FALCON ETHANE PIPELINE PROJECT

MIST-NETTING SURVEY REPORT

2017 ADDENDUM

SHELL PIPELINE COMPANY, LP

BEAVER, WASHINGTON, AND ALLEGHENY COUNTIES, PENNSYLVANIA

Prepared for:

Shell Pipeline Company, LP
910 Louisiana Street, Room 41082A
Houston, Texas 77002

Prepared by:

AECOM
Foster Plaza 6
681 Andersen Drive, Suite 400
Pittsburgh, Pennsylvania 15220

TABLE OF CONTENTS

Tables

Figures

Appendices

1.0 INTRODUCTION

AECOM is providing environmental services for the Shell Pipeline Company, LP's (Shell) proposed Falcon Pipeline Project (Project). This report is the 2017 Addendum (Addendum) to the Mist-Netting Survey Report previously submitted to the United States Fish and Wildlife Service (USFWS) on December 16, 2016 for the Project. Due to potential re-routes, four additional mist-netting sites were established in Beaver, Washington and Allegheny Counties in Pennsylvania (PA) (Figure 1-Location Map). Mist netting sites were added were re-routes varied significantly from the original project route.

The proposed Project re-routes are located within the range of the Indiana bat (*Myotis sodalis)*, a federally and state endangered species, and within range of the federally-threatened northern long-eared bat (*Myotis septentrionalis*). Due to the anticipated forest clearing associated with the proposed Project re-routes, a mist-netting survey was conducted during the 2017 Indiana bat survey season May 15 - August 15, 2017 to determine presence/probable absence of Indiana bat and northern long-eared bat. This Addendum summarizes the findings of the survey.

2.0 BACKGROUND

2.1 Survey Area

The survey area consists of four mist netting sites along the PA portion of the Project. This survey area is primarily composed of mixed deciduous and regenerating forest, agricultural land, some strip mine and residential areas. The additional 4 mist netting locations are located along re-routed portions of the pipeline route and replace original sample locations.

3.0 METHODOLOGY

3.1 Mist-Netting Locations

Guidelines set by the 2017 USFWS in the Range-Wide Indiana Bat Summer Survey Guidelines and the 2017 PA Game Commission Bat Surveyor Packet were followed for this survey. Each MNL consisted of at least three net sets operated for 2 nights each. The locations of each MNL are depicted on both aerial and USGS topographic maps and are located in Appendix A.

Field reconnaissance surveys were conducted in June and July 2017 where AECOM biologists identified suitable MNLs within each kilometer of forested habitat along the proposed pipeline

re-route. Net sites were selected in the most suitable Indiana and northern long-eared bat habitat within or within close proximity to the Project's proposed limit of disturbance (LOD). MNLs were selected along potential travel corridors in the following habitat types: forests, wetlands, and riparian zones. Suitable travel corridors included logging/ATV trails, dirt and gravel access roads, stream corridors, and other forest openings. Attempts were made to space out MNLs along the study corridor however, the sites were placed in the habitats most conducive to use by Indiana and northern long-eared bats. A high-precision, handheld, global positioning system (GPS) receiver (model GeoXH handheld, Trimble, Sunnyvale, CA) was used to record each selected MNL.

3.2 Mist-Netting Surveys

Mist-net surveys were performed by AECOM qualified bat surveyors between June 26th and July 26th, 2017 under Pennsylvania Game Commission (PGC) Special Use Permit #40705(Appendix B). Each MNL consisted of a minimum of three net sets of varying heights placed to maximize the potential of catching Indiana and northern long-eared bats. An attempt was made to completely close the flight corridors (side-to-side/top-to-bottom) with the mist-net setups, where possible, in flyways and foraging areas to maximize the potential for bat captures. Attempts were made to hide/blend the net setups into the surrounding habitat as much as possible. If net sets were unproductive on the first survey night or bats were observed "detecting" setups, efforts were made to adjust the setup to maximize the potential for bat capture. The sample duration was typically from sunset to approximately 2:00 am, with a minimum survey period of at least 300 minutes (5 hours). Surveys were suspended for periods of high winds (exceeding 18 mph or causing the billowing of nets), heavy fog, thunderstorms or rain showers, and resumed if the inclement weather passed. If inclement weather persisted, or, temperatures dropped below 10 degrees Celsius (50 degrees Fahrenheit), the survey night was terminated and subsequently resurveyed. Each survey location was mist-netted for a minimum of full five hours, two nights each.

During each survey night, deployed nets were checked every ten minutes beginning at sunset and all captured bats were immediately removed from the netting. Upon removal, each bat was transported in a disposable paper bag to the respective MNL centralized processing area. Each bat was identified to species by a qualified bat biologist and weighed to the nearest 0.5 g (0.017 oz.). Forearm, ear, tragus, and hind foot measurements were taken to the nearest 1.0 mm (0.04 in.). Age was determined by reviewing each bat for fusion of joints in finger bones to distinguish between juveniles and adults (Schwartz and Schwartz, 1981). Each bat was sexed and assessed to reproductive status and condition. Females were examined for breast lactation

and/or hairless areas around each nipple to determine reproductive status. All bats were evaluated for any abnormal characteristics or unusual features such as parasites, wounds, injuries, etc. Any evidence of white-nose related wing damage was recorded and the appropriate wing score was given per the Wing Damage Index scoring system. Representative species photographs were taken using a digital camera. Unless a transmitter was to be fixated, each bat was released within 20-minutes of capture upon the collection of all necessary data.

To prevent the transmission of the disease *Pseudogymnoascus destructans*, or White-Nose Syndrome (WNS), paper bags used to transport bats to the processing station were disposed of upon the removal of the bat. All equipment and gear were disinfected as outlined in the National White-Nose Syndrome Decontamination Protocol – Version 04.12.2016 (2016) prior to processing the next bat. Disposable nitrile gloves were worn over leather handling gloves and were disinfected or disposed of after handling each bat. After each night's mist-netting activity, mist-nets and leather handling gloves were disinfected per the guidance provided in the protocol.

3.3 Telemetry and Emergence Counts

Tracking of all Indiana bats and reproductive female northern long-eared bats was required in an attempt to identify and characterize roost trees. The telemetry protocol identified in the 2017 PA Game Commission Bat Surveyor Packet – Appendix I was adhered to in the survey. After collecting morphometric data from targeted individuals, a radio transmitter, not to exceed 6% of the bats body weight, was fitted to the bat prior to its release. The following morning, biologists then used telemetry equipment to track the bat to its diurnal roost. A description of the roost and surrounding habitat was recorded on the PGC Bat Tree - Day Roost – Datasheet and the location was recorded. Emergence counts were then performed for a minimum of two-days at each roost. If it was determined that a bat changed roosts between survey days, emergence counts were then conducted at the new roost tree a minimum of two days. A PGC Bat Emergence Dataform was completed for each emergence count survey.

4.0 RESULTS

4.1 Mist-Netting Locations

Four sites were selected to be sampled within the Project area (Appendix A). Using best professional judgement, the most appropriate habitat locations found along the Project area pipeline were sampled. In some cases, shorter or longer gaps between sampling locations exist due to poor to marginal habitat conditions that were found within each forested kilometer during the initial field reconnaissance.

Table 1 summarizes each MNL and dates the survey was conducted. Inclement weather that persisted such as temperatures falling below 10 degrees Celsius (50 degrees Fahrenheit), heavy fog, high winds (exceeding 18 mph or causing the billowing of nets), steady rain showers, or thunderstorms, resulted in the early termination of some survey nights. In these instances, data was provided for the partial night of survey, but the site was resurveyed until two full 5-hour nights were achieved.

Refer to Appendix A for a depiction of each general MNL. Bat Netting/Trapping Site Survey Record data forms are provided in Appendix C and provide the exact location of each mist-net setup. Individual mist-net setup location photographs are provided in Appendix D.

Table 1

Mist-netting Site Summary

Site	Longitude	Latitude	Survey Dates (2016)	Net Heights (Set #1/Set #2/Set #3)	Type of Habitat
MNL-ALT-01	40° 36' 5.98" N	80° 25' 26.30" W	6/26, 6/27, 6/28	Triple/Triple/Triple	Forested Valley/Stream
MNL-ALT-02	40° 36' 46.91" N	80° 24' 35.30" W	6/29, 7/5, 7/6, & 7/11	Triple/Triple/Triple	Forested Valley/Stream/Pipeline Corridor
MNL-ALT-04	40° 28' 40.56" N	80° 17' 30.16" W	7/12 & 7/17	Triple/Triple/Triple	ATV trails/Pond
MNL-ALT-05	40° 20' 34.05" N	80° 15' 44.51" W	7/25 & 7/26	Triple/Triple/Triple	Forested Rail Trail

4.2 Bat Captures

Data collected and recorded on all bat species captured included species, sex, age, weight, and reproductive condition. Age was determined for each individual as evidenced by epiphyseal-diaphyseal fusion of long bones in the wing. Reproductive condition of females was recorded as pregnant (based on abdominal palpation), not pregnant, lactating, post lactating, or non-reproductive. Reproductive condition of males was recorded as scrotal or non-reproductive. Any information related to white nose syndrome was also recorded. Upon completion of the examination, the bats were released. A qualified bat biologist was present on-site each survey night to ensure proper handling and identification of all species captured. All precautions

outlined by USFWS to prevent the spread of white nose syndrome were taken as part of the survey. Bat capture data forms are included in Appendix C.

The following data is based on 4 MNLs for the Project. A total of 18 bats were captured during survey from June 26 to July 26, 2017. A total of four different species were collected and included ten (10) big brown bats (*Eptesicus fuscus*), five (5) eastern red bats (*Lasiurus borealis*), two (2) hoary bats (*Lasiurus cinereus*), and one (1) northern long-eared bat (*Myotis septentrionalis*). No Indiana bats were captured during this survey. Table 2 – Bats Captured Per Site summarizes the number of bats caught at each MNL.

Overall the condition of the bats was normal with some minor wing damage or injuries noted on a few collected specimens. Data on each individual bat captured is located on the Bat Measurement and Capture data forms included in Appendix C and representative species photographs of bats captured are included in Appendix E.

Table 2
Bats Captured Per Site

Site	Eptesicus fuscus	Lasionycteris noctivagans	Lasiurus borealis	Lasiurus cinereus	Perymyotis subflavus	Myotis leibii	Myotis lucifugus	Myotis septentrionalis	Myotis sodalis	Total Combined Species
MNL-ALT-01	1	0	3	2	0	0	0	0	0	6
MNL-ALT-02	7	0	0	0	0	0	0	0	0	7
MNL-ALT-04	1	0	0	0	0	0	0	1	0	2
MNL-ALT-05	1	0	2	0	0	0	0	0	0	3

5.3 Telemetry

AECOM biologists' radio tagged a Northern Long–eared bat captured at netting location MN ALT 2 and conducted telemetry searches for the radio tagged bat for a minimum of four hours per day in an effort to locate its daytime roosting location. The greatest search effort was focused on forested areas close to the capture location and gradually expanded to search forested areas farther from the capture location within and adjacent to the study area of the proposed pipeline. Telemetry was conducted by Brian Cooper (QBS), and care was taken to seek out terrain features which may have interfered with signal between the transmitter and the receiver unit. Care was taken to listen from high elevations when possible and to explore contour features which may shield the transmitter signal. After seven consecutive days of searching for the tagged bat up to four miles from the original capture location, AECOM biologists concluded that the bat was most likely roosting on an offline property. Roosts were not located thus no data forms related to roosts are included with this report.

Table 3- Telemetry Search Hours

Date:	July 18	July 19	July 20	July 21	July 22	July 23	July 24
Search Hours:	7	8	11	8	8	4	4.5

6.0 CONCLUSIONS

No Indiana bats were caught during the survey. One northern long-eared bats was captured during the survey, and was fitted with a transmitter and tracked. Telemetry was conducted by Brian Cooper (QBS), and care was taken to seek out terrain features which may have interfered with signal between the transmitter and the receiver unit. Care was taken to listen from high elevations when possible and to explore contour features which may shield the transmitter signal. After seven consecutive days of searching for the tagged bat up to four miles from the original capture location, AECOM biologists concluded that the bat was most likely roosting on an offline property. AECOM proposes that the Project, barring significant pipeline re-routes, is not likely to adversely affect the Indiana bat, however, AECOM and Shell Pipeline Company, LP are requesting input from USFWS regarding the presence of northern long-eared bats in the Project area and will need USFWS input and guidance on northern long-eared bat captures related to the Project.

7.0 LITERATURE CITED

Barbour, R. W. and W. H. Davis. 1969. Bats of America. University Press of Kentucky, Lexington, KY, pp. 88-95.

Caceres, M., & Barclay, R. M. 2000, May 12. Mammalian Species - Myotis septentrionalis. American Society of Mammologists, 634, 1-4.

Endangered Species Preservation Act of 15 October 1966 (80 Stat. 926; U.S.C. 668[c]).

Endangered Species Act of 1973 16 U.S.C. 1531.

Endangered Species Act (as amended) 50 C.F.R. 402

Hall, E.R. 1981. The Mammals of North America. Volume 2, 2nd edition. The Ronald Press, New York, NY, p. 536.

Merritt, J. E. 1987. Guide to the Mammals of Pennsylvania. University of Pittsburgh Press for the Carnegie Museum of Natural History, Pittsburgh, PA, pp. 79-118.

WNS Decontamination Team. 2016. National White-Nose Syndrome Decontamination Protocol-Version 04.12.2016. Retrieved from https://www.whitenosesyndrome.org/sites/default/files/resource/national_wns_decon_protocol_04.12.2016.pdf.

Pennsylvania Game Commission. 2015. PA Game Commission Bat Surveyor Packet – Revised February 11, 2016. Commonwealth of Pennsylvania, Harrisburg, PA.

Schwartz, C. and E. Schwartz. 1981. Wild Mammals of Missouri. University of Missouri Press, Springfield, MO.

United States Department of the Interior, Fish and Wildlife Service. 2007. Indiana Bat (Myotis sodalis) Draft Recovery Plan, First Revision (April 2007). Great Lakes-Big Rivers Region – Region 3. Fort Snelling, MN.

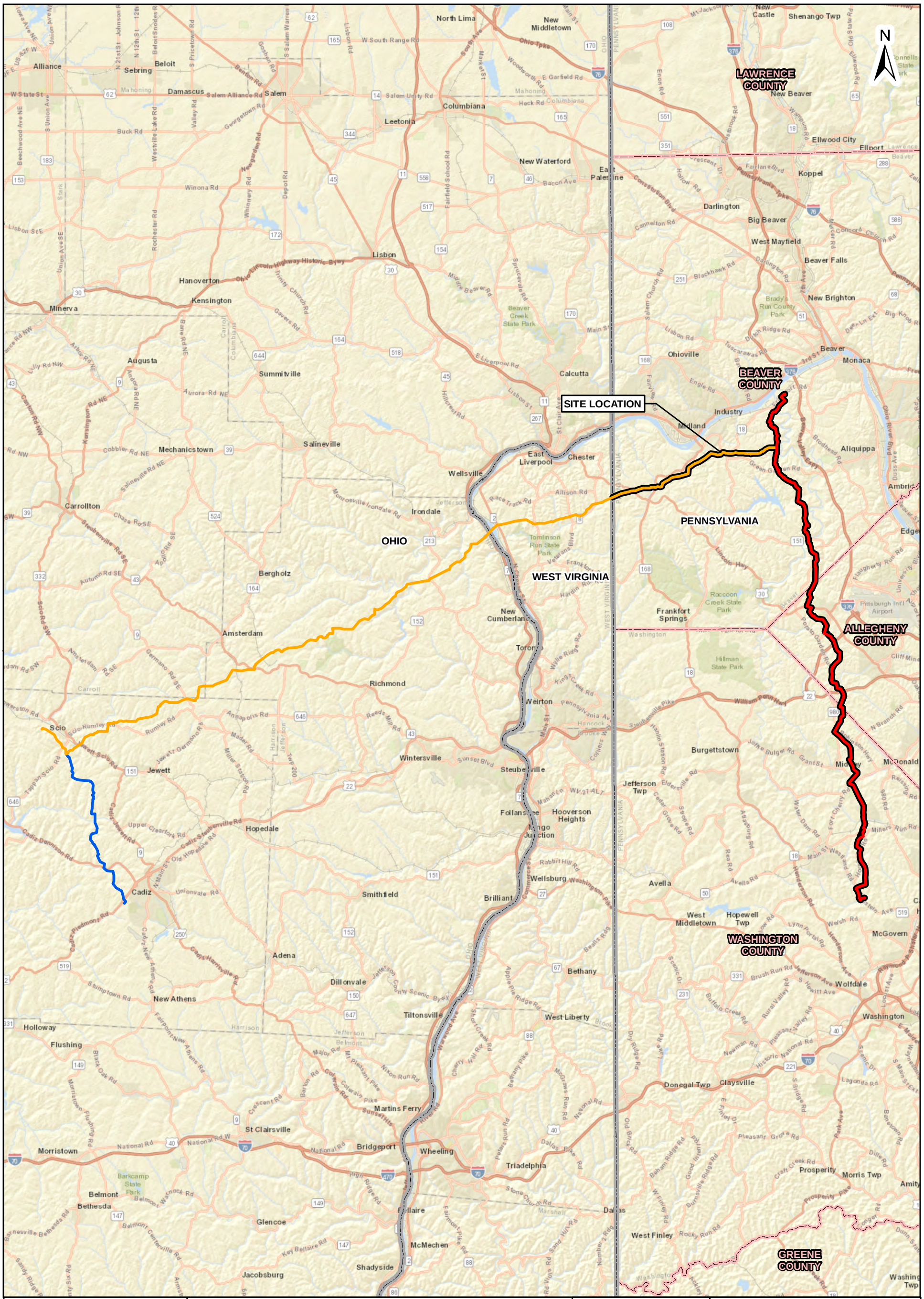
United States Fish and Wildlife Service. 2016a. Endangered and Threatened Wildlife and Plants; 4(d) Rule for the Northern Long-eared Bat. Federal Register, Vol. 81-No. 9. 50 CFR Part 17. Docket No. FWS-R5-ES-2011-0024;4500030113.

United States Fish and Wildlife Service. 2016b. Range-Wide Indiana Bat Summer Survey Guidelines – April 2016. Retrieved from https://www.fws.gov/Midwest/endangered/mammals/inba/inbasummersurveyguidance.html.

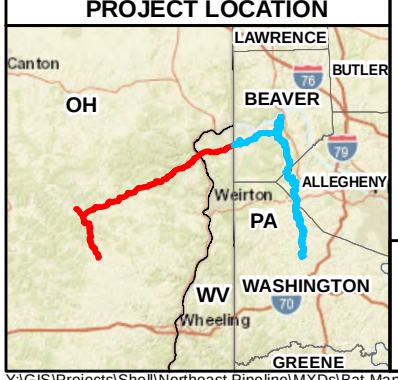
Wisconsin Department of Natural Resources. 2013. Wisconsin Northern Long-Eared Bat Species Guidance. Bureau of Natural Heritage Conservation, Wisconsin Department of Natural Resources

Figure 1

Project Location Map



PROJECT LOCATION



LEGEND

- PROPOSED HOUSTON TO MONACA PIPELINE
- PROPOSED SCIO TO MONACA PIPELINE
- PROPOSED CADIZ TO SCIO PIPELINE
- PROJECT AREA
- COUNTY BOUNDARY
- STATE BOUNDARY

MILES: 0 2.5 5 10

REFERENCE: BACKGROUND LAYER - SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P CORP., NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI (THAILAND), MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY.

COORDINATE SYSTEM: NAD 1983 UTM ZONE 17NTRANSVERSE MERCATOR

SHELL PIPELINE COMPANY, LP
910 LOUISIANA STREET,
ROOM 41082A
HOUSTON, TEXAS 77002

AECOM
FOSTER PLAZA 6
681 ANDERSEN DRIVE
SUITE 400
PITTSBURGH, PA 15220
412-503-4700

FIGURE 1

Location Map

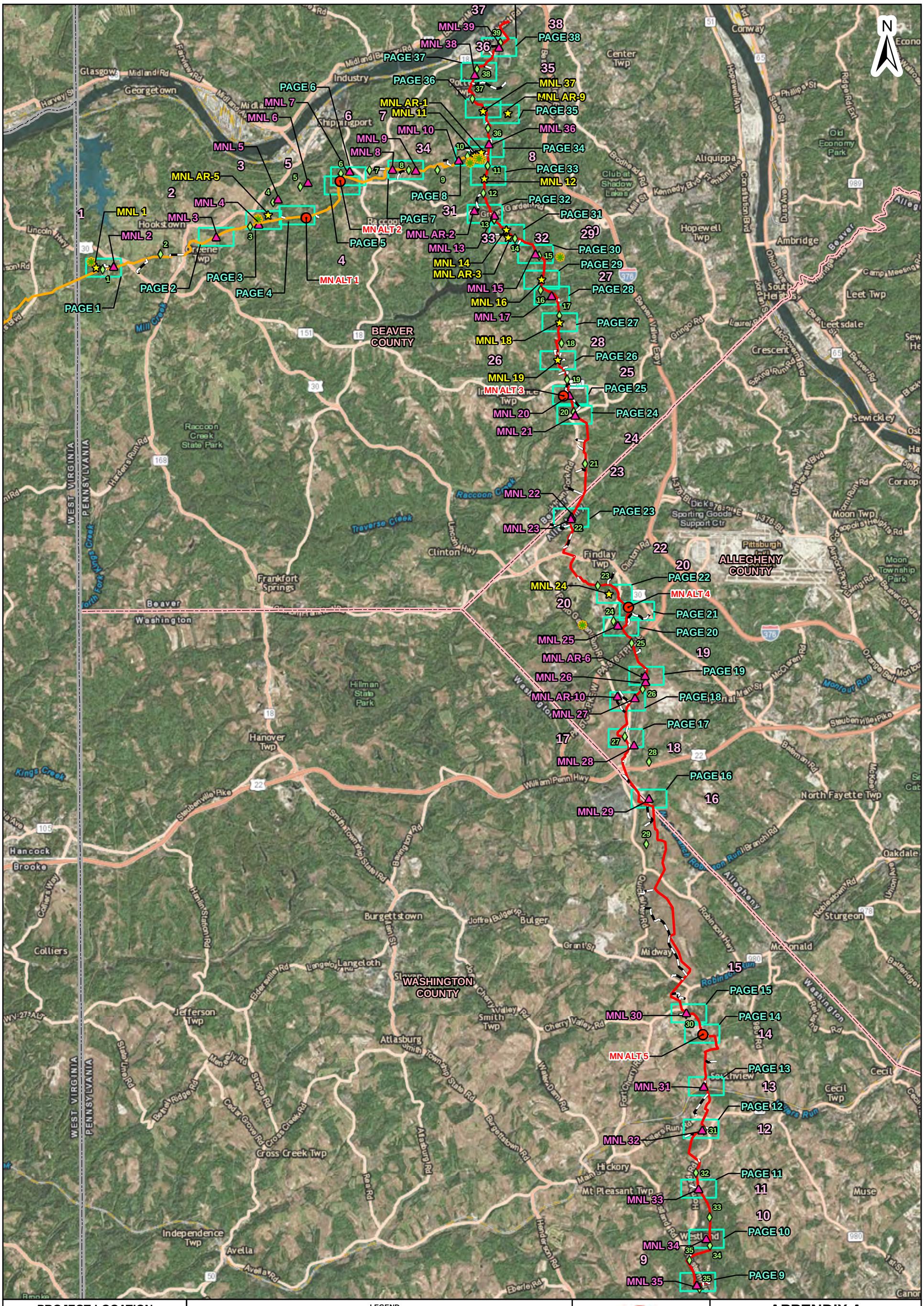
SHELL PIPELINE COMPANY, LP
FALCON ETHANE
PIPELINE PROJECT

DRAWN BY: KFS Date: 12/9/2016
APPROVED: JLK PROJECT #: 60487539

Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_Bat_Project_Location_Map_161209.mxd

Appendices

Appendix A
Mist-netting Location Mapping



PROJECT LOCATION

ALLEGHENY, BEAVER, AND WASHINGTON COUNTIES, PENNSYLVANIA

LEGEND

- ADDITIONAL MIST-NIETTING LOCATION
- ROOST TREE
- MIST NETTING LOCATION (MNL)
- MYSE CAPTURED MIST NETTINGL LOCATION
- PREVIOUSLY SUBMITTED KILOMETER MARKER
- PROPOSED ACCESS ROAD
- PROPOSED HOUSTON TO MONACA PIPELINE
- PROPOSED SCIO TO MONACA PIPELINE
- PAGE BOUNDARY
- COUNTY BOUNDARY
- STATE BOUNDARY

REFERENCE: AERIAL LAYER - SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P CORP., NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI (THAILAND), MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY
ESRI, HERE, DELORME, MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS
ESRI, HERE, DELORME, MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY
COORDINATE SYSTEM: NAD 1983 UTM ZONE 17NTRANSVERSE MERCATOR

SHELL PIPELINE COMPANY, LP
910 LOUISIANA STREET,
ROOM 41082A
HOUSTON, TEXAS 77002

AECOM
FOSTER PLAZA 6
681 ANDERSEN DRIVE
SUITE 400
PITTSBURGH, PA 15220
412-503-4700

APPENDIX A

MIST-NETTING LOCATION INDEX MAP

SHELL PIPELINE COMPANY, LP
FALCON ETHANE PIPELINE PROJECT

DRAWN BY: KFS Date: 5/31/2017
APPROVED: JLK PROJECT #: 60487539

PATH:Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_Bat_MNL_Map_INDEX_20170530.mxd

PROJECT LOCATION

ALLEGHENY, BEAVER, AND WASHINGTON COUNTIES, PENNSYLVANIA

LEGEND

- ADDITIONAL MIST-NIETTING LOCATION
- ROOST TREE
- PREVIOUSLY SUBMITTED KILOMETER MARKER
- MILEPOSTS
- MIST NETTING LOCATION (MNL)
- MYSE CAPTURED MIST NETTINGL LOCATION
- PROPOSED HOUSTON TO MONACA PIPELINE
- PROPOSED SCIO TO MONACA PIPELINE
- PROPOSED ACCESS ROAD
- OPEN END WETLAND LINE
- EPHEMERAL STREAM
- INTERMITTENT STREAM
- PERENNIAL STREAM
- DELINEATED PEM WETLAND
- DELINEATED PFO WETLAND
- DELINEATED PSS WETLAND
- DELINEATED PUB WETLAND
- PROPOSED LOD
- TOWNSHIP BOUNDARY
- COUNTY BOUNDARY
- STATE BOUNDARY

REFERENCE: AERIAL LAYER - CONTRACTED IMAGERY TAKEN OCTOBER, 2015 AND SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P CORP., NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI (THAILAND), MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY, COPYRIGHT:© 2013 NATIONAL GEOGRAPHIC SOCIETY, I-CUBED .

COORDINATE SYSTEM: NAD 1983 UTM ZONE 17NTRANSVERSE MERCATOR

0 125 250 500 Feet

SHELL PIPELINE COMPANY, LP
910 LOUISIANA STREET,
ROOM 41082A
HOUSTON, TEXAS 77002

AECOM
FOSTER PLAZA 6
681 ANDERSEN DRIVE
4TH FLOOR
PITTSBURGH, PA 15220
412-503-4700

APPENDIX A

MIST-NETTING LOCATION MAP

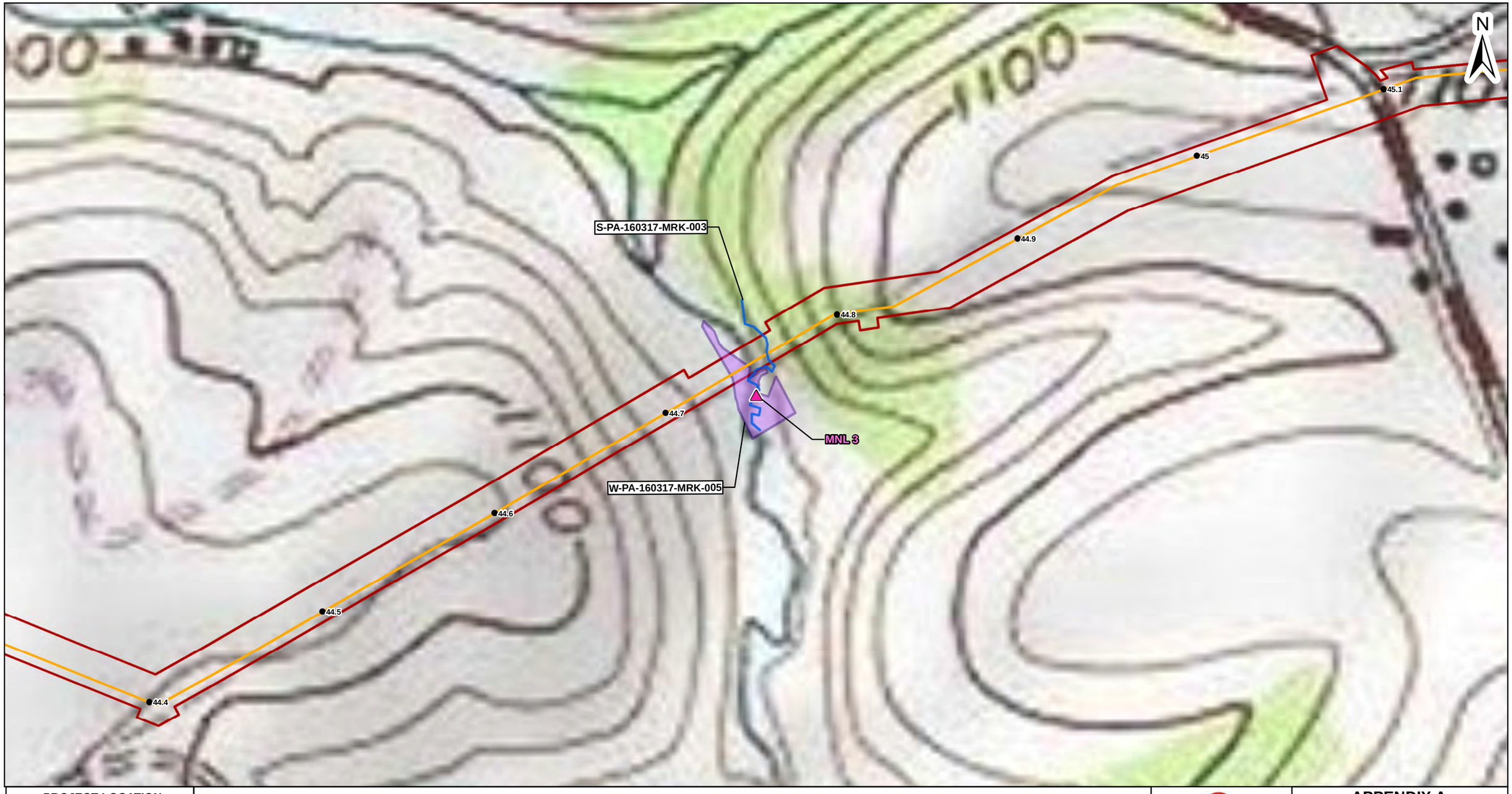
PAGE 1 OF 38

SHELL PIPELINE COMPANY, LP
FALCON ETHANE PIPELINE PROJECT

DRAWN BY: KFS Date: 5/31/2017
APPROVED: JLK PROJECT#: 60487539

Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PATH:Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd



PROJECT LOCATION

ALLEGHENY, BEAVER, AND WASHINGTON COUNTIES, PENNSYLVANIA

LEGEND

- ADDITIONAL MIST-NIETTING LOCATION
- ROOST TREE
- PREVIOUSLY SUBMITTED KILOMETER MARKER
- MILEPOSTS
- MIST NETTING LOCATION (MNL)
- MYSE CAPTURED MIST NETTINGL LOCATION
- PROPOSED HOUSTON TO MONACA PIPELINE
- PROPOSED SCIO TO MONACA PIPELINE
- PROPOSED ACCESS ROAD
- OPEN END WETLAND LINE
- EPHEMERAL STREAM
- INTERMITTENT STREAM
- PERENNIAL STREAM
- DELINEATED PEM WETLAND
- DELINEATED PFO WETLAND
- DELINEATED PSS WETLAND
- DELINEATED PUB WETLAND
- PROPOSED LOD
- TOWNSHIP BOUNDARY
- COUNTY BOUNDARY
- STATE BOUNDARY

REFERENCE: AERIAL LAYER - CONTRACTED IMAGERY TAKEN OCTOBER, 2015 AND SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P CORP., NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI (THAILAND), MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY, COPYRIGHT:© 2013 NATIONAL GEOGRAPHIC SOCIETY, I-CUBED .

