



August 19, 2016

Lora Z. Lattanzi
Field Office Supervisor
United States Fish and Wildlife Service
110 Radnor Road, Suite 101
State College, PA 16801

**Subject: Bog Turtle Restriction Discussion Summary
Sunoco Pipeline L.P. - Pennsylvania Pipeline Project
(Formerly part of the Mariner East 2 Pipeline Project - Project #2014-0200)**

Dear Ms. Lattanzi:

Thank you for the United States Fish and Wildlife Service (USFWS) letter dated June 24, 2016; in which, the USFWS makes the determination that the construction of the Sunoco Pipeline L.P. (SPLP) Pennsylvania Pipeline Project (Project) is 'not likely to adversely affect' the threatened bog turtle (*Clemmys muhlenbergii*). Sunoco understands this determination was made after considering the avoidance and conservation measures contained in the letter and presented within the submitted and reviewed *Bog Turtle Conservation Plan* dated April 2016. It is SPLP's intent to comply with all avoidance and conservation measures in the June 2016 letter for all referenced threatened and endangered species.

As presented to you and your staff in our meeting on August 10, 2016, SPLP was able to avoid horizontal directional drilling (HDD) at four of the five originally planned wetland crossings. The only remaining unavoidable HDD will occur at the A54/A55 wetland. SPLP originally proposed to complete this HDD prior to November 1st in accordance with the June 24 letter to avoid hibernating turtles that could possibly be disturbed should an Inadvertent Return (IR) of drilling mud occur. However, since the original proposal, delays associated with the issuance of required Pennsylvania Department of Environmental Protection (PADEP) permits could result in the start of construction at the A54/A55 wetland after November 1st, requiring drilling activities after that date.

At the August 10, 2016 meeting, SPLP's engineer, Mike Mathwig of Rooney Engineering, presented a detailed discussion on the design of the HDD at this location. Mike discussed the very low likelihood of an Inadvertent Return (IR) based on information and lessons learned from a nearby (similar) successful HDD and geotechnical study information that provides depths to bedrock and the depth of the drill within the bedrock when below the wetlands. The drill sequencing was also discussed, which demonstrated that the pilot hole phase of the HDD resulted in the highest hole pressure and are when IRs have the most potential to occur as opposed to the reaming phase. During this discussion, your staff provided recommendations for redesigning the entry/exit holes and workspaces associated with them. As a result, the design has been revised to move the eastern exit/entry hole 300 feet from the wetland boundary and the workspaces associated with the eastern exit/entry hole to be more than 50 feet from the wetland boundary. That revised plan is provided in Attachment A.

At the previous recommendation of the USFWS at our April 6, 2016 meeting, SPLP installed on August 10, 2016, six piezometers to monitor ground water at this HDD (Attachment B). On July 18, 2016, the USFWS approved Tetra Tech's *Shallow Groundwater Level Monitoring Plan for the Horizontal Directional Drill at Wetlands A54 and A55*. Ground water will be monitored during the pre-construction, construction, and post-construction phases of the HDD in accordance with that plan. During the August

10, 2016 meeting, SPLP was also receptive to the USFWS' recommendation for monitoring bog turtles within these wetlands before, during, and after construction and has developed a protocol for this effort. The protocol includes the attachment of up to 10 radio telemetry transmitters to bog turtles and monitoring them throughout the HDD. That protocol is provided in Attachment C. In addition to this monitoring, a bog turtle specialist will be present during all phases of the HDD and will work in conjunction with project Environmental Inspectors (EIs), the drill chief, and SPLP officials to ensure project limits of disturbance are adhered to, inspections are conducted for IRs, and implementation of the project's *Inadvertent Return Contingency Plan with Special Bog Turtle Conditions* are followed if needed. In particular, the EIs ensure the project's approved (PADEP) Erosion and Sediment Control Plan is adhered to, including ensuring all floodway, wetland, and stream setbacks for refueling and storage of equipment are maintained. At this location, refueling and storage of equipment will be greater than 50 feet from the wetland boundary on the eastern side of the HDD and greater than 225 feet on the western side. All project staff will receive mandatory environmental and safety training and the drill crew at this location will receive separate and site-specific training by the bog turtle specialist and EI.

