



May 11, 2021

Mr. Nicholas J. Bryan, P.L.S.
Sr. Director – E&C Environmental
Energy Transfer
535 Fritztown Road
Sinking Spring, PA 19608

Re: *Review Comments of DEP and DCNR on
Sunoco Pipeline, L.P.'s October 1, 2020, Proposed
Assessment and Remediation Plan for Marsh Creek Lake and Environs*
Sunoco Pipeline, L.P.'s October 1, 2020, "Initial Response
to Administrative Order and Supplemental Response
to Notice of Violation"
DEP Permit Nos. E15-862 and ESG 01 000 15 001
Upper Uwchlan Township
Chester County

Dear Mr. Bryan:

The Department of Environmental Protection (DEP) and Department of Conservation and Natural Resources (DCNR) (collectively referred to as Agencies) have reviewed Sunoco Pipeline, L.P.'s (Sunoco) October 1, 2020, submittal titled, "Initial Response to Administrative Order and Supplemental Response to Notice of Violation," dated October 1, 2020, and attached reports (Report). The October 1, 2020, submittal includes an impact assessment and restoration and cleanup plan titled "HDD S3-0290 Impact Assessment and Restoration Plan – Streams SH10/SH11 and Wetland H17." This document has sections completed by Sunoco's consultants, Tetra Tech (TT), and AECOM.

The Report was submitted in response to DEP's August 20, 2020, Notice of Violation (NOV), and September 11, 2020, Administrative Order (Order) that require, among other things, that Sunoco assess the adverse impacts to Wetland H17, unnamed tributaries SH10 and SH11 (UNTs), and a cove of Marsh Creek Lake H3 (Ranger Cove) caused by its August 10, 2020, discharge of approximately 7,800 gallons of drilling fluid associated with its S3-0290 horizontal directional drilling (HDD) operation, the August 11, 2020, subsidence event in Wetland H17 and the 26 cubic yards of grout placed in the subsidence hole to temporarily stabilize the site. The Order also requires Sunoco to develop approvable clean-up and restoration plans for these impacts.

In response to the October 1, 2020, Report, the Agencies have set forth below specific comments on Sunoco's assessment and remediation plans, along with a summary of restoration needs for ecological and recreational resources, including the tributaries,

wetlands, and reservoir within the boundaries of Marsh Creek State Park. The Report will continue to be reviewed by the Agencies.

COMMENTS ON OCTOBER 1, 2020, PROPOSED ASSESSMENT AND REMEDIATION PLAN FOR MARSH CREEK LAKE AND ENVIRONS

1. The sampling methods employed by the consultants do not comply fully with DEP, Bureau of Clean Water (BCW) sampling procedures available at the following website:
<https://www.dep.pa.gov/Business/Water/CleanWater/WaterQuality/Pages/Data-Collection-Protocols.aspx>. The Report failed to discuss the QA/QC procedures used for calibration and documentation of field meter and the QA/QC procedures utilized for surface and sediment chemistry sampling (such as trip blanks, duplicates, and equipment rinse). Future monitoring and sampling should comply with DEP's established sampling procedures unless an alternative method has been approved.
2. There are data gaps in the sampling results. For instance, Sunoco's consultants recorded the sampling date but not include the time of day. Time of day is important because certain parameters, especially dissolved oxygen (DO) and pH, can have wide diurnal variations in an eutrophic lake such as Marsh Creek Lake. Not knowing the time of day prevents a reviewer from determining whether an elevated or depressed parameter value is due to contamination or is the natural product of photosynthesis. If the records exist, please provide time of day for each of the field measurements. The time of day should be included in all future reports.
3. AECOM collected water and sediment samples for chemical and flux analyses, and sediment samples for USGS Full Clay Phase Analysis by X-Ray Diffraction (XRD), in Ranger Cove. However, AECOM only collected a small number of samples, four (4) water and sediment samples and five (5) XRD samples. One sample of each group was from a reference site. The AECOM sampling effort and results are too limited to draw any meaningful conclusions. Moreover, samples for chemical analysis were not collected until 28 days after the IR occurred. In addition, the number of observational sample locations (31) represented too small of an area to allow a complete assessment of impacts to Ranger Cove. Explain your sampling rationale, including the small number of samples that were collected and evaluate the need for additional samples for the purpose of determining whether the drilling fluid contained elevated levels of contaminants.
4. AECOM used the U.S. Geological Survey Full Clay Phase Analysis by X-ray Diffraction to analyze for bentonite. The Report did not provide any information describing this method or any information on its accuracy. No validation is provided on the accuracy of the visual observations compared to the XRD analyses to determine the presence/absence of drilling fluid. Provide an explanation of this analytical technique and its accuracy.

