SUNOCO PIPELINE
An ENERGY TRANSFER Partnership

August 27, 2021

Via Electronic Mail – johohenste@pa.gov

John Hohenstein, P.E.
Environmental Program Manager
Waterways & Wetlands Program
Pennsylvania Department of Environmental Protection
Southeast Regional Office
2 East Main Street
Norristown, PA 19401

Re: **Sunoco Pipeline LP – Pennsylvania Pipeline Project (Mariner East II)**
Chapter 105 Permit No. E15-862
Major Amendment – HDD S3-0290
Response to Technical Deficiency Comments
Upper Uwchlan Township, Chester County, PA

Dear Mr. Hohenstein:

In an August 6, 2021 letter from the Department, Sunoco Pipeline, LP ("SPLP") received technical deficiency comments regardingreview of Chapter 105 Major Amendment Request which was submitted to the Department on April 7, 2021 and determined to be complete by the Department on April 16th for the 290 HDD location in Upper Uwchlan Township, Chester County (the "290 HDD"). That request of the Department was for a change in the crossing method at Wetland H17 and its associated tributaries from an HDD to an open trench.

In response to those comments, SPLP offers the following reiteration of the comments with the responses and supporting attachments, where applicable, below each comment:

1. ***Option 5*** - Option 5 does not impact streams and wetlands and has minimal impacts to floodways and other environmental resources. Yet, Option 5 was not selected as the "preferred option" due to road closures and public safety issues. The exact description and extent of these of public health and safety concerns due to the proposed road closures and pipeline construction impacts of Option 5 are not clear. This information needs to be provided. It must include, at a minimum:

   a) A detailed description and analysis of the public health and safety issues specifically identifying the nature of the public health and safety issues and explaining why this option is not recommended as the preferred option;

   SPLP Response:
   The April 7 amendment application describes in detail how Option 5 would result in substantial and protracted impacts on residential uses, public access, emergency access,

roadways, and infrastructure, and related hazards and impacts to life and property, for a significant duration (up to 6 months). In response to the Department's request, SPLP has gathered additional information to supplement the April 7th alternatives analysis and provides that herein as Attachment A. This supplemental information further demonstrates the public health and safety concerns associated with Option 5.

b) Written documentation and supporting materials from State, township, emergency services, schools, utilities, sanitary sewers, on-lot septic systems owners and other facilities that would be impacted by the Option 5 route, documenting the extent of use and/or need to use such roadways;

SPLP Response:
SPLP provides additional information in Attachment A to supplement the alternatives analysis provided within the April 7 application. This supplemental information further clarifies and provides additional supporting documentation regarding the services and utilities that would be impacted by the Option 5 route.

c) A table(s) including the number of residences, commercial, and industrial properties, schools, medical facilities, school bus stops and pick-ups, sanitary sewers, on-lot septic systems, other underground and above ground utilities (provide maps showing the location of these utilities and the location of any private or public water supplies within 1,000 ft of this Option);

SPLP Response:
SPLP provides within Attachment A a Summary Comparative Assessment of Consistency with Fundamental Routing Criteria and Associated Potential Impacts on Life, Property, and the Environment for Options 3, 4, and 5 table (Table 3) that provides the information requested. Where information was not readily available based on SPLP's efforts, SPLP explains (i) the steps it took to obtain information, (ii) limitations in obtaining information, and (iii) alternative information provided that addresses the purpose and intent of this comment.

d) Correspondence and an assessment indicating whether PennDOT and/or the township will grant easements or other access measures for the pipeline within the public highways;

SPLP Response:
Two approvals would be required for Option 5, a Township longitudinal occupancy permit and a PennDOT highway occupancy permit and the processes for obtaining these permits is outlined in the response to TD comment 1(e). The April 7 amendment application describes in detail how Option 5 would result in substantial and protracted impacts on residential uses, public access, emergency access, roadways, and infrastructure, and related hazards and impacts to life and property, for a significant duration (up to 6 months). The April 7 amendment application also described that the Upper Uwchlan Township's position is that closing roadways and rerouting traffic through township roads would be very impactful for many residents and the Township prefers other options that avoid pipeline construction in heavily trafficked roadways including Little Conestoga Road. During a site visit with a PennDOT representative, it was verbally conveyed that PennDOT may be willing to grant a highway occupancy permit, but that would only be with approval of the Township's longitudinal occupancy

permit. Therefore, it is undetermined whether the Township would grant a longitudinal occupancy permit for the in-road pipeline construction and operation in Little Conestoga and Green Valley roads for Option 5. As a result, PennDOT's approval is also undetermined due to it being contingent upon the Township's approval.

e) A description of the process to obtain these easements;

SPLP Response:
SPLP would submit a longitudinal occupancy permit, revised highway occupancy permit and driveway permit to Upper Uwchlan Township. In addition, SPLP would submit a detour plan associated with the PennDOT highway occupancy permit applications for review and approval by Upper Uwchlan Township. The Township and PennDOT review the plans and applications and, if approved, issue the permits. However, as noted for TD comment 1(d), the Township has verbally expressed that it does not prefer Option 5 and therefore it is unknown if they would grant the occupancy permit. The timeframe for acquiring these permits is unknown since historically in similar circumstances, Upper Uwchlan Township has delayed the issuance of road permit approvals until DEP issues the permit amendment approval.

f) A description of any other concerns with installing a pipeline in or along a public roadway such as depth of pipe, set-back requirements, future maintenance and protection considerations for this pipeline, as well as any other utility co-located within or adjacent to the roadway right of way;

SPLP Response:
SPLP provides additional information in Attachment A to supplement the alternatives analysis provided within the April 7 application. This supplemental information further clarifies and provides the additional information requested in TD comment 1(f).

g) A comparison and description, in detail, of the available and required workspace along the proposed route;

SPLP Response:
SPLP provides additional information in Attachment A to supplement the alternatives analysis provided within the April 7 application. This supplemental submittal further clarifies and provides the additional information requested in TD comment 1(g).

h) An analysis of whether the pipeline can be along but offset from the roads;

SPLP Response:
SPLP provides an analysis of Options 5N and 5S in Attachment A to supplement the alternatives analysis provided within the April 7 application. Option 5N is represented by an alternative that is offset to the north of Green Valley and Little Conestoga roads, whereas Option 5S represents an offset to the south of these roads. As concluded within the Attachment A, these options are not technically feasible and were eliminated from further consideration. In summary, Options 5N and 5S (in addition to direct encroachment on residential structures) would result in violation of township landscape screening requirements and subdivision on-lot septic system requirements, and does not comply with PHMSA regulations in 49 CFR Part 195.210 regarding residential dwellings offsets.

i) The distances from the offset pipeline to each residential/commercial/industrial structure;

SPLP Response:
Although determined to be not technically feasible, SPLP provides in Attachment A the distances to residential and commercial/industrial structures for each of the offset alternatives 5N and 5S.

j) A description of a traffic plan detailing how traffic will be managed, time estimate of any closures and detours, and any other relevant requirements of the required road work; and

SPLP Response:
SPLP within its April 7 application already provided a traffic study that demonstrated that significant lane closures and detours would be needed to construct Option 5. Attachment A provides additional interpretation and clarification (in common terms) of the previously provided traffic study results.

k) Identify water mains, wells or other associated structures that are in the proposed route. If public water supply wells are within 1,000 ft provide documentation that the water supplier was notified and that they do not object to the project.

SPLP Response:
SPLP provides additional information in Attachment A regarding the single public water supply within 1,000 ft of Option 5, however contacting the water supplier regarding their position on the project/alternatives is beyond the scope of the Chapter 105 regulations. Furthermore, the Department issued a Press Release on May 7, 2021, a Pennsylvania Bulletin Public Notice on May 8th, and hosted a virtual public hearing on June 16th regarding the amendment application. The amendment application has also been posted on the Department's website since April 2021. These outreach efforts provided ample opportunity (>45 days) for nearby water suppliers to comment on the project/alternatives and no public water supplier objected to the preferred alternative.

2. ***Potential Option not assessed (termed Option 5a by the Department)*** – Another option, not included by Sunoco in the Major Amendment request, is moving the pipeline adjacent to the Pennsylvania Turnpike. As with Option5, this option also does not have impacts to streams and wetlands. This 5a route would follow the general path of Option 5, but instead of placing the pipeline in Little Conestoga Road, it crosses the road and is placed north of Little Conestoga Road, adjacent to and parallel to the Pennsylvania Turnpike running in a westerly direction to a crossing of Milford Road and ending at the Sunoco pumping facility. Sunoco needs to assess the feasibility of utilizing this alternative route. Include a detailed description of residential/ commercial/industrial facilities similar to what will be provided for Option 5.

SPLP Response:
SPLP provides additional information in Attachment A to supplement the alternatives analysis provided within the April 7 application. This supplemental information provides an assessment of the Department proposed Option 5a. As concluded within the Attachment A, the Pennsylvania Turnpike Commission has confirmed in writing that it will not approve Option 5a and therefore this option is not technically feasible and is eliminated from further consideration.

3. ***Option 4- Preferred Route*** – Option 4 would temporarily impact Wetland WH-17 and two streams. Sunoco needs to, at a minimum, provide the following information and analyses:

   a) Describe and provide a detailed rationale of why this option is preferred over other options that would have less environmental impacts;

      SPLP Response:
      SPLP refers the Department to the responses provided for TD comment 1 for which the requested comparisons are made and supported within Attachment A. Note that the environmental impacts from Option 4 are minor and temporary and can be restored successfully as demonstrated at numerous locations associated with this project.

   b) Compare Option 4 to Options 3, 5 and 5a in terms of permanent and temporary property impacts and analysis of the public health and safety issues;

      SPLP Response:
      SPLP refers the Department to the responses provided for TD comment 1 for which the requested comparisons are made and supported within Attachment A. As concluded within the response to TD comment 2, the Option 5a is not a technically feasible route, and therefore is eliminated from further consideration and analysis

   c) As requested above, with regard to Option 5, provide similar descriptions and tables including the number of residential/commercial/industrial properties and structures and other features that will be impacted, and the extent of each potential impact; and

      SPLP Response:
      SPLP refers the Department to the responses provided for TD comment 1 for which the requested comparisons are made and supported within Attachment A.

   d) Provide an analysis, with findings, as to whether the impact to forested areas from this Option can be reduced by limiting disturbance and altering work procedures.

      SPLP Response:
      SPLP evaluated potential impacts to wetland and upland forested areas as part of standard operating procedures when siting the Option 4 route. Option 4 avoids forested wetland impacts by reducing workspace width through Wetland H17 from the standard 75 foot-wide ROW to the 50-foot-wide permanent right-of-way. Although Option 4 has some upland forested land impacts, SPLP reduced upland forested land impacts to the maximum extent practicable while allowing for a constructable project that also minimizes the areal extent of wetland crossings and avoids significant impacts to other environmental resources. For instance, on the western end of the Option 4 SPLP reroutes the workspaces southwest of a line of large trees and avoids a large forested area that occurs on the property owned by Aqua.

4. Private and public water supplies– for Options 3, 4, 5 and 5a identify the source of drinking water for each residential/commercial/industrial properties and structures and indicate whether the water supply will potentially be affected. If public water supply wells are within 1,000 ft provide documentation that the water supplier was notified and that they do not object to the project.

SPLP Response:
As concluded within the response to TD comment 2, the Option 5a is not a technically feasible route, and therefore is eliminated from further consideration and analysis. As provided within our response to TD comments 1 and 3 and supporting Attachment A, no water private wells or lines are encountered by the workspace of Options 3, 4, and 5. The open cut construction method is proposed for each Option and therefore the only potential impact would be related to direct open cut of a water well or line. As noted within the response to TD comment 1(k), SPLP provides additional information in Attachment A regarding the single public water supply within 1,000 ft of the options, however contacting the water supplier regarding their position on the project/alternatives is beyond the scope of the Chapter 105 regulations. Furthermore, the Department issued a Press Release on May 7, 2021, a Pennsylvania Bulletin Public Notice on May 8th, and hosted a virtual public hearing on June 16th regarding the amendment application. The amendment application has also been posted on Department's website since April 2021. These outreach efforts provided ample opportunity (>45 days) for nearby water suppliers to comment on the project/alternatives, and no public water supplier objected to the preferred alternative.

5. Geology - Provide an assessment of the geologic conditions that will affect the volume of storm runoff and groundwater which will require trench dewatering and how this water will be treated and discharged. Describe the geology of all options and the relationship to proposed excavation dewatering/discharge plans.

SPLP Response:
An assessment of the geologic conditions and description of geology of all options is provided in Attachment B. In summary, the northwest end of each pipeline route option starts where groundwater is expected to be deeper than 30 feet. Approximately 200 ft from the northwest end, all three options enter a region where water is expected to be about ten feet below ground surface (bgs). In this area, Option 5 diverges and continues through areas with expected groundwater depths from zero to six feet for approximately 3,100 ft until the route options converge near the southeastern end. Most of Options 3 and 4 are in areas with groundwater deeper than ten feet except where they cross the wetland south of the pond. Both routes will have a roughly 320-foot stretch where groundwater will be between zero and six feet bgs. Installation of the pipeline using open cut construction methods results in approximate total trench depths of 8 to 10 feet which includes pipe cover (4 ft non-roadways and5 ft under roadways), the diameter of the 20-inch pipe and bedding/support under the pipe. Any portion of an option that is within an area where groundwater is estimated to be 10 feet or less may require trench dewatering. Option 5 is expected to encounter much more ground water where workspace and suitable discharge areas are more limited than for Options 3 and 4. Additional discussion on dewatering is included in the response to comment 6 below.

6. Sediment and Runoff and Trench Dewatering – Assess and recommend enhanced BMPs and other practices to be installed to manage stormwater runoff to tributaries discharging to Marsh Creek Lake. It is noted that stormwater will drain to Ranger's Cove, which is proposed to be dredged. Explain how stormwater will be managed should dredging take place that will protect the Lake and the tributaries from additional impacts. Identify and examine additional methods and measures to enhance the BMPs designed to manage such discharges. Notably, the soils adjacent to the Lake and the tributaries have a high clay content; based on observations of runoff there is a colloidal component to these soils. These

colloidal clays will not likely be retained by 50-micron filter bags, potentially resulting in impacts to the Lake and its tributaries if additional controls are not implemented. Other control methods need to be investigated, proposed, and submitted for review and approval to ensure that the Lake and its tributaries are protected from such runoff. Submit for review and approval a contingency plan detailing the required temporary discharge permit submissions required to address groundwater and turbidity associated with high volumes of groundwater inflow to the trench that includes the design and location of turbidity treatment systems and BMPs. This plan must include measures to prevent the discharge of any residual drilling fluids that may be encountered and all permits and be on-site upon commencement of any activity, and ready for immediate implementation to remove discharge turbidity to levels specified by the Department.

SPLP Response:
For the section of Options 3 and 4 between the eastern start of the option west to Highview Road, which encompasses wetland H17 and streams S-H10 and S-H11, SPLP would avoid surface discharge by pumping any excess groundwater to onsite storage tanks and hauling the water to an offsite disposal facility for management. This removal from the site includes any drilling fluids or flowable fill that may be encountered. The remainder of Options 3 and 4 west of Highview Road will be dewatered via a filter bag surrounded by compost filter sock. This enhanced dewatering control setup will be sited in an upland area surrounded by dense vegetation that is greater than 500 feet from any receiving stream/wetland. As mentioned in the response to TD comment 6, Option 5 is aligned through areas with expected groundwater depths from zero to six feet for approximately 3,100 ft. Option 5 is 2,780 feet longer than Options 3 and 4 through this shallow depth range. Option 5 is expected to encounter much more ground water where workspace and suitable discharge areas are more limited than for Options 3 and 4. SPLP would need to haul excess water off-site for most of Option 5. The E&S Plan included in Attachment C has been revised to provide the specifications for the dewatering plan for Option 4.

7. Wetland H17 restoration - The extreme and frequent impacts to this Wetland may limit its restoration. Submit a plan for Department review that describes in detail the restoration, monitoring and methods proposed to for the recovery of this wetland. Provide alternative mitigation options should this wetland not fully recover.

SPLP Response:
On October 1, 2020 SPLP presented to the Department a restoration plan for the earth feature that was discovered on August 10, 2020. The earth feature area has been in a temporarily stabilized state (i.e., flowable fill, sandbag/filter sock barriers) since discovery. Subsequently, it was determined that the restoration could occur after completion of a separate, but related, grouting operation to be covered under an Emergency Permit. That Emergency Permit was issued by the Department on May 3, 2021 to complete the grout action. That permit was conditioned on submitting a monitoring and restoration plan for the earth feature area. SPLP submitted that plan to the Department on June 4, 2021. The grout action has been completed, and SPLP is ready to restore the earth feature area. However, pending authorization to open cut this area, SPLP, in agreement with the Department, will postpone this restoration so that removal of the flowable fill and installation of the pipeline can be completed in a single action to minimize repeated impacts if Option 4 is authorized. SPLP has also received Department approval on July 2, 2021 of the soils to be imported to restore this area once the flowable fill is removed.

SPLP plans to monitor this wetland for successful restoration in accordance with all approved plans and permits. Site-specific monitoring of water quality, hydrology, and functions and values will be assessed pre-construction, during construction, and post-construction to meet the requirements of the site-specific Emergency Permit. However, after the first growing season post-grouting (and/or post-open trench), SPLP will continue to monitor Wetland H17 in accordance with the received Chapter 105 E15-862 permit. The E15-862 permit requires monitoring twice per year for three years and once per year up to 5 years. Wetland H17 and streams S-H10 and S-H11 will be included in the monitoring program as conditioned in the E15-862 permit and the results reported within the required monitoring reports.

A site-specific monitoring report documenting the results of the water quality, hydrology, and function and value assessments associated with the earth feature will be submitted to the Department by May 31 after the first growing season following completion of the grouting operation (and/or post-open trench). The report will document the successful restoration or provide corrective actions to be taken to achieve successful restoration. After the first growing season evaluation and submission of the site-specific report, the monitoring results at Wetland H17 will be provided within the reporting requirements of the 5-year monitoring as required per the Chapter 105 permit E15-862.

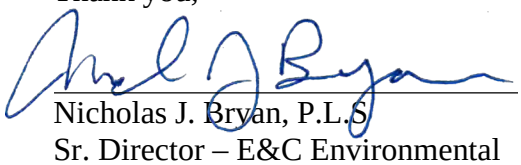
SPLP also has planned additional monitoring for Wetland H17 and streams S-H10 and S-H11 outside of the earth feature/open cut section. That more encompassing plan was submitted to the Department on June 15, 2021 within the HDD S3-0290 Impact Assessment and Restoration Plan – Streams S-H10/S-H11 and Wetland H17. This monitoring is to occur quarterly and includes assessments of biological integrity, physical habitat, water quality and functions and values.

The plan for restoration and monitoring outlined within the June 15 impact assessment and restoration plan will not change with implementation of Option 4, and any failures in recovery after restoration will be readily discovered, reported, and corrective actions proposed. SPLP notes that this wetland successfully recovered after the installation of the 16-inch pipeline via a HDD resulted in remediation of disturbances related to inadvertent return events.

Because SPLP's monitoring commitments for the wetland H17 associated tributaries are frequent and comprehensive, allowing for early detection and correction, mitigation is not expected to be required. In the unlikely event mitigation is required, SPLP will propose mitigation in accordance with the Department's regulations.

If you have any questions or need additional information regarding this supplemental response and the enclosed documents, please contact me at (570) 505-3740 or via email at Nick.Bryan@EnergyTransfer.com.

Thank you,



Nicholas J. Bryan, P.L.S.
Sr. Director – E&C Environmental
Energy Transfer

Attachments

Attachment A
Alternatives Analysis
Public Health and Safety Supplemental Information

ATTACHMENT A

TECHNICAL FEASIBILITY OF OPTIONS 5a, 5N, and 5S

In the Pennsylvania Department of Environmental Protection ("PADEP" or "Department") technical deficiency ("TD") comment letter dated August 6, 2021, the Department requested that Sunoco Pipeline LP ("SPLP") assess the feasibility of using three additional alternative routes for the 20-inch-diameter natural gas liquids ("NGL") pipeline to replace the originally proposed and approved HDD S3-290 (the "290 HDD") segment for the Mariner East II Project in Upper Uwchlan Township, Chester County. As requested by the Department, this section provides applicable narrative assessments, figures, quantitative residential impact tables, and agency correspondence relative to these three additional alternative routes, hereafter referred to as Options 5a, 5N, and 5S. This Attachment further supports SPLP's evaluation and conclusion that option 4 is the preferred alternative with the least impacts to life, property, safety and the environment.

Option 5a

Per TD comment 2, the Department requested that SPLP assess the feasibility of using Option 5a (as termed by the Department), presumed (by the Department) to avoid impacts to wetlands and streams, that would follow the general path of Option 5 but reroute the 20-inch-diameter pipeline to the north of (instead of within) Little Conestoga Road adjacent and parallel to the south side of the Pennsylvania Turnpike. Specifically, Option 5a is concomitant with the open cut construction method routing of Option 5 for approximately 1,138 feet from the eastern start point northward to its intersection with Green Valley Road, then (instead of being routed within Green Valley Road and Little Conestoga Road) continues northward for approximately 464 feet crossing Green Valley Road and Little Conestoga Road to the south side of the Pennsylvania Turnpike, turns westward for approximately 2,755 feet located parallel and as close as possible (given paved road surface and topographic grade) adjacent to the south side of the Pennsylvania Turnpike (overlapping the turnpike right-of-way by approximately 37 feet and northernmost portion of 8 private residential parcels by approximately 13 feet), jogs slightly southwest then west to cross Milford Road, then finally turns southwest and south to interconnect with the SPLP's Eagle Station. **Figure 1 (Appendix A)** depicts the Option 5a alignment, including the pipeline centerline, 50-foot-wide permanent right-of-way ("ROW"), 25-foot-wide temporary workspace ("TWS"), additional temporary workspace ("ATWS"), and temporary access roads for construction of Option 5a.