Vibration monitoring along the alignment and within these wetlands was also discussed and Tetra Tech is in the process of investigating the feasibility of such a study. This would be a unique study, and the options for monitoring, mounting equipment, power supply feeds, and data collection/transmission are all under review. Similar to the bog turtle monitoring study, a protocol will be submitted to the USFWS for review prior to implementation. This information will be shared with the USFWS to increase the understanding of vibration generated by HDDs and its potential impact, if any, on the bog turtle. If the vibration study is determined not to be feasible given current technology, the radio telemetry study and the presence of the bog turtle specialist during the drill will provide valuable information with regards to potential effects of HDD activities on bog turtles.

SPLP will implement these additional avoidance and conservation measures should it be necessary to start or complete the HDD after November 1st. With the implementation of the additional avoidance and conservation measures, SPLP concludes that the likelihood of an adverse impact to a bog turtle is very low. Additionally, with the implementation of these supplemental avoidance and conservation measures, SPLP understands that the USFWS's previous determination that the Project is not likely to adversely affect the bog turtle would remain the same.

SPLP invites the staff of the USFWS Pennsylvania Field Office to visit the site of the HDD at your convenience. SPLP also wishes to thank the managers and staff of the Pennsylvania Field Office for their assistance during this consultation and requests feedback if the summarized discussion is different than your understanding. The guidance provided by your staff during this consultation has been greatly appreciated.

Please feel free to contact Gary Mowad at gmecconsulting@aol.com or 512-626-7158 or myself at any time at brad.schaeffer@tetrattech.com or 716-849-9419 with any questions or if additional information is needed.

Sincerely,



Brad Schaeffer
Project Manager/Senior Biologist

Attachment:

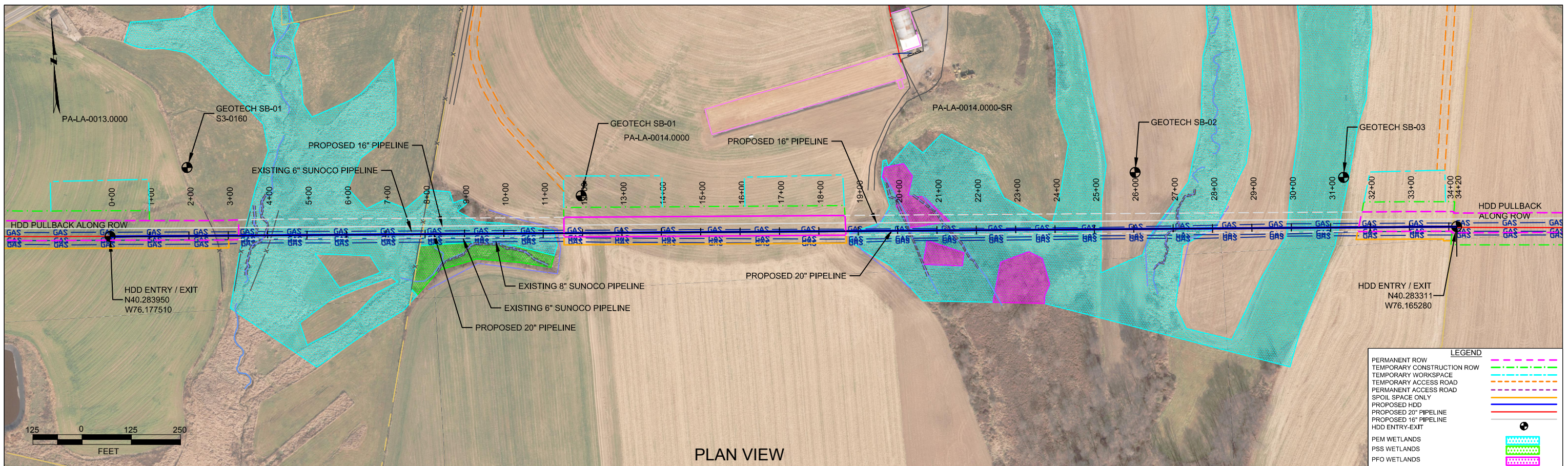
- A: Revised HDD Plan
- B: Piezometer Location Map
- B: Telemetry Protocol

CC:

Chris Embry, Sunoco Logistics;
Matt Gordon, Sunoco Logistics;
Monica Styles, Sunoco Logistics;
Gary Mowad, GMEC;
Brad Schaeffer, Tetra Tech;
Preston Smith, Tetra Tech;
Robert Anderson, USFWS
Pam Shellenberger, USFWS
Brian Scofield, USFWS
File 112IC05958