COORDINATE SYSTEM: NAD 1983 UTM ZONE 17NTRANSVERSE MERCATOR

0 125 250 500 Feet

SHELL PIPELINE COMPANY, LP
910 LOUISIANA STREET,
ROOM 41082A
HOUSTON, TEXAS 77002

AECOM
FOSTER PLAZA 6
681 ANDERSEN DRIVE
4TH FLOOR
PITTSBURGH, PA 15220
412-503-4700

APPENDIX A

MIST-NETTING LOCATION MAP

SHELL PIPELINE COMPANY, LP
FALCON ETHANE PIPELINE PROJECT

DRAWN BY: KFS Date: 5/31/2017
APPROVED: JLK PROJECT#: 60487539

Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PATH:Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PROJECT LOCATION

ALLEGHENY, BEAVER, AND WASHINGTON COUNTIES, PENNSYLVANIA

LEGEND

- ADDITIONAL MIST-NIETTING LOCATION
- ROOST TREE
- PREVIOUSLY SUBMITTED KILOMETER MARKER
- MILEPOSTS
- MIST NETTING LOCATION (MNL)
- MYSE CAPTURED MIST NETTINGL LOCATION
- PROPOSED HOUSTON TO MONACA PIPELINE
- PROPOSED SCIO TO MONACA PIPELINE
- PROPOSED ACCESS ROAD
- OPEN END WETLAND LINE
- EPHEMERAL STREAM
- INTERMITTENT STREAM
- PERENNIAL STREAM
- DELINEATED PEM WETLAND
- DELINEATED PFO WETLAND
- DELINEATED PSS WETLAND
- DELINEATED PUB WETLAND
- PROPOSED LOD
- TOWNSHIP BOUNDARY
- COUNTY BOUNDARY
- STATE BOUNDARY

REFERENCE: AERIAL LAYER - CONTRACTED IMAGERY TAKEN OCTOBER, 2015 AND SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P CORP., NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI (THAILAND), MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY, COPYRIGHT:© 2013 NATIONAL GEOGRAPHIC SOCIETY, I-CUBED .

COORDINATE SYSTEM: NAD 1983 UTM ZONE 17NTRANSVERSE MERCATOR

0 125 250 500 Feet

SHELL PIPELINE COMPANY, LP
910 LOUISIANA STREET,
ROOM 41082A
HOUSTON, TEXAS 77002

AECOM
FOSTER PLAZA 6
681 ANDERSEN DRIVE
4TH FLOOR
PITTSBURGH, PA 15220
412-503-4700

APPENDIX A

MIST-NETTING LOCATION MAP

SHELL PIPELINE COMPANY, LP
FALCON ETHANE PIPELINE PROJECT

DRAWN BY: KFS Date: 5/31/2017
APPROVED: JLK PROJECT#: 60487539

Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PATH:Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PROJECT LOCATION

ALLEGHENY, BEAVER, AND WASHINGTON COUNTIES, PENNSYLVANIA

LEGEND

- ADDITIONAL MIST-NIETTING LOCATION
- ROOST TREE
- PREVIOUSLY SUBMITTED KILOMETER MARKER
- MILEPOSTS
- MIST NETTING LOCATION (MNL)
- MYSE CAPTURED MIST NETTINGL LOCATION
- PROPOSED HOUSTON TO MONACA PIPELINE
- PROPOSED SCIO TO MONACA PIPELINE
- PROPOSED ACCESS ROAD
- OPEN END WETLAND LINE
- EPHEMERAL STREAM
- INTERMITTENT STREAM
- PERENNIAL STREAM
- DELINEATED PEM WETLAND
- DELINEATED PFO WETLAND
- DELINEATED PSS WETLAND
- DELINEATED PUB WETLAND
- PROPOSED LOD
- TOWNSHIP BOUNDARY
- COUNTY BOUNDARY
- STATE BOUNDARY

REFERENCE: AERIAL LAYER - CONTRACTED IMAGERY TAKEN OCTOBER, 2015 AND SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P CORP., NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI (THAILAND), MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY, COPYRIGHT:© 2013 NATIONAL GEOGRAPHIC SOCIETY, I-CUBED .

COORDINATE SYSTEM: NAD 1983 UTM ZONE 17NTRANSVERSE MERCATOR

0 125 250 500 Feet

SHELL PIPELINE COMPANY, LP
910 LOUISIANA STREET,
ROOM 41082A
HOUSTON, TEXAS 77002

AECOM
FOSTER PLAZA 6
681 ANDERSEN DRIVE
4TH FLOOR
PITTSBURGH, PA 15220
412-503-4700

APPENDIX A

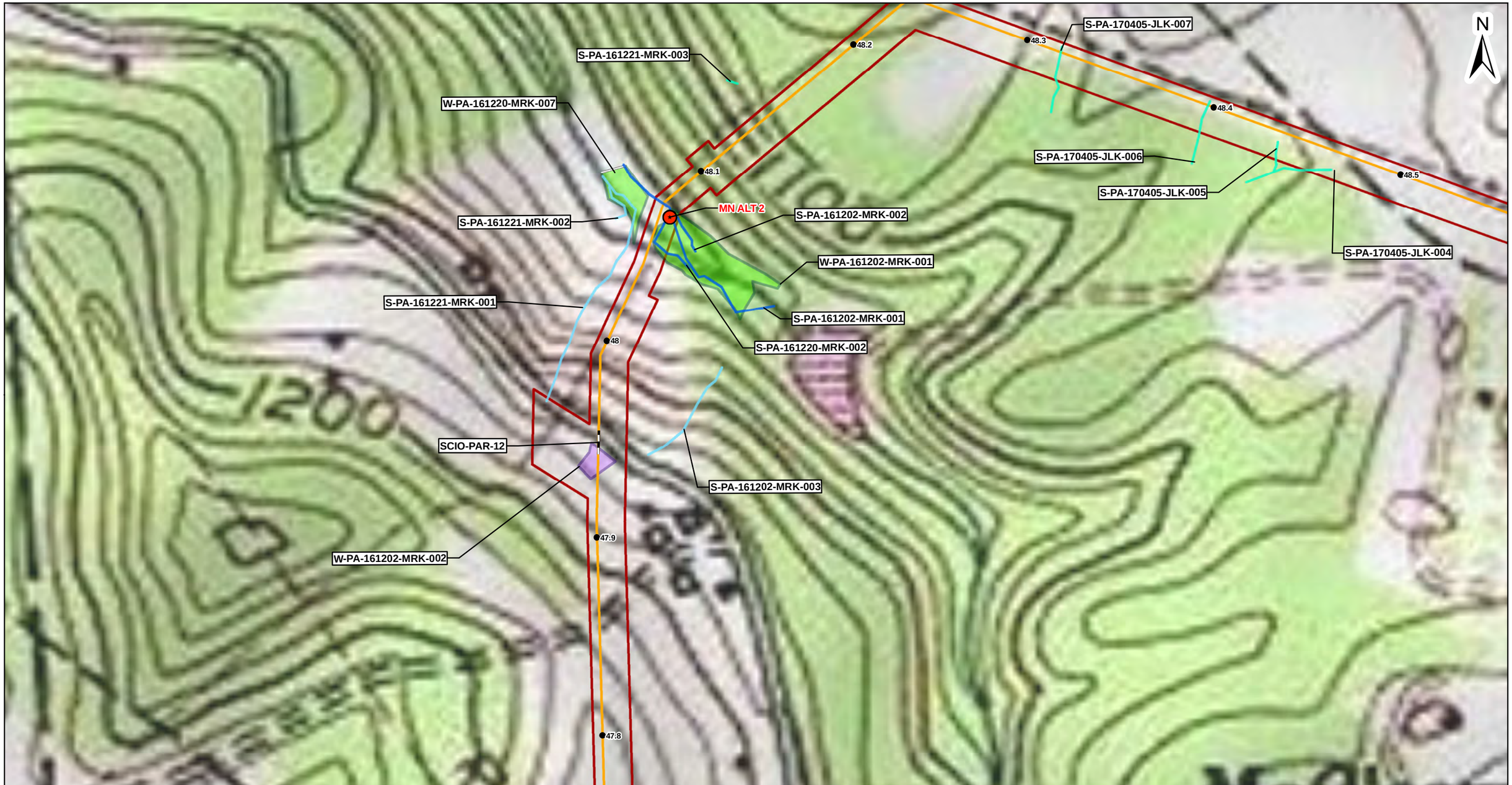
MIST-NETTING LOCATION MAP

SHELL PIPELINE COMPANY, LP
FALCON ETHANE PIPELINE PROJECT

DRAWN BY: KFS Date: 5/31/2017
APPROVED: JLK PROJECT#: 60487539

Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PATH:Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd



PROJECT LOCATION

ALLEGHENY, BEAVER, AND WASHINGTON COUNTIES, PENNSYLVANIA

LEGEND

- ADDITIONAL MIST-NIETTING LOCATION
- ROOST TREE
- PREVIOUSLY SUBMITTED KILOMETER MARKER
- MILEPOSTS
- MIST NETTING LOCATION (MNL)
- MYSE CAPTURED MIST NETTINGL LOCATION
- PROPOSED HOUSTON TO MONACA PIPELINE
- PROPOSED SCIO TO MONACA PIPELINE
- PROPOSED ACCESS ROAD
- OPEN END WETLAND LINE
- EPHEMERAL STREAM
- INTERMITTENT STREAM
- PERENNIAL STREAM
- DELINEATED PEM WETLAND
- DELINEATED PFO WETLAND
- DELINEATED PSS WETLAND
- DELINEATED PUB WETLAND
- PROPOSED LOD
- TOWNSHIP BOUNDARY
- COUNTY BOUNDARY
- STATE BOUNDARY

REFERENCE: AERIAL LAYER - CONTRACTED IMAGERY TAKEN OCTOBER, 2015 AND SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P CORP., NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI (THAILAND), MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY, COPYRIGHT:© 2013 NATIONAL GEOGRAPHIC SOCIETY, I-CUBED .

COORDINATE SYSTEM: NAD 1983 UTM ZONE 17NTRANSVERSE MERCATOR

0 125 250 500 Feet

SHELL PIPELINE COMPANY, LP
910 LOUISIANA STREET,
ROOM 41082A
HOUSTON, TEXAS 77002

AECOM
FOSTER PLAZA 6
681 ANDERSEN DRIVE
4TH FLOOR
PITTSBURGH, PA 15220
412-503-4700

APPENDIX A

MIST-NETTING LOCATION MAP

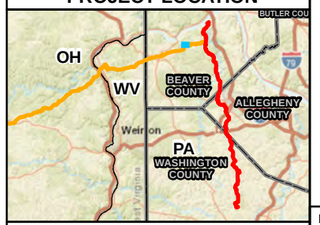
SHELL PIPELINE COMPANY, LP
FALCON ETHANE PIPELINE PROJECT

DRAWN BY: KFS Date: 5/31/2017
APPROVED: JLK PROJECT#: 60487539

Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PATH:Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PROJECT LOCATION



ALLEGHENY, BEAVER, AND WASHINGTON COUNTIES, PENNSYLVANIA

LEGEND

- ADDITIONAL MIST-NIETTING LOCATION
- ROOST TREE
- PREVIOUSLY SUBMITTED KILOMETER MARKER
- MILEPOSTS
- MIST NETTING LOCATION (MNL)
- MYSE CAPTURED MIST NETTINGL LOCATION
- PROPOSED HOUSTON TO MONACA PIPELINE
- PROPOSED SCIO TO MONACA PIPELINE
- PROPOSED ACCESS ROAD
- OPEN END WETLAND LINE
- EPHEMERAL STREAM
- INTERMITTENT STREAM
- PERENNIAL STREAM
- DELINEATED PEM WETLAND
- DELINEATED PFO WETLAND
- DELINEATED PSS WETLAND
- DELINEATED PUB WETLAND
- PROPOSED LOD
- TOWNSHIP BOUNDARY
- COUNTY BOUNDARY
- STATE BOUNDARY

REFERENCE: AERIAL LAYER - CONTRACTED IMAGERY TAKEN OCTOBER, 2015 AND SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P CORP., NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI (THAILAND), MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY, COPYRIGHT:© 2013 NATIONAL GEOGRAPHIC SOCIETY, I-CUBED .

COORDINATE SYSTEM: NAD 1983 UTM ZONE 17NTRANSVERSE MERCATOR

0 125 250 500 Feet

SHELL PIPELINE COMPANY, LP
910 LOUISIANA STREET,
ROOM 41082A
HOUSTON, TEXAS 77002

AECOM
FOSTER PLAZA 6
681 ANDERSEN DRIVE
4TH FLOOR
PITTSBURGH, PA 15220
412-503-4700

APPENDIX A

MIST-NETTING LOCATION MAP

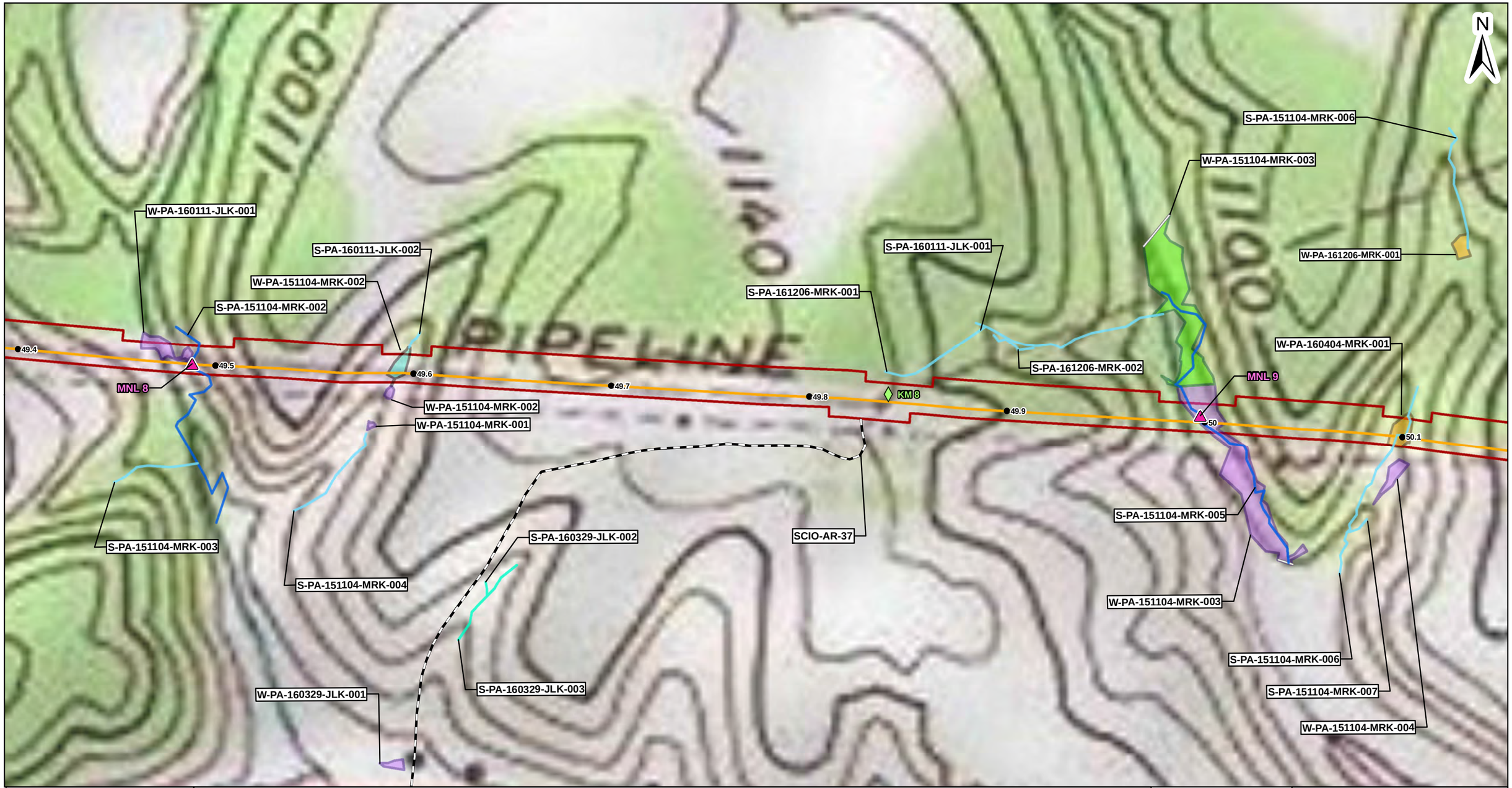
PAGE 6 OF 38

SHELL PIPELINE COMPANY, LP
FALCON ETHANE PIPELINE PROJECT

DRAWN BY: KFS Date: 5/31/2017
APPROVED: JLK PROJECT#: 60487539

Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PATH:Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd



PROJECT LOCATION

ALLEGHENY, BEAVER, AND WASHINGTON COUNTIES, PENNSYLVANIA

LEGEND

- ADDITIONAL MIST-NIETTING LOCATION
- ROOST TREE
- PREVIOUSLY SUBMITTED KILOMETER MARKER
- MILEPOSTS
- MIST NETTING LOCATION (MNL)
- MYSE CAPTURED MIST NETTINGL LOCATION
- PROPOSED HOUSTON TO MONACA PIPELINE
- PROPOSED SCIO TO MONACA PIPELINE
- PROPOSED ACCESS ROAD
- OPEN END WETLAND LINE
- EPHEMERAL STREAM
- INTERMITTENT STREAM
- PERENNIAL STREAM
- DELINEATED PEM WETLAND
- DELINEATED PFO WETLAND
- DELINEATED PSS WETLAND
- DELINEATED PUB WETLAND
- PROPOSED LOD
- TOWNSHIP BOUNDARY
- COUNTY BOUNDARY
- STATE BOUNDARY

REFERENCE: AERIAL LAYER - CONTRACTED IMAGERY TAKEN OCTOBER, 2015 AND SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P CORP., NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI (THAILAND), MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY, COPYRIGHT:© 2013 NATIONAL GEOGRAPHIC SOCIETY, I-CUBED .

COORDINATE SYSTEM: NAD 1983 UTM ZONE 17NTRANSVERSE MERCATOR

0 125 250 500 Feet

SHELL PIPELINE COMPANY, LP
910 LOUISIANA STREET,
ROOM 41082A
HOUSTON, TEXAS 77002

AECOM
FOSTER PLAZA 6
681 ANDERSEN DRIVE
4TH FLOOR
PITTSBURGH, PA 15220
412-503-4700

APPENDIX A

MIST-NETTING LOCATION MAP

SHELL PIPELINE COMPANY, LP
FALCON ETHANE PIPELINE PROJECT

DRAWN BY: KFS Date: 5/31/2017
APPROVED: JLK PROJECT#: 60487539

Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PATH:Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PROJECT LOCATION

ALLEGHENY, BEAVER, AND WASHINGTON COUNTIES, PENNSYLVANIA

LEGEND

- ADDITIONAL MIST-NIETTING LOCATION
- ROOST TREE
- PREVIOUSLY SUBMITTED KILOMETER MARKER
- MILEPOSTS
- MIST NETTING LOCATION (MNL)
- MYSE CAPTURED MIST NETTINGL LOCATION
- PROPOSED HOUSTON TO MONACA PIPELINE
- PROPOSED SCIO TO MONACA PIPELINE
- PROPOSED ACCESS ROAD
- OPEN END WETLAND LINE
- EPHEMERAL STREAM
- INTERMITTENT STREAM
- PERENNIAL STREAM
- DELINEATED PEM WETLAND
- DELINEATED PFO WETLAND
- DELINEATED PSS WETLAND
- DELINEATED PUB WETLAND
- PROPOSED LOD
- TOWNSHIP BOUNDARY
- COUNTY BOUNDARY
- STATE BOUNDARY

REFERENCE: AERIAL LAYER - CONTRACTED IMAGERY TAKEN OCTOBER, 2015 AND SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P CORP., NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI (THAILAND), MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY, COPYRIGHT:© 2013 NATIONAL GEOGRAPHIC SOCIETY, I-CUBED .

COORDINATE SYSTEM: NAD 1983 UTM ZONE 17NTRANSVERSE MERCATOR

0 125 250 500 Feet

SHELL PIPELINE COMPANY, LP
910 LOUISIANA STREET,
ROOM 41082A
HOUSTON, TEXAS 77002

AECOM
FOSTER PLAZA 6
681 ANDERSEN DRIVE
4TH FLOOR
PITTSBURGH, PA 15220
412-503-4700

APPENDIX A

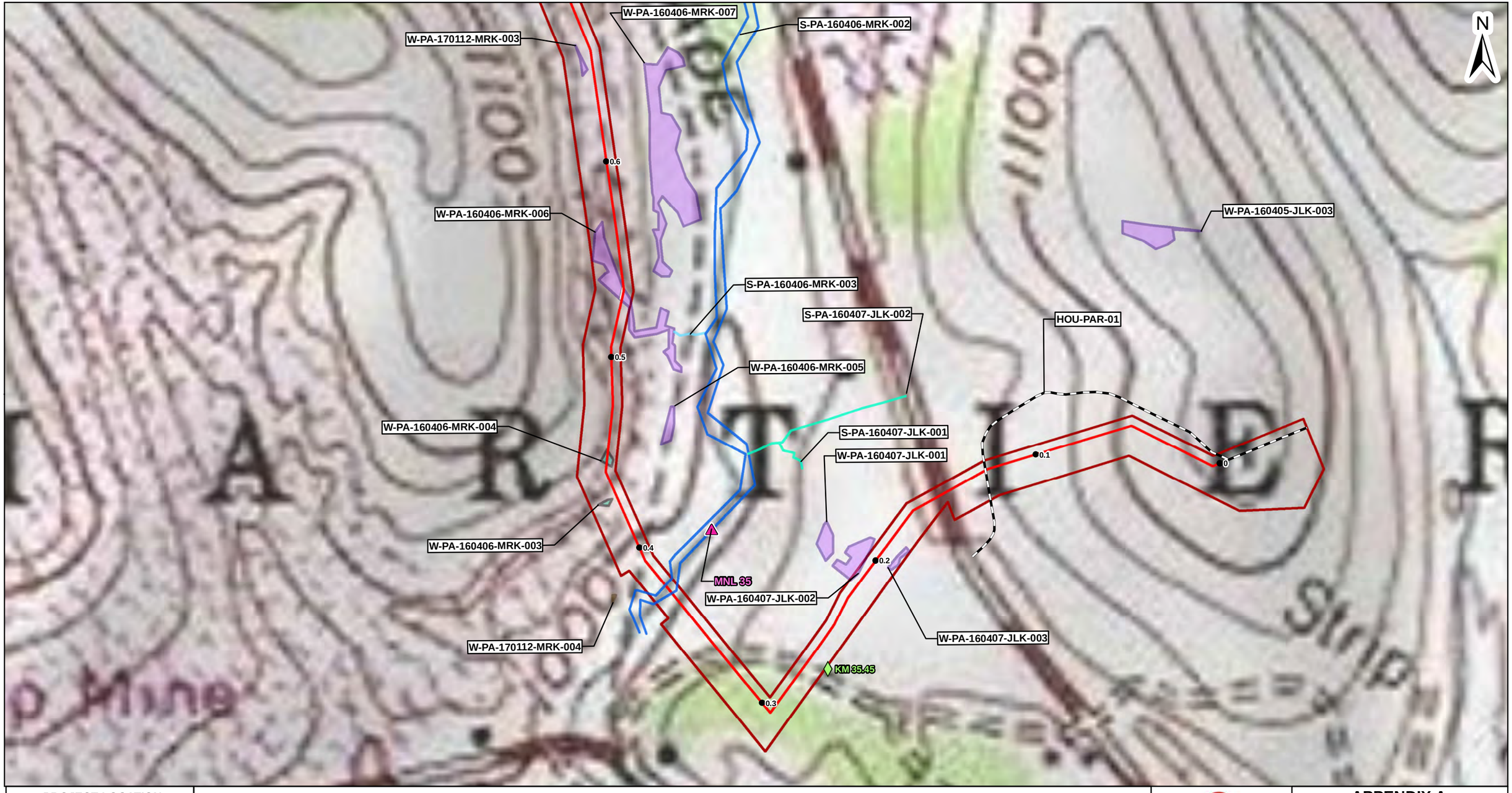
MIST-NETTING LOCATION MAP

SHELL PIPELINE COMPANY, LP
FALCON ETHANE PIPELINE PROJECT

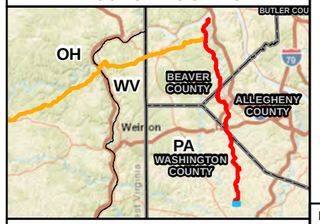
DRAWN BY: KFS Date: 5/31/2017
APPROVED: JLK PROJECT#: 60487539

Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PATH:Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd



PROJECT LOCATION



ALLEGHENY, BEAVER, AND WASHINGTON COUNTIES, PENNSYLVANIA

LEGEND

- ADDITIONAL MIST-NIETTING LOCATION
- ROOST TREE
- PREVIOUSLY SUBMITTED KILOMETER MARKER
- MILEPOSTS
- MIST NETTING LOCATION (MNL)
- MYSE CAPTURED MIST NETTINGL LOCATION
- PROPOSED HOUSTON TO MONACA PIPELINE
- PROPOSED SCIO TO MONACA PIPELINE
- PROPOSED ACCESS ROAD
- OPEN END WETLAND LINE
- EPHEMERAL STREAM
- INTERMITTENT STREAM
- PERENNIAL STREAM
- DELINEATED PEM WETLAND
- DELINEATED PFO WETLAND
- DELINEATED PSS WETLAND
- DELINEATED PUB WETLAND
- PROPOSED LOD
- TOWNSHIP BOUNDARY
- COUNTY BOUNDARY
- STATE BOUNDARY

REFERENCE: AERIAL LAYER - CONTRACTED IMAGERY TAKEN OCTOBER, 2015 AND SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P CORP., NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI (THAILAND), MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY, COPYRIGHT:© 2013 NATIONAL GEOGRAPHIC SOCIETY, I-CUBED .

COORDINATE SYSTEM: NAD 1983 UTM ZONE 17NTRANSVERSE MERCATOR

0 125 250 500 Feet

SHELL PIPELINE COMPANY, LP
910 LOUISIANA STREET,
ROOM 41082A
HOUSTON, TEXAS 77002

AECOM
FOSTER PLAZA 6
681 ANDERSEN DRIVE
4TH FLOOR
PITTSBURGH, PA 15220
412-503-4700

APPENDIX A

MIST-NETTING LOCATION MAP

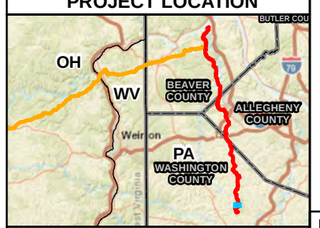
SHELL PIPELINE COMPANY, LP
FALCON ETHANE PIPELINE PROJECT

DRAWN BY: KFS Date: 5/31/2017
APPROVED: JLK PROJECT#: 60487539

Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PATH:Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PROJECT LOCATION



ALLEGHENY, BEAVER, AND WASHINGTON COUNTIES, PENNSYLVANIA

LEGEND

- ADDITIONAL MIST-NIETTING LOCATION
- ROOST TREE
- PREVIOUSLY SUBMITTED KILOMETER MARKER
- MILEPOSTS
- MIST NETTING LOCATION (MNL)
- MYSE CAPTURED MIST NETTINGL LOCATION
- PROPOSED HOUSTON TO MONACA PIPELINE
- PROPOSED SCIO TO MONACA PIPELINE
- PROPOSED ACCESS ROAD
- OPEN END WETLAND LINE
- EPHEMERAL STREAM
- INTERMITTENT STREAM
- PERENNIAL STREAM
- DELINEATED PEM WETLAND
- DELINEATED PFO WETLAND
- DELINEATED PSS WETLAND
- DELINEATED PUB WETLAND
- PROPOSED LOD
- TOWNSHIP BOUNDARY
- COUNTY BOUNDARY
- STATE BOUNDARY

REFERENCE: AERIAL LAYER - CONTRACTED IMAGERY TAKEN OCTOBER, 2015 AND SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P CORP., NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI (THAILAND), MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY, COPYRIGHT:© 2013 NATIONAL GEOGRAPHIC SOCIETY, I-CUBED .

COORDINATE SYSTEM: NAD 1983 UTM ZONE 17NTRANSVERSE MERCATOR

0 125 250 500 Feet

SHELL PIPELINE COMPANY, LP
910 LOUISIANA STREET,
ROOM 41082A
HOUSTON, TEXAS 77002

AECOM
FOSTER PLAZA 6
681 ANDERSEN DRIVE
4TH FLOOR
PITTSBURGH, PA 15220
412-503-4700

APPENDIX A

MIST-NETTING LOCATION MAP

SHELL PIPELINE COMPANY, LP
FALCON ETHANE PIPELINE PROJECT

DRAWN BY: KFS Date: 5/31/2017
APPROVED: JLK PROJECT#: 60487539

Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PATH:Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PROJECT LOCATION

ALLEGHENY, BEAVER, AND WASHINGTON COUNTIES, PENNSYLVANIA

LEGEND

- ADDITIONAL MIST-NIETTING LOCATION
- ROOST TREE
- PREVIOUSLY SUBMITTED KILOMETER MARKER
- MILEPOSTS
- MIST NETTING LOCATION (MNL)
- MYSE CAPTURED MIST NETTINGL LOCATION
- PROPOSED HOUSTON TO MONACA PIPELINE
- PROPOSED SCIO TO MONACA PIPELINE
- PROPOSED ACCESS ROAD
- OPEN END WETLAND LINE
- EPHEMERAL STREAM
- INTERMITTENT STREAM
- PERENNIAL STREAM
- DELINEATED PEM WETLAND
- DELINEATED PFO WETLAND
- DELINEATED PSS WETLAND
- DELINEATED PUB WETLAND
- PROPOSED LOD
- TOWNSHIP BOUNDARY
- COUNTY BOUNDARY
- STATE BOUNDARY

REFERENCE: AERIAL LAYER - CONTRACTED IMAGERY TAKEN OCTOBER, 2015 AND SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P CORP., NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI (THAILAND), MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY, COPYRIGHT:© 2013 NATIONAL GEOGRAPHIC SOCIETY, I-CUBED .

COORDINATE SYSTEM: NAD 1983 UTM ZONE 17NTRANSVERSE MERCATOR

0 125 250 500 Feet

SHELL PIPELINE COMPANY, LP
910 LOUISIANA STREET,
ROOM 41082A
HOUSTON, TEXAS 77002

AECOM
FOSTER PLAZA 6
681 ANDERSEN DRIVE
4TH FLOOR
PITTSBURGH, PA 15220
412-503-4700

APPENDIX A

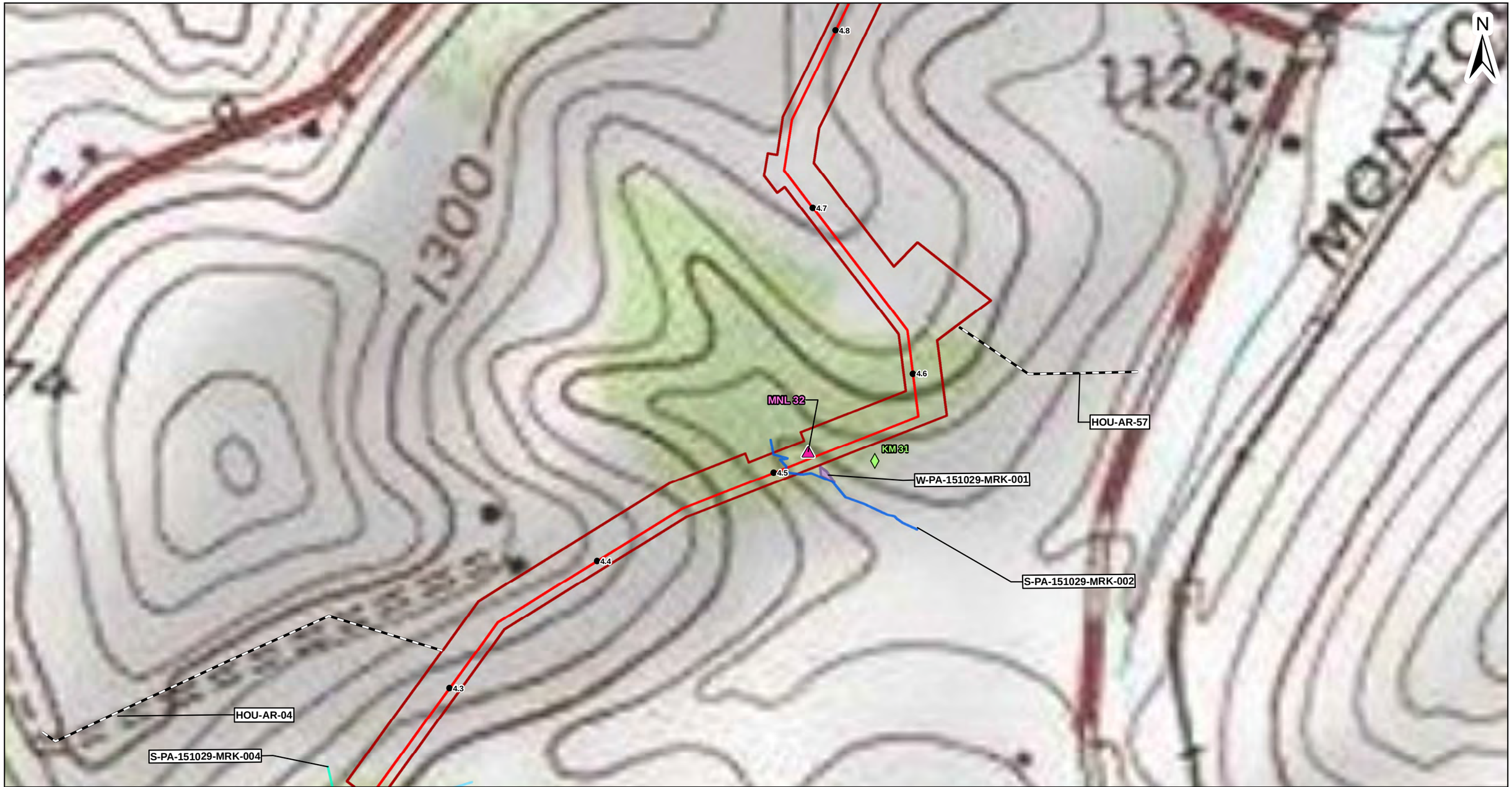
MIST-NETTING LOCATION MAP

SHELL PIPELINE COMPANY, LP
FALCON ETHANE PIPELINE PROJECT

DRAWN BY: KFS Date: 5/31/2017
APPROVED: JLK PROJECT#: 60487539

Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PATH:Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd



PROJECT LOCATION

ALLEGHENY, BEAVER, AND WASHINGTON COUNTIES, PENNSYLVANIA

LEGEND

- ADDITIONAL MIST-NIETTING LOCATION
- ROOST TREE
- PREVIOUSLY SUBMITTED KILOMETER MARKER
- MILEPOSTS
- MIST NETTING LOCATION (MNL)
- MYSE CAPTURED MIST NETTINGL LOCATION
- PROPOSED HOUSTON TO MONACA PIPELINE
- PROPOSED SCIO TO MONACA PIPELINE
- PROPOSED ACCESS ROAD
- OPEN END WETLAND LINE
- EPHEMERAL STREAM
- INTERMITTENT STREAM
- PERENNIAL STREAM
- DELINEATED PEM WETLAND
- DELINEATED PFO WETLAND
- DELINEATED PSS WETLAND
- DELINEATED PUB WETLAND
- PROPOSED LOD
- TOWNSHIP BOUNDARY
- COUNTY BOUNDARY
- STATE BOUNDARY

REFERENCE: AERIAL LAYER - CONTRACTED IMAGERY TAKEN OCTOBER, 2015 AND SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P CORP., NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI (THAILAND), MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY, COPYRIGHT:© 2013 NATIONAL GEOGRAPHIC SOCIETY, I-CUBED .