The portions of Option 5a located adjacent to the south side of the Pennsylvania Turnpike and in the vicinity of the crossing of Milford Road are located within (the 50-foot-wide permanent ROW almost entirely overlaps) the turnpike's right-of-way and, moreover, the Pennsylvania Turnpike Commission's ("Commission's") proposed turnpike expansion area, depicted on **Figure 1 (Appendix A)** as "Proposed Turnpike Expansion Grading Contours." Based on direct consultation with, and letter correspondence (provided in **Appendix B**) from, the Commission, the turnpike "total reconstruction and widening project between Mileposts 308 and 312 will directly impact the pipeline in this location, requiring it to be relocated. Accordingly, the Commission does not support Option 5a." Therefore, permanent operation of the pipeline within the turnpike expansion area is prohibited by the Commission, and thus the Department-identified Option 5a routing is not available to SPLP and Option 5a is not technically feasible. SPLP has thus eliminated this option from further evaluation.

Option 5N

Per TD comment 1(h), the Department requested that SPLP assess the feasibility of routing the 20-inch-diameter pipeline adjacent to, but offset to the north of, Green Valley Road and Little Conestoga Road. This alternative Option 5N (as termed by SPLP) would follow the general path of Option 5 but reroute the pipeline to the north of (instead of within) Green Valley Road and Little Conestoga Road. Specifically, Option 5N is concomitant with the open cut construction method routing of Option 5 for approximately 1,054 feet from the eastern start point northward to its intersection with Green Valley Road, then (instead of being routed within Green Valley Road and Little Conestoga Road) turns west for approximately 123 feet adjacent to the south side of Green Valley Road, turns north for 82 feet crossing Green Valley Road, turns west for 454 feet located adjacent to the north of Green Valley Road and crossing Little Conestoga Road, continues west for 1,485 feet adjacent to the north of Little Conestoga Road, continues northwest-west for 161 feet crossing Milford Road, then finally continues 233 feet west to interconnect with the SPLP's Eagle Station.

Figure 2 (Appendix A) depicts the Option 5N alignment, including the pipeline centerline, 50-foot-wide permanent ROW, 25-foot-wide TWS, ATWS, and temporary access roads for construction of Option 5N. **Figure 2a** depicts the Department's requested Option 5N applying SPLP's Mariner East II Project **standard 75-foot-wide construction workspace** (see *Safety Requirements and Baseline Industry BMPs*) with no realignments or workspace reductions to avoid structures to demonstrate structures that would be directly impacted by the standard workspace. **Figure 2b** depicts a **construction workspace reduced from the project-wide standard and minimized** to avoid direct impacts (using a nominal avoidance buffer) to residential structures and associated infrastructure where practicable; this reduced workspace was used to measure distances to residential structures (per TD comment 1(i)) as presented in **Table 1**.

It is important to note that one of SPLP's primary objectives during initial routing of the Mariner East II Project, in addition to co-location with existing SPLP pipeline ROWs, was to avoid, to the maximum extent practicable, congested residential, commercial, and industrial areas that would necessitate pipeline construction and operation activities crossing or in close proximity to residential and other occupied structures and associated infrastructure, as presented in the original Project-wide Alternatives Analysis (incorporated herein by reference). Option 5N negates this primary routing objective, which is in large part the reason for SPLP's development of in-road (instead of adjacent road) Option 5. Therefore, in a concerted effort to avoid or minimize direct (e.g., structure demolition and permanent removal, grading, open trench) and indirect (e.g., heavy equipment noise, vibration, fugitive dust) impacts to residences, Option 5N is routed parallel and as close as practicable adjacent to the north sides of Green Valley Road and Little Conestoga Road. Option 5N essentially abuts the north side of the pavement of Green Valley Road. Option 5N is offset from the north side of Little Conestoga Road to ensure a minimum setback distance of 5 feet from the Aqua firewater line and fire hydrants (which is located parallel to and offset from the north side of Little Conestoga Road) and on top of a raised (above the road grade) earthen berm planted with evergreen landscaping to serve as a noise and visual screen for residents located north of Little Conestoga Road.

In response to TD comment 1(i), **Table 1** presents the distance from the pipeline centerline and reduced construction workspace to each residential structure. An entry of "0" indicates the structure is located within the 50-foot-wide permanent ROW and would not comply with the U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration's ("PHMSA's") regulations to avoid areas containing private dwellings as far as practicable (given there are other practicable alternative routes that avoid or further avoid private residential dwellings) pursuant to 49 Code of Federal Regulations ("CFR") Part 195.210 (PHMSA 2021) and ensure proper operation inspections to detect and report construction encroachment and assure the safe operation of the pipeline pursuant to 49 CFR Part 195.412 and PHMSA's Operations & Maintenance Enforcement Guidance in 49 CFR Part 195 Subpart F (PHMSA 2017).

Table 1. Option 5N (Reduced Workspace) Distance to Occupied Residential, Commercial, and Industrial Structures within 200 feet of Construction Workspace

Structure Type	Parcel Tract Number	Parcel Address	Distance to Pipeline Centerline (feet)[1]	Distance to Construction Workspace (feet)[1]
In-ground Pool	3203 0409000	101 Edgefield Drive	94	30
Outbuilding	3203 0415000	202 Stanley Drive	84	32
In-ground Pool	3203 0415000	202 Stanley Drive	68	15
Residential Home	3203 0415000	202 Stanley Drive	111	62
Outbuilding	3203 0418000	201 Stanley Drive	37	10
Residential Home	3203 0418000	201 Stanley Drive	95	37
Outbuilding	3203 0419000	115 Edgefield Drive	4	0
Residential Home	3203 0419000	115 Edgefield Drive	164	109
Outbuilding	3203 0420000	117 Edgefield Drive	0	0
Residential Home	3203 0420000	117 Edgefield Drive	138	80
Residential Home	3203 0421000	119 Edgefield Drive	154	55
Residential Home	3203 0422000	121 Edgefield Drive	150	54
In-ground Pool	3203 0422000	121 Edgefield Drive	175	115
Outbuilding	3203 0422000	121 Edgefield Drive	168	64
Outbuilding	3203 0055000	10 Green Valley Road	138	22
Outbuilding	3203 0055000	10 Green Valley Road	105	43
Residential Home	3203 0055000	10 Green Valley Road	149	56

1 An entry of "0" indicates the structure is located within the 50-foot-wide permanent ROW and therefore would not comply with PHMSA regulations pursuant to 49 CFR 195.210 to avoid, as far as practicable, areas containing private dwellings.

Despite routing and siting the workspace offset to the north of, but as far south as practicable adjacent to, Green Valley Road and Little Conestoga Road to avoid or minimize impacts to residential structures and associated infrastructure, Option 5N results in the following unavoidable direct impacts to residential, commercial, and industrial structures and associated infrastructure:

- Direct pipeline centerline and permanent ROW crossing of two aboveground residential structures (two outbuildings) within the 50-foot-wide permanent ROW that, per SPLP

ROW restrictions, would require permanent relocation outside of the permanent ROW (see **Figure 2b** and **Table 1**).

- Direct crossing of five (5) buried on-lot septic system lines and leach fields including three (3) by the pipeline centerline, one (1) within the 50-foot-wide permanent ROW, and one (1) by ATWS (see **Figure 2b**) that:
    - cannot be used by the private residence during construction through the septic system/leach field;
    - in most cases, per SPLP ROW restrictions or if damaged during construction, would require permanent relocation and replacement outside the permanent ROW; and
    - if sufficient space is not available or soil percolation tests fail specifications to relocate the septic system/leach field on-lot (closer to residences in this case), then either an aboveground septic system or connection to a public sanitary sewer (which is currently not available in the Edgefield Subdivision) would be required.
- Insufficient space is available on-lot to relocate at least one (1) and up to four (4) on-lot septic systems and leach fields in accordance with Township requirements and pursuant to Pennsylvania's Standards for Onlot Sewage Treatment Facilities (Pa Code Title 25, Chapter 73.13)[1], resulting in private resident violation of the Edgefield Subdivision-Phase Three Approval Plan (approved by the Township of Upper Uwchlan) requirement that each lot shall use individual on-lot sewage systems.
- Per the impact minimization alignment, direct crossing and permanent removal of all existing mature tree landscaping serving as a noise and visual screen along the southern portion of the 50-foot-wide permanent ROW adjacent to Little Conestoga Road, resulting in violation of the Township of Upper Uwchlan's requirements[2] for a 30-foot-wide planting strip that acts as an effective screen separating the roadway ("commercial, industrial or institutional use") abutting "an existing residential use or residential district" pursuant to Part II: General Legislation/Zoning Code, Article XV Common Regulations, Chapter 200 – Zoning, Section 200-77 Screening.
- Furthermore, SPLP's ROW restrictions relevant to the replacement of this Township-required landscaping strip would prohibit plantings on top of and within 10 feet of the pipeline centerline (at a minimum for shallow-rooted shrubs) and strongly discourage planting within the 50-foot-wide permanent ROW (for deep rooted trees) to avoid or minimize potential damage to the buried pipeline, thus requiring replanting of the 30-foot-wide vegetation screening north of the permanent ROW and closer to existing residences, outbuildings, and other structures (on-lot septic systems, in-ground pools). In addition to serving as a permanent visual barrier between residences and the southern portion of

[1] Pursuant to Pennsylvania's Standards for Onlot Sewage Treatment Facilities (Pa Code Title 25, Chapter 73.13): on-lot sewage tanks and absorption fields must be at least 10 feet away from property lines, swimming pools, and pressurized water supply lines; sewage tanks must be at least 50 feet away from an individual water supply or water supply system suction line; and absorption fields must be at least 100 feet away from an individual water supply or water supply system suction line

[2] In the Township of Upper Uwchlan's Part II: General Legislation/Zoning Code, screening is required "where a proposed commercial, industrial or institutional use abuts an existing residential use or residential district" under Article XV Common Regulations, Chapter 200 – Zoning, Section 200-77 Screening. "The portion of the tract that abuts a use or district intended to be screened shall be provided with a minimum of thirty-foot planting strip which will act as an effective screen separating uses." Vegetative screening shall include a variety of evergreen species (but no more than three) which are indigenous to the area so as to provide a year-round visual barrier; incorporate earthen mounds or berms, wherever possible, to improve sound as well as visual buffering, and shall be broken at points of vehicular or pedestrian access; and plant materials used in the screen planting shall be at least six feet in height when planted and be of a species which will produce within two years a complete visual screen of at least eight feet in height.

their properties, insufficient space is available to accommodate this replacement 30-foot-wide vegetation screening for eight (8) of ten (10) residences located north of Little Conestoga Road as it would overtop existing on-lot septic system leach fields, outbuildings, in-ground pools, and/or driveways. Therefore, violation of the Township-required landscaping strip is unavoidable for these eight (8) residences.

- Direct crossing and potential temporary interruption or permanent relocation of local on-lot distribution utilities serving private residences within the construction workspace, including public water pipelines, stormwater pipelines, and three (3) mapped Pennsylvania Groundwater Information System (PaWGIS) private water supply wells.

As a result, Option 5N is not technically feasible due to resultant violation of township landscape screening requirements and state and municipal on-lot septic system requirements. Furthermore, Option 5N does not avoid private residential dwellings as far as practicable (given there are other practicable alternative routes that avoid or further avoid private residential dwellings) and thereby does not comply with PHMSA regulations in 49 CFR Part 195.210. In addition, Option 5N results in the direct crossing and potential temporary interruption or permanent relocation of local on-lot distribution utilities serving private residences within the construction workspace that would be avoided by Option 5.

Shifting the construction workspace further to the north to avoid the existing raised berm and noise and visual (evergreen trees and associated root systems) screening adjacent to Little Conestoga Road would only serve to further restrict the available construction workspace while encroaching on additional on-lot septic systems/leach fields and residential utility infrastructure and at least 25 feet closer to all affected residences, and placing the permanent ROW through four (4) additional outbuildings and two in-ground pools (not in compliance with PHMSA regulations pursuant to 49 CFR Part 195.210). As a result, shifting the construction workspace any distance further to the north adjacent to Little Conestoga Road is also not technically feasible.

Therefore, regardless of the distance of offset adjacent to the north of the roads, SPLP has determined that Option 5N is not technically feasible and thereby has eliminated this alternative from further consideration and evaluation.

Option 5S

Per TD comment 1(h), the Department requested that SPLP assess the feasibility of routing the 20-inch-diameter pipeline adjacent to, but offset to the south of, Green Valley Road and Little Conestoga Road. This alternative Option 5S (as termed by SPLP) would follow the general path of Option 5 but reroute the pipeline to the south of (instead of within) Green Valley Road and Little Conestoga Road. Specifically, Option 5S is concomitant with the open cut construction method routing of Option 5 for approximately 1,054 feet from the eastern start point northward to its intersection with Green Valley Road, then (instead of being routed within Green Valley Road and Little Conestoga Road) turns west for approximately 411 feet adjacent to the south side of Green Valley Road, then continues west for 1,547 feet adjacent to the south of Little Conestoga Road, continues northwest-west for 306 feet crossing Milford Road, then finally continues 216 feet west to interconnect with the SPLP's Eagle Station.

Figure 3 (Appendix A) depicts the Option 5S alignment, including the pipeline centerline, 50-foot-wide permanent ROW, 25-foot-wide TWS, ATWS, and temporary access roads for

construction of Option 5S. **Figure 3a** depicts the Department's requested Option 5S applying SPLP's Mariner East II Project **standard 75-foot-wide construction workspace** (see *Safety Requirements and Baseline Industry BMPs*) with no realignments or workspace reductions to avoid structures to demonstrate structures that would be directly impacted by the standard workspace. **Figure 3b** depicts a **construction workspace reduced from the project-wide standard and minimized** to avoid direct impacts (using a nominal avoidance buffer) to residential structures and associated infrastructure where practicable; this reduced workspace was used to measure distances to residential structures (per TD comment 1(i)) as presented in **Table 2**.

As noted for Option 5N, it is important to note that one of SPLP's primary objectives during initial routing of the Mariner East II Project, in addition to co-location with existing SPLP pipeline ROWs, was to avoid, to the maximum extent practicable, congested residential, commercial, and industrial areas that would necessitate pipeline construction and operation activities crossing or in close proximity to residential and other occupied structures and associated infrastructure, as presented in the original Project-wide Alternatives Analysis (incorporated herein by reference). Option 5S negates this primary routing objective, which is in large part the reason for SPLP's development of in-road (instead of adjacent road) Option 5. Therefore, in a concerted effort to avoid or minimize direct (e.g., structure demolition and permanent removal, grading, open trench) and indirect (e.g., heavy equipment noise, vibration, fugitive dust) impacts to residences, Option 5S is routed parallel and as close as practicable adjacent to the south sides of Green Valley Road and Little Conestoga Road. Option 5S essentially abuts the south side of the pavement of Green Valley Road. Option 5S is offset from the south side of Little Conestoga Road to ensure a minimum setback distance of 35 feet from the high-tension electric power line (which is located parallel to and offset from the south side of Little Conestoga Road).

In response to TD comment 1(i), **Table 2** presents the distance from the pipeline centerline and reduced construction workspace to each residential structure. An entry of "0" indicates the structure is located within the 50-foot-wide permanent ROW and would not comply with the U.S. Department of Transportation, PHMSA's regulations to avoid areas containing private dwellings as far as practicable (given there are other practicable alternative routes that avoid or further avoid private residential dwellings) pursuant to 49 CFR Part 195.210 (PHMSA 2021) and ensure proper operation inspections to detect and report construction encroachment and assure the safe operation of the pipeline pursuant to 49 CFR Part 195.412 and PHMSA's Operations & Maintenance Enforcement Guidance in 49 CFR Part 195 Subpart F (PHMSA 2017).

Table 2. Option 5S (Reduced Workspace) Distance to Occupied Residential, Commercial, and Industrial Structures within 200 feet of Construction Workspace

Structure Type	Parcel Tract Number	Parcel Address	Distance to Pipeline Centerline (feet)[1]	Distance to Construction Workspace (feet)[1]
Residential Home	3203 0054020	495 Little Conestoga Road	19	0
Residential Home	3203 0054060	485 Little Conestoga Road	107	57
Residential Home	3203 005406A	475 Little Conestoga Road	138	91
In-ground Pool	3203 005406A	475 Little Conestoga Road	200	152
Outbuilding	3203 0054050	465 Little Conestoga Road	74	23
Residential Home	3203 0054050	465 Little Conestoga Road	76	26

Outbuilding	3203 0054070	455 Little Conestoga Road	75	25
Residential Home	3203 0054070	455 Little Conestoga Road	36	10
Residential Home	3203 0054080	23 Highview Road	0	0
Outbuilding	3203 0054030	425 Little Conestoga Road	0	0
Outbuilding	3203 0054030	425 Little Conestoga Road	16	0
Residential Home	3203 0054030	425 Little Conestoga Road	21	10
1 An entry of "0" indicates the structure is located within the 50-foot-wide permanent ROW and therefore would not comply with PHMSA regulations pursuant to 49 CFR 195.210 to avoid, as far as practicable, areas containing private dwellings.				

Despite routing and siting the workspace offset to the south of, but as far north as practicable adjacent to, Green Valley Road and Little Conestoga Road to avoid or minimize impacts to residential structures and associated infrastructure, Option 5S results in the following unavoidable direct impacts to residential, commercial, and industrial structures and associated infrastructure:

- Direct crossing of four (4) aboveground residential structures, including two homes and two outbuildings, within the 50-foot-wide permanent ROW that, per SPLP ROW restrictions, would require permanent relocation outside of the permanent ROW (see **Figure 3b** and **Table 1**).
- Direct crossing of two (2) buried on-lot septic system lines and leach fields, including one (1) within the 50-foot-wide permanent ROW and one (1) within ATWS (see **Figure 3b**) that:
    - cannot be used by the private residence during construction through the septic system/leach field;
    - in most cases, per SPLP ROW restrictions or if damaged during construction, would require permanent relocation and replacement outside the permanent ROW; and
    - if sufficient space is not available or soil percolation tests fail specifications to relocate the septic system/leach field on-lot (closer to residences in this case), then either an aboveground septic system or connection to a public sanitary sewer (which is currently not available in the Edgefield Subdivision) would be required.
- Insufficient space is available on-lot to relocate at least one (1) on-lot septic system and leach field in accordance with Township requirements and pursuant to Pennsylvania's Standards for Onlot Sewage Treatment Facilities (Pa Code Title 25, Chapter 73.13)[3], resulting in private resident violation of the Edgefield Subdivision-Phase One Plan requirement that each lot shall use individual on-lot sewage systems.
- Per the impact minimization alignment, direct crossing and permanent removal of existing mature tree landscaping serving as a noise and visual screen within the 50-foot-wide permanent ROW adjacent to Little Conestoga Road, resulting in violation of the Township of Upper Uwchlan's requirements[4] for a 30-foot-wide planting strip that acts as an effective screen separating the roadway ("commercial, industrial or institutional use") abutting "an existing residential use or residential district" pursuant to Part II: General

[3] See footnote 1.

[4] See footnote 2.

Legislation/Zoning Code, Article XV Common Regulations, Chapter 200 – Zoning, Section 200-77 Screening.

- Furthermore, SPLP's ROW restrictions relevant to the replacement of this Township-required landscaping strip would prohibit plantings on top of and within 10 feet of the pipeline centerline (at a minimum for shallow-rooted shrubs) and strongly discourage planting within the 50-foot-wide permanent ROW (for deep rooted trees) to avoid or minimize potential damage to the buried pipeline, thus requiring replanting of the 30-foot-wide vegetation screening north of the permanent ROW and closer to existing residences, outbuildings, and other structures (on-lot septic systems, in-ground pools). In addition to serving as a permanent visual barrier between residences and the northern portion of their properties, insufficient space is available to accommodate this replacement 30-foot-wide vegetation screening for four (4) of six (6) residences located south of Little Conestoga Road as it would overtop the residences themselves and/or existing on-lot septic system leach fields. Therefore, violation of the Township-required landscaping strip is unavoidable for these four (4) residences.
- Direct crossing and potential temporary interruption or permanent relocation of local on-lot distribution utilities serving private residences within the construction workspace, including public water pipelines, buried electric distribution lines, and one private water well.

As a result, Option 5S is not technically feasible due to direct permanent ROW encroachment on two residential structures not in compliance with PHMSA regulations in 49 CFR Part 195.210, violation of township landscape screening requirements, and violation of subdivision on-lot septic system requirements. Furthermore, Option 5S does not avoid private residential dwellings as far as practicable (given there are other practicable alternative routes that avoid or further avoid private residential dwellings) and thereby does not comply with PHMSA regulations in 49 CFR Part 195.210. In addition, Option 5S results in the direct crossing and potential temporary interruption or permanent relocation of local on-lot distribution utilities serving private residences within the construction workspace that would be avoided by Option 5.

Shifting the construction workspace further to the south to avoid noise and visual (mature tree landscaping and associated root systems) screening adjacent to the south side of Little Conestoga Road would only serve to further restrict the available construction workspace while encroaching on additional on-lot septic systems/leach fields and residential utility infrastructure closer to all affected residences, and potentially (depending on distance routing further south) placing the permanent ROW through additional residences and outbuildings (not in compliance with PHMSA regulations pursuant to 49 CFR Part 195.210). As a result, shifting the construction workspace any distance further to the south adjacent to Little Conestoga Road (and north of Option 3) is also not technically feasible.

Therefore, regardless of the distance of offset adjacent to the south of the roads, SPLP has determined that Option 5S is not technically feasible and thereby has eliminated this alternative from further consideration and evaluation.

Conclusion

Based on the above analysis, SPLP has determined that Options 5a, 5N, and 5S are not technically feasible, and therefore are eliminated from further consideration and evaluation,

including comparative evaluation with Options 3, 4, and 5 of potential impacts to life, property, safety, and the environment.

