



September 26, 2016

Program Manager, Waterways and Wetlands,  
Pennsylvania Department of Environmental Protection, Northeast Regional Office  
2 Public Square  
Wilkes-Barre, PA 18701

**Re: Comment: PennEast Pipeline Project**

The Delaware Riverkeeper Network (“DRN”) submits the following comment to the Pennsylvania Department of Environmental Protection (“Department”) with regard to the Section 401 water quality certification application and Chapter 105 water obstruction and encroachment permits for the PennEast Pipeline Project (the “Project”). This comment supplements DRN’s June submission regarding the same applications. The attached exhibits support the comments below, and identify additional concerns as well.

Where a natural gas pipeline impacts an exceptional value (“EV”) wetland, the Pennsylvania Department of Environmental Protection (“DEP”) may not grant a permit under Chapter 105 of the Pennsylvania Code or Section 401 of the Clean Water Act unless the applicant affirmatively demonstrates in writing that “[t]he project is water-dependent. A project is water-dependent when the project requires access or proximity to or siting within the wetland to fulfill the basic purposes of the project.” 25 Pa. Code § 105.18a(a)(2).

The Project is not a water dependent project. Pipeline projects and other linear infrastructure do not require access to water (such as a dock or a dam). Additionally, pipeline projects can use a construction technique called Horizontal Directional Drilling (“HDD”) to

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construct the pipeline underneath waterways and wetlands, avoiding impacts entirely. For this type of crossing, a specialized drill rig is used to advance an angled borehole below the stream or wetland to be crossed and, using a telemetry guidance system, the borehole is steered beneath the stream or wetland and then back to the ground surface. The hole is then reamed to a size, adequate for the pipe to pass through, and the pipeline is then pulled back through the bore hole.

The Department's records are replete with examples of pipeline projects that have utilized this technology. For example, the Department reviewed and accepted Tennessee Gas Pipeline Company's use of this technology to construct its Northeast Upgrade pipeline project under the Delaware River. *See* 42 Pa Bulletin 7478-7482. Additionally, the Department required Columbia Gas Pipeline to HDD under the Exceptional Value wetlands and at least seven streams for the Eastside Expansion Project. *See* Permit E15-846. Indeed, Tennessee Gas Pipeline Company recently described the viability of HDD technology in its application to the Department for Orion Pipeline Project.

Because pipeline projects are not water-dependent, the Department is prohibited from issuing Chapter 105 permits to the extent these projects impact an EV wetland. Because the Project proposes to impact numerous EV wetlands, the Department may not provide a Chapter 105 permit for the Project pursuant to 25 Pa. Code § 105.18a(a)(2).

Additionally, the Department is prohibited from approving construction and operational activity that will have an adverse impact on "Exceptional Value" wetlands as described by 25 Pa. Code § 105.18a.

Pennsylvania's water quality standards establish a clear regulatory regime with respect to the protections afforded to wetlands within the state. *See generally*, 25 Pa. Code 96.3(b) (incorporating the antidegradation protections in §§ 93.4a- 93.4d and 105.1, 105.15, 105.17, 105.18a, 105.20a and 105.451). The Department may not grant a permit or authorization for a proposed project "located in, along, across or projecting into an exceptional value wetland, or

otherwise affecting an exceptional value wetland” if the dam, water obstruction or encroachment will have an “*adverse impact on the wetland* as determined in accordance with §§ 105.14(b) and 105.15.” 25 Pa. Code § 105.18a(a)(1) (emphasis added).

The only reference in 25 Pa. Code 105.14(b) or 105.15 that specifically provides guidance to Respondents for making a determination of an “adverse impact” on wetlands is § 105.14(b)(13), which states that the Department must “consider the impact on the wetland’s values and functions.” *See* 25 Pa. Code §105.14(b)(13). Wetland functions are defined in the Pennsylvania Code to include, but are not limited to, the those set out in 25 Pa. Code § 105.1.

