

January 3, 2019

Via Electronic Mail

Dana Drake, P.E.
Environmental Program Manager
Waterway and Wetlands Program
Pennsylvania Department of Environmental Protection
Southwest Regional Office
400 Waterfront Drive
Pittsburgh, PA 15222-4745

**Re: Response to Department's Comments
HDD S2-0010, E65-973
Loyalhanna Lake Crossing
Loyalhanna Township, Westmoreland County**

Dear Ms. Drake:

In compliance with the Corrected Stipulated Order dated August 10, 2017 a Reevaluation Report on the above-referenced horizontal directional drill ("HDD") was submitted to the Department on August 17, 2018. In a letter dated December 17, 2018, issued 122 days after submittal of the Reevaluation Report, the Department requested more information. Please accept this letter as a response. Your requests are bolded below followed by the response.

- 1. SPLP identifies two private water supplies within 450 feet of the HDD, WL-10242015-520-01 and WL-04272017-499-02, and states that the upper portions of the production intervals of these wells could intersect the elevation of the HDD profile. SPLP further states in Section 3 .1.2 that drilling fluids appeared in these two wells during drilling of the 20-inch line.**

Regarding potential impacts to these water supplies, SPLP simply states, "keep in mind that these wells are approximately located 321 and 396 feet from the HDD." In Section 4.1, SPLP further states it believes a large portion of the fluid in the pore space will have cured since drilling. Nonetheless, some portions may be in a fluid state, which may impact the water supply if there are any losses of circulation during drilling of the 16-inch line.

SPLP states that property owners within 450 feet of the alignment were offered temporary water but declined. However, SPLP does not elaborate upon the measures it will employ to address those potential impacts in an acceptable manner. SPLP must address those potential impacts in an acceptable manner.

As part of this re-evaluation, and in advance of commencing the HDD, SPLP has the option to enter into written agreements with all private water supply owners whose

water supplies may be impacted by this Drill, regardless of their location. Under the agreements, SPLP must address short and long-term replacement of potable water supplies adequate in quantity and quality for the purposes served, to the satisfaction of each potentially affected water supply owners. The agreements should provide for SPLP to conduct water quality and quantity testing of each potentially affected water supply prior to, during, and after the HDD activities. SPLP needs to provide proof of these agreements to the DEP with a response to this letter.

In the alternative, if SPLP chooses not to pursue these agreements with the private water supply owners, it must provide a discussion of actions to be taken by SPLP to prevent water supply impacts from occurring. SPLP needs to demonstrate how, in the absence of the agreements described above, SPLP will avoid impacts to all water supplies. SPLP's approach should include the utilization of technical and non-technical measures to avoid and minimize such impacts, including, but not limited to, the conversion of the HDD to a trench installation, use of other trenchless construction methods, the use of American Standards Institute/National Sanitation Foundation (ANSI/NSF) Standard 60 approved gels or other approved additives that could prevent such impacts from the Drill, or some combination of the above. To the extent that SPLP proposes to use any ANSI/NSF 60 certified HDD additives, consistent with Special Condition H.5 contained in DEP Permit No. 65-973, SPLP will need to demonstrate that the manner in which SPLP anticipates using each additive is consistent with the manner indicated in the ANSI/NSF Standard 60 certification for that additive. In addition, SPLP should state whether it will be following all conditions included as part of the additive's certification or, if not, provide an explanation for any deviation(s) from the certification and why that deviation is necessary and acceptable.

SPLP will not utilize drilling fluid additives during this directional drill since the use of “additives” is not allowed by the State of Pennsylvania. SPLP will address the potential for water supply impacts by implementation of drilling best management practices for the control of fluid loss and losses of circulation as itemized below:

1. During the pilot hole phase of the HDD, surface casing will be installed at the eastern entry point down into competent bedrock to control the loss of drilling fluids;
2. Proactive measures will be employed to control losses of circulation to prevent migration of drilling fluids and potential for IRs during the HDD phases. These measures include close monitoring of drilling fluid returns and immediate shut-down when losses are detected. The objective of this approach is to immediately suspend drilling activity once a loss of 500 to 1,000 gallons of drilling fluid is detected. Observations to detect losses are made by mud plant operators, drillers, utility inspectors, and professional geologists (PGs) present at all times during drilling activities. When these drilling fluid loss events occur, the initial countermeasure is the placement of a grout plug into the affected zone to seal against additional migration when drilling resumes. In some cases several rounds of grout plugging are needed until the HDD ceases to lose drilling fluid.

