Lasionycteris*, and *Perimyotis*), *M. sodalis*, and *M. leibii*, samples from any time of year will be of use for addressing migration and assessing effective population size.

Please also collect hair samples from any bat species (except *Eptesicus*) and store them in the empty vials provided. They are very quick and easy to collect. Cut hairs in approximately a 1.5 cm \* 1.5 cm area between the scapulae, and drop them into an empty vial. Try to get as much of the length of hair as possible, but only cut as close to the body as you feel comfortable with. The more hair you collect the better, so please try to fill the vial as much as possible. There are no restrictions on when we would like these samples from (we need them from the entire year).



If you are willing to collect samples for us, please contact me so I can send you the sampling supplies required. In your reply, please note the area(s) of the country you will be working and the anticipated amount of sampling to be conducted.

I have attached the sampling protocol for the project. Please feel free to pass this along to other researchers that might be interested. Thanks for any help you can provide.

Eric Britzke

No virus found in this outgoing message.  
Checked by AVG.  
Version: 7.5.524 / Virus Database: 269.23.4/1394 - Release Date: 4/23/2008  
7:16 PM

---

For help please see: <http://www.wpunj.edu/irt/list/>

You are currently subscribed to nebwg-l as: PERNIS01@lrkimball.com.  
To unsubscribe send a blank email to [leave-nebwg-l-77341V@list.wpunj.edu](mailto:leave-nebwg-l-77341V@list.wpunj.edu)

## Description of Samples Requested

Please collect samples from any bat species (except *Eptesicus*) if you encounter them. Take two punches from the wing membrane of each individual, and store them in the same vial containing salt/DMSO.

Ideally, for each species, we are interested in getting tissue samples from 30-60 individuals of any species you capture (up to ~ 30 individuals of each sex), from each population (all sampling locations within a county (or a similar area) likely constitute a single population) during the time that bats are resident (during pregnancy and lactation in the summer, or during winter after swarming). However, for any migratory species (*Lasiurus*, *Lasionycteris*, *Perimyotis*) and both *Myotis sodalis* and *Myotis leibii*, we would like additional samples from any other time of year as well.

In any analyses of population structure, we need to be certain that the bats are resident, and if samples are collected outside of these times, then we can't be sure that the individuals haven't dispersed into that area from another (which would wash out any genetic signal of population differentiation that may be present in either season). However, for migratory species (*Lasiurus*, *Lasionycteris*, and *Perimyotis*), *M. sodalis*, and *M. leibii*, samples from any time of year will be of use for addressing migration and assessing effective population size.

Please also collect hair samples from any bat species (except *Eptesicus*) and store them in the empty vials provided. They are very quick and easy to collect. Cut hairs in approximately a 1.5 cm × 1.5 cm area between the scapulae, and drop them into an empty vial. Try to get as much of the length of hair as possible, but only cut as close to the body as you feel comfortable with. The more hair you collect the better, so please try to fill the vial as much as possible. There are no restrictions on when we would like these samples from (we need them from the entire year).



## **TISSUE AND HAIR SAMPLING PROTOCOLS**

### Special notes

1. Hair samples should be placed in the clear tubes without any liquid. They do not need any special handling after collection; however, we ask that samples not be placed in hot vehicles for the summer.
2. Tubes with liquid (typically salt/DMSO) should be kept in cool place as much as possible. After tissue is placed in the tubes, shake the tube to ensure the tissue sample is immersed in the liquid, and place the tubes in a refrigerator or freezer (preferred) as soon as possible to limit the amount of decay that occurs in the tissue. DMSO breaks down in light and high heat, so please try not to leave the tubes out in direct sunlight or in your vehicle during the day.
3. If you need more supplies, let us know and we will send them to you.
4. Please fill out the datasheet as you collect samples, as it becomes difficult to go back and find the data later. If you prefer (or are willing), we can provide an excel spreadsheet with the fields in the datasheet. Data can then be entered directly into this format rather than having to write stuff down on a sheet. Either way will work for us, we just want to make sure we get the necessary data for the samples.
5. Promptly return all samples to either of us when you are done with your field work

**Eric Britzke**  
**815 Dillard Street**  
**Forrest City, AR 72335**  
**Ebritzke@sbcglobal.net**

**Maarten Vonhof**  
**Dept. of Biological Sciences**  
**Western Michigan University**  
**1903 W. Michigan Avenue**  
**Kalamazoo, MI 49008-5410**  
**maarten.vonhof@wmich.edu**

### Hair Sampling Protocol:

1. Clip a small amount of fur (1.5 cm × 1.5 cm area) from the area between the scapulae using scissors. Get as much of the length of the hair as possible, but you do not necessarily have to cut down to the base. There should be a sizeable amount of hair in the tube. While the analysis does not require a lot of hair, we want to make sure we get enough to do all analyses, so the axiom more is better works.
2. Store the hair in one of the **empty** vials provided. Please label the vial with the date (with the month written out, e.g., 12/Aug/2001, or Aug/12/2001), bat species (you can use the 4 letter species code (e.g., MYSO, MULU, etc.)), sex, age, your unique identifier for that bat (e.g., band number), and the location. Try to leave a bit of room so that we can write our own identifier on the vial. Be careful when choosing the marking pen to write on the vial, as some will rub off in handling. In our experience, ultra fine point Sharpies provide point small enough to permit writing on the tubes, while still providing permanence of the data on the sample.
3. Once finished, please wipe any remaining hair off of the scissors with an alcohol swab. Be very careful to avoid cross-contamination.
4. Fill out the datasheet completely as each sample is collected.



## Tissue Sampling

When taking tissue from the wing membranes, stay close to the body (between the leg and the fifth digit in the wing) so as not to greatly affect flight performance. Do not punch areas with large blood vessels. Based on recaptures of sampled bats, the hole in the membrane usually grows back within 2-3 weeks, so there are no long-term effects. Bats are commonly captured with holes much larger than those we are inflicting on their wings, and these holes don't appear to result in a loss of flight ability. Tissue samples should then be stored in DMSO solution provided.

## Membrane Sampling Protocol:

1. Flame the instruments (punch, forceps) thoroughly to sterilize them, and to ensure that no tissue or hair from the last bat remains. The instruments should get hot. This can be accomplished easily with a lighter in the field.
2. LET THE INSTRUMENTS COOL, by placing them on the vial box in such a way that the business ends do not touch anything, and remain sterile. If you don't let them cool, you will cauterize the hole, and it won't grow back. Wipe the instruments with an alcohol swab to remove any residue from the flaming, and then let the instruments dry for a few seconds.
3. Then stretch the wing or tail membrane over a flat, hard or semi-hard surface (cutting board, clipboard, binder, cardboard, etc.). While stretching the membrane press the punch down onto the membrane of one wing close to the legs (between the legs and the fifth digit), and twist and/or rock the punch slightly until you can tell the punch has gone through the membrane on all sides. Make sure to avoid major blood vessels. There is no need to hammer the punch down through the membrane, and doing so will decrease the life of the punch. Each punch can be reused multiple times (5-40 depending on how hard you are on it), but please use your judgment as to how well the punch is cutting, and dispose of punches as soon as they start to dull.
4. The cut tissue should now be sitting on the surface you punched on and you can easily pick it up with forceps. If not, the membrane may be in the hollow portion of the punch, in which case you can dig it out with the forceps. Store the membrane samples in the O-ring vials containing salt/DMSO solution (clear liquid).
5. Repeat for the other wing. Place both pieces of membrane from an individual into the same vial containing salt/DMSO solution. When finished, please make sure that both pieces of tissue are sitting in the solution, and you may have to shake the vial (with the cap on!) to dislodge them from the sides of the vial.
6. Make sure to label all vials with your unique identifier for that bat, the date (with the month written out, e.g., 12/Aug/2001, or Aug/12/2001), location, bat species, sex, reproductive condition, and age. Please also fill out the data sheet provided with the necessary information.
7. Between bats, please make sure you clean the punching surface well, either by flushing with a spray bottle containing alcohol (isopropyl, 70-95% ethanol) or wiping down the surface well with an alcohol swab, and flame the biopsy punch and forceps. The goal is to minimize the chances of contaminating future samples.

8. If you ever have the opportunity to collect from dead bats, please collect a decent amount of membrane from each wing (1 cm × 1 cm area) and drop it into a vial with DMSO. Please also take some muscle tissue (it is easiest to take it from the pectoral muscles) and store it in a separate vial containing salt/DMSO. Take a minimum of a 2 mm<sup>3</sup> piece of tissue (a small cube), but if you can, collect as much as will fit into the vial.

General:

1. Repeat the above procedure for each bat.
2. While in the field, store the vials (empty or with tissue samples) at “room temperature” or a slightly cool space, and out of direct sunlight (sunlight degrades the DMSO). Letting them get too hot isn’t very good (e.g., in a truck in full sunlight). Once out of the field, please freeze them if you can, or at least store them in a refrigerator, at your earliest convenience. This helps to slow down any potential decay.
3. At the end of the field season, I would be most grateful if you could provide the capture data (date, location, identifier, species, sex, age, reproductive condition, mass, forearm length) for each bat in electronic or paper form, along with a GPS or map location for each capture site (in UTM’s or lat/long, to place the sampling locations on a map). All data will be treated with strict confidence, and will only be used to provide the background for the genetic and isotopic analyses.

We realize you have other higher priorities while you are in the field, so please only collect when you feel comfortable or can actually do so. Please try to collect punches from any individuals of rare or less common species you capture. However, the more samples we can get of both sexes per population per species the better, and all samples will be useful, so please collect as many samples as you are willing to. If you are sampling over a broad geographic area, use your judgment as to what constitutes a population of potentially interacting animals. Sampling locations within ~10 km of each other or from within the same valley can likely be treated as a single population. If the sampling locations are very far apart, or separated by an obvious barrier, then they likely can’t.



Data sheet to be completed for each tissue and hair sample collected as part of stable isotope and genetic analyses.

Collector \_\_\_\_\_

Address \_\_\_\_\_

Phone Number \_\_\_\_\_

Email \_\_\_\_\_

[illegible]<sup>1</sup> Hair or tissue

<sup>2</sup> If you are banding, simply use the band number. If you are not banding then use a unique number based on you initials and a number.

## **APPENDIX C**

### **SITE DATA FORMS AND PHOTOGRAPHS**



BAT NETTING/TRAPPING SITE SURVEY RECORD

Page 1 of 2

1. Survey Date: AUGUST 9, 2008 2. Company Name: KIMBALL

3. Reporter: STEVE PERWICK 4. Assistants: STOKI, D. MCGRAW

5. Site Name and/or Number: (SITE 01) (S01)

6. Site is (circle one): hibernation site summer habitat

7a. If hibernation site circle one: limestone mine, coal mine, limestone cave, sandstone cave, RR tunnel,  
other structure, describe - \_\_\_\_\_

7b. If summer habitat, describe area being sampled (e.g. forested stream or forest clearing with stream):

RIPARIAN CORRIDORS ALONG CASSELMAN RIVER & MOUTH OF BLUE LICK CK. CADJ. AG. LAND

8. County: SOMERSET 9. 7.5' Quad.: Meyersdale

10. Was site GPS'd (required)? (YES) - NO Set 01 39° 50' 8.611"N 79° 2' 30.634"W

11. Geographic Coordinates (D-M-S): Latitude: Set 02 39° - 50' - 16.342"N, Longitude: 79° - 2' - 31.170"W

Datum (circle one): NAD27 (Preferred) NAD83 WGS84, Other: \_\_\_\_\_

12. Ownership and Access: (Who owns site or controls access? Give name and address.) Cecil Petenbrink

758 Petenbrink Rd. Garnett, PA 15542; CSX 500 Water St. Jacksonville, FL 32202

13. Time (military) & Temperature: Start Time 20:20 h Stop Time 21:25 h Total Minutes: 305

Start Temp. 14.6 °C End Temp. 11.0 °C HUMIDITY  
START - 96  
END - 100

14. General Weather (circle one): Clear Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;

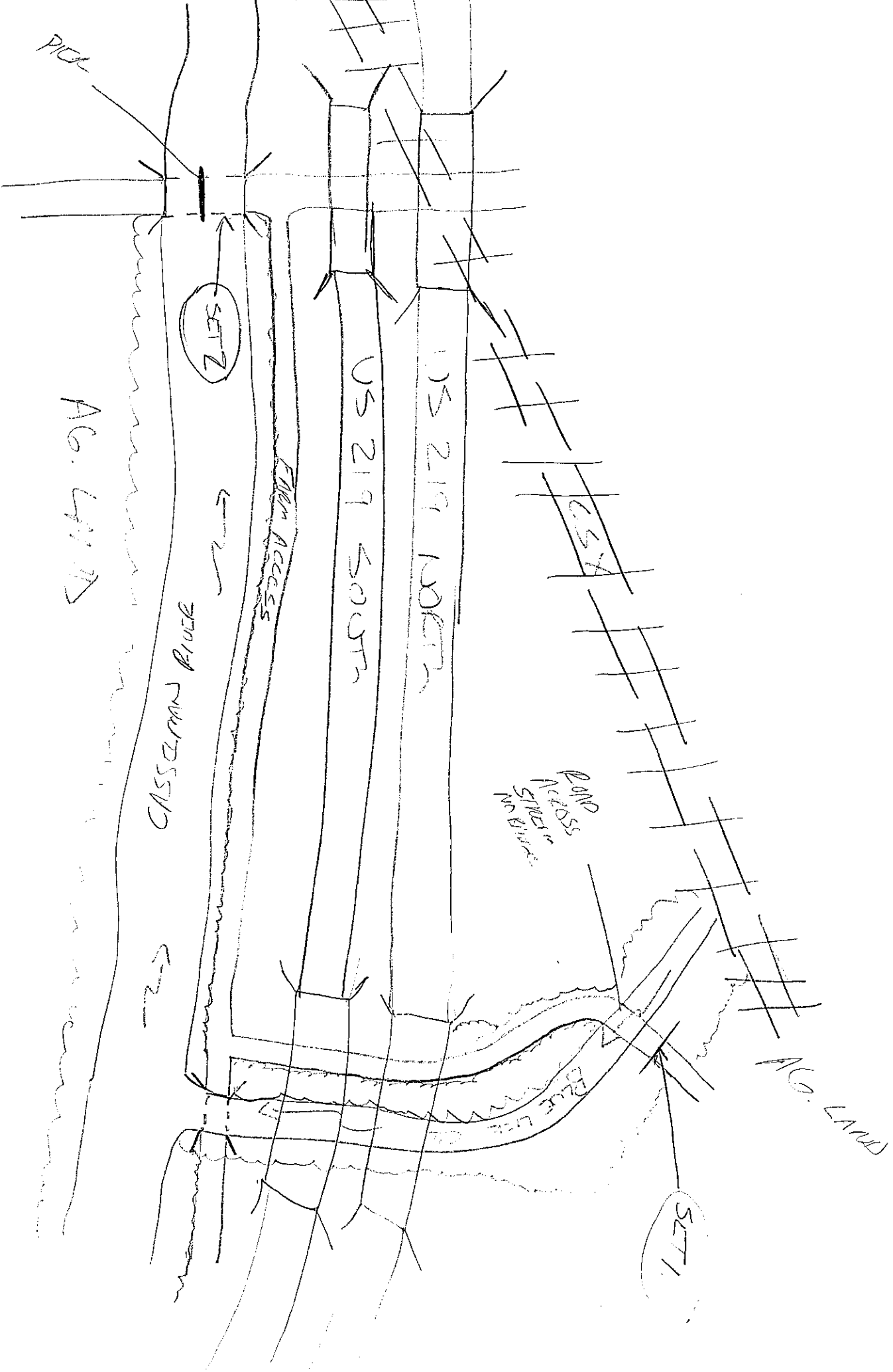
Steady Rain; Thunderstorms; Snow; Other: \_\_\_\_\_

15. General Wind Conditions (circle one): Calm Breezy (Leaves Rustling), Windy (trees swaying).

16. Capture Setup at Site:

Set #	Type	Count	Dimensions	Description	TOTAL AREA (m)
1	Nets	4	12m x 2.6m	Stacked over trail	124.8 sq. m
1					
1	NETS	2	2-6 x 2.6m	FARM ACCESS Rd along perennial stream (Blue Lick)	31.2
2	NETS	4	2-6 x 2.6m & 2-9 x 2.6m	OVER CASSELMAN RIVER PIER TO ABUTMENT (RIGHT DESCENDING BANK)	31.2 & 46.8

\* TIED 9M & 6M TOGETHER Total Capture Area: 109.2 sq. m  
COVER FROM PIER TO ABUTMENT RIGHT DESCENDING BANK



AG. LAND

2017 NW 1/4 SEC 2

FROM ACRES

US 219 NORTH

US 219 SOUTH

POND  
1' & 2'  
NO BUSH

Blue Line

AG. LAND



LOTS OF ROADWAY  
DISTURBANCE

(Site Survey Record – Continued)

Site Name/No.: (SITE 01) S01

Date: 8/09/08

17. Describe habitat 150 m around site: (topography and vegetation including dominant tree species.)

NARROW RURAL CORRIDORS ASS. WITH CASS. PINE & BLUELICK CK.  
ADJACENT AGRICULTURAL LANDS. MAJOR ADJACENT HWY SYSTEM, LOCAL US219, & FARM  
ACCESS RDS. FRAGMENT LANDSCAPE. BUCKEYE, POMPINE, B. CHERRY, WILLOW WITH DENSE  
HERBACEOUS MEADOWS.

18. Was reproductive status checked? (YES) / NO (if "NO" only enter numbers in Total columns)

\*CAPTURE RESULTS

Species	Number of Adult Females				No. Juv. Fem.	Total No. Fem.	Number of Adult Males		No. Juv. Male	Total No. Males	Species Totals
	NR	PG	L	PL			SCR	NR			
<i>Eptesicus fuscus</i>	2		1			3	2	1	1	4	7
<i>Myotis lucifugus</i>						1					1
<i>Myotis septentrionalis</i>											
<i>Myotis leibii</i>											
<i>Myotis sodalis</i>											
<i>Eptesicus fuscus</i>											
<i>Pipistrellus subflavus</i>											
<i>Lasiurus borealis</i>											
<i>Lasiurus cinereus</i>											
<i>Lasionycteris noctivagans</i>											
Other – specify:											
Other – specify:											
Reproductive Status: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen. *Complete Measurement and Capture Data Form for all: (1) <i>Myotis sodalis</i> , (2) <i>Myotis leibii</i> , (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA.											Grand Total
											1

19. BAT DETECTORS & OTHER MONITORING DEVICES: Tallies of bat passes / hour. One to 5 hours required for Indiana bat hibernacula surveys. Monitor one hour after 22:00 hrs when trapping/netting hibernacula and 5 hours when only monitoring with bat detectors, night vision or infrared device (when site can not be trapped/netted). Describe procedure & equipment used in remarks.

1 <sup>st</sup> hour	2 <sup>nd</sup> hour	3 <sup>rd</sup> hour	4 <sup>th</sup> hour	5 <sup>th</sup> hour
Start Time:	Start Time:	Start Time:	Start Time:	Start Time:
End Time:	End Time:	End Time:	End Time:	End Time:
Tallies:	Tallies:	Tallies:	Tallies:	Tallies:

20. REMARKS:

- 1<sup>st</sup> BAT OBSERVED @ 20:35
- significant decrease in activity after 2200

**Bat Measurement and Capture Data Form**(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: <u>501 (site DI)</u>				Date: <u>8/9/08</u>		Set No. Captured In: <u>2</u>		Name of Person Identifying the Bat: <u>Steve Pernick</u>				*Capture Number: <u>01</u>		
Height in meters captured above ground surface: <u>1</u> m				Body Measurements (grams and millimeters)					Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)
Species <u>M. LUCI</u>	Sex <u>F</u>	Age <u>A</u>	Repro. Condition <u>PL</u>	Wt. (g) <u>7</u>	Ear <u>12</u>	Tragus <u>5</u>	Fore- arm <u>37</u>	Hind Foot <u>9</u>	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right	
Time of Capture <u>21:05</u>		Photo Taken <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Remarks: <u>hair and tissue sample taken</u>										
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen														
Site Name Or Number:				Date:		Set No. Captured In:		Name of Person Identifying the Bat:				*Capture Number:		
Height in meters captured above ground surface: _____ m				Body Measurements (grams and millimeters)					Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore- arm	Hind Foot	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right	
Time of Capture		Photo Taken Yes / No		Remarks:										
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen														
Site Name Or Number:				Date:		Set No. Captured In:		Name of Person Identifying the Bat:				*Capture Number:		
Height in meters captured above ground surface: _____ m				Body Measurements (grams and millimeters)					Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore- arm	Hind Foot	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right	
Time of Capture		Photo Taken Yes / No		Remarks:										

\*Capture Number = number in sequence by site.



BAT NETTING/TRAPPING SITE SURVEY RECORD

Page 1 of 2

1. Survey Date: 8/10/08 2. Company Name: Kimball

3. Reporter: Steve Pernick 4. Assistants: Dennis McGraw

5. Site Name and/or Number: 501 (Site 01)

6. Site is (circle one): hibernation site summer habitat

7a. If hibernation site circle one: limestone mine, coal mine, limestone cave, sandstone cave, RR tunnel,  
other structure, describe - \_\_\_\_\_.

7b. If summer habitat, describe area being sampled (e.g. forested stream or forest clearing with stream):

riparian corridor along Casselman River and mouth of Blue Lick Creek, adjacent to ag. land

8. County: SOMERSET 9. 7.5' Quad.: Meysersdale

10. Was site GPS'd (required)? YES - NO Set 01, 39° 50' 8.611"N 79° 2' 30.634"W

11. Geographic Coordinates (D-M-S): Latitude: 39° - 50' - 16.342"N, Longitude: 79° - 2' - 31.170"W

Datum (circle one): NAD27 (Preferred), NAD83, WGS84, Other: \_\_\_\_\_

12. Ownership and Access: (Who owns site or controls access? Give name and address.) Cecil Petenbrink

258 Petenbrink Rd Gannett, PA 15542, CSX 500 Water St Jacksonville, FL 32202

13. Time (military) & Temperature: Start Time 2020 h Stop Time 0130 h Total Minutes: 310  
Start Temp. 15.4 °C End Temp. 13.5 °C Start humid 85% end humid 92%

14. General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;  
Steady Rain; Thunderstorms; Snow; Other: \_\_\_\_\_.

15. General Wind Conditions (circle one): Calm, Breezy (Leaves Rustling), Windy (trees swaying).

16. Capture Setup at Site:

Set #	Type	Count	Dimensions	Description	TOTAL AREA (m)
1	Nets	1	12m x 2.6m	Stacked over trail	124.8 sq. m
1	nets	2	6m x 2.6	stacked over access road adjacent to perennial stream (Blue Lick Creek)	31.2
2	nets	2	15m x 2.6	over Casselman River, pier to abutment on right descending bank	78.0

Total Capture Area: 109.2 sq. m

(Site Survey Record – Continued)

Site Name/No.:

501 (Site 01)

Date: 8/10/08

17. Describe habitat 150 m around site: (topography and vegetation including dominant tree species.)

NARROW RIPARIAN CORRIDOR ASSOC. W/ CASSELMAN RIVER + BLUE LICK CREEK,  
MAJOR ARTERIAL HWY. SYSTEM, LOCAL U.S. 219 + FARM ACCESS ROADS.  
HIGH AMT. OF ROADWAY DISTURBANCE, FRAGMENTED LANDSCAPE, GL. LOCUST, RED MAPLE  
BL. CHERRY, WILLOW – DENSE HERBACEOUS MEADOWS.18. Was reproductive status checked? YES / NO (if "NO" only enter numbers in Total columns)

## \*CAPTURE RESULTS

Species	Number of Adult Females				No. Juv. Fem.	Total No. Fem.	Number of Adult Males		No. Juv. Male	Total No. Males	Species Totals
	NR	PG	L	PL			SCR	NR			
<i>Eptesicus fuscus</i>	2		1			3	2	1	1	4	7
<i>Myotis lucifugus</i>											
<i>Myotis septentrionalis</i>											
<i>Myotis leibii</i>											
<i>Myotis sodalis</i>											
<i>Eptesicus fuscus</i>											
<i>Pipistrellus subflavus</i>											
<i>Lasiurus borealis</i>											
<i>Lasiurus cinereus</i>											
<i>Lasionycteris noctivagans</i>											
Other – specify:											
Other – specify:											
Reproductive Status: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen.											Grand Total
*Complete Measurement and Capture Data Form for all: (1) <i>Myotis sodalis</i> , (2) <i>Myotis leibii</i> , (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA.											○

19. BAT DETECTORS &amp; OTHER MONITORING DEVICES: Tallies of bat passes / hour. One to 5 hours required for Indiana bat hibernacula surveys. Monitor one hour after 22:00 hrs when trapping/netting hibernacula and 5 hours when only monitoring with bat detectors, night vision or infrared device (when site can not be trapped/netted). Describe procedure &amp; equipment used in remarks.

1 <sup>st</sup> hour	2 <sup>nd</sup> hour	3 <sup>rd</sup> hour	4 <sup>th</sup> hour	5 <sup>th</sup> hour
Start Time:	Start Time:	Start Time:	Start Time:	Start Time:
End Time:	End Time:	End Time:	End Time:	End Time:
Tallies:	Tallies:	Tallies:	Tallies:	Tallies:

20. REMARKS:

- VERY LITTLE BAT ACTIVITY UPON SURVEY START
- NO ACTIVITY ON DETECTOR AFTER 21:00



**SR 6219 Section 020, Meyersdale to Somerset  
Special Use Permit No. 93-2008 with Amendments 1 and 2  
Site Photographs**



**Photograph 1:** Site 01 Set 1



**Photograph 2:** Site 01 Set 2



US 219 IMPROVEMENT  
PROJECT

S.R. 6219 SECTION 020  
MEYERSDALE TO SOMERSET  
SOMERSET COUNTY, PENNSYLVANIA

MIST NET SURVEY  
FOR THE  
INDIANA BAT  
(*Myotis sodalis*)

SITE 1

Legend

Mist Net Survey Site

Surface Water Features

- Ephemeral
- Intermittent
- Perennial
- Surface Drainage Channel
- Wetlands
- Wetland Open Ends

Mapping Features

- Area of Detailed Investigation (LRK 2007/2008)
- Required R-O-W
- Structures
- Cell Tower
- Railroad
- Treeline
- Unimproved Roads / Trails
- Roadways
- Contours

Land Use

- Low Density Residential
- Successional Rangeland
- Transitional
- Water
- Barren Land
- Agricultural Land
- Grassland
- Forest
- Urban
- Roadway
- Miscellaneous
- Alignment and Stations

1

0 50 100 200 Feet

1 inch equals 200 feet

JRG 12/22/2008

H:\PROJ\07-0039\TR\HIGHWAYS\DOCS\Environmental\_Activities\arcview\figures\T&E\_update\_07\_2007\IndianaBat\Field Maps.mxd



BAT NETTING/TRAPPING SITE SURVEY RECORD

Page 1 of 2

1. Survey Date: 7/14/08 2. Company Name: Kimball

3. Reporter: Steve Pernick 4. Assistants: Steve Toki

5. Site Name and/or Number: Site 02 (502)

6. Site is (circle one): hibernation site summer habitat

7a. If hibernation site circle one: limestone mine, coal mine, limestone cave, sandstone cave, RR tunnel,

— other structure, describe - \_\_\_\_\_

7b. If summer habitat, describe area being sampled (e.g. forested stream or forest clearing with stream):

Forested stream valley (perennial stream, 3<sup>rd</sup> order) with wetland

8. County: Somerset 9. 7.5' Quad.: Meyersdale

10. Was site GPS'd (required)? YES NO Set 02-39° 50' 53.069"N 79° 2' 31.149"W

11. Geographic Coordinates (D-M-S): Latitude: Set 01: 39° - 50' - 55.07"N, Longitude: 79° - 2' - 36.53"W

Datum (circle one): NAD27 (Preferred), NAD83 WGS84, Other: \_\_\_\_\_

12. Ownership and Access: (Who owns site or controls access? Give name and address.) David Jenkins

172 Creek Rd. Meyersdale PA 15552

13. Time (military) & Temperature: Start Time 20:30 h Stop Time 1:50 h Total Minutes: 320  
Start Temp. 14.8 °C End Temp. 11.7 °C Start humid 90% end humid 85%

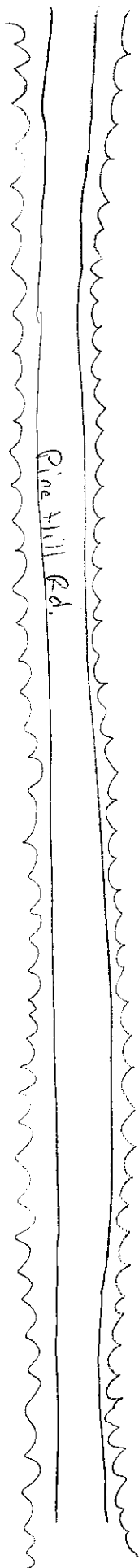
14. General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;  
Steady Rain; Thunderstorms; Snow; Other: \_\_\_\_\_

15. General Wind Conditions (circle one): Calm, Breezy (Leaves Rustling), Windy (trees swaying).

16. Capture Setup at Site:

Set #	Type	Count	Dimensions	Description	TOTAL AREA (m)
1	Nets	4	12m x 2.6m	Stacked over trail	124.8 sq. m
1	net	1	6 x 2.6	over perennial stream	15.6
2	nets	2	9 x 2.6	over perennial stream	46.8
3	nets	3	9 x 2.6	Floodplain opening in Forest at wetland	70.2

Total Capture Area: 132.6 sq. m



forest

Set 3

fore of land

Forest

Set 2

W

Set 1





(Site Survey Record – Continued)

Site Name/No.: Sited (SO2)


Date: 7/14/08

**17. Describe habitat 150 m around site: (topography and vegetation including dominant tree species.)**

- mixed age class deciduous forest, moderate density, rocky valley & slopes, moderately steep slopes,
- veg - beech, white oak, ironwood, red maple, sugar maple, hemlock, black cherry, hawthorn, green ash
- stream is moderate/steep gradient perennial, 15 ft wide x 6 in deep, somewhat restricted flyway due to veg over stream

**18. Was reproductive status checked?** YES / NO (if "NO" only enter numbers in **Total** columns)

**\*CAPTURE RESULTS**

Species	Number of Adult Females				No. Juv. Fem.	Total No. Fem.	Number of Adult Males		No. Juv. Male	Total No. Males	Species Totals
	NR	PG	L	PL			SCR	NR			
<i>Eptesicus fuscus</i>	2		1			3	2	1	1	4	7
<i>Myotis lucifugus</i>											
<i>Myotis septentrionalis</i>											
<i>Myotis leibii</i>											
<i>Myotis sodalis</i>											
<i>Eptesicus fuscus</i>											
<i>Pipistrellus subflavus</i>											
<i>Lasiurus borealis</i>											
<i>Lasiurus cinereus</i>											
<i>Lasionycteris noctivagans</i>											
Other – specify:											
Other – specify:											
<b>Reproductive Status:</b> NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen. <b>*Complete Measurement and Capture Data Form for all:</b> <b>(1) <i>Myotis sodalis</i>, (2) <i>Myotis leibii</i>, (3) bats you are banding or band recaptures,</b> <b>(4) radio-tagged bats and (5) bat species not usually found in PA.</b>											<b>Grand Total</b> 

**19. BAT DETECTORS & OTHER MONITORING DEVICES:** Tallies of bat passes / hour. One to 5 hours required for Indiana bat hibernacula surveys. Monitor one hour after 22:00 hrs when trapping/netting hibernacula and 5 hours when only monitoring with bat detectors, night vision or infrared device (when site can not be trapped/netted). Describe procedure & equipment used in remarks.

1 <sup>st</sup> hour	2 <sup>nd</sup> hour	3 <sup>rd</sup> hour	4 <sup>th</sup> hour	5 <sup>th</sup> hour
Start Time:	Start Time:	Start Time:	Start Time:	Start Time:
End Time:	End Time:	End Time:	End Time:	End Time:
Tallies:	Tallies:	Tallies:	Tallies:	Tallies:

**20. REMARKS:**

- 20:40 ruby-throated hummingbird in set 3
- first bat on detector at 21:30
- 22:45 activity occasional but slow overall, at least one bat is cruising through open forest but not over stream (based on detector)
- very little insect activity
- 24:00 activity stops
- may consider netting road for next night if little traffic
- no other trails at site or travel corridors.
- stream corridor may be too dense to serve as travel corridor and lacks destination due to habitat

BAT NETTING/TRAPPING SITE SURVEY RECORD

Page 1 of 2

1. Survey Date: 7/20/08 2. Company Name: Kimball

3. Reporter: Steve Pernick 4. Assistants: Eric Lange

5. Site Name and/or Number: SO2 (Site 02)

6. Site is (circle one): hibernation site summer habitat

7a. If hibernation site circle one: limestone mine, coal mine, limestone cave, sandstone cave, RR tunnel,

other structure, describe - \_\_\_\_\_

7b. If summer habitat, describe area being sampled (e.g. forested stream or forest clearing with stream):

Forested stream valley (perennial stream, 3rd order) with wetland

8. County: Somerset 9. 7.5' Quad.: Meyersdale

10. Was site GPS'd (required)? YES - NO

Set 02

Set 01 39° 50' 55.017"N 79° 2' 36.513"W

11. Geographic Coordinates (D-M-S): Latitude: 39° 50' 53.069"N, Longitude: 79° 2' 31.149"W

Datum (circle one): NAD27 (Preferred), NAD83, WGS84, Other: \_\_\_\_\_

12. Ownership and Access: (Who owns site or controls access? Give name and address.) David Jenkins

172 Creek Rd Meyersdale, PA 15552

13. Time (military) & Temperature: Start Time 2040 h Stop Time 2210 h Total Minutes: 330

Start Temp. 22 °C End Temp. 16 °C <sup>start humidity 100%</sup>  
<sup>end humidity 100%</sup>

14. General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;

Steady Rain; Thunderstorms; Snow; Other: survey preceded by evening rain

15. General Wind Conditions (circle one): Calm, Breezy (Leaves Rustling), Windy (trees swaying).

16. Capture Setup at Site:

Set #	Type	Count	Dimensions	Description	TOTAL AREA (m)
1	Nets	4	12m x 2.6m	Stacked over trail	124.8 sq. m
1	net	1	6 x 2.6	over perennial stream	15.6
2	nets	2	9 x 2.6	over perennial stream	46.8
3	nets	3	9 x 2.6	floodplain opening in forest at wetland	70.2

Total Capture Area: 132.6 sq. m



see previous site diagram

(Site Survey Record – Continued)

Site Name/No.: 502 (Site 02)Date: 7/20/08**17. Describe habitat 150 m around site: (topography and vegetation including dominant tree species.)**

- mixed age class deciduous forest, moderate density, rocky valley & slopes, moderately steep slopes
- forest dominant species – beech, white oak, iron wood, red maple, sugar maple, hemlock, cherry, hawthorn, green ash
- stream is moderate/steep gradient perennial, 15' x 6", somewhat restricted flyway due to veg over stream

**18. Was reproductive status checked? YES / NO (if "NO" only enter numbers in Total columns)****\*CAPTURE RESULTS**

Species	Number of Adult Females				No. Juv. Fem.	Total No. Fem.	Number of Adult Males		No. Juv. Male	Total No. Males	Species Totals
	NR	PG	L	PL			SCR	NR			
<i>Eptesicus fuscus</i>	2		1			3	2	1	1	4	7
<i>Myotis lucifugus</i>								2		2	2
<i>Myotis septentrionalis</i>											
<i>Myotis leibii</i>											
<i>Myotis sodalis</i>											
<i>Eptesicus fuscus</i>											
<i>Pipistrellus subflavus</i>											
<i>Lasiurus borealis</i>											
<i>Lasiurus cinereus</i>											
<i>Lasionycteris noctivagans</i>											
Other – specify:											
Other – specify:											
Reproductive Status: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen. <b>*Complete Measurement and Capture Data Form for all:</b> (1) <i>Myotis sodalis</i> , (2) <i>Myotis leibii</i> , (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA.											Grand Total  2

**19. BAT DETECTORS & OTHER MONITORING DEVICES:** Tallies of bat passes / hour. One to 5 hours required for Indiana bat hibernacula surveys. Monitor one hour after 22:00 hrs when trapping/netting hibernacula and 5 hours when only monitoring with bat detectors, night vision or infrared device (when site can not be trapped/netted). Describe procedure & equipment used in remarks.

1 <sup>st</sup> hour	2 <sup>nd</sup> hour	3 <sup>rd</sup> hour	4 <sup>th</sup> hour	5 <sup>th</sup> hour
Start Time:	Start Time:	Start Time:	Start Time:	Start Time:
End Time:	End Time:	End Time:	End Time:	End Time:
Tallies:	Tallies:	Tallies:	Tallies:	Tallies:

**20. REMARKS:**

- 2105 first bat on detector  
2215 detected call infrequent/sporadic, little activity  
2300 activity on detector has picked and is more frequent, two visual bat fly overs  
1000 Fog (light) rolling in, temp 16.2°C, activity has decreased



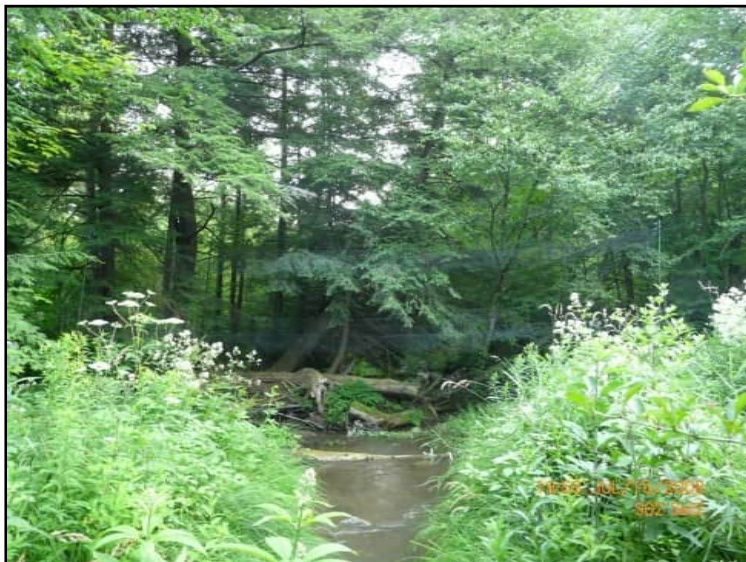
**Bat Measurement and Capture Data Form**(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: <u>S02 Set 1 (Site 0)</u>				Date: <u>7/20/08</u>				Set No. Captured In: <u>1</u>		Name of Person Identifying the Bat: <u>Steve Pernick</u>				*Capture Number: <u>1</u>		
Height in meters captured above ground surface: <u>2</u> m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species <u>M. Lucifugus</u>		Sex <u>M</u>	Age <u>A</u>	Repro. Condition <u>NR</u>	Wt. (g) <u>6.5</u>	Ear <u>12</u>	Tragus <u>6</u>	Fore- arm <u>37</u>	Hind Foot <u>8</u>	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right		
Time of Capture <u>22:40</u>		Photo Taken <u>Yes</u> / No		Remarks: <u>Bone injury (Fore Finger) prior, has healed.</u>												
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen																
Site Name Or Number: <u>S02 Set 2 (Site 0)</u>				Date: <u>7/20/08</u>				Set No. Captured In: <u>2</u>		Name of Person Identifying the Bat: <u>Steve Pernick</u>				*Capture Number: <u>2</u>		
Height in meters captured above ground surface: <u>3</u> m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species <u>M. Lucifugus</u>		Sex <u>M</u>	Age <u>A</u>	Repro. Condition <u>NR</u>	Wt. (g) <u>6.0</u>	Ear <u>12</u>	Tragus <u>6</u>	Fore- arm <u>37</u>	Hind Foot <u>8</u>	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right		
Time of Capture <u>23:30</u>		Photo Taken Yes / No		Remarks: <u>Testes swollen but no descended.</u>												
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen																
Site Name Or Number:				Date:				Set No. Captured In:		Name of Person Identifying the Bat:				*Capture Number:		
Height in meters captured above ground surface: m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species		Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore- arm	Hind Foot	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right		
Time of Capture		Photo Taken Yes / No		Remarks:												

\*Capture Number = number in sequence by site.



**Photograph 3:** Site 02 Set 1



**Photograph 4:** Site 02 Set 2



**Photograph 5:** Site 02 Set 3































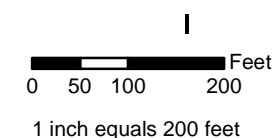
**US 219 IMPROVEMENT PROJECT**  
**S.R. 6219 SECTION 020**  
**MEYERSDALE TO SOMERSET**  
SOMERSET COUNTY, PENNSYLVANIA

**MIST NET SURVEY FOR THE INDIANA BAT**  
**(*Myotis sodalis*)**

**SITE 2**

**Legend**

-  Mist Net Survey Site
- Surface Water Features**
  -  Ephemeral
  -  Intermittent
  -  Perennial
  -  Surface Drainage Channel
  -  Wetlands
  -  Wetland Open Ends
- Mapping Features**
  -  Area of Detailed Investigation (LRK 2007/2008)
  -  Required R-O-W
  -  Structures
  -  Cell Tower
  -  Railroad
  -  Treeline
  -  Unimproved Roads / Trails
  -  Roadways
  -  Contours
- Land Use**
  -  Low Density Residential
  -  Successional Rangeland
  -  Transitional
  -  Water
  -  Barren Land
  -  Agricultural Land
  -  Grassland
  -  Forest
  -  Urban
  -  Roadway
  -  Miscellaneous
  -  Alignment and Stations



## BAT NETTING/TRAPPING SITE SURVEY RECORD

Page 1 of 2

1. Survey Date: 7/17/08 2. Company Name: Kimball3. Reporter: Steve Pernick 4. Assistants: Troy Gallerher5. Site Name and/or Number: 503 (Site 03)6. Site is (circle one): hibernation site summer habitat

7a. If hibernation site circle one: limestone mine, coal mine, limestone cave, sandstone cave, RR tunnel,

other structure, describe - \_\_\_\_\_

7b. If summer habitat, describe area being sampled (e.g. forested stream or forest clearing with stream):

forested valley with developed floodplain and braided channel8. County: Somerset 9. 7.5' Quad.: Meyersdale10. Was site GPS'd (required)? YES - NO  
Set 01 39° 51' 17.998"N 79° 2' 28.414"W  
Set 02 39° 51' 24.223"N 79° 2' 26.446"W11. Geographic Coordinates (D-M-S): Latitude: 39° 51' 17.966"N, Longitude: 79° 2' 32.241"WDatum (circle one): NAD27 (Preferred), NAD83, WGS84, Other: \_\_\_\_\_12. Ownership and Access: (Who owns site or controls access? Give name and address.) Benjamin  
Haver 317 Boant Rd Barrett, PA 1554213. Time (military) & Temperature: Start Time 2040 h Stop Time 0200 h Total Minutes: 320  
Start Temp. 20 °C <sup>68°F</sup> End Temp. 17 °C <sup>63°F</sup> Start humid 92% End humid 93%14. General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;

Steady Rain; Thunderstorms; Snow; Other: \_\_\_\_\_

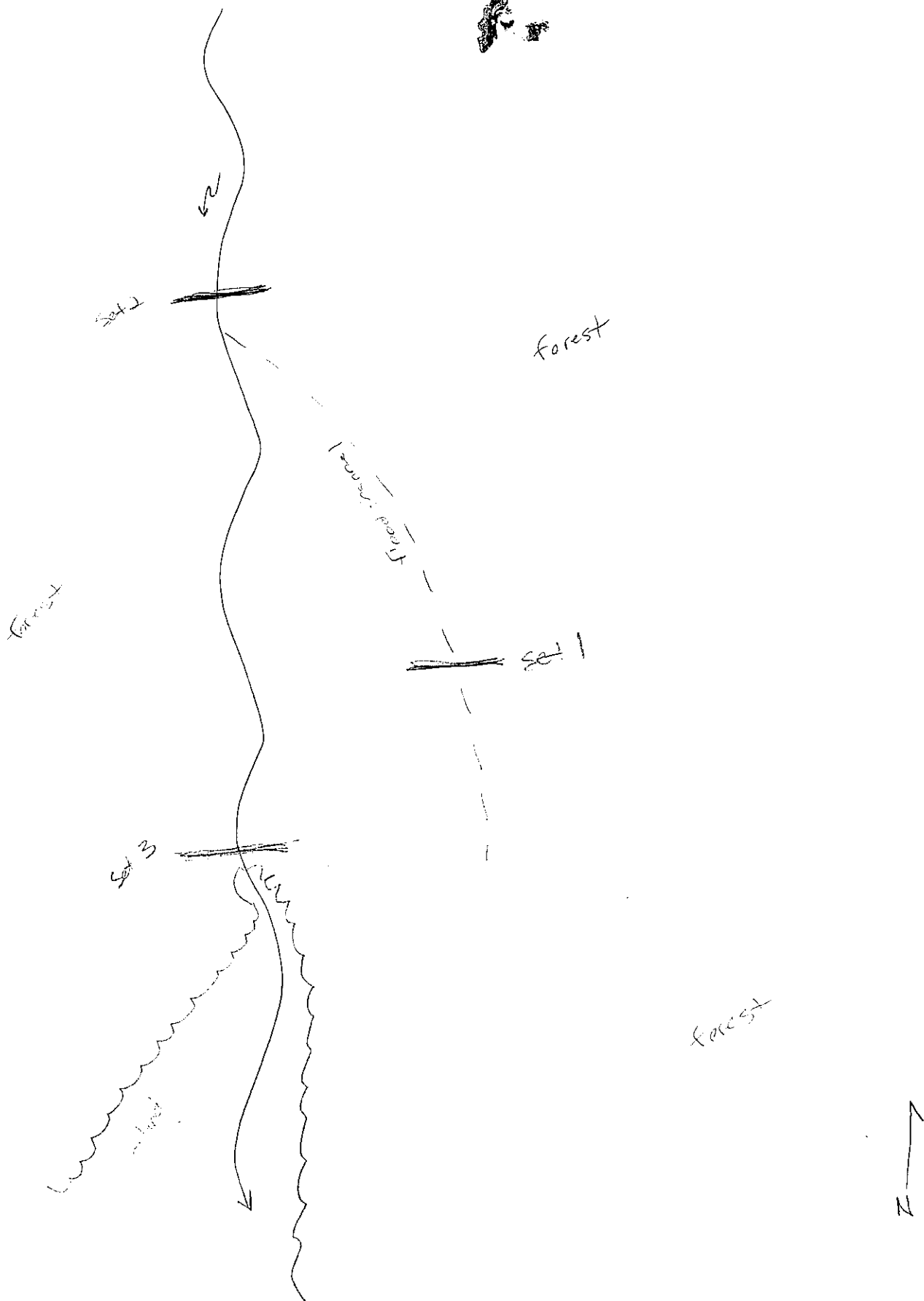
15. General Wind Conditions (circle one): Calm, Breezy (Leaves Rustling), Windy (trees swaying).

## 16. Capture Setup at Site:

Set #	Type	Count	Dimensions	Description	TOTAL AREA (m)
1	Nets	1	12m x 2.6m	Stacked over trail	124.8 sq. m
1	nets	1	9m x 2.6	over flood channel	23.4
2	nets	2	6m x 2.6	over perennial stream	31.2
3	nets	3	9m x 2.6	over perennial stream	70.2

Total Capture Area: 124.8 sq. m





(Site Survey Record – Continued) Site Name/No.: S03 (Site 03) Date: 7/17/08

**17. Describe habitat 150 m around site:** (topography and vegetation including dominant tree species.)

- steep sided forested valley with perennial stream and developed flood plain
- stream 10' x 4", braided in areas and having a flood channel
- mature forest, mixed age, red oak, white oak, red end sugar maple, apple, green ash, black cherry

**18. Was reproductive status checked?** YES NO (if "NO" only enter numbers in **Total** columns)

**\*CAPTURE RESULTS**

Species	Number of Adult Females				No. Juv. Fem.	Total No. Fem.	Number of Adult Males		No. Juv. Male	Total No. Males	Species Totals
	NR	PG	L	PL			SCR	NR			
<i>Eptesicus fuscus</i>	2		1			3	2	1	1	4	7
<i>Myotis lucifugus</i>								1		1	1
<i>Myotis septentrionalis</i>											
<i>Myotis leibii</i>											
<i>Myotis sodalis</i>											
<i>Eptesicus fuscus</i>											
<i>Pipistrellus subflavus</i>											
<i>Lasiurus borealis</i>											
<i>Lasiurus cinereus</i>											
<i>Lasionycteris noctivagans</i>											
Other – specify:											
Other – specify:											
Reproductive Status: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen. <b>*Complete Measurement and Capture Data Form for all:</b> (1) <i>Myotis sodalis</i> , (2) <i>Myotis leibii</i> , (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA.											Grand Total
											1

**19. BAT DETECTORS & OTHER MONITORING DEVICES:** Tallies of bat passes / hour. One to 5 hours required for Indiana bat hibernacula surveys. Monitor one hour after 22:00 hrs when trapping/netting hibernacula and 5 hours when only monitoring with bat detectors, night vision or infrared device (when site can not be trapped/netted). Describe procedure & equipment used in remarks.

1 <sup>st</sup> hour	2 <sup>nd</sup> hour	3 <sup>rd</sup> hour	4 <sup>th</sup> hour	5 <sup>th</sup> hour
Start Time:	Start Time:	Start Time:	Start Time:	Start Time:
End Time:	End Time:	End Time:	End Time:	End Time:
Tallies:	Tallies:	Tallies:	Tallies:	Tallies:

**20. REMARKS:**

2115 First BAT on Detector  
 22:00 very little bat activity and appearing to consist of only a single bat, insect activity very slow also  
 23:20 bat activity all but ceased, one call at 23:15, appearing to be same single bat  
 • othersite considerations are lack of trails or other travel corridors, stream appears to provide travel in some reaches but has obstructions due to veg density in others



**Bat Measurement and Capture Data Form**(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: <u>503 Set3 (Sta 03)</u>				Date: <u>7/17/08</u>				Set No. Captured In: <u>3</u>				Name of Person Identifying the Bat: <u>Steve Pernick</u>				*Capture Number: <u>1</u>			
Height in meters captured above ground surface: <u>4</u> m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)						Transmitter Attached? If so: Frequency (mHz)			
<u>Species</u> <u>Sex</u> <u>Age</u> <u>Repro. Condition</u>				<u>Wt.</u> (g) <u>Ear</u>		<u>Tragus</u> <u>Fore-arm</u>		<u>Hind Foot</u>		<u>Recapture</u> Yes/No		<u>Band Material</u>		<u>Band Color</u>				<u>Band Inscription</u>	
<u>Time of Capture</u> <u>0040</u>				<u>Photo Taken</u> <input checked="" type="radio"/> Yes / <input type="radio"/> No		Remarks: <u>No parasites; no marks, no comments.</u>													
<i>Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen</i>																			
Site Name Or Number:				Date:				Set No. Captured In:				Name of Person Identifying the Bat:				*Capture Number:			
Height in meters captured above ground surface: _____ m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)						Transmitter Attached? If so: Frequency (mHz)			
<u>Species</u> <u>Sex</u> <u>Age</u> <u>Repro. Condition</u>				<u>Wt.</u> (g) <u>Ear</u>		<u>Tragus</u> <u>Fore-arm</u>		<u>Hind Foot</u>		<u>Recapture</u> Yes/No		<u>Band Material</u>		<u>Band Color</u>				<u>Band Inscription</u>	
<u>Time of Capture</u>				<u>Photo Taken</u> <input type="radio"/> Yes / <input type="radio"/> No		Remarks:													
<i>Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen</i>																			
Site Name Or Number:				Date:				Set No. Captured In:				Name of Person Identifying the Bat:				*Capture Number:			
Height in meters captured above ground surface: _____ m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)						Transmitter Attached? If so: Frequency (mHz)			
<u>Species</u> <u>Sex</u> <u>Age</u> <u>Repro. Condition</u>				<u>Wt.</u> (g) <u>Ear</u>		<u>Tragus</u> <u>Fore-arm</u>		<u>Hind Foot</u>		<u>Recapture</u> Yes/No		<u>Band Material</u>		<u>Band Color</u>				<u>Band Inscription</u>	
<u>Time of Capture</u>				<u>Photo Taken</u> <input type="radio"/> Yes / <input type="radio"/> No		Remarks:													

\*Capture Number = number in sequence by site.

BAT NETTING/TRAPPING SITE SURVEY RECORD

Page 1 of 2

1. Survey Date: 25 JULY 08 2. Company Name: KIMBALL  
3. Reporter: S. PERNICK 4. Assistants: D. MCGRAW  
5. Site Name and/or Number: 503 (51403)  
6. Site is (circle one): hibernation site summer habitat  
7a. If hibernation site circle one: limestone mine, coal mine, limestone cave, sandstone cave, RR tunnel,  
other structure, describe - \_\_\_\_\_

7b. If summer habitat, describe area being sampled (e.g. forested stream or forest clearing with stream):

FORESTED VALLEY w DEVELOPED FLOODPLAIN + BRAIDED CHANNEL

8. County: SOMERSET 9. 7.5' Quad.: Meyersdale  
Set 01 39° 51' 17.998"N 79° 2' 28.414"W  
10. Was site GPS'd (required)? YES - NO Set 02 39° 51' 24.223"N 79° 2' 26.446"W  
11. Geographic Coordinates (D-M-S): Set 03 Latitude: 39° - 51' - 17.961"N, Longitude: 79° - 2' - 32.241"W

Datum (circle one): NAD27 (Preferred), NAD83, WGS84, Other: \_\_\_\_\_

12. Ownership and Access: (Who owns site or controls access? Give name and address.) Benjamin Haen  
317 Brant Rd Garrett, PA 15542

13. Time (military) & Temperature: Start Time 20:35 h Stop Time 01:45 h Total Minutes: 310  
Start Temp. 18 °C End Temp. 14.5 °C HUMIDITY  
START - 85  
END - 100

14. General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;  
Steady Rain; Thunderstorms; Snow; Other: \_\_\_\_\_

15. General Wind Conditions (circle one): Calm; Breezy (Leaves Rustling); Windy (trees swaying).

16. Capture Setup at Site:

Set #	Type	Count	Dimensions	Description	TOTAL AREA (m)
1	Nets	4	12m x 2.6m	Stacked over trail	124.8 sq. m
1	NETS	1	9m x 2.6	OVER FLOOD CHANNEL	23.4
2	NETS	2	6m x 2.6	OVER PERM. STREAM	31.2
3	NETS	3	9m x 2.6	OVER PERM. STREAM	70.2

Total Capture Area: 124.8 sq. m



(Site Survey Record – Continued)

Site Name/No.: 503 (SH 03)Date: 25 JULY 08

17. Describe habitat 150 m around site: (topography and vegetation including dominant tree species.)

- STEEP-SLOPED FORESTED VALLEY W/ PERM. STREAM + DEVELOPED FLOODPLAIN
- STREAM 10' X 4", BRAIDED IN AREAS + HAVING A FLOOD CHANNEL
- MATURE FOREST, MIXED AGE, RED OAK, WHITE OAK, RED + SUGAR MAPLE, APPLE, GREEN ASH, BLACK CHERRY

18. Was reproductive status checked? (YES) / NO (if "NO" only enter numbers in **Total** columns)

## \*CAPTURE RESULTS

Species	Number of Adult Females				No. Juv. Fem.	Total No. Fem.	Number of Adult Males		No. Juv. Male	Total No. Males	Species Totals
	NR	PG	L	PL			SCR	NR			
<i>Eptesicus fuscus</i>	2		1			3	2	1	1	4	7
<i>Myotis lucifugus</i>											1*
<i>Myotis septentrionalis</i>											
<i>Myotis leibii</i>											
<i>Myotis sodalis</i>											
<i>Eptesicus fuscus</i>				1		1					
<i>Pipistrellus subflavus</i>											
<i>Lasiurus borealis</i>											
<i>Lasiurus cinereus</i>											
<i>Lasionycteris noctivagans</i>											
Other – specify:											
Other – specify:											
Reproductive Status: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen. *Complete Measurement and Capture Data Form for all: (1) <i>Myotis sodalis</i> , (2) <i>Myotis leibii</i> , (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA.											Grand Total 2

CAUGHT  
BUT  
ESCAPED

19. BAT DETECTORS &amp; OTHER MONITORING DEVICES: Tallies of bat passes / hour. One to 5 hours required for Indiana bat hibernacula surveys. Monitor one hour after 22:00 hrs when trapping/netting hibernacula and 5 hours when only monitoring with bat detectors, night vision or infrared device (when site can not be trapped/netted). Describe procedure &amp; equipment used in remarks.

1 <sup>st</sup> hour	2 <sup>nd</sup> hour	3 <sup>rd</sup> hour	4 <sup>th</sup> hour	5 <sup>th</sup> hour
Start Time:	Start Time:	Start Time:	Start Time:	Start Time:
End Time:	End Time:	End Time:	End Time:	End Time:
Tallies:	Tallies:	Tallies:	Tallies:	Tallies:

## 20. REMARKS:

- INCIDENTAL TAKE – KINGFISHER
- ACTIVITY CEASED @ 00:00

**Bat Measurement and Capture Data Form**

(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: <u>(SITE 03) S03</u>				Date: <u>25 JULY 08</u>				Set No. Captured In: <u>3</u>		Name of Person Identifying the Bat: <u>S. VERNICK</u>				*Capture Number: <u>01</u>		
Height in meters captured above ground surface: <u>2</u> m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right			
E. FUSCUS	F	AD.	PL	13.0	16	6	49	9								
Time of Capture <u>22:25</u>		Photo Taken <u>(Yes)</u> / No		Remarks: MAMMARYS APPEAR TO BE NON-PROMINENT; CHAPPED SKIN, WHAT IS POSSIBLY DRIED MILK AROUND TEATS. • CANINES SHOW WEAR - ROUNDED/FLATTENED TIPS • TONGUE APPEARED WHITISH OR DRY, ADDED H <sub>2</sub> O + SEEMED FINE (CORNSTARCH FROM GLOVE)												
Repro. Condition: NR=nonreproductive, PG=pregnant, L=lactating, PL=post lactating, SCR=scrotal/epididymis swollen																
Site Name Or Number: <u>(SITE 03) S03</u>				Date: <u>25 JULY 08</u>				Set No. Captured In: <u>2</u>		Name of Person Identifying the Bat: <u>S. VERNICK</u>				*Capture Number: <u>02</u>		
Height in meters captured above ground surface: <u>2</u> m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right			
M. LUCIFUGUS																
Time of Capture <u>23:45</u>		Photo Taken Yes / <u>(No)</u>		Remarks: CAUGHT IN NET; ESCAPED JUST PRIOR TO UNTANGLING												
Repro. Condition: NR=nonreproductive, PG=pregnant, L=lactating, PL=post lactating, SCR=scrotal/epididymis swollen																
Site Name Or Number:				Date:				Set No. Captured In:		Name of Person Identifying the Bat:				*Capture Number:		
Height in meters captured above ground surface: m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right			
Time of Capture		Photo Taken		Remarks:												
		Yes / No														





**Photograph 6:** Site 03 Set 1



**Photograph 7:** Site 03 Set 2



**Photograph 8:** Site 03 Set 3




**US 219 IMPROVEMENT  
PROJECT  
S.R. 6219 SECTION 020  
MEYERSDALE TO SOMERSET  
SOMERSET COUNTY, PENNSYLVANIA**

**MIST NET SURVEY  
FOR THE  
INDIANA BAT  
(*Myotis sodalis*)**


**SITE 3**

**Legend**


 Mist Net Survey Site

**Surface Water Features**


 Ephemeral

 Intermittent


 Perennial

 Surface Drainage Channel


 Wetlands

 Wetland Open Ends

**Mapping Features**

 Area of Detailed Investigation  
(LRK 2007/2008)


 Required R-O-W


 Structures

 Cell Tower


 Railroad


 Treeline


 Unimproved Roads / Trails

 Roadways

 Contours


 Low Density Residential

 Successional Rangeland

 Transitional

 Water

 Barren Land

 Agricultural Land


 Grassland

 Forest

 Urban

 Roadway

 Miscellaneous

 Alignment and Stations

1

0 50 100 200 Feet

1 inch equals 200 feet

JRG 12/22/2008



## BAT NETTING/TRAPPING SITE SURVEY RECORD

Page 1 of 2

1. Survey Date: 7/15/08 2. Company Name: Kimball3. Reporter: Steve Pernick 4. Assistants: Steve Toki5. Site Name and/or Number: S04 (Site 04)6. Site is (circle one): hibernation site summer habitat7a. If hibernation site circle one: limestone mine, coal mine, limestone cave, sandstone cave, RR tunnel,  
other structure, describe - \_\_\_\_\_

7b. If summer habitat, describe area being sampled (e.g. forested stream or forest clearing with stream):

forested valley with perennial stream (Swamp Creek)8. County: Somerset 9. 7.5' Quad.: Meyersdale10. Was site GPS'd (required)? YES - NO  
Set 01 39°51'58.115"N 79°2'16.588"W  
Set 02 39°51'55.097"N 79°2'17.490"W  
Set 0311. Geographic Coordinates (D-M-S): Latitude: 39°-51'-55.408"N, Longitude: 79°-2'-15.288"WDatum (circle one): NAD27 (Preferred), NAD83, WGS84, Other: \_\_\_\_\_12. Ownership and Access: (Who owns site or controls access? Give name and address.) Paul Hay 345 Creek Rd  
Meyersdale, PA 15552; Reed Luce 2091 New Centerville Rd Rockwood, PA 1555713. Time (military) & Temperature: Start Time 20:40 h Stop Time 1:50 h Total Minutes: 310  
Start Temp. 59°F 15.0°C End Temp. 59°F 10.6°C start humid 100%  
end humid 100%14. General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;  
Steady Rain; Thunderstorms; Snow; Other: \_\_\_\_\_15. General Wind Conditions (circle one): Calm, Breezy (Leaves Rustling), Windy (trees swaying).

## 16. Capture Setup at Site:

Set #	Type	Count	Dimensions	Description	TOTAL AREA (m)
1	Nets	4	12m x 2.6m	Stacked over trail	124.8 sq. m
1	net	1	6m x 2.6	over trail	15.6
2	nets	2	9m x 2.6	over perennial stream	46.8
3	nets	4	9m x 2.6	across floodplain wetland opening in forested adjacent to stream	93.6

Total Capture Area: 186.0 sq. m





(Site Survey Record – Continued) Site Name/No.: 504 (Site 04) Date: 7/15/08

17. Describe habitat 150 m around site: (topography and vegetation including dominant tree species.)
- steep sided forested stream valley with a few floodplain wetlands, moderate density, mixed age
  - stream  $\approx 12' \times 6'$
  - hemlock, cherry, white and red oaks, red maple, hawthorn, magnolia, green ash

18. Was reproductive status checked? YES / NO (if "NO" only enter numbers in **Total** columns)

**\*CAPTURE RESULTS**

Species	Number of Adult Females				No. Juv. Fem.	Total No. Fem.	Number of Adult Males		No. Juv. Male	Total No. Males	Species Totals
	NR	PG	L	PL			SCR	NR			
<i>Eptesicus fuscus</i>	2		1			3	2	1	1	4	7
<i>Myotis lucifugus</i>											
<i>Myotis septentrionalis</i>											
<i>Myotis leibii</i>											
<i>Myotis sodalis</i>											
<i>Eptesicus fuscus</i>											
<i>Pipistrellus subflavus</i>											
<i>Lasiurus borealis</i>											
<i>Lasiurus cinereus</i>											
<i>Lasionycteris noctivagans</i>											
Other – specify:											
Other – specify:											
Reproductive Status: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen. <b>*Complete Measurement and Capture Data Form for all:</b> (1) <i>Myotis sodalis</i> , (2) <i>Myotis leibii</i> , (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA.											Grand Total

19. BAT DETECTORS & OTHER MONITORING DEVICES: Tallies of bat passes / hour. One to 5 hours required for Indiana bat hibernacula surveys. Monitor one hour after 22:00 hrs when trapping/netting hibernacula and 5 hours when only monitoring with bat detectors, night vision or infrared device (when site can not be trapped/netted). Describe procedure & equipment used in remarks.

1 <sup>st</sup> hour	2 <sup>nd</sup> hour	3 <sup>rd</sup> hour	4 <sup>th</sup> hour	5 <sup>th</sup> hour
Start Time:	Start Time:	Start Time:	Start Time:	Start Time:
End Time:	End Time:	End Time:	End Time:	End Time:
Tallies:	Tallies:	Tallies:	Tallies:	Tallies:

20. REMARKS:

- 21:00 batson detector and visually foraging above canopy (>60')
- 21:15 moth activity appears good at start
- 22:00 near full moon rises over ridge
- 23:00 activity drops off, insect activity also down, temp 54°F
- 24:00 no activity on detector, one bat escapes set 1 unidentified
- overall lack of success at this site appears due to combination of lack of site diversity, tight stream corridor, and cool temps, recommend moving site to top of hill bordering agriculture for second night

BAT NETTING/TRAPPING SITE SURVEY RECORD

Page 1 of 2

1. Survey Date: 01 AUGUST 08 2. Company Name: KIMBALL

3. Reporter: S. PERNICK 4. Assistants: D. MCGRAW, E. LANGE

5. Site Name and/or Number: (SITE 04) 504

6. Site is (circle one): hibernation site summer habitat

7a. If hibernation site circle one: limestone mine, coal mine, limestone cave, sandstone cave, RR tunnel,  
other structure, describe - \_\_\_\_\_.

7b. If summer habitat, describe area being sampled (e.g. forested stream or forest clearing with stream):

FORESTED VALLEY WITH PERENNIAL STREAM (SWAMP CREEK)

8. County: SOMERSET 9. 7.5' Quad.: Meyersdale

10. Was site GPS'd (required)? (YES) - NO  
Set 01 39° 51' 58.115"N 79° 2' 16.588"W  
Set 02 39° 51' 55.697"N 79° 2' 17.490"W  
Set 03

11. Geographic Coordinates (D-M-S): Latitude: 39° - 01' - 55.408"N, Longitude: 79° - 02' - 15.289"W

Datum (circle one): NAD27 (Preferred), NAD83, WGS84, Other: \_\_\_\_\_

12. Ownership and Access: (Who owns site or controls access? Give name and address.) Paul Hay

345 Creek Rd Meyersdale, PA 15552; Reed Luce 2091 New Centerville Rd Rockwood, PA 15557

13. Time (military) & Temperature: Start Time 20:30 h Stop Time 01:40 h Total Minutes: 310

Start Temp. 19 °C End Temp. 18 °C HUMIDITY  
START - 100  
END - 100

14. General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;  
Steady Rain; Thunderstorms; Snow; Other: \_\_\_\_\_.

15. General Wind Conditions (circle one): Calm; Breezy (Leaves Rustling); Windy (trees swaying).

16. Capture Setup at Site:

Set #	Type	Count	Dimensions	Description	TOTAL AREA (m)
<u>1</u>	<u>Nets</u>	<u>4</u>	<u>12m x 2.6m</u>	<u>Stacked over trail</u>	<u>124.8 sq. m</u>
<u>1</u>	<u>NETS</u>	<u>1</u>	<u>6m x 2.6m</u>	<u>OVER TRAIL</u>	<u>15.6</u>
<u>2</u>	<u>NETS</u>	<u>2</u>	<u>9m x 2.6m</u>	<u>OVER PERM. STREAM</u>	<u>46.8</u>
<u>3</u>	<u>NETS</u>	<u>4</u>	<u>9m x 2.6m</u>	<u>ACROSS FLOODPLAIN WET- LAND OPENING IN FOREST &amp; ADJACENT TO STREAM</u>	<u>93.6</u>

Total Capture Area: 156.0 sq. m



SEE DIAGRAM

SEE PREVIOUS ENTRY NIGHT

(Site Survey Record – Continued)

Site Name/No.:

(SITE 04) 504

Date: 01 AUG. 08

**17. Describe habitat 150 m around site: (topography and vegetation, including dominant tree species.)**

- STEEP-SIDED FORESTED STREAM VALLEY W/ A FEW FLOODPLAIN WETLANDS, MODERATE DENSITY, MIXED-AGE
- STREAM ~ 12' X 6"
- HEMLOCK, CHERRY, WHITE + RED OAKS, RED MAPLE, HAWTHORN, GREEN ASH,

**18. Was reproductive status checked?** YES / NO (if "NO" only enter numbers in **Total** columns) MAGNOLIA**\*CAPTURE RESULTS**

Species	Number of Adult Females				No. Juv. Fem.	Total No. Fem.	Number of Adult Males		No. Juv. Male	Total No. Males	Species Totals
	NR	PG	L	PL			SCR	NR			
<i>Eptesicus fuscus</i>	2		1			3	2	1	1	4	7
<i>Myotis lucifugus</i>											
<i>Myotis septentrionalis</i>											
<i>Myotis leibii</i>											
<i>Myotis sodalis</i>											
<i>Eptesicus fuscus</i>								1		1	1
<i>Pipistrellus subflavus</i>											
<i>Lasiurus borealis</i>											
<i>Lasiurus cinereus</i>											
<i>Lasionycteris noctivagans</i>											
Other – specify:											
Other – specify:											
Reproductive Status: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen. <b>*Complete Measurement and Capture Data Form for all:</b> (1) <i>Myotis sodalis</i> , (2) <i>Myotis leibii</i> , (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA.											Grand Total 1

**19. BAT DETECTORS & OTHER MONITORING DEVICES:** Tallies of bat passes / hour. One to 5 hours required for Indiana bat hibernacula surveys. Monitor one hour after 22:00 hrs when trapping/netting hibernacula and 5 hours when only monitoring with bat detectors, night vision or infrared device (when site can not be trapped/netted). Describe procedure & equipment used in remarks.

1 <sup>st</sup> hour	2 <sup>nd</sup> hour	3 <sup>rd</sup> hour	4 <sup>th</sup> hour	5 <sup>th</sup> hour
Start Time:	Start Time:	Start Time:	Start Time:	Start Time:
End Time:	End Time:	End Time:	End Time:	End Time:
Tallies:	Tallies:	Tallies:	Tallies:	Tallies:

**20. REMARKS**

20:30 - Bat monitor indicated frequent bat activity. Visual of three bats overhead.  
23:35 - thunder and light rain roll in  
00:25 - storm clears, activity resumes, plan is to extend survey 50 min. to make up time  
00:30 - Incidental capture of flying squirrel, appeared to be southern but was not handled to get positive ID  
01:30 - Rain starts again, survey cancelled



**Bat Measurement and Capture Data Form**(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: <u>(SITE 04) S84</u>				Date: <u>01 AUG. 08</u>				Set No. Captured In: <u>1</u>		Name of Person Identifying the Bat: <u>S. PERNICK</u>				*Capture Number: <u>01</u>		
Height in meters captured above ground surface: _____ m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
<u>Species</u> E. FUSCUS <u>Sex</u> M <u>Age</u> AD <u>Repro. Condition</u> NR				<u>Wt. (g)</u> 16.5 <u>Ear</u> 14		<u>Tragus</u> 6 <u>Fore-arm</u> 45 <u>Hind Foot</u> 8		<u>Recapture Yes/No</u> <u>Band Material</u> <u>Band Color</u> <u>Band Inscription</u> <u>Band on Left/Right</u>								
Time of Capture <u>21:31</u>		Photo Taken <u>Yes</u> / No		Remarks:												
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen																
Site Name Or Number:				Date:				Set No. Captured In:		Name of Person Identifying the Bat:				*Capture Number:		
Height in meters captured above ground surface: _____ m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
<u>Species</u>  <u>Sex</u>  <u>Age</u>  <u>Repro. Condition</u> 				<u>Wt. (g)</u>  <u>Ear</u> 		<u>Tragus</u>  <u>Fore-arm</u>  <u>Hind Foot</u> 		<u>Recapture Yes/No</u> <u>Band Material</u> <u>Band Color</u> <u>Band Inscription</u> <u>Band on Left/Right</u>								
Time of Capture		Photo Taken Yes / No		Remarks:												
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen																
Site Name Or Number:				Date:				Set No. Captured In:		Name of Person Identifying the Bat:				*Capture Number:		
Height in meters captured above ground surface: _____ m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
<u>Species</u>  <u>Sex</u>  <u>Age</u>  <u>Repro. Condition</u> 				<u>Wt. (g)</u>  <u>Ear</u> 		<u>Tragus</u>  <u>Fore-arm</u>  <u>Hind Foot</u> 		<u>Recapture Yes/No</u> <u>Band Material</u> <u>Band Color</u> <u>Band Inscription</u> <u>Band on Left/Right</u>								
Time of Capture		Photo Taken Yes / No		Remarks:												

\*Capture Number = number in sequence by site.

BAT NETTING/TRAPPING SITE SURVEY RECORD

Page 1 of 2

1. Survey Date: 8/2/08 2. Company Name: Kimball

3. Reporter: Steve Pernick 4. Assistants: Steve Toki

5. Site Name and/or Number: 504 (Site 04)

6. Site is (circle one): hibernation site summer habitat

7a. If hibernation site circle one: limestone mine, coal mine, limestone cave, sandstone cave, RR tunnel,  
other structure, describe - \_\_\_\_\_.

7b. If summer habitat, describe area being sampled (e.g. forested stream or forest clearing with stream):

steep forested valley with perennial stream (Swamp Creek)

8. County: Somerset 9. 7.5' Quad.: Meyersdale

10. Was site GPS'd (required)? YES - NO  
Set 01 39° 51' 58.115" N 79° 2' 16.588" W  
Set 02 39° 51' 55.097" N 79° 2' 17.490" W

11. Geographic Coordinates (D-M-S): Latitude: 39° - 51' - 55.908" N, Longitude: 79° - 2' - 15.289" W

Datum (circle one): NAD27 (Preferred), NAD83, WGS84, Other: \_\_\_\_\_

12. Ownership and Access: (Who owns site or controls access? Give name and address.) Paul Hay 345

Creek Rd Meyersdale, PA 15552; Reed Luce 2091 New Centreville Rd Rockwood, PA 15557

13. Time (military) & Temperature: Start Time 2030 h Stop Time 24:00 h Total Minutes: 210

Start Temp. 16 °C End Temp. 13.7 °C Start humidity 100%  
end humid 100%

14. General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;  
Steady Rain; Thunderstorms; Snow; Other: \_\_\_\_\_.

15. General Wind Conditions (circle one): Calm; Breezy (Leaves Rustling), Windy (trees swaying).

16. Capture Setup at Site:

Set #	Type	Count	Dimensions	Description	TOTAL AREA (m)
1	Nets	4	12m x 2.6m	Stacked over trail	124.8 sq. m
1	nets	2	6m x 2.6	over trail	31.2
2	nets	2	9m x 2.6	over perennial stream	46.8
3	nets	4	9m x 2.6	across flood plain opening in forest over wetland	93.6

Total Capture Area: 171.6 sq. m



see previous night's diagram

(Site Survey Record – Continued)

Site Name/No.: 504 (Site 04)Date: 8/2/08

## 17. Describe habitat 150 m around site: (topography and vegetation including dominant tree species.)

- steep-sided forested stream valley with floodplain wetlands, moderate density, mixed age class
- stream approx. 12' x 6"
- hemlock, cherry, white and red oak, red maple, hawthorn, green ash, magnolia

18. Was reproductive status checked? YES / NO (if "NO" only enter numbers in **Total** columns)

## \*CAPTURE RESULTS

Species	Number of Adult Females				No. Juv. Fem.	Total No. Fem.	Number of Adult Males		No. Juv. Male	Total No. Males	Species Totals
	NR	PG	L	PL			SCR	NR			
<i>Eptesicus fuscus</i>	2		1			3	2	1	1	4	7
<i>Myotis lucifugus</i>											
<i>Myotis septentrionalis</i>											
<i>Myotis leibii</i>											
<i>Myotis sodalis</i>											
<i>Eptesicus fuscus</i>									1		1
<i>Pipistrellus subflavus</i>											
<i>Lasiurus borealis</i>											
<i>Lasiurus cinereus</i>											
<i>Lasionycteris noctivagans</i>											
Other – specify:											
Other – specify:											
Reproductive Status: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen. *Complete Measurement and Capture Data Form for all: (1) <i>Myotis sodalis</i> , (2) <i>Myotis leibii</i> , (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA.											Grand Total 1

## 19. BAT DETECTORS &amp; OTHER MONITORING DEVICES: Tallies of bat passes / hour. One to 5 hours required for Indiana bat hibernacula surveys. Monitor one hour after 22:00 hrs when trapping/netting hibernacula and 5 hours when only monitoring with bat detectors, night vision or infrared device (when site can not be trapped/netted). Describe procedure &amp; equipment used in remarks.

1 <sup>st</sup> hour	2 <sup>nd</sup> hour	3 <sup>rd</sup> hour	4 <sup>th</sup> hour	5 <sup>th</sup> hour
Start Time:	Start Time:	Start Time:	Start Time:	Start Time:
End Time:	End Time:	End Time:	End Time:	End Time:
Tallies:	Tallies:	Tallies:	Tallies:	Tallies:

## 20. REMARKS

- tonight's survey is the 3<sup>rd</sup> for this site and is to make up for 2 hours lost previous night (8/1/08) on account of storms
- 2045 bats on detector and visually



**Bat Measurement and Capture Data Form**(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

*B.B.*

Site Name Or Number: <u>(SITE 4) S04</u>				Date: <u>8/2/08</u>		Set No. <u>03</u> Captured In:		Name of Person <u>STEVE PERICK</u> Identifying the Bat:				*Capture Number: <u>001</u>		
Height in meters captured above ground surface: <u>7</u> m				Body Measurements (grams and millimeters)					Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)
Species <u>E. FUSCUS</u>	Sex <u>M</u>	Age <u>J</u>	Repro. Condition <u>NR</u>	Wt. (g) <u>13.5</u>	Ear <u>16</u>	Tragus <u>6</u>	Fore-arm <u>48</u>	Hind Foot <u>8</u>	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right	
Time of Capture <u>10:50</u>	Photo Taken <u>Yes</u> / No		Remarks:											

Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen

*B. 12.5 26*

Site Name Or Number:				Date:		Set No. Captured In:		Name of Person Identifying the Bat:				*Capture Number:		
Height in meters captured above ground surface: m				Body Measurements (grams and millimeters)					Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right	
Time of Capture	Photo Taken Yes / No		Remarks:											

Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen

Site Name Or Number:				Date:		Set No. Captured In:		Name of Person Identifying the Bat:				*Capture Number:		
Height in meters captured above ground surface: m				Body Measurements (grams and millimeters)					Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right	
Time of Capture	Photo Taken Yes / No		Remarks:											

\*Capture Number = number in sequence by site.



**Photograph 9:** Site 04 Set1



**Photograph 10:** Site 04 Set 2



**Photograph 11:** Site 04 Set 3



**US 219 IMPROVEMENT  
PROJECT  
S.R. 6219 SECTION 020  
MEYERSDALE TO SOMERSET  
SOMERSET COUNTY, PENNSYLVANIA**

**MIST NET SURVEY  
FOR THE  
INDIANA BAT  
(*Myotis sodalis*)**


**SITE 4**


**Legend**


 Mist Net Survey Site


**Surface Water Features**


 Ephemeral

 Intermittent


 Perennial


 Surface Drainage Channel

 Wetlands

 Wetland Open Ends


**Mapping Features**

 Area of Detailed Investigation  
(LRK 2007/2008)


 Required R-O-W


 Structures

 Cell Tower

 Railroad


 Treeline


 Unimproved Roads / Trails


 Roadways

 Contours

**Land Use**


 Low Density Residential

 Successional Rangeland

 Transitional

 Water

 Barren Land


 Agricultural Land

 Grassland

 Forest

 Urban

 Roadway

 Miscellaneous

 Alignment and Stations

1

0 50 100 200 Feet

1 inch equals 200 feet

BAT NETTING/TRAPPING SITE SURVEY RECORD

1. Survey Date: 26 JULY 08 2. Company Name: KIM BALL

3. Reporter: S. PERNICK 4. Assistants: D. McGRAN, J. GUSTKEY

5. Site Name and/or Number: (SITE 05) S05

6. Site is (circle one): hibernation site summer habitat

7a. If hibernation site circle one: limestone mine, coal mine, limestone cave, sandstone cave, RR tunnel,  
other structure, describe - \_\_\_\_\_

7b. If summer habitat, describe area being sampled (e.g. forested stream or forest clearing with stream):

FORESTED STREAM (BUFFALO CREEK)

8. County: SOMERSET 9. 7.5' Quad: Meyersdale

10. Was site GPS'd (required)? YES - NO  
Set 01 39° 52' 17.654"N 79° 2' 58.481"W  
Set 02 39° 52' 17.587"N 79° 2' 56.539"W  
Set 03 39° 52' 17.827"N 79° 3' 0.497"W

11. Geographic Coordinates (D-M-S): Latitude: 39° 52' 17.316"N, Longitude: 79° 02' 55.702"W

Datum (circle one): NAD27 (Preferred), NAD83, WGS84, Other: \_\_\_\_\_

12. Ownership and Access: (Who owns site or controls access? Give name and address.) E. Kent Landefeld

147 Hillside Lane Somerset, PA 15501

13. Time (military) & Temperature: Start Time 20:30 h Stop Time 01:45 h Total Minutes: 315  
Start Temp. 18.4 °C End Temp. 14 °C HUMIDITY START-99.6

14. General Weather (circle one): Clear Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;  
Steady Rain; Thunderstorms; Snow; Other: \_\_\_\_\_

15. General Wind Conditions (circle one): Calm Breezy (Leaves Rustling), Windy (trees swaying).

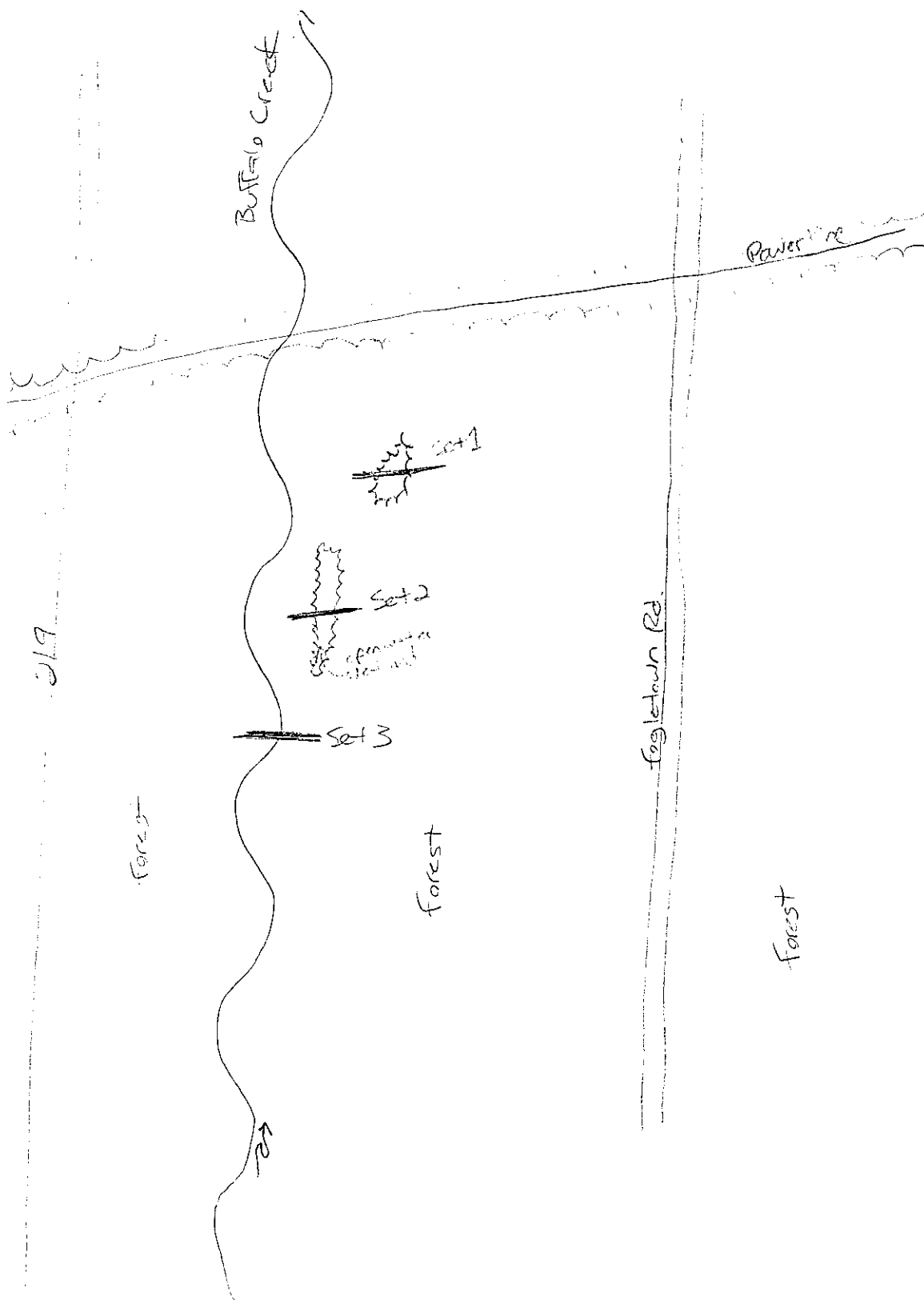
16. Capture Setup at Site:

Set #	Type	Count	Dimensions	Description	TOTAL AREA (m)
1	Nets	4	12m x 2.6m	Stacked over trail	124.8 sq. m
1	NETS	1	9m x 2.6m	OPENING IN FORESTED FLOODPLAIN	23.4
2	NETS	2	6m x 2.6m	STACKED OVER WETLAND IN FLOODPLAIN	31.2
3	NETS	3	9m x 2.6m	STACKED OVER BUFFALO CREEK	70.2

Total Capture Area: 124.8 sq. m



N →



(Site Survey Record – Continued)

Site Name/No.:

(SITE 05) S05

Date: 26 JULY 08

17. Describe habitat 150 m around site: (topography and vegetation including dominant tree species.)

FORESTED RIPARIAN FLOODPLAIN. DOMINANT TREES INCLUDE HEMLOCK, RED MAPLE, BLACK BIRCH, UNDERSTORY COMPRISED OF RHODODENDRON, WITCH HAZEL, BLACKBERRY, SOME

18. Was reproductive status checked? YES / NO (if "NO" only enter numbers in Total columns)

## \*CAPTURE RESULTS

Species	Number of Adult Females				No. Juv. Fem.	Total No. Fem.	Number of Adult Males		No. Juv. Male	Total No. Males	Species Totals
	NR	PG	L	PL			SCR	NR			
<i>Eptesicus fuscus</i>	2		1			3	2	1	1	4	7
<i>Myotis lucifugus</i>			1		1	3*					3
<i>Myotis septentrionalis</i>											1*
<i>Myotis leibii</i>											
<i>Myotis sodalis</i>											
<i>Eptesicus fuscus</i>											
<i>Pipistrellus subflavus</i>											
<i>Lasiurus borealis</i>											
<i>Lasiurus cinereus</i>											
<i>Lasionycteris noctivagans</i>											
Other – specify:											
Other – specify:											
Reproductive Status: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen. *Complete Measurement and Capture Data Form for all: (1) <i>Myotis sodalis</i> , (2) <i>Myotis leibii</i> , (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA.											Grand Total 4

\*1 ESCAPE

ESCAPEE

19. BAT DETECTORS &amp; OTHER MONITORING DEVICES: Tallies of bat passes / hour. One to 5 hours required for Indiana bat hibernacula surveys. Monitor one hour after 22:00 hrs when trapping/netting hibernacula and 5 hours when only monitoring with bat detectors, night vision or infrared device (when site can not be trapped/netted). Describe procedure &amp; equipment used in remarks.