Therefore, to the extent that any project applicant seeking a Section 401 water quality certification or Chapter 105 permit proposes a project that results in the loss of wetland functionality as defined in § 105.1 of an “Exceptional Value” wetland, the impact must be considered “adverse.” *See also Pennsylvania Environmental Law and Practice*, ch. 6-4.3, Permit Review (8th ed. 2015) (“From all practical perspectives, it is rare that a project in or affecting an EV wetland will be permitted. Very few projects can meet . . . these tests”). Such an adverse impact finding dictates that the Project violates Pennsylvania’s water quality standards and the Department may not grant Chapter 105 permits for the Project. Construction and operational activity for the proposed Project will result in the permanent conversion of numerous “Exceptional Value” forested wetlands to emergent (nonforested) wetlands. Such a conversion is an adverse impact and prohibited by the Pennsylvania Code. Therefore, the Department may not issue Chapter 105 permits for this Project. A seven-year long hydrological study on water quality demonstrates that cutting trees can increase turbidity in nearby water bodies even if the trees and vegetation are left in place. *See* Marryanna, L. et al, “Water Quality Response To Clear Felling Trees For Forest Plantation Establishment At Bukit Tarek F.R., Selangor,” Vol. 18[1] *Journal of Physical Science* 33-45 (2007) (experimental plot was clear cut, left in place with a 65.6 foot wide buffer next to river, and river’s turbidity increased on-average by 279%). Another study,

also involving leaving cut trees/vegetation in place, demonstrates that even five months after deforestation, nitrates had increased and pH was altered in a water body, adversely impacting water quality. *See* Likens, G.L. et al., “Effects of Forest Cutting and Herbicide Treatment on Nutrient Budgets in the Hubbard Brook Watershed-Ecosystem” 40 *Ecol. Monogr.* 23-47 (1970) (study also showed large increases for all major ions, except for ammonium, bicarbonate, and sulfate). Additionally, the three Schmid expert reports further detail the myriad of ways in which wetlands are adversely impacted by the permanent conversion from forested wetlands to emergent or scrub shrub wetlands.

PennEast contends that the Project will be constructed in full compliance with all applicable state laws, and that in temporary work spaces and restored areas the natural landscape will return to its former, or some altered but healthy ecological status. In fact, experience shows that neither is true. The Delaware Riverkeeper Network has found that the construction methods proposed necessarily result in environmental harms and failures of mitigation/restored areas to return to ecological health.

As the result of document reviews and field investigations during construction of three sections of pipeline -- the TGP 300 line upgrade, TGP Northeast Upgrade Project (NEUP), and Columbia 1278 pipeline -- in the Upper Delaware River Basin the Delaware Riverkeeper Network documented:

- over 60 instances where best management practices (BMPs) were not present, inadequate or not functioning or in need of repair, maintenance or reinforcement,
- 4 instances of fueling being conducted in wetlands or near waterbodies,
- dozens of instances of poor signage and staking and mapping errors which sometimes led to impacts off of the permitted Right of Way (ROW), loss of trees outside the ROW, and inaccurate mitigation calculations,
- thermal impacts, extreme (and unreversed) soil compaction, nutrient impacts, benthic invertebrate changes from pipeline cuts, including for streams with exceptional value, high quality and or C-1 anti-degradation classifications,
- discrepancies between pipeline company monthly compliance reports and what work and activities to meet compliance and avoid pollution were actually occurring or not occurring on the ground. We also noted excessive lag time in the filing and/or public release of construction reports making for difficult follow up in the field. We documented

too few pipeline inspectors and a lack of oversight person-power for these extensive linear projects that spanned many miles and where work was going on simultaneously along the routes with little independent oversight.

Based on first hand observations and monitoring of these pipelines, it is clear that:

- Interstate natural gas pipeline projects result in a multitude of environmental impacts that inflict high levels of unnecessary ecological damage – this damage is not avoided, nor properly mitigated, despite the resource reports that are drafted or the guidance provided by the Department or other federal or state agencies;
- Violations of environmental laws are common place and an accepted part of pipeline construction – and compliance outweighs penalties and violations to the detriment of the environment and the public;
- Construction problems and potential violations are not properly responded to by the company, by the Department or by other state or federal agencies and mitigation does not undo the harms inflicted - as a result of both, pipelines inflict enduring and/or repetitive harms on natural resources; and
- Current or proposed guidance from the Department or other regulatory agencies do not prevent, avoid, or otherwise mitigate these ecological and public harms or the multitude of bad practices used by the pipeline companies.
- To the extent that the Department’s analyses does not build in a consideration that not all BMPs will be appropriately deployed, its approval of any certification or permits is arbitrary.