5. The tables listing water and sediment chemistry results do not include detection limits for each chemical parameter and do not indicate which screening benchmarks are less than the detection limits. These parameters are incorrectly listed as nondetects (ND) but should be listed as possible but unknown exceedances of screening values. Resubmit the analytical tables revised to include detection limits and identify when detection limits are greater than criteria. Future sampling should provide detection limits and indicate when NDs are greater than criteria.
6. U.S. EPA, Region 3, BTAG Group screening benchmarks were used to determine elevated concentrations (termed exceedances) of chemical parameters. The BTAG benchmarks for most metals are for the dissolved phase of the metals; a few metals have total metal benchmarks. Each metal should be screened to the appropriate benchmark, either dissolved or total. AECOM screened both total and dissolved metals results to the same benchmarks and did not distinguish whether the benchmark was for total or dissolved metal. Screen each metal to the appropriate benchmark and distinguish whether the benchmark was for total or dissolved metal.
7. Sunoco should have used DEP's water quality criteria instead of the U.S. EPA's BTAG benchmarks for surface water, except with regard to sediment. DEP does not have sediment criteria. The Region 3 BTAG sediment benchmarks are one commonly used sediment screening criteria that can be used here. Please provide this data and include it in future monitoring.
8. A vertical profile should be taken at sampling locations to understand variation throughout the water column. It is unclear from what the depth the samples were taken with the peristaltic pump. It is also unclear at what depth the in-situ readings were taken. Please provide this data for the existing samples and include it in future sample data.
9. TT did not collect samples for the chemical analyses of surface water and sediments of the UNTs and Wetland H17. Only field parameters (physicochemical parameter data such as temperature, dissolved oxygen, redox, specific conductance, and pH) were measured with a portable meter. Additional sampling should have been conducted to assess the degree of contamination discharged to the UNTs and Wetland H17. Of current concern is whether any drilling fluid remains and, if so, its vertical and longitudinal dispositions and quantities in the UNTs and Wetland H17. A water and sediment sampling workplan should be prepared and submitted for review and approval to determine if contaminants remain and, if so, how they will be addressed, and how the tributaries and wetland will be restored. Please include a schedule for implementation. More details are set forth below. Once approved, the plan will need to be implemented in accordance with the approved schedule.
10. Completed field meter calibration sheets were not provided along with field meter data. Sample collections should have included implementation of cross-section surveys to ensure that field meter readings were representative of the targeted reach as a whole. Vertical profile surveys should also be considered, particularly in the lower

sections where UNT SH10 enter the reservoir. Parameters including total dissolved solids and salinity, which are parameters calculated with non-site-specific equations, are not appropriate for collection with a field meter, especially when targeting non-natural conditions. Total dissolved solids and salinity should be measured by laboratory analytical methods and included in future monitoring.

11. A deficiency of the sample collection effort was that samples of the drilling fluids that were discharged were apparently not collected. TT and AECOM do not provide any reasoning why these samples were not collected. If samples were collected and analyzed, provide this data. Otherwise, provide an explanation for this deficiency.
12. Benthic macroinvertebrates and fish communities were not sampled or assessed in the UNTs and Wetland H17. One can reasonably assume that both these communities were adversely impacted and may have been eliminated due to the discharge and cleanup measures employed. Likewise, Ranger Cove was not sampled for either of these aquatic communities. The effect of the discharge on the numerous fish habitat enhancement structures previously installed in Ranger Cove was also not assessed. Ranger Cove has spawning habitats for bass and other sunfish. The impact of the discharge on these spawning habitats was not assessed. The lack of collected data on the degree of impact prevents Sunoco and its consultants from making accurate estimates on the rates of recovery of aquatic life to pre-discharge conditions. Devise enhancement/restoration and monitoring plans to determine the extent of impacts that occurred or likely will occur due to the IR. The plans should address restoring and/or enhancing aquatic habitats and monitoring the recoveries of these aquatic populations and communities.
13. Cause and effect determinations conducted by DEP require macroinvertebrate and instream chemistry sampling, neither of which were conducted or are planned to be conducted in the UNTs. In the absence of previous baseline benthic macroinvertebrate samples from the UNTs, a reference area such as S-C96, should be chosen for future comparison. Habitat assessments conducted after sediment removal are inadequate to characterize the extent of stream bed impacts from the release of drilling fluid and remediation efforts that were attempted. Monitoring of the UNTs should include benthic macroinvertebrate and instream chemistry sampling. Provide this data for the reference area and include it in future reports on the monitoring of the UNTs.
14. Wetland H17 was impacted by the discharged drilling fluid and then by the clean-up measures. Other impacts include subsidence, grouting, and soil compaction. Residual amounts of drilling mud may also be present in stream sediments and wetland soils. Residue was not addressed by Sunoco's consultants. TT proposes to monitor the recovery of aquatic plants as a measure of successful restoration, but no direct monitoring of the hydrology that supports the wetland is planned. Due to the extent of impactful activities in the wetland and adjacent areas the monitoring should include a series of piezometers to measure and record the water table that supports the wetland. In addition, there was no detailed assessment of the wetland plants in terms of species

