



June 22, 2019

District Engineer
U.S. Army Corps of Engineers, Philadelphia District
Wanamaker Building
100 Penn Square East
Philadelphia, PA 19107-3390
Penneast-Comments@usace.army.mil

RE: Comment Letter: Public CENAP-OP-R –Re. CENAP 2014-00975– PennEast Pipeline Company’s PennEast Pipeline Project

To Whom It May Concern:

The Delaware Riverkeeper Network, and the Delaware Riverkeeper (collectively “DRN”) submit the following comments on the supplemental application for a Department of Army permit pursuant to Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act with respect to the PennEast Pipeline Project (PennEast Pipeline) proposed by PennEast Pipeline Company, LLC (“PennEast”). Clean Air Council joins in these comments.

According to the Corps Public Notice, PennEast is proposing to construct 120.2 miles of new 36-inch diameter natural gas pipeline. The overall project will begin with two interconnects with existing intrastate natural gas pipelines (the Wyoming Interconnect at Mile Post 0.0 connects to an Energy Transfer Partners, L.P pipeline and the Springville Interconnect at Mile Post 0.3 connects to a Williams Partners pipeline) in Dallas Township, Luzerne County, Pennsylvania to a terminal point along the existing Transco Pipeline in Hopewell Township, Mercer County, New Jersey. The proposed overall project also includes the proposed 0.6 mile Blue Mountain lateral consisting of , the 2.1 mile Hellertown lateral consisting of 24-inch diameter pipe, the 0.6 mile Gilbert Lateral consisting of 12-inch diameter pipe, and the 1.5 mile Lambertville lateral consisting of 36-inch.

The project includes hundreds of stream and wetland crossings in the Susquehanna River and Delaware River watersheds. PennEast’s supplemental 404 permit application to the Army Corps Philadelphia District, as noticed in the May 23, 2019 Public Notice CENAP-OP-R re Application no. CENAP 2014-00975, includes four individual permits for four separate single and complete crossings of wetlands associated with the PennEast project:

DELAWARE RIVERKEEPER NETWORK
925 Canal Street, Suite 3701
Bristol, PA 19007
Office: (215) 369-1188
fax: (215)369-1181
dm@delawareriverkeeper.org
www.delawareriverkeeper.org

- IP 6 - Wetland complex (Carbon County).
- IP 7 - Wetland complex (Carbon County).
- IP 8 - Wetland complex and unnamed tributaries to Hokendauqua Creek (Northampton County).
- IP 9 – Wetland complex and unnamed tributaries to Bull Run (Northampton County).

However, the Corps cannot adequately evaluate the probable impacts, including cumulative impacts, of the proposed activity and its intended use on the public interest, on the 22 factors that it is required to consider as part of its public interest review per 33 C.F.R. § 320.4(a)(1)., including “conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shore erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership and, in general, the needs and welfare of the people,” without considering these individual permits in the context of the Project as a whole. Additionally, the Corps relies heavily on the Project information provided by FERC’s FEIS which includes information for the Project as a whole, not just the individual permit areas described in Corps Public Notice. As such, this comment largely addresses the project-wide impacts of proposed pipeline. We also speak directly to the deficiencies of, and errors in, the EIS, (both the FEIS and the DEIS) thereby demonstrating that the Corps was not justified in relying upon this document for its decision-making.

PennEast’s Section 404 application for a permit from the United States Army Corps of Engineers (“Corps”) must be denied because:

- 1) The adverse effects of the proposed Project outweigh its potential benefits and do not meet the standards for the Corps’ public interest review;
- 2) the Project conflicts with the requirements of a Clean Water Act Water Quality Certification;
- 3) the Corps has failed to establish a baseline for its public interest review; and
- 4) FERC’s FEIS and the materials provided by PennEast continue to include inaccurate, false and misleading information and that the information provided is incomplete in significant and substantively important ways, and as such the Corps does not have the information it needs for informed or accurate decision-making.

The information that has been garnered from the Corps’ Public Notice, the FEIS materials, the filed resource reports, filings with other regulatory agencies, that were then vetted, analyzed and in some cases field verified by third party experts and DRN, demonstrates that this project will inflict substantial adverse environmental and community impacts regardless of implementation of the supposed mitigation recommended by PennEast or by FERC. In addition to the comments specifically discussed here, the expert reports filed here within include a number of factual and legal deficiencies that are provided and adopted by DRN and incorporated by reference. We note from the outset that while a number of our expert reviews and comments were directed to the Draft EIS (DEIS) as that was the FERC document subject to public comment, the comment referenced in those reports and included in this comment are just as relevant to final EIS documents, and other materials submitted by PennEast and/or relied upon by the Corps in making its assessments to date.

According to the FEIS, construction of the project will impact 1,613.5 acres of land (1,065.2 acres for pipeline facilities, 110.1 acres for access roads; 372.3 acres for pipe and contractor ware yards, 31.1 acres for above ground facilities). According to the FEIS, the project will at least cut through 255 waterbodies (including 159 perennial, 45 intermittent, 40 ephemeral, 11 open water), 633 acres of forest, 91 wetlands,

impact “several” vernal pools, and infringe upon and damage habitat for threatened and endangered species of bat, sturgeon, snake, turtle, mussels and more. This comment and others will prove that these impacts are sorely understated, incomplete, and misrepresent the footprint and damage that would be inflicted if the PennEast pipeline were built.

I. The adverse effects of the proposed Project (even as deficiently described) outweigh its potential benefits and do not meet the standards for the Corps’ public interest review necessary to issue a 404 permit.

The Corps must deny a Section 404 permit when issuing the permit would be “contrary to the public interest,” 33 C.F.R. § 320.4(a)(1). During a public interest review, the Corps must consider “all the facts” and then deny a permit if “the costs of the project outweigh[] its potential benefits and . . . the public interest would best be served by denying the permit.” *Buttrey v. United States*, 690 F.2d 1170, 1185 (5th Cir. 1982). To evaluate the project's effects on the public interest, the Corps must balance the “benefits which reasonably may be expected to accrue from the proposal” against the “reasonably foreseeable detriments.” 33 C.F.R. § 320.4(a)(1). This “careful weighing” considers “[a]ll factors which may be relevant to the proposal . . . including the cumulative effects thereof.” *Id.* As in any such analysis, “[s]imple logic, fairness, and the premises of cost-benefit analysis . . . demand that a cost-benefit analysis be carried out objectively.” *Sierra Club v. Sigler*, 695 F.2d 957, 979 (5th Cir. 1983). For example, the Corps' public interest review may not “mention the positive anticipated impact of the proposal on jobs and municipal taxes” but “sidestep [] any consideration of adverse economic effects.” *Hough v. Marsh*, 557 F. Supp. 74, 86 (D. Mass. 1982).

The Corps' regulations list over twenty factors (including “conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shore erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership and, in general, the needs and welfare of the people,”) to evaluate during a public interest review, including “conservation, economics, aesthetics, general environmental concerns, [and] wetlands.” 33 C.F.R. § 320.4(a)(1). Every permit decision must also consider “the public and private need” for the work, “the practicability of using reasonable alternative locations and methods to accomplish the objective of the . . . work,” and “[t]he extent and permanence of the beneficial and/or detrimental effects” of the proposed project. *Id.* § 320.4(a)(2).

Even with the immense deficiencies and inaccuracies in the information found in the Corps Public Notice and the FERC FEIS, it is clear that the PennEast Pipeline will result in extremely adverse effects to almost every category that the Corps is required to consider, with or without the mitigation the Corps postures, given the reality of the harms to be inflicted. The probable adverse impacts, including cumulative impacts, of the proposed PennEast Pipeline and its intended use on the public interest, which are generally absent from the Corps’ Public Notice and FERC FEIS, are outlined below. These reasonably foreseeable adverse impacts far outweigh any benefits which reasonably may be expected to accrue from the proposal, making clear that the proposed project would be contrary to the public interest.

a. The adverse Economic effects of the Project on the public far outweigh any reasonably foreseeable benefit.

In its public interest review, the Corps is required to consider “all the facts” and then deny a permit if “the costs of the project outweigh[] its potential benefits and . . . the public interest would best be served by denying the permit.” *Buttrey v. United States*, 690 F.2d 1170, 1185 (5th Cir. 1982). To evaluate the project's effects on the public interest, the Corps must balance the “benefits which reasonably may be expected to accrue from the proposal” against the “reasonably foreseeable detriments.” 33 C.F.R. § 320.4(a)(1). This “careful weighing” considers “[a]ll factors which may be relevant to the proposal . . . including the cumulative effects thereof.” *Id.* As in any such analysis, “[s]imple logic, fairness, and the premises of cost-benefit analysis . . . demand that a cost-benefit analysis be carried out objectively.” *Sierra Club v. Sigler*, 695 F.2d 957, 979 (5th Cir. 1983). For example, the Corps' public interest review may not “mention the positive anticipated impact of the proposal on jobs and municipal taxes” but “sidestep [] any consideration of adverse economic effects.” *Hough v. Marsh*, 557 F. Supp. 74, 86 (D. Mass. 1982).

According to a robust and thorough analysis of the economic impacts of the proposed Project conducted by Key Log Economics,¹ the adverse economic impacts (or costs to the public) would outweigh the economic benefits claimed by PennEast by up to \$54.3 billion:

“Adding up all one-time recurring costs, and discounting those future costs to 2017, we estimate the total external costs of PennEast Pipeline to be between \$13.3 and \$56.6 billion. By contrast, the pipeline would in the words of FERC’s DEIS provide only “minor” benefits in the form of economic impact during construction and operation of the pipeline. Using PennEast LLC’s own estimates (Econsult Solutions & Drexel University School of Economics, 2015) and applying the same methods to calculate the present value of all future benefits, the pipeline promises a total of \$2.3 billion in economic impact over 30 years of operation. This means for every dollar of benefit promised, the PennEast Pipeline would impose between \$5.85 and \$24.97 in costs.”

This disparity at the expense of the public interest, while likely greatly underestimated (as explained below), clearly demonstrates that the adverse impacts from the Project far outweigh the potential economic benefits of the Project and as such mandate that the Corps deny the permit.

As outlined below and explained in further detail in the accompanying expert analyses,² the construction and operation of the Project would greatly adversely impact the economic resources of the area, in both the near and long-term. The potential adverse environmental-economic effects include: effects on ecosystem service value, effects on property value, the social cost of carbon, effects on economic development, and other impacts not quantified such as public health impact and impact on county community services.

For each of these categories with quantifiable economic data available, expert analysis conducted by Key Log Economics found that the one-time and annual costs to the public that would result from the proposed Project would be:

Lost ecosystem service value (“the benefits nature provides to people for free”): such as for water and air purification, aesthetics, and recreation “that will become less available and/or less valuable due to the PE’s construction and operation.”

- o Over the one-year construction period (a one-time cost): **\$6.3 to \$22.1 million**

¹ *Economic Costs of the PennEast Pipeline*, Spencer Phillips, PhD, et al., Key-Log Economics, LLC. January 2017.

² *Economic Costs of the PennEast Pipeline*, Spencer Phillips, PhD, et al., Key-Log Economics, LLC. January 2017.

; See also letter dated September 9, 2016 written by Key-Log Economics to Secretary Kimberly Bose & Deputy Secretary Nathaniel J. Davis.

- o In the ROW and in other permanent infrastructure (annual): **\$2.6 to \$9.8 million**

Property value: “loss of private property value as owners and would-be owners choose properties farther from the pipeline’s right-of-way, evacuation zone, compressor station, and viewshed.”

- o Total property value lost (a one-time cost): **\$159.7 to \$177.3 million**
- o Resulting loss in property tax revenue (annual): **\$2.7 to \$3.0 million**

The social cost of carbon (the economic cost of harm associated with carbon emissions):

- o “The project would contribute to an equivalent of 21.3 million metric tons of carbon dioxide a year. Using a 5% discount rate, the social cost of carbon ranges from \$291.9 to \$608.1 million per year between 2019 and 2048. Using a 2.5% discount rate for the same time period, the social cost of carbon ranges between **\$1.5 and \$2.3 billion per year.**”³

Economic activity that depends on the region’s scenic, recreational, and quality-of-life:

(We consider scenarios in which visitor spending declines by 10% from current levels, and the rate of growth in retirement and proprietor’s income slows by 10%)

- o Annual loss of recreation tourism expenditures of \$448.0 million that would otherwise support 4,090 jobs and generate \$38.8 million in state and local tax receipts
- o Annual loss of personal income of \$55.6 million due to slower growth in the number of retirees
- o Annual loss of personal income of \$16.3 million due to slower growth in sole proprietorships

The analysis found that the total one-time and annual costs to the public that would result from the proposed Project would be:

Total estimated costs:

- o One-time costs (lost property value plus lost ecosystem service value during construction) would total between \$166.0 and \$199.4 million
- o Annual costs (costs that recur year after year) would range from \$5.3 to \$12.8 million PLUS the social cost of carbon, which varies by year, and ranges between \$291.9 million and \$2.3 billion per year
 - Present discounted value of all future annual costs (including the social cost of carbon): \$13.1 to \$56.4 billion
- o One-time costs plus the discounted value of all future annual costs: \$13.3 to \$56.6 billion”⁴

These estimates are conservative. These estimates are conservative because they do not represent all potential costs as several categories of cost cannot be directly quantified, such as the value of preserving the landscape, damages to human and environmental health and property in the event of leaks and explosions, and the lack of sufficient data to quantify the cost increase of community services such as emergency response and road maintenance. Additionally, many of the adverse economic impacts that would result from the Project have not been quantified but also must be considered by the Corps. These include community service costs, such as provision of public and private water, roads and traffic, emergency services, and law enforcement; as well as effects on economic development, tourism, recreation, retirement income, and jobs.

³ *Economic Costs of the PennEast Pipeline*, Spencer Phillips, PhD, et al., Key-Log Economics, LLC. January 2017.

⁴ *Economic Costs of the PennEast Pipeline*, Spencer Phillips, PhD, et al., Key-Log Economics, LLC. January 2017.