DRN’s observations in the field demonstrate and document that construction, operation and maintenance practices like those being proposed by the PennEast pipeline company, even when followed in full compliance with regulatory standards, results in unavoidable, unmitigated and irreparable harm and violations of state water quality standards and wetlands protections. In addition, DRN monitoring has documented that over and above these impacts, violations of law are commonplace during pipeline construction, operation and maintenance and as a result the violations of law, including water quality standards and wetland protections, are further exacerbated. The Department’s analysis needs to build in a consideration of the inevitable impacts and implications of construction activity for the project that will necessarily involve violations of the laws governing the construction activity.<sup>1</sup> Furthermore, PennEast’s applications are missing a tremendous amount of information. While the expert reports were focused on the

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<sup>1</sup> See discussion in this comment and attachment titled: Delaware Riverkeeper Network *Field Monitoring Report, Pipeline Construction & Maintenance Irreparably Harms Rivers, Wetlands and Streams*.

information missing in the application for a Federal Energy Regulatory Commission certificate, the same missing data and analysis cross applies to the applications before the Department. As an example of some of the information PennEast did not include in its materials see below:

1. Evaluation of the presence of working and abandoned mines near the proposed crossing of the Susquehanna River;
2. Evaluation of liquefaction hazards along the pipeline route and at the compressor station site;
3. Final landslide hazard inventory;
4. Necessary mitigation measures and post construction monitoring plan for liquefaction hazards and landslide hazards;
5. Evaluations to support routine/mitigation measures through geologically hazardous areas;
6. Final landslide inventory;
7. Landslide mitigation measures with locations;
8. Post construction landslide monitoring plan;
9. Final karst mitigation plan;
10. Results of all geotechnical investigations, including karst areas, necessary for HDD planning and design;
11. Final planned design of each HDD crossing;
12. A revised/final list, based on final surveys, of water wells and springs within 150 feet of any construction workspace (500 feet in areas characterized by Karst terrain);
13. Identification of the management and field environmental professionals responsible for notification for contaminated sites;
14. Documentation of the final hydrostatic test water withdrawal sources and locations;
15. Documentation of all necessary permits and approvals for each hydrostatic test water withdrawal source;
16. Identification of special construction methods for construction in extremely saturated wetlands;
17. Justification for required additional workspace to accommodate special construction methods for extremely saturated wetlands;
18. A revised/final table of impacts on vernal pools within or near the proposed workspaces based on completed surveys;
19. An Invasive Plant Species Management Plan for use during construction and operation;
20. Identification of appropriate seed mixes to be used during revegetation efforts;
21. Completed surveys identifying all potential suitable habitats for special status species in the project area;
22. Remaining site specific construction plans for all residences within 25 feet of the construction ROW and additional temporary workspaces (ATWS) including landowner approval;
23. Mitigation measures to minimize adverse impacts for the 7 residential developments, 3 commercial developments, 2 municipal developments and 1 hospital expansion identified as being within 0.25 miles of the project and its facilities;
24. Update on the status of the site specific crossing plans for each of the recreational and special interest areas listed as being crossed or otherwise affected by the pipeline;

Given all of these missing pieces, coupled with the missing, inaccurate and deficient information documented in this and other comments, it is impossible for the Department to assert that the Project will not violate any state water quality standards.

In addition to the missing and deficient information identified above, Delaware Riverkeeper Network experts have identified a multitude of deficiencies, inaccuracies, and missing information discussed in the attached reports including, but not limited to, the following missing information:

1. The layout of the proposed preferred route and the Bucks County Alternative fails to show the lateral pipeline to the proposed Gilbert Interconnect which requires crossing the Delaware River;
2. Full evaluation of alternatives given their watershed protection benefits;
3. The applications fail to consider the environmental ramifications of the open trenching method of wetland crossings, including impacts to groundwater flows that are so vital to the majority of wetlands impacted by this project;
4. The applications fail to disclose sufficient details about proposed water sources for hydrostatic testing;
5. HDD crossing plans including specific crossing area, specific methods to be used, location of mud pits, pipe assembly areas, all areas to be disturbed and/or cleared for construction, containment plans for spills, contingency plans, etc.;
6. HDD water discharge details including the specific volume of anticipated discharge, discharge method and impacts on receiving streams;
7. Standards used to guide HDD water withdrawals without preventing impacts on downstream ecological or human uses and needs;
8. The applications should provide a table of bedrock aquifers that includes relevant properties, including specific capacity statistics or well yields, and conductivity where available.
9. The applications needs to include map, analysis and evaluation of the recharge, runoff, pollution, vegetation, habitat, soil and erosion impacts resulting from the combination of soil type, slope, compaction potential and depth to bedrock for each section of pipeline along the proposed preferred route as well as alternatives.
10. The applications should include a complete inventory of springs and seeps within a quarter mile of the pipeline to adequately consider the changes which could occur due to pipeline construction.
11. The applications should present the result of a final karst study for the area and present plans for mitigating problems caused by constructing through karst or caused by rapid contaminant transport within karst.
12. The applications should include data or information regarding the mineral content of the soils to be crossed by the proposed pipeline and the results of leaching tests that should be required.
13. The applications should assess the potential for pipeline construction to generate acid generation or leach metals in all areas where it crosses mine spoil.