1 <sup>st</sup> hour	2 <sup>nd</sup> hour	3 <sup>rd</sup> hour	4 <sup>th</sup> hour	5 <sup>th</sup> hour
Start Time:	Start Time:	Start Time:	Start Time:	Start Time:
End Time:	End Time:	End Time:	End Time:	End Time:
Tallies:	Tallies:	Tallies:	Tallies:	Tallies:

20. REMARKS:

• FIRST BAT(S) OBSERVED @ 20:50



**Bat Measurement and Capture Data Form**(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: <u>(SITE 05) S05</u>		Date: <u>26 JULY 08</u>		Set No. Captured In: <u>3</u>		Name of Person Identifying the Bat: <u>S. PERNICK</u>		*Capture Number: <u>01</u>					
Height in meters captured above ground surface: <u>3</u> m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)			
Species M. LUCIFUGUS	Sex F	Age AD.	Repro. Condition L	Wt. (g) 7.0	Ear 14	Tragus 6	Fore-arm 39	Hind Foot 8	Recapture Yes/No		Band Material	Band Color	Band Inscription
Time of Capture <u>21:05</u>	Photo Taken <input checked="" type="radio"/> Yes / <input type="radio"/> No	Remarks:											
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen													
Site Name Or Number: <u>(SITE 05) S05</u>		Date: <u>26 JULY 08</u>		Set No. Captured In: <u>3</u>		Name of Person Identifying the Bat: <u>S. PERNICK</u>		*Capture Number: <u>02</u>					
Height in meters captured above ground surface: <u>  </u> m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)			
Species M. LUCIFUGUS	Sex F	Age JUV.	Repro. Condition NR	Wt. (g) 6.0	Ear 14	Tragus 6	Fore-arm 36	Hind Foot 8	Recapture Yes/No		Band Material	Band Color	Band Inscription
Time of Capture <u>21:35</u>	Photo Taken <input checked="" type="radio"/> Yes / <input type="radio"/> No	Remarks: <u>SMALL LIGHT RED MITES ON WINGS</u> <u>• SMALL TEAR ON RT. WING BTWN. 1<sup>st</sup> + 2<sup>nd</sup> FINGER.</u> <u>• FINGER JOINTS NOT FULLY FUSED.</u>											
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen													
Site Name Or Number: <u>(SITE 05) S05</u>		Date: <u>26 JULY 08</u>		Set No. Captured In: <u>3</u>		Name of Person Identifying the Bat: <u>S. Pernick</u>		*Capture Number: <u>03</u>					
Height in meters captured above ground surface: <u>5</u> m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)			
Species M. Lucifugus	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot	Recapture Yes/No		Band Material	Band Color	Band Inscription
Time of Capture <u>22:10</u>	Photo Taken Yes / <input checked="" type="radio"/> No	Remarks: <u>Escaped upon lowering of net.</u>											

\*Capture Number = number in sequence by site.

**Bat Measurement and Capture Data Form**(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: <u>(SITE 05) S05</u>				Date: <u>26 JULY 08</u>				Set No. Captured In: <u>1</u>		Name of Person Identifying the Bat: <u>S. PERNICK</u>				*Capture Number: <u>04</u>		
Height in meters captured above ground surface: <u>1</u> m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species <u>SEPT.</u>	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right			
Time of Capture <u>23:20</u>		Photo Taken Yes / <u>No</u>		Remarks: <u>ESCAPED UPON APPROACHING THE NET.</u>												
Repro. Condition: NR=nonreproductive, PG=pregnant, L=lactating, PL=post lactating, SCR=scrotal/epididymis swollen																
Site Name Or Number:				Date:				Set No. Captured In:		Name of Person Identifying the Bat:				*Capture Number:		
Height in meters captured above ground surface: m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right			
Time of Capture		Photo Taken Yes / No		Remarks:												
Repro. Condition: NR=nonreproductive, PG=pregnant, L=lactating, PL=post lactating, SCR=scrotal/epididymis swollen																
Site Name Or Number:				Date:				Set No. Captured In:		Name of Person Identifying the Bat:				*Capture Number:		
Height in meters captured above ground surface: m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right			
Time of Capture		Photo Taken Yes / No		Remarks:												

\*Capture Number = number in sequence by site.



BAT NETTING/TRAPPING SITE SURVEY RECORD

Page 1 of 2

1. Survey Date: 3 AUG. 08 2. Company Name: KIMBALL  
3. Reporter: S. PERNICK 4. Assistants: D. MCGRAW  
5. Site Name and/or Number: (SITE 05) S05  
6. Site is (circle one): hibernation site summer habitat

7a. If hibernation site circle one: limestone mine, coal mine, limestone cave, sandstone cave, RR tunnel,  
other structure, describe - \_\_\_\_\_

7b. If summer habitat, describe area being sampled (e.g. forested stream or forest clearing with stream):  
FORESTED STREAM (BUFFALO CREEK)

8. County: SOMERSET 9. 7.5' Quad: Meyersdale  
10. Was site GPS'd (required)? YES - NO  
Set 01 39° 52' 017.654"N 79° 2' 58.481"W  
Set 02 39° 52' 17.589"N 79° 2' 56.539"W  
Set 03 39° 52' 17.827"N 79° 3' 0.497"W  
11. Geographic Coordinates (D-M-S): Latitude: 39° - 52' - 17.316"N, Longitude: 79° - 2' - 55.702"W

Datum (circle one): NAD27 (Preferred), NAD83, WGS84, Other: \_\_\_\_\_

12. Ownership and Access: (Who owns site or controls access? Give name and address.) \_\_\_\_\_

13. Time (military) & Temperature: Start Time 20:20 h Stop Time 01:35 h Total Minutes: 315  
Start Temp. 16.3 °C End Temp. 11.3 °C HUMIDITY  
START - 100  
END - 100

14. General Weather (circle one): Clear, Partly Cloudy, Mostly Cloudy, Cloudy, Drizzle, Intermittent Rain;  
Steady Rain; Thunderstorms; Snow; Other: \_\_\_\_\_

15. General Wind Conditions (circle one): Calm, Breezy (Leaves Rustling), Windy (trees swaying).

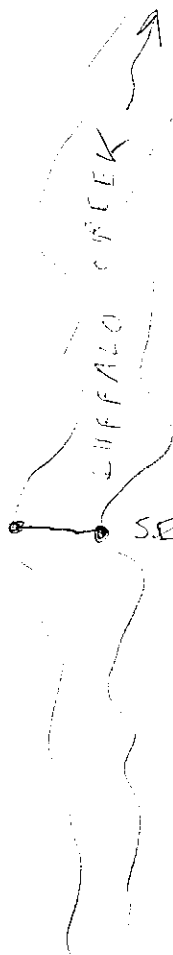
16. Capture Setup at Site:

Set #	Type	Count	Dimensions	Description	TOTAL AREA (m)
1	Nets	1	12m x 2.6m	Stacked over trail	124.8 sq. m
1	NETS	1	9m x 2.6m	OPENING IN FORESTED FLOOD PLAIN	23.4
2	NETS	2	9m x 2.6m	STACKED OVER LINEAR CLEARING	46.8
3	NETS	3	9m x 2.6m	STACKED OVER BUFFALO CREEK	70.2

Total Capture Area: 140.4 sq. m

U.S. 219

FOREST



FOREST

POWERLINE

SITE 2

FOREST

SET 1

SET 3

FOREST

FOGLETOWN ROAD

PREVIOUSLY LOGGED & FOREST





(Site Survey Record – Continued)

Site Name/No.:

(SITE 05) S05

Date: 3 AUG. 08

17. Describe habitat 150 m around site: (topography and vegetation including dominant tree species.)  
FORESTED RIPARIAN CORRIDOR. DOMINANT TREES INCLUDE HEMLOCK, RED MAPLE, BLACK BIRCH. UNDERSTORY MOSTLY RHODODENDRON, WITH HAZEL, BLACKBERRY. CORRIDOR ALONG STREAM LIES IN FAIRLY STEEP-SIDED VALLEY.

18. Was reproductive status checked? YES / NO (if "NO" only enter numbers in **Total** columns)

## \*CAPTURE RESULTS

Species	Number of Adult Females				No. Juv. Fem.	Total No. Fem.	Number of Adult Males		No. Juv. Male	Total No. Males	Species Totals
	NR	PG	L	PL			SCR	NR			
<i>Eptesicus fuscus</i>	2		1			3	2	1	1	4	7
<i>Myotis lucifugus</i>	1					1					1
<i>Myotis septentrionalis</i>											
<i>Myotis leibii</i>											
<i>Myotis sodalis</i>											
<i>Eptesicus fuscus</i>											
<i>Pipistrellus subflavus</i>											
<i>Lasiurus borealis</i>											
<i>Lasiurus cinereus</i>											
<i>Lasionycteris noctivagans</i>											
Other – specify:											
Other – specify:											
Reproductive Status: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen. *Complete Measurement and Capture Data Form for all: (1) <i>Myotis sodalis</i> , (2) <i>Myotis leibii</i> , (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA.											Grand Total 1

19. BAT DETECTORS & OTHER MONITORING DEVICES: Tallies of bat passes / hour. One to 5 hours required for Indiana bat hibernacula surveys. Monitor one hour after 22:00 hrs when trapping/netting hibernacula and 5 hours when only monitoring with bat detectors, night vision or infrared device (when site can not be trapped/netted). Describe procedure & equipment used in remarks.

1 <sup>st</sup> hour	2 <sup>nd</sup> hour	3 <sup>rd</sup> hour	4 <sup>th</sup> hour	5 <sup>th</sup> hour
Start Time:	Start Time:	Start Time:	Start Time:	Start Time:
End Time:	End Time:	End Time:	End Time:	End Time:
Tallies:	Tallies:	Tallies:	Tallies:	Tallies:

## 20. REMARKS

- 1<sup>st</sup> BAT ON DETECTOR @ 20:50
- SET 2 RELOCATED - SEE SITE DIAGRAM
- 2300 activity drops off

**Bat Measurement and Capture Data Form**(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: <u>SOS (Site 05)</u>				Date: <u>8/3/08</u>				Set No. Captured In: <u>3</u>		Name of Person Identifying the Bat: <u>Steve Pernick</u>				*Capture Number: <u>1</u>	
Height in meters captured above ground surface: <u>2</u> m				Body Measurements (grams and millimeters)					Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species <u>M. lucif</u>	Sex <u>F</u>	Age <u>A</u>	Repro. Condition <u>NR</u>	Wt. (g) <u>7.5</u>	Ear <u>13</u>	Tragus <u>5</u>	Fore- arm <u>38</u>	Hind Foot <u>8</u>	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right		
Time of Capture <u>0015</u>		Photo Taken <u>Yes</u> / No		Remarks: <u>flea</u>											

Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen

Site Name Or Number:				Date:				Set No. Captured In:		Name of Person Identifying the Bat:				*Capture Number:	
Height in meters captured above ground surface: _____ m				Body Measurements (grams and millimeters)					Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore- arm	Hind Foot	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right		
Time of Capture		Photo Taken Yes / No		Remarks:											

Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen

Site Name Or Number:				Date:				Set No. Captured In:		Name of Person Identifying the Bat:				*Capture Number:	
Height in meters captured above ground surface: _____ m				Body Measurements (grams and millimeters)					Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore- arm	Hind Foot	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right		
Time of Capture		Photo Taken Yes / No		Remarks:											

\*Capture Number = number in sequence by site.





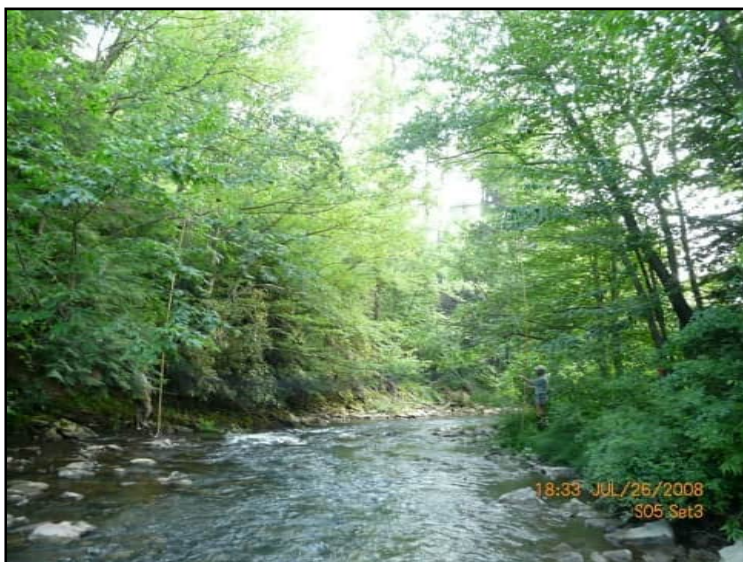
**Photograph 12:**

Site 05 Set 1



**Photograph 13:**

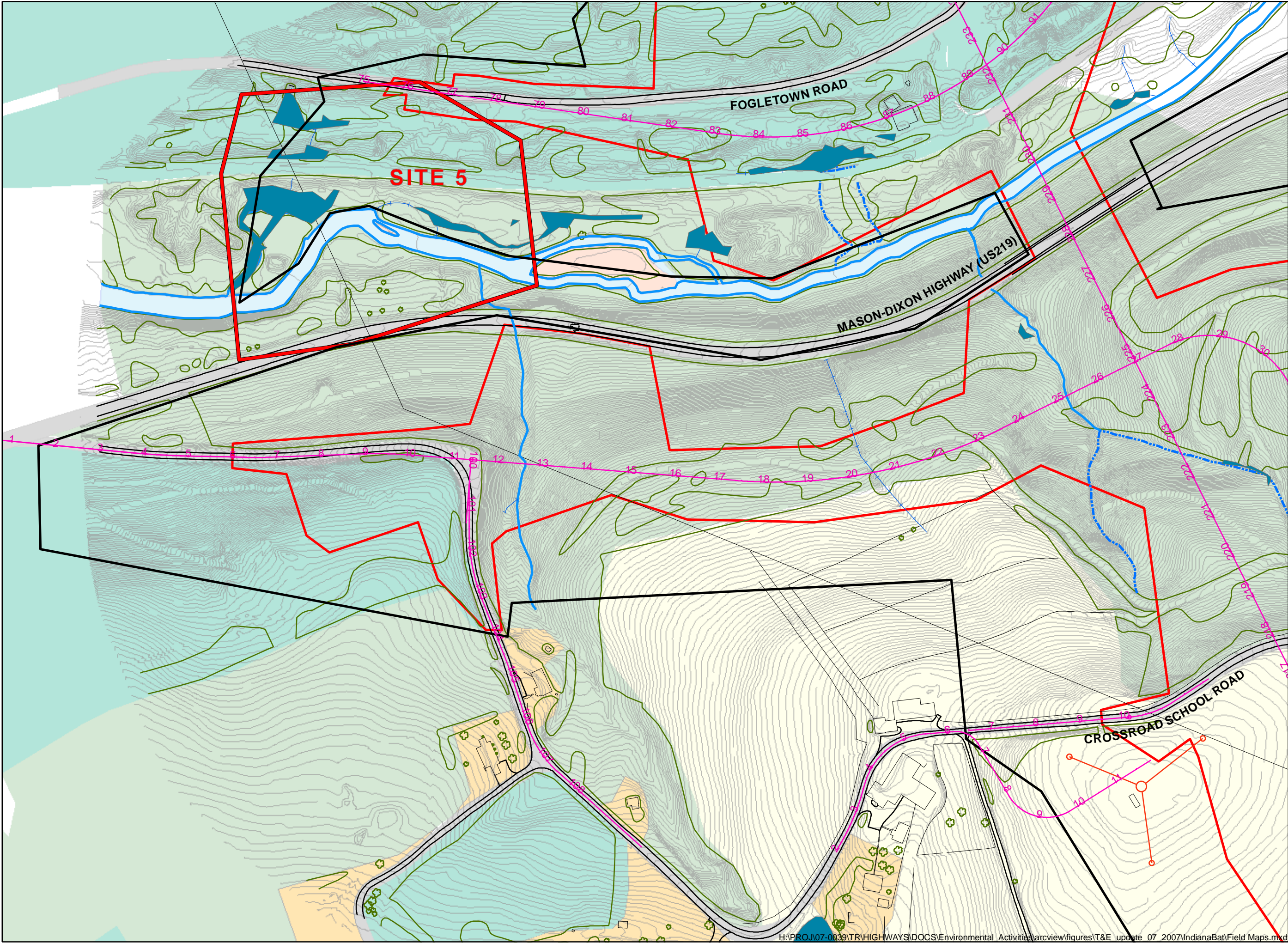
Site 05 Set 2



**Photograph 14:**

Site 05 Set 3































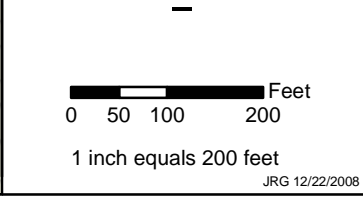


**US 219 IMPROVEMENT  
PROJECT**  
**S.R. 6219 SECTION 020**  
**MEYERSDALE TO SOMERSET**  
SOMERSET COUNTY, PENNSYLVANIA

**MIST NET SURVEY  
FOR THE  
INDIANA BAT  
(*Myotis sodalis*)**

**SITE 5**

- Legend**
-  Mist Net Survey Site
  - Surface Water Features**
    -  Ephemeral
    -  Intermittent
    -  Perennial
    -  Surface Drainage Channel
    -  Wetlands
    -  Wetland Open Ends
  - Mapping Features**
    -  Area of Detailed Investigation (LRK 2007/2008)
    -  Required R-O-W
    -  Structures
    -  Cell Tower
    -  Railroad
    -  Treeline
    -  Unimproved Roads / Trails
    -  Roadways
    -  Contours
  - Land Use**
    -  Low Density Residential
    -  Successional Rangeland
    -  Transitional
    -  Water
    -  Barren Land
    -  Agricultural Land
    -  Grassland
    -  Forest
    -  Urban
    -  Roadway
    -  Miscellaneous
    -  Alignment and Stations





## BAT NETTING/TRAPPING SITE SURVEY RECORD

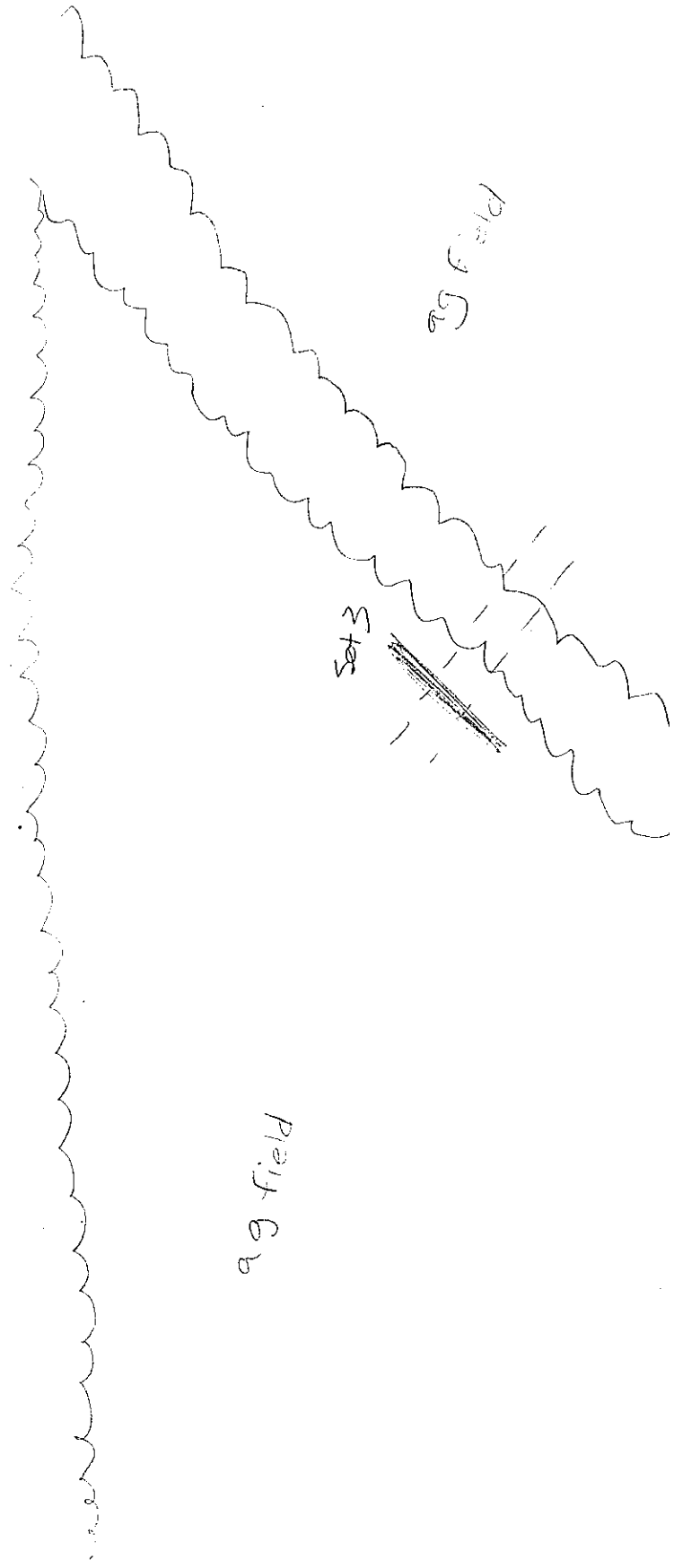
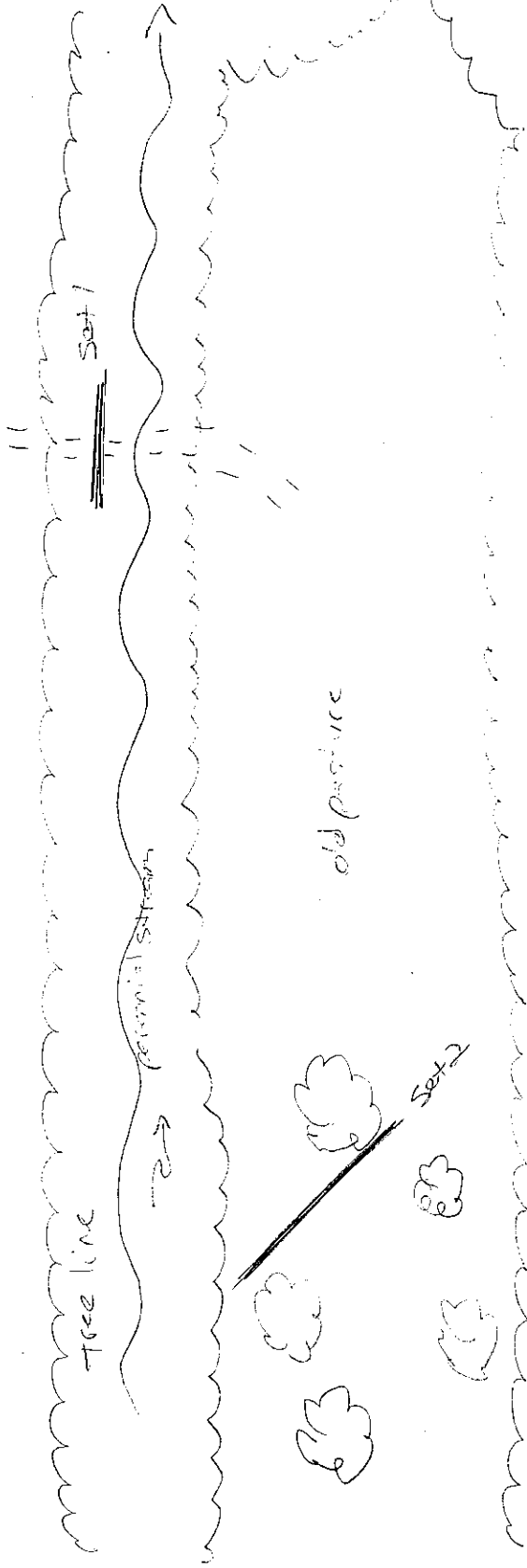
1. Survey Date: 7/16/08 2. Company Name: Kimbell3. Reporter: Steve Pernick 4. Assistants: John Gustkey, Kelly Eisner5. Site Name and/or Number: 506 (Site 06)6. Site is (circle one): hibernation site summer habitat7a. If hibernation site circle one: limestone mine, coal mine, limestone cave, sandstone cave, RR tunnel,  
other structure, describe - \_\_\_\_\_7b. If summer habitat, describe area being sampled (e.g. forested stream or forest clearing with stream):  
small perennial stream in broken agriculture/forest setting8. County: Somerset 9. 7.5' Quad.: Murdock10. Was site GPS'd (required)? YES NO Set 01 39° 54' 7.157"N 79° 2' 27.874"W  
Set 02 39° 54' 6.606"N 79° 2' 29.251"W11. Geographic Coordinates (D-M-S): Latitude: 39° - 54' - 2.757"N, Longitude: 79° - 2' - 29.821"WDatum (circle one): NAD27 (Preferred), NAD83, WGS84, Other: \_\_\_\_\_12. Ownership and Access: (Who owns site or controls access? Give name and address.) Robert Koval  
1010 Barnett Shattout Rd Berlin, PA 1553013. Time (military) & Temperature: Start Time 2040 h Stop Time 1:50 h Total Minutes: \_\_\_\_\_Start Temp. 19 °C End Temp. 14 °C start humid 90%  
end humid 100%14. General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;  
Steady Rain; Thunderstorms; Snow; Other: \_\_\_\_\_15. General Wind Conditions (circle one): Calm, Breezy (Leaves Rustling), Windy (trees swaying).

## 16. Capture Setup at Site:

Set #	Type	Count	Dimensions	Description	TOTAL AREA (m)
1	Nets	4	12m x 2.6m	Stacked over trail	124.8 sq. m
1	nets	2	6m x 2.6	over trail adjacent to creek	
2	nets	2	9m x 2.6	adjacent to creek in open understory	
3	nets	3	9m x 2.6	trail in tree line between ag fields	

Total Capture Area: \_\_\_\_\_ sq. m

late succession pasture






(Site Survey Record – Continued)

Site Name/No.: SD6 (Site 06)Date: 7/16/08**17. Describe habitat 150 m around site: (topography and vegetation including dominant tree species.)**

- hilly with mix of ag, forest, overgrown pasture
- small perennial stream (2' x 2')
- tree species - white oak, black cherry, hawthorn, red maple

**18. Was reproductive status checked? YES / NO (if "NO" only enter numbers in Total columns)****\*CAPTURE RESULTS**

Species	Number of Adult Females				No. Juv. Fem.	Total No. Fem.	Number of Adult Males		No. Juv. Male	Total No. Males	Species Totals
	NR	PG	L	PL			SCR	NR			
<i>Eptesicus fuscus</i>	2		1			3	2	1	1	4	7
<i>Myotis lucifugus</i>											
<i>Myotis septentrionalis</i>											
<i>Myotis leibii</i>											
<i>Myotis sodalis</i>											
<i>Eptesicus fuscus</i>											
<i>Pipistrellus subflavus</i>											
<i>Lasiurus borealis</i>											
<i>Lasiurus cinereus</i>											
<i>Lasionycteris noctivagans</i>											
Other – specify:											
Other – specify:											
Reproductive Status: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen. <b>*Complete Measurement and Capture Data Form for all:</b> (1) <i>Myotis sodalis</i> , (2) <i>Myotis leibii</i> , (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA.											Grand Total 

**19. BAT DETECTORS & OTHER MONITORING DEVICES:** Tallies of bat passes / hour. One to 5 hours required for Indiana bat hibernacula surveys. Monitor one hour after 22:00 hrs when trapping/netting hibernacula and 5 hours when only monitoring with bat detectors, night vision or infrared device (when site can not be trapped/netted). Describe procedure & equipment used in remarks.

1 <sup>st</sup> hour	2 <sup>nd</sup> hour	3 <sup>rd</sup> hour	4 <sup>th</sup> hour	5 <sup>th</sup> hour
Start Time:	Start Time:	Start Time:	Start Time:	Start Time:
End Time:	End Time:	End Time:	End Time:	End Time:
Tallies:	Tallies:	Tallies:	Tallies:	Tallies:

**20. REMARKS:**

- 21:00 first bat visual and detector
- 22:00 activity on detector already slows and becomes infrequent, insect activity observed to be low also
- 22:30 moon observed to rise above tree line, almost full moon
- 23:00 bat activity all but ceases, temp 15°C

## BAT NETTING/TRAPPING SITE SURVEY RECORD

Page 1 of 2

1. Survey Date: 7/21/08 2. Company Name: Kimball3. Reporter: Steve Pernick 4. Assistants: Eric Lange, John Gustkey5. Site Name and/or Number: 506 (Site 06)6. Site is (circle one): hibernation site summer habitat7a. If hibernation site circle one: limestone mine, coal mine, limestone cave, sandstone cave, RR tunnel,  
other structure, describe - \_\_\_\_\_

7b. If summer habitat, describe area being sampled (e.g. forested stream or forest clearing with stream):

Small perennial stream in broken agriculture / Forest setting8. County: Somerset 9. 7.5' Quad.: Mundack10. Was site GPS'd (required)? YES - NO  
Set 01 39° 54' 7.157"N 79° 2' 27.814"W  
Set 02 39° 54' 6.606"N 79° 2' 29.251"W11. Geographic Coordinates (D-M-S): Latitude: 39° 54' -2.757"N, Longitude: 79° 2' -29.821"WDatum (circle one): NAD27 (Preferred), NAD83, WGS84, Other: \_\_\_\_\_12. Ownership and Access: (Who owns site or controls access? Give name and address.) Robert Koval1010 Garrett Shortcut Rd Berlin, PA 1553013. Time (military) & Temperature: Start Time 2030 h Stop Time 2220 h Total Minutes: 850  
Start Temp. 23 °C End Temp. 18 °C  
start 93% humidity  
end humidity 100%14. General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;

Steady Rain; Thunderstorms; Snow; Other: \_\_\_\_\_

15. General Wind Conditions (circle one): Calm, Breezy (Leaves Rustling), Windy (trees swaying).

## 16. Capture Setup at Site:

Set #	Type	Count	Dimensions	Description	TOTAL AREA (m)
1	Nets	4	12m x 2.6m	Stacked over trail	124.8 sq. m
1	nets	62	6m x 2.6	over trail adjacent to creek	31.2
2	nets	62	9m x 2.6	adjacent to creek in open understory	46.8
3	nets	3	9m x 2.6	trail in tree line between fields	70.2

Total Capture Area: 148.2 sq. m



322 Previous Site History

(Site Survey Record – Continued) Site Name/No.: 506 (Site 06) Date: 7/21/08

17. Describe habitat 150 m around site: (topography and vegetation including dominant tree species.)

see 506 7/16/08 site diagram  
& veg. notes

18. Was reproductive status checked? YES / NO (if "NO" only enter numbers in **Total** columns)

**\*CAPTURE RESULTS**

Species	Number of Adult Females				No. Juv. Fem.	Total No. Fem.	Number of Adult Males		No. Juv. Male	Total No. Males	Species Totals
	NR	PG	L	PL			SCR	NR			
<i>Eptesicus fuscus</i>	2		1			3	2	1	1	4	7
<i>Myotis lucifugus</i>											
<i>Myotis septentrionalis</i>											
<i>Myotis leibii</i>											
<i>Myotis sodalis</i>											
<i>Eptesicus fuscus</i>											1*
<i>Pipistrellus subflavus</i>											
<i>Lasiurus borealis</i>											
<i>Lasiurus cinereus</i>											
<i>Lasionycteris noctivagans</i>											
Other – specify:											
Other – specify:											
Reproductive Status: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen. <b>*Complete Measurement and Capture Data Form for all:</b> (1) <i>Myotis sodalis</i> , (2) <i>Myotis leibii</i> , (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA.											Grand Total 1

\* Escaped from net  
reproductive status not determined

19. BAT DETECTORS & OTHER MONITORING DEVICES: Tallies of bat passes / hour. One to 5 hours required for Indiana bat hibernacula surveys. Monitor one hour after 22:00 hrs when trapping/netting hibernacula and 5 hours when only monitoring with bat detectors, night vision or infrared device (when site can not be trapped/netted). Describe procedure & equipment used in remarks.

1 <sup>st</sup> hour	2 <sup>nd</sup> hour	3 <sup>rd</sup> hour	4 <sup>th</sup> hour	5 <sup>th</sup> hour
Start Time:	Start Time:	Start Time:	Start Time:	Start Time:
End Time:	End Time:	End Time:	End Time:	End Time:
Tallies:	Tallies:	Tallies:	Tallies:	Tallies:

20. REMARKS:

2030 first bat seen visually and on detector  
 21:20 Light rain begins, Activity continues  
 22:00 – 22:45 surveyor shut down due passing thunderstorm  
 00:13 little activity, calm  
 1:08 Rain begins



**Bat Measurement and Capture Data Form**(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: <u>S06 (Site 06)</u>				Date: <u>7/21/08</u>				Set No. Captured In: <u>3</u>		Name of Person Identifying the Bat: <u>Steve Pernick</u>				*Capture Number: <u>1</u>		
Height in meters captured above ground surface: <u>3</u> m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species <u>Eptesicus</u> <u>Fusius</u>	Sex <u>--</u>	Age <u>--</u>	Repro. Condition <u>--</u>	Wt. (g) <u>--</u>	Ear <u>--</u>	Tragus <u>--</u>	Fore- arm <u>--</u>	Hind Foot <u>--</u>	Recapture Yes/No <u>--</u>	Band Material <u>--</u>	Band Color <u>--</u>	Band Inscription <u>--</u>	Band on Left/Right <u>--</u>			
Time of Capture <u>20:45</u>		Photo Taken Yes / <u>(No)</u>		Remarks: <u>Escaped upon approach.</u>												
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen																
Site Name Or Number:				Date:				Set No. Captured In:		Name of Person Identifying the Bat:				*Capture Number:		
Height in meters captured above ground surface: m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore- arm	Hind Foot	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right			
Time of Capture		Photo Taken Yes / No		Remarks:												
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen																
Site Name Or Number:				Date:				Set No. Captured In:		Name of Person Identifying the Bat:				*Capture Number:		
Height in meters captured above ground surface: m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore- arm	Hind Foot	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right			
Time of Capture		Photo Taken Yes / No		Remarks:												

\*Capture Number = number in sequence by site.



**Photograph 15:** Site 06 Set 1



**Photograph 16:** Site 06 Set 2



**Photograph 17:** Site 06 Set 3



**US 219 IMPROVEMENT  
PROJECT  
S.R. 6219 SECTION 020  
MEYERSDALE TO SOMERSET  
SOMERSET COUNTY, PENNSYLVANIA**

**MIST NET SURVEY  
FOR THE  
INDIANA BAT  
(*Myotis sodalis*)**

**SITE 6**

**Legend**

 Mist Net Survey Site

**Surface Water Features**


 Ephemeral

 Intermittent

 Perennial


 Surface Drainage Channel

 Wetlands

 Wetland Open Ends

**Mapping Features**

 Area of Detailed Investigation  
(LRK 2007/2008)


 Required R-O-W

 Structures

 Cell Tower

 Railroad

 Treeline

 Unimproved Roads / Trails


 Roadways

 Contours


**Land Use**


 Low Density Residential

 Successional Rangeland

 Transitional

 Water

 Barren Land


 Agricultural Land


 Grassland

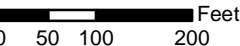
 Forest

 Urban

 Roadway

 Miscellaneous

 Alignment and Stations

 Feet  
0 50 100 200

1 inch equals 200 feet

## BAT NETTING/TRAPPING SITE SURVEY RECORD

Page 1 of 2

1. Survey Date: 7/18/08 2. Company Name: Kimball3. Reporter: Steve Pernick 4. Assistants: Troy Gallaheer5. Site Name and/or Number: SO7 (S1407)6. Site is (circle one): hibernation site summer habitat7a. If hibernation site circle one: limestone mine, coal mine, limestone cave, sandstone cave, RR tunnel,  
other structure, describe - \_\_\_\_\_

7b. If summer habitat, describe area being sampled (e.g. forested stream or forest clearing with stream):

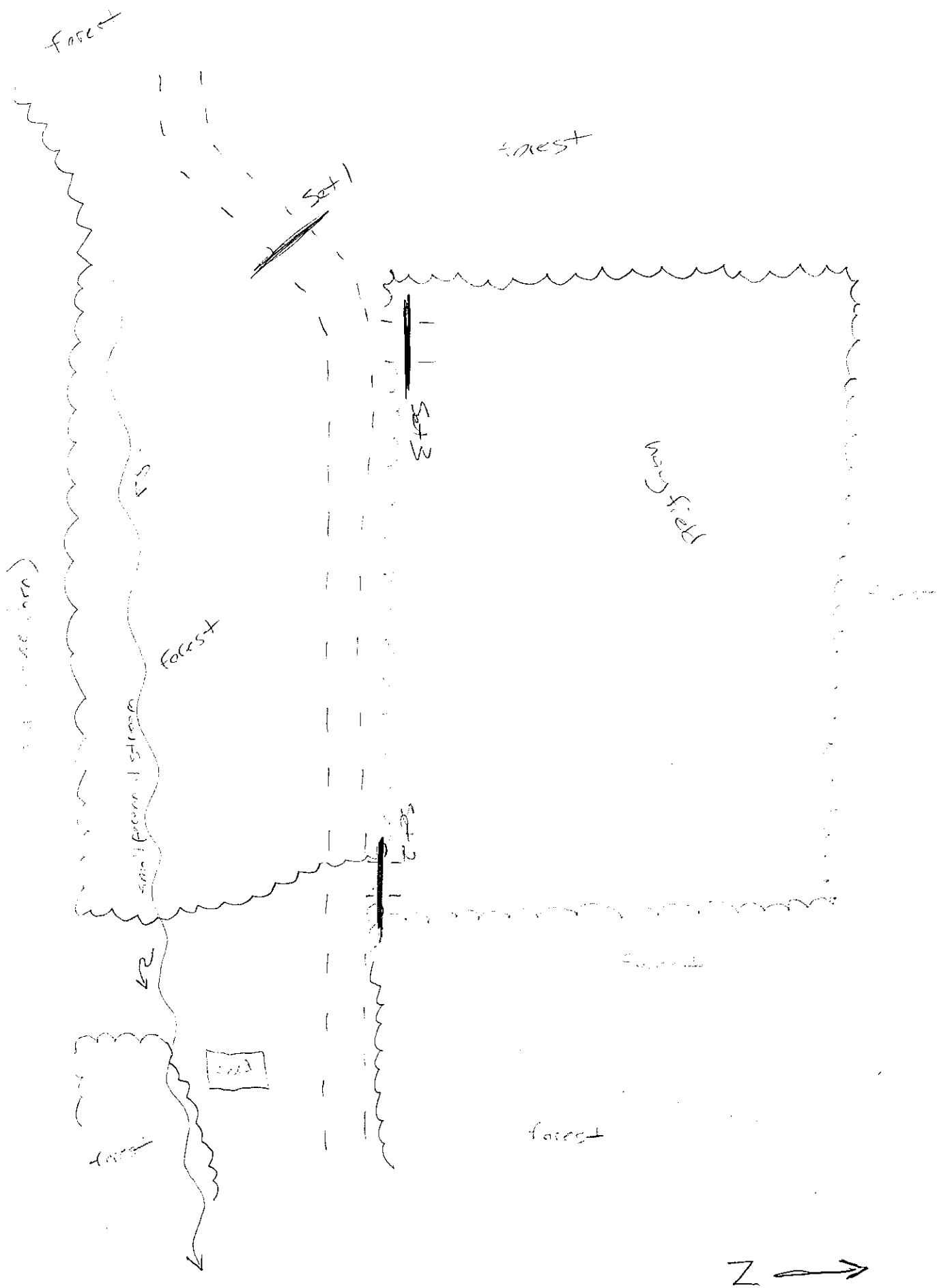
trails at ag and forest in upland setting and adjacent to small perennial stream8. County: Somerset 9. 7.5' Quad.: Set 01 39° 54' 29.232"N 79° 2' 49.165"W10. Was site GPS'd (required)? YES - NO Set 02 39° 54' 28.847"N 79° 2' 43.428"W11. Geographic Coordinates (D-M-S): Set 03 39° - 54' - 28.847"N, Longitude: 79° - 2' - 43.428"WDatum (circle one): NAD27 (Preferred) NAD83, WGS84, Other: \_\_\_\_\_12. Ownership and Access: (Who owns site or controls access? Give name and address.) Charles Thomas  
2003 Garrett Shortcut Rd Berlin, PA 1553013. Time (military) & Temperature: Start Time 2040 h Stop Time 0200 h Total Minutes: 320  
Start Temp. 23 °C End Temp. 16.8 °C start humid 80  
end humid 95.914. General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;  
Steady Rain; Thunderstorms; Snow; Other: \_\_\_\_\_15. General Wind Conditions (circle one): Calm, Breezy (Leaves Rustling), Windy (trees swaying).

## 16. Capture Setup at Site:

Set #	Type	Count	Dimensions	Description	TOTAL AREA (m)
1	Nets	4	12m x 2.6m	Stacked over trail	124.8 sq. m
1	nets	1	6 x 2.6	over trail in forest	15.6
2	nets	2	9 x 2.6	over trail to hay field	46.8
3	nets	4	6 x 2.6	over trail to hay field	62.4

Total Capture Area: 124.8 sq. m





(Site Survey Record – Continued) Site Name/No.: 507 (Site 07) Date: 7/18/08

17. Describe habitat 150 m around site: (topography and vegetation including dominant tree species.)
- upland forest with connecting agriculture components and a small perennial stream
  - stream is 2' x 2"
  - forest is hemlock, black birch, red maple, white oak, hickory sp., cherry
  - forest under going recent logging
18. Was reproductive status checked? YES / NO (if "NO" only enter numbers in **Total** columns)

**\*CAPTURE RESULTS**

Species	Number of Adult Females				No. Juv. Fem.	Total No. Fem.	Number of Adult Males		No. Juv. Male	Total No. Males	Species Totals
	NR	PG	L	PL			SCR	NR			
<i>Eptesicus fuscus</i>	2		1			3	2	1	1	4	7
<i>Myotis lucifugus</i>											
<i>Myotis septentrionalis</i>	2							2	—	2	2
<i>Myotis leibii</i>											
<i>Myotis sodalis</i>											
<i>Eptesicus fuscus</i>	2	1	1			4		3		3	7
<i>Pipistrellus subflavus</i>											
<i>Lasiurus borealis</i>								1		1	1
<i>Lasiurus cinereus</i>											
<i>Lasionycteris noctivagans</i>											
Other – specify:											
Other – specify:											
Reproductive Status: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen. <b>*Complete Measurement and Capture Data Form for all:</b> (1) <i>Myotis sodalis</i> , (2) <i>Myotis leibii</i> , (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA.											Grand Total 10

19. BAT DETECTORS & OTHER MONITORING DEVICES: Tallies of bat passes / hour. One to 5 hours required for Indiana bat hibernacula surveys. Monitor one hour after 22:00 hrs when trapping/netting hibernacula and 5 hours when only monitoring with bat detectors, night vision or infrared device (when site can not be trapped/netted). Describe procedure & equipment used in remarks.

1 <sup>st</sup> hour	2 <sup>nd</sup> hour	3 <sup>rd</sup> hour	4 <sup>th</sup> hour	5 <sup>th</sup> hour
Start Time:	Start Time:	Start Time:	Start Time:	Start Time:
End Time:	End Time:	End Time:	End Time:	End Time:
Tallies:	Tallies:	Tallies:	Tallies:	Tallies:

20. REMARKS:

2055 first bat visual and detector  
 2247 Incidental capture of flying squirrel, appeared to be southern flying squirrel but was not handled to get positive ID, set 3



**Bat Measurement and Capture Data Form**(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: <u>S07 Set (Site 07)</u>		Date: <u>7/18/08</u>		Set No. Captured In: <u>3</u>		Name of Person Identifying the Bat: <u>Steve Pernick</u>		*Capture Number: <u>1</u>					
Height in meters captured above ground surface: <u>4</u> m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)			
Species <u>Eptesicus</u> <u>Fuscus</u>	Sex <u>F</u>	Age <u>A</u>	Repro. Condition <u>NR</u>	Wt. (g) <u>11</u>	Ear <u>13</u>	Tragus <u>5</u>	Fore- arm <u>43</u>	Hind Foot <u>9</u>	Recapture Yes/No		Band Material	Band Color	Band Inscription
Time of Capture <u>2150</u>		Photo Taken <u>Yes</u> / No		Remarks: <u>Wing mites, bat retains features of juvenile (wing bone fusion not fully complete)</u>									
Repro. Condition: NR=nonreproductive, PG=pregnant, L=lactating, PL=post lactating, SCR=scrotal/epididymis swollen.													
Site Name Or Number: <u>S07 Set 3 (Site 01)</u>		Date: <u>7/18/08</u>		Set No. Captured In: <u>3</u>		Name of Person Identifying the Bat: <u>Steve Pernick</u>		*Capture Number: <u>2</u>					
Height in meters captured above ground surface: <u>3</u> m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)			
Species <u>Lasiurus</u> <u>Borealis</u>	Sex <u>M</u>	Age <u>A</u>	Repro. Condition <u>NR</u>	Wt. (g) <u>11.5</u>	Ear <u>8</u>	Tragus <u>3</u>	Fore- arm <u>40</u>	Hind Foot <u>6</u>	Recapture Yes/No		Band Material	Band Color	Band Inscription
Time of Capture <u>2155</u>		Photo Taken <u>Yes</u> / No		Remarks: <u>Right wing swollen dark tissue blob on right forearm.</u>									
Repro. Condition: NR=nonreproductive, PG=pregnant, L=lactating, PL=post lactating, SCR=scrotal/epididymis swollen.													
Site Name Or Number: <u>S07 Set 3 (Site 01)</u>		Date: <u>7/18</u>		Set No. Captured In: <u>3</u>		Name of Person Identifying the Bat: <u>STEVE PERNICK</u>		*Capture Number: <u>3</u>					
Height in meters captured above ground surface: <u>4</u> m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)			
Species <u>Eptesicus</u> <u>Fuscus</u>	Sex <u>M</u>	Age <u>A</u>	Repro. Condition <u>NR</u>	Wt. (g) <u>17.5</u>	Ear <u>13</u>	Tragus <u>5</u>	Fore- arm <u>43</u>	Hind Foot <u>9</u>	Recapture Yes/No		Band Material	Band Color	Band Inscription
Time of Capture <u>2240</u>		Photo Taken <u>Yes</u> / No		Remarks: <u>WING MITES, BELLY Full</u>									

\*Capture Number = number in sequence by site.

**Bat Measurement and Capture Data Form**(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: S07 SET 1 (SITE)				Date: 7/18/08				Set No. Captured In: 1		Name of Person Identifying the Bat: STEVE PERNICK				*Capture Number: 4		
Height in meters captured above ground surface: 1 m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species E. fuscus	Sex M	Age A	Repro. Condition NR	Wt. (g) 19.5	Ear 14	Tragus 5	Fore- arm 45	Hind Foot 10	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right			
Time of Capture 2340		Photo Taken <input checked="" type="radio"/> Yes / No		Remarks: BELLY Full, Wing mites,												
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen																
Site Name Or Number: S07 SET 1 (SITE)				Date: 7/18/08				Set No. Captured In: 1		Name of Person Identifying the Bat: STEVE PERNICK				*Capture Number: 5		
Height in meters captured above ground surface: 1 m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species E. fuscus	Sex F	Age A	Repro. Condition L	Wt. (g) 22.5	Ear 16	Tragus 7	Fore- arm 49	Hind Foot 9	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right			
Time of Capture 2340		Photo Taken <input checked="" type="radio"/> Yes / No		Remarks: BELLY Full - could not determine if pregnant / Hole in Right wing / wing mites												
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen																
Site Name Or Number: S07 SET 1 (SITE)				Date: 7/18/08				Set No. Captured In: 1		Name of Person Identifying the Bat: STEVE PERNICK				*Capture Number: 6		
Height in meters captured above ground surface: 1 m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species E. fuscus	Sex F	Age A	Repro. Condition PG	Wt. (g) 22	Ear 14	Tragus 6	Fore- arm 46	Hind Foot 9	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right			
Time of Capture 2340		Photo Taken <input checked="" type="radio"/> Yes / No		Remarks: Nipples exposed / WING MITES												

\*Capture Number = number in sequence by site.



**Bat Measurement and Capture Data Form**(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: <u>SOT Set 1 (Site 1)</u>		Date: <u>7/18/09</u>		Set No. Captured In: <u>1</u>		Name of Person Identifying the Bat: <u>STEVE PERWICK</u>		*Capture Number: <u>7</u>					
Height in meters captured above ground surface: <u>1</u> m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)			
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot	Recapture Yes/No		Band Material	Band Color	Band Inscription
<u>M. Sept</u>	<u>M</u>	<u>A</u>	<u>NR</u>	<u>6</u>	<u>16</u>	<u>8</u>	<u>35</u>	<u>7</u>					
Time of Capture <u>2340</u>	Photo Taken <u>Yes</u> / No	Remarks: <u>NO REMARKS</u>											
Repro. Condition: NR=nonreproductive, PG=pregnant, L=lactating, PL=post lactating, SCR=scrotal/epididymis swollen													
Site Name Or Number: <u>SOT Set 3 (Site 1)</u>		Date: <u>7/18/08</u>		Set No. Captured In: <u>3</u>		Name of Person Identifying the Bat: <u>STEVE PERWICK</u>		*Capture Number: <u>8</u>					
Height in meters captured above ground surface: <u>3</u> m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)			
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot	Recapture Yes/No		Band Material	Band Color	Band Inscription
<u>E. fuscus</u>	<u>F</u>	<u>A</u>	<u>NR</u>	<u>19.5</u>	<u>14</u>	<u>6</u>	<u>45</u>	<u>9</u>					
Time of Capture <u>0030</u>	Photo Taken <u>Yes</u> / No	Remarks: <u>Belly full of bugs - difficult to tell if pregnant no other signs of reproduction</u> <u>Wing mites.</u>											
Repro. Condition: NR=nonreproductive, PG=pregnant, L=lactating, PL=post lactating, SCR=scrotal/epididymis swollen													
Site Name Or Number: <u>SOT Set 3 (Site 1)</u>		Date: <u>7/18/08</u>		Set No. Captured In: <u>3</u>		Name of Person Identifying the Bat: <u>STEVE PERWICK</u>		*Capture Number: <u>9</u>					
Height in meters captured above ground surface: <u>7</u> m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)			
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot	Recapture Yes/No		Band Material	Band Color	Band Inscription
<u>E. fuscus</u>	<u>M</u>	<u>A</u>	<u>NR</u>	<u>19</u>	<u>15</u>	<u>6</u>	<u>45</u>	<u>9</u>					
Time of Capture <u>0030</u>	Photo Taken <u>Yes</u> / No	Remarks: <u>Testicles swollen not descended / wing mites / belly full of bugs.</u>											

\*Capture Number = number in sequence by site.

**Bat Measurement and Capture Data Form**(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: 507 SET 3 (SHO)				Date: 7/18/08				Set No. Captured In: 3		Name of Person Identifying the Bat: STEVE PERWICK				*Capture Number: 10		
Height in meters captured above ground surface: 8 m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore- arm	Hind Foot	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right			
M, SEPT	M	A	NR	6.5	15	7	35	7								
Time of Capture 0030		Photo Taken <input checked="" type="checkbox"/> Yes / No		Remarks:												
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen																
Site Name Or Number:				Date:				Set No. Captured In:		Name of Person Identifying the Bat:				*Capture Number:		
Height in meters captured above ground surface: m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore- arm	Hind Foot	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right			
Time of Capture		Photo Taken Yes / No		Remarks:												
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen																
Site Name Or Number:				Date:				Set No. Captured In:		Name of Person Identifying the Bat:				*Capture Number:		
Height in meters captured above ground surface: m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore- arm	Hind Foot	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right			
Time of Capture		Photo Taken Yes / No		Remarks:												

\*Capture Number = number in sequence by site.



BAT NETTING/TRAPPING SITE SURVEY RECORD

Page 1 of 2

1. Survey Date: 31 JULY 08 2. Company Name: KIMBALL

3. Reporter: S. PERNICK 4. Assistants: S. TOKI, D. MCGRAW

5. Site Name and/or Number: (SITE 07) (S07)

6. Site is (circle one): hibernation site summer habitat

7a. If hibernation site circle one: limestone mine, coal mine, limestone cave, sandstone cave, RR tunnel,  
other structure, describe - \_\_\_\_\_

7b. If summer habitat, describe area being sampled (e.g. forested stream or forest clearing with stream):

TRAILS AT AG + FOREST IN UPLAND SETTING ADJACENT TO SMALL PERN, STREAM

8. County: SOMERSET 9. 7.5' Quad.: Mundock

10. Was site GPS'd (required)? YES - NO  
Set 01  $39^{\circ}54'29.232''N$   $79^{\circ}2'49.105''W$   
Set 02  $39^{\circ}54'28.847''N$   $79^{\circ}2'43.428''W$   
Set 03

11. Geographic Coordinates (D-M-S): Latitude: 39  $^{\circ}$  54  $'$  29.232  $''N$ , Longitude: 79  $^{\circ}$  2  $'$  49.105  $''W$

Datum (circle one): NAD27 (Preferred), NAD83, WGS84, Other: \_\_\_\_\_

12. Ownership and Access: (Who owns site or controls access? Give name and address.) Charles Thomas  
2003 Gamett Shattuck Rd Berlin, PA 15530

13. Time (military) & Temperature: Start Time 20:30 h Stop Time 01:50 h Total Minutes: 320  
Start Temp. 21  $^{\circ}C$  End Temp. 16  $^{\circ}C$  HUMIDITY  
START - 100  
END - 100

14. General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;  
Steady Rain; Thunderstorms; Snow; Other: \_\_\_\_\_

15. General Wind Conditions (circle one): Calm, Breezy (Leaves Rustling), Windy (trees swaying).

16. Capture Setup at Site:

Set #	Type	Count	Dimensions	Description	TOTAL AREA (m)
1	Nets	4	12m x 2.6m	Stacked over trail	124.8 sq. m
1	NETS	2	6m x 2.6m	STACKED OVER TRAIL	31.2
2	NETS	2	9m x 2.6m	STACKED IN OPENING	46.8
3	NETS	4	9m x 2.6m	STACKED IN OPENING	93.6

Total Capture Area: 171.6 sq. m

SITE DIAGRAM

- SEE PREVIOUS NIGHT (BOOK 1)



(Site Survey Record - Continued)

Site Name/No.:

507 (Site 07)

Date: 31 JULY 08

17. Describe habitat 150 m around site: (topography and vegetation including dominant tree species.)

- UPLAND FOREST w/ CONNECTING AG COMPONENTS AND A SMALL PERM. STREAM
- STREAM IS 2' X 2'
- DOMINANT VEGETATION IS HEMLOCK, BLACK BIRCH, RED MAPLE, WHITE OAK, HICKORY SPP., CHERRY (SOME RECENT LOGGING)

18. Was reproductive status checked? ☒ YES / NO (if "NO" only enter numbers in Total columns)

## \*CAPTURE RESULTS

Species	Number of Adult Females				No. Juv. Fem.	Total No. Fem.	Number of Adult Males		No. Juv. Male	Total No. Males	Species Totals
	NR	PG	L	PL			SCR	NR			
<i>Eptesicus fuscus</i>	2		1			3	2	1	1	4	7
<i>Myotis lucifugus</i>	1					1		1		1	2
<i>Myotis septentrionalis</i>											
<i>Myotis leibii</i>											
<i>Myotis sodalis</i>											
<i>Eptesicus fuscus</i>			11			2		1111		5*	7
<i>Pipistrellus subflavus</i>											
<i>Lasiurus borealis</i>											
<i>Lasiurus cinereus</i>											
<i>Lasionycteris noctivagans</i>											
Other - specify:											
Other - specify:											
Reproductive Status: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen. *Complete Measurement and Capture Data Form for all: (1) <i>Myotis sodalis</i> , (2) <i>Myotis leibii</i> , (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA.											Grand Total 9

\*1 BAT ESCAPED

19. BAT DETECTORS &amp; OTHER MONITORING DEVICES: Tallies of bat passes / hour. One to 5 hours required for Indiana bat hibernacula surveys. Monitor one hour after 22:00 hrs when trapping/netting hibernacula and 5 hours when only monitoring with bat detectors, night vision or infrared device (when site can not be trapped/netted). Describe procedure &amp; equipment used in remarks.

1 <sup>st</sup> hour	2 <sup>nd</sup> hour	3 <sup>rd</sup> hour	4 <sup>th</sup> hour	5 <sup>th</sup> hour
Start Time:	Start Time:	Start Time:	Start Time:	Start Time:
End Time:	End Time:	End Time:	End Time:	End Time:
Tallies:	Tallies:	Tallies:	Tallies:	Tallies:

## 20. REMARKS

- INCIDENTAL CAPTURE - FLYING SQUIRREL AT 11:30  
- MISSING LOWER HALF OF TAIL
- MODERATE BAT ACTIVITY.

**Bat Measurement and Capture Data Form**

(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: <u>(SITE 07) (S07)</u>		Date: <u>31 JULY 08</u>		Set No. Captured In: <u>3</u>		Name of Person Identifying the Bat: <u>S. PERNICK</u>		*Capture Number: <u>01</u>					
Height in meters captured above ground surface: <u>4</u> m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)			
Species <u>E. FUSCUS</u>	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot	Recapture Yes/No		Band Material	Band Color	Band Inscription
Time of Capture <u>20:45</u>	Photo Taken <input checked="" type="radio"/> Yes / <input type="radio"/> No	Remarks: <u>BAT ESCAPED UPON LOWERING NET</u>											
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen													
Site Name Or Number: <u>(SITE 07) (S07)</u>		Date: <u>31 JULY 08</u>		Set No. Captured In: <u>3</u>		Name of Person Identifying the Bat: <u>S. PERNICK</u>		*Capture Number: <u>02</u>					
Height in meters captured above ground surface: <u>6</u> m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)			
Species <u>E. FUSCUS</u>	Sex <u>M</u>	Age <u>AD.</u>	Repro. Condition <u>NR</u>	Wt. (g) <u>18.5</u>	Ear <u>15</u>	Tragus <u>6</u>	Fore-arm <u>45</u>	Hind Foot <u>9</u>	Recapture Yes/No		Band Material	Band Color	Band Inscription
Time of Capture <u>20:45</u>	Photo Taken <input checked="" type="radio"/> Yes / <input type="radio"/> No	Remarks: <u>WING MITES</u>											
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen													
Site Name Or Number: <u>(SITE 07) S07</u>		Date: <u>31 JULY 08</u>		Set No. Captured In: <u>3</u>		Name of Person Identifying the Bat: <u>S. PERNICK</u>		*Capture Number: <u>03</u>					
Height in meters captured above ground surface: <u>6</u> m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)			
Species <u>E. FUSCUS</u>	Sex <u>M</u>	Age <u>AD.</u>	Repro. Condition <u>NR</u>	Wt. (g) <u>15.5</u>	Ear <u>17</u>	Tragus <u>7</u>	Fore-arm <u>45</u>	Hind Foot <u>9</u>	Recapture Yes/No		Band Material	Band Color	Band Inscription
Time of Capture <u>21:15</u>	Photo Taken <input checked="" type="radio"/> Yes / <input type="radio"/> No	Remarks: <u>LEFT 5<sup>TH</sup> DIGIT, BROKEN BUT HEALED.</u>											

\*Capture Number = number in sequence by site.



**Bat Measurement and Capture Data Form**

(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: <u>(SITE 07) S07</u>		Date: <u>31 JULY 08</u>		Set No. Captured In: <u>3</u>		Name of Person Identifying the Bat: <u>S. PERNICK</u>				*Capture Number: <u>04</u>				
Height in meters captured above ground surface: <u>8</u> m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)			
Species <u>E. FUSCUS</u>	Sex <u>F</u>	Age <u>AD</u>	Repro. Condition <u>L</u>	Wt. (g) <u>21.5</u>	Ear <u>15</u>	Tragus <u>6</u>	Fore-arm <u>48</u>	Hind Foot <u>8</u>	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right	
Time of Capture <u>22:35</u>	Photo Taken <input checked="" type="checkbox"/> Yes / <input type="checkbox"/> No	Remarks: <u>MITES PRESENT. CANINES WORN</u>												
Repro. Condition: NR=nonreproductive, PG=pregnant, L=lactating, PL=post lactating, SCR=scrotal/epididymis swollen														
Site Name Or Number: <u>(SITE 07) S07</u>		Date: <u>31 JULY 08</u>		Set No. Captured In: <u>3</u>		Name of Person Identifying the Bat: <u>S. PERNICK</u>				*Capture Number: <u>05</u>				
Height in meters captured above ground surface: <u>10</u> m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)			
Species <u>E. FUSCUS</u>	Sex <u>M</u>	Age <u>AD</u>	Repro. Condition <u>NR</u>	Wt. (g) <u>18.0</u>	Ear <u>16</u>	Tragus <u>6</u>	Fore-arm <u>47</u>	Hind Foot <u>9</u>	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right	
Time of Capture <u>22:35</u>	Photo Taken <input checked="" type="checkbox"/> Yes / <input type="checkbox"/> No	Remarks: <u>MITES</u>												
Repro. Condition: NR=nonreproductive, PG=pregnant, L=lactating, PL=post lactating, SCR=scrotal/epididymis swollen														
Site Name Or Number: <u>(SITE 07) S07</u>		Date: <u>31 JULY 08</u>		Set No. Captured In: <u>1</u>		Name of Person Identifying the Bat: <u>S. PERNICK</u>				*Capture Number: <u>06</u>				
Height in meters captured above ground surface: <u>2</u> m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)			
Species <u>E. FUSCUS</u>	Sex <u>F</u>	Age <u>AD.</u>	Repro. Condition <u>L</u>	Wt. (g) <u>20.0</u>	Ear <u>14.0</u>	Tragus <u>6</u>	Fore-arm <u>45</u>	Hind Foot <u>8</u>	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right	
Time of Capture <u>23:00</u>	Photo Taken <input checked="" type="checkbox"/> Yes / <input type="checkbox"/> No	Remarks: <u>left canine worn, right + canine missing</u>												

\*Capture Number = number in sequence by site.

BB  
32.5  
BAG  
11

BB  
29.5  
BAG  
11.5

BB  
33.0  
BAG  
11.0

## Bat Measurement and Capture Data Form

(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: (SITE 07) (S07)		Date: 31 JULY 08		Set No.: Z Captured In:		Name of Person Identifying the Bat: S. PERNICK				*Capture Number: 07			
Height in meters captured above ground surface: 3 m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)			
Species M. LUCI	Sex F	Age AD	Repro. Condition NR	Wt. (g) 8	Ear 17	Tragus 6	Fore-arm 38	Hind Foot 9	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right
Time of Capture 00:30	Photo Taken <input checked="" type="checkbox"/> Yes / <input type="checkbox"/> No	Remarks: BAT FLEAS. MITE											
Repro. Condition: NR=nonreproductive, PG=pregnant, L=lactating, PL=post lactating, SCR=scrotal/epididymis swollen													
Site Name Or Number: (SITE 07) S07		Date: 31 JULY 08		Set No.: 2 Captured In:		Name of Person Identifying the Bat: S. PERNICK				*Capture Number: 08			
Height in meters captured above ground surface: 3 m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)			
Species M. LUCI	Sex M	Age AD	Repro. Condition NR	Wt. (g) 6.0	Ear 14	Tragus 7	Fore-arm 35	Hind Foot 8	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right
Time of Capture 01:30	Photo Taken <input checked="" type="checkbox"/> Yes / <input type="checkbox"/> No	Remarks:											
Repro. Condition: NR=nonreproductive, PG=pregnant, L=lactating, PL=post lactating, SCR=scrotal/epididymis swollen													
Site Name Or Number: (SITE 07) S07		Date: 31 JULY 08		Set No.: 1 Captured In:		Name of Person Identifying the Bat: S. PERNICK				*Capture Number: 09			
Height in meters captured above ground surface: 2 m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)			
Species E. FUSCUS	Sex M	Age AD	Repro. Condition NR	Wt. (g) 18.0	Ear 15	Tragus 6	Fore-arm 45	Hind Foot 9	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right
Time of Capture 01:50	Photo Taken <input checked="" type="checkbox"/> Yes / <input type="checkbox"/> No	Remarks: WING MITE											

\*Capture Number = number in sequence by site.





**Photograph 18:** Site 07 Set 1



**Photograph 19:** Site 07 Set 2



**Photograph 20:** Site 07 Set 3

**US 219 IMPROVEMENT  
PROJECT**  
**S.R. 6219 SECTION 020**  
**MEYERSDALE TO SOMERSET**  
SOMERSET COUNTY, PENNSYLVANIA

**MIST NET SURVEY  
FOR THE  
INDIANA BAT**  
*(Myotis sodalis)*

**SITE 7**

**Legend**


 Mist Net Survey Site

**Surface Water Features**


 Ephemeral

 Intermittent


 Perennial


 Surface Drainage Channel


 Wetlands


 Wetland Open Ends

**Mapping Features**

 Area of Detailed Investigation  
(LRK 2007/2008)


 Required R-O-W


 Structures

 Cell Tower

 Railroad

 Treeline

 Unimproved Roads / Trails

 Roadways

 Contours


**Land Use**


 Low Density Residential


 Successional Rangeland


 Transitional


 Water


 Barren Land


 Agricultural Land

 Grassland

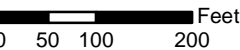
 Forest

 Urban

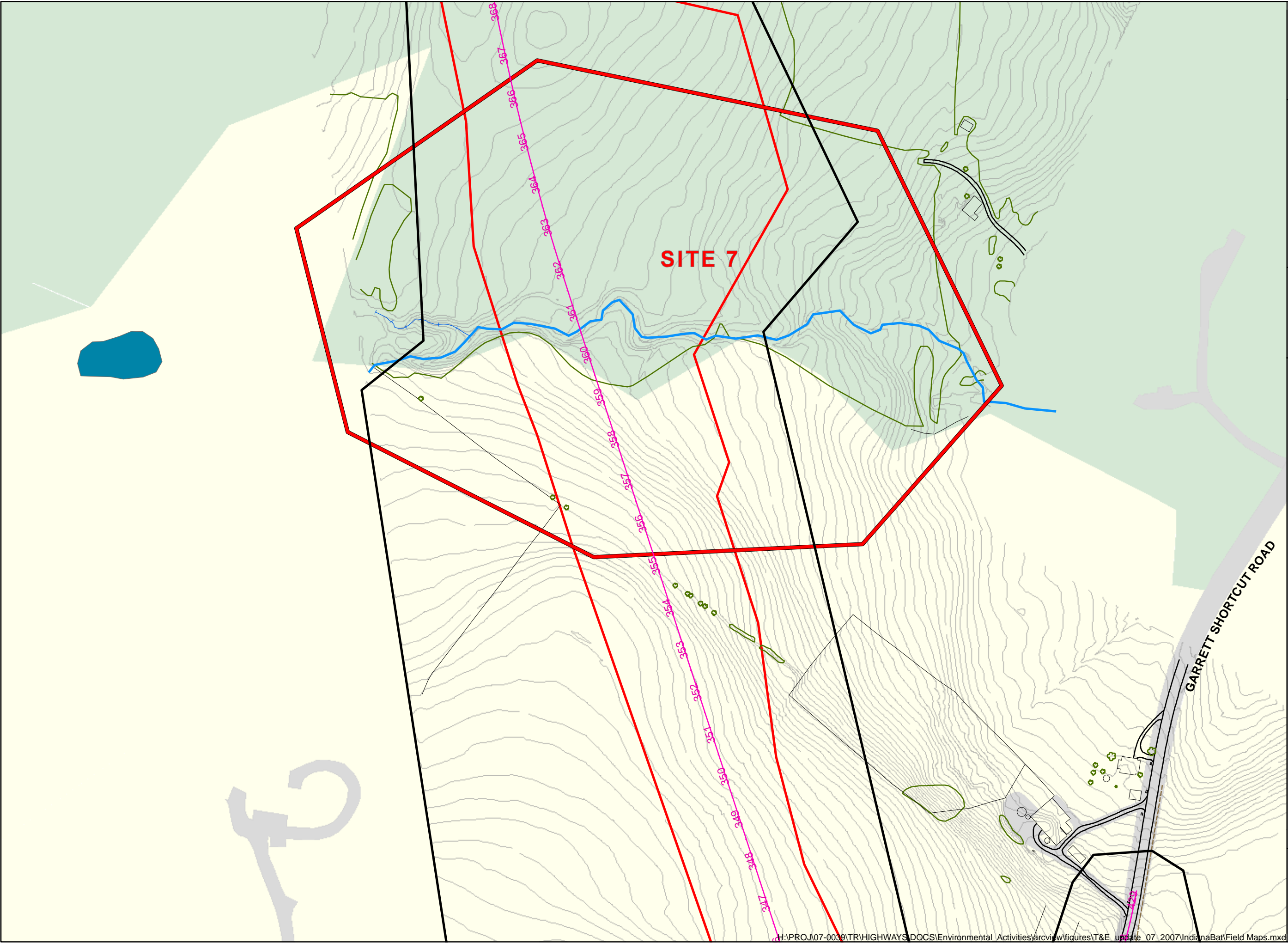
 Roadway

 Miscellaneous

 Alignment and Stations

 Feet  
0 50 100 200

1 inch equals 200 feet





BAT NETTING/TRAPPING SITE SURVEY RECORD

1. Survey Date: 7/27 2. Company Name: Kimball  
3. Reporter: Steve Pernick 4. Assistants: Dennis McGraw, Eric Lange  
5. Site Name and/or Number: S08 (Site 08)

6. Site is (circle one): ☐ hibernation site ☒ summer habitat

7a. If hibernation site circle one: limestone mine, coal mine, limestone cave, sandstone cave, RR tunnel,  
other structure, describe -

7b. If summer habitat, describe area being sampled (e.g. forested stream or forest clearing with stream):  
Forested slope of a stream valley -- see site diagram

8. County: Somerset

9. 7.5' Quad: Mundock

10. Was site GPS'd (required)? ☒ YES ☐ NO

Set 01  $39^{\circ}54'36.778''N$   $79^{\circ}2'53.021''W$   
Set 02  $39^{\circ}54'38.488''N$   $79^{\circ}2'52.635''W$

11. Geographic Coordinates (D-M-S): Latitude: 39°-54'-38.033''N, Longitude: 79°-2'-44.580''W

Datum (circle one): ☐ NAD27 (Preferred) ☒ NAD83 ☐ WGS84, Other:

12. Ownership and Access: (Who owns site or controls access? Give name and address.) Penn Potomac

Coal Company PO Box 68 Boswell, PA 15531

13. Time (military) & Temperature: Start Time 20:40 h Stop Time 1:40 h Total Minutes: 300  
76% Humidity 100% Humidity  
Start Temp. 18.6 °C End Temp. 12.5 °C

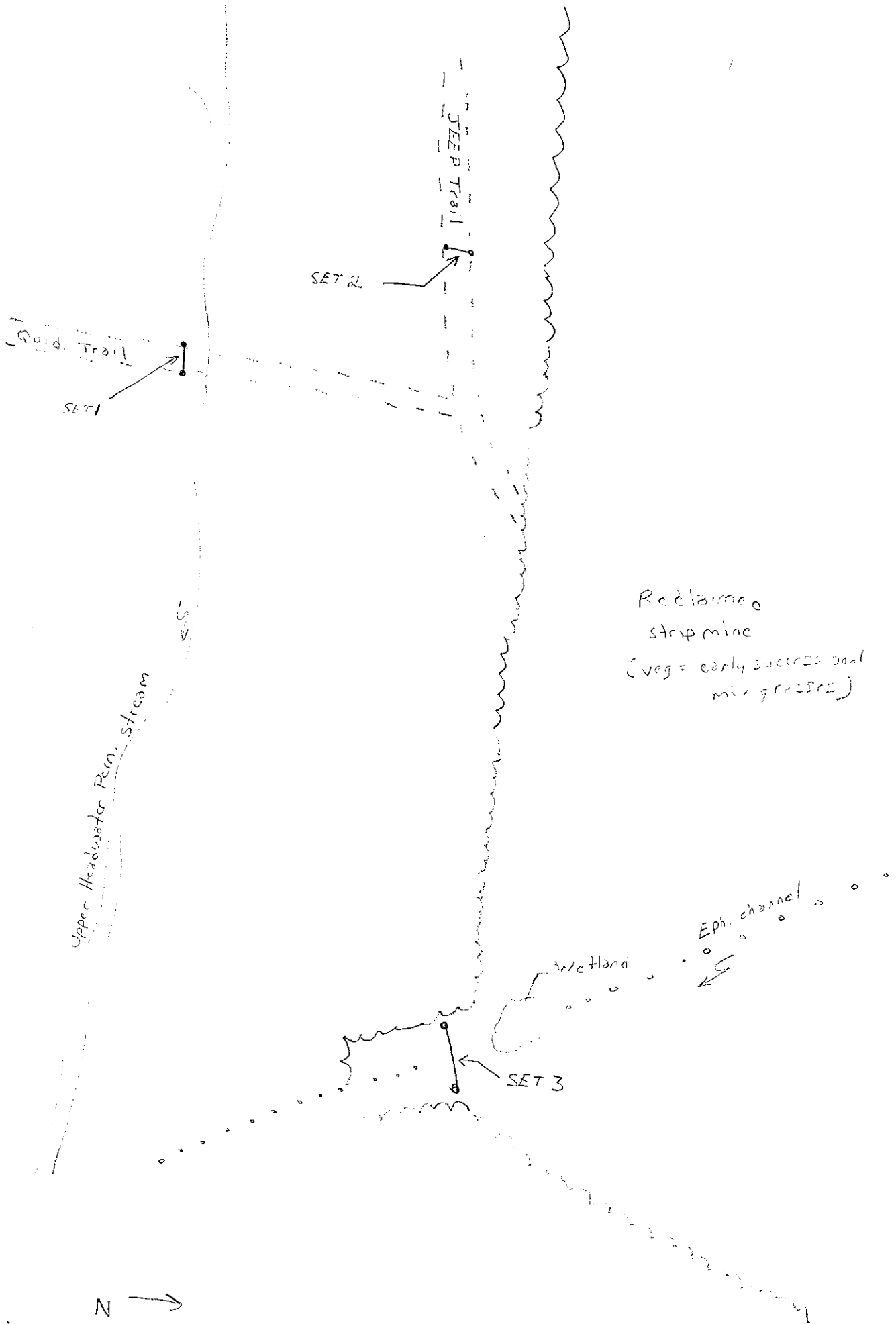
14. General Weather (circle one): ☒ Clear ☐ Partly Cloudy ☐ Mostly Cloudy ☐ Cloudy ☐ Drizzle ☐ Intermittent Rain;  
Steady Rain; Thunderstorms; Snow; Other:

15. General Wind Conditions (circle one): ☒ Calm ☐ Breezy (Leaves Rustling) ☐ Windy (trees swaying).

16. Capture Setup at Site:

Set #	Type	Count	Dimensions	Description	TOTAL AREA (m)
1	Nets	1	12m x 2.6m	Stacked over trail	124.8 sq. m
1	Nets	1	6m x 2.6m	stacked over eph. channel	15.6
2	Nets	1	6m x 2.6m	stacked over forest trail	15.6
3	Nets	4	9m x 2.6m	stacked over forest trail	93.6

Total Capture Area: 124.8 sq. m



Not to scale



(Site Survey Record - Continued)

Site Name/No.: S 08 (Site 08)

Date: 7/27/08

17. Describe habitat 150 m around site: (topography and vegetation including dominant tree species.)

R. maple W. oak  
B. Locust E. Hemlock  
B. Birch B. Cherry

Mix pole/mature, understory mod/dense mt. laurel, rhododendra, witch hazel, b. birch saplings

Sample sites on gently sloped stream valley (forested) side slope adjacent to reclaimed strip mine land.

18. Was reproductive status checked? YES / NO (if "NO" only enter numbers in **Total** columns)

**\*CAPTURE RESULTS**

Species	Number of Adult Females				No. Juv. Fem.	Total No. Fem.	Number of Adult Males		No. Juv. Male	Total No. Males	Species Totals
	NR	PG	L	PL			SCR	NR			
<i>Eptesicus fuscus</i>	2		1			3	2	1	1	4	7
<i>Myotis lucifugus</i>								1		1	1
<i>Myotis septentrionalis</i>	1					1					
<i>Myotis leibii</i>											
<i>Myotis sodalis</i>											
<i>Eptesicus fuscus</i>											
<i>Pipistrellus subflavus</i>											
<i>Lasiurus borealis</i>											
<i>Lasiurus cinereus</i>											
<i>Lasionycteris noctivagans</i>											
Other - specify:											
Other - specify:											
Reproductive Status: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen. <b>*Complete Measurement and Capture Data Form for all:</b> (1) <i>Myotis sodalis</i> , (2) <i>Myotis leibii</i> , (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA.											Grand Total 2

19. BAT DETECTORS & OTHER MONITORING DEVICES: Tallies of bat passes / hour. One to 5 hours required for Indiana bat hibernacula surveys. Monitor one hour after 22:00 hrs when trapping/netting hibernacula and 5 hours when only monitoring with bat detectors, night vision or infrared device (when site can not be trapped/netted). Describe procedure & equipment used in remarks.