COMPARISON OF LIFE, PROPERTY, AND ENVIRONMENT IMPACTS FOR OPTIONS 3, 4, AND 5

Regulatory Protection of Life, Property, and the Environment

In reviewing permit applications under Chapter 105 – Dam Safety and Waterway Management, the Commonwealth of Pennsylvania's regulations require the Department to evaluate "[p]otential threats to life or property created by the [construction of a] dam, water obstruction or encroachment" to make a determination of impact (25 Pa. Code § 105.14(b)(1)), as well as to evaluate "[p]otential threats to life, property or safe navigation created by the continuing operation or maintenance of the project" (25 Pa. Code § 105.14(c)(1)). This section presents a complete and consolidated comparative evaluation of potential impacts to life, property, and the environment for Options 3, 4, and 5 to support the Department's evaluation per the regulations above and in response to TD comments 1 and 3.

A comparative assessment of impacts to environmental resources, including waters of the Commonwealth, for Options 3, 4, and 5 was previously provided in SPLP's HDD 290 Major Amendment Application submitted to the Department on April 7, 2021, and is herein incorporated by reference.

Fundamental Pipeline Routing Objectives to Avoid and Minimize Impacts on Life, Property, and the Environment

Routing Criteria and Potential Impacts to Life, Property, and the Environment

Pipeline construction is fundamentally a heavy construction activity applied along a restricted linear work zone across variable terrain and numerous obstacles that has potential impacts to life, property, and the environment. Pipeline operations and maintenance of a hazardous liquids pipeline also possesses potential impacts to these resources. In addition to compliance with applicable PHMSA (49 CRF Part 195) regulations for hazardous liquids pipelines, these potential impacts also are fundamentally avoided, minimized, and mitigated by, but not necessarily limited to, the primary pipeline routing criteria discussed below, including maximizing co-location with existing pipeline corridors, avoiding residential areas, avoiding in-road construction and operation, and avoiding potential significant impacts to environmental resources. Although these primary routing criteria and associated potential impacts to life, property, and the environment have been previously and thoroughly discussed and presented in the original Project-wide Alternatives Analysis (December 2016) and/or the HDD 290 Major Amendment Application (April 7, 2021), they are repeated, clarified , and/or supplemented herein to present a complete and consolidated comparative evaluation (alternatives analysis) for Options 3, 4, and 5.

Safety Requirements and Baseline Industry BMPs

As presented in SPLP's original Project-wide Alternatives Analysis, it is important to note that for a 20-inch-diameter hazardous liquid pipeline the industry standard construction workspace is 100 feet wide (supported by INGAA Foundation 1999), typically consisting of a 50-foot-wide permanent ROW and 50-foot-wide TWS, as well as ATWS at obstacle crossings and temporary access roads. All things being equal, a 100-foot-wide construction workspace ensures

appropriate space for a safe and maneuverable pipeline construction ROW to accommodate pipeline heavy construction activities, including but not limited to sufficient space for grading and earth movement, construction equipment and material staging, pipe staging, open trenching, topsoil segregation, trench spoil storage, and heavy equipment movement and passing lane, as well as for required erosion and sedimentation controls. The INGAA Foundation (1999) study recommends that these baseline construction workspace widths be adopted, with increases or decreases for special conditions (e.g., sensitive environmental areas, sites with cultural or historical significance, densely populated areas), with construction on narrow ROWs likely requiring larger workspace areas at either end of the constrained area.

As presented in SPLP's original Project-wide Alternatives Analysis, SPLP applied a reduced project-specific standard 75-foot-wide construction workspace on the Mariner East II Project as a programmatic measure to reduce direct workspace impacts by 25 percent across the project. As a result, construction workspace is fundamentally reduced across the project, thereby constraining pipeline heavy construction activities, which further enhances the importance of applying the following primary routing criteria to ensure a safe and maneuverable construction workspace unencumbered by obstacles and congestion and avoid and minimize potential impacts to life, property, and the environment.

Routing Criteria 1 – Co-Location with Existing SPLP Pipeline Rights-of-Way

As presented in the original Project-wide Alternatives Analysis, the route and location of the Mariner East II pipelines were selected as a result of a detailed and multi-factor analysis that included, among other things, considerations related to engineering and design requirements, construction constraints, field conditions, technology, logistics, environmental considerations, land ownership, and safety considerations. The initial routing criteria and route selected for the Project was co-located with (abut and/or overlap) an existing SPLP pipeline ROW to avoid and minimize potential impacts on life, property, and the environment, including but not limited to those associated with "greenfield" routing. This multi-factor analysis resulted in selection of the path for the original HDD 290 location, which was largely co-located with a pre-existing pipeline right-of-way corridor for the 8-inch Mariner East I pipeline. The 16-inch pipeline (as well as previous installation of SPLP's 8-inch pipeline in the 1930s) has already been successfully constructed along this ROW corridor. The co-location of pipelines within pre-existing pipeline and other utility corridors is also consistent with the recommendations from the Governor's Pipeline Infrastructure Task Force Report (February 2016), which included a recommendation to co-locate pipelines whenever possible. Per this report, the co-location of pipelines avoids, among other things, "greenfield" construction and reduces "the amount of disturbance and fragmentation that would otherwise occur with a separate pipeline corridor." Co-location of the pipelines minimizes new, permanent land disturbance and land use fragmentation, including encumbrance on existing private, commercial, and industrial development; potential inconsistency with county or residential land use plans or requirements; and "stranding" existing developed areas and future development between encumbered pipeline corridors. Co-location of the pipelines also minimizes new, permanent forest and habitat fragmentation, as pre-existing pipeline and utility corridors have already been cleared, thereby avoiding the necessity of clearing new forest areas or habitat when possible.

In partial response to TD comment 1(f), the co-location of pipelines in pre-existing pipeline and utility corridors is also preferred for operations, maintenance, and inspection of pipelines, which

are enhanced when the pipelines are located within the same or adjacent right-of-way corridors. The co-location of pipelines is preferred for safety considerations, because co-locating pipelines in the same or adjacent rights-of-way provides an additional level of awareness for the location of the pipelines for members of the public and contractors who may work in the area. This provides enhanced safety against third-party damage as the public and contractors are more likely to recognize a well-marked, pre-existing utility corridor with multiple utilities because of the higher concentration of aboveground line markers and frequent inspection activities. Co-location decreases the "effort, duration, and cost of pipeline operations responding to third-party One Call requests and potential pipeline and right-of-way encroachment by third-party activities." Co-location also decreases "the length of the pipeline, right-of-way, and equipment and personnel access ways, and thus [decreases] the associated effort, duration, and cost of pipeline monitoring and maintenance activities. These activities include, but are not necessarily limited to, right-of-way vegetation maintenance, aerial inspection, ground inspection, in-line inspection, corrosion protection, anomaly detection, and pipeline repair and maintenance to ensure pipeline safety and integrity during the life of pipeline operations." For these logistical reasons, as presented in the original Project-wide Alternatives Analysis, rerouting (not co-locating) the pipeline to further avoid or minimize minor and temporary impacts on individual wetlands, on a site-specific (such as is the intent of Option 5) and cumulative project basis, "results in suboptimal pipeline operation and maintenance process, access, efficiency, and duration; as well as increased cost, to ensure pipeline safety and integrity during the life of pipeline operations."

As presented in the original Project-wide Alternatives Analysis, given the primary importance of co-location, the initial Mariner East II pipeline was co-located with pre-existing pipeline and other utility and road corridors to the maximum extent practicable (and ultimately 83 percent of its length), primarily diverging from co-location at the four Major Route Alternatives to avoid "obvious community, cultural, and natural resource impacts". For this comparative analysis of alternatives for installation of the 20-inch pipeline in the HDD 290 area (see **Table 3**), Option 3 is entirely (100 percent) co-extensive and the preferred Option 4 reroute is primarily (77 percent) co-extensive with the original SPLP 16-inch (and 8-inch) installation location(s). However, the preferred Option 4 route only diverges from this pre-existing pipeline corridor (23 percent) to further avoid residential areas "as far as practicable" in accordance with PHMSA regulations (see Routing Criteria 2) compared to Option 3, and to further avoid or minimize potential impacts to community and residential life, property, and the environment as far as practicable. Option 5 is only co-located with this pre-existing pipeline corridor for a very limited extent (12 percent) at the west and east ends of this alignment.

Routing Criteria 2 – Avoidance of Congested Residential Developments

It is important to note that one of SPLP's primary objectives during initial routing of the Mariner East II Project, after co-location with existing SPLP pipeline ROWs, was to avoid, to the maximum extent practicable, congested residential, commercial, and industrial areas that would necessitate pipeline construction and operation activities crossing or in close proximity to residential and other occupied structures and associated infrastructure, as presented in the original Project-wide Alternatives Analysis (incorporated herein by reference). For instance, Section 3.3 of the original Project-wide Alternatives Analysis documents SPLP's adoption of Major Route Alternatives (reroutes departing from SPLP ROWs) that avoided the congested residential and developed communities in the Borough of Blairsville in Indiana County; around the heavily developed and

populated area of Altoona—specifically between the Borough of Cresson, Cambria County and the Township of Frankstown in Blair County; and around the heavily developed and populated areas of North Middleton and Mechanicsburg in Cumberland County. In addition, Section 5.1 of the original Project-wide Alternatives Analysis documents SPLP's adoption of 72 Minor Route Variations (reroutes departing from SPLP ROWs and Major Route Alternative alignments) avoiding impacts to significant other (non-wetland) environmental resources, including approximately 28.6 miles of reroutes avoiding 16 residential development/municipalities and 12 commercial or industrial development areas. Based on these concerted routing efforts, the Mariner East II Project crosses only approximately 20.3 miles of congested residential, commercial, and industrial areas representing only 6 percent of the 307.8-mile-long pipeline corridor.

These concerted efforts to avoid congested residential, commercial, and industrial areas were adopted at significant cumulative effort and cost to SPLP, and with the intention to comply with PHMSA regulations to avoid these areas "as far as practicable" (49 CFR 195.210) and avoid the potential impacts to life and property associated with pipeline construction and operation activities crossing or in close proximity to residential and other occupied structures and associated infrastructure. These potential impacts are discussed below.

Construction

Construction-related potential impacts to life, property, and the environment in residential areas typically would be temporary (during the period of construction and restoration activities) and primarily result in disruption to normal use of a resident's home, outbuildings, and land. Potential disruptions include, but may not be limited to, exclusion from the construction work zone (fencing, barriers), grading/movement of earth, disturbance or removal of landscaping, removal/relocation of buried and aboveground infrastructure (signage, flagpoles, fences, septic systems, irrigation systems, outbuildings, driveways), heavy equipment noise and vibration, and generation of fugitive dust. These disruptions are increased the closer the pipeline centerline (trench excavation, pipe installation, trench backfilling) and construction workspace (equipment storage, heavy equipment movement, earth disturbance, spoil pile storage, restoration, etc.) are located to occupied residential structures and encroach upon infrastructure.

Operation

Operation-related potential impacts to life, property, and the environment in residential areas typically would be permanent (during the operational life of the pipeline) and primarily result in limitations on the normal use of those portions of a resident's property. The most substantive disruption to normal use is the prohibition to construct and maintain permanent structures within the 50-foot-wide permanent ROW that encroaches on a private residence or a commercial or industrial facility. Prohibited structures typically include, at a minimum, residences, outbuildings, other permanent aboveground buildings, and driveways, as well as deep rooted landscaping (trees). Irrigation systems and septic systems also are typically prohibited. These prohibitions permanently restrict the use of these portions of private residential, commercial, or industrial properties for the operational life of the pipeline. As a result of these permanent restrictions and associated impacts on property uses, establishment of new permanent pipeline easements on previously unaffected properties is avoided or minimized, and co-location with existing pipeline corridors is strongly preferred, to the maximum extent practicable.

Routing Criteria 3 – Avoidance of In-Road Construction and Operation

Routing a hazardous liquids pipeline to avoid in-road construction to the maximum extent practicable is a fundamentally important objective to avoid numerous meaningful and material impacts to the environment and human environment resources. In fact, the current routing of the approximately 307.8-mile-long Mariner East II pipeline corridor only includes less than 0.3-mile (less than 0.1 percent) of longitudinal in-road construction limited to one area – Meadow Creek Lane in Chester County.

These concerted efforts to avoid in-road construction and operation in high-traffic areas traversing highly congested residential, commercial, and industrial areas were adopted at significant cumulative effort and cost to SPLP, with the intention to avoid the potential impacts to life and property associated with in-road pipeline construction and operation activities in close proximity to residential and other occupied structures and associated infrastructure. The following identifies and describes potential impacts to life and property associated with in-road construction and operation of a pipeline, particularly as applied to Option 5 (given Options 3 and 4 do not require longitudinal in-road pipeline construction and operation).

Construction

In partial response to TD comment 1(f) regarding concerns with installation of the SPLP pipelines within public roadways, SPLP detailed such impacts related to Option 5 in its HDD 290 Major Amendment Application (April 7, 2021), which is repeated and supplemented below.

In-road Construction Traffic and Access Impacts to Life and Property

In its HDD 290 Major Amendment Application, SPLP evaluated the use of the open cut construction method for installation of the 20-inch pipeline along a reroute within existing roadways, referred to as Option 5, to replace the revised 2,640-foot-long HDD alignment. Option 5 involves longitudinal in-road construction within a heavily-trafficked roadway (Little Conestoga Road) and other roadways (Milford Road, Green Valley Road) that traverse a congested residential area. Based on the following assessment, Option 5 results in the greatest impact on roadways (substantive and protracted disturbance to public access on a high-traffic local artery and interconnecting roadways), private access ways, and buried and overhead utility infrastructure, which increase impacts to life, heath, and property compared to alternatives that do not require in-road construction (Options 3 and 4).

Based on SPLP's initial consultation with PennDOT and the township, there are two conceptual construction plans for Option 5:

- Single Lane Closure Construction Plan – The first conceptual plan is the most likely scenario that would limit daily construction work hours to 9:00 am to 3:00 pm and use lane closures to generally (subject to traffic controls and access restrictions or prohibitions) allow one lane open to local traffic flow during construction; this approach would require a longer construction schedule (tentatively estimated at a minimum of 3 months, but most likely would require daily temporary road resurfacing which would double the duration to an estimated 6 months).
- Full Road Closure Construction Plan – The second conceptual plan is much less likely, but to the extent allowed, would involve 24/7 construction with complete road closures and use of detours to allow local traffic to bypass construction areas; this approach would likely have a shorter construction schedule, depending on the number, extent, and juxtaposition

of underground obstructions encountered (conservatively estimated at a minimum of 2 months).

Regardless of the approved construction plan, SPLP would be required to obtain and comply with PennDOT and township roadway construction permits, including applicable required traffic controls (e.g., road closures, detours, lane closures, flagmen, temporary traffic lights) and construction restrictions (e.g., seasonal prohibitions, daily work hour limits, weekend work restrictions or prohibitions, daily restoration or plating of open trenches, daily temporary road surfacing, post-construction permanent road resurfacing). Furthermore, SPLP would need to conduct a detailed survey and mapping of existing roadways, aboveground and buried utilities, and other infrastructure (driveways, obstacles) to develop a roadway construction and restoration plan for PennDOT and township review and approval; and other (utility, private access) service impact avoidance, minimization, and restoration plans for utility provider and landowner review, approval, and easement acquisition; both of these review and approval processes would likely require protracted durations to complete (the timeline for which is unknown per response to TD comment 1(e)).

Furthermore, regardless of the approved construction plan, 20-inch NGL pipeline construction within Little Conestoga Road presents a number of substantive hazards. These hazards are due primarily to pipeline installation depth requirements (PennDOT requires 60 inches of cover under public roadways), constrained workspace (either limited to the narrow full paved roadway bound to the north and south by parallel utilities for full road closure, or even narrower area approximately 14 feet wide within the paved roadway for single lane closure), and anticipated typical PennDOT in-roadway construction restrictions. Based on these cumulative conditions, regardless of construction plan, construction within Little Conestoga Road likely would be performed in three "road-to-road" segments: from Milford Road-to-Stanley Road, Stanley Road-to-Highview Road, and Highview Road-to-Green Valley Road. Construction within each segment typically would be limited to 150-foot-long sections, resulting in slowed construction progress, and require daily trench excavation; pipe hauling, lowering, and welding; installation of foam trench breakers between sections; backfilling the trench section with flowable fill; and plating and/or temporary surfacing of the excavated trench. Due to severely constrained workspace, representing a limited available margin of safeguarding, hazards to equipment, materials, personnel, and vehicles/passengers are commensurately increased. Based on these constraints, construction and restoration of this alternative most likely would require up to 2 months (for complete road closure) or 6 months (for single lane closure).

In response to TD comment 1(c), although the location of school bus and emergency service vehicle transit routes were not readily or publicly available, the locations of schools, school district boundaries, school bus stops, and emergency response facilities (police, fire, EMS) serving the roadways affected by longitudinal in-road construction for Option 5 (Milford Road, Little Conestoga Road, Green Valley Road, and adjacent residential community roads) are depicted on **Figure 5 (Appendix D)**. Despite the lack of available transit route maps, it is clear that school buses and emergency vehicles must, by necessity, access Little Conestoga Road and Green Valley Road for student morning pick-up/afternoon drop-off and in the event of an immediate police, fire, or EMS (life and property) emergency in this residential area. These roads also must clearly require routine access by residents adjacent to, and the general public in the vicinity of, the construction work zone for normal daily transit activities (transit to access school, work, and services).

Although specific transit routes were not available from the Downingtown Area School District, a map of school bus stops that would be impacted by Option 5, including those primarily (most

efficiently) accessible via Little Conestoga Road, are depicted on **Figure 5 (Appendix D)**. The school bus stops (and routes to serve them) cover 10 buses with morning pick-up (starting between 6:30 – 7:00 AM) and afternoon drop-off (from 3:30 – 4:30 PM) for the Downingtown Area School District. Based on the juxtaposition of these bus stops, the school bus routes must necessarily (most efficiently) transit Little Conestoga Road, such that if the road (for Option 5) is closed or limited to one lane, then school buses would either need to reroute around the construction zone or transit through traffic controls and a single lane, and in either event would experience delays. School bus access to the bus stops would use more circuitous and detour routes via access from other secondary roadways (Edgefield Drive, or Highview Road to Lakeview Road) to the only other available local artery (Milford Road).

Based on SPLP consultation with the Upper Uwchlan Township police chief, multiple emergency service route(s) use the Milford Road/Little Conestoga Road intersection. Because the Township has no township-based fire or EMS services, these services are provided from outside the Township. These include the Lionvile, Ludwig's Corner, East Brandywine, and Glen Moore Fire Companies, and EMS services provided by the Uwchlan and Minquas ambulance services. The police department also utilizes multiple routes traversing the Milford Road/Little Conestoga Road intersection required to access the western area of the Township. Furthermore, the Township of Upper Uwchlan is within the boundaries of the Limerick Operating Plant Emergency Evacuation Zone, and the Milford Road/Little Conestoga Road intersection would be utilized as a traffic control point in the event of a Limerick incident as well as a man-made or natural event. As with school bus transit, if Little Conestoga Road is closed or limited to one lane, then emergency vehicles would either need to reroute around the construction zone or transit through traffic controls and a single lane, and in either event would experience delays. Emergency vehicle access to affected residences would use more circuitous and detour routes via access from other secondary roadways (Edgefield Drive, or Highview Road to Lakeview Road) to the only other available local artery (Milford Road).

Because of the road or lane closures and detours required by Option 5, SPLP contracted STV, Inc. to conduct a traffic study to evaluate potential impacts to public, school bus, and emergency service (police, fire, EMS) vehicle transit routes and transit times compared to the current level of service (LOS)[5] along existing roadways for the work zones of both the complete road closure and single lane closure construction plans. This study was provided in SPLP's Major Amendment Application (dated April 7. 2021) in Appendix C. **In response to TD comment 1(j), the following summarizes and supplements the results of this traffic study in common terms.**

The traffic study included evaluation of in-roadway open cut pipeline construction along Milford Road (Phase 1, which requires road closures/detours; there is no lane closure option for Phase 1) and Little Conestoga Road (Phase 2, which may involve either road closures/detours or lane closure construction plans) in Upper Uwchlan Township, Chester County. Under existing conditions, the Route 100 at Font Road and Route 100 at Park Road/Station Boulevard intersections, which are in the vicinity of and would be part of detour routes around the pipeline work areas, experience substantial delays during the PM peak traffic hour (see **Figure 5, Appendix D** depicting these intersections). For the full road closure/detour construction plan, detour conditions for both phases further deteriorate LOS (increase traffic and delays) at these intersections due to additional volume, especially in Phase 2. During the PM peak hour, the

[5] Level of service (LOS) is a traffic engineering term used to characterize traffic flow in terms of average total vehicle delay of all movements through an intersection, ranked from A to F. For instance, LOS A represents free flow conditions, LOS E represents unstable flow or intolerable delay, and LOS F represents forced flow or jammed conditions.

Phase 2 detour would result in excessive average delays per vehicle of 15 minutes at Route 100 at the Font Road intersection. The delay at all key intersections, along with additional travel time associated with the detour, is estimated to increase network-wide travel time by 147% for all vehicles, including emergency vehicles. In addition to delay for all road users, impacts identified would also affect the local fire company (Lionvile Fire Company) and local school bus routes (Pickering Valley Elementary). For the (Phase 2) lane closure construction plan, using alternating traffic operations with 150-feet work area sections along Little Conestoga Road, would also result in considerable delays for all road users (including emergency vehicles) with long queues and occasional wait through more than one cycle.