According to the Key-Log Economics analysis:

“If PE is built, there will likely be increases in the costs of community services, such as for traffic control and extra law enforcement capacity needed during construction and for emergency preparedness/emergency services during operation. As borough, township, city, and county governments, as well as volunteer fire companies meet these needs, costs for services would increase.”

Roads, traffic, and community services may be adversely impacted. As outlined in the Key-Log Economics Report:

“Damaged or worn-out roads, an increase in traffic volume involving those heavy vehicles, and an influx of out-of-area workers unfamiliar with local roads are also associated with increases in motor vehicle accidents (Muehlenbachs & Krupnick, 2014). Motor vehicle accidents impose a range of costs, from emergency response, medical care, time off of work, premature death, property damage, and the cost of time lost to traffic jams at accident scenes (National Highway Traffic Safety Administration, 2015).”

PennEast Pipeline Company has stated it will pay to restore roads damaged during construction, but it is up to individual municipalities to survey the state of their roads prior to construction to ensure that PennEast meets this promise. This cost of securing baseline information, then identifying the damage, and then pursuing and securing repair is all on local communities, as are the costs of the damage to vehicles inflicted by the damage while in disrepair.

Pipelines also pose new challenges to emergency responders, with fire and rescue teams devoting more time and resources to training, planning, and response to pipeline incidents. An investigation into a California pipeline rupture that killed eight people, injured several others, and destroyed 38 homes revealed that local responders were not prepared.⁵ There are significant time and resource costs in pursuing this training and planning that are not accounted for. In addition, the costs of actual response when there is an accident, incident or explosion are also not accounted for.

Law enforcement costs will also increase. In addition to responding to any increase in motor vehicle accidents due to increased traffic, research has shown an increase in crime in gas drilling areas. This kind of community and economic impact will translate to pipeline construction areas. As Key-Log Economics⁶ states:

“Furthermore, a multi-state analysis found that counties with high drilling had statistically significant increases in violent crime and property crime (Multi-State Shale Research Collaborative, 2014). Temporary out-of-state workers have been associated with increased arrests, traffic violations, protection-from-abuse orders, and warrants for people failing to appear in court (Associated Press, 2011).

PennEast expects 60% of their 2,400-person workforce to consist of non-local, temporary hires (Federal Energy Regulatory Commission, 2016b). While pipeline construction jobs will

⁵ *Economic Costs of the PennEast Pipeline*, Spencer Phillips, PhD, et al., Key-Log Economics, LLC. January 2017.

⁶ *Economic Costs of the PennEast Pipeline*, Spencer Phillips, PhD, et al., Key-Log Economics, LLC. January 2017.

come and go more quickly than gas field jobs, it is reasonable to assume, prepare for, and expect higher costs for additional law enforcement needs.”

The PennEast Pipeline Project will also have detrimental impacts in the areas of economic development, tourism, recreation, retirement income, and jobs.

Clean, high-quality environments are important to tourism and wildlife-related recreational activities and businesses in the communities that will be impacted by PennEast construction, operation and maintenance. In addition, several counties and regions include the importance of a clean environment and scenic and recreational amenities in their economic development plans – as a result PennEast will be an adverse impact to the businesses and recreational enjoyment present today as well as adversely impact and depress the economic and recreational uses in the future. The adverse impacts of a pipeline in a region that depends on tourism and outdoor recreation would not be in the public interest. In the Pocono Mountains, partially located in Carbon County, a study reported 25 million person-trips, totaling in about \$1.3 billion in spending.⁷

Because of community concern about the pipeline project, it is important to consider what impact this would have on retirement income. Key-Log Economics⁸ found that even a 10% growth rate reduction would mean a loss of \$55.6 million in investment income and age-related transfer payments.

This community concern also applies to people starting a new business or moving an existing business to the area. Jobs will be adversely affected by the pipeline project. Using the same 10% example as in the previous retirement income scenario, that 10% reduction in the rate of growth would mean 791 fewer jobs and \$16.3 million less in personal income.⁹

The Key-Log economic report describes how the economic impacts are not in the public interest, stating, “A loss of scenic and recreational amenities, the perception and the reality of physical danger, and environmental and property damage resulting from the PennEast Pipeline could discourage people from visiting, relocating to, or staying in the region. Workers, businesses, and retirees who might otherwise choose to locate along the PE’s proposed route will instead pick locations that have retained their character, their productive and healthy landscapes, and their promise for a higher quality of life.”

The community service costs for public and private water are discussed under “water supply and conservation” below.

Available estimates of the Project’s economic benefits are flawed, biased, and imbalanced. The economic benefits asserted by PennEast and FERC are indefensible and unsupported, and the economic harms are entirely overlooked.

In addition to the fact that the estimates of the adverse impacts or economic costs to the public provided here are conservatively calculated, it is also important for the Corps to consider, as part of its cost-benefit analysis required for a public interest review, that the estimated potential benefits of the project provided by PennEast and the FERC FEIS are inherently biased and imbalanced.

⁷ *Economic Costs of the PennEast Pipeline*, Spencer Phillips, PhD, et al., Key-Log Economics, LLC. January 2017.

⁸ *Economic Costs of the PennEast Pipeline*, Spencer Phillips, PhD, et al., Key-Log Economics, LLC. January 2017.

⁹ *Economic Costs of the PennEast Pipeline*, Spencer Phillips, PhD, et al., Key-Log Economics, LLC. January 2017.

The economic analysis provided in FERC’s materials should not be relied on by the Corps in order to carry out the objective cost-benefit analysis required for a public interest review as FERC policy relies on applicants to provide information about benefits and costs, incentivizing the applicant “to be generous in counting benefits and parsimonious in counting the costs of its proposal.” This is reflected in the EIS, where “FERC has made no effort itself to ensure a full accounting of economic costs to landowners or the broader community despite the wealth of comments placed on the docket that could support such an assessment.”¹⁰

In addition, Key Log Economics’ analysis determined the estimates provided by PennEast to be based on flawed research and assumptions, and to avoid the inclusion of costs or adverse impacts to the economy necessary for a balanced review.

“PE LLC has published estimates of economic benefits in the form of employment and income stemming from the construction and operation of the PE (PennEast Pipeline Company, LLC, 2015b). These studies suffer from errors in the choice and application of methods and in assumptions made regarding the long-run economic stimulus represented by the PE. Most significantly, the studies make no mention of likely economic costs, and their projections of long-term benefits extend far beyond the time period (of a year or so) within which economic impact analysis is either useful or appropriate.”¹¹

FERC accepts this deficient and imbalanced analysis:

While the DEIS considers all presumed benefits advanced by PennEast, it ignores the economic damage inflicted to public health, property values, jobs, businesses and from the loss of ecosystem services.¹²

As determined in a careful analysis by Key-Log Economics,¹³ in short, the FERC EIS:

- Overestimates short term impacts due to inherent issues with the models used and the choice of the size of the study region.
- Overestimates long term job “creation” and other impacts due to use of a model empirically proven to have no value as a predictor of economic activity occurring more than a year into the future.

In addition to providing exaggerated and false claims of benefit, the EIS ignores the economic harms inflicted by construction and operation of PennEast. Among its many deficiencies, the EIS analysis does not consider the adverse impacts to recreation and ecotourism so vitally important to the impacted region; the

¹⁰The policy’s stated objective “is for the applicant to develop whatever record is necessary, and for the Commission to impose whatever conditions are necessary, for the Commission to be able to find that the benefits to the public from the project outweigh the adverse impact on the relevant interests” J. J. Hoecker, et al. *Certification of New Interstate Natural Gas Pipeline Facilities*, 88 FERC, para 61, 227. 1999.

¹¹ *Economic Costs of the PennEast Pipeline*, Spencer Phillips, PhD, et al., Key-Log Economics, LLC. January 2017 and Letter dated September 9, 2016 written by Key-Log Economics to Secretary Kimberly Bose & Deputy Secretary Nathaniel J. Davis.

¹² Letter dated September 9, 2016 written by Key-Log Economics to Secretary Kimberly Bose & Deputy Secretary Nathaniel J. Davis.

¹³ In addition to the Key-Log Economics analyses attached see *Review of PennEast Pipeline Project Economic Impact Analysis*, Jannette Barth, Pepacton Institute, April 4, 2016 This report was provided on the FERC docket as public comment prior to completion of the DEIS, but FERC clearly chose to ignore this report along with all the other comments they ignored.

analysis fails to consider the implications for future investment in open space preservation and the adverse impacts thereof as communities realize that preserved lands are not protected from pipeline construction; the economic damage to agricultural crop production is overlooked as are harms to other businesses;¹⁴ the impact on market values and marketability of properties are misrepresented; the costs to the community to respond to emergencies, to the increased stormwater runoff, pollution inputs, and other adverse impacts that could result from this project and be foisted upon the shoulders of local towns and residents are given short shrift if they are mentioned at all; and the DEIS does not consider the health impacts to the residents who will be impacted by construction and operation of this project.

By way of more specific examples, the EIS analysis ignores the many and varied economic harms that would result from the construction, operation and maintenance of the PennEast pipeline. Attached is a detailed analysis of the many deficiencies provided by Key-Log Economics. Among the deficiencies highlighted in that report, and in other resources provided as part of this comment, the EIS fails to consider:

- **Public health costs:** “Based upon experience with other pipelines it can be anticipated that, for example, just in Carbon County where 560 people live within 2 miles of the proposed compressor station (US Census Bureau, 2015), there will be on the order of “504 people experiencing odor events, 398 people experiencing respiratory impacts, 325 people experiencing sinus problems, and 218 people experiencing sleep disturbances and/or severe headaches.”¹⁵
- **Reduced property values:** Of the comments reviewed by the Delaware Riverkeeper Network in partnership with Key-Log Economics, “35% mention concerns about the effect on property value. Of this group, 99.6% believe the effect on property value will be negative.”¹⁶

“68% of Realtors believe the presence of a pipeline would decrease residential property value.”¹⁷

“Of these Realtors, 56% believe the decrease in value would be between 5% and 10%. (Kielisch does not report the magnitude of the price decrease expected by the other 44%).”¹⁸

“70% of Realtors believe a pipeline would cause an increase in the time it takes to sell a home. This is not merely an inconvenience, but a true economic and financial cost to the seller.”¹⁹

¹⁴ We have learned from farmers, and it has been documented on the record, that crop production has gone down by as much as 30% when a pipeline cuts through farm crop lands. DEIS figures do not consider harms to other local businesses, such as the 7th generation nursery business reported in the press that said their ability to continue to operate would be harmed if PennEast passes through their property as is under consideration.

¹⁵ Letter dated September 9, 2016 written by Key-Log Economics to Secretary Kimberly Bose & Deputy Secretary Nathaniel J. Davis.

¹⁶ Letter dated September 9, 2016 written by Key-Log Economics to Secretary Kimberly Bose & Deputy Secretary Nathaniel J. Davis.

¹⁷ Letter dated September 9, 2016 written by Key-Log Economics to Secretary Kimberly Bose & Deputy Secretary Nathaniel J. Davis.

¹⁸ Letter dated September 9, 2016 written by Key-Log Economics to Secretary Kimberly Bose & Deputy Secretary Nathaniel J. Davis.

¹⁹ Letter dated September 9, 2016 written by Key-Log Economics to Secretary Kimberly Bose & Deputy Secretary Nathaniel J. Davis.

“In a survey of buyers presented with the prospect of buying an otherwise desirable home with a 36 inch diameter gas transmission line on the property, 62.2% stated that they would no longer buy the property at any price. Of the remainder, half (18.9%) stated that they would still buy the property, but only at a price 21%, on average, below what would otherwise be the market price. The other 18.9% said the pipeline would have no effect on the price they would offer.

Not incidentally, the survey participants were informed that the risks of “accidental explosions, terrorist threats, tampering, and the inability to detect leaks” were “extremely rare” (Kielisch, 2015, p.7). Considering only those buyers who are still willing to purchase the property, the expected loss in market value would be 10.5%. This loss in value provides the midlevel impact in our estimates. A much greater loss (and higher estimates) would occur if one were to consider the fact that 62% of buyers are effectively reducing their offer prices by 100%, making the average reduction in offer price for all potential buyers 66.2%.”²⁰

“Based on five “impact studies” in which appraisals of smaller properties with and without pipelines were compared, “the average impact [on value] due to the presence of a gas transmission pipeline is 11.6%”(Kielisch, 2015, p. 11). The average rises to a range of 12% to 14% if larger parcels are considered, possibly due to the loss of subdivision capability.”²¹

Research has also “found that properties within the ‘emergency plan response zone’ of sour gas wells and natural gas pipelines faced an average loss in value of 3.8%, other things being equal.”²²

Proximity to compressor stations has inflicted health harms, quality of life impacts and property damage, as well as lost property value, and has had impacts so severe that in at least one documented case it forced a family to abandon their \$250,000 investment in their home rather than suffer the health, safety and other harms they were experiencing.²³

“In Hancock, another New York town with a much smaller (15,000 hp) compressor station, three homeowners have had their property assessments reduced, two by 25% and one by 50%, due to the impact of truck traffic, noise, odors, and poor air quality associated with the compressor station (“Proximity of Compressor Station Devalues Homes by as Much as 50%” 2015).”²⁴

The experts at Key-Log Economics estimate that “properties within one half mile of the Kidder Township compressor station would lose 25% of their value if the station is built.” ... “[T]he Kidder compressor station would reduce the value of 43 properties by a total of \$1.9 million dollars.”²⁵

²⁰ Letter dated September 9, 2016 written by Key-Log Economics to Secretary Kimberly Bose & Deputy Secretary Nathaniel J. Davis.

²¹ Letter dated September 9, 2016 written by Key-Log Economics to Secretary Kimberly Bose & Deputy Secretary Nathaniel J. Davis.

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²³ Letter dated September 9, 2016 written by Key-Log Economics to Secretary Kimberly Bose & Deputy Secretary Nathaniel J. Davis.

²⁴ Letter dated September 9, 2016 written by Key-Log Economics to Secretary Kimberly Bose & Deputy Secretary Nathaniel J. Davis.

²⁵ Letter dated September 9, 2016 written by Key-Log Economics to Secretary Kimberly Bose & Deputy Secretary Nathaniel J. Davis.