1 <sup>st</sup> hour	2 <sup>nd</sup> hour	3 <sup>rd</sup> hour	4 <sup>th</sup> hour	5 <sup>th</sup> hour
Start Time:	Start Time:	Start Time:	Start Time:	Start Time:
End Time:	End Time:	End Time:	End Time:	End Time:
Tallies:	Tallies:	Tallies:	Tallies:	Tallies:

20. REMARKS:

20:40 - Start  
21:07 - Bat activity begins

• INCIDENTAL CAPTURE - FLYING SQUIRREL AT 23:30 (PHOTOS 142 → 144)

**Bat Measurement and Capture Data Form**(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: 508 (site 08)				Date: 7/27/08				Set No. Captured In: 2		Name of Person Identifying the Bat: Steve Pernick				*Capture Number: 01		
Height in meters captured above ground surface: 1.5 m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species M. sept	Sex F	Age A	Repro. Condition NR	Wt. (g) 6	Ear 16	Tragus 8	Fore- arm 37	Hind Foot 8	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right			
Time of Capture 21:23		Photo Taken <input checked="" type="checkbox"/> Yes / No		Remarks: Right side of tail membrane has a small hole												
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen																
Site Name Or Number: 508 (site 08)				Date: 7/27/08				Set No. Captured In: 3		Name of Person Identifying the Bat: Steve Pernick				*Capture Number: 02		
Height in meters captured above ground surface: 7.0 m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species L.B M. lucif	Sex M	Age Adult	Repro. Condition NR	Wt. (g) 7	Ear 13	Tragus 5	Fore- arm 36	Hind Foot 8	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right			
Time of Capture 23:23		Photo Taken <input checked="" type="checkbox"/> Yes / No		Remarks: NR												
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen																
Site Name Or Number:				Date:				Set No. Captured In:		Name of Person Identifying the Bat:				*Capture Number:		
Height in meters captured above ground surface: m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore- arm	Hind Foot	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right			
Time of Capture		Photo Taken Yes / No		Remarks:												



BAT NETTING/TRAPPING SITE SURVEY RECORD

Page 1 of 2

1. Survey Date: 8/8/08 2. Company Name: Kimball

3. Reporter: Steve Pernick 4. Assistants: Eric Lange, Dennis McGraw

5. Site Name and/or Number: (Site 8) (508)

6. Site is (circle one): hibernation site summer habitat

7a. If hibernation site circle one: limestone mine, coal mine, limestone cave, sandstone cave, RR tunnel,  
other structure, describe - \_\_\_\_\_

7b. If summer habitat, describe area being sampled (e.g. forested stream or forest clearing with stream):

Forested slope of stream valley adjacent to reclaimed surface mine

8. County: Somerset 9. 7.5' Quad.: Mundock

10. Was site GPS'd (required)? YES - NO  
Set 01 39° 54' 36.778" N 79° 2' 53.021" W  
Set 02 39° 54' 38.488" N 79° 2' 52.635" W

11. Geographic Coordinates (D-M-S): Latitude: 39° 54' 38.033" N, Longitude: 79° 2' 41.580" W

Datum (circle one): NAD27 (Preferred), NAD83, WGS84, Other: \_\_\_\_\_

12. Ownership and Access: (Who owns site or controls access? Give name and address.) Penn Pocahontas Coal Company PO Box 68 Boswell, PA 15531

13. Time (military) & Temperature: Start Time 20:30 h Stop Time 01:30 h Total Minutes: 300  
Start Temp. 17 °C End Temp. 11 °C Humidity start - 92  
END - 100

14. General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;  
Steady Rain; Thunderstorms; Snow; Other: \_\_\_\_\_

15. General Wind Conditions (circle one): Calm, Breezy (Leaves Rustling), Windy (trees swaying).

16. Capture Setup at Site:

Set #	Type	Count	Dimensions	Description	TOTAL AREA (m)
<u>1</u>	<u>Nets</u>	<u>4</u>	<u>12m x 2.6m</u>	<u>Stacked over trail</u>	<u>124.8 sq. m</u>
<u>1</u>	<u>Nets</u>	<u>1</u>	<u>6m x 2.6m</u>	<u>stacked over trail</u>	<u>15.6</u>
<u>2</u>	<u>Nets</u>	<u>1</u>	<u>6m x 2.6m</u>	<u>stacked over trail</u>	<u>15.6</u>
<u>3</u>	<u>Nets</u>	<u>4</u>	<u>9m x 2.6m</u>	<u>stacked over trail</u>	<u>93.6</u>

Total Capture Area: 124.8 sq. m

(Site Survey Record – Continued)

Site Name/No.:

(Site 8) (S08)

Date: 8/8/08

## 17. Describe habitat 150 m around site: (topography and vegetation including dominant tree species.)

Mix pole/mature w/understory that is moderate to dense consisting of Mt. laurel, rhododendra with hazel, b. birch saplings. Dominant overstory r. maple, b. locust, b. birch, w. oak, E. hemlock, b. cherry. Site is located adj. to reclaimed strip mine. See Site 08 7/27/08 For site diagram.

18. Was reproductive status checked? **YES** / NO (if "NO" only enter numbers in **Total** columns)

## \*CAPTURE RESULTS

Species	Number of Adult Females				No. Juv. Fem.	Total No. Fem.	Number of Adult Males		No. Juv. Male	Total No. Males	Species Totals
	NR	PG	L	PL			SCR	NR			
<i>Eptesicus fuscus</i>	2		1			3	2	1	1	4	7
<i>Myotis lucifugus</i>											
<i>Myotis septentrionalis</i>											
<i>Myotis leibii</i>											
<i>Myotis sodalis</i>											
<i>Eptesicus fuscus</i>											
<i>Pipistrellus subflavus</i>											
<i>Lasiurus borealis</i>											
<i>Lasiurus cinereus</i>											
<i>Lasionycteris noctivagans</i>											
Other – specify:											
Other – specify:											
Reproductive Status: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen. *Complete Measurement and Capture Data Form for all: (1) <i>Myotis sodalis</i> , (2) <i>Myotis leibii</i> , (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA.											Grand Total 0

## 19. BAT DETECTORS &amp; OTHER MONITORING DEVICES: Tallies of bat passes / hour. One to 5 hours required for Indiana bat hibernacula surveys. Monitor one hour after 22:00 hrs when trapping/netting hibernacula and 5 hours when only monitoring with bat detectors, night vision or infrared device (when site can not be trapped/netted). Describe procedure &amp; equipment used in remarks.

1 <sup>st</sup> hour	2 <sup>nd</sup> hour	3 <sup>rd</sup> hour	4 <sup>th</sup> hour	5 <sup>th</sup> hour
Start Time:	Start Time:	Start Time:	Start Time:	Start Time:
End Time:	End Time:	End Time:	End Time:	End Time:
Tallies:	Tallies:	Tallies:	Tallies:	Tallies:

## 20. REMARKS

20:56 - Bat activity heard on detector

• VERY INFREQUENT BAT ACTIVITY

• BAT ACTIVITY CEASES ON DETECTOR AFTER 21:30



**Bat Measurement and Capture Data Form**(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: <u>508 (Site 08)</u>				Date: <u>8/8/08</u>				Set No. Captured In:		Name of Person Identifying the Bat: <u>Steve Pernick</u>				*Capture Number:	
Height in meters captured above ground surface: _____ m				Body Measurements (grams and millimeters)					Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore- arm	Hind Foot	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right		
Time of Capture	Photo Taken Yes / No		Remarks: <u>NO CAPTURES</u>												

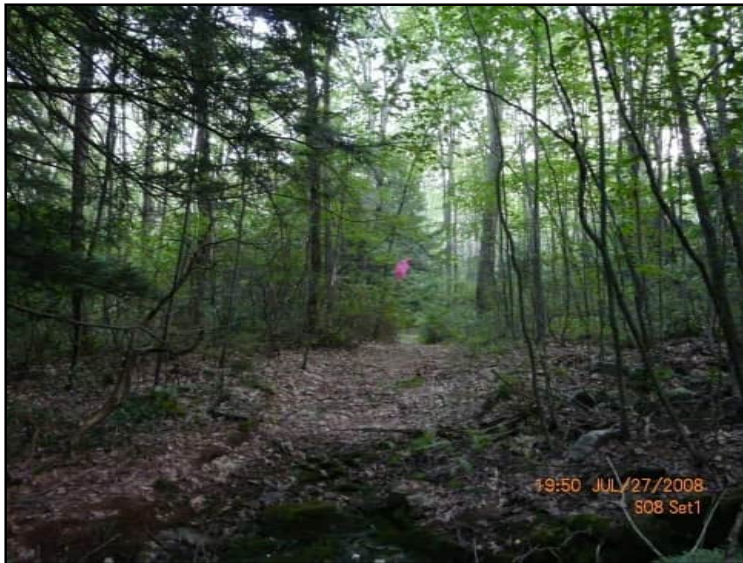
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen

Site Name Or Number:				Date:				Set No. Captured In:		Name of Person Identifying the Bat:				*Capture Number:	
Height in meters captured above ground surface: _____ m				Body Measurements (grams and millimeters)					Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore- arm	Hind Foot	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right		
Time of Capture	Photo Taken Yes / No		Remarks:												

Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen

Site Name Or Number:				Date:				Set No. Captured In:		Name of Person Identifying the Bat:				*Capture Number:	
Height in meters captured above ground surface: _____ m				Body Measurements (grams and millimeters)					Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore- arm	Hind Foot	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right		
Time of Capture	Photo Taken Yes / No		Remarks:												

\*Capture Number = number in sequence by site.



**Photograph 21:** Site 08 Set 1



**Photograph 22:** Site 08 Set 2



**Photograph 23:** Site 08 Set 3



US 219 IMPROVEMENT  
PROJECT

S.R. 6219 SECTION 020  
MEYERSDALE TO SOMERSET  
SOMERSET COUNTY, PENNSYLVANIA

MIST NET SURVEY  
FOR THE  
INDIANA BAT  
(*Myotis sodalis*)

SITE 8

Legend

Mist Net Survey Site

Surface Water Features

Ephemeral

Intermittent

Perennial

Surface Drainage Channel

Wetlands

Wetland Open Ends

Mapping Features

Area of Detailed Investigation  
(LRK 2007/2008)

Required R-O-W

Structures

Cell Tower

Railroad

Treeline

Unimproved Roads / Trails

Roadways

Contours

Land Use

Low Density Residential

Successional Rangeland

Transitional

Water

Barren Land

Agricultural Land

Grassland

Forest

Urban

Roadway

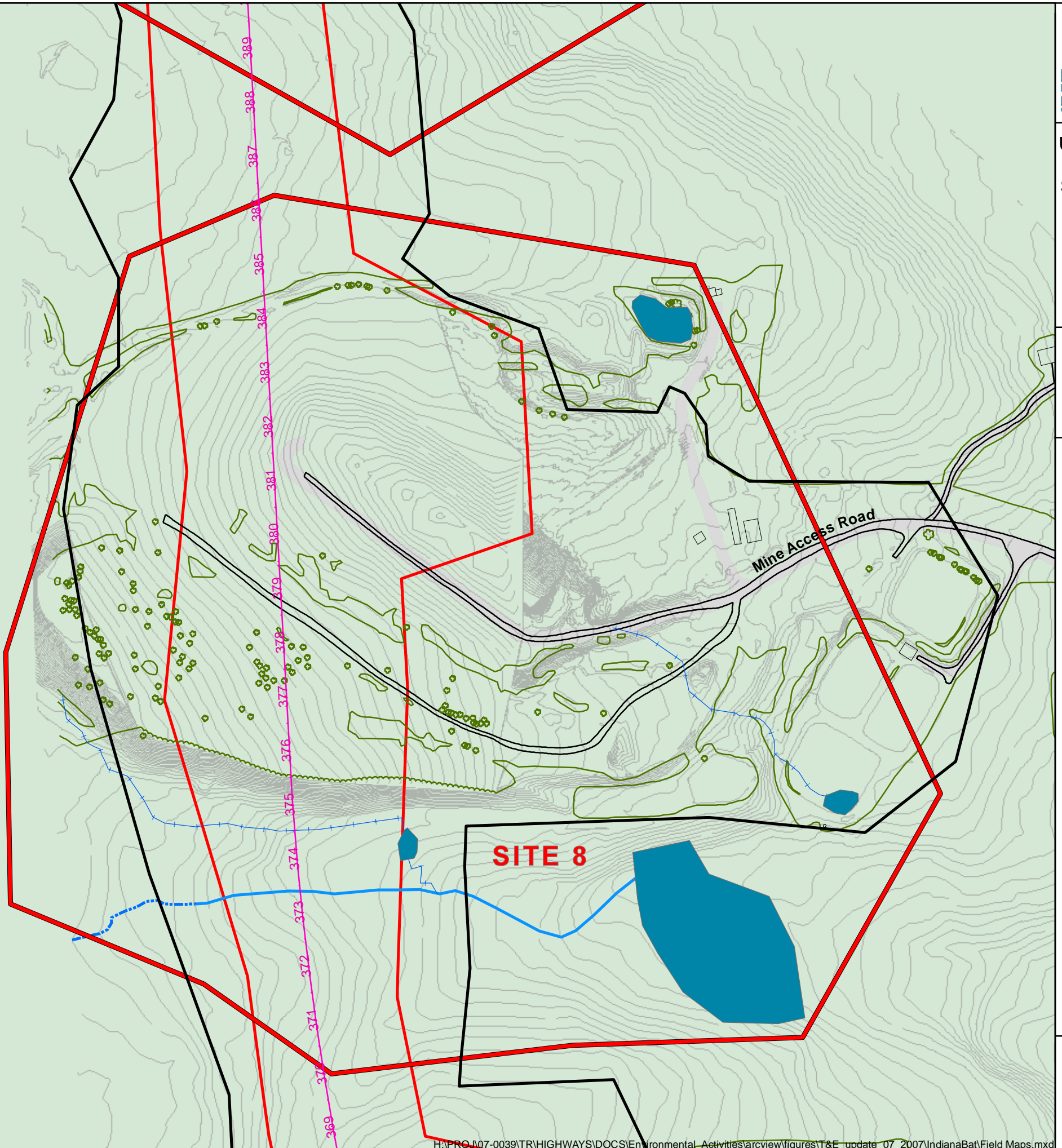
Miscellaneous

Alignment and Stations

0 50 100 200 Feet

1 inch equals 200 feet

JRG 12/22/2008



BAT NETTING/TRAPPING SITE SURVEY RECORD

Page 1 of 2

1. Survey Date: 27 July 08 2. Company Name: KIMBALL

3. Reporter: S. PERNICK 4. Assistants: T. GALLAHER

5. Site Name and/or Number: (SITE 09) S09

6. Site is (circle one): hibernation site summer habitat

7a. If hibernation site circle one: limestone mine, coal mine, limestone cave, sandstone cave, RR tunnel,

other structure, describe -

7b. If summer habitat, describe area being sampled (e.g. forested stream or forest clearing with stream):

MIXED AGED FOREST ADJACENT TO SURFACE MINE WITH SMALL SCRP DECIDUOUS WOODS

8. County: Somerset 9. 7.5' Quad.: Murdock

10. Was site GPS'd (required)? YES - NO  
Set 01 39° 54' 50.092"N 79° 2' 59.347"W  
Set 02 39° 54' 53.196"N 79° 2' 58.871"W

11. Geographic Coordinates (D-M-S): Latitude: 39° 54' 54.195"N, Longitude: 79° 2' 58.349"W

Datum (circle one): NAD27 (Preferred), NAD83, WGS84, Other:

12. Ownership and Access: (Who owns site or controls access? Give name and address.) Richard Merrill

Ligonier Minnimal #5, 3720 Rte 711 Ligonier, PA 15658

13. Time (military) & Temperature: Start Time 2030 h Stop Time 0150 h Total Minutes: 320

Start Temp. 17.0 °C End Temp. 12.7 °C Humidity 99.5  
START STOP 98.8

14. General Weather (circle one): Clear Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;

Steady Rain; Thunderstorms; Snow; Other:

15. General Wind Conditions (circle one): Calm Breezy (Leaves Rustling), Windy (trees swaying).

16. Capture Setup at Site:

Set #	Type	Count	Dimensions	Description	TOTAL AREA (m)
1	Nets	4	12m x 2.6m	Stacked over trail	124.8 sq. m
1	net	1	6m x 2.6	OVER TRAIL/ROAD	15.6
2	nets	2	6m x 2.6	OVER TRAIL/ROAD	31.2
3	nets	3	6m x 2.6	OVER TRAIL/ROAD	78.0

Total Capture Area: 124.8 sq. m





(Site Survey Record – Continued)

Site Name/No.: (SITE 09) S09

Date: 27 July 08

## 17. Describe habitat 150 m around site: (topography and vegetation including dominant tree species.)

MIXED AGED FOREST w/ MORE SAPLING & POLE SIZE. Forest community dominated by oaks spp. (RES & WHITE) MAPLE spp. with ASH, BLACK CHERRY, & AMERICAN BIRCH. DENSE UNDERSTORY (SAPLING) SMALL LEaved LINDEN SPECIES FOREST w/ FERN & SPOON WILLOW

18. Was reproductive status checked? YES / NO (if "NO" only enter numbers in **Total** columns)

## \*CAPTURE RESULTS

Species	Number of Adult Females				No. Juv. Fem.	Total No. Fem.	Number of Adult Males		No. Juv. Male	Total No. Males	Species Totals
	NR	PG	L	PL			SCR	NR			
<i>Eptesicus fuscus</i>	2		1			3	2	1	1	4	7
<i>Myotis lucifugus</i>								5			5
<i>Myotis septentrionalis</i>	1							1			2
<i>Myotis leibii</i>											
<i>Myotis sodalis</i>											
<i>Eptesicus fuscus</i>			2								2
<i>Pipistrellus subflavus</i>											
<i>Lasiurus borealis</i>											
<i>Lasiurus cinereus</i>											
<i>Lasionycteris noctivagans</i>											
Other – specify:											
Other – specify:											9
Reproductive Status: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen. *Complete Measurement and Capture Data Form for all: (1) <i>Myotis sodalis</i> , (2) <i>Myotis leibii</i> , (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA.											Grand Total 9

## 19. BAT DETECTORS &amp; OTHER MONITORING DEVICES: Tallies of bat passes / hour. One to 5 hours required for Indiana bat hibernacula surveys. Monitor one hour after 22:00 hrs when trapping/netting hibernacula and 5 hours when only monitoring with bat detectors, night vision or infrared device (when site can not be trapped/netted). Describe procedure &amp; equipment used in remarks.

1 <sup>st</sup> hour	2 <sup>nd</sup> hour	3 <sup>rd</sup> hour	4 <sup>th</sup> hour	5 <sup>th</sup> hour
Start Time:	Start Time:	Start Time:	Start Time:	Start Time:
End Time:	End Time:	End Time:	End Time:	End Time:
Tallies:	Tallies:	Tallies:	Tallies:	Tallies:

20. REMARKS: 2137 FIRST BAT HEARD ON DETECTOR



**Bat Measurement and Capture Data Form**(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: (SITE 09) S09		Date: 7/27/08		Set No. 3 Captured In:		Name of Person Identifying the Bat: STEVE PERNICK		*Capture Number: 1					
Height in meters captured above ground surface: 4 m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)			
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot	Recapture Yes/No		Band Material	Band Color	Band Inscription
M. Luci	M	A	NR	8g	14	6	37	8					
Time of Capture 2110	Photo Taken <input checked="" type="checkbox"/> Yes / No		Remarks: NO REMARKS										
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen													
Site Name Or Number: (SITE 09) S09		Date: 27 July 08		Set No. 1 Captured In:		Name of Person Identifying the Bat: STEVE PERNICK		*Capture Number: 2					
Height in meters captured above ground surface: 1.5 m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)			
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot	Recapture Yes/No		Band Material	Band Color	Band Inscription
M. Septe	F	A	NR	7.5	17	9	37	8					
Time of Capture 2120	Photo Taken <input checked="" type="checkbox"/> Yes / No		Remarks: NO REMARKS										
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen													
Site Name Or Number: (SITE 09) S09		Date: 27 July 08		Set No. 2 Captured In:		Name of Person Identifying the Bat: STEVE PERNICK		*Capture Number: 3					
Height in meters captured above ground surface: 3 m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)			
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot	Recapture Yes/No		Band Material	Band Color	Band Inscription
M. Luci	m	A	NR	6.5	16	8	35	8					
Time of Capture 2150	Photo Taken Yes / No		Remarks: NO REMARKS.										

\*Capture Number = number in sequence by site.

**Bat Measurement and Capture Data Form**

(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: <u>(SITE 09) S09</u>				Date: <u>27 July 08</u>				Set No. Captured In: <u>3</u>		Name of Person Identifying the Bat: <u>STEVE PERNICK</u>				*Capture Number: <u>4</u>		
Height in meters captured above ground surface: <u>2</u> m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species <u>E. fuscus.</u>	Sex <u>F</u>	Age <u>A</u>	Repro. Condition <u>L</u>	Wt. (g) <u>21</u>	Ear <u>14</u>	Tragus <u>5</u>	Fore-arm <u>47</u>	Hind Foot <u>9</u>	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right			
Time of Capture <u>2205</u>		Photo Taken <u>Yes</u> / No		Remarks: <u>WING MITES - TEETH WORN (OLDER BAT)</u>												
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen																
Site Name Or Number: <u>(SITE 09) S09</u>				Date: <u>27 July 08</u>				Set No. Captured In: <u>3</u>		Name of Person Identifying the Bat: <u>Steve Pernick</u>				*Capture Number: <u>5</u>		
Height in meters captured above ground surface: <u>1.5</u> m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species <u>My. Septe</u>	Sex <u>M</u>	Age <u>A</u>	Repro. Condition <u>NR</u>	Wt. (g) <u>75</u>	Ear <u>17</u>	Tragus <u>8</u>	Fore-arm <u>36</u>	Hind Foot <u>8</u>	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right			
Time of Capture <u>2245</u>		Photo Taken <u>Yes</u> / No		Remarks: <u>NO REMARKS</u>												
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen																
Site Name Or Number: <u>(SITE 09) S09</u>				Date: <u>27 July 08</u>				Set No. Captured In: <u>3</u>		Name of Person Identifying the Bat: <u>STEVE PERNICK</u>				*Capture Number: <u>6</u>		
Height in meters captured above ground surface: <u>6</u> m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species <u>E. Fuscus</u>	Sex <u>F</u>	Age <u>A</u>	Repro. Condition <u>L</u>	Wt. (g) <u>20</u>	Ear <u>14</u>	Tragus <u>5</u>	Fore-arm <u>48</u>	Hind Foot <u>9</u>	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right			
Time of Capture <u>2245</u>		Photo Taken <u>Yes</u> / No		Remarks: <u>WING MITES - TEETH SLIGHTLY WORN.</u>												

\*Capture Number = number in sequence by site.



**Bat Measurement and Capture Data Form**(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: <u>(Site 09) 809</u>				Date: <u>27 July 08</u>				Set No. Captured In: <u>2</u>		Name of Person Identifying the Bat: <u>STEVE PERNICK</u>				*Capture Number: <u>7</u>	
Height in meters captured above ground surface: <u>2</u> m				Body Measurements (grams and millimeters)					Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right		
M. Luci	M	A	NR	7.5	12	4	37	9							
Time of Capture <u>2315</u>		Photo Taken <input checked="" type="checkbox"/> Yes / No		Remarks: <u>FLEAs - Retaining some juvenile characteristic bones not fully fused.</u>											
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen															
Site Name Or Number: <u>(Site 09) 809</u>				Date: <u>27 July 08</u>				Set No. Captured In: <u>3</u>		Name of Person Identifying the Bat: <u>STEVE PERNICK</u>				*Capture Number: <u>8</u>	
Height in meters captured above ground surface: <u>2</u> m				Body Measurements (grams and millimeters)					Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right		
M. Luci	M	A	NR	7	13	5	39	8							
Time of Capture <u>0100</u>		Photo Taken <input checked="" type="checkbox"/> Yes / No		Remarks: <u>MUDDY (ear, wings, everything)</u>											
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen															
Site Name Or Number: <u>(Site 09) 809</u>				Date: <u>27 July 08</u>				Set No. Captured In: <u>3</u>		Name of Person Identifying the Bat: <u>STEVE PERNICK</u>				*Capture Number: <u>9</u>	
Height in meters captured above ground surface: <u>3</u> m				Body Measurements (grams and millimeters)					Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right		
M. Luci	M	A	NTZ	7.5	13	6	36	8							
Time of Capture <u>0105</u>		Photo Taken <input checked="" type="checkbox"/> Yes / No		Remarks: <u>No Remarks</u>											

\*Capture Number = number in sequence by site.

## BAT NETTING/TRAPPING SITE SURVEY RECORD

Page 1 of 2

1. Survey Date: 8/8/08 2. Company Name: KIMBALL3. Reporter: S. PERINICK 4. Assistants: S. TOKI5. Site Name and/or Number: SITE 09 (S09)6. Site is (circle one): hibernation site summer habitat7a. If hibernation site circle one: limestone mine, coal mine, limestone cave, sandstone cave, RR tunnel,  
other structure, describe - \_\_\_\_\_

7b. If summer habitat, describe area being sampled (e.g. forested stream or forest clearing with stream):

MIXED AGED FOREST ADJACENT TO SURFACE MINE WITH SMALL SCRP PRAIRY WETLANDS8. County: SOMERSET 9. 7.5' Quad.: MUNDACK10. Was site GPS'd (required)? YES NO Set 01 39° 54' 50.092"N 79° 2' 59.347"WSet 02 39° 54' 53.196"N 79° 2' 58.871"W  
Set 03  
11. Geographic Coordinates (D-M-S): Latitude: 39 ° 54 ' 49.195 "N, Longitude: 79 ° 2 ' 58.349 "WDatum (circle one): NAD27 (Preferred), NAD83 WGS84, Other: \_\_\_\_\_12. Ownership and Access: (Who owns site or controls access? Give name and address.) Richard MerrillLigonier Minirail #5, 3720 Rte 711 Ligonier, PA 1565813. Time (military) & Temperature: Start Time 20:20 h Stop Time 01:20 h Total Minutes: 300Start Temp. 14.5 °C End Temp. 10 °C start humid 100  
end humid 10014. General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;  
Steady Rain; Thunderstorms; Snow; Other: \_\_\_\_\_15. General Wind Conditions (circle one): Calm; Breezy (Leaves Rustling), Windy (trees swaying).

## 16. Capture Setup at Site:

Set #	Type	Count	Dimensions	Description	TOTAL AREA (m)
<u>1</u>	<u>Nets</u>	<u>4</u>	<u>12m x 2.6m</u>	<u>Stacked over trail</u>	<u>124.8 sq. m</u>
<u>1</u>	<u>NETS</u>	<u>1</u>	<u>6m x 2.6m</u>	<u>OVER TRAIL</u>	<u>15.6</u>
<u>2</u>	<u>NETS</u>	<u>2</u>	<u>6m x 2.6m</u>	<u>OVER TRAIL</u>	<u>31.2</u>
<u>3</u>	<u>NETS</u>	<u>3</u>	<u>6m x 2.6m</u>	<u>OVER TRAIL</u>	<u>46.8</u>

Total Capture Area: 93.6 sq. m



STE Drawings  
JULY 27<sup>TH</sup> 2008

TAKE WIND SPEED 75.7

COMMONWEALTH OF PENNSYLVANIA  
Pennsylvania Game Commission

Page 2 of 2

(Site Survey Record – Continued)

Site Name/No.: (SITE 09) S09

Date: 8/8/08

17. Describe habitat 150 m around site: (topography and vegetation including dominant tree species.)

MIXED PAVED FOREST W/ MORE SAPLING / BIRCH DOMINANCE. FOREST COMMUNITY DOMINATED BY OAK SPP. (ROCKS / WHITES), MAPLE SPP., WITH ASH, BIRCH, HEMLOCK & CUCUMBER MAGNOLIA TO LESSER EXTENT. DENSE SAPLING GROWTH. SMALL HEADWATER STREAMS PRESENT W/ SMALL RUNNEL / SOD WETLANDS SCATTERED WITHIN FOREST

18. Was reproductive status checked? YES / NO (if "NO" only enter numbers in Total columns)

\*CAPTURE RESULTS

Species	Number of Adult Females				No. Juv. Fem.	Total No. Fem.	Number of Adult Males		No. Juv. Male	Total No. Males	Species Totals
	NR	PG	L	PL			SCR	NR			
<i>Eptesicus fuscus</i>	2		1			3	2	1	1	4	7
<i>Myotis lucifugus</i>											
<i>Myotis septentrionalis</i>											
<i>Myotis leibii</i>											
<i>Myotis sodalis</i>											
<i>Eptesicus fuscus</i>											
<i>Pipistrellus subflavus</i>											
<i>Lasiurus borealis</i>											
<i>Lasiurus cinereus</i>											
<i>Lasionycteris noctivagans</i>											
Other – specify:											
Other – specify:											
Reproductive Status: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen. *Complete Measurement and Capture Data Form for all: (1) <i>Myotis sodalis</i> , (2) <i>Myotis leibii</i> , (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA.											Grand Total 0

19. BAT DETECTORS & OTHER MONITORING DEVICES: Tallies of bat passes / hour. One to 5 hours required for Indiana bat hibernacula surveys. Monitor one hour after 22:00 hrs when trapping/netting hibernacula and 5 hours when only monitoring with bat detectors, night vision or infrared device (when site can not be trapped/netted). Describe procedure & equipment used in remarks.

1 <sup>st</sup> hour	2 <sup>nd</sup> hour	3 <sup>rd</sup> hour	4 <sup>th</sup> hour	5 <sup>th</sup> hour
Start Time:	Start Time:	Start Time:	Start Time:	Start Time:
End Time:	End Time:	End Time:	End Time:	End Time:
Tallies:	Tallies:	Tallies:	Tallies:	Tallies:

20. REMARKS

• 2055 first bat on detector. – TWO BATS OBSERVED @ 20:55 FORAGING ALONG TREE LINE  
 ADJ. TO SURFACE MINE.  
 @ 2130 activity decreased noticeably, temp 14°





**Photograph 24:** Site 09 Set 1



**Photograph 25:** Site 09 Set 2



**Photograph 26:** Site 09 Set 3

**US 219 IMPROVEMENT  
PROJECT**  
**S.R. 6219 SECTION 020**  
**MEYERSDALE TO SOMERSET**  
SOMERSET COUNTY, PENNSYLVANIA

**MIST NET SURVEY  
FOR THE  
INDIANA BAT**  
*(Myotis sodalis)*

**SITE 9**

**Legend**

 Mist Net Survey Site

**Surface Water Features**


 Ephemeral

 Intermittent


 Perennial


 Surface Drainage Channel

 Wetlands

 Wetland Open Ends

**Mapping Features**

 Area of Detailed Investigation  
(LRK 2007/2008)


 Required R-O-W


 Structures

 Cell Tower

 Railroad

 Treeline

 Unimproved Roads / Trails


 Roadways

 Contours


**Land Use**


 Low Density Residential

 Successional Rangeland

 Transitional

 Water

 Barren Land

 Agricultural Land

 Grassland

 Forest

 Urban

 Roadway

 Miscellaneous

 Alignment and Stations

**1**

0 50 100 200 Feet

1 inch equals 200 feet



## BAT NETTING/TRAPPING SITE SURVEY RECORD

1. Survey Date: 7/30/08 2. Company Name: Kimball3. Reporter: Steve Pernick 4. Assistants: Eric Lange5. Site Name and/or Number: 510 (Site 10)6. Site is (circle one): hibernation site summer habitat7a. If hibernation site circle one: limestone mine, coal mine, limestone cave, sandstone cave, RR tunnel,  
other structure, describe - \_\_\_\_\_

7b. If summer habitat, describe area being sampled (e.g. forested stream or forest clearing with stream):

open corridor through forest (old water diversion site), open understory in yard like setting8. County: Somerset 9. 7.5' Quad.: Mundock10. Was site GPS'd (required)? YES NO Set 1 39° 55' 46.876"N 79° 2' 57.993"W11. Geographic Coordinates (D-M-S): Latitude: 39° - 55' - 49.230"N, Longitude: 79° - 2' - 58.712"WDatum (circle one): NAD27 (Preferred), NAD83, WGS84, Other: \_\_\_\_\_12. Ownership and Access: (Who owns site or controls access? Give name and address.) Balen Shaffer1200 Garrett Shortcut Rd Berlin, PA 1553013. Time (military) & Temperature: Start Time 2030 h Stop Time 01:38 h Total Minutes: 308Start Temp. 19 °C End Temp. 19.5 °C Start humid 100%  
End humid 100%14. General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;

Steady Rain; Thunderstorms; Snow; Other: \_\_\_\_\_

15. General Wind Conditions (circle one): Calm, Breezy (Leaves Rustling), Windy (trees swaying).

## 16. Capture Setup at Site:

Set #	Type	Count	Dimensions	Description	TOTAL AREA (m)
1	Nets	4	12m x 2.6m	Stacked over trail	124.8 sq. m
1	nets	2	9 x 2.6	(yard/park) In sparse wooded area	46.8
2	nets	4	9 x 2.6	Stack over trail	93.6

Total Capture Area: 140.4 sq. m

10/10/07  
 10/10/07



□ Wetland Camp

10/10/07

Pue/10/10/07



COMMONWEALTH OF PENNSYLVANIA  
Pennsylvania Game Commission

Date: 7/30/08

(Site Survey Record - Continued)

Site Name/No.: S10 (Site 10)

17. Describe habitat 150 m around site: (topography and vegetation including dominant tree species.)  
Mixed mature/pole deciduous forest. Dominant species B, cherry, R. maple (canopy). Dominant understory  
N. arrowwood and b. cherry saplings.

18. Was reproductive status checked? YES / NO (if "NO" only enter numbers in Total columns)

## \*CAPTURE RESULTS

Species	Number of Adult Females				No. Juv. Fem.	Total No. Fem.	Number of Adult Males		No. Juv. Male	Total No. Males	Species Totals
	NR	PG	L	PL			SCR	NR			
<i>Eptesicus fuscus</i>	2		1			3	2	1	1	4	7
<i>Myotis lucifugus</i>								1		2	2
<i>Myotis septentrionalis</i>											
<i>Myotis leibii</i>											
<i>Myotis sodalis</i>						4					4
<i>Eptesicus fuscus</i>											
<i>Pipistrellus subflavus</i>											
<i>Lasiurus borealis</i>											
<i>Lasiurus cinereus</i>											
<i>Lasionycteris noctivagans</i>											
Other - specify:											
Other - specify:											
Reproductive Status: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen. *Complete Measurement and Capture Data Form for all: (1) <i>Myotis sodalis</i> , (2) <i>Myotis leibii</i> , (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA.											Grand Total 6

19. BAT DETECTORS & OTHER MONITORING DEVICES: Tallies of bat passes / hour. One to 5 hours required for Indiana bat hibernacula surveys. Monitor one hour after 22:00 hrs when trapping/netting hibernacula and 5 hours when only monitoring with bat detectors, night vision or infrared device (when site can not be trapped/netted). Describe procedure & equipment used in remarks.

1 <sup>st</sup> hour	2 <sup>nd</sup> hour	3 <sup>rd</sup> hour	4 <sup>th</sup> hour	5 <sup>th</sup> hour
Start Time:	Start Time:	Start Time:	Start Time:	Start Time:
End Time:	End Time:	End Time:	End Time:	End Time:
Tallies:	Tallies:	Tallies:	Tallies:	Tallies:

## 20. REMARKS

2100 first bat on detector, several seen visually at same time also  
 2250 bat escapes net at 10m  
 ~2400 activity slows

2410 Incidental capture of flying squirrel, appeared to be southern but was not handled for positive ID

**Bat Measurement and Capture Data Form**(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: <u>S10 (Site 10)</u>				Date: <u>7/30/08</u>		Set No. Captured In: <u>2</u>		Name of Person Identifying the Bat: <u>Steve Pernick</u>				*Capture Number: <u>C01</u>		
Height in meters captured above ground surface: <u>5</u> m				Body Measurements (grams and millimeters)					Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)
Species <u>E. fuscus</u> Sex <u>F</u> Age <u>A</u> Repro. Condition <u>L</u>				Wt. (g) <u>17</u> Ear <u>16</u> Tragus <u>6</u> Fore-arm <u>44</u> Hind Foot <u>9</u>					Recapture Yes/No <u>  </u> Band Material <u>  </u> Band Color <u>  </u> Band Inscription <u>  </u> Band on Left/Right <u>  </u>					
Time of Capture <u>21:00</u>		Photo Taken <u>Yes</u> / No		Remarks: <u>- -</u>										
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen														
Site Name Or Number: <u>S10 (Site 10)</u>				Date: <u>7/30/08</u>		Set No. Captured In: <u>1</u>		Name of Person Identifying the Bat: <u>Steve Pernick</u>				*Capture Number: <u>C02</u>		
Height in meters captured above ground surface: <u>3</u> m				Body Measurements (grams and millimeters)					Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)
Species <u>M. lucii</u> Sex <u>M</u> Age <u>A</u> Repro. Condition <u>NR</u>				Wt. (g) <u>7.5</u> Ear <u>13</u> Tragus <u>5</u> Fore-arm <u>36</u> Hind Foot <u>8</u>					Recapture Yes/No <u>  </u> Band Material <u>  </u> Band Color <u>  </u> Band Inscription <u>  </u> Band on Left/Right <u>  </u>					
Time of Capture <u>21:32</u>		Photo Taken <u>Yes</u> / No		Remarks: <u>  </u>										
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen														
Site Name Or Number: <u>S10 (Site 10)</u>				Date: <u>7/30/08</u>		Set No. Captured In: <u>2</u>		Name of Person Identifying the Bat: <u>Steve Pernick</u>				*Capture Number: <u>C03</u>		
Height in meters captured above ground surface: <u>5</u> m				Body Measurements (grams and millimeters)					Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)
Species <u>E. fuscus</u> Sex <u>F</u> Age <u>A</u> Repro. Condition <u>PL</u>				Wt. (g) <u>16.5</u> Ear <u>15</u> Tragus <u>6</u> Fore-arm <u>43</u> Hind Foot <u>9</u>					Recapture Yes/No <u>  </u> Band Material <u>  </u> Band Color <u>  </u> Band Inscription <u>  </u> Band on Left/Right <u>  </u>					
Time of Capture <u>21:38</u>		Photo Taken <u>Yes</u> / No		Remarks: <u>wing miles</u>										

\*Capture Number = number in sequence by site.



**Bat Measurement and Capture Data Form**(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: <u>S10 (S1+10)</u>				Date: <u>7/30/08</u>				Set No. Captured In: <u>2</u>		Name of Person Identifying the Bat: <u>Steve Pernick</u>				*Capture Number: <u>04</u>	
Height in meters captured above ground surface: <u>2</u> m				Body Measurements (grams and millimeters)					Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species <u>E. Fuscus</u>	Sex <u>F</u>	Age <u>A</u>	Repro. Condition <u>PL</u>	Wt. (g) <u>20</u>	Ear <u>15</u>	Tragus <u>5</u>	Fore- arm <u>46</u>	Hind Foot <u>9</u>	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right		
Time of Capture <u>22:12</u>		Photo Taken <u>(Yes)</u> / No		Remarks: <u>Wing mites</u>											
Repro Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen															
Site Name Or Number: <u>S10 (S1+10)</u>				Date: <u>7/30/08</u>				Set No. Captured In: <u>2</u>		Name of Person Identifying the Bat: <u>Steve Pernick</u>				*Capture Number: <u>05</u>	
Height in meters captured above ground surface: <u>3</u> m				Body Measurements (grams and millimeters)					Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species <u>E. Fuscus</u>	Sex <u>F</u>	Age <u>A</u>	Repro. Condition <u>L</u>	Wt. (g) <u>20</u>	Ear <u>16</u>	Tragus <u>6</u>	Fore- arm <u>49</u>	Hind Foot <u>9</u>	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right		
Time of Capture <u>22:51</u>		Photo Taken <u>(Yes)</u> / No		Remarks: <u>Wing mites</u>											
Repro Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen															
Site Name Or Number: <u>S10 (S1+10)</u>				Date: <u>7/30/08</u>				Set No. Captured In: <u>1</u>		Name of Person Identifying the Bat: <u>Steve Pernick</u>				*Capture Number: <u>06</u>	
Height in meters captured above ground surface: <u>2.5</u> m				Body Measurements (grams and millimeters)					Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species <u>M. lucii</u>	Sex <u>M</u>	Age <u>J</u>	Repro. Condition <u>NR</u>	Wt. (g) <u>6.5</u>	Ear <u>13</u>	Tragus <u>5</u>	Fore- arm <u>36</u>	Hind Foot <u>8</u>	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right		
Time of Capture <u>01:38</u>		Photo Taken <u>(Yes)</u> / No		Remarks:											

\*Capture Number = number in sequence by site.

BAT NETTING/TRAPPING SITE SURVEY RECORD

Page 1 of 2

1. Survey Date: 8/7/08 2. Company Name: Kimbell

3. Reporter: Steve Pernick 4. Assistants: Eric Lange

5. Site Name and/or Number: S10 (Site 10)

6. Site is (circle one): hibernation site summer habitat

7a. If hibernation site circle one: limestone mine, coal mine, limestone cave, sandstone cave, RR tunnel,  
other structure, describe - \_\_\_\_\_

7b. If summer habitat, describe area being sampled (e.g. forested stream or forest clearing with stream):

open corridor through forest (old water diversion site), open understory in yard like setting

8. County: Somerset 9. 7.5' Quad.: Mundock

Set 01 39° 55' 46.876"N 79° 2' 57.993"W

10. Was site GPS'd (required)? YES - NO

Set 02  
11. Geographic Coordinates (D-M-S): Latitude: 39° - 55' - 49.236"N, Longitude: 79° - 2' - 58.742"W

Datum (circle one): NAD27 (Preferred) NAD83 WGS84, Other: \_\_\_\_\_

12. Ownership and Access: (Who owns site or controls access? Give name and address.) Galen Shaffer

1220 Garrett Shortcut Rd Berlin, PA 15530

13. Time (military) & Temperature: Start Time 2020 h Stop Time 01:40 h Total Minutes: 320

Start Temp. 16 °C End Temp. 11 °C humid  
start 92%  
end 100%

14. General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;

Steady Rain; Thunderstorms; Snow; Other: \_\_\_\_\_

15. General Wind Conditions (circle one): Calm, Breezy (Leaves Rustling), Windy (trees swaying).

16. Capture Setup at Site:

Set #	Type	Count	Dimensions	Description	TOTAL AREA (m)
<u>1</u>	<u>Nets</u>	<u>4</u>	<u>12m x 2.6m</u>	<u>Stacked over trail</u>	<u>124.8 sq. m</u>
<u>1</u>	<u>nets</u>	<u>2</u>	<u>9 x 2.6m</u>	<u>yard park area</u>	<u>46.8</u>
<u>2</u>	<u>nets</u>	<u>4</u>	<u>9 x 2.6m</u>	<u>stack over trail</u>	<u>93.6</u>

Total Capture Area: 140.4 sq. m



(Site Survey Record -- Continued)

Site Name/No.:

S10 (Site 10)

Date: 8/7/08

## 17. Describe habitat 150 m around site: (topography and vegetation including dominant tree species.)

Mixed mature/pole deciduous forest. Dominant species B. cherry, R. maple (canopy).  
Dominant understory N. arrowwood and B. cherry saplings SEE site 10 7/30/08 For

18. Was reproductive status checked? YES / NO (if "NO" only enter numbers in Total columns)site  
diagram.

## \*CAPTURE RESULTS

Species	Number of Adult Females				No. Juv. Fem.	Total No. Fem.	Number of Adult Males		No. Juv. Male	Total No. Males	Species Totals
	NR	PG	L	PL			SCR	NR			
<i>Eptesicus fuscus</i>	2		1			3	2	1	1	4	7
<i>Myotis lucifugus</i>											
<i>Myotis septentrionalis</i>											
<i>Myotis leibii</i>											
<i>Myotis sodalis</i>											
<i>Eptesicus fuscus</i>											
<i>Pipistrellus subflavus</i>											
<i>Lasiurus borealis</i>								1		1	1
<i>Lasiurus cinereus</i>											
<i>Lasionycteris noctivagans</i>											
Other -- specify:											
Other -- specify:											
Reproductive Status: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen. *Complete Measurement and Capture Data Form for all: (1) <i>Myotis sodalis</i> , (2) <i>Myotis leibii</i> , (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA.											Grand Total 1

## 19. BAT DETECTORS &amp; OTHER MONITORING DEVICES: Tallies of bat passes / hour. One to 5 hours required for Indiana bat hibernacula surveys. Monitor one hour after 22:00 hrs when trapping/netting hibernacula and 5 hours when only monitoring with bat detectors, night vision or infrared device (when site can not be trapped/netted). Describe procedure &amp; equipment used in remarks.

1 <sup>st</sup> hour	2 <sup>nd</sup> hour	3 <sup>rd</sup> hour	4 <sup>th</sup> hour	5 <sup>th</sup> hour
Start Time:	Start Time:	Start Time:	Start Time:	Start Time:
End Time:	End Time:	End Time:	End Time:	End Time:
Tallies:	Tallies:	Tallies:	Tallies:	Tallies:

## 20. REMARKS

20:55 Bat activity begins.

22:54 temperature 53° sparse bat activity

**Bat Measurement and Capture Data Form**(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: <u>S10 (Site 10)</u>				Date: <u>8/7/08</u>		Set No. Captured In: <u>2</u>		Name of Person Identifying the Bat: <u>Steve Pernick</u>				*Capture Number: <u>01</u>		
Height in meters captured above ground surface: <u>10</u> m				Body Measurements (grams and millimeters)					Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)
Species <u>L. borealis</u>	Sex <u>M</u>	Age <u>A</u>	Repro. Condition <u>NR</u>	Wt. (g) <u>11</u>	Ear <u>10</u>	Tragus <u>4</u>	Fore- arm <u>39</u>	Hind Foot <u>7</u>	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right	
Time of Capture <u>21:15</u>		Photo Taken <u>(Yes)</u> / No		Remarks: <u>Hair &amp; tissue sample taken</u>										
Repro. Condition: NR=nonreproductive, PG=pregnant, L=lactating, PL=post lactating, SCR=serotal/epididymis swollen														
Site Name Or Number:				Date:		Set No. Captured In:		Name of Person Identifying the Bat:				*Capture Number:		
Height in meters captured above ground surface: _____ m				Body Measurements (grams and millimeters)					Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore- arm	Hind Foot	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right	
Time of Capture		Photo Taken Yes / No		Remarks:										
Repro. Condition: NR=nonreproductive, PG=pregnant, L=lactating, PL=post lactating, SCR=serotal/epididymis swollen														
Site Name Or Number:				Date:		Set No. Captured In:		Name of Person Identifying the Bat:				*Capture Number:		
Height in meters captured above ground surface: _____ m				Body Measurements (grams and millimeters)					Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore- arm	Hind Foot	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right	
Time of Capture		Photo Taken Yes / No		Remarks:										

\*Capture Number = number in sequence by site.





**Photograph 27:** Site 10 Set 1



**Photograph 28:** Site 10 Set 2

**US 219 IMPROVEMENT  
PROJECT**  
**S.R. 6219 SECTION 020**  
**MEYERSDALE TO SOMERSET**  
SOMERSET COUNTY, PENNSYLVANIA

**MIST NET SURVEY  
FOR THE  
INDIANA BAT**  
*(Myotis sodalis)*

**SITE 10**

**Legend**


 Mist Net Survey Site

**Surface Water Features**

 Ephemeral

 Intermittent


 Perennial


 Surface Drainage Channel


 Wetlands

 Wetland Open Ends


**Mapping Features**


 Area of Detailed Investigation (LRK 2007/2008)

 Required R-O-W

 Structures


 Cell Tower


 Railroad


 Treeline


 Unimproved Roads / Trails

 Roadways

 Contours


 Low Density Residential


 Successional Rangeland


 Transitional


 Water


 Barren Land


 Agricultural Land


 Grassland

 Forest

 Urban

 Roadway

 Miscellaneous

 Alignment and Stations

1

0 50 100 200 Feet

1 inch equals 200 feet

JRG 12/22/2008

H:\PROJ\07-0039\TR\HIGHWAYS\DOCS\Environmental\_Activities\arcview\figures\T&E\_update\_07\_2007\IndianaBat\Field Maps.mxd



BAT NETTING/TRAPPING SITE SURVEY RECORD

Page 1 of 2

1. Survey Date: 30 JULY 08 2. Company Name: KIMBAIL

3. Reporter: S. PERKIN 4. Assistants: S. TOKI, D. MCGRAW

5. Site Name and/or Number: (SITE 11) (S11)

6. Site is (circle one): hibernation site summer habitat

7a. If hibernation site circle one: limestone mine, coal mine, limestone cave, sandstone cave, RR tunnel,  
other structure, describe - \_\_\_\_\_

7b. If summer habitat, describe area being sampled (e.g. forested stream or forest clearing with stream):

FORESTED TRAIL + FOREST EDGE WITHIN FORESTED CORRIDOR

8. County: SOMERSET 9. 7.5' Quad.: Mundock

10. Was site GPS'd (required)? (YES) NO Set 01 39° 56' 23.735"N 79° 2' 40.080"W

11. Geographic Coordinates (D-M-S): <sup>Set 02</sup> Latitude: 39° - 56' - 20.940"N, Longitude: 79° - 2' - 36.978"W

Datum (circle one): NAD27 (Preferred) NAD83 WGS84, Other: \_\_\_\_\_

12. Ownership and Access: (Who owns site or controls access? Give name and address.) Boy Bonesburg  
985 Garnett Shortcut Rd Berlin, PA 15530

13. Time (military) & Temperature: Start Time 20:40 h Stop Time 01:45 h Total Minutes: 305

Start Temp. 19.2 °C End Temp. 19.3 °C HUMIDITY  
START-98 END-100

14. General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;  
Steady Rain; Thunderstorms; Snow; Other: \_\_\_\_\_

15. General Wind Conditions (circle one): Calm, Breezy (Leaves Rustling), Windy (trees swaying).

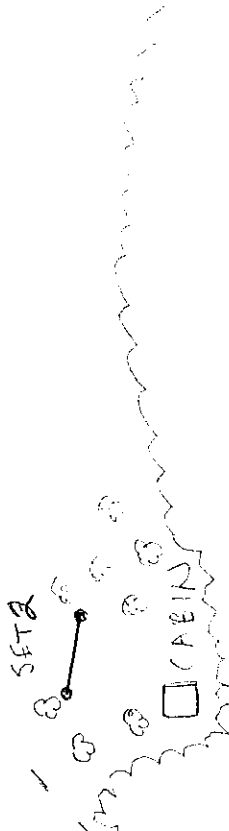
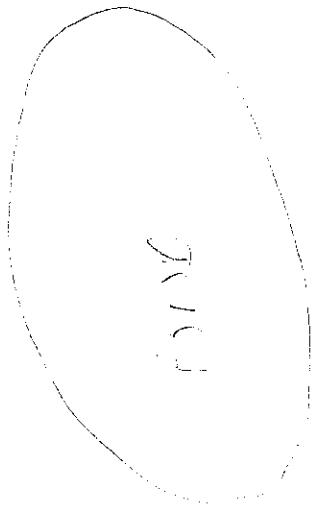
16. Capture Setup at Site:

Set #	Type	Count	Dimensions	Description	TOTAL AREA (m)
1	Nets	4	12m x 2.6m	Stacked over trail	124.8 sq. m.
1	NETS	2	9m x 2.6m	STACKED IN FORESTED EDGE OPENING	46.8
2	NETS	4	9m x 2.6m	STACKED OVER TRAIL	93.6

Total Capture Area: 140.4 sq. m

→→

11/29/86



VEG. NOTES

LINEAR, FORESTED CORRIDOR DOMINATED BY BLACK BIRCH, RED MAPLE, SOME RED OAKS, BLACK CHERRY, SOME SHAGBARK HICKORY. SPARSE TO MODERATE UNDERSTORY MOSTLY WOODLAND FERNS, SPICE BUSH, + WITCH HAZEL

SET 1

TRAIL

FOREST

GARRETT STATE CUT

11/29/86



(Site Survey Record - Continued)

Site Name/No.:

(SITE 11) (S11)

Date: 30 JULY 08

17. Describe habitat 150 m around site: (topography and vegetation including dominant tree species.)

MATURE, MIXED-STAGE POLE ADJACENT TO GRASSY/HAY AG-FIELDS WITH ONE POND AND SOME WETLANDS. DOMINANT VEGETATION INCLUDES BL. LOCUST, RED MAPLE, HEMLOCK, BL. BIRCH, CHERRY. SPARSE UNDERSTORY OF WOODLAND FERNS, WITCH HAZEL.

18. Was reproductive status checked? ☒ YES / NO (if "NO" only enter numbers in Total columns)

## \*CAPTURE RESULTS

Species	Number of Adult Females				No. Juv. Fem.	Total No. Fem.	Number of Adult Males		No. Juv. Male	Total No. Males	Species Totals
	NR	PG	L	PL			SCR	NR			
<i>Eptesicus fuscus</i>	2		1			3	2	1	1	4	7
<i>Myotis lucifugus</i>	1			111		4		1		1	5
<i>Myotis septentrionalis</i>								1		1	1
<i>Myotis leibii</i>											
<i>Myotis sodalis</i>											
<i>Eptesicus fuscus</i>							1			1	1
<i>Pipistrellus subflavus</i>											
<i>Lasiurus borealis</i>											
<i>Lasiurus cinereus</i>											
<i>Lasionycteris noctivagans</i>											
Other - specify:											
Other - specify:											
Reproductive Status: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen. *Complete Measurement and Capture Data Form for all: (1) <i>Myotis sodalis</i> , (2) <i>Myotis leibii</i> , (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA.											Grand Total 7

19. BAT DETECTORS &amp; OTHER MONITORING DEVICES: Tallies of bat passes / hour. One to 5 hours required for Indiana bat hibernacula surveys. Monitor one hour after 22:00 hrs when trapping/netting hibernacula and 5 hours when only monitoring with bat detectors, night vision or infrared device (when site can not be trapped/netted). Describe procedure &amp; equipment used in remarks.

1 <sup>st</sup> hour	2 <sup>nd</sup> hour	3 <sup>rd</sup> hour	4 <sup>th</sup> hour	5 <sup>th</sup> hour
Start Time:	Start Time:	Start Time:	Start Time:	Start Time:
End Time:	End Time:	End Time:	End Time:	End Time:
Tallies:	Tallies:	Tallies:	Tallies:	Tallies:

## 20. REMARKS

- 1<sup>ST</sup> BAT OBSERVED @ 20:45 - MODERATE ACTIVITY  
? LITTLE BROWN CAUGHT & ESCAPED IN SET 2 @ 21:30 - ESCAPE WHILE LOWERING NET.  
CAPTURE @ 10M IN NET. ACTIVITY DECREASED SIGNIFICANTLY AFTER 23:00 HRS  
• INCIDENTAL CAPTURE - FLYING SQUIRREL AT 10:30

**Bat Measurement and Capture Data Form**

(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: <u>(SITE 11) (S11)</u>		Date: <u>30 JULY 08</u>		Set No. Captured In:		Name of Person Identifying the Bat: <u>S. PERNICK</u>				*Capture Number: <u>01</u>				
Height in meters captured above ground surface: <u>4</u> m		Body Measurements (grams and millimeters)					Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)		
Species <u>M. lucif</u>	Sex <u>M</u>	Age <u>A</u>	Repro. Condition <u>NR</u>	Wt. (g) <u>7</u>	Ear <u>13</u>	Tragus <u>6</u>	Fore- arm <u>38</u>	Hind Foot <u>8</u>	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right	
Time of Capture <u>21:30</u>	Photo Taken <u>Yes</u> / No		Remarks: <u>Bat fleas present.</u>											
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen														
Site Name Or Number: <u>(SITE 11) (S11)</u>		Date: <u>30 JULY 08</u>		Set No. Captured In: <u>2</u>		Name of Person Identifying the Bat: <u>S. PERNICK</u>				*Capture Number: <u>02</u>				
Height in meters captured above ground surface: <u>2</u> m		Body Measurements (grams and millimeters)					Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)		
Species <u>M. LUCI.</u>	Sex <u>F</u>	Age <u>AD.</u>	Repro. Condition <u>NR</u>	Wt. (g) <u>7.0</u>	Ear <u>14</u>	Tragus <u>5</u>	Fore- arm <u>37</u>	Hind Foot <u>8</u>	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right	
Time of Capture <u>22:15</u>	Photo Taken <u>Yes</u> / No		Remarks: <u>BAT FLEAS</u>											
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen														
Site Name Or Number: <u>(SITE 11) (S11)</u>		Date: <u>30 JULY 08</u>		Set No. Captured In: <u>2</u>		Name of Person Identifying the Bat: <u>S. PERNICK</u>				*Capture Number: <u>03</u>				
Height in meters captured above ground surface: <u>4</u> m		Body Measurements (grams and millimeters)					Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)		
Species <u>E. FUSCUS</u>	Sex <u>M</u>	Age <u>AD.</u>	Repro. Condition <u>SCR</u>	Wt. (g) <u>20.5</u>	Ear <u>14</u>	Tragus <u>5</u>	Fore- arm <u>45</u>	Hind Foot <u>9</u>	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right	
Time of Capture <u>22:30</u>	Photo Taken <u>Yes</u> / No		Remarks:											

\*Capture Number = number in sequence by site.



**Bat Measurement and Capture Data Form**(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: (SITE 11) (S11)				Date: 30 JULY 08				Set No. Captured In: 2		Name of Person Identifying the Bat: S. PERNICK				*Capture Number: 04		
Height in meters captured above ground surface: 1 m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species M. LUCI.	Sex F	Age AD	Repro. Condition PL	Wt. (g) 7.5	Ear 13	Tragus 5	Fore-arm 38	Hind Foot 8	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right			
Time of Capture 22:30		Photo Taken <input checked="" type="checkbox"/> Yes / <input type="checkbox"/> No		Remarks:												
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen																
Site Name Or Number: (SITE 11) S11				Date: 30 JULY 08				Set No. Captured In: 2		Name of Person Identifying the Bat: S. PERNICK				*Capture Number: 05		
Height in meters captured above ground surface: 3 m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species M. SEPT.	Sex M	Age AD.	Repro. Condition NR	Wt. (g) 6.5	Ear 17	Tragus 10	Fore-arm 35	Hind Foot 8	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right			
Time of Capture 01:10		Photo Taken <input checked="" type="checkbox"/> Yes / <input type="checkbox"/> No		Remarks:												
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen																
Site Name Or Number: (SITE 11) (S11)				Date: 30 JULY 08				Set No. Captured In: 2		Name of Person Identifying the Bat: S. PERNICK				*Capture Number: 06		
Height in meters captured above ground surface: 3 m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species M. LUCI.	Sex F	Age AD.	Repro. Condition PL	Wt. (g) 10.0	Ear 13	Tragus 5	Fore-arm 38	Hind Foot 8	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right			
Time of Capture 01:40		Photo Taken <input checked="" type="checkbox"/> Yes / <input type="checkbox"/> No		Remarks: BAT FLEAS												

\*Capture Number = number in sequence by site.

**Bat Measurement and Capture Data Form**(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: (SITE 11) SW				Date: 30 JULY 08				Set No. Captured In: 2		Name of Person Identifying the Bat: S. PERNICK				*Capture Number: 07		
Height in meters captured above ground surface: 3 m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species M. LUCI.		Sex F	Age AD.	Repro. Condition PL	Wt. (g) 7.0	Ear 13	Tragus 5	Fore- arm 38	Hind Foot 8	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right		
Time of Capture 01:40		Photo Taken (Yes) / No		Remarks:												
Repro. Condition: NR=nonreproductive, PG=pregnant, L=lactating, PL=post lactating, SCR=scrotal/epididymis swollen																
Site Name Or Number:				Date:				Set No. Captured In:		Name of Person Identifying the Bat:				*Capture Number:		
Height in meters captured above ground surface: m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species		Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore- arm	Hind Foot	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right		
Time of Capture		Photo Taken Yes / No		Remarks:												
Repro. Condition: NR=nonreproductive, PG=pregnant, L=lactating, PL=post lactating, SCR=scrotal/epididymis swollen																
Site Name Or Number:				Date:				Set No. Captured In:		Name of Person Identifying the Bat:				*Capture Number:		
Height in meters captured above ground surface: m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species		Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore- arm	Hind Foot	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right		
Time of Capture		Photo Taken Yes / No		Remarks:												

\*Capture Number = number in sequence by site.



BAT NETTING/TRAPPING SITE SURVEY RECORD

Page 1 of 2

1. Survey Date: 7 AUG 08 2. Company Name: KIMBALL
3. Reporter: S. Pernick 4. Assistants: S. Toki, K. Eismont
5. Site Name and/or Number: (Site 11) S11
6. Site is (circle one): hibernation site summer habitat
- 7a. If hibernation site circle one: limestone mine, coal mine, limestone cave, sandstone cave, RR tunnel,  
other structure, describe - \_\_\_\_\_
- 7b. If summer habitat, describe area being sampled (e.g. forested stream or forest clearing with stream):  
Forested Trail + Forest Edge within forested corridor
8. County: Somerset 9. 7.5' Quad.: Mundock
10. Was site GPS'd (required)? YES NO Set 01 39° 56' 23.735"N 79° 2' 40.080"W  
Set 02 \_\_\_\_\_
11. Geographic Coordinates (D-M-S): Latitude: 39° - 56' - 20.940"N, Longitude: 79° - 2' - 36.978"W  
Datum (circle one): NAD27 (Preferred), NAD83, WGS84, Other: \_\_\_\_\_
12. Ownership and Access: (Who owns site or controls access? Give name and address.) Boy Barnesburg  
985 Garrett Shortcut Rd Berlin, PA 15530
13. Time (military) & Temperature: Start Time 20:20 h Stop Time 01:45 h Total Minutes: 325  
Start Temp. 17.0 °C End Temp. 12.8 °C Humidity  
Start: 82.50 End: 99%
14. General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;  
Steady Rain; Thunderstorms; Snow; Other: \_\_\_\_\_
15. General Wind Conditions (circle one): Calm, Breezy (Leaves Rustling), Windy (trees swaying).

16. Capture Setup at Site:

Set #	Type	Count	Dimensions	Description	TOTAL AREA (m)
<u>1</u>	<u>Nets</u>	<u>4</u>	<u>12m x 2.6m</u>	<u>Stacked over trail</u>	<u>124.8 sq. m</u>
<u>1</u>	<u>Nets</u>	<u>2</u>	<u>9m x 2.6m</u>	<u>stacked over trail</u>	<u>46.8</u>
<u>2</u>	<u>Nets</u>	<u>4</u>	<u>9m x 2.6m</u>	<u>stacked in forested edge openings</u>	<u>93.6</u>

Total Capture Area: 140.4 sq. m

See Site Diagram  
from Previous Night



(Site Survey Record – Continued)

Site Name/No.:

(Site 11) S11

Date: 7 AUG 08

17. Describe habitat 150 m around site: (topography and vegetation including dominant tree species.)

Mature, mixed-stage pole adjacent to grassy/hay ag fields with one pond and some wetlands. Dominant vegetation includes bl. locust, red maple, hemlock, bl. birch, cherry, sparse understory of woodland ferns, witchhazel.

18. Was reproductive status checked? YES / NO (if "NO" only enter numbers in Total columns)

## \*CAPTURE RESULTS

Species	Number of Adult Females				No. Juv. Fem.	Total No. Fem.	Number of Adult Males		No. Juv. Male	Total No. Males	Species Totals
	NR	PG	L	PL			SCR	NR			
<i>Eptesicus fuscus</i>	2		1			3	2	1	1	4	7
<i>Myotis lucifugus</i>								2		2	2
<i>Myotis septentrionalis</i>											
<i>Myotis leibii</i>											
<i>Myotis sodalis</i>											
<i>Eptesicus fuscus</i>								1		1	1
<i>Pipistrellus subflavus</i>											
<i>Lasiurus borealis</i>											
<i>Lasiurus cinereus</i>											
<i>Lasionycteris noctivagans</i>											
Other – specify:											
Other – specify:											
Reproductive Status: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen. *Complete Measurement and Capture Data Form for all: (1) <i>Myotis sodalis</i> , (2) <i>Myotis leibii</i> , (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA.											Grand Total 3

19. BAT DETECTORS &amp; OTHER MONITORING DEVICES: Tallies of bat passes / hour. One to 5 hours required for Indiana bat hibernacula surveys. Monitor one hour after 22:00 hrs when trapping/netting hibernacula and 5 hours when only monitoring with bat detectors, night vision or infrared device (when site can not be trapped/netted). Describe procedure &amp; equipment used in remarks.

1 <sup>st</sup> hour	2 <sup>nd</sup> hour	3 <sup>rd</sup> hour	4 <sup>th</sup> hour	5 <sup>th</sup> hour
Start Time:	Start Time:	Start Time:	Start Time:	Start Time:
End Time:	End Time:	End Time:	End Time:	End Time:
Tallies:	Tallies:	Tallies:	Tallies:	Tallies:

## 20. REMARKS

1st bat observed at 20:45. Activity on MONITOR<sup>R</sup> DECREASED SIGNIFICANTLY AFTER 21:45. ONLY SPORADIC & WITH LESS FREQUENCY

**Bat Measurement and Capture Data Form**

(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: <u>S11 (Site 11)</u>		Date: <u>8/7/08</u>		Set No. Captured In: <u>1</u>		Name of Person Identifying the Bat: <u>Steve Pernick</u>		*Capture Number: <u>01</u>					
Height in meters captured above ground surface: <u>2</u> m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)			
Species <u>E. fuscus</u>	Sex <u>M</u>	Age <u>A</u>	Repro. Condition <u>NR</u>	Wt. (g) <u>13</u>	Ear <u>15</u>	Tragus <u>6</u>	Fore- arm <u>44</u>	Hind Foot <u>9</u>	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right
Time of Capture <u>27:30</u>		Photo Taken <u>Yes</u> / No		Remarks: <u>DAMAGED TRAGUS (RIGHT EAR). MITES PRESENT</u>									
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen													
Site Name Or Number: <u>S11 (Site 11)</u>		Date: <u>7 AUG 08</u>		Set No. Captured In: <u>2</u>		Name of Person Identifying the Bat: <u>S. Pernick</u>		*Capture Number: <u>02</u>					
Height in meters captured above ground surface: <u>4</u> m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)			
Species <u>M. lucii</u>	Sex <u>M</u>	Age <u>A</u>	Repro. Condition <u>NR</u>	Wt. (g) <u>65</u>	Ear <u>13</u>	Tragus <u>7</u>	Fore- arm <u>37</u>	Hind Foot <u>8</u>	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right
Time of Capture <u>00:30</u>		Photo Taken <u>Yes</u> / No		Remarks: <u>Hair and Tissue sample taken</u>									
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen													
Site Name Or Number: <u>S11 (Site 11)</u>		Date: <u>7 AUG 08</u>		Set No. Captured In: <u>1</u>		Name of Person Identifying the Bat: <u>S. Pernick</u>		*Capture Number: <u>03</u>					
Height in meters captured above ground surface: <u>2</u> m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)			
Species <u>M. lucii</u>	Sex <u>M</u>	Age <u>A</u>	Repro. Condition <u>NR</u>	Wt. (g) <u>65</u>	Ear <u>14</u>	Tragus <u>7</u>	Fore- arm <u>36</u>	Hind Foot <u>6</u>	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right
Time of Capture <u>00:35</u>		Photo Taken <u>Yes</u> / No		Remarks: <u>Hair and Tissue sample taken</u>									

\*Capture Number = number in sequence by site.





**Photograph 29:** Site 11 Set 1




**Photograph 30:** Site 11 Set 2

**US 219 IMPROVEMENT  
PROJECT  
S.R. 6219 SECTION 020  
MEYERSDALE TO SOMERSET  
SOMERSET COUNTY, PENNSYLVANIA**


**MIST NET SURVEY  
FOR THE  
INDIANA BAT  
(*Myotis sodalis*)**


**SITE 11**


**Legend**

 Mist Net Survey Site

**Surface Water Features**


 Ephemeral

 Intermittent


 Perennial


 Surface Drainage Channel


 Wetlands


 Wetland Open Ends

**Mapping Features**

 Area of Detailed Investigation  
(LRK 2007/2008)


 Required R-O-W

 Structures


 Cell Tower

 Railroad


 Treeline

 Unimproved Roads / Trails

 Roadways

 Contours


**Land Use**


 Low Density Residential

 Successional Rangeland


 Transitional


 Water


 Barren Land


 Agricultural Land


 Grassland

 Forest

 Urban

 Roadway

 Miscellaneous

 Alignment and Stations

1

0 50 100 200 Feet

1 inch equals 200 feet

JRG 12/22/2008



## BAT NETTING/TRAPPING SITE SURVEY RECORD

1. Survey Date: 7/23/08 2. Company Name: Kimball
3. Reporter: Steve Bernick 4. Assistants: Eric Lange, DENNIS MACGRAW
5. Site Name and/or Number: S12 (SITE 12) 13
6. Site is (circle one): hibernation site summer habitat
- 7a. If hibernation site circle one: limestone mine, coal mine, limestone cave, sandstone cave, RR tunnel,  
other structure, describe - \_\_\_\_\_

7b. If summer habitat, describe area being sampled (e.g. forested stream or forest clearing with stream):

FORESTED, MIXED-STAGE, MATURE-POLE

8. County: SOMERSET 9. 7.5' Quad.: Murdock
10. Was site GPS'd (required)? YES - NO
11. Geographic Coordinates (D-M-S): Latitude: 39° 57' 7.118"N Longitude: 79° 2' 40.798"W  
Set 01 Set 02 Set 03 Set 04 Set 05 Set 06 Set 07 Set 08 Set 09 Set 10 Set 11 Set 12 Set 13 Set 14 Set 15 Set 16 Set 17 Set 18 Set 19 Set 20 Set 21 Set 22 Set 23 Set 24 Set 25 Set 26 Set 27 Set 28 Set 29 Set 30 Set 31 Set 32 Set 33 Set 34 Set 35 Set 36 Set 37 Set 38 Set 39 Set 40 Set 41 Set 42 Set 43 Set 44 Set 45 Set 46 Set 47 Set 48 Set 49 Set 50 Set 51 Set 52 Set 53 Set 54 Set 55 Set 56 Set 57 Set 58 Set 59 Set 60 Set 61 Set 62 Set 63 Set 64 Set 65 Set 66 Set 67 Set 68 Set 69 Set 70 Set 71 Set 72 Set 73 Set 74 Set 75 Set 76 Set 77 Set 78 Set 79 Set 80 Set 81 Set 82 Set 83 Set 84 Set 85 Set 86 Set 87 Set 88 Set 89 Set 90 Set 91 Set 92 Set 93 Set 94 Set 95 Set 96 Set 97 Set 98 Set 99 Set 100 Set 101 Set 102 Set 103 Set 104 Set 105 Set 106 Set 107 Set 108 Set 109 Set 110 Set 111 Set 112 Set 113 Set 114 Set 115 Set 116 Set 117 Set 118 Set 119 Set 120 Set 121 Set 122 Set 123 Set 124 Set 125 Set 126 Set 127 Set 128 Set 129 Set 130 Set 131 Set 132 Set 133 Set 134 Set 135 Set 136 Set 137 Set 138 Set 139 Set 140 Set 141 Set 142 Set 143 Set 144 Set 145 Set 146 Set 147 Set 148 Set 149 Set 150 Set 151 Set 152 Set 153 Set 154 Set 155 Set 156 Set 157 Set 158 Set 159 Set 160 Set 161 Set 162 Set 163 Set 164 Set 165 Set 166 Set 167 Set 168 Set 169 Set 170 Set 171 Set 172 Set 173 Set 174 Set 175 Set 176 Set 177 Set 178 Set 179 Set 180 Set 181 Set 182 Set 183 Set 184 Set 185 Set 186 Set 187 Set 188 Set 189 Set 190 Set 191 Set 192 Set 193 Set 194 Set 195 Set 196 Set 197 Set 198 Set 199 Set 200 Set 201 Set 202 Set 203 Set 204 Set 205 Set 206 Set 207 Set 208 Set 209 Set 210 Set 211 Set 212 Set 213 Set 214 Set 215 Set 216 Set 217 Set 218 Set 219 Set 220 Set 221 Set 222 Set 223 Set 224 Set 225 Set 226 Set 227 Set 228 Set 229 Set 230 Set 231 Set 232 Set 233 Set 234 Set 235 Set 236 Set 237 Set 238 Set 239 Set 240 Set 241 Set 242 Set 243 Set 244 Set 245 Set 246 Set 247 Set 248 Set 249 Set 250 Set 251 Set 252 Set 253 Set 254 Set 255 Set 256 Set 257 Set 258 Set 259 Set 260 Set 261 Set 262 Set 263 Set 264 Set 265 Set 266 Set 267 Set 268 Set 269 Set 270 Set 271 Set 272 Set 273 Set 274 Set 275 Set 276 Set 277 Set 278 Set 279 Set 280 Set 281 Set 282 Set 283 Set 284 Set 285 Set 286 Set 287 Set 288 Set 289 Set 290 Set 291 Set 292 Set 293 Set 294 Set 295 Set 296 Set 297 Set 298 Set 299 Set 300 Set 301 Set 302 Set 303 Set 304 Set 305 Set 306 Set 307 Set 308 Set 309 Set 310 Set 311 Set 312 Set 313 Set 314 Set 315 Set 316 Set 317 Set 318 Set 319 Set 320 Set 321 Set 322 Set 323 Set 324 Set 325 Set 326 Set 327 Set 328 Set 329 Set 330 Set 331 Set 332 Set 333 Set 334 Set 335 Set 336 Set 337 Set 338 Set 339 Set 340 Set 341 Set 342 Set 343 Set 344 Set 345 Set 346 Set 347 Set 348 Set 349 Set 350 Set 351 Set 352 Set 353 Set 354 Set 355 Set 356 Set 357 Set 358 Set 359 Set 360 Set 361 Set 362 Set 363 Set 364 Set 365 Set 366 Set 367 Set 368 Set 369 Set 370 Set 371 Set 372 Set 373 Set 374 Set 375 Set 376 Set 377 Set 378 Set 379 Set 380 Set 381 Set 382 Set 383 Set 384 Set 385 Set 386 Set 387 Set 388 Set 389 Set 390 Set 391 Set 392 Set 393 Set 394 Set 395 Set 396 Set 397 Set 398 Set 399 Set 400 Set 401 Set 402 Set 403 Set 404 Set 405 Set 406 Set 407 Set 408 Set 409 Set 410 Set 411 Set 412 Set 413 Set 414 Set 415 Set 416 Set 417 Set 418 Set 419 Set 420 Set 421 Set 422 Set 423 Set 424 Set 425 Set 426 Set 427 Set 428 Set 429 Set 430 Set 431 Set 432 Set 433 Set 434 Set 435 Set 436 Set 437 Set 438 Set 439 Set 440 Set 441 Set 442 Set 443 Set 444 Set 445 Set 446 Set 447 Set 448 Set 449 Set 450 Set 451 Set 452 Set 453 Set 454 Set 455 Set 456 Set 457 Set 458 Set 459 Set 460 Set 461 Set 462 Set 463 Set 464 Set 465 Set 466 Set 467 Set 468 Set 469 Set 470 Set 471 Set 472 Set 473 Set 474 Set 475 Set 476 Set 477 Set 478 Set 479 Set 480 Set 481 Set 482 Set 483 Set 484 Set 485 Set 486 Set 487 Set 488 Set 489 Set 490 Set 491 Set 492 Set 493 Set 494 Set 495 Set 496 Set 497 Set 498 Set 499 Set 500 Set 501 Set 502 Set 503 Set 504 Set 505 Set 506 Set 507 Set 508 Set 509 Set 510 Set 511 Set 512 Set 513 Set 514 Set 515 Set 516 Set 517 Set 518 Set 519 Set 520 Set 521 Set 522 Set 523 Set 524 Set 525 Set 526 Set 527 Set 528 Set 529 Set 530 Set 531 Set 532 Set 533 Set 534 Set 535 Set 536 Set 537 Set 538 Set 539 Set 540 Set 541 Set 542 Set 543 Set 544 Set 545 Set 546 Set 547 Set 548 Set 549 Set 550 Set 551 Set 552 Set 553 Set 554 Set 555 Set 556 Set 557 Set 558 Set 559 Set 560 Set 561 Set 562 Set 563 Set 564 Set 565 Set 566 Set 567 Set 568 Set 569 Set 570 Set 571 Set 572 Set 573 Set 574 Set 575 Set 576 Set 577 Set 578 Set 579 Set 580 Set 581 Set 582 Set 583 Set 584 Set 585 Set 586 Set 587 Set 588 Set 589 Set 590 Set 591 Set 592 Set 593 Set 594 Set 595 Set 596 Set 597 Set 598 Set 599 Set 600 Set 601 Set 602 Set 603 Set 604 Set 605 Set 606 Set 607 Set 608 Set 609 Set 610 Set 611 Set 612 Set 613 Set 614 Set 615 Set 616 Set 617 Set 618 Set 619 Set 620 Set 621 Set 622 Set 623 Set 624 Set 625 Set 626 Set 627 Set 628 Set 629 Set 630 Set 631 Set 632 Set 633 Set 634 Set 635 Set 636 Set 637 Set 638 Set 639 Set 640 Set 641 Set 642 Set 643 Set 644 Set 645 Set 646 Set 647 Set 648 Set 649 Set 650 Set 651 Set 652 Set 653 Set 654 Set 655 Set 656 Set 657 Set 658 Set 659 Set 660 Set 661 Set 662 Set 663 Set 664 Set 665 Set 666 Set 667 Set 668 Set 669 Set 670 Set 671 Set 672 Set 673 Set 674 Set 675 Set 676 Set 677 Set 678 Set 679 Set 680 Set 681 Set 682 Set 683 Set 684 Set 685 Set 686 Set 687 Set 688 Set 689 Set 690 Set 691 Set 692 Set 693 Set 694 Set 695 Set 696 Set 697 Set 698 Set 699 Set 700 Set 701 Set 702 Set 703 Set 704 Set 705 Set 706 Set 707 Set 708 Set 709 Set 710 Set 711 Set 712 Set 713 Set 714 Set 715 Set 716 Set 717 Set 718 Set 719 Set 720 Set 721 Set 722 Set 723 Set 724 Set 725 Set 726 Set 727 Set 728 Set 729 Set 730 Set 731 Set 732 Set 733 Set 734 Set 735 Set 736 Set 737 Set 738 Set 739 Set 740 Set 741 Set 742 Set 743 Set 744 Set 745 Set 746 Set 747 Set 748 Set 749 Set 750 Set 751 Set 752 Set 753 Set 754 Set 755 Set 756 Set 757 Set 758 Set 759 Set 760 Set 761 Set 762 Set 763 Set 764 Set 765 Set 766 Set 767 Set 768 Set 769 Set 770 Set 771 Set 772 Set 773 Set 774 Set 775 Set 776 Set 777 Set 778 Set 779 Set 780 Set 781 Set 782 Set 783 Set 784 Set 785 Set 786 Set 787 Set 788 Set 789 Set 790 Set 791 Set 792 Set 793 Set 794 Set 795 Set 796 Set 797 Set 798 Set 799 Set 800 Set 801 Set 802 Set 803 Set 804 Set 805 Set 806 Set 807 Set 808 Set 809 Set 810 Set 811 Set 812 Set 813 Set 814 Set 815 Set 816 Set 817 Set 818 Set 819 Set 820 Set 821 Set 822 Set 823 Set 824 Set 825 Set 826 Set 827 Set 828 Set 829 Set 830 Set 831 Set 832 Set 833 Set 834 Set 835 Set 836 Set 837 Set 838 Set 839 Set 840 Set 841 Set 842 Set 843 Set 844 Set 845 Set 846 Set 847 Set 848 Set 849 Set 850 Set 851 Set 852 Set 853 Set 854 Set 855 Set 856 Set 857 Set 858 Set 859 Set 860 Set 861 Set 862 Set 863 Set 864 Set 865 Set 866 Set 867 Set 868 Set 869 Set 870 Set 871 Set 872 Set 873 Set 874 Set 875 Set 876 Set 877 Set 878 Set 879 Set 880 Set 881 Set 882 Set 883 Set 884 Set 885 Set 886 Set 887 Set 888 Set 889 Set 890 Set 891 Set 892 Set 893 Set 894 Set 895 Set 896 Set 897 Set 898 Set 899 Set 900 Set 901 Set 902 Set 903 Set 904 Set 905 Set 906 Set 907 Set 908 Set 909 Set 910 Set 911 Set 912 Set 913 Set 914 Set 915 Set 916 Set 917 Set 918 Set 919 Set 920 Set 921 Set 922 Set 923 Set 924 Set 925 Set 926 Set 927 Set 928 Set 929 Set 930 Set 931 Set 932 Set 933 Set 934 Set 935 Set 936 Set 937 Set 938 Set 939 Set 940 Set 941 Set 942 Set 943 Set 944 Set 945 Set 946 Set 947 Set 948 Set 949 Set 950 Set 951 Set 952 Set 953 Set 954 Set 955 Set 956 Set 957 Set 958 Set 959 Set 960 Set 961 Set 962 Set 963 Set 964 Set 965 Set 966 Set 967 Set 968 Set 969 Set 970 Set 971 Set 972 Set 973 Set 974 Set 975 Set 976 Set 977 Set 978 Set 979 Set 980 Set 981 Set 982 Set 983 Set 984 Set 985 Set 986 Set 987 Set 988 Set 989 Set 990 Set 991 Set 992 Set 993 Set 994 Set 995 Set 996 Set 997 Set 998 Set 999 Set 1000

Datum (circle one): NAD27 (Preferred), NAD83, WGS84, Other: \_\_\_\_\_

12. Ownership and Access: (Who owns site or controls access? Give name and address.) Randy Airesman  
185 Dusty Trail Lane Berlin, PA 15530

13. Time (military) & Temperature: Start Time 20:38 h Stop Time 01:45 h Total Minutes: 307  
Start Temp. 18 °C End Temp. 15 °C HUMIDITY START - 92°  
END - 99.5°

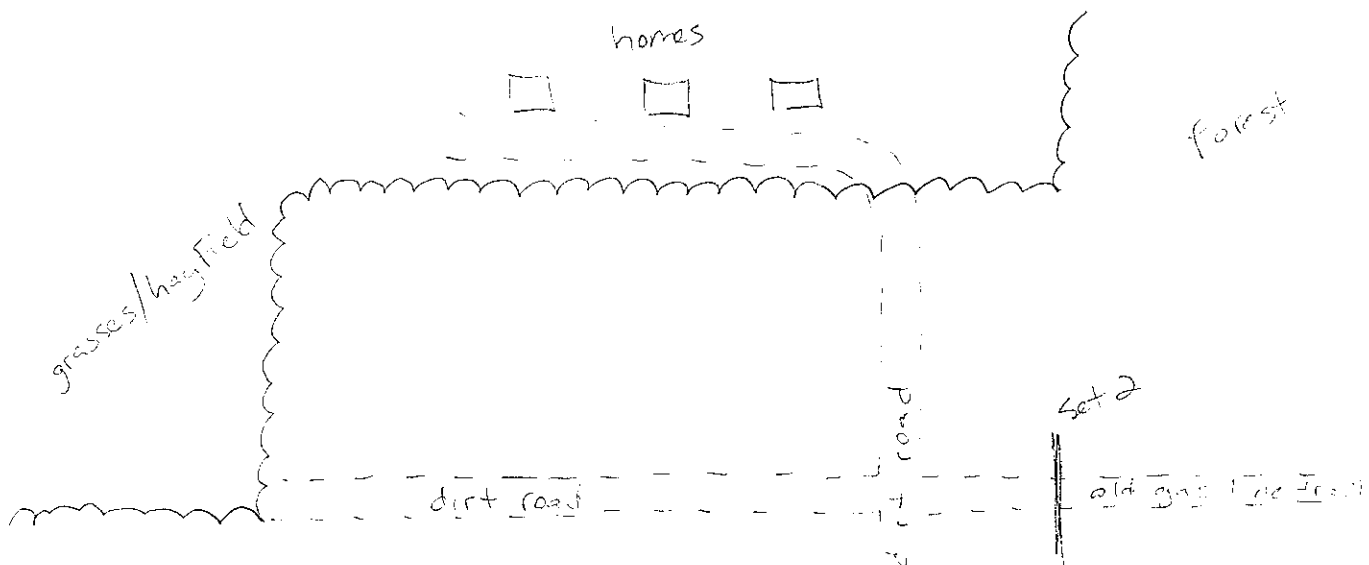
14. General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;  
Steady Rain; Thunderstorms; Snow; Other: \_\_\_\_\_

15. General Wind Conditions (circle one): Calm; Breezy (Leaves Rustling); Windy (trees swaying).

## 16. Capture Setup at Site:

5. Capture Setup at Site:

Set #	Type	Count	Dimensions	Description	TOTAL AREA (m)
1	Nets	1	12m x 2.6m	Stacked over trail	124.8 sq. m
1	NETS	2	6m x 2.6m	STACKED OVER TRAIL ADJACENT TO ROAD	31.2
2	NETS	2	9m x 2.6m	STACKED OVER OLD GASLINE ADJACENT TO RD.	46.8
3	NETS	3	9m x 2.6m	STACKED OVER MAIN ACCESS ROAD	70.2



set 3

forest

forest

set 1

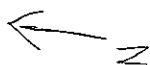
pond



WETLAND

EPH.

STREAM



loghouse  
and stone quarry



(Site Survey Record - Continued) Site Name/No.: Site 12 S12 Date: 23 JULY 08

17. Describe habitat 150 m around site: (topography and vegetation including dominant tree species.)  
MIXED STAGE, MATURE-POLE FOREST COMPOSED OF RED OAK, WH. OAK, BLACK BIRCH, BLACK CHERRY, RED MAPLE, CUCUMBER MAGNOLIA, WITH UNDERSTORY OF SPICEBUSH, SOME M.F. ROSE. SOME WL'S + ONE PERN. STREAM ~150m TO S.