14. The applications should present avoidance and mitigation discussions focused on preventing the leaching and transport of acid and metals from the site.
15. The applications should provide a plume map of groundwater contamination and a map showing soils contamination from the Palmerton Zinc Pile Superfund site and assess the implications of the various proposed pipeline routes for water, groundwater and drinking water contamination.
16. The applications failed to consider: how pipeline construction and operations could affect recharge and shallow groundwater flow in aquifers near the proposed pipeline; preferential flow caused by trenching in the aquifer; potential contaminant transport enhanced by the trenching; groundwater drawdown caused by the trenching.
17. The applications fail to consider how the project construction would affect recharge rates, which are highly variable with the underlying geology, soil type and thickness, and topography controlling the actual recharge location.
18. The applications fail to consider the pipeline trench as a pathway for contamination.
19. The applications fail to define and analyze a reasonable range of alternatives.
20. The applications fail to account for the public health impacts of the proposed Project.
21. The applications fail to include an analysis of ecosystem services lost due to the construction, operation and maintenance of the pipeline.
22. The applications fail to require sufficient information to determine the potential extent of blasting at each stream or wetland crossing.
23. The applications fail to consider site specific conditions to determine whether blasting in stream channels may be required.
24. The applications fail to address that proposed pipeline construction practices and long-term maintenance of the ROW in a non-forested condition will alter land surface conditions and result in greater stormwater impacts.

The attached report by Dr. Jim Schmid identifies many more problems with PennEast's applications. Dr. Schmid's report demonstrates just how deficient, inaccurate, and misleading PennEast has been in its applications. For more detail on the items identified below see attached report by Dr. Schmid.

- The size (acreage) of some wetlands along the proposed pipeline were undermapped significantly.
- There are internal discrepancies in the reported acreage of many delineated wetlands in the PennEast documents
- Most wetlands within and along the proposed pipeline right-of way (ROW) are not visibly flagged in the field making field verification and ground truth difficult.
- Some wetlands which should be classified as "exceptional value" pursuant to Pennsylvania law were incorrectly identified by the applicant as "other"
- An assessment of the functions and values of existing wetlands has not been done, and no evaluation of proposed impacts on the functions and values of wetlands has been done
- Additional wetlands exist within approximately 19.4 miles of right-of-way (24% of the proposed pipeline Study Area) that have not been investigated because access was not (initially) granted. Impacts to those wetlands have not been acknowledged, calculated, or mitigated for
- No "existing use" analysis of affected streams has been done, possibly leading to an

undercount of the number and extent of Exceptional Value Wetlands.

- Bog turtle searches did not encompass the entire area requested by USFWS
- Certain areas of suitable bog turtle habitat were not acknowledged by the applicant
- The Department cannot develop an appropriate mitigation plan based on the information and analysis in the applications with regard to wetlands because the applications provide “no evidence that the functions and values of each wetland proposed to be impacted have been determined or evaluated.”
- Most of the wetlands data is unreliable because it is largely “based on available remote sensing mapping, and not on field-based investigations.”
- There are numerous “instances where wetlands shown on project drawings appear to be significantly under-mapped”

To the extent these deficiencies in accurately describing both the size and quality of the wetlands subject to construction for the Project, the Department cannot accurately determine the appropriate scope of mitigation necessary to compensate for these irreversible and unavoidable harms. For example, many of the wetlands in the Project area are not appropriately classified pursuant to the Pennsylvania Code and the requirements therein, thus preventing the Department and the public from considering the quality of the wetlands impacted. Indeed, there is no data in the applications analyzing wetland quality outside of this classification system, therefore it is critical that these classifications are exactly accurate (which they are not).

Other critical deficiencies include, but are certainly not limited to:

- It is impossible, from the information presented the PennEast application materials, to “directly determine how many stream crossings of Exceptional Value streams in Pennsylvania will involve open cuts in areas that are currently forested conditions, on public lands, on steep slopes or erosive soils, or any combination of the above conditions that can impact water quality and that should inform pipeline location and construction decisions. It is impossible to easily determine if these crossings also include Additional Temporary Work Space (ATWS) areas within 50 feet of the waterbody that further increase disturbance and the potential for water quality impacts, or are located in geologic formations that may require blasting within the stream channel. The PennEast application materials do not include any comprehensive compilation and evaluation of the data at stream and wetland crossings, or any indication that site specific conditions and their impact on water quality (or other environmental impacts) have informed decisions related to project location and project construction methods”<sup>2</sup>