COORDINATE SYSTEM: NAD 1983 UTM ZONE 17NTRANSVERSE MERCATOR

0 125 250 500 Feet

SHELL PIPELINE COMPANY, LP
910 LOUISIANA STREET,
ROOM 41082A
HOUSTON, TEXAS 77002

AECOM
FOSTER PLAZA 6
681 ANDERSEN DRIVE
4TH FLOOR
PITTSBURGH, PA 15220
412-503-4700

APPENDIX A

MIST-NETTING LOCATION MAP

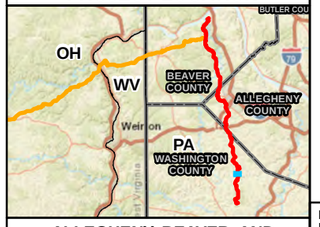
SHELL PIPELINE COMPANY, LP
FALCON ETHANE PIPELINE PROJECT

DRAWN BY: KFS Date: 5/31/2017
APPROVED: JLK PROJECT#: 60487539

Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PATH:Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PROJECT LOCATION



ALLEGHENY, BEAVER, AND WASHINGTON COUNTIES, PENNSYLVANIA

LEGEND

- ADDITIONAL MIST-NIETTING LOCATION
- ROOST TREE
- PREVIOUSLY SUBMITTED KILOMETER MARKER
- MILEPOSTS
- MIST NETTING LOCATION (MNL)
- MYSE CAPTURED MIST NETTINGL LOCATION
- PROPOSED HOUSTON TO MONACA PIPELINE
- PROPOSED SCIO TO MONACA PIPELINE
- PROPOSED ACCESS ROAD
- OPEN END WETLAND LINE
- EPHEMERAL STREAM
- INTERMITTENT STREAM
- PERENNIAL STREAM
- DELINEATED PEM WETLAND
- DELINEATED PFO WETLAND
- DELINEATED PSS WETLAND
- DELINEATED PUB WETLAND
- PROPOSED LOD
- TOWNSHIP BOUNDARY
- COUNTY BOUNDARY
- STATE BOUNDARY

REFERENCE: AERIAL LAYER - CONTRACTED IMAGERY TAKEN OCTOBER, 2015 AND SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P CORP., NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI (THAILAND), MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY, COPYRIGHT:© 2013 NATIONAL GEOGRAPHIC SOCIETY, I-CUBED .

COORDINATE SYSTEM: NAD 1983 UTM ZONE 17NTRANSVERSE MERCATOR

0 125 250 500 Feet

SHELL PIPELINE COMPANY, LP
910 LOUISIANA STREET,
ROOM 41082A
HOUSTON, TEXAS 77002

AECOM
FOSTER PLAZA 6
681 ANDERSEN DRIVE
4TH FLOOR
PITTSBURGH, PA 15220
412-503-4700

APPENDIX A

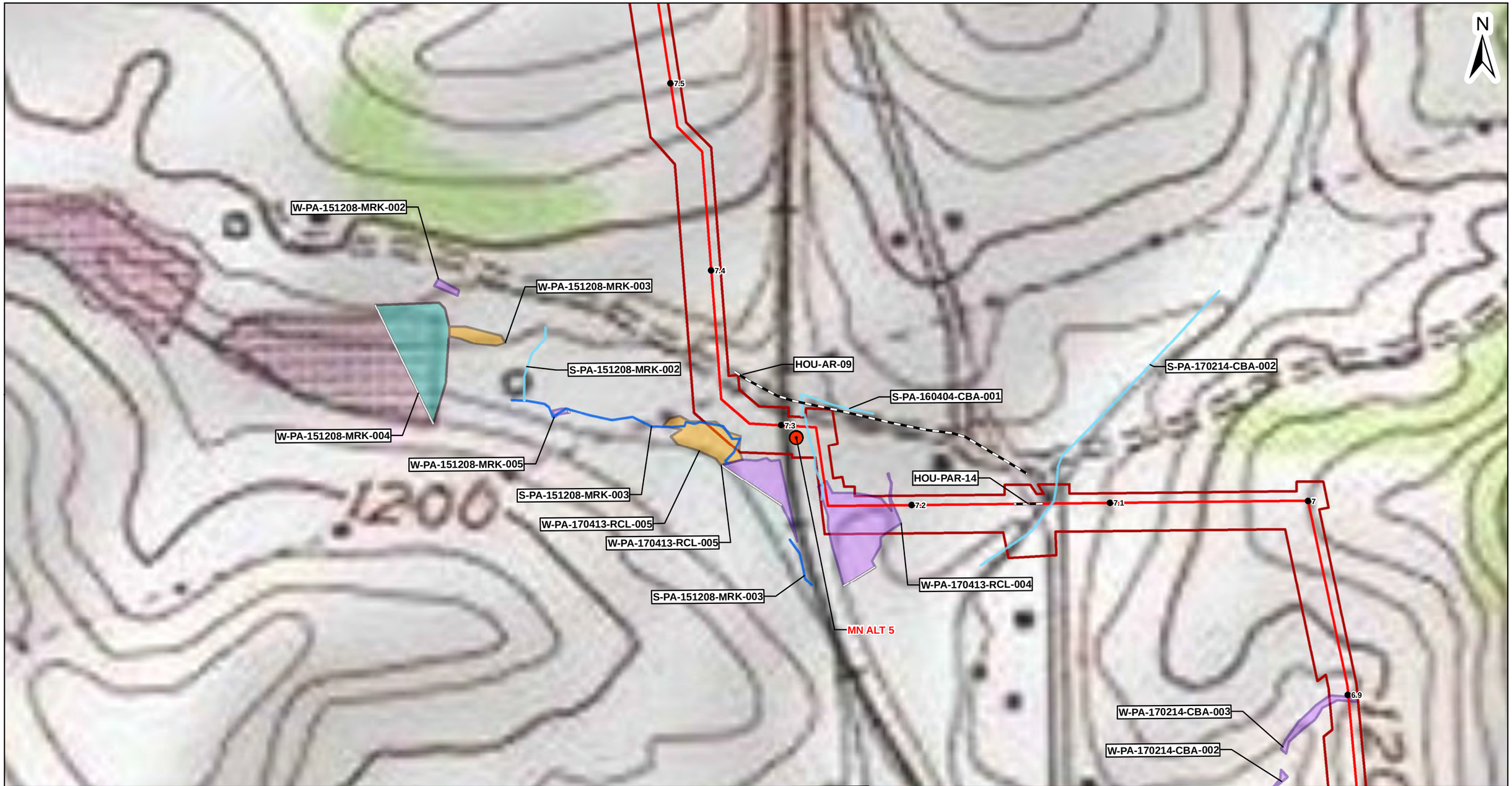
MIST-NETTING LOCATION MAP

SHELL PIPELINE COMPANY, LP
FALCON ETHANE PIPELINE PROJECT

DRAWN BY: KFS Date: 5/31/2017
APPROVED: JLK PROJECT#: 60487539

Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PATH:Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd



PROJECT LOCATION

ALLEGHENY, BEAVER, AND WASHINGTON COUNTIES, PENNSYLVANIA

LEGEND

- ADDITIONAL MIST-NIETTING LOCATION
- ROOST TREE
- PREVIOUSLY SUBMITTED KILOMETER MARKER
- MILEPOSTS
- MIST NETTING LOCATION (MNL)
- MYSE CAPTURED MIST NETTINGL LOCATION
- PROPOSED HOUSTON TO MONACA PIPELINE
- PROPOSED SCIO TO MONACA PIPELINE
- PROPOSED ACCESS ROAD
- OPEN END WETLAND LINE
- EPHEMERAL STREAM
- INTERMITTENT STREAM
- PERENNIAL STREAM
- DELINEATED PEM WETLAND
- DELINEATED PFO WETLAND
- DELINEATED PSS WETLAND
- DELINEATED PUB WETLAND
- PROPOSED LOD
- TOWNSHIP BOUNDARY
- COUNTY BOUNDARY
- STATE BOUNDARY

REFERENCE: AERIAL LAYER - CONTRACTED IMAGERY TAKEN OCTOBER, 2015 AND SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P CORP., NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI (THAILAND), MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY, COPYRIGHT:© 2013 NATIONAL GEOGRAPHIC SOCIETY, I-CUBED .

COORDINATE SYSTEM: NAD 1983 UTM ZONE 17NTRANSVERSE MERCATOR

0 125 250 500 Feet

SHELL PIPELINE COMPANY, LP
910 LOUISIANA STREET,
ROOM 41082A
HOUSTON, TEXAS 77002

AECOM
FOSTER PLAZA 6
681 ANDERSEN DRIVE
4TH FLOOR
PITTSBURGH, PA 15220
412-503-4700

APPENDIX A

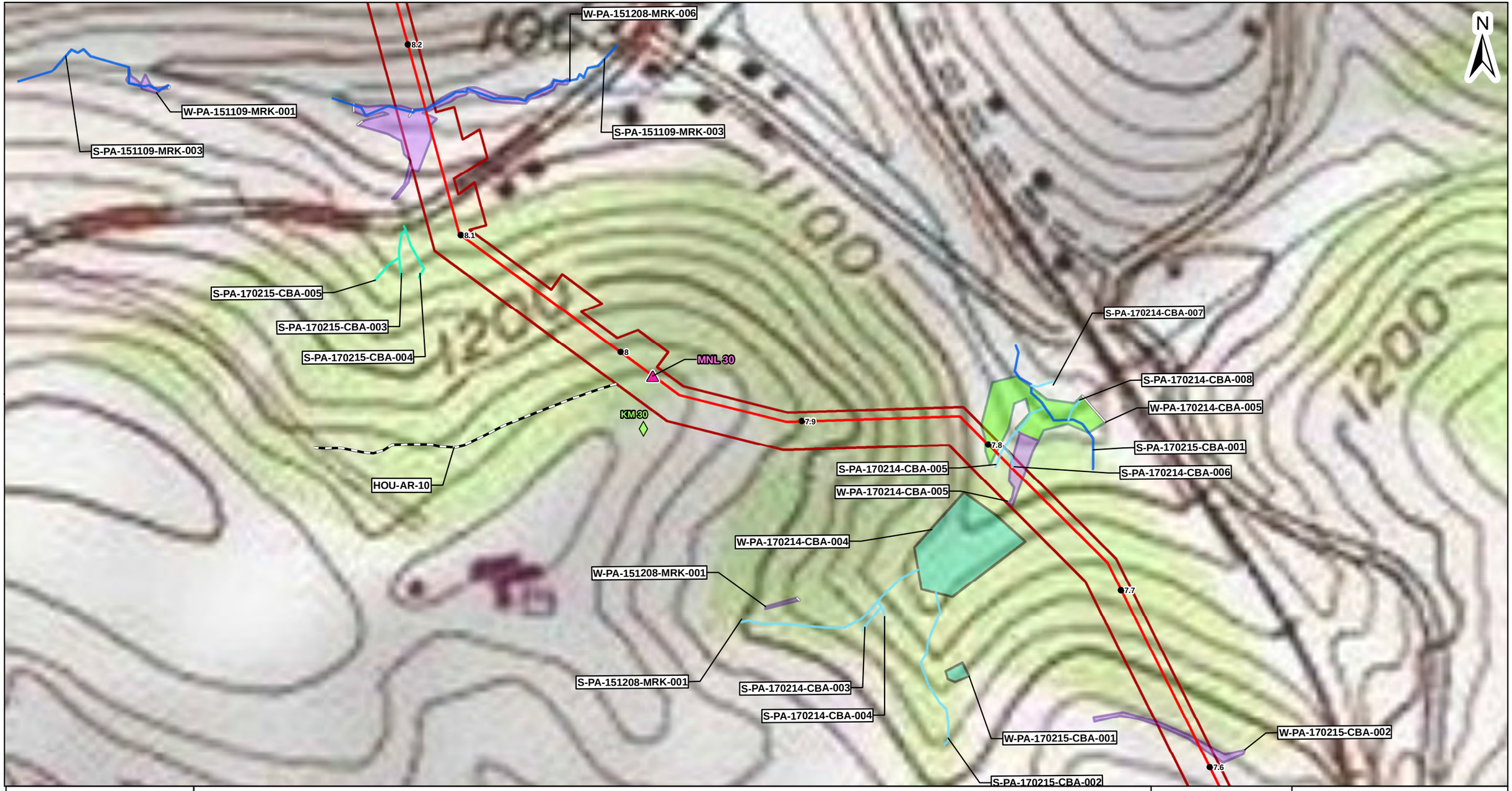
MIST-NETTING LOCATION MAP

SHELL PIPELINE COMPANY, LP
FALCON ETHANE PIPELINE PROJECT

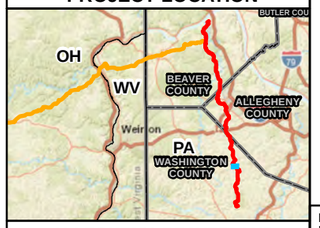
DRAWN BY: KFS Date: 5/31/2017
APPROVED: JLK PROJECT#: 60487539

Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PATH:Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd



PROJECT LOCATION



ALLEGHENY, BEAVER, AND WASHINGTON COUNTIES, PENNSYLVANIA

LEGEND

- ADDITIONAL MIST-NIETTING LOCATION
- ROOST TREE
- PREVIOUSLY SUBMITTED KILOMETER MARKER
- MILEPOSTS
- MIST NETTING LOCATION (MNL)
- MYSE CAPTURED MIST NETTINGL LOCATION
- PROPOSED HOUSTON TO MONACA PIPELINE
- PROPOSED SCIO TO MONACA PIPELINE
- PROPOSED ACCESS ROAD
- OPEN END WETLAND LINE
- EPHEMERAL STREAM
- INTERMITTENT STREAM
- PERENNIAL STREAM
- DELINEATED PEM WETLAND
- DELINEATED PFO WETLAND
- DELINEATED PSS WETLAND
- DELINEATED PUB WETLAND
- PROPOSED LOD
- TOWNSHIP BOUNDARY
- COUNTY BOUNDARY
- STATE BOUNDARY

REFERENCE: AERIAL LAYER - CONTRACTED IMAGERY TAKEN OCTOBER, 2015 AND SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P CORP., NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI (THAILAND), MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY, COPYRIGHT:© 2013 NATIONAL GEOGRAPHIC SOCIETY, I-CUBED .

COORDINATE SYSTEM: NAD 1983 UTM ZONE 17NTRANSVERSE MERCATOR

0 125 250 500 Feet

SHELL PIPELINE COMPANY, LP
910 LOUISIANA STREET,
ROOM 41082A
HOUSTON, TEXAS 77002

AECOM
FOSTER PLAZA 6
681 ANDERSEN DRIVE
4TH FLOOR
PITTSBURGH, PA 15220
412-503-4700

APPENDIX A

MIST-NETTING LOCATION MAP

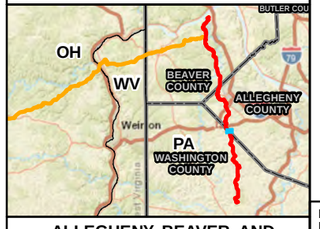
SHELL PIPELINE COMPANY, LP
FALCON ETHANE PIPELINE PROJECT

DRAWN BY: KFS Date: 5/31/2017
APPROVED: JLK PROJECT#: 60487539

Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PATH:Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PROJECT LOCATION



ALLEGHENY, BEAVER, AND WASHINGTON COUNTIES, PENNSYLVANIA

LEGEND

- ADDITIONAL MIST-NIETTING LOCATION
- ROOST TREE
- PREVIOUSLY SUBMITTED KILOMETER MARKER
- MILEPOSTS
- MIST NETTING LOCATION (MNL)
- MYSE CAPTURED MIST NETTINGL LOCATION
- PROPOSED HOUSTON TO MONACA PIPELINE
- PROPOSED SCIO TO MONACA PIPELINE
- PROPOSED ACCESS ROAD
- OPEN END WETLAND LINE
- EPHEMERAL STREAM
- INTERMITTENT STREAM
- PERENNIAL STREAM
- DELINEATED PEM WETLAND
- DELINEATED PFO WETLAND
- DELINEATED PSS WETLAND
- DELINEATED PUB WETLAND
- PROPOSED LOD
- TOWNSHIP BOUNDARY
- COUNTY BOUNDARY
- STATE BOUNDARY

REFERENCE: AERIAL LAYER - CONTRACTED IMAGERY TAKEN OCTOBER, 2015 AND SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P CORP., NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI (THAILAND), MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY, COPYRIGHT:© 2013 NATIONAL GEOGRAPHIC SOCIETY, I-CUBED .

COORDINATE SYSTEM: NAD 1983 UTM ZONE 17NTRANSVERSE MERCATOR

0 125 250 500 Feet

SHELL PIPELINE COMPANY, LP
910 LOUISIANA STREET,
ROOM 41082A
HOUSTON, TEXAS 77002

AECOM
FOSTER PLAZA 6
681 ANDERSEN DRIVE
4TH FLOOR
PITTSBURGH, PA 15220
412-503-4700

APPENDIX A

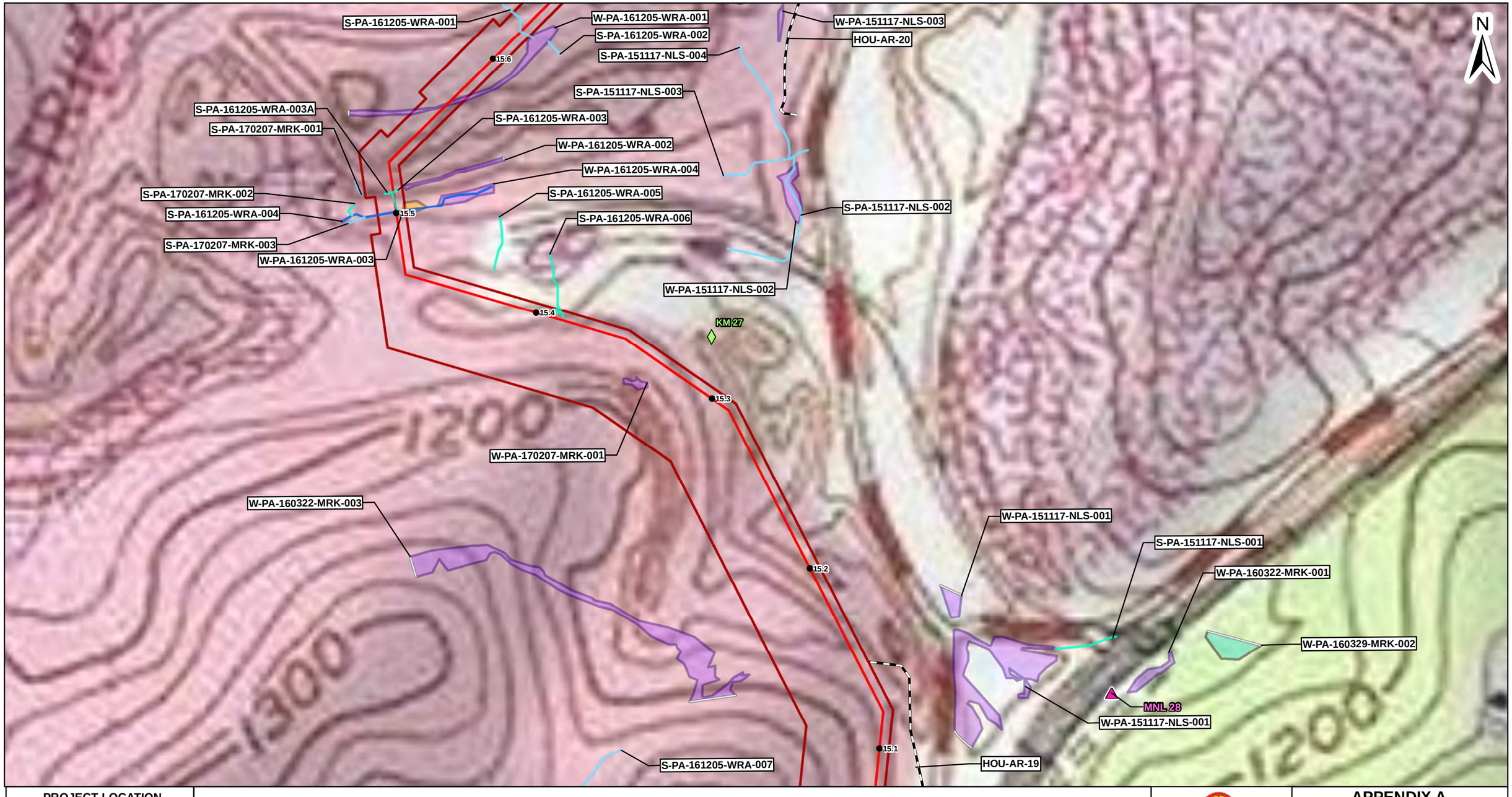
MIST-NETTING LOCATION MAP

PAGE 16 OF 38

SHELL PIPELINE COMPANY, LP
FALCON ETHANE PIPELINE PROJECT

DRAWN BY: KFS Date: 5/31/2017
APPROVED: JLK PROJECT#: 60487539

Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd



PROJECT LOCATION

ALLEGHENY, BEAVER, AND WASHINGTON COUNTIES, PENNSYLVANIA

LEGEND

- ADDITIONAL MIST-NIETTING LOCATION
- ROOST TREE
- PREVIOUSLY SUBMITTED KILOMETER MARKER
- MILEPOSTS
- MIST NETTING LOCATION (MNL)
- MYSE CAPTURED MIST NETTINGL LOCATION
- PROPOSED HOUSTON TO MONACA PIPELINE
- PROPOSED SCIO TO MONACA PIPELINE
- PROPOSED ACCESS ROAD
- OPEN END WETLAND LINE
- EPHEMERAL STREAM
- INTERMITTENT STREAM
- PERENNIAL STREAM
- DELINEATED PEM WETLAND
- DELINEATED PFO WETLAND
- DELINEATED PSS WETLAND
- DELINEATED PUB WETLAND
- PROPOSED LOD
- TOWNSHIP BOUNDARY
- COUNTY BOUNDARY
- STATE BOUNDARY

REFERENCE: AERIAL LAYER - CONTRACTED IMAGERY TAKEN OCTOBER, 2015 AND SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P CORP., NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI (THAILAND), MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY, COPYRIGHT:© 2013 NATIONAL GEOGRAPHIC SOCIETY, I-CUBED .

COORDINATE SYSTEM: NAD 1983 UTM ZONE 17NTRANSVERSE MERCATOR

0 125 250 500 Feet

SHELL PIPELINE COMPANY, LP
910 LOUISIANA STREET,
ROOM 41082A
HOUSTON, TEXAS 77002

AECOM
FOSTER PLAZA 6
681 ANDERSEN DRIVE
4TH FLOOR
PITTSBURGH, PA 15220
412-503-4700

APPENDIX A

MIST-NETTING LOCATION MAP

PAGE 17 OF 38

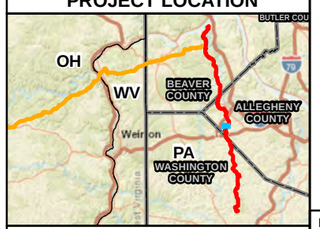
SHELL PIPELINE COMPANY, LP
FALCON ETHANE PIPELINE PROJECT

DRAWN BY: KFS Date: 5/31/2017
APPROVED: JLK PROJECT#: 60487539

Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PATH:Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PROJECT LOCATION



ALLEGHENY, BEAVER, AND WASHINGTON COUNTIES, PENNSYLVANIA

LEGEND

- ADDITIONAL MIST-NIETTING LOCATION
- ROOST TREE
- PREVIOUSLY SUBMITTED KILOMETER MARKER
- MILEPOSTS
- MIST NETTING LOCATION (MNL)
- MYSE CAPTURED MIST NETTINGL LOCATION
- PROPOSED HOUSTON TO MONACA PIPELINE
- PROPOSED SCIO TO MONACA PIPELINE
- PROPOSED ACCESS ROAD
- OPEN END WETLAND LINE
- EPHEMERAL STREAM
- INTERMITTENT STREAM
- PERENNIAL STREAM
- DELINEATED PEM WETLAND
- DELINEATED PFO WETLAND
- DELINEATED PSS WETLAND
- DELINEATED PUB WETLAND
- PROPOSED LOD
- TOWNSHIP BOUNDARY
- COUNTY BOUNDARY
- STATE BOUNDARY

REFERENCE: AERIAL LAYER - CONTRACTED IMAGERY TAKEN OCTOBER, 2015 AND SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P CORP., NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI (THAILAND), MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY, COPYRIGHT:© 2013 NATIONAL GEOGRAPHIC SOCIETY, I-CUBED .

COORDINATE SYSTEM: NAD 1983 UTM ZONE 17NTRANSVERSE MERCATOR

0 125 250 500 Feet

SHELL PIPELINE COMPANY, LP
910 LOUISIANA STREET,
ROOM 41082A
HOUSTON, TEXAS 77002

AECOM
FOSTER PLAZA 6
681 ANDERSEN DRIVE
4TH FLOOR
PITTSBURGH, PA 15220
412-503-4700

APPENDIX A

MIST-NETTING LOCATION MAP

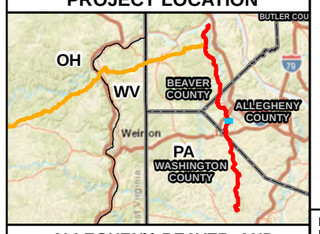
SHELL PIPELINE COMPANY, LP
FALCON ETHANE PIPELINE PROJECT

DRAWN BY: KFS Date: 5/31/2017
APPROVED: JLK PROJECT#: 60487539

Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PATH:Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PROJECT LOCATION



ALLEGHENY, BEAVER, AND WASHINGTON COUNTIES, PENNSYLVANIA

LEGEND

- ADDITIONAL MIST-NIETTING LOCATION
- ROOST TREE
- PREVIOUSLY SUBMITTED KILOMETER MARKER
- MILEPOSTS
- MIST NETTING LOCATION (MNL)
- MYSE CAPTURED MIST NETTINGL LOCATION
- PROPOSED HOUSTON TO MONACA PIPELINE
- PROPOSED SCIO TO MONACA PIPELINE
- PROPOSED ACCESS ROAD
- OPEN END WETLAND LINE
- EPHEMERAL STREAM
- INTERMITTENT STREAM
- PERENNIAL STREAM
- DELINEATED PEM WETLAND
- DELINEATED PFO WETLAND
- DELINEATED PSS WETLAND
- DELINEATED PUB WETLAND
- PROPOSED LOD
- TOWNSHIP BOUNDARY
- COUNTY BOUNDARY
- STATE BOUNDARY

REFERENCE: AERIAL LAYER - CONTRACTED IMAGERY TAKEN OCTOBER, 2015 AND SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P CORP., NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI (THAILAND), MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY, COPYRIGHT:© 2013 NATIONAL GEOGRAPHIC SOCIETY, I-CUBED .

COORDINATE SYSTEM: NAD 1983 UTM ZONE 17NTRANSVERSE MERCATOR

0 125 250 500 Feet

SHELL PIPELINE COMPANY, LP
910 LOUISIANA STREET,
ROOM 41082A
HOUSTON, TEXAS 77002

AECOM
FOSTER PLAZA 6
681 ANDERSEN DRIVE
4TH FLOOR
PITTSBURGH, PA 15220
412-503-4700

APPENDIX A

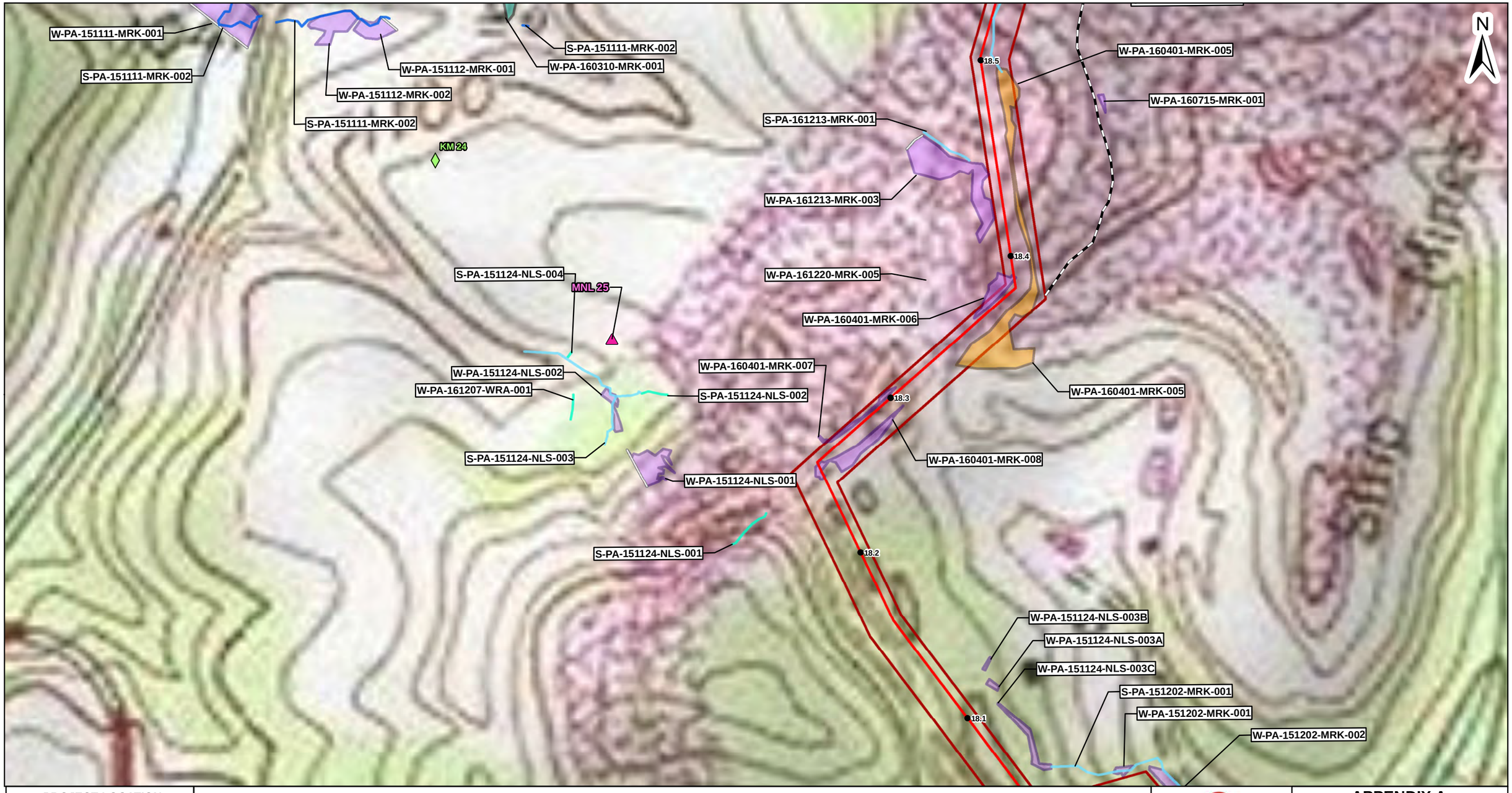
MIST-NETTING LOCATION MAP

SHELL PIPELINE COMPANY, LP
FALCON ETHANE PIPELINE PROJECT

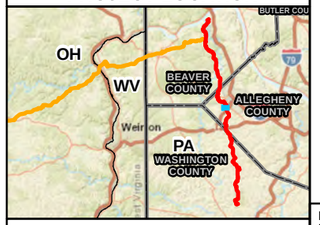
DRAWN BY: KFS Date: 5/31/2017
APPROVED: JLK PROJECT#: 60487539

Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PATH:Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd



PROJECT LOCATION



ALLEGHENY, BEAVER, AND WASHINGTON COUNTIES, PENNSYLVANIA

LEGEND

- ADDITIONAL MIST-NIETTING LOCATION
- ROOST TREE
- PREVIOUSLY SUBMITTED KILOMETER MARKER
- MILEPOSTS
- MIST NETTING LOCATION (MNL)
- MYSE CAPTURED MIST NETTINGL LOCATION
- PROPOSED HOUSTON TO MONACA PIPELINE
- PROPOSED SCIO TO MONACA PIPELINE
- PROPOSED ACCESS ROAD
- OPEN END WETLAND LINE
- EPHEMERAL STREAM
- INTERMITTENT STREAM
- PERENNIAL STREAM
- DELINEATED PEM WETLAND
- DELINEATED PFO WETLAND
- DELINEATED PSS WETLAND
- DELINEATED PUB WETLAND
- PROPOSED LOD
- TOWNSHIP BOUNDARY
- COUNTY BOUNDARY
- STATE BOUNDARY

REFERENCE: AERIAL LAYER - CONTRACTED IMAGERY TAKEN OCTOBER, 2015 AND SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P CORP., NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI (THAILAND), MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY, COPYRIGHT:© 2013 NATIONAL GEOGRAPHIC SOCIETY, I-CUBED .