and distribution prior to the discharge. Thus, no direct comparisons can be made. Provide a work plan for assessing wetland hydrology for Wetland H17.

15. It is unclear how flow permanence (intermittent, perennial) determinations were made for the UNTs. An acceptable method (such as the North Carolina Division of Water Quality, Methodology for Identification of Intermittent and Perennial Streams and Their Origins, Version 4.1.1) should be utilized during the monitoring of the UNTs. Provide an explanation of how the flow permanence determinations were made for the UNTs, including any data gathered, and include an explanation of the method to be used in future monitoring of the UNTs.
16. The discharge occurred on August 10, 2020, but TT's sampling of field parameters did not occur until August 15, 2020, AECOM did not collect surface water and sediment samples until August 28, and samples for flux analyses were not collected until September 3. Accordingly, the validity of the samples as representative of water quality impacts during the inadvertent return is questionable. The implications of these delays in sampling were not considered in the impact assessments. Among other implications, the delayed sampling likely resulted in underestimating the degree of impact. Please examine and explain how Sunoco's estimation of the degree of impacts was influenced by the delay in sampling.
17. The turbidity sensor type installed on the U-52 field meter is not specified, but the maximum turbidity range on the available sensors for this meter is 1,000 NTU. Readings at the maximum are likely hard-capped and should be reported as greater than or equal to the maximum. A reading of 1,000 NTU was recorded on August 14, 2020, at MP 5 and should be reported as ≥ 1000 NTU. Future monitoring results should be similarly reported.
18. It is unclear if the appropriate Stream Habitat Data Collection Protocol was implemented. DEP protocols and assessment methods provide guidance for riffle/run prevalent waterbodies and low gradient waterbodies. As of 2018, the PADEP Water Quality Network Habitat Assessment (Form 3800-FM-BPNPSM0402) is no longer DEP's current data collection protocol. Current data collection protocols and field forms can be found at the link above. Provide the habitat assessments using DEP's current stream habitat assessment method and forms.
19. It is unclear if the UNTs were riffle/run dominant or low gradient. Use of the above habitat assessment should include a clear indication of a riffle/run dominant or low gradient stream, and the appropriate assessment form needs to be used. Restoration plans should include an assessment of whether restoration of riffle/run habitat should be included in the plan. Such a determination should include comparison to reference, nonimpacted tributaries to the lake.
20. A reference site selected by TT was the Styer Road Cove. This area was impacted by a 100–500-gallon IR during repairs to Sunoco's 8-inch petroleum pipeline in 2015. Explain why this site was chosen as a reference site as future use of this site as a

reference is questionable. Provide an assessment of other potential reference sites and justification for the chosen reference site.