3. In accordance with the landowner agreements, field technicians under the direction of a professional geologist (PG) will perform weekly sampling wells WL-08172017-499-01, WL-08172017-499-02, and WL-10242016-520-01 for all parameters within SPLPs baseline sampling program, including residual bentonite. During each sampling event specific conductance, pH, and turbidity readings will be taken and observations of water clarity and color will be made. Weekly sampling will begin prior to the start of drilling and will continue until the 16-inch pipe is pulled into place. Samples for this purpose will be drawn from a pre-treatment sampling point, if possible. This weekly monitoring program will be performed to compliment standard pre-construction, during construction and post-construction sampling events for each well.

The Operations Plan provides that SPLP will offer all landowners with a private water supply source located within 450 ft of the HDD alignment an alternative temporary water supply. In accordance with the Operations Plan, SPLP offered temporary water supplies to all water supply owners within 450 feet of the HDD profile during the 20-inch HDD, and has done so again in advance of the 16-inch HDD. Copies of the landowner letters are provided in Attachment 1. As stated in the Reevaluation Report, only one landowner agreed to accept temporary water supply during the HDD process.

If, during HDD activities, there is any impact to water well quality or quantity in response to drilling activities, the landowner will again be offered temporary water service until completion of the HDD is achieved. If HDD construction activity is determined to have a permanent impact on either the quality or quantity of a landowner water supply well, then SPLP will replace the water supply with a supply of equivalent quality and yield.

2. **During the public comment period, the Department received correspondence from counsel for the owner of well WL-08172017-499-01 stating that they requested SPLP to drill a replacement well. This well is shown to be 776 feet from the HDD.**

In Section 2.3.5, SPLP states that the affected water supply owner has been on temporary water supply since the water supply was affected by drilling fluid during the installation of the 20-inch line. Given that the installation of the 20-inch line was completed in July of 2017, it is unclear why a temporary water supply has been necessary since that time. Please provide information related to SPLP.

As noted by the Department, SPLP provided the owner of this water well with a temporary water supply during construction of the 20-inch HDD. Subsequently, SPLP and the owner agreed that SPLP could disconnect the temporary water supply after installation of the 16-inch line is complete, rather than disconnect and reconnect the temporary water supply before construction activities associated with the 16-inch HDD begin. Once installation of the 16-inch line is complete, SPLP will assess the landowner's well and reconnect the well if no impact is demonstrated.

- 3. In Section 3.1.2, SPLP mentions the potential existence of a quarry high wall just west of the eastern entry/exit pit that may have contributed to the inadvertent returns (IRs) during installation of the 20-inch line. What level of investigation was conducted by SPLP to confirm the existence of the high wall and to understand its history? Please identify the location of the high wall as it relates to the locations of the IRs that occurred during installation of the 20-inch line.**

As stated in Section 3.1.2 of the Hydrogeologic Report, the reports by local residents of a “quarry wall” was anecdotal and was not confirmed by the U.S. Army Corps of Engineers. As discussed in the investigation report prepared by GES, Inc. provided in Attachment 1, there is no evidence confirming this feature in vicinity to the HDD location.