ATTACHMENT A

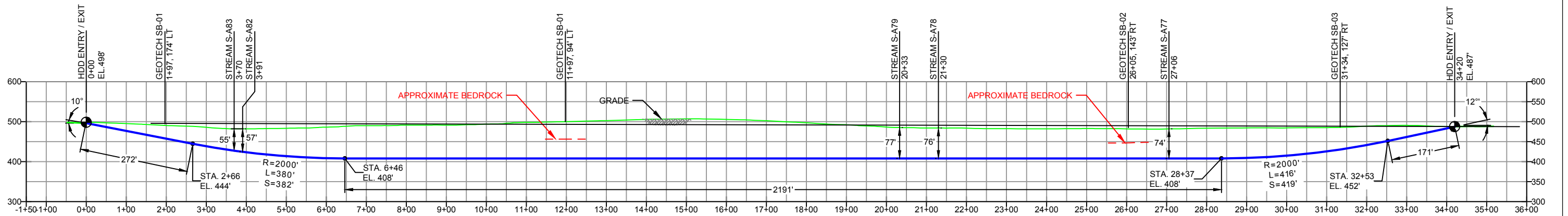
Revised HDD Plan



PLAN VIEW

LANCASTER COUNTY, PENNSYLVANIA - WEST COCALICO TOWNSHIP
S3-0161

PROFILE VIEW



<p>GEOTECH SB-01 -NG EL. 494' -TOPSOIL (0' - 0.1') -SM (0.1' - 21.5') -GROUNDWATER (15.0') -SC (21.5' - 26.0') -CL (26.0' - 30.0') -COMPLETION DEPTH EL. 464'</p> <p>NOTE: REFER TO TEST BORING LOG S3-0160 FOR COMPLETE SOIL MATERIAL DESCRIPTION</p>	<p>GEOTECH SB-01 -NG EL. 500' -TOPSOIL (0' - 0.7') -CL (0.7' - 13.5') -GROUNDWATER (17.0') -SM (13.5' - 44.0') -WEATHERED SILTSTONE/SANDSTONE (44.0' - 45.0') -COMPLETION DEPTH EL. 441'</p> <p>NOTE: REFER TO TEST BORING LOG S3-0170 FOR COMPLETE SOIL MATERIAL DESCRIPTION</p>	<p>GEOTECH SB-02 -NG EL. 485' -TOPSOIL (0' - 0.7') -GROUNDWATER (13.0') -SC (0.7' - 21.0') -CL (21.0' - 35.0') -WEATHERED SILTSTONE (35.0' - 44.0') -COMPLETION DEPTH EL. 441'</p> <p>NOTE: REFER TO TEST BORING LOG S3-0170 FOR COMPLETE SOIL MATERIAL DESCRIPTION</p>	<p>GEOTECH SB-03 -NG EL. 487' -TOPSOIL (0' - 0.3') -SM (0.3' - 11.5') -GROUNDWATER (6.0') -SC (11.5' - 30.0') -COMPLETION DEPTH EL. 457'</p> <p>NOTE: REFER TO TEST BORING LOG S3-0170 FOR COMPLETE SOIL MATERIAL DESCRIPTION</p>
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DESIGN AND CONSTRUCTION:

- CONTRACTOR SHALL FIELD VERIFY DEPTH OF ALL EXISTING UTILITIES SHOWN OR NOT SHOWN ON THIS DRAWING.
- THE MINIMUM SEPARATION DISTANCE FROM EXISTING SUBSURFACE UTILITIES SHALL NOT BE LESS THAN 10 FEET AS MEASURED FROM THE OUTSIDE EDGE OF THE UTILITY TO OUTSIDE OF PROPOSED PIPELINE.
- DESIGNED IN ACCORDANCE WITH CFR 49 195 & ASME B31.4
- CROSSING PIPE SPECIFICATION:
HDD HORZ. LENGTH (L)=3420'
HDD PIPE LENGTH (S)=3435'
20" x 0.456" W.T., X-65, API5L, PSL2, ERW, BFW
COATING: 14-16 MILS FBE WITH 40 MILS MIN. ARO (POWERCONCRETE R95)