- **Damage caused by air pollution to agriculture and infrastructure:** “One study found that shale gas air pollution damages in Pennsylvania already amount to between \$7.2 and \$30 million, with compressor stations responsible for 60-75% of this total (Walker & Koplinka-Loehr, 2014). Using the low estimate of 60%, that is between \$4.32 and \$18 million in damages associated with compressor stations.”²⁶
- **Loss of Ecosystem Services** The ecosystem services, “benefits that flow from nature to people”, that will be lost, for example, “tangible physical quantities, such as food, timber, and clean drinking water, life support functions like assimilating waste that ends up in air and water or on the land, as well as aesthetics, recreational opportunities, and other benefits of a more cultural, social, or spiritual nature.”²⁷

In addition, there is no recognition in the EIS for the decrease in property values associated with increased ecological impacts to the environment from PennEast. For example, one of the benefits of living next to a stream or other natural body of water is the increased property value those riparian rights bring as well as the recreational and quality of life benefits that can be enjoyed. But the cut of a pipeline diminishes all of these rights and benefits of living near a waterway. Property values are demonstrably harmed by the presence of a pipeline.²⁸ Aesthetic qualities, ecological health of a stream and instream populations such as fish are diminished due to a pipeline’s stream cuts and permanent loss of riparian vegetation essential for healthy riparian and instream habitat. Ecological and aesthetic harm translates into diminished recreational enjoyment and opportunities as well as a diminished ability to enjoy the environment and one’s property.

The impacts to the market value and marketability of homes that will result from the removal of mature vegetation to make way for the pipeline (both permanent ROW and temporary construction areas that will not be fully restored) must also be fully and fairly considered. Healthy, mature, vegetated buffers along waterways are known to enhance property market values.²⁹ For example, "Pennypack Park in Philadelphia is credited with a 38% increase in the value of a nearby property."

In addition, "[t]wo regional economic surveys documented that conserving forests on residential and commercial sites enhanced property values by an average of 6 to 15% and increased the rate at which units were sold or leased."³⁰ And in a survey conducted by the National Association of Home Builders, 43% of home buyers paid a premium of up to \$3,000, 30% paid premiums of \$3,000 to \$5,000, and 27% paid premiums of over \$5,000 for homes with trees.³¹ To the extent the PennEast project will be cutting down forests and buffers and replacing them with low growing grasslands, and to the extent that the forest fragmentation caused by pipeline construction and maintenance will result in additional forest degradation

²⁶ Letter dated September 9, 2016 written by Key-Log Economics to Secretary Kimberly Bose & Deputy Secretary Nathaniel J. Davis.

²⁷ Letter dated September 9, 2016 written by Key-Log Economics to Secretary Kimberly Bose & Deputy Secretary Nathaniel J. Davis.

²⁸ *Review of INGAA Foundation Report, “Pipeline Impact to Property Value and Property Insurability”*, Key-Log Economics, March 11, 2015.

²⁹ ECONorthwest (2018). *The Economic Value of Riparian Buffers in the Delaware River Basin*.

³⁰ Center for Watershed Protection, *Better Site Design: A Handbook for Changing Development Rules in Your Community*, Citing two studies by Morales and Weyerhauser, August, 1998.

³¹ Cheryl Kollin, *Designing with Nature and Showing the Benefits*, Land Development, National Association of Home Builders, Winter, 1997.

as far as 300 feet back on either side of the ROW, the impacts to home market values and marketability must be considered.

In addition, the economic analysis included in the EIS fails to consider the potentially superior economic benefits and values of a clean energy alternative for fulfilling energy needs in Pennsylvania, New Jersey and the unnamed surrounding states PennEast asserts it is seeking to serve. For example, investments in clean energy strategies are known to result in far superior job creation for every million dollars invested as compared to the oil and gas industry, including pipeline projects.

Research has demonstrated that investment in clean energy generates a greater number of long term jobs that bring greater capacity for workers earning and advancement. Every million dollars invested in clean energy, including wind, solar, eco-friendly water, and energy efficiency, generates 6 to 8 times the number of direct jobs, and 3 times the number of direct, indirect and induced jobs collectively as compared to oil, gas or coal.³²

FERC wrongly concentrates its determinations regarding pipeline certificate approvals largely on the contracts and the alleged reliability and accessibility proposed by the applicant without considering the economic costs articulated above –given that improper review, FERC’s failure to fully consider economic harms renders a decision flowing therefrom as arbitrary and capricious.

Overall, Key Log Economic’s analysis found the PennEast DEIS “to be greatly lacking both in the scope of economically relevant environmental effects considered and in the quality of the analysis of those few effects considered.”³³

While the Corps regulations state that “it will generally be assumed that appropriate economic evaluations have been completed, the proposal is economically viable, and is needed in the marketplace” when reviewing the permit application of a private enterprise, **“in appropriate cases [the district engineer], may make an independent review of the need for the project from the perspective of the overall public interest,”** recognizing that the economic impacts of many projects are “important to the local community [...] affecting such factors as **employment, tax revenues, community cohesion, community services, and property values.**” 33 C.F.R. § 320.4(q). (emphasis added).

Given that independent economic analysis found that the adverse economic impacts of the Project could outweigh the company’s claimed benefits by over \$50 billion³⁴; the economic evaluations and estimates provided by PennEast and the FEIS are shown to be biased, flawed, and unbalanced; and the extensive qualitative analysis provided here and in the abundance of public comments demonstrating adverse impacts to **employment, tax revenues, community services, and property values**, the proposed PennEast Pipeline project is clearly an appropriate case for the district engineer to undertake an independent review of the need for the project for the protection of the public interest.

In fact, in this case, there is significant evidence on the record challenging the claim of need for the project. (See comments below):

³² See *The Economic Benefits of Investing in Clean Energy*, by the Center for American Progress & PERI University of Massachusetts Amherst.

³³ Letter dated September 9, 2016 written by Key-Log Economics to Secretary Kimberly Bose & Deputy Secretary Nathaniel J. Davis.

³⁴ *Economic Costs of the PennEast Pipeline*, Spencer Phillips, PhD, et al., Key-Log Economics, LLC. January 2017.

Additionally, the Corps is required to “independent[ly] verif[y]” the applicant's data and conclusions. *Utahns for Better Transp.*, 305 F.3d at 1186; *Sierra Club v. Van Antwerp*, 362 F. App'x 100, 106 (11th Cir. 2010) (“[T]he Corps may rely on information submitted by the applicant but must *independently verify such information.*” (emphasis added)). The Corps' duty of independent verification is especially strong when the Corps “receives particularized objections to material upon which it importantly relied in its review.” *Van Abbema v. Fornell*, 807 F.2d 633, 640 (7th Cir. 1986) *49 (considering a challenge to a Corps permit under NEPA). If the Corps bases its permitting conclusions on insufficient, unverified, or false information, the Corps' conclusions are “arbitrary and capricious.” *Id.* at 639 (holding the Corps may not base its conclusions on “entirely false premises or information”); *Utahns for Better Transp.*, 305 F.3d at 1187 (holding the Corps may not rely on insufficient information or unverified cost estimates).

Here, it is clear that the record shows that the net costs resulting from the construction of this pipeline outweigh the alleged public benefits of the Project, and that those costs are being advanced for a project for which there is no genuine need. The Corps must deny the Projects 404 permits as the project is clearly contrary to the public interest.

b. The Project would offer only adverse impacts to the conservation of a variety of resources important to the public good.

The proposed project offers no net benefits to conservation in the area of the project and greatly disrupts the conservation of a variety of resources, such as established forest ecosystems and habitats, wetlands, aquatic ecosystems, vulnerable or high value habitats and species, including many swaths of lands thought to be permanently preserved through both public and private means in the deliberate and concerted effort to conserve the resources of the region.

The adverse impacts to the conservation of these resources that would result from the Project are serious and often permanent. Ecological destruction and/or irreparable damage results from tree clearing, land clearing, soil compaction, crossing of wetlands and waterbodies, and from construction and maintenance activities. These adverse impacts have cascading detrimental effects on the environment and public good.

According to PennEast and the FEIS, construction of the project will impact 1,613.5 acres of land (1,065.2 acres for pipeline facilities, 110.1 acres for access roads; 372.3 acres for pipe and contractor ware yards, 31.1 acres for above ground facilities). According to the FEIS the project will at least cut through 255 waterbodies (including 159 perennial, 45 intermittent, 40 ephemeral, 11 open water), 633 acres of forest, 91 wetlands, impact “several” vernal pools, and infringe upon and damage habitat for threatened and endangered species of bat, sturgeon, snake, turtle, mussels and more. However, as demonstrated in this comment, these impacts are sorely understated, incomplete, and misrepresent the footprint and damage that would be inflicted if the PennEast pipeline were built.

By way of illustrating resources of high public value whose conservation will be adversely affected, Key Log Economics’ technical report³⁵ found that:

The route would cross important waterways such as the Delaware—the longest undammed river east of the Mississippi, Lehigh, and Susquehanna rivers, pristine streams, the Appalachian Trail,

³⁵ *Economic Costs of the PennEast Pipeline*, Spencer Phillips, PhD, et al., Key-Log Economics, LLC. January 2017. \

wetlands, forests, and established public and private conservation lands. The D&R Greenway Land Trust estimates that the proposed route in New Jersey “will touch lands that have been preserved over time with public funding totaling over \$37 million” (D&R Greenway Land Trust, 2015). In addition, the project would potentially harm the habitat of several federally listed endangered species (Federal Energy Regulatory Commission, 2016b).

The variety of harms that would result from the proposed cuts through preserved open space must be fully and fairly considered—whether the open space is preserved by purchase or conservation easement. The protection of open space is necessary to preserve the remarkable resources of the Lower Delaware River corridor. Natural areas are critical for water quality, have more stable soils, provide habitat for plants and animal species, prevent invasive species spread, and help maintain the value of historical sites. Loss of open space adversely impacts water quality, aquatic habitat, and the intact ecological health that is otherwise benefitted by the preserved open space. Pipeline passage through open space significantly reduces scenic character and recreational opportunities thereby adversely impacting jobs and economic benefits associated with recreation, vacation and other related industries. Realtors in the region have asserted at public meetings and through the survey indicated above that the presence, or even the potential presence, of an interstate transmission pipeline of the size proposed by PennEast adversely impacts the marketability of nearby homes. The Corps must fully and fairly consider these harms and require quantifiable and documented data to support any assertions/findings.

There are impacts from the fragmentation of the forest by PennEast as well as by other cuts in the same region by other pipelines and/or linear projects. Over the life of the pipeline, maintenance of the ROW will result in new impacts as well as perpetuate ongoing harms. Operation and maintenance of the pipeline will include the prevention of tree growth and maintenance of low growing vegetation only – this will be accomplished by periodic mowing and the use of herbicides. The mowing will disturb the vegetation and habitats that were allowed to encroach on the ROW. The herbicides will include impacts for non-target species, and could have implications for soil microbes and nearby wetland, vernal pool and stream ecosystems. Maintenance activities will involve periodic trimming, pruning, cutting back and removal of trees and woody vegetation growing along the perimeter of the ROW. “The inspection and maintenance of the ROW means the repetitive access and traverse of the ROW by inspection vehicles and maintenance equipment. This increases overall soil compaction and because there are no stabilized access-ways, it also creates repeated opportunity for soil erosion.”³⁶

Forest ecological systems would experience enduring but also fresh impacts throughout the life and presence of the pipeline. The initial impact will include the removal of the forest and understory vegetation, coupled with the changes in light, moisture, wind, etc. impacting 300 feet into the forest on either side of the ROW footprint. There will be enduring compacted soils, and dramatically altered vegetative composition along the ROW and along that forest edge that will increase volume and alter the timing of stormwater runoff, reduce groundwater recharge, and change/take habitats for species of all kinds. There will then be the influx of invasive plant and animal species that will have cascading impacts on the forest ecosystem, which will spread along the ROW and back into the core of the adjacent forest.

The loss of riparian vegetation associated with the PennEast pipeline will make impacted streams more susceptible to erosion events and flooding, resulting in the loss of riparian lands (including floodplain) and exacerbating the sedimentation impacts of construction. As noted by experts, the deforestation caused by the PennEast pipeline will result in increased stormwater runoff; this will result in increasing flows in the

³⁶ See the FERC Draft EIS.

stream with stream banks more susceptible to its erosive forces due to the loss of vegetative protection. Increased erosion means loss of habitat; channel migration that can have serious implications for riparian lands and vegetation over long stretches and long periods of time as the stream continues to erode, downcut and deposit sediment in order to try and reestablish a stable channel; and increased instream sedimentation which is considered a pollutant both legally and scientifically. Additionally, 44 dry stream crossings will impact Conservation Areas and Public Lands, and 14 dry stream crossings will impact areas held in private conservation easement.³⁷

The PennEast Pipeline will be cutting down hundreds of acres of forest. “Fifty-seven percent of the pipeline right-of-way area, or approximately 446 acres, is currently forested and will permanently be altered from forest during pipeline operation. An additional 139 acres of forest will be removed for construction.”³⁸ In forested areas the habitat loss will not just be in the immediate footprint of the pipeline, but it will impact an additional 300 feet of forest on either side of the ROW.³⁹ This means that for every mile of pipeline cut through a forest an additional 72 acres of forest will be harmed. In addition, the pipeline will irreparably alter a tremendous number of wetlands (how many is unclear, as this comment and our attached reports document the incredibly inaccurate, misleading and deficient job PennEast and FERC, through the EIS, did on assessing wetland impacts), including their changing functions and values. The result will be to reduce available bird habitat, nesting grounds and feeding grounds, to impact bat species as well as a number of amphibians and mammal species.

PennEast’s minimal mitigation measures will not come close to negating the adverse impacts to conservation. PennEast will only be required to “ensure that the soils are stable and is under no regulatory obligation to restore soil to pre-construction conditions.” “[T]hese changes in the properties of the soils along the pipeline and within the pipeline ROW will contribute to the predicted increases in the volume and rate of runoff. Along the entire length of the 115.1-mile long pipeline, these changes in the post-construction hydrology of the affected lands (especially the steeper sloped areas) will invariably alter runoff properties. The end result will be impacts to the streams, wetlands and riparian areas traversed by the pipeline and pipeline ROW and increased opportunity for erosion along the steeper segments of the pipeline and pipeline ROW. Because PennEast is not required to implement any of the conventionally utilized best management measures to collect, treat and control ROW runoff, there is no way to mitigate for these changes other than to revegetate. However, once again the cover type will be different pre to post-construction (e.g. trees to grass) and PennEast is only obligated to achieve 80% post-revegetation coverage with the vegetation type it is using.”