- 4. In response to IRs that occurred during installation of the 20-inch line, it states in Section 3.1.2 that a vertical relief boring was installed to capture the lost returns which was highly effective in stopping all of the IRs. Given the success of the relief bore during drilling of the 20-inch line, SPLP should consider the feasibility of using a relief bore as a preemptive measure to reduce the risk of IRs occurring during installation of the 16-inch line.**

Although the vertical relief well installed for the 20-inch line was effective in stopping IRs, the discharge from the relief well was difficult to manage at times. Due to the vertical flow pathway out of the relief well, cuttings fall out of the fluid column and clog the pathway. Annular pressure builds up behind the clog until cuttings and drilling fluid blow from the relief well in a sudden event. These “blowing” events are difficult to control and can result in temporary uncontrolled discharges to the land surface, as occurred during use of relief well for the 20-inch line.

SPLP submits that we have been, and are, in complete compliance with the agreed terms and requirements of analysis of the Order, as agreed to by the Department, and that no further analysis is required for the Department to consent to the start of this HDD. SPLP therefore requests that the Department approve the Reevaluation Report for Loyalhanna Lake Horizontal Directional Drill (S2-0010) as soon as possible.

Sincerely,



Larry J. Gremminger, CWB
Geotechnical Evaluation Leader
Mariner II Pipeline Project

Attachment:

- 1-Landowner Water Supply letters
- 2-GES Report on Quarry Wall Investigation

ATTACHMENT 1
LANDOWNER WATER SUPPLY LETTERS



SUNOCO PIPELINE
An ENERGY TRANSFER Partnership

P. O. Box 2218
Altoona, PA 16602

February 26, 2018

BY CERTIFIED AND FIRST CLASS MAIL



Re: Mariner East 2 – Pennsylvania Pipeline Project
Horizontal Directional Drilling Construction Notification
and Offer of Alternative Temporary Water Supply



Previously, Sunoco Pipeline L.P. (“SPLP”) wrote to inform you that certain construction activity known as Horizontal Directional Drilling (“HDD”) for Mariner East 2, also known as the Pennsylvania Pipeline Project, is located within 450 feet of your property boundary. In that letter, SPLP offered private water supply/well testing at SPLP’s expense if you have a private water supply/well located within 450 feet of the HDD alignments. If you have not yet requested testing of your qualifying private water supply/well, but now would like SPLP to have your private water supply/well tested, please contact the Sunoco representative for your area by calling Amy Abramowich at (814) 204-0450.

In addition, as part of this construction activity, SPLP is offering landowners with a private water supply/well located within 450 feet of the HDD alignments to be connected to an alternative temporary water supply, such as a water buffalo, that will be installed and maintained at SPLP’s expense for the entire period of HDD operations.

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Thank you for your cooperation.

Mark McConnell
Land Project Manager
Representing Sunoco Pipeline L.P.
Office: (814) 204-0450

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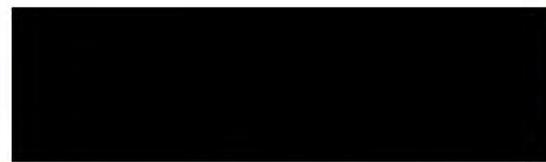
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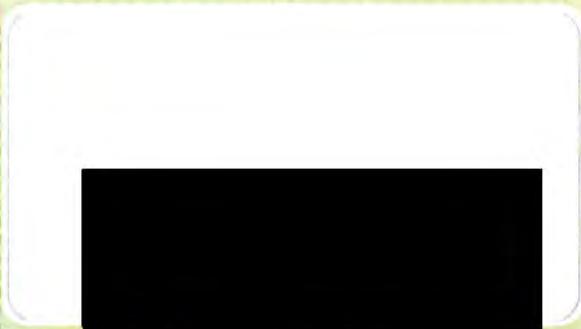


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ATTACHMENT 2
GES REPORT ON QUARRY WALL INVESTIGATION



January 4, 2019

Larry Gremminger, CWB
Managing Environmental Scientist
Gremminger and Associates, Inc.
226 South Live Oak Street
Bellville, Texas 77418

Re: Response to Department's Comments
HDD S2-0010, E65-973
Loyalhanna Lake Crossing
Loyalhanna Township, Westmoreland County
Comment No. 3

Dear Mr. Gremminger:

At your request and on behalf of Sunoco Pipeline, L. P. (SPLP) Groundwater & Environmental Services, Inc. (GES) has prepared this response to comment no. 3 in the comment letter issued by the Pennsylvania Department of Environmental Protection (Department) on December 17, 2018 relative to the above referenced Hydrogeologic Re-Evaluation Report for the 16-inch HDD S2-0010. Comment no. 3 is listed in bold italic font followed by GES' response.