As a result, regardless of the approved construction plan (full road closure/detours or lane closure), Option 5 would result in substantive disruption to normal traffic flow, ingress/egress, and public and emergency vehicle access to all areas (residences, commercial, industrial properties) within the construction zone and across the affected road network. Certain unavoidable impacts would occur associated with longitudinal in-road construction in Little Conestoga Road and Green Valley Road, including road or lane closures and restricted or scheduled local resident access within the construction zone, and detours around the construction zone. Specifically:

- Residential Single Ingress/Egress Points – Full road or lane closures would particularly affect residents whose only access to public roadways (via private residential driveways) front Little Conestoga Road (four [4] residents abutting the south side of Little Conestoga Road) or front Green Valley Road (all four [4] residents abutting the no-outlet Green Valley Road) (see these affected "Residential Single Ingress/Egress Points" depicted on **Figure 5, Appendix D**). Based on SPLP's previous experience with in-roadway construction on the Mariner East II Project, despite daily and ongoing close communication with affected residents, local access to private driveways and access ways across the construction zone will necessarily be prohibited or highly restricted during the construction period. Such restrictions include, but are not limited to, open trenches across or adjacent to private driveways, safety barriers (construction fencing, jersey barriers, road barriers), and periods of no available or highly restricted or scheduled access. PennDOT typically requires construction contractors to provide emergency vehicle access across such construction zones (e.g., provide plating or other bridging across open trenches) within 15 minutes of notice of need. As a result, despite traffic control requirements (e.g., flagmen, temporary traffic lights) and close communication with affected residents (e.g., scheduling and providing access by plating of open trenches or driveways), these access restrictions result in the temporary prohibition or delays (typically up to 15 minutes) in available access, including for private residents, service/delivery vehicles, school buses, and emergency services (police, fire, EMS), and associated unnecessary hazards to life and property. These disruptions would occur for the significant duration of the anticipated 2-month (full road closure) or 6-month (single lane closure) construction period.
- Restricted Access Roadways – In addition, the full road or single lane closure of Little Conestoga Road would restrict all residents south of Little Conestoga Road and east of Milford Road, and north of Little Conestoga Road (south of the Pennsylvania Turnpike) and east of Milford Road to single access points to a local artery roadway (Milford Road). As a result, the construction work zone road or lane closure would require local residents to use more circuitous and detour routes via access from other secondary roadways (Edgefield Drive, or Highview Road to Lakeview Road) to the only other available local artery (Milford Road) (see "Restricted Access Roadways" on **Figure 5, Appendix D**) and continuing access to the detour route (see below).

- Construction Work Zone Detour Route – Furthermore, these restricted access residences must use a single lengthy (approximately 4.3-mile-long) detour around the construction work zone. This detour (from west to east) would start at the west end of the construction work zone at Milford Road, and transit via Milford Road to Font Road to Route 100 to Little Conestoga Road, and end back at east end the construction work zone on Little Conestoga Road (see detour route depicted on **Figure 5, Appendix D**).

As concluded in the traffic study, these unavoidable impacts result in local resident and network-wide delays for all vehicles, that cumulatively result in up to 15-minute delays for local resident, general public, school bus, and emergency vehicle transit across the affected intersections and access to residences within the in-road construction zone; and a 147% increase in transit times for all vehicles in the detour zone road network; particularly during PM peak traffic hours. With all vehicles (including emergency vehicles) being thusly substantively delayed, impacts to life, health, and property are substantively increased in the event of an emergency requiring immediate police, fire, or medical intervention.

Therefore, regardless of the approved construction plan, this Option 5 would result in substantive disturbance and/or closure to public and emergency vehicle access on a high-traffic local artery roadway (Little Conestoga Road), interconnecting roadways (Milford Road, Highview Road, Green Valley Road), and private driveways and access ways. Considering the location of known adjacent features and existing utilities, an excavation of sufficient size to accommodate an open trench construction method within and adjacent to the affected roadways (Milford Road, Little Conestoga Road, Highview Road, Green Valley Road) would result in substantive disruption (for instance, via complete road closures/detours, lane closures, increased traffic, traffic controls, and transit delays along detours, affected roadways, and lane closures) to normal traffic flow, ingress/egress, and public and emergency service access to the roadways; private landowner access to homes and property; public access to services; and potentially temporary shutdown of local public and utility services (particularly the Aqua public water mainline and PECO electric distribution service to local residences); for the duration of the anticipated 2-month (road closure) or 6-month (lane closure) construction periods. Although this alternative would avoid direct impact to residences, it would require direct impact to private residential driveways and other infrastructure, as well as interruptions in daily (private residents, service/delivery vehicles, school buses) and emergency service (police, fire, ambulance/EMS) access to affected local residents, and associated unnecessary hazards to life and property. **Based on SPLP due diligence discussions with township officials to explore this roadway reroute alternative, the township concurs that closing roadways and rerouting traffic through township roads would be very impactful for many residents and would prefer other options that avoid pipeline construction in heavily trafficked roadways including Little Conestoga Road.**

Based on this analysis, although Option 5 is technically feasible and has the least temporary impact on certain environmental resources (i.e., wetland, waterbody, forested land), it results in substantial and protracted impacts on residential uses, public access, emergency access, roadways, and infrastructure, and related impacts to life and property, for a significant duration (up to 2 months or 6 months depending upon construction plan). These risks were found to be greater for Option 5 compared to any of the other alternatives considered. Furthermore, relative to the preferred Option 4 where the construction schedule is the shortest and impacts to aquatic resources are temporary and minor (not “adverse”), Option 5 is not the most practicable alternative with regard to existing technology, logistics, and cost that results in the least impact on all environmental resources and the human environment.

Concerns Related to Pipeline Depth Requirements

In response to TD comment 1(f), as previously noted in SPLP's Major Amendment Application, SPLP specifications require a minimum of 48-inches of cover over the installed pipelines, whereas the PennDOT requires deeper installation of 60-inches of cover under public roadways. For a 20-inch-diameter pipeline, this requires excavation of a trench a minimum of 80 inches (6.66 feet) deep as well as some over-depth to accommodate pipe installation. Typically, all things being equal, an increase in pipeline installation depths requires additional TWS to accommodate excavation, storage, and backfilling of additional trench spoil. However, as previously noted, the workspace for Option 5 is significantly restricted (narrow) as it is bounded to the north (Aqua buried fire water line and hydrants) and south (PECO overhead electric distribution line) by existing utilities that prohibit the use of TWS. To compensate for this narrow workspace, trench spoil must be hauled and temporarily stored away from the immediate construction zone, thus decreasing construction progress, increasing the duration of the construction schedule, and resulting in the extended durations of construction disturbances to the local community and trafficways reported above for Option 5 (2 months for road closure or 6 months for single lane closure construction plans).

In addition, as noted in response to TD comment 6, Option 5 is aligned through areas with expected groundwater depths from zero to six feet for approximately 3,100 feet, which is 2,780 feet longer than Options 3 and 4 through this shallow depth range. Option 5 is expected to encounter much more groundwater where workspace and suitable discharge areas are more limited than for Options 3 and 4, which is further exacerbated given the deeper trench excavation required for in-road construction (a minimum of 6.66 feet). SPLP would need to haul excess water off-site for most of Option 5, which further extends the anticipated construction duration (beyond the 2 months or 6 months depending on construction plan reported above) for Option 5.

<u>Operation</u>

In partial response to TD comment 1(f) regarding concerns with operation and maintenance of the SPLP pipeline installed within public roadways, the co-location of pipelines in pre-existing pipeline and utility corridors (instead of in-road) is preferred for operations, maintenance, and inspection of pipelines, which are enhanced when the pipelines are located within the same or adjacent right-of-way corridors. This provides enhanced safety against third-party damage as the public and contractors are more likely to recognize a well-marked, pre-existing utility corridor with multiple utilities because of the higher concentration of aboveground line markers and frequent inspection activities. Furthermore, suboptimal pipeline operation impacts (see discussion in Routing Criteria 1) are further exacerbated by longitudinal in-road construction and operation of pipelines, wherein repair of any anomalies requires re-excavation of the road surface to access the deeply buried pipeline, and associated road or lane closures, traffic controls, local public and emergency transit delays, utility service interruptions, and other impacts to the local community, life, property, and the environment similar to those discussed above for in-road construction.

Routing Criteria 4 – Avoidance of Significant Impacts to Environmental Resources

PADEP regulations regarding permitting of structures and activities in exceptional value (25 Pa. Code § 105.18a(a)(3)) and other (§ 105.18a(b)(3)) wetlands require that: "There is no practicable alternative to the proposed project that would…not have *other significant adverse effects on the environment*." (*emphasis added*). As part of Chapter 105 permit application review, PADEP regulations also require that the Department make a determination of impact based on (in part):

"Potential threats to life or property created by the dam, water obstruction or encroachment" including such threats associated with project construction (25 Pa. Code § 105.14(b)(1)) and operation and maintenance (25 Pa. Code § 105.14(c)(1)).

Based on the comparative analysis of alternative impacts to environmental and human environment resources previously presented in SPLP's Major Permit Amendment application dated April 7, 2021, all three options under current evaluation (Options 3, 4, and 5) result in no significant impacts to environmental resources. This includes no significant impacts to waters of the Commonwealth, as use of the open cut construction method results in only temporary and minor (not "adverse") impacts to these resources. This is an established assessment given that, as part of the original Chapter 105 permits for Mariner East II, the Department permitted open cut construction method crossings of 403 wetlands (out of 562 crossings) and 632 streams (out of 883 crossings) without requiring further initial rerouting of the pipeline alignment.

Supplemental Data Collection Methodology and Constraints

Note that, with the exception of private on-lot septic systems, all buried and aboveground utilities, public water supplies, and private water wells were previously and necessarily identified and located via One Call solicitation and in-field civil survey within the construction workspaces of Option 3 (concomitant with the right-of-way for the originally proposed HDD 290) and Option 4 (as part of SPLP's Major Amendment Application dated April 7, 2021), inclusive of the numerous utilities in proximity to the intersection of Milford Road/Little Conestoga Road. Therefore, the majority of supplemental data collected was relevant to Option 5 (as well as Options 5N and 5S which have been determined not technically feasible and therefore eliminated from further consideration).

In response to TD comments 1 and 3, SPLP researched and collected supplemental data and information (for Option 5 only, unless otherwise noted) to support the comparative analysis of Options 3, 4, and 5. The following summarizes the nature, extent, and quality of data and information collected and incorporated into this analysis, as well as identifies data gaps for information that was not readily available:

- Residential and Commercial/Industrial Parcel Boundaries – Georeferenced parcel boundary geographic information system (GIS) layers are publicly available data and were obtained from the Chester County Informational Services, GIS Services Department. These georeferenced boundaries area depicted on **Figure 4 (Appendix C).**
- Residential and Commercial/Industrial Structures – Are based on the attributed parcel information (e.g., residential or commercial) provided by the Chester County Informational Services Department. Structures were digitized within the GIS environment using ArcGIS aerial base map imagery to the degree of accuracy available and these locations are depicted on **Figure 4 (Appendix C).**
- Public Water Main Pipelines and Hydrants – Based on research and review of the publicly available Edgefield Subdivision plans submitted to the Township for approval, all residences within this subdivision are required to interconnect with public water supply. Consultation with Aqua provided a PDF map of the general locations of public water main pipelines and fire hydrants across the alternative evaluation area. These PDF maps were

digitized within the GIS environment to the degree of accuracy available, and furthermore these lines were civil surveyed in the field, and therefore represent complete and accurate information as depicted on **Figure 4 (Appendix C).**

- Public Water Distribution Interconnect Lines – Available information for public water distribution lines, interconnecting from the Aqua water main to service individual residences, was very limited to paper map (not to scale) drawings if incidentally included as part of the on-lot septic system permit applications (see below). Therefore, these data are largely incomplete across the alternative evaluation area. These paper maps were digitized within the GIS environment to the degree of accuracy available and these estimated locations are depicted on **Figure 4 (Appendix C)**. These (incidentally available) locations are based on permit applications, and not as-built survey, and therefore they are approximations that would require survey access permission provided by each individual affected landowner and in-field survey, location, and verification.
- Private On-Lot Septic Systems – Based on research and review of the publicly available Edgefield Subdivision plans submitted to the Township for approval, all residences within this subdivision are required to have on-lot septic systems. **Figure 4 (Appendix C)** depicts the estimated or approximate location of on-lot septic system lines, tanks, and leach fields based on review of individual residence on-lot septic system approved permits (paper maps, not to scale) obtained from the Chester County Health Department. These paper maps were digitized within the GIS environment to the degree of accuracy available and these estimated locations are depicted on **Figure 4 (Appendix C)**. These locations are based on permit applications, and not as-built survey, and therefore they are approximations that would require survey access permission provided by each individual affected landowner and in-field survey, location, and verification.
- Private Water Wells (known) – Known private wells were identified within 200 feet of the options and was based on landowner communication efforts regarding the identification of these features for the HDD 0290 reevaluation. Additional information on private water wells was provided by a search of the Pennsylvania Groundwater Information Website (PaGWIS) that provides general information on private wells, including some provided with locations. However, this information has proven to be unreliable for accurate locational data and is declaimed to as such within the PaGWIS metadata. The PaGWIS data is presented herein to simply display where this public information is present in the alternative evaluation area and would require landowner communication and survey to verify the information. An additional analysis of private water wells within 200 feet of the three options is included in **Table 3** and depicted on **Figure 4 (Appendix C)**.
- Public Water Suppliers – Public water suppliers were identified for the options and was based on owner communication efforts regarding the identification of suppliers within 450 feet of the HDD 0290 reevaluation. An additional analysis of public water supplies within 1,000 feet of the three options is included in **Table 3** and depicted on **Figure 4 (Appendix C)**.
- Stormwater Lines – SPLP performed in-field reconnaissance to identify visible stormwater intakes and lines and performed civil survey to accurately map the locations of these facilities across the alternative evaluation area. However, given these data are limited to structures visible at the ground surface, they do not include full mapping of the areal extent of these facilities (particularly buried stormwater lines), as such data was not readily available.

- Public Sanitary Sewer Lines – Consultation with Upper Uwchlan Township provided PDF maps, and no public sanitary sewer lines are present within the workspace or in the vicinity of Options 3, 4, and 5.
- Electric Distribution Lines – Consultation with PECO provided PDF maps of the general locations of aboveground (pole-mounted) high-tension electric distribution mainline (generally located on the south side of Little Conestoga Road) and individual underground (buried) electric distribution lines to individual residences. The electric mainline was civil surveyed in the field, and therefore represents complete and accurate information as depicted on **Figure 4 (Appendix C).** However, for the underground electric distribution lines, the PDF maps were digitized within the GIS environment to the degree of accuracy available and estimated locations are depicted on **Figure 4 (Appendix C).**
- School Bus Routes and Stops – Although specific transit routes were not available from the Downingtown Area School District, a map of school bus stops that would be impacted by Option 5, including those only accessible via Little Conestoga Road, are depicted on **Figure 5 (Appendix D)**, and included in this narrative assessment.
- Emergency Vehicle Routes – Based on consultation with the Upper Uwchlan Township police chief, although no emergency vehicle transit routes or maps were provided, a description was provided of the multiple emergency service route(s) and facilities that use the Milford Road/Little Conestoga Road intersection and is included in this narrative assessment.

In response to TD comments 1(c) and 1(k), these utility locations (including public and private water supplies, wells, and pipelines) in the vicinity of Options 3, 4, and 5 are mapped and presented in **Figure 4 (Appendix C)**. Based on the results of the mapping and assessment of utility data, numerous individual utilities would be paralleled or crossed by the pipeline centerline or construction workspace for Options 3, 4, and 5, particularly at the open cut construction method crossing of the intersection of Milford Road/Little Conestoga Road. Based on assessment of these results, the utility data do not provide a meaningful or material factor that discerns between impacts associated with the options (and for this reason, certain utility data are not included in **Table 3**), except in individual cases as presented in this analysis.

Comparison of Impacts to Life, Property, and the Environment

In response to TD comments 1 and 3, as stated above, the industry-standard routing criteria applied to the Mariner East II Project are fundamentally intended to avoid, minimize, and mitigate potential impacts to life, property, and the environment. Therefore, consistency with each of the four fundamental routing criteria is essential to avoid or minimize these potential impacts to the maximum extent practicable. **Table 3** provides a quantitative and qualitative summary of relevant data characteristic of the potential impacts to life, property, and the environment most directly associated with each of the four fundamental routing criteria and that are present assuming use of the open cut construction method for Options 3, 4, and 5. **Table 3** also provides a high-level determination of whether each option is consistent (“Yes”) or inconsistent (“No”) with each of the four fundamental routing criteria based on the more detailed data summary.

In response to TD comments 3(b) and 3(c), **Tables 4, 5, and 6** present the distance from the pipeline centerline and reduced construction workspace to each occupied residential structure for Options 3, 4, and 5, respectively. An entry of “0” indicates the structure is located within the 50-foot-wide permanent ROW and would not comply with the U.S. Department of Transportation,

PHMSA regulations to avoid areas containing private dwellings "as far as practicable" (given there are other practicable alternative routes that avoid or further avoid private residential dwellings) pursuant to 49 CFR Part 195.210 (PHMSA 2021) and ensure proper operation inspections to detect and report construction encroachment and assure the safe operation of the pipeline pursuant to 49 CFR Part 195.412 and PHMSA's Operations & Maintenance Enforcement Guidance in 49 CFR Part 195 Subpart F (PHMSA 2017).

The only discerning residential area factor is the crossing of septic system lines and/or leach fields by Option 3 (four) and Option 4 (four), which are avoided by Option 5. However, most of these lines/leach fields (four crossed by Options 3 and two crossed by Option 4) are within the existing permanent ROW for the 8-inch (and 16-inch) SPLP pipeline installed in the 1930s and thereby represent encroachments onto SPLP's ROW; therefore (regardless of whether Option 3 or 4 are constructed) these facilities require relocation outside of the 50-foot-wide permanent ROW to comply with existing SPLP ROW restrictions. The other two septic system leach fields located within the permanent ROW of Option 4 may be avoided by the pipeline centerline excavation and avoid damage, and adequate space is available on-lot to relocate these two leach fields, if necessary. As a result, these septic system crossings (other than the requirement prohibiting use during active construction) do not represent a material impact on life and property, or a meaningful discerning factor for impact comparison across the options.

Moreover, despite temporary and minor (not "adverse") impacts to aquatic resources that are common (open cut construction method crossings of 403 wetlands and 632 streams) across the Marine East II Project, Options 3 and 4 are fully consistent with Routing Criteria 1 (100 percent and 77 percent co-located with existing SPLP pipeline right-of-way, respectively), Routing Criteria 3 (both fully avoid longitudinal in-road pipeline construction and operation), and Routing Criteria 4 (both avoid significant impacts on environmental and human environment resources), and thereby avoid and minimize potential meaningful and material impacts on life and property related to these criteria. Conversely, Option 5 is not materially consistent with Routing Criteria 1 (only 12 percent of route co-located with existing SPLP corridors limited to each end of the alternative), is not consistent with Routing Criteria 3 (majority [62 percent] of route requires longitudinal in-road pipeline construction and operation), and is potentially not consistent with Routing Criteria 4 (closing roadways and rerouting traffic through township roads would be "very impactful" for many residents and may represent a significant impact on local community life and property, and therefore is not preferred by the Upper Uwchlan Township). As a result, Option 5 does not avoid and minimize potential meaningful and material impacts on life and property, and therefore is not the most practicable or preferred alternative and is eliminated from further consideration.

That leaves a comparison of Options 3 and 4. Options 3 and 4 result in very similar quantitative and qualitative impacts on environmental and human environment resources (see **Table 3** and refer to Table 7 in SPLP's HDD 290 Major Amendment Application submitted to the Department on April 7, 2021) and associated potential impacts to life and property (see discussions in Routing Criteria 1 and 2). However, SPLP proactively considered a minor reroute alternative to Option 3 (adopted in Option 4) to further reduce potential temporary construction and permanent operation impacts to life and property "as far as practicable" within 50 feet of occupied structures in accordance with PHMSA regulations (49 CFR Part 195.210), as these potential impacts are the most material in closest proximity to occupied residences. As a result of this minor reroute, the Option 4 pipeline centerline is located within 50 feet of two (2) (instead of six [6] on Option 3), and

construction workspace is located within 50 feet of three (3) (instead of six [6] on Option 3), occupied residences, as presented in **Tables 4 and 5**. Although the Option 4 reroute diverges from co-location with the existing SPLP pipeline corridor for approximately 0.20 mile, it is still in close proximity adjacent to the existing corridor (and in very close proximity to SPLP's Eagle Station) which does not materially affect pipeline operation and maintenance activities. As a result, Option 4 was intentionally designed to optimize the balance of competing routing criteria (co-location versus avoidance of residences), and results in the most practicable alternative that minimizes potential meaningful and material impacts on the environment and human environment resources. Therefore, SPLP selected Option 4 as the preferred route alternative.

Conclusion

Based on the foregoing analysis of SPLP's iterative implementation of fundamental routing criteria, despite temporary and minor impacts to aquatic resources that are common across the Marine East II Project, Option 4 is the alternative that avoids significant impacts to the environment while also optimizing the balance of competing routing criteria (co-location versus avoidance of residences), and results in the most practicable alternative that minimizes potential meaningful and material impacts on the environment and human environment resources. Therefore, SPLP selected Option 4 as the preferred route alternative.

REFERENCES

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PHMSA. 2021. Transportation of Hazardous Liquids by Pipeline. 49 Code of Federal Regulations Part 195.

The INGAA Foundation, Inc. 1999. Temporary Right-of-Way Width Requirements for Pipeline Construction. Prepared by Gulf Interstate Engineering, Houston, TX. 45 pp.