This is only an overview of the many and cumulative adverse impacts that will affect the conservation of resources in the area. The attached expert reports provide further details and specificity of these impacts—although it is impossible to quantify them all given the lack of survey access along the proposed route and the deficient information provided by PennEast, FERC, and the Corps on the record. However, based on the scale of the project, the magnitude of severe, unavoidable, unmitigatable, and irreversible

³⁷ *Professional Review & Comment of the Draft Environmental Impact Statement and Supporting Documents Related to Surface Water Impacts of the Proposed PennEast Pipeline Project*, Michelle Adams & Marc Henderson, Water Resources Engineers, Meliora Design, LLC, September 5, 2016.

³⁸ *Professional Review & Comment of the Draft Environmental Impact Statement and Supporting Documents Related to Surface Water Impacts of the Proposed PennEast Pipeline Project*, Michelle Adams & Marc Henderson, Water Resources Engineers, Meliora Design, LLC, September 5, 2016.

³⁹ *Pennsylvania Energy Impacts Assessment*, Nels Johnson, the Nature Conservancy, November 15, 2010; Cara Lee, Brad Stratton, Rebecca Shirer, Ellen Weiss, *An Assessment of the Potential Impacts of High Volume Hydraulic Fracturing (HVHF) on Forest Resources*, The Nature Conservancy, Dec. 19, 2011.

adverse impacts to greenfield land, forests, wetlands, waterways and other resources of great importance to the public interest—it is clear that any benefit from the minimal mitigation, compensation, and restoration plans offered by PennEast will be outweighed by the adverse impacts to conservation of vital resources.

c. The Project will adversely impact the Aesthetics of the region.

There are no conceivable aesthetic benefits that could result from the proposed Project. However, many detrimental impacts to the regional aesthetics have been identified and, in some cases, quantified or mapped.

The Project would adversely affect the public’s viewshed along the pipeline corridor:

Beyond the areas where the proposed pipeline would alter land use and present the risk of physical danger, the pipeline would change the aesthetic qualities of the region. Residents and visitors will see the pipeline corridor as a break in a once completely forested hillside, and the lower aesthetic quality would translate into further loss of value for properties from which the corridor is visible.⁴⁰

In measuring its ecosystem value, aesthetic value is defined as “the role that beautiful, healthy natural areas play in attracting people to live, work, and recreate in a region.” The monetary effect of lost aesthetic value, an ecosystem service enjoyed by the public, along the pipeline corridor can be quantified. Below are excerpts from the attached Key Log report demonstrating the value of aesthetic losses due to construction and operation of the pipeline.:

Ecosystem Service	Study Region			
	Baseline (low) (2015\$)	Loss (low) (2015\$)	Baseline (high) (2015\$)	Loss (high) (2015\$)
Aesthetic Value	4,074,427	(4,074,427)	16,294,264	(16,294,264)

Table 1. Ecosystem Service Value Lost to the Construction Corridor, New Temporary Roads, Pipeyards, and Temporary Aboveground Infrastructure, Relative to Baseline, by Ecosystem Service.⁴¹

Ecosystem Service	Study Region			
	Baseline (low) (2015\$)	Loss (low) (2015\$)	Baseline (high) (2015\$)	Loss (high) (2015\$)
Aesthetic Value	1,770,919	(1,707,351)	7,092,570	(7,013,190)

Table 2. Ecosystem Service Value Lost Each Year Post Construction in Right-Of-Way, Relative to Baseline, by Ecosystem Service.⁴²

⁴⁰ *Economic Costs of the PennEast Pipeline*, Spencer Phillips, PhD, et al., Key-Log Economics, LLC. January 2017.

⁴¹ Adapted from *Economic Costs of the PennEast Pipeline*, Spencer Phillips, PhD, et al., Key-Log Economics, LLC. January 2017.

⁴² Adapted from *Economic Costs of the PennEast Pipeline*, Spencer Phillips, PhD, et al., Key-Log Economics, LLC. January 2017.

Ecosystem Service	Study Region			
	Baseline (low) (2015\$)	Loss (low) (2015\$)	Baseline (high) (2015\$)	Loss (high) (2015\$)
Aesthetic Value	150,016	(150,016)	603,428	(603,428)

Table 3. Ecosystem Service Value Lost Each Year Post Construction in Permanent Infrastructure, Relative to Baseline, by Ecosystem Service⁴³

The visual effects felt by the adverse aesthetic impact of the pipeline corridor have far-reaching effects on the surrounding region. For the purpose of this study, the economic loss from adverse aesthetic impacts was calculated only within the footprint of the pipeline corridor. However, the visual effects felt by the surrounding community are also considered:

Utility corridors from which power lines are visible decrease property values (by 6.3% in one study) (Bolton & Sick, 1999). This suggests that a pipeline corridor reduces property value either by impairing a good view or, like power lines, by simply being unattractive. It is reasonable to conclude that the proposed PE would have effects on property value due to the visual effects⁴⁴

The *Visibility of the Proposed PennEast Pipeline* map below illustrates the places where the pipeline would be visible in the study region that might suffer a portion of lost aesthetic value. This analysis shows that:

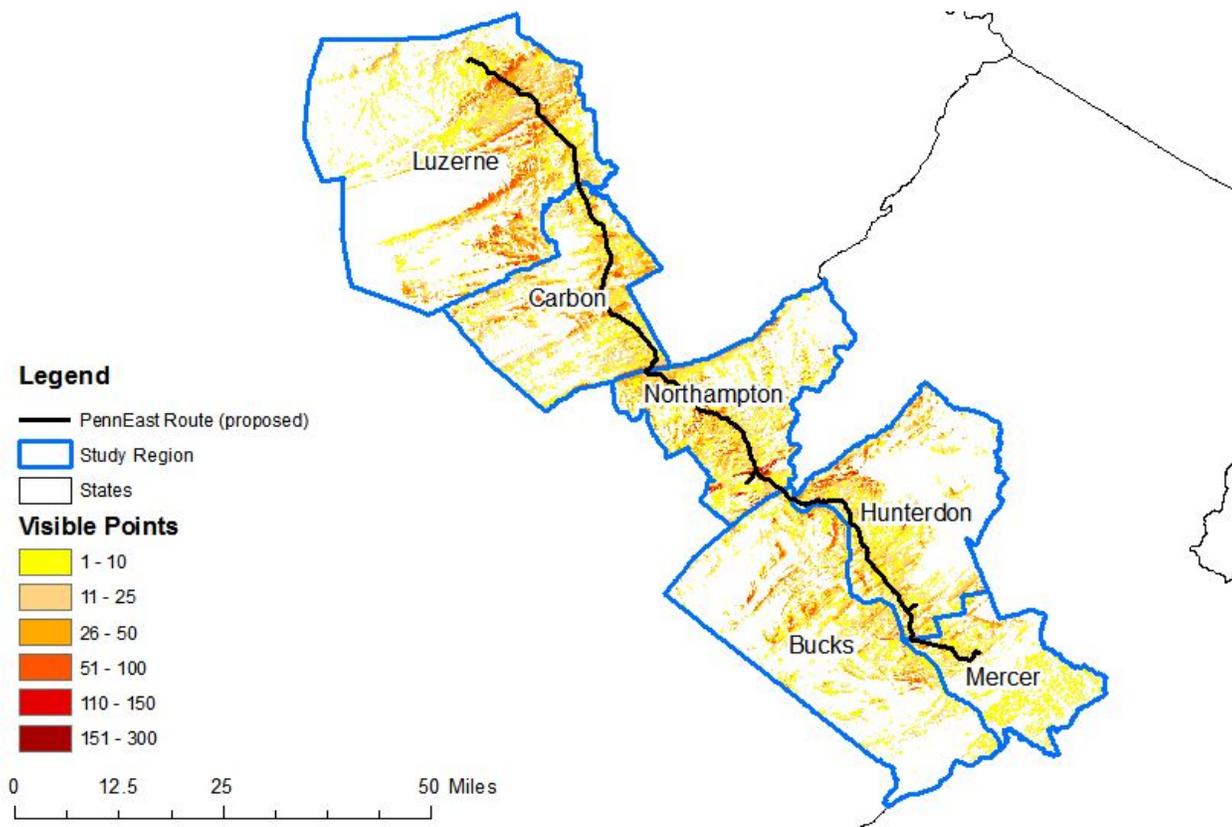
- “there are places in the study region where 30 km, or 18.6 miles, of the pipeline corridor could be visible”⁴⁵
- “it would be possible to see at least one point (representing 100m) along the ROW from 36% of the six-county study region. For this 36% of the region, an average of 1.8 km (1.1 miles) of the PE ROW would be visible. For 20% of the study region, seeing 10 or more points, or 1 km (0.62 miles) of the ROW is possible.”⁴⁶
- It is important to note that the concept of “out of site and out of mind” can wreak havoc on our natural waterbodies, wetlands and forests and the overall health of the watershed – often pushing pipeline corridors in more rural or remote areas where property values are not as high but where healthier habitats remain. This often puts pipelines or can redirect pipelines through re-routes in the intact forests and in remote places with steep slopes and high quality and exceptional value streams and wetlands and public preserved lands or DCNR lands ultimately putting an enormous tax on our public trust and wild spaces that remain.

⁴³ Adapted from *Economic Costs of the PennEast Pipeline*, Spencer Phillips, PhD, et al., Key-Log Economics, LLC. January 2017.

⁴⁴ *Economic Costs of the PennEast Pipeline*, Spencer Phillips, PhD, et al., Key-Log Economics, LLC. January 2017.

⁴⁵ *Economic Costs of the PennEast Pipeline*, Spencer Phillips, PhD, et al., Key-Log Economics, LLC. January 2017.

⁴⁶ *Economic Costs of the PennEast Pipeline*, Spencer Phillips, PhD, et al., Key-Log Economics, LLC. January 2017.



Visibility of the Proposed PennEast Pipeline⁴⁷

The color of each point on the map indicates the number of waypoints, spaced 100m apart, along the PE route and within 25 miles that could be seen from each point. Note that the analysis is based on elevation only and does not take into account the extent to which buildings or trees may mask views of the pipeline corridor.

Sources: PE route obtained from the Delaware Riverkeeper Network; Counties from USGS (U.S. Department of Interior & U.S. Geological Survey, 2015).

Diminished aesthetic value has clear and cascading region-wide effects on the public interest and human wellbeing:

Beyond the loss of ecosystem services stemming from the conversion of land in the ROW, the loss of property value resulting from the chance of biophysical impacts (leaks and explosions), or the certainty of impacts on aesthetics, the proposed PE would also diminish physical ecosystem services, scenic amenity, and passive use values that are realized or enjoyed beyond the evacuation zone and out of sight of the pipeline corridor. The people affected include residents, businesses, and landowners throughout the study region, as well as past, current, and future visitors to the region. The impacts on human well-being would be reflected in economic decisions such as whether to stay in or migrate to the study region, whether to choose the region as a place to do business, and whether to spend scarce vacation time and dollars near the PE instead of in some other place.⁴⁸

Economic impacts of the cascading detriments to the public interest from the loss of aesthetic impacts of the Project are predicted to include:

⁴⁷ Adapted from *Economic Costs of the PennEast Pipeline*, Spencer Phillips, PhD, et al., Key-Log Economics, LLC. January 2017.

⁴⁸ *Economic Costs of the PennEast Pipeline*, Spencer Phillips, PhD, et al., Key-Log Economics, LLC. January 2017.

- o Economic activity that depends on the region’s scenic, recreational, and quality-of-life:
 - Annual loss of recreation tourism expenditures of \$448.0 million that would otherwise support 4,090 jobs and generate \$38.8 million in state and local tax receipts
 - Annual loss of personal income of \$55.6 million due to slower growth in the number of retirees
 - Annual loss of personal income of \$16.3 million due to slower growth in sole proprietorships⁴⁹

Additional examples of adverse aesthetic impacts that would result from the proposed Project include:

- One of the benefits of living next to a stream or other natural body of water is the increased property value those riparian rights bring as well as the recreational and quality of life benefits that can be enjoyed. Property values are demonstrably harmed by the presence of a pipeline.⁵⁰ Ecological and aesthetic harm translates into diminished recreational enjoyment and opportunities as well as a diminished ability to enjoy the environment and one’s property.
- The crossing of the Appalachian Trail by the proposed route is in a section that is only feet away from a scenic overlook and cliff outcropping – it is hard to imagine a more damaging location for harming this important recreational and cultural resource. This area is also prime timber rattlesnake habitat.

The adverse impacts to the aesthetics of the region created by the Project are not caused by the appearance of the pipeline itself, “but rather the gap or break in otherwise intact forests, farm fields, or other more natural features through which the ROW passes.”⁵¹ As a result, the adverse impacts to aesthetics are impossible to mitigate as long as the pipeline ROW is maintained, and likely long after. Claims that aesthetic impacts can be mitigated by measures such as allowing temporary work spaces or additional temporary work spaces to revert to pre-construction conditions are misleading as this would do nothing to mitigate the visual impact of the unavoidable ROW that must be maintained according to the industry.

The adverse and unmitigatable impacts on aesthetics that would result from the proposed Project would clearly be a detriment to the public interest and are reason enough for the Corps to deny the Project 404 permits.

d. The proposed Project would adversely affect a significant number of General Environmental Concerns that would have a detrimental impact on the public interest and public trust.

The proposed Project would have extremely adverse impacts on many general environmental concerns that are crucial to the public interest. There are no beneficial impacts to general environmental concerns that would result from the proposed project. While there are too many adverse impacts to the environment generally to list them all here, the following are a sample of the many detriments the project would have on the environment. Many more examples can be found in the expert reports attached to this comment, although not all of the adverse impacts from the project can be identified because of the substantial data gaps and deficiencies in the Project materials.