- INTERNAL DESIGN PRESSURE 1480 PSIG (SEAM FACTOR 1.0, DESIGN FACTOR 0.50 (HOOP STRESS)).
- INSTALLATION METHOD: HORIZONTAL DIRECTIONAL DRILL (HDD).
- PIPELINE WARNING MARKERS SHALL BE INSTALLED ON BOTH SIDES OF ALL ROAD, RAILWAY, AND STREAM CROSSINGS.
- CARRIER PIPE NOT ENCASED.
- PIPE / AMBIENT TEMPERATURE MUST BE NO LESS THAN 30°F DURING PULLBACK WITHOUT PRIOR WRITTEN APPROVAL FROM THE ENGINEER.
- CONDUCT 4-HOUR PRE-INSTALLATION HYDROTEST OF HDD PIPE STRING TO MINIMUM 1850 PSIG.
- SEE SUNOCO PENNSYLVANIA PIPELINE PROJECT ESRI WEBMAP FOR ACCESS ROAD ALIGNMENT.
- SUNOCO PIPELINE, L.P.'S HORIZONTAL DIRECTIONAL DRILL INADVERTENT RETURN CONTINGENCY PLAN WILL BE IMPLEMENTED AT ALL TIMES.
- SUNOCO PIPELINE, L.P.'S EROSION AND SEDIMENTATION CONTROL PLAN WILL BE IMPLEMENTED AT ALL TIMES.

- NOTES**
- ALL COORDINATES SHOWN ARE IN LATITUDE AND LONGITUDE. ALL MSL ELEVATIONS ARE NAD83
 - STATIONING IS BASED ON HORIZONTAL DISTANCES.
 - ROONEY ENGINEERING, INC. AND SUNOCO PIPELINE, LP ARE NOT RESPONSIBLE FOR LOCATION OF FOREIGN UTILITIES SHOWN IN PLOT PLAN OR PROFILE. THE INFORMATION SHOWN HEREIN IS FURNISHED WITHOUT LIABILITY ON THE PART OF ROONEY ENGINEERING, INC. AND SUNOCO PIPELINE, LP, FOR ANY DAMAGES RESULTING FROM ERRORS OR OMISSIONS THEREIN.
 - CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL UTILITIES. CONTACT ONE CALL AT 811 PRIOR TO DIGGING.
 - SUNOCO EMERGENCY HOTLINE NUMBER IS #1-800-786-7440.

REVISIONS						
NO.	DESCRIPTION	BY	DATE	CHK	DATE	APP
4	DESIGN CHANGE	DLM	08/10/16	RMB	08/10/16	AAW
3	DESIGN CHANGE	DLM	08/05/16	RMB	08/05/16	AAW
2	DESIGN CHANGE	DLM	04/12/16	RMB	04/12/16	AAW
1	DESIGN CHANGE	MRS	02/24/16	RMB	02/24/16	AAW
0	ISSUED FOR CONSTRUCTION	MRS	01/21/16	RMB	01/21/16	AAW

Sunoco Logistics Partners L.P.