- 3. In Section 3.1.2, SPLP mentions the potential existence of a quarry high wall just west of the eastern entry/exit pit that may have contributed to the inadvertent returns (IRs) during installation of the 20-inch line. What level of investigation was conducted by SPLP to confirm the existence of the high wall and to understand its history? Please identify the location of the high wall as it relates to the locations of the IRs that occurred during installation of the 20-inch line.***

During the construction of the 20-inch pipeline at HDD S2-0010 and IRs that occurred east of Loyalhanna Lake it was rumored by local by-stander that the pilot boring may have passed through a former historic quarry high wall and quarry workings. Along the alignments of HDs S2-0010 and S2-0010-16 the topographic gradient between Bush Road and parking lot for boat launch at Loyalhanna Lake steepens over a distance of about 200 feet (see Figure 1). This steepened slope runs parallel to the lake shoreline from the intersection of Bush Road and the boat launch entrance road, south approximately 2,300 feet. The pipeline right-of-way crosses the steepened slope approximately 220 feet south of that intersection. Historic aerial photography and historic topographic maps were examined for evidence that this steepened slope might represent the location of the former quarry rumored to exist by the by-stander at this location.

USGS topographic maps from 1900, 1902, 1903, 1964, 1953, 1954, 1958, 1959, 1964, 1971, 1973 and 1986 were examined at USGS Historical Topographic Map Explorer (<http://historicalmaps.arcgis.com/usgs/>). The steepened slope can be seen on most maps and examples are provided on Figure 2 from 1902 and 1973. However, none of the maps show the typical mapping symbol for surface mining that are plotted at the locations of a former quarries. The map for 1902 shows the channel of Loyalhanna Creek which was dammed in 1942 by the US Army Corp of Engineers to create Loyalhanna Lake. From these maps it appears as though the steepened slope is the eastern limit of the former Loyalhanna Creek flood plain.



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Historic aerial photography obtained through Penn Pilot (<http://www.pennpilot.psu.edu/>) and Google Earth Pro from 1939, 1957, 1967, 1995, and 2006 were examined for evidence of quarry activity. Images of the photos are shown on Figure 3. On each image, the general area of the steepened slope where it crosses the pipeline ROW is circled in red and the break in slope due west of Bush Road is traced by a dashed yellow line. Examination of the air photo from 1939 shows land between Bush Road and the lake that appears to be farm land and an area of disturbed ground east of the break in slope but no quarry pit or quarry high wall is present. The image from 1957 shows a rising lake level that is beginning to cover over the Loyalhanna Creek flood plain, and the beginnings of land development to create the boat launch area can be seen. On the air photo image from 1967 the beginnings of tree growth on the northern part of the slope are present and the slope is entirely covered with trees on the air photo images from 1995 to present. No identifiable quarry features are present in any of the air photo images.

Based on examination of historic topographic maps and historic aerial photography no evidence has been found to support the rumored existence of a former quarry and it is concluded that the steepened slope is the eastern limit of the former Loyalhanna Creek flood plain. Figure 4 shows all the IR locations, and the break in the steepened slope discussed above is indicated as a dashed yellow line.

Please do not hesitate to contact me at 814-502-7014 if you have any questions regarding this matter.

Sincerely,
Groundwater & Environmental Services, Inc.

A handwritten signature in blue ink that reads "Richard T. Wardrop". The signature is written in a cursive, flowing style.

Richard T. Wardrop, P. G
Lead Hydrogeologist

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By affixing my seal to this document, I am certifying that the geologic information is true and correct. I further certify I am licensed to practice in the Commonwealth of Pennsylvania and that it is within my professional expertise to verify the correctness of the information.