⁴⁹ *Economic Costs of the PennEast Pipeline*, Spencer Phillips, PhD, et al., Key-Log Economics, LLC. January 2017.

⁵⁰ *Review of INGAA Foundation Report, “Pipeline Impact to Property Value and Property Insurability”*, Key-Log Economics, March 11, 2015

⁵¹ *Economic Costs of the PennEast Pipeline*, Spencer Phillips, PhD, et al., Key-Log Economics, LLC. January 2017.

Project construction and maintenance activities, including clearing, grading, trench excavation, backfilling, and movement of construction equipment along the ROW and access roads would lead to a large number of adverse impacts on the environment including soil compaction, removal of vegetation, increased stormwater runoff and decreased groundwater recharge. These can cause increased soil erosion in and into waterways and wetlands, increased thermal impacts, reduced stream baseflow, reduced wetland baseflow, changes in hydrology, lost habitat, increased invasive species, polluted runoff into waterways and wetlands, disruptive noise pollution, air pollution, nuisance recreational users of the pipeline such as ATVs, among many other adverse impacts to the environment. All of these impacts are directly harmful in the locations where construction, operation and maintenance occur, but also create much more significant adverse harms when considered cumulatively. The Corps is required to consider cumulative impacts in its 404 evaluation.

All of these adverse environmental effects would have a directly negative impact on the public interest through the loss of vital resources and ecosystem services we rely on, as well as the cascading effects that would result.

- 75% of the stream crossings will be undertaken using open cut methods. Many of the streams that will be open cut have the highest quality designations available in Pennsylvania and New Jersey.
- Compacted soils in and around the pipeline right of way, accompanied by low growing plants (to the degree they are able to grow in the compacted soils or under PennEast's ROW management protocols) will result in increased runoff to nearby streams, thereby increasing flows that impact downstream communities in terms of flooding, erosion, habitat and water quality impacts.
- Compacted soils and lost or altered vegetation will decrease groundwater recharge. In addition, the presence of the pipeline will alter the flow path of some groundwater systems. The result will be to reduce and/or diverting water from streams and wetlands diminishing and denying needed base flow. Reduced baseflow will adversely impact water quality, habitat, and recreation. The cumulative impact of these harms across the pipeline and multiple pipelines for affected waterways and wetlands could be significant depending on the harm being evaluated. In addition to adversely impacting stream and/or wetland base flows, drinking water supplies/aquifers could be adversely impacted, losing the historic water recharge they receive.

Additionally, blasting activities used for the construction of the Project leave behind “nitrogen which can run off with stormflow and enter streams as nitrate or ammonia.”⁵²

PennEast and FERC suggest that compliance with standard regulatory requirements and/or mitigation measures will avoid anticipated harms. But we know from experience and past harms along other pipeline projects this is woefully not the case, and so the Corps needs to more intentionally and carefully consider proposed plans. For example, PennEast and FERC state that completed Erosion & Sediment (“E & S”) Control Plans by agencies will adequately avoid harms but this is a false conclusion as can be seen on other pipeline projects where severe sediment pollution harmed local waterbodies, many of which had special protection designations.⁵³ Most agencies require quick establishment of groundcover to stabilize soils which takes the place of establishing more desired and diverse native habitats, biodiversity and soil health is lost. Once soil chemistry, soil porosity, and soil layering (horizons) that took eons to form are destroyed by the

⁵² ECONorthwest (2018). The Economic Value of Riparian Buffers in the Delaware River Basin.

⁵³ Field Monitoring Report, Pipeline Construction & Maintenance Irreparably Harms Rivers, Wetlands and Streams. Addendum to Comment for the PennEast Pipeline, Delaware Riverkeeper Network.

construction process, erosion control measures usually require lime and fertilizer to be applied so that seed mixes grow rapidly. The addition of lime and fertilizer are like poison to what were once forest soils of low pH and low nutrients. This essentially ruins the chance that the soil will ever revert to a native plant community again. Alien invasive weeds of all kinds thrive on the nutrient-enriched, topsy-turvy soil layers in the aftermath of construction. Native herbaceous plants and shrubs almost never outcompete weeds in these altered, nutrient-enriched, high pH soils. Just like on abandoned farmland, these construction sites act as "post-agricultural soils," and just like our abundant forests on post-agricultural soils, the herbaceous and shrub layers will be dominated by alien weeds virtually forever, especially with overabundant deer in the equation.⁵⁴

By way of further example, FERC and PennEast presume "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. The mitigation measures proposed by the PennEast Pipeline will not negate these serious adverse effects to the environment. As explained by Meliora Design:

"Compaction in construction work spaces will not be restored by simply regrading to pre-existing contours, retiling 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."⁵⁵

"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."⁵⁶

Cumulative Impacts Must be Considered on a Sub Watershed Scale.

The Corps cumulative impacts assessment should be considered across a broad range of environmental and community harms (e.g. air, water, wetlands, habitat, forest, floodplain, water quality, drinking water

⁵⁴ Dr. Emile DeVito, New Jersey Conservation Foundation, Email Correspondence Re: Tennessee Gas Pipeline practices. July 14, 2015.

⁵⁵ *Professional Review & Comment of the Draft Environmental Impact Statement and Supporting Documents Related to Surface Water Impacts of the Proposed PennEast Pipeline Project*, Michelle Adams & Marc Henderson, Water Resources Engineers, Meliora Design, LLC, September 5, 2016

⁵⁶ *Professional Review & Comment of the Draft Environmental Impact Statement and Supporting Documents Related to Surface Water Impacts of the Proposed PennEast Pipeline Project*, Michelle Adams & Marc Henderson, Water Resources Engineers, Meliora Design, LLC, September 5, 2016

supplies, health, safety, climate change, economics). Consideration of the multiple cuts proposed by PennEast on a subwatershed scale is required. FERC has not assessed the cumulative impact of multiple cuts on a subwatershed scale. Therefore, the Corps will need to conduct its own independent analysis and subject that analysis to public comment.

Cumulative impacts must be assessed by ecological system type – e.g. forests, wetlands, species habitat.

Cumulative impacts of the pipeline construction, operation, and maintenance on impacted ecological systems must also be considered. The Corps should evaluate the cumulative impacts to key ecological systems, over the lifetime of the pipeline, from construction through operation and including maintenance activities. For example, forest ecological systems would experience enduring but also fresh impacts throughout the life and presence of the pipeline. The initial impact will include the removal of the forest and understory vegetation, coupled with the changes in light, moisture, wind, etc. impacting 300 feet into the forest on either side of the ROW footprint. There will be enduring compacted soils, and dramatically altered vegetative composition along the ROW and along that forest edge that will increase volume and alter the timing of stormwater runoff, reduce groundwater recharge, change/take habitats for species of all kinds. There will be the influx of invasive plant and animal species that will have cascading impacts on the forest ecosystem, which will spread along the ROW and back into the core of the adjacent forest, and may introduce invasives into a region that could spread to other intact forest systems in the area but not directly on the PennEast pipeline route. There are the impacts of the fragmentation of the forest by PennEast but also by other cuts in the same region by other pipelines and/or linear projects. Over the life of the pipeline will be the maintenance of the ROW which will include the prevention of tree growth and maintenance of low growing vegetation only – this will be accomplished by periodic mowing and the use of herbicides. The mowing will disturb the vegetation, habitats and species along and nearby the ROW. The herbicides will include impacts for non-target species, and could have implications for soil microbes and nearby wetland, vernal pool and stream ecosystems. Maintenance activities will involve periodic trimming, pruning, cutting back and removal of trees and woody vegetation growing along the perimeter of the ROW. “The inspection and maintenance of the ROW means the repetitive access and traverse of the ROW by inspection vehicles and maintenance equipment. This increases overall soil compaction and because there are no stabilized access-ways, it also creates repeated opportunity for soil erosion.” PennEast will only be required to “ensure that the soils are stable and is under no regulatory obligation to restore soil to pre-construction conditions.” “[T]hese changes in the properties of the soils along the pipeline and within the pipeline ROW will contribute to the predicted increases in the volume and rate of runoff. Along the entire length of the 115.1-mile long pipeline, these changes in the post-construction hydrology of the affected lands (especially the steeper sloped areas) will invariably alter runoff properties. The end result will be impacts to the streams, wetlands and riparian areas traversed by the pipeline and pipeline ROW and increased opportunity for erosion along the steeper segments of the pipeline and pipeline ROW. Because PennEast is not required to implement any of the conventionally utilized best management measures to collect, treat and control ROW runoff, there is no way to mitigate for these changes other than to revegetate. However, once again the cover type will be different pre to post-construction (e.g. trees to grass) and PennEast is only obligated to achieve 80% post-revegetation coverage with the vegetation type it is using.”⁵⁷

⁵⁷ *Technical Review of Volume I FERC Draft Environmental Impact Statement Submitted for PennEast Pipeline Project*, Princeton Hydro, September 2016

As documented in the comment from Meliora Design,⁵⁸ the EIS fails to consider cumulative impacts in an ecological system and fails to consider the multiple elements of specific site conditions that impact one another synergistically to determine what will be the impact that results from development of that site, with and/or without mitigation – e.g. pre and post vegetation composition, soils, slope etc. (While these comments were originally directed at the DEIS, they apply equally to the final EIS and Corps review.) This missing component of the EIS is massive and seriously undermines any of the conclusions reached regarding ecological impacts:

- “The DEIS and 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 DEIS fails 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 DEIS fails 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.”
- “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, including information discussed further in this memo. Important site-specific information is located in different Resource Report volumes and other documents, and not easily correlated or evaluated. Much of the information discussed in this memo was compiled from multiple volumes, documents, and updates and is not readily reviewed by FERC or other reviewing agencies in a comprehensive manner. The project selection of stream and wetland crossing locations and construction methods cannot be clearly evaluated in the form in which it is presented in the DEIS and supporting documents.”
- Riparian buffer conditions, floodway and floodplain characteristics along proposed open cut streams and wetlands are not documented or evaluated. This is a large omission and should be catalogued properly as riparian vegetation can have direct influence on the health of the stream or wetland in way of thermal impacts, algae blooms and other water quality connections.

These cumulative assessments, considering near term and long term impacts, cumulative impacts resulting from the damage done near term and long term to a resource, including the lasting implications even with mitigation measures undertaken and full compliance with the law (let alone acknowledgement of the violations that are documented to take place as a matter of course during pipeline construction, operation and maintenance) need to be evaluated by the Corps and are not included in the FERC EIS. The forest

⁵⁸ *Professional Review & Comment of the Draft Environmental Impact Statement and Supporting Documents Related to Surface Water Impacts of the Proposed PennEast Pipeline Project*, Michelle Adams & Marc Henderson, Water Resources Engineers, Meliora Design, LLC, September 5, 2016

example above is but one kind of resource that experiences these multi-pronged impacts in need of cumulative assessment – vernal pools, wetlands, streams, aquatic life, avian life, amphibian life, soil life, and wildlife all need an assessment of the cumulative impacts that will be visited upon them by PennEast if it were to be constructed.

Based upon the lack of information, the misrepresentations regarding cumulative impacts, and the reality of the extent and breadth of the harms which can be determined even from the information provided, the Corps can and must reject the 404 permit.

Consideration of cumulative impacts that will result to ecological resources and recreational and cultural assets resulting from PennEast as well as other existing, proposed or anticipated infrastructure projects is required but does not appear to have been well considered on the record. Each project individually depletes the natural and scenic resources of the region, and the combined impact becomes increasingly severe, unavoidable, unmitigatable, and irreversible.

The Corps evaluation of cumulative impacts must consider reasonably foreseeable shale gas extraction/production as well as its end uses. Pursuant to 33 C.F.R. § 320.4(a)(1), in evaluating the 404 permit for the proposed Project, the Corps must include an “evaluation of the probable impacts, including **cumulative impacts**, of the proposed activity and its intended use on the public interest.” Additionally, the “benefits which reasonably may be expected to accrue from the proposal must be balanced against its **reasonably foreseeable detriments**.” 33 C.F.R. § 320.4(a)(1)(emphasis added). As such, the Corps must consider in its cumulative impact analysis the reasonably foreseeable shale gas extraction activities (including drilling and fracking operations) that will result, as well as impacts from the end uses of the gas including at power plants and LNG exports (given that the PennEast gas could be directed to export facilities such as Cove Point, a potential outcome identified throughout the FERC docket and the PennEast record).

All direct, cumulative, and foreseeable impacts must be considered. Documentation of these cumulative impacts is included as attachments to this comment, including evidence that:

- The PennEast pipeline will induce the drilling of on or about 3,000 new wells in Pennsylvania (from a combination of wells that have been drilled but are not yet producing and wells not yet drilled) in Northeast Pennsylvania, in Bradford, Susquehanna, Lycoming, and Tioga counties.

The cumulative review of PennEast must include the water, air, forest, habitat, soil, climate change and other impacts of the shale gas extraction that will be induced, supported and/or advanced by construction of the PennEast pipeline. Attached to this comment are multiple reports documenting the harms that will result from the shale gas extraction activities.

Use of standard construction practices will result in environmental violations and degradation.

PennEast and the EIS assert in multiple ways that the project will be constructed in full compliance with all applicable laws and that in temporary workspaces 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 pointed this out in great detail in our comments to date. The fact that FERC fails to consider the reality of pipeline construction, and that construction is fraught with environmental violations and a failure of mitigation/restored areas to return to ecological health is a significant deficiency.

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 FERC 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 FERC 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 FERC 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.

Attached please find: *Field Monitoring Report, Pipeline Construction & Maintenance Irreparably Harms Rivers, Wetlands and Stream, Addendum to Comment for the PennEast Pipeline*, a compilation of Delaware Riverkeeper Network technical documents, reports and observations compiled as the result of field monitoring which support, inform and expand upon these conclusions. 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.

Additionally, we attach new information documenting the significant violations and environmental damage inflicted most recently by construction of the Mariner East 2 pipeline. While this is a liquids pipeline, the implications documented in the attached materials are equally applicable to PennEast, perhaps more so given that PennEast will not be subject to the same breadth of state legal requirements that the Mariner East Project is.