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<sup>2</sup> Michelle Adams & Marc Henderson, Water Resources Engineers, Meliora Design, LLC, *Professional Review & Comment of the Draft Environmental Impact Statement and Supporting Documents Related to Surface Water Impacts of the Proposed PennEast Pipeline Project*, September 2016

- Many of the “dry crossings of streams are in areas of severely erodible soils (103 dry crossings), rugged terrain with slopes greater than 30% (34 dry crossings), and other (often multiple) site specific constraints that increase the likelihood and potential for adverse water quality impacts. Thirty (30) dry stream crossings are located at sites with both severely erodible soils and rugged terrain. This information must be gleaned from multiple sources within the PennEast application and is not presented comprehensively in either the PennEast application materials . . . The [applications] fail[] to consider these site specific conditions in determining pipeline location and suitability of construction methods to minimize impacts or protect water quality.”<sup>3</sup>

- Beyond a general list of potential impacts of pipelines construction on water resources, the application materials “do[] not quantify either the existing conditions or describe how the pipeline would affect the existing conditions.”<sup>4</sup>

- “The . . . supporting materials provided by PennEast fail to consider the unique, site specific conditions at each individual proposed stream and wetland crossing, and the corresponding potential adverse water quality impacts associated with stream crossings, including open cut crossings. The [applications] fail[] to comprehensively evaluate each stream crossing with regards to conditions such as water quality, erosive soils, existing land use and forested areas, existing slopes, riparian buffers, and the potential need for in-stream blasting. Lacking consideration of the site specific conditions at each crossing, the [applications] fail[] to require adequate location and construction recommendations to protect water quality, as well as construction techniques specific to conditions at each crossing. The proposed stream and wetland crossing locations, methods of construction, and long-term land use conditions appear to be based on the needs and preferences of PennEast and not informed by site specific conditions.”<sup>5</sup>

- “Importantly, the supporting documentation provided by PennEast fails to provide stream and wetland crossing information in a manner that allows FERC and other reviewing agencies to evaluate the site specific conditions at each stream crossing...”<sup>6</sup>

- The application materials fail to consider or even acknowledge stormwater impacts from pipeline construction, as no stormwater management is proposed or required for the pipeline area.<sup>7</sup>

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<sup>3</sup> Michelle Adams & Marc Henderson, Water Resources Engineers, Meliora Design, LLC, *Professional Review & Comment of the Draft Environmental Impact Statement and Supporting Documents Related to Surface Water Impacts of the Proposed PennEast Pipeline Project*, September 2016

<sup>4</sup> Tom Myers, Ph.D. *Technical Memorandum Review of Draft Environmental Impact Statement, Proposed PennEast Pipeline, Docket No. CP15-558-000, FERC\EIS: 0271D*, August 31, 2016

<sup>5</sup> Michelle Adams & Marc Henderson, Water Resources Engineers, Meliora Design, LLC, *Professional Review & Comment of the Draft Environmental Impact Statement and Supporting Documents Related to Surface Water Impacts of the Proposed PennEast Pipeline Project*, September 2016

<sup>6</sup> Michelle Adams & Marc Henderson, Water Resources Engineers, Meliora Design, LLC, *Professional Review & Comment of the Draft Environmental Impact Statement and Supporting Documents Related to Surface Water Impacts of the Proposed PennEast Pipeline Project*, September 2016

- The application materials fail to accurately examine the potential for landslides resulting from site preparation, construction activities, and post-construction changes to soil properties and vegetative cover (not just those triggered by seismic events) – the Erosion and Sediment Control Plan relied upon by FERC and PennEast to avoid this threat is, according to expert review, lacking with respect to any actual special measures proposed for steep sloped areas to prevent landslides from occurring.<sup>8</sup>

- The application materials “evaluation of soil compaction impacts based primarily on a soil’s drainage classification is incorrect.”<sup>9</sup>

- The application materials fail “to consider the site specific conditions that will impact stormwater and erosion, including existing land cover, steep slopes, soil erosion potential, revegetation potential, and proximity to waterbodies, as well as pipeline maintenance practices. There is no correlation of site specific data and information related to the factors that impact stormwater runoff and erosion in the DEIS or supporting materials. The DEIS fails to evaluate the varying conditions that will impact stormwater and erosion, and correspondingly fails to require site specific construction techniques and stormwater management practices.”<sup>10</sup>

- The application materials fail “to address the permanent, long term changes to land use cover and soil conditions, and the corresponding increase in stormwater runoff and erosion. As a result of pipeline construction, there will be permanent long term water quality impacts related to stormwater runoff, including increases in the rate, volume, and frequency of stormwater runoff.”<sup>11</sup>

- The application materials fail to adequately assess of hydrostatic testing impacts and do not consider data generated on hydrostatic test water showing “phosphorus levels (total phosphorus) ranging from 0.03 mg/l to 0.07 mg/L; which is enough to stimulate an algae bloom” or test results showing that hydrostatic test “return water is typically very low in dissolved oxygen” which “could cause a temporary but significant impact to the organisms residing in a stream especially during low flow conditions or during the summer when DO saturation is low.”