January 4, 2019



Richard T. Wardrop, P. G.
Lic. No. PG000157G

date

Figures

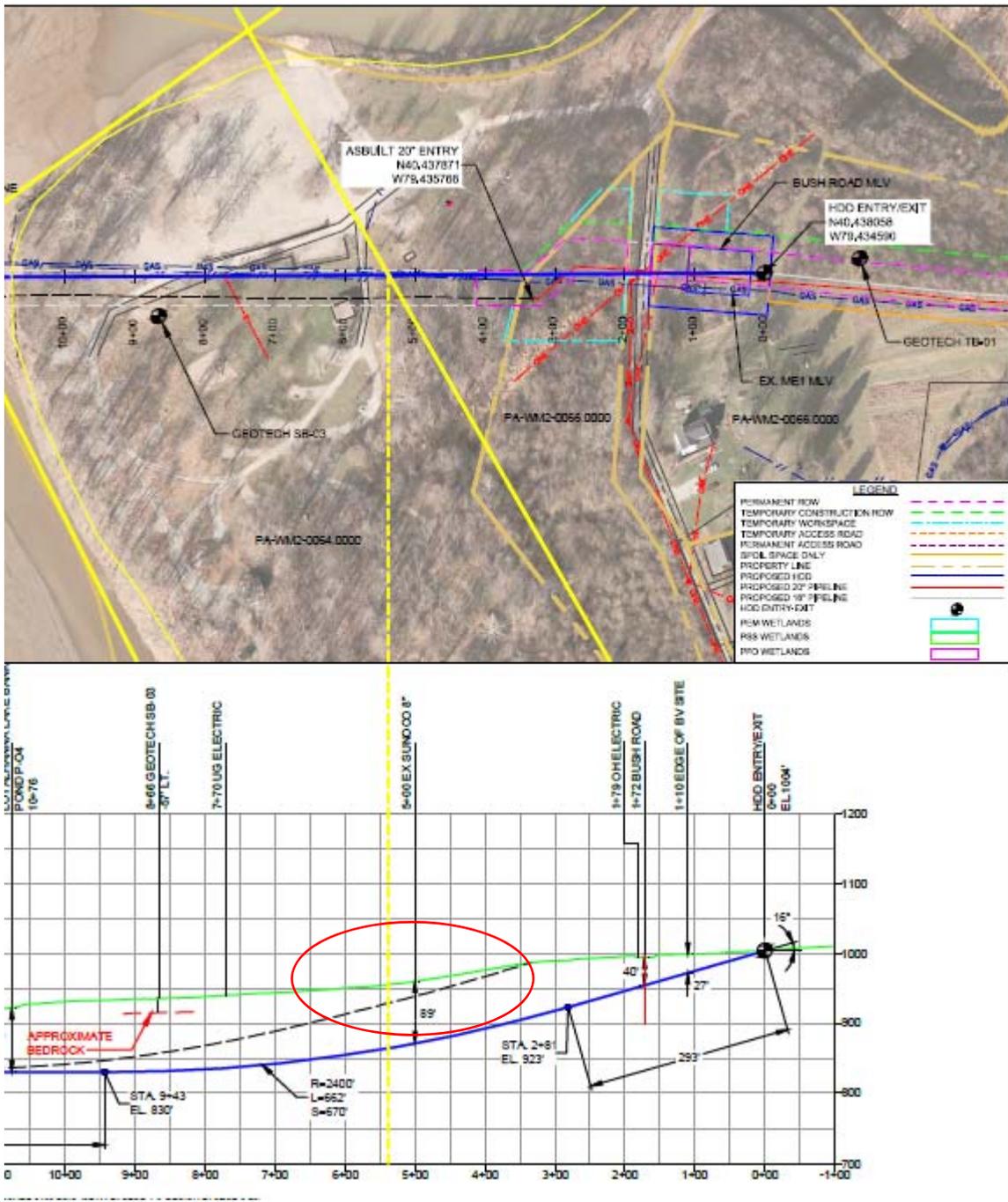


Figure 1. Portion of HDD S2-0010-16 Plan and Profile showing steepening of slope (red ellipse on profile)