COORDINATE SYSTEM: NAD 1983 UTM ZONE 17NTRANSVERSE MERCATOR

0 125 250 500 Feet

SHELL PIPELINE COMPANY, LP
910 LOUISIANA STREET,
ROOM 41082A
HOUSTON, TEXAS 77002

AECOM
FOSTER PLAZA 6
681 ANDERSEN DRIVE
4TH FLOOR
PITTSBURGH, PA 15220
412-503-4700

APPENDIX A

MIST-NETTING LOCATION MAP

PAGE 20 OF 38

SHELL PIPELINE COMPANY, LP
FALCON ETHANE PIPELINE PROJECT

DRAWN BY: KFS Date: 5/31/2017
APPROVED: JLK PROJECT#: 60487539

Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PATH:Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

S-PA-161123-WRA-006
W-PA-170213-JLK-003
18.9
W-PA-170213-JLK-004
18.8
MN ALT 4
18.7
W-PA-161220-MRK-006
W-PA-161220-MRK-001
W-PA-160401-MRK-004
W-PA-161220-MRK-003
W-PA-160401-MRK-002
W-PA-161220-MRK-002
18.6
W-PA-160401-MRK-001
W-PA-160401-MRK-003
HOU-AR-26
W-PA-161220-MRK-004
S-PA-161220-MRK-001
W-PA-160401-MRK-005
18.5
W-PA-160715-MRK-001
N

PROJECT LOCATION

ALLEGHENY, BEAVER, AND WASHINGTON COUNTIES, PENNSYLVANIA

LEGEND

- ADDITIONAL MIST-NIETTING LOCATION
- ROOST TREE
- PREVIOUSLY SUBMITTED KILOMETER MARKER
- MILEPOSTS
- MIST NETTING LOCATION (MNL)
- MYSE CAPTURED MIST NETTINGL LOCATION
- PROPOSED HOUSTON TO MONACA PIPELINE
- PROPOSED SCIO TO MONACA PIPELINE
- PROPOSED ACCESS ROAD
- OPEN END WETLAND LINE
- EPHEMERAL STREAM
- INTERMITTENT STREAM
- PERENNIAL STREAM
- DELINEATED PEM WETLAND
- DELINEATED PFO WETLAND
- DELINEATED PSS WETLAND
- DELINEATED PUB WETLAND
- PROPOSED LOD
- TOWNSHIP BOUNDARY
- COUNTY BOUNDARY
- STATE BOUNDARY

REFERENCE: AERIAL LAYER - CONTRACTED IMAGERY TAKEN OCTOBER, 2015 AND SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P CORP., NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI (THAILAND), MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY, COPYRIGHT:© 2013 NATIONAL GEOGRAPHIC SOCIETY, I-CUBED .

COORDINATE SYSTEM: NAD 1983 UTM ZONE 17NTRANSVERSE MERCATOR

0 125 250 500 Feet

SHELL PIPELINE COMPANY, LP
910 LOUISIANA STREET,
ROOM 41082A
HOUSTON, TEXAS 77002

AECOM
FOSTER PLAZA 6
681 ANDERSEN DRIVE
4TH FLOOR
PITTSBURGH, PA 15220
412-503-4700

APPENDIX A

MIST-NETTING LOCATION MAP

SHELL PIPELINE COMPANY, LP FALCON ETHANE PIPELINE PROJECT

DRAWN BY: KFS Date: 5/31/2017
APPROVED: JLK PROJECT#: 60487539

Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PATH:Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PROJECT LOCATION

ALLEGHENY, BEAVER, AND WASHINGTON COUNTIES, PENNSYLVANIA

LEGEND

- ADDITIONAL MIST-NIETTING LOCATION
- ROOST TREE
- PREVIOUSLY SUBMITTED KILOMETER MARKER
- MILEPOSTS
- MIST NETTING LOCATION (MNL)
- MYSE CAPTURED MIST NETTINGL LOCATION
- PROPOSED HOUSTON TO MONACA PIPELINE
- PROPOSED SCIO TO MONACA PIPELINE
- PROPOSED ACCESS ROAD
- OPEN END WETLAND LINE
- EPHEMERAL STREAM
- INTERMITTENT STREAM
- PERENNIAL STREAM
- DELINEATED PEM WETLAND
- DELINEATED PFO WETLAND
- DELINEATED PSS WETLAND
- DELINEATED PUB WETLAND
- PROPOSED LOD
- TOWNSHIP BOUNDARY
- COUNTY BOUNDARY
- STATE BOUNDARY

REFERENCE: AERIAL LAYER - CONTRACTED IMAGERY TAKEN OCTOBER, 2015 AND SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P CORP., NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI (THAILAND), MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY, COPYRIGHT:© 2013 NATIONAL GEOGRAPHIC SOCIETY, I-CUBED .

COORDINATE SYSTEM: NAD 1983 UTM ZONE 17NTRANSVERSE MERCATOR

0 125 250 500 Feet

SHELL PIPELINE COMPANY, LP
910 LOUISIANA STREET,
ROOM 41082A
HOUSTON, TEXAS 77002

AECOM
FOSTER PLAZA 6
681 ANDERSEN DRIVE
4TH FLOOR
PITTSBURGH, PA 15220
412-503-4700

APPENDIX A

MIST-NETTING LOCATION MAP

SHELL PIPELINE COMPANY, LP
FALCON ETHANE PIPELINE PROJECT

DRAWN BY: KFS Date: 5/31/2017
APPROVED: JLK PROJECT#: 60487539

Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PATH:Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PROJECT LOCATION

ALLEGHENY, BEAVER, AND WASHINGTON COUNTIES, PENNSYLVANIA

LEGEND

- ADDITIONAL MIST-NIETTING LOCATION
- ROOST TREE
- PREVIOUSLY SUBMITTED KILOMETER MARKER
- MILEPOSTS
- MIST NETTING LOCATION (MNL)
- MYSE CAPTURED MIST NETTINGL LOCATION
- PROPOSED HOUSTON TO MONACA PIPELINE
- PROPOSED SCIO TO MONACA PIPELINE
- PROPOSED ACCESS ROAD
- OPEN END WETLAND LINE
- EPHEMERAL STREAM
- INTERMITTENT STREAM
- PERENNIAL STREAM
- DELINEATED PEM WETLAND
- DELINEATED PFO WETLAND
- DELINEATED PSS WETLAND
- DELINEATED PUB WETLAND
- PROPOSED LOD
- TOWNSHIP BOUNDARY
- COUNTY BOUNDARY
- STATE BOUNDARY

REFERENCE: AERIAL LAYER - CONTRACTED IMAGERY TAKEN OCTOBER, 2015 AND SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P CORP., NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI (THAILAND), MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY, COPYRIGHT:© 2013 NATIONAL GEOGRAPHIC SOCIETY, I-CUBED .

COORDINATE SYSTEM: NAD 1983 UTM ZONE 17NTRANSVERSE MERCATOR

0 125 250 500 Feet

SHELL PIPELINE COMPANY, LP
910 LOUISIANA STREET,
ROOM 41082A
HOUSTON, TEXAS 77002

AECOM
FOSTER PLAZA 6
681 ANDERSEN DRIVE
4TH FLOOR
PITTSBURGH, PA 15220
412-503-4700

APPENDIX A

MIST-NETTING LOCATION MAP

PAGE 23 OF 38

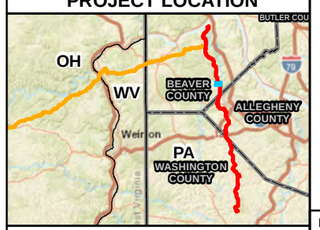
SHELL PIPELINE COMPANY, LP
FALCON ETHANE PIPELINE PROJECT

DRAWN BY: KFS Date: 5/31/2017
APPROVED: JLK PROJECT#: 60487539

Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PATH:Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PROJECT LOCATION



ALLEGHENY, BEAVER, AND WASHINGTON COUNTIES, PENNSYLVANIA

LEGEND

- ADDITIONAL MIST-NIETTING LOCATION
- ROOST TREE
- PREVIOUSLY SUBMITTED KILOMETER MARKER
- MILEPOSTS
- MIST NETTING LOCATION (MNL)
- MYSE CAPTURED MIST NETTINGL LOCATION
- PROPOSED HOUSTON TO MONACA PIPELINE
- PROPOSED SCIO TO MONACA PIPELINE
- PROPOSED ACCESS ROAD
- OPEN END WETLAND LINE
- EPHEMERAL STREAM
- INTERMITTENT STREAM
- PERENNIAL STREAM
- DELINEATED PEM WETLAND
- DELINEATED PFO WETLAND
- DELINEATED PSS WETLAND
- DELINEATED PUB WETLAND
- PROPOSED LOD
- TOWNSHIP BOUNDARY
- COUNTY BOUNDARY
- STATE BOUNDARY

REFERENCE: AERIAL LAYER - CONTRACTED IMAGERY TAKEN OCTOBER, 2015 AND SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P CORP., NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI (THAILAND), MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY, COPYRIGHT:© 2013 NATIONAL GEOGRAPHIC SOCIETY, I-CUBED .

COORDINATE SYSTEM: NAD 1983 UTM ZONE 17NTRANSVERSE MERCATOR

0 125 250 500 Feet

SHELL PIPELINE COMPANY, LP
910 LOUISIANA STREET,
ROOM 41082A
HOUSTON, TEXAS 77002

AECOM
FOSTER PLAZA 6
681 ANDERSEN DRIVE
4TH FLOOR
PITTSBURGH, PA 15220
412-503-4700

APPENDIX A

MIST-NETTING LOCATION MAP

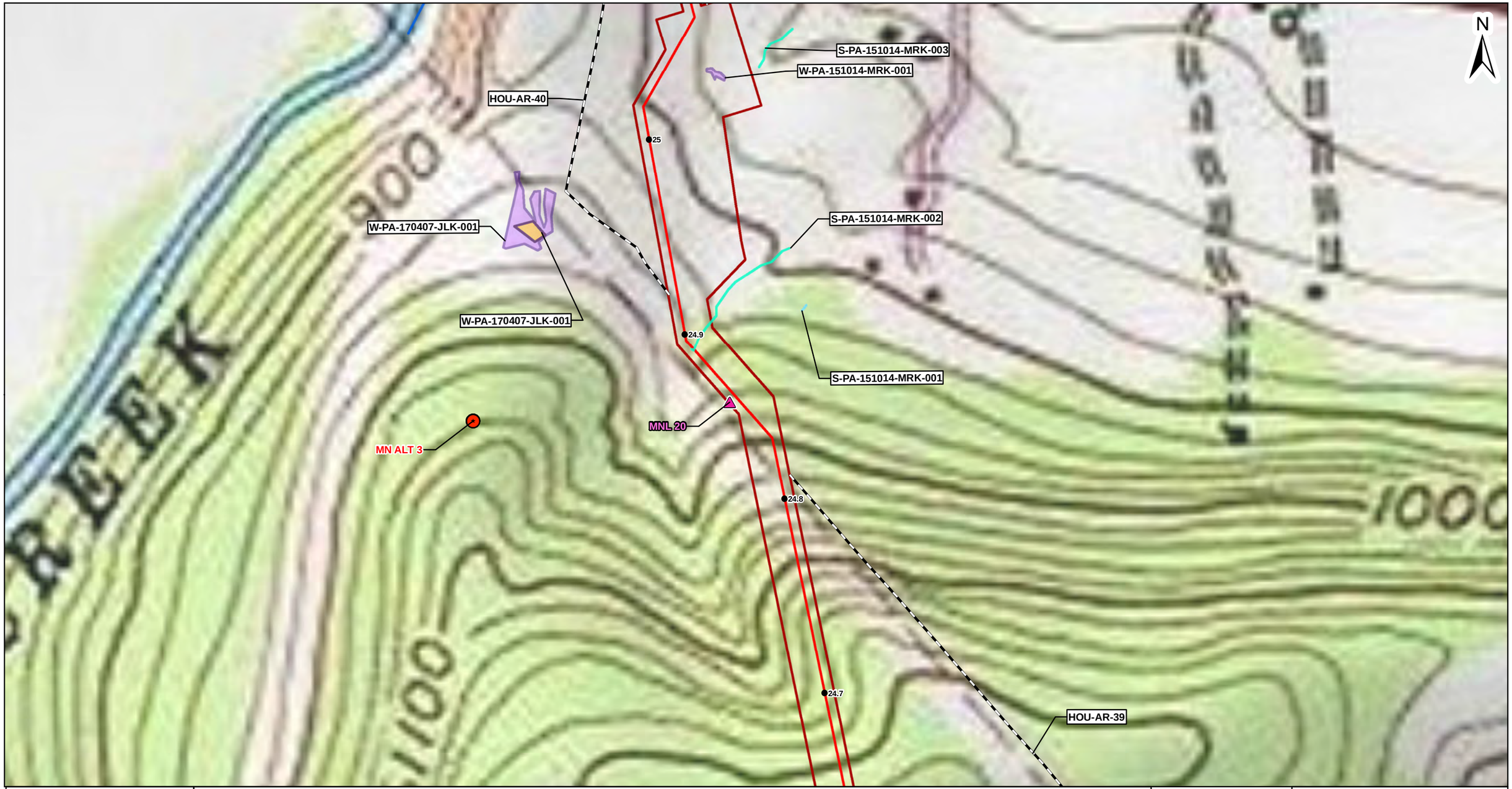
PAGE 24 OF 38

SHELL PIPELINE COMPANY, LP
FALCON ETHANE PIPELINE PROJECT

DRAWN BY: KFS Date: 5/31/2017
APPROVED: JLK PROJECT#: 60487539

Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PATH:Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd



PROJECT LOCATION

ALLEGHENY, BEAVER, AND WASHINGTON COUNTIES, PENNSYLVANIA

LEGEND

- ADDITIONAL MIST-NIETTING LOCATION
- ROOST TREE
- PREVIOUSLY SUBMITTED KILOMETER MARKER
- MILEPOSTS
- MIST NETTING LOCATION (MNL)
- MYSE CAPTURED MIST NETTINGL LOCATION
- PROPOSED HOUSTON TO MONACA PIPELINE
- PROPOSED SCIO TO MONACA PIPELINE
- PROPOSED ACCESS ROAD
- OPEN END WETLAND LINE
- EPHEMERAL STREAM
- INTERMITTENT STREAM
- PERENNIAL STREAM
- DELINEATED PEM WETLAND
- DELINEATED PFO WETLAND
- DELINEATED PSS WETLAND
- DELINEATED PUB WETLAND
- PROPOSED LOD
- TOWNSHIP BOUNDARY
- COUNTY BOUNDARY
- STATE BOUNDARY

REFERENCE: AERIAL LAYER - CONTRACTED IMAGERY TAKEN OCTOBER, 2015 AND SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P CORP., NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI (THAILAND), MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY, COPYRIGHT:© 2013 NATIONAL GEOGRAPHIC SOCIETY, I-CUBED .

COORDINATE SYSTEM: NAD 1983 UTM ZONE 17NTRANSVERSE MERCATOR

0 125 250 500 Feet

SHELL PIPELINE COMPANY, LP
910 LOUISIANA STREET,
ROOM 41082A
HOUSTON, TEXAS 77002

AECOM
FOSTER PLAZA 6
681 ANDERSEN DRIVE
4TH FLOOR
PITTSBURGH, PA 15220
412-503-4700

APPENDIX A

MIST-NETTING LOCATION MAP

PAGE 25 OF 38

SHELL PIPELINE COMPANY, LP
FALCON ETHANE PIPELINE PROJECT

DRAWN BY: KFS Date: 5/31/2017
APPROVED: JLK PROJECT#: 60487539

Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PATH:Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PROJECT LOCATION

ALLEGHENY, BEAVER, AND WASHINGTON COUNTIES, PENNSYLVANIA

LEGEND

- ADDITIONAL MIST-NIETTING LOCATION
- ROOST TREE
- PREVIOUSLY SUBMITTED KILOMETER MARKER
- MILEPOSTS
- MIST NETTING LOCATION (MNL)
- MYSE CAPTURED MIST NETTINGL LOCATION
- PROPOSED HOUSTON TO MONACA PIPELINE
- PROPOSED SCIO TO MONACA PIPELINE
- PROPOSED ACCESS ROAD
- OPEN END WETLAND LINE
- EPHEMERAL STREAM
- INTERMITTENT STREAM
- PERENNIAL STREAM
- DELINEATED PEM WETLAND
- DELINEATED PFO WETLAND
- DELINEATED PSS WETLAND
- DELINEATED PUB WETLAND
- PROPOSED LOD
- TOWNSHIP BOUNDARY
- COUNTY BOUNDARY
- STATE BOUNDARY

REFERENCE: AERIAL LAYER - CONTRACTED IMAGERY TAKEN OCTOBER, 2015 AND SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P CORP., NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI (THAILAND), MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY, COPYRIGHT:© 2013 NATIONAL GEOGRAPHIC SOCIETY, I-CUBED .

COORDINATE SYSTEM: NAD 1983 UTM ZONE 17NTRANSVERSE MERCATOR

0 125 250 500 Feet

SHELL PIPELINE COMPANY, LP
910 LOUISIANA STREET,
ROOM 41082A
HOUSTON, TEXAS 77002

AECOM
FOSTER PLAZA 6
681 ANDERSEN DRIVE
4TH FLOOR
PITTSBURGH, PA 15220
412-503-4700

APPENDIX A

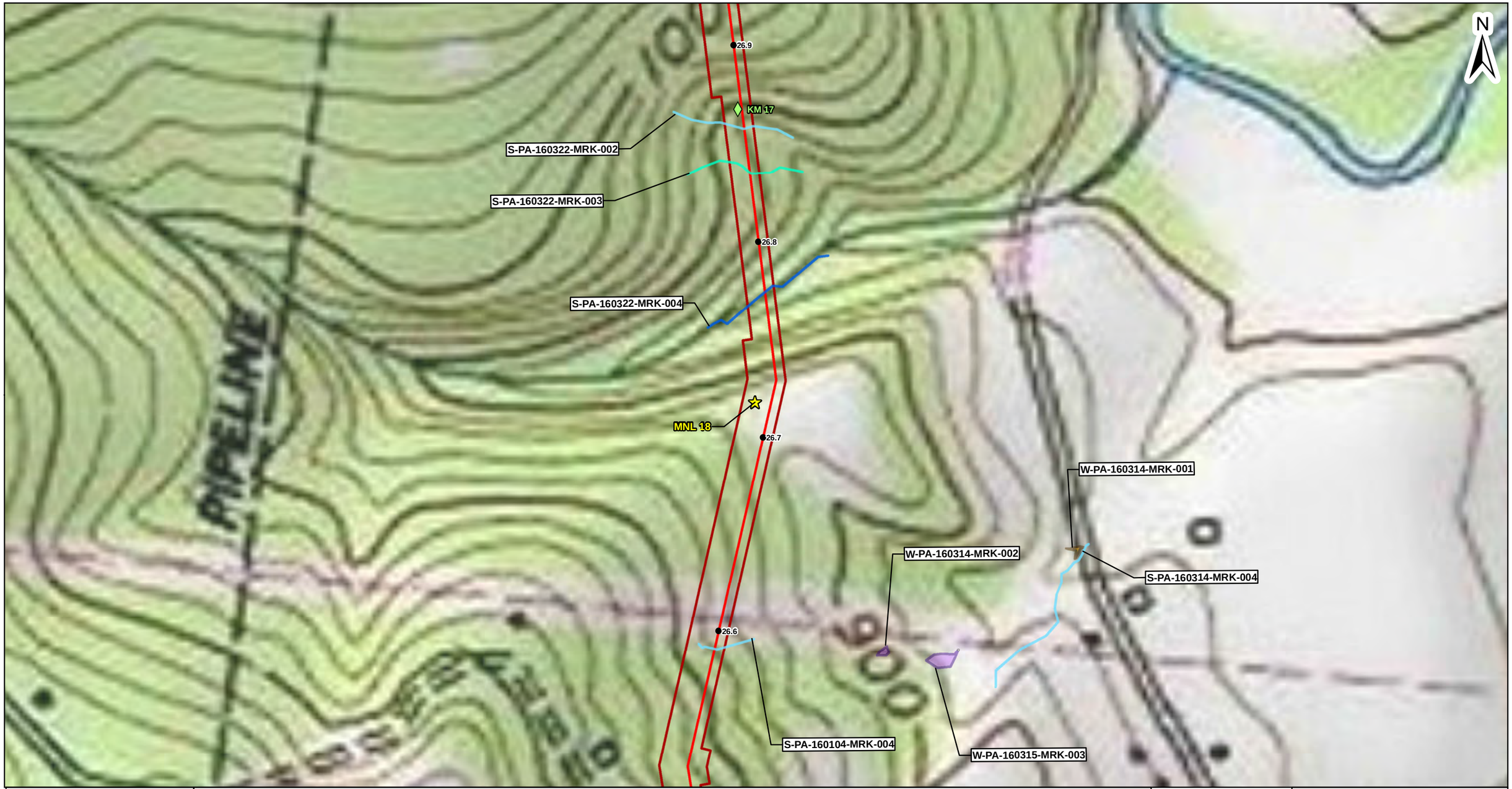
MIST-NETTING LOCATION MAP

SHELL PIPELINE COMPANY, LP
FALCON ETHANE PIPELINE PROJECT

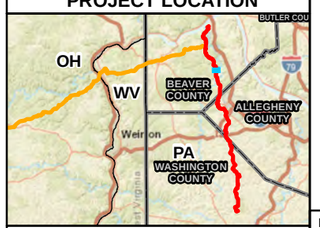
DRAWN BY: KFS Date: 5/31/2017
APPROVED: JLK PROJECT#: 60487539

Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PATH:Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd



PROJECT LOCATION



ALLEGHENY, BEAVER, AND WASHINGTON COUNTIES, PENNSYLVANIA

LEGEND

- ADDITIONAL MIST-NIETTING LOCATION
- ROOST TREE
- PREVIOUSLY SUBMITTED KILOMETER MARKER
- MILEPOSTS
- MIST NETTING LOCATION (MNL)
- MYSE CAPTURED MIST NETTINGL LOCATION
- PROPOSED HOUSTON TO MONACA PIPELINE
- PROPOSED SCIO TO MONACA PIPELINE
- PROPOSED ACCESS ROAD
- OPEN END WETLAND LINE
- EPHEMERAL STREAM
- INTERMITTENT STREAM
- PERENNIAL STREAM
- DELINEATED PEM WETLAND
- DELINEATED PFO WETLAND
- DELINEATED PSS WETLAND
- DELINEATED PUB WETLAND
- PROPOSED LOD
- TOWNSHIP BOUNDARY
- COUNTY BOUNDARY
- STATE BOUNDARY

REFERENCE: AERIAL LAYER - CONTRACTED IMAGERY TAKEN OCTOBER, 2015 AND SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P CORP., NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI (THAILAND), MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY, COPYRIGHT:© 2013 NATIONAL GEOGRAPHIC SOCIETY, I-CUBED .

COORDINATE SYSTEM: NAD 1983 UTM ZONE 17NTRANSVERSE MERCATOR

0 125 250 500 Feet

SHELL PIPELINE COMPANY, LP
910 LOUISIANA STREET,
ROOM 41082A
HOUSTON, TEXAS 77002

AECOM
FOSTER PLAZA 6
681 ANDERSEN DRIVE
4TH FLOOR
PITTSBURGH, PA 15220
412-503-4700

APPENDIX A

MIST-NETTING LOCATION MAP

SHELL PIPELINE COMPANY, LP
FALCON ETHANE PIPELINE PROJECT

DRAWN BY: KFS Date: 5/31/2017
APPROVED: JLK PROJECT#: 60487539

Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PATH:Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PROJECT LOCATION

ALLEGHENY, BEAVER, AND WASHINGTON COUNTIES, PENNSYLVANIA

LEGEND

- ADDITIONAL MIST-NIETTING LOCATION
- ROOST TREE
- PREVIOUSLY SUBMITTED KILOMETER MARKER
- MILEPOSTS
- MIST NETTING LOCATION (MNL)
- MYSE CAPTURED MIST NETTINGL LOCATION
- PROPOSED HOUSTON TO MONACA PIPELINE
- PROPOSED SCIO TO MONACA PIPELINE
- PROPOSED ACCESS ROAD
- OPEN END WETLAND LINE
- EPHEMERAL STREAM
- INTERMITTENT STREAM
- PERENNIAL STREAM
- DELINEATED PEM WETLAND
- DELINEATED PFO WETLAND
- DELINEATED PSS WETLAND
- DELINEATED PUB WETLAND
- PROPOSED LOD
- TOWNSHIP BOUNDARY
- COUNTY BOUNDARY
- STATE BOUNDARY

REFERENCE: AERIAL LAYER - CONTRACTED IMAGERY TAKEN OCTOBER, 2015 AND SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P CORP., NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI (THAILAND), MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY, COPYRIGHT:© 2013 NATIONAL GEOGRAPHIC SOCIETY, I-CUBED .

COORDINATE SYSTEM: NAD 1983 UTM ZONE 17NTRANSVERSE MERCATOR

0 125 250 500 Feet

SHELL PIPELINE COMPANY, LP
910 LOUISIANA STREET,
ROOM 41082A
HOUSTON, TEXAS 77002

AECOM
FOSTER PLAZA 6
681 ANDERSEN DRIVE
4TH FLOOR
PITTSBURGH, PA 15220
412-503-4700

APPENDIX A

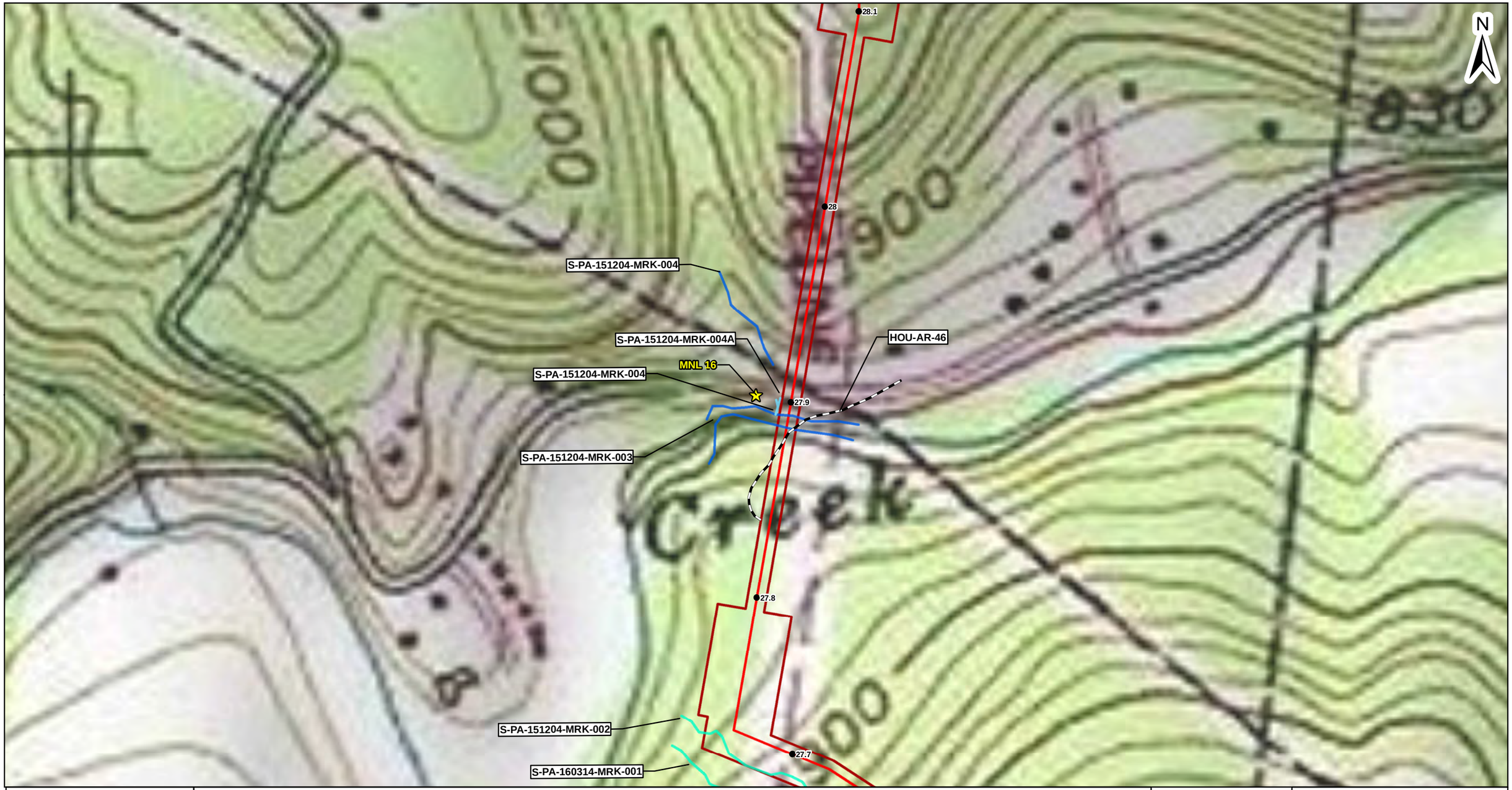
MIST-NETTING LOCATION MAP

SHELL PIPELINE COMPANY, LP
FALCON ETHANE PIPELINE PROJECT

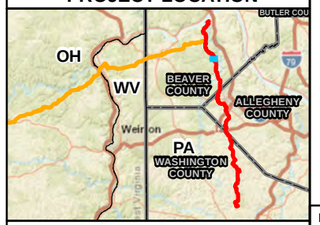
DRAWN BY: KFS Date: 5/31/2017
APPROVED: JLK PROJECT#: 60487539

Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PATH:Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd



PROJECT LOCATION



ALLEGHENY, BEAVER, AND WASHINGTON COUNTIES, PENNSYLVANIA

LEGEND

- ADDITIONAL MIST-NIETTING LOCATION
- ROOST TREE
- PREVIOUSLY SUBMITTED KILOMETER MARKER
- MILEPOSTS
- MIST NETTING LOCATION (MNL)
- MYSE CAPTURED MIST NETTINGL LOCATION
- PROPOSED HOUSTON TO MONACA PIPELINE
- PROPOSED SCIO TO MONACA PIPELINE
- PROPOSED ACCESS ROAD
- OPEN END WETLAND LINE
- EPHEMERAL STREAM
- INTERMITTENT STREAM
- PERENNIAL STREAM
- DELINEATED PEM WETLAND
- DELINEATED PFO WETLAND
- DELINEATED PSS WETLAND
- DELINEATED PUB WETLAND
- PROPOSED LOD
- TOWNSHIP BOUNDARY
- COUNTY BOUNDARY
- STATE BOUNDARY

REFERENCE: AERIAL LAYER - CONTRACTED IMAGERY TAKEN OCTOBER, 2015 AND SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P CORP., NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI (THAILAND), MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY, COPYRIGHT:© 2013 NATIONAL GEOGRAPHIC SOCIETY, I-CUBED .