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<sup>7</sup> Michelle Adams & Marc Henderson, Water Resources Engineers, Meliora Design, LLC, *Professional Review & Comment of the Draft Environmental Impact Statement and Supporting Documents Related to Surface Water Impacts of the Proposed PennEast Pipeline Project*, September 2016

<sup>8</sup> Princeton Hydro, *Technical Review of Volume I FERC Draft Environmental Impact Statement Submitted for PennEast Pipeline Project*, September 2016.

<sup>9</sup> See discussion in: Princeton Hydro, *Technical Review of Volume I FERC Draft Environmental Impact Statement Submitted for PennEast Pipeline Project*, September 2016.

<sup>10</sup> Michelle Adams & Marc Henderson, Water Resources Engineers, Meliora Design, LLC, *Professional Review & Comment of the Draft Environmental Impact Statement and Supporting Documents Related to Surface Water Impacts of the Proposed PennEast Pipeline Project*, September 2016

<sup>11</sup> Michelle Adams & Marc Henderson, Water Resources Engineers, Meliora Design, LLC, *Professional Review & Comment of the Draft Environmental Impact Statement and Supporting Documents Related to Surface Water Impacts of the Proposed PennEast Pipeline Project*, September 2016

- The application materials fail to do “not address potential groundwater contamination events associated with the operation and maintenance of the pipeline, including the long-term application of herbicides to control the growth of vegetation or the management of invasive plants within and adjacent to the pipeline ROW.”<sup>12</sup>

- In addition, the failure to provide the public with GIS referenced routes and images so they could be plotted in interactive maps for the public to review files is grossly negligent and yet another way that the public has not been provided all of the information needed to engage in the review and comment process.

- The application materials conclude that approximately 0.13 acre of vernal pool habitats would be impacted by construction of the Project, with 0.11 acre permanently impacted during operation. Spot checks in short sections of already surveyed areas of the route make clear that many sensitive vernal pools and groundwater seeps and wetlands have been missed and not accurately depicted by field surveys.

The application materials note that seven wetlands in Pennsylvania are considered suitable bog turtle habitat. However, Save Carbon County hired an independent USFWS qualified bog turtle surveyor (Jason Tesauro) who identified nine properties containing one or more suitable bog turtle wetlands in the Hunters Creek drainage (part of Aquashicola Creek watershed) alone. Tesauro’s report was posted on the FERC docket and also filed with the USFWS. The following are areas that were identified to have suitable bog turtle habitat by Save Carbon County’s consultant in September of 2015 and were not surveyed or were left out of the report by PennEast’s consultant AECOM.

1. Angun property, MP 44.8

1 suitable bog turtle area identified by Tesauro missing from AECOM July 2015 bog turtle survey report. Parcel listed as unsurveyed on PennEast’s March 2016 wetland delineation maps.

*“The area was small (~0.1 acre), but **clearly consistent with suitable bog turtle habitat criteria.**”* – Jason Tesauro on Angun property

2. Conner property, MP 44.9

1 suitable bog turtle area identified by Tesauro missing from AECOM July 2015 bog turtle survey report. Parcel listed as unsurveyed on PennEast’s March 2016 wetland delineation maps.

3. Maroney property, MP 45

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<sup>12</sup> Princeton Hydro, *Technical Review of Volume I FERC Draft Environmental Impact Statement Submitted for PennEast Pipeline Project*, September 2016.

1 suitable bog turtle area identified by Tesauro missing from AECOM July 2015 bog turtle survey report. Parcel listed as unsurveyed on PennEast's March 2016 wetland delineation maps.

*"Collectively, these patches comprised 0.2 acres of suitable bog turtle habitat."* – Jason Tesauro on Conner and Maroney properties

4. Knirnschild property, between MP 45 and 45.1

2 suitable bog turtle areas identified by Tesauro missing from AECOM July 2015 bog turtle survey report. Parcel was fully surveyed on PennEast's March 2016 wetland delineation maps.