TETRA TECH ROONEY
(303) 792-5911

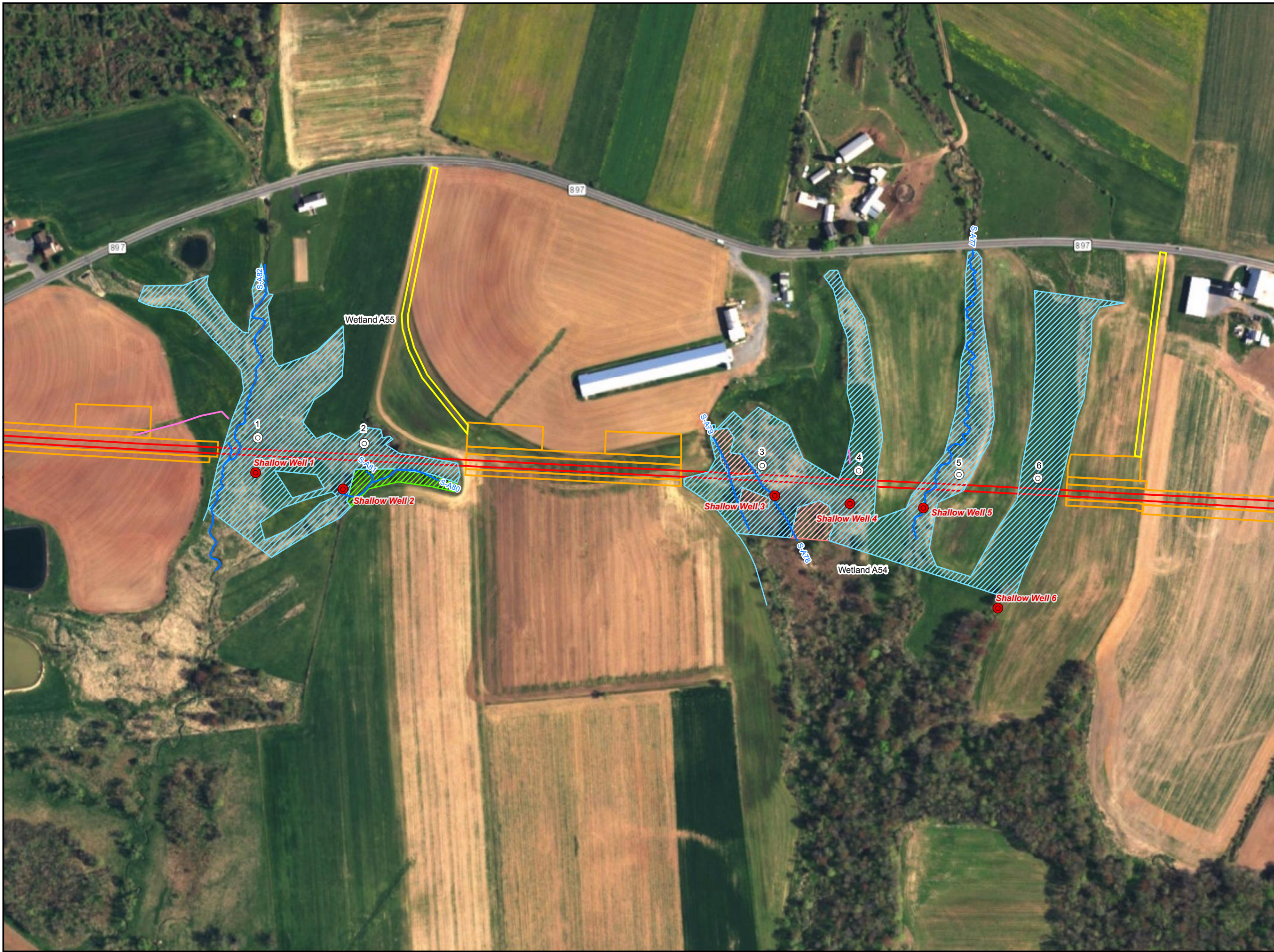
SUNOCO PIPELINE, L.P.

HORIZONTAL DIRECTIONAL DRILL
WETLAND A54 & A55
PENNSYLVANIA PIPELINE PROJECT

SCALE: 1"=250' DWG. NUMBER: PA-LA-0014.0000-SR

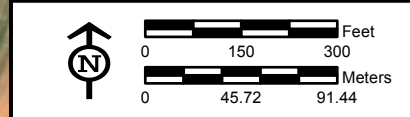
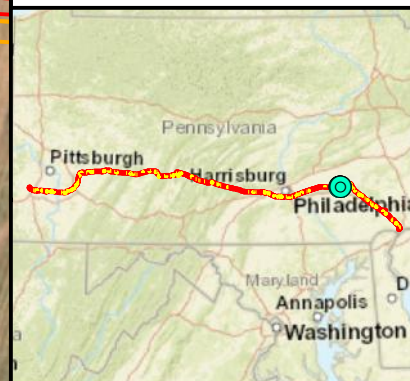
ATTACHMENT B

Piezometer Location Map



- Legend**
- GPS Data 8/16/16
 - Proposed Piezometer Location
 - Drainage Feature
 - Stream
 - ▨ PEM
 - ▨ PFO
 - ▨ PSS
 - PEM Continuation
 - Access Road
 - Alignment Centerline
 - Limit of Disturbance

Sheet Identifier



**PROPOSED PIEZOMETER LOCATION MAP
FIGURE 2**

PENNSYLVANIA PIPELINE PROJECT
FEBRUARY 25, 2016 ALIGNMENT
SUNOCO LOGISTICS, L.P.
LANCASTER COUNTY, PENNSYLVANIA



Notes:
1) Aerial photograph provided by ESRI's ArcGIS Online World Imagery map service (© 2015 ESRI and its data suppliers).