COORDINATE SYSTEM: NAD 1983 UTM ZONE 17NTRANSVERSE MERCATOR

0 125 250 500 Feet

SHELL PIPELINE COMPANY, LP
910 LOUISIANA STREET,
ROOM 41082A
HOUSTON, TEXAS 77002

AECOM
FOSTER PLAZA 6
681 ANDERSEN DRIVE
4TH FLOOR
PITTSBURGH, PA 15220
412-503-4700

APPENDIX A

MIST-NETTING LOCATION MAP

SHELL PIPELINE COMPANY, LP
FALCON ETHANE PIPELINE PROJECT

DRAWN BY: KFS Date: 5/31/2017
APPROVED: JLK PROJECT#: 60487539

Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PATH:Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PROJECT LOCATION

ALLEGHENY, BEAVER, AND WASHINGTON COUNTIES, PENNSYLVANIA

LEGEND

- ADDITIONAL MIST-NIETTING LOCATION
- ROOST TREE
- PREVIOUSLY SUBMITTED KILOMETER MARKER
- MILEPOSTS
- MIST NETTING LOCATION (MNL)
- MYSE CAPTURED MIST NETTINGL LOCATION
- PROPOSED HOUSTON TO MONACA PIPELINE
- PROPOSED SCIO TO MONACA PIPELINE
- PROPOSED ACCESS ROAD
- OPEN END WETLAND LINE
- EPHEMERAL STREAM
- INTERMITTENT STREAM
- PERENNIAL STREAM
- DELINEATED PEM WETLAND
- DELINEATED PFO WETLAND
- DELINEATED PSS WETLAND
- DELINEATED PUB WETLAND
- PROPOSED LOD
- TOWNSHIP BOUNDARY
- COUNTY BOUNDARY
- STATE BOUNDARY

REFERENCE: AERIAL LAYER - CONTRACTED IMAGERY TAKEN OCTOBER, 2015 AND SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P CORP., NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI (THAILAND), MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY, COPYRIGHT:© 2013 NATIONAL GEOGRAPHIC SOCIETY, I-CUBED .

COORDINATE SYSTEM: NAD 1983 UTM ZONE 17NTRANSVERSE MERCATOR

0 125 250 500 Feet

SHELL PIPELINE COMPANY, LP
910 LOUISIANA STREET,
ROOM 41082A
HOUSTON, TEXAS 77002

AECOM
FOSTER PLAZA 6
681 ANDERSEN DRIVE
4TH FLOOR
PITTSBURGH, PA 15220
412-503-4700

APPENDIX A

MIST-NETTING LOCATION MAP

PAGE 30 OF 38

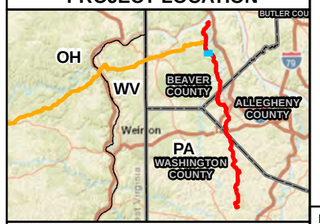
SHELL PIPELINE COMPANY, LP
FALCON ETHANE PIPELINE PROJECT

DRAWN BY: KFS Date: 5/31/2017
APPROVED: JLK PROJECT#: 60487539

Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PATH:Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PROJECT LOCATION



ALLEGHENY, BEAVER, AND WASHINGTON COUNTIES, PENNSYLVANIA

LEGEND

- ADDITIONAL MIST-NIETTING LOCATION
- ROOST TREE
- PREVIOUSLY SUBMITTED KILOMETER MARKER
- MILEPOSTS
- MIST NETTING LOCATION (MNL)
- MYSE CAPTURED MIST NETTINGL LOCATION
- PROPOSED HOUSTON TO MONACA PIPELINE
- PROPOSED SCIO TO MONACA PIPELINE
- PROPOSED ACCESS ROAD
- OPEN END WETLAND LINE
- EPHEMERAL STREAM
- INTERMITTENT STREAM
- PERENNIAL STREAM
- DELINEATED PEM WETLAND
- DELINEATED PFO WETLAND
- DELINEATED PSS WETLAND
- DELINEATED PUB WETLAND
- PROPOSED LOD
- TOWNSHIP BOUNDARY
- COUNTY BOUNDARY
- STATE BOUNDARY

REFERENCE: AERIAL LAYER - CONTRACTED IMAGERY TAKEN OCTOBER, 2015 AND SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P CORP., NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI (THAILAND), MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY, COPYRIGHT:© 2013 NATIONAL GEOGRAPHIC SOCIETY, I-CUBED .

COORDINATE SYSTEM: NAD 1983 UTM ZONE 17NTRANSVERSE MERCATOR

0 125 250 500 Feet

SHELL PIPELINE COMPANY, LP
910 LOUISIANA STREET,
ROOM 41082A
HOUSTON, TEXAS 77002

AECOM
FOSTER PLAZA 6
681 ANDERSEN DRIVE
4TH FLOOR
PITTSBURGH, PA 15220
412-503-4700

APPENDIX A

MIST-NETTING LOCATION MAP

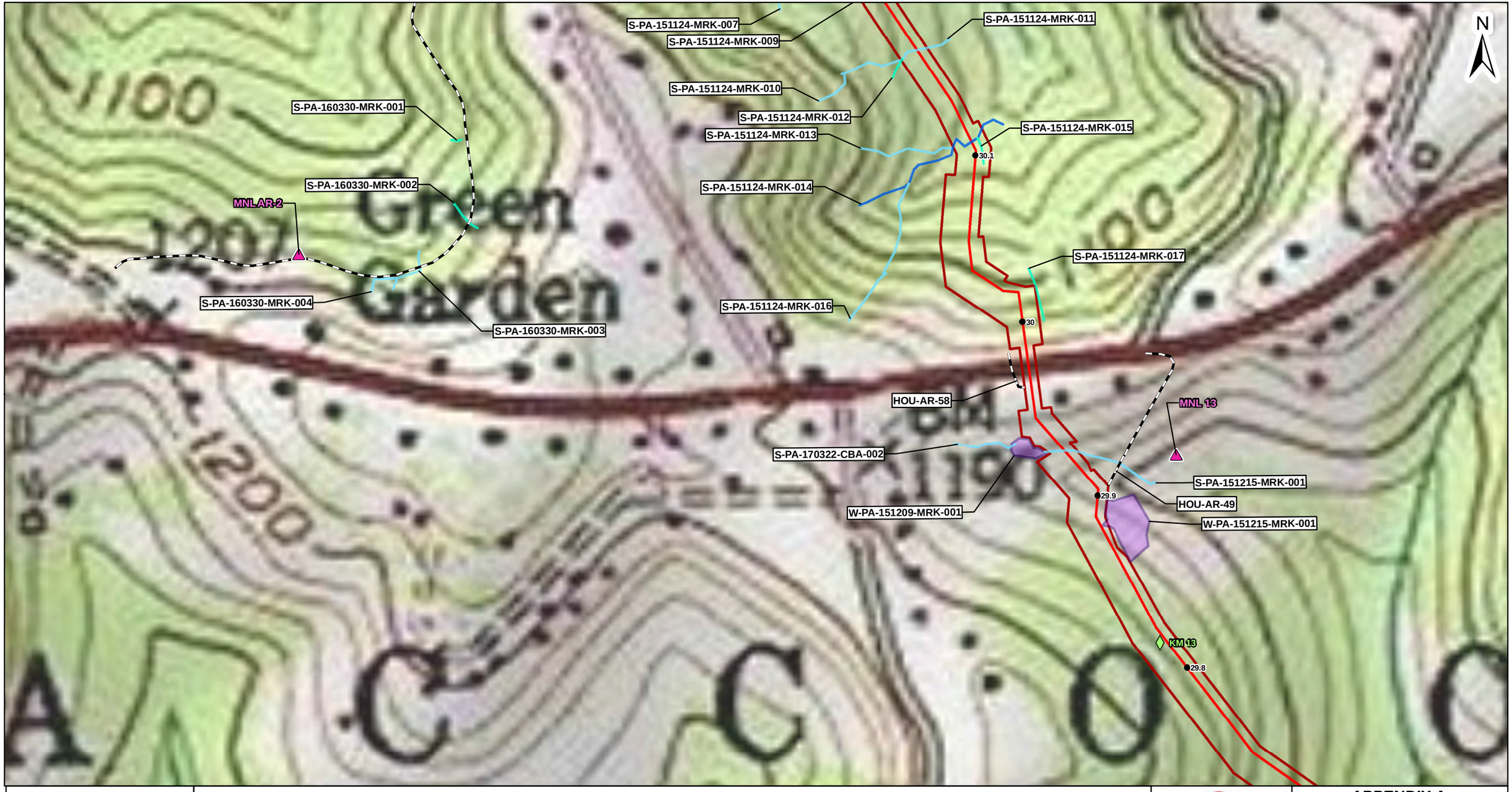
PAGE 31 OF 38

SHELL PIPELINE COMPANY, LP
FALCON ETHANE PIPELINE PROJECT

DRAWN BY: KFS Date: 5/31/2017
APPROVED: JLK PROJECT#: 60487539

Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PATH:Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd



PROJECT LOCATION

ALLEGHENY, BEAVER, AND WASHINGTON COUNTIES, PENNSYLVANIA

LEGEND

- ADDITIONAL MIST-NIETTING LOCATION
- ROOST TREE
- PREVIOUSLY SUBMITTED KILOMETER MARKER
- MILEPOSTS
- MIST NETTING LOCATION (MNL)
- MYSE CAPTURED MIST NETTINGL LOCATION
- PROPOSED HOUSTON TO MONACA PIPELINE
- PROPOSED SCIO TO MONACA PIPELINE
- PROPOSED ACCESS ROAD
- OPEN END WETLAND LINE
- EPHEMERAL STREAM
- INTERMITTENT STREAM
- PERENNIAL STREAM
- DELINEATED PEM WETLAND
- DELINEATED PFO WETLAND
- DELINEATED PSS WETLAND
- DELINEATED PUB WETLAND
- PROPOSED LOD
- TOWNSHIP BOUNDARY
- COUNTY BOUNDARY
- STATE BOUNDARY

REFERENCE: AERIAL LAYER - CONTRACTED IMAGERY TAKEN OCTOBER, 2015 AND SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P CORP., NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI (THAILAND), MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY, COPYRIGHT:© 2013 NATIONAL GEOGRAPHIC SOCIETY, I-CUBED .

COORDINATE SYSTEM: NAD 1983 UTM ZONE 17NTRANSVERSE MERCATOR

0 125 250 500 Feet

SHELL PIPELINE COMPANY, LP
910 LOUISIANA STREET,
ROOM 41082A
HOUSTON, TEXAS 77002

AECOM
FOSTER PLAZA 6
681 ANDERSEN DRIVE
4TH FLOOR
PITTSBURGH, PA 15220
412-503-4700

APPENDIX A

MIST-NETTING LOCATION MAP

SHELL PIPELINE COMPANY, LP
FALCON ETHANE PIPELINE PROJECT

DRAWN BY: KFS Date: 5/31/2017
APPROVED: JLK PROJECT#: 60487539

Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PATH:Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PROJECT LOCATION

ALLEGHENY, BEAVER, AND WASHINGTON COUNTIES, PENNSYLVANIA

LEGEND

- ADDITIONAL MIST-NIETTING LOCATION
- ROOST TREE
- PREVIOUSLY SUBMITTED KILOMETER MARKER
- MILEPOSTS
- MIST NETTING LOCATION (MNL)
- MYSE CAPTURED MIST NETTINGL LOCATION
- PROPOSED HOUSTON TO MONACA PIPELINE
- PROPOSED SCIO TO MONACA PIPELINE
- PROPOSED ACCESS ROAD
- OPEN END WETLAND LINE
- EPHEMERAL STREAM
- INTERMITTENT STREAM
- PERENNIAL STREAM
- DELINEATED PEM WETLAND
- DELINEATED PFO WETLAND
- DELINEATED PSS WETLAND
- DELINEATED PUB WETLAND
- PROPOSED LOD
- TOWNSHIP BOUNDARY
- COUNTY BOUNDARY
- STATE BOUNDARY

REFERENCE: AERIAL LAYER - CONTRACTED IMAGERY TAKEN OCTOBER, 2015 AND SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P CORP., NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI (THAILAND), MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY, COPYRIGHT:© 2013 NATIONAL GEOGRAPHIC SOCIETY, I-CUBED .

COORDINATE SYSTEM: NAD 1983 UTM ZONE 17NTRANSVERSE MERCATOR

0 125 250 500 Feet

SHELL PIPELINE COMPANY, LP
910 LOUISIANA STREET,
ROOM 41082A
HOUSTON, TEXAS 77002

AECOM
FOSTER PLAZA 6
681 ANDERSEN DRIVE
4TH FLOOR
PITTSBURGH, PA 15220
412-503-4700

APPENDIX A

MIST-NETTING LOCATION MAP

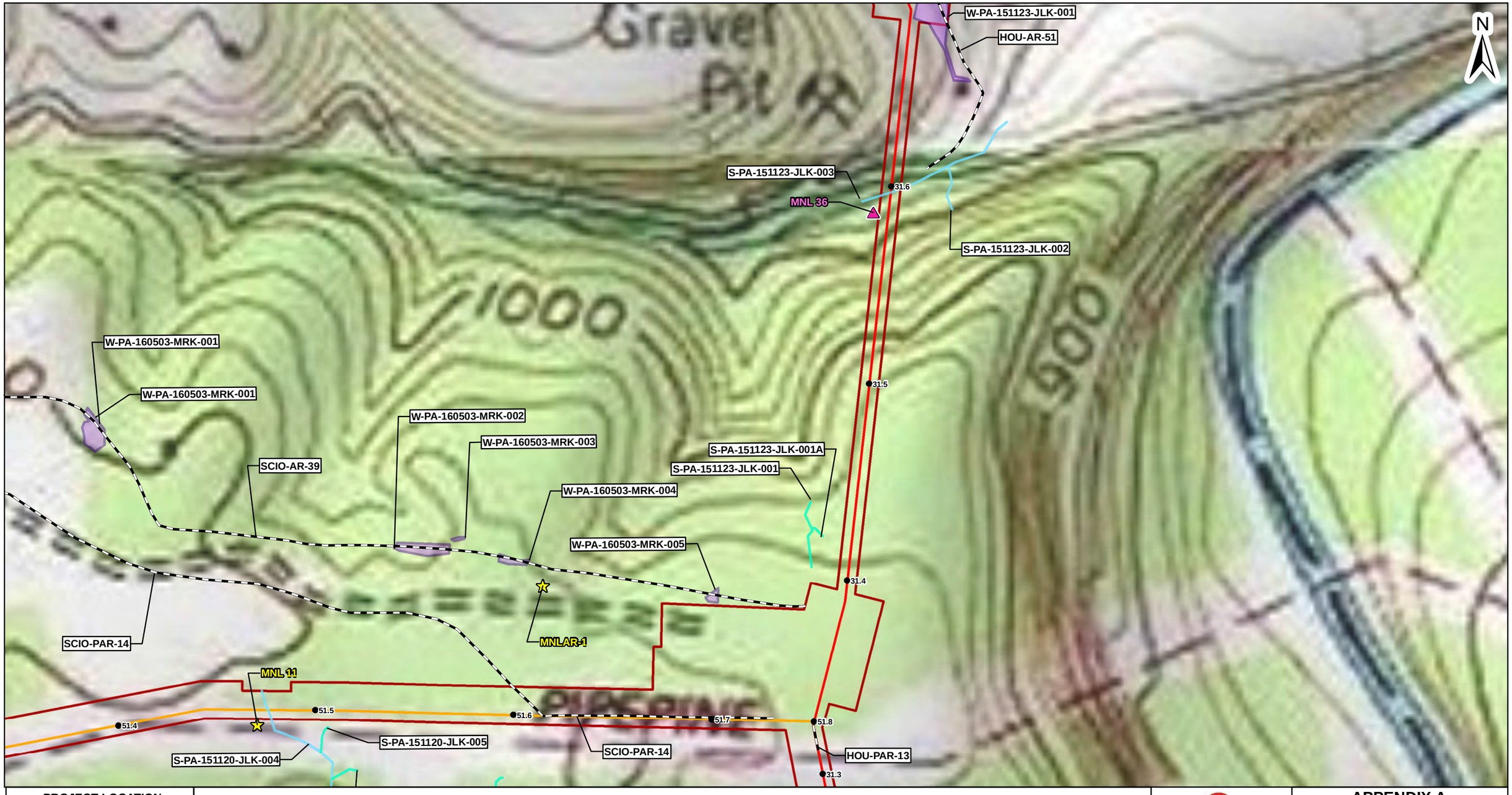
PAGE 33 OF 38

SHELL PIPELINE COMPANY, LP
FALCON ETHANE PIPELINE PROJECT

DRAWN BY: KFS Date: 5/31/2017
APPROVED: JLK PROJECT#: 60487539

Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PATH:Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd



PROJECT LOCATION

ALLEGHENY, BEAVER, AND WASHINGTON COUNTIES, PENNSYLVANIA

LEGEND

- ADDITIONAL MIST-NIETTING LOCATION
- ROOST TREE
- PREVIOUSLY SUBMITTED KILOMETER MARKER
- MILEPOSTS
- MIST NETTING LOCATION (MNL)
- MYSE CAPTURED MIST NETTINGL LOCATION
- PROPOSED HOUSTON TO MONACA PIPELINE
- PROPOSED SCIO TO MONACA PIPELINE
- PROPOSED ACCESS ROAD
- OPEN END WETLAND LINE
- EPHEMERAL STREAM
- INTERMITTENT STREAM
- PERENNIAL STREAM
- DELINEATED PEM WETLAND
- DELINEATED PFO WETLAND
- DELINEATED PSS WETLAND
- DELINEATED PUB WETLAND
- PROPOSED LOD
- TOWNSHIP BOUNDARY
- COUNTY BOUNDARY
- STATE BOUNDARY

REFERENCE: AERIAL LAYER - CONTRACTED IMAGERY TAKEN OCTOBER, 2015 AND SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P CORP., NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI (THAILAND), MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY, COPYRIGHT:© 2013 NATIONAL GEOGRAPHIC SOCIETY, I-CUBED .

COORDINATE SYSTEM: NAD 1983 UTM ZONE 17NTRANSVERSE MERCATOR

0 125 250 500 Feet

SHELL PIPELINE COMPANY, LP
910 LOUISIANA STREET,
ROOM 41082A
HOUSTON, TEXAS 77002

AECOM
FOSTER PLAZA 6
681 ANDERSEN DRIVE
4TH FLOOR
PITTSBURGH, PA 15220
412-503-4700

APPENDIX A

MIST-NETTING LOCATION MAP

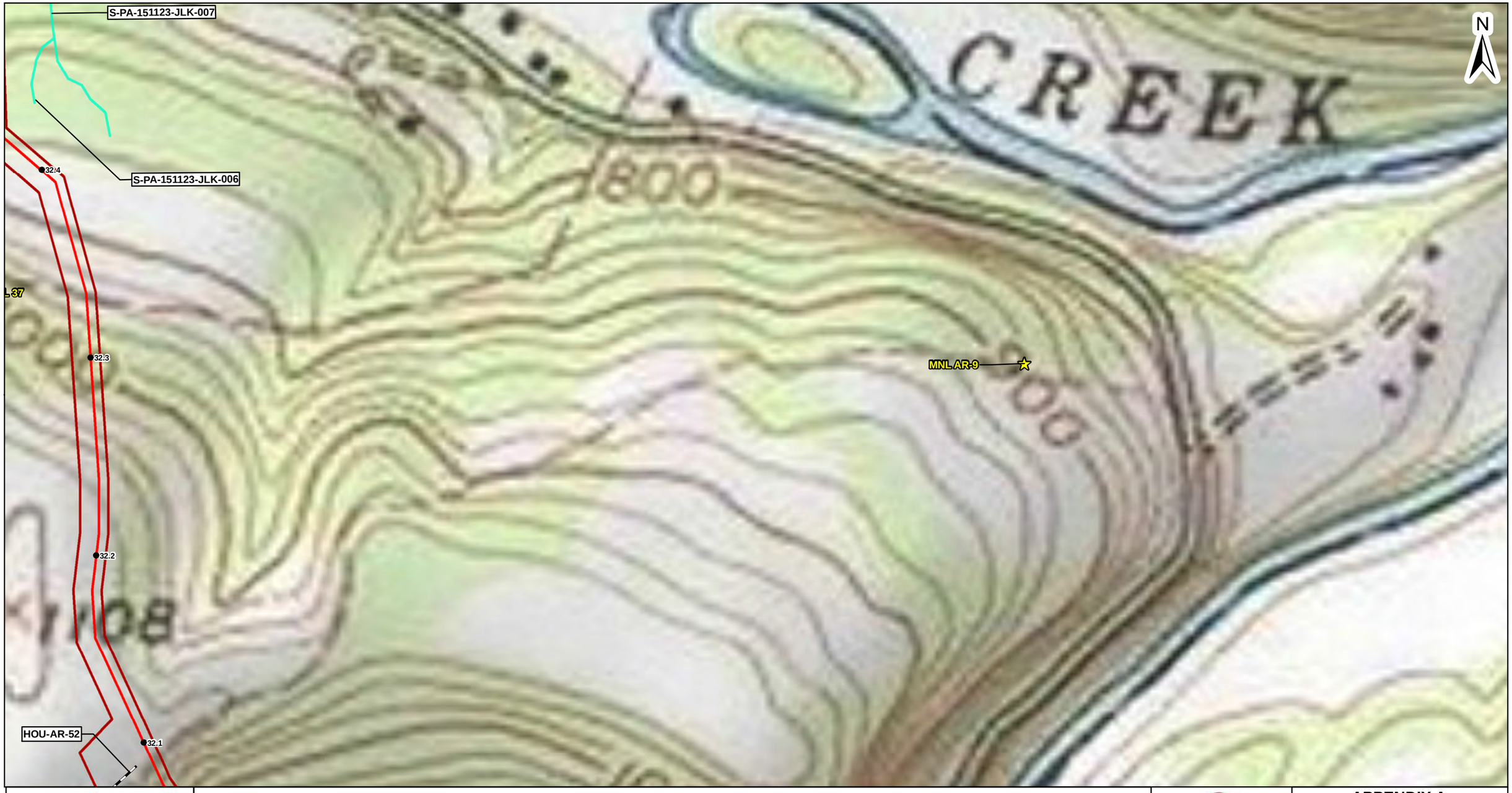
PAGE 34 OF 38

SHELL PIPELINE COMPANY, LP
FALCON ETHANE PIPELINE PROJECT

DRAWN BY: KFS Date: 5/31/2017
APPROVED: JLK PROJECT#: 60487539

Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PATH:Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd



PROJECT LOCATION

ALLEGHENY, BEAVER, AND WASHINGTON COUNTIES, PENNSYLVANIA

LEGEND

- ADDITIONAL MIST-NIETTING LOCATION
- ROOST TREE
- PREVIOUSLY SUBMITTED KILOMETER MARKER
- MILEPOSTS
- MIST NETTING LOCATION (MNL)
- MYSE CAPTURED MIST NETTINGL LOCATION
- PROPOSED HOUSTON TO MONACA PIPELINE
- PROPOSED SCIO TO MONACA PIPELINE
- PROPOSED ACCESS ROAD
- OPEN END WETLAND LINE
- EPHEMERAL STREAM
- INTERMITTENT STREAM
- PERENNIAL STREAM
- DELINEATED PEM WETLAND
- DELINEATED PFO WETLAND
- DELINEATED PSS WETLAND
- DELINEATED PUB WETLAND
- PROPOSED LOD
- TOWNSHIP BOUNDARY
- COUNTY BOUNDARY
- STATE BOUNDARY

REFERENCE: AERIAL LAYER - CONTRACTED IMAGERY TAKEN OCTOBER, 2015 AND SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P CORP., NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI (THAILAND), MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY, COPYRIGHT:© 2013 NATIONAL GEOGRAPHIC SOCIETY, I-CUBED .

COORDINATE SYSTEM: NAD 1983 UTM ZONE 17NTRANSVERSE MERCATOR

0 125 250 500 Feet

SHELL PIPELINE COMPANY, LP
910 LOUISIANA STREET,
ROOM 41082A
HOUSTON, TEXAS 77002

AECOM
FOSTER PLAZA 6
681 ANDERSEN DRIVE
4TH FLOOR
PITTSBURGH, PA 15220
412-503-4700

APPENDIX A

MIST-NETTING LOCATION MAP

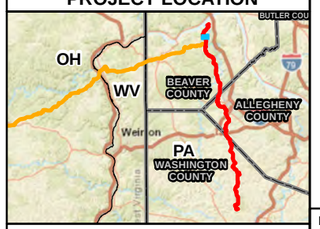
SHELL PIPELINE COMPANY, LP
FALCON ETHANE PIPELINE PROJECT

DRAWN BY: KFS Date: 5/31/2017
APPROVED: JLK PROJECT#: 60487539

Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PATH:Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PROJECT LOCATION



ALLEGHENY, BEAVER, AND WASHINGTON COUNTIES, PENNSYLVANIA

LEGEND

- ADDITIONAL MIST-NIETTING LOCATION
- ROOST TREE
- PREVIOUSLY SUBMITTED KILOMETER MARKER
- MILEPOSTS
- MIST NETTING LOCATION (MNL)
- MYSE CAPTURED MIST NETTINGL LOCATION
- PROPOSED HOUSTON TO MONACA PIPELINE
- PROPOSED SCIO TO MONACA PIPELINE
- PROPOSED ACCESS ROAD
- OPEN END WETLAND LINE
- EPHEMERAL STREAM
- INTERMITTENT STREAM
- PERENNIAL STREAM
- DELINEATED PEM WETLAND
- DELINEATED PFO WETLAND
- DELINEATED PSS WETLAND
- DELINEATED PUB WETLAND
- PROPOSED LOD
- TOWNSHIP BOUNDARY
- COUNTY BOUNDARY
- STATE BOUNDARY

REFERENCE: AERIAL LAYER - CONTRACTED IMAGERY TAKEN OCTOBER, 2015 AND SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P CORP., NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI (THAILAND), MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY, COPYRIGHT:© 2013 NATIONAL GEOGRAPHIC SOCIETY, I-CUBED .

COORDINATE SYSTEM: NAD 1983 UTM ZONE 17NTRANSVERSE MERCATOR

0 125 250 500 Feet

SHELL PIPELINE COMPANY, LP
910 LOUISIANA STREET,
ROOM 41082A
HOUSTON, TEXAS 77002

AECOM
FOSTER PLAZA 6
681 ANDERSEN DRIVE
4TH FLOOR
PITTSBURGH, PA 15220
412-503-4700

APPENDIX A

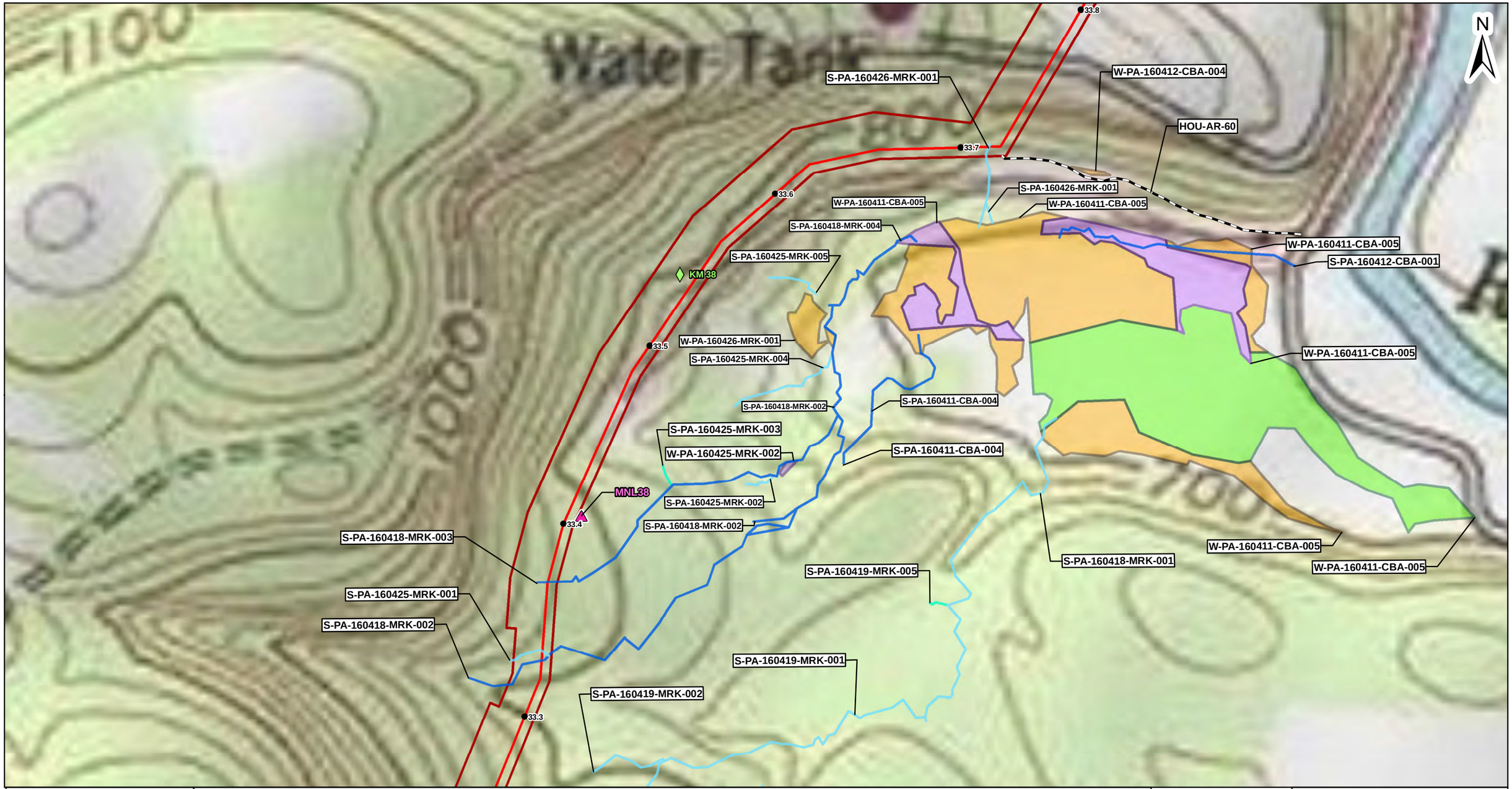
MIST-NETTING LOCATION MAP

SHELL PIPELINE COMPANY, LP
FALCON ETHANE PIPELINE PROJECT

DRAWN BY: KFS Date: 5/31/2017
APPROVED: JLK PROJECT#: 60487539

Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PATH:Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd



PROJECT LOCATION

ALLEGHENY, BEAVER, AND WASHINGTON COUNTIES, PENNSYLVANIA

LEGEND

- ADDITIONAL MIST-NIETTING LOCATION
- ROOST TREE
- PREVIOUSLY SUBMITTED KILOMETER MARKER
- MILEPOSTS
- MIST NETTING LOCATION (MNL)
- MYSE CAPTURED MIST NETTINGL LOCATION
- PROPOSED HOUSTON TO MONACA PIPELINE
- PROPOSED SCIO TO MONACA PIPELINE
- PROPOSED ACCESS ROAD
- OPEN END WETLAND LINE
- EPHEMERAL STREAM
- INTERMITTENT STREAM
- PERENNIAL STREAM
- DELINEATED PEM WETLAND
- DELINEATED PFO WETLAND
- DELINEATED PSS WETLAND
- DELINEATED PUB WETLAND
- PROPOSED LOD
- TOWNSHIP BOUNDARY
- COUNTY BOUNDARY
- STATE BOUNDARY

REFERENCE: AERIAL LAYER - CONTRACTED IMAGERY TAKEN OCTOBER, 2015 AND SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P CORP., NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI (THAILAND), MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY, COPYRIGHT:© 2013 NATIONAL GEOGRAPHIC SOCIETY, I-CUBED .