18. Was reproductive status checked? (YES) / NO (if "NO" only enter numbers in **Total** columns)

## \*CAPTURE RESULTS

Species	Number of Adult Females				No. Juv. Fem.	Total No. Fem.	Number of Adult Males		No. Juv. Male	Total No. Males	Species Totals
	NR	PG	L	PL			SCR	NR			
<i>Eplesicus fuscus</i>	2		1			3	2	1	1	4	7
<i>Myotis lucifugus</i>			1			1		11		2	3
<i>Myotis septentrionalis</i>			1			1					1
<i>Myotis leibii</i>											
<i>Myotis sodalis</i>											
<i>Eplesicus fuscus</i>	11		11			5	1	11		4	9
<i>Pipistrellus subflavus</i>											
<i>Lasiurus borealis</i>								1		1	1
<i>Lasiurus cinereus</i>											
<i>Lasionycteris noctivagans</i>											
Other - specify:											
Other - specify:											
Reproductive Status: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen. *Complete Measurement and Capture Data Form for all: (1) <i>Myotis sodalis</i> , (2) <i>Myotis leibii</i> , (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA.											Grand Total 14

19. BAT DETECTORS & OTHER MONITORING DEVICES: Tallies of bat passes / hour. One to 5 hours required for Indiana bat hibernacula surveys. Monitor one hour after 22:00 hrs when trapping/netting hibernacula and 5 hours when only monitoring with bat detectors, night vision or infrared device (when site can not be trapped/netted). Describe procedure & equipment used in remarks.

1 <sup>st</sup> hour	2 <sup>nd</sup> hour	3 <sup>rd</sup> hour	4 <sup>th</sup> hour	5 <sup>th</sup> hour
Start Time:	Start Time:	Start Time:	Start Time:	Start Time:
End Time:	End Time:	End Time:	End Time:	End Time:
Tallies:	Tallies:	Tallies:	Tallies:	Tallies:

## 20. REMARKS:

- 1.) 1<sup>st</sup> BAT OBSERVED AT 20:50 PM  
2.) CALM TO BREEZY CONDITIONS AT 21:50 (NO APPARENT EFFECT ON ACTIVITY)

**Bat Measurement and Capture Data Form**(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: <u>(SITE 12) S12</u>		Date: <u>23 JULY 08</u>		Set No. Captured In: <u>1</u>		Name of Person Identifying the Bat: <u>S. PERNICK</u>		*Capture Number: <u>01</u>					
Height in meters captured above ground surface: <u>3</u> m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)			
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot	Recapture Yes/No		Band Material	Band Color	Band Inscription
<u>M. LUCIFUGUS</u>	<u>M</u>	<u>ADULT</u>	<u>NR</u>	<u>6</u>	<u>13</u>	<u>5</u>	<u>38</u>	<u>7</u>					
Time of Capture	Photo Taken		Remarks:										
<u>21:10</u>	<u>Yes</u> / No												
Repro. Condition: NR=nonreproductive, PG=pregnant, L=lactating, PL=post lactating, SCR=scrotal/epididymis swollen													
Site Name Or Number: <u>S12 (SITE 12)</u>		Date: <u>23 JULY 08</u>		Set No. Captured In: <u>3</u>		Name of Person Identifying the Bat: <u>S. PERNICK</u>		*Capture Number: <u>02</u>					
Height in meters captured above ground surface: <u>3</u> m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)			
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot	Recapture Yes/No		Band Material	Band Color	Band Inscription
<u>E. FUSCUS</u>	<u>F</u>	<u>ADULT</u>	<u>L</u>	<u>18</u>	<u>14</u>	<u>6</u>	<u>47</u>	<u>9</u>					
Time of Capture	Photo Taken		Remarks: <u>INFESTATION OF WING MITES</u>										
<u>21:20</u>	<u>Yes</u> / No												
Repro. Condition: NR=nonreproductive, PG=pregnant, L=lactating, PL=post lactating, SCR=scrotal/epididymis swollen													
Site Name Or Number: <u>(SITE 12) S12</u>		Date: <u>23 JULY 08</u>		Set No. Captured In: <u>3</u>		Name of Person Identifying the Bat: <u>S. PERNICK</u>		*Capture Number: <u>03</u>					
Height in meters captured above ground surface: <u>1</u> m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)			
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot	Recapture Yes/No		Band Material	Band Color	Band Inscription
<u>E. FUSCUS</u>	<u>M</u>	<u>ADULT</u>	<u>NR</u>	<u>15.5</u>	<u>15</u>	<u>6</u>	<u>44</u>	<u>9</u>					
Time of Capture	Photo Taken		Remarks:										
<u>21:50</u>	<u>Yes</u> / No												

\*Capture Number = number in sequence by site.



**Bat Measurement and Capture Data Form**(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: <u>(SITE 12) S12</u>		Date: <u>23 JULY 08</u>		Set No. <u>3</u> Captured In:		Name of Person Identifying the Bat: <u>S. PERNICK</u>		*Capture Number: <u>04</u>					
Height in meters captured above ground surface: <u>1</u> m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)			
Species <u>E. FUSCUS</u>	Sex <u>M</u>	Age <u>ADULT</u>	Repro. Condition <u>NR</u>	Wt. (g) <u>13.5</u>	Ear <u>14</u>	Tragus <u>5</u>	Fore-arm <u>44</u>	Hind Foot <u>9</u>	Recapture Yes/No		Band Material	Band Color	Band Inscription
Time of Capture <u>21:50</u>		Photo Taken <u>Yes</u> / No		Remarks:									
Repro. Condition: NR=nonreproductive, PG=pregnant, L=lactating, PL=post lactating, SCR=scrotal/epididymis swollen													
Site Name Or Number: <u>(SITE 12) S12</u>		Date: <u>23 JULY 08</u>		Set No. <u>3</u> Captured In:		Name of Person Identifying the Bat: <u>S. PERNICK</u>		*Capture Number: <u>05</u>					
Height in meters captured above ground surface: <u>2</u> m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)			
Species <u>E. FUSCUS</u>	Sex <u>M</u>	Age <u>ADULT</u>	Repro. Condition <u>NR</u>	Wt. (g) <u>16.0</u>	Ear <u>15</u>	Tragus <u>5</u>	Fore-arm <u>47</u>	Hind Foot <u>10</u>	Recapture Yes/No		Band Material	Band Color	Band Inscription
Time of Capture <u>21:50</u>		Photo Taken <u>Yes</u> / No		Remarks: <u>TESTES SWOLLEN but not descended.</u>									
Repro. Condition: NR=nonreproductive, PG=pregnant, L=lactating, PL=post lactating, SCR=scrotal/epididymis swollen													
Site Name Or Number: <u>(SITE 12) S12</u>		Date: <u>23 JULY 08</u>		Set No. <u>3</u> Captured In:		Name of Person Identifying the Bat: <u>S. PERNICK</u>		*Capture Number: <u>06</u>					
Height in meters captured above ground surface: <u>3</u> m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)			
Species <u>E. FUSCUS</u>	Sex <u>F</u>	Age <u>ADULT</u>	Repro. Condition <u>NR</u>	Wt. (g) <u>20.0</u>	Ear <u>15</u>	Tragus <u>6</u>	Fore-arm <u>47</u>	Hind Foot <u>9</u>	Recapture Yes/No		Band Material	Band Color	Band Inscription
Time of Capture <u>21:50</u>		Photo Taken <u>Yes</u> / No		Remarks: <u>WING MITES</u>									

\*Capture Number = number in sequence by site.

**Bat Measurement and Capture Data Form**

(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: <u>(SITE 12) S12</u>		Date: <u>23 JULY 08</u>		Set No. <u>3</u> Captured In:		Name of Person Identifying the Bat: <u>S. PERNICK</u>		*Capture Number: <u>07</u>					
Height in meters captured above ground surface: <u>3</u> m		Body Measurements (grams and millimeters)					Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species <u>E. FUSCUS</u>	Sex <u>F</u>	Age <u>ADULT</u>	Repro. Condition <u>L</u>	Wt. (g) <u>17.5</u>	Ear <u>15</u>	Tragus <u>6</u>	Fore-arm <u>48</u>	Hind Foot <u>9</u>	Recapture Yes/No	Band Material	Band Color		Band Inscription
Time of Capture <u>21:55</u>		Photo Taken <input checked="" type="checkbox"/> Yes / No		Remarks: <u>WING MITES</u>									
Repro. Condition: NR=nonreproductive, PG=pregnant, L=lactating, PL=post lactating, SCR=scrotal/epididymis swollen													
Site Name Or Number: <u>(SITE 12) S12</u>		Date: <u>23 JULY 08</u>		Set No. <u>3</u> Captured In:		Name of Person Identifying the Bat: <u>S. PERNICK</u>		*Capture Number: <u>08</u>					
Height in meters captured above ground surface: <u>1</u> m		Body Measurements (grams and millimeters)					Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species <u>E. FUSCUS</u>	Sex <u>F</u>	Age <u>AD.</u>	Repro. Condition <u>L</u>	Wt. (g) <u>18.0</u>	Ear <u>15</u>	Tragus <u>6</u>	Fore-arm <u>45</u>	Hind Foot <u>9</u>	Recapture Yes/No	Band Material	Band Color		Band Inscription
Time of Capture <u>22:38</u>		Photo Taken <input checked="" type="checkbox"/> Yes / No		Remarks: <u>INFESTATION OF WING MITES</u>									
Repro. Condition: NR=nonreproductive, PG=pregnant, L=lactating, PL=post lactating, SCR=scrotal/epididymis swollen													
Site Name Or Number: <u>(SITE 12) S12</u>		Date: <u>23 JULY 08</u>		Set No. <u>E</u> Captured In:		Name of Person Identifying the Bat: <u>S. PERNICK</u>		*Capture Number: <u>09</u>					
Height in meters captured above ground surface: <u>0.5</u> m		Body Measurements (grams and millimeters)					Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species <u>E. FUSCUS</u>	Sex <u>M</u>	Age <u>AD.</u>	Repro. Condition <u>NR</u>	Wt. (g) <u>15</u>	Ear <u>15</u>	Tragus <u>7</u>	Fore-arm <u>47</u>	Hind Foot <u>8</u>	Recapture Yes/No	Band Material	Band Color		Band Inscription
Time of Capture <u>23:15</u>		Photo Taken <input checked="" type="checkbox"/> Yes / No		Remarks:									

\*Capture Number = number in sequence by site.



**Bat Measurement and Capture Data Form**

(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: (SITE 12) S12		Date: 23 JULY 08		Set No. Captured In: 3		Name of Person Identifying the Bat: S. PERNICK		*Capture Number: 10					
Height in meters captured above ground surface: 1 m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)			
Species E. FUSCUS	Sex F	Age AD.	Repro. Condition NR	Wt. (g) 17.5	Ear 16	Tragus 8	Fore- arm 46	Hind Foot 8	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right
Time of Capture 24:00	Photo Taken <input checked="" type="checkbox"/> Yes / No		Remarks: WING MITES										
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen													
Site Name Or Number: (SITE 12) S12		Date: 23 JULY 08		Set No. Captured In: 3		Name of Person Identifying the Bat: S. PERNICK		*Capture Number: 11					
Height in meters captured above ground surface: 3 m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)			
Species L. BOREALIS	Sex M	Age AD.	Repro. Condition NR	Wt. (g) 11.5	Ear 10	Tragus 5	Fore- arm 40	Hind Foot 6	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right
Time of Capture 24:00	Photo Taken <input checked="" type="checkbox"/> Yes / No		Remarks:										
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen													
Site Name Or Number: (SITE 12) S12		Date: 23 JULY 08		Set No. Captured In: 3		Name of Person Identifying the Bat: S. PERNICK		*Capture Number: 12					
Height in meters captured above ground surface: 4 m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)			
Species M. SEPT.	Sex F	Age AD.	Repro. Condition L	Wt. (g) 6.5	Ear 15	Tragus 7	Fore- arm 35	Hind Foot 8	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right
Time of Capture 24:00	Photo Taken <input checked="" type="checkbox"/> Yes / No		Remarks:										

\*Capture Number = number in sequence by site.

**Bat Measurement and Capture Data Form**

(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: <u>(SITE 12) S12</u>		Date: <u>23 JULY 08</u>		Set No. Captured In: <u>2</u>		Name of Person Identifying the Bat: <u>S. PERNICK</u>		*Capture Number: <u>13</u>					
Height in meters captured above ground surface: <u>3</u> m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)			
Species <u>M. LUCIFUGUS</u>	Sex <u>F</u>	Age <u>AD.</u>	Repro. Condition <u>L</u>	Wt. (g) <u>7.5</u>	Ear <u>13</u>	Tragus <u>5</u>	Fore- arm <u>37</u>	Hind Foot <u>7</u>	Recapture Yes/No		Band Material	Band Color	Band Inscription
Time of Capture <u>24:00</u>		Photo Taken <u>(Yes)</u> / No		Remarks: <u>BAT FLEAS</u>									
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen													
Site Name Or Number: <u>(SITE 12) S12</u>		Date: <u>23 JULY 08</u>		Set No. Captured In: <u>2</u>		Name of Person Identifying the Bat: <u>S. PERNICK</u>		*Capture Number: <u>14</u>					
Height in meters captured above ground surface: <u>3</u> m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)			
Species <u>M. LUCIFUGUS</u>	Sex <u>M</u>	Age <u>AD.</u>	Repro. Condition <u>NR</u>	Wt. (g) <u>6.5</u>	Ear <u>13</u>	Tragus <u>6</u>	Fore- arm <u>37</u>	Hind Foot <u>8</u>	Recapture Yes/No		Band Material	Band Color	Band Inscription
Time of Capture <u>01:40</u>		Photo Taken <u>(Yes)</u> / No		Remarks:									
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen													
Site Name Or Number:		Date:		Set No. Captured In:		Name of Person Identifying the Bat:		*Capture Number:					
Height in meters captured above ground surface: m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)			
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore- arm	Hind Foot	Recapture Yes/No		Band Material	Band Color	Band Inscription
Time of Capture		Photo Taken Yes / No		Remarks:									

\*Capture Number = number in sequence by site.



BAT NETTING/TRAPPING SITE SURVEY RECORD

Page 1 of 2

1. Survey Date: 12 AUG 08 2. Company Name: Kimball

3. Reporter: S. Pernick 4. Assistants: K. Eismont

5. Site Name and/or Number: (Site 12) S12

6. Site is (circle one): hibernation site summer habitat

7a. If hibernation site circle one: limestone mine, coal mine, limestone cave, sandstone cave, RR tunnel,  
other structure, describe - \_\_\_\_\_

7b. If summer habitat, describe area being sampled (e.g. forested stream or forest clearing with stream):  
Forested mixed-stage, mature pole

8. County: Somerset 9. 7.5' Quad.: Murdock

10. Was site GPS'd (required)? YES NO  
Set 01  $39^{\circ} 57' 7.118''N$   $79^{\circ} 2' 40.798''W$   
Set 02  $39^{\circ} 57' 6.068''N$   $79^{\circ} 2' 35.106''W$

11. Geographic Coordinates (D-M-S): Latitude: Set 03  $39^{\circ} - 57' - 6.918''N$ , Longitude:  $79^{\circ} - 2' - 37.400''W$

Datum (circle one): NAD27 (Preferred), NAD83, WGS84, Other: \_\_\_\_\_

12. Ownership and Access: (Who owns site or controls access? Give name and address.) Bandy  
Ainsman 185 Dusty Trail In Berlin, PA 15530

13. Time (military) & Temperature: Start Time 20:20 h Stop Time 2140 h Total Minutes: 320

Start Temp. 21 °C End Temp. 17 °C Humidity  
Start - 80  
end - 94

14. General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;  
Steady Rain; Thunderstorms; Snow; Other: \_\_\_\_\_

15. General Wind Conditions (circle one): Calm, Breezy (Leaves Rustling), Windy (trees swaying).

16. Capture Setup at Site:

Set #	Type	Count	Dimensions	Description	TOTAL AREA (m)
1	Nets	4	12m x 2.6m	Stacked over trail	124.8 sq. m
1	Nets	2	6 x 2.6m	stacked over trail adjacent to road	31.2
2	Nets	2	19 x 2.6m	stacked over old gas line adj. to road	46.8
3	Nets	3	9 x 2.6m	stacked over main access road	70.2

Total Capture Area: 148.2 sq. m

See Diagram from  
Previous Night



(Site Survey Record - Continued) Site Name/No.: S12 (Site 12) Date: 6 AUG 08

## 17. Describe habitat 150 m around site: (topography and vegetation including dominant tree species.)

Mixed stage, mature-pole forest composed of red oak, w. oak, black birch, black cherry, red maple, cuc. magnolia, w/ understory of spirebush, some m.f. rose some w.l.s + some fern. stream a son to S.

18. Was reproductive status checked? YES / NO (if "NO" only enter numbers in **Total** columns)

## \*CAPTURE RESULTS

Species	Number of Adult Females				No. Juv. Fem.	Total No. Fem.	Number of Adult Males		No. Juv. Male	Total No. Males	Species Totals
	NR	PG	L	PL			SCR	NR			
<i>Eptesicus fuscus</i>	2		1			3	2	1	1	4	7
<i>Myotis lucifugus</i>								1			1
<i>Myotis septentrionalis</i>											
<i>Myotis leibii</i>											
<i>Myotis sodalis</i>											
<i>Eptesicus fuscus</i>				3		3	1	1		3	7*
<i>Pipistrellus subflavus</i>											
<i>Lasiurus borealis</i>											
<i>Lasiurus cinereus</i>											
<i>Lasionycteris noctivagans</i>											
Other - specify:											
Other - specify:											
Reproductive Status: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen. *Complete Measurement and Capture Data Form for all: (1) <i>Myotis sodalis</i> , (2) <i>Myotis leibii</i> , (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA.											Grand Total 8

Escaped prior to sex determination

## 19. BAT DETECTORS &amp; OTHER MONITORING DEVICES: Tallies of bat passes / hour. One to 5 hours required for Indiana bat hibernacula surveys. Monitor one hour after 22:00 hrs when trapping/netting hibernacula and 5 hours when only monitoring with bat detectors, night vision or infrared device (when site can not be trapped/netted). Describe procedure &amp; equipment used in remarks.

1 <sup>st</sup> hour	2 <sup>nd</sup> hour	3 <sup>rd</sup> hour	4 <sup>th</sup> hour	5 <sup>th</sup> hour
Start Time:	Start Time:	Start Time:	Start Time:	Start Time:
End Time:	End Time:	End Time:	End Time:	End Time:
Tallies:	Tallies:	Tallies:	Tallies:	Tallies:

## 20. REMARKS

1st bat sighting at 21:00

**Bat Measurement and Capture Data Form**(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: <u>S12 (Site 12)</u>		Date: <u>6 AUG 08</u>		Set No. Captured In: <u>3</u>		Name of Person Identifying the Bat: <u>S. Pernick</u>		*Capture Number: <u>01</u>					
Height in meters captured above ground surface: <u>2</u> m		Body Measurements (grams and millimeters)					Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)		
Species <u>E. fuscus</u>	Sex <u>F</u>	Age <u>A</u>	Repro. Condition <u>PL</u>	Wt. (g) <u>21.5</u>	Ear <u>15</u>	Tragus <u>6</u>	Fore-arm <u>47</u>	Hind Foot <u>10</u>	Recapture Yes/No	Band Material		Band Color	Band Inscription
Time of Capture <u>21:00</u>	Photo Taken <u>Yes</u> / No	Remarks: <u>- canines visibly worn</u> <u>- wing nites present (larger reddish variety)</u>											
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen													
Site Name Or Number: <u>S12 (Site 12)</u>		Date: <u>6 AUG 08</u>		Set No. Captured In: <u>3</u>		Name of Person Identifying the Bat: <u>S. Pernick</u>		*Capture Number: <u>02</u>					
Height in meters captured above ground surface: <u>3</u> m		Body Measurements (grams and millimeters)					Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)		
Species <u>E. fuscus</u>	Sex <u>M</u>	Age <u>A</u>	Repro. Condition <u>SCR</u>	Wt. (g) <u>13.0</u>	Ear <u>15</u>	Tragus <u>6</u>	Fore-arm <u>41</u>	Hind Foot <u>8</u>	Recapture Yes/No	Band Material		Band Color	Band Inscription
Time of Capture <u>21:00</u>	Photo Taken <u>Yes</u> / No	Remarks: <u>Dorsal balding around the rump</u>											
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen													
Site Name Or Number: <u>S12 (Site 12)</u>		Date: <u>6 AUG 08</u>		Set No. Captured In: <u>3</u>		Name of Person Identifying the Bat: <u>S. Pernick</u>		*Capture Number: <u>03</u>					
Height in meters captured above ground surface: <u>2</u> m		Body Measurements (grams and millimeters)					Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)		
Species <u>E. fuscus</u>	Sex <u>M</u>	Age <u>A</u>	Repro. Condition <u>NR</u>	Wt. (g) <u>15.5</u>	Ear <u>15</u>	Tragus <u>6</u>	Fore-arm <u>43</u>	Hind Foot <u>8</u>	Recapture Yes/No	Band Material		Band Color	Band Inscription
Time of Capture <u>21:35</u>	Photo Taken <u>Yes</u> / No	Remarks: <u>wing nites present</u>											

\*Capture Number = number in sequence by site.



**Bat Measurement and Capture Data Form**

(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: <u>S12 (S14 12)</u>				Date: <u>6 AUG 08</u>				Set No. Captured In: <u>3</u>		Name of Person Identifying the Bat: <u>S. Pernick</u>				*Capture Number: <u>04</u>		
Height in meters captured above ground surface: <u>2</u> m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species <u>E. fuscus</u>	Sex <u>F</u>	Age <u>A</u>	Repro. Condition <u>PL</u>	Wt. (g) <u>19.5</u>	Ear <u>16</u>	Tragus <u>6</u>	Fore-arm <u>46</u>	Hind Foot <u>10</u>	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right			
Time of Capture <u>21:35</u>		Photo Taken <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Remarks: <u>wing mites present</u>												
Repro. Condition: NR=nonreproductive, PG=pregnant, L=lactating, PL=post lactating, SCR=scrotal/epididymis swollen																
Site Name Or Number: <u>S12 (S14 12)</u>				Date: <u>6 AUG 08</u>				Set No. Captured In: <u>3</u>		Name of Person Identifying the Bat: <u>S. Pernick</u>				*Capture Number: <u>05</u>		
Height in meters captured above ground surface: <u>3</u> m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species <u>E. fuscus</u>	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right			
Time of Capture <u>21:35</u>		Photo Taken Yes / No		Remarks: <u>escaped from net while removing other bat</u>												
Repro. Condition: NR=nonreproductive, PG=pregnant, L=lactating, PL=post lactating, SCR=scrotal/epididymis swollen																
Site Name Or Number: <u>S12 (S14 12)</u>				Date: <u>6 AUG 08</u>				Set No. Captured In: <u>3</u>		Name of Person Identifying the Bat: <u>S. Pernick</u>				*Capture Number: <u>06</u>		
Height in meters captured above ground surface: <u>3</u> m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species <u>M. luc</u>	Sex <u>M</u>	Age <u>A</u>	Repro. Condition <u>NR</u>	Wt. (g) <u>7.0</u>	Ear <u>14</u>	Tragus <u>6</u>	Fore-arm <u>37</u>	Hind Foot <u>8</u>	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right			
Time of Capture <u>21:40</u>		Photo Taken <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Remarks: <u>-bat fleas noted</u> <u>- Hair + Tissue sample taken</u>												

\*Capture Number = number in sequence by site.

30.0  
11.5  
19.5

18.0  
-11.0  
7.0

**Bat Measurement and Capture Data Form**(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: <u>S12 (Site 12)</u>				Date: <u>6 AUG 08</u>		Set No. Captured In: <u>3</u>		Name of Person Identifying the Bat: <u>S. Pernick</u>				*Capture Number: <u>07</u>		
Height in meters captured above ground surface: <u>2</u> m				Body Measurements (grams and millimeters)					Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)
Species <u>E. fuscus</u>	Sex <u>M</u>	Age <u>A</u>	Repro. Condition <u>NR</u>	Wt. (g) <u>15.0</u>	Ear <u>15</u>	Tragus <u>6</u>	Fore- arm <u>45</u>	Hind Foot <u>9</u>	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right	
Time of Capture <u>22:15</u>		Photo Taken <input checked="" type="radio"/> Yes <input type="radio"/> No		Remarks: <u>wing nites present</u>										
Repro. Condition: NR=nonreproductive, PG=pregnant, L=lactating, PL=post lactating, SCR=scrotal/epididymis swollen														
Site Name Or Number: <u>S12 (Site 12)</u>				Date: <u>6 AUG 08</u>		Set No. Captured In: <u>3</u>		Name of Person Identifying the Bat: <u>S. Pernick</u>				*Capture Number: <u>08</u>		
Height in meters captured above ground surface: <u>2</u> m				Body Measurements (grams and millimeters)					Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)
Species <u>E. fuscus</u>	Sex <u>F</u>	Age <u>A</u>	Repro. Condition <u>PL</u>	Wt. (g) <u>21.5</u>	Ear <u>16</u>	Tragus <u>6</u>	Fore- arm <u>52</u>	Hind Foot <u>9</u>	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right	
Time of Capture <u>22:15</u>		Photo Taken <input checked="" type="radio"/> Yes <input type="radio"/> No		Remarks: <u>- right upper canine decayed - both canines worn</u> <u>- wing nites present</u>										
Repro. Condition: NR=nonreproductive, PG=pregnant, L=lactating, PL=post lactating, SCR=scrotal/epididymis swollen														
Site Name Or Number:				Date:		Set No. Captured In:		Name of Person Identifying the Bat:				*Capture Number:		
Height in meters captured above ground surface: m				Body Measurements (grams and millimeters)					Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore- arm	Hind Foot	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right	
Time of Capture		Photo Taken Yes / No		Remarks:										

\*Capture Number = number in sequence by site.





**Photograph 31:** Site 12 Set 2



**Photograph 32:** Site 12 Set 3

**US 219 IMPROVEMENT  
PROJECT  
S.R. 6219 SECTION 020  
MEYERSDALE TO SOMERSET  
SOMERSET COUNTY, PENNSYLVANIA**

**MIST NET SURVEY  
FOR THE  
INDIANA BAT  
(*Myotis sodalis*)**

**SITE 12**

**Legend**

 Mist Net Survey Site

**Surface Water Features**


 Ephemeral

 Intermittent


 Perennial


 Surface Drainage Channel


 Wetlands

 Wetland Open Ends

**Mapping Features**

 Area of Detailed Investigation (LRK 2007/2008)


 Required R-O-W

 Structures

 Cell Tower

 Railroad


 Treeline


 Unimproved Roads / Trails

 Roadways

 Contours

**Land Use**

 Low Density Residential

 Successional Rangeland


 Transitional


 Water


 Barren Land


 Agricultural Land


 Grassland

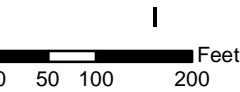
 Forest

 Urban

 Roadway

 Miscellaneous

 Alignment and Stations



1 inch equals 200 feet



BAT NETTING/TRAPPING SITE SURVEY RECORD

1. Survey Date: 7/22/08 2. Company Name: Kimball  
3. Reporter: Steve Pernick 4. Assistants: Eric Lange  
5. Site Name and/or Number: S13 (Site 13)  
6. Site is (circle one): ☐ hibernation site ☒ summer habitat  
7a. If hibernation site circle one: limestone mine, coal mine, limestone cave, sandstone cave, RR tunnel,  
other structure, describe -

7b. If summer habitat, describe area being sampled (e.g. forested stream or forest clearing with stream):  
forested upland with small perennial stream, fallow fields with a pond, connected by trails and game line

8. County: Somerset 9. 7.5' Quad.: Mundock  
Set 01 39° 57' 16.810"N 79° 2' 46.588"W  
Set 02 39° 57' 17.012"W 79° 2' 35.140"W  
10. Was site GPS'd (required)? ☒ YES ☐ NO  
11. Geographic Coordinates (D-M-S): Latitude: 39° - 57' - 15.801"N, Longitude: 79° - 2' - 40.986"W  
Datum (circle one): ☒ NAD27 (Preferred), ☒ NAD83, WGS84, Other:

12. Ownership and Access: (Who owns site or controls access? Give name and address.) Pandy Airesman  
185 Dusky Trail lane Berlin, PA 15530

13. Time (military) & Temperature: Start Time 2035 h Stop Time 01:35 h Total Minutes: 300  
Start Temp. 19 °C End Temp. 19.5 °C

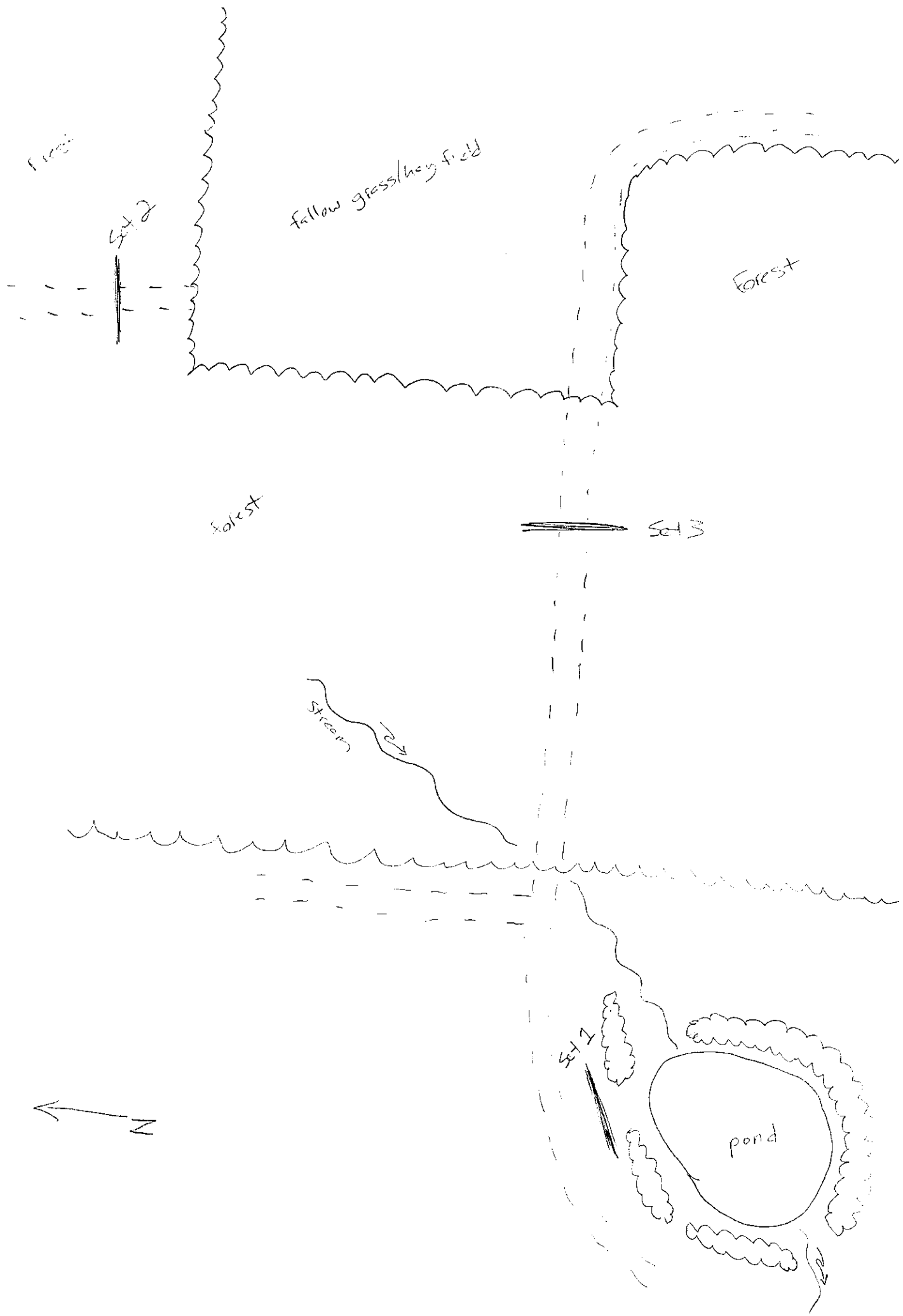
14. General Weather (circle one): Clear; ☒ Partly Cloudy; ☐ Mostly Cloudy; ☐ Cloudy; ☐ Drizzle; ☐ Intermittent Rain;  
☐ Steady Rain; ☐ Thunderstorms; ☐ Snow; Other:

15. General Wind Conditions (circle one): ☒ Calm, ☐ Breezy (Leaves Rustling), ☐ Windy (trees swaying).

16. Capture Setup at Site:

Set #	Type	Count	Dimensions	Description	TOTAL AREA (m)
	Nets	4	12m x 2.6m	Stacked over trail	124.8 sq. m
1	nets	2	9 x 2.6	break in treeline at pond	46.8
2	nets	2	9 x 2.6	over gas line trail in forest	46.8
3	nets	4	6 x 2.6	over dirt road in forest	62.4

Total Capture Area: 156.0 sq. m





(Site Survey Record – Continued) Site Name/No.: 513 (Site 13) Date: 7/22/08

17. Describe habitat 150 m around site: (topography and vegetation including dominant tree species.)

- rather level upland, mixed ageless deciduous forest, moderate density, includes small perennial stream (3' x 2") and a small pond (x 1/8 cc.)
- forest dominant forest species: white oak, red oak, red maple, black cherry, magnolia, black birch, black locust

18. Was reproductive status checked? YES / NO (if "NO" only enter numbers in **Total** columns)

**\*CAPTURE RESULTS**

Species	Number of Adult Females				No. Juv. Fem.	Total No. Fem.	Number of Adult Males		No. Juv. Male	Total No. Males	Species Totals
	NR	PG	L	PL			SCR	NR			
<i>Eptesicus fuscus</i>	2		1			3	2	1	1	4	7
<i>Myotis lucifugus</i>	11					2		11		3	5
<i>Myotis septentrionalis</i>											
<i>Myotis leibii</i>											
<i>Myotis sodalis</i>											
<i>Eptesicus fuscus</i>	1		111			4		11		2	6
<i>Pipistrellus subflavus</i>											
<i>Lasiurus borealis</i>								1		1	2
<i>Lasiurus cinereus</i>											
<i>Lasionycteris noctivagans</i>											
Other – specify:											
Other – specify:											
Reproductive Status: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen. <b>*Complete Measurement and Capture Data Form for all:</b> (1) <i>Myotis sodalis</i> , (2) <i>Myotis leibii</i> , (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA.											Grand Total 13

19. BAT DETECTORS & OTHER MONITORING DEVICES: Tallies of bat passes / hour. One to 5 hours required for Indiana bat hibernacula surveys. Monitor one hour after 22:00 hrs when trapping/netting hibernacula and 5 hours when only monitoring with bat detectors, night vision or infrared device (when site can not be trapped/netted). Describe procedure & equipment used in remarks.

1 <sup>st</sup> hour	2 <sup>nd</sup> hour	3 <sup>rd</sup> hour	4 <sup>th</sup> hour	5 <sup>th</sup> hour
Start Time:	Start Time:	Start Time:	Start Time:	Start Time:
End Time:	End Time:	End Time:	End Time:	End Time:
Tallies:	Tallies:	Tallies:	Tallies:	Tallies:

20. REMARKS:

00:20 Light Rain begins, activity continues  
 0:52 Rain stopped, activity still present  
 1:08 Rain starts again

**Bat Measurement and Capture Data Form**(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: <u>S13 (SITE 13)</u>				Date: <u>7/22/08</u>		Set No. Captured In: <u>3</u>		Name of Person Identifying the Bat: <u>Steve Pernick</u>				*Capture Number: <u>1</u>			
Height in meters captured above ground surface: <u>4</u> m				Body Measurements (grams and millimeters)					Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species <u>E. Fuscus</u>	Sex <u>M</u>	Age <u>Adult</u>	Repro. Condition <u>NR</u>	Wt. (g) <u>14</u>	Ear <u>14</u>	Tragus <u>6</u>	Fore- arm <u>47</u>	Hind Foot <u>9</u>	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right		
Time of Capture <u>20:05</u>		Photo Taken <u>(Yes)</u> / No		Remarks: <u>NO</u>											
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen															
Site Name Or Number: <u>(SITE 13) S13</u>				Date: <u>7/22/08</u>		Set No. Captured In: <u>3</u>		Name of Person Identifying the Bat: <u>Steve Pernick</u>				*Capture Number: <u>2</u>			
Height in meters captured above ground surface: <u>1.5</u> m				Body Measurements (grams and millimeters)					Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species <u>E. Fuscus</u>	Sex <u>F</u>	Age <u>Adult</u>	Repro. Condition <u>NR</u>	Wt. (g) <u>19.5</u>	Ear <u>16</u>	Tragus <u>7</u>	Fore- arm <u>48</u>	Hind Foot <u>9</u>	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right		
Time of Capture <u>20:15</u>		Photo Taken <u>(Yes)</u> / No		Remarks: <u>No</u>											
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen															
Site Name Or Number: <u>S13 (SITE 13)</u>				Date: <u>7/22/08</u>		Set No. Captured In: <u>1</u>		Name of Person Identifying the Bat: <u>Steve Pernick</u>				*Capture Number: <u>3</u>			
Height in meters captured above ground surface: <u>4</u> m				Body Measurements (grams and millimeters)					Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species <u>E. Fuscus</u>	Sex <u>F</u>	Age <u>Adult</u>	Repro. Condition <u>Lactating</u>	Wt. (g) <u>15.5</u>	Ear <u>14</u>	Tragus <u>5</u>	Fore- arm <u>43</u>	Hind Foot <u>9</u>	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right		
Time of Capture <u>20:30</u>		Photo Taken <u>(Yes)</u> / No		Remarks: <u>wing mites, dark black coloration of upper part mouth</u>											

\*Capture Number = number in sequence by site.



**Bat Measurement and Capture Data Form**

(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: <u>S13 (SITE 13)</u>				Date: <u>7/22/08</u>				Set No. Captured In: <u>3</u>		Name of Person Identifying the Bat: <u>Steve Pernick</u>				*Capture Number: <u>4</u>		
Height in meters captured above ground surface: <u>4</u> m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species <u>L. borealis</u>	Sex <u>M</u>	Age <u>Adult</u>	Repro. Condition <u>NR</u>	Wt. (g) <u>10.5</u>	Ear <u>11</u>	Tragus <u>4</u>	Fore- arm <u>37</u>	Hind Foot <u>6</u>	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right			
Time of Capture <u>21:30</u>		Photo Taken <u>Yes</u> / No		Remarks: <u>Right wing has 4 pin holes</u>												
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen																
Site Name Or Number: <u>S13 (SITE 13)</u>				Date: <u>7/22/08</u>				Set No. Captured In: <u>3</u>		Name of Person Identifying the Bat: <u>Steve Pernick</u>				*Capture Number: <u>5</u>		
Height in meters captured above ground surface: <u>1</u> m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species <u>E. Fuscus</u>	Sex <u>F</u>	Age <u>Adult</u>	Repro. Condition <u>lactating</u>	Wt. (g) <u>20.5</u>	Ear <u>16</u>	Tragus <u>7</u>	Fore- arm <u>50</u>	Hind Foot <u>10</u>	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right			
Time of Capture <u>22:19</u>		Photo Taken <u>Yes</u> / No		Remarks: <u>Teeth slightly worn, wing mites</u>												
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen																
Site Name Or Number: <u>S13 (site 13)</u>				Date: <u>7/22/08</u>				Set No. Captured In: <u>3</u>		Name of Person Identifying the Bat: <u>Steve Pernick</u>				*Capture Number: <u>6</u>		
Height in meters captured above ground surface: <u>1</u> m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species <u>E. Fuscus</u>	Sex <u>F</u>	Age <u>Adult</u>	Repro. Condition <u>lactating</u>	Wt. (g)	Ear <u>15</u>	Tragus <u>6</u>	Fore- arm <u>43</u>	Hind Foot <u>9</u>	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right			
Time of Capture <u>20:19</u>		Photo Taken <u>Yes</u> / No		Remarks: <u>Upper mouth is black, infested wing mites</u>												

\*Capture Number = number in sequence by site.

**Bat Measurement and Capture Data Form**(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: SITE 13 S13				Date: 7/22/08				Set No. Captured In: 3		Name of Person Identifying the Bat: Steve Pernick				*Capture Number: 7		
Height in meters captured above ground surface: 2 m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species <i>L. borealis</i>	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore- arm	Hind Foot	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right			
Time of Capture 22:30		Photo Taken Yes / <input checked="" type="checkbox"/> No		Remarks: Escaped												
Repro. Condition: NR=nonreproductive, PG=pregnant, L=lactating, PL=post lactating, SCR=scrotal/epididymis swollen																
Site Name Or Number: S13 (SITE 13)				Date: 7/22/08				Set No. Captured In: 3		Name of Person Identifying the Bat: Steve Pernick				*Capture Number: 8		
Height in meters captured above ground surface: 2 m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species <i>M. lucifera</i>	Sex M	Age Adult	Repro. Condition testes swollen Not distended	Wt. (g) 8	Ear 14	Tragus 8	Fore- arm 35	Hind Foot 9	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right			
Time of Capture 22:30		Photo Taken <input checked="" type="checkbox"/> Yes / No		Remarks:												
Repro. Condition: NR=nonreproductive, PG=pregnant, L=lactating, PL=post lactating, SCR=scrotal/epididymis swollen																
Site Name Or Number: S13 (SITE 13)				Date: 7/22/08				Set No. Captured In: 3		Name of Person Identifying the Bat: Steve Pernick				*Capture Number: 9		
Height in meters captured above ground surface: 2.5 m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species <i>E. fuscus</i>	Sex M	Age Adult	Repro. Condition NR	Wt. (g) 17	Ear 15	Tragus 6	Fore- arm 46	Hind Foot 9	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right			
Time of Capture 22:30		Photo Taken <input checked="" type="checkbox"/> Yes / No		Remarks: Tip of penis is yellow, orange around mouth												

\*Capture Number = number in sequence by site.

B/B.  
21  
13  
8B/B  
29.5  
12.5  
17.0



COMMONWEALTH OF PENNSYLVANIA  
Pennsylvania Game Commission**Bat Measurement and Capture Data Form**(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: <u>S13 (SITE 13)</u>		Date: <u>7/22/08</u>		Set No. Captured In: <u>3</u>		Name of Person Identifying the Bat: <u>Steve Pernick</u>		*Capture Number: <u>10</u>					
Height in meters captured above ground surface: <u>2.5</u> m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)			
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot	Recapture Yes/No		Band Material	Band Color	Band Inscription
<u>M. lucii</u>	<u>M</u>	<u>Adult</u>	<u>NR</u>	<u>8</u>	<u>14</u>	<u>6</u>	<u>39</u>	<u>8</u>					
Time of Capture	Photo Taken		Remarks:										
<u>22:43</u>	<u>Yes</u> / No												

Repro. Condition: NR=nonreproductive, PG=pregnant, L=lactating, PL=post lactating, SCR=scrotal/epididymis swollen

Site Name Or Number: <u>S13 (SITE 13)</u>		Date: <u>7/22/08</u>		Set No. Captured In: <u>3</u>		Name of Person Identifying the Bat: <u>Steve Pernick</u>		*Capture Number: <u>11</u>					
Height in meters captured above ground surface: <u>3</u> m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)			
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot	Recapture Yes/No		Band Material	Band Color	Band Inscription
<u>M. lucii</u>	<u>M</u>	<u>Adult</u>	<u>NR</u>	<u>7</u>	<u>14</u>	<u>6</u>	<u>37</u>	<u>8</u>					
Time of Capture	Photo Taken		Remarks:										
<u>23:51</u>	<u>Yes</u> / No												

Repro. Condition: NR=nonreproductive, PG=pregnant, L=lactating, PL=post lactating, SCR=scrotal/epididymis swollen

Site Name Or Number: <u>S13 (SITE 13)</u>		Date: <u>7/22/08</u>		Set No. Captured In: <u>3</u>		Name of Person Identifying the Bat: <u>Steve Pernick</u>		*Capture Number: <u>12</u>					
Height in meters captured above ground surface: <u>3</u> m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)			
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot	Recapture Yes/No		Band Material	Band Color	Band Inscription
<u>M. lucii</u>	<u>M</u>	<u>Adult</u>	<u>NR</u>	<u>7.5</u>	<u>14</u>	<u>5</u>	<u>37</u>	<u>8</u>					
Time of Capture	Photo Taken		Remarks:										
<u>23:51</u>	<u>Yes</u> / No												

\*Capture Number = number in sequence by site.

**Bat Measurement and Capture Data Form**(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: <u>S13 (SITE 13)</u>				Date: <u>7/22/08</u>		Set No. Captured In: <u>3</u>		Name of Person Identifying the Bat: <u>Steve Pernick</u>				*Capture Number: <u>13</u>		
Height in meters captured above ground surface: <u>4</u> m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)
Species <u>M. lucif</u>	Sex <u>F</u>	Age <u>Adult</u>	Repro. Condition <u>NR</u>	Wt. (g) <u>8</u>	Ear <u>13</u>	Tragus <u>5</u>	Fore- arm <u>37</u>	Hind Foot <u>9</u>	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right	
Time of Capture <u>00:50</u>	Photo Taken <u>(Yes)</u> / No		Remarks:											
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen														
Site Name Or Number:				Date:		Set No. Captured In:		Name of Person Identifying the Bat:				*Capture Number:		
Height in meters captured above ground surface: _____ m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore- arm	Hind Foot	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right	
Time of Capture	Photo Taken Yes / No		Remarks:											
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen														
Site Name Or Number:				Date:		Set No. Captured In:		Name of Person Identifying the Bat:				*Capture Number:		
Height in meters captured above ground surface: _____ m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore- arm	Hind Foot	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right	
Time of Capture	Photo Taken Yes / No		Remarks:											

\*Capture Number = number in sequence by site.



BAT NETTING/TRAPPING SITE SURVEY RECORD

Page 1 of 2

1. Survey Date: 4 AUG. 08 2. Company Name: KIMBALL

3. Reporter: S. PERNICK 4. Assistants: D. MCCRAW, K. ELSMONT

5. Site Name and/or Number: (SITE 13) S13

6. Site is (circle one): hibernation site summer habitat

7a. If hibernation site circle one: limestone mine, coal mine, limestone cave, sandstone cave, RR tunnel,  
other structure, describe - \_\_\_\_\_

7b. If summer habitat, describe area being sampled (e.g. forested stream or forest clearing with stream):

FORESTED UPLAND W/ SMALL PERM. STREAM, FALLOW FIELDS W/ POND  
CONNECTED BY TRAILS + GASLINES

8. County: SOMERSET 9. 7.5' Quad.: Murdock  
Set 01  $39^{\circ} 57' 16.810'' N$   $79^{\circ} 2' 46.588'' W$   
Set 02  $39^{\circ} 57' 17.012'' N$   $79^{\circ} 2' 35.140'' W$

10. Was site GPS'd (required)? (YES) - NO

11. Geographic Coordinates (D-M-S): Latitude: 39 <sup>Set 03</sup>  $^{\circ}$  57  $'$  15.801  $'' N$ , Longitude: 79  $^{\circ}$  2  $'$  46.986  $'' W$

Datum (circle one): NAD27 (Preferred), NAD83, WGS84, Other: \_\_\_\_\_

12. Ownership and Access: (Who owns site or controls access? Give name and address.) \_\_\_\_\_

RANDY AIRESMAN 185 Dusty Trail Ln Berlin, PA 15530

13. Time (military) & Temperature: Start Time 20:25 h Stop Time 01:35 h Total Minutes: 310

Start Temp. 18.3  $^{\circ} C$  End Temp. 14.8  $^{\circ} C$  HUMIDITY  
START - 100  
END - 100

14. General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;  
Steady Rain; Thunderstorms; Snow; Other: \_\_\_\_\_

15. General Wind Conditions (circle one): Calm; Breezy (Leaves Rustling); Windy (trees swaying).

16. Capture Setup at Site:

Set #	Type	Count	Dimensions	Description	TOTAL AREA (m)
1	Nets	4	12m x 2.6m	Stacked over trail	124.8 sq. m
1	NETS	2	9m x 2.6m	BREAK IN TREELINE BY POND	46.8
2	NETS	2	9m x 2.6m	OVER GASLINE TRAIL IN FOREST	46.8
3	NETS	4	6m x 2.6m	OVER DIRT ROAD IN FOREST	62.4

Total Capture Area: 136.0 sq. m

SITE DIAGRAM

- SEE PREVIOUS NIGHT



(Site Survey Record – Continued)

Site Name/No.:

S13 (Site 13)

Date: 4 AUG. 08

17. Describe habitat 150 m around site: (topography and vegetation including dominant tree species.)

- MOSTLY LEVEL UPLAND, MIXED-AGE DECIDUOUS FOREST OF MODERATE DENSITY. INCLUDES SM. PERM. STREAM (3'x2") AND ONE SMALL POND (~1/8 acre).
- DOMINANT FOREST SPECIES: WHITE OAK, RED OAK, RED MAPLE, BLACK CHERRY, MAGNOLIA, BLACK BIRCH, & BLACK LOCUST

18. Was reproductive status checked? (YES) / NO (if "NO" only enter numbers in Total columns)

## \*CAPTURE RESULTS

Species	Number of Adult Females				No. Juv. Fem.	Total No. Fem.	Number of Adult Males		No. Juv. Male	Total No. Males	Species Totals
	NR	PG	L	PL			SCR	NR			
<i>Eptesicus fuscus</i>	2		1			3	2	1	1	4	7
<i>Myotis lucifugus</i>	1					1		2		2	3
<i>Myotis septentrionalis</i>											
<i>Myotis leibii</i>											
<i>Myotis sodalis</i>											
<i>Eptesicus fuscus</i>								5		5	5
<i>Pipistrellus subflavus</i>											
<i>Lasiurus borealis</i>											
<i>Lasiurus cinereus</i>											
<i>Lasionycteris noctivagans</i>											
Other – specify:											
Other – specify:											
Reproductive Status: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen. *Complete Measurement and Capture Data Form for all: (1) <i>Myotis sodalis</i> , (2) <i>Myotis leibii</i> , (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA.											Grand Total 8

19. BAT DETECTORS &amp; OTHER MONITORING DEVICES: Tallies of bat passes / hour. One to 5 hours required for Indiana bat hibernacula surveys. Monitor one hour after 22:00 hrs when trapping/netting hibernacula and 5 hours when only monitoring with bat detectors, night vision or infrared device (when site can not be trapped/netted). Describe procedure &amp; equipment used in remarks.

1 <sup>st</sup> hour	2 <sup>nd</sup> hour	3 <sup>rd</sup> hour	4 <sup>th</sup> hour	5 <sup>th</sup> hour
Start Time:	Start Time:	Start Time:	Start Time:	Start Time:
End Time:	End Time:	End Time:	End Time:	End Time:
Tallies:	Tallies:	Tallies:	Tallies:	Tallies:

## 20. REMARKS

- 1<sup>st</sup> BAT OBSERVED @ 20:40

03:15 - Incidental Capture - Flying Squirrel - appeared to be southern, but not handled for positive ID.

**Bat Measurement and Capture Data Form**(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: 513 (Site 13)		Date: 4 AUG. 08		Set No. Captured In: 3		Name of Person Identifying the Bat: S. PERNICK				*Capture Number: 01				
Height in meters captured above ground surface: 2.5 m				Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)		
Species E. fuscus	Sex M	Age A	Repro. Condition NR	Wt. (g) 15.5	Ear 14	Tragus 6	Fore- arm 47	Hind Foot 9	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right	
Time of Capture 2115	Photo Taken <input checked="" type="checkbox"/> Yes / No		Remarks: —											
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen														
Site Name Or Number: 513 (Site 13)		Date: 4 AUG 08		Set No. Captured In: 3		Name of Person Identifying the Bat: S. Pernick				*Capture Number: 02				
Height in meters captured above ground surface: 5 m				Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)		
Species E. fuscus	Sex M	Age A	Repro. Condition NR	Wt. (g) 18.5	Ear 15	Tragus 6	Fore- arm 46	Hind Foot 9	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right	
Time of Capture 2115	Photo Taken <input checked="" type="checkbox"/> Yes / No		Remarks: wing nites present											
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen														
Site Name Or Number: 513 (Site 13)		Date: 4 AUG 08		Set No. Captured In: 3		Name of Person Identifying the Bat: S. Pernick				*Capture Number: 03				
Height in meters captured above ground surface: 4 m				Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)		
Species E. fuscus	Sex M	Age A	Repro. Condition NR	Wt. (g) 19.0	Ear 15	Tragus 6	Fore- arm 44	Hind Foot 9	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right	
Time of Capture 2120	Photo Taken <input checked="" type="checkbox"/> Yes / No		Remarks: —											

\*Capture Number = number in sequence by site.



**Bat Measurement and Capture Data Form**(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: <u>S13 (Site 13)</u>		Date: <u>4 AUG 08</u>		Set No. Captured In: <u>3</u>		Name of Person Identifying the Bat: <u>S. Pernick</u>		*Capture Number: <u>04</u>					
Height in meters captured above ground surface: <u>5</u> m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)			
Species <u>E. fuscus</u>	Sex <u>M</u>	Age <u>A</u>	Repro. Condition <u>NR</u>	Wt. (g) <u>170</u>	Ear <u>16</u>	Tragus <u>7</u>	Fore- arm <u>46</u>	Hind Foot <u>9</u>	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right
Time of Capture <u>2150</u>	Photo Taken <u>Yes</u> / No		Remarks: <u>—</u>										
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen													
Site Name Or Number: <u>S13 (Site 13)</u>		Date: <u>4 AUG 08</u>		Set No. Captured In: <u>51</u>		Name of Person Identifying the Bat: <u>S. Pernick</u>		*Capture Number: <u>05</u>					
Height in meters captured above ground surface: <u>4</u> m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)			
Species <u>M. luc.</u>	Sex <u>F</u>	Age <u>A</u>	Repro. Condition <u>NR</u>	Wt. (g) <u>7.5</u>	Ear <u>12</u>	Tragus <u>5</u>	Fore- arm <u>36</u>	Hind Foot <u>9</u>	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right
Time of Capture <u>2200</u>	Photo Taken <u>Yes</u> / No		Remarks: <u>Hair + Tissue Sample taken</u>										
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen													
Site Name Or Number: <u>S13 (Site 13)</u>		Date: <u>4 AUG 08</u>		Set No. Captured In: <u>53</u>		Name of Person Identifying the Bat: <u>S. Pernick</u>		*Capture Number: <u>06</u>					
Height in meters captured above ground surface: <u>2</u> m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)			
Species <u>E. fuscus</u>	Sex <u>M</u>	Age <u>A</u>	Repro. Condition <u>NR</u>	Wt. (g) <u>16.0</u>	Ear <u>16</u>	Tragus <u>6</u>	Fore- arm <u>46</u>	Hind Foot <u>8</u>	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right
Time of Capture <u>2230</u>	Photo Taken <u>Yes</u> / No		Remarks: <u>—</u>										

\*Capture Number = number in sequence by site.

**Bat Measurement and Capture Data Form**

(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: <u>S13 (Site 13)</u>				Date: <u>4 AUG 08</u>				Set No. Captured In: <u>3</u>		Name of Person Identifying the Bat: <u>S. Pernick</u>				*Capture Number: <u>07</u>	
Height in meters captured above ground surface: <u>10</u> m				Body Measurements (grams and millimeters)					Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species <u>M. Lucif.</u>	Sex <u>M</u>	Age <u>A</u>	Repro. Condition <u>NR</u>	Wt. (g) <u>7.0</u>	Ear <u>14</u>	Tragus <u>6</u>	Fore- arm <u>38</u>	Hind Foot <u>8</u>	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right		
Time of Capture <u>2325</u>		Photo Taken <u>Yes</u> / No		Remarks: <u>Fleas noted</u> <u>Hair + Tissue sample taken</u>											

Repro. Condition: NR = nonreproductive, PG = pregnant, L = lactating, PL = post lactating, SCR = scrotal/epididymis swollen

Site Name Or Number: <u>S13 (Site 13)</u>				Date: <u>4 AUG 08</u>				Set No. Captured In: <u>3</u>		Name of Person Identifying the Bat: <u>S. Pernick</u>				*Capture Number: <u>08</u>	
Height in meters captured above ground surface: <u>2.5</u> m				Body Measurements (grams and millimeters)					Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species <u>M. Lucif</u>	Sex <u>M</u>	Age <u>A</u>	Repro. Condition <u>NR</u>	Wt. (g) <u>7.0</u>	Ear <u>15</u>	Tragus <u>7</u>	Fore- arm <u>38</u>	Hind Foot <u>9</u>	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right		
Time of Capture <u>01:35</u>		Photo Taken <u>Yes</u> / No		Remarks: <u>Hair + Tissue sample taken</u>											

Repro. Condition: NR = nonreproductive, PG = pregnant, L = lactating, PL = post lactating, SCR = scrotal/epididymis swollen

Site Name Or Number:				Date:				Set No. Captured In:		Name of Person Identifying the Bat:				*Capture Number:	
Height in meters captured above ground surface: _____ m				Body Measurements (grams and millimeters)					Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore- arm	Hind Foot	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right		
Time of Capture		Photo Taken Yes / No		Remarks:											





**Photograph 33:** Site 13 Set 1



**Photograph 34:** Site 13 Set 2




**Photograph 35:** Site 13 Set 3

**US 219 IMPROVEMENT  
PROJECT  
S.R. 6219 SECTION 020  
MEYERSDALE TO SOMERSET  
SOMERSET COUNTY, PENNSYLVANIA**


**MIST NET SURVEY  
FOR THE  
INDIANA BAT  
(*Myotis sodalis*)**


**SITE 13**


**Legend**

 Mist Net Survey Site

**Surface Water Features**


 Ephemeral

 Intermittent


 Perennial


 Surface Drainage Channel

 Wetlands


 Wetland Open Ends

**Mapping Features**

 Area of Detailed Investigation  
(LRK 2007/2008)


 Required R-O-W


 Structures

 Cell Tower

 Railroad

 Treeline


 Unimproved Roads / Trails

 Roadways


 Contours


**Land Use**


 Low Density Residential


 Successional Rangeland


 Transitional


 Water


 Barren Land


 Agricultural Land


 Grassland

 Forest

 Urban

 Roadway

 Miscellaneous

 Alignment and Stations

1

0 50 100 200 Feet

1 inch equals 200 feet

JRG 12/22/2008



## BAT NETTING/TRAPPING SITE SURVEY RECORD

1. Survey Date: 7/19/08 2. Company Name: Kimball3. Reporter: Steve Pernick 4. Assistants: Troy Callahan5. Site Name and/or Number: S141 (Site 14)6. Site is (circle one): hibernation site summer habitat7a. If hibernation site circle one: limestone mine, coal mine, limestone cave, sandstone cave, RR tunnel,  
other structure, describe - \_\_\_\_\_

7b. If summer habitat, describe area being sampled (e.g. forested stream or forest clearing with stream):

forest with gas line cut, trail, wetland, and settling ponds8. County: Somerset 9. 7.5' Quad.: Murdock  
Set 01  $39^{\circ} 57' 59.891''N$   $79^{\circ} 2' 36.928''W$ 10. Was site GPS'd (required)? YES NO Set 02  $39^{\circ} 58' 0.446''N$   $79^{\circ} 2' 39.471''W$ 11. Geographic Coordinates (D-M-S): Latitude: Set 03  $39^{\circ} 57' 56.460''N$ , Longitude: 79^{\circ} 2' 37.066''WDatum (circle one): NAD27 (Preferred), NAD83, WGS84, Other: \_\_\_\_\_12. Ownership and Access: (Who owns site or controls access? Give name and address) Commonwealth of PA DGS (SCI)SIS N. Office Building, Harrisburg, PA 17101; PA Game Commission PO Box 62 Myersdale, PA 15552  
SCI-1590 Walpers Mill Rd Somerset, PA 1551013. Time (military) & Temperature: Start Time 20:35 h Stop Time 22:05 h Total Minutes: 330  
Start Temp 22.3 °C End Temp 17 °C start humid 85% end humid 92%14. General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;  
Steady Rain; Thunderstorms; Snow; Other: \_\_\_\_\_15. General Wind Conditions (circle one): Calm; Breezy (Leaves Rustling); Windy (trees swaying).

## 16. Capture Setup at Site:

Set #	Type	Count	Dimensions	Description	TOTAL AREA (m)
1	Nets	4	12m x 2.6m	Stacked over trail	124.8 sq. m
1	net	1	6m x 2.6	over trail	15.6
2	nets	1	9m x 2.6	over gas line cut	23.4
3	nets	3	9m x 2.6	over gas line cut	70.2

Total Capture Area: 109.2 sq. m

Forest  
(SGL)

Forest  
(SGL)

gasline

Set 2

Set 1

trail at SCI property line

Forest

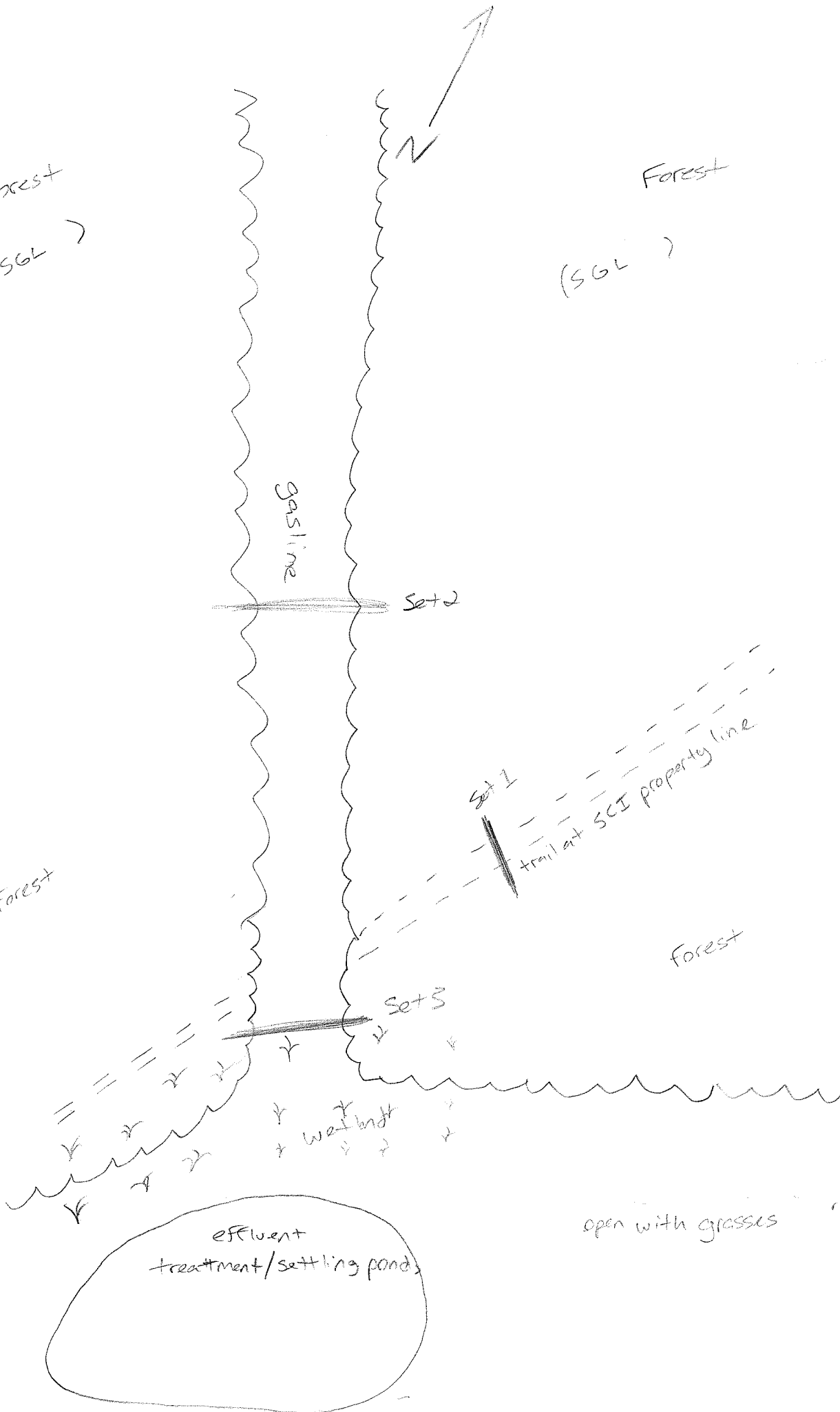
Forest

Set 3

wetland

effluent  
treatment/settling ponds

open with grasses





(Site Survey Record – Continued)

Site Name/No.:

514 (Site 14)

Date:

7/19/08

**17. Describe habitat 150 m around site: (topography and vegetation including dominant tree species)**

- relatively level forested area, mixed age class, moderate density, with forested wetlands and emergent wetland components and adjacent to settling ponds
- forest dominants include: white oak, red maple, hemlock, black birch, black cherry, red oak

**18. Was reproductive status checked? YES / NO (if "NO" only enter numbers in Total columns)****\*CAPTURE RESULTS**

Species	Number of Adult Females				No. Juv. Fem.	Total No. Fem.	Number of Adult Males		No. Juv. Male	Total No. Males	Species Totals
	NR	PG	L	PL			SCR	NR			
<i>Eptesicus fuscus</i>	2		1			3	2	1	1	4	7
<i>Myotis lucifugus</i>	2		1					4			8*
<i>Myotis septentrionalis</i>	1		1								2
<i>Myotis leibii</i>											
<i>Myotis sodalis</i>											
<i>Eptesicus fuscus</i>											
<i>Pipistrellus subflavus</i>											
<i>Lasiurus borealis</i>											
<i>Lasiurus cinereus</i>											
<i>Lasionycteris noctivagans</i>											
Other – specify:											
Other – specify:											
Reproductive Status: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen. <b>*Complete Measurement and Capture Data Form for all:</b> (1) <i>Myotis sodalis</i> , (2) <i>Myotis leibii</i> , (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA.											Grand Total 10*

\*capture  
1 escape  
prior to  
sex deter.**19. BAT DETECTORS & OTHER MONITORING DEVICES:** Tallies of bat passes / hour. One to 5 hours required for Indiana bat hibernacula surveys. Monitor one hour after 22 00 hrs when trapping/netting hibernacula and 5 hours when only monitoring with bat detectors, night vision or infrared device (when site can not be trapped/netted). Describe procedure & equipment used in remarks.

1 <sup>st</sup> hour	2 <sup>nd</sup> hour	3 <sup>rd</sup> hour	4 <sup>th</sup> hour	5 <sup>th</sup> hour
Start Time:	Start Time:	Start Time:	Start Time:	Start Time:
End Time:	End Time:	End Time:	End Time:	End Time:
Tallies:	Tallies:	Tallies:	Tallies:	Tallies:

**20. REMARKS:**21:00 First bat seen visually  
21:45 no activity on detector

**Bat Measurement and Capture Data Form**(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: <u>S14 Set 3 (S1414)</u>		Date: <u>7/19/08</u>		Set No. Captured In: <u>3</u>		Name of Person Identifying the Bat: <u>Steve Pernick</u>		*Capture Number: <u>1</u>					
Height in meters captured above ground surface: <u>3</u> m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)			
Species <u>M. SEPT.</u>	Sex <u>F</u>	Age <u>A</u>	Repro. Condition <u>L</u>	Wt. (g) <u>7</u>	Ear <u>16</u>	Tragus <u>8</u>	Fore- arm <u>37</u>	Hind Foot <u>7</u>	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right
Time of Capture <u>2145</u>		Photo Taken <input checked="" type="radio"/> Yes / <input type="radio"/> No		Remarks: <u>Wing mutes, Bat Bugs</u>									
Repro. Condition: NR = nonreproductive, PG = pregnant, L = lactating, PL = post lactating, SCR = scrotal/epididymis swollen													
Site Name Or Number: <u>S14 SET 3 (S1414)</u>		Date: <u>7/19/08</u>		Set No. Captured In: <u>3</u>		Name of Person Identifying the Bat: <u>Steve Pernick</u>		*Capture Number: <u>2</u>					
Height in meters captured above ground surface: <u>4</u> m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)			
Species <u>M. SEPT</u>	Sex <u>F</u>	Age <u>A</u>	Repro. Condition <u>NR</u>	Wt. (g) <u>7</u>	Ear <u>16</u>	Tragus <u>9</u>	Fore- arm <u>35</u>	Hind Foot <u>8</u>	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right
Time of Capture <u>2150</u>		Photo Taken <input checked="" type="radio"/> Yes / <input type="radio"/> No		Remarks: <u>No comments</u>									
Repro. Condition: NR = nonreproductive, PG = pregnant, L = lactating, PL = post lactating, SCR = scrotal/epididymis swollen													
Site Name Or Number: <u>S14 Set 2 (S1414)</u>		Date: <u>7/19/08</u>		Set No. Captured In: <u>2</u>		Name of Person Identifying the Bat: <u>Steve Pernick</u>		*Capture Number: <u>3</u>					
Height in meters captured above ground surface: <u>2</u> m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)			
Species <u>M. Luci</u>	Sex <u>M</u>	Age <u>A</u>	Repro. Condition <u>NR</u>	Wt. (g) <u>7</u>	Ear <u>12</u>	Tragus <u>6</u>	Fore- arm <u>36</u>	Hind Foot <u>8</u>	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right
Time of Capture <u>2230</u>		Photo Taken <input checked="" type="radio"/> Yes / <input type="radio"/> No		Remarks: <u>Finger joints showing characteristics of juvenile - Not fully fused</u> <u>No Keel'd calcar - HAD Long toe hairs</u>									

\*Capture Number = number in sequence by site.



**Bat Measurement and Capture Data Form**(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: <u>S14 Set 2 (S1414)</u>		Date: <u>7/19/08</u>		Set No. Captured In: <u>2</u>		Name of Person Identifying the Bat: <u>STEVE PERWICK</u>		*Capture Number: <u>4</u>					
Height in meters captured above ground surface: <u>2</u> m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)			
Species <u>M. Lucii</u>	Sex <u>F</u>	Age <u>A</u>	Repro. Condition <u>NR</u>	Wt. (g) <u>8.5</u>	Ear <u>13</u>	Tragus <u>6</u>	Fore- arm <u>38</u>	Hind Foot <u>8</u>	Recapture Yes/No		Band Material	Band Color	Band Inscription
Time of Capture <u>2230</u>	Photo Taken <input checked="" type="radio"/> Yes / No	Remarks: <u>NO Comment.</u>											
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen													
Site Name Or Number: <u>S14 Set 3 (S1414)</u>		Date: <u>7/19/08</u>		Set No. Captured In: <u>3</u>		Name of Person Identifying the Bat: <u>STEVE PERWICK</u>		*Capture Number: <u>5</u>					
Height in meters captured above ground surface: <u>5</u> m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)			
Species <u>M. Lucii</u>	Sex <u>M</u>	Age <u>A</u>	Repro. Condition <u>NR</u>	Wt. (g) <u>6</u>	Ear <u>13</u>	Tragus <u>5</u>	Fore- arm <u>36</u>	Hind Foot <u>7</u>	Recapture Yes/No		Band Material	Band Color	Band Inscription
Time of Capture <u>2300</u>	Photo Taken <input checked="" type="radio"/> Yes / No	Remarks: <u>FLEAS</u>											
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen													
Site Name Or Number: <u>S14 Set 3 (S1414)</u>		Date: <u>7/19/08</u>		Set No. Captured In: <u>3</u>		Name of Person Identifying the Bat: <u>STEVE PERWICK</u>		*Capture Number: <u>6</u>					
Height in meters captured above ground surface: <u>2</u> m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)			
Species <u>M. Lucii</u>	Sex <u>M</u>	Age <u>A</u>	Repro. Condition <u>NR</u>	Wt. (g) <u>7</u>	Ear <u>9*</u>	Tragus <u>6</u>	Fore- arm <u>38</u>	Hind Foot <u>8</u>	Recapture Yes/No		Band Material	Band Color	Band Inscription
Time of Capture <u>2305</u>	Photo Taken <input checked="" type="radio"/> Yes / No	Remarks: <u>*BOTH EARS MISSING TIPS - Possible Frostbite</u>											

\*Capture Number = number in sequence by site.

**Bat Measurement and Capture Data Form**(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: <u>S14 Set 1 (Site 14)</u>		Date: <u>7/19/08</u>		Set No. Captured In: <u>1</u>		Name of Person Identifying the Bat: <u>STEVE PERICK</u>				*Capture Number: <u>7</u>			
Height in meters captured above ground surface: <u>0.5</u> m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)		
Species <u>M. Lucii</u>	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore- arm	Hind Foot	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right
Time of Capture <u>2350</u>	Photo Taken Yes / No	Remarks: <u>Visually witnessed - ESCAPED Net when reached for.</u>											
Repro. Condition: NR=nonreproductive, PG=pregnant, L=lactating, PL=post lactating, SCR=scrotal/epididymis swollen													
Site Name Or Number: <u>S14 Set 3 (Site 14)</u>		Date: <u>7/19/08</u>		Set No. Captured In: <u>3</u>		Name of Person Identifying the Bat: <u>STEVE PERICK</u>				*Capture Number: <u>8</u>			
Height in meters captured above ground surface: <u>3</u> m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)		
Species <u>M. Lucii</u>	Sex <u>F</u>	Age <u>A</u>	Repro. Condition <u>NR</u>	Wt. (g) <u>7</u>	Ear <u>13</u>	Tragus <u>6</u>	Fore- arm <u>37</u>	Hind Foot <u>9</u>	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right
Time of Capture <u>0100</u>	Photo Taken <u>(Yes)</u> / No	Remarks: <u>Fleas</u>											
Repro. Condition: NR=nonreproductive, PG=pregnant, L=lactating, PL=post lactating, SCR=scrotal/epididymis swollen													
Site Name Or Number: <u>S14 Set 2 (Site 14)</u>		Date: <u>7/19/08</u>		Set No. Captured In: <u>2</u>		Name of Person Identifying the Bat: <u>Steve Pernick</u>				*Capture Number: <u>9</u>			
Height in meters captured above ground surface: <u>2</u> m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)		
Species <u>M. Lucii</u>	Sex <u>F</u>	Age <u>A</u>	Repro. Condition <u>L</u>	Wt. (g) <u>85</u>	Ear <u>13</u>	Tragus <u>6</u>	Fore- arm <u>37</u>	Hind Foot <u>8</u>	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right
Time of Capture <u>0205</u>	Photo Taken <u>(Yes)</u> / No	Remarks: <u>FRONT TEETH MISSING</u>											

\*Capture Number = number in sequence by site.

18.5  
WB  
11.519.5  
WB  
11



**Bat Measurement and Capture Data Form**(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: 514 Set 2 (Site 14)				Date: 7/19/08				Set No. Captured In: 2		Name of Person Identifying the Bat: Steve Pernick				*Capture Number: 10		
Height in meters captured above ground surface: 2 m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore- arm	Hind Foot		Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right		
M. Luci	m	A	NR	9.5	14	6	35	8								
Time of Capture 0207		Photo Taken Yes / No		Remarks: No Comments.												
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen																
Site Name Or Number:				Date:				Set No. Captured In:		Name of Person Identifying the Bat:				*Capture Number:		
Height in meters captured above ground surface: m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore- arm	Hind Foot		Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right		
Time of Capture		Photo Taken Yes / No		Remarks:												
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen																
Site Name Or Number:				Date:				Set No. Captured In:		Name of Person Identifying the Bat:				*Capture Number:		
Height in meters captured above ground surface: m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore- arm	Hind Foot		Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right		
Time of Capture		Photo Taken Yes / No		Remarks:												

\*Capture Number = number in sequence by site.

BAT NETTING/TRAPPING SITE SURVEY RECORD

Page 1 of 2

1. Survey Date: 7/24/08 2. Company Name: Kimball

3. Reporter: Steve Pernick 4. Assistants: Dennis McGraw

5. Site Name and/or Number: S14 (Site 14)

6. Site is (circle one): hibernation site summer habitat

7a. If hibernation site circle one: limestone mine, coal mine, limestone cave, sandstone cave, RR tunnel,  
other structure, describe - \_\_\_\_\_

7b. If summer habitat, describe area being sampled (e.g. forested stream or forest clearing with stream):

Forest with gas line cut, trail, wetlands, and settling pond

8. County: Somerset 9. 7.5' Quad.: Murdock

10. Was site GPS'd (required)? YES - NO

11. Geographic Coordinates (D-M-S): Latitude: <sup>Set 03</sup> 39° - 57' - 56.466"N, Longitude: 79° - 2' - 37.066"W

Datum (circle one): NAD27 (Preferred), NAD83, WGS84, Other: \_\_\_\_\_

12. Ownership and Access: (Who owns site or controls access? Give name and address.) Commonwealth of PA - DGS (SC1)  
SIS N. Office Building Harrisburg, PA 17101; PA Game Commission PO Box 102 Meyersdale, PA 15552

13. Time (military) & Temperature: Start Time 2035 h Stop Time 01:50 h Total Minutes: 315  
Start Temp. 18 °C End Temp. 16 °C <sup>Start humid 83%</sup>  
<sup>end humid 86%</sup>

14. General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;  
Steady Rain; Thunderstorms; Snow; Other: \_\_\_\_\_

15. General Wind Conditions (circle one): Calm, Breezy (Leaves Rustling), Windy (trees swaying).

16. Capture Setup at Site:

Set #	Type	Count	Dimensions	Description	TOTAL AREA (m)
1	Nets	4	12m x 2.6m	Stacked over trail	124.8 sq. m
1	nets	2	6 x 2.6	over trail	31.2
2	nets	2	9 x 2.6	over gasline cut	46.8
3	nets	3	9 x 2.6	over gasline cut	70.2

Total Capture Area: 148.2 sq. m

see Previous site diagram



(Site Survey Record – Continued)

Site Name/No.:

S14 (Site 14)

Date:

7/24/08

**17. Describe habitat 150 m around site: (topography and vegetation including dominant tree species.)**

• relatively level forested area, mixed age class, moderate density, with forested wetlands and emergent wetlands, and adjacent to settling pond

• Forest dominants include: white oak, red oak, red maple, hemlock, black cherry, black birch

**18. Was reproductive status checked? (YES) / NO (if "NO" only enter numbers in Total columns)****\*CAPTURE RESULTS**

Species	Number of Adult Females				No. Juv. Fem.	Total No. Fem.	Number of Adult Males		No. Juv. Male	Total No. Males	Species Totals
	NR	PG	L	PL			SCR	NR			
<i>Eptesicus fuscus</i>	2		1			3	2	1	1	4	7
<i>Myotis lucifugus</i>	1		1			2		1111		9	11
<i>Myotis septentrionalis</i>			1			1					1
<i>Myotis leibii</i>											
<i>Myotis sodalis</i>											
<i>Eptesicus fuscus</i>								11		2	2
<i>Pipistrellus subflavus</i>											
<i>Lasiurus borealis</i>											
<i>Lasiurus cinereus</i>											
<i>Lasionycteris noctivagans</i>											
Other – specify:											
Other – specify:											
Reproductive Status: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen. <b>*Complete Measurement and Capture Data Form for all:</b> (1) <i>Myotis sodalis</i> , (2) <i>Myotis leibii</i> , (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA.											Grand Total 14

**19. BAT DETECTORS & OTHER MONITORING DEVICES:** Tallies of bat passes / hour. One to 5 hours required for Indiana bat hibernacula surveys. Monitor one hour after 22:00 hrs when trapping/netting hibernacula and 5 hours when only monitoring with bat detectors, night vision or infrared device (when site can not be trapped/netted). Describe procedure & equipment used in remarks.

1 <sup>st</sup> hour	2 <sup>nd</sup> hour	3 <sup>rd</sup> hour	4 <sup>th</sup> hour	5 <sup>th</sup> hour
Start Time:	Start Time:	Start Time:	Start Time:	Start Time:
End Time:	End Time:	End Time:	End Time:	End Time:
Tallies:	Tallies:	Tallies:	Tallies:	Tallies:

**20. REMARKS:**

- an additional net was added to sets 142 from previous nights survey
- 1<sup>st</sup> BAT DETECTED @ 21:00
- 24:00 bat activity wanes,

**Bat Measurement and Capture Data Form**(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: (SITE 14) S14		Date: 24 JULY 08		Set No. 3 Captured In:		Name of Person Identifying the Bat: S. PERNICK		*Capture Number: 01					
Height in meters captured above ground surface: 4 m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)			
Species M. LUCIFUGUS	Sex M	Age AD.	Repro. Condition NR	Wt. (g) 6.0	Ear 13	Tragus 6	Fore-arm 37	Hind Foot 8	Recapture Yes/No		Band Material	Band Color	Band Inscription
Time of Capture 21:10	Photo Taken <input checked="" type="checkbox"/> Yes / No	Remarks: BROKEN FOREFINGER ON LEFT WING - SWOLLEN BUT APPEARS TO BE HEALING											
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen													
Site Name Or Number: (SITE 14) S14		Date: 24 JULY 08		Set No. 3 Captured In:		Name of Person Identifying the Bat: S. PERNICK		*Capture Number: 02					
Height in meters captured above ground surface: 3 m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)			
Species M. LUCIFUGUS	Sex M	Age AD.	Repro. Condition NR	Wt. (g) 6.5	Ear 13	Tragus 6	Fore-arm 37	Hind Foot 7	Recapture Yes/No		Band Material	Band Color	Band Inscription
Time of Capture 21:10	Photo Taken <input checked="" type="checkbox"/> Yes / No	Remarks:											
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen													
Site Name Or Number: (SITE 14) S14		Date: 24 JULY 08		Set No. 3 Captured In:		Name of Person Identifying the Bat: S. PERNICK		*Capture Number: 03					
Height in meters captured above ground surface: 3 m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)			
Species M. LUCIFUGUS	Sex F	Age AD.	Repro. Condition NR	Wt. (g) 5.5	Ear 14	Tragus 6	Fore-arm 35	Hind Foot 8	Recapture Yes/No		Band Material	Band Color	Band Inscription
Time of Capture 21:10	Photo Taken <input checked="" type="checkbox"/> Yes / No	Remarks:											

\*Capture Number = number in sequence by site.

**Bat Measurement and Capture Data Form**(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: (SITE 14) S14		Date: 24 JULY 08		Set No. 3 Captured In:		Name of Person Identifying the Bat: S. PERNICK		*Capture Number: 04					
Height in meters captured above ground surface: 2 m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)			
Species M. LUCIFUGUS	Sex M	Age AD.	Repro. Condition NR	Wt. (g) 7.0	Ear 13	Tragus 6	Fore-arm 37	Hind Foot 8	Recapture Yes/No		Band Material	Band Color	Band Inscription
Time of Capture 21:10	Photo Taken <input checked="" type="checkbox"/> Yes / No	Remarks:											
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen													
Site Name Or Number: (SITE 14) S14		Date: 24 JULY 08		Set No. 3 Captured In:		Name of Person Identifying the Bat: S. PERNICK		*Capture Number: 05					
Height in meters captured above ground surface: 2 m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)			
Species M. LUCIFUGUS	Sex M	Age AD.	Repro. Condition NR	Wt. (g) 8.0	Ear 14	Tragus 6	Fore-arm 37	Hind Foot 8	Recapture Yes/No		Band Material	Band Color	Band Inscription
Time of Capture 21:10	Photo Taken <input checked="" type="checkbox"/> Yes / No	Remarks:											
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen													
Site Name Or Number: (SITE 14) S14		Date: 24 JULY 08		Set No. 3 Captured In:		Name of Person Identifying the Bat: S. PERNICK		*Capture Number: 06					
Height in meters captured above ground surface: 4 m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)			
Species M. LUCIFUGUS	Sex M	Age AD.	Repro. Condition NR	Wt. (g) 6.0	Ear 15	Tragus 6	Fore-arm 38	Hind Foot 8	Recapture Yes/No		Band Material	Band Color	Band Inscription
Time of Capture 21:10	Photo Taken <input checked="" type="checkbox"/> Yes / No	Remarks:											

\*Capture Number = number in sequence by site.