PGH P:\GIS\SUNOCOMARINER EAST 2\MXD\PENPIPELINE_PROPOSEDPIEZOMETER.MXD 08/16/16 SP

ATTACHMENT C

Radio Telemetry Protocol

**SUNOCO PIPELINE, L.P. – PENNSYLVANIA PIPELINE PROJECT (PPP)
RADIO-TELEMETRY STUDY PROTOCOL
FOR BOG TURTLE MONITORING ASSOCIATED
WITH THE HORIZONTAL DIRECTIONAL DRILL (HDD) AT WETLANDS A54 AND A55
IN LANCASTER COUNTY, PENNSYLVANIA**

Project Objective

The objective of the bog turtle radio-telemetry study for the Sunoco Pipeline, L.P. - PPP is to document the usage of portions of wetlands A54 and A55 by known populations of bog turtles and to monitor the effects of the proposed HDD in wetlands A54 and A55 on these populations. This radio-telemetry study will occur during all phases of the project (pre-construction, during construction, and post-construction) within wetlands A54 and A54. This study will collect baseline data to identify where bog turtles are overwintering (in hibernacula areas), and determine if any activities associated with the proposed HDD have an effect on the species.

Approximate time line of events concerning radio-tracking are as follows:

- Between September 18 and October 15, 2016, Skelly and Loy will conduct up to 8 days of bog turtle Phase 3 surveys in order to capture a maximum of 5 appropriately sized bog turtles in wetland A54 and a maximum of 5 appropriately sized bog turtles in wetland A55 to be fitted with transmitters. An objective of a total of 10 fitted bog turtles has been set.
- Skelly and Loy will deploy at least 20 bog turtle traps in wetlands A54 and A55. These traps will assist in expediting the capture of bog turtles suitable for the placement of transmitters. The traps will be used for at least 10 consecutive days, or at least until 10 bog turtles have been fitted with transmitters. Traps will be checked daily while they are deployed in Wetlands A54 and A54.
- All healthy adult bog turtles (no more than 5 in each wetland A54 and A55) of suitable size captured during these surveys will be fitted with transmitters equipped with batteries that will have approximately 9 months of service life. An equal number of males and females will be fitted with transmitters to the extent practical.
- During the pre-construction time period, bog turtles fitted with transmitters will be tracked twice a week to monitor bog turtle activity, identify fall travel patterns, and determine the locations of over-wintering sites. All bog turtle locations will be recorded via GPS technology (sub-meter accuracy) and mapped accordingly. Bog turtles may be periodically checked (handled) during this time period if no movement has been observed since the previous field tracking and to ensure proper attachment of the transmitter. The pre-construction time period will be approximately 4 weeks.
- During the active construction time period (when the HDD is ongoing) bog turtles fitted with transmitters will be tracked at least every other day while the drilling is active to monitor bog turtle activity and determine/confirm the usage of over-wintering sites. All locations will be recorded via GPS technology (sub-meter

accuracy) and mapped accordingly. No bog turtles will be handled or disturbed by the biologist tracking the turtles during this time period.

- During the early post-construction time period bog turtles fitted with transmitters will be tracked twice a week to monitor bog turtle activity and determine/confirm the usage of over-wintering sites. All locations will be recorded via GPS technology (sub-meter accuracy) and mapped accordingly. No bog turtles will be handled or disturbed by the biologist tracking the turtles during this time period. The early post-construction time period will last 4 weeks.
- All bog turtles fitted with transmitters will continue to be tracked and mapped at least 1 time per month until April 2017, at which time they will be captured and have their transmitters removed.
- Bog turtles fitted with transmitters will be minimally handled during the study, and in any event, will be returned to their location of capture as soon as possible.

Data Collection and Reporting

During the telemetry study, data collected during our field efforts will include a general weather description, ambient air temperature and humidity, soil temperature, water temperature, wind speed, and cloud cover. Additionally, the location of the bog turtles via Global Positioning System (GPS) Technology with sub-meter accuracy will be recorded and mapped during all telemetry field efforts. Bog turtles captured during our study will be processed and vital physical data (weight, length, etc.) will be recorded upon initial capture to determine if they are to be fitted with a transmitter. Only healthy adult bog turtles will be fitted with transmitters and will be marked via notching of marginal scutes for identification purposes. Juveniles or small adults that are captured during the initial survey effort will be marked via notching on marginal scutes for identification purposes. Juveniles and small adults will also be processed and documented, weather data and location will be recorded, and then will be released at their location of capture.