COORDINATE SYSTEM: NAD 1983 UTM ZONE 17NTRANSVERSE MERCATOR

0 125 250 500 Feet

SHELL PIPELINE COMPANY, LP
910 LOUISIANA STREET,
ROOM 41082A
HOUSTON, TEXAS 77002

AECOM
FOSTER PLAZA 6
681 ANDERSEN DRIVE
4TH FLOOR
PITTSBURGH, PA 15220
412-503-4700

APPENDIX A

MIST-NETTING LOCATION MAP

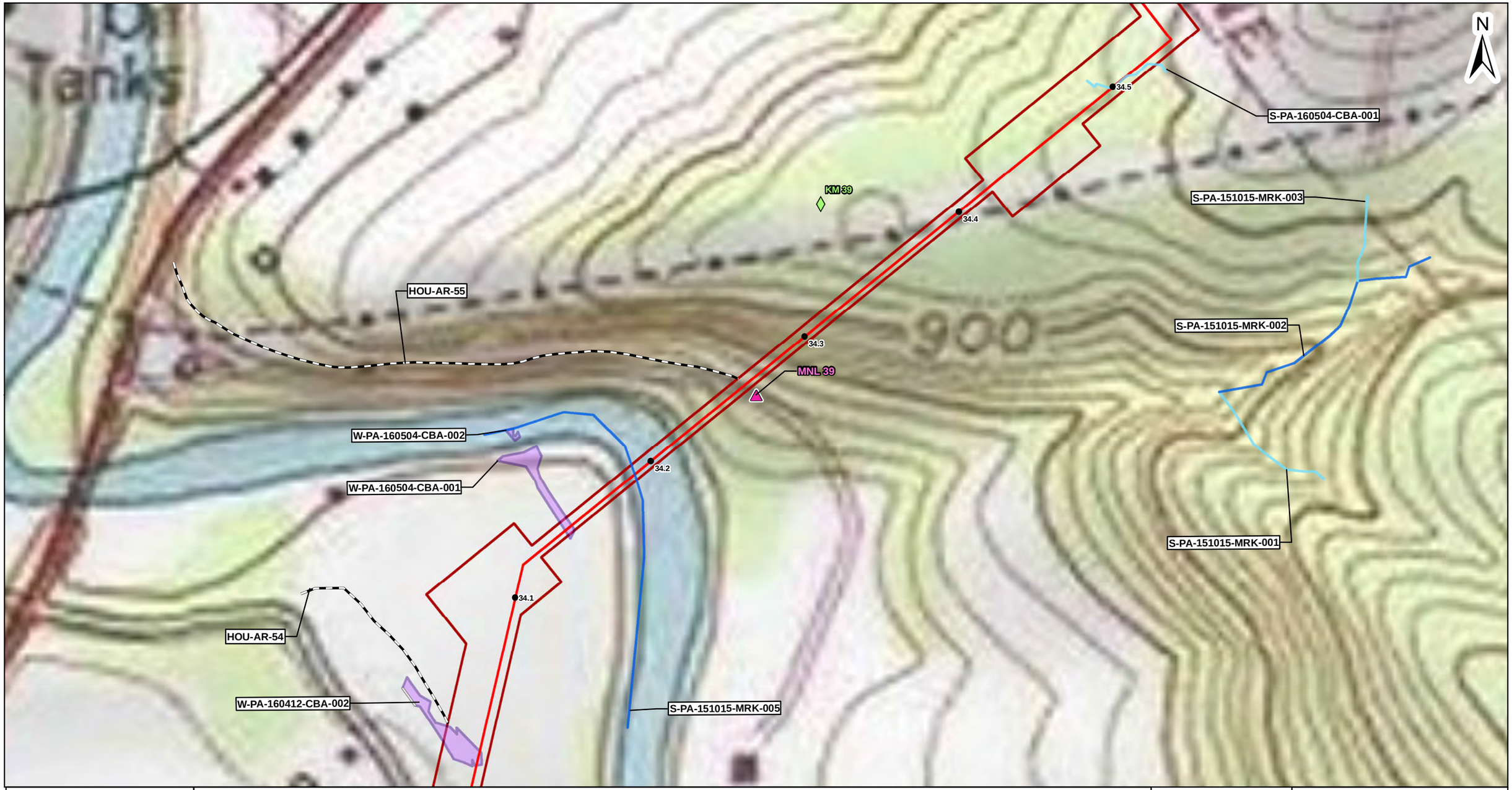
PAGE 37 OF 38

SHELL PIPELINE COMPANY, LP
FALCON ETHANE PIPELINE PROJECT

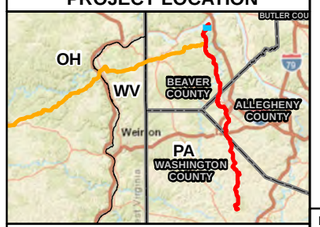
DRAWN BY: KFS Date: 5/31/2017
APPROVED: JLK PROJECT#: 60487539

Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PATH:Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd



PROJECT LOCATION



ALLEGHENY, BEAVER, AND WASHINGTON COUNTIES, PENNSYLVANIA

LEGEND

- ADDITIONAL MIST-NIETTING LOCATION
- ROOST TREE
- PREVIOUSLY SUBMITTED KILOMETER MARKER
- MILEPOSTS
- MIST NETTING LOCATION (MNL)
- MYSE CAPTURED MIST NETTINGL LOCATION
- PROPOSED HOUSTON TO MONACA PIPELINE
- PROPOSED SCIO TO MONACA PIPELINE
- PROPOSED ACCESS ROAD
- OPEN END WETLAND LINE
- EPHEMERAL STREAM
- INTERMITTENT STREAM
- PERENNIAL STREAM
- DELINEATED PEM WETLAND
- DELINEATED PFO WETLAND
- DELINEATED PSS WETLAND
- DELINEATED PUB WETLAND
- PROPOSED LOD
- TOWNSHIP BOUNDARY
- COUNTY BOUNDARY
- STATE BOUNDARY

REFERENCE: AERIAL LAYER - CONTRACTED IMAGERY TAKEN OCTOBER, 2015 AND SOURCES: ESRI, HERE, DELORME, USGS, INTERMAP, INCREMENT P CORP., NRCAN, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), ESRI (THAILAND), MAPMYINDIA, © OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY, COPYRIGHT:© 2013 NATIONAL GEOGRAPHIC SOCIETY, I-CUBED .

COORDINATE SYSTEM: NAD 1983 UTM ZONE 17NTRANSVERSE MERCATOR

0 125 250 500 Feet

SHELL PIPELINE COMPANY, LP
910 LOUISIANA STREET,
ROOM 41082A
HOUSTON, TEXAS 77002

AECOM
FOSTER PLAZA 6
681 ANDERSEN DRIVE
4TH FLOOR
PITTSBURGH, PA 15220
412-503-4700

APPENDIX A

MIST-NETTING LOCATION MAP

PAGE 38 OF 38

SHELL PIPELINE COMPANY, LP
FALCON ETHANE PIPELINE PROJECT

DRAWN BY: KFS Date: 5/31/2017
APPROVED: JLK PROJECT#: 60487539

Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

PATH:Y:\GIS\Projects\Shell\Northeast Pipeline\MXDs\Bat Maps\Permit\PA\PA_BAT_MNL_TOPO_MAP_20170530.mxd

Appendix B
PGC Permit

PENNSYLVANIA GAME COMMISSION
COMMONWEALTH OF PENNSYLVANIA
2001 ELMERTON AVENUE
HARRISBURG PA 17110

SPECIAL USE PERMIT

PERMIT TYPE INDIANA BAT SURVEY
PERMIT # 40705

DESCRIPTION BAT SAMPLING - CAPTURE & RELEASE ALL BATS INCLUDING INDIANA BATS (MYOTIS SODALIS)

PERMITTEE

RYAN LEIBERHER
STE 205
100 STERLING PKWY
MECHANICSBURG PA 17050 - 2903

DOB 1/8/1977
PHONE 717-795-8001

BUSINESS AECOM

REGION SE, SW
EFFECTIVE DATE 6/8/2017 - 8/15/2017
FEE $ 0

REPORT REQUIRED AS SPECIFIED
RENEWABLE NO
PITTMAN-ROBERTSON NO

SPECIES BAT

SUBPERMITEE BRIAN COOPER-QBS

CONDITIONS

1 THE VALIDITY OF THIS PERMIT IS CONDITIONED UPON THE RECEIPT AND MAINTENANCE OF ANY OTHER APPLICABLE FEDERAL, STATE OR LOCAL PERMITS REQUIRED BY LAW.

2 A COPY OF THIS PERMIT SHALL BE CARRIED AND PRESENTED UPON REQUEST OF ANY DULY AUTHORIZED OFFICER OR REPRESENTATIVE OF THE COMMISSION.

3 ALL PERMITTED ACTIVITIES SHALL AT ALL TIMES BE CONDUCTED IN CONFORMANCE WITH ALL APPLICABLE REQUIREMENTS OF THE GAME AND WILDLIFE CODE (34 PA.C.S. § 101 ET SEQ.) AND ITS ATTENDANT REGULATIONS (58 PA. CODE § 131.1 ET SEQ.).

4 STUDY AREA IS THE SHELL FACON ETHAN PIPELINE - BEAVER, ALLEGHENY, AND WASHINGTON COUNTIES

5 PERMITTEE WILL ABIDE BY THE ALL THE GUIDANCE AND REQUIREMENTS IN THE 2017 PA BAT SURVEY REPORTING PACKET AND THE 2017 USFWS SUMMER SURVEY GUIDANCE.

6 THE SUMMER NETTING PERIOD IS MAY 15 THROUGH AUGUST 15 AND IF PROPERLY PERMITTED, THE HIBERNACULA TRAPPING SAMPLING PERIOD IS SEPTEMBER 15 THROUGH OCTOBER 15.

CONTINUED...

PENNSYLVANIA GAME COMMISSION
COMMONWEALTH OF PENNSYLVANIA
2001 ELMERTON AVENUE
HARRISBURG PA 17110

SPECIAL USE PERMIT

PERMIT TYPE INDIANA BAT SURVEY
PERMIT # 40705

7 BATS MAY BE CAPTURED THROUGH THE USE OF MIST NETS AND HARP TRAPS. UP TO 10 INDIVIDUAL BATS PER PROJECT MAY BE BANDED WITH FOREARM BANDS FOR TRAINING PURPOSES OR TO MARK RARE CAPTURES, INCLUDING INDIANA AND LONG-EARED BATS (YELLOW AND ORANGE ARE RESTRICTED AS NOTED IN BAT PACKET. ANY INDIANA BAT (MYOTIS SODALIS), NORTHERN LONG-EARED BAT (M.SEPTENTIRONALIS), LITTLE BROWN BAT (MYOTIS LUCIFUGUS), SMALL-FOOTED (STATE THREATENED, M.LEIBII) AND REPRODUCTIVE FEMALE/JUVENILE SILVER-HAIRED BATS (L.NOCTIVIGANS) AND REPRODUCTIVE FEMALE/JUVENILE SEMINOLE BATS (L.SEMINOLUS) SHALL FOLLOW NOTIFICATION AND TELEMTRY REQUIRMENTS IN BAT PACKET. TISSUE, BLOOD OR OTHER DESTRUCTIVE SAMPLES MAY NOT BE TAKEN FROM ANY BAT UNLESS APPROVED AND STATED ON PERMIT. AN ACOUSTICAL BAT DETECTOR MAY BE USED AT EACH NET SITE.

8 EQUIPMENT WILL BE CLEANED AND DECONTAMINATED, FOLLOWING THE LATEST DECONTAMINATION PROCEDURES AVAILABLE AT HTTP://WHITENOSESYNDROME.ORG/ (WNS INFO). PERMITTEES ARE REQUIRED TO FOLLOW ALL DECONTAMINATION AND DISINFECTION GUIDELINES FOR ALL BAT FIELD STUDIES.

9 ALL BATS CAPTURED DURING THE SURVEY SHALL BE HANDLED IN A HUMANE MANNER AND NON TARGET BATS SHALL BE RELEASED UNHARMED. ANY BAT THAT MAY DIE DUE TO HANDLING WILL BE REPORTED IMMEDIATELY TO THE PENNSYLVANIA GAME COMMISSION, AS DESCRIBED IN THE 2016 BAT PACKET, OR BY CALLING THE BUREAU OF WILDLIFE MANAGEMENT, 2001 ELMERTON AVENUE, HARRISBURG, PA 17110, (717) 787-5529.

10 A REPORT OF THE ACTIVITIES CONDUCTED THROUGH THIS PERMIT SHALL BE PROVIDED TO THE PENNSYLVANIA GAME COMMISSION WITHIN 120 DAYS OF THE COMPLETION OF THE PROJECT. REPORTS WILL INCLUDE THE PROVIDED MANDATORY REPORTING FORMS IN HARD COPY. PLEASE SEND TO SAME ADDRESS IN CONDITION 9 ATTN: GREG TURNER.

11 IF A SURVEY IS CONDUCTED FOR A PROJECT (OR ANY PORTION THEREOF) THAT HAS UNDERGONE A PENNSYLVANIA NATURAL DIVERISITY 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 10 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 120 DAYS OF THE COMPLETION OF THE PROJECT.

12 A QUALIFIED BAT SURVEYOR (QBS) MUST BE PRESENT DURING THE TIMES OF SURVEYS, FOLLOWING THE LEVEL OF EFFORT, ETHICS, AND ATTENDANCE AT NETS AS SPECIFIED IN BAT PACKET. QBSS ARE RESPONSIBLE FOR OVERSEEING ALL ASPECTS OF THE PROJECT INCLUDING ADHERENCE TO PGC NETTING STANDARDS AND EFFORT REQUIREMENTS. THIS PERSON AND ALL OTHER QBS/BIS SHALL BE LISTED ON THE USFWS QUALIFIED BAT SURVEYORS LIST AS WELL AS THIS PERMIT.

13 ONLY QUALIFIED BAT SURVEYORS (QBS) AND APPROVED BAT IDENTIFIERS (BI) WILL IDENTIFY BATS. BAT IDENTIFIERS SHALL BE LISTED ON THE USFWS BAT IDENTIFIER LIST. ASSISTANTS DO NOT NEED TO BE LISTED ON THIS PERMIT.

14 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.

CONTINUED...

PENNSYLVANIA GAME COMMISSION
COMMONWEALTH OF PENNSYLVANIA
2001 ELMERTON AVENUE
HARRISBURG PA 17110

SPECIAL USE PERMIT

PERMIT TYPE INDIANA BAT SURVEY
PERMIT # 40705

15 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.

16 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.

PERMITTEE SIGNATURE DATE

Randy L Shupp

DIRECTOR, BUREAU OF
WILDLIFE PROTECTION

REVISION # 1

COMMONWEALTH OF PENNSYLVANIA
PENNSYLVANIA GAME COMMISSION
BUREAU OF WILDLIFE MANAGEMENT
WILDLIFE DIVERSITY SECTION
2001 Elmerton Avenue, Harrisburg, PA 17110-9797 Tel: 717.787.5529 Fax: 717.787.3292

DATE: May 11, 2017

SUBJECT: Bat Survey Guidelines and Changes in 2017

TO: Pennsylvania Qualified Bat Surveyors

FROM: Greg Turner, Wildlife Biologist
2001 Elmerton Ave, Harrisburg, PA 17110

Dear Colleagues,

Another year is upon us. We have been busy here doing winter surveys, trapping emerging and swarming bats, monitoring maternity colonies, and LOTs of WNS-related research. In entering and looking at data, it sure seems like certain species are getting really hard to encounter with random surveys. With these incredibly low levels of some species, one change you will notice is the addition of telemetry on adult female little browns to identify maternity roosts and obtain a single emergence count. Since little browns are gregarious and rather consistent in roost site selection annually, identification of these sites has good potential to further our conservation efforts for this species. We have kept the level of effort at a minimal level and in concert with known foraging parameters to reduce duplicative efforts at same roosts. Should you not acquire landowner permission to confirm the exact location of the roost or perform the emergence survey you should contact myself and Mike Scafini immediately.

As you are all likely aware, the USFWS is requiring data be submitted via their recently developed spreadsheet. Although we had intended to convert data submission requirements in 2017 to this same format, specific data fields were not able to be included in this regional spreadsheet in time for this season. As such, we will continue with the data submission protocol that we have always had, and work with USFWS so that their spreadsheet collects all the valuable data that goes into our long-term dataset.

If you ever have questions on the protocol or what is expected of you, please know you may email or call for clarification and we will get back to you as soon as possible.

Thank you for your continued cooperation.

2016 PA Game Commission Bat Surveyor Packet

Commonwealth of Pennsylvania, Pennsylvania Game Commission

Standard and Minimum Effort Requirements for Qualified Bat Surveyor Netting within the Commonwealth of Pennsylvania for Environmental Review Projects

Mist-net or acoustical surveys will be carried out in accordance with and to the level of effort as specified by the most up-to-date U.S .Fish and Wildlife Service's (USFWS) "*2017 Range-wide Indiana Bat Summer Survey Guidelines."* **http://www.fws.gov/midwest/endangered/mammals/inba/inbasummersurveyguidance.html**. In the field, effort should be equally distributed among the best and most appropriate habitat in an effort to detect all bat species present. Any restricted or additional methods described in this document and required as a stipulation of your permit (i.e. reporting of dead bats, measuring of all bats, photo documenting rare species, transmitter attachment etc.) must be followed as a requirement of the Pennsylvania Game Commission (PGC) Permit. We recommend consulting with environmental review staff of both the PGC and USFWS for approval of survey plans **prior** to actual surveys. Surveyors should refer to Project Environmental Review Receipt (Receipt) and establish personal communication with environmental review staff as early as possible to discuss each project. Any modifications to protocols must be approved ahead of time by the environmental review staff of both agencies for federally listed species and with PGC staff for species that are not federally listed. Projects using acoustical surveys to meet USFWS requests do not require a State permit; however, copies of all acoustic survey reports prepared for the USFWS should be sent to the PGC, and should include all details outlined in the Acoustical survey section. All participants are required to follow the latest White-Nose decontamination protocols: https://www.whitenosesyndrome.org/topics/decontamination.

Netting Season: May 15 – August 15

General Netting Guidelines and Prohibitions: Site selection is the ultimate responsibility of the permitted Qualified Bat Surveyor (QBS) on site, and will target prime capture locations for the targeted species of concern. Professional judgment is foremost in site selection and net set deployment. Photographs of sets and a map of the project area depicting deployments are highly recommended to complete justification if deviating from standard PGC policy. Poles for triple or quad high nets will have a pulley system for efficient bat removal. Nets will be the lowest visibility weights available (50 denier 2-Ply Nylon or 75 denier 2-Ply Polyester) and 38 mm (~1.5 in) mesh. Standard net lengths will be available to cover most travel corridors ranging from 6 m (~19 ft) to 18 m (~59 ft).

Nets will be hung in the standard manner to provide bag in panels and be placed among "clutter" to minimize detection. Overstretched nets that eliminate panel bagging will not be permitted. Sites will be monitored quietly; loud noises (other than low volume occasional communication), continuous lighting, running engines, smoking, campfires and other activities that disturb/alert bats, will not be allowed within 300 m of a Site. Each net Site will be sampled for 2 nights beginning at dusk for at least 5 hours (300 minutes). Different but proximate locations are suggested for day 2 sampling. Each net set must be continually staffed and checked ~every 10 minutes by a staff member. Both QBS and BIs may oversee a maximum of 2 sites, but only if each is staffed by another team member, constant communication is available, and travel time is less than 10 minutes between sites. The number of nets within a site will follow USFWS 2017 guidelines and be approved by environmental review staff ahead of time.

All bats must be held until verified by a QBS or BI and the verification and data collection will occur within 20 minutes of capture. Unless a transmitter is being attached, all bats will be released unharmed within 20 minutes. All bats captured must be measured and recorded on forms in Section 3 of this document, and State or Federally-listed species or rare species (Telemetry protocols Appendix I, Section E) should be photo documented at a minimum. Similar to previous years, a representative sample of reproductive northern long-eared females (adult males and juveniles are excluded) that meet the transmitter attachment body mass requirements in Appendix I, will have a transmitter attached. Should the QBS on site determine the attachment

is not warranted for a biological reason (i.e. too much wing damage), that reasoning should be documented on Form P-70008-M. Supplemental photographs may also be beneficial and included in report, should no subsequent capture suffice as a replacement to attach a transmitter. Data collected on northern long-eared bats with attached transmitter will be no less than a single roost tree identified and a single emergence count performed, and submitted via forms in Section 4 of this document. The maximum number of transmitters required per project will remain at 1 per every 3 miles (5 KM) for linear projects or one per 123 acres for non-linear projects.

New for 2017, will be the attachment of a transmitter to a representative sample of reproductive little brown bat females (adult males and juveniles are excluded) that meet the transmitter attachment body mass requirements spelled out in Appendix I. Should the QBS on site determine the attachment is not warranted for a biological reason (i.e. too much wing damage), that reasoning should be documented on Form P-70008-M. Supplemental photographs may also be beneficial and included in report, should no subsequent capture suffice as a replacement to attach a transmitter. Data collected on little brown bats with transmitter will be no less than a single roost tree identified and a single emergence count performed, and submitted via forms in Section 4 of this document. The maximum number of transmitters required per project will be 1 per every 3 miles (5 KM) for linear projects or one per 123 acres for non-linear projects.

All listed species (State or Federal) captured must be reported via email to all of the listed PGC contacts within 72 hours, and all federally listed species must additionally be reported to the USFWS within 72 hours (see Contacts below). Any specimens that perish require immediate notification to the PGC and any federally listed species that perish require immediate notification to the USFWS. All such specimens must be retained in refrigerated or frozen condition until direction is provided by PGC staff. Any physical sample collection (*i.e.*, fur, blood, wing punch) needs prior approval and to be stated specifically on permit. All forearm bands must be appropriate size for the species and have a unique identification number. Banding is not required for any capture, and is limited to a maximum of 10 bands per project as a means to educate staff or to band approved, state-listed species. Generic, mass banding is not permitted unless specifically requested ahead of time and stated on permit (repeated survey effort for mark/recapture is desired for justification). Banding of small-footed bats is prohibited unless authorized. Use of orange forearm bands is only permitted for Indiana bats captured across the State and yellow bands are only permitted for Indiana bats captured at Canoe Creek. Photographs of definitive characteristics for all *Myotis* species, uncommon species, and injuries or deformities are highly recommended to accompany report. Collection of guano for genetic confirmation is acceptable practice.

Should the PGC find that quality netting locations suitable for triple-high net sets are available but that lower net sets were deployed and not meeting standards below, that poor quality netting locations were selected, or other violations explained above were not adhered to by the QBS or BI, permits may be revoked and the qualified surveyor(s) may be considered unable to perform their duty, resulting in removal from the Pennsylvania list of QBS and BIs.

Netting Effort: Capture sites for bats should be evenly dispersed across the project area. Efforts may focus on one or several bat species, so surveyors should refer to their PNDI Receipt as well as their personal communication with environmental review staff from both the PGC and USFWS as appropriate, and equally divide the level of effort to target each prioritized species as appropriate for the project area. It should be recorded under the comment section for each site what the targeted species for each net set are. Each net Site will be sampled for 2 nights beginning at sunset for at least 5 hours (300 minutes). Different but proximate locations are suggested for second night. Each net set will be checked ~every 10 minutes. Minimally, one person designated as a BI or QBS will record data on

required forms and oversee no more than 2 sites at any time. To monitor greater than one site per BI/QBS, there must be an additional staff member to assist, ability to communicate between staff must exist at all times, and travel time between sites for the BI/QBS must be less than 10 minutes.

Minimum Nightly Effort/Site = 420 Units of Effort (UE): The USFWS guidelines should be followed, with the QBS using their best judgment to select the most appropriate sites for the targeted species at each project area. All nets used within a site will be described in Section 15 of Form P-70008-N-T. In Pennsylvania, we encourage total capture effort to encompass a multitude of habitats and locations to encounter and capture all species present. Given that Indiana bats and many other species are often captured in elevated net sets comprised of 3 or greater stacked nets, they will be considered the standard deployment when conducting surveys in PA, and should represent >50% of all net sets. Poles will have a pulley system for efficient bat removal. In Pennsylvania, the amount of netting per hour is used to derive the level of effort expended. One unit of effort is equal to $1m^2$ of net area in place for 1 hour - (total m^2 of capture area) x (minutes in place/60). Prior to declines from WNS the average effort/Site of companies capturing Indiana bats in PA ranged from 490 to 680 UE. For Pennsylvania, each net Site must provide a minimum of 420 UE per night. For example, 2 sets- each measuring 7 m high by 6 m wide in place for the required 5 hours would meet the minimum effort of 420 UE: ((7 m x 6 m) + (7 m x 6 m)) x 5 hrs. With increased netting effort required by USFWS, and larger number of nets allowed per set or per site, meeting this minimum should be simple. In the rare situation where stacked nets can't be used at the required level stated above, or when alternative deployments to target a specific location/species is chosen, the minimum effort must still be met with more nets or net sets at a Site. Alternative deployments should be justified and described in the Remarks section of Form P-70008-N/T. If unable to complete the required effort on one night, such as bad weather, the site will be repeated using full UE on another night.

Acoustical Survey Guidelines and Reporting Requirements: If the USFWS is requesting the survey, and the surveyor chooses to perform acoustic surveys, no State permit is required. It is the responsibility of the surveyor to meet any USFWS qualifications to properly conduct surveys, and follow all provided standards and protocols they provide, and complete analysis by their timeline. Reports should be forwarded to the PGC for any analysis that determines a State-listed species (Indiana, northern long-eared, or small-footed Myotis) is present. The surveyor should have all original files (including noise files) as recorded on file should they be requested. The report should include, but is not limited to, a thorough description of equipment used at each site, placement, analysis of call reception/quality per site, and percent of calls identified. A table and detailed of all State-listed species identified along with their locations is required (this includes inconclusive ID/species groupings containing the State-listed species). Detailed spectrographs from the original recording of all potential State-listed species calls are to be reported and paired with comparable, natural library calls from known species.

Weather -- Surveys will be suspended when:

- Rain, steady drizzle or heavy fog occurs.
- Temperature falls below 10ºC (50ºF).
- Winds result in frequently moving/billowing nets OR wind gusts exceeding 18 mph.

Sampling may resume that night if/when the poor conditions pass. If a full five hours is not achieved in a night another full five hour night is required.

Qualified Bat Surveyors (QBS): A qualified surveyor is one whose credentials and experience have been reviewed by the USFWS Pennsylvania Field Office (USFWS-PAFO) and the PGC and found to have expertise in all of the following:

- Correct identification of North American bats, to species.
- Proper notification of mortality or capture of listed species.
- Collection of biological information on bats of the northeast.
- Selecting Net Sites and placing Net Sets to maximize bat captures.
- Attaching radio transmitters, and bat bands.
- Oversee entire radio-tracking process and mapping behavior gained through biotelemetry.
- Identifying, describing, and conducting emergence counts of day roosts.
- Documenting study information (bats, net sets, portal entrances, etc.) with photography.

Standard and Minimum Effort Requirements for Qualified Bat Surveyor Netting within the Commonwealth of Pennsylvania for Environmental Review Projects.

A QBS is responsible for overseeing all aspects of surveys, and is, therefore, required to be at an active project site (including net surveys, telemetry monitoring and roost evaluations). Each QBS is responsible for knowing all permit conditions, bat packet requirements, site selection, set installation and the inspection of net sets each night. Only a QBS may apply for a permit and the permit must list all other QBS and BI's for a project. The permit holding QBS does not have to be on site during every active survey, so long as the sufficient number of QBSs listed on the permit are present to oversee the project. QBS are the individuals who act in the capacity of Principal Investigator (PI), having field oversight: responsibility for net setup, bat captures, bat identification, telemetry studies, safe handling procedures, adherence to WNS disinfection protocols, and any required training or oversight of newer employees. They are also the individuals responsible for ensuring permits are properly acquired, all bat permitting requirements are met, and ensuring that reports are accurate, complete and submitted to the appropriate agencies on time. In addition, the QBS will have direct communication (i.e. 2 way radio, cell phones etc.) with site workers. A QBS may have direct oversight for the identification of bats at up to 2 net Sites at a time unless travel between sites is >10 minutes in which case only 1 Site can be monitored. They may also oversee a single BI in charge of 2 additional net sites, so long as travel between sites is < 10 minutes, and absence from their primary site is <10 minutes without staff monitoring the net sites they are responsible for, or a BI remains in their stead. The QBS will verify and oversee photo documentation of listed species, and other species not regularly found in PA (see page 4, Bat Measurement Section for list), and supervise radio tagging, banding, and telemetry. **All** QBS listed on permit have the potential to be held responsible for any violation confirmed.

Bat Identifier (BI): A BI is an experienced bat surveyor capable of identifying all bat species and may have oversight for the identification of bats at up to 2 net Sites at a time unless travel between sites is >10 minutes in which case only 1 Site can be monitored. BIs can document their progress toward learning all the skills required for a QBS.

Assistants: Assistants are under the direct supervision of the QBS and are only responsible for assisting in site set-up, take-down and removal of bats. They do not need to be listed on the Pennsylvania QBS and BI list and do not need to be listed on any permit. An assistant can be noted as making correct ID's when they identify a bat prior to a QBS/BI identifying it. Viewing bats already identified is valuable, but not noteworthy. Documentation of bats they were primary identifier for should include species and QBS overseeing their identification.

Getting on the PA Bat List: BI's and Assistants that wish to document their bat experience can briefly note these activities in the comment sections of PGC Forms: P-70008-NT and/or P-70008-M. (example: *Name* was primary identifier of 2 Indiana bats upon removal from net, measured, banded, attached transmitters and verified by *QBS* as acceptable work.). Spelling *Name* clearly will facilitate future retrieval of this information from the database.

In 2016, a new submission form was created to standardize information from applicants seeking to be on the PA bat surveyor list, and should be obtained from either the PA field office of the USFWS or from the PGC. Submissions to this list are accepted between Jan 1 and March 31 each year. Any QBS involved in the training of staff that will be seeking a position on this list, should be prepared to vouch that the individual(s) have attained the required skills in writing, and should oversee their submissions.

Telemetry: The PGC shall be notified for all species with transmitters attached. The USFWS-PAFO shall be notified for Federally-listed bat captures and telemetry. Notification will occur as soon as possible but not to exceed 72 hours after capture. The list of species for which telemetry is necessary, level of effort for each species, and general guidance for transmitter attachment can be found in the attached telemetry protocol found in Appendix I. The frequency of transmitters, receivers and antennas will be tuned to 172 MHz. This will avoid conflicts with game species transmitters and allow the PGC to assist on lost subjects as the need arises, with either ground or air support.

Permit process: All permit inquiries, submissions and amendments should go through the PGC's Bureau of Wildlife Protection (BWP) Special Permit Enforcement Division, Attn: Chad Eyler ceyler@pa.gov. Projects requested via an environmental review process should include mapping, project descriptions, etc, and be vetted by this section and USFWS if applicable.

Permits not involving Environmental Review: Permits for a bio-blitz or for Academic needs (research or education) do not need permit holder to be on QBS list, and are not subject to telemetry protocols, but are subject to completing the attached forms, measuring all bats, photo documentation of listed species, notification, and all other provisions of the permit as stated. Exceptions for banding, taking of destructive samples, or other activities not commonly permitted should be included in permit proposal.

Ethical Standards from USFWS, PA Field Office-Reminder that Surveyors are expected to:

- Current permits covering all work locations to be conducted in Pennsylvania are required.
- Follow all provisions of State Permits including White Nose Syndrome decontamination protocols.
- Conduct surveys and studies in a manner that ensures the safety of all bats. Physical samples including but not limited to fur, blood, and wing punches are prohibited unless authorized on permit. Requests must be made when applying for permit.
- Follow established survey guidelines, and accurately, fully, and truthfully report on the methods used and results obtained during these surveys.
- Maintain field notes documenting their work and provide copies of field notes upon request.
- Report all federally endangered, i.e. *M.sodalis and M.septentrionalis*, bat findings to the Service and PGC within 72 hours.

- Contact the PGC (and USFWA-PAFO for federally listed species) within 24 hours if any bat is killed or injured. For subjects that have perished, keep the specimen refrigerated or frozen for submission to the PGC.
- Maintain the confidentiality of state or federally listed bat locations or captures.
- Obtain landowner permission before accessing land.

- Refrain from removing any bats from their habitat, holding them in captivity, collecting tissue (wing punches) or blood samples, conducting radio-telemetry studies, or harp trapping unless specifically authorized by a State Permit. Weighing, measuring, analyzing and photographing Indiana bats are standard operating procedures that take place when conducting mist net surveys.

Failure to adhere to any of these ethical standards or guidelines may result in an individual's removal from the list of qualified surveyors and revocation of their State Permit.

Contacts:

USFWS Pennsylvania Field Office (814) 234-4090

Pam Shellenberger	Pamela_Shellenberger@fws.gov
Melinda Turner	Melinda_Turner@fws.gov
Robert Anderson	Robert_M_Anderson@fws.gov

PA Game Commission

Greg Turner	(814) 599-7883	grturner@pa.gov
Michael Scafini	(717) 409-2848	mscafini@pa.gov
Tracey Librandi Mumma	(717) 787-4250	tlibrandi@pa.gov

COMMONWEALTH OF PENNSYLVANIA

Pennsylvania Game Commission, Bureau of Wildlife Protection, Special Permits Enforcement Division
2001 Elmerton Avenue, Harrisburg, PA 17110-9797

Procedure and format for permittee reports to the PA Game Commission when conducting bat capture surveys within the Commonwealth.