**Bat Measurement and Capture Data Form**

(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: <u>(SITE 14) S14</u>		Date: <u>24 JULY 08</u>		Set No. Captured In: <u>3</u>		Name of Person Identifying the Bat: <u>S. PERNICK</u>			*Capture Number: <u>07</u>					
Height in meters captured above ground surface: <u>2</u> m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)				
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right	
M. LUCIFUGUS	M	AD.	NR	6.5	13	5	36	8						
Time of Capture <u>21:20</u>		Photo Taken <u>Yes</u> / No		Remarks:										
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen														
Site Name Or Number: <u>(SITE 14) S14</u>		Date: <u>24 JULY 08</u>		Set No. Captured In: <u>3</u>		Name of Person Identifying the Bat: <u>S. PERNICK</u>			*Capture Number: <u>08</u>					
Height in meters captured above ground surface: <u>2</u> m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)				
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right	
M. LUCIFUGUS	M	AD.	NR	6.5	14	6	36	8						
Time of Capture <u>21:20</u>		Photo Taken <u>Yes</u> / No		Remarks:										
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen														
Site Name Or Number: <u>(SITE 14) S14</u>		Date: <u>24 JULY 08</u>		Set No. Captured In: <u>3</u>		Name of Person Identifying the Bat: <u>S. PERNICK</u>			*Capture Number: <u>09</u>					
Height in meters captured above ground surface: <u>2</u> m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)				Transmitter Attached? If so: Frequency (mHz)				
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right	
E. FUSCUS	M	AD.	NR	14.0	14	5	44	9						
Time of Capture <u>21:20</u>		Photo Taken <u>Yes</u> / No		Remarks: <u>WING MITES</u>										

\*Capture Number = number in sequence by site.

**Bat Measurement and Capture Data Form**(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: (SITE 14) S14		Date: 24 JULY 08		Set No. Captured In: 2		Name of Person Identifying the Bat: S. PERNICK				*Capture Number: 10			
Height in meters captured above ground surface: 0.5 m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)		
Species E. FUSCUS	Sex M	Age AD.	Repro. Condition NR	Wt. (g) 16.0	Ear 14	Tragus 6	Fore- arm 45	Hind Foot 8	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right
Time of Capture 21:50	Photo Taken <input checked="" type="checkbox"/> Yes / No	Remarks: SWOLLEN TESTES											
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen													
Site Name Or Number: (SITE 14) S14		Date: 24 JULY 08		Set No. Captured In: 2		Name of Person Identifying the Bat: S. PERNICK				*Capture Number: 11			
Height in meters captured above ground surface: 0.5 m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)		
Species M. SEPT.	Sex F	Age AD.	Repro. Condition L	Wt. (g) 7.0	Ear 17	Tragus 9	Fore- arm 37	Hind Foot 8	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right
Time of Capture 21:50	Photo Taken <input checked="" type="checkbox"/> Yes / No	Remarks:											
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen													
Site Name Or Number: (SITE 14) S14		Date: 24 JULY 08		Set No. Captured In: 2		Name of Person Identifying the Bat: S. PERNICK				*Capture Number: 12			
Height in meters captured above ground surface: 2 m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)		
Species M. LUCIFUGUS	Sex M	Age AD.	Repro. Condition NR	Wt. (g) 7.5	Ear 13	Tragus 4	Fore- arm 35	Hind Foot 8	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right
Time of Capture 22:50	Photo Taken <input checked="" type="checkbox"/> Yes / No	Remarks:											

\*Capture Number = number in sequence by site.

**Bat Measurement and Capture Data Form**(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: (SITE 14) S14		Date: 24 JULY 08		Set No. Captured In: 3		Name of Person Identifying the Bat: S. PERNICK				*Capture Number: 13			
Height in meters captured above ground surface: 2 m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)		
Species M. LUCIFUGUS	Sex M	Age AD.	Repro. Condition NR	Wt. (g) 6.5	Ear 14	Tragus 5	Fore- arm 37	Hind Foot 8	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right
Time of Capture 23:30	Photo Taken (Yes) / No	Remarks:											
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen													
Site Name Or Number: (SITE 14) S14		Date: 24 JULY 08		Set No. Captured In: 2		Name of Person Identifying the Bat: S. PERNICK				*Capture Number: 14			
Height in meters captured above ground surface: 1 m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)		
Species M. LUCIFUGUS	Sex F	Age AD.	Repro. Condition L	Wt. (g) 7.5	Ear 14	Tragus 6	Fore- arm 37	Hind Foot 8	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right
Time of Capture 01:25	Photo Taken (Yes) / No	Remarks:											
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen													
Site Name Or Number: -		Date:		Set No. Captured In: SEF2		Name of Person Identifying the Bat:				*Capture Number:			
Height in meters captured above ground surface: - m		Body Measurements (grams and millimeters)				Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)		
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore- arm	Hind Foot	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right
Time of Capture 2:52	Photo Taken Yes / No	Remarks:											

\*Capture Number = number in sequence by site.





**Photograph 36:** Site 14 Set 1



**Photograph 37:** Site 14 Set 2



**Photograph 38:** Site 14 Set 3

US 219 IMPROVEMENT  
PROJECT  
S.R. 6219 SECTION 020  
MEYERSDALE TO SOMERSET  
SOMERSET COUNTY, PENNSYLVANIA

MIST NET SURVEY  
FOR THE  
INDIANA BAT  
(*Myotis sodalis*)

SITE 14

Legend

Mist Net Survey Site

Surface Water Features

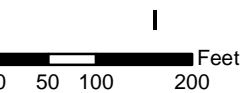
- Ephemeral
- Intermittent
- Perennial
- Surface Drainage Channel
- Wetlands
- Wetland Open Ends

Mapping Features

- Area of Detailed Investigation (LRK 2007/2008)
- Required R-O-W
- Structures
- Cell Tower
- Railroad
- Treeline
- Unimproved Roads / Trails
- Roadways
- Contours

Land Use

- Low Density Residential
- Successional Rangeland
- Transitional
- Water
- Barren Land
- Agricultural Land
- Grassland
- Forest
- Urban
- Roadway
- Miscellaneous
- Alignment and Stations



1 inch equals 200 feet

JRG 12/22/2008



BAT NETTING/TRAPPING SITE SURVEY RECORD

Page 1 of 2

1. Survey Date: 7/29/08 2. Company Name: Kimball

3. Reporter: Steve Pernick 4. Assistants: Eric Lange, John Gust Key

5. Site Name and/or Number: (SITE 15) (S15)

6. Site is (circle one): hibernation site summer habitat

7a. If hibernation site circle one: limestone mine, coal mine, limestone cave, sandstone cave, RR tunnel,  
other structure, describe - \_\_\_\_\_

7b. If summer habitat, describe area being sampled (e.g. forested stream or forest clearing with stream):

Forest clearing along water line and trail Sets 2 + 3 + 1

8. County: Somerset 9. 7.5' Quad.: Murdock

10. Was site GPS'd (required)? YES - NO  
Set 01 39° 58' 24.468"N 79° 2' 38.113"W  
Set 02 39° 58' 24.367"N 79° 2' 32.580"W  
Set 03

11. Geographic Coordinates (D-M-S): Latitude: 39° - 58' - 26.52"N, Longitude: 79° - 2' - 38.362"W

Datum (circle one): NAD27 (Preferred), NAD83, WGS84, Other: \_\_\_\_\_

12. Ownership and Access: (Who owns site or controls access? Give name and address.) PA Game

Commission PO Box 602 Meyersdale, PA 15552; PennDOT Keystone Building 400 N. St. Harrisburg, PA 17120

13. Time (military) & Temperature: Start Time 20:30 h Stop Time 1:57 h Total Minutes: 327  
88% humidity 92% humidity  
Start Temp. 18.5 °C End Temp. 15.5 °C

14. General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;  
Steady Rain; Thunderstorms; Snow; Other: \_\_\_\_\_

15. General Wind Conditions (circle one): Calm, Breezy (Leaves Rustling), Windy (trees swaying).

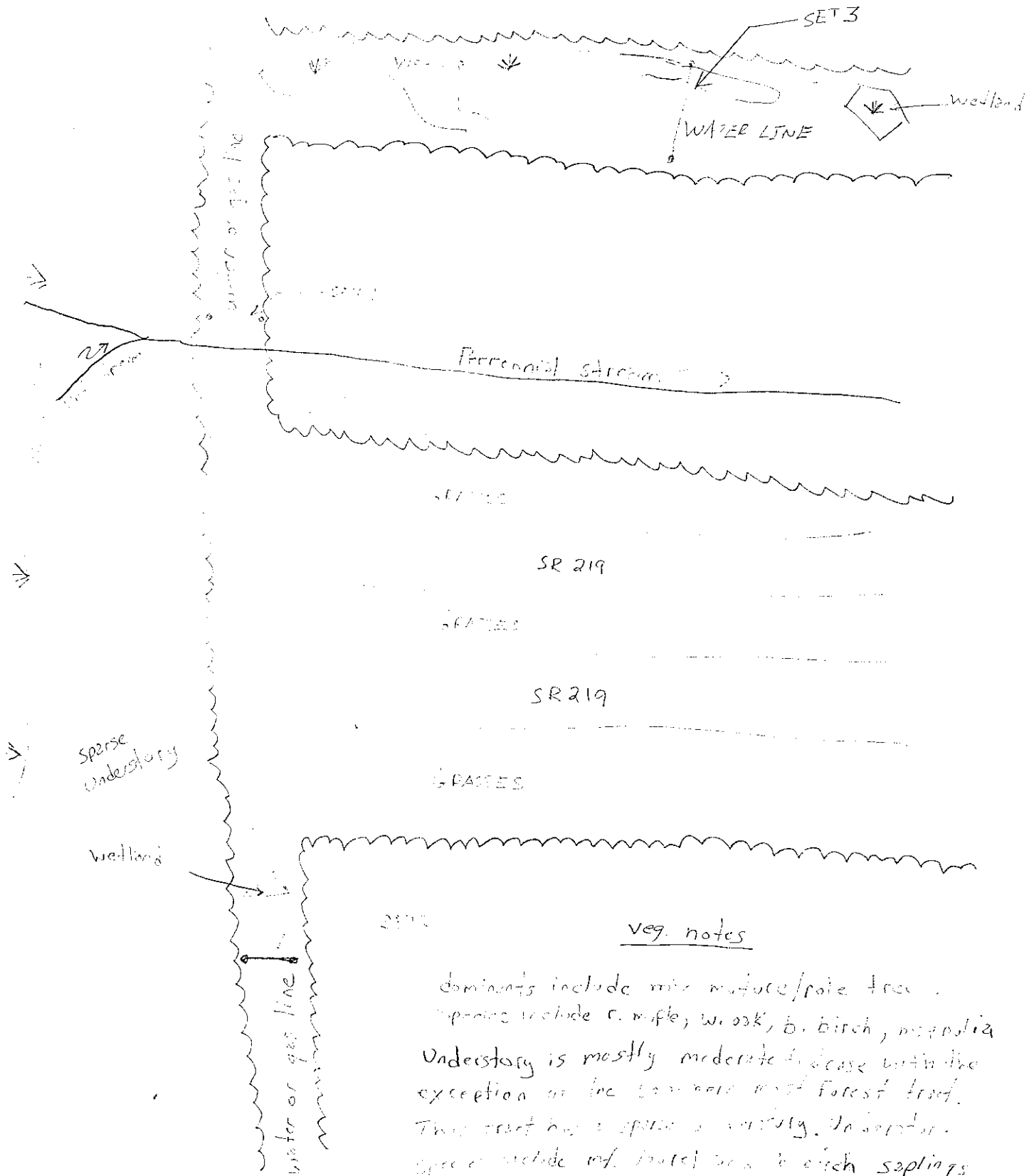
16. Capture Setup at Site:

Set #	Type	Count	Dimensions	Description	TOTAL AREA (m)
1	Nets	4	12m x 2.6m	Stacked over trail	124.8 sq. m
1	nets	1	9m x 2.6m	stacked over trail	23.4
2	nets	2	9m x 2.6m	stacked over trail	46.8
3	nets	3	9m x 2.6m	stacked over trail	70.2

Total Capture Area: 140.4 sq. m



N →  
not to scale  
Site diagram



(Site Survey Record – Continued)

Site Name/No.:

(Site 15) (S15)

Date: 7/29/08

## 17. Describe habitat 150 m around site: (topography and vegetation including dominant tree species.)

Gradually sloping forested terrain. Adjacent to Somerset terminus of US 219, adjacent to State Game Lands. See site diagram for vegetation notes.

18. Was reproductive status checked? YES / NO (if "NO" only enter numbers in Total columns)

## \*CAPTURE RESULTS

Species	Number of Adult Females				No. Juv. Fem.	Total No. Fem.	Number of Adult Males		No. Juv. Male	Total No. Males	Species Totals
	NR	PG	L	PL			SCR	NR			
<i>Eptesicus fuscus</i>	2		1			3	2	1	1	4	7
<i>Myotis lucifugus</i>								1		1	1
<i>Myotis septentrionalis</i>											
<i>Myotis leibii</i>											
<i>Myotis sodalis</i>											
<i>Eptesicus fuscus</i>								1		1	1
<i>Pipistrellus subflavus</i>											
<i>Lasiurus borealis</i>											
<i>Lasiurus cinereus</i>											
<i>Lasionycteris noctivagans</i>											
Other – specify:											
Other – specify:											
Reproductive Status: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen. *Complete Measurement and Capture Data Form for all: (1) <i>Myotis sodalis</i> , (2) <i>Myotis leibii</i> , (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA.											Grand Total 2

## 19. BAT DETECTORS &amp; OTHER MONITORING DEVICES: Tallies of bat passes / hour. One to 5 hours required for Indiana bat hibernacula surveys. Monitor one hour after 22:00 hrs when trapping/netting hibernacula and 5 hours when only monitoring with bat detectors, night vision or infrared device (when site can not be trapped/netted). Describe procedure &amp; equipment used in remarks.

1 <sup>st</sup> hour	2 <sup>nd</sup> hour	3 <sup>rd</sup> hour	4 <sup>th</sup> hour	5 <sup>th</sup> hour
Start Time:	Start Time:	Start Time:	Start Time:	Start Time:
End Time:	End Time:	End Time:	End Time:	End Time:
Tallies:	Tallies:	Tallies:	Tallies:	Tallies:

## 20. REMARKS:

20:40 Bat activity begins

21:08 → Bat escape from set 3, caught at 5m

22:00 – 23:00 → little bat activity

23:20 → some bat activity

23:45 some bat activity

**Bat Measurement and Capture Data Form**(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: <u>S15 (Site 15)</u>				Date: <u>7/29/08</u>				Set No. Captured In: <u>3</u>				Name of Person Identifying the Bat: <u>Steve Pernick</u>				*Capture Number: <u>01</u>	
Height in meters captured above ground surface: <u>5</u> m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)						Transmitter Attached? If so: Frequency (mHz)	
Species <u>E. fuscus</u> Sex <u>M</u> Age <u>A</u> Repro. Condition <u>NR</u> Wt. (g) <u>17</u> Ear <u>14</u> Tragus <u>6</u> Fore-arm <u>45</u> Hind Foot <u>9</u>				Recapture Yes/No		Band Material		Band Color		Band Inscription		Band on Left/Right					
Time of Capture <u>21:35</u>		Photo Taken <u>Yes</u> / No		Remarks: <u>Wing bone fusion not complete - retaining characteristic of Juvenile</u> <u>Has wing mites</u>													
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen																	
Site Name Or Number: <u>S15 (Site 15)</u>				Date: <u>7/29/08</u>				Set No. Captured In: <u>3</u>				Name of Person Identifying the Bat: <u>Steve Pernick</u>				*Capture Number: <u>02</u>	
Height in meters captured above ground surface: <u>5</u> m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)						Transmitter Attached? If so: Frequency (mHz)	
Species <u>M. L. lei</u> Sex <u>M</u> Age <u>A</u> Repro. Condition <u>NR</u> Wt. (g) <u>9</u> Ear <u>14</u> Tragus <u>6</u> Fore-arm <u>37</u> Hind Foot <u>8</u>				Recapture Yes/No		Band Material		Band Color		Band Inscription		Band on Left/Right					
Time of Capture <u>0:38</u>		Photo Taken <u>Yes</u> / No		Remarks:													
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen																	
Site Name Or Number:				Date:				Set No. Captured In:				Name of Person Identifying the Bat:				*Capture Number:	
Height in meters captured above ground surface: m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)						Transmitter Attached? If so: Frequency (mHz)	
Species Sex Age Repro. Condition Wt. (g) Ear Tragus Fore-arm Hind Foot				Recapture Yes/No		Band Material		Band Color		Band Inscription		Band on Left/Right					
Time of Capture		Photo Taken Yes / No		Remarks:													

\*Capture Number = number in sequence by site.



BAT NETTING/TRAPPING SITE SURVEY RECORD

Page 1 of 2

1. Survey Date: 11 AUG 08 2. Company Name: Kimball  
3. Reporter: Steve Pernick 4. Assistants: Dennis McGraw, Kelly Eismant  
5. Site Name and/or Number: S15 (Site 15)  
6. Site is (circle one): hibernation site summer habitat

7a. If hibernation site circle one: limestone mine, coal mine, limestone cave, sandstone cave, RR tunnel,  
other structure, describe - \_\_\_\_\_

7b. If summer habitat, describe area being sampled (e.g. forested stream or forest clearing with stream):

Forest clearing along waterline and trail Sets 2+3+1

8. County: Somerset 9. 7.5' Quad.: Murdock  
10. Was site GPS'd (required)? YES - NO Set 01 39° 58' 24.468" N 79° 2' 38.113" W  
Set 02 39° 58' 24.367" N 79° 2' 32.580" W  
11. Geographic Coordinates (D-M-S): Latitude: 39° - 58' - 24.362" N, Longitude: 79° - 2' - 38.362" W  
Datum (circle one): NAD27 (Preferred), NAD83, WGS84, Other: \_\_\_\_\_

12. Ownership and Access: (Who owns site or controls access? Give name and address.) PennDOT Keystone  
Building 400 North St Harrisburg, PA 17120 ; PA Game Commission PO Box 62 Meyersdale, PA 15552

13. Time (military) & Temperature: Start Time 20:15 h Stop Time 21:30 h Total Minutes: 315  
Start Temp. 14.5 °C End Temp. 12.5 °C

14. General Weather (circle one): Clear, Partly Cloudy, Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;  
Steady Rain; Thunderstorms; Snow; Other: \_\_\_\_\_ Humidity start: 94% End: 98%

15. General Wind Conditions (circle one): Calm, Breezy (Leaves Rustling), Windy (trees swaying).

16. Capture Setup at Site:

Set #	Type	Count	Dimensions	Description	TOTAL AREA (m)
1	Nets	4	12m x 2.6m	Stacked over trail	124.8 sq. m
1	Nets	1	9m x 2.6m	stacked over trail	23.4
2	Nets	2	9m x 2.6m	stacked over trail	46.8
3	Nets	3	9m x 2.6m	stacked over trail	70.2

Total Capture Area: 140.4 sq. m

Ser 7/29/08 Site Diagram

(Site Survey Record - Continued)

Site Name/No.:

S15 (Site 15)

Date: 11 AUG 08

## 17. Describe habitat 150 m around site: (topography and vegetation including dominant tree species.)

Gradually sloping forested terrain. Adjacent to Somerset terminus of US 219, adjacent to State Game Lands. Veg dominant s: phloche-mix mature/psb trees, including r. maple, w. oak, b. birch, magnolia. Understory is mostly moderate to dense w/ the exception of the southern most forest tract. This tract has a sparse understory inc. mt laurel + birch.

18. Was reproductive status checked? ☒ YES ☐ NO (if "NO" only enter numbers in **Total** columns)

## \*CAPTURE RESULTS

Species	Number of Adult Females				No. Juv. Fem.	Total No. Fem.	Number of Adult Males		No. Juv. Male	Total No. Males	Species Totals
	NR	PG	L	PL			SCR	NR			
<i>Eptesicus fuscus</i>	2		1			3	2	1	1	4	7
<i>Myotis lucifugus</i>											
<i>Myotis septentrionalis</i>											
<i>Myotis leibii</i>											
<i>Myotis sodalis</i>											
<i>Eptesicus fuscus</i>											
<i>Pipistrellus subflavus</i>											
<i>Lasiurus borealis</i>											
<i>Lasiurus cinereus</i>											
<i>Lasionycteris noctivagans</i>											
Other - specify:											
Other - specify:											
Reproductive Status: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen. *Complete Measurement and Capture Data Form for all: (1) <i>Myotis sodalis</i> , (2) <i>Myotis leibii</i> , (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA.											Grand Total +4 Zero

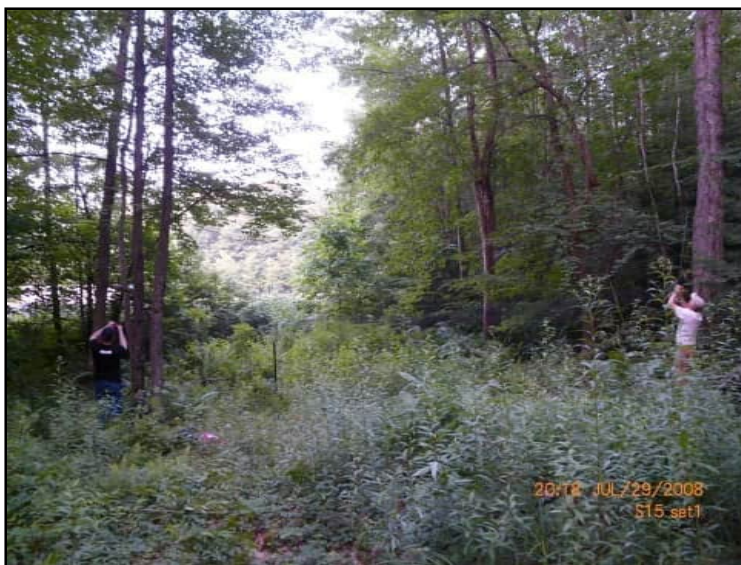
## 19. BAT DETECTORS &amp; OTHER MONITORING DEVICES: Tallies of bat passes / hour. One to 5 hours required for Indiana bat hibernacula surveys. Monitor one hour after 22:00 hrs when trapping/netting hibernacula and 5 hours when only monitoring with bat detectors, night vision or infrared device (when site can not be trapped/netted). Describe procedure &amp; equipment used in remarks.

1 <sup>st</sup> hour	2 <sup>nd</sup> hour	3 <sup>rd</sup> hour	4 <sup>th</sup> hour	5 <sup>th</sup> hour
Start Time:	Start Time:	Start Time:	Start Time:	Start Time:
End Time:	End Time:	End Time:	End Time:	End Time:
Tallies:	Tallies:	Tallies:	Tallies:	Tallies:

## 20. REMARKS:

- First bat activity at 20:35
- 20:50 - low bat activity
- zero bats captured in nets
- last bat detected 21:30





**Photograph 39:** Site 15 Set 1



**Photograph 40:** Site 15 Set 2



**Photograph 41:** Site 15 Set 3

**US 219 IMPROVEMENT  
PROJECT**  
**S.R. 6219 SECTION 020**  
**MEYERSDALE TO SOMERSET**  
SOMERSET COUNTY, PENNSYLVANIA


**MIST NET SURVEY  
FOR THE  
INDIANA BAT  
(*Myotis sodalis*)**


**SITE 15**

**Legend**


 Mist Net Survey Site


**Surface Water Features**


 Ephemeral

 Intermittent


 Perennial


 Surface Drainage Channel

 Wetlands

 Wetland Open Ends


**Mapping Features**

 Area of Detailed Investigation (LRK 2007/2008)


 Required R-O-W

 Structures

 Cell Tower


 Railroad


 Treeline


 Unimproved Roads / Trails

 Roadways


 Contours


 Low Density Residential

 Successional Rangeland

 Transitional

 Water

 Barren Land


 Agricultural Land

 Grassland

 Forest

 Urban

 Roadway

 Miscellaneous

 Alignment and Stations

1

0 50 100 200 Feet

1 inch equals 200 feet

JRG 12/22/2008

BAT NETTING/TRAPPING SITE SURVEY RECORD

Page 1 of 2

1. Survey Date: 7/29/08 2. Company Name: Kimball

3. Reporter: Steve Pernick 4. Assistants: Kelly Eiesmont

5. Site Name and/or Number: S16 (Site 16)

6. Site is (circle one): hibernation site summer habitat

7a. If hibernation site circle one: limestone mine, coal mine, limestone cave, sandstone cave, RR tunnel,  
other structure, describe - \_\_\_\_\_

7b. If summer habitat, describe area being sampled (e.g. forested stream or forest clearing with stream):

forested stream at edge of clearing, wetland in forest opening, adjacent to 219

8. County: Somerset 9. 7.5' Quad.: Murdock

10. Was site GPS'd (required)? YES NO Set 01 39° 58' 59.859" N 79° 2' 35.875" W

11. Geographic Coordinates (D-M-S): Latitude: 39° - 58' - 59.859" N, Longitude: 79° - 2' - 35.875" W

Datum (circle one): NAD27 (Preferred) NAD83, WGS84, Other: \_\_\_\_\_

12. Ownership and Access: (Who owns site or controls access? Give name and address.) PA Game

Commission PO Box 602 Myersdale, PA 15552

13. Time (military) & Temperature: Start Time 2030 h Stop Time 2200 h Total Minutes: 330

Start Temp. 17.7 °C End Temp. 13 °C start humid 100%  
end humid 100%

14. General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;  
Steady Rain; Thunderstorms; Snow; Other: \_\_\_\_\_

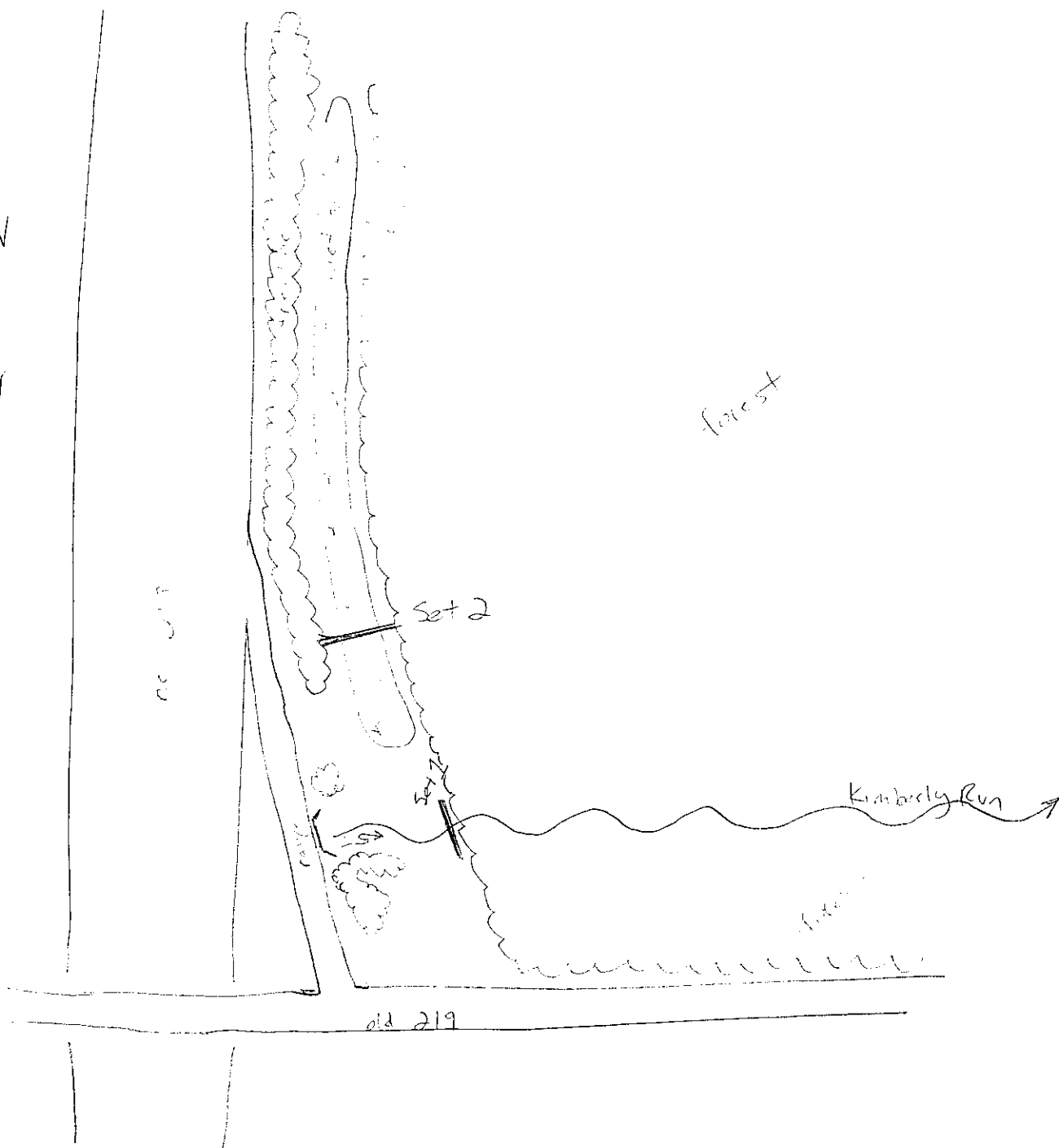
15. General Wind Conditions (circle one): Calm, Breezy (Leaves Rustling), Windy (trees swaying).

16. Capture Setup at Site:

Set #	Type	Count	Dimensions	Description	TOTAL AREA (m)
1	Nets	4	12m x 2.6m	Stacked over trail	124.8 sq. m
1	nets	2	9m x 2.6	over Kimberly Run	46.8
2	nets	4	9m x 2.6	over wetland at Kimberly Run	93.6

Total Capture Area: 140.4 sq. m





(Site Survey Record – Continued) Site Name/No.: 516 (Site 16) Date: 7/29/08**17. Describe habitat 150 m around site: (topography and vegetation including dominant tree species.)**

- dense, mixed decid/conv forest, mixed age class, relatively gentle sloped
- dominant species - red oak, hemlock, red maple
- Kimberly Run is 20' w x 1 1/2' d, site also includes a long emergent wetland system

**18. Was reproductive status checked? YES / NO (if "NO" only enter numbers in Total columns)****\*CAPTURE RESULTS**

Species	Number of Adult Females				No. Juv. Fem.	Total No. Fem.	Number of Adult Males		No. Juv. Male	Total No. Males	Species Totals
	NR	PG	L	PL			SCR	NR			
<i>Eptesicus fuscus</i>	2		1			3	2	1	1	4	7
<i>Myotis lucifugus</i>	1					1		2		2	3
<i>Myotis septentrionalis</i>											
<i>Myotis leibii</i>											
<i>Myotis sodalis</i>											
<i>Eptesicus fuscus</i>									1	1	1
<i>Pipistrellus subflavus</i>											
<i>Lasiurus borealis</i>					1	1	2			2	3
<i>Lasiurus cinereus</i>											
<i>Lasionycteris noctivagans</i>											
Other – specify:											
Other – specify:											
Reproductive Status: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen. <b>*Complete Measurement and Capture Data Form for all:</b> (1) <i>Myotis sodalis</i> , (2) <i>Myotis leibii</i> , (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA.											Grand Total 7

**19. BAT DETECTORS & OTHER MONITORING DEVICES:** Tallies of bat passes / hour. One to 5 hours required for Indiana bat hibernacula surveys. Monitor one hour after 22:00 hrs when trapping/netting hibernacula and 5 hours when only monitoring with bat detectors, night vision or infrared device (when site can not be trapped/netted). Describe procedure & equipment used in remarks.

1 <sup>st</sup> hour	2 <sup>nd</sup> hour	3 <sup>rd</sup> hour	4 <sup>th</sup> hour	5 <sup>th</sup> hour
Start Time:	Start Time:	Start Time:	Start Time:	Start Time:
End Time:	End Time:	End Time:	End Time:	End Time:
Tallies:	Tallies:	Tallies:	Tallies:	Tallies:

**20. REMARKS:**

• 2100 first bat on detector

**Bat Measurement and Capture Data Form**(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: (Site 16) S16				Date: 29 July 08				Set No. Captured In: 2		Name of Person Identifying the Bat: Steve Pernick				*Capture Number: 1		
Height in meters captured above ground surface: 4 m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right			
L. borealis	F	J	NR	9.5	10	4	42	6								
Time of Capture	Photo Taken		Remarks:													
2110	Yes / No															
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen																
Site Name Or Number: (Site 16) S16				Date: 29 July 08				Set No. Captured In: 2		Name of Person Identifying the Bat: Steve Pernick				*Capture Number: 2		
Height in meters captured above ground surface: 5 m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right			
E. fuscus	M	J	NR	11	14	5	43	9								
Time of Capture	Photo Taken		Remarks: Infested w/ wing nites													
2110	Yes / No															
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen																
Site Name Or Number: (Site 16) S16				Date: 29 July 08				Set No. Captured In: 2		Name of Person Identifying the Bat: Steve Pernick				*Capture Number: 3		
Height in meters captured above ground surface: 5 m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right			
L. borealis	M	A	SCR	10.5	11	5	40	6								
Time of Capture	Photo Taken		Remarks:													
2115	Yes / No															

\*Capture Number = number in sequence by site.



**Bat Measurement and Capture Data Form**(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: (Site 16) <u>816</u>				Date: <u>29 JULY 08</u>		Set No. Captured In: <u>1</u>		Name of Person Identifying the Bat: <u>Steve Pernick</u>				*Capture Number: <u>04</u>		
Height in meters captured above ground surface: <u>4</u> m				Body Measurements (grams and millimeters)					Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right	
<i>M. Lucifugus</i>	M	A	NR	6.5	14	6	36	8						
Time of Capture <u>2240</u>		Photo Taken <input checked="" type="checkbox"/> Yes / <input type="checkbox"/> No		Remarks:										
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen														
Site Name Or Number: (Site 16) <u>816</u>				Date: <u>29 JULY 08</u>		Set No. Captured In: <u>1</u>		Name of Person Identifying the Bat: <u>Steve Pernick</u>				*Capture Number: <u>05</u>		
Height in meters captured above ground surface: <u>1</u> m				Body Measurements (grams and millimeters)					Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right	
<i>M. Lucifugus</i>	F	A	NR	8.5	14	6	38	8						
Time of Capture <u>2325</u>		Photo Taken <input checked="" type="checkbox"/> Yes / <input type="checkbox"/> No		Remarks:										
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen														
Site Name Or Number: (Site 16) <u>816</u>				Date: <u>29 JULY 08</u>		Set No. Captured In: <u>1</u>		Name of Person Identifying the Bat: <u>Steve Pernick</u>				*Capture Number: <u>06</u>		
Height in meters captured above ground surface: <u>4</u> m				Body Measurements (grams and millimeters)					Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right	
<i>L. borealis</i>	M	A	SCR	12.0	10	5	42	6						
Time of Capture <u>2400</u>		Photo Taken <input checked="" type="checkbox"/> Yes / <input type="checkbox"/> No		Remarks:										

\*Capture Number = number in sequence by site.

**Bat Measurement and Capture Data Form**(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: <u>Sik 16</u> <u>S16</u>				Date: <u>29 July 08</u>				Set No. Captured In: <u>1</u>		Name of Person Identifying the Bat: <u>Steve Pernick</u>				*Capture Number: <u>07</u>		
Height in meters captured above ground surface: <u>2</u> m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
<u>Species</u> <u>M. lucifugus</u> <u>Sex</u> <u>M</u> <u>Age</u> <u>A</u> <u>Repro. Condition</u> <u>NR</u>				<u>Wt.</u> (g) <u>7</u> <u>Ear</u> <u>14</u>		<u>Tragus</u> <u>6</u> <u>Fore-arm</u> <u>36</u>		<u>Hind Foot</u> <u>8</u>		<u>Recapture</u> <u>Yes/No</u>		<u>Band Material</u> <u>Band Color</u> <u>Band Inscription</u> <u>Band on Left/Right</u>				
Time of Capture <u>00 35</u>		<u>Photo Taken</u> <input checked="" type="checkbox"/> Yes / <input type="checkbox"/> No		Remarks:												
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen																
Site Name Or Number:				Date:				Set No. Captured In:		Name of Person Identifying the Bat:				*Capture Number:		
Height in meters captured above ground surface: _____ m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
<u>Species</u>  <u>Sex</u>  <u>Age</u>  <u>Repro. Condition</u> 				<u>Wt.</u> (g) <u>Ear</u>		<u>Tragus</u> <u>Fore-arm</u>		<u>Hind Foot</u>		<u>Recapture</u> <u>Yes/No</u>		<u>Band Material</u> <u>Band Color</u> <u>Band Inscription</u> <u>Band on Left/Right</u>				
Time of Capture		<u>Photo Taken</u> <input type="checkbox"/> Yes / <input type="checkbox"/> No		Remarks:												
Repro. Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen																
Site Name Or Number:				Date:				Set No. Captured In:		Name of Person Identifying the Bat:				*Capture Number:		
Height in meters captured above ground surface: _____ m				Body Measurements (grams and millimeters)						Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)	
<u>Species</u>  <u>Sex</u>  <u>Age</u>  <u>Repro. Condition</u> 				<u>Wt.</u> (g) <u>Ear</u>		<u>Tragus</u> <u>Fore-arm</u>		<u>Hind Foot</u>		<u>Recapture</u> <u>Yes/No</u>		<u>Band Material</u> <u>Band Color</u> <u>Band Inscription</u> <u>Band on Left/Right</u>				
Time of Capture		<u>Photo Taken</u> <input type="checkbox"/> Yes / <input type="checkbox"/> No		Remarks:												

\*Capture Number = number in sequence by site.

## BAT NETTING/TRAPPING SITE SURVEY RECORD

Page 1 of 2

1. Survey Date: 8/11/08 2. Company Name: Kimball3. Reporter: Steve Pernick 4. Assistants: Steve Toki5. Site Name and/or Number: S16 (Site 16)6. Site is (circle one): hibernation site summer habitat7a. If hibernation site circle one: limestone mine, coal mine, limestone cave, sandstone cave, RR tunnel,  
other structure, describe - \_\_\_\_\_

7b. If summer habitat, describe area being sampled (e.g. forested stream or forest clearing with stream):

Forested stream at edge of clearing, wetland in forest opening, adjacent to 2198. County: Somerset 9. 7.5' Quad.: Mundock  
Set 61 39° 58' 59.859"N 79° 2' 35.875"W10. Was site GPS'd (required)? YES NO11. Geographic Coordinates (D-M-S): Latitude: Set 62 39° - 58' - 57.794"N, Longitude: 79° - 2' - 36.542"WDatum (circle one): NAD27 (Preferred), NAD83, WGS84, Other: \_\_\_\_\_12. Ownership and Access: (Who owns site or controls access? Give name and address.) PA Game  
Commission PO Box 62 Meyersdale, PA 1555213. Time (military) & Temperature: Start Time 2015 h Stop Time 1:25 h Total Minutes: 30  
Start Temp. 13.5 °C End Temp. 10.5 °C start humid 100%  
end humid 100%14. General Weather (circle one): Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;  
Steady Rain; Thunderstorms; Snow; Other: \_\_\_\_\_15. General Wind Conditions (circle one): Calm Breezy (Leaves Rustling), Windy (trees swaying).

## 16. Capture Setup at Site:

Set #	Type	Count	Dimensions	Description	TOTAL AREA (m)
1	Nets	4	12m x 2.6m	Stacked over trail	124.8 sq. m
1	nets	2	9m x 2.6	over Kimberly Run	46.8
2	nets	4	9m x 2.6	over wetland adjacent to Kimberly Run	93.6

Total Capture Area: 140.4 sq. m



see site diagram  
from previous night

(Site Survey Record – Continued)

Site Name/No.: 516 (Site 16) Date: 8/11/08

## 17. Describe habitat 150 m around site: (topography and vegetation including dominant tree species.)

- dense, mixed decid/conif forest, mixed age class, relatively gentle sloped
- dominant species - red oak, hemlock, red maple
- Kimberly Run is 20'w x 1 1/2'd, site also includes a long emergent wetland system

18. Was reproductive status checked? YES / NO (if "NO" only enter numbers in **Total** columns)

## \*CAPTURE RESULTS

Species	Number of Adult Females				No. Juv. Fem.	Total No. Fem.	Number of Adult Males		No. Juv. Male	Total No. Males	Species Totals
	NR	PG	L	PL			SCR	NR			
<i>Eptesicus fuscus</i>	2		1			3	2	1	1	4	7
<i>Myotis lucifugus</i>									1		
<i>Myotis septentrionalis</i>											
<i>Myotis leibii</i>											
<i>Myotis sodalis</i>											
<i>Eptesicus fuscus</i>											
<i>Pipistrellus subflavus</i>											
<i>Lasiurus borealis</i>	1					(1)	1	1		(2)	(3)
<i>Lasiurus cinereus</i>											
<i>Lasionycteris noctivagans</i>											
Other – specify:											
Other – specify:											
Reproductive Status: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen. *Complete Measurement and Capture Data Form for all: (1) <i>Myotis sodalis</i> , (2) <i>Myotis leibii</i> , (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA.											Grand Total (3)

## 19. BAT DETECTORS &amp; OTHER MONITORING DEVICES: Tallies of bat passes / hour. One to 5 hours required for Indiana bat hibernacula surveys. Monitor one hour after 22:00 hrs when trapping/netting hibernacula and 5 hours when only monitoring with bat detectors, night vision or infrared device (when site can not be trapped/netted). Describe procedure &amp; equipment used in remarks.

1 <sup>st</sup> hour	2 <sup>nd</sup> hour	3 <sup>rd</sup> hour	4 <sup>th</sup> hour	5 <sup>th</sup> hour
Start Time:	Start Time:	Start Time:	Start Time:	Start Time:
End Time:	End Time:	End Time:	End Time:	End Time:
Tallies:	Tallies:	Tallies:	Tallies:	Tallies:

## 20. REMARKS

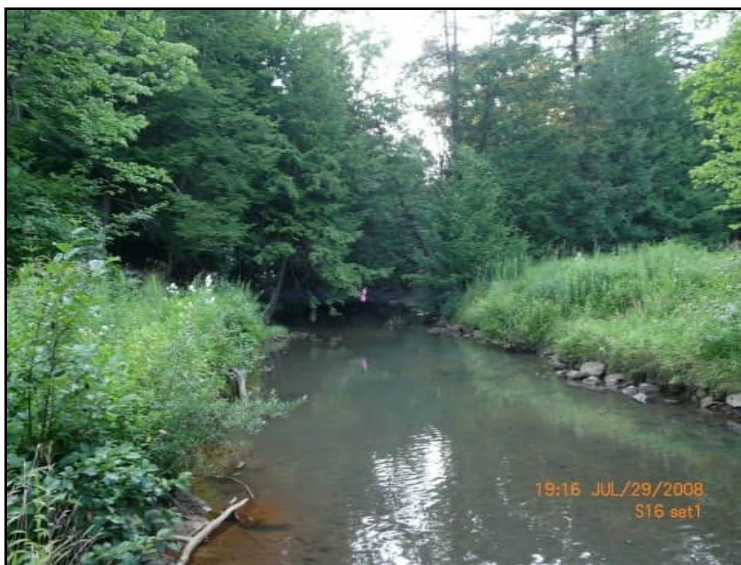
2025 First bat seen flying very high

**Bat Measurement and Capture Data Form**(Complete for all (1) *Myotis sodalis*, (2) *Myotis leibii*, (3) bats you are banding or band recaptures, (4) radio-tagged bats and (5) bat species not usually found in PA)

Site Name Or Number: <u>(SITE 16) S16</u>				Date: <u>8/11/08</u>		Set No. <u>01</u> Captured In:		Name of Person <u>STEVE PERINICK</u> Identifying the Bat:				*Capture Number: <u>01</u>		
Height in meters captured above ground surface: <u>2</u> m				Body Measurements (grams and millimeters)					Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)
Species <u>L. borealis</u>	Sex <u>M</u>	Age <u>J</u>	Repro. Condition <u>NR</u>	Wt. (g) <u>9.5</u>	Ear <u>9</u>	Tragus <u>4</u>	Fore-arm <u>41</u>	Hind Foot <u>7</u>	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right	
Time of Capture <u>22:00</u>	Photo Taken <u>Yes</u> / No		Remarks: <u>HAIR &amp; TISSUE SAMPLES TAKEN</u>											
Repro Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen														
Site Name Or Number: <u>(SITE 16) S16</u>				Date: <u>8/11/08</u>		Set No. <u>02</u> Captured In:		Name of Person <u>STEVE PERINICK</u> Identifying the Bat:				*Capture Number: <u>02</u>		
Height in meters captured above ground surface: <u>3</u> m				Body Measurements (grams and millimeters)					Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)
Species <u>L. borealis</u>	Sex <u>m</u>	Age <u>A</u>	Repro. Condition <u>NR</u>	Wt. (g) <u>9.5</u>	Ear <u>10</u>	Tragus <u>4</u>	Fore-arm <u>41</u>	Hind Foot <u>7</u>	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right	
Time of Capture <u>1:10</u>	Photo Taken <u>Yes</u> / No		Remarks: <u>HAIR &amp; TISSUE SAMPLES TAKEN</u>											
Repro Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis swollen														
Site Name Or Number: <u>(SITE 16) S16</u>				Date: <u>8/11/08</u>		Set No. <u>02</u> Captured In:		Name of Person <u>STEVE PERINICK</u> Identifying the Bat:				*Capture Number: <u>03</u>		
Height in meters captured above ground surface: <u>7</u> m				Body Measurements (grams and millimeters)					Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)					Transmitter Attached? If so: Frequency (mHz)
Species <u>L. borealis</u>	Sex <u>F</u>	Age <u>A</u>	Repro. Condition <u>NR</u>	Wt. (g) <u>10</u>	Ear <u>11</u>	Tragus <u>6</u>	Fore-arm <u>45</u>	Hind Foot <u>7</u>	Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right	
Time of Capture <u>1:20</u>	Photo Taken <u>Yes</u> / No		Remarks: <u>HAIR &amp; TISSUE SAMPLES TAKEN</u>											

\*Capture Number = number in sequence by site.





**Photograph 42:** Site 16 Set 1




**Photograph 43:** Site 16 Set 2

**US 219 IMPROVEMENT PROJECT**  
**S.R. 6219 SECTION 020**  
**MEYERSDALE TO SOMERSET**  
**SOMERSET COUNTY, PENNSYLVANIA**







**MIST NET SURVEY FOR THE INDIANA BAT**  
**(*Myotis sodalis*)**

**SITE 16**










**Legend**

 Mist Net Survey Site













**Surface Water Features**

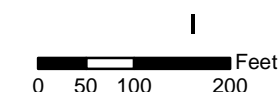
-  Ephemeral
-  Intermittent
-  Perennial
-  Surface Drainage Channel
-  Wetlands
-  Wetland Open Ends

**Mapping Features**

-  Area of Detailed Investigation (LRK 2007/2008)
-  Required R-O-W
-  Structures
-  Cell Tower
-  Railroad
-  Treeline
-  Unimproved Roads / Trails
-  Roadways
-  Contours

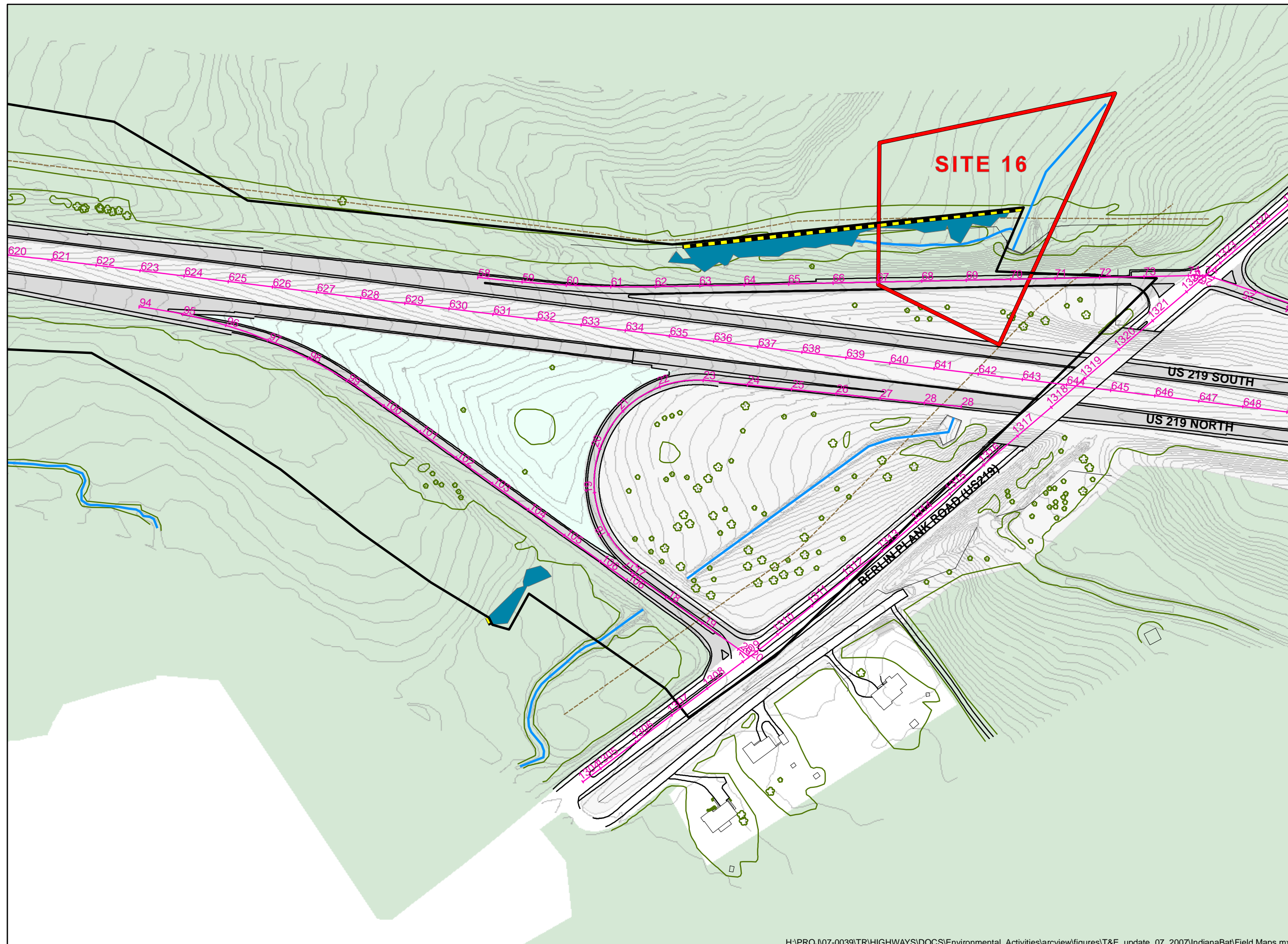
**Land Use**

-  Low Density Residential
-  Successional Rangeland
-  Transitional
-  Water
-  Barren Land
-  Agricultural Land
-  Grassland
-  Forest
-  Urban
-  Roadway
-  Miscellaneous
-  Alignment and Stations



1 inch equals 200 feet

JRG 12/22/2008





October 17, 2008

Maarten Vonhof  
Dept. of Biological Sciences  
Western Michigan University  
1903 W. Michigan Avenue  
Kalamazoo, MI 49008-5410

RE: Bat Hair and Tissue Samples

Dear Mr. Vonhof:

Our field season for bat surveys has come to a close for the year. It has been a pleasure to participate in the hair and tissue sample collection protocol for your on-going studies.

I have enclosed our data sheets and the hair and tissue samples collected.

Please feel free to contact me with any questions you may have, or should you require additional information pertaining to the submitted samples.

Sincerely,  
L. Robert Kimball and Associates

Steve J. Pernick  
Senior Natural Resources Specialist

Enclosures  
SJP/

A R C H I T E C T U R E | E N G I N E E R I N G | T E C H N O L O G Y | C O N S U L T I N G





Collector Steve Pernick Address 615 W. Highland Ave., Ebensburg, PA 15931

Phone Number (814) 472-7700

[illegible]

<sup>2</sup> If you are banding, simply use the band number. If you are not banding then use a unique number based on you initials and a number.

**APPENDIX D**

**REPRESENTATIVE SPECIES**  
**PHOTOGRAPHS**



**SR 6219 Section 020, Meyersdale to Somerset  
Special Use Permit No. 93-2008 with Amendments 1 and 2  
Representative Capture Photographs**



**Photograph 1:** *Eptesicus fuscus* July 18, 2008 Site 07 Capture 04



**Photograph 2:** *Myotis lucifugus* August 4, 2008 Site 05 Capture 01



**Photograph 3:** *Lasiurus borealis* July 18, 2008 Site 07 Capture 02



**Photograph 4:** *Myotis septentrionalis* July 27, 2008 Site 09 Capture 05



**Photograph 5:** Incidental Capture- Southern Flying Squirrel (*Glaucomys volans*) Site 08

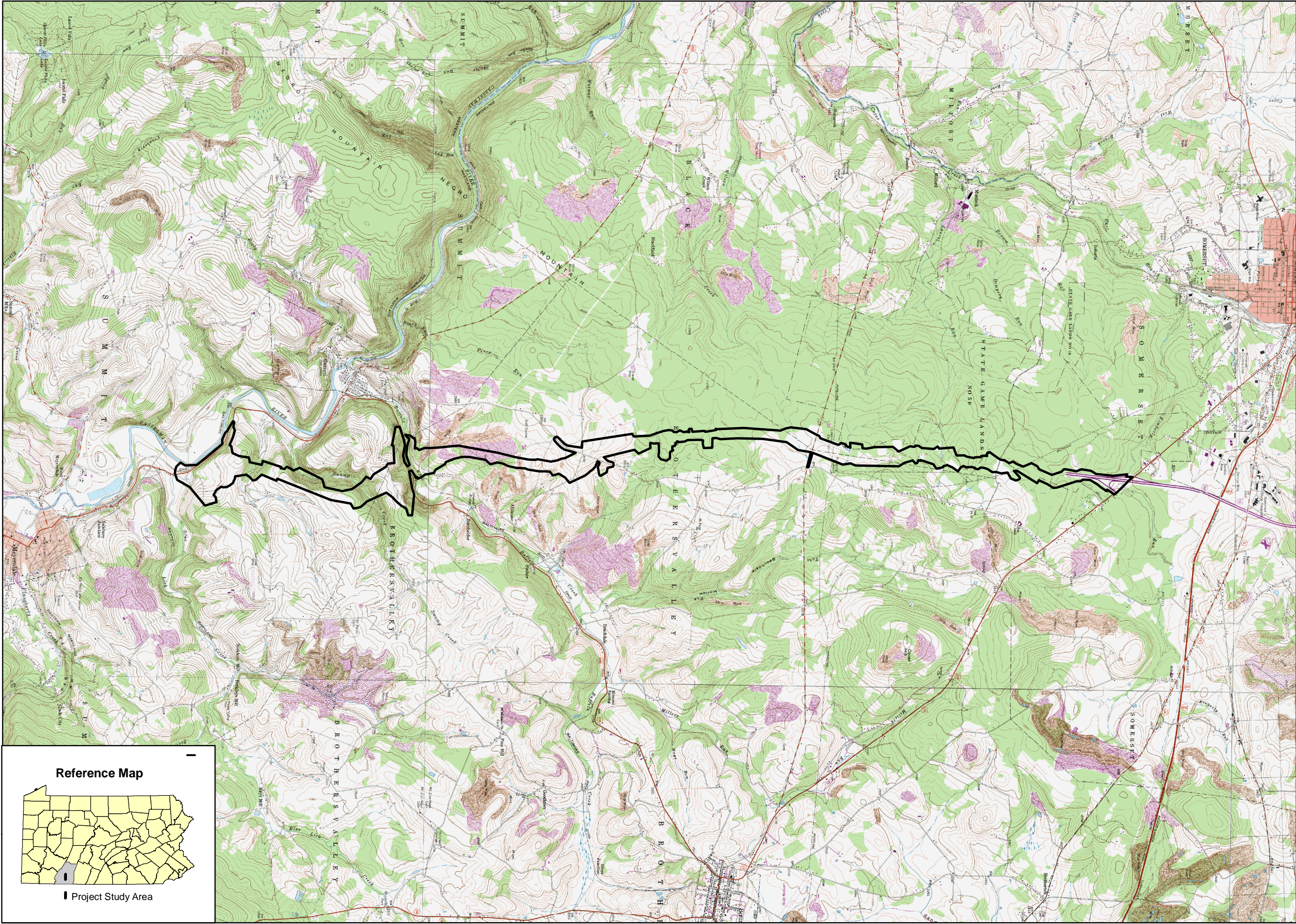


**Photograph 6:** Incidental Capture- Southern Flying Squirrel (*Glaucomys volans*) Site 13



# FIGURES





**US 219 IMPROVEMENT  
PROJECT**  
**S.R. 6219 SECTION 020**  
**MEYERSDALE TO SOMERSET**  
SOMERSET COUNTY, PENNSYLVANIA

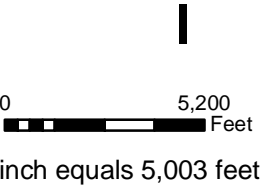
**MIST NET SURVEY  
FOR THE  
INDIANA BAT  
(*Myotis sodalis*)**

**Figure 1**

**PROJECT  
LOCATION**

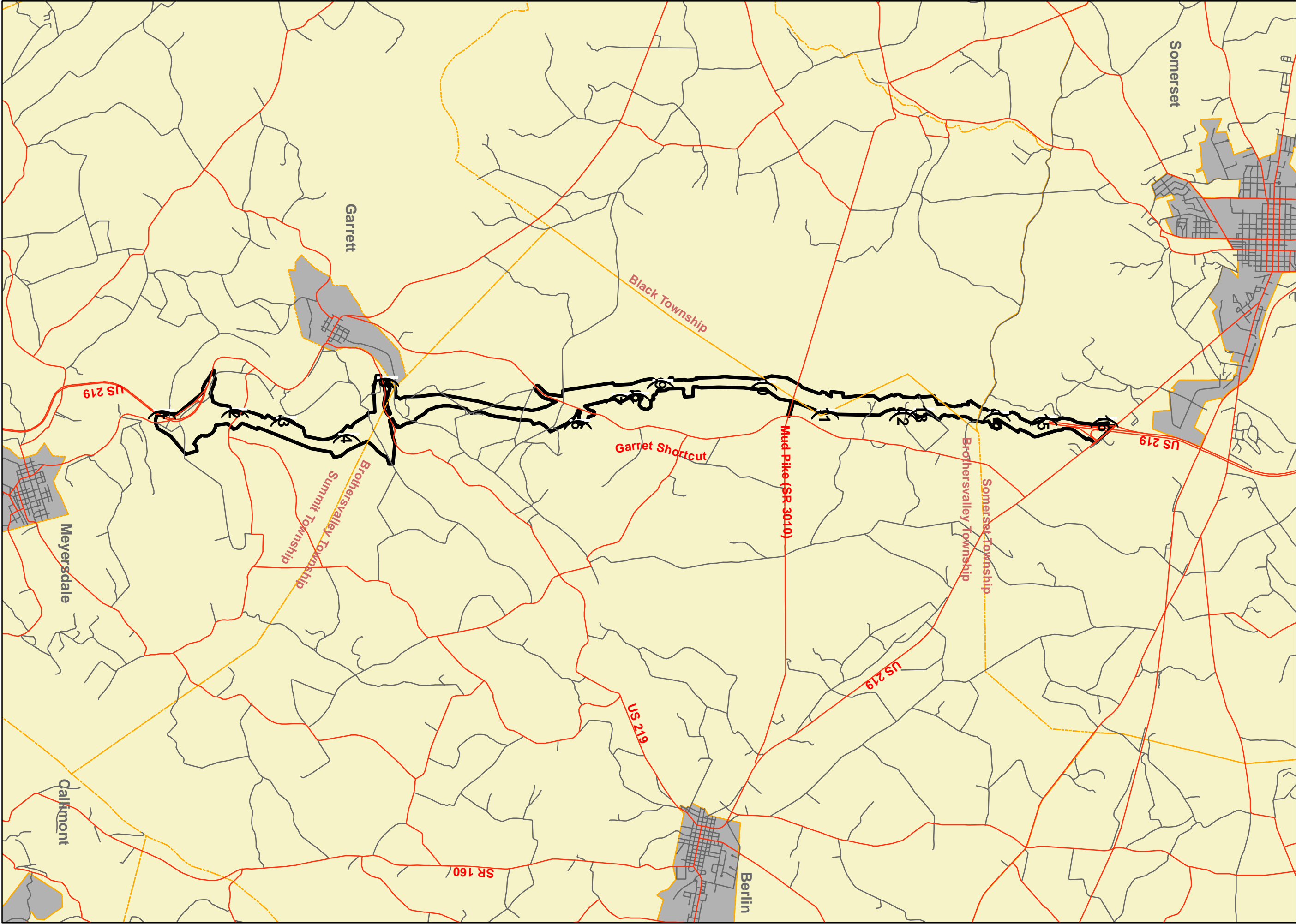
**Legend**

 Project Study Area



Base Mapping:  
USGS 7.5 Minute Topographic  
Pennsylvania Quadrangles:  
From Northeast to Southwest:  
Bakersville, Somerset, Stoystown,  
Rockwood, Murdock, Berlin,  
Markleton, Meyersdale, and  
Wittenberg







**US 219 IMPROVEMENT  
PROJECT**  
**S.R. 6219 SECTION 020**  
**MEYERSDALE TO SOMERSET**  
SOMERSET COUNTY, PENNSYLVANIA

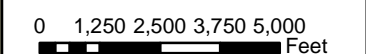
**MIST NET SURVEY  
FOR THE  
INDIANA BAT  
(*Myotis sodalis*)**

**Figure 2**  
**MIST NET  
SURVEY SITES**

**Legend**

 Mist Net Survey Site

 Project Study Area

  
0 1,250 2,500 3,750 5,000 Feet  
1 inch equals 5,000 feet

Base Mapping:  
2008 PA Municipality Data  
2008 PADOT Local Roads  
2008 PADOT State Roads



US 219 IMPROVEMENT  
PROJECT

S.R. 6219 SECTION 020  
MEYERSDALE TO SOMERSET


SOMERSET COUNTY, PENNSYLVANIA

MIST NET SURVEY  
FOR THE  
INDIANA BAT  
(*Myotis sodalis*)

Figure 3

RELATIVE DENSITY  
AND DISTRIBUTION  
CAPTURE RESULTS

Legend




*Lasiurus borealis*


*Myotis lucifugus*

*Myotis septentrionalis*

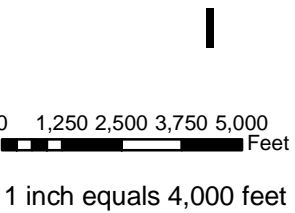
*Eptesicus fuscus*



Mist Net Survey Sites



Project Study Area



Base Mapping:  
USGS 7.5 Minute Topographic  
Quadrangles:  
Within Study Area:  
Meyersdale and Murdock, PA  
East of Study Area:  
Berlin and Wittenberg, PA.

Pie charts are sized proportional to  
the total number of bats captured at  
each site. Size in legend represents  
2 captures.



19741B Leistersburg Pike  
Hagerstown, MD 21742

E-mail: skellyloy@skellyloy.com  
Internet: www.skellyloy.com



Phone: 301-766-4236

Fax: 301-766-4190

December 31, 2012

Mr. Gregory M. Illig, P.E.  
Senior Project Manager  
Pennsylvania Department of  
Transportation, Engineering District 9-0  
Design Division, Plans Development  
1620 North Juniata Street  
Hollidaysburg, Pennsylvania 16648

Re: U.S. 219 Improvements Project  
S.R. 6219, Section 020  
Somerset County  
Bat Hibernaculum Investigations  
Final Report

Dear Mr. Illig:

Skelly and Loy, Inc. is pleased to submit the enclosed copy of the U.S. 219 Improvements Project, S.R. 6219, Section 020, Bat Hibernaculum Investigations Final Report. This document has been revised in accordance with comments received from the Pennsylvania Department of Transportation (PennDOT) and the Pennsylvania Game Commission (PGC) on December 27, 2012. It is our understanding that the U.S. Fish and Wildlife Service (USFWS) reviewed the December 7, 2012, Draft Report and did not have any comments for revisions. After your review, please forward a copy of this Final Report onto the USFWS and PGC. We will be pleased to provide hard copies of the Final Report upon request.

If you have any questions or comments regarding this submission, please contact Mr. Andy Brookens or me. Thank you.

Sincerely yours,

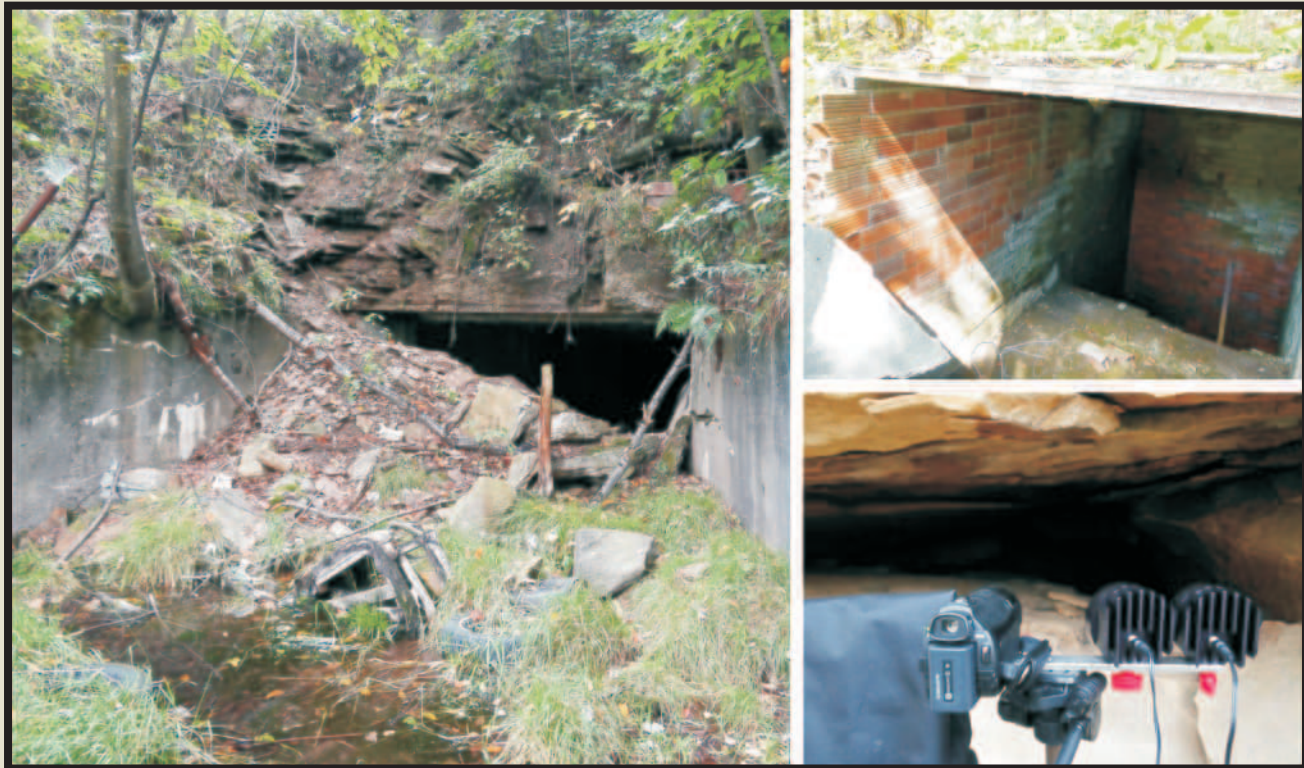
SKELLY and LOY, Inc.

Julie A. Zeyzus  
Biologist

cc: Jonathan Crum, FHWA  
James T. Pruss, PennDOT, District 9-0  
Thomas R. Yocum, PennDOT, District 9-0  
Domenic Piccolomini, SP&K  
Andy Brookens  
R11-0332.011  
File: ILLIG\_JAZ\_Revised-31Dec12.docx

# **U.S. ROUTE 219 IMPROVEMENTS PROJECT S.R. 6219, SECTION 020**

## **BAT HIBERNACULUM INVESTIGATIONS FINAL REPORT**



**PREPARED FOR**

**PENNSYLVANIA DEPARTMENT OF TRANSPORTATION,  
ENGINEERING DISTRICT 9-0**

**PREPARED BY**



**DECEMBER 2012**



**U.S. ROUTE 219 IMPROVEMENTS PROJECT  
S.R. 6219, SECTION 020  
BAT HIBERNACULUM INVESTIGATIONS  
FINAL REPORT**

**PREPARED FOR**



**PENNSYLVANIA DEPARTMENT OF TRANSPORTATION,  
ENGINEERING DISTRICT 9-0  
1620 NORTH JUNIATA STREET  
HOLLIDAYSBURG, PENNSYLVANIA 16648**

**PREPARED BY**



**449 EISENHOWER BOULEVARD, SUITE 300  
HARRISBURG, PENNSYLVANIA 17111**

**DECEMBER 31, 2012**

## TABLE OF CONTENTS

	PAGE
EXECUTIVE SUMMARY .....	1
I. INTRODUCTION.....	4
II. DEFINITION AND DETERMINATION OF APPLICABLE PROJECT ACTION AREA .....	6
III. DETERMINATION OF ADDITIONAL MINES/MINE OPENINGS WITHIN THE ACTION AREA THAT MAY SUPPORT BAT HIBERNATION .....	7
A. METHODOLOGIES .....	7
B. RESULTS .....	14
IV. ASSESSING POTENTIAL HIBERNACULA AND INDIANA BAT PRESENCE .....	24
A. TECHNICAL GUIDANCE AND AGENCY COORDINATION .....	24
B. METHODOLOGIES .....	25
C. RESULTS .....	29
V. DISCUSSION.....	37
A. PORTAL SITE #1 AND AIR SHAFT SITE #4 .....	37
B. EASTERN SMALL-FOOTED MYOTIS ( <i>MYOTIS LEIBII</i> ) .....	40
C. CONSTRUCTION ACTIVITIES IN RELATION TO PORTAL SITE #1 AND AIR SHAFT SITE #4.....	40
D. HIGHWALL SITE #3 .....	41
E. HIGHWALL SITE #2 .....	41
F. PIPE SITE #5.....	41
VI. CONCLUSIONS .....	43
VII. LIST OF PREPARERS.....	44
VIII. LITERATURE CITED .....	47

### APPENDICES

- APPENDIX A - AGENCY CORRESPONDENCE
- APPENDIX B - PERMIT AND PROTOCOLS
- APPENDIX C - DATA FORMS
  - PHASE I ASSESSMENT
  - PORTAL SITE 1
  - HIGHWALL SITE 2 AND SITE 3
  - AIRSHAFT SITE 4
  - PIPE SITE 5
- APPENDIX D - PHOTOGRAPHS
- APPENDIX E - GEOTECHNICAL REPORTS
- APPENDIX F - RESUMES
- APPENDIX G - BAT VIDEO



## LIST OF TABLES

NO.	DESCRIPTION	PAGE
1	SUMMARY OF UNDERGROUND MINING OPERATIONS WITHIN THE ACTION AREA .....	9
2	SUMMARY OF INVESTIGATED OPENINGS AUGUST 16 AND SEPTEMBER 17 THROUGH 21, 2012.....	21
3	SURVEY NIGHT SUMMARY, PORTAL SITE #1 SEPTEMBER 20 TO OCTOBER 18, 2012 .....	29
4	BAT CAPTURE SUMMARY, PORTAL SITE #1 .....	30
5	SURVEY NIGHT SUMMARY, HIGHWALL SITE #2 AND HIGHWALL SITE #3 SEPTEMBER 20 TO OCTOBER 9, 2012 .....	31
6	SURVEY NIGHT SUMMARY, AIR SHAFT SITE #4 SEPTEMBER 21 TO OCTOBER 19, 2012 .....	33
7	BAT CAPTURE SUMMARY, AIR SHAFT SITE #4 .....	34
8	SURVEY NIGHT SUMMARY, PIPE SITE #5 OCTOBER 9, 13, 14, AND 15, 2012.....	35
9	SPECIES DIVERSITY AT PORTAL SITE #1 AND AIR SHAFT SITE #4 DURING 15 VALID SURVEY NIGHTS SEPTEMBER 20 THROUGH OCTOBER 19, 2012 .....	39



## LIST OF FIGURES

NO.	DESCRIPTION	PAGE
1	LOCATION MAP .....	Following Text
2	PROJECT ALIGNMENT .....	Following Text
3A	CROP LINES AND MINE LOCATIONS .....	Following Text
3B	CROP LINES AND MINE LOCATIONS .....	Following Text
3C	CROP LINES AND MINE LOCATIONS .....	Following Text
3D	CROP LINES AND MINE LOCATIONS .....	Following Text
3E	CROP LINES AND MINE LOCATIONS .....	Following Text
3F	MINING DATA.....	Following Text
3G	MINING DATA.....	Following Text
4A	FIELD INVESTIGATION.....	Following Text
4B	FIELD INVESTIGATION.....	Following Text
5	INVESTIGATED OPENINGS .....	Following Text
6	POTENTIAL HIBERNACULA .....	Following Text

## LIST OF GRAPHS

NO.	DESCRIPTION	PAGE
1	TOTAL BAT CAPTURES, PORTAL SITE #1.....	38
2	TOTAL BAT CAPTURES, AIR SHAFT SITE #4 .....	38

## **EXECUTIVE SUMMARY**



## EXECUTIVE SUMMARY

The State Route (S.R.) 6219, Section 020, transportation improvement project entails the construction of approximately 10 miles (mi) (16 kilometers [km]) of new, limited-access, four-lane highway extending from an existing highway section south of Somerset to Meyersdale. This new alignment would eventually connect to the proposed improvement of Section 019, extending U.S. Route 219 to Interstate 68 in Maryland. The primary land uses within the action area of the proposed improvement project include timber production, coal mining, agriculture, state lands, and residential and commercial properties. Active and reclaimed strip mines are evident in the western part of the action area, while agriculture is dominant east of the Allegheny Front, where forest cover is highly fragmented.

Summer mist-net surveys conducted during July and August 2008 in Section 020 failed to capture the federally endangered Indiana myotis (*Myotis sodalis*) or the Pennsylvania-listed, threatened eastern small-footed myotis (*Myotis leibii*). These efforts suggest that Indiana myotis maternity colonies are not present within the action area, but late summer and fall use of the project area may occur during the swarming period. The U.S. Fish and Wildlife Service (USFWS) indicated in the 2007 Biological Opinion for the S.R. 6219, Section 019, transportation improvement project and amended to include S.R. 6219, Section 020, in 2011 that the project was within the vicinity of two known Indiana bat hibernacula, [REDACTED] and the South Penn Tunnel.

Based on recent developments, the USFWS recommended in a technical assistance correspondence dated September 11, 2012, that the Federal Highway Administration (FHWA) review the project effects for Section 020 due to the potential presence of additional Indiana bat hibernacula within the action area. The review of these effects would encompass the following elements:

1. definition and determination of the applicable project action area;
2. determination of any additional mines or mine openings within the action area that may support bats;
3. assessment of any newly discovered suitable opening for winter bat use (hibernacula); and
4. determination if Indiana myotis are among the bats hibernating in the action area.

The objectives were met through a multi-phased hibernacula assessment that included a portal investigation and bat capture survey, each occurring within a 1,500-foot (ft) (457.2-meter [m]) action area previously defined in the 2007 Biological Opinion for the S.R. 6219, Section 019, transportation improvement project and amended to include S.R. 6219, Section 020, in 2011.

Pennsylvania Department of Transportation (PennDOT) personnel conducted a field view meeting with Skelly and Loy biologists on August 16, 2012, to evaluate an open portal discussed during a meeting between USFWS and FHWA on August 9, 2012, and later addressed in the September 11, 2012, USFWS technical assistance letter. In addition to this portal, a mine entry collapse and a mine subsidence depression were also assessed for openings in the landscape. These areas were evaluated in accordance with the 2012 Pennsylvania Game Commission (PGC) *Protocol for Assessing Bat Use of Potential Hibernacula*.

A review of historical abandoned mine maps, aerial photographs, and topographic maps verified that both extensive surface and underground mining has occurred within the action area over the past century. Large underground mine complexes had been historically developed within the Lower Freeport and Upper Kittanning coal seams, while the surface mine disturbances were, and continue to be, primarily associated within the stratigraphic higher Upper Freeport seam.

In accordance with the September 11, 2012, USFWS technical assistance letter, a portal investigation occurred within the action area that included a desktop review of available secondary source mining resources to identify historic mining areas and abandoned mine features and a field investigation to locate openings within the action area that may support bat hibernation. The portal investigation to identify any additional openings within the landscape that may serve as potential bat hibernacula occurred between September 17 and September 21, 2012.

Based on information gleaned from the desktop resources and mining methodologies review, detailed field investigations and reconnaissance were conducted within segments of the action area characterized for high probability underground mining operations as well as surficial cropping of historic underground coal seams. Field investigations were also conducted in the area of any documented limestone caves located within the action area. Twenty-four (24) additional potential portal openings were evaluated during the field investigation process. Two limestone caves, Martz Rockshelter and Martz Rockshelter No. 2, were reportedly destroyed

during a previous reconstruction of the S.R. 6219 transportation corridor south of Garrett. This was confirmed during field investigations.

A total of 27 investigated openings (3 from the August 16, 2012, field view meeting and 24 from the detailed field investigations and reconnaissance) were assessed using the 2012 PGC *Protocol for Assessing Bat Use of Potential Hibernacula*. Six openings were found to meet criteria detailed in the 2012 PGC protocol; five of the six openings were found within the action area. The five openings found within the action area, which included the previously discovered opening identified in the September 11, 2012, USFWS technical assistance letter, were surveyed in accordance with the 2012 PGC protocol to determine if Indiana myotis were among the bats hibernating within the action area. Of the five openings surveyed for bat presence, two (Portal Site #1 and Air Shaft Site #4) were discovered to be used by bats from a harp trap capture survey that occurred between September 20 and October 19, 2012. One additional site (Highwall Site #3) was discovered to be used by one bat from an infrared (IR) camcorder survey on October 9, 2012. The bat observed from IR video footage was not captured and was not identifiable using acoustic analysis software. Two Pennsylvania-listed eastern small-footed myotis were captured at Portal Site #1; one on October 3 and the other on October 4, 2012. No Indiana myotis were captured at any of the five surveyed sites.

A report of the proposed construction activities near Portal Site #1 and Air Shaft Site #4 was provided to the USFWS and PGC on November 6, 2012, for their review. The analysis of proposed activities concluded that, based on the best available information, the mine openings and air flow through the surveyed mine workings should not be impacted by the proposed construction of S.R. 6219. Construction activities are proposed to take place between 2013 and 2017, with tree removal to occur between the November 15 and March 31 timeframe, in accordance with the Biological Opinion, and the majority of tree removal is planned for 2012-2013. Further coordination by the FHWA and PennDOT with the USFWS and PGC is anticipated to determine the next steps towards threatened and endangered species compliance for the S.R. 6219, Section 020, transportation improvement project.



## **I. INTRODUCTION**

## I. INTRODUCTION

The S.R. 6219, Section 020, Meyersdale to Somerset transportation improvement project entails the construction of approximately 10 mi (16 km) of new, limited-access, four-lane highway extending from the existing U.S. Route 219 limited access terminus in Somerset, Pennsylvania, south to the northern terminus of the U.S. Route 219 Meyersdale Bypass (Figure 1). Via the Meyersdale Bypass, this new alignment would eventually connect to the proposed improvement of Section 019, extending U.S. Route 219 to Interstate 68 in Maryland (Figure 2). The primary land uses in the action area of the proposed improvement project include timber production, coal mining, agriculture, state lands, and residential and commercial properties. Active and reclaimed strip mines are evident in the western part of the action area, while agriculture is dominant east of the Allegheny Front, where forest cover is highly fragmented.

Summer mist-net surveys conducted during July and August 2008 in Section 020 failed to capture the federally endangered Indiana myotis (*Myotis sodalis*) or the Pennsylvania-listed, threatened eastern small-footed myotis (*Myotis leibii*). These efforts suggest that Indiana bat maternity colonies are not present within the action area, but it was the opinion of the USFWS that late summer and fall use of the project area may occur during the swarming period.

Proposed construction activities within the action area may impact abandoned mines that may serve as an Indiana myotis hibernaculum either through directly altering the hibernation habitat or eliminating the hibernaculum as a suitable swarming/breeding site. Suitable mine/cave hibernacula for the Indiana myotis are in limited supply (USFWS, 2007a).

There are currently 19 known Indiana myotis hibernacula within Pennsylvania. These hibernacula include limestone caves; limestone, clay, and anthracite coal mines; and an abandoned railroad tunnel. In the Indiana Bat Draft Recovery Plan (USFWS 2007b), Indiana myotis hibernacula are assigned priority numbers on the basis of winter population sizes and to protect essential hibernation sites across the species' range. Priority numbers range from Priority 1 (which are considered to be essential to recovery and long-term conservation of the species) to Priority 4 (which are less important to recovery and long-term conservation, typically supporting fewer than 50 Indiana myotis).

Approximately 2.7 mi (4.3 km) of the proposed Section 020 alignment are located within 10 mi (16 km) of the [REDACTED] a defunct limestone mine serving as an Indiana myotis hibernaculum (USFWS, 2007a) and classified by the USFWS as a Priority 4 with current or observed historic populations of fewer than 50 Indiana myotis (USFWS, 2007b). The remaining

portion of the proposed highway alignment is located within 12 mi (19 km) of the South Penn Railroad Tunnel, classified by the USFWS as a Priority 3 hibernaculum with current or observed historic populations of 50 to 1,000 Indiana myotis (USFWS, 2007b). The distance between Section 020 and these two hibernacula suggest that no direct disturbances to either the hibernacula or hibernating bats at these locations would occur.

Based on recent developments, the USFWS recommended in its technical assistance correspondence dated September 11, 2012 (Appendix A) that the FHWA review the project effects for Section 020 due to the potential presence of additional Indiana myotis hibernacula within the action area. The review of these effects would encompass the following elements:

1. definition and determination of the applicable project action area;
2. determination of any additional mines or mine openings within the action area that may support bats;
3. assessment of any newly discovered suitable opening for winter bat use (hibernacula); and
4. determination if Indiana bats are among the bats hibernating in the action area.

The following sections summarize and provide conclusions to the aforementioned elements.



## **II. DEFINITION AND DETERMINATION OF APPLICABLE PROJECT ACTION AREA**

## **II. DEFINITION AND DETERMINATION OF APPLICABLE PROJECT ACTION AREA**

The Federal Endangered Species Act, by regulation, defines a project action area as all areas to be affected directly or indirectly by a federal action and not merely the immediate area involved in the action [50 CFR 402.02]. The action areas of transportation improvement projects typically include the paved roadway surface, median, developed roadway shoulders, maintained road-cut slopes, and areas that are affected by roadway-induced noise, runoff, introduced invasive species, and subsurface effects from blasting and land excavation. The Biological Opinion for the S.R. 6219, Section 019, transportation improvement project (USFWS, 2007a), and later amended to include Section 020 (Appendix A), defined the action area as 1,500 ft (457.2 m) on each side of the proposed highway pavement. The S.R. 6219, Section 020, project is a long, linear project that bisects waterways, forests, agricultural land, residential areas, and active/reclaimed surface mining areas similar in nature to the Section 019 project. For the purposes of assessing project effects on potential Indiana myotis hibernacula within Section 020, the project action area has also been characterized as 1,500 ft (457.2 m) on each side of the proposed highway pavement.