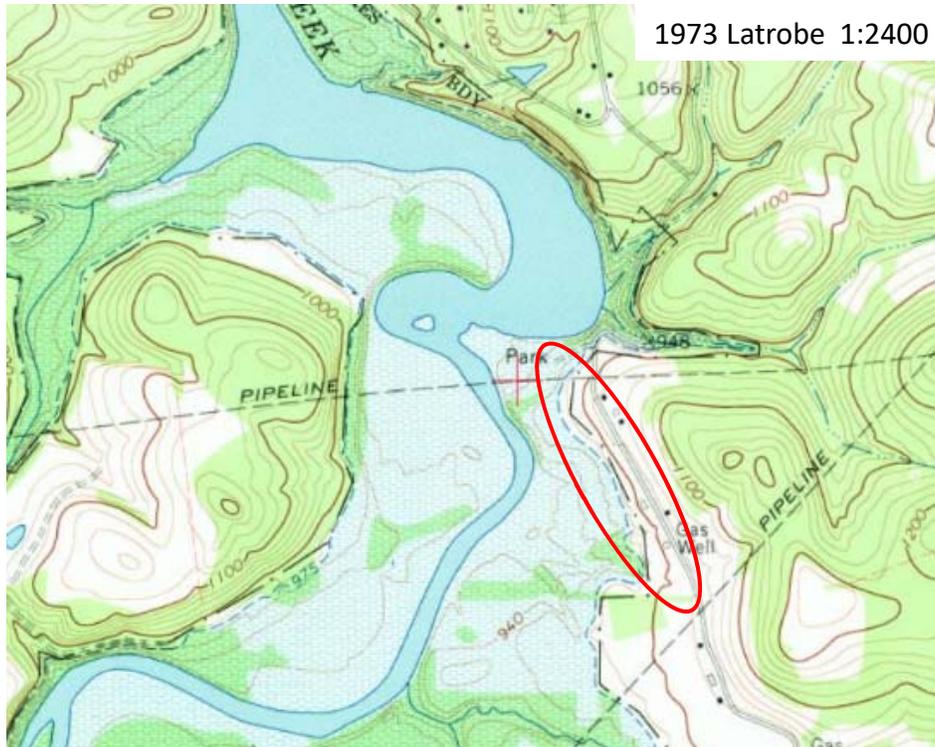
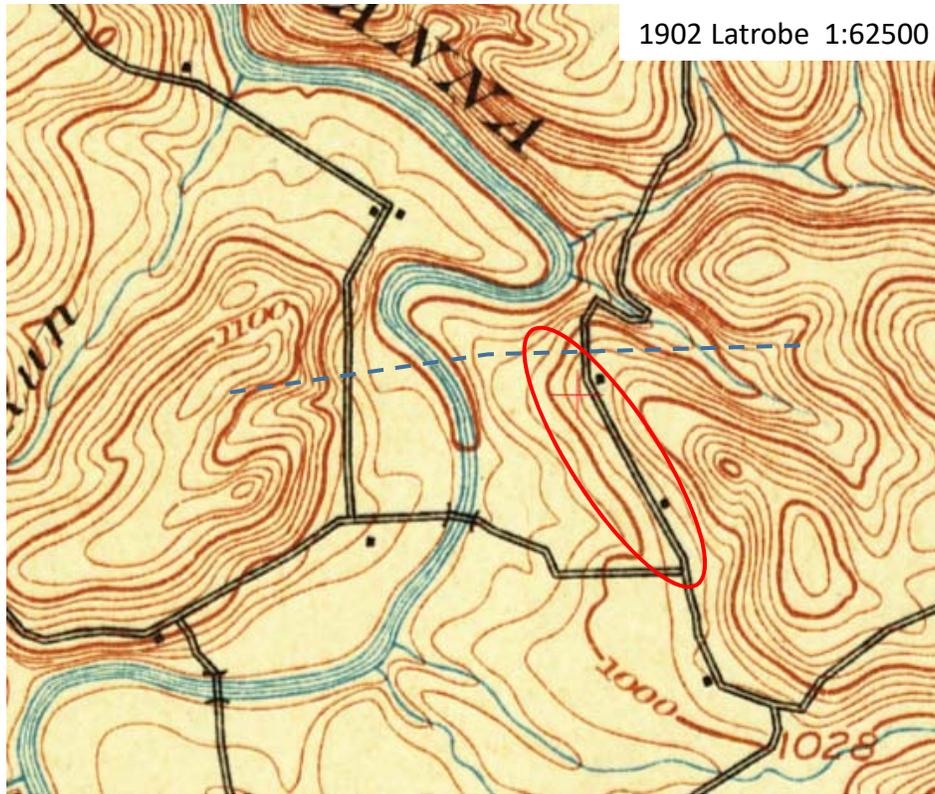