21. AECOM's sediment sampling utilized a petite Ponar sampler, which due to its weight and closing action would likely resuspend an amount of the deposited drilling fluid and affect the sample results. Other sediment sampling equipment, such as an Eckman sampler or core sampler, would have created less resuspension. Explain how this resuspension was accounted for.
22. AECOM conducted visual assessments at 31 locations on August 17, 2020, and reported that only 13 of these 31 locations had visual evidence of drilling fluid. The sediment layer of drilling fluid was estimated to cover 1.9 acres and the deposit's thickness ranged from 0.5-in. to 6.0 in. Trace amounts (less than 0.5 percent) of bentonite were confirmed by X-ray Diffraction (XRD) analyses. AECOM reassessed the cove on September 2, 2020, and reported that the drilling fluid appeared to have been transported and re-deposited over an estimated 7.4 acres of Ranger Cove. AECOM states that the particles (assumed to be drilling fluid) appear to have dispersed outside the originally documented footprint in trace amounts. This conclusion is based on observational data and not analytical data. Discuss the rationale for this type of sampling.
23. Based apparently on the September 2 observations, AECOM considered only 7.4 acres of Ranger Cove's 33 acres to be impacted and proposed to utilize hydraulic dredging to remove the drilling fluid deposits from only 2.4 acres of the Cove. Eight months have passed since the AECOM September 2 assessment. Drilling fluid particles may have dispersed further in the reservoir. AECOM's conclusion that target dredging of a 1 to 2.4-acre area will remove 90 percent of the drilling fluid may be outdated. Sunoco should identify for review and approval, the depths and contours for removal of drilling fluids/bentonite that will result in ideal bathymetry for a healthy littoral community and fishery, without creating a concern that recreation or reservoir operations will resuspending drilling fluids, which have not been removed. When dredging is conducted, Sunoco must be able to demonstrate that the drilling fluid deposits have been removed to the satisfaction of the Agencies. A workplan for additional sampling and characterization of the sediments in Ranger Cove during dredging operations should be prepared and submitted for review and approval. Once approved, the workplan should be implemented contemporaneously with dredging operations.
24. AECOM's Cove Restoration proposal includes a concise treatability study that proposes use of polymers, geo-tubes, and sediment dewatering. Dredged sediment handling and final disposal are not discussed. An alternatives analysis of removal methods, including a no action alternative, was not conducted. No other removal method is discussed. DEP will require more details to assess this proposal. This matter will require additional coordination and approval. The proposed dredging, discharge of dredge dewatering and disposal of dredged material will need to be coordinated with DEP and the U.S. Army Corps of Engineers and comply with state

and federal law. Dredged solids must be handled according to DEP waste regulations and any discharge of solids filtrate collected in a lined berm must be addressed appropriately. Sunoco should prepare and submit for agency review and approval a Dredged Sediment Handling and Disposal Plan that explores various alternatives to address dredged sediment handling and final disposal of dredge spoils. All operational aspects of the dredge, including, but not limited to, access routes, staging, and potential additional impacts to Marsh Creek State Park, must be authorized in advance by the DCNR.

25. Restoration and restoration monitoring will need to meet all Special Conditions of Permit E15-862 and paragraph 4 of the September 11, 2020, Order. Pursuant to the conditions of Permit E15-862, monitoring is required for 5 years, not the 2 years suggested by AECOM. Restoration reports should be submitted to DEP quarterly beginning on July 31, 2021, as described in Sunoco's restoration discussions of the impact assessment report. The July report should detail and discuss all restoration conducted to date. The Report should also include the success of the restoration measures to date and include remedial plans to address any area where restoration is failing.
26. A macrophyte (SAV) survey completed in 2011 by DEP found Ranger Cove (along with the rest of the Lake) dominated by very dense Eurasian Water Milfoil and Hydrilla [misidentified by AECOM as elodea]. These invasives infest the Lake and affect water quality, aquatic life, and recreational activities. SAV harvesting, disposal and secondary effects on the Lake will need to be considered in the restoration plan.
27. DEP plankton collection methods can be found at the site below. Phytoplankton were collected separately. It is unclear from what depth the grab samples were taken or whether they were integrated/composite samples or single point. It is also unclear why a horizontal tow was completed rather than two vertical tows through the oxic zone. Further, it is unclear how the resampling of zooplankton due to laboratory error, and the additional time that had then passed since the event, may have affected the sample results. Preservation methods were not specified. Provide this data and include it in all future monitoring reports.
<http://files.dep.state.pa.us/Water/Drinking%20Water%20and%20Facility%20Regulation/WaterQualityPortalFiles/Methodology/2015%20Methodology/Quantitative%20Plankton%20Sampling.pdf>.
28. The last sentence of Section 3.5.2 (page 5) of AECOM's portion of the October 1 report states that, "Additionally, drilling fluids and sediment from unrelated construction/development activities may also be redistributed throughout the impact areas" Details on these other discharges of drilling fluid in the SH10 watershed need to be provided. If this statement cannot be supported, then it and other unsubstantiated statements in the Report should be deleted.

29. Section 3.5.4 (page 7) that states: “. . . that limited exceedances of conservative surface-water and sediment screening benchmarks . . . are unlikely to result in unacceptable risk to ecological receptors.” The Report offers no support for this statement. Please provide the support for this statement or delete it.
30. The last sentence of Section 3.5.5 dealing with the FLUX samples should be deleted or supported. The small number of samples collected for both assessments do not support these sweeping conclusions.
31. Sunoco must coordinate with PA Fish and Boat Commission (FBC) regarding the presence of the state-listed threatened redbelly turtle known to inhabit the lake. Dredging operations should be coordinated with the FBC and potential red-belly nesting and hibernation sites should be identified and avoided.