**III. DETERMINATION OF ADDITIONAL MINES/  
MINE OPENINGS WITHIN THE ACTION AREA  
THAT MAY SUPPORT BAT HIBERNATION**



### **III. DETERMINATION OF ADDITIONAL MINES/MINE OPENINGS WITHIN THE ACTION AREA THAT MAY SUPPORT BAT HIBERNATION**

Many species of bats within northern latitudes are non-migratory and must hibernate during the winter seasonal cycle between approximately October and April (USFWS, 2007a). Hibernation is necessary for species such as the Indiana myotis to ensure survival while prey such as insects are unavailable. Typical hibernaculum microhabitats include limestone caves and abandoned underground mine workings. Indiana myotis often hibernate in the same hibernaculum with other species of bats and are occasionally observed clustered with or adjacent to other species, including little brown myotis (*Myotis lucifugus*) and northern myotis (*Myotis septentrionalis*) [USFWS 2007b]. Specific roost sites in caves or mines must maintain an appropriate micro-climate of air temperatures and air flow conditions during the hibernation period.

Previous investigations in areas with similar topographic conditions and land use history as the Section 020 action area have determined that, under certain circumstances, abandoned mine lands can provide openings and portals to underground mines supporting bat hibernacula. A multi-phased investigative process was developed by the FHWA and PennDOT with recommendations from the USFWS and PGC to investigate the potential for mines/mine openings within the action area that may support bat hibernaculum. This multi-phased investigative process included a field view meeting, desktop review, and field investigations. The methodologies were designed through the collaboration and expertise of USFWS biologists, PGC biologists, Pennsylvania Qualified Indiana Bat Surveyors (QIBS), and coal mining engineers familiar with the mining history of the action area. Refer to Appendix F for resumes of qualified project personnel.

#### **A. METHODOLOGIES**

##### **1. Phase I: Field View Meeting**

PennDOT personnel conducted a field view meeting with Skelly and Loy biologists on August 16, 2012, to evaluate the open portal discussed during a meeting between USFWS and FHWA on August 9, 2012, and later addressed in the September 11, 2012, USFWS technical assistance letter. In addition to this portal, a mine entry collapse and a mine subsidence depression were also assessed for openings in the landscape. These areas were evaluated in accordance with the methods detailed under Phase III: Field Investigations.

## **2. Phase II: Desktop Review and Mining Methodologies of the Action Area**

A desktop review of available secondary source mining resources was conducted by the PennDOT Design Team and Skelly and Loy personnel including coal mining engineers, QIBS, and other biologists to identify historic mining areas and abandoned mine features within the project action area. The following resources were obtained, compiled, and digitally overlaid on project area alignment base maps (Figures 3A-3G):

- Aerial photography;
- USGS topographical and LiDAR mapping;
- Pennsylvania Department of Environmental Protection (PA DEP), Bureau of Abandoned Mines and Reclamation (BAMR), Abandoned Mine Lands data set;
- Pennsylvania Geological Survey - Historical Maps Bulletin 56A, 1953, Plates 5 through 13 - Somerset County;
- PA DEP, Coal Mining Operations (2011);
- PA DEP, Industrial Mineral Mining Operations;
- PAMAP Program, Pennsylvania Department of Conservation and Natural Resources, Bureau of Topographic and Geologic Survey;
- WPA Mine Maps;
- Detailed maps of previous coal mining operations;
- PASDA point information for abandoned/open mines;
- Historic Mining Operation Maps from local coal companies; and
- PGC limestone caves and documented mine portals.

Bedrock within the action area is associated with the upper portion of the Pennsylvanian-aged Allegheny formation. The stratigraphy of the Allegheny formation is characterized by the presence of alternating sequences of beds of sandstone, shale, and coal seams of both unmineable and mineable thicknesses. In this portion of Somerset County, Pennsylvania, the important mineable seams lying above the drainage of Buffalo Creek are identified in descending stratigraphic order as the Upper Freeport (E), Lower Freeport (D), and Upper Kittanning (C') coal seams.

A review of historical abandoned mine maps, aerial photographs, and topographic maps illustrates that both surface and underground mining has occurred within the action area over the past century. Large underground mine complexes had been historically developed within the Lower Freeport and Upper Kittanning coal seams while the surface mine disturbances were, and continue to be, primarily associated within the stratigraphically higher Upper Freeport seam. Table 1 summarizes the identified underground mining operations in proximity to the project action area and the associated coal seam that was extracted.

**TABLE 1  
SUMMARY OF UNDERGROUND MINING OPERATIONS  
WITHIN THE ACTION AREA**

<b>MINE NAME</b>	<b>MINED SEAM</b>
Neline Coal Company	Lower Freeport
Moshannon Mine	Lower Freeport
National Mine	Lower Freeport
Theodore Mine	Lower Freeport
Fogle Mine	Lower Freeport
Enterprise Mine	Upper Kittanning
Consolidation Coal	Upper Kittanning
Casselman Mine	Upper Kittanning
Ponfeigh Mine	Upper Kittanning

The underground mining operations typically incorporated the room and pillar mining method for coal extraction. Depending upon seam thickness, this method extracts approximately 50 percent of the in-place coal seam, creating open voids (rooms) and leaving pillars of coal for support at regular intervals throughout the mine. Access to the mine is through a portal. The portal is developed at the crop of the coal seam being mined and is excavated perpendicular to the seam going several hundred feet back into the hillside. These portals vary in width and are as high as the thickness of coal seam. Since the portal was the main access to the mine, they were often shored up with steel and concrete. The portal served as the main access to the mine workings and is the main haulage way for coal that is removed from the mine workings. Another access point to the mine would be through ventilation shafts or boreholes. These structures can be either horizontal or vertical in orientation. Ventilation in a mine is essential to being able to maintain air quality and minimize the buildup of methane and



carbon monoxide gas. Direction of air flow is often dependent upon the atmospheric pressure difference between the mine and outside conditions. If the air pressure is higher on the outside of the mine, airflow will be inward, and if it is lower on the outside of the mine, air will reverse direction and flow out of the mine. Airflow can continue to be present at a mine opening upon the abandonment of the mine. The sources for air entering a mine can come from, or arise from, several scenarios including additional openings to the surface created by mine operations that have not been permanently sealed with manmade seals but have collapsed naturally and appear as to have been backfilled, naturally occurring fissures/fractures that exist in the bedrock, or naturally occurring fissures/fractures created from roof rock and coal pillar collapse as a result of natural weathering of the bedrock in the mine.

Prior to the initiation of the Surface Mining Control and Reclamation Act of 1977 (SMCRA), coal operators typically abandoned the mine operation site upon completion of resource extraction. This practice left the landscape scattered with un-reclaimed contour mine cuts, open underground mine openings, shafts, refuse piles, and mine support buildings in differing states of disrepair. Through the decades since abandonment, the bedrock around the openings would weather, fracture, subside, and eventually collapse, permanently sealing the former portal opening.

Following the enactment of SMCRA, mine operators were required to seal all underground mine access points upon the completion of extraction activities. Mine seals have many different designs depending on whether it is a dry or wet mine. In most cases, the mine portal is sealed utilizing a block wall which covers the opening. The seal is then backfilled with available overburden material and graded to match the original contour of the land. These areas are then topsoiled and seeded. Vertical shafts are often capped with a concrete slab, topsoiled, and seeded to prevent access.

Surface mines are required to backfill the highwalls created during coal extraction activities. Upon reaching the limit of economic coal extraction, the area is then graded to achieve the approximate original topographic contour, topsoiled, and seeded; therefore, eliminating any exposed coal seams created as a result of the mining activity. Surface mining conducted above previous underground mining operations in the same location will alter any remaining artifacts of the previous extraction methods. Land grading associated with surface coal extraction and subsequent reclamation activities effectively removes abandoned portals and mine opening entrances into the former underground operations.

Due to the steepness of the topographic setting within the action area, cover materials above the coal will be thin near the coal crop and thickens rapidly as one moves a few hundred

feet upslope. Generally today's practice is to begin coal works beneath a minimum of 100 ft (30.5 m) of cover. However, at the time when some of the mines in the action area were developed, they often literally mined from the coal crop and extracted 100 percent of the coal until the miners daylighted the mine or hit the tree roots above. Therefore, the potential for finding areas subjected to subsidence are likely. As previously referenced, subsidence potential is dependent upon the amount of cover above the mine. It is also dependent on coal thickness, coal extraction percentage, and the type and spacing of supports used in the mine.

Once support structures fail, the surface will subside, leaving large trough-shaped areas on the surface. In some instances, this failure will create an opening in the surface that is parallel to the room and pillar development of the mine but is only as long as the distance between pillars and the collapsed support material upslope until the cover material becomes thick enough to hold the roof in the mine. The collapse is often limited in length and blocks off access to the voids created by the mining process.

A review of coal crop seam mapping for Somerset County published by the Pennsylvania Geological Survey was completed by consulting mine engineers to identify additional locations of potential mine portals or openings that may not have been reported to PA DEP BAMR. Figures 3A-3G provide detailed information regarding these additional areas and their significance to historic coal mining within the action area.

In addition to a review of mine mapping sources for Somerset County, the PGC was contacted for information on previously evaluated abandoned mine openings and limestone caves known to the PGC or previously evaluated by any PGC staff.

### **3. Phase III: Field Investigations**

Based on information gleaned from the desktop resources and mining methodologies review, detailed field investigations and reconnaissance were conducted within segments of the action area characterized for high-probability underground mining operations as well as surficial cropping of historic underground coal seams. High-probability areas were determined from the location of mining features identified from the desktop review (Figures 3A-3G) and from the expertise of coal mining engineers. Field investigations were also conducted in any documented limestone caves located within the action area. Active surface mining operations as well as reclaimed historic surface mining areas were not field-investigated due to the alteration and removal of any portals or artifacts associated with the previous underground extraction operations. The detailed field investigations and reconnaissance were conducted

under the direction and supervision of PA QIBS Julie Zeyzus according to the methodologies and study plan approach coordinated and approved by the USFWS and PGC. The plan of approach was also determined and approved from the ongoing technical assistance provided by the USFWS and PGC as discussed from weekly status meetings and any additional meetings necessary throughout the survey period. Figures 4A and 4B illustrate the approximate locations of detailed field investigations and reconnaissance within the action area.

Field reconnaissance search teams of five to ten investigators systematically traversed targeted areas of high-probability underground mining operations, PA DEP BAMR potential mine portal points, and surficial cropping of historic underground coal seams in topographic valley landscape positions. Many of the investigators had previous experience in conducting large area reconnaissance for natural resources, mining features, and/or rock habitat features associated with impact assessments for linear transportation or utility corridor projects. The investigation team also typically included a consulting coal mining engineer familiar with historic mining practices within the action area. The distance between observers typically ranged from 25 to 50 ft (7.6 m to 15 m), dependent on visibility, terrain, and obstructions. In very dense vegetation, observers walked in a zigzag pattern or crawled in order to thoroughly observe any potentially suitable opening features.

Potential field indicators of previous mining activities or natural openings within the landscape were of importance to the search teams during this reconnaissance effort. Field indicators used to develop search image profiles for the investigators included the following:

- abandoned equipment such as railcars, railroad ties, railcar tracks, buildings, tipples, and fan equipment from airshafts;
- refuse piles, accumulations of coal, highwalls, trenches/troughs indicating subsidence/sink holes/collapse, and exposed coal seams on streambanks and rock overhangs;
- topographic valley features potentially conveying abandoned mine drainage;
- vertical indentations in the hillside that may represent a collapsed entry point;
- culvert pipes going into the hillside that may be used to pipe abandoned mine drainage from part of a reclaimed entry point;
- reclamation ponds and wetlands;
- haulroad networks;



- natural caves, rock outcrops, boulders, rock ledges, rock overhangs, and stone walls;
- hillside road cuts;
- talus; and
- tunnels.

During the field truthing, observers made visual observations of cave and mine entrances, cliffs and highwalls, stone walls and road cuts, outcrops, rock ledges, sinkholes, and any other geologic and topographic characteristics that may suggest the presence of historic mine features as directed by consulting mining engineers. Any natural openings within the landscape were also noted. Areas with additional physical signs such as mining equipment, buildings and tipples, refuse piles, abandoned mine drainage, reclamation areas/ponds, etc., were also investigated.

Prior to the field reconnaissance efforts, PennDOT personnel field surveyed the location of potential mine portals obtained from secondary PA DEP or mining map sources during the Preliminary Engineering and Final Design phases of the project. These locations were staked in the field and given an identification label (i.e., PE, MP, or FD).

Upon the observance of a manmade or natural feature or sign of historic mining, an investigation of the feature or area was conducted to determine if an opening within the landscape existed. Once an opening in the landscape was located, it was determined if it met the minimum diameter requirement of 6.0 in (15 cm) for horizontal openings and 1.0 ft (0.3 m) for vertical openings identified in the 2012 PGC *Protocol for Assessing Bat Use of Potential Hibernacula* (Appendix B). If the opening met the minimum requirements, then the opening was assigned an identification number (i.e., AMB-1), field-located utilizing GPS coordinates (NAD 83 Datum), and evaluated further as detailed below.

Natural and manmade openings identified during the field reconnaissance efforts that may potentially provide winter bat habitat were assessed by USFWS/PGC Pennsylvania-approved QIBS Julie Zeyzus and/or USFWS/PGC Pennsylvania-approved Bat Identifier (BI) Andrew Nevin, who is also experienced with potential hibernaculum evaluations. Both surveyors were approved by the USFWS Pennsylvania Field Office to assess openings as a potential bat hibernaculum (Appendix A; Clinton Riley e-mail correspondence dated September 14, 2012; FHWA, PennDOT District 9-0, USFWS, and Skelly and Loy conference call meeting on September 19, 2012). The QIBS investigated openings at GPS points identified by the search team using the 2012 PGC *Protocol for Assessing Bat Use of Potential Hibernacula* and

recorded data on a Phase I Cave/Mine Portal Assessment Data Sheet (Appendix C; modified from USFWS Kentucky Field Office, Phase I Habitat Assessment Sample Data Sheet, 2011). The QIBS was not part of the search team on all reconnaissance sweeping efforts, but instead assessed openings identified during these efforts and performed quality control for the openings identified by the search team. The BI also assessed openings using the 2012 PGC protocol and notified the QIBS of any potential, questionable, or marginal openings. In these cases, the QIBS further assessed the opening using the 2012 PGC protocol and made a final determination of the openings' suitability for bat hibernation. For openings assessed by the BI, if the BI determined that the opening did not meet characteristics detailed in the 2012 PGC protocol or was not questionable or marginal, the BI eliminated it as a potential hibernaculum and the QIBS did not investigate the opening.

Openings that met characteristics for potential winter bat use would be carried forward for formal hibernaculum surveys using the recommended bat capture survey techniques identified in the 2012 PGC *Protocol for Assessing Bat Use of Potential Hibernacula*. Refer to Part IV - Assessing Indiana Bat Use of Potential Hibernaculum for details regarding further assessment of openings that met 2012 PGC protocol requirements as a potential bat hibernaculum.

## **B. RESULTS**

### **1. Phase I: Field View Meeting**

Of the three areas assessed during the Field View Meeting on August 16, 2012, only the open mine portal (identified as JAZ-3) met criteria for potential bat use detailed in the PGC *Protocol for Assessing Bat Use of Potential Hibernacula* (2012). Data from this opening were recorded on a Phase I Cave/Mine Portal Assessment Data Sheet (Appendix C). The open mine portal was previously discussed during a meeting between USFWS and FHWA on August 9, 2012, and later addressed in the September 11, 2012, USFWS technical assistance letter. According to the September 11, 2012, USFWS technical assistance letter, "bats had been observed flying from this mine portal in the summer of 2008." Additionally, the letter states, "We [USFWS] have also received an anecdotal report that a bat was observed flying from this portal during February 2011." As a result, the USFWS recommended further assessment of the abandoned open mine portal. Refer to Appendix D for photographs of JAZ-3 and Figure 5 and Table 2 for location information.

### i. Investigated Opening JAZ-3

Opening JAZ-3 was a coal mine portal associated with an abandoned underground operation. After a comprehensive review of detailed mine maps for the Buffalo/Fogletown area, it was determined, based on the best available information, that the mine opening was associated with the Enterprise Coal Company's Ponfeigh Mine #1 that produced coal from the Upper Kittanning seam (Appendix E, L. R. Kimball Design Memorandum, Upper Kittanning Mine Openings, November 1, 2012). This opening is located approximately 1,420 ft (432.8 m) west of the proposed mainline highway alignment.

The width of the opening was about 11.9 ft (3.6 m) at the entrance, and the height varied from about 1.6 ft (0.5 m) to 4.4 ft (1.3 m) (left to right). Internal dimensions within the first 34.0 ft (10.4 m) were about 11 ft x 6.0 ft (3.4 m x 1.8 m). Beyond 34.0 ft (10.4 m), the width was about 15 ft (4.5 m) and the height varied from about 5.0 ft (1.5 m) to about 8.0 ft (2.4 m). The length of the open passage was at least 70 ft (21 m). No slope was observed within this length. The entrance and first 34.0 ft (10.4 m) were concrete-lined and stable. Collapse was evidenced at 34.0 ft (10.4 m) inside the portal and beyond in the form of shale fragments and pillar failure. Cool airflow was measured flowing out of the portal at an average of 1.8 mi/hr (2.9 km/hr). No toxic gases were detected by the observers. Water was present within the first 34.0 ft (10.4 m) inside the portal. Maximum depth of water was 1.5 ft (0.5 m) in areas, and no water was observed beyond 34.0 ft (10.4 m). No past flooding that would completely obstruct the opening was evidenced. Water drained from the portal opening into an inundated moss wetland. Buffalo Creek was located about 350 ft (90 m) south of opening. Canopy cover was 60% and included red oak (*Quercus rubra*) and black birch (*Betula lenta*) as dominant canopy species. Ambient temperature at the time of the observation was 78.8° F (26.0° C), and the temperature at 34.0 ft (10.4 m) inside the portal was 52.7° F (11.5° C). No foraging signs from bats were observed; no side passages, rooms, or chambers were observed; and it was not known if other portals were connected to JAZ-3.

The open mine portal JAZ-3 met criteria detailed in the 2012 PGC *Protocol for Assessing Bat Use of Potential Hibernacula*. Additional assessment was necessary to determine if the opening was used by bats. Refer to Part IV for details regarding further assessment of the mine portal (Site #1).



## **2. Phase II: Desktop Review and Mining Methodologies of the Action Area**

A review of historical abandoned mine maps, aerial photographs, and topographic maps verified that both extensive surface and underground mining has occurred within the action area over the past century. Large underground mine complexes had been historically developed within the Lower Freeport and Upper Kittanning coal seams while the surface mine disturbances were, and continue to be, primarily associated within the stratigraphic higher Upper Freeport seam.

The PA DEP BAMR data sets identified 14 Mine Entry/Opening/Portal points, 2 Industrial Mineral Mining locations, 7 coal crop seams (Clarion, Lower Kittanning, Upper Kittanning, Lower Freeport, Upper Freeport, Lower and Upper Bakersfield), 6 abandoned mines, 5 inactive mines, 5 reclamation completed areas, and 9 underground mines (Figures 3A-3G). Active mining operations were not included in the investigation.

Two caves were identified in the action area by the Somerset County Cave Data Base provided by the PGC. The Martz Rockshelter and Martz Rockshelter No. 2 (both reported at Coordinates 39.839167 N, -79.041111 W) were reportedly destroyed during a previous reconstruction of the S.R. 6219 transportation corridor south of Garrett. A field reconnaissance of these coordinates confirmed their location and previous destruction within the existing right-of-way of S.R. 6219.

According to a September 21, 2012, e-mail from Tracey Librandi Mumma of the PGC, the PGC does not have evidence that any mine portals were investigated by PGC environmental staff.

According to PennDOT field view meeting minutes (Appendix A), one closed mine and a “mine vent” was field-investigated by PGC environmental review staff during preliminary engineering. The “mine vent” was also identified in the *US 219 Improvements Projects, Vegetation and Wildlife Summary Report* (Greenhorne and O’Mara, Inc., 2002). However, the location of the closed mine that was investigated by the PGC environmental review staff was uncertain.

Three abandoned mine points within the project action area (PE-#1, PE-#4, and PE-#5) were identified during Preliminary Engineering investigations (Greenhorne and O’Mara, Inc., 2002). Two additional mine points (MP#6 and MP#7) that do not overlap with other identified mine resources were obtained from PennDOT.

### **3. Phase III: Field Investigations**

Field reconnaissance search teams totaling 298 person-hours conducted detailed investigations of targeted high-probability underground mining operations, PA DEP BAMR potential mine portal points, and potential surficial cropping of historic underground coal seams in topographic valley landscape positions during the period between September 17 - 21, 2012 (Figures 4A-4B). A total of 24 additional openings were identified during the Phase III Field Investigations for further evaluation under the 2012 PGC criteria (Figure 5). Five of the 24 openings were found to meet 2012 PGC criteria as a potential hibernaculum. These include APN-2 (PE-5); DRB-1 (MP-2); JAZ-2; and two separate openings within PJD-2, identified as PJD-2a and PJD-2b. Refer to Appendix C for a completed Phase I Cave/Mine Portal Assessment Data Sheet and Appendix D for photographs of the five openings.

#### **i. Assessment of Investigated Openings**

##### **a. Investigated Opening APN-2 (PE-5)**

Opening APN-2 was a pre-1970 terracotta brick fan house with open ventilation shaft and concrete floor. This structure was identified in the U.S. 219 Improvements Project Vegetation and Wildlife Summary Report submitted by Greenhorne and O'Mara, Inc. (2002) on behalf of FHWA and PennDOT District 9-0. At the time of the submission of the Greenhorne and O'Mara report, the metal fan casing for the shaft and the terracotta brick structure surrounding the shaft was intact. During the 2012 field investigations, the terracotta brick structure was partially demolished and the metal fan casing was removed. This existing opening is located approximately 1,315 ft (400.8 m) east of the proposed mainline highway alignment.

After a comprehensive review of detailed mine maps for the Althouse area, it was determined, based on the best available information, that the air shaft was associated with the Somerset Coal Company's Allegheny Mine that produced coal from the Upper Kittanning seam (Appendix E, L. R. Kimball Design Memorandum, Upper Kittanning Mine Openings, November 1, 2012).

A 13 ft x 8 ft (4 m x 2.4 m) vertical, terracotta brick-lined opening remains within the concrete floor. The depth of the vertical opening (i.e., length of open passage) within the concrete floor was at least 40 ft (12 m). The brick structure surrounding the vertical opening was not stable; loose and fallen brick was observed. However, the vertical opening appeared

intact within the concrete floor. Slight airflow, cooler than the outside temperature, was observed coming out of the opening at the time of the initial assessment. No toxic gases were detected. Although moist beneath the brick structure and within the vertical opening, no inundation was present and no evidence of past flooding was observed. An unnamed tributary was located about 90 ft (27 m) southwest of the opening. Canopy cover was 70% and included red pine (*Pinus resinosa*) and red maple (*Acer rubrum*). No foraging signs from bats were observed; no side passages, rooms, or chambers were observed.

b. Investigated Opening DRB-1 (MP-2)

Opening DRB-1 was created as a result of subsidence into an abandoned mine entry. This mine entry was believed to correspond with an historic mine point identified in the PA DEP BAMR database and designated as MP-2 by the PennDOT design team. Based on the review of underground mine maps, coal seam elevation plots, underground workings mapping by consulting mining engineers, as well as the location of MP-2, it is the opinion of the mining engineers, based on best available information, to have been associated with the Moshannon underground mine complex that produced coal from the Lower Freeport seam (Appendix E). DRB-1 was located outside of the action area (Figure 5).

The size of the opening at the surface was 2.0 ft x 7.5 ft (0.6 m x 2.3 m). At about 20 ft (6.0 m) inside the opening, the dimensions increased to about 5 ft x 7.5 ft (1.5 m x 2.3 m). The passage sloped down from the surface. As a result of the subsidence, the opening at the surface was eroded soil and unstable. No air flow registered on the wind meter, and no air movement was noticed from dropping powder at about 1.6 ft (0.5 m) inside the opening. No temperature difference within the opening was evident compared to the outside temperature. No toxic gases were detected. No water was present, and no evidence of past flooding was observed. Buffalo Creek was located about 395 ft (120 m) south of the opening. The length of the passage was visible for about 20 ft (6.0 m). No foraging signs from bats were observed; no side passages, rooms, or chambers were observed.

c. Investigated Opening JAZ-2

Opening JAZ-2 was a terracotta pipe within an historic mining area. The diameter of the pipe was 18.0 in (45.7 cm). The pipe was mostly intact with some breaks and cracks within the observable area. The pipe was visited on September 19, 21, and 28 and October 7, 2012. No



air flow was detected or measured on September 19, 21, or 28, but slight air flow out of the pipe was noticed on October 7 by three observers from dropping powder inside the pipe and watching its movement. No temperature difference was observed inside the pipe from outside the pipe on September 19. The pipe felt cooler on the inside compared to the outside temperature on September 21. On September 28, the outside air temperature was measured to be 59.45° F (15.25° C); and at 2.0 ft (0.6 m) inside the pipe, the temperature was measured to be 58.55° F (14.75° C). On October 7, the temperature at about 3 ft (1 m) inside the pipe was 53.2° F (11.8° C), while the outside temperature was 52.5° F (11.4° C). Humidity inside the pipe was 76%, and it was 56% outside the pipe on October 7. No water was within the pipe; however, water was seeping from the ground about 3 ft (1 m) below the pipe. It was unknown if the pipe served the purpose of water transport. No algal growth within the pipe or other signs of past water presence was observed. The view within the pipe was unobstructed for at least 45 ft (14 m). At 45 ft (14 m), the pipe bends to the right and out of view. Buffalo Creek was located about 328 ft (100 m) south of the pipe. Canopy cover was 70% and included musclewood (*Carpinus caroliniana*) and black birch as dominant canopy species. No foraging signs from bats were observed; no side passages, rooms, or chambers were observed. The other end of the pipe was not located. Based on the location of the pipe in the ground and its observed length, the pipe appears to pass under Fogletown Road. An abandoned mine was located across Fogletown Road, north of JAZ-2, as observed from available mine resources. It is unknown if the terracotta pipe connected to the mine associated with these closed portals to drain water from the mine or if the purpose of the pipe was for road runoff.

d. Investigated Openings PJD-2a and PJD-2b

The feature associated with PJD-2 is an extensive highwall that resulted from the stripping of a coal seam. As a result of the stripping, numerous sandstone outcrops were exposed. Within these outcrops, two openings met 2012 PGC criteria as a potential hibernaculum (identified as PJD-2a and PJD-2b).

e. PJD-2a

Opening PJD-2a was about 5.0 ft (1.5 m) wide at the surface and narrowed to about 3 ft (1 m) internally. The surface and internal height varied from <1.6 ft (<0.5 m) to about 1.6 ft (0.5 m). Within the observable area, the passage was almost level. The entrance was not stable;

sandstone fragments and various sized rock were observed within the opening that may have flaked from the ceiling and/or fallen due to a potential underground collapse. No air flow was detected or measured using a wind meter. No toxic gases were detected. No water was present, and no evidence of past flooding was observed. Buffalo Creek was located about 853 ft (260 m) south of the opening. The length of the passage was at least 18 ft (5.5 m) and curved to the right out of sight. Canopy cover was 80% and included black birch and black cherry (*Prunus serotina*) as dominant canopy species. No foraging signs from bats were observed; no side passages, rooms, or chambers were observed. The coal seam was located approximately 20 ft (6.0 m) below the opening. The opening may have been connected to an historic mine due to rock separation that may have resulted from collapse into a mine void.

f. PJD-2b

Opening PJD-2b was about 10 ft (3.0 m) wide at the surface and narrowed to about 6.5 ft (2.0 m) at about 11 ft (3.5 m) inside. The surface and internal height varied from about 1.5 ft (0.5 m) to less than 3 ft (1 m). The passage sloped down from the entrance for about 10 ft (3.3 m) to a smaller opening about 1.5 ft (0.5 m) diameter before it was no longer visible. The entrance was not stable; sandstone fragments and various sized rock were observed within the opening that may have flaked from the ceiling and/or fallen due to a potential underground collapse. No air flow was detected or measured. No toxic gases were detected. No water was present, and no evidence of past flooding was observed. Buffalo Creek was located about 853 ft (260 m) south of the opening. The length of the passage was at least 15 ft (4.5 m); an overhanging rock obstructs the view beyond this point. Canopy cover was 80% and included black birch and black cherry as dominant canopy species. No foraging signs from bats were observed; no side passages, rooms, or chambers were observed. The coal seam was located approximately 10 ft (3.3 m) below the internal, 1.5-ft (0.5-m) diameter opening. The opening may have been connected to an historic mine due to rock separation that may have resulted from collapse into a mine void.

ii. **Summary of Investigated Openings**

The five additional openings assessed during the Phase III - Field investigations met criteria detailed in the 2012 PGC *Protocol for Assessing Bat Use of Potential Hibernacula*. In addition to opening JAZ-3 evaluated during the August 16, 2012, field view meeting, further

assessment was necessary for APN-2, JAZ-2, PJD-2a, and PJD-2b to determine if the openings were used by bats. Due to the location of DRB-1 to the proposed project, additional research regarding this opening occurred, and a summary of the findings are detailed in Appendix E, L. R. Kimball Design Memorandum, Potential Mine Opening MP#2, October 29, 2012, and under Part IV - Assessing Indiana Bat Use of Potential Hibernaculum. Table 2 summarizes all 27 openings investigated which include three on August 16, 2012, and 24 between September 17 and 21, 2012. Refer to Part IV for details regarding further assessment of the air shaft APN-2 (Site #4), terracotta pipe JAZ-2 (Site #5), abandoned mine portal JAZ-3 (Site #1), and highwall openings PJD-2a and PJD-2b (Site #2 and Site #3).

**TABLE 2**  
**SUMMARY OF INVESTIGATED OPENINGS**  
**AUGUST 16 AND SEPTEMBER 17 THROUGH 21, 2012**

NO.	IDENTIFIED OPENING	COORDINATES (DECIMAL DEGREES, NAD 83)		DESCRIPTION	FURTHER ASSESSMENT NECESSARY/ RATIONALE
		LATITUDE (N)	LONGITUDE (W)		
1	AMB-1	39.87295	79.04622	Possible mine subsidence opening	No/ Ended <50 ft (<15 m) with no cracks/crevices >6 in (>15 cm)
2	AMB-2	39.87329	79.04632	Opening in the ground	No/ Ended <50 ft (<15 m) with no cracks/crevices >6 in (>15 cm)
3	AMB-3	39.87359	79.04915	Multiple openings within hillside	No/ Ended <50 ft (<15 m) with no cracks/crevices >6 in (>15 cm), narrowed to <6 in (<15 cm) for horizontal openings, or narrowed to <1 ft (<0.3 m) for vertical openings
4	AMB-4	39.88915	79.03909	Mine collapse	No/ Ended <50 ft (<15 m) with no cracks/crevices >6 in (>15 cm)
5	AMB-5	39.91516	79.04411	Abandoned mine preparation facility	No/ Ended <50 ft (<15 m) with no cracks/crevices >6 in (>15 cm)
6	APN-1 (PE-4)	39.87246	79.04597	Opening within spoil pile	No/ Ended <50 ft (<15 m) with no cracks/crevices >6 in (>15 cm)
7	APN-2 (PE-5)	39.89197	79.03872	Abandoned ventilation shaft	Yes



**TABLE 2  
(CONTINUED)**

NO.	IDENTIFIED OPENING	COORDINATES (DECIMAL DEGREES, NAD 83)		DESCRIPTION	FURTHER ASSESSMENT NECESSARY/ RATIONALE
		LATITUDE (N)	LONGITUDE (W)		
8	APN-3	39.87100	79.04854	Abandoned mine	No/ Ended <50 ft (<15 m) with no cracks/crevices >6 in (>15 cm)
9	APN-4	39.91391	79.04602	Outcrop	No/ Ended <50 ft (<15 m) with no cracks/crevices >6 in (>15 cm)
10	DRB-1 (MP-2)	39.88104	79.03841	Opening due to subsidence	No/ Refer to Appendix E for further information
11	ERB-1	39.87215	79.04359	Subsidence area	No/ Ended <50 ft (<15 m) with no cracks/crevices >6 in (>15 cm)
12	JAZ-1	39.87381	79.04754	Possible mine entry collapse	No/ Ended <50 ft (<15 m) with no cracks/crevices >6 in (>15 cm)
13	JAZ-2	39.87260	79.04444	Terracotta pipe	Yes
14	JAZ-3	39.872694	79.048806	Abandoned mine portal	Yes
15	JAZ-4	39.87360	79.04366	Openings within an outcrop	No/ Ended <50 ft (<15 m) with no cracks/crevices >6 in (>15 cm)
16	JAZ-5	39.87351	79.04352	Openings within an outcrop	No/ Ended <50 ft (<15 m) with no cracks/crevices >6 in (>15 cm)
17	JAZ-6	39.87313	79.04595	Collapsed mine entry	No/ Openings ended <50 ft (<15 m) with no cracks/crevices >6 in (>15 cm)
18	JAZ-7	39.87307	79.04609	Subsidence depression	No/ Openings ended <50 ft (<15 m) with no cracks/crevices >6 in (>15 cm)
19	LTZ-1	39.87263	79.04272	Opening in side of bank	No/ Ended <50 ft (<15 m) with no cracks/crevices >6 in (>15 cm)
20	LTZ-2	39.87436	79.04486	Opening within an outcrop	No/ Ended <50 ft (<15 m) with no cracks/crevices >6 in (>15 cm)

**TABLE 2  
(CONTINUED)**

NO.	IDENTIFIED OPENING	COORDINATES (DECIMAL DEGREES, NAD 83)		DESCRIPTION	FURTHER ASSESSMENT NECESSARY/ RATIONALE
		LATITUDE (N)	LONGITUDE (W)		
21	PJD-1 (MP-4)	39.91085	79.04961	Opening within an outcrop	No/ Ended <50 ft (<15 m) with no cracks/crevices >6 in (>15 cm)
22	PJD-2	39.87391	79.04942	Multiple openings within a highwall	No/ Ended <50 ft (<15 m) with no cracks/crevices >6 in (>15 cm)
23	PJD-2a	39.87391	79.04942	Opening within highwall	Yes
24	PJD-2b	39.87391	79.04942	Opening within highwall	Yes
25	PJD-3	39.87209	79.04804	Collapsed timbers for either a mine portal or for railroad support	No/ Openings ended <50 ft (<15 m) with no cracks/crevices >6 in (>15 cm); an approximate 50-ft (15-m) pipe included was open at both ends
26	TAS-2	39.88633	79.04031	Portal opening	No/ Ended <50 ft (<15 m) with no cracks/crevices >6 in (>15 cm)
27	TWS-1	39.87238	79.04805	Terracotta pipe	No/ Ended <50 ft (<15 m) with no cracks/crevices >6 in (>15 cm)

#### **IV. ASSESSING POTENTIAL HIBERNACULA AND INDIANA BAT PRESENCE**



#### **IV. ASSESSING POTENTIAL HIBERNACULA AND INDIANA BAT PRESENCE**

Six of the 27 openings identified during Part III - Determination of Additional Mines/Mine Openings Within the Action Area that May Support Bat Hibernation were concluded to meet the 2012 Pennsylvania Game Commission *Protocol for Assessing Bat Use of Potential Hibernacula* criteria as a potential hibernaculum. These include APN-2 (PE-5); DRB-1 (MP-2); JAZ-2; JAZ-3; and two separate openings within PJD-2, identified as PJD-2a and PJD-2b. Five of the six investigated openings were carried forward for potential hibernaculum capture surveys. The determination for the remaining opening, DRB-1 (MP-2), is described below.

Opening DRB-1, created as a result of subsidence into an abandoned mine entry, was believed to correspond with an historic mine point identified in the PA DEP BAMR database and designated as MP-2 by the PennDOT design team. Based on best available information, it is the opinion of mining engineers to have been associated with the Moshannon underground mine complex that produced coal from the Lower Freeport seam. This opening was located outside of the action area, approximately 1,931 ft (588.6 m) east of the proposed Section 020 mainline. Geotechnical and engineering analysis completed by PennDOT concluded that neither subsurface impacts to the existing workings of the Moshannon underground mine complex nor surface impacts within 1,000 ft (304.8 m) of the opening would result from the construction of the highway improvement project (Appendix E). Therefore, bat surveys to confirm winter habitat use were not conducted at the DRB-1 (MP-2) opening.

##### **A. TECHNICAL GUIDANCE AND AGENCY COORDINATION**

The 2012 PGC *Protocol for Assessing Bat Use of Potential Hibernacula* was designed to maximize the potential for determining the use, if any, of abandoned mine portals by the Indiana myotis; however, the survey is not designed to prove the absolute absence of the species. The USFWS identified the 2012 PGC protocol as the preferred technique for evaluating abandoned mine openings for use by bats for the S.R. 6219, Section 020 bat hibernacula assessment. If no bats have been, or are, documented to use the opening, then the three nights of sampling identified in the protocol would be adequate for determining hibernaculum use.

In addition to the 2012 PGC protocol, the September 11, 2012, USFWS technical assistance correspondence recommended that for open features where bat use has been previously documented, or was documented during the fulfillment of additional investigative processes using the 2012 PGC protocol, 15 nights of trapping be conducted between

September 20 and October 10 in accordance with the standard temperature and environmental conditions identified in the 2012 PGC protocol.

Additional protocol guidance and continued technical assistance was requested from the USFWS and PGC throughout the execution of the surveys due to the dynamics of weather conditions and adaptive survey techniques.

## **B. METHODOLOGIES**

Mine feature openings APN-2 (PE-5), JAZ-2, JAZ-3, PJD-2a, and PJD-2b were formally surveyed according to PGC and USFWS methodologies to determine their potential use as winter hibernaculum for bats as well as the presence of the Indiana myotis.

All bat survey efforts were conducted under the supervision of USFWS/PGC Pennsylvania-approved QIBS Julie Zeyzus, as authorized by PGC Special Use Permit No. 155-2012. Additional supporting bat biologists for this effort included the following:

- Michael Fishman - USFWS/PGC Pennsylvania-approved QIBS;
- Jim Hart - USFWS/PGC Pennsylvania-approved QIBS;
- Ryan Slack - USFWS/PGC Pennsylvania-approved QIBS;
- Jack Basiger - USFWS/PGC Pennsylvania-approved QIBS;
- Mary Gilmore - USFWS/PGC Pennsylvania-approved BI; and
- Drew Wanke - USFWS/PGC Pennsylvania-approved BI.

### **1. Harp Trap Survey**

#### **i. Portal JAZ-3 (Site #1) and Air Shaft APN-2 (Site #4)**

Harp trap surveys were conducted in accordance with guidance provided in the September 11, 2012, USFWS technical assistance letter. According to the technical assistance letter, the USFWS requested that the previously identified Portal JAZ-3 (Site #1) be trapped for 15 nights between September 20 and October 10 and in accordance with the temperature and environmental conditions identified in the 2012 PGC protocol.

Additionally, for each opening assessed during the portal investigation that may be suitable for bats (Phase III - Field Investigation), the USFWS requested a bat capture survey to be conducted using the 2012 PGC protocol. If no bats are documented to use the opening, the three nights of sampling identified in the 2012 PGC protocol was adequate. However, if bat use was documented using the 2012 PGC protocol, then the USFWS requested that these openings

also be surveyed for 15 nights between September 20 and October 10 and in accordance with the temperature and environmental conditions identified in the 2012 PGC protocol.

In addition to Portal JAZ-3 (Site #1), only one other investigated opening that qualified for further assessment, Air Shaft APN-2 (Site #4), was surveyed using a harp trap for 15 nights. Bats were captured at Portal Site #1 and Air Shaft Site #4 using one 3.3 ft x 3.3 ft (1 m x 1 m) harp trap (Bat Conservation and Management, Inc., Carlisle, Pennsylvania) at each opening. All surveying, handling, and care of bats followed the PGC *Protocol for Assessing Bat Use of Potential Hibernacula* (2012) and guidelines set forth by bat researchers (Gannon and Sikes, 2007; Kunz and Parsons, 2009). A field crew of at least two individuals, one of which being a USFWS/PGC Pennsylvania-approved QIBS, surveyed the openings by erecting capture equipment and processing captured bats. Traps were checked every hour; however, more frequent trap checks occurred depending on bat activity and weather conditions. In addition to the trap, an ultrasonic bat detector was placed 5 to 15 ft (1.5 to 4.6 m) from the opening and bat passes were monitored and tallied hourly in accordance with the 2012 PGC protocol. The sensitivity on the ultrasound detectors was set between 5 and 6.

The PGC provided five orange forearm bands and 150 metal forearm bands to be used during this project. The orange forearm bands were to be used on any Indiana myotis captures. Captured northern myotis (*Myotis septentrionalis*) and little brown myotis (*Myotis lucifugus*) received a metal forearm band, up to 150 individuals. Females were banded on the left forearm and males were banded on the right forearm. No forearm band was placed on captures of a Pennsylvania-listed, threatened eastern small-footed myotis in accordance with PGC guidelines.

Surveyors assessed species, sex, age, and reproductive condition for all bats captured. Morphometric measurements were taken on captured bats and included mass and ear, tragus, forearm, and hind foot lengths. Reproductive condition of females was recorded as post-lactating, post-reproductive, vulva swollen, or non-reproductive. Reproductive condition of males was recorded as scrotal/epididymis swollen or non-reproductive. Bats were not held for longer than one hour. When bat captures were significant, only threatened or endangered species and banded bats would be processed as described herein. Upon completion of the examination, bats were released. General weather conditions at each trap site were recorded. All data collected were recorded on PGC Bat Netting/Trapping Survey Site Record data forms (FORM P-70008-NT, 12/09) and Bat Measurement and Capture data forms (FORM P-70008-M, 12/01 or FORM P-70008-M, 12/09) (Appendix C).

When weather conditions were unfavorable (e.g., moderate to heavy rain and/or wind speeds greater than 9 miles per hour (mi/hr) [0.45 meters per second {m/s}] for more than two



hours; temperature below 50° F (10° C) within the first two hours of sampling and/or below 35° F (1.7° C) before the end of the survey), the survey night was rescheduled. Due to repeated weather delays between September 20 and September 30, 2012, a request via e-mail was made to the USFWS on September 30, 2012, for permission to make amendments to the 2012 PGC protocol for this project in order to increase the likelihood of obtaining 15 nights of surveys at the Portal Site #1 and Air Shaft Site #4 (Appendix B). The request was to 1) change the minimum temperature requirement within the first two hours of the survey from 50° F (10° C) to 45° F (7.2° C) and count as a valid survey and 2) extend the survey period from October 10 to October 15 and count as a valid survey. The request for the lower temperature requirement was granted in an e-mail from USFWS on October 1, 2012, but not for extending the survey (Appendix B). Beginning the night of October 1, 2012, surveys followed the changed temperature requirements.

Due to additional weather delays between October 1 and October 8, 2012, 15 nights of valid surveys at Portal Site #1 and Air Shaft Site #4 were not likely attainable. During a Status Meeting telephone conference on October 9, 2012, amongst the USFWS, FHWA, and PennDOT District 9-0, the USFWS requested, and it was agreed by FHWA and PennDOT, to extend the survey period beyond October 10 until 15 nights of valid surveys had been completed at both the Portal Site #1 and Air Shaft Site #4 but not to survey beyond October 31, 2012 (Appendix B).

## **2. Mist Net, Acoustic Detector, and Infrared (IR) Camcorder Surveys**

### **i. Highwall PJD-2a (Site #2), Highwall PJD-2b (Site #3), and Pipe JAZ-2 (Site #5)**

The remaining three investigated openings that qualified for further assessment – Highwall PJD-2a (Site #2), Highwall PJD-2b (Site #3), and Pipe JAZ-2 (Site #5) – were surveyed using the 2012 PGC protocol and guidance and continued technical assistance from the USFWS and PGC after the commencement of the surveys. When weather conditions were unfavorable (e.g., moderate to heavy rain and/or wind speeds greater than 9 mi/hr [0.45 m/s] for more than two hours; temperature below 50° F (10° C) within the first two hours of sampling and/or below 35° F (1.7° C) before the end of the survey), the survey night was rescheduled. Due to repeated weather delays, amendments to the 2012 PGC protocol were requested and were granted by the USFWS and applied to the surveys. Refer to *Harp Trap Surveys* and

Appendix B for amendments to the 2012 PGC protocol regarding temperature requirements and survey time period.

One 20 ft x 8.5 ft (6 m x 2.6 m) or 8.5 ft x 8.5 ft (2.6 m x 2.6 m) mist net (Avinet, Dryden, N.Y.) was deployed to capture any bats entering or exiting the Highwall Site #2 and Highwall Site #3 on September 20 and October 1-2, 2012, and at the Pipe Site #5 between October 9 and 15, 2012. An AnaBat acoustic recording detector (Titley Scientific, Columbia, MO) was also placed 5 to 15 ft (1.5 to 4.6 m) from the openings to tally bat passes in accordance with the 2012 PGC protocol and determine bat presence in case bats were avoiding the mist nets. Nets were deployed and checked every ten minutes by either a USFWS-approved QIBS or BI. Files recorded from the AnaBat acoustic detector were downloaded and analyzed by a USFWS-approved QIBS using AnaLookW or AnaLook-DOS software (Chris Corben, North America). Noise was filtered from each file, and the remaining files were visually examined for characteristics of a bat call. Calls recorded at the Highwall Site #3 on October 9, 2012, were analyzed using EcoClass Version 1.1 software (Britzke, 2012).

An infrared (IR) camcorder (Sony Corporation of America) was also placed 5 to 15 ft (1.5 to 4.6 m) in front of the Pipe Site #5 during the entire survey period. On October 4 and 9, an IR camcorder was used to replace the mist nets at Highwall Site #2 and Highwall Site #3. If the AnaBat files revealed a recorded bat call, the IR camcorder video footage five minutes before the recorded call and five minutes after was reviewed to see if any bats were observed entering or exiting the openings.

Refer to Figure 6 for the location of the five surveyed sites (JAZ-3, APN-2, JAZ-2, PJD-2a, and PJD-2b) in relation to each other, the action area, and coal crop line boundaries.

### **3. White Nose Syndrome Precautions**

The USFWS *White-Nose Syndrome Decontamination Protocol* (updated 2012) and PGC *Bat Handling/Disinfection Protocol for Summer Bat Field Studies* (2009) were followed for all bat handling and for equipment decontamination during the study. Wing damage that may have resulted from WNS scarring was assessed using *Wing-Damage Index Used for Characterizing Wing Condition of Bats Affected by White-Nose Syndrome* (Reichard, undated) and documented on PGC survey data forms.

## C. RESULTS

### 1. Portal Site #1 (JAZ-3)

#### i. Survey Nights

The survey period for Portal Site #1 began on September 20, 2012, and ended on October 18, 2012, for a total of 29 nights. Of the 29 nights during the survey period, surveys were canceled or deemed not valid on 14 nights due to inclement weather such as rain for more than two hours during the survey, temperatures below 50° F (10° C) between September 20 and September 30, or temperatures below 45° F (7.2° C) between October 1 and October 18 for the first two hours of the survey. Refer to Appendix C for completed Bat Netting/Trapping Site Survey Records and Appendix D for survey site photographs. Table 3 summarizes the 29 nights of the Portal Site #1 survey period.

**TABLE 3**  
**SURVEY NIGHT SUMMARY, PORTAL SITE #1**  
**SEPTEMBER 20 TO OCTOBER 18, 2012**

DATE	VALID SURVEY COMPLETED	DATE	VALID SURVEY COMPLETED
9/20	YES	10/05	YES
9/21	YES	10/06	No, temperatures did not meet protocol
9/22	YES	10/07	No, temperatures did not meet protocol
9/23	No, temperatures did not meet protocol	10/08	No, temperatures did not meet protocol
9/24	No, temperatures did not meet protocol	10/09	No, temperatures did not meet protocol
9/25	YES	10/10	No, temperatures did not meet protocol
9/26	YES	10/11	No, temperatures did not meet protocol
9/27	No, rain events did not meet protocol	10/12	No, temperatures did not meet protocol
9/28	No, temperatures did not meet protocol	10/13	YES*
9/29	No, temperatures did not meet protocol	10/14	YES
9/30	No, temperatures did not meet protocol	10/15	YES
10/01	YES	10/16	No, temperatures did not meet protocol
10/02	YES	10/17	YES
10/03	YES	10/18	YES
10/04	YES		

\* Although the temperature within the first two hours on this survey night dropped to 44.6° F (7.0° C), the USFWS and PGC accepted the survey as valid during a conference call on October 15, 2012 (Appendix A).



## ii. Bat Captures

There were 488 bats of 5 species captured over 15 valid survey nights at Portal Site #1, including two Pennsylvania listed, threatened eastern small-footed myotis (*Myotis leibii*), 95 little brown myotis (*Myotis lucifugus*), 65 northern myotis (*Myotis septentrionalis*), 7 big brown bat (*Eptesicus fuscus*), and 319 tri-colored bat (*Perimyotis subflavus*). No Indiana myotis (*Myotis sodalis*) were captured. In addition to the bats captured during the 15 valid survey nights, 23 bats of three species (5 little brown myotis, 4 northern myotis, and 14 tri-colored bat) were captured on three nights that were not considered a valid survey due to inclement weather (September 27, 28, and October 9), making the grand total bat captures at Portal Site #1 511. Refer to Appendix C for completed Bat Measurement and Capture Data Forms and Appendix D for representative bat photographs. Table 4 summarizes all bat captures at Portal Site #1.

**TABLE 4**  
**BAT CAPTURE SUMMARY, PORTAL SITE #1**

SPECIES	FEMALES						MALES				ESCAPEES	TOTAL
	ADULT				JUVENILE	TOTAL	ADULT		JUVENILE	TOTAL		
	NR	PG	L	PL, PR, OR VS			SCR	NR				
<i>Myotis lucifugus</i>	10			8	2	20	44	35		79	1	100
<i>Myotis septentrionalis</i>	10			6		16	46	6	1	53		69
<i>Myotis leibii</i>	1			1		2						2
<i>Myotis sodalis</i>												0
<i>Eptesicus fuscus</i>	1			1		2	5			5		7
<i>Perimyotis subflavus</i>	34			54	1	89	199	36	1	236	8	333
TOTAL	56	0	0	70	3	129	294	77	2	373	9	511

NR = nonreproductive  
PG = pregnant  
L = lactating  
PL = post lactating

PR = post reproductive  
VS = vulva swollen  
SCR = scrotal/epididymis swollen

## iii. Banded Bats

A total of 100 bats were banded at Portal Site #1; 16 of these were recaptured at the portal on a different night. Five additional recaptured bats were originally captured and banded at Air Shaft Site #4. Three of these five were recaptured at both the Portal Site #1 and Air Shaft Site #4 on the same night.

## **2. Highwall Site #2 (PJD-2a), Highwall Site #3 (PJD-2b)**

### **i. Survey Nights**

The survey period for the Highwall Site #2 began on September 20 and ended on October 4, 2012, and included seven survey nights. Highwall Site #3 was surveyed on the same seven nights plus an additional night on October 9, 2012, for a total of eight survey nights. Two nights at both sites during the survey period had to be canceled due to inclement weather that did not meet 2012 PGC protocol requirements. Refer to Appendix C for completed Bat Netting/Trapping Site Survey Records and Appendix D for survey site photographs. Table 5 summarizes the survey nights for the Highwall Site #2 and Highwall Site #3.

**TABLE 5  
SURVEY NIGHT SUMMARY, HIGHWALL SITE #2 AND HIGHWALL SITE #3  
SEPTEMBER 20 TO OCTOBER 9, 2012**

<b>DATE</b>	<b>SITE NO.</b>	<b>EQUIPMENT DEPLOYED</b>	<b>VALID SURVEY COMPLETED</b>
9/20	Site #2 and #3	1 mist net, 1 acoustic recorder at each site	YES
9/27	Site #2 and #3	1 mist net, 1 acoustic recorder at each site	No, rain events did not meet protocol
9/28	Site #2 and #3	1 mist net, 1 acoustic recorder at each site	No, temperatures did not meet protocol
10/01	Site #2 and #3	1 mist net, 1 acoustic recorder at each site	YES
10/02	Site #2 and #3	1 mist net, 1 acoustic recorder at each site	YES
10/04	Site #2 and #3	1 infrared camcorder, 1 acoustic recorder at each site	YES
10/09	Site #3 ONLY	1 infrared camcorder, 1 acoustic recorder	YES*

\* Although the temperature within the first two hours on this survey night dropped below 45° F (7.2° C), the USFWS and PGC accepted the survey as valid during a conference call on October 15, 2012 (Appendix A).

### **ii. Bat Captures**

No bat captures occurred at either Highwall Site #2 or Highwall Site #3 during any of the survey nights where mist net equipment was deployed.

### **iii. Acoustic and Infrared (IR) Camcorder Recordings**

The files generated from the AnaBat acoustic recording detector on September 20 and October 1 were eliminated as containing bat calls through the use of noise filters compatible for AnaLookW software or were eliminated visually.

Files were generated from the AnaBat acoustic recording detector on October 2, 2012. All files except two were eliminated as containing bat calls either through the use of noise filters compatible for AnaLookW software or through visual inspection. The two remaining files were visually inspected and observed to contain one bat pulse at each of the two highwall openings. Additional results were obtained from the deployment of infrared camcorders, used in place of the mist nets, and from the deployment of acoustic recording equipment on October 4, 2012.

On October 4, files were generated from the AnaBat acoustic recording detectors deployed at both highwall openings. Using a noise filter compatible with AnaLook-DOS software, 12 acoustic files were not eliminated as noise. The time stamps for 9 of the 12 files were cross-referenced with the timing of the video footage from the IR camcorders. No bats were observed entering or leaving the two highwall openings in the video footage. There was no video footage for the remaining three files. One file was generated prior to the start of the survey and was eliminated visually as being emitted from a bat. The remaining two files were generated after the battery failed in the IR camcorder at Highwall Site #3. One of these two files was eliminated visually as containing pulses emitted from a bat. However, the other file could not be eliminated and, therefore, it could not be determined if the pulse recorded at that time was emitted from a bat using the Highwall Site #3 opening. Additional results were obtained at Highwall Site #3 from a second deployment of infrared camcorders and acoustic recording equipment on October 9, 2012.

On October 9, files were generated from the AnaBat acoustic recording detectors deployed only at Highwall Site #3. Using a noise filter compatible with AnaLook-DOS software, six acoustic files were not eliminated as noise. Upon cross-referencing the time stamp on the six acoustic files with the timing of the video footage from the IR camcorders, one bat was observed leaving the Highwall Site #3 opening at 20:50 hours. Refer to the DVD for a video clip of the bat emerging from Highwall Site #3 (Appendix G).

In an effort to identify the bat species at Highwall Site #3, ultrasound pulses emitted from this bat were analyzed using EcoClass version 1.1 software (Britzke, 2012). The Excel spreadsheet output generated from the analysis did not provide a determination of the bat species associated with the pulses.



### 3. Air Shaft Site #4 (APN-2)

#### i. Survey Nights

The survey period for Air Shaft Site #4 began on September 21, 2012, and ended on October 19, 2012, for a total of 29 nights. Of the 29 nights during the survey period, surveys had to be canceled or deemed not valid on 14 nights due to inclement weather such as rain for more than two hours during the survey, temperatures below 50° F (10° C) between September 21 and September 30 for the first two hours of the survey, or temperatures below 45° F (7.2° C) between October 1 and October 19 for the first two hours of the survey. Refer to Appendix C for completed Bat Netting/Trapping Site Survey Records and Appendix D for survey site photographs. Table 6 summarizes the 29 nights of the Air Shaft Site #4 survey period.

**TABLE 6  
SURVEY NIGHT SUMMARY, AIR SHAFT SITE #4  
SEPTEMBER 21 TO OCTOBER 19, 2012**

DATE	VALID SURVEY COMPLETED	DATE	VALID SURVEY COMPLETED
9/21	YES	10/06	No, temperatures did not meet protocol
9/22	YES	10/07	No, temperatures did not meet protocol
9/23	No, temperatures did not meet protocol	10/08	No, temperatures did not meet protocol
9/24	No, temperatures did not meet protocol	10/09	No, temperatures did not meet protocol
9/25	YES	10/10	No, temperatures did not meet protocol
9/26	YES	10/11	No, temperatures did not meet protocol
9/27	No, rain events did not meet protocol	10/12	No, temperatures did not meet protocol
9/28	No, temperatures did not meet protocol	10/13	YES
9/29	No, temperatures did not meet protocol	10/14	YES
9/30	No, temperatures did not meet protocol	10/15	YES
10/01	YES	10/16	No, temperatures did not meet protocol
10/02	YES	10/17	YES
10/03	YES	10/18	YES
10/04	YES	10/19	YES
10/05	YES		

## ii. Bat Captures

There were 292 bats of 3 species captured over 15 valid survey nights at the Air Shaft Site #4. No Indiana myotis or eastern small-footed myotis were captured. Captured species included 24 little brown myotis, 52 northern myotis, and 215 tri-colored bat. One bat was reported as “undetermined” due to a potential measurement, photographic recording, or data entry error. However, the determination made by three QIBS, upon reviewing the photographs of the bat, was that the bat was not a threatened or endangered species. In addition to the bats captured during the 15 valid survey nights, 19 bats of three species (2 little brown myotis, 7 northern myotis, and 10 tri-colored bat) were captured on three nights that were not considered a valid survey due to inclement weather (September 28 and October 6 and 9), making the grand total bat captures at Air shaft Site #4 311. Refer to Appendix C for completed Bat Measurement and Capture Data Forms and Appendix D for representative bat photos. Table 7 summarizes all bat captures at Air Shaft Site #4.

**TABLE 7**  
**BAT CAPTURE SUMMARY, AIR SHAFT SITE #4**

SPECIES	FEMALES						MALES				ESCAPEES	TOTAL
	ADULT				JUVENILE	TOTAL	ADULT		JUVENILE	TOTAL		
	NR	PG	L	PL, PR, OR VS			SCR	NR				
<i>Myotis lucifugus</i>	7					7	13	6		19		26
<i>Myotis septentrionalis</i>	12			2		14	27	18		45		59
<i>Myotis leibii</i>												0
<i>Myotis sodalis</i>												0
<i>Eptesicus fuscus</i>												0
<i>Perimyotis subflavus</i>	47			3		50	94	79	1	174	1	225
Undetermined												1
TOTAL	66	0	0	5	0	71	134	103	1	238	1	311

NR = nonreproductive  
PG = pregnant  
L = lactating  
PL = post lactating

PR = post reproductive  
VS = vulva swollen  
SCR = scrotal/epididymis swollen

### iii. Banded Bats

A total of 49 bats were banded at Air Shaft Site #4; 11 of these were recaptured at the air shaft on a different night. Five bats banded at Air Shaft Site #4 were recaptured at Portal Site #1. Three of these five were recaptured at both the Portal Site #1 and Air Shaft Site #4 on the same night.

## 4. Pipe Site #5 (JAZ-2)

### i. Survey Nights

The survey nights for the Pipe Site #5 were October 9, 13, 14, and 15, 2012, which included three valid survey nights. The survey on October 9 was not valid due to temperatures falling below 45° F (7.2° C) within the first two hours. Refer to Appendix C for completed Bat Netting/Trapping Site Survey Records and Appendix D for survey site photographs. Table 8 summarizes the survey nights for the Pipe Site #5.

**TABLE 8**  
**SURVEY NIGHT SUMMARY, PIPE SITE #5**  
**OCTOBER 9, 13, 14, AND 15, 2012**

DATE	VALID SURVEY COMPLETED	DATE	VALID SURVEY COMPLETED
10/09	No, temperatures did not meet protocol	10/14	YES
10/13	YES*	10/15	YES

\* Although the temperature at two hours within this survey night dropped to 44.4° F (6.9° C), the USFWS and PGC accepted the survey as valid during a conference call on October 15, 2012 (Appendix A).

### ii. Bat Captures

No bat captures occurred at the Pipe Site #5 during any of the survey nights.

### iii. Acoustic and Infrared (IR) Camcorder Recordings

The files generated from the AnaBat acoustic recording detector on October 13 and 15 were eliminated as containing bat calls through the use of noise filters compatible with AnaLook-DOS or AnaLookW software or were eliminated visually.



On October 14, files were generated from the AnaBat acoustic recording detectors deployed at Pipe Site #5. Using a noise filter compatible with AnaLook-DOS software, ten acoustic files were not eliminated as noise. The time stamps for nine of the ten files were cross-referenced with the timing of the video footage from the IR camcorders. No bats were observed entering or leaving the pipe opening in the video footage. There was no video footage for the remaining file, which contained two recordings. This time period may have been during a battery or memory card change for the camcorder. Upon visually reviewing this acoustic file, the frequency for the entire duration of the recordings was below 30 kHz.

## **V. DISCUSSION**

## V. DISCUSSION

The S.R. 6219, Section 020, Bat Hibernacula Assessment was designed to meet the following objectives detailed in the September 11, 2012, USFWS technical assistance letter:

1. Determine if any additional mines or mine openings within the action area may support bats.
2. Assess any newly discovered suitable opening for winter bat use (hibernacula).
3. Determine if Indiana bats are among the bats hibernating in the action area.

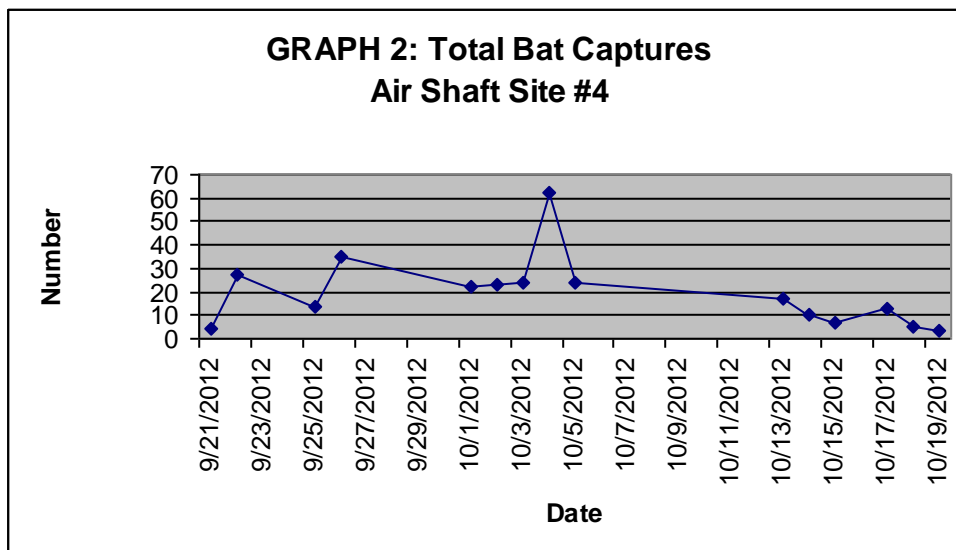
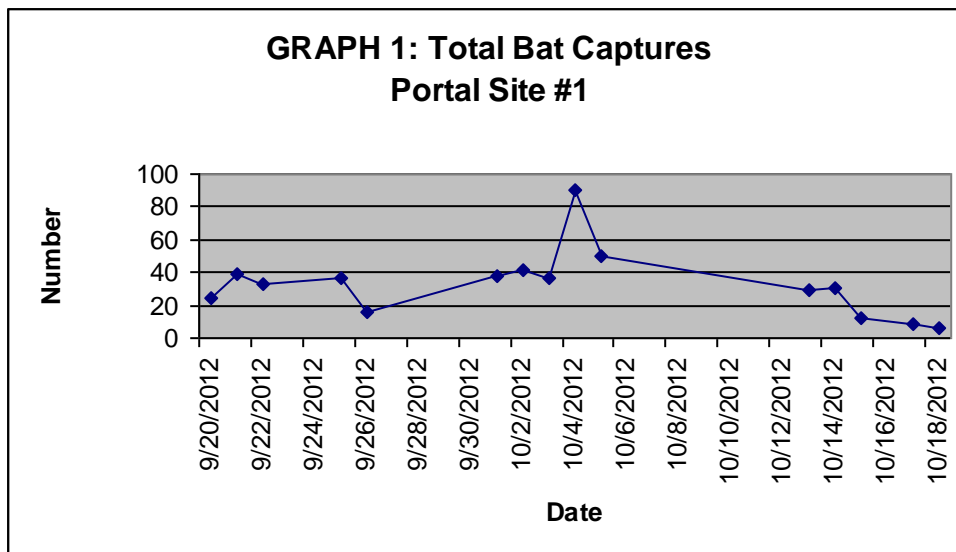
These objectives were addressed through a multi-phased hibernacula assessment that included a portal investigation and bat capture survey, each occurring within a 1,500 ft (457.2 m) action area as defined in the 2007 Biological Opinion for the S.R. 6219, Section 019, transportation improvement project, and amended to include S.R. 6219, Section 020, in 2011. The portal investigations included a desktop review of available mining and caves resources and a field investigation of 298 person-hours to locate potential openings within the action area that may support bat hibernation. As a result of the field investigations, newly discovered openings within the project action area were assessed, and five additional openings were found to meet criteria detailed in the 2012 PGC *Protocol for Assessing Bat Use of Potential Hibernacula*. Four of these openings, plus one opening identified in the September 11, 2012, USFWS technical assistance letter, were found within the action area and surveyed in accordance with the 2012 PGC protocol to determine if Indiana bats were among the species hibernating within the action area. Of the five openings surveyed for bat presence, two were discovered to be bat hibernacula (Portal Site #1 and Air Shaft Site #4) and one site (Highwall Site #3) was found to be used by one bat, although whether the opening was used as a hibernaculum or roost was unknown. Below is a discussion of these three openings plus the two openings where bat presence was not discovered (Highwall Site #2 and Pipe Site #5).

### A. PORTAL SITE #1 AND AIR SHAFT SITE #4

Using the 2012 PGC *Protocol for Assessing Bat Use of Potential Hibernacula*, the September 11, 2012, USFWS technical assistance letter, and ongoing technical assistance from the USFWS and the PGC, no Indiana bats were captured at the Portal Site #1 or Air Shaft



Site #4 during the 15 valid survey nights or during the nights where surveying occurred but was deemed not valid due to inclement weather. Due to the length of the survey period and the capture results, the best nights for bat activity were sampled following the 2012 PGC protocol and peak bat activity was captured at these two hibernacula. Graphs 1 and Graph 2 illustrate the pronounced peak in bat captures on October 4, 2012, and the decline in bat captures after October 4 for the 15 valid survey nights at Portal Site #1 and Air Shaft Site #4, respectively.



Six hibernating bat species occur in Pennsylvania hibernacula: little brown myotis (MYLU), northern myotis (MYSE), eastern small-footed myotis (MYLE), Indiana myotis (MYSO),

big brown bat (EPFU), and tri-colored bat (PESU). Species diversity for the 15 valid survey nights was higher at the Portal Site #1 than at the Air Shaft Site #4. Five of the six Pennsylvania hibernating bat species were captured at the Portal Site #1, and three of the six were captured at Air Shaft Site #4. Species diversity peaked at the Portal Site #1 on October 3 and 4, October 4 also being the highest capture night (Table 9).

**TABLE 9**  
**SPECIES DIVERSITY AT PORTAL SITE #1 AND AIR SHAFT SITE #4**  
**DURING 15 VALID SURVEY NIGHTS**  
**SEPTEMBER 20 THROUGH OCTOBER 19, 2012**

DATE	PORTAL SITE #1, SPECIES CAPTURED					AIR SHAFT SITE #4, SPECIES CAPTURED		
	MYLU	MYSE	MYLE	EPFU	PESU	MYLU	MYSE	PESU
9/20/12	X	X			X	---	---	---
9/21/12	X	X			X		X	X
9/22/12	X	X			X	X		X
9/25/12	X	X			X		X	X
9/26/12		X			X		X	X
10/01/12	X	X			X		X	X
10/02/12	X	X			X		X	X
10/03/12	X	X	X	X	X	X	X	X
10/04/12	X	X	X	X	X	X	X	X
10/05/12	X				X	X	X	X
10/13/12	X	X			X	X	X	X
10/14/12	X	X		X	X		X	X
10/15/12	X	X			X	X	X	X
10/17/12	X	X			X	X	X	X
10/18/12		X			X	X	X	X
10/19/12	---	---	---	---	---	X	X	

Since the hibernacula capture surveys for the S.R. 6219, Section 020, project occurred during the time of peak bat activity, it is likely that the surveys occurred during peak Indiana bat activity. Therefore, the survey nights were appropriate for capturing a snapshot of the bat density and diversity at both the Portal Site #1 and Air Shaft Site #4. Although bat capture surveys cannot prove the absolute absence of a species, the September 11, 2012, USFWS

technical assistance letter, in conjunction with the 2012 PGC protocol (and modifications through further coordination with the USFWS and PGC), was designed to reasonably prove whether or not any Indiana myotis use the hibernacula located within the project action area.

Since five male bats were captured at the Air Shaft Site #4 then recaptured at the Portal Site #1, this may suggest that male bats visit more than one hibernaculum during the swarming season (USFWS, 2007b) and, therefore, the captured bat may not hibernate at the site of capture. Since three of the five bats were captured at both sites in one night, this may also suggest that bats visit more than one hibernaculum within the same night during the swarming season. Air Shaft Site #4 was located 1.4 mi (2.3 km) from Portal Site #1.

## **B. EASTERN SMALL-FOOTED MYOTIS (*MYOTIS LEIBI*)**

Two female eastern small-footed myotis were captured at the Portal Site #1, one on October 3 and the other on October 4, 2012. These captures suggest that this species was using the Portal Site #1 as a hibernaculum. The eastern small-footed myotis is listed as State Threatened in the Commonwealth of Pennsylvania under the Pennsylvania Game and Wildlife Code by the PGC (Pennsylvania Natural Heritage Program [PHNP], 2012), State Ranked as S1B, S1N (critically imperiled) (NatureServe, 2009), Globally Ranked as G3 (vulnerable) (NatureServe, 2009), and is classified as a Species of Concern by the USFWS, Midwest Region (USFWS, 2012). The eastern small-footed myotis apparently prefers caves and abandoned mine shafts located within the Allegheny Mountain of Pennsylvania (PHNP, undated). The species is listed as threatened in Pennsylvania due to an apparent population decline between the 1930s and late 1970s (PHNP, undated). In the most recent Environmental Review correspondence for the U.S. 219 Improvements Project, S.R. 6219, Section 20, dated July 16, 2012, the PGC had not identified the eastern small-footed myotis as a species of special concern for this project (Appendix A).

## **C. CONSTRUCTION ACTIVITIES IN RELATION TO PORTAL SITE #1 AND AIR SHAFT SITE #4**

Detailed information regarding the proximity of Portal Site #1 and Air Shaft Site #4 to the S.R. 6219, Section 020, project and any construction activities in relation to the mines associated with these openings are found in Appendix E, L. R. Kimball Design Memorandum, Upper Kittanning Mine Openings, November 1, 2012.



This memorandum states that, based on the best available information, it can reasonably be concluded that the mine openings and air flow through the mine workings should not be impacted by the proposed construction of S.R. 6219.

#### **D. HIGHWALL SITE #3**

Mist net, acoustic detector, and IR camcorder surveys occurred at Highwall Site #3 to determine bat presence in accordance with the 2012 PGC Protocol and ongoing technical assistance from the USFWS and the PGC. Within the five nights of accepted surveys, no bats were captured at Highwall Site #3 during the three mist net survey nights; however, potential bat ultrasound was recorded on three of the five nights, and one bat leaving the opening was recorded using an IR camcorder on one of the five nights. It was unknown if the bat observed on the IR camcorder footage was using the opening as a hibernaculum or a roost location. The species of the bat was not identifiable through acoustic analysis. It was determined through FHWA and PennDOT correspondence with the USFWS during a weekly status meeting that no additional surveys were required for the opening. Refer to Appendix A for Status Meeting Minutes from October 15, 2012, discussing results from the Highwall Site #3 surveys and a summary of the determination.

#### **E. HIGHWALL SITE #2**

Mist net, acoustic detector, and IR camcorder surveys occurred at Highwall Site #2 to determine bat presence in accordance with the 2012 PGC Protocol and ongoing technical assistance from the USFWS and the PGC. No bats were discovered using this opening; therefore, no further determination or discussion of impacts to the opening were necessary.

#### **F. PIPE SITE #5**

Mist net, acoustic detector, and IR camcorder surveys occurred at Pipe Site #5 to determine bat presence in accordance with the 2012 PGC Protocol and ongoing technical assistance from the USFWS and the PGC. No bat captures occurred, and no IR video footage revealed bats using the pipe.

One acoustic file containing two ultrasound recordings was generated on October 14, 2012, by the AnaBat acoustic detector. The IR camcorder was not operational during the time this file was generated and could not be cross-referenced with video footage to determine if the

ultrasound recordings were emitted by a bat entering or leaving Pipe Site #5. Upon further inspection of the files, the ultrasound recordings may not have been emitted by a bat. Since this time period may have been during a battery or memory card change in the camcorder, the recording could have included noise created by the surveyors. If the ultrasound was from a bat, the frequency for the entire duration of both ultrasound recordings was below 30 kHz, which was outside the typical frequency of a call from an Indiana myotis or eastern small-footed myotis (Szewczak, 2011).

From discussions among FHWA, PennDOT, and USFWS regarding the results of the surveys at Pipe Site #5, it was concluded that no further surveys, determination, or discussion of impacts to the opening were necessary since no bat captures occurred and no bats were observed on the IR camcorder footage (Appendix A).

## **VI. CONCLUSIONS**



## VI. CONCLUSIONS

The S.R. 6219, Section 020, Bat Hibernaculum Assessment included detailed investigations of potential bat winter habitat within the project action area between September 17 and October 19, 2012. The investigations were completed in accordance with the 2012 PGC *Protocol for Assessing Bat Use of Potential Hibernacula*; the September 11, 2012, USFWS technical assistance letter; and ongoing technical assistance from the USFWS and PGC. As a result of the detailed investigations, including approximately 298 person-hours of field reconnaissance and extensive bat trapping surveys over the course of a 30-day period, two bat hibernacula were discovered within the project action area, Portal Site #1 and Air Shaft Site #4. One additional site, Highwall Site #3, was discovered to be used by one bat from an IR camcorder survey. The bat observed from IR video footage was not captured and was not identifiable using acoustic analysis software. Two Pennsylvania-listed, threatened eastern small-footed myotis were captured at Portal Site #1. No Indiana myotis were captured at any of the five surveyed sites.

A report of the proposed construction activities near Portal Site #1 and Air Shaft Site #4 was provided to the USFWS and PGC on November 6, 2012, for their review. The analysis of proposed activities concluded that, based on the best available information, the mine openings and air flow through the surveyed mine workings should not be impacted by the proposed construction of S.R. 6219. Highway construction activities are proposed to take place between 2013 and 2017, with tree removal to occur between the November 15 and March 31 timeframe, in accordance with the Biological Opinion, where the majority of tree removal is planned for 2012-2013. Further coordination by the FHWA and PennDOT with the USFWS and PGC is anticipated to determine the next steps towards threatened and endangered species compliance for the S.R. 6219, Section 020, transportation improvement project.

## **VII. LIST OF PREPARERS**

## VII. LIST OF PREPARERS

Julie A. Zeyzus, Biologist  
Skelly and Loy, Inc.  
B.S., Biology Education, 1994  
12 Years of Experience  
USFWS Qualified Indiana Bat Surveyor  
Special Use Permit No. 155-2012

Michael S. Fishman, Senior Managing Environmental Scientist  
Barton and Loguidice, P. C.  
B.S., Natural Resources, Wildlife and Aquatic Sciences, 1988  
26 Years of Experience  
USFWS Qualified Indiana Bat Surveyor

Jack T. Basiger, Staff Scientist  
Civil and Environmental Consultants, Inc.  
B.A., Wildlife and Fisheries Science, 2007  
7 Years of Experience  
USFWS Qualified Indiana Bat Surveyor

James A. Hart, Mammalogist  
Wildlife Specialists, LLC.  
BS, Biology, 1988  
MS, Biology, 1991  
25 Years of Experience  
USFWS Qualified Indiana Bat Surveyor

Ryan A. Slack, Project Manager II  
Civil and Environmental Consultants, Inc.  
B.S., Wildlife Science, 1993  
18 Years of Experience  
USFWS Qualified Indiana Bat Surveyor

Mary B. Gilmore, Project Scientist  
Civil and Environmental Consultants, Inc.  
B.S., Forestry and Wildlife Management, 2008  
5 Years of Experience  
USFWS Qualified Bat Identifier

Drew Wanke, Biologist  
Wildlife Specialists, LLC.  
B.S., Conservation Biology, 2007  
6 Years of Experience  
USFWS Qualified Bat Identifier

Dennis R. Bell, Jr., P.G., Senior Geologist  
Skelly and Loy, Inc.  
B.S., Geology, 1984  
33 Years of Experience





Terry W. Schmidt, P.E., Vice President, Engineering  
Skelly and Loy, Inc.  
B.S., Mining Engineering, 1985  
M.S., Mining Engineering, 1994  
26 Years of Experience

Andrew M. Brookens, Regional Director of  
Natural Resources, Aquatic Biologist,  
Director of Threatened and Endangered Species Services  
Skelly and Loy, Inc.  
B.S. Biology, 1993  
19 Years of Experience

Dennis W. Lewis, GIS Analyst  
Skelly and Loy, Inc.  
A.A., Imagery Interpretation and  
Intelligence Analysis, 1986  
25 Years of Experience

Andrew P. Nevin, Biologist  
Skelly and Loy, Inc.  
B.S., Biology, 2005  
7 Years of Experience  
USFWS Qualified Bat Identifier

Paul J. DeAngelo, Biologist,  
Director of Natural Resources Analysis  
Skelly and Loy, Inc.  
B.S., Environmental Biology, 1991  
M.S., Environmental Pollution Control, 2005  
21 Years of Experience

Benjamin T. Berra, Environmental Scientist/Biologist  
Skelly and Loy, Inc.  
B.S. Geoenvironmental Studies, 1996  
M.S. Geoenvironmental Studies, 1998  
14 Years of Experience

Logan T. Zugay, Wildlife Biologist/Environmental Scientist  
Skelly and Loy, Inc.  
B.S., Wildlife Biology, 2011  
1 Year of Experience

Eric R. Bruggeman, Environmental Specialist  
Skelly and Loy, Inc.  
B.S., Geography Land-use, 2004  
8 Years of Experience

Trent A. Sustich, Environmental Specialist  
Skelly and Loy, Inc.  
B.S. Physical/Environmental Geography, 2011  
1 Year of Experience

Megan D. Hinkle, Biologist  
Skelly and Loy, Inc.  
B.S., Biology and Chemistry, 2011  
1 Year of Experience

Todd J. Phillips, Environmental Scientist III  
Barton and Loguidice, P. C.  
B. Tech., Wildlife Management, 2004  
7 Years of Experience

Peter C. Riggs, Environmental Engineer I  
Barton and Loguidice, P. C.  
B.S., Environmental Resources Engineering  
1 Year of Experience

## **VIII. LITERATURE CITED**



## VIII. LITERATURE CITED

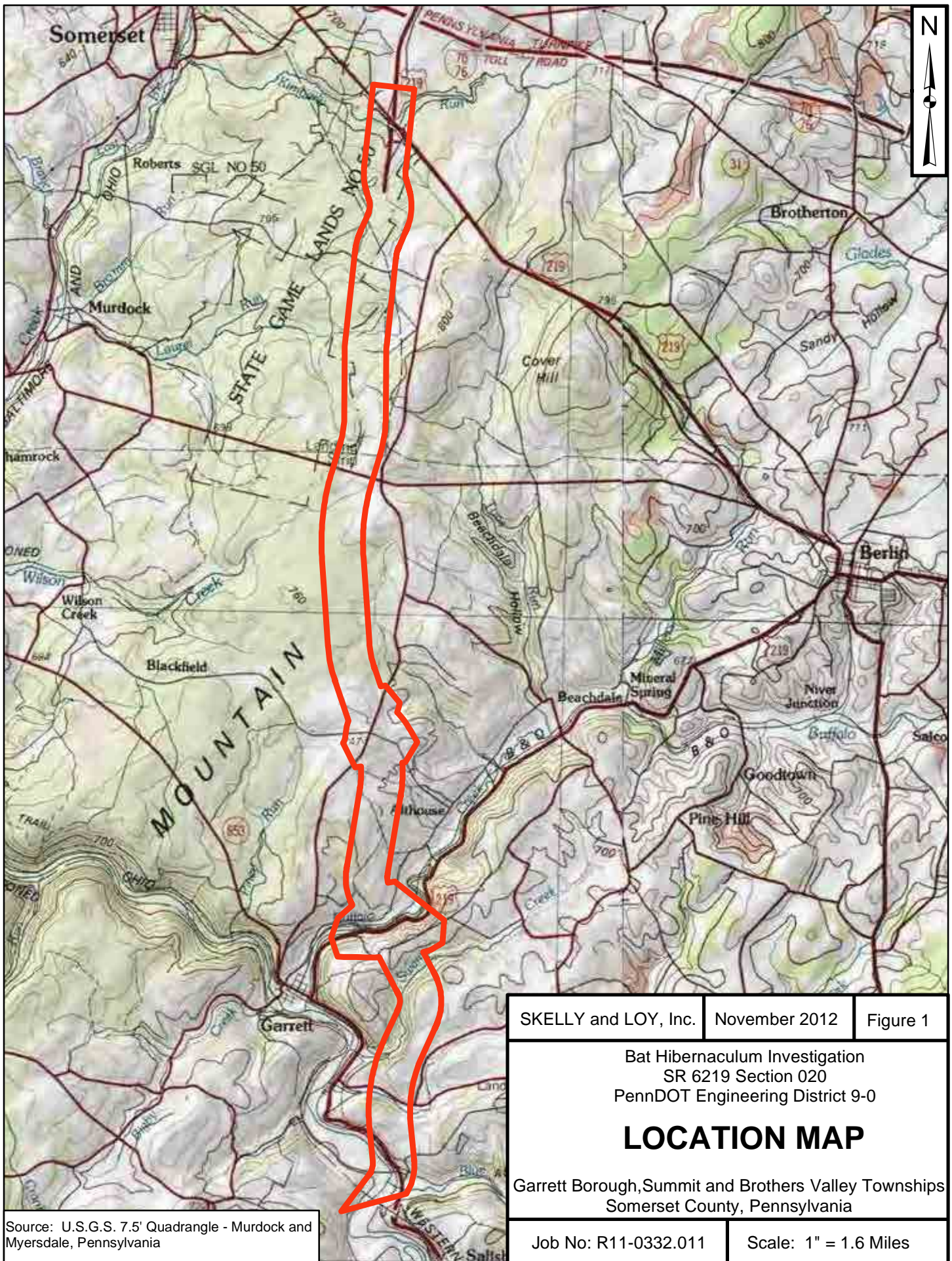
- Britzke, E. R. 2012. EcoClass-Draft, Version 1.1. U.S. Army Engineer Research and Development Center, Vicksburg, Mississippi.
- Gannon, W. L. and R.S. Sikes. 2007. Guidelines of the American Society of Mammalogists for the use of wild animals in research. *Journal of Mammalogy*. 88:809-823.
- Greenhorne and O'Mara, Inc. 2002. US 219 Improvements Projects, Vegetation and Wildlife Summary Report.
- Kunz, T. H. and S. Parsons. 2009. *Ecological and Behavioral Methods for the Study of Bats*. The Johns Hopkins University Press, Baltimore, Maryland.
- NatureServe. 2009 (last updated, July 2012). NatureServe Explorer: An online encyclopedia of life (Web application). Version 7.1. Arlington, Virginia. <http://www.natureserve.org/explorer>. (Accessed: November 2012)
- Pennsylvania Game Commission. 2012. *Protocol for Assessing Bat Use of Potential Hibernacula*. Bureau of Wildlife Management, Wildlife Diversity Section, Harrisburg, PA.
- Pennsylvania Game Commission. 2009. *Bat Handling/Disinfection Protocol for Summer Bat Field Studies*. Bureau of Wildlife Management, Wildlife Diversity Section, Harrisburg, PA.
- Pennsylvania Natural Heritage Program, undated. Eastern Small-footed Myotis (*Myotis leibii*). Fact Sheet adapted from: Frank Felbaum, et al. Endangered and Threatened Species of Pennsylvania. Harrisburg, PA: Wild Resource Conservation Fund, 1995.
- Pennsylvania Natural Heritage Program, 2012. Species of Special Concern Lists website; <http://www.naturalheritage.state.pa.us/Species.aspx> (Accessed: November 2012).
- Reichard, J. D. undated. *Wing-Damage Index Used for Characterizing Wing Condition of Bats Affected by White-Nose Syndrome*. Boston University, Boston, MA.
- Szewczak, J. M. 2011. Echolocation Call Characteristics of Eastern US Bats (workshop handout). Humboldt State University, Arcata, CA.
- U.S. Fish and Wildlife Service. 2007a. Agency Draft Indiana Bat (*Myotis sodalis*) Revised Recovery Plan. USFWS Region 3, Fort Snelling, Minnesota.
- U.S. Fish and Wildlife Service. 2007b. *The Effects of the US 6219, Section 019, Transportation Improvement Project on the Indiana bat (Myotis sodalis), Somerset County, Pennsylvania and Garrett County, Maryland*. Submitted to the Federal Highway Administration. USFWS Northeast Region, Pennsylvania Field Office, State College, Pennsylvania.
- U.S. Fish and Wildlife Service. 2011. *The Effects of the US 6219, Section 019, Transportation Improvement Project on the Indiana bat (Myotis sodalis), Somerset County, Pennsylvania and Garrett County, Maryland*. Amendment to include SR 6219, Section 020 (US 219 Improvement Project, Meyersdale to Somerset). Submitted to the Federal Highway Administration. USFWS Northeast Region, Pennsylvania Field Office, State College, Pennsylvania.