Table 3. Summary Comparative Assessment of Consistency with Fundamental Routing Criteria and Associated Potential Impacts on Life, Property, and the Environment for Options 3, 4, and 5

Fundamental Routing Criteria	Option 3	Option 4	Option 5
Criteria 1 – Co-Location with Existing SPLP/Pipeline ROWs [1]	**Yes**	**Yes**	**No**
Total Length (feet)	2,780	3,184	3,482
Total Construction Workspace Footprint (acres)	7.02	8.02	6.51
Length of Route Co-Located with Existing SPLP/Pipeline ROWs (feet)	2,780	2,130	322
Percent of Route Co-Located with Existing SPLP/Pipeline ROWs (percent)	100	77	12
Land Parcels Stranded Between Existing SPLP Pipeline ROW and Option (number)	0	3	9
Criteria 2 – Avoid Occupied Residential/Commercial/Industrial Properties [2]	**No**	**No**	**No**
Residential Properties within Construction Workspace (number / acres)	10 / 3.97	12 / 4.82	14 / 1.74
Residential Properties within 200 feet of Construction Workspace (number / acres)	19 / 18.57	20 / 21.78	26 / 21.55
Residential Structures within Construction Workspace (number)	0	0	0
Residential Structures within 200 feet of Construction Workspace (number)	9	12	17
Commercial/Industrial Properties within Construction Workspace (number / acres)	2 / 1.09	2 / 1.09	2 / 1.09
Commercial/Industrial Properties within 200 feet of Construction Workspace (number / acres)	2 / 2.53	2 / 2.77	2 / 4.16
Commercial/Industrial Structures within Construction Workspace (number)	0	0	0
Commercial/Industrial Structures within 200 feet of Construction Workspace (number)	2	2	2
Septic Systems (Lines, Leach Fields) within 50-foot-wide Permanent ROW (number)	4	4	0
Additional Septic Systems (Lines, Leach Fields) within TWS / ATWS (number)	0	0	0
Private Water Wells within Construction Workspace (number)	0	0	0
Private Water Wells within 200 feet of the Construction Workspace (number)	2	1	2
Public Water Supplies within 1,000 feet of Construction Workspace (number)	1	1	1
Criteria 3 – Avoid In-Road Construction and Operation	**Yes**	**Yes**	**No**
Avoid In-Road Pipeline Construction and Operation	Yes	Yes	No
Length of Route Requiring Longitudinal In-Road Construction and Operation (feet / percent)	0	0	2,161 / 62
School Bus Routes Impacted (Reduced Level of Service/Delays)	No	No	Yes
Emergency Medical Routes (Reduced Level of Service/Delays)	No	No	Yes
Criteria 4 – Avoid Significant Impacts to the Environment [3]	**Yes**	**Yes**	**Potentially No**
Avoid Significant Adverse Impacts to Wetlands and Streams	Yes	Yes	Yes
Avoid Significant Adverse Impacts to Threatened and Endangered Species	Yes	Yes	Yes
Avoid Significant Adverse Impacts to NRHP-Listed/Eligible Cultural Resources	Yes	Yes	Yes
Avoid Significant Adverse Impacts to the Human Environment (Life and Property)	Yes	Yes	Potentially No [3]
1 Co-location with existing SPLP/pipeline corridors is the first and most fundamental routing requirement for numerous reasons, including but not limited to consistency with the Governor's Task Force pipeline routing recommendations, PHMSA regulations and requirements, and SPLP			

standards to avoid establishing new permanent ROW encumbrances and associated potential significant impacts on private properties, and stranding congested residential/commercial/industrial areas between separate operational pipeline corridors thereby permanently restricting future land uses in potential inconsistency with local master land use development plans; and to best meet PHSMA hazardous pipeline inspection, operations, and maintenance requirements fundamentally intended to assure public safety.

2 PHMSA regulation (49 CFR Part 195.210(a) – Pipeline location) states that the "Pipeline right-of-way *must be selected to avoid, as far as practicable,* areas containing private dwellings, industrial buildings, and places of public assembly." (*emphasis added*).

3 PADEP regulations regarding permitting of structures and activities in exceptional value (25 Pa. Code § 105.18a(a)(3)) and other (§ 105.18a(b)(3)) wetlands require that: "There is no practicable alternative to the proposed project that would…not have *other significant adverse effects on the environment*." (*emphasis added*). As part of Chapter 105 permit application review, PADEP regulations also require that the Department make a determination of impact based on (in part): "Potential threats to life or property created by the dam, water obstruction or encroachment" including such threats associated with project construction (25 Pa. Code § 105.14(b)(1)) and operation and maintenance (25 Pa. Code § 105.14(c)(1)). As previously stated in SPLP's Major Permit Amendment application dated April 7, 2021: "Based on SPLP due diligence discussions with township officials to explore this roadway reroute alternative, the township concurs that closing roadways and rerouting traffic through township roads would be *very impactful* for many residents and would prefer other options that avoid pipeline construction in heavily trafficked roadways including Little Conestoga Road." (*emphasis added*). Accordingly, it is currently undetermined: 1) whether Upper Uwchlan Township and PennDOT would approve longitudinal occupancy permit, driveway, and detour applications and a detailed construction plan for Option 5; 2) the nature and extent of impacts to the local community based on any final approved plan; and 3) whether the township's concerns represent a significant impact on the local community and associated human environment resources.

Table 4. Option 3 Distance to Occupied Residential, Commercial, and Industrial Structures within 200 feet of Construction Workspace[1]

Structure Type	Parcel Tract Number	Parcel Address	Distance to Pipeline Centerline (feet)[2]	Distance to Construction Workspace (feet)[2]
Residential Home	3203 0054110	17 Highview Road	149	114
Residential Home	3203 0054100	19 Highview Road	38	3
Residential Home	3203 0054150	20 Highview Road	99	59
Residential Home	3203 0054090	21 Highview Road	120	34
In-ground Pool	3203 0054090	21 Highview Road	103	63
Outbuilding	3203 0054090	21 Highview Road	187	147
Residential Home	3203 0054070	455 Little Conestoga Road	140	101
Residential Home	3203 0054050	465 Little Conestoga Road	41	5
Outbuilding	3203 0054050	465 Little Conestoga Road	27	0
Residential Home	3203 005406A	475 Little Conestoga Road	39	29
In-ground Pool	3203 005406A	475 Little Conestoga Road	76	66
Residential Home	3203 0054060	485 Little Conestoga Road	42	53
Residential Home	3203 005307B	501 Milford Road	136	110

1 SPLP has purchased two residential properties and associated structures that will not be occupied during pipeline construction and therefore are not included in this table (outlined in yellow on **Figure 4 (Appendix C)**).

2 An entry of "0" indicates the structure is located within the 50-foot-wide permanent ROW and therefore would not comply with PHMSA regulations pursuant to 49 CFR 195.210 to avoid, as far as practicable, areas containing private dwellings.

Table 5. Option 4 Distance to Occupied Residential, Commercial, and Industrial Structures within 200 feet of Construction Workspace[1]

Structure Type	Parcel Tract Number	Parcel Address	Distance to Pipeline Centerline (feet)[2]	Distance to Construction Workspace (feet)[2]
Residential Home	3203 0053500	1 Waterview Road	153	53
Residential Home	3203 0054110	17 Highview Road	137	112
Residential Home	3203 0054100	19 Highview Road	38	3
Residential Home	3203 0054150	20 Highview Road	99	59
Residential Home	3203 0054090	21 Highview Road	120	34
In-ground Pool	3203 0054090	21 Highview Road	103	63
Outbuilding	3203 0054090	21 Highview Road	187	147
Residential Home	3203 0054070	455 Little Conestoga Road	140	101
Residential Home	3203 0054050	465 Little Conestoga Road	143	87
Outbuilding	3203 0054050	465 Little Conestoga Road	104	54
Residential Home	3203 005406A	475 Little Conestoga Road	147	122
In-ground Pool	3203 005406A	475 Little Conestoga Road	137	112
Residential Home	3203 0054060	485 Little Conestoga Road	42	53
Residential Home	3203 005307B	501 Milford Road	110	137

1 SPLP has purchased two residential properties and associated structures that will not be occupied during pipeline construction and therefore are not included in this table (outlined in yellow on **Figure 4 (Appendix C)**).

2 An entry of “0” indicates the structure is located within the 50-foot-wide permanent ROW and therefore would not comply with PHMSA regulations pursuant to 49 CFR 195.210 to avoid, as far as practicable, areas containing private dwellings.

Table 6. Option 5 Distance to Occupied Residential, Commercial, and Industrial Structures within 200 feet of Construction Workspace[1]

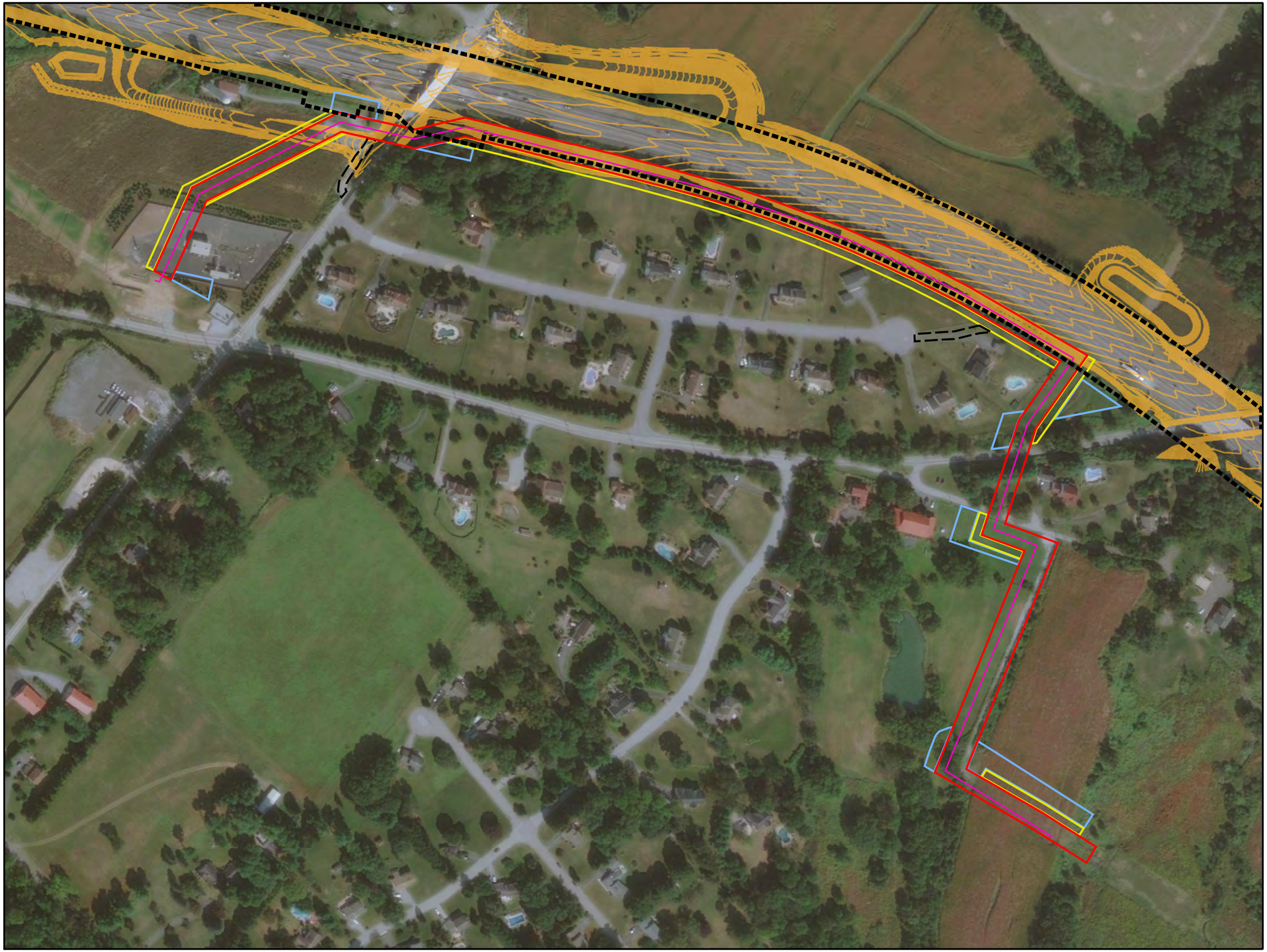
Structure Type	Parcel Tract Number	Parcel Address	Distance to Pipeline Centerline (feet)[2]	Distance to Construction Workspace (feet)[2]
Residential Home	3203 0055000	10 Green Valley Road	98	73
Outbuilding	3203 0055000	10 Green Valley Road	134	109
In-ground Pool	3203 0055000	10 Green Valley Road	184	146
Residential Home	3203 0409000	101 Edgefield Road	197	172
In-ground Pool	3203 0409000	101 Edgefield Road	143	118
Outbuilding	3203 0409000	101 Edgefield Road	93	68
Residential Home	3203 0411000	103 Edgefield Road	178	153
In-ground Pool	3203 0411000	103 Edgefield Road	132	107
Outbuilding	3203 0411000	103 Edgefield Road	144	120
Residential Home	3203 0412000	105 Edgefield Road	188	163
In-ground Pool	3203 0412000	105 Edgefield Road	132	107
Residential Home	3203 0422000	121 Edgefield Drive	198	173
Residential Home	3203 0418000	201 Stanley Drive	130	105
Outbuilding	3203 0418000	201 Stanley Drive	81	56
Residential Home	3203 0415000	202 Stanley Drive	168	96
In-ground Pool	3203 0415000	202 Stanley Drive	117	92
Outbuilding	3203 0415000	202 Stanley Drive	83	58
Residential Home	3203 0054080	23 Highview Road	71	46
Residential Home	3203 0054030	425 Little Conestoga Road	47	22
Residential Home	3203 0054030	425 Little Conestoga Road	93	68
Outbuilding	3203 0054030	425 Little Conestoga Road	63	38
Residential Home	3203 0054070	455 Little Conestoga Road	116	91
Residential Home	3203 0054050	465 Little Conestoga Road	146	121
Residential Home	3203 0054060	485 Little Conestoga Road	185	160
Residential Home	3203 005307B	501 Milford Road	146	124

1 SPLP has purchased two residential properties and associated structures that will not be occupied during pipeline construction and therefore are not included in this table (outlined in yellow on **Figure 4 (Appendix C)**).

2 An entry of "0" indicates the structure is located within the 50-foot-wide permanent ROW and therefore would not comply with PHMSA regulations pursuant to 49 CFR 195.210 to avoid, as far as practicable, areas containing private dwellings.

Appendix A

Figures – Options 5a, 5N, and 5S



Legend

- Proposed Turnpike Expansion Grading Countours
- Existing Turnpike ROW

Option 5a Reroute

- 20" Centerline
- Permanent ROW
- Temporary ROW
- ATWS
- Temporary Access Road

0 125 250 500

1 inch = 250 feet

N

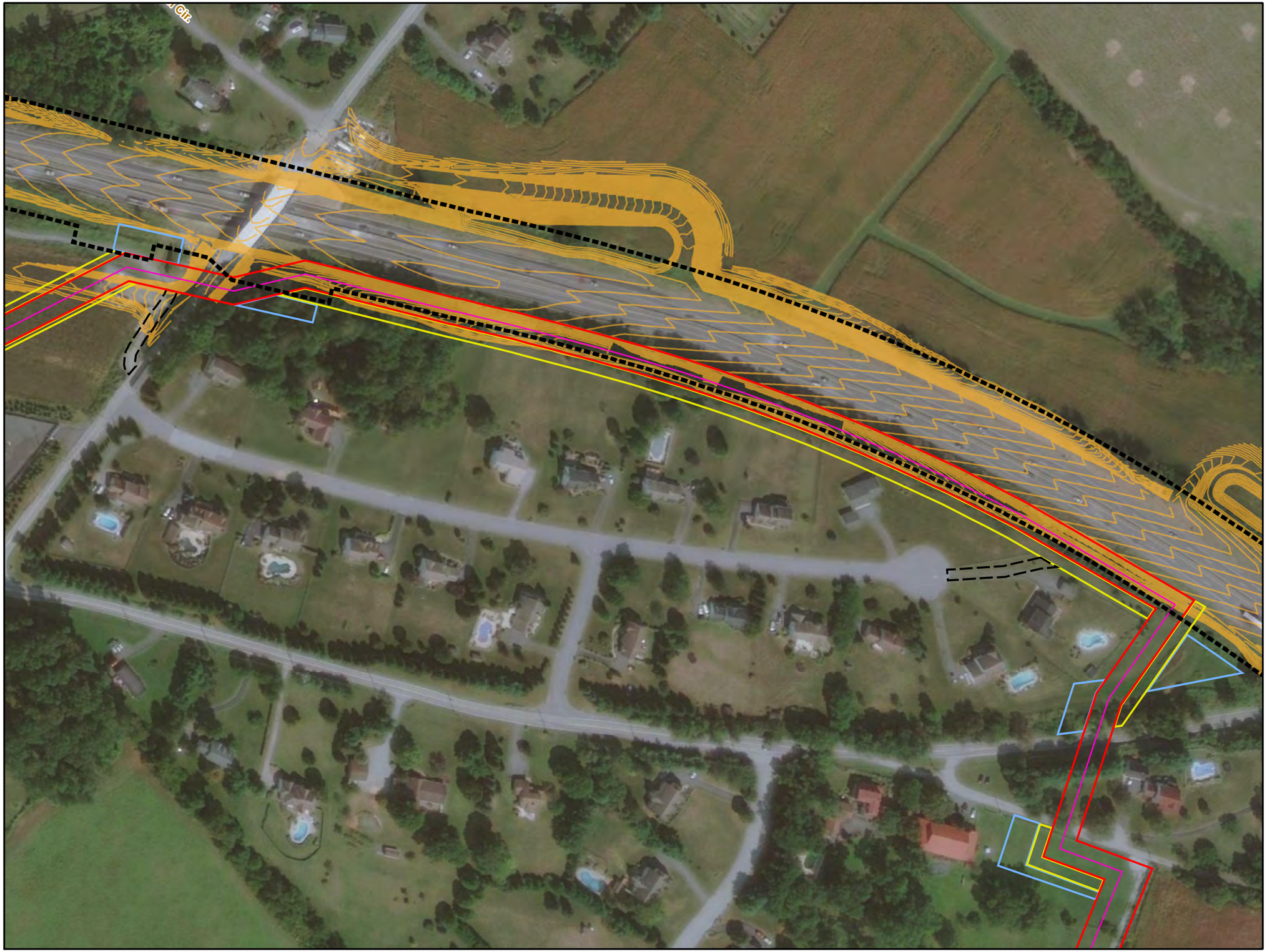
Figure 1.
Option 5a -
Turnpike Reroute
Sheet 1 of 2

Prepared By:	Date:
TETRA TECH	8/11/2021

Base Map: NWI Wetlands 2020. NHD Flowlines 2020. ESRI World Imagery 09/2019.

Coordinate System: NAD 83 Stateplane, PA South, Feet

E:\GIS\Projects\112C05958-PPPM\MXD\EA\AlternativesAnalysis\Option 5 - Map for Thruway.mxd LN



Legend

- Proposed Turnpike Expansion Grading Countours
- Existing Turnpike ROW

Option 5a Reroute

- 20" Centerline
- Permanent ROW
- Temporary ROW
- ATWS
- Temporary Access Road

0 87.5 175 350

1 inch = 175 feet

N

Figure 1.
Option 5a -
Turnpike Reroute
Sheet 2 of 2

Prepared By:	Date:
TETRA TECH	8/11/2021

Base Map: NWI Wetlands 2020. NHD Flowlines 2020. ESRI World Imagery 09/2019.

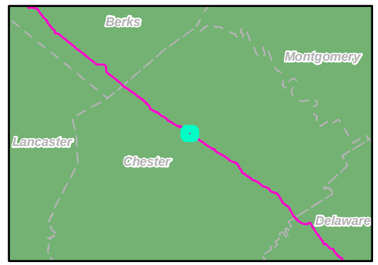
Coordinate System: NAD 83 Stateplane, PA South, Feet

E:\GIS\Projects\112C05958-PPPM\MXD\EA\AlternativesAnalysis\Option 5 - Map for Thruway.mxd LN

Legend

Option 5N Reroute

- 20" Centerline
- Permanent ROW
- Temporary ROW
- ATWS
- Building Footprints
- Parcels



0 125 250 500

1 inch = 250 feet

N

Figure 2a.
Option 5N Alternative
Continuous Workspace

Prepared By:	Date:
TETRA TECH	8/18/2021

Base Map: NWI Wetlands 2020. NHD Flowlines 2020. ESRI World Imagery 09/2019.

Coordinate System: NAD 83 Stateplane, PA South, Feet

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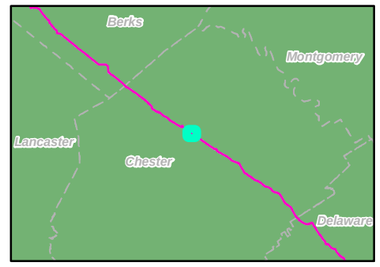
Legend

Option 5N Reroute

- 20" Centerline
- Septic Tank Lines
- Permanent ROW
- Temporary ROW
- ATWS
- Building Footprints
- Parcels



0 125 250 500

1 inch = 250 feet

N

Figure 2b.
Option 5N Alternative
Reduced Workspace

Prepared By:	Date:
TETRA TECH	8/20/2021

Base Map: NWI Wetlands 2020. NHD Flowlines 2020. ESRI World Imagery 09/2019.

Coordinate System: NAD 83 Stateplane, PA South, Feet

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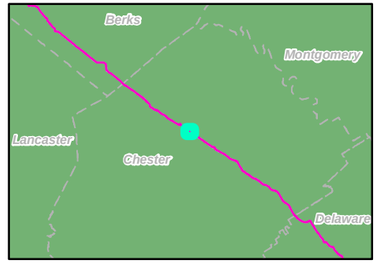
Legend

Option 5S Reroute

- 20" Centerline
- Permanent ROW
- Temporary ROW
- ATWS
- Building Footprints
- Parcels



0 125 250 500

1 inch = 250 feet

Figure 3a.
Option 5S Alternative
Continuous Workspace

Prepared By:	Date:
TETRA TECH	8/18/2021

Base Map: NWI Wetlands 2020. NHD Flowlines 2020. ESRI World Imagery 09/2019.