Items 1 through 31 should be responded to in detail sufficient to address the concerns raised.

RESTORATION OF MARSH CREEK STATE PARK ECOLOGICAL RESOURCES

The Agencies have evaluated the ecological damages to waters of the Commonwealth, including the tributaries, wetlands, and Marsh Creek Lake. This analysis was based on preexisting available information and studies, Sunoco’s response documents, and independent site assessments.

Specific restoration needs for ecological resources, including the tributaries, wetlands, and reservoir within the boundaries of Marsh Creek State Park, are set out below:

- A. Restoration of Wetland H17, Tributaries S-H10 and S-H11, and Mouth of Ranger Cove.
- B. Construction of a Forebay in Upper Ranger Cove.
- C. Construction of Fish Habitat and Other Aquatic Habitat Structures in Ranger Cove.
- D. Invasive Macrophyte Removal Replacing with Plantings of Native Species.

Each of these restoration needs are explained below:

- A. Restoration of Wetlands and Tributaries - The Agencies have identified a significant impact to stream substrates and benthic macroinvertebrate populations, including significant reduction of aquatic species after the IR event and subsequent remediation efforts have removed an entire benthic macroinvertebrate population within the tributaries. In addition, field studies show an alteration of the stream channel, and loss of pool and riffle structure. Pursuant to paragraph 4 of the September 11, 2020, Order, Sunoco must provide a restoration plan addressing substrate, bed, and banks, for review and approval. The restoration plan design should reduce shear stress and scour through a low bank-height ratio. The

restoration plan design should consider establishing braided tributary channels interconnected with a mosaic of floodplain wetlands to interact with the groundwater table in basal gravel beds, serving to filter pollutants and reduce in-stream temperatures, and provide gravels critical to the restoration of stream habitat diversity. The restoration plan design should entail grade control suitable to ensure the stream channel does not erode upslope.

- B. Construction of Forebay - As residual amounts of drilling mud remain in stream sediments and wetland soils, Sunoco's dredge design should consider inclusion of a hydraulic settling area, or forebay where the tributary/wetland complex enters the lake, allowing for the settling, capture, removal, and monitoring of the total sediment load from the contributing watershed for a period of 5 years.
- C. Construction of Fish Habitat – Pursuant to paragraph 4 of the September 11, 2020, Order, to remedy any dredge impacts to fish and aquatic habitat at the completion of the dredge, Sunoco must submit a habitat plan to address full restoration of fish and other aquatic habitat structures for review and approval. The plan should consider turtle basking platforms, catfish spawning boxes, 'spider humps,' 'post clusters,' and 'junior porcupine cribs.' The habitat plan should also address how the extent (breadth and post dredging contours) of the sediment removal will influence implementation of the habitat plan.
- D. Planting and Invasive Plants - Impacts arising from remediation and ongoing monitoring efforts have not taken into account a current assessment of ecological benefit and recreation losses. Trampled vegetation and soil compaction arising from accessing the impact area has detrimentally affected wetland plant communities and soils. Future impacts are anticipated to arise from foot and vehicular traffic, and equipment associated with dredging. Sunoco will need to submit a wetland vegetative community and submerged aquatic plant (SAV) restoration plan, including the suppression of non-native species and replanting and reseeding of native herbaceous and woody native species, for review and approval. The restoration plan should include a monitoring plan to monitor post restoration remediation efforts until successful native wetland plant communities are robustly established for a minimum of 5 years.

Please respond to the above within 30 calendar days. You may request a time extension, in writing, to respond to deficiencies beyond the 30 calendar days. Requests for time extensions will be reviewed and considered. You will be notified in writing of the decision to either grant or deny the time extension, including a specific due date to respond if the extension is granted.

Should you have any questions regarding the above comments, please contact Mr. Hohenstein by e-mail at johohenste@pa.gov and Ms. Bollinger by e-mail at hbollinger@pa.gov .

Sincerely,



John Hohenstein, P.E.
Environmental Program Manager, Waterways and Wetlands
Department of Environmental Protection



For Heather Bollinger
Chief, Park Operations and Maintenance Division
Department of Natural Resources and Conservation

cc: Chester County Conservation District
Upper Uwchlan Township
PA Fish and Boat Commission
U.S. Army Corps of Engineers - Philadelphia
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