*"The southern terminus of the Sei Pike valley (Knirnschild property--closest to the intersection of Sei Pike and Spruce Hollow Roads) contained the largest area of suitable bog turtle habitat along Sei Pike...The potential habitat area was approximately 0.4 acres."* – Jason Tesauro on Knirnschild property

5. Fernandez property, between MP 45 and 45.1

1 highly suitable bog turtle area identified by Tesauro missing from AECOM July 2015 bog turtle survey report. One wetland, 052915\_JC\_1001\_PEM, is listed as unsuitable bog turtle habitat in AECOM's report. Part of parcel listed as fully surveyed and another part is listed as unsurveyed on PennEast's March 2016 wetland delineation maps.

*"...the Fernandez site contained a 0.2-acre elongated area of spring-fed marsh and shrub swamp situated between the base of the Spruce Hollow Rd embankment and the stream...The Fernandez site, although small, contained highly suitable potential bog turtle habitat."* – Jason Tesauro on Fernandez property

6. Mosier property, between MP 45 and 45.1

1 suitable bog turtle area identified by Tesauro missing from AECOM July 2015 bog turtle survey report. Part of parcel listed as unsurveyed and other part does not appear on PennEast's March 2016 wetland delineation maps.

*"The approximate size of the suitable bog turtle habitat on the Mosier property was 1 acre."* – Jason Tesauro on Mosier property

7. Randy property, MP 45.2

1 suitable bog turtle area identified by Tesauro missing from AECOM July 2015 bog turtle survey report. Parcel does not appear on PennEast's March 2016 wetland delineation maps.

8. Vees property, MP 45.7

1 suitable bog turtle area identified by Tesauro missing from AECOM July 2015 bog turtle survey report. One wetland east of the property, 051115\_JC\_1001\_PEM, is listed as unsuitable bog turtle habitat in AECOM's report. Parcel does not appear on PennEast's March 2016 wetland delineation maps.

*“The wetland contained a 1.5 acre spring fed marsh with deep mud and muck soils, rivulets, and shallow-water swales...Approximate habitat size: 0.54 acres...The two properties evaluated along the Hunters Creek contained a significant area of emergent and scrub-shrub wetlands, much of which **appeared suitable for bog turtles.**” – Jason Tesauro on Randy and Vees properties*

9. Anthony property, MP 45.9

2 highly suitable bog turtle areas identified by Tesauro missing from AECOM July 2015 bog turtle survey report. Parcel listed as unsurveyed on PennEast’s March 2016 wetland delineation report.

*“The wetland system on the Anthony property encompassing the headwaters above the farm’s outbuildings to the marsh along Stagecoach Road East **supports highly suitable bog turtle habitat.**” – Jason Tesauro on Anthony property*

The failure to accurately delineate these wetlands, and therefore failure to accurately classify them pursuant to the Pennsylvania Code, renders the DEIS legally and factually deficient. The expert report is attached.

PennEast presumes that there is no difference between the hydrologic response of a forested woodland and the compacted, post-construction pipeline right-of-way. As a result, there is no consideration of construction practices to avoid or mitigate the harms inflicted on these natural resources and thereby prevent the ecological harm that will result in the form of lost habitat, increased stormwater runoff, reduced groundwater infiltration and recharge, inability of vegetation to regrow etc.

As proposed for the PennEast Pipeline,

“Compaction in construction work spaces will not be restored by simply regrading to pre-existing contours, retilling at the surface, and reseeding the area as currently outlined in the permit application materials. Heavy equipment used in the construction of the pipeline will inherently compact work areas to depths deeper than conventional surface tilling can reach. Compaction creates conditions that inhibit the germination of plants and plant root growth. Existing topsoil will not be segregated and restored, but will be lost in the construction process. The establishment of vegetative cover within the pipeline ROW will be

more difficult once surface soils are compacted, and forested woodland will not be restored. <sup>13</sup>

“When vegetation regrowth is limited, the likelihood of accelerated erosion is increased. When runoff cannot infiltrate, is not slowed at the surface by vegetation, and has direct contact with exposed soils, sediments are much more likely to be transported to downhill streams and wetlands. This is of specific concern on significant portions of the pipeline right-of-way in proximity to stream crossings, where soils to be disturbed by pipeline construction are classified as Severe Erosion Potential (79), Poor Vegetation (122), and Rugged Terrain with slopes greater than 30% (28). These areas are especially prone to erosion and sediment transport to waterbodies.” <sup>14</sup>

The application materials fail to recognize these impacts and fail to consider alternatives to avoid or mitigate the harms including constructions practices that reduce the removal of pre-existing vegetation, that limit the building envelope, and that prevent compaction during construction – practices discussed in the attached report by expert Leslie Sauer.