U.S. Fish and Wildlife Service. 2009, updated 2012. *White-Nose Syndrome Decontamination Protocol*. USFWS Region 3, Fort Snelling, Minnesota.

U.S. Fish and Wildlife Service. 2012. Species of Concern website: <http://www.fws.gov/midwest/es/soc>. USFWS Region 3.

## FIGURES





SKELLY and LOY, Inc.

November 2012

Figure 1

Bat Hibernaculum Investigation  
SR 6219 Section 020  
PennDOT Engineering District 9-0

## LOCATION MAP

Garrett Borough, Summit and Brothers Valley Townships  
Somerset County, Pennsylvania

Job No: R11-0332.011

Scale: 1" = 1.6 Miles

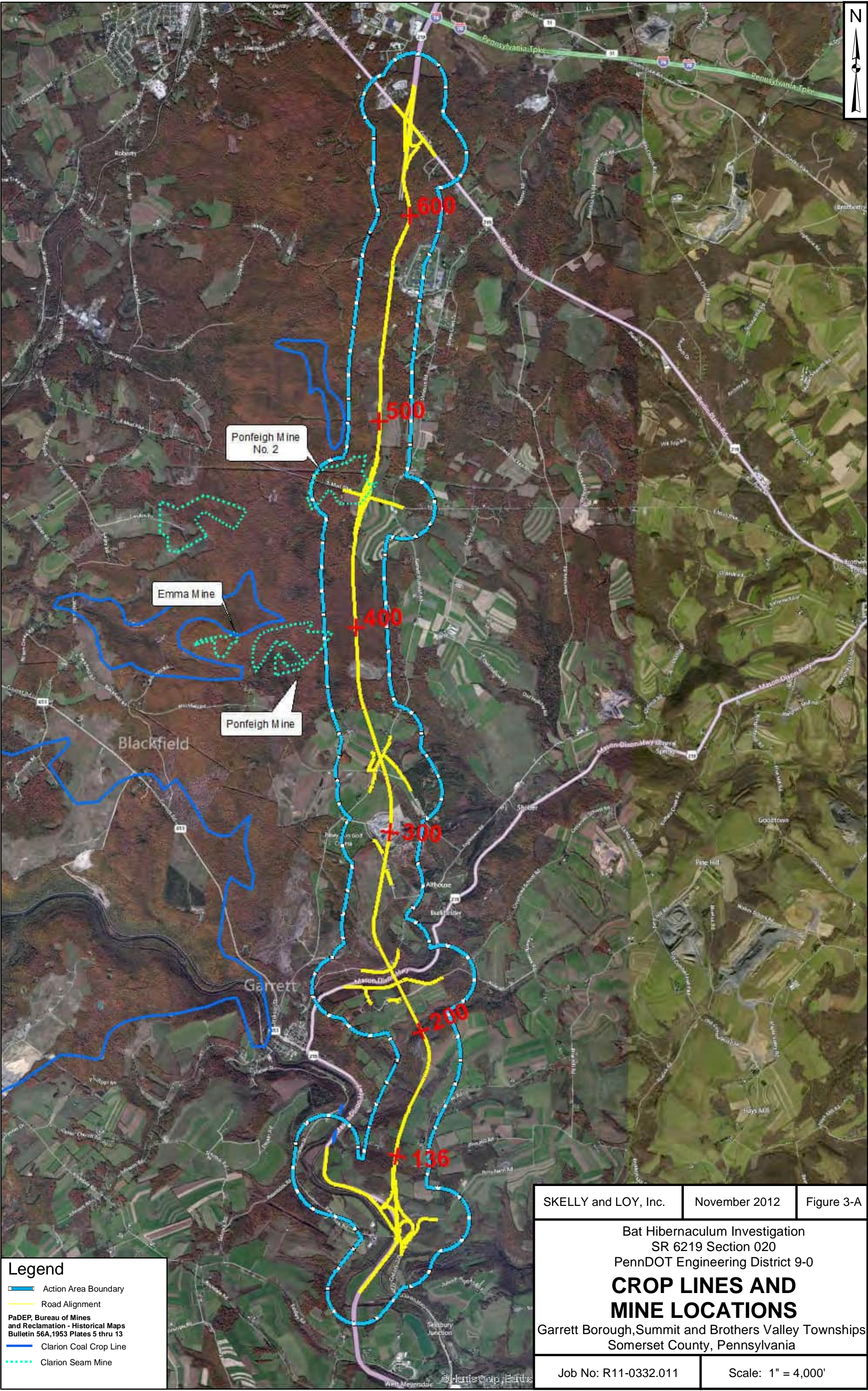
Source: U.S.G.S. 7.5' Quadrangle - Murdock and  
Myersdale, Pennsylvania





SKELLY and LOY, Inc.	November 2012	Figure 2
Bat Hibernaculum Investigation SR 6219 Section 020 PennDOT Engineering District 9-0		
<b>PROJECT ALIGNMENT</b>		
Garrett Borough, Summit and Brothers Valley Townships Somerset County, Pennsylvania		
Job No: R11-0332.011	Scale: 1" = 4,000'	





**Legend**

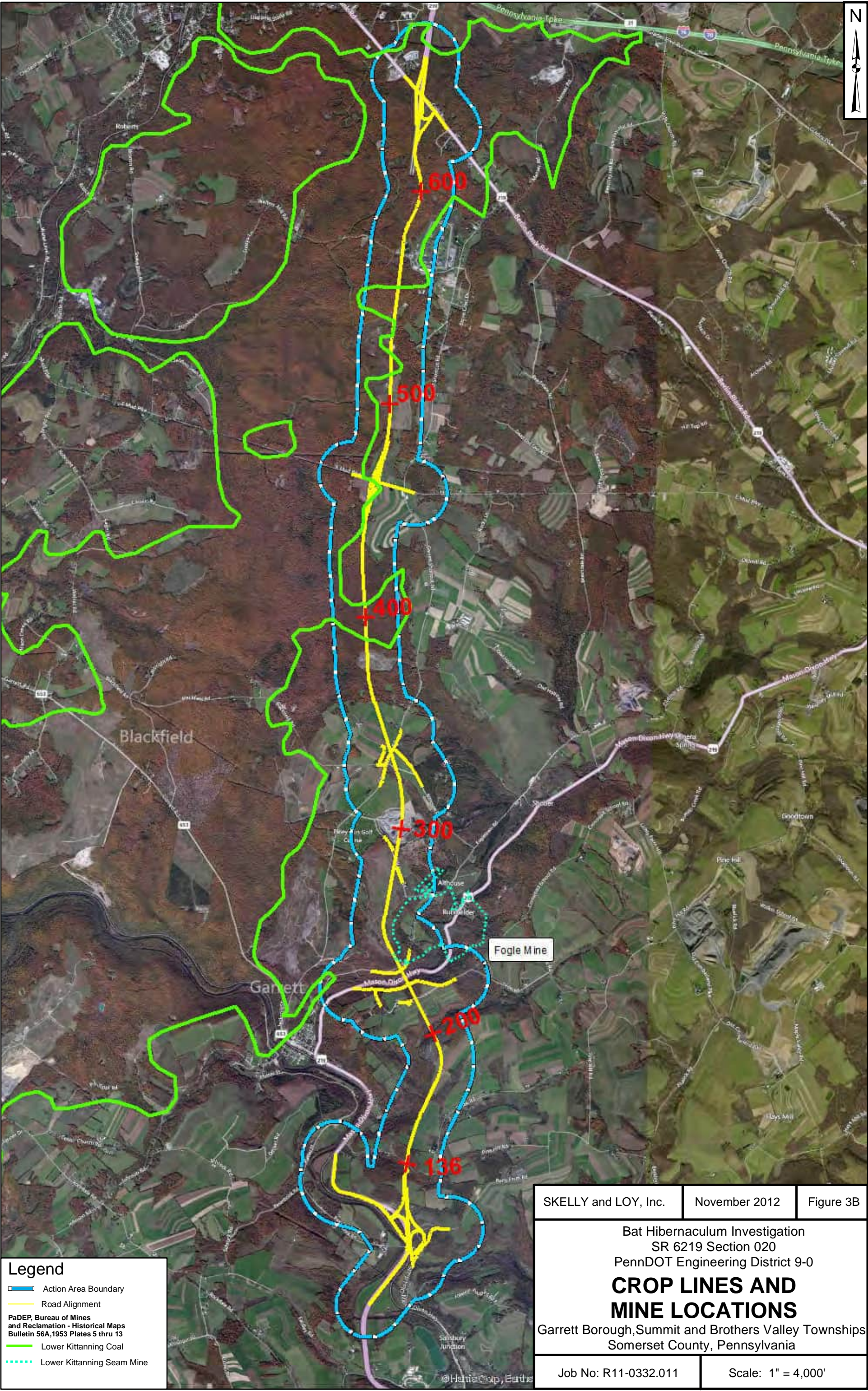
- Action Area Boundary
- Road Alignment
- PaDEP, Bureau of Mines and Reclamation - Historical Maps Bulletin 56A, 1953 Plates 5 thru 13
- Clarion Coal Crop Line
- Clarion Seam Mine

SKELLY and LOY, Inc. November 2012 Figure 3-A

Bat Hibernaculum Investigation  
SR 6219 Section 020  
PennDOT Engineering District 9-0  
**CROP LINES AND  
MINE LOCATIONS**  
Garrett Borough, Summit and Brothers Valley Townships  
Somerset County, Pennsylvania

Job No: R11-0332.011 Scale: 1" = 4,000'





Legend

Action Area Boundary

Road Alignment

PaDEP, Bureau of Mines  
and Reclamation - Historical Maps  
Bulletin 56A, 1953 Plates 5 thru 13

Lower Kittanning Coal

Lower Kittanning Seam Mine

SKELLY and LOY, Inc.	November 2012	Figure 3B
Bat Hibernaculum Investigation SR 6219 Section 020 PennDOT Engineering District 9-0		
<b>CROP LINES AND MINE LOCATIONS</b>		
Garrett Borough, Summit and Broders Valley Townships Somerset County, Pennsylvania		
Job No: R11-0332.011	Scale: 1" = 4,000'	









Legend

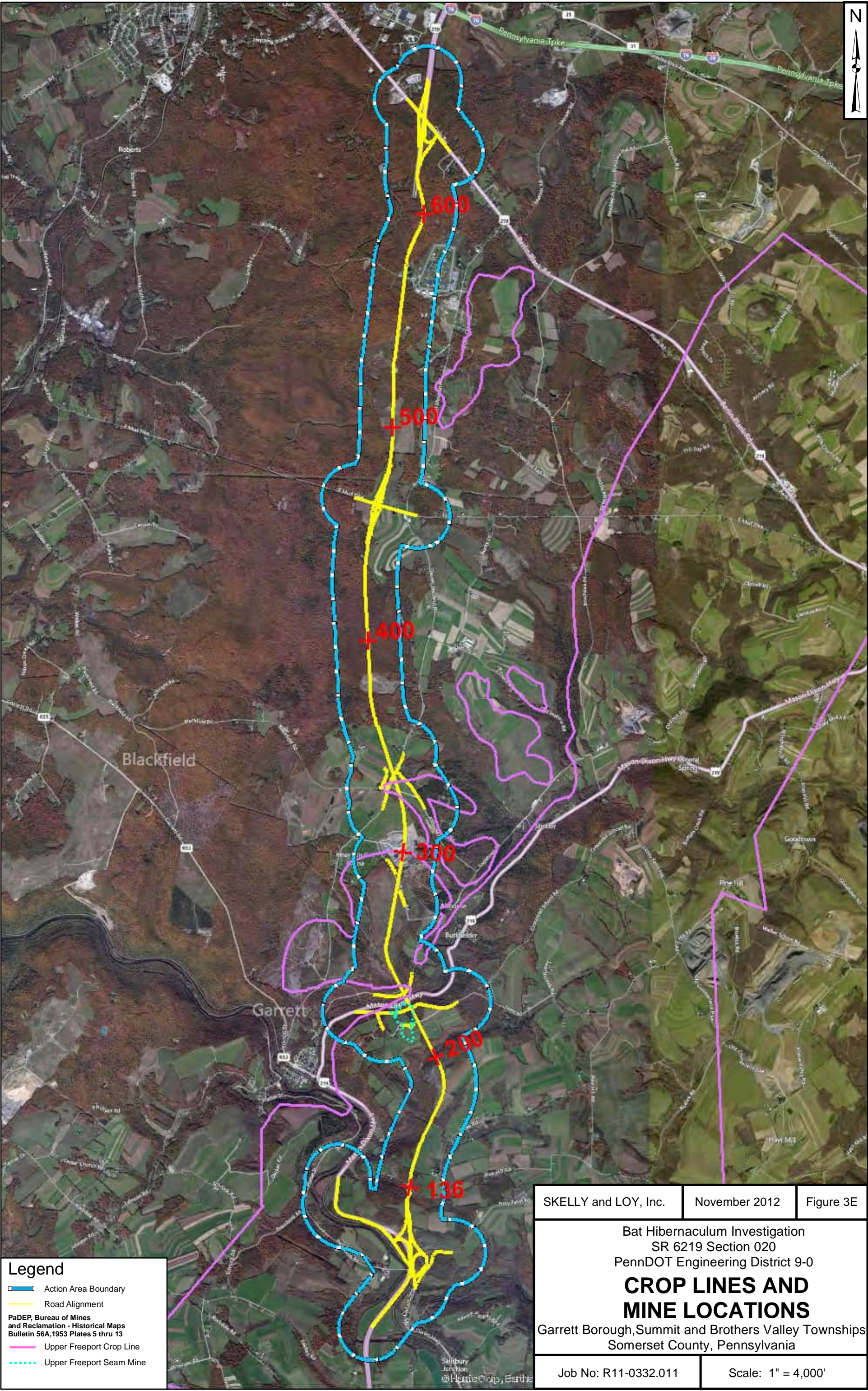
- Action Area Boundary
- Road Alignment
- PaDEP, Bureau of Mines and Reclamation - Historical Maps Bulletin 56A, 1953 Plates 5 thru 13
- Lower Freeport Crop Line
- ..... Lower Freeport Seam Mine

SKELLY and LOY, Inc.      November 2012      Figure 3D

Bat Hibernaculum Investigation  
SR 6219 Section 020  
PennDOT Engineering District 9-0  
**CROP LINES AND  
MINE LOCATIONS**  
Garrett Borough, Summit and Brothers Valley Townships  
Somerset County, Pennsylvania

Job No: R11-0332.011      Scale: 1" = 4,000'





Legend

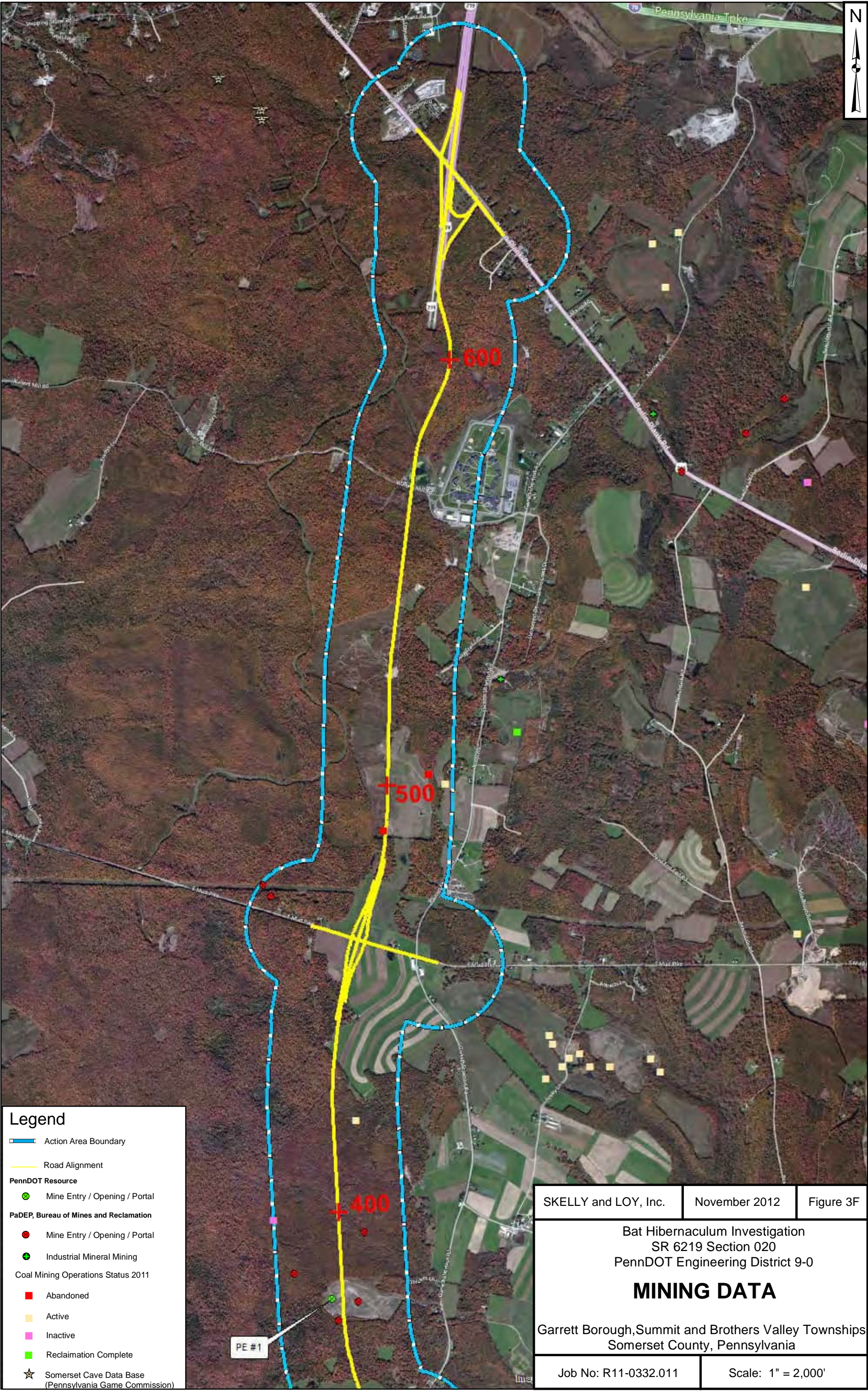
- Action Area Boundary
- Road Alignment
- PaDEP, Bureau of Mines and Reclamation - Historical Maps Bulletin 56A, 1953 Plates 5 thru 13
- Upper Freeport Crop Line
- Upper Freeport Seam Mine

SKELLY and LOY, Inc. November 2012 Figure 3E

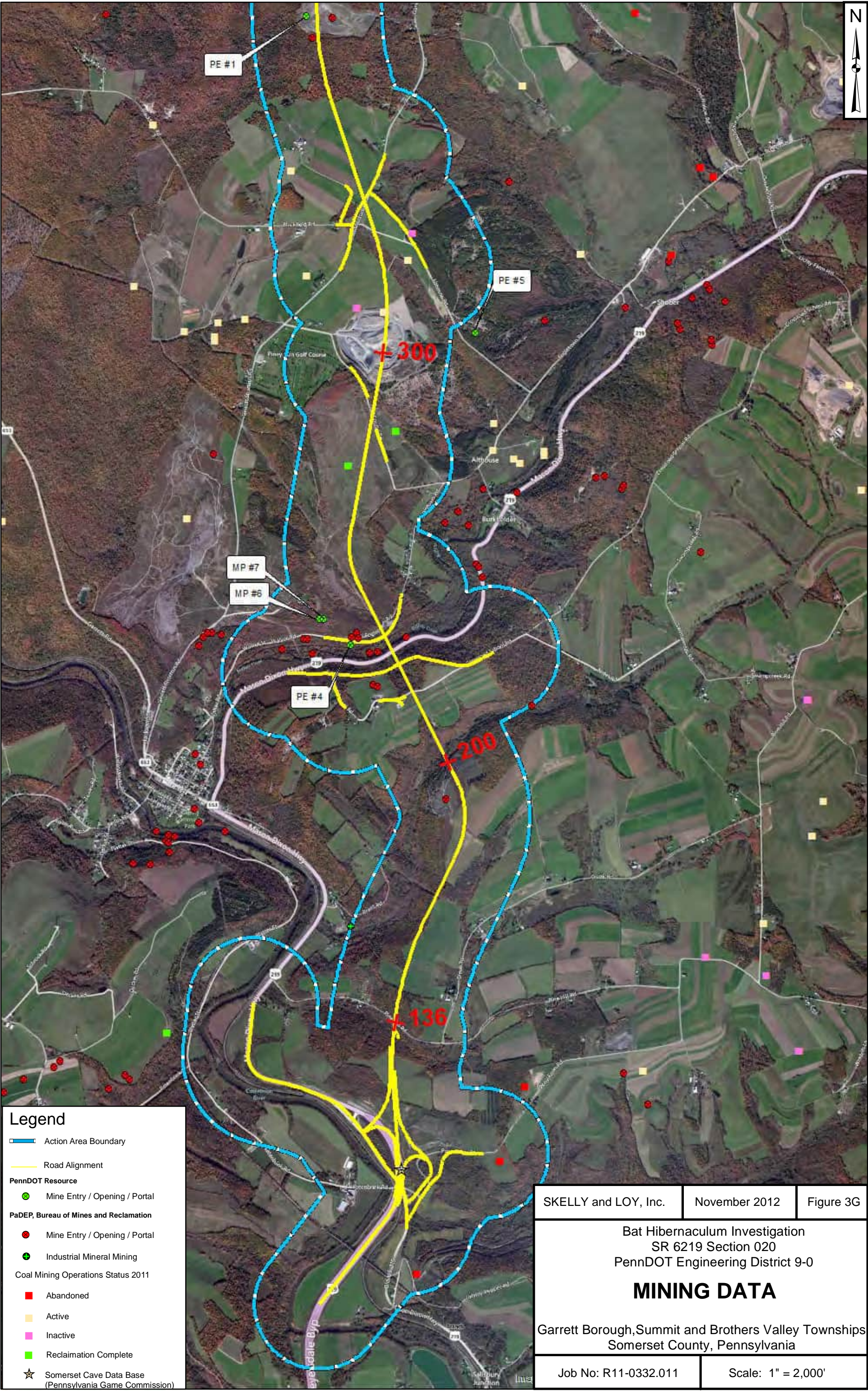
Bat Hibernaculum Investigation  
SR 6219 Section 020  
PennDOT Engineering District 9-0  
**CROP LINES AND  
MINE LOCATIONS**  
Garrett Borough, Summit and Brothers Valley Townships  
Somerset County, Pennsylvania

Job No: R11-0332.011 Scale: 1" = 4,000'







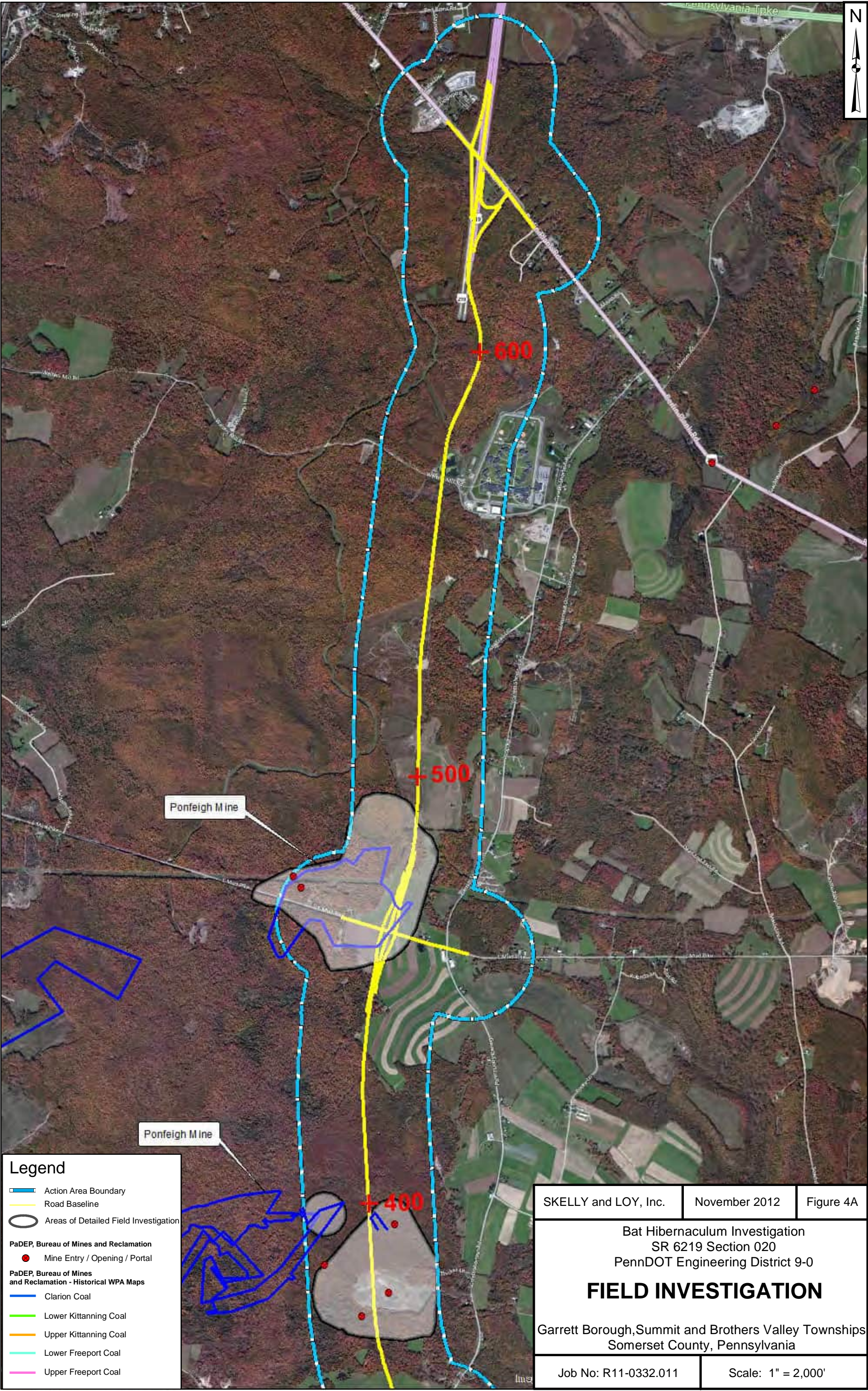


Legend

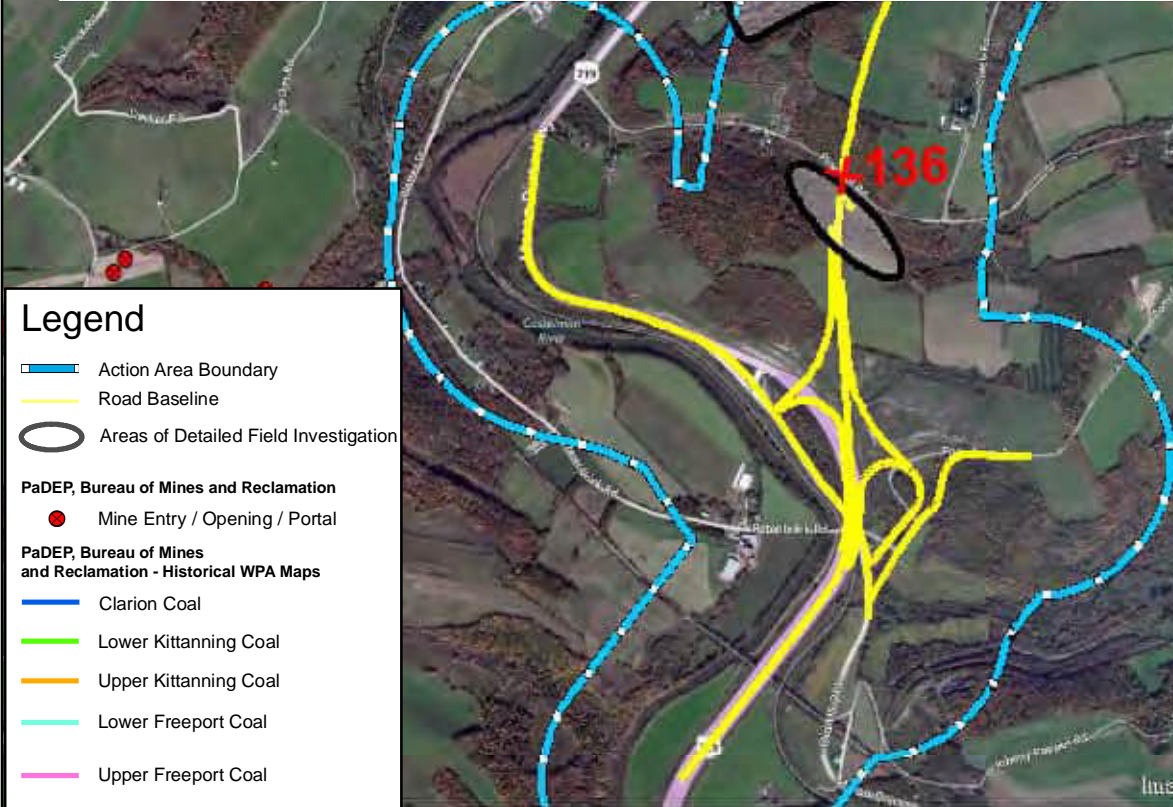
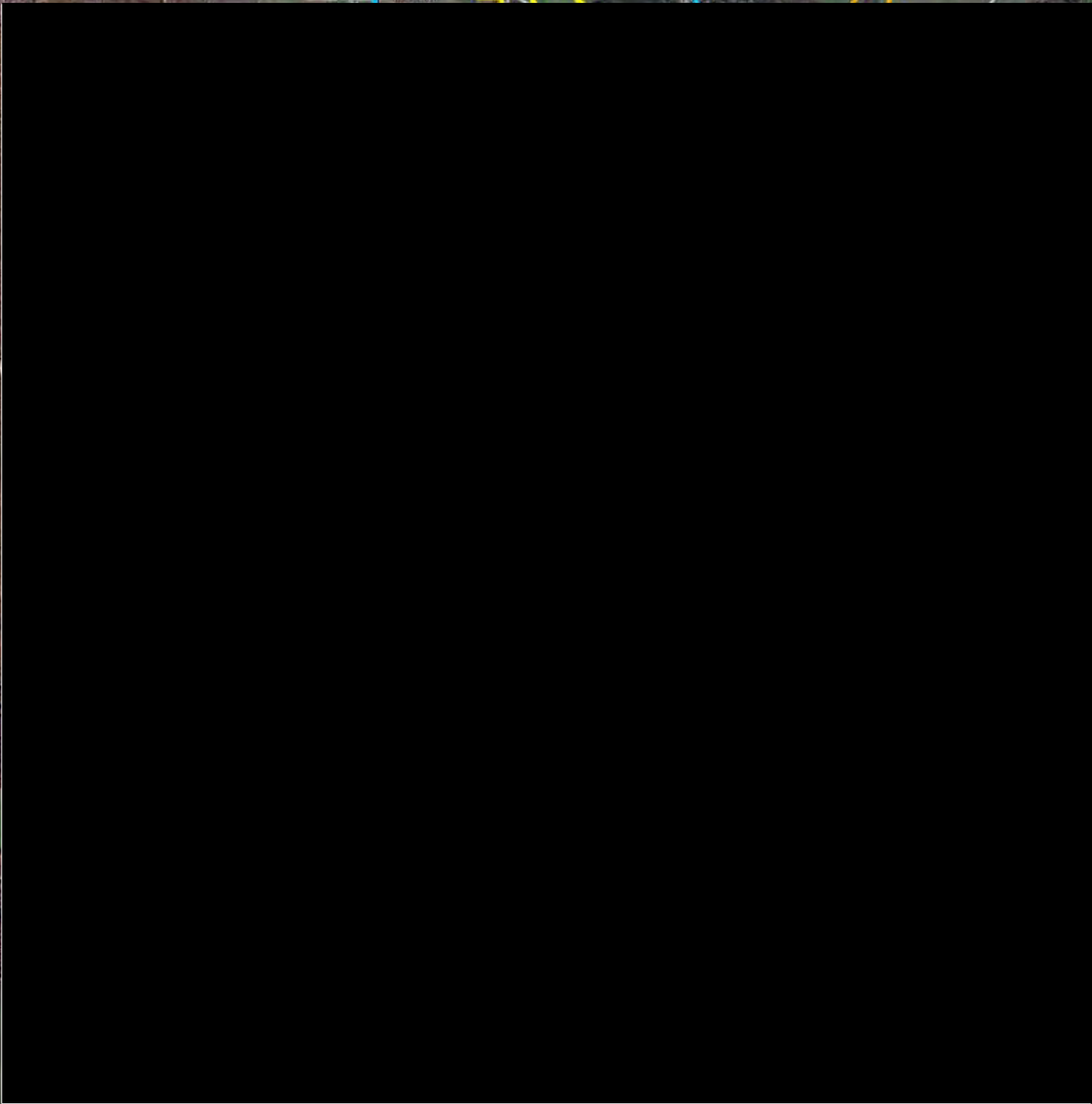
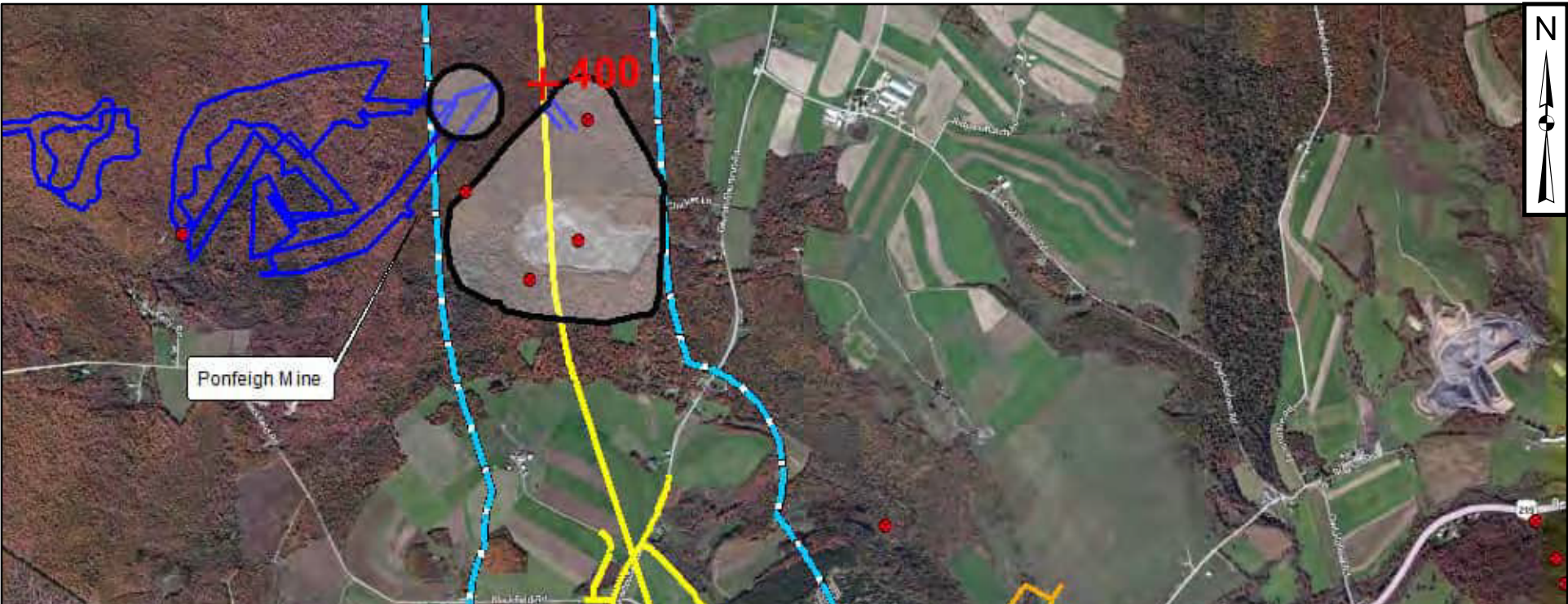
- Action Area Boundary
- Road Alignment
- PennDOT Resource**
  - Mine Entry / Opening / Portal
- PaDEP, Bureau of Mines and Reclamation**
  - Mine Entry / Opening / Portal
  - Industrial Mineral Mining
- Coal Mining Operations Status 2011**
  - Abandoned
  - Active
  - Inactive
  - Reclamation Complete
- ★ Somerset Cave Data Base (Pennsylvania Game Commission)

SKELLY and LOY, Inc.	November 2012	Figure 3G
Bat Hibernaculum Investigation SR 6219 Section 020 PennDOT Engineering District 9-0		
<b>MINING DATA</b>		
Garrett Borough, Summit and Brothers Valley Townships Somerset County, Pennsylvania		
Job No: R11-0332.011	Scale: 1" = 2,000'	









Legend

Action Area Boundary

Road Baseline

Areas of Detailed Field Investigation

PaDEP, Bureau of Mines and Reclamation

Mine Entry / Opening / Portal

PaDEP, Bureau of Mines and Reclamation - Historical WPA Maps

Clarion Coal

Lower Kittanning Coal

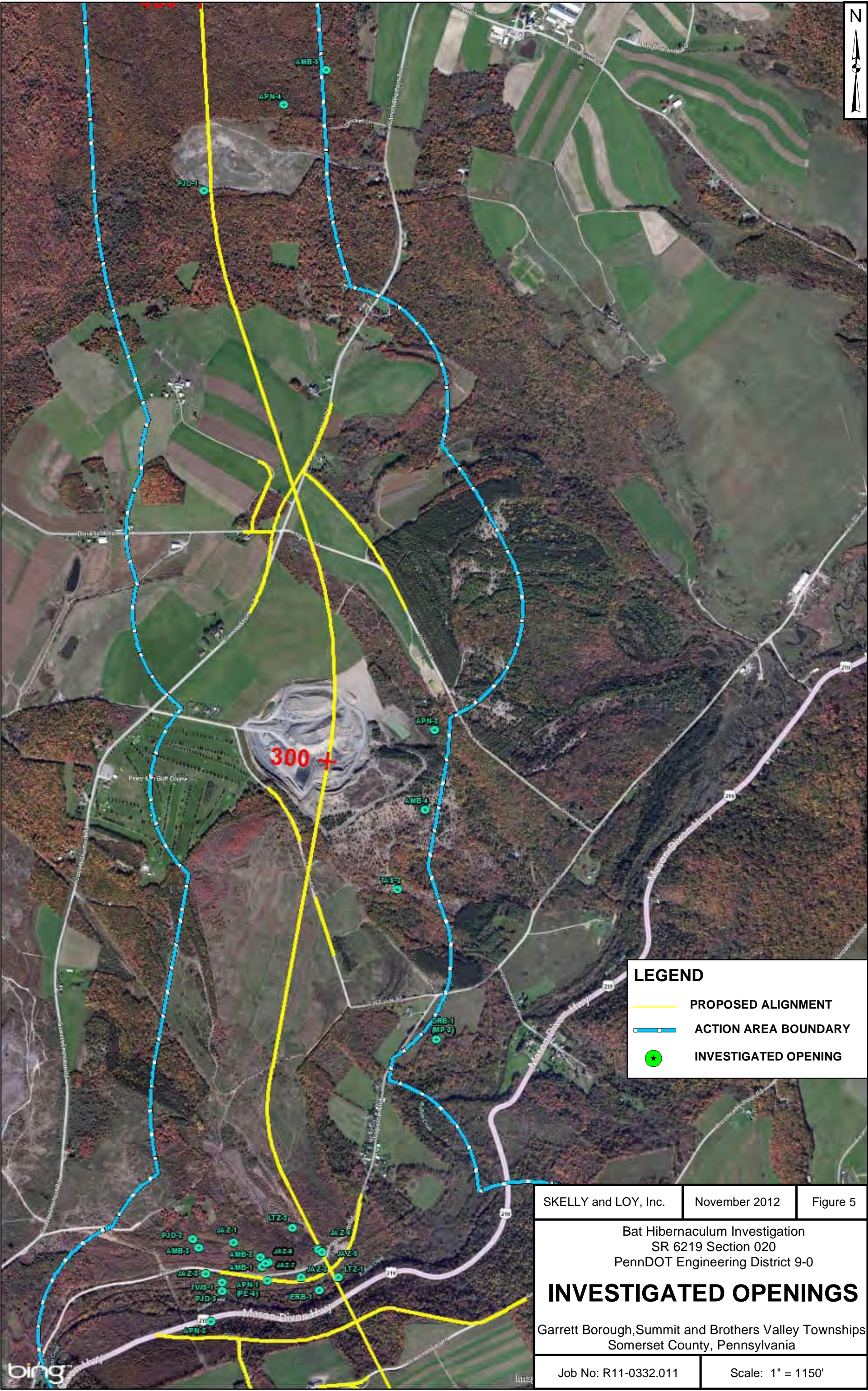
Upper Kittanning Coal

Lower Freeport Coal

Upper Freeport Coal

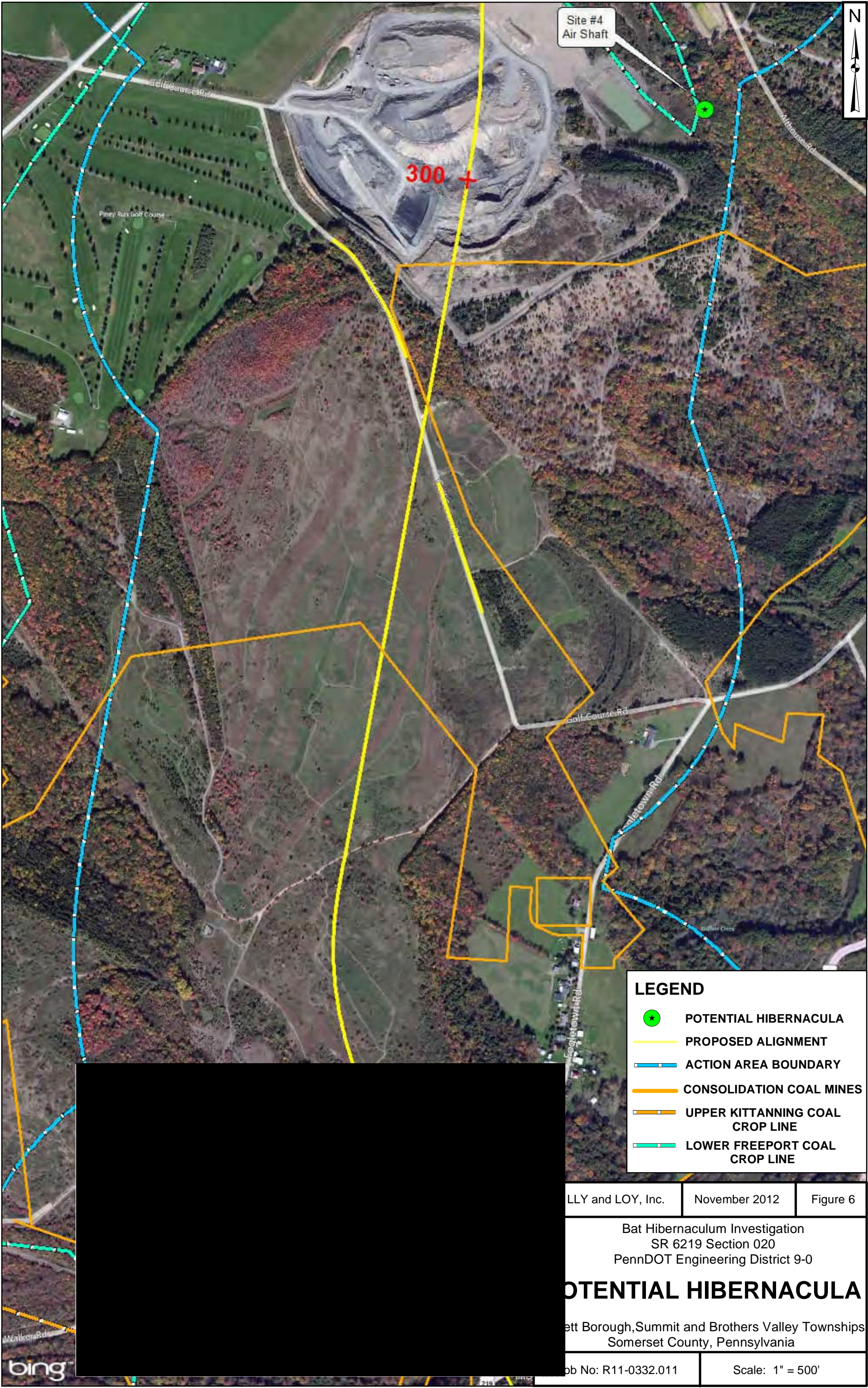
SKELLY and LOY, Inc.	November 2012	Figure 4B
Bat Hibernaculum Investigation SR 6219 Section 020 PennDOT Engineering District 9-0		
FIELD INVESTIGATION		
Garrett Borough, Summit and Brothers Valley Townships Somerset County, Pennsylvania		
Job No: R11-0332.011	Scale: 1" = 2,000'	





SKELLY and LOY, Inc.	November 2012	Figure 5
Bat Hibernaculum Investigation SR 6219 Section 020 PennDOT Engineering District 9-0		
<b>INVESTIGATED OPENINGS</b>		
Garrett Borough, Summit and Brothers Valley Townships Somerset County, Pennsylvania		
Job No: R11-0332.011	Scale: 1" = 1150'	







## **APPENDICES**

## **APPENDIX A - AGENCY CORRESPONDENCE**





# United States Department of the Interior



FISH AND WILDLIFE SERVICE  
Pennsylvania Field Office  
315 South Allen Street, Suite 322  
State College, Pennsylvania 16801-4850

September 11, 2012

Jon Crum  
Federal Highway Administration  
228 Walnut Street, Room 508  
Harrisburg, PA 17101-1720

RE: USFWS Project #2007-2430; Mine surveys  
S.R. 6219, Section 020 (Somerset to Meyersdale); Somerset County, Pennsylvania

Dear Mr. Crum:

This documents ongoing consultation between the Fish and Wildlife Service (Service), Federal Highway Administration (FHWA), U.S. Army Corps of Engineers and the Pennsylvania Department of Transportation (PennDOT) regarding the S.R. 219 Section 020 Transportation Improvement (from Meyersdale to Somerset). The Service and FHWA completed formal consultation regarding the subject project on August 28, 2011. The biological opinion concluded that the proposed removal of 230 acres of forested habitat in proximity to two known hibernacula would result in take, but not jeopardize the continued existence of, the Indiana bat (*Myotis sodalis*), a federally-listed endangered species. With this biological opinion and incidental take statement, the incidental injury or death of Indiana bats that might result from the project, as considered in the biological opinion, is not prohibited. The following comments are provided pursuant to the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) to ensure the protection of endangered and threatened species.

## Background

In our letter of August 10, 2012, we recommended that FHWA review the project effect determination because we recently were made aware of an additional mine portal approximately 100 feet from the proposed limit of disturbance near Garrett, PA. A Service biologist confirmed this opening during a July 17, 2012, field view and observed significant cold airflow coming from the mine. Subsequently we learned that bats have been observed flying from this mine portal in the summer of 2008 (Federal Highway Administration. Indiana Bat Meeting. 8 September 2010). We have also received an anecdotal report that a bat was observed flying from this portal during February 2011. Habitat at this entrance, and perhaps within the mine, is likely to be adversely affected by the proposed project due to blasting and roadway construction, and altering bat hibernation habitat has the potential to affect regional bat populations.

During an August 28, 2012, meeting between the Service, FHWA, and PennDOT we discussed options for gathering relevant information necessary to support an updated Indiana bat effect determination. Subsequently, we engaged the Pennsylvania Game Commission (with whom we share jurisdiction on Indiana bats) regarding a survey approach that might reasonably be expected to

detect Indiana bats if present. As described during a September 10, 2012 conference call, the following recommendations were developed with the Commission.

The survey objectives would be: 1) to determine if there are any additional mines or mine openings within the action area that may support bats; 2) to assess any newly discovered suitable opening for winter (hibernation) bat use; and 3) to determine if Indiana bats are among the bats hibernating in the action area.

#### Portal Reconnaissance

Pennsylvania Department of Environmental Protection (PADEP) mine maps indicate there are abandoned mine portals in the project area. Consequently, information available regarding the project action area – particularly those portions that overlap previous mining activities – should be thoroughly assessed for the presence of portals. As described during the August 28 meeting, begin by accessing the Pennsylvania Spatial Data Access (PASDA) website to obtain PADEP abandoned mine lands layers. Our analysis indicates that there are at least two abandoned mine portals within the area that may be directly or indirectly affected by the project (one of these appears to be the opening we observed on July 17), but there may be more. The area assessed should include the area of permanent and temporary disturbance as well as work-area buffers to ensure the portal search includes all areas that would be directly or indirectly affected by the project (*e.g.*, the affected area at locations where blasting, extensive excavation, or waste disposal will extend further from the disturbed surface area). For more detailed information on the extent of mining activities, visit the PADEP mining office to obtain detailed mine maps for the S.R. 219 section 020 action area. This will help identify the potential extent of the area that should be searched for portals.

After these information sources are explored, conduct field reconnaissance to locate the existing mapped PADEP portals, as well as other abandoned mine portals in the project area. Mine openings are most readily located when snow cover is extensive due to venting of warmer air from the portals during those periods. During other seasons, the use of experienced personnel ensures that an accurate and complete survey is conducted. Therefore, we advise that these searches be carried out by someone with demonstrated expertise in successfully locating abandoned mine portals. For example, individuals who have contracted with PADEP's Bureau of Abandoned Mine Reclamation (BAMR) to locate and characterize abandoned mine portals would likely have the necessary expertise for this type of field reconnaissance. If an individual lacking prior demonstrated experience with abandoned mine assessments is used to identify mine portals we recommend that the area assessed, and the methods used to delineate that area, be provided to us for review and comment as soon as possible.

We understand that project representatives may have already begun addressing several of these recommended steps. A thorough analysis of the area at this stage is important, however, as failure to locate additional mine portals now presents the risk that these features will be discovered in subsequent months or during grubbing and clearing prior to construction.

#### Portal Evaluation

Evaluate all portals to determine whether or not each has characteristics that may support bats, using the enclosed *Protocol for Assessing Bat Use of Potential Hibernacula* (see "Assessing Suitability of Caves / Abandoned Mines for Bat Surveys"). These assessments should be carried out by a qualified Indiana bat surveyor.

## Bat Surveys

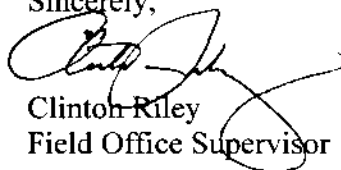
For each portal that may be suitable for bats, conduct bat surveys in accordance with the enclosed *Protocol for Assessing Bat Use of Potential Hibernacula*. These surveys should be carried out by a qualified Indiana bat surveyor. If no bats have been, or are, documented to use the portal, the three nights of sampling identified in this *Protocol* are adequate.

However, as we noted during the September 10 conference call, the existing bat-sampling protocols are designed to detect bat presence prior to mine closure with the assumption that identified bat hibernacula will be protected rather than closed. These methods are not intended to census all bat species present nor estimate bat abundance. We understand that FHWA may be unable to redesign project plans at this time if newly discovered hibernacula are likely to be directly or indirectly impacted. Therefore, additional sampling effort is necessary to determine if Indiana bats are among the bat species present at the identified bat hibernacula, and whether effects on a newly discovered hibernaculum must be incorporated in an updated effect determination.

Consequently, where bat use has been previously documented<sup>1</sup> or is documented using this *Protocol*, conduct 15 nights of trapping between September 20 and October 10, in accordance with the temperature and environmental conditions identified in the *Protocol*. Place orange, plastic bands on all captured Indiana bats, and also place a numbered metal band on up to two Indiana bats. In addition, and while not a requirement to complete the current consultation, we highly recommend that that northern long-eared bats and little brown bats be banded as well<sup>2</sup>, in accordance with Pennsylvania Game Commission specifications. This would ensure that the current survey efforts also would serve to evaluate the potential effects of the project on species that are under consideration for federal listing and that could be listed as endangered or threatened species within the time-frame associated with this project, and prevent redundant survey expense and effort if such listing occurs.

Ideally, this type of investigation would have been completed early in the project development and environmental review process. In this instance, not only is relevant information being considered late in the process, but the concomitant reduction in local bat populations due to white-nose syndrome makes detecting Indiana bats that may be present substantially more difficult due to diminished numbers. Nonetheless, we are aware that the S.R. 219 section 020 project is a high priority for the project proponents and we are committed to provide timely review and comment as you revise your project effect determination. If you have any questions regarding this matter, please contact Robert Anderson of my staff at 814-234-4090.

Sincerely,



Clinton Riley  
Field Office Supervisor

---

<sup>1</sup> A recent field view by Service biologist Robert Anderson revealed significant cold air flow from an abandoned mine portal in the project area. The air flow may be indicative of ventilation supported by multiple openings and a micro-climate that may support a significant number of bats. Bats were observed emerging from this portal in 2008 and February, 2011, but no bat surveys were conducted at that time.

<sup>2</sup> The Service has also been petitioned to list the eastern small-footed bat, but our discussions with the Pennsylvania Game Commission conclude that tagging bats of this species would be inappropriate at this time.





# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

Pennsylvania Field Office  
315 South Allen Street, Suite 322  
State College, Pennsylvania 16801-4850



August 29, 2011

Keith Lynch, Division Administrator  
Federal Highway Administration  
228 Walnut Street, Room 508  
Harrisburg, PA 17101-1720

RE: USFWS Project #2007-2430

Dear Mr. Lynch:

This letter constitutes an amendment to the Fish and Wildlife Service's October 2, 2007, *Biological Opinion on the Effects of the U.S. 6219, Section 019, Transportation Improvement Project on the Indiana bat (Myotis sodalis) Somerset County, Pennsylvania and Garrett County, Maryland*. This amendment is issued in response to your letter of March 29, 2011, in which you requested reinitiation of consultation and modification of our biological opinion regarding S.R. 6219 Section 019 (I-68, Maryland to Meyersdale), to include an additional section of the U.S. 219 project from Meyersdale to Somerset (*i.e.*, S.R. 6219, Section 020) .

### CONSULTATION HISTORY

This amendment is based on the following events and information:

July 17 and December 4, 2001	The Service responded to a March 12, 2001, list request indicating the project area is in the range of the Indiana bat and within several miles of two known Indiana bat hibernacula, but that more information was needed about the project in order to make an informed effect determination, or evaluate the need for species surveys.
April 17, 2003	The Service requested additional information regarding identified, but unsurveyed, mine openings identified in a December 2002 report entitled <i>U.S. 219 Improvement Project, Meyersdale to Somerset, Vegetation and Wildlife Summary Report</i> . Due to the proposed clearing of 180 to 200 acres of forest, the Service also recommended either a seasonal restriction on tree cutting or a mist net survey to determine if an Indiana maternity colony activity existed in the action area.

August 6, 2004	The Service responded to a July 8, 2004, request for updated threatened and endangered species information by reiterating the April 17 recommendations.
January 4, 2005	The Service reiterated the April 17, 2003, recommendations in comments provided to the Federal Highway Administration regarding the draft Environmental Impact Statement for this project.
November 8, 2007	The Service responded to a July 23, 2007, request for updated information regarding threatened and endangered species, as the Administration's 2005 final Environmental Impact Statement neither committed to a seasonal restriction on tree cutting or mist-net surveys. Further, the Service provided new information that suggested tree removal restrictions may not adequately avoid take of Indiana bats, especially in consideration of the extent of forest removal proposed along the S.R. 6219 corridor (Section 020 and Section 019, combined), that exceeded 700 acres. Based on the level of habitat alteration and the new information regarding Indiana bat maternity colony activity in Pennsylvania, the Service could not concur with the Administration's determination that the project may affect but was not likely to adversely affect Indiana bats. Therefore, the Service recommended that either surveys be completed to determine if Indiana bat maternity colonies are present in the Section 020 action area, or that the Administration assume presence and reinitiate formal consultation regarding Section 019 to also consider Section 020.
December 17, 2007	The Administration provided the Service with additional information regarding possible project affects resulting from construction of S.R. 6219 Section 020, to which on January 14, 2008, we responded that we again could not concur that forest removal restrictions alone would avoid take of Indiana bats based on new information about Indiana bat occurrence in Pennsylvania, new understanding about the effects of roads on Indiana bats, and the extent of habitat alteration in sections 19 and 20 of S.R. 6219 combined.
March 26, 2009	PennDOT provided the Service with a copy of a report entitled <i>Mist Net Survey for the Indiana Bat for the Proposed U.S. 219 Improvement Project, SR 6219 Section 020 Meyersdale to Somerset, Somerset County, Pennsylvania</i> , describing the results of July and August 2008 mist net surveys that failed to capture Indiana bats. Based upon 1) the mist-net survey results, 2) additional information that suggested the mine shafts near the project were not suitable bat hibernacula, 3) the distance to known Indiana bat hibernacula, and 4) the project proponents commitment to implement forest removal restrictions, in our letter of April 20, 2009, we concurred that the construction of S.R. 6219 Section 020 was not likely to adversely affect Indiana bats.

June 23, 2010	We responded to a May 25, 2010, request for updated information regarding threatened and endangered species, with new information regarding the extent of Indiana bat foraging and roosting behavior within swarming habitat. Recent telemetry studies have documented Indiana bats using forest habitat substantially farther from hibernacula than had been previously assumed (10-11 miles). The proposed S.R. 6219 Section 020 alignment is within 10 miles of two known Indiana bat hibernacula; therefore, Indiana bat absence cannot be supported in light of the best available scientific information. The letter of June 23 provided detailed measures that included not only seasonal forest removal restrictions to avoid take, but also measures to minimize and partially offset anticipated adverse effects with a recommendation that the Administration initiate formal consultation.
September 29, 2010	The Service and PennDOT representatives met to discuss the current project design and conservation measures being developed for the <i>Biological Assessment</i> .
December 15, 2010	In response to PennDOT's request of November 1, 2010, the Service responded that land conveyed to the Pennsylvania Game Commission can only be considered a benefit to Indiana bat conservation if long-term forest management for this species is conveyed with the land parcel.
April 1, 2011	The Administration provided the <i>Biological Assessment</i> to the Service and requested reinitiation of formal consultation regarding the effects of the S.R. 6219 Section 019 project to include Section 020.
May 9, 2011	The Service acknowledged initiation of formal consultation
August 29, 2011	The Service provided the Administration with an amended biological opinion.

## **Project Description**

The project description for the S.R. 6219, Section 019 project is appended to include Section 020, which involves the construction of 10 miles of new, limited-access, four-lane highway extending from an existing highway section south of Somerset, Pennsylvania to Meyersdale, Pennsylvania. This may eventually connect with Section 019, extending U.S. 219 to Interstate 68 in Maryland. The 2005 Final Environmental Impact Statement (FEIS) details the project description for Section 020, while the November 2006 Record of Decision (ROD) identified Alternative C-1 as the build alternative.

The basic design of Section 020 is similar to that considered in Section 019; however, three interchanges are proposed. New or reconfigured interchanges are proposed in the vicinity of Mud Pike in Black and Brothersvalley Townships; at the northern terminus of the project, south



of Somerset; and at the existing Meyersdale interchange, which will be reconfigured at the southern terminus of Section 020.

The primary land uses in the action area include timber production, coal mining, agriculture, and oil and gas development. Active and reclaimed strip mines are evident in the western part of the action area, while agriculture is dominant east of the Allegheny Front, where forest cover is highly fragmented. The portion of the action area that overlaps the project footprint is predominantly forested, and some areas are used for timber production. The Section 020 project is expected to result in disturbance of approximately 400 acres, including the removal of 230 acres of forest across the linear project area.

Project minimization measures include a seasonal restriction on tree cutting, and forest conservation. Forest removal is proposed to occur only from November 15 to March 31 to avoid directly killing any Indiana bats that may be roosting in the trees. The permanent loss of 230 acres of forest will be partially offset by the conservation of 60 acres of land, including 1) the transfer of 21.5 acres of existing forest land in the northern portion of the project area to the Pennsylvania Game Commission, and 2) the conservation by PennDOT of 38.5 acres of forested right-of-way in the southern portion of the project area. The 21.5-acre parcel that is transferred to the Pennsylvania Game Commission is expected to become part of the 3,200-acre State Game Lands 50. Addition acreage will be allowed to mature and revegetate naturally, or will be planted, including 71 acres known as the “Louie-Beech wetland site” that may be transferred to, and preserved by, a non-profit agency and may eventually result in suitable Indiana bat roosting and foraging habitat if mature forest is allowed to develop. Finally, 140.5 acres of temporarily-cleared right-of-way will be planted in native species or allowed to revegetate naturally. This includes 90.5 acres of wetland and terrestrial mitigation bank will be preserved in some manner, and 50 acres will be preserved as forested, or re-forested, right-of-way. Some of this land may eventually mature into forest habitat that could be utilized by Indiana bats for roosting and foraging.

### **Status of the Indiana bat in Pennsylvania**

There are currently 18 known Indiana bat hibernacula in Pennsylvania, distributed among ten counties, including Armstrong, Beaver, Blair, Centre, Fayette, Huntingdon, Lawrence, Luzerne, Mifflin and Somerset. These hibernacula include limestone caves, mines (limestone, anthracite coal), and an abandoned railroad tunnel. In the Indiana Bat Draft Recovery Plan (USFWS 2007), Indiana bat hibernacula are assigned priority numbers on the basis of winter population sizes and to protect essential hibernation sites across the species’ range. Priority numbers range from Priority 1, which are considered to be essential to recovery and long-term conservation of the Indiana bat to Priority 4, which are less important to recovery and long-term conservation, and typically have current or observed historic populations of fewer than 50 Indiana bats.

The total known Indiana bat hibernating population in Pennsylvania was estimated to be 1,038 bats in 2007 (USFWS 2010), with the largest concentration being found in the J.D. Hartman Mine (a.k.a. Canoe Creek hibernaculum) in Blair County. This is the State’s only Priority 2 hibernaculum, with Indiana bat population counts ranging from approximately 600 to 800 over the past decade. There are three Priority 3 (P3) hibernacula in Pennsylvania with extant populations, but only two of them (*i.e.*, South Penn Railroad Tunnel and Long Run Mine) currently support Indiana bat populations exceeding 100 bats.

An emerging threat not considered in the 2008 biological opinion is white-nose syndrome (WNS), a malady of unknown origin that is killing cave-dwelling bats in unprecedented numbers in the northeastern United States. This affliction was first documented at four sites in eastern New York in the winter of 2006-07, but photographic evidence emerged subsequently of apparently affected bats at an additional site, Howe's Cave, collected the previous winter in February 2006. Data suggest that a newly identified fungus (*Geomyces destructans*) (Gargas *et al.* 2009) is responsible, at least in part, for the impacts and mortality associated with WNS (Blehert *et al.* 2009).

White-nose syndrome was first detected in eastern Pennsylvania during the winter of 2008-2009, and by 2011, it had been documented across much of the State (PGC 2009). In April 2010, WNS was documented at the [REDACTED] where the total bat population (of all species combined) had declined by 50 percent, from approximately 30,000 to 15,000 bats. Although the Pennsylvania Game Commission did not attempt a full assessment and count of bats during this survey, they did not observe any clinical signs of WNS on the 82 Indiana bats that were observed (C. Butchkoski, Pennsylvania Game Commission, *in litt.* 2010). By 2011, WNS had been confirmed at all but one of Pennsylvania's Indiana bat hibernacula.

Despite all of the unanswered questions about WNS, there are now five years of population monitoring data which provide valuable insights into the effects of WNS. Considering WNS has been affecting hibernating bat populations for the longest in New York (since February 2006), data from that State may provide the best indication of the effects of this disease on bats, including Indiana bats. By 2010, all known Indiana bat hibernacula in New York had been documented with WNS. However, the effects of WNS on Indiana bats varied between affected hibernacula. Some Indiana bat hibernating populations have declined by 92 to 100%, while counts of Indiana bats at other WNS-affected New York hibernacula have declined to a lesser extent (Hicks *et al.* 2008, Turner *et al.* 2011). For example, there has been a 21% decline at the Barton Hill Mine, and a 77% decline at Glen Park Cave (Turner *et al.* 2011).

### **Status of the Indiana bat the action area**

The status of Indiana bats in the amended action area (inclusive of Section 020) is similar to that discussed in the biological opinion for the S.R. 6219, Section 019 project. The proposed project is located within the Indiana bat Appalachian Mountains Recovery Unit (RU), which made up 7.0% of the range-wide Indiana bat population in 2009. Between 2001 and 2009, the hibernating population in this RU increased from 16,384 to 27,458. However, populations in this RU are expected to decline precipitously over the next few years due to WNS, which has been documented throughout most of this RU.

As was the case in the project area considered for S.R. 6219, Section 019, summer mist-net surveys conducted during July and August 2008 in Section 020 failed to capture Indiana bats. These data suggest that Indiana bat maternity colonies are not present, but late summer and fall use of the project area by Indiana bats of both sexes may occur during the swarming period. Male Indiana bats tend to summer in the vicinity of their hibernacula, so regardless of maternity colony presence, adult males are likely to be present in forests near hibernacula during the spring, summer and fall months. Adults and juveniles of both sexes will be present in forests near hibernacula in late summer and fall. However, the timing and sampling effort expended

during mist net surveys are not likely to detect the more diffuse populations of Indiana bats that are not part of an active maternity colony. Male Indiana bats are most common in areas near hibernacula (Gardner and Cook 2002) but because they typically roost solitarily in the summer, they are less likely to be detected by mist-netting than adult females, which tend to occur in high-density maternity colonies.

Approximately 2.7 miles of the proposed new roadway is within 10 miles of the [REDACTED] that was also considered in the original Section 019 biological opinion due to the close proximity of that roadway section passing by the mine. [REDACTED]

[REDACTED] of the project area, had a hibernating population of 139 Indiana bats during the 2009 census, and is a priority 3 (P3) hibernacula. Site-specific studies have found Indiana bats foraging and roosting up to 11.1 miles from the [REDACTED] habitat radii swarming bats and their habitat could be affected by roadway construction and operation. As described above, forests and woodlots in the vicinity of hibernacula provide important foraging and roosting habitat for Indiana bats, especially during the fall and spring, when bats are building up their fat reserves prior to and after hibernation. During the non-hibernating period, Indiana bats roost and forage in forest habitat. To a lesser extent, the foraging bats also use a variety of adjacent fields, meadows, emergent wetlands, riparian corridors and shrub-lands. From late August through mid-November, they concentrate their roosting and foraging activities in the vicinity of their hibernacula (e.g., caves, abandoned mines) to build up fat reserves to take them through the winter hibernating period, when food is not available. Because the SR 6219 corridor is located within the swarming radius of two Indiana bat hibernacula, suitable habitat in the project area may be used by Indiana bats.

## EFFECTS OF THE ACTION

The Biological Assessment concludes that the proposed S.R. 6219, Section 020 project may result in harm and harassment of Indiana bats due to the loss of 230 acres of forest. Other assumptions in the *Biological Assessment* are summarized below:

- Construction, operation, and maintenance of the proposed roadway section will not create a barrier to Indiana bat travel corridors for bats moving to and from [REDACTED] or the [REDACTED] to foraging and roosting habitat east of the roadway because the bats will use the riparian corridors under roadway bridges.
- The total project area includes approximately 486 acres (Kimball 2008) with an estimated removal of 230 acres of forest, much of which is potential Indiana bat foraging and roosting habitat (*Biological Assessment*, Section IV, B.2., p. 9). This will be offset by protection of 21.5 acres of habitat that will be turned over to the Pennsylvania Game Commission to become part of State Game Lands 50 along with 38.5 acres of existing right-of-way that will "...be preserved in some manner by PennDOT" (*Biological Assessment*, Section VI, B.1., p. 18).
- Additional mitigation required for other aspects of the project will secure habitat that may eventually be suitable for Indiana bats in the action area, including the 71-acre "Louie-



Beech wetland mitigation site; 140.5 acres of right-of-way that may be planted or become reforested naturally, including a 90.5-acre wetland mitigation and terrestrial bank.

The effects of construction and use of SR 6219, Section 020 on Indiana bats are similar to those considered for Section 019, and these previously-described effects are hereby incorporated by reference. However, unlike Section 019, which is proposed to pass within 1,100 feet of the [REDACTED] hibernaculum, the distance between Section 020 and the two hibernacula

[REDACTED] that no disturbance to either the hibernacula or hibernating bats is likely. Construction of Section 020 will result in the loss 230 acres of forest that is suitable for both foraging and roosting during the spring, summer, and fall. The Administration and PennDOT have committed to remove trees only when the bats are typically hibernating; therefore, direct take of Indiana bats is unlikely to occur during land clearing and construction. However, we concur that any Indiana bats that use this habitat will be harmed or harassed due to the permanent loss of their habitat and the need to adjust to these habitat losses, particularly swarming habitat, and swarming and migrating Indiana bats. Take resulting from the roadway will most likely involve adult males that remain in the vicinity of the hibernacula during the spring, summer, and fall. It is difficult to predict how many adult males will be killed over the life of the project because their number and distribution within the action area are not fully known. We anticipate that take of adult males will be relatively low because adult males tend to occur solitarily in widely-dispersed home ranges across the landscape.

The project will result in the loss of 230 acres of forest land, much of which will be permanently converted to highway and maintained right-of-way. This change in landuse will have comparable effects to those considered in the Section 019 biological opinion, which evaluates the removal of 208 acres of forest cover within the total disturbance area of 375 acres. The two completed project segments combined will result in 438 acres of forest removal. The effects of the action depend, to a great extent, on the reaction of Indiana bats to changes in their environment. While most of the habitat impacts will occur during site preparation, most of the effects likely to result in take of the species will occur after construction, during road operation and maintenance. Although forest clearing during site preparation may not represent an appreciable reduction in the amount or quality of foraging habitat on a county-wide percentage of forest, individual Indiana bats will have to adjust to this habitat loss by adjusting the size or configuration of their foraging areas. Indiana bats using the affected forest areas for foraging will have alternative foraging habitat available within the action area, but they will likely have to shift or expand their foraging ranges into areas previously unused by them to make up for the loss of foraging habitat. The impact of shifting flight patterns and foraging areas will vary from bat to bat. Bats that fail to cross the considerably widened roadway will lose substantially more forested habitat than is actually disturbed during construction. Habitat fragmentation will be greatest if the bats that hibernate in [REDACTED] and [REDACTED] [REDACTED] ined will essentially bisect Somerset County and State Game Lands 50. The project proponents are hopeful that travel corridors will be utilized at stream crossings where 50-foot forested riparian corridors will be retained; however, unless these are contiguous with adjacent forest areas, these travel corridors may not be accessible to or used by bats that forage and travel locally.

Operation of the new roadway will introduce traffic of a significantly increased volume and speed to the action area. This may result in increased mortality due to vehicle collisions, but is

perhaps more likely to alter the bats' flight behavior relative to the road and road-side vegetation for bats that need to cross the U.S. 6219 project corridor over the road.

Compensatory mitigation is being conducted to offset other resource losses, such as to wetlands, State Game Lands, and portions of private property that will become landlocked by the new road. Some of this mitigation was described in the *Biological Assessment* (Section X, p. 22) as a conservation benefit to the Indiana bat under section 7(a)(1) of the Act. These areas may eventually benefit Indiana bats if maintained in a forested condition, but only if the conserved acreage is accessible to the bats that utilize two hibernacula positioned east of the project area. Other land parcels, such as portions of the 71-acre "Louie-Beech wetland site", may be planted in a manner that will eventually serve as forest habitat, but reforested land will not be available as foraging or roosting habitat for several decades. The habitat conservation that is described in the *Biological Assessment* would only partially offset Indiana bat habitat loss resulting from the project, and there is no commitment to ensure the long-term habitat protection or management of these areas consistent with the conservation of the Indiana bat. Therefore, as with the section 019 project, we cannot factor habitat conservation measures into the analysis of project effects.

As discussed above, the proposed project is most likely to affect male Indiana bats, which tend to occur as solitary individuals in widely dispersed home ranges across the landscape. The loss of male Indiana bats will affect the population unit(s) to which they belong – namely the hibernating population at the [REDACTED] and/or [REDACTED]. Without knowing how many Indiana bats will be killed or injured over the life of the project, it would be challenging to model the effects of their mortality on these hibernating populations. However, we would expect that the loss of Indiana bats would reduce the size and resilience of the hibernating population, particularly in light of the increased mortality rates resulting from white-nose syndrome. Road-related mortality would be expected to reduce the ability of the hibernating population to grow and potentially recover from the effects of WNS. However, if road-related mortality rates are low (*e.g.*, a small number of individuals over many years of road operation), the magnitude of this effect may not appreciably reduce the size of the hibernating population.

## CONCLUSION

Critical habitat for the Indiana bat has been designated at 11 caves and two mines in West Virginia, Tennessee, Kentucky, Illinois, Indiana, and Missouri. However, this action does not affect those areas. Consequently, no destruction or adverse modification of critical habitat is anticipated.

WNS is present in much of this RU, including in the action area at both the [REDACTED] and the [REDACTED]. As a result, we expect hibernating populations of Indiana bats throughout the RU to experience population declines similar to those in New York and New England. A 90% population decline due to WNS would leave an estimated 2700 Indiana bats within a RU spanning six states. Assuming some level of immunological or behavioral resistance is present or develops among survivors, recovery will have the best chance of success where the largest number of survivors persist and congregate to breed. This suggests that both the RU and range-wide population would begin recovering from WNS at a very limited number of focal areas where surviving individuals can congregate to breed. While surviving individuals associated with smaller hibernacula, such as the [REDACTED] cannot be discounted, a 90%

population reduction due to WNS would leave such hibernacula with fewer individuals. However, a 90% decline at larger hibernacula (with larger starting populations) such as the South Penn Tunnel, would likely leave a larger number of survivors, increasing the likelihood of successful swarming and breeding.

Considering WNS survivors from larger hibernacula will most likely form the core populations necessary for the species survival and recovery, actions that reduce the numbers or reproduction of these individuals are of particular concern. The ability of the species to survive and recover in this RU will depend on some level of species' resistance to WNS and/or the implementation of recovery actions to reduce the risk of WNS. In either case, this means keeping survivors of WNS alive so they can breed. The proposed action is expected to slightly reduce the numbers of bats associated with two hibernacula. The affected South Penn Tunnel is one of only 10 hibernacula of comparable size (P3) in the entire RU supporting a hibernating population of more than 100 bats. Construction and operation of a four-lane U.S. 219 will harm or harass WNS survivors, most likely adult males that remain in the vicinity of the two hibernacula. In the presence of WNS, road related mortality would be expected to remove some of these surviving, and apparently resistant, individuals. The additive mortality resulting from the presence of the new road would somewhat reduce the ability of the hibernating population to recover from the effects of WNS. However, road-related mortality rates will likely be relatively low, because adult males tend to occur solitarily in widely-dispersed home ranges. In addition, because remaining males can mate with several females, and males from other hibernacula can immigrate into the area, we believe it is possible that resistance will continue to develop over time. The combined result should allow the hibernating population at [REDACTED] and [REDACTED] to persist in the presence of the new roadway.

The Indiana bat is facing an unprecedented and high degree of threat due to WNS, such that extinction is a real possibility in the near future. WNS is poorly understood and we currently have very limited ability to alleviate this threat. The urgent conservation need is to increase the species' survival and reproduction in order to stabilize and then reverse this population decline. Rather than increasing survival and reproduction, however, the proposed project will reduce the species' numbers.

In summary, the loss of individual Indiana bats that are members the [REDACTED] and [REDACTED] hibernacula will directly affect the hibernating populations to which these bats belonged. The proposed project will introduce a potential and persistent source of additive mortality to a landscape occupied by an Indiana bats. Mortality will be reduced if the bats find and use safe passage under the new highway bridges to access sufficient suitable roosting and foraging habitat, portions of which will be preserved adjacent to and on the opposite side of Section 020 from both [REDACTED] and [REDACTED] hibernacula. No maternity colony activity was evident in Section 020 or Section 019; therefore, the number of affected individual bats is expected to be low, and primarily include adult males. While both WNS and the proposed project are expected to increase Indiana bat mortality rates and reduce hibernating populations, nonetheless the proposed project is not expected to result in additive mortality at a level that would reduce appreciably the reproduction and numbers of the Indiana bat. Therefore, the Service has concluded the proposed project is not likely to jeopardize the continued existence of the species.



## INCIDENTAL TAKE STATEMENT

FHWA and PennDOT did not estimate incidental take of Indiana bats in their *Biological Assessment* for Section 020, so this take statement is based entirely on the Service's Effects Analysis. The incidental take statement in the 2008 biological opinion is hereby appended to include incidental take resulting from the loss of an additional 230 forested acres of potential Indiana bat foraging and roosting habitat, some of which will be permanent lost when it is converted to roadway pavement and associated cut and fill slopes. We expect that this habitat loss will result in take in the form of harm or harassment for all Indiana bats that had depended upon this habitat for use in spring, summer or fall. Roadway operation is also expected to result in take in the form of mortality due to vehicle collisions. Take resulting from habitat loss and fragmentation is expected to occur in the first year following habitat removal, and continue through the first year of road operation as the Indiana bats adjust to the presence of the new roadway. This risk of road mortality is expected to continue at a lower level as long as the road is in operation, which we considered over the next 30 years. The risk of collision will be reduced by maintaining forest riparian corridors under the bridge structure. In addition, the anticipated reduction in population density of bats associated with the [REDACTED] and [REDACTED] [REDACTED] as a result of WNS suggests that over the next several decades population density will be low and relatively few collisions are likely.

Total take is expected to be minimal. The actual level of incidental take will be difficult to detect or quantify for the following reasons: 1) the population density of Indiana bats in the action area is expected to be diffuse and seasonally present; 2) individuals (juveniles and adults) are small and cryptic making them difficult to locate; 3) finding dead or injured specimens is unlikely; 4) losses in the hibernating population due to highway construction and operation may be exacerbated by, and difficult to separate from, declines resulting from WNS.

## REASONABLE AND PRUDENT MEASURES and TERMS AND CONDITIONS

Several Terms and Conditions in the biological opinion are specific to Section 019 (*i.e.*, pre-construction mist-netting surveys, monitoring direct effects in [REDACTED] and conservation actions near the proposed Piney Creek Bridge) and are not applicable to Section 020. However, in addition to the Reasonable and Prudent Measures and implementing Terms and Conditions described in the biological opinion, the following is required in order to be exempt from the prohibitions of section 9 of the Act.

For the preserved and reforested land to be beneficial to Indiana bats and partially offset the adverse effects of the project, long-term protection and management must be consistent with Indiana bat forest conservation and management goals. For the effects analysis presented in the *Biological Assessment* to remain valid, it is incumbent on the project proponents to ensure that their assumptions are realized through the implementation of conservation measures needed to support the above assumptions, as confirmed through monitoring.

**Term and Condition 1.G.** The project proponents will address the long-term habitat needs of the Indiana bat through on-site reforestation (see "a" below), permanent protection of off-site forest (see "b" below), or both, combining to at least 230 acres of Indiana bat forest habitat. Land parcels described in the *Biological Assessment* may be included in this conservation acreage.

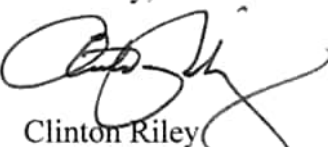
a. Forest habitat restored and protected must provide for the long-term needs of the Indiana bat. To accomplish this, reforestation will occur by replanting with at least six different tree species listed in Attachment A. At least four “exfoliating bark” tree species will be planted and equal at least 40% of the stems per acre. No more than 20% of any one species will be included in the planting mixture, and no more than 50 stems per acre of black locust will be planted. Success will be measured as 400 live woody stems per acre. Forest restoration will be implemented in accordance with the methods detailed in the Forest Reclamation Advisories published by the Appalachian Regional Reforestation Initiative (<http://arri.osmre.gov/FRA.htm>). Following reforestation, the project proponents will manage the property as described in the *Biological Assessment* (Section VII, A.1 p. 18 - 19.) consistent with the goal of conserving Indiana bat roosting and foraging habitat.

b. Acres protected off-site will be forest appropriate for Indiana bat roosting and foraging, and will be permanently protected and placed in conservation ownership prior to forest clearing related to construction. Land parcels described in the *Biological Assessment* will be included in this conservation acreage only to the extent to which these lands are already in a forested condition.

- The conservation acreage, including its location and quality, are subject to review and approval by the Service’s Pennsylvania Field Office.
- The conservation acreage will be placed in the ownership of a conservation entity (e.g., Pennsylvania Game Commission, conservation organization or PennDOT in areas of retained right-of-way) that is both able and willing to protect and manage the habitat in perpetuity for Indiana bats. The recipient (proposed owner) of the conservation acreage is subject to Service review and approval. Conservation lands will be deed-restricted to ensure the land owner holds, protects, maintains and manages the lands in perpetuity for the primary conservation benefit of the Indiana bat, with any habitat management subject to a Fish and Wildlife Service-approved management plan.
- The Service and Pennsylvania Game Commission, and their representatives, will have access to conservation lands for future research and monitoring.