For the reason stated above as well as the extensive adverse impacts that would result from the Project that are included in the attachments to this comment, including the many cascading impacts to the public interest—as well as the evidence demonstrating that these adverse impacts largely cannot be mitigated—the proposed Project would be contrary to the public interest and the Corps should deny its 404 permit.

e. The proposed Project would adversely affect a significant number of wetlands that are of considerable value to the public interest.

The Project includes multiple wetland crossings in the Delaware River and Susquehanna River watersheds that would have both temporary and permanent adverse effects on wetlands and the vital services that they provide for the public.

Sections 320.4(b)(1) and 320.4(b)(3) specifically contemplate a robust review of wetlands in the public interest review process, as the protection of vulnerable wetlands is a distinct priority in the Corps' review. The Corps is required to apply a presumption during the public interest review that “[m]ost wetlands constitute a productive and valuable public resource, the unnecessary alteration or destruction of which should be discouraged as contrary to the public interest.” *Id.* § 320.4(b)(1). The Corps also is required to evaluate applications with the recognition that individual wetland sites “may be part of a complete and interrelated wetland area.” *Id.* § 320.4(b)(3). Although alterations at individual sites “may constitute a minor change, the cumulative effect of numerous piecemeal changes can result in a major impairment of wetland resources.” *Id.* These requirements give effect to the Clean Water Act's statutory purpose and ensure that “wetlands will [not] be destroyed simply because it is more convenient than not to do so.” *Buttrey*, 690 F.2d at 1180.

The expert reports attached provide a general description of the way in which the permanent conversion of forested wetlands to emergent wetlands constitutes an adverse impact on the functions and values of those wetlands. The attached expert reports address the way in which wetland functions are disrupted, decreased, or lost as a result of a permanent conversion from forested to emergent wetland cover type. The Corps' Public Notice provides details on the acreage of wetlands –that will be permanently converted from forested wetlands to emergent wetlands as a result of the proposed Project.⁵⁹

⁵⁹ As noted later, these calculations of impacts have been grossly undercounted.

Additionally, a series of the attached reports detail the way in which the functional conversion of wetlands – specific to the portion of the proposed Project in Pennsylvania – will result in adverse impacts to the functions and values of those wetlands. The report breaks down the harms to each of the wetlands and measures the intensity and scope of the ground disturbance. In addition to detailing the adverse impacts as a result of wetland conversion, attached reports also detail the ways in which the mitigation techniques and site location are insufficient to satisfy the requirements of a 404 permit. The expert reports attached to this comment, irrefutably demonstrate that the permanent conversion of wetlands called for by this project will result in adverse impacts to those wetlands.

The Corps has vastly undercut or excluded consideration of the full acreage of impacts resulting from construction activity for the Project in its Public Notice. The Corps has also failed to properly account for the value, functionality, and acreage that will be impacted as a result of construction activity.

The Corps' Public Notice quantifies only the following distinct permanent wetland impacts resulting from the Project, it does not discuss or assess the full wetland impacts of the project which are far greater than just the 4 individual permit sites:

the permanent conversion of 5.98 acres of PFO and PSS wetlands to PEM wetlands within the Philadelphia Area of Operations associated with the 30-foot wide permanently maintained area over top of the proposed pipeline. All other PFO and PSS wetlands temporarily impacted by the project will be restored and left to revert back to their natural condition. There are no permanent impacts associated with the four individual permits discussed in the Public Notice. The four individual permits described in the Public Notice result in a total of 2.167 acres of permanent conversion.

- Specifically, the following permanent conversion impacts occur at the following:
 - IP-6 = 0.519 acres
 - IP-7 = 0.770 acres
 - IP-8 = 0.293 acres
 - IP-9 = 0.585 acres

Specifically, each of these crossings will have the following wetland impacts:

IP-6: Pipeline crossing of a Palustrine Forested (PFO) wetland and Palustrine Emergent Wetland (PEM).

The crossing will impact a total of 1.437 acres of wetlands. Specifically, the crossing will impact 1.324 acres of PFO wetland and 0.113 acre of PEM wetland. Once the crossing is restored there will be no loss of wetland area, however, the crossing will result in the permanent conversion of 0.519 acre of PFO wetland to Palustrine Emergent (PEM) wetlands. Compensatory mitigation has been offered by the applicant to offset the 0.520 acres of permanent conversation

IP-7: Pipeline crossing of two Palustrine Forested (PFO) wetlands. The crossing will impact 1.909 acres of wetlands. Once the crossing is restored there will be no loss of wetland area, however, the crossing will result in the permanent conversion of 0.770 acre of PFO wetland to Palustrine Emergent (PEM)

wetlands. Compensatory mitigation has been offered by the applicant to offset the 0.770 acres of permanent conversation.

IP-8: Pipeline crossing of unnamed tributaries to the Hokendauqua Creek, PFO wetlands, and PEM wetlands. The crossing will impact a total of 1.150 acres of waters and wetlands. Specifically, the crossing will impact 0.007 acre of waterways, 0.815 acres of PFO wetland and 0.328 acre of PEM wetland. The waterways will be crossed in a dry condition either during a period of no flow or created by construction of a coffer dam and bypassing the water around the work area via pumps or a flume. Once a dry condition is established the pipeline will be installed via traditional open trench methods. Once the crossing is restored there will be no loss of waterway or wetland area, however, the crossing will result in the permanent conversion of 0.223 acre of PFO wetland to Palustrine Emergent (PEM) wetlands. Compensatory mitigation has been offered by the applicant to offset the 0.223 acres of permanent conversation.

IP-9: Pipeline crossing unnamed tributary to Bull Run and PFO wetlands. The crossing will impact a total of 1.284 acres. Specifically, the crossing will impact 0.096 acre of waterways, 1.284 acres of PFO wetlands. The waterways will be crossed in a dry condition either during a period of no flow or created by construction of a cofferdam and bypassing the water around the work area via pumps or a flume. Once a dry condition is established the pipeline will be installed via traditional open trench methods. Once the crossing is restored there will be no loss of waterway or wetland area, however, the crossing will result in the permanent conversion of 0.585 acre of PFO wetland to PEM wetland. Compensatory mitigation has been offered by the applicant to offset the 0.585 acre of permanent conversation.

With so many PFO wetlands possibly being impacted in these realignments alone, the Corps should consider why PennEast does not instead propose outright horizontal directional drilling (HDD) under these forested resources and complexes since thermal impacts certainly will occur with open cuts along with all the other soil and compaction disturbances. Being the large impacts seen time and time again it is an insult and failure of the agencies that companies continue to propose open cuts to forested streams and forested wetlands and agencies continue to rubber stamp such proposals that lead to great harm when alternatives are possible. Economic feasibility must not just be based on what the company says is expensive when so much harm is at stake that will be passed off to the taxpayers down the road.

The Corps does not discuss or assess the full wetland impacts of the project which are far greater than just the 5 individual permit sites discussed in the public notice. However, the Corp's cannot adequately evaluate the probable impacts, including cumulative impacts, of the proposed activity and its intended use on the public interest, on the 22 factors that it is required to consider as part of its public interest review per 33 C.F.R. § 320.4(a)(1), and on the full array of wetland impacts without considering these individual permits as part of the Project as a whole.

FERC concludes that the Project will temporarily impact about 36 acres of wetlands (20 acres in Pennsylvania and 16 acres in New Jersey) and permanently impact about 20 acres of

wetlands (12 acres in Pennsylvania and 8 acres in New Jersey). We note, again, as demonstrated by expert reports by Schmid & Company and field monitoring reports attached to this comment, FERC severely undercut the actual number of and acreage of impacted wetlands that would be adversely affected by the Project. And so not only is the wetland impact significantly greater than what the Corps' public notice takes into consideration, it is greater than even the much larger figure FERC provides.

The Corps' regulations specifically prohibit the issuance of a permit that involves the alteration of "important" wetlands unless the Corps determines that "the benefits of the proposed alteration outweigh the damage to the wetlands resource." 33 C.F.R. §320.4(b)(4). The Corps cannot possibly begin to balance the twenty different factors as required in its public interest review without first properly classifying, characterizing, and counting the ground disturbance and impacts that will result from the proposed project, including to the full array and acreage of wetlands that will be harmed.

Additionally, expert analysis and field monitoring have clearly demonstrated the information provided by PennEast and reported by FERC on the Project's impact to wetlands is full of inconsistencies, regularly undervalues or misrepresents impacts, and is full of information gaps. As such, the Corps should not rely on the information provided by PennEast or FERC to evaluate the project's impacts to wetlands. The 404 permit should be denied.

As documented in the comment from Meliora Design,⁶⁰

"The DEIS and 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 DEIS fails 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 DEIS fails 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."

"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, including information discussed further in this memo. Important site specific information is located in different Resource Report volumes and other documents, and not easily correlated or evaluated. Much of the information discussed in this memo was compiled from multiple volumes, documents, and updates and is not readily reviewed by FERC or other reviewing agencies in a comprehensive manner. The project selection of stream and wetland crossing locations and construction methods cannot be clearly evaluated in the form in which it is presented in the DEIS and supporting documents."

⁶⁰ *Professional Review & Comment of the Draft Environmental Impact Statement and Supporting Documents Related to Surface Water Impacts of the Proposed PennEast Pipeline Project*, Michelle Adams & Marc Henderson, Water Resources Engineers, Meliora Design, LLC, September 5, 2016

Meliora's March 2019 expert report⁶¹ indicates 22.25 acres of PEM, PSS, and PFO wetlands impacted by the PennEast pipeline construction, PennEast has proposed 10.37 acres of wetland mitigation, about 47% of the wetland impact. The wetlands will be addressed on a County-scale, so the wetland mitigation could occur anywhere within the county, which means that it could occur within a different watershed. As a result, the impacted habitat is degraded and the wetland function is removed from the HQ and EV watersheds. The report also notes the Construction Sequence for the PennEast pipeline is described as an "assembly line flow" where there are separate crews conducting different portions of the pipeline installation process. This means steps in the construction are sequential and are not happening all at once. This leaves large gaps in time where one process may lag behind another in the pipeline assembly flow. This is critically important with how and when erosion and sediment control procedures are implemented. By disturbing the CWA and not immediately installing the pipeline, the construction sequence allows for long periods of earth disturbance to be exposed to weather and erosive conditions. DRN has observed this phenomenon along multiple pipelines in the past first-hand. Previous experience with oil and gas pipeline construction projects has shown that as much as 6 months can pass between site clearing and grading and pipeline trenching. This allows for an excessive amount of time for the site to be left disturbed. The minimum design requirement for E&S practices is to control runoff from the 2-year 24-hour storm. It is likely that a storm that exceeds the design standards for the temporary E&S controls will occur during this time and cause practices to fail, which leads to sediment pollution leaving the CWA and entering wetlands and waterbodies. The likelihood of a storm that exceeds design standards for the temporary E&S controls is magnified by the weather instability caused by climate change. NOAA has documented the extreme weather events plaguing the U.S., including Pennsylvania, the increase in flood severity is a missing part of the PennEast analysis and data.

According to Meliora's March 2019 expert report⁶², PennEast plans do not adequately protect the sensitive environmental resources such as EV wetlands and HQ/EV streams within the CWA. The pipeline traverses through 37.7 miles of HQ and 9.5 miles of EV watersheds in PA, which include impacts to 22.25 acres of PEM, PSS, and PFO wetlands, 86 crossings of HQ streams, and 18 crossings of EV streams. Many of these features are shown to be impacted by construction practices despite narrative and details suggesting alternative practices to minimize these impacts. This lack of coordination between the narratives, details, and plans will cause confusion in the field for the contractor and best practices will not be followed. In addition, not all stream crossings are noted on the E&S plan, therefore no direction is given to the contractor about what approach is to be taken to cross the undocumented watercourse. The plans were specifically developed by licensed professionals with large amounts of information at their disposal to provide planning and design to minimize impacts to natural resources. For example, stream PA-NHD-057 in Pine Run watershed (EV) at STA 2117+30 is shown to start and stop around the right-of-way even though topography would suggest it continues north to south. This crossing is also missing from the Aquatic Resources Impact Table.

Spot checks and field-truthing indicate inadequate and incomplete mapping of sensitive wetlands along the proposed ROW. For example:

⁶¹ *Review of PennEast Pipeline Application for Chapter 102 and 105 Permits*, Michele Adams & Marc Henderson, Water Resources Engineers, Meliora Design, LLC, March 2019.

⁶² *Review of PennEast Pipeline Application for Chapter 102 and 105 Permits*, Michele Adams & Marc Henderson, Water Resources Engineers, Meliora Design, LLC, March 2019.

- Along one 0.5 mile of the proposed route in sensitive State Gamelands, at least 12 vernal pool complexes or groundwater seeps were identified while PennEast tables only indicate 2 vernal pool habitats along the same proposed route and no groundwater seeps.⁶³
- “72% of the proposed pipeline alignment in New Jersey and 23% in Pennsylvania has not yet been field investigated for wetlands and other water resources.”⁶⁴

A report on *The Effects of the Proposed PennEast Pipeline on Exceptional Value Wetlands in Pennsylvania* by Schmid and Company⁶⁵ found that:

- The size (acreage) of some wetlands along the proposed pipeline were undermapped significantly.
- 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.
- Many of the wetlands in the Project area are not appropriately classified pursuant to the Pennsylvania Code and the requirements therein, thus preventing FERC and the public from considering the quality of the wetlands impacted. Indeed, there is no data in the DEIS analyzing wetland quality outside of this classification system, therefore it is critical that these classifications are exactly accurate (which they are not).
- Some wetlands which should be classified as "exceptional value" pursuant to Pennsylvania law were incorrectly identified by the applicant as "other"
- No "existing use" analysis of affected streams has been done, possibly leading to an undercount of the number and extent of Exceptional Value Wetlands.
- 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.
- [Neither the Corps nor] FERC can develop an appropriate mitigation plan based on the information and analysis in the EIS with regard to wetlands because the EIS “provides 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.”