Coordinate System: NAD 83 Stateplane, PA South, Feet

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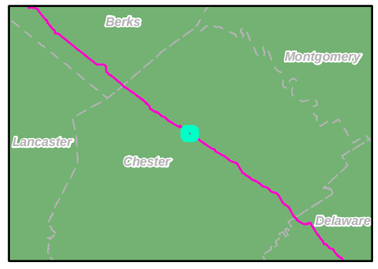
Legend

Option 5S Reroute

- 20" Centerline
- Septic Tank Lines
- Permanent ROW
- Temporary ROW
- ATWS
- Building Footprints
- Parcels



0 125 250 500

1 inch = 250 feet

Figure 3b.
Option 5S Alternative
Reduced Workspace

Prepared By:	Date:
TETRA TECH	8/20/2021

Base Map: NWI Wetlands 2020. NHD Flowlines 2020. ESRI World Imagery 09/2019.

Coordinate System: NAD 83 Stateplane, PA South, Feet

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Appendix B

Correspondence with Pennsylvania Turnpike Commission Regarding Options 5a

Pennsylvania Turnpike Commission
PO Box 67676
Harrisburg PA 17106-7676
717.939.9551

August 13, 2021

Robert Fox, Esq.
Manko, Gold, Katcher, Fox, LLP
401 City Avenue
Suite 901
Bala Cynwyd, PA 19004

Re: Sunoco Mariner East Pipeline Project
Proposed Option 5a - "Turnpike Reroute"

VIA EMAIL TO: RFox@mankogold.com

Dear Mr. Fox,

I am writing in response to your request that the Turnpike Commission review Sunoco's proposed "Option 5a" for the Mariner East Pipeline Project. Please be advised, the Commission's total reconstruction and widening project between Mileposts 308 and 312 will directly impact the pipeline in this location, requiring it to be relocated. Accordingly, the Commission does not support Option 5a.

If you require any additional information or would like to discuss the matter further, please feel free to contact me or Chief Counsel, Doreen McCall.

Very truly yours,

Gary L. Graham, P.E.
Assistant Chief Engineer - Design

cc: Doreen McCall (via email)

Appendix C

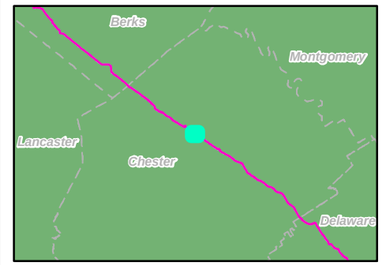
Figure 4 – Utility Locations in Proximity to Options 3, 4, and 5

Legend

- Option 3 Construction Workspace
- Option 4 Construction Workspace
- Option 5 Construction Workspace

Existing Utilities

- Private Water Well
- Public Water Supplies within 1,000 feet
- Pennsylvania Groundwater Information System (PaWGIS) Well
- Fire Hydrant
- Water Line
- Stormwater Line
- Electric Overhead Line
- Underground Electric Line
- Septic Tank Line
- SPLP NGL Pipeline
- Building Footprints
- SPLP Purchased Parcel
- Parcels



0 150 300 600

1 inch = 300 feet

N

Figure 4.
Existing Utilities in Vicinity of Options 3, 4, and 5

Prepared By:	Date:
TETRA TECH	8/26/2021

Base Map: NWI Wetlands 2020. NHD Flowlines 2020. ESRI World Imagery 09/2019.

Coordinate System: NAD 83 Stateplane, PA South, Feet

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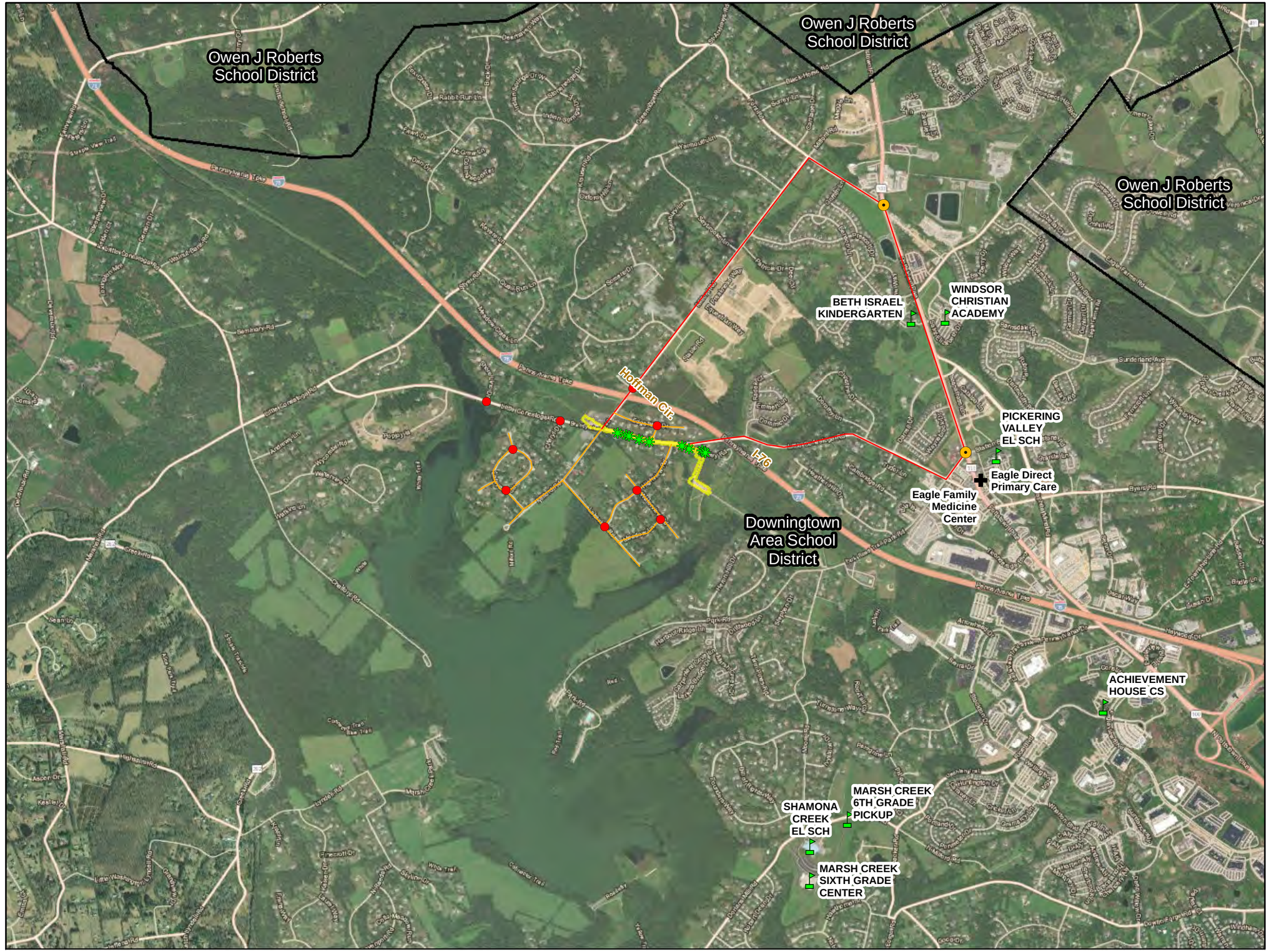
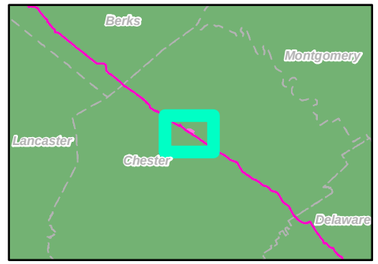
Appendix D

Figure 5 – School Bus and Emergency Vehicle Transit Routes for Option 5



Legend

- Downingtown School District Boundaries
- Schools
- School Bus Stops
- Emergency Facilities
- Construction Work Zone Detour Route
- Restricted Access Roadways
- Substantial Traffic Delay (PM Peak Hour)
- Residential Single Ingress/Egress Points
- Option 5 Construction Workspace



0 950 1,900 3,800

1 inch = 2,000 feet

N

Figure 5a.
Public, School, and Emergency Service Transit Constraints and Detours for Option 5

Prepared By:	Date:
TETRA TECH	8/27/2021

Base Map: NWI Wetlands 2020. NHD Flowlines 2020. ESRI World Imagery 09/2019.

Coordinate System: NAD 83 Stateplane, PA South, Feet

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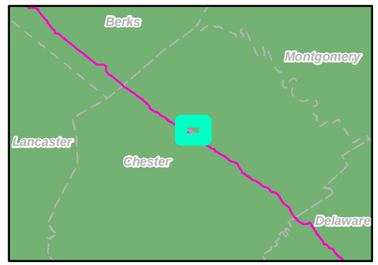
Legend

- School Bus Stops
- Construction Work Zone Detour Route
- Restricted Access Roadways
- Substantial Traffic Delay (PM Peak Hour)
- Residential Single Ingress/Egress Points
- Option 5 Construction Workspace



0 487.5 975 1,950

1 inch = 1,000 feet

N

Figure 5b.
Public, School, and Emergency Service Transit Constraints and Detours for Option 5

Prepared By:	Date:
TETRA TECH	8/27/2021

Base Map: NWI Wetlands 2020. NHD Flowlines 2020. ESRI World Imagery 09/2019.

Coordinate System: NAD 83 Stateplane, PA South, Feet

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Attachment B
Hydrogeological Review

RETTEW

3020 Columbia Avenue, Lancaster, PA 17603 ● Phone: (800) 738-8395
E-mail: rettew@rettew.com ● Website: rettew.com

August 26, 2021

Mr. Nick Bryan, PLS
Energy Transfer
101 W. Third St., 3rd Floor
Williamsport, PA 17701

RE: Hydrogeological Review
Sunoco Pipeline, L.P. Pipeline Project
HDD S3-0290 Alternate Options (Little Conestoga Road)
Upper Uwchlan Township, Chester County, Pennsylvania
RETTEW Project No. 096303002

Dear Nick:

In an August 6, 2021 letter from the Department, Sunoco Pipeline, L.P. ("SPLP") received technical deficiency comments regarding review of Chapter 105 Major Amendment Request which was submitted to the Department on April 7, 2021 and determined to be complete by the Department on April 16th for the 290 HDD location in Upper Uwchlan Township, Chester County (the "290 HDD"). That request of the Department was for a change in the crossing method at Wetland H17 and its associated tributaries from an HDD to an open trench.

In response to Comment #5, which requested SPLP to *"Provide an assessment of the geologic conditions that will affect the volume of storm runoff and groundwater which will require trench dewatering and how this water will be treated and discharged. Describe the geology of all options and the relationship to proposed excavation dewatering/discharge plans."* As such, RETTEW Associates, Inc. has completed a review of the hydrogeology of the area around the S3-0290 (Little Conestoga Road) horizontal directional drill (HDD) site for all options presented to identify potential geological controls on the local occurrence and movement of groundwater.

GEOLOGY

The S3-0290 options are located northeast of Marsh Creek Reservoir in Upper Uwchlan Township, Chester County, Pennsylvania (see **Figure 1**). This is an area of low rolling hills and intervening valleys with a dominant SW-NE trend. The bedrock geology (**Figure 2**) consists of Precambrian-aged volcanic and metamorphic rocks, with most contacts, and a major fault to the north, following (probably dictating) the topographic trend. As depicted in **Figure 2**, the pipeline options primarily cross Precambrian-aged Graphitic felsic gneiss, with the northwest (upstream) ends lying on metadiabase, and the southern ends (downstream) on the Franklin Marble.

The graphitic felsic gneiss includes the Pickering Gneiss and small areas of marble and serpentinite. Outside the marble, it is dominantly quartz and feldspar with varying amounts of graphite. It can also be medium-grained, light to dark gray and greenish gray (Berg et al., 1980). Fractures are well developed; moderately to highly abundant; regular; moderately to closely spaced; open and steeply dipping to vertical These provide a moderate secondary porosity and permeability (Geyer and Wilshusen, 1982).

The metadiabase is dark greenish gray to almost black and fine-grained (0.5- to 1-mm grain size). It contains augite, andesine to labradorite feldspar, and magnetite. Fractures have a blocky pattern, are well developed and moderately abundant, open and steeply dipping. These provide a very shallow and low secondary porosity and permeability. Effective porosity and permeability decline rapidly with depth (Geyer and Wilshusen, 1982). making this formation largely a barrier to deep groundwater flow.

The Franklin Marble consists of fine- to medium-grained white marble containing specks of graphite. Fractures in the marble are well developed, moderately abundant, moderately spaced, open and nearly vertical (Geyer and Wilshusen, 1982). Solutionally-enlarged (karstified) fractures provide a secondary porosity of moderate to high magnitude, and high permeability. Dissolution of the marble almost certainly controls the location and orientation of the tongue of Marsh Creek Reservoir that extends into the stream valley at the southern end of the pipeline route options.

GROUNDWATER

Marsh Creek Reservoir probably represents the local base level, inducing a regional southwestward groundwater flow. The potentiometric surface probably mimics topography, with groundwater flow locally mimicking surface drainage patterns. Local groundwater depths (**Figure 3**) can be interpolated from static water levels in wells reported in the Pennsylvania Groundwater Information System (PaGWIS), soil and geotechnical borings along the S3-0290 HDD path, and the boundaries of surface waters and wetlands where groundwater depth is essentially zero feet below ground surface (bgs). A database of groundwater depths was compiled from PaGWIS well with reported coordinates and static water levels, the S3-0290 borings that encountered water, and the traces of streams and outlines of wetlands (from the Chester County GIS) which were assigned a groundwater depth of zero feet bgs. These points were contoured using linear interpolation with Gaussian smoothing over a window of 100 by 100 feet, with the contours and input data points shown on **Figure 3**. All three pipeline route options start where groundwater is expected to be deeper than 30 feet. All three options enter a region where water is expected to be about ten feet bgs near Borings SB-01 and S3-290_AP_A1. In this area, Option 5 diverges and runs through areas with expected groundwater depths from zero to six feet until the route options converge near SB-03. Route Options 3 and 4 stay in areas with groundwater deeper than ten feet except where they cross the wetlands south of the pond near SB-03. Both of these routes will have a roughly 320-foot stretch where groundwater will be between zero and six feet bgs. The southern ends of all three options lie within the FEMA 100-year floodplain of the stream that feeds Marsh Creek Reservoir where groundwater is expected to be less than 10 feet bgs.

FRACTURE TRACE ANALYSIS

Geologic fractures, particularly if hydraulically active, often produce semi-linear features at the ground surface. Anomalously deep weathering along fractures may lead to straight valley or stream segments, deep soils which retain water and produce linear soil tonal, vegetative, or thermal patterns. For this analysis, RETTEW examined regional topography from USGS mapping (**Figure 1**), data from the Shuttle Radar Topography Mission (SRTM), detailed topography from light detection and ranging (LiDAR), historical aerial photographs, and thermal imagery (from the PA Imagery Navigator). On each image, linear features that crossed the HDD path were digitized. Care was exercised to ensure that anthropogenic features such as fences, roads and hedgerows were not falsely identified as geologic photolinears. The photolinears from each image/figure are overlain on topography and geology in **Figure 4**. Note that there are numerous photolinears crossing the HDD south of the pond on the topographic map. These probably control the location of the wetland south of the pond. Their presence is confirmed by several IRs and earth

features shown on **Figure 4**, as well as the geotechnical borings shown on **Figure 3**. The borings in this area generally show a highly fractured rock surface, with competence (as measured by core recovery, rock quality designation or RQD, and seismic velocities) increasing with depth. With few exceptions, competent rock occurs at depths of 30 to 40 feet (+/-).

The 20-inch pipeline HDD has been internally pressure grouted across this fracture zone, which may locally greatly reduce the secondary porosity and permeability. In addition, surface grouting has been completed across this zone in an attempt to cap fractures where they emerge at the top-of-rock. This should reduce communication between surface and deep groundwater in the vicinity of the wetland south of the pond near SB-03.

CONCLUSIONS

Throughout the S3-290 area, groundwater in the graphitic gneiss should occur and move primarily along fractures – particularly the major fractures or fracture zones identified by the fracture trace analysis. The porosity and permeability of the fracture zones crossing the HDD south of the pond have almost certainly been reduced by grouting. The metadiabase on the north end of the HDD may act as a local aquitard. The Franklin Marble south of the HDD may be karstified, producing a local preferred pathway for groundwater flow. Shallow groundwater will be encountered along most of the Option 5 route. Options 3 and 4 will involve roughly 320-foot stretches where groundwater will lie at depths of zero to six feet.

LIMITATIONS

The survey described above was completed using standard and/or routinely accepted practices of the geophysical and remote sensing industry, and the equipment employed represents, in RETTEW's professional opinion, the best available technology. RETTEW does not accept responsibility for survey limitations due to inherent technological limitations or unforeseen site-specific conditions. We will notify you of such limitations or conditions, when they are identifiable.

We have enjoyed and appreciated the opportunity to have worked with you. If you have any questions, please do not hesitate to contact the undersigned.

Sincerely,

Timothy D. Bechtel, PhD, PG
Senior Project Manager

David M. Mostoller
Senior Project Manager

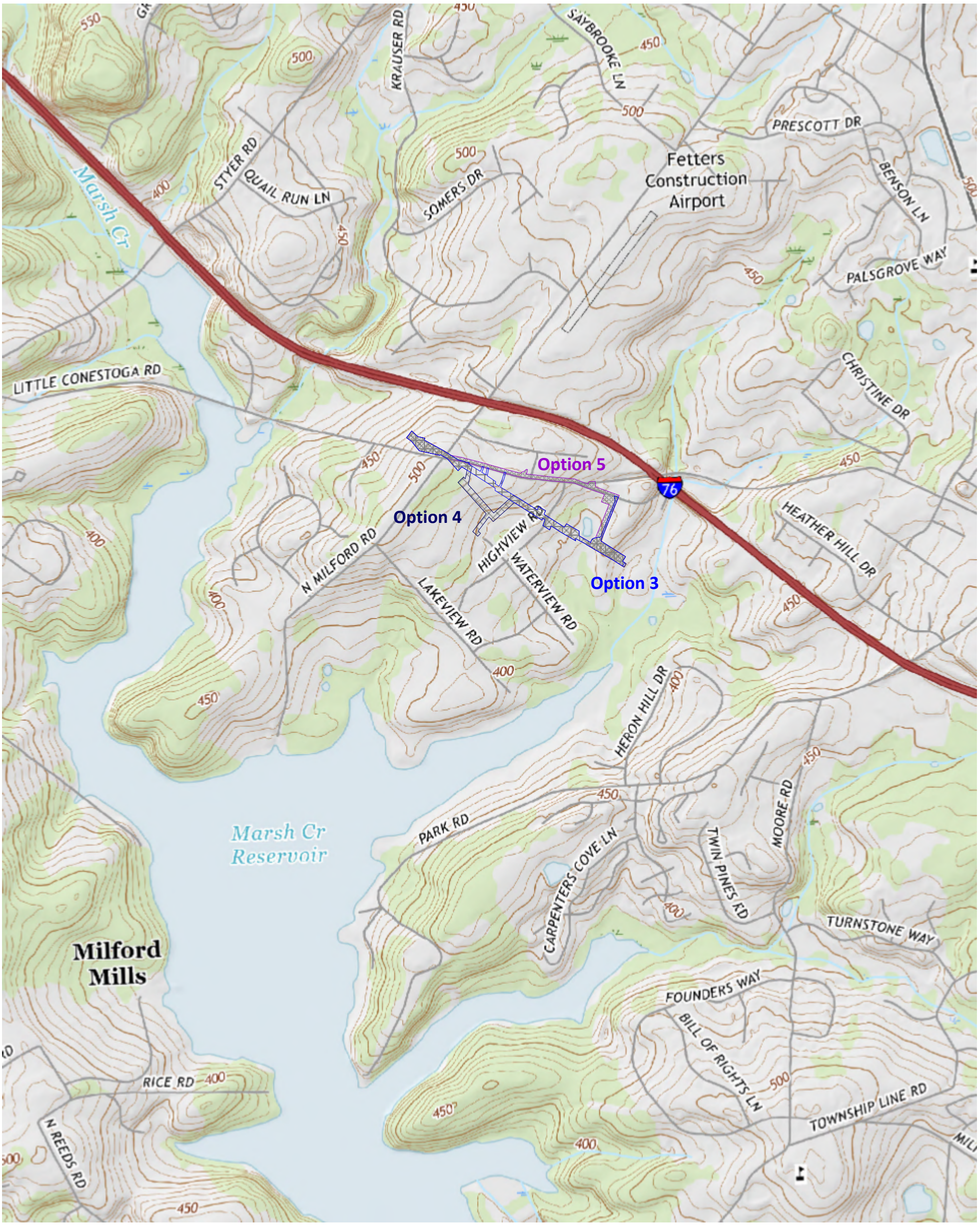
Enclosures

References

Berg, T. M., W. E. Edmunds, A. R. Geyer, and others, Compilers, 1980, Geologic Map of Pennsylvania: Pennsylvania Geologic Survey, Fourth Series, Map 1, 2nd Edition, 3 sheets, Scale 1:250,000.

Geyer, A. R., and P. J. Wilshusen, 1982, Engineering Characteristics of the Rocks of Pennsylvania, Pennsylvania Topographic and Geologic Survey, Environmental Geology Report 1, Second Edition, 300 pages.

Z:\Shared\Projects\09630\096303002 - SL - Spread 6 HDDs Geophysics\GP\S3-0290_Milford Rd (Little Conestoga)\Geology Review Report\Report\0290 Geology Review Report 2021-08-26.docx



Scale (feet)

0 1200 2400 3600 4800

N

Notes:
Topo map from USGS via NETR.
Pipeline options from SPLP.