The application did not consider how pipeline construction and operations could affect recharge and shallow groundwater flow in aquifers near the proposed pipeline. Areas where the pipeline compacts soils over critical recharge areas, especially on ridge tops and valley bottoms, would increase runoff and decrease recharge. Recharge supports baseflow, therefore decreasing recharge as a result of the construction and operation of the pipeline will affect baseflow in streams. Most importantly groundwater discharge would be decreased during low flow periods. These impacts are not considered in the application.

Additionally, pipeline construction in valley bottoms affects groundwater flow in other ways. If the conductivity of the backfill is higher than that of the surrounding aquifer material,

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<sup>13</sup> Michelle Adams & Marc Henderson, Water Resources Engineers, Meliora Design, LLC, *Professional Review & Comment of the Draft Environmental Impact Statement and Supporting Documents Related to Surface Water Impacts of the Proposed PennEast Pipeline Project*, September 2016

<sup>14</sup> Michelle Adams & Marc Henderson, Water Resources Engineers, Meliora Design, LLC, *Professional Review & Comment of the Draft Environmental Impact Statement and Supporting Documents Related to Surface Water Impacts of the Proposed PennEast Pipeline Project*, September 2016

the trench could intercept flow to the stream and cause it to flow elsewhere, possibly never to reach the stream. If the conductivity is lower than that of the surrounding aquifer material, it could deflect the groundwater flow away from the stream, although it could also cause the groundwater flow to discharge to the surface away from the stream. These impacts are not considered in the application. In order to comply with Pennsylvania's water quality standards, PADEP must ensure the following:

- PennEast must complete site-specific impact analyses that considers the potential for pipeline construction effects, including compaction and vegetation removal, to change recharge patterns.
- PennEast must complete site-specific impact analyses showing how the changed location and rates of recharge would change baseflow in streams and its wetlands.
- PennEast must propose methods to monitor these effects. Piezometers should be installed in wetlands downgradient from the pipeline to monitor changes in water levels and compare those changes to predicted changes. Piezometers should also be installed in strategic locations of the trench backfill and just outside the trench to determine whether the trench is causing drawdown or whether preferential flow is occurring (see Sections 3.2 and 3.3).
- PennEast must propose methods to mitigate these effects. If the analysis shows changes in recharge or flow patterns, the backfill could have drains installed to allow cross-trench flow. If necessary the surface of the pipeline could be scarified to increase infiltration through the soils.

Furthermore, groundwater follows the path of least resistance, which usually means the path with the highest conductivity. All but the most homogeneous formations have pathways that are much more conductive than the overall formation. The proportion of the overall flow through an aquifer that occurs through these natural pathways can be quite large. Pipeline construction would create preferential flow pathways in two ways. One would be by creating a trench with higher conductivity than the surrounding formation. Groundwater would tend to flow into and then through the high-conductivity trench. However, PennEast and the Department has not even acknowledged this potential issue, much less analyzed it. Preferential flow is most probable along slopes where groundwater flows from ridges to valley bottoms, although the effects could also occur in valley bottoms and ridgetops.

A pipeline causes drawdown by providing preferential flow paths, as described in the previous section, which will change flow gradients and groundwater levels. This would affect areas depending on shallow groundwater tables, which would include wetlands where small difference in water level that persists for a substantial time period could change the character of the wetland. It would also include areas that have vegetation that depends on shallow groundwater. Lowering the water table, even a small amount, for a substantial period could have long term effects on the vegetation types, whether formally delineated as a wetland or not. The application does not analyze how the pipeline would affect any specific area with important vegetation types or aquatic species. There are broad statements about temporary impacts during construction, but there no analysis of the change in groundwater flow patterns as described herein.

The proposed pipeline would cross several contaminated areas, but PennEast does not address how they would be avoided or how contamination released due to construction would be mitigated. PennEast claims they will eventually sample sediments. “PennEast will develop a plan for collecting an appropriate number of sediment samples within the Susquehanna River to determine whether PCBs are present in the Project area. ... In the event that PCBs are found ... PennEast will consult with the appropriate agencies to determine whether the concentration present is at a level that would warrant PennEast to take additional precautions to prevent the release of PCBs into the water column”. Thus, PennEast is requesting water quality certification without even providing evidence regarding whether it will encounter conditions that would cause PCBs to be released from stream sediments. Additionally, there is no inventory of sediment quality for any water crossings, it is impossible to conclude the project will not cause a massive release of PCBs or other contaminants from river crossings, especially the dry crossing of the Susquehanna River.

Sincerely,

/s/ Aaron Stemplewicz

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