A March 2019 supplemental report by Schmid and Company⁶⁶ noted that:

⁶³ *Field Monitoring Report, Pipeline Construction & Maintenance Irreparably Harms Rivers, Wetlands and Streams. Addendum to Comment for the PennEast Pipeline*, Delaware Riverkeeper Network.

⁶⁴ *The Effects of the Proposed PennEast Pipeline on Exceptional Value Wetlands in Pennsylvania, Prepared for the Delaware Riverkeeper Network*, Schmid and Company, July 2016; Letter dated September 9, 2016 written by Schmid & Company, Consulting Ecologists to Maya K. van Rossum, the Delaware Riverkeeper.

⁶⁵ *The Effects of the Proposed PennEast Pipeline on Exceptional Value Wetlands in Pennsylvania, Prepared for the Delaware Riverkeeper Network*, Schmid and Company, July 2016

⁶⁶ *Impacts of the Proposed PennEast Pipeline on Exceptional Value Wetlands in Pennsylvania, Supplemental Report, Prepared for the Delaware Riverkeeper Network*, Schmid and Company, March 2019.

- In the current PennEast pipeline route, only 9 wetland crossings involve trenchless methods (5 HDD crossings and 4 conventional bores), and none of those necessarily is proposed primarily to avoid wetland impacts.
- While avoidance of wetlands is mentioned as a general consideration in the pipeline siting and alternatives analysis, specific areas where identified exceptional value wetlands were avoided is nowhere discussed.
- PennEast is unclear and inconsistent when calculating how much permanent conversion of PSS and PFO wetlands is proposed to occur (they fluctuate between 30 feet and 10 feet; see PennEast statements below).
 - “A 30’ wide ROW will be maintained through PFO and PSS wetlands, resulting in the conversion of PFO and PSS to PEM wetlands.”
 - “In accordance with FERC guidelines PennEast will maintain a 10-foot-wide corridor centered on the pipeline for operational purposes.”
 - “A permanent 10-foot wide cleared corridor will be maintained through wetland resource areas in accordance with FERC’s Plan and Procedures.”

For a full analysis of the adverse impacts to wetlands that would result from the proposed Project, as well as the resulting harms to the public interest, see the expert reports attached.⁶⁷ Because the drawings by PennEast consultants have been field verified as being inaccurate, we also request a JD to reevaluate all wetland delineations.

PennEast proposes to mitigate the Project’s wetland impacts by “enhance[ing] 17.84 acres of PEM wetlands by the planting of trees and shrubs and protecting 0.49 acre of streams.” The Corps Public Notice states that this approximately 3 to 1 ratio adequately addresses the temporal loss associated with the mitigation until it becomes established. However, it is important to the Corps public interest evaluation of the Project to note that Compensatory Mitigation measures, such as the three offsite wetland mitigation areas within the Upper Central Susquehanna River Sub basin and the Central Delaware River Sub basin proposed by PennEast, do not negate the loss of ecosystem function and resulting impacts to the public interest felt elsewhere.

FERC suggests that “emergent vegetation regenerates quickly (in wetlands), typically within one to three years and in scrub shrub and forested wetlands, PE would maintain a 10 foot wide corridor centered over the pipeline in an herbaceous state and would selectively cut trees within a 30-foot-wide corridor centered over the pipeline. The remainder of forested and scrub-shrub vegetation would be allowed to return to

⁶⁷ *Professional Review & Comment of the Draft Environmental Impact Statement and Supporting Documents Related to Surface Water Impacts of the Proposed PennEast Pipeline Project*, Michelle Adams & Marc Henderson, Water Resources Engineers, Meliora Design, LLC, September 5, 2016

Table A Attachment to Professional Review & Comment..., Meliora Design, LLC, September 5, 2016

The Effects of the Proposed PennEast Pipeline on Exceptional Value Wetlands in Pennsylvania, Prepared for the Delaware Riverkeeper Network, Schmid and Company, July 2016 Letter dated September 9, 2016 written by Schmid & Company, Consulting Ecologists to Maya K. van Rossum, the Delaware Riverkeeper.

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

Technical Review of Volume I FERC Draft Environmental Impact Statement Submitted for PennEast Pipeline Project, Princeton Hydro, September 2016. Field Monitoring Report, Pipeline Construction & Maintenance Irreparably Harms Rivers, Wetlands and Streams. Addendum to Comment for the PennEast Pipeline, Delaware Riverkeeper Network.

preconstruction conditions and would not be affected during operation. No permanent fill or loss of wetland area would result from construction and operation of the Project.” But DRN has documented continued and irreversible impacts to wetlands from pipeline crossings that are sustained beyond this short-term view, especially in forested wetlands where tree regrowth can take decades to recover.⁶⁸ In light of deer browse and other impacts to changed soils, trees may never establish as they had prior to the ROW impact in these forested wetlands. Invasive plant species often move into these wetlands and impact the wetland ecology long term.⁶⁹

Wetlands provide various ecosystem services such as carbon storage, flood abatement, water quality maintenance, and biodiversity support. Wetland mitigation and other “offset” policies rely on restoration as a form of compensation for the loss of ecosystem function and structure, with the assumption that the entire suite of ecosystem services that have been lost will be replaced.⁷⁰ Research over the past decade indicates that there are many cases where wetland restoration, including compensatory mitigation, leads to the creation of wetlands that are not ecologically equivalent to naturally occurring wetlands, which calls into question the level to which ecosystem services can be replaced. It is unlikely that any mitigation will fully restore each ecosystem service equally.

Tradeoffs occur when one service is changed at the expense of another. For example, studies have shown that optimizing restored wetlands for nutrient cycling and removal comes at the expense of less biodiversity.¹ There are currently no standard requirements for measuring ecosystem functions at impacted wetlands prior to impact or after mitigation or restoration. The performance standards used to evaluate mitigation wetlands are based on vegetation and provide little indication of whether other ecosystem functions are being replaced in any capacity. Therefore, it is unknown which ecosystem services are being provided through wetland mitigation and their level of effectiveness. It is likely that many ecosystem services will be impaired compared to what the natural wetland provided.

As part of settlement negotiations from a prior pipeline case brought by Clean Air Council, Delaware Riverkeeper Network, and Mountain Watershed Association where gross errors and inadequacies to wetland protections were documented (Mariner East 2), DRN and CAC experts are serving on an Alternatives Analysis Stakeholder Workgroup with industry and agency to review PADEP Chapter 105 wetland regulations as it pertains to Alternatives Analysis. An HDD work group is also part of this effort – again due to gross errors and pollution incidents from the Mariner 2 pipeline and the need for much better oversight from the start by the state agency and others. This work is ongoing with public comment periods expected in the fall and a timeline going into Spring or Summer 2020. As such, there should be no movement or approvals on any more pipeline permits especially in way of the water pollution impacts, until that process has been completed. The 404 application should be denied or at least put on hold at minimum for consideration until this stakeholder process has been completed and the public has had adequate time to respond. The water resources proposed to be cut by PennEast cannot suffer the same harm seen time and time again on past pipeline projects – repeating a system that has been failing the public trust.

As such, the Corps’ cost-benefit analysis of the “benefits which reasonably may be expected to accrue from the proposal must be balanced against its reasonably foreseeable detriments” should not consider the

⁶⁸ Field Monitoring Report, Pipeline Construction & Maintenance Irreparably Harms Rivers, Wetlands and Streams. Addendum to Comment for the PennEast Pipeline, Delaware Riverkeeper Network.

⁶⁹ Field Monitoring Report, Pipeline Construction & Maintenance Irreparably Harms Rivers, Wetlands and Streams. Addendum to Comment for the PennEast Pipeline, Delaware Riverkeeper Network.

⁷⁰ Jessop, Jordan, et al. “Tradeoffs Among Ecosystem Services in Restored Wetlands” *Biological Conservation*, vol. 191, 2015, pp. 341–348.

proposed compensatory mitigation measures to have the same net positive impact on wetlands and the public interest as the unavoidable negative impacts that would result to wetlands from the Project. This abundance of evidence makes clear that the effect of the Project on wetlands would ultimately be adverse and detrimental to the public interest and that the 404 permit should be denied.

f. The Project will inflict only adverse impacts on the historical properties of the region and provide no benefits.

There are no conceivable benefits to the historic properties of the region that could result from the proposed Project. While here too there are issues of missing information that need to be addressed, the information on the record and concerns expressed by relevant agencies already demonstrate there will be adverse impacts from the Project.

The Corps' Public Notice for the Project states that:

“FERC is the lead federal agency responsible for the Section 106 process. The permit areas are within the Area of Potential Effect for the Overall Project as reviewed by FERC, and the results of the cultural resources investigations will be coordinated with the SHPO and the Tribes. If any significant resources exist within the permit area, the USACE will work with the FERC, the SHPO and the Tribes to avoid, minimize or mitigate impacts.”

However, the information provided by FERC lacks documentation of PA and NJ State Historic Preservation Offices (SHPOs) regarding proposed avoidance, resource identification, recommendations, updated documentation, avoidance plans, evaluation reports, treatment plans and mitigation for National Register of Historic Places – eligible archaeological sites that cannot be protected from project impacts.

Additionally, the National Park Service (NPS) expressed concern about the proposed PennEast pipeline crossing of the North Branch of the Susquehanna River which includes part of the river-based Captain John Smith Chesapeake National Historic Trail. NPS' prime concern involves effects to archaeological resources and cultural landscapes that may be of importance to tribes. However, FERC materials have failed to identify of NPS concerns with regards to effects to trails and cultural resources or provide a vibration monitoring plan and modification of blasting plan that include a review of potential effects to cultural resources.

The Corps cannot consider the impacts to historic properties included in the FERC materials to be adequate to base its own public interest review. Many impacted community members have commented on the destruction of historic resources that would result from the Project at the expense of the public's interest.

g. The proposed Project would significantly adversely affect Fish and Wildlife Values throughout the region and would result in a detrimental impact on the public interest.

The proposed Project would have many significant and adverse effects on Fish and Wildlife Values throughout the region and would result in a detrimental impact on the public interest. The extent of these adverse impacts is not included in the Corps' Public Notice.

The Corps' Public Notice States that:

A preliminary review of this application indicates that the proposed work would not affect listed species or their critical habitat pursuant to Section 7 of the Endangered Species Act as amended. The following Threatened or Endangered Species are known to exist within the portion of the overall project being reviewed within the Philadelphia District's Area of Operation; Bog Turtle, Northern Long Eared Bat, Indiana Bat, Dwarf Wedge Mussel, Rusty Patch Bumble Bee, and Northern Bull Rush. The USFWS issued a Biological Opinion (BO) for the PennEast Pipeline project on November 28, 2017. The following species determinations were made at the four wetland crossings:

IP-6: Bog Turtle – Not Within a Watershed Known to Have an Occurrence of Bog Turtles Indiana Bat and Northern Long Eared Bat – Not Likely to Adversely Affect Dwarf Wedge Mussel – Not Likely to Adversely Affect Rusty Patch Bumble Bee – Not Addressed in BO, USFWS Assumes Species Not Present Northern Bull Rush – Not Likely to Adversely Affect

IP-7: Bog Turtle – Not Within a Watershed Known to Have an Occurrence of Bog Turtles Indiana Bat and Northern Long Eared Bat – Not Likely to Adversely Affect Dwarf Wedge Mussel – Not Likely to Adversely Affect Rusty Patch Bumble Bee – Not Addressed in BO, USFWS Assumes Species Not Present Northern Bull Rush – Not Likely to Adversely Affect

IP-8: Bog Turtle – Wetlands Surveyed and Found Not To Be Potential Habitat Indiana Bat and Northern Long Eared Bat – Not Likely to Adversely Affect Dwarf Wedge Mussel – Not Likely to Adversely Affect Rusty Patch Bumble Bee – Not Addressed in BO, USFWS Assumes Species Not Present Northern Bull Rush – Not Likely to Adversely Affect

IP-9: Bog Turtle – Wetlands Surveyed and Found Not To Be Potential Habitat Indiana Bat and Northern Long Eared Bat – Not Likely to Adversely Affect Dwarf Wedge Mussel – Not Likely to Adversely Affect Rusty Patch Bumble Bee – Not Addressed in BO, USFWS Assumes Species Not Present Northern Bull Rush – Not Likely to Adversely Affect.

The information provided for IP-9 is incorrect because some of the wetlands in that area were found to be potential bog turtle habitat, which is why a Phase 2 survey was conducted there. A Phase 2 survey would not be conducted in an area that was not deemed suitable habitat by a Phase 1 survey. The Phase 2 survey was conducted in May and June of 2015 by Skelly and Loy Engineering-Environmental Consultants in the vicinity of IP-9, which is known as the Buttermilk Site. The Buttermilk Site is part of a large complex of PEM, PSS, and PFO wetlands containing suitable hydrology, suitable mucky soils between 3 and 36 inches deep, and suitable plant species such as soft rush and jewelweed to be considered textbook bog turtle habitat. In fact, a Phase 3 trapping survey was eventually conducted at this wetland complex because it was so large and was considered highly suitable bog turtle habitat that was too difficult to survey by Phase 2 alone. The notion that IP-9 was not found to be potential bog turtle habitat is grossly inaccurate and misleading.

Bog turtles have been historically documented near this site and there is even a farm on Buttermilk Road called "Bog Turtle Farm." In 2016 and 2017, DRN was contacted by concerned landowners in the area who were pressured by PennEast representatives trying to force them to grant access to their properties in order for their bog turtle consultants to conduct surveys. These PennEast representatives were attempting to have surveys conducted prior to April 15, which is outside of the USFWS recognized survey window of April 15 to June 15 for Phase 2 and Phase 3 surveys. On May 30, 2017, a DRN biologist was granted permission to visit a property in this area that was being pressured by PennEast. During this site visit, two vernal pools

and numerous springs and seeps were documented. In addition, wetland delineation flagging by PennEast consultants was found; however, the landowner had not given PennEast permission to survey. While it was determined that the landowner's neighbor had allowed survey access to PennEast, the wetland delineation flags crossed the property boundaries and therefore the PennEast surveyors were trespassing. Below are photos of the forested wetland in the vicinity of IP-9, the two vernal pools, and the wetland delineation flagging from trespassing PennEast surveyors.