Adults bog turtles fitted with transmitters will be processed and documented during the transmitter removal process in April 2017. Bog turtles not fitted with transmitters that are encountered incidentally during our field monitoring efforts will be noted, measured, notched and released. Bog turtles may be periodically checked (handled) during the active-season (April 1 – October 31) if no movement has been observed since the previous field check and to ensure proper attachment of the transmitter.

All bog turtles found over the duration of the telemetry study will be photographed and reported to the USFWS and PFBC via email, as required for Qualified Bog Turtle Surveyors (QBTS). Periodic status reports will be submitted to the USFWS throughout the study period, and a final summary report with mapping figures, photographs, etc. will be provided to the USFWS.

In addition, the following reporting protocols will be followed dependent upon bog turtle movements and observations:

- The USFWS/PFBC will be provided a map showing the location of the hibernating turtles, once all are hibernating.
- Any large movements of over 15 feet from the original hibernation location after November 1 and before April 1 or any surface observations during this time period

- will be immediately reported to the USFWS/PFBC if movement or surfacing cannot be dismissed due to unseasonably warm weather.
- Any mortalities will result in drill stoppage and immediate reporting to the USFWS.

Tracking Equipment and Methods

Transmitter

The transmitter, model SOPR-2190, is designed by Wildlife Materials, Inc., and has been used extensively by researchers in Pennsylvania for bog turtle telemetry studies. This time-proven transmitter is a newer variation of the SOPB transmitter and incorporates a slight curvature into the transmitter to conform better to a bog turtle's carapace. The transmitter has been constructed by the manufacturer to be waterproof and will be used due to its relatively long shelf life and activity (service) life in combination with a very light weight. Transmitters are equipped with an on/off switch (activated by a magnet) which can be removed immediately prior to placement on a bog turtle. Each transmitter weighs less than 5 grams, and in combination with an epoxy adhesive, will total no more than 8% (typically 10 grams or less) of an individual bog turtle's weight. The transmitters being built for this study will employ a 15 cm antenna which is 25% smaller than the standard size for this model. Skelly and Loy worked with the manufacturer to ensure the smaller antenna will provide ample signal strength while still providing the necessary service life. The average length of time a transmitter lasts depends on the current drain of its battery. Skelly and Loy intends to use transmitters with batteries that typically function for at least 7 to 9 months, according to the manufacturer's specification and technical advisors. Personal communications with researchers using similar transmitters and Skelly and Loy's experience using the same transmitters confirm the expected transmitter service life.

Receiver

The receiver (radio-tracking device) is designed by Wildlife Materials, Inc., and will be custom built to pick up individual signals from 150.000 to 150.480 megahertz. The model will be a TRX-48S which is capable of tracking the number of bog turtles prescribed by this investigation. This receiver will utilize a Yagi, 3 element, folding directional antenna.

Adhesive

The adhesive that Skelly and Loy intends to use is a waterproof plumber's putty manufactured by Master Plumber that is distributed by True Value Hardware. The adhesive dries in approximately 20 minutes and was selected due to its ability to maintain a highly adhesive quality as well as its low-heat setting temperature. This adhesive was used by Skelly and Loy staff members during a several year telemetry study for bog turtles in Berks County, by The Nature Conservancy (TNC) in a bog telemetry study at a preserve in Lancaster County, by TNC in a multi-year bog turtle telemetry study in Monroe County, and most recently by Skelly and Loy in a multi-year bog turtle telemetry study in Chester County. Skelly and Loy also successfully used this product to repair/replace approximately 20% of the carapace of a bog turtle that had been severely injured/damaged. This emergency repair was made at the request of the PFBC and two years after the repair, this bog turtle was observed in good health and was still being protected by the epoxy section of artificial shell.

Due to some concern over heat being generated by the epoxy adhesive during hardening, Ms. Teresa Amitrone (formerly of Skelly and Loy) tested the product for temperature in ten trials. In each of the trials, 10 one-inch balls of the adhesive were prepared. A piece of plastic wrap was

placed around the balls so that a thermometer could be inserted into the adhesive without sticking to it. An average high temperature of 37.0° C was recorded during this trial. It should be noted that 37.0° C converts to 98.6° F, the average temperature of the human body. It was determined that the adhesive generated no more heat than that of a human hand. Thus it was concluded that no unnecessary stress was placed on bog turtles as a result of high temperatures associated with the adhesive material during transmitter placement. No bog turtles that have been fitted with transmitters by Skelly and Loy have ever been noticeably stressed or harmed as a result of this application method.