Figure 1: Topographic Setting

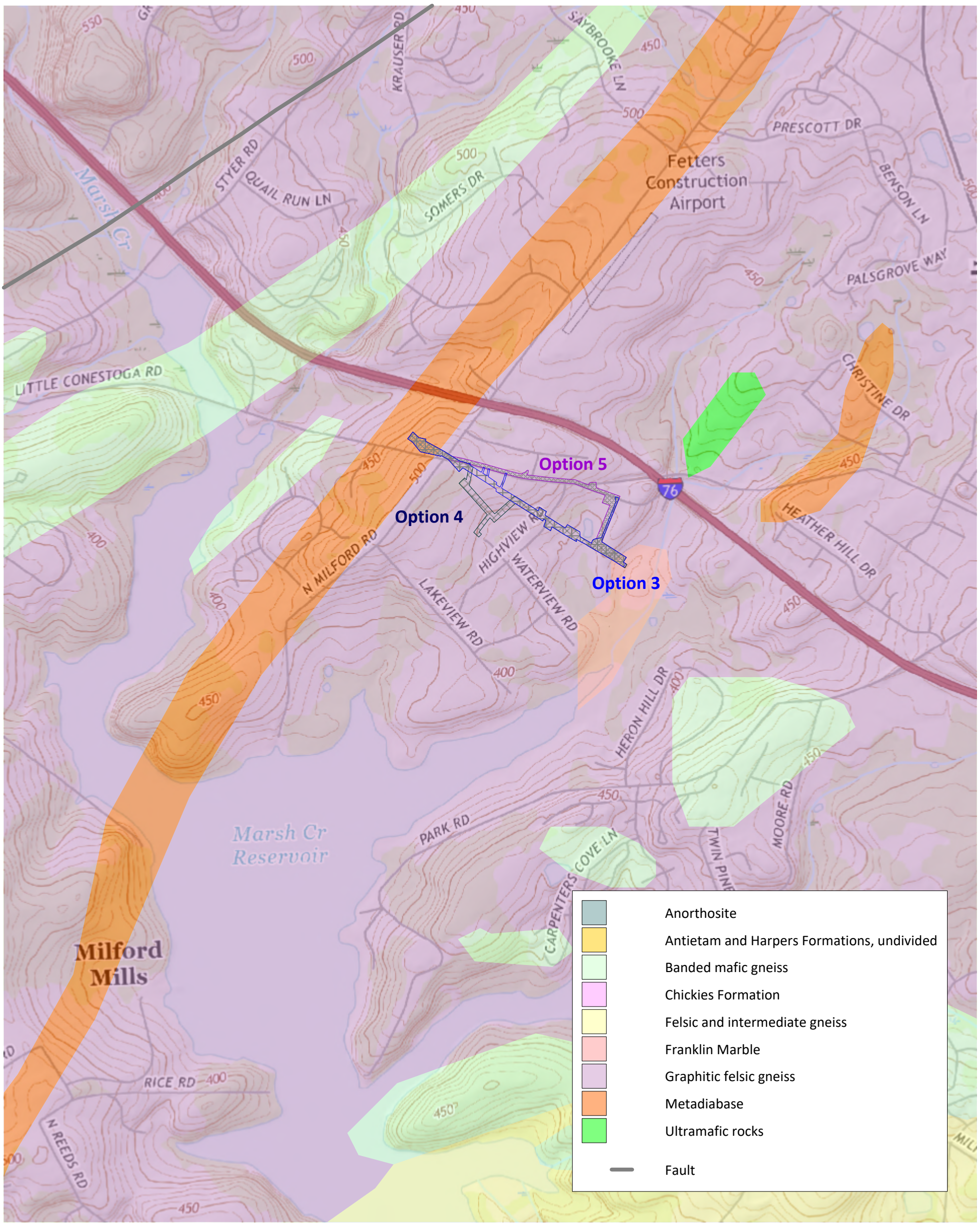
Little Conestoga Road S3-0290

UPPER UWCHLAN TOWNSHIP

CHESTER COUNTY, PA

RETTEW Field Services, Inc.
3020 Columbia Avenue, Lancaster, PA 17603
Phone 1-800-738-8395

SURVEY DATE:	NA
RETTEW No.:	096303002
REVIEWED BY:	FKB
DRAWN BY:	TDB
DATE:	08/26/2021
SCALE:	1" = 1200'
FIGURE NO.	1 of 4



Notes:
Data from PaGEODE.
Pipeline options from SPLP.

Figure 2: Geology

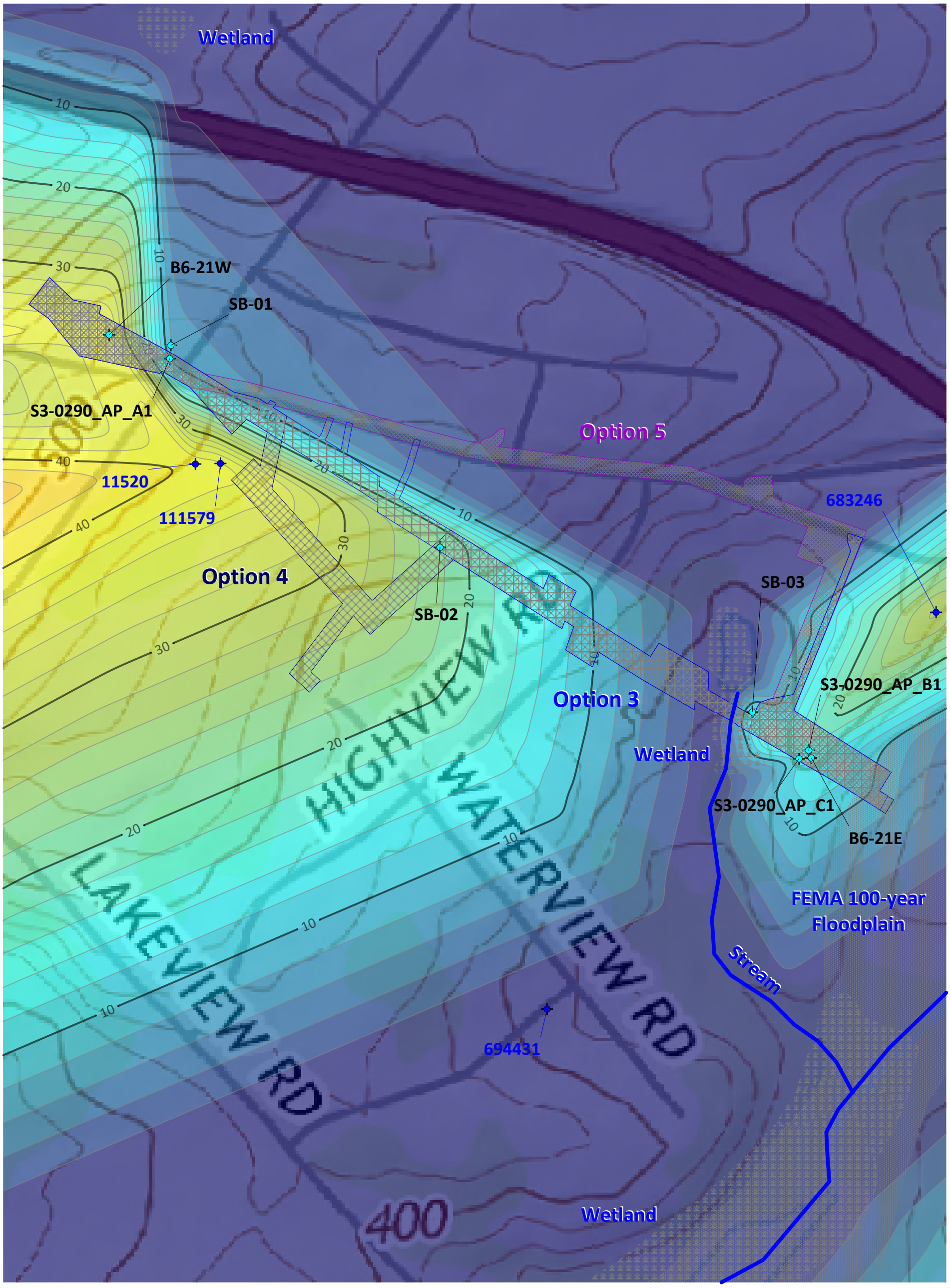
Little Conestoga Road S3-0290

UPPER UWCHLAN TOWNSHIP

CHESTER COUNTY, PA

RETTEW Field Services, Inc.
3020 Columbia Avenue, Lancaster, PA 17603
Phone 1-800-738-8395

SURVEY DATE:	NA
RETTEW No.:	096303002
REVIEWED BY:	FKB
DRAWN BY:	TDB
DATE:	08/26/2021
SCALE:	1" = 1200'
FIGURE NO.	2 of 4



Scale (feet)

0 300 600 900 1200

Notes:

Pipeline options from SPLP.
Well data from PaGWIS.
Wetlands and streams from Chester County GIS.
100-year floodplain from FEMA (2017).
Groundwater depth contours in feet bgs.

Figure 3: Goundwater Depth

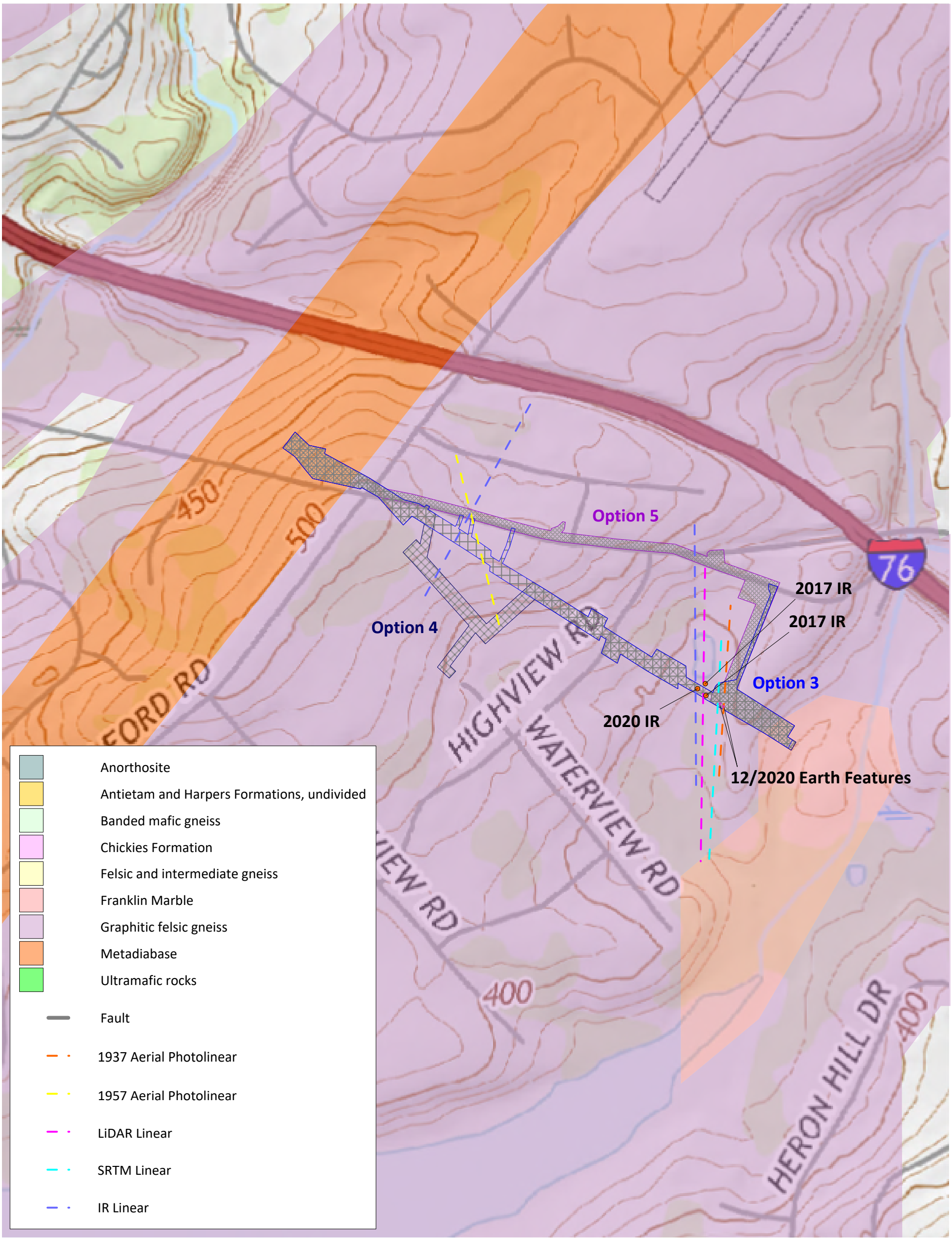
Little Conestoga Road S3-0290

UPPER UWCHLAN TOWNSHIP

CHESTER COUNTY, PA

RETTEW Field Services, Inc.
3020 Columbia Avenue, Lancaster, PA 17603
Phone 1-800-738-8395

SURVEY DATE:	NA
RETTEW No.:	096303002
REVIEWED BY:	FKB
DRAWN BY:	TDB
DATE:	08/26/2021
SCALE:	1" = 300'
FIGURE NO.	3 of 4



Notes:
Geology from PaGEODE.
Pipeline options, borings, IRs, and earth features from SPLP.
Fractures from sources in legend.

Figure 4: Major Fractures

Little Conestoga Road S3-0290

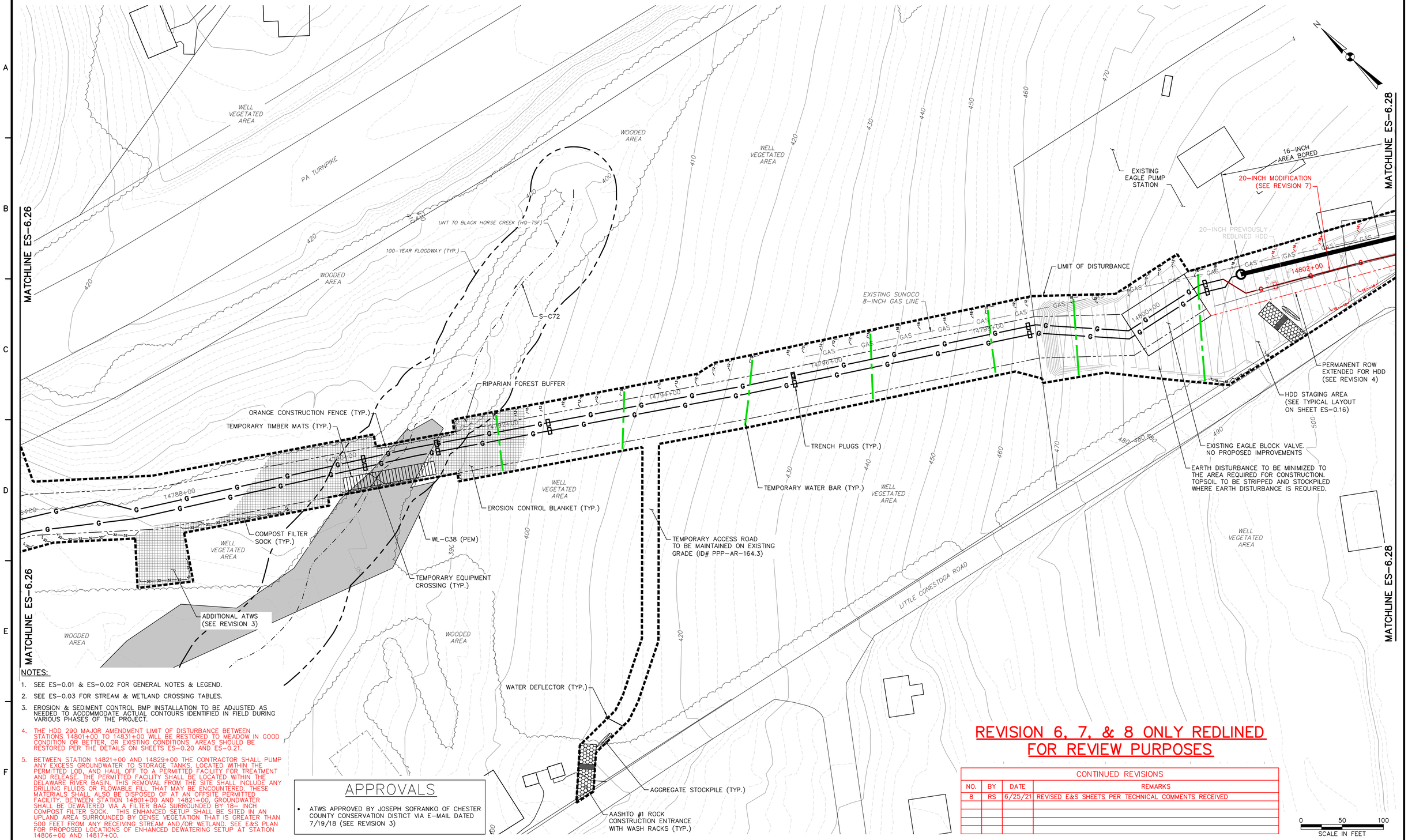
UPPER UWCHLAN TOWNSHIP

CHESTER COUNTY, PA

RETTEW Field Services, Inc.
3020 Columbia Avenue, Lancaster, PA 17603
Phone 1-800-738-8395

SURVEY DATE:	NA
RETTEW No.:	096303002
REVIEWED BY:	FKB
DRAWN BY:	TDB
DATE:	08/26/2021
SCALE:	1" = 500'
FIGURE NO.	4 of 4

Attachment C
Revised Option 4 E&S Plans



NOTES:

1. SEE ES-0.01 & ES-0.02 FOR GENERAL NOTES & LEGEND.
2. SEE ES-0.03 FOR STREAM & WETLAND CROSSING TABLES.
3. EROSION & SEDIMENT CONTROL BMP INSTALLATION TO BE ADJUSTED AS NEEDED TO ACCOMMODATE ACTUAL CONTOURS IDENTIFIED IN FIELD DURING VARIOUS PHASES OF THE PROJECT.
4. THE HDD 290 MAJOR AMENDMENT LIMIT OF DISTURBANCE BETWEEN STATIONS 14801+00 TO 14831+00 WILL BE RESTORED TO MEADOW IN GOOD CONDITION OR BETTER, OR EXISTING CONDITIONS. AREAS SHOULD BE RESTORED PER THE DETAILS ON SHEETS ES-0.20 AND ES-0.21.
5. BETWEEN STATION 14821+00 AND 14829+00 THE CONTRACTOR SHALL PUMP ANY EXCESS GROUNDWATER TO STORAGE TANKS, LOCATED WITHIN THE PERMITTED LOD, AND HAUL OFF TO A PERMITTED FACILITY FOR TREATMENT AND RELEASE. THE PERMITTED FACILITY SHALL BE LOCATED WITHIN THE DELAWARE RIVER BASIN. THIS REMOVAL FROM THE SITE SHALL INCLUDE ANY DRILLING FLUIDS OR FLOWABLE FILL THAT MAY BE ENCOUNTERED. THESE MATERIALS SHALL ALSO BE DISPOSED OF AT AN OFFSITE PERMITTED FACILITY. BETWEEN STATION 14801+00 AND 14821+00, GROUNDWATER SHALL BE DEWATERED VIA A FILTER BAG SURROUNDED BY 18- INCH COMPOST FILTER SOCK. THIS ENHANCED SETUP SHALL BE SITED IN AN UPLAND AREA SURROUNDED BY DENSE VEGETATION THAT IS GREATER THAN 500 FEET FROM ANY RECEIVING STREAM AND/OR WETLAND. SEE E&S PLAN FOR PROPOSED LOCATIONS OF ENHANCED DEWATERING SETUP AT STATION 14806+00 AND 14817+00.