The report is divided into six sections that include: (1) Cover page, (2) Site Survey Record, (3) Bat Measurement and Capture Data Forms, (4) Roost forms, (5) Maps and (6) Photo Documentation.

Section 1 - Cover

A separate cover page should be provided for each project with the accompanying data of Sections 2 through 6 contained within. An example is provided.

Section 2* - Bat Netting/Trapping Site Survey Record

(FORM P-70008-N/T)

This is a **mandatory** two-page summary of site(s) surveyed and of captures. It should be completed for all sites surveyed, including those with no captures. If a capture technique other than mist netting or harp trapping is used, it should be described in remarks. Complete 1 for each site survey night (If site is trapped twice, 2 site survey records are required).

Section 3* - Bat Measurement and Capture Data Form

(FORM P-70008-M)

Starting in 2015, reporting all captures on this form is MANDATORY.
All measurements should follow North American collector standards (Nagorsen, D. W. and R. L. Peterson. 1980. Measurements and Weights. Pp. 22-26 in Mammal Collectors' Manual. Royal Ontario Museum, Publications in Life Sciences).

Band color restrictions: Yellow- only on *M.sodalis* at Canoe Creek St. Park; Orange- only for *M.sodalis* elsewhere. Other bands may be applied to *M.sodalis*. A limit of 10 bands per project rule is in place. Mass banding projects need a formal proposal submitted, and approval noted on permit. Banding of *M.leibii* is prohibited without prior approval.

Section 4* – Roost Forms

When conducting telemetry there are 2 roost forms that are provided: one for describing roosts (WD-DR-02/13) and another for bat emergence data (WD-EM-02/13). Species required for telemetry are described below telemetry protocol (Appendix I).

***Section 2, 3, and 4 forms may not be modified for reporting because they are used for data entry. If necessary, supplemental pages may be added to report unique data. Electronic versions of forms may be requested.**

Section 5 - Maps

An example is provided. All survey sites will be reported on a map (preferably a 7.5' USGS Topographic Map) so that locations can be accurately located and coordinates verified.

Section 6 - Photo Documentation

An example is provided. Photographs (preferably digital) will be taken of identification characteristics of every individual in below list. The photos should be labeled with the unique site name, date, capture number, QBS/company, and preferably have this information written on paper in background of photo. Please be aware some of these species photos are about documenting the defining characteristics of species for legal reasons, and some are due to their rarity and potential future status or last documentations in areas.

Species to be photographed: *Myotis lucifugus, Myotis septentrionalis, Myotis leibii, Myotis sodalis, Perimyotis subflavus, Nycticeius humeralis*

COMMONWEALTH OF PENNSYLVANIA
Pennsylvania Game Commission
Bureau of Wildlife Protection, Special Permits Enforcement Division
2001 Elmerton Avenue, Harrisburg, PA 17110-9797

Section 1 - Cover

PERMITTEE BAT CAPTURE REPORT

*Mail **hard copy** of reports to address on the heading of this page within 120 days of project completion.*

Permit Number_____

Project Name:_____

Company/
Organization/
Permittee Name:_____

Address: _____

_____

_____

_____

Phone: (_____)_____-_____ **Fax**: (_____)_____-_____

E-Mail:_____

Project Supervisor Name:_____

Supervisor Contact: Phone: (____)____ - _____

E-Mail: _____

If this is contracted work, provide the name & address of the individual/organization work is being performed for:

_____

_____

_____

Mail 2 **hard copies** of report to address on heading of cover page within 120 days of project completion.

COMMONWEALTH OF PENNSYLVANIA
Pennsylvania Game Commission

BAT NETTING/TRAPPING SITE SURVEY RECORD

1. Survey Date:_____ **2. Company Name:**_____

3. Bat Identifier:_____ **4. Assistants:**_____
(Responsible Recorder)

5. Project Name and Unique Site Name/Number:_____

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:_____ **9. 7.5' Quad.:**_____

10. Geographic Coordinates (D-M-S): Latitude: _____°-_____'-_____"N, Longitude: _____°-_____'-_____"W

Datum *(circle one)*: **NAD27** (Preferred), NAD83, WGS84, Other:_____

11. Ownership and Access: *(Who owns site or controls access? Give name and address.)*_____

_____

12. Time *(military)* **& Temperature:** Start Time_____h Stop Time_____h Total Minutes:_____

Start Temp._____°C End Temp._____°C *(must stay ≥10°C for summer netting)*

13. General Weather *(circle one)***:** Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain;
(suspend netting during periods of rain) Steady Rain; Thunderstorms; Snow; Other:_____.

14. General Wind Conditions *(circle one)*: Calm, Breezy (Leaves Rustling), Windy (Trees Swaying).

15. 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*

Total Capture Area:_____sq. m

(Site Survey Record – Continued) **Site Name/No.: _____ Date**:_____

16. Describe habitat 150 m around site: *(topography and vegetation including dominant tree species.)*

17. 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			
Eptesicus fuscus	*2*		*1*			*3*	*2*	*1*	*1*	*4*	*7*
Myotis lucifugus											
Myotis septentrionalis											
Myotis leibii											
Myotis sodalis											
Eptesicus fuscus											
Perimyotis subflavus											
Lasiurus borealis											
Lasiurus cinereus											
Lasionycteris noctivagans											
Other – specify:											
Other – specify:											

Reproductive Status: **NR**= nonreproductive, **PG**= pregnant, **L**= lactating, **PL**= post lactating, **SCR**= scrotal/epididymis swollen. **Grand Total**

Note: Pregnant is a category for females that are visibly pregnant. If visible reproductive status is not determined, the bat should be classified as NR. Visibly pregnant last year may be noted in comments, but classified as NR.

***Complete Measurement and Capture Data Form for all Captures**

Photo document all listed species, all species not considered residents, or abnormalities noted

18. BAT DETECTORS & OTHER MONITORING DEVICES: *If used in conjunction with trapping, report 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.*

1st hour	2nd hour	3rd hour	4th hour	5th 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:**

19. REMARKS:

FORM P-70008-M
12/09
Section 3

COMMONWEALTH OF PENNSYLVANIA
Pennsylvania Game Commission

Bat Measurement and Capture Data Form

Site Name Or Number:				Date:						Set No. Captured In:			Name of Person Identifying the Bat:			
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*			
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot					Recapture Yes/No	Band Material	Band Color	Band Inscriptio
Time of Capture	Photo Taken Yes / No		WNS Wing Score	Wing Photo ID: Remarks:												

Repro.Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis s

Site Name Or Number:				Date:						Set No. Captured In:			Name of Person Identifying the Bat:			
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*			
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot					Recapture Yes/No	Band Material	Band Color	Band Inscriptio
Time of Capture	Photo Taken Yes / No		WNS Wing Score	Wing Photo ID: Remarks:												

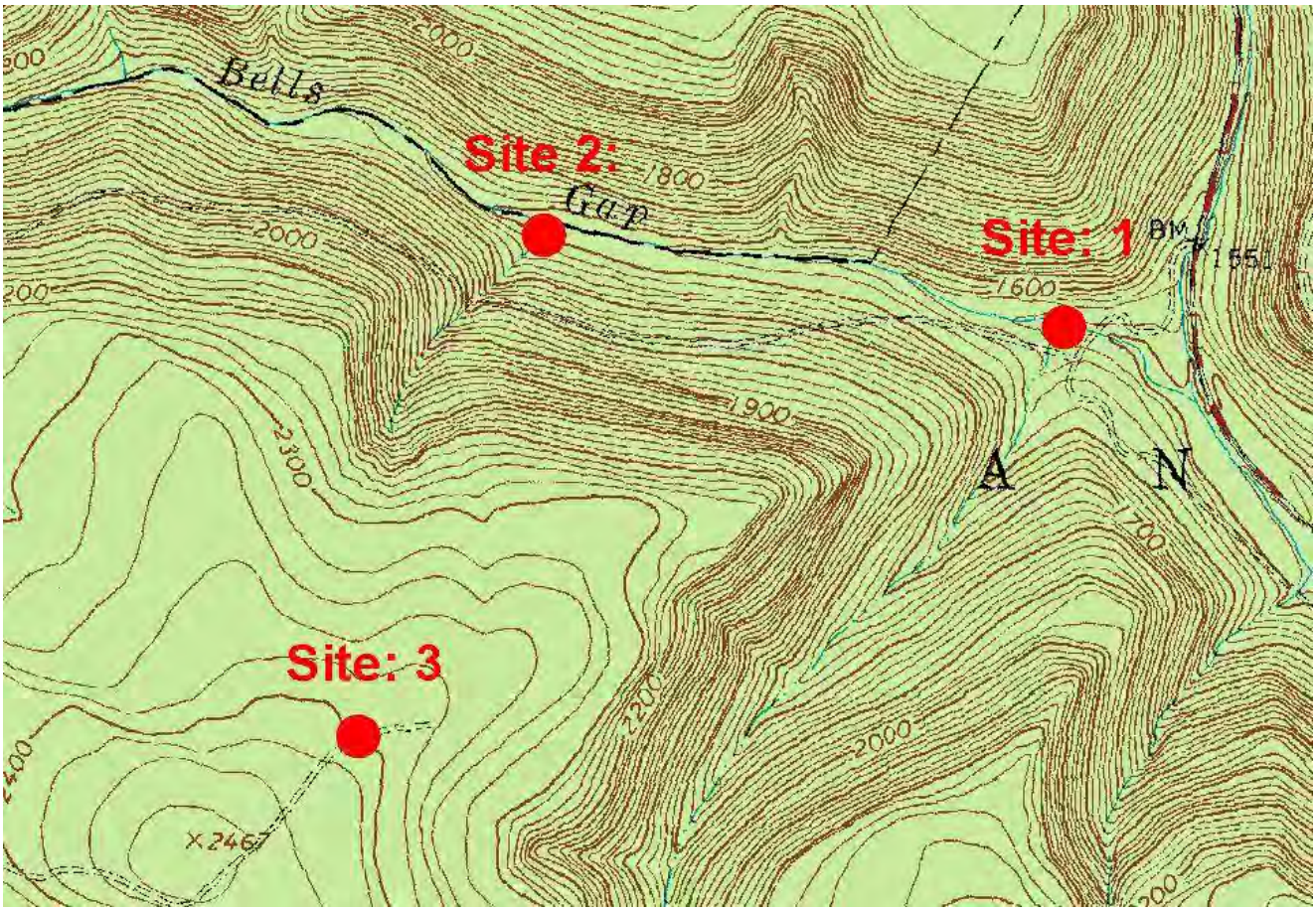
Repro.Condition: NR= nonreproductive, PG= pregnant, L= lactating, PL= post lactating, SCR= scrotal/epididymis s

Site Name Or Number:				Date:						Set No. Captured In:			Name of Person Identifying the Bat:			
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*			
Species	Sex	Age	Repro. Condition	Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot					Recapture Yes/No	Band Material	Band Color	Band Inscriptio
Time of Capture	Photo Taken Yes / No		WNS Wing Score	Wing Photo ID: Remarks:												

*Capture Number = number in sequence by site.

Section 5 - Maps *(example)*

Blair Co., Blandburg Quadrangle, Bells Gap Area.
Location of Sites 1, 2, and 3 for Project PA-24



Section 6 - Photos *(example)*

Male *Myotis sodalis* captured at **Site 1**
Capture date: **7/18/01**
Capture Number: **06**

Portrait

Keeled Calcar

Mail 2 **hard copies** of report to below address within 120 days of project completion to:

Pennsylvania Game Commission
Bureau of Wildlife Protection, Special Permits Enforcement Division
2001 Elmerton Avenue, Harrisburg, PA 17110-9797

PGC Form:
WD-DR-02/09
Section 4

PA GAME COMMISSION
Wildlife Diversity Section
Bat Tree - Day Roost - Data Sheet

1-
Landowner: **Name:** _____ **Address:** _____

Phone: _____ _____

2-BAT INFO
Dates on Roost: _____ **Day Roost Number:** _____
(Date = Date bat was on roost; Day Roost No.= Bat # & numbered tree, in sequence, for that bat ~ 241PGC-01)

Surveyors: _____ **Roost Type:** Tree - Building - Other_____

Bat Species: _____ **Band No.:**_____ **Transmitter Frequency:** _____

Ht.(m) bat is roosting off ground: _____ Was Bat Emergence Form Completed? **YES - NO**
Comments: *(Where is bat roosting? Under bark? If building-describe)*

_____

3-LOCATION

County: _____ **Quadrangle:** _____

Latitude: _____ (DMS) **Elevation (ft.):** _____

Longitude: _____ (DMS) **%Slope:** **Slope Aspect (0-360):**

Datum: Nad27 (prefered) NAD83/WGS84 (circle one)

4-TREE INFORMATION

Species: _____ **DBH (cm):**_____ Is Tree Alive? **YES - NO** *(CIRCLE)*

Height: (%UP _____ **+ %DOWN** _____**) X Dist.(m) to tree**_____ **=**_____**m**

1st Branch Ht. ***(%UP*** _____ ***+ %DOWN*** _____***) X Dist.(m) to tree***_____ **=**_____***m***

Estimate % Canopy Cover Around Tree: _____

Is suitable roost area on tree exposed to direct sunlight? **YES - NO** *(circle one)*
If so - estimate # of hours of exposure to direct sun: _____
Azimuth of Exposure (which way does exposed part of tree face): _____ *(0-360)*

Exfoliating Bark? **YES - NO** **Estimate % of tree with Exfoliating Bark:**_____

Cavities? **YES - NO If yes - Describe:**_____

5-SURROUNDING HABITAT
Distance (m) to Water:_____ **Water Type:**_____

Understory Species:_____

Overstory Species: _____
On reverse side of form Comment on Overstory Species and Habitat Composition.

PGC Form:
WD-EM-05/02
Section 4

PA GAME COMMISSION, Wildlife Diversity Section
Bat Emergence Form

*** It is important to keep lights and noise disturbance to a minimum during the emergence period. ***

DAY ROOST NO.:_____ **DATE:**_____

ROOST TYPE: Building Tree Other: _____

Surveyors: _____

_____

Transmitted Bat Band No.:_____ **Transmitter Frequency:**_____

Weather **Temperature:**_____***F**

Sky Condition Code:_____ **Wind Scale Code:**_____

Sky Conditions

Code	
0	Clear or a few clouds
1	Partly cloudy/variable sky
2	Cloudy (broken) or overcast
4	Fog or smoke
5	Drizzle
7	Snow
8	Showers

Beaufort Wind Scale

Code	MPH	Indicators
0	<1	Smoke rises vertically
1	1-3 mph	Smoke Drift shows wind direction
2	4 - 7 mph	Wind felt on face/leaves rustle
3	8 - 12 mph	Leaves&sm.twigs in constant motion
4	13 - 18 mph	Raises dust & loose paper
5	19 - 24 mph	Small trees in leave sway

Night Vision Equipment Used? **YES - NO** Bat Detector Used? **YES - NO**

Telemety Equipment Present? **YES - NO**

Time Surveyors arrived at Roost :_____ ***(use 24 hour clock for times)***

Time First Bat Seen Flying:_____

Time Transmitted Bat Emerged:_____ **And Azimuth Last Detected:**_____

Time Last Bat Seen Emerging:_____ **Total Emergence Count:**_____

Comments: *(include other emergence observations, weather, bat behavior, etc.)*

Pennsylvania Game Commission - Bat Telemetry Protocol

A. *Species for which telemetry is required:*
   1. Indiana bats (*M. sodalis*); all bats meeting body mass requirement, meet level of effort in section 'D' below.
   2. Northern long-eared bat (*M. septentrionalis*): 1 adult female meeting body mass requirements, every 3 linear miles of project or every 124 acres of project.
   3. Eastern small-footed bat (*M. leibii*); all bats meeting body mass requirement, meet level of effort in section 'D' below.
   4. Silver-haired bat (*L. noctivagans*); all reproductive females and juveniles meeting body mass requirement, level of effort in section 'D' below.
   5. Seminole bats (*L. seminolus*); all reproductive females and juveniles meeting body mass requirement, level of effort in section 'D' below.
   6. Little brown bat (*M. lucifugus*): 1 adult female meeting body mass requirements, every 3 linear miles of project or every 124 acres of project.

B. *Banding and transmitter attachment*
   1. Banding
      a. Any banding must be requested in advance, and explicitly labeled on your permit. Banding is only permitted for projects that detail level of effort to obtain recapture information, or at minimal levels for training purposes. Banding materials, size, and ID numbers must be approved prior to use. No orange or yellow darvic bands are to be used without specific approval. Split metal bands with tabs and unique number system are preferred for generic banding of species, numbering must be approved ahead of time
      b. No banding *M. leibii*
   2. Transmitters
      a. Try not to exceed 5% and **DO NOT** exceed more than 10% of the bats body weight
      b. With the lighter transmitters you should be able to be close to 5%; any transmitter that fits weight rule may be used

C. *Equipment*
   1. Receivers: Receiver can be a scanning or non-scanning type
   2. Antennas
      a. Antennas must be tuned to the frequencies of your transmitters and receiver (172 MHz)
      b. Antennas should be at least a 2-element (H-antenna) or 3+ element (yagi)
   3. Transmitters
      a. Transmitters should be tuned to 172 MHz to match the PGC; Approval and justification required in advance from the PGC
      b. Transmitter application (Perma-type surgical cement [Plainville, CT] is recommended)
         i. Separate the fur (blowing on fur works best) at the mid-dorsal region between shoulder blades and add a thin layer of latex, medical adhesive (Perma-type, Skin-Bond Cement or Osto-Bond) glue.

ii. Apply a thin layer of latex, medical adhesive (Perma-type, Skin-Bond Cement or Osto-Bond) glue to the transmitter.
iii. When the glue on both the transmitter and bat and transmitter are tacky, joined together by wrapping glue and hair up around transmitter to form a secure bond according to manufacturer recommendations.

D. Level of effort

1. Maximum number = 6 bats per survey season per PNDI project if the project area is less than 10 miles in length or 5,165 acres in size; if the PNDI project is a large project (i.e. project size of 10 miles in length or 5,165 acres or more) then consult with PGC environmental review staff to determine the maximum number of bats. Federal and state listed species are to be prioritized over special concern species.
2. Minimum of 3 nights of telemetry per bat
3. Minimum of 10 hours a night with a minimum of 3 successful triangulations per hour totaling 30 successful triangulations per night
   a. Lead biologist should have experience conducting telemetry on flying bats, be familiar with triangulation programs, be able to overcome typical field application difficulties (i.e. bounce/terrain), and be confident they are meeting these requirements
   b. 10 hour minimum per night includes the time spent by the bat roosting, unless time spent roosting can be attributed to weather (rain, wind over 18 mph, and/or night with starting temperatures below 60°F).
   c. No more than 2 hours of any night should be missed due to telemetry crew error and/or weather reasons (rain, wind over 18 mph, and/or night with starting temperatures below 60°F).
4. For each day any transmittered bat is documented roosting at a particular day roost, a minimum of 1 emergence count is required.
   a. All day roost found must have a minimum of 1 emergence count conducted
   b. Surveyors should arrive at least ½ hour before sunset and remain at the roost tree, counting all bats emerging until the time at which all bats have emerged or the lighting diminishes to a point at which the surveyor can no longer see to count the bats
   c. If emergence counts during telemetry are conducted on nights when the starting temperature is below 60°F and wind codes are 4 and above an additional emergence count is needed when more favorable weather conditions exist

E. Data sheets and data

1. Process data by individual animal and provide shapefiles of data points, minimum convex polygons of evening activity and fixed kernel utilization distribution of 95%, 75%, and 50% of the activity data.
2. PGC data sheets MUST be completed:
   a. Bat-Netting/Trapping Site Survey Record
   b. Bat Measurement and Capture Data Form
   c. Bat Transmitter Detection Record
   d. Day Roost Forms
      i. Complete this form for all roost types – trees, rocks, building, etc.

   ii. Regardless of roost type, fill out the following under 4-Roost Information: canopy cover estimation; whether roost is exposed to direct sunlight; hours of exposure to direct sunlight; and azimuth of exposure
e. Bat Emergence Form
f. Bats' activity schedule referenced to general locations on a map
   i. Foraging and Roosting as a minimum for activity remarks
   ii. Fall telemetry of males should include amount of time within mine, foraging and roosting

Appendix C- Dataforms

Bat Netting/Trapping Site Survey Records

Bat Measurement and Capture Data Forms

FORM P-70008-N/T
12/09
Section 2

COMMONWEALTH OF PENNSYLVANIA
Pennsylvania Game Commission

BAT NETTING/TRAPPING SITE SURVEY RECORD

1. **Survey Date:** 6/26/17 2. **Company Name:** AECOM

3. **Bat Identifier:** (Responsible Recorder) B. Cooper 4. **Assistants:** C. Ashbaugh

5. **Site Name and/or Number:** Falcon - MN-A17-01

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): Forested valley with intermittent stream, gravel road, and ATV trail

8. **County:** Beaver 9. **7.5' Quad.:** _____

10. **Was site GPS'd (required) ?** (YES) - NO

11. **Geographic Coordinates (D-M-S):** Latitude: 40 ° 36 ' 05.7 "N, Longitude: 80 ° 25 ' 08.2 "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 21:00 h Stop Time 02:10 BC h Total Minutes: 300 (10 min suspended)

Start Temp. 19.4 °C End Temp. 11.1 °C *(must stay ≥10 °C for summer netting)*

14. **General Weather** *(circle one)*: Clear; Partly Cloudy; (Mostly Cloudy); Cloudy; Drizzle; Intermittent Rain; Steady Rain; Thunderstorms; Snow; Other: Light drizzle 00:30 - 00:40
(suspend netting during periods of 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
A	Nets	3	9 x 2.6m	Stacked over trail/road	70.2
B	Nets	3	9 x 2.6m	Stacked over stream	70.2
C	Nets	3	9 x 2.6m	Stacked over trail	70.2

Total Capture Area: 210.6 sq. m

(Site Survey Record Continued) **Site Name/No.:** Falcon - MN-AH-01 **Date:** 6/26/17

17. Describe habitat 150 m around site: *(topography and vegetation including dominant tree species.)*
Low stream valley with mixed age hardwoods. Sycamore, Walnut, oak, elm

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			
Eptesicus fuscus	2		1			3	2	1	1	4	7
Myotis lucifugus											
Myotis septentrionalis											
Myotis leibii											
Myotis sodalis											
Eptesicus fuscus			1			1					1
Perimyotis subflavus											
Lasiurus borealis			1			1					1
Lasiurus cinereus											
Lasionycteris noctivagans											
Other – specify:											
Other – specify:											

Reproductive Status: **NR**= nonreproductive, **PG**= pregnant, **L**= lactating, **PL**= post lactating, **SCR**= scrotal/epididymis swollen.
Note: Pregnant is a category for females that are visibly pregnant. All others should be classified as NR
Visibly pregnant last year may be noted in comments.
***Complete Measurement and Capture Data Form for all Captures**
Photo document all listed species, all species not considered residents, or abnormalities noted

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.*

1st hour	2nd hour	3rd hour	4th hour	5th 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:

Light drizzle 00:30 - 00:40 (10 minutes). Nets remained dry, netting resumed. Kept nets open an additional 10 min for 300 minutes total.

FORM P-70008-N/T
12/09
Section 2

COMMONWEALTH OF PENNSYLVANIA
Pennsylvania Game Commission

BAT NETTING/TRAPPING SITE SURVEY RECORD

1. Survey Date: 6/27/17 **2. Company Name:** AECOM

3. Bat Identifier: (Responsible Recorder) B. Coopes **4. Assistants:** C. Ashbaugh

5. Site Name and/or Number: Falcon-MN-Alt-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):
Forested Valley with intermittent stream, gravel road, and ATV trail

8. County: Beaver **9. 7.5' Quad.:** _____

10. Was site GPS'd (required) ? (YES) - NO

11. Geographic Coordinates (D-M-S): Latitude: 40 ° 36 ' 05.7 "N, Longitude: 80 ° 25 ' 08.2 "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 21:00 h Stop Time 23:00 h Total Minutes: 120

Start Temp. ~~10.6~~ 15.6 °C End Temp. 9.9 °C *(must stay ≥10°C for summer netting)*

15.555
9 | 150
-9
60
54

14. General Weather *(circle one)*: Clear; (Partly Cloudy;) Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain; Steady Rain; Thunderstorms; Snow; Other: _____.
(suspend netting during periods of 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
A	Nets	3	9m x 2.6m	Stacked over road	70.2
B	Nets	3	9m x 2.6m	Stacked over stream	70.2
C	Nets	3	9m x 2.6m	Stacked over trail	70.2

Total Capture Area: 210.6 sq. m

(Site Survey Record – Continued) **Site Name/No.:** Falcon-MN-A11-01 **Date:** 6/27/17

17. Describe habitat 150 m around site: *(topography and vegetation including dominant tree species.)*
Low stream valley with mixed age hardwoods. Sycamore, walnut, oak, elm

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			
Eptesicus fuscus	2		1			3	2	1	1	4	7
Myotis lucifugus											
Myotis septentrionalis											
Myotis leibii											
Myotis sodalis											
Eptesicus fuscus											
Perimyotis subflavus											
Lasiurus borealis											
Lasiurus cinereus											
Lasionycteris noctivagans											
Other – specify											
Other – specify											

Reproductive Status: **NR**= nonreproductive, **PG**= pregnant, **L**= lactating, **PL**= post lactating, **SCR**= scrotal/epididymis swollen.

Note: Pregnant is a category for females that are visibly pregnant. All others should be classified as NR Visibly pregnant last year may be noted in comments.

***Complete Measurement and Capture Data Form for all Captures**

Photo document all listed species, all species not considered residents, or abnormalities noted

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.*

1st hour	2nd hour	3rd hour	4th hour	5th 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:
Cold out @ 23:00

FORM P-70008-N/T
12/09
Section 2

COMMONWEALTH OF PENNSYLVANIA
Pennsylvania Game Commission

BAT NETTING/TRAPPING SITE SURVEY RECORD

1. **Survey Date:** 6/28/17 2. **Company Name:** AECOM

3. **Bat Identifier:** (Responsible Recorder) B. Coopes 4. **Assistants:** C. Ashbaugh

5. **Site Name and/or Number:** Falcon-MN-Alt-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):

Forested valley with intermittent stream, gravel road, and ATV trail

8. **County:** Beaver 9. **7.5' Quad.:** _____

10. **Was site GPS'd (required) ?** (YES) - NO

11. **Geographic Coordinates (D-M-S):** Latitude: 40 ° 36 ' 05.7 "N, Longitude: 80 ° 25 ' 08.2 "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 21:00 h Stop Time 02:00 h Total Minutes: 300

Start Temp. 17.8 °C End Temp. 11.7 °C *(must stay ≥10°C for summer netting)*

14. **General Weather** *(circle one)*: (Clear) Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain; Steady Rain; Thunderstorms; Snow; Other: _____.
(suspend netting during periods of 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
A	Nets	3	9m x 2.6m	stacked over road	70.2
B	Nets	3	9m x 2.6m	stacked over stream	70.2
C	Nets	3	9m x 2.6m	Stacked over trail	70.2

Total Capture Area: 210.6 sq. m

(Site Survey Record – Continued) **Site Name/No.:** Falcon-MN-Alt-01 **Date:** 6/28/17

17. Describe habitat 150 m around site: *(topography and vegetation including dominant tree species.)*
Low stream valley with mixed age hardwoods. Sycamore, walnut, oak, elm

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			
Eptesicus fuscus	2		1			3	2	1	1	4	7
Myotis lucifugus											
Myotis septentrionalis											
Myotis leibii											
Myotis sodalis											
Eptesicus fuscus											
Perimyotis subflavus											
Lasiurus borealis				1		1			1	1	2
Lasiurus cinereus			1			1		1		1	2
Lasionycteris noctivagans											
Other – specify:											
Other – specify:											

Reproductive Status: **NR**= nonreproductive, **PG**= pregnant, **L**= lactating, **PL**= post lactating, **SCR**= scrotal/epididymis swollen.

Note: Pregnant is a category for females that are visibly pregnant. All others should be classified as NR Visibly pregnant last year may be noted in comments.

***Complete Measurement and Capture Data Form for all Captures**

Photo document all listed species, all species not considered residents, or abnormalities noted

Grand Total 4

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.*

1st hour	2nd hour	3rd hour	4th hour	5th 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:

FORM P-70008-N/T
12/09
Section 2

COMMONWEALTH OF PENNSYLVANIA
Pennsylvania Game Commission

BAT NETTING/TRAPPING SITE SURVEY RECORD

1. **Survey Date:** 6/29/17 2. **Company Name:** AECOM

3. **Bat Identifier:** (Responsible Recorder) B. Cooper 4. **Assistants:** C. Ashbaugh

5. **Site Name and/or Number:** Shell Falcon - MN-Alt-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 valley with small stream, pipeline corridor, and ATV trails

8. **County:** Beaver 9. **7.5' Quad.:** Hookstown

10. **Was site GPS'd (required) ?** (YES) - NO

11. **Geographic Coordinates (D-M-S):** Latitude: 40 °-36 '-45.5 "N, Longitude: 80 °-24 '-36.9 "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 21:00 h Stop Time 22:45 h Total Minutes: ~~300~~ BC 105

Start Temp. 23.3 °C End Temp. _____ °C *(must stay ≥10°C for summer netting)*

14. **General Weather** *(circle one)*: Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain; Steady Rain; (Thunderstorms); Snow; Other: Rainout @ 2245
(suspend netting during periods of 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
A	Nets	3	6mx2.6m	stacked over trail	46.8
B	Nets	3	6mx2.6m	Stacked over trail	46.8
C	Nets	3	9mx2.6m	Stacked over trail	BC ~~46.8~~ 70.2

Total Capture Area: 163.8 sq. m

(Site Survey Record – Continued) **Site Name/No.:** ~~MR-A~~ BC Shell Falcon-MN-A11-02 **Date:** 6/29/17

17. Describe habitat 150 m around site: *(topography and vegetation including dominant tree species.)*

Forested valley with small stream, pipeline corridor, and ATV trails. Sugar maple, slippery elm.

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			
Eptesicus fuscus	2		1			3	2	1	1	4	7
Myotis lucifugus											
Myotis septentrionalis											
Myotis leibii											
Myotis sodalis											
Eptesicus fuscus								1		1	1
Perimyotis subflavus											
Lasiurus borealis											
Lasiurus cinereus											
Lasionycteris noctivagans											
Other – specify:											
Other – specify:											

Reproductive Status: **NR**= nonreproductive, **PG**= pregnant, **L**= lactating, **PL**= post lactating, **SCR**= scrotal/epididymis swollen.

Note: Pregnant is a category for females that are visibly pregnant. All others should be classified as NR Visibly pregnant last year may be noted in comments.

***Complete Measurement and Capture Data Form for all Captures**

Photo document all listed species, all species not considered residents, or abnormalities noted

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.*

1st hour	2nd hour	3rd hour	4th hour	5th 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:

Rainout @ 22:45

FORM P-70008-N/T
12/09
Section 2

COMMONWEALTH OF PENNSYLVANIA
Pennsylvania Game Commission

BAT NETTING/TRAPPING SITE SURVEY RECORD

1. **Survey Date:** 7/5/17 2. **Company Name:** AECOM

3. **Bat Identifier:** (Responsible Recorder) B. Cooper 4. **Assistants:** J. Killosky

5. **Site Name and/or Number:** Shell Falcon - MN-Alt-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 valley with small stream, pipeline corridor, and ATV trails

8. **County:** Beaver 9. **7.5' Quad.:** Hookstown

10. **Was site GPS'd (required) ?** (YES) - NO

11. **Geographic Coordinates (D-M-S):** Latitude: 40 ° 36 ' 45.5 "N, Longitude: 80 ° 24 ' 36.9 "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 21:00 h Stop Time 02:00 h Total Minutes: 300

Start Temp. 24.4 °C End Temp. 19.4 °C *(must stay ≥10°C for summer netting)*

14. **General Weather** *(circle one)*: Clear; Partly Cloudy; Mostly Cloudy; (Cloudy); Drizzle; Intermittent Rain; Steady Rain; Thunderstorms; Snow; Other: _____.
(suspend netting during periods of 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*
A	Nets	3	6m x 2.6m	stacked over trail	46.8
B	Nets	3	6m x 2.6m	Stacked over trail	46.8
C	Nets	3	9m x 2.6m	Stacked over trail	70.2

Total Capture Area: 163.8 sq. m

(Site Survey Record – Continued) **Site Name/No.:** Shell Falcon - MN-Alt-02 **Date:** 7/5/17

17. Describe habitat 150 m around site: *(topography and vegetation including dominant tree species.)*
Forested valley with small stream, pipeline corridor, and ATV trails.
Sugar maple, slippery elm

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			
Eptesicus fuscus	2		1			3	2	1	1	4	7
Myotis lucifugus											
Myotis septentrionalis											
Myotis leibii											
Myotis sodalis											
Eptesicus fuscus			1			1		3		3	4
Perimyotis subflavus											
Lasiurus borealis											
Lasiurus cinereus											
Lasionycteris noctivagans											
Other – specify:											
Other – specify:											

Reproductive Status: **NR**= nonreproductive, **PG**= pregnant, L= lactating, **PL**= post lactating, **SCR**= scrotal/epididymis swollen.
Note: Pregnant is a category for females that are visibly pregnant. All others should be classified as NR Visibly pregnant last year may be noted in comments.