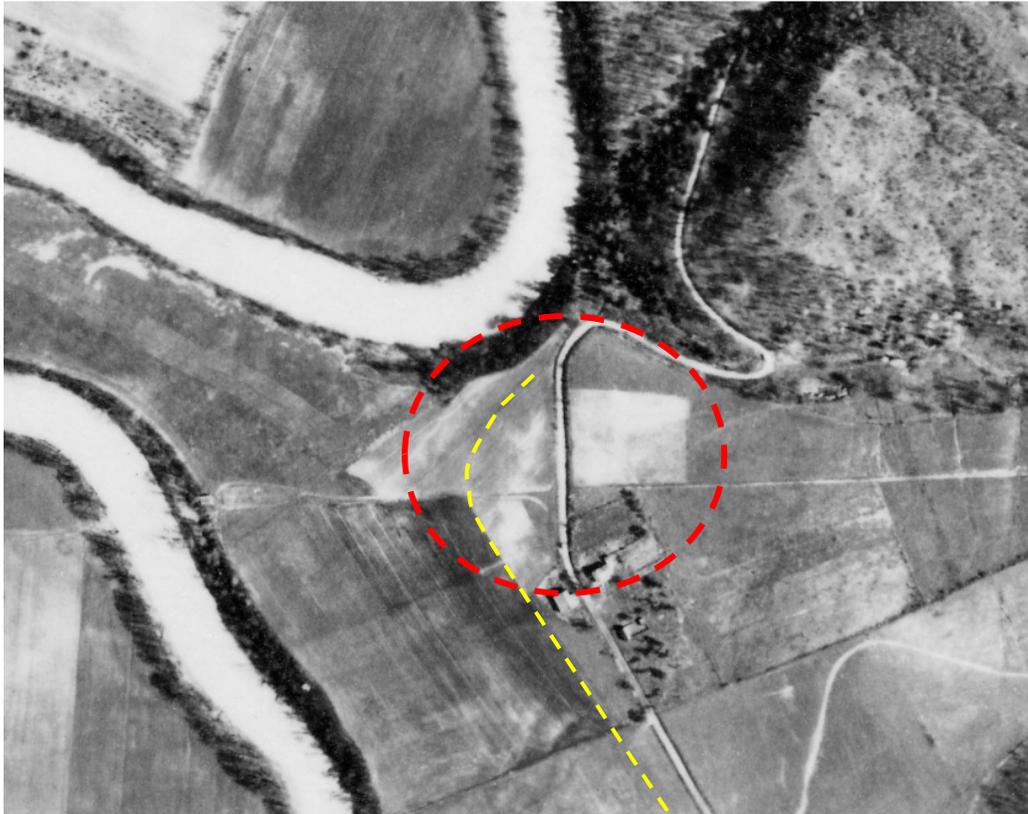