APPROVALS

- ATWS APPROVED BY JOSEPH SOFRANKO OF CHESTER COUNTY CONSERVATION DISTICT VIA E-MAIL DATED 7/19/18 (SEE REVISION 3)

REVISION 6, 7, & 8 ONLY REDLINED FOR REVIEW PURPOSES

CONTINUED REVISIONS

NO.	BY	DATE	REMARKS
8	RS	6/25/21	REVISED E&S SHEETS PER TECHNICAL COMMENTS RECEIVED

0 50 100
SCALE IN FEET

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REVISIONS

NO.	BY	DATE	REMARKS
1	RS	3/28/17	INCORPORATED THE SPECIAL CONDITIONS SET FORTH IN DEP'S CHAPTER 102 AND CHAPTER 105 PERMITS
2	RS	5/25/17	DRAWINGS PROVIDED TO FIELD
3	RS	6/26/18	CENTERLINE (16" AND 20" FLIPPED) AND ATWS MODIFICATION
4	RS	6/5/19	PERM ROW EXTENDED FOR HDD
5	RS	7/17/19	20" HDD MODIFICATION (REMOVED)
6	RS	1/21/21	RE-ROUTE, 20" HDD REVISED TO OPEN TRENCH, AND LOD ADDED
7	RS	3/10/21	REVISED RE-ROUTE

SUNOCO PIPELINE LP
SINKING SPRING, PENNSYLVANIA

PENNSYLVANIA PIPELINE PROJECT CONSTRUCTION SPREAD 6

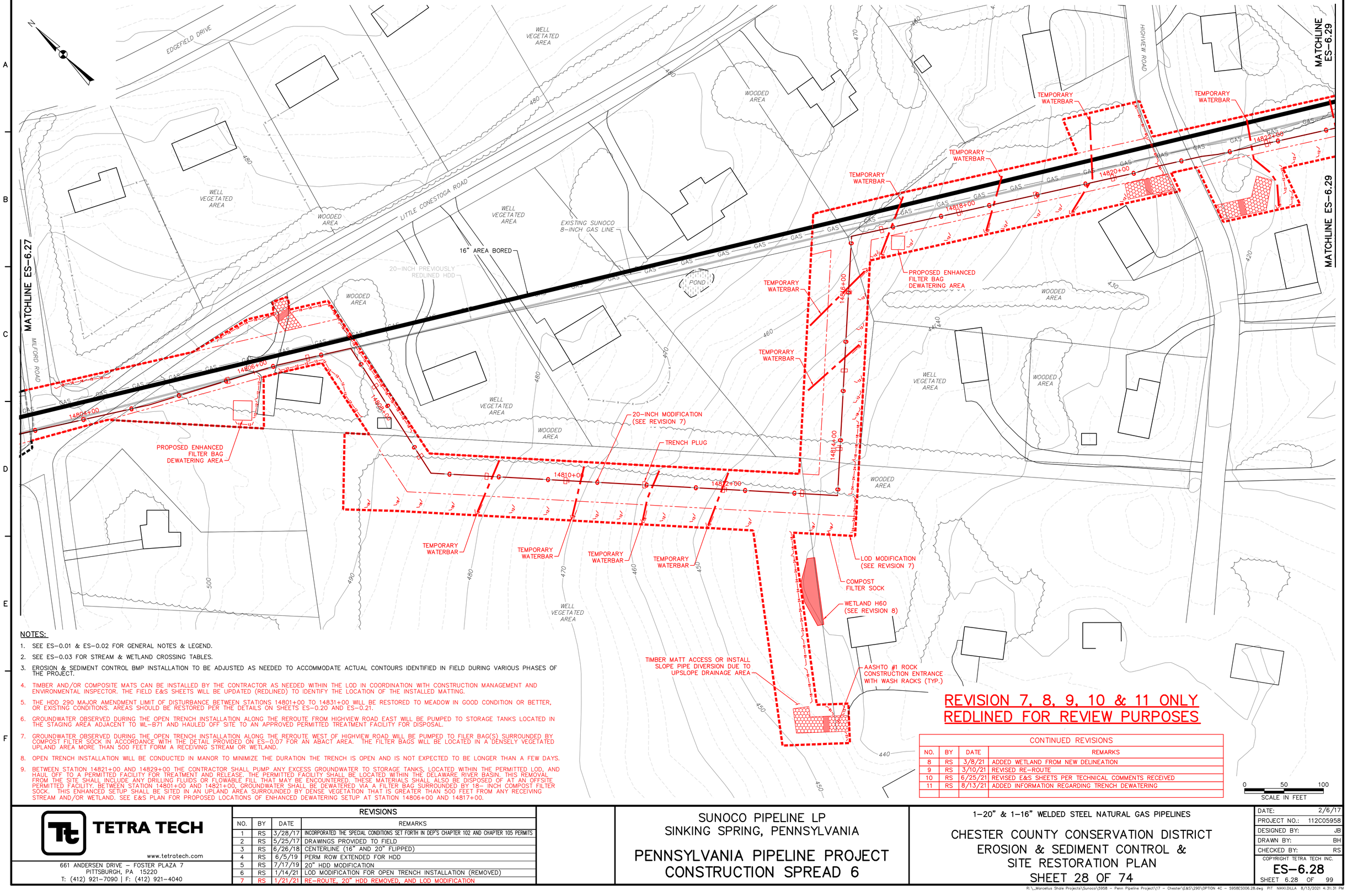
1-20" & 1-16" WELDED STEEL NATURAL GAS PIPELINES

CHESTER COUNTY CONSERVATION DISTRICT EROSION & SEDIMENT CONTROL & SITE RESTORATION PLAN SHEET 27 OF 74

DATE:	2/6/17
PROJECT NO.:	112C05958
DESIGNED BY:	JB
DRAWN BY:	BH
CHECKED BY:	RS

ES-6.27
SHEET 6.27 OF 99

R:_Marcellus Shale Projects\Sunoco\5958 - Penn Pipeline Project\17 - Chester\E&S\290\OPTION 4C - 5958ES006.27.dwg PIT NIKKI.DILLA 8/13/2021 4:30:42 PM



NOTES:

1. SEE ES-0.01 & ES-0.02 FOR GENERAL NOTES & LEGEND.
2. SEE ES-0.03 FOR STREAM & WETLAND CROSSING TABLES.
3. EROSION & SEDIMENT CONTROL BMP INSTALLATION TO BE ADJUSTED AS NEEDED TO ACCOMMODATE ACTUAL CONTOURS IDENTIFIED IN FIELD DURING VARIOUS PHASES OF THE PROJECT.
4. TIMBER AND/OR COMPOSITE MATS CAN BE INSTALLED BY THE CONTRACTOR AS NEEDED WITHIN THE LOD IN COORDINATION WITH CONSTRUCTION MANAGEMENT AND ENVIRONMENTAL INSPECTOR. THE FIELD E&S SHEETS WILL BE UPDATED (REDLINED) TO IDENTIFY THE LOCATION OF THE INSTALLED MATTING.
5. THE HDD 290 MAJOR AMENDMENT LIMIT OF DISTURBANCE BETWEEN STATIONS 14801+00 TO 14831+00 WILL BE RESTORED TO MEADOW IN GOOD CONDITION OR BETTER, OR EXISTING CONDITIONS. AREAS SHOULD BE RESTORED PER THE DETAILS ON SHEETS ES-0.20 AND ES-0.21.
6. GROUNDWATER OBSERVED DURING THE OPEN TRENCH INSTALLATION ALONG THE REROUTE FROM HIGHVIEW ROAD EAST WILL BE PUMPED TO STORAGE TANKS LOCATED IN THE STAGING AREA ADJACENT TO WL-B71 AND HAULED OFF SITE TO AN APPROVED PERMITTED TREATMENT FACILITY FOR DISPOSAL.
7. GROUNDWATER OBSERVED DURING THE OPEN TRENCH INSTALLATION ALONG THE REROUTE WEST OF HIGHVIEW ROAD WILL BE PUMPED TO FILER BAG(S) SURROUNDED BY COMPOST FILTER SOCK IN ACCORDANCE WITH THE DETAIL PROVIDED ON ES-0.07 FOR AN ABACT AREA. THE FILTER BAGS WILL BE LOCATED IN A DENSELY VEGETATED UPLAND AREA MORE THAN 500 FEET FORM A RECEIVING STREAM OR WETLAND.
8. OPEN TRENCH INSTALLATION WILL BE CONDUCTED IN MANOR TO MINIMIZE THE DURATION THE TRENCH IS OPEN AND IS NOT EXPECTED TO BE LONGER THAN A FEW DAYS.
9. BETWEEN STATION 14821+00 AND 14829+00 THE CONTRACTOR SHALL PUMP ANY EXCESS GROUNDWATER TO STORAGE TANKS, LOCATED WITHIN THE PERMITTED LOD, AND HAUL OFF TO A PERMITTED FACILITY FOR TREATMENT AND RELEASE. THE PERMITTED FACILITY SHALL BE LOCATED WITHIN THE DELAWARE RIVER BASIN. THIS REMOVAL FROM THE SITE SHALL INCLUDE ANY DRILLING FLUIDS OR FLOWABLE FILL THAT MAY BE ENCOUNTERED. THESE MATERIALS SHALL ALSO BE DISPOSED OF AT AN OFFSITE PERMITTED FACILITY. BETWEEN STATION 14801+00 AND 14821+00, GROUNDWATER SHALL BE DEWATERED VIA A FILTER BAG SURROUNDED BY 18- INCH COMPOST FILTER SOCK. THIS ENHANCED SETUP SHALL BE SITED IN AN UPLAND AREA SURROUNDED BY DENSE VEGETATION THAT IS GREATER THAN 500 FEET FROM ANY RECEIVING STREAM AND/OR WETLAND. SEE E&S PLAN FOR PROPOSED LOCATIONS OF ENHANCED DEWATERING SETUP AT STATION 14806+00 AND 14817+00.

REVISION 7, 8, 9, 10 & 11 ONLY
REDLINED FOR REVIEW PURPOSES

CONTINUED REVISIONS

NO.	BY	DATE	REMARKS
8	RS	3/8/21	ADDED WETLAND FROM NEW DELINEATION
9	RS	3/10/21	REVISED RE-ROUTE
10	RS	6/25/21	REVISED E&S SHEETS PER TECHNICAL COMMENTS RECEIVED
11	RS	8/13/21	ADDED INFORMATION REGARDING TRENCH DEWATERING

SCALE IN FEET: 0 50 100

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REVISIONS

NO.	BY	DATE	REMARKS
1	RS	3/28/17	INCORPORATED THE SPECIAL CONDITIONS SET FORTH IN DEP'S CHAPTER 102 AND CHAPTER 105 PERMITS
2	RS	5/25/17	DRAWINGS PROVIDED TO FIELD
3	RS	6/26/18	CENTERLINE (16" AND 20" FLIPPED)
4	RS	6/5/19	PERM ROW EXTENDED FOR HDD
5	RS	7/17/19	20" HDD MODIFICATION
6	RS	1/14/21	LOD MODIFICATION FOR OPEN TRENCH INSTALLATION (REMOVED)
7	RS	1/21/21	RE-ROUTE, 20" HDD REMOVED, AND LOD MODIFICATION

SUNOCO PIPELINE LP
SINKING SPRING, PENNSYLVANIA

PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 6

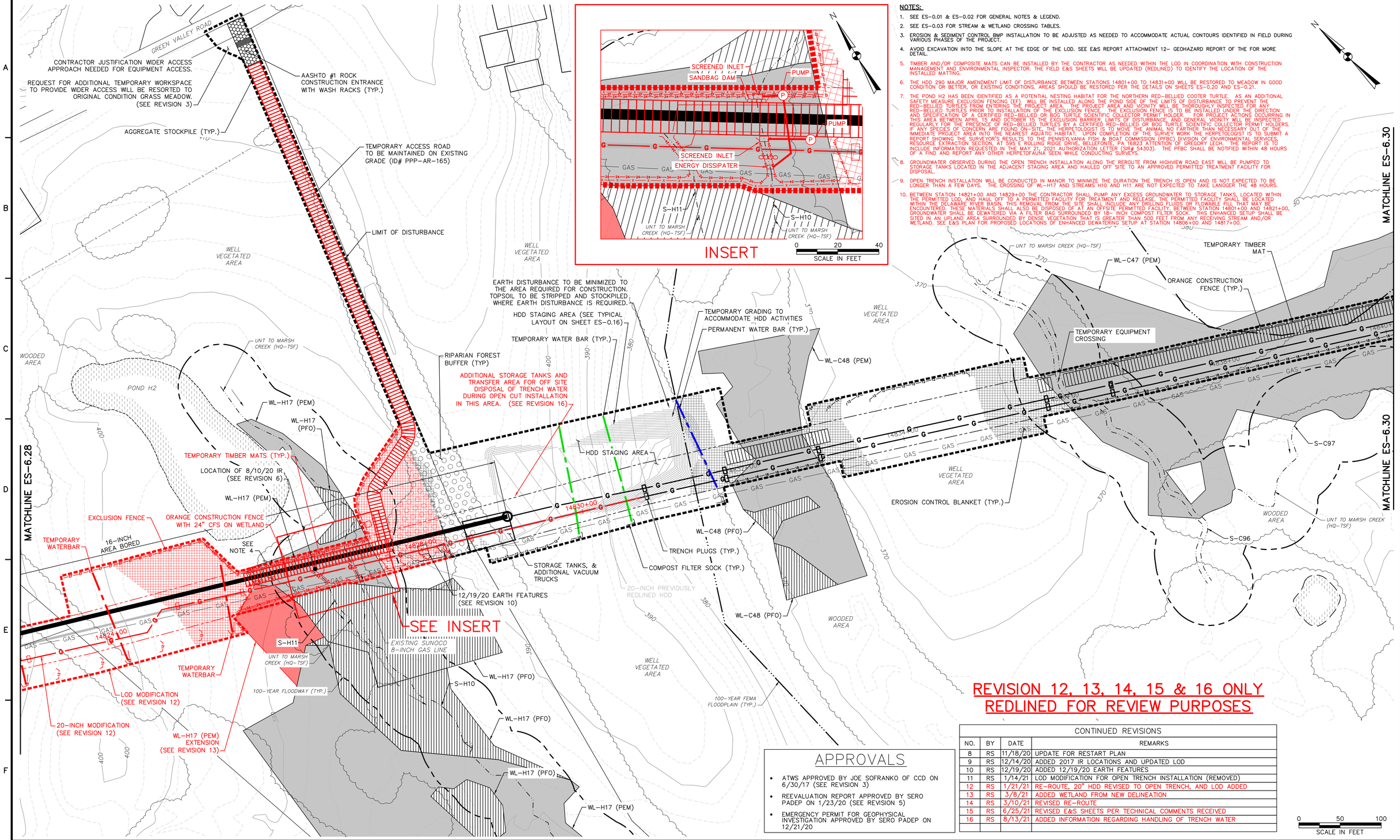
1-20" & 1-16" WELDED STEEL NATURAL GAS PIPELINES

CHESTER COUNTY CONSERVATION DISTRICT
EROSION & SEDIMENT CONTROL &
SITE RESTORATION PLAN
SHEET 28 OF 74

DATE:	2/6/17
PROJECT NO.:	112C05958
DESIGNED BY:	JB
DRAWN BY:	BH
CHECKED BY:	RS

ES-6.28
SHEET 6.28 OF 99

R:_Marcellus Shale Projects\Sunoco\5958 – Penn Pipeline Project\17 – Chester\E&S\290\OPTION 4C – 5958ES006.28.dwg PIT NIKKI.DILLA 8/13/2021 4:31:31 PM



NOTES:

1. SEE ES-0.01 & ES-0.02 FOR GENERAL NOTES & LEGEND.
2. SEE ES-0.03 FOR STREAM & WETLAND CROSSING TABLES.
3. EROSION & SEDIMENT CONTROL BMP INSTALLATION TO BE ADJUSTED AS NEEDED TO ACCOMMODATE ACTUAL CONTOURS IDENTIFIED IN FIELD DURING VARIOUS PHASES OF THE PROJECT.
4. AVOID EXCAVATION INTO THE SLOPE AT THE EDGE OF THE LOD. SEE E&S REPORT ATTACHMENT 12- GEOHAZARD REPORT OF THE FOR MORE DETAIL.
5. TIMBER AND/OR COMPOSITE MATS CAN BE INSTALLED BY THE CONTRACTOR AS NEEDED WITHIN THE LOD IN COORDINATION WITH CONSTRUCTION MANAGEMENT AND ENVIRONMENTAL INSPECTOR. THE FIELD E&S SHEETS WILL BE UPDATED (REDLINED) TO IDENTIFY THE LOCATION OF THE INSTALLED MATTING.
6. THE HDD 290 MAJOR AMENDMENT LIMIT OF DISTURBANCE BETWEEN STATIONS 14801+00 TO 14831+00 WILL BE RESTORED TO MEADOW IN GOOD CONDITION OR BETTER, OR EXISTING CONDITIONS. AREAS SHOULD BE RESTORED PER THE DETAILS ON SHEETS ES-0.20 AND ES-0.21.
7. THE POND H2 HAS BEEN IDENTIFIED AS A POTENTIAL NESTING HABITAT FOR THE NORTHERN RED-BELLIED COOTER TURTLE. AS AN ADDITIONAL SAFETY MEASURE EXCLUSION FENCING (EF) WILL BE INSTALLED ALONG THE POND SIDE OF THE LIMITS OF DISTURBANCE TO PREVENT THE RED-BELLIED TURTLES FROM ENTERING THE PROJECT AREA. THE PROJECT AREA AND VICINITY WILL BE THOROUGHLY INSPECTED FOR ANY RED-BELLIED TURTLES PRIOR TO INSTALLATION OF THE EXCLUSION FENCE. THE EXCLUSION FENCE IS TO BE INSTALLED UNDER THE DIRECTION AND SPECIFICATION OF A CERTIFIED RED-BELLIED OR BOG TURTLE SCIENTIFIC COLLECTOR PERMIT HOLDER. FOR PROJECT ACTIONS OCCURRING IN THIS AREA BETWEEN APRIL 15 AND OCTOBER 15 THE EXCLUSION BARRIER, LIMITS OF DISTURBANCE, AND GENERAL VICINITY WILL BE INSPECTED REGULARLY FOR THE PRESENCE OF RED-BELLIED TURTLES BY A CERTIFIED RED-BELLIED OR BOG TURTLE SCIENTIFIC COLLECTOR PERMIT HOLDERS. IF ANY SPECIES OF CONCERN ARE FOUND ON-SITE, THE HERPETOLOGIST IS TO MOVE THE ANIMAL NO FARTHER THAN NECESSARY OUT OF THE IMMEDIATE PROJECT AREA INTO THE NEAREST AQUATIC HABITAT. UPON COMPLETION OF THE SURVEY WORK THE HERPETOLOGIST IS TO SUBMIT A REPORT SHOWING THE SURVEYOR'S RESULTS TO THE PENNSYLVANIA FISH & BOAT COMMISSION (PFBC) DIVISION OF ENVIRONMENTAL SERVICES, RESOURCE EXTRACTION SECTION, AT 595 E ROLLING RIDGE DRIVE, BELLEFONTE, PA 16823 ATTENTION OF GREGORY LECH. THE REPORT IS TO INCLUDE INFORMATION REQUESTED IN THE MAY 21, 2021 AUTHORIZATION LETTER (SR# 54303). THE PFBC SHALL BE NOTIFIED WITHIN 48 HOURS OF A FIND AND REPORT ANY OTHER HERPETOFAUNA SEEN WHILE CONDUCTING SURVEYS.
8. GROUNDWATER OBSERVED DURING THE OPEN TRENCH INSTALLATION ALONG THE REROUTE FROM HIGHVIEW ROAD EAST WILL BE PUMPED TO STORAGE TANKS LOCATED IN THE ADJACENT STAGING AREA AND HAULED OFF SITE TO AN APPROVED PERMITTED TREATMENT FACILITY FOR DISPOSAL.
9. OPEN TRENCH INSTALLATION WILL BE CONDUCTED IN MANOR TO MINIMIZE THE DURATION THE TRENCH IS OPEN AND IS NOT EXPECTED TO BE LONGER THAN A FEW DAYS. THE CROSSING OF WL-H17 AND STREAMS H10 AND H11 ARE NOT EXPECTED TO TAKE LANOGER THE 48 HOURS.
10. BETWEEN STATION 14821+00 AND 14829+00 THE CONTRACTOR SHALL PUMP ANY EXCESS GROUNDWATER TO STORAGE TANKS, LOCATED WITHIN THE PERMITTED LOD, AND HAUL OFF TO A PERMITTED FACILITY FOR TREATMENT AND RELEASE. THE PERMITTED FACILITY SHALL BE LOCATED WITHIN THE DELAWARE RIVER BASIN. THIS REMOVAL FROM THE SITE SHALL INCLUDE ANY DRILLING FLUIDS OR FLOWABLE FILL THAT MAY BE ENCOUNTERED. THESE MATERIALS SHALL ALSO BE DISPOSED OF AT AN OFFSITE PERMITTED FACILITY. BETWEEN STATION 14801+00 AND 14821+00, GROUNDWATER SHALL BE DEWATERED VIA A FILTER BAG SURROUNDED BY 18- INCH COMPOST FILTER SOCK. THIS ENHANCED SETUP SHALL BE SITED IN AN UPLAND AREA SURROUNDED BY DENSE VEGETATION THAT IS GREATER THAN 500 FEET FROM ANY RECEIVING STREAM AND/OR WETLAND. SEE E&S PLAN FOR PROPOSED LOCATIONS OF ENHANCED DEWATERING SETUP AT STATION 14806+00 AND 14817+00.

REVISION 12, 13, 14, 15 & 16 ONLY
REDLINED FOR REVIEW PURPOSES

CONTINUED REVISIONS			
NO.	BY	DATE	REMARKS
8	RS	11/18/20	UPDATE FOR RESTART PLAN
9	RS	12/14/20	ADDED 2017 IR LOCATIONS AND UPDATED LOD
10	RS	12/19/20	ADDED 12/19/20 EARTH FEATURES
11	RS	1/14/21	LOD MODIFICATION FOR OPEN TRENCH INSTALLATION (REMOVED)
12	RS	1/21/21	RE-ROUTE, 20" HDD REVISED TO OPEN TRENCH, AND LOD ADDED
13	RS	3/8/21	ADDED WETLAND FROM NEW DELINEATION
14	RS	3/10/21	REVISED RE-ROUTE
15	RS	6/25/21	REVISED E&S SHEETS PER TECHNICAL COMMENTS RECEIVED
16	RS	8/13/21	ADDED INFORMATION REGARDING HANDLING OF TRENCH WATER

APPROVALS

- ATWS APPROVED BY JOE SOFRANKO OF CCD ON 6/30/17 (SEE REVISION 3)
- REEVALUATION REPORT APPROVED BY SERO PADEP ON 1/23/20 (SEE REVISION 5)
- EMERGENCY PERMIT FOR GEOPHYSICAL INVESTIGATION APPROVED BY SERO PADEP ON 12/21/20

0 50 100
SCALE IN FEET

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REVISIONS			
NO.	BY	DATE	REMARKS
1	RS	3/28/17	INCORPORATED THE SPECIAL CONDITIONS SET FORTH IN DEP'S CHAPTER 102 AND CHAPTER 105 PERMITS
2	RS	5/25/17	DRAWINGS PROVIDED TO FIELD
3	RS	6/28/17	ATWS ADDED
4	RS	6/26/18	CENTERLINE (16" AND 20" FLIPPED)
5	RS	7/17/19	20" HDD MODIFICATION
6	RS	8/11/20	LOD ADDED FOR IR REMOVED
7	RS	9/17/20	DRILLING FLUID TRANSFER LINE NOW USED AS GROUT TRANSFER LINE (PENDING)

SUNOCO PIPELINE LP
SINKING SPRING, PENNSYLVANIA

PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 6

1-20" & 1-16" WELDED STEEL NATURAL GAS PIPELINES

CHESTER COUNTY CONSERVATION DISTRICT
EROSION & SEDIMENT CONTROL &
SITE RESTORATION PLAN
SHEET 29 OF 74

DATE:	2/6/17
PROJECT NO.:	112C05958
DESIGNED BY:	JB
DRAWN BY:	BH
CHECKED BY:	RS

ES-6.29
SHEET 6.29 OF 99

R:_Marcellus Shale Projects\Sunoco\5958 - Penn Pipeline Project\17 - Chester\E&S\290\OPTION 4C - 5958ES006.29.dwg PIT NIKKI.DILLA 8/19/2021 6:53:42 AM