***Complete Measurement and Capture Data Form for all Captures**
Photo document all listed species, all species not considered residents, or abnormalities noted

Grand Total 4

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.*

1st hour	2nd hour	3rd hour	4th hour	5th 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:

FORM P-70008-N/T
12/09
Section 2

COMMONWEALTH OF PENNSYLVANIA
Pennsylvania Game Commission

BAT NETTING/TRAPPING SITE SURVEY RECORD

1. **Survey Date:** 7/6/17 2. **Company Name:** AECOM

3. **Bat Identifier:** (Responsible Recorder) B. Cooper 4. **Assistants:** J. Killosky

5. **Site Name and/or Number:** Shell Falcon-MN-Alt-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 valley with small stream, pipeline corridor, and ATV trails

8. **County:** Beaver 9. **7.5' Quad.:** Hookstown

10. **Was site GPS'd (required) ?** (YES) - NO

11. **Geographic Coordinates (D-M-S):** Latitude: 40 °- 36 '- 45.5 "N, Longitude: 80 °- 24 '- 36.9 "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 2100 h Stop Time 2130 h Total Minutes: 30

Start Temp. 22.4 °C End Temp. _____ °C *(must stay ≥10°C for summer netting)*

14. **General Weather** *(circle one)*: Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain; *(suspend netting during periods of 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
A	Nets	3	6m x 2.6m	stacked over trail	46.8
B	Nets	3	6m x 2.6m	stacked over trail	46.8
C	Nets	3	9m x 2.6m	stacked over trail	70.2

Total Capture Area: 163.8 sq. m

(Site Survey Record – Continued) **Site Name/No.:** MN-AH-02 **Date:** 7/6/17

17. Describe habitat 150 m around site: *(topography and vegetation including dominant tree species.)*
Forested valley with small stream, pipeline ROW, and ATV trails.
Sugar maple, slippery elm

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			
Eptesicus fuscus	2		1			3	2	1	1	4	7
Myotis lucifugus											
Myotis septentrionalis											
Myotis leibii											
Myotis sodalis											
Eptesicus fuscus											
Perimyotis subflavus											
Lasiurus borealis											
Lasiurus cinereus											
Lasionycteris noctivagans											
Other – specify:											
Other – specify:											

Reproductive Status: **NR**= nonreproductive, **PG**= pregnant, **L**= lactating, **PL**= post lactating, **SCR**= scrotal/epididymis swollen.

Note: Pregnant is a category for females that are visibly pregnant. All others should be classified as NR Visibly pregnant last year may be noted in comments.

***Complete Measurement and Capture Data Form for all Captures**

Photo document all listed species, all species not considered residents, or abnormalities noted

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.*

1st hour	2nd hour	3rd hour	4th hour	5th 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:

Rainout @ 21:30

FORM P-70008-N/T
12/09
Section 2

COMMONWEALTH OF PENNSYLVANIA
Pennsylvania Game Commission

BAT NETTING/TRAPPING SITE SURVEY RECORD

1. **Survey Date:** 7/11/17 2. **Company Name:** AECOM

3. **Bat Identifier:** B. Cooper (Responsible Recorder) 4. **Assistants:** C. Ashbaugh

5. **Site Name and/or Number:** Shell Falcon - MN - Alt - 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 valley with small stream, pipeline corridor, and ATV trails

8. **County:** Beaver 9. **7.5' Quad.:** Hookstown

10. **Was site GPS'd (required) ?** (YES) - NO

11. **Geographic Coordinates (D-M-S):** Latitude: 40 ° - 36 ' - 45.5 "N, Longitude: 80 ° - 24 ' - 36.9 "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 21:00 h Stop Time 02:00 h Total Minutes: 300

Start Temp. 21.7 °C End Temp. 19.4 °C *(must stay ≥10 °C for summer netting)*

14. **General Weather** *(circle one)*: Clear; Partly Cloudy; Mostly Cloudy; (Cloudy); Drizzle; Intermittent Rain; Steady Rain; Thunderstorms; Snow; Other: _____.
(suspend netting during periods of 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	1	12m x 2.6m	Stacked over trail	124.8 sq. m
A	Nets	3	6m x 2.6m	Stacked over trail	46.8
B	Nets	3	6m x 2.6m	Stacked over trail	46.8
C	Nets	3	9m x 2.6m	Stacked over trail	70.2

Total Capture Area: 163.8 sq. m

Pennsylvania Game Commission

(Site Survey Record – Continued) **Site Name/No.:** Shell Falcon - MN-AH-02 **Date:** 7/11/17

17. Describe habitat 150 m around site: *(topography and vegetation including dominant tree species.)*

Forested valley with small stream, pipeline corridor, and ATV trails.
Sugar maple, slippery elm

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			
Eptesicus fuscus	2		1			3	2	1	1	4	7
Myotis lucifugus											
Myotis septentrionalis											
Myotis leibii											
Myotis sodalis											
Eptesicus fuscus			1	1		2					2
Perimyotis subflavus											
Lasiurus borealis											
Lasiurus cinereus											
Lasionycteris noctivagans											
Other – specify:											
Other – specify											

Reproductive Status: **NR**= nonreproductive, **PG**= pregnant, **L**= lactating, **PL**= post lactating, **SCR**= scrotal/epididymis swollen.

Note: Pregnant is a category for females that are visibly pregnant. All others should be classified as NR
Visibly pregnant last year may be noted in comments.

***Complete Measurement and Capture Data Form for all Captures**

Photo document all listed species, all species not considered residents, or abnormalities noted

Grand Total 2

19. BAT DETECTORS & OTHER MONITORING DEVICES: *Tallies of bat passes / hour. One to 5 hours required for Indiana ba*
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.

1st hour	2nd hour	3rd hour	4th hour	5th 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:

FORM P-70008-N/T
12/09
Section 2

COMMONWEALTH OF PENNSYLVANIA
Pennsylvania Game Commission

BAT NETTING/TRAPPING SITE SURVEY RECORD

1. **Survey Date:** 7/12/17 2. **Company Name:** AECOM

3. **Bat Identifier:** (Responsible Recorder) B. Cooper 4. **Assistants:** C. Ashbaugh

5. **Site Name and/or Number:** MN-Alt-04 Shell Falcon

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):
Small ATV trails intersecting power line ROW adjacent to large pond

8. **County:** ~~Beaver~~ BC Allegheny 9. **7.5' Quad.:** _____

10. **Was site GPS'd (required) ?** (YES) NO

11. **Geographic Coordinates (D-M-S):** Latitude: 40 ° 28 ' 42.3 " N, Longitude: 80 ° 17 ' 31.1 " 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 21:00 h Stop Time 02:00 h Total Minutes: 300

Start Temp. 21.7 °C End Temp. 19.4 °C *(must stay ≥10°C for summer netting)*

14. **General Weather** *(circle one)*: Clear; Partly Cloudy; (Mostly Cloudy); Cloudy; Drizzle; Intermittent Rain; Steady Rain; Thunderstorms; Snow; Other: _____.
(suspend netting during periods of 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
A	Nets	3	6m x 2.6m	Stacked over trail	46.8
B	Nets	3	9m x 2.6m	Stacked over trail	70.2
C	Nets	3	6m x 2.6m	Stacked over trail	46.8
					~~163.8~~ BC

Total Capture Area: 163.8 sq. m

(Site Survey Record – Continued) **Site Name/No.:** Shell Falcon- MN-AH-04 **Date:** 7/12/17

17. Describe habitat 150 m around site: *(topography and vegetation including dominant tree species.)*

Small ATV trails intersecting powerline ROW adjacent to large pond.
Red maple, 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			
Eptesicus fuscus	2		1			3	2	1	1	4	7
Myotis lucifugus											
Myotis septentrionalis											
Myotis leibii											
Myotis sodalis											
Eptesicus fuscus											
Perimyotis subflavus											
Lasiurus borealis											
Lasiurus cinereus											
Lasionycteris noctivagans											
Other – specify:											
Other – specify:											

Reproductive Status: **NR**= nonreproductive, **PG**= pregnant, **L**= lactating, **PL**= post lactating, **SCR**= scrotal/epididymis swollen.

Note: Pregnant is a category for females that are visibly pregnant. All others should be classified as NR Visibly pregnant last year may be noted in comments.

***Complete Measurement and Capture Data Form for all Captures**

Photo document all listed species, all species not considered residents, or abnormalities noted

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.*

1st hour	2nd hour	3rd hour	4th hour	5th 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:

FORM P-70008-N/T
12/09
Section 2

COMMONWEALTH OF PENNSYLVANIA
Pennsylvania Game Commission

BAT NETTING/TRAPPING SITE SURVEY RECORD

1. **Survey Date:** 7/17/17 2. **Company Name:** AECOM

3. **Bat Identifier:** (Responsible Recorder) B. Coops 4. **Assistants:** C. Ashbaugh

5. **Site Name and/or Number:** Shell Falcon MN-Alt-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):

Small ATV trails intersecting power line ROW adjacent to large pond

8. **County:** Allegheny 9. **7.5' Quad.:**_____

10. **Was site GPS'd (required) ?** (YES) - NO

11. **Geographic Coordinates (D-M-S):** Latitude: ____°-____'-____"N, Longitude: ____°-____'-____"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 21:05 h Stop Time 02:05 h Total Minutes: 300

Start Temp. 21.1 °C End Temp._____°C *(must stay ≥10°C for summer netting)*

14. **General Weather** *(circle one)*: Clear; Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain; Steady Rain; Thunderstorms; Snow; Other:_____.
(suspend netting during periods of 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*
A	Nets	3	6mx2.6m	Stacked over trail	46.8
B	Nets	3	9mx2.6m	Stacked over trail	70.2
C	Nets	3	6mx2.6m	Stacked over trail	46.8

Total Capture Area: 163.8 sq. m

(Site Survey Record – Continued) **Site Name/No.:** Shell Falcon-MN-AH-04 **Date:** 7/17/17

17. Describe habitat 150 m around site: *(topography and vegetation including dominant tree species.)*

Small ATV trails intersecting powerline ROW adjacent to large pond.

Red maple, 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			
Eptesicus fuscus	2		1			3	2	1	1	4	7
Myotis lucifugus											
Myotis septentrionalis					1	1					1
Myotis leibii											
Myotis sodalis											
Eptesicus fuscus				1		1					1
Perimyotis subflavus											
Lasiurus borealis											
Lasiurus cinereus											
Lasionycteris noctivagans											
Other – specify:											
Other – specify:											

Reproductive Status: **NR**= nonreproductive, **PG**= pregnant, **L**= lactating, **PL**= post lactating, **SCR**= scrotal/epididymis swollen.

Note: Pregnant is a category for females that are visibly pregnant. All others should be classified as NR Visibly pregnant last year may be noted in comments.

***Complete Measurement and Capture Data Form for all Captures**

Photo document all listed species, all species not considered residents, or abnormalities noted

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.*

1st hour	2nd hour	3rd hour	4th hour	5th 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:

MYSE - 172.606

FORM P-70008-N/T
12/09
Section 2

COMMONWEALTH OF PENNSYLVANIA
Pennsylvania Game Commission

BAT NETTING/TRAPPING SITE SURVEY RECORD

1. **Survey Date:** 7/25/17 2. **Company Name:** AECOM

3. **Bat Identifier:** (Responsible Recorder) B. Coopes 4. **Assistants:** C. Ashbaugh

5. **Site Name and/or Number:** Shell Falcon MN-Alt-05

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):

Montour Rail Trail, gravel path with forested border.

8. **County:** Washington 9. **7.5' Quad.:** _____

10. **Was site GPS'd (required) ?** (YES) - NO

11. **Geographic Coordinates (D-M-S):** Latitude: 40 °- 20 '- 33.3 "N, Longitude: 80 °- 15 '- 45.3 "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 21:00 h Stop Time 02:00 h Total Minutes: 300

Start Temp. 21.1 °C End Temp. 11.1 °C *(must stay ≥10°C for summer netting)*

14. **General Weather** *(circle one)*: (Clear); Partly Cloudy; Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain; Steady Rain; Thunderstorms; Snow; Other: _____.
(suspend netting during periods of 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
A	Nets	3	9m x 2.6m	Stacked over trail	70.2
B	Nets	3	9m x 2.6m	Stacked over trail	70.2
C	Nets	3	9m x 2.6m	Stacked over trail	70.2

Total Capture Area: 210.6 sq. m

(Site Survey Record – Continued) **Site Name/No.:** Shell Falcon MN-AL-05 **Date:** 7/25/17

17. Describe habitat 150 m around site: *(topography and vegetation including dominant tree species.)*
Montour Rail Trail - Gravel path through agricultural area with trees bordering the trail. Sumac, Walnut, Cherry, elm

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			
Eptesicus fuscus	2		1			3	2	1	1	4	7
Myotis lucifugus											
Myotis septentrionalis											
Myotis leibii											
Myotis sodalis											
Eptesicus fuscus											
Perimyotis subflavus											
Lasiurus borealis										1	1
Lasiurus cinereus											
Lasionycteris noctivagans											
Other – specify											
Other – specify											

Reproductive Status: **NR**= nonreproductive, **PG**= pregnant, **L**= lactating, **PL**= post lactating, **SCR**= scrotal/epididymis swollen.

Note: Pregnant is a category for females that are visibly pregnant. All others should be classified as NR Visibly pregnant last year may be noted in comments.

***Complete Measurement and Capture Data Form for all Captures**

Photo document all listed species, all species not considered residents, or abnormalities noted

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.*

1st hour	2nd hour	3rd hour	4th hour	5th 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:

Red bat escape - male

FORM P-70008-N/T
12/09
Section 2

COMMONWEALTH OF PENNSYLVANIA
Pennsylvania Game Commission

BAT NETTING/TRAPPING SITE SURVEY RECORD

1. Survey Date: 7/26/17 **2. Company Name:** AECOM

3. Bat Identifier: (Responsible Recorder) B. Cooper **4. Assistants:** C. Ashbaugh

5. Site Name and/or Number: Shell Falcon MN-ALT-05

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):

Montour Rail Trail, gravel path with forested border

8. County: Washington **9. 7.5' Quad.:** _____

10. Was site GPS'd (required) ? (YES) - NO

11. Geographic Coordinates (D-M-S): Latitude: 40 ° 20 ' 333 "N, Longitude: 80 ° 15 ' 453 "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 21:00 h Stop Time 02:00 h Total Minutes: 300

Start Temp. 16.1 °C End Temp. 13.2 °C *(must stay ≥10°C for summer netting)*

14. General Weather *(circle one)*: Clear; (Partly Cloudy); Mostly Cloudy; Cloudy; Drizzle; Intermittent Rain; Steady Rain; Thunderstorms; Snow; Other: _____.
(suspend netting during periods of 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
A	Nets	3	9m x 2.6m	Stacked over trail	70.2
B	Nets	3	9m x 2.6m	Stacked over trail	70.2
C	Nets	3	9m x 2.6m	Stacked over trail	70.2

Total Capture Area: 210.6 sq. m

(Site Survey Record – Continued) **Site Name/No.:** Shell Falcon MN-AH-05 **Date:** 7/26/17

17. Describe habitat 150 m around site: *(topography and vegetation including dominant tree species.)*
Montour Rail Trail - Gravel path through agricultural area with trees bordering the trail. Sumac, walnut, cherry, elm

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			
Eptesicus fuscus	2		1			3	2	1	1	4	7
Myotis lucifugus											
Myotis septentrionalis											
Myotis leibii											
Myotis sodalis											
Eptesicus fuscus								1		1	1
Perimyotis subflavus											
Lasiurus borealis							1			1	1
Lasiurus cinereus											
Lasionycteris noctivagans											
Other – specify:											
Other – specify:											

Reproductive Status: **NR**= nonreproductive, **PG**= pregnant, **L**= lactating, **PL**= post lactating, **SCR**= scrotal/epididymis swollen.

Note: Pregnant is a category for females that are visibly pregnant. All others should be classified as NR Visibly pregnant last year may be noted in comments.

***Complete Measurement and Capture Data Form for all Captures**

Photo document all listed species, all species not considered residents, or abnormalities noted

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.*

1st hour	2nd hour	3rd hour	4th hour	5th 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:

FORM P-70008-M
12/09
Section 3

COMMONWEALTH OF PENNSYLVANIA
Pennsylvania Game Commission

Page# 1 of ____

Bat Measurement and Capture Data Form

Site Name Or Number:	Date:	Set No. Captured In:	Name of Person Identifying the Bat:	*Capture Number:
MN-ALT-01	6/26/17	A	BRIAN COOPER	1

Height in meters captured above ground surface: 3 m

Species	Sex	Age	Repro. Condition	Body Measurements (grams and millimeters) Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot		Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.) Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right	Transmitter Attached? If so: Frequency (mHz)
EPTESICUS fuscus	F	A	LAC	17	14	~~8~~ CAL 8	43	10		NO	—	—	—		NO

Time of Capture	Photo Taken	WNS Wing Score	Wing Photo ID:
~~2200~~ CAL 2200	(Yes) / No	1	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:
MN-ALT-01	6/26/17	A	BRIAN COOPER	2

Height in meters captured above ground surface: 4 m

Species	Sex	Age	Repro. Condition	Body Measurements (grams and millimeters) Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot		Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.) Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right	Transmitter Attached? If so: Frequency (mHz)
LASIURUS borealis	F	A	LAC	14.3	11	6	42	8		NO	—	—	—	—	NO

Time of Capture	Photo Taken	WNS Wing Score	Wing Photo ID:
2400	(Yes) / No	1	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

Species	Sex	Age	Repro. Condition	Body Measurements (grams and millimeters) Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot		Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.) Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right	Transmitter Attached? If so Frequency (mHz)

Time of Capture	Photo Taken	WNS Wing Score	Wing Photo ID:
	Yes / No		Remarks:

*Capture Number = number in sequence by site.

FORM P-70008-M
12/09
Section 3

COMMONWEALTH OF PENNSYLVANIA
Pennsylvania Game Commission

Bat Measurement and Capture Data Form

Site Name Or Number:	Date:	Set No. Captured In:	Name of Person Identifying the Bat:	*Capture Number:
MN-ALT-01	6/28/17	A	BRIAN COOPER	1

Height in meters captured above ground surface: CBA 8.5 m

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	Transmitter Attached? If so Frequency (mHz)
LASIURUS BOREALIS	M	JUV	NR	7.9	10.5	6	39.5	8.5		NO	—	—	—	—	No

Time of Capture	Photo Taken	WNS Wing Score	Wing Photo ID:
2230	(Yes) / No	Ø	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:
MN-ALT-9	6/28/17	B	BRIAN COOPER	2

Height in meters captured above ground surface: 2.5 m

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	Transmitter Attached? If so Frequency (mHz)
LASIURUS CINEREUS	M	A	NR	24.7	15.5	9	53.5	10.5		NO	—	—	—	—	NO

Time of Capture	Photo Taken	WNS Wing Score	Wing Photo ID:
2255	(Yes) / No	Ø	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:
MN-ALT-01	6/28/17	A	BRIAN COOPER	3

Height in meters captured above ground surface: 2 m

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	Transmitter Attached? If so Frequency (mHz)
LASIURUS BOREALIS	F	A	PL	11.2	11	6	41	7.5		NO	—	—	—	—	NO

Time of Capture	Photo Taken	WNS Wing Score	Wing Photo ID:
2345	(Yes) / No	1	Remarks:

*Capture Number = number in sequence by site.

FORM P-70008-M
12/09
Section 3

COMMONWEALTH OF PENNSYLVANIA
Pennsylvania Game Commission

Page# 3 of ____

Bat Measurement and Capture Data Form

Site Name Or Number:	Date:	Set No. Captured In:	Name of Person Identifying the Bat:	*Capture Number:
MN-ALT-01	6/28/17	B	BRIAN COOPER	4

Height in meters captured above ground surface: 3 m

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	Transmitter Attached? If so: Frequency (mHz)
LASIURUS CINEREUS	F	A	L	31	17	9	55	10.5		NO	—	—	—	—	NO

Body Measurements (grams and millimeters) | Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)

Time of Capture	Photo Taken	WNS Wing Score	Wing Photo ID:
2400	(Yes) / No	0	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

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	Transmitter Attached? If so: Frequency (mHz)
							~~5~~								

Body Measurements (grams and millimeters) | Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)

Time of Capture	Photo Taken	WNS Wing Score	Wing Photo ID:
	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

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	Transmitter Attached? If so: Frequency (mHz)

Body Measurements (grams and millimeters) | Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)

Time of Capture	Photo Taken	WNS Wing Score	Wing Photo ID:
	Yes / No		Remarks:

*Capture Number = number in sequence by site

FORM P-70008-M
12/09
Section 3

COMMONWEALTH OF PENNSYLVANIA
Pennsylvania Game Commission

Page# 1 of _____

Bat Measurement and Capture Data Form

Site Name Or Number:	Date:	Set No. Captured In:	Name of Person Identifying the Bat:	*Capture Number:
MN-ALT-02	6/29/17	A	BRIAN COOPER	1

Height in meters captured above ground surface:	Species	Sex	Age	Repro. Condition	Body Measurements (grams and millimeters) Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot		Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.) Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right	Transmitter Attached? If so: Frequency (mHz)
m	EPTESICUS FUSCUS	M	A	NR	16.3	17	7	46.0	11		No	—	—	—	—	No

Time of Capture	Photo Taken	WNS Wing Score	Wing Photo ID: / Remarks:
2200	(Yes) / No	0	

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:
MN-ALT-02	7/5/17	B	Brian Cooper	2

Height in meters captured above ground surface:	Species	Sex	Age	Repro. Condition	Body Measurements (grams and millimeters) Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot		Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.) Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right	Transmitter Attached? If so: Frequency (mHz)
2 m	Ep Fu	F	A	L	19.1	16.5	8	46	11.5		No	—	—	—	—	No

Time of Capture	Photo Taken	WNS Wing Score	Wing Photo ID: / Remarks:
23:30	(Yes) / No	1	

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:
MN-ALT-02	7/5/17	B	Brian Cooper	3

Height in meters captured above ground surface:	Species	Sex	A Age	Repro. Condition	Body Measurements (grams and millimeters) Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot		Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.) Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right	Transmitter Attached? If so: Frequency (mHz)
3 m	Ep Fu	M	~~AR~~	NR	19.3	16	7	46.5	11		No	—	—	—	—	No

Time of Capture	Photo Taken	WNS Wing Score	Wing Photo ID: / Remarks:
01:00	(Yes) / No	0	

*Capture Number = number in sequence by site.

FORM P-70008-M
12/09
Section 3

COMMONWEALTH OF PENNSYLVANIA
Pennsylvania Game Commission

Bat Measurement and Capture Data Form

Site Name Or Number:	Date:	Set No. Captured In:	Name of Person Identifying the Bat:	*Capture Number:
MN-ALT-02	7/5/17	B	Brian Cooper	4

Height in meters captured above ground surface: 3.0 m

Species	Sex	Age	Repro. Condition	Body Measurements (grams and millimeters) Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot		Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.) Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right	Transmitter Attached? If so: Frequency (mHz)
Epfu	M	A	NR	18.5	16.5	7.5	45.5	11		No	—	—	—	—	No

Time of Capture	Photo Taken	WNS Wing Score	Wing Photo ID:
01:00	(Yes) / No	Ø	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:
MN-ALT-02	7/5/17	B	Brian Cooper	5

Height in meters captured above ground surface: 3.0 m

Species	Sex	Age	Repro. Condition	Body Measurements (grams and millimeters) Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot		Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.) Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right	Transmitter Attached? If so: Frequency (mHz)
Epfu	M	A	NR	18.7	16.5	7.5	45.5	11		No	—	—	—	—	No

Time of Capture	Photo Taken	WNS Wing Score	Wing Photo ID:
01:25	(Yes) / No	Ø	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

Species	Sex	Age	Repro. Condition	Body Measurements (grams and millimeters) Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot		Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.) Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right	Transmitter Attached? If so: Frequency (mHz)

Time of Capture	Photo Taken	WNS Wing Score	Wing Photo ID:
	Yes / No		Remarks:

*Capture Number = number in sequence by site

FORM P-70008-M
12/09
Section 3

COMMONWEALTH OF PENNSYLVANIA
Pennsylvania Game Commission

Bat Measurement and Capture Data Form

Site Name Or Number: MN-Alt-02 | Date: 7/11/17 | Set No. Captured In: B | Name of Person Identifying the Bat: B. Coopes | *Capture Number: 7

Height in meters captured above ground surface: 7 m

Species	Sex	Age	Repro. Condition	Body Measurements (grams and millimeters) Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot		Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.) Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right	Transmitter Attached? If so Frequency (mHz)
Eptesicus fuscus	F	A	PL	20.3	17	8	49	8		NO	—	—	—	—	NO

Time of Capture	Photo Taken	WNS Wing Score	Wing Photo ID: / Remarks:
2245	Yes / No	1	

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

Species	Sex	Age	Repro. Condition	Body Measurements (grams and millimeters) Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot		Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.) Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right	Transmitter Attached? If so Frequency (mHz)

Time of Capture	Photo Taken	WNS Wing Score	Wing Photo ID: / Remarks:
	Yes / No		

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

Species	Sex	Age	Repro. Condition	Body Measurements (grams and millimeters) Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot		Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.) Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right	Transmitter Attached? If so Frequency (mHz)

Time of Capture	Photo Taken	WNS Wing Score	Wing Photo ID: / Remarks:
	Yes / No		

*Capture Number = number in sequence by site.

FORM P-70008-M
12/09
Section 3

COMMONWEALTH OF PENNSYLVANIA
Pennsylvania Game Commission

Page# 1 of ____

Bat Measurement and Capture Data Form

Site Name Or Number:	Date:	Set No. Captured In:	Name of Person Identifying the Bat:	*Capture Number:
MN-ALT-04	7/17/17	B	B. Cooper	01

Height in meters captured above ground surface: 2.0 m

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	Transmitter Attached? If so: Frequency (mHz)
Myotis septentrionalis	F	J	NR	6.5	16	9	36.5	9		N	—	—	—	—	172.606

Body Measurements (grams and millimeters) | Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)

Time of Capture	Photo Taken	WNS Wing Score	Wing Photo ID:
22:30	(Yes) / No	0	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:
MN-ALT-04	7/17/17	B	B. COOPER	02

Height in meters captured above ground surface: 2 m

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	Transmitter Attached? If so: Frequency (mHz)
Eptesicus fuscus	F	A	PL	20.3	16	7	46.5	10		No	—	—	—	—	No

Body Measurements (grams and millimeters) | Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)

Time of Capture	Photo Taken	WNS Wing Score	Wing Photo ID:
0120	(Yes) / No	0	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

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	Transmitter Attached? If so: Frequency (mHz)

Body Measurements (grams and millimeters) | Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.)

Time of Capture	Photo Taken	WNS Wing Score	Wing Photo ID:
	Yes / No		Remarks:

*Capture Number = number in sequence by site

FORM P-70008-M
12/09
Section 3

COMMONWEALTH OF PENNSYLVANIA
Pennsylvania Game Commission

Page# 1 of 1

Bat Measurement and Capture Data Form

Site Name Or Number:	Date:	Set No. Captured In:	Name of Person Identifying the Bat:	*Capture Number:
MN-ALT-05	7/25/17	C	B. Cooper	01

Height in meters captured above ground surface: ____ m

Species	Sex	Age	Repro. Condition	Body Measurements (grams and millimeters) Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot		Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.) Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right	Transmitter Attached? If so Frequency (mHz)
Lasiurus borealis	M	UNK	UNK												

Time of Capture	Photo Taken	WNS Wing Score	Wing Photo ID:
23:45	Yes / (No)	UNK	Remarks: Escaped from net

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:
MN-ALT-05	7/26/17	A	BRIAN COOPER	02

Height in meters captured above ground surface: 1.5 m

Species	Sex	Age	Repro. Condition	Body Measurements (grams and millimeters) Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot		Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.) Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right	Transmitter Attached? If so Frequency (mHz)
EPTESICUS FUSCUS	M	A	NR	14	18	8	45	9.5		NO	—	—	—	—	—

Time of Capture	Photo Taken	WNS Wing Score	Wing Photo ID:
2155	(Yes) / No	1	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:
MN-ALT-05	7/26/17	B	BRIAN COOPER	03

Height in meters captured above ground surface: 3 m

Species	Sex	Age	Repro. Condition	Body Measurements (grams and millimeters) Wt. (g)	Ear	Tragus	Fore-arm	Hind Foot		Band Information (if banded) (Band Males on bat's RIGHT fa., Females on bat's LEFT fa.) Recapture Yes/No	Band Material	Band Color	Band Inscription	Band on Left/Right	Transmitter Attached? If so Frequency (mHz)
LASIURUS BOREALIS	M	A	SCR	12.5	12	6	40.5	10		NO	—	—	—	—	—

Time of Capture	Photo Taken	WNS Wing Score	Wing Photo ID:
2225	(Yes) / No	0	Remarks:

*Capture Number = number in sequence by site.

Appendix D
MNL Site Photographs

Photograph: 1	
Description: MN-ALT-01-Net A	

Photograph: 2	
Description: MN-ALT-01-Net B	

Photograph: 3	
Description: MN-ALT-01-Net C	

Photograph: 4	
Description: MN-ALT-02-Net A	

Photograph: 5	
Description: MN-ALT-02-Net B	

Photograph: 6	
Description: MN-ALT-02-Net C	

Photograph: 7	
Description: MN-ALT-04-Net A	

Photograph: 8	
Description: MN-ALT-04-Net B	

Photograph: 9	
Description: MN-ALT-04-Net C	

Photograph: 10	
Description: MN-ALT-05-Net A	

Photograph: 11	
Description: MN-ALT-05-Net B	

Photograph: 12	
Description: MN-ALT-05-Net C	

Appendix E
Representative Bat Photographs

Photograph:	Date:
1	06/26/17

Species:

Eptesicus fuscus

Location:

MN-ALT-01

Photograph:	Date:
2	06/28/17

Species:

Lasiurus borealis

Location:

MN-ALT-01

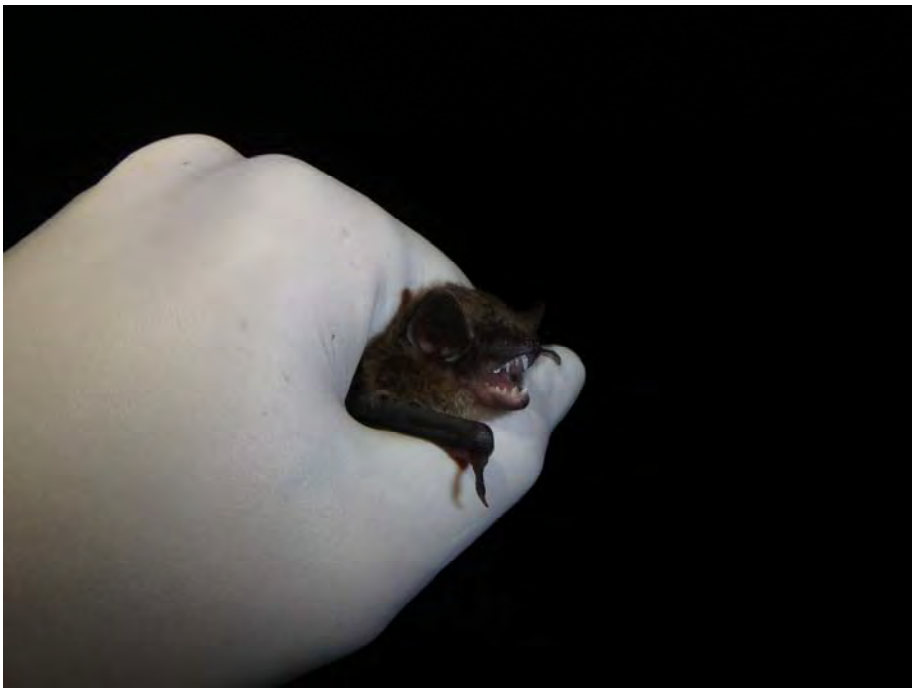
Photograph:	Date:	
3	06/28/17	
Species: *Lasiurus cinereus*		
Location: MN-ALT-01		

Photograph:	Date:	
4	07/05/17	
Species: *Eptesicus fuscus*		
Location: MN-ALT-02		

Photograph:	Date:
5	07/17/17
Species: *Myotis septentrionalis*	
Location: MN-ALT-04	

Photograph:	Date:
6	07/17/17
Species: *Myotis septentrionalis*	
Location: MN-ALT-04	

Photograph:	Date:
7	07/26/17
Species: *Eptesicus fuscus*	
Location: MN-ALT-05	



Photograph:	Date:
8	07/26/17
Lasiurus borealis	
Location: MN-ALT-05