Figure 2. Historic USGS topographic maps showing area of interest, steepening of slope inside red ellipses, and no surface mining symbols.

USDA Flight Date 5/3/39 <http://www.pennpilot.psu.edu/>

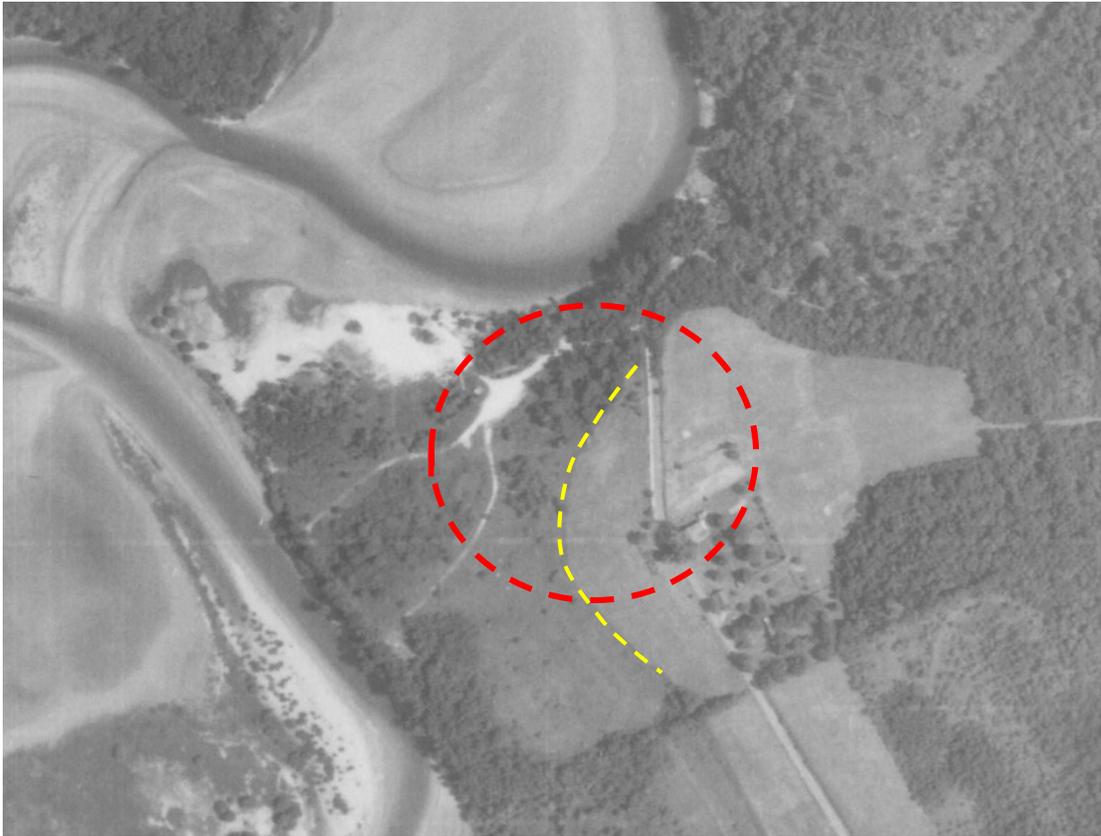


USDA Flight Date 5/31/57 <http://www.pennpilot.psu.edu/>



Figure 3a. Historic aerial photo image in area of interest from 1939 and 1957

Flight Date 6/27/1967 USDA <http://www.pennpilot.psu.edu/>



Google Earth Flight Date 3/1995 USGS



Figure 3b. Historic aerial photo image in area of interest from 1967 and 1995

Google Earth Flight Date 10/2006 USDA



Figure 3c. Historic aerial photo image in area of interest from 2006



Google Earth™ 7.1.8.8330 (October 15, 2015). Logansport, Indiana, United States
 42.027196, -79.508712, View as 3D
 Russia Technologies 2017. Google 2017. Map data © OpenStreetMap contributors, Imagery © Google



Legend

-  IR Location
-  IR Location (where mud reached water source)
-  Potable Well Location
-  Relief Boring Location

 Approximate Location of 20" Pipeline  Approximate Location of 16" Pipeline



Figure 4. Locations of IRs from 20-inch HDD showing break in slope (yellow dashed line)