Skelly and Loy prefers this adhesive because it does not require the bog turtle to be removed from its location of capture for any extended period of time. Furthermore, if other slower setting epoxy adhesives were used, the bog turtle would have to be removed from the wetland and held off-site overnight for the adhesive to thoroughly cure. By using this adhesive, the added stress of being removed from the wetland for a long period of time can be avoided.

A clear coat of epoxy (Loc-tite 5 minute epoxy) will be used to cover the transmitter and hardened epoxy putty adhesive. This 2-part, clear coat epoxy will be mixed in a cup and then applied with a cotton swab over the affixed transmitter/epoxy putty to provide additional waterproofing and protection of the transmitter's adhesion to the carapace.

Attachment Method

Once a bog turtle is captured and it is determined to be of suitable size (typically 120 grams or more) and in good health, data (measurements, sex, age approximation, etc.) will be collected on the individual and marginal scutes will be notched (if not previously notched) for identification purposes. Before attaching the transmitter, a small wire brush and a small nylon brush will be used to thoroughly clean the carapace in the area where the transmitter will be attached (see attached photograph for preferred transmitter location). The area, once scrubbed clean, will be washed with water from a spray bottle. Once the cleaned area is completely dry, the transmitter to be attached will be turned on and checked with the receiver to ensure proper working condition.

The two-part plumbers putty will then be mixed/kneaded to activate the adhesive qualities of the product. Once kneaded for approximately 1 minute the mixed putty will generate heat, become adhesive (sticky), and allow for up to 2 minutes of working time to ensure the optimal adhesion. A small, oblong ball will be made by rolling the piece of epoxy putty between fingers and then placed on the back of the carapace (left/back). The transmitter will then be pressed into the epoxy putty and the epoxy putty will be formed/pressed around the sides of the transmitter. As the epoxy putty begins to set, a small blade will be utilized to scrape the excess epoxy putty off the bog turtle and transmitter. The bog turtle will be frequently weighed during this time period to ensure the "8% of total body weight" limit is not exceeded.

The bog turtle will be contained in a dry, shaded container while the epoxy putty dries and sets hard enough that no mark is made using a fingernail. Once hardened, the transmitter and epoxy putty will be covered with a clear coat epoxy (Loc-tite 5 minute epoxy) using a cotton swab. This provides an additional layer of protection to the adhesive characteristics of the transmitter to the carapace.

Risks of Long-Term Use of Transmitters on Bog Turtles

Skelly and Loy staff members have had lengthy conversations and extensive field experience/training with individuals who are considered bog turtle experts and have extensive experience with telemetry studies (Scott Smith – Maryland Department of Natural Resources; George Gress – TNC; Teresa Amitrone – Liberty Environmental; etc.). These scientists are all actively researching bog turtles and all have been or are currently involved with radio telemetry with the genus *Clemmys/Glyptemys*. Based on information provided by these researchers and based on our previous telemetry experience, Skelly and Loy is unaware of risks to bog turtles by telemetry studies that would pose a significant risk to individual bog turtles or the overall health of the population in the project area.

Additional Precautions and Safety Measures

Skelly and Loy will follow all currently accepted decontamination protocols during their telemetry study. These protocols will ensure that researchers and bog turtle populations will not be exposed to harmful viruses or bacteria. Standard decontamination practices will be applied when entering and exiting wetland A54 and A55, and should ensure researchers and their equipment do not spread diseases which could be harmful to the bog turtle. Researchers will also follow standard decontamination practices to ensure their health and safety, as well.

Telemetry Study Team

Skelly and Loy will employ a team approach to ensure a successful telemetry study. The Skelly and Loy team will consist of Ben Berra, Andy Brookens, and Logan Zugay (all recognized/qualified bog turtle surveyors), as well as Dylan Woodworth. Mr. Berra, Mr. Brookens, and Mr. Zugay have gained extensive experience with all aspects of telemetry research for bog turtles through their participation in multiple studies (including PennDOT, TNC, and MD DNR studies). The Skelly and Loy team will be present during the initial surveys for bog turtles and for the attachment of all transmitters to suitable bog turtles.

Photograph show approximate location where transmitters will be located on suitable bog turtles