If you have any questions regarding this matter, please contact Robert Anderson of this office at 814-234-4090.

Sincerely,



Clinton Riley  
Field Office Supervisor

Enclosure

## References cited

- Blehert, D.S., A.C. Hicks, M. Behr, C.U. Meteyer, B.M. Berlowski-Zier, E.L. Buckles, J.T.H. Coleman, S.R. Darling, A. Gargas, R. Niver, J.C. Okoniewski, R.J. Rudd, and W.B. Stone. 2009. Bat white-nose syndrome: an emerging fungal pathogen? *Science* 323:227.
- Gardner, J.E. and E.A. Cook. 2002. Seasonal and geographic distribution and quantification of potential summer habitat. Pp. 9-20 *in* A. Kurta and J. Kennedy (eds.), *The Indiana bat: biology and management of an endangered species*. Bat Conservation International, Austin, TX.
- Gargas, A., M.T. Trest, M. Christensen, T.J. Volk, and D.S. Blehert. 2009. *Geomyces destructans* sp. nov. associated with bat white-nose syndrome. *Mycotaxon* 108:147-154.
- Hicks, A.C., C.J. Herzog, R.I. von Linden, S.R. Darling, and J.T.H. Coleman. 2008. White-Nose Syndrome, field observations from the first two winters. *Proceedings of the first national White-Nose Syndrome meeting*, Albany, New York, 9-11 June, 2008.
- L. Robert Kimball and Associates, Inc. 2008. Final Environmental Impact Statement Re-Evaluation Report. Prepared for the Federal Highway Administration. 18 pp. plus tables and figures.
- Pennsylvania Game Commission. 2009 . Wildlife Diversity Program 2009 Report. Pennsylvania Game Commission, Bureau of Wildlife Management. 16 pp.
- Turner, G.G., D.M. Reeder, and J.T.H. Coleman. 2011. A five-year assessment of mortality and geographic spread of white-nose syndrome in North American bats and a look to the future. *Bat Research News* 52(2): 13-27.
- U.S. Fish and Wildlife Service. 2007. Indiana Bat (*Myotis sodalis*) Draft Recovery Plan: First Revision. U.S. Fish and Wildlife Service, Fort Snelling, MN. 258 pp.



## TREE SPECIES LIST FOR INDIANA BAT HABITAT RESTORATION

<i>Acer rubrum</i>	red maple
<i>Acer saccharum</i>	sugar maple
<i>Carya cordiformis</i>	bitternut hickory
<i>Carya glabra</i>	pignut hickory
<i>Carya laciniosa</i>	shellbark hickory
<i>Carya ovata</i>	shagbark hickory
<i>Carya tomentosa</i>	mockernut hickory
<i>Fraxinus americana</i>	white ash
<i>Fraxinus nigra</i>	black ash
<i>Fraxinus pennsylvanica</i>	green ash
<i>Platanus occidentalis</i>	sycamore
<i>Populus deltoides</i>	eastern cottonwood
<i>Quercus alba</i>	white oak
<i>Quercus coccinea</i>	scarlet oak
<i>Quercus prinus</i>	chestnut oak
<i>Quercus rubra</i>	northern red oak
<i>Quercus velutina</i>	black oak
<i>Robinia pseudoacacia</i>	black locust
<i>Sassafras albidum</i>	sassafras
<i>Ulmus americana</i>	American elm
<i>Ulmus rubra</i>	slippery elm

Planting plans should include at least six of the tree species listed above, one of which must be shagbark hickory. To promote diversity, no more than 15 percent of any one tree species shall be included in planting plans.

---

**From:** Clint\_Riley@fws.gov  
**Sent:** Friday, September 14, 2012 6:19 PM  
**To:** Illig, Gregory M  
**Cc:** Brookens, Andy; Squillario, Attilio S; corey.donahue@dot.gov; Fawver, Gary; 'jonathan.crum@dot.gov'; Pruss, James T; Zeyzus, Julie; Keith.Lynch@dot.gov; Lombard, Mark; 'Robert\_M\_Anderson@fws.gov'; Vankirk, Ryan; Librandi Mumma, Tracey; Prestash, Thomas; Yocum, Thomas R; Greenland, Vince; Carole\_Copeyon@fws.gov  
**Subject:** Re: SR 6219-020 Portal Reconnaissance Principal Investigator Qualifications

Greg -

Thank you for inviting our comment and assistance in assigning an individual to address survey work for this project, as described in our technical assistance letter to Jon Crum of the Federal Highway Administration dated September 11, 2012. As discussed during this afternoon's phone call, we concur that Julie Zeyzus is capable of performing this survey work consistent with the objectives of that letter.

This concurrence is based on the following understandings and expectations:

- We note that Ms. Zeyzus is on our list of qualified Indiana bat surveyors, which is especially relevant to the actual bat surveys described in our letter.
- No list exists of individuals previously reviewed for qualifications to survey for mines and mine openings that might support bat use. However, the information provided below indicates Ms. Zeyzus participated in several projects involving this type of survey work. We understand from our discussions that Ms. Zeyzus's involvement in this work was direct and personal, and that she was individually responsible for successful identification of abandoned mine portals. While some records of this work may be unavailable due to confidentiality obligations, we also understand further documentation corroborates Ms. Zeyzus's personal experience in this regard.
- We understand that as an employee of Skelley and Loy, Ms. Zeyzus will have access to substantial resources and expertise useful for identifying abandoned mines and mine openings.
- We understand that this project will be a priority for Ms. Zeyzus during this survey season, enabling her to address this sizable obligation, and that she will have adequate resources to address additional mine openings if they are found.
- We understand the FWS will have the opportunity to review and provide technical advice on plans for both the mine portal surveys and the bat surveys.
- The PA Game Commission has issued a valid permit for Ms. Zeyzus to perform this work, and in response to our questions, has provided no information indicating she would not be capable of performing this type of survey work.

We appreciate your coordination with our agency to ensure that potential impacts to the Indiana bat, if any, will be identified and can be addressed prior to construction of this project. The FHWA, as the federal action agency for this project, is copied on this email.

Clint Riley  
Supervisor, Pennsylvania Field Office  
U.S. Fish and Wildlife Service  
814-234-4090

"Illig, Gregory M" <[gillig@pa.gov](mailto:gillig@pa.gov)>

09/12/2012 06:37 PM

To " [Clint\\_Riley@fws.gov](mailto:Clint_Riley@fws.gov) " <[Clint\\_Riley@fws.gov](mailto:Clint_Riley@fws.gov)>, "Librandi Mumma, Tracey" <[tlibrandi@pa.gov](mailto:tlibrandi@pa.gov)>

cc "Robert\_M\_Anderson@fws.gov" <[Robert\\_M\\_Anderson@fws.gov](mailto:Robert_M_Anderson@fws.gov)>, "[Keith.Lynch@dot.gov](mailto:Keith.Lynch@dot.gov)" <[Keith.Lynch@dot.gov](mailto:Keith.Lynch@dot.gov)>, "jonathan.crum@dot.gov" <[jonathan.crum@dot.gov](mailto:jonathan.crum@dot.gov)>, "[corey.donahue@dot.gov](mailto:corey.donahue@dot.gov)" <[corey.donahue@dot.gov](mailto:corey.donahue@dot.gov)>, "Fawver, Gary" <[GFAWVER@pa.gov](mailto:GFAWVER@pa.gov)>, "Lombard, Mark" <[MLOMBARD@pa.gov](mailto:MLOMBARD@pa.gov)>, "Vankirk, Ryan" <[RVANKIRK@pa.gov](mailto:RVANKIRK@pa.gov)>, "Prestash, Thomas" <[TPRESTASH@pa.gov](mailto:TPRESTASH@pa.gov)>, "Greenland, Vince" <[VGREENLAND@pa.gov](mailto:VGREENLAND@pa.gov)>, "Pruss,

James T" <[JPRUSS@pa.gov](mailto:JPRUSS@pa.gov)>, "Yocum, Thomas R" <[TYOCUM@pa.gov](mailto:TYOCUM@pa.gov)>, "Squillario, Attilio S" <[asquillari@pa.gov](mailto:asquillari@pa.gov)>, "Zeyzus, Julie" <[jzeyzus@skellyloy.com](mailto:jzeyzus@skellyloy.com)>, "Brookens, Andy" <[abrookens@skellyloy.com](mailto:abrookens@skellyloy.com)>

Subject SR 6219-020 Portal Reconnaissance Principal Investigator Qualifications

Clint/Tracey,

We are proposing Ms. Julie Zeyzus (Qualified Indiana Bat Surveyor) of Skelley and Loy as our principal investigator for the portal reconnaissance. Attached for your review is Ms. Zeyzus's work experience including her experience as it relates to portal reconnaissance (including team leader). We appreciate your attention in reviewing the attached information, please provide your concurrence so that we can move forward with the study plan.

Thanks,  
Greg

**Gregory M. Illig, P.E.** | Senior Project Manager  
PA Department of Transportation | Engineering District 9-0  
Design Division | Plans Development  
1620 N. Juniata Street | Hollidaysburg PA 16648  
Phone: 814.696.7179 | Fax: 814.696.7149  
Email: [gillig@pa.gov](mailto:gillig@pa.gov)

[attachment "Julie Zeyzus (Skelley&Loy) Portal Reconnaissance Qualifications.pdf" deleted by Clint Riley/R5/FWS/DOI]



Conference Call  
SR 6219, Section 020  
Bat Hibernacula Investigations

September 19, 2012

Meeting Attendance:

Clint Riley, US Fish and Wildlife Service  
Robert Anderson, US Fish and Wildlife Service  
Keith Lynch, Federal Highway Administration  
Jim Pruss, PennDOT District 9-0  
Greg Illig, PennDOT District 9-0  
Andy Brookens, Skelly and Loy, Inc.  
Julie Zeyzus, Skelly and Loy, Inc.  
Andrew Nevin, Skelly and Loy, Inc.

A conference call with USFWS, FHWA, PENNDOT, and Skelly and Loy, Inc. occurred on September 19, 2012. The purpose of the conference call was to:

1. Discuss the appropriateness of the action area for the field investigations phase of the bat hibernacula investigations;
2. Update USFWS on the methods being used during the field investigations phase (portal reconnaissance) of the bat hibernacula investigations.

Discussion on Appropriate Action Area

The discussion regarding the action area included clarification of the definition and how the definition should be interpreted for the field investigations. From correspondence between PennDOT, FHWA, and USFWS prior to the September 19, 2012 conference call, USFWS had indicated that the action area was defined as “1,000 feet from edge of pavement.” During the conference call, the USFWS indicated the action area may be more or less than 1,000 ft., but this distance was not an unreasonable baseline, and should be based on the disturbance characteristics of the proposed project at that particular location. It was recommended by USFWS to FHWA and PENNDOT to reexamine the

definition of action area as described in the 2007 Biological Opinion for the SR 6219, Section 019 project (later amended to include S.R. 6219, Section 020).

Subsequent to this conference call, the 2007 Biological Opinion was reviewed. Within this Biological Opinion document the action area is defined as extending 1,500 ft. from each side of the pavement. Based on this information the extension of the investigation area to a distance 1,500 ft. from the edge of pavement would be undertaken in locations determined to have the potential for underground mining features.

The appropriate action area is ultimately evaluated by the lead action agency while considering the extent of direct and indirect impacts as part of the Biological Assessment process in Section 7.

#### Discussion on Methods for Field Investigations

Skelly and Loy indicated that due to the size of the area to be field investigated for potential mine openings and the narrow time frame for completing trap surveys for any newly discovered mine openings, it was not feasible or time effective for the US Fish and Wildlife Service Qualified Indiana Bat Surveyor (QIBS), Julie Zeyzus, to perform all the field investigations and assess all the potential openings in the landscape. As a result, Skelly and Loy's plan of approach included using a field reconnaissance search team of 5 to 10 investigators to systematically traverse targeted areas of high probability, maintaining a distance of about 25-50 feet apart to locate openings in the landscape. The QIBS and Skelly and Loy's consulting coal mining engineers collaborated on the development of a technical approach to the field investigations and reconnaissance efforts. The field reconnaissance search team was briefed on the technical approach and field indicators for potential openings. At least one of these mining engineers typically served as part of the search team to locate openings within the landscape.

Once the search team located an opening, a GPS point was taken and the opening was flagged. The QIBS and/or another bat surveyor, Andrew Nevin, who is also a USFWS-

qualified bat identifier (BI) experienced with potential hibernaculum investigations, returned to the GPS location to assess the opening using the 2012 PGC *Protocol for Assessing Bat Use of Potential Hibernacula*. The QIBS was not part of the search team on all reconnaissance sweeping efforts, but instead assessed openings identified by the search team and performed quality assurance and control. The BI also assessed openings and, in these cases, the QIBS did not investigate the opening unless the BI determined that it was necessary.

After the discussion of Skelly and Loy's protocol for the portal reconnaissance, the USFWS agreed that the protocol was a reasonable approach to the portal reconnaissance. Skelly and Loy asked if the USFWS were going to send out an email regarding the acceptance of this protocol and the USFWS stated that citing the conference meeting discussion would be sufficient.

The above summary included an interpretation by Skelly and Loy personnel of the discussion that took place between USFWS, FHWA, PENNDOT, and Skelly and Loy during a conference call on September 19, 2012.

Prepared by:

Skelly and Loy, Inc.

Julie Zeyzus, Andy Brookens, Andrew Nevin





# US 219 Improvements Project

## Field View for Upland Sandpiper Habitat

**Date:** March 25, 2003  
**Location:** Project Site – Somerset, PA  
**Attendees:** Scott Hammond, PENNDOT  
Kevin Mixon, PA Game Commission  
Doug George, G&O  
Kathy Krommes, G&O  
Steven Pomeroy, G&O

A meeting was held on March 25, 2003 in the field to discuss with Kevin Mixon issues related to upland sandpiper surveys and implications of open mines that may be used by the Indiana bat. The meeting focused on impacts of the C-1 alignment. A tour of the potential upland sandpiper habitats along the alignment and the mine opening was planned.

Kevin was shown the fields along the C-1 alignment to enable him to formulate a more accurate evaluation of the presence of potential upland sandpiper habitat. His impression was that most of the habitat present was poor or marginal with little ground or nesting cover and of insufficient size to provide the nesting and feeding resources for the species. Woodlots along the alignment generally break up the habitat too much to allow sufficiently sized open field habitat for the sandpiper. (Areas along Alignment D are more open, and more suitable habitat is present.)

Kevin noted that upland sandpiper surveys should be conducted in two areas along the C-1 alignment. One of these areas extends from approximately Station 240+00 to approximately Station 315+00 — this is from the northern side of the hunting club property to the Garrett Shortcut. The second area is from approximately Station 450+00 to approximately Station 477+00, which encompasses fields on the northern and southern sides of Mud Pike west of the Garrett Shortcut.

Kevin requested that G&O provide him with topographic maps showing the locations of upland sandpiper sightings during 2002. Information on habitats, number of birds observed, observers' names, and date and time of sightings were also requested. *[This information was transmitted to Kevin in an email on 4/3/2003.]*

After some discussion, it was determined that there was a misunderstanding regarding the location of the mine opening. Scott thought that the opening of concern was located along Fogletown Road, adjacent to Buffalo Creek and the C/C-1 alignment. The mine entrance at this location has been closed. The opening of concern is a mine vent located near Althouse Road, approximately 1,500 feet east of the C-1 alignment. After reviewing the location of the mine vent, Kevin stated that the opening was too distant from Alignments B and C-1 to be of concern to the Game Commission. During the day, the open mine vent was visited; no evidence of bat usage (feces) was noted. The mine entrance at Fogletown Road was rechecked to verify that no openings were present. Kevin concluded that the entrance is closed.

To: Attendees, File

RE: SR 6219-020  
Somerset County  
USFWS/PGC Coordination Conference Call  
Meeting Minutes

Date: October 15, 2012

Time: 2:00 PM

Those in attendance were:

Clint Riley, US Fish and Wildlife Service  
Bob Anderson, US Fish and Wildlife Service  
Jon Crum, Federal Highway Administration  
Tracey Librandi Mumma, PA Game Commission  
Ryan Vankirk, P.E., PennDOT Central Office  
Mark Lombard, PennDOT Central Office  
Vince Greenland, P.E., PennDOT District 9-0  
Jim Pruss, P.E., PennDOT District 9-0  
Greg Illig, P.E., PennDOT District 9-0  
Chris Trusch, PennDOT District 9-0  
Tom Yocum, PENNDOT District 9-0  
Attilio Squillario, PENNDOT District 9-0

**PURPOSE:**

A conference call was held on October 15, 2012 at approximately 2:00 pm to discuss the ongoing coordination efforts between the USFWS, FHWA, PGC, and PennDOT regarding potential bat hibernacula.

**DISCUSSION:**

- G. Illig: Gave an update on the survey efforts so far:
  - Main mine opening: 12 nights
  - Airshaft: 11 nights
  - High wall: 3 nights
  - Terra-cotta pipe: 2 nights
- G. Illig: Noted that the surveyors also trapped on October 9, but the temperature fell below the range that was required.
- C. Riley: Have there been a lot of repeat captures?
- G. Illig: I do not have that information on hand.
- C. Riley: Have the past few nights been good?
- G. Illig: On October 13 the main opening fell to 44.2°, which is below what is required, but we continued to trap the location. Should we include these results or throw them out?
- B. Anderson: It was less than one degree off so it will be fine to include it.
- G. Illig: Based on the survey results, the project team is ready to conclude surveys at both highwall locations. Greg then summarize the results provided by the project QIBS, Julie Zeyzus:
  - Both locations were netted for 3 nights (9/20/12, 10/1/12, and 10/2/12) with no bat captures.

- Due to files recorded on the detector (1 at each location), an IR camera was setup at each location on 10/4/12. No bats were observed, however the battery failed at one of the locations (site#3) prior to completing the required 5 hours of surveying.
- On 10/9/12 the IR camera was setup at the one high wall location (site#3) and one bat was observed leaving this location.
- G. Illig: Based on this information does anyone see any issues with us drawing a conclusion to surveys at these two locations?
- T. Librandi Mumma: Where is the high wall located?
- G. Illig: The high wall is approximately 500 feet upslope from the main opening outside of the physical limits of disturbance.
- C. Riley: If I understand everything that you said correctly, it would be fine to stop trapping at this location.
- T. Librandi Mumma: I agree, but would like to see the final data.
- C. Riley: Moving forward, just summarize the data and send it to us, at USFWS, as soon as possible. This can just be a separate submission from the entire report.
- G. Illig: Moving on to the questions that Tracey had in her email.
  1. What is the scale of the two maps?
    - Maps are currently not at the same scale, we will add a scale put.
  2. How do the 2 maps relate to one another, do they connect?
    - Both maps were the same map; one was just a magnified view.
  3. How does the alignment location relate to the mine corridor locations?
    - Will get the alignment put on the map.
  4. How deep is the mine compared to the alignment and blasting areas?
    - Depth varies by location, are currently working to get a definitive answer.
  5. Is the mine still active?
    - Mine is not active.
  6. Where is the second opening of this mine that is being trapped?
    - The airshaft will be shown on the map.
- T. Librandi Mumma: Will look at the updated info when I receive it and we can work together about what the next step is to take.
- G. Illig: Does anybody have anything else?
  - ❖ There were no other comments/questions and the conference call was concluded.

These minutes are a summary of the writer's interpretation of the meeting. Should you have any comments regarding the minutes please contact me within 5 business days of receipt. If no comments are received by this time, it will be considered that all attendees are in agreement and the minutes will be considered final.

Prepared by:



Gregory M. Illig, P.E.  
PennDOT Project Manager



To: Attendees, File

RE: SR 6219-020  
Somerset County  
USFWS/PGC Coordination Conference Call  
Meeting Minutes

Date: October 22, 2012

Time: 2:00 PM

Those in attendance were:

Bob Anderson, US Fish and Wildlife Service  
Carole Copeyon, US Fish and Wildlife Service  
Keith Lynch, Federal Highway Administration  
Jon Crum, Federal Highway Administration  
Tracey Librandi Mumma, PA Game Commission  
Gary Fawver, P.E., PennDOT Central Office  
Mark Lombard, PennDOT Central Office  
Greg Illig, P.E., PennDOT District 9-0  
Chris Trusch, PennDOT District 9-0  
Tom Yocum, PENNDOT District 9-0  
Attilio Squillario, PENNDOT District 9-0

**PURPOSE:**

A conference call was held on October 22, 2012 at approximately 2:00 pm to discuss the ongoing coordination efforts between the USFWS, FHWA, PGC, and PennDOT regarding potential bat hibernacula.

**DISCUSSION:**

- G. Illig: Update on trapping: Concluded trapping for the main opening, airshaft, terra cotta pipe, and high wall. No Indiana Bats were trapped.
- B. Anderson: Do you have a date that we can anticipate seeing the final report?
- G. Illig: We anticipate a early to mid November submission of the Biological Assessment.
- B. Anderson: Data that we have been receiving looks good so far.
- G. Fawver: Based on what you have seen, are we done?
- B. Anderson: Informally I can say you didn't catch an Indiana Bat, which is good, but need to see all of the data before we can scientifically rule it out.
- T. Librandi Mumma: I agree, need more info to justify.
- G. Illig: All of the necessary data will be in the report.
- G. Illig: Next issue is the updated swarming radius. The map was updated to show the 11.1 mile swarming radius for the Indiana Bat from the South Penn Tunnel, but it still looks a little different from the USFWS map.
- C. Copeyon: Upon further research a fall 2007 collection study shows that it should actually be 12 miles not 11.1 miles as previously discussed.
- G. Illig: Moving on, I will send Tracey the map for the mine openings and any potential impacts for the Eastern Small Footed Bat.
- T. Librandi Mumma: OK, sounds good.
- G. Fawver: Did the Game Commission and USFWS ever look into the language that should be used on the land transfer?
- T. Librandi Mumma: This was replacement lands for State Gamelands 50 and there were no deed restrictions.
- B. Anderson: I know Clint was talking about it, but I don't know what ever came out of it.

- G. Fawver: Discuss this with Clint and send out an email of what he finds out.
- B. Anderson: OK
- G. Illig: Any other questions?
  - ❖ There were no other comments/questions and the conference call was concluded.

These minutes are a summary of the writer's interpretation of the meeting. Should you have any comments regarding the minutes please contact me within 5 business days of receipt. If no comments are received by this time, it will be considered that all attendees are in agreement and the minutes will be considered final.

Prepared by:



Gregory M. Illig, P.E.  
PennDOT Project Manager



COMMONWEALTH OF PENNSYLVANIA  
**Pennsylvania Game Commission**

2001 ELMERTON AVENUE  
HARRISBURG, PA 17110-9797

*"To manage all wild birds, mammals and their habitats  
for current and future generations."*

**ADMINISTRATIVE BUREAUS:**

ADMINISTRATION.....717-787-5670  
HUMAN RESOURCES.....717-787-7836  
FISCAL MANAGEMENT.....717-787-7314  
CONTRACTS AND  
PROCUREMENT.....717-787-6594  
LICENSING.....717-787-2084  
OFFICE SERVICES.....717-787-2116  
WILDLIFE MANAGEMENT.....717-787-5529  
INFORMATION & EDUCATION.....717-787-6286  
WILDLIFE PROTECTION.....717-783-6526  
WILDLIFE HABITAT  
MANAGEMENT.....717-787-6818  
REAL ESTATE DIVISION.....717-787-6568  
AUTOMATED TECHNOLOGY  
SERVICES.....717-787-4076

[www.pgc.state.pa.us](http://www.pgc.state.pa.us)

Division of Environmental  
Planning and Habitat  
Protection  
717-783-5957

July 16, 2012

PNDI Large Project Review

John R. Gustkey Jr.  
L. R. Kimball  
615 West Highland Avenue  
P.O. Box 1000  
Ebensburg, PA 15931

PNDI Large Project Review  
Re: US 219 Improvements Project - SR 6219, Section 020 Meyersdale to Somerset  
Somerset County, PA

Dear Mr. Gustkey,

The is in response to your letter requesting an update review of information concerning state listed endangered and threatened species of birds and mammals as related to the US 219 Improvements Project (Meyersdale to Somerset) The Pennsylvania Game Commission (PGC) screened this project for potential impacts to species and resources of concern under PGC responsibility, which includes birds and mammals only.

**Potential Impact Anticipated**

PNDI records indicate species or resources of concern are located in the vicinity of the project. The PGC has received and thoroughly reviewed the information that you provided to this office, as well as PNDI data, and has determined that potential impacts to the following endangered species may be associated with your project:

Scientific Name	Common Name	PA Status	Federal Status
<i>Myotis sodalis</i>	Indiana Bat	ENDANGERED	ENDANGERED
<i>Spiza Americana</i>	Dickcissel	ENDANGERED	
<i>Bartramia longicauda</i>	Upland Sandpiper	THREATENED	
<i>Myotis septentrionalis</i>	Northern Long-eared Bat	SPECIAL CONCERN	



## Next Steps

Indiana bats are a federally listed endangered species under the jurisdiction of the U.S. Fish and Wildlife Service. As a result, our agency defers comments on potential impacts to Indiana bats to the U.S. Fish and Wildlife Service.

An April 2007 site visit documented three sites that could potentially provide habitat for both upland sandpipers and dickcissel. No upland sandpipers or dickcissel were observed during the April 2007 site visit. PennDOT and PGC concurred that these three sites would be re-evaluated prior to construction in order to determine the potential impact of the project on upland sandpipers and dickcissel. Habitat at the three sites was re-evaluated on April 2010 to determine if there had been changes. The re-evaluation documented that available nesting habitat had been reduced following the 2007 investigation at all three sites. Likewise, no upland sandpipers or dickcissel were observed. Therefore, based on the information submitted concerning the nature of the project, the immediate location, and our detailed resource information, the PGC has determined that no impact is likely to upland sandpipers or dickcissel. Therefore, no further coordination with the PGC will be necessary at this time for these species.

Due to their ecological significance, the following conservation measure is suggested to avoid potential impacts to *Myotis septentrionalis*: All trees or dead snags greater than 5 inches in diameter at breast height that need to be harvested to facilitate the project (including any access roads or off - R.O.W. work spaces) shall be cut between November 1 and March 31.

Finally, the proposed project is located on portions of State Game Lands #50. Additional coordination is necessary with the PGC (coordination with Mr. Douglas Dunkerley, Acting PGC Southwest Region Land Management Supervisor, 724-238-9523 and PGC Harrisburg Office) regarding the temporary and permanent impacts from this project to State Game Land #50.

This response represents the most up-to-date summary of the PNDI data files and is valid for two (2) years from the date of this letter. An absence of recorded information does not necessarily imply actual conditions on site. Should project plans change or additional information on listed or proposed species become available, this determination may be reconsidered.

Should the proposed work continue beyond the period covered by this letter, please resubmit the project to this agency as an "Update" (including an updated PNDI receipt, project narrative and accurate map). If the proposed work has not changed and no additional information concerning listed species is found, the project will be cleared for PNDI requirements under this agency for two additional years.

This finding applies to impacts to birds and mammals only. To complete your review of state and federally-listed threatened and endangered species and species of special concern, please be sure that the U.S. Fish and Wildlife Service, the PA Department of Conservation and Natural Resources, and/or the PA Fish and Boat Commission have been contacted regarding this project as directed by the online PNDI ER Tool found at [www.naturalheritage.state.pa.us](http://www.naturalheritage.state.pa.us).

Sincerely,



Tracey Librandi Mumma  
Division of Environmental Planning & Habitat Protection  
Bureau of Wildlife Habitat Management  
Phone: 717-787-4250, Extension 3614  
Fax: 717-787-6957  
E-mail: [tlibrandi@state.pa.us](mailto:tlibrandi@state.pa.us)  
A PNHP Partner



TLM/tlm

cc: Anderson  
Dunkerley  
DuBrock  
Brauning  
Gross  
Butchkoski  
Turner

## **APPENDIX B - PERMIT AND PROTOCOLS**





# United States Department of the Interior



FISH AND WILDLIFE SERVICE  
Pennsylvania Field Office  
315 South Allen Street, Suite 322  
State College, Pennsylvania 16801-4850

September 11, 2012

Jon Crum  
Federal Highway Administration  
228 Walnut Street, Room 508  
Harrisburg, PA 17101-1720

RE: USFWS Project #2007-2430; Mine surveys  
S.R. 6219, Section 020 (Somerset to Meyersdale); Somerset County, Pennsylvania

Dear Mr. Crum:

This documents ongoing consultation between the Fish and Wildlife Service (Service), Federal Highway Administration (FHWA), U.S. Army Corps of Engineers and the Pennsylvania Department of Transportation (PennDOT) regarding the S.R. 219 Section 020 Transportation Improvement (from Meyersdale to Somerset). The Service and FHWA completed formal consultation regarding the subject project on August 28, 2011. The biological opinion concluded that the proposed removal of 230 acres of forested habitat in proximity to two known hibernacula would result in take, but not jeopardize the continued existence of, the Indiana bat (*Myotis sodalis*), a federally-listed endangered species. With this biological opinion and incidental take statement, the incidental injury or death of Indiana bats that might result from the project, as considered in the biological opinion, is not prohibited. The following comments are provided pursuant to the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) to ensure the protection of endangered and threatened species.

## Background

In our letter of August 10, 2012, we recommended that FHWA review the project effect determination because we recently were made aware of an additional mine portal approximately 100 feet from the proposed limit of disturbance near Garrett, PA. A Service biologist confirmed this opening during a July 17, 2012, field view and observed significant cold airflow coming from the mine. Subsequently we learned that bats have been observed flying from this mine portal in the summer of 2008 (Federal Highway Administration. Indiana Bat Meeting. 8 September 2010). We have also received an anecdotal report that a bat was observed flying from this portal during February 2011. Habitat at this entrance, and perhaps within the mine, is likely to be adversely affected by the proposed project due to blasting and roadway construction, and altering bat hibernation habitat has the potential to affect regional bat populations.

During an August 28, 2012, meeting between the Service, FHWA, and PennDOT we discussed options for gathering relevant information necessary to support an updated Indiana bat effect determination. Subsequently, we engaged the Pennsylvania Game Commission (with whom we share jurisdiction on Indiana bats) regarding a survey approach that might reasonably be expected to

detect Indiana bats if present. As described during a September 10, 2012 conference call, the following recommendations were developed with the Commission.

The survey objectives would be: 1) to determine if there are any additional mines or mine openings within the action area that may support bats; 2) to assess any newly discovered suitable opening for winter (hibernation) bat use; and 3) to determine if Indiana bats are among the bats hibernating in the action area.

#### Portal Reconnaissance

Pennsylvania Department of Environmental Protection (PADEP) mine maps indicate there are abandoned mine portals in the project area. Consequently, information available regarding the project action area – particularly those portions that overlap previous mining activities – should be thoroughly assessed for the presence of portals. As described during the August 28 meeting, begin by accessing the Pennsylvania Spatial Data Access (PASDA) website to obtain PADEP abandoned mine lands layers. Our analysis indicates that there are at least two abandoned mine portals within the area that may be directly or indirectly affected by the project (one of these appears to be the opening we observed on July 17), but there may be more. The area assessed should include the area of permanent and temporary disturbance as well as work-area buffers to ensure the portal search includes all areas that would be directly or indirectly affected by the project (*e.g.*, the affected area at locations where blasting, extensive excavation, or waste disposal will extend further from the disturbed surface area). For more detailed information on the extent of mining activities, visit the PADEP mining office to obtain detailed mine maps for the S.R. 219 section 020 action area. This will help identify the potential extent of the area that should be searched for portals.

After these information sources are explored, conduct field reconnaissance to locate the existing mapped PADEP portals, as well as other abandoned mine portals in the project area. Mine openings are most readily located when snow cover is extensive due to venting of warmer air from the portals during those periods. During other seasons, the use of experienced personnel ensures that an accurate and complete survey is conducted. Therefore, we advise that these searches be carried out by someone with demonstrated expertise in successfully locating abandoned mine portals. For example, individuals who have contracted with PADEP's Bureau of Abandoned Mine Reclamation (BAMR) to locate and characterize abandoned mine portals would likely have the necessary expertise for this type of field reconnaissance. If an individual lacking prior demonstrated experience with abandoned mine assessments is used to identify mine portals we recommend that the area assessed, and the methods used to delineate that area, be provided to us for review and comment as soon as possible.

We understand that project representatives may have already begun addressing several of these recommended steps. A thorough analysis of the area at this stage is important, however, as failure to locate additional mine portals now presents the risk that these features will be discovered in subsequent months or during grubbing and clearing prior to construction.

#### Portal Evaluation

Evaluate all portals to determine whether or not each has characteristics that may support bats, using the enclosed *Protocol for Assessing Bat Use of Potential Hibernacula* (see "Assessing Suitability of Caves / Abandoned Mines for Bat Surveys"). These assessments should be carried out by a qualified Indiana bat surveyor.

## Bat Surveys

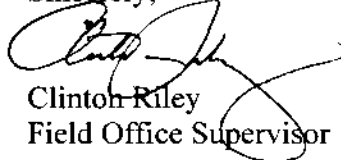
For each portal that may be suitable for bats, conduct bat surveys in accordance with the enclosed *Protocol for Assessing Bat Use of Potential Hibernacula*. These surveys should be carried out by a qualified Indiana bat surveyor. If no bats have been, or are, documented to use the portal, the three nights of sampling identified in this *Protocol* are adequate.

However, as we noted during the September 10 conference call, the existing bat-sampling protocols are designed to detect bat presence prior to mine closure with the assumption that identified bat hibernacula will be protected rather than closed. These methods are not intended to census all bat species present nor estimate bat abundance. We understand that FHWA may be unable to redesign project plans at this time if newly discovered hibernacula are likely to be directly or indirectly impacted. Therefore, additional sampling effort is necessary to determine if Indiana bats are among the bat species present at the identified bat hibernacula, and whether effects on a newly discovered hibernaculum must be incorporated in an updated effect determination.

Consequently, where bat use has been previously documented<sup>1</sup> or is documented using this *Protocol*, conduct 15 nights of trapping between September 20 and October 10, in accordance with the temperature and environmental conditions identified in the *Protocol*. Place orange, plastic bands on all captured Indiana bats, and also place a numbered metal band on up to two Indiana bats. In addition, and while not a requirement to complete the current consultation, we highly recommend that that northern long-eared bats and little brown bats be banded as well<sup>2</sup>, in accordance with Pennsylvania Game Commission specifications. This would ensure that the current survey efforts also would serve to evaluate the potential effects of the project on species that are under consideration for federal listing and that could be listed as endangered or threatened species within the time-frame associated with this project, and prevent redundant survey expense and effort if such listing occurs.

Ideally, this type of investigation would have been completed early in the project development and environmental review process. In this instance, not only is relevant information being considered late in the process, but the concomitant reduction in local bat populations due to white-nose syndrome makes detecting Indiana bats that may be present substantially more difficult due to diminished numbers. Nonetheless, we are aware that the S.R. 219 section 020 project is a high priority for the project proponents and we are committed to provide timely review and comment as you revise your project effect determination. If you have any questions regarding this matter, please contact Robert Anderson of my staff at 814-234-4090.

Sincerely,



Clinton Riley  
Field Office Supervisor

---

<sup>1</sup> A recent field view by Service biologist Robert Anderson revealed significant cold air flow from an abandoned mine portal in the project area. The air flow may be indicative of ventilation supported by multiple openings and a micro-climate that may support a significant number of bats. Bats were observed emerging from this portal in 2008 and February, 2011, but no bat surveys were conducted at that time.

<sup>2</sup> The Service has also been petitioned to list the eastern small-footed bat, but our discussions with the Pennsylvania Game Commission conclude that tagging bats of this species would be inappropriate at this time.



## PROTOCOL FOR ASSESSING BAT USE OF POTENTIAL HIBERNACULA

### RATIONALE

A typical cave or mine portal survey is an attempt to determine presence or probable absence of bats; it does not provide sufficient data to determine population size or structure, or to determine the number, type or relative abundance of bat species using a hibernaculum. Following these guidelines will standardize procedures for bat surveys at caves and mine portals. Although the capture of an endangered or threatened bat confirms its presence, failure to catch an endangered or threatened species solely using this protocol does not absolutely confirm its absence.

### ASSESSING SUITABILITY OF CAVES / ABANDONED MINES FOR BAT SURVEYS

In general, a cave or mine opening can be dismissed from bat surveys under any of the following circumstances:

- There is only one horizontal opening, and it is less than 6 inches in diameter, and no or very little airflow is detected.
- The opening is a vertical shaft less than 1 foot in diameter.
- The passage continues less than 50 feet and terminates with no fissures that bats can access. (This assumes the passage is safe enough to enter, and has been thoroughly inspected.)
- The mine is prone to flooding, collapsed shut and completely sealed, or otherwise inaccessible to bats.
- It is a “new” opening, which has occurred recently (less than 1 year old) due to subsidence.

*Additional notes: Bats can access mines via old open buildings such as a fan house. Foliage and other vegetation in front of mine openings do not stop use by bats. They can navigate through foliage. Collapsed entrances with multiple crevices between boulders, etc. are accessible to bats and should be sampled. Collapses completely sealed with fine soil are of course inaccessible to bats.*

### SAMPLING DATES, TIMES AND TEMPERATURE CRITERIA

- Sampling will be conducted between September 15 and October 15
- Sampling will start ½ hour before sunset and continue for at least 5 hours. This applies for all sampling methods (harp-trapping, mist-netting, use of bat detectors, etc.)
- During each sampling period, weather must provide for:
  - Temperatures >50°F (10°C) for first 2 hours of sampling and must not fall below 35°F (1.7°C) before the end of the first 5 hours of sampling.
  - At least 3 hours free of rain.
  - At least 3 hours free of high wind.
- Sampling will be conducted for at least 3 evenings (do not have to be consecutive), with at least 1 of the 3 sampling events occurring between September 25 and October 10.
- Noise and the shining of lights will be kept to a minimum with no smoking around the sample site. The use of radios, campfires, running vehicles, punk sticks, citronella candles and other disturbances will not be permitted within 300 feet of site during surveys.
- Before conducting surveys, local residents and/or law enforcement agencies should be informed of the scheduled nighttime activities.

## Appendix A

### EQUIPMENT

*No equipment, litter or other debris will be left unattended at site that could result in the capture or entanglement of any animals. Any equipment stored at site between sampling sessions will be clearly labeled with contact information.*

Harp Trap (first choice): Place in front of opening and block surrounding space with plastic sheeting or bird netting. Traps should be tended at least once per hour. When the catch rate is high (>25 bats per hour) or during inclement weather, traps should be tended more frequently.

Mist Nets (second choice): 50 denier, 38mm mesh. Place in front of or around openings that cannot be harp-trapped. Nets need to be monitored closely and checked at least once every 10 minutes. At sites with a heavy bat swarm, the net should be monitored continuously.

Bat Detector: In addition to the harp trap or mist nets, an ultrasonic bat detector should be on site to monitor bat activity when trapping or netting, and assess the general effectiveness of the harp trap or mist-net placement. Detector should be pointed toward cave or mine opening, approximately 5 to 15 feet from the entrance to detect swarming bats and bats going in/out of opening. Bat passes should be monitored and tallied on an hourly basis throughout the entire sampling period ( $\geq 5$  hours). Reporting format will be: Start and end time for each 1-hour interval and bat passes for that hour.

Alternative Monitoring Techniques: In situations where it is too dangerous to approach an entrance, night vision/infrared/thermal-imaging recording devices should be used to monitor and record bat activity to determine bat use of the site. However, this should be done in conjunction with acoustic monitoring (use of an ultrasonic bat detector, see above), so bats can be identified to species. Bat activity in or around the entrance can be monitored by counting bat passes with a bat detector, or night vision/infrared video tapes can be recorded to provide actual counts of bats entering and exiting the opening. Bat passes should be monitored and tallied on an hourly basis throughout the entire sampling period ( $\geq 5$  hours). Reporting format will be: Start and end time for each 1-hour interval and bat passes for that hour.

### REPORTING

In addition to reports for the client, the Pennsylvania Game Commission requires copies of the report as part of their permitting requirements. To simplify data entry, mandatory sampling summary forms are also required by the PA Game Commission for bat surveys within the Commonwealth. Provide copies of these reports and completed forms to both the PGC and USFWS. If the bat surveyor did not receive a copy of the data form with the permit, the form can be obtained by contacting:

Pennsylvania Game Commission  
Bureau of Law Enforcement, Technical Services Division  
2001 Elmerton Avenue, Harrisburg, PA 17110-9797  
717/787-5740

### INTERIOR WINTER HIBERNACULA SURVEYS

Sites that are determined to be safe for entry to conduct winter counts (primarily caves & stable hard rock mines) will be coordinated with the Pennsylvania Game Commission, Wildlife Diversity Section and scheduled for interior surveys between January 1 and March 10. Contact information for the Wildlife Diversity Section is:

PA Game Commission  
Bureau of Wildlife Management, Wildlife Diversity Section  
2001 Elmerton Avenue, Harrisburg, PA 17110-9797  
(717) 787-5529

## ASSESSING MINE OPENINGS FOR BAT USE

### BAT DETECTION METHODS AND PORTAL CLOSURE GUIDELINES

#### 1. Mine Opening Assessments

- a. All mine openings proposed for closure will be evaluated using the *Protocol for Assessing Bat Use of Potential Hibernacula* (Appendix A).
- b. If a mine opening has one or more characteristics making bat occupation unlikely (see “Assessing Suitability of Caves/Abandoned Mines for Bat Surveys” in Appendix A), the portal or opening may be closed at any time without further consultation with the U.S. Fish and Wildlife Service (USFWS) or Pennsylvania Game Commission (PGC).
- c. If a mine opening is potentially suitable for bats, the opening will undergo a bat survey in accordance with the specifications detailed in Appendix A. This survey will be done by a Qualified Indiana Bat Surveyor (see list at <http://www.fws.gov/northeast/pafo/surveys.html>).
- d. Appendices A and B will be provided to individuals contracted to conduct bat surveys so they are aware of the survey protocols, bat detection thresholds, closure guidelines, and reporting procedures. Survey results (see 3, below), will be included in their report for all surveyed mine openings.
- e. Given the effects of white-nose syndrome on bats, it is recommended that any site where bats are captured be given priority for the installation of bat-friendly gates.

#### 2. Survey Results & Remedial Actions

The action to be taken at a mine opening depends upon the bat survey results, as detailed below, based on the detection method used.

- a. Detection Method 1 – trap placement at mine opening during the fall sampling period, in accordance with Appendix A.

Capture Results <sup>1</sup> / Opening	Action
No bats (of any species)	Close opening between May 15 and August 30. <sup>2</sup>
1 or more Indiana bats	Consult with USFWS <u>and</u> install bat-friendly gate between May 15 and August 30.
Any state-listed species	Consult with PGC <u>and</u> install bat-friendly gates.
1 or 2 bats (not including any federal or state-listed bats)	Install bat-friendly gates <u>or</u> close the opening between June 1 and July 31. It is recommended that any site where bats are captured be given priority for the installation of bat-friendly gates.
≥ 3 bats (not including any federal or state-listed bats)	Install bat-friendly gates and avoid impacts to habitat in the vicinity of the opening, <u>or</u> consult with PGC & USFWS regarding the potential for listed species.

<sup>1</sup> These are cumulative capture results from the entire fall sampling period.

<sup>2</sup> A seasonal restriction is warranted to avoid sealing undetected federal and state-listed bats within mines. White-nose syndrome has reduced bat populations substantially, affecting our ability to detect the presence of individual bats associated with these reduced populations. In addition, the fall sampling period targets Indiana bats and little brown bats, but is likely to miss other species of concern (e.g., eastern small-footed bat, northern long-eared bat).



- b. Detection Method 2 – Use of a bat detector with no trap over the mine opening. This assumes the opening is too dangerous to set up a trap.

Detector should be placed between 5-15 feet from the opening and pointed towards opening if horizontal (into or across any vertical or subsidence entrances). If the acoustic detector is farther than 15 feet from the opening, a visual detection method (e.g., night vision, infrared, or thermal-imaging device) should be used in conjunction with the acoustic detector.

Detectors should be in operation for a minimum of 5 hours each night, for at least 3 nights in the fall within specified time frames in Appendix A, and should meet temperature and environmental conditions outlined in Appendix A. Analyze all calls using a USFWS-approved call analysis program, and submit the diagnostic results from the program to the USFWS and PGC. A copy of the raw call files should be kept for a minimum of 3 years, should either agency desire a copy or to have the files run through a new/updated program.

<u>Results<sup>3</sup> / Opening</u>	<u>Action</u>
No detected bat passes into/out of mine portal	Close opening between May 15 and August 30.
≤ 5 detected bat pass into/out of mine portal	Analyze calls. If it is not a threatened or endangered bat species, either close the opening between June 1 and July 31 <u>or</u> install bat-friendly gates. Consult with PGC if any state-listed species are detected, along with USFWS if any federally-listed species are detected.
> 5 detected bat passes into/out of mine portal	Analyze all calls. Consult with USFWS and PGC, or install bat-friendly gates.

### 3. Reporting and Documentation

- a. All results from bat surveys will be submitted to the PGC in accordance with PGC-approved reporting procedures and data sheets. Bat survey results will also be submitted to the USFWS, with the following information detailed on an Excel spreadsheet: location of portal (latitude/longitude), dates surveyed, survey detection method and equipment used (see above), name and affiliation of surveyor, survey results by date, action taken (or proposed to be taken) with regard to each portal (gate, backfill/seal, no action), and date of action at each portal (date gated or closed).
- b. Provide the PGC and USFWS with the exact location (latitude/longitude) of all mine openings. For each opening, indicate the action taken (*i.e.*, gate installed, opening sealed shut), along with date of action.

### 4. Gating

All gates should be “bat-friendly”. To avoid harming bats and changing the cave or mine micro-climate, gates should be constructed consistent with current gating guidelines for bat conservation. The inclusion of doors on gates installed at coal mines is discouraged. Further information can be found in the [Agency Guide to Cave and Mine Gates 2009](#).

---

<sup>3</sup> These are cumulative results from the entire fall sampling period.



Commonwealth of Pennsylvania  
**PENNSYLVANIA GAME COMMISSION**  
2001 Elmerton Avenue  
Harrisburg, PA 17110-9797  
(717) 783-8164

**SPECIAL USE PERMIT NO. 155-2012 (AMENDMENT 7)**

**QUALIFIED INDIANA BAT SURVEYOR:**

JULIE ZEYZUS  
SKELLY AND LOY, INC.  
19741-B LEITERSBURG PIKE  
HAGERSTOWN, PA 21742  
412-443-6745

**EFFECTIVE**  
**09/15/2012**

**EXPIRES**  
**10/31/2012**

**SCIENTIFIC STUDY**  
**BAT SAMPLING - CAPTURE & RELEASE**  
**ALL BATS INCLUDING**  
**INDIANA BATS (MYOTIS SODALIS)**  
**AND**  
**SPECIAL PROVISIONS FOR HIBERNACULA**  
**TRAPPING FROM 09/15/12 TO 10/31/12**

**ADDITIONAL QUALIFIED INDIANA BAT SURVEYORS:** MICHAEL FISHMAN,  
RYAN SLACK, JACK BASIGER, LISA WINHOLD, JIM HART, STEVE  
PERNICK

**RENEWABLE: YES ☒ NO ☐**

**REPORT REQUIRED:**

**☒ AS SPECIFIED**

**☒ UPON COMPLETION**

**BAT IDENTIFIERS:** ANDREW NEVIN, MARY GILMORE, DREW WANKE,

**ASSISTANTS:** ERIC BRUGGEMAN, LOGAN ZUGAY, MEGAN DENNIS,  
ANDY BROOKENS, PAUL DEANGELO, BEN BERRA, JASON HARKHOM,  
TRENT SUSTICH, TODD PHILLIPS, BRIAN MCGRATH, HEATHER BEATTY,  
SHANNON WILLIAMS, PETER RIGGS, TRACEY CRUMB

**CONDITIONS AND AUTHORIZATIONS:**

- A. THE VALIDITY OF THIS PERMIT IS CONDITIONED UPON RECEIPT OF ANY OTHER REQUIRED FEDERAL, STATE OR LOCAL PERMITS.**
- B. STUDY AREAS WILL BE:**
  - 1) POTENTIAL BAT HIBERNACULA SURVEY WITHIN THE SR 219, SECTION 020 PROJECT AREA, GARRETT BOROUGH, SUMMIT TOWNSHIP AND BROTHERS VALLEY TOWNSHIP, SOMERSET COUNTY.**
- C. BATS MAY BE CAPTURED THROUGH THE USE OF MIST NETS AND HARP TRAPS. BATS (NOT INCLUDING THE SMALL-FOOTED BAT) MAY BE BANDED USING FOREARM BANDS (ORANGE BANDS MAY ONLY BE USED ON INDIANA BATS; no yellow bands may be used at all) AS PRESCRIBED IN PROJECT OUTLINE. AN ACOUSTICAL BAT DETECTOR MAY BE USED AT EACH NET SITE.**
- D. UPDATED PROTOCOLS AND MINIMUM EFFORT FOR HIBERNACULA TRAPPING ACCOMPANY THIS PERMIT. AN INCREASE IN SURVEY EFFORT MAY BE REQUIRED BY THE USFWS ON THIS PROJECT.**
- E. A BAT NETTING/TRAPPING SURVEY RECORD (P-7008-NT) WILL BE COMPLETED FOR EACH SURVEY NIGHT AND A BAT MEASUREMENT AND CAPTURE FORM (P-7008-M) WILL BE COMPLETED FOR ALL M.SODALIS, M.LEIBII, ALL BANDED BATS AND ANY SPECIES NOT COMMONLY FOUND IN PA. SEND REQUIRED REPORTS BY DECEMBER 31 TO PENNSYLVANIA GAME COMMISSION, BUREAU OF WILDLIFE MANAGEMENT, (ATTN: CAL BUTCHKOSKI), 2001 ELMERTON AVENUE, HARRISBURG, PA 17110.**

**SPECIAL USE PERMIT NO. 155-2012 (AMENDMENT 7)**

**QUALIFIED INDIANA BAT SURVEYOR:**

JULIE ZEYZUS  
SKELLY AND LOY, INC.  
19741-B LEITERSBURG PIKE  
HAGERSTOWN, PA 21742  
412-443-6745

**EFFECTIVE**  
**09/15/2012**

**EXPIRES**  
**10/31/2012**

**SCIENTIFIC STUDY**  
**BAT SAMPLING - CAPTURE & RELEASE**  
**ALL BATS INCLUDING**  
**INDIANA BATS (MYOTIS SODALIS)**  
**AND**  
**SPECIAL PROVISIONS FOR HIBERNACULA**  
**TRAPPING FROM 09/15/12 TO 10/31/12**

**ADDITIONAL QUALIFIED INDIANA BAT SURVEYORS:** MICHAEL FISHMAN,  
RYAN SLACK, JACK BASIGER, LISA WINHOLD, JIM HART, STEVE  
PERNICK

**RENEWABLE: YES [X] NO [ ]**

**REPORT REQUIRED:**

**[X] AS SPECIFIED**

**[X] UPON COMPLETION**

**BAT IDENTIFIERS:** ANDREW NEVIN, MARY GILMORE, DREW WANKE,

**ASSISTANTS:** ERIC BRUGGEMAN, LOGAN ZUGAY, MEGAN DENNIS,  
ANDY BROOKENS, PAUL DEANGELO, BEN BERRA, JASON HARKHOM,  
TRENT SUSTICH, TODD PHILLIPS, BRIAN MCGRATH, HEATHER BEATTY,  
SHANNON WILLIAMS, PETER RIGGS, TRACEY CRUMB

**CONDITIONS AND AUTHORIZATIONS:**

- D. NEW EQUIPMENT SHOULD BE USED IN BAT SURVEYS IN COUNTIES UNAFFECTED BY WHITE NOSE SYNDROME (WNS). COUNTIES CURRENTLY AFFECTED BY WNS INCLUDE BUCKS, FAYETTE, CARBON, HUNTINGDON, LYCOMING, LACKAWANNA, LUZERNE, LAWRENCE, CENTRE, MONROE, NORTHUMBERLAND, SCHUYKILL, SULLIVAN, AND MIFFLIN. USED EQUIPMENT THAT CANNOT BE SANITIZED AS DESCRIBED WILL NOT BE TRANSPORTED INTO WNS UNAFFECTED COUNTIES. AFTER EACH USE, ALL HARDWARE AND SOFT SIDED EQUIPMENT (TRAPS, NETS, HANDLING GLOVES, AND BAT RETENTION OR MEASUREMENT EQUIPMENT) SHALL BE 1) WASHED FREE OF COARSE MUD AND DEBRIS; 2) SANITIZED BY SUBMERGING IN A 10% BLEACH SOLUTION FOR AT LEAST 10 MINUTES; 3) RINSED IN CLEAN WATER AT LEAST TWICE; AND 4) AIR-DRIED. ANY EQUIPMENT THAT CANNOT BE SUBMERGED CANNOT BE TRANSPORTED INTO COUNTIES UNAFFECTED BY WNS. AS A REMINDER, THE WHITE FUNGUS IS ONLY ONE SIGN OF WNS. YOU SHOULD NOT EXPECT TO FIND BATS WITH FUNGUS ON THEM DURING THE SUMMER OR FALL. HOWEVER, ALL BATS WITH ABNORMAL WING/TAIL MEMBRANE CHARACTERISTICS DESCRIBED IN THE ATTACHED GUIDELINES SHOULD BE PHOTOGRAPHED AND REPORTED TO THE PENNSYLVANIA GAME COMMISSION WITHIN 24 HOURS (SEE ATTACHED). PERMITTEES ARE REQUIRED TO FOLLOW ALL DECONTAMINATION AND DISINFECTION GUIDELINES INCLUDED WITH THIS PERMIT (BAT HANDLING/DISINFECTION PROTOCOL FOR SUMMER BAT FIELD STUDIES).
- E. ALL BATS CAPTURED DURING THE SURVEY SHALL BE HANDLED IN A HUMANE MANNER AND NON TARGET BATS SHALL BE RELEASED UNHARMED. ANY NON TARGET BAT THAT MAY DIE DUE TO HANDLING WILL BE REPORTED TO THE PENNSYLVANIA GAME COMMISSION, BUREAU OF WILDLIFE MANAGEMENT, 2001 ELMERTON AVENUE, HARRISBURG, PA 17110, (717)787-5529, WITHIN 72 HOURS OF ITS DEATH.
- F. A REPORT OF THE ACTIVITIES CONDUCTED THROUGH THIS PERMIT SHALL BE PROVIDED TO THE PENNSYLVANIA GAME COMMISSION WITHIN 90 DAYS OF THE COMPLETION OF THE PROJECT. REPORTS WILL INCLUDE THE PROVIDED MANDATORY REPORTING FORMS IN HARD COPY. THE FINAL REPORT SHALL BE PROVIDED BY 12/31/12. PLEASE SEND TO ADDRESS AS "E" ATTN: CAL BUTCHKOSKI.
- G. IF A SURVEY IS CONDUCTED FOR A PROJECT (OR ANY PORTION THEREOF) THAT HAS UNDERGONE A PENNSYLVANIA NATURAL DIVERSITY INVENTORY (PNDI) ENVIRONMENTAL REVIEW BY THE PENNSYLVANIA GAME COMMISSION'S DIVISION OF ENVIRONMENTAL PLANNING AND HABITAT PROTECTION (REGARDLESS OF THE OUTCOME OF THAT ENVIRONMENTAL REVIEW), AN ELECTRONIC COPY OF THE REPORT AND FORMS REQUIRED UNDER CONDITION "F" SHALL ALSO BE PROVIDED ON COMPACT DISC TO THE PENNSYLVANIA GAME COMMISSION, DIVISION OF ENVIRONMENTAL PLANNING AND HABITAT PROTECTION, ATTN: TRACEY LIBRANDI MUMMA, 2001 ELMERTON AVENUE, HARRISBURG, PA 17110, WITHIN 90 DAYS OF THE COMPLETION OF THE PROJECT.
- H. A COPY OF THIS PERMIT MUST BE CARRIED AT ALL TIMES AND PRESENTED TO ANY AUTHORIZED PERSON UPON REQUEST.
- I. A QUALIFIED INDIANA BAT SURVEYOR MUST BE PRESENT DURING THE TIMES OF SURVEYS AND IS RESPONSIBLE FOR OVERSEEING ALL ASPECTS OF THE PROJECT INCLUDING ADHERANCE TO PGC NETTING STANDARDS AND EFFORT REQUIREMENTS. THIS PERSON SHALL BE LISTED ON THE USFWS





Commonwealth of Pennsylvania  
**PENNSYLVANIA GAME COMMISSION**  
2001 Elmerton Avenue  
Harrisburg, PA 17110-9797

(717) 783-8164

**QUALIFIED INDIANA BAT SURVEYORS LIST.**

- J. ONLY QUALIFIED INDIANA BAT SURVEYORS AND APPROVED BAT IDENTIFIERS WILL IDENTIFY BATS. BAT IDENTIFIERS SHALL BE LISTED ON THE USFWS BAT IDENTIFIER LIST.
- K. PROJECT AREA MAY BE EXTENDED TO STATE GAME LANDS WITH PRIOR PERMISSION OF REGIONAL LAND MANAGEMENT SUPERVISOR (LMS), WHO CAN BE CONTACTED THROUGH THE APPROPRIATE REGIONAL OFFICE.
- L. ONCE PERMISSION FROM THE LMS IS OBTAINED, WHEN PARKING OR LEAVING A VEHICLE UNATTENDED IN AN AREA NOT OPEN TO PUBLIC TRAVEL, PERMITTEE SHALL DISPLAY A LOGO OR CARD IN AN OBVIOUS LOCATION IN OR ON YOUR VEHICLE TO IDENTIFY ITS AFFILIATION AND LEAVE A COPY OF THIS PERMIT ON THE DASHBOARD, VISIBLE FROM OUTSIDE THE VEHICLE.
- M. ACCESS WILL ONLY BE GRANTED FOR OFFICIAL PURPOSES AND NO UNAUTHORIZED PERSONS SHALL BE TRANSPORTED BEHIND COMMISSION GATES OR INTO OTHER AREAS CLOSED TO THE PUBLIC.
- N. NO ACTIVITY SHALL OCCUR BEFORE NOON ON ALL SATURDAYS DURING THE SPRING TURKEY SEASON. ACCESS MAY BE DENIED AT OTHER TIMES DUE TO HUNTING SEASONS, INCLEMENT WEATHER, ROAD CONDITIONS OR OTHER CONFLICTS AS DETERMINED BY THE LMS. CONSENT FOR RIGHT OF ENTRY SHALL NOT INTERFERE WITH LAWFUL PUBLIC HUNTING AND TRAPPING ACTIVITIES.

---

GIVEN UNDER MY HAND AND THE SEAL OF THE PENNSYLVANIA GAME COMMISSION THIS 12TH DAY OF OCTOBER, 2012 AT HARRISBURG, DAUPHIN COUNTY, PENNSYLVANIA.

---

**DIRECTOR, BUREAU OF WILDLIFE PROTECTION**

c: REGIONAL DIRECTOR ANDERSON  
LAW ENFORCEMENT SUPERVISOR TOMLINSON  
CAL BUTCHKOSKI, TRACEY LIBRANDI MUMMA  
ALL AFFECTED WCO'S  
FILE

---

**From:** Robert\_M\_Anderson@fws.gov  
**Sent:** Monday, October 01, 2012 3:40 PM  
**To:** Zeyzus, Julie  
**Cc:** Brookens, Andy; Clint\_Riley@fws.gov; gillig@pa.gov; Carole\_Copeyon@fws.gov; tlibrandi@state.pa.us  
**Subject:** Re: SR 6219-020: Bat Survey Questions

Julie,

Having now had the opportunity to discuss the various options within FWS, and with PGC biologists, the priority should be to complete as many nights of trapping as possible in the next week to 10 days, even if this means lowering the first two hour temperature criteria to 45 degrees rather than 50. This is the preferable option to a significant extension in the trapping period into later October.

Regarding your question about the acoustic detection. If I am understanding you correctly, you feel that these portals are not being used by bats and that the detector is picking up echoes. If the portal trap is set with a relatively good seal and you have not been catching bats in three nights of trapping, then I think your conclusion is supported. If the trap is positioned in a way that it may not be efficiently capturing bats then you should consider augmenting the data with another technique, such as thermal imaging. This would verify whether these portals are being used by bats or not. If portals are not being used by bats, then there is no point in 15 nights of trapping. Since I have not been to the high-wall portals, I am not in the position to evaluate how well positioned the traps are for efficiently catching bats. Ultimately, you and the other qualified bat surveyors, will need to be able to support and report the conclusion that these portals are, or are not, being used by bats.

Robert M. Anderson  
U.S. Fish and Wildlife Service  
315 South Allen Street, Suite 322  
State College, PA 16801  
(814)234-4090 x223  
[www.fws.gov/northeast/pafo/index.html](http://www.fws.gov/northeast/pafo/index.html)

▼ "Zeyzus, Julie" <jzeyzus@skellyloy.com>

"Zeyzus, Julie"  
<jzeyzus@skellyloy.com>

09/30/2012 07:14 PM

To<Robert\_M\_Anderson@fws.gov>, <Clint\_Riley@fws.gov>

cc"Brookens, Andy" <abrookens@skellyloy.com>,  
<gillig@pa.gov>

SubjectSR 6219-020: Bat Survey Questions

Robert and Clint,

We are experiencing weather delays during our bat trap surveys for the SR 6219 Section 020 project. As of Monday October 1, 2012, the two openings we are surveying where bats have been captured will likely not meet the 15 night trap protocol recommended in your September 11, 2012 guidance letter. One opening has only five valid survey nights and the other has only four as of October 1. As a result, I am writing to ask if we can have an Amendment to the protocol for this project that includes the following:

1. Change the minimum temperature requirement for the first two hours of the survey from 50 degrees Fahrenheit to 45 degrees Fahrenheit and count as a valid survey;
2. Change the end date for the survey from October 10 to October 15 and count as a valid survey.

Additionally, I emailed Robert on Friday September 28, 2012 asking about the use of acoustic detectors to tally bat passes. My question was if we survey an opening for three nights and do not capture bats, but we note a bat pass using an acoustic detector, does that bat pass initiate a 15 night survey for the site? We have only one site where we have not captured a bat or noted a bat pass using an acoustic detector. We are trying to survey the site two additional nights, but weather has prevented this so far. The site includes two openings within a highwall. The site is very rocky and a call from a bat foraging or passing by behind the acoustic detectors may be picked up by the detector due to bounce off the rock. Additionally, a bat may pass by the detector but not use the openings for winter habitat. So in case we do note a bat pass on the acoustic detector at this site, I would like clarification on whether the acoustic detection of a bat without a bat capture falls within the three night sampling protocol or the 15 night sampling protocol.

Your advice will be greatly appreciated.

Thank you for your time,

Julie Zeyzus

---

**Julie Zeyzus** | Biologist

Skelly and Loy, Inc. | 19741-B Leitersburg Pike | Hagerstown, MD 21742 | USA

Office: 301.766.4236 | Fax: 301.766.4190 | Mobile: 412.443.6745

[www.skellyloy.com](http://www.skellyloy.com) | [facebook.com](https://www.facebook.com) | [Linkedin.com](https://www.linkedin.com)

**Be Safety Smart Right From The Start**

The information transmitted is intended only for the person or entity to which it is addressed and may contain confidential and/or privileged material. Any review, retransmission, dissemination or other use of, or taking of any action in reliance upon, this information by persons or entities other than the intended recipient is prohibited. If you received this in error, please contact the sender and delete the material from any computer.





To: Attendees, File

RE: SR 6219-020  
Somerset County  
USFWS/PGC Coordination Conference Call  
Meeting Minutes

Date: October 9, 2012

Time: 1:30 PM

Those in attendance were:

Clint Riley, US Fish and Wildlife Service  
Bob Anderson, US Fish and Wildlife Service  
Jon Crum, Federal Highway Administration  
Cory Donahue, P.E., Federal Highway Administration  
Tracey Librandi Mumma, PA Game Commission  
Gary Fawver, P.E., PennDOT Central Office  
Mark Lombard, PennDOT Central Office  
Jim Pruss, P.E., PennDOT District 9-0  
Greg Illig, P.E., PennDOT District 9-0  
Chris Trusch, PennDOT District 9-0

**PURPOSE:**

A conference call was held on October 9, 2012 at approximately 1:30 pm to discuss the ongoing coordination efforts between the USFWS, FHWA, PGC, and PennDOT regarding potential bat hibernacula.


**DISCUSSION:**

- G. Illig: Gave an update on the trapping efforts so far:
  - Main mine opening: 10 nights
  - Airshaft: 9 nights
  - High wall: 3 nights
- G. Illig: At the main opening, one Eastern Small Footed Bat was trapped on October 3 and one was captured on October 4. Since this is a state protected what type of coordination will be required?
- T. Librandi Mumma: Need to see a map of the mine before any recommendations can be made.
- C. Riley: We are coming to the end of the trapping season (ends October 15). I would recommend that you try very hard to trap all 15 nights. While the bats may not have been moving due to the decreased temperatures, they will definitely need to go out and forage to fatten up for winter.
- G. Illig: Just keep trapping to get 15 nights?
- C. Riley: Doesn't seem likely that Indiana Bats are in their hibernacula yet, from what we have seen they have been going in later in the year. So yes, continue to trap.
- T. Librandi Mumma: Will trapping need to go beyond October 15? The permit only currently goes up to October 15.
- G. Illig: I would say it is almost a guarantee that we will need to go past October 15.
- T. Librandi Mumma: How far will we need to extend it?
- G. Illig: Not sure at this point, any recommendations?
- C. Riley: You should aim to trap during the times when Indiana Bats could be there. This could possibly extend into November if weather conditions don't improve.
- T. Librandi Mumma: We just want to make sure that we don't push it back too far and miss out.

- G. Fawver: Weather for this week does not look very good, so I would like to extend the trapping permit out as far as we can.
- T. Librandi Mumma: How does October 31 sound?
- C. Riley: That is what Bob and I were thinking. The 31<sup>st</sup> seems to make sense since this was the old protocol and it should give you enough nights to finish trapping.
- T. Librandi Mumma: Julie will need to request the extension to October 31 so that we can sign off on it. She can just make this request via email.
- B. Anderson: Can you have Julie create a spreadsheet to summarize their trapping. We would like it to see a brief detail of each night, which would include species, sex, numbers, and temperatures.
- C. Riley: From this information we could possibly see patterns that could justify ending the trapping.
- B. Anderson: It will be important that we see the sex of the bats. Usually the females tend to enter sooner while the males tend to linger a little bit.
- T. Librandi Mumma: Send this information to the Game Commission as well as USFWS.
- B. Anderson: Make sure that all of the previous nights are shown on this spreadsheet.
- C. Riley: We will need to see a lot of info in the report, but for this spreadsheet just show the raw numbers. We just want the basic information so we can make an accurate justification for the trapping.
- G. Illig: So at this point we should just plan on trapping until we hit 15 nights?
- C. Riley: Yes, that should be our working plan at this point.
- G. Illig: We are currently doing further assessment on the two pipes to see if they will need to be trapped.
- B. Anderson: It will be Julie's call if she thinks that they could meet the characteristics of possible hibernacula.
- G. Fawver: Has Skelly and Loy been out lately to look at these pipes?
- G. Illig: They looked at them on Sunday. It was determined that the first pipe is closed off at about 28 feet back, but they could not determine how far back the second pipe went.
- B. Anderson: The first pipe doesn't meet the requirements because it will need to go back at least 50 feet to be considered possible hibernacula. More research will need to be done on the other pipe.
- G. Illig: So at this point how should we coordinate for the Eastern Small Footed Bat capture?
- T. Librandi Mumma: Not sure at this point, just get me the map of the mine and I will review and go on from there.
- G. Illig: OK, I will get the map to you.
- G. Illig: Any other questions?
  - ❖ There were no other comments/questions and the conference call was concluded.

These minutes are a summary of the writer's interpretation of the meeting. Should you have any comments regarding the minutes please contact me within 5 business days of receipt. If no comments are received by this time, it will be considered that all attendees are in agreement and the minutes will be considered final.

Prepared by:



Gregory M. Illig, P.E.  
PennDOT Project Manager

## **APPENDIX C - DATA FORMS**



## **PHASE I ASSESSMENT**

### Phase I Cave/Mine Portal Assessment Data Sheet

Identification Number: [REDACTED]

Location: SR 6219, Sect 020; Murdock USGS Quadrangle; Somerset County; Brothers Valley Township; West of Althouse Road

Observers: Andrew Nevin, Dennis Bell, Andy Brookens, Ben Berra, Logan Zugay, Eric Bruggeman, Trent Sustich, Julie Zeyzus

Latitude : 39.89197 Longitude : 79.03872

Date: 9/21/12, 9/25/12 Time: 18 :00 hours Temperature (outside): about 15°C

Opening (cave, quarry, shaft, or adit)	Vertical ventilation shaft
Opening Size: Height x Width (or Diameter)	4 m x 2.4 m vertical opening in concrete floor
Internal Dimensions: Height x Width	Vertical opening appeared consistent in size within viewable area (4 m x 2.4 m); Brick structure dimensions were about 2.4 m x 3.0 m
Slope (up or down from entrance)	Perpendicular to surface
Entrance Stable?	Terracotta brick structure around vertical opening was not stable; loose and fallen brick observed
Direction of Airflow (In or out?)	Out, at time of observation
Amount of Airflow (e.g., none, slight, heavy)	Slight, at time of observation
Air warmer or cooler than outside temp.	Cooler
Humidity	Unknown
Evidence of toxic gases? (Describe)	None detected by observers
Evidence of collapse?	Vertical opening appeared intact within concrete floor
Ceiling Condition	Terracotta brick structure around vertical opening was not stable; loose and fallen brick observed
Amount of water in opening	No inundation; moist areas observed under brick structure and within vertical opening
Evidence of past flooding?	None
Observed length of portal	At least 12 m
Distance to nearest water source	Unnamed tributary, 27 m southwest
% Canopy Cover at portal entrance	70%, red pine and red maple
Foraging Signs? (e.g., moth wings)	None observed

Are any portals suspected or known to be connected? Which ones?

After a comprehensive review of detailed mine maps for the Althouse area, it was determined, based on the best available information, that the air shaft was associated with the Somerset Coal Company's Allegheny Mine that produced coal from the Upper Kittanning seam. The opening is located approximately 400.8 m east of the proposed SR 6219, Section 020 mainline highway alignment.

Any observable side passages? None observed

Describe the number and size of any observable rooms or chambers. None observed

Additional comments:

Opening meets criteria detailed in the Pennsylvania Game Commission 2012 *Protocol for Assessing Bat Use of Potential Hibernacula*; additional assessment necessary to determine if opening is used by bats



**Phase I Cave/Mine** [REDACTED]

Location: SR 6219, Sect 020; Murdock USGS Quadrangle; Somerset County, Brothers Valley Township; East of Fogletown Road, near intersection of Fogletown Road and Golf Course Road

Observers: Dennis Bell, Andy Brookens, Andrew Nevin, Julie Zeyzus

Latitude : 39.88104 N Longitude : 79.03841

Date: 9/26/12 Time: 18:00 hours Temperature (outside): about 17°C

Opening (cave, quarry, shaft, or adit)	Mine entry opened due to subsidence
Opening Size: Height x Width (or Diameter)	At surface, 0.6 m x 2.3 m
Internal Dimensions: Height x Width	At about 6 m inside, opening is at least 1.5 m x 2.3 m
Slope (up or down from entrance)	Slopes down from entrance; about 30% slope
Entrance Stable?	No; entrance is eroded soil, opening is a result of subsidence
Direction of Airflow (In or out?)	Not applicable
Amount of Airflow (e.g., none, slight, heavy)	No air flow registered on wind meter; no air movement noticed from dropping powder at about 0.5 m inside opening
Air warmer or cooler than outside temp.	No temperature difference noticed
Humidity	Unknown
Evidence of toxic gases? (Describe)	None detected
Evidence of collapse?	Subsidence evident
Ceiling Condition	Not stable near entrance where subsidence occurred
Amount of water in opening	None
Evidence of past flooding?	None observed
Observed length of portal	At least 6 m; unobstructed passage
Distance to nearest water source	Beaver Creek about 120 m south
% Canopy Cover at portal entrance	
Foraging Signs? (e.g., moth wings)	None observed

Are any portals suspected or known to be connected? Which ones?

Based on the review of underground mine maps, coal seam elevation plots, underground workings mapping by consulting mining engineers, as well as the location of MP-2, it is the opinion of the mining engineers, based on best available information, to have been associated with the Moshannon underground mine complex that produced coal from the Lower Freeport

seam. This opening was located outside of the action area, approximately 588.6 m east of the proposed Section 020 mainline.

Any observable side passages? None observed from the observation point

Describe the number and size of any observable rooms or chambers.

DRB-1 appears to be an opening that resulted from subsidence into a mine entry; no rooms or chambers observed from the observation point.

Additional comments:

Opening DRB-1 (MP-2) meets criteria detailed in the Pennsylvania Game Commission 2012 *Protocol for Assessing Bat Use of Potential Hibernacula*. For additional information, refer to L.R. Kimball Design Memorandum, Potential Mine Opening MP#2, October 29, 2012.

### Phase I Cave/Mine Portal Assessment Data Sheet

Identification Number: [REDACTED]

Location: SR 6219, Sect 020; Meyersdale USGS Quadrangle; Somerset County, Bothers Valley Township; South of Fogletown Road

Observers: Julie Zeyzus, Andrew Nevin, Terry Schmidt, Michael Fishman, Andy Brookens, Eric Bruggeman

Latitude : 39.8726 N Longitude : 79.04444 W

Date: 9/19/12\* Time: afternoon Temperature (outside): about 15°C

Opening (cave, quarry, shaft, or adit)	Terracotta pipe within historic mining area
Opening Size: Height x Width (or Diameter)	45.7 cm diameter
Internal Dimensions: Height x Width	45.7 cm
Slope (up or down from entrance)	Level as far as observable area
Entrance Stable?	Yes
Direction of Airflow (In or out?)	Not applicable
Amount of Airflow (e.g., none, slight, heavy)	None noticed on 9/19/12*
Air warmer or cooler than outside temp.	No temperature difference noticed on 9/19/12*
Humidity	Unknown on 9/19/12*
Evidence of toxic gases? (Describe)	None detected
Evidence of collapse?	No
Ceiling Condition	Pipe mostly intact; some breaks and cracks within observable area
Amount of water in opening	None; water seeping from ground about 1 m below pipe
Evidence of past flooding?	None; unknown if pipe serves the purpose for water transport - no algal growth within the pipe or other signs of past water presence observed
Observed length of portal	At least 14 m; pipe bends to the right (northeast) after 14 m and out of view
Distance to nearest water source	Waters seeping from ground 1 m below pipe; Beaver Creek located about 100 m south
% Canopy Cover at portal entrance	70%; muscledwood, black birch
Foraging Signs? (e.g., moth wings)	None observed

Are any portals suspected or known to be connected? Which ones?

Two closed, abandoned mine portals located approximately 45 m and 15 m northwest of JAZ-2; it is unknown if the terracotta pipe connected to the mine associated with these closed portals to



drain water from the mine or if the purpose of the pipe was for road runoff; other end of pipe was not located; based on the location of the pipe in the ground and its observed length, it appears to pass under Fogletown Road

Any observable side passages? Not applicable

Describe the number and size of any observable rooms or chambers. Not applicable

Additional comments:

\*JAZ-2 was visited three additional times, September 21, 28, and October 7, 2012. Below are additional notes from these three dates:

September 21 = No air flow registered on wind meter or observed from squeezing puffball spores inside pipe and watching the movement of the spores; Air inside pipe felt slightly cooler than outside temperature

September 28 (16:57 hours) = No air flow registered on wind meter at 0.6 m inside pipe; no air movement noticed from placing a thin strip of surveyor's flag 0.6 m inside pipe; no air movement noticed from dropping powder 0.6 m inside pipe; outside temperature 15.25°C; temperature 0.6 m inside pipe 14.75°C; overcast, breezy at time of observation; rain/thunderstorms occurred day before observation

October 7 (12:30 hours) = No air flow measured on wind meter; slight air flow out of the pipe was noticed by three observers from dropping powder about 1 m inside pipe and watching the movement of the powder; outside temperature 11.4°C; temperature about 1 m inside pipe 11.8°C; cloudy, light, occasional breeze

### Phase I Cave/Mine Portal Assessment Data Sheet

Identification Number: [REDACTED]

Location: SR 6219, Sect 020; Meyersdale USGS Quadrangle; Somerset County, Garrett Borough; South of Walker Road

Observers: Julie Zeyzus, Andrew Nevin

Latitude : 39.872694 N Longitude : 79.048806 W

Date: 8/16/2012 Time: 9:30 hours Temperature (outside): 26°C

Opening (cave, quarry, shaft, or adit)	Abandoned portal of bituminous coal mine
Opening Size: Height x Width (or Diameter)	3.6 m width at entrance; height varies from 0.5 m to 1.33 m (left to right)
Internal Dimensions: Height x Width	Within first 10.4 m = about 3.4 m width x 1.8 m height; beyond 10.4 m = about 4.5 m width; height varies from about 1.5 m to about 2.4 m
Slope (up or down from entrance)	No slope within 21 m of open passage
Entrance Stable?	Yes, concrete lined
Direction of Airflow (In or out?)	Out (at time of observation)
Amount of Airflow (e.g., none, slight, heavy)	Moderate at time of observation; 3.2 km/hr max; 2.9 km/hr average
Air warmer or cooler than outside temp.	Cooler
Humidity	90% (outside)
Evidence of toxic gases? (Describe)	None detected by observers
Evidence of collapse?	Yes, at about 10.4 m inside portal and beyond; shale fragments and pillar failure observed
Ceiling Condition	Stable at entrance (concrete ceiling); unstable beginning at about 10.4 m and beyond
Amount of water in opening	Water up to about 0.5 m within first 10.4 m inside portal; none observed beyond this point; water draining from portal opening
Evidence of past flooding?	No past flooding that would completely obstruct opening was evidenced (see above)
Observed length of portal	At least 21 m
Distance to nearest water source	Moss wetland/inundation in front of opening; Buffalo Creek, about 90 m south
% Canopy Cover at portal entrance	60%; red oak and black birch
Foraging Signs? (e.g., moth wings)	None observed

Are any portals suspected or known to be connected? Which ones?

After a comprehensive review of detailed mine maps for the Buffalo/Fogletown area, it was determined, based on the best available information, that the mine opening was associated with the Enterprise Coal Company's Ponfeigh Mine #1 that produced coal from the Upper Kittanning seam. This opening is located approximately 432.8 m west of the proposed mainline highway alignment.

Any observable side passages? None observed

Describe the number and size of any observable rooms or chambers. None observed

Additional comments:

Temperature at about 6.5 m in front of opening = 15°C

Temperature at about 10.4 m inside portal = 11.5°C

Opening meets criteria detailed in the Pennsylvania Game Commission 2012 *Protocol for Assessing Bat Use of Potential Hibernacula*; additional assessment necessary to determine if opening is used by bats



### Phase I Cave/Mine Portal Assessment Data Sheet

Identification Number: P XXXXXXXXXX

Location: SR 6219, Sect 020; Meyersdale USGS Quadrangle; Somerset County, Brothers Valley Township; North of Walker Road

Observers: Andrew Nevin, Julie Zeyzus

Latitude : 39.87391 N Longitude : 79.04942 W

Date: 09/18/2012 Time: afternoon Temperature (outside):

Opening (cave, quarry, shaft, or adit)	Opening within a highwall created from stripping of coal seam; numerous sandstone outcrops exposed
Opening Size: Height x Width (or Diameter)	At surface, about 1.5 m width, height varies from <0.5 m to about 0.5 m
Internal Dimensions: Height x Width	1 m width, height varies from <0.5 m to about 0.5 m
Slope (up or down from entrance)	Almost level
Entrance Stable?	No, sandstone fragments and rock from fallen ceiling or from rock separation due to underground collapse was observed
Direction of Airflow (In or out?)	Not applicable (NA)
Amount of Airflow (e.g., none, slight, heavy)	None detected
Air warmer or cooler than outside temp.	NA
Humidity	Unknown
Evidence of toxic gases? (Describe)	None detected
Evidence of collapse?	Yes, possible explanation for rock separation
Ceiling Condition	Few rocks fallen inside opening; outer rocks break easily; considered unstable
Amount of water in opening	None
Evidence of past flooding?	None observed
Observed length of portal	At least 5.5 m; curved to the right out of sight
Distance to nearest water source	Buffalo Creek, 260 m south
% Canopy Cover at portal entrance	80%; early successional forest; black birch, black cherry
Foraging Signs? (e.g., moth wings)	None observed; other mammal signs such as scat were observed

Are any portals suspected or known to be connected? Which ones? None observed; coal seam located approximately 6 m below opening; opening potentially connected to an historic mine due to rock separation that may have resulted from a collapse into a mine void

Any observable side passages? None observed

Describe the number and size of any observable rooms or chambers. None observed from the surface, did not enter opening

Additional comments:

Opening meets criteria detailed in the Pennsylvania Game Commission 2012 *Protocol for Assessing Bat Use of Potential Hibernacula*; additional assessment necessary to determine if opening is used by bats.

### Phase I Cave/Mine Portal Assessment Data Sheet

Identification Number: [REDACTED]

Location: SR 6219, Sect 020; Meyersdale USGS Quadrangle; Somerset County, Brothers Valley Township; North of Walker Road

Observers: Andrew Nevin, Julie Zeyzus

Latitude : 39.87391 N Longitude : 79.04942 W

Date: 09/18/2012 Time: afternoon Temperature (outside):

Opening (cave, quarry, shaft, or adit)	Highwall created from stripping of coal seam; numerous sandstone outcrops exposed
Opening Size: Height x Width (or Diameter)	Opening to surface is about 3 m wide and narrows to about 2 m at about 3.5 m in from surface; height varies from about 0.5 m to just under 1 m (observed from left to right)
Internal Dimensions: Height x Width	Refer to above; a 0.5 m diameter opening was observed at about 3.5 m within highwall
Slope (up or down from entrance)	Slopes down from entrance for about 3 m before no longer visible
Entrance Stable?	No, sandstone fragments and rock from fallen ceiling or from rock separation due to underground collapse was observed
Direction of Airflow (In or out?)	Not applicable (NA)
Amount of Airflow (e.g., none, slight, heavy)	None detected
Air warmer or cooler than outside temp.	NA
Humidity	Unknown
Evidence of toxic gases? (Describe)	No
Evidence of collapse?	Yes, possible explanation for rock separation
Ceiling Condition	Ceiling was "shelved" and pieces of shelf had fallen
Amount of water in opening	None
Evidence of past flooding?	None observed
Observed length of portal	At least 4.5 m to the internal, 0.5 m diameter opening; overhanging rock obstructs view beyond this point
Distance to nearest water source	Buffalo Creek, 260 m south
% Canopy Cover at portal entrance	80%; early successional forest; black birch, black cherry
Foraging Signs? (e.g., moth wings)	None observed; other mammal signs such as scat were observed



Are any portals suspected or known to be connected? Which ones? None observed; coal seam located approximately 3.3 m below the internal, 0.5 m diameter opening; opening potentially connected to an historic mine due to rock separation that may have resulted from a collapse into a mine void

Any observable side passages? None observed

Describe the number and size of any observable rooms or chambers. None observed from the surface, did not enter opening

Additional comments:

Opening meets criteria detailed in the Pennsylvania Game Commission 2012 *Protocol for Assessing Bat Use of Potential Hibernacula*; additional assessment necessary to determine if opening is used by bats