As demonstrated in earlier sections of this comment, the Corps cannot adequately evaluate the probable impacts, including cumulative impacts, of the proposed activity and its intended use on the public interest, on the 22 factors that it is required to consider as part of its public interest review per 33 C.F.R. § 320.4(a)(1), including “fish and wildlife values” without considering these individual permits as part of the Project as a whole. Additionally, given the rampant deficiencies in surveys used to determine the presence of endangered species and critical habitat, outlined below, the Corps should not accept the applicant’s claim that the Northern Long Eared Bat and Indiana Bat are the only Threatened or Endangered Species known to exist within the portion of the overall Project being reviewed.

The following examples of false, inaccurate, misleading and/or deficient information regarding Endangered Species and Critical Habitat and other fish and wildlife values from the FERC EIS demonstrate that the presence of protected wildlife is far greater than reported by PennEast or FERC. This deficient and often false information cannot be used as a basis for the Corps to evaluate the true effects of the Project on the public interest. However, the information gathered through independent expert analysis and field-truthing demonstrate that the Project’s impacts on fish and wildlife values would be adverse and that no public benefit to fish and wildlife values would result. As such, the Corps must reject PennEast Pipeline’s 404 permit applications.

False, inaccurate, misleading and/or deficient information regarding Endangered Species and Critical Habitat and other fish and wildlife values from the FERC EIS:

- A total of 8 NJ state threatened, endangered, or special concern mussel species are completely left out of the EIS. These species are as follows: triangle floater (threatened), brook floater (endangered), yellow lampmussel (threatened), eastern lampmussel (threatened), green floater (endangered), tidewater mucket (threatened), eastern pondmussel (threatened), and creeper (species of special concern). All eight of these species may potentially occur in various waterbodies crossed by the project, based on the GIS range maps created by the Conserve Wildlife Foundation of New

Jersey found at:

<http://conservewildlife.maps.arcgis.com/apps/MapJournal/index.html?appid=093a625e6fa044e191595e57dceee027&webmap=7fc0d5a9cd0f419a8fdd3d254b316752>

- The DEIS notes that surveys resulted in “no suitable habitat” in regards to the red-shouldered hawk, however, the surveys missed two red-shouldered hawk nests and multiple adult and juvenile red-shouldered hawks that were observed in the area of MP 93.5 and MP 93.6 by Dennis and Joann Kager in Kingwood Township, NJ. The nests were adjacent to the ROW where the pipeline would go, and photographs and observational data were submitted to NJDEP.
- The conclusion of “absence” as a result of the Phase 2 presence/absence bog turtle surveys does not carry much weight when it is admitted that the project may affect the species and is likely to adversely affect the species because not all areas have been surveyed. The same can be said for the Indiana bat, northern long-eared bat, dwarf wedgemussel, and northeastern bulrush. FERC’s failure to evaluate the areas where there is likely to be an adverse impact to these species renders the DEIS factually deficient.
- The EIS notes that 7 wetlands in PA are considered suitable bog turtle habitat. However, Save Carbon County hired an independent USFWS qualified bog turtle surveyor (Jason Tesauro) who identified 9 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.
- Bog turtle searches did not encompass the entire area requested by USFWS.
- The habitats that are listed in the DEIS as being surveyed for timber rattlesnakes and copperheads are not complete. DRN documented optimum timber rattlesnake habitat during assessments conducted in SGL 168 from at least MP 52.9 to 51.0 along Blue Mountain near Danielsville, PA. DEIS states that 51.1 to 51.6 was surveyed for timber rattlesnake but this only includes one section of this habitat and does not include all of the optimal habitat areas in that area of SGLs. There are other areas that should have been/should be the subject of Phase 1 and/or Phase 2 surveys but have not been.⁷¹
- The maintenance of the ROW will include the prevention of tree growth and maintenance of low growing vegetation only – this will be accomplished by periodic mowing and the use of herbicides. The mowing will disturb the vegetation and habitats that were allowed to encroach on the ROW. The herbicides will include impacts for non-target species, and could have implications for soil microbes and nearby wetland, vernal pool and stream ecosystems. Openings in the canopy and vegetation along the ROW will encourage the influx of invasive plant and animal species that will have cascading impacts on the forest ecosystem, which will spread along the ROW and back into the core of the adjacent forest.
- The habitat of Ruffed Grouse includes deciduous and mixed forest, dense undergrowth, overgrown pasture, scrub oak, thick shrubland, young forest, and understory and can be found in Carbon, Luzerne, Northampton, Bucks, Hunterdon, and Lehigh Counties. These are all habitats and regions that will be cut and damaged by PennEast, and for which analysis of direct impacts for this species were not considered.
- The habitat of White-throated Sparrow includes coniferous and mixed forest, dense thickets, secondary growth areas, adjacent to ponds or openings, and forest edge in Hunterdon, Luzerne,

⁷¹ *Field Monitoring Report, Pipeline Construction & Maintenance Irreparably Harms Rivers, Wetlands and Streams. Addendum to Comment for the PennEast Pipeline, Delaware Riverkeeper Network.*

Northampton, Carbon, Lehigh, and Bucks Counties. These are all habitats and regions that will be cut and damaged by PennEast, and for which analysis of direct impacts for this species were not considered.

- The habitat of Magnolia Warbler includes coniferous and mixed forest, especially young spruces, nests in trees, deciduous shrubs or low trees (during migration) in Luzerne, Northampton, Carbon, Lehigh, Bucks, and Hunterdon Counties. These are all habitats and regions that will be cut and damaged by PennEast, and for which analysis of direct impacts for this species were not considered.
- The habitat of Yellow-Rumped Warbler includes mature coniferous and mixed coniferous/deciduous forest and forest edge and includes Luzerne, Northampton, Carbon, Lehigh, Bucks, and Hunterdon Counties. These are all habitats and regions that will be cut and damaged by PennEast, and for which analysis of direct impacts for this species were not considered.
- FERC falsely states that vernal pools to be cut by the pipeline will only have temporary impacts or not significant sustaining impacts yet it fails to consider the 1,000 feet of upland forest that amphibians using vernal pools require for parts of the year when they are not in their breeding vernal pool habitats. A pipeline cut adjacent and through a vernal pool or within 1,000 feet of a vernal pool can be a death sentence for migrating amphibians who may not be able to successfully cross the dry compacted pipeline route to reach their seasonal vernal pool.⁷² Predation also increases with these pipeline cuts.

On July 14, 2017, FERC submitted a Biological Assessment to the USFWS and requested that the Service develop a Biological Opinion as to whether authorizing the proposed pipeline project is likely to jeopardize the continued existence of any federally listed species. FERC's Biological Assessment concluded that the project "may affect and is likely to adversely affect the northern long-eared bat, Indiana bat, bog turtle, and northeastern bulrush." Additionally, it concluded that the project "may affect, but is not likely to adversely affect dwarf wedgemussels" and that there would be "no effect on the rusty patched bumble bee." The Delaware Riverkeeper Network offers the following comments on FERC's Biological Assessment, as it has bearing on the Corps assessment of fish and wildlife impacts resulting from the project:

Northern long-eared bat and Indiana bat: At the admission of FERC and by their own recommendation in their Biological Assessment, there is the potential for adverse impacts to these two bat species. See attached report for a more complete discussion of potential impacts to bats from both the pipeline and the reasonably foreseeable gas drilling that will result. In its Final EIS, FERC states that,

"Construction of the Project would disturb a total of approximately 601 acres of forested habitats, which could potentially support these bat species."

"Young bats or those that are unable to fly could be killed if tree clearing activities occur while the trees are occupied by bats. In addition, bats are sensitive to disturbance and may abandon disturbed roosts trees if the trees are occupied at the time of construction. If this occurs, then the disturbance and subsequent abandonment could have energetic repercussions on affected bats, potentially decreasing the likelihood of successful reproduction and survival."

"The Project also has the potential to impact listed bat species during operation. Noise, visual, and ground-vibration disturbance would occur during certain operation and maintenance-related

⁷² *Field Monitoring Report, Pipeline Construction & Maintenance Irreparably Harms Rivers, Wetlands and Streams. Addendum to Comment for the PennEast Pipeline*, Delaware Riverkeeper Network.

activities (e.g., during routine inspections of the line). Potential disturbance to listed bat species could occur during ongoing maintenance activities, and disturbances to bats can result in individuals fleeing the area, thereby using up critical limited energy reserves, which can potentially result in mortality.”

“Because all potentially suitable habitats for the Indiana bat and northern long-eared bat have not been surveyed to-date, it is possible that unidentified habitats for these bat species occur along the Project’s proposed disturbance footprint. . . . In addition, the Project would have long-term impacts on forested habitats that are used as foraging or roosting habitats by listed bats.”

Bog turtle: Only 80% of bog turtle surveys have been completed in PA and 31% in NJ at the time the Final EIS was submitted. Additionally, the proposed pipeline has been re-routed several times to avoid potential bog turtle habitat. This includes the deviation at MP 49.3 near the Blue Mountain Ski Resort in Carbon County, PA. Although the purpose of this deviation is to avoid the wetland area, it still comes within 250 feet of it at its closest point. A similar deviation was made at MP 73.5 in Northampton County, PA to avoid the large wetland complex where Phase 3 trapping surveys were conducted (where wetland IP-9 in the public notice is located). In this case, the edge of the right-of-way in the deviation still clips the edge of the wetland complex. Furthermore, these deviations would not alleviate groundwater contamination concerns because they are still too close to the wetlands. Any contamination to groundwater would impact a larger area and particularly any nearby spring-fed emergent wetlands that bog turtles prefer. With the amount of unsurveyed wetlands and by FERC’s own statements, it’s clear that adverse impacts to bog turtles are likely. In its Final EIS, FERC states that,

“Construction of the Project within wetland habitats has the potential to impact bog turtles. If present during construction, bog turtles could be directly injured or killed by construction equipment, or disturbed due to the presence of humans and machines in the area. In addition, construction and operation of the Project could alter wetland habitats that support this species. As discussed in detail within Sections 4.4 and 4.5, construction of the Project has the potential to alter wetland hydrology, increase the risk of invasive plant establishment/spread, and can fragment habitats.”

“Although no bog turtles have been found during Project-specific surveys, the Project would cross through and impact potential bog turtle habitat (including habitats in unsurveyed areas), and bog turtles could be present in unsurveyed areas.”

Northeastern bulrush: As with the other species, there is a great degree of uncertainty about the presence of northeastern bulrush within the project corridor and FERC statements reflect this in addition to their conclusion in their Biological Assessment. Regarding northeastern bulrush, FERC states in their Final EIS that,

“Not all potential habitat for this species has been surveyed to date, and the unsurveyed wetlands along the Project’s disturbance footprint may support this species. As a result, the Project has the potential to impact this listed species. If this species cannot be avoided by the Project, then potential impacts could include direct removal of individual northeastern bulrush plants during trenching or clearing, crushing of plants by equipment, or alterations to their wetland habitats (e.g., altered wetland hydrology and increased risk of invasive plant establishment/spread).”

Dwarf wedgemussel: In its Biological Assessment, FERC concludes that the project “may affect, but is not likely to adversely affect” dwarf wedgemussels. This conclusion is puzzling when specific dwarf wedgemussel surveys have not been conducted. According to the Final EIS,

“No Project-specific surveys for the dwarf wedgemussel have been conducted (beyond a general habitat assessments conducted for freshwater mussels; see table 4.6-1); however, the dwarf wedgemussel is known to occur in the Delaware River.”

“Individual mussels could be crushed by construction equipment and killed during the proposed conventional open-cut crossing method that may be used at the upstream tributaries to the Delaware River. In addition, construction of the Project could impact this species if activities increase the sedimentation levels found in occupied waterbodies. Increased sedimentation could impact this mussel through burial of eggs or mortality of their food supplies. These effects would impact species living both at the point where sedimentation increased and at points farther downstream.”

Based on these statements, it’s more likely that the project would affect and adversely affect this species. Unless surveys were conducted between the time the Final EIS was submitted and the present time, it’s difficult to understand how any other conclusion can be reached.

Rusty patched bumble bee: FERC concludes that there would be “no effect” on the rusty patched bumble bee in its Biological Assessment. However, the Final EIS states that,

“No Project-specific surveys for the rusty patched bumble bee have been conducted or are planned by PennEast; however, data from the FWS indicates that this species can occur in all four Pennsylvania counties crossed by the Project.”

“If present during construction, rusty patched bumblebee colonies could be destroyed, and direct mortality of bees could occur during vegetation clearing and right-of-way and road construction. In addition, impacts could occur due to the loss of suitable habitat or as a result of habitat fragmentation.”

Once again, it’s difficult to understand how FERC can be so certain that there would be no effect if surveys have not been conducted. Based on FERC’s statements on the direct mortality of bees and habitat loss, it seems that the project would likely adversely affect the species as is the case with the rest of the species in the Biological Assessment.

The inconsistencies within each of these individually—the DEIS, the FEIS, and statements made to other federal agencies including USFWS -- undermine FERC’s claims regarding the likelihood that adverse impacts will occur to fish and wildlife species as well as the extent of those species and the impacts. In light of FERC’s own admissions outlined above, the Corps must recognize the huge threat to all of these protected species that would result from this project.

Claims that adverse impacts will be temporary in nature or that permanent losses and conversion of ecosystems will still have value to wildlife as habitat, foraging and nesting areas fails to recognize the sensitivity and particularity, especially of already endangered species, in the region. The Corps should find that the proposed Project would significantly adversely affect Fish and Wildlife Values throughout the region and would result in a detrimental impact on the public interest and should deny the project 404 certification.

h. The proposed Project would adversely affect Flood Hazards and would have a detrimental impact on the public interest.

The proposed Project would have potential detrimental impacts to Flood Hazards in the region, particularly as result of potential rain and flooding events during construction of waterbody crossings that are dewatered in order to install the pipeline.

“The Project crosses 255 waterbodies (159 perennial, 45 intermittent, 40 ephemeral, and 11 open water), with eleven (11) of these water courses classified by FERC as major waterbodies that are over 100 feet in width.”⁷³ Of these, the Project will include 165 stream crossings in Pennsylvania and 90 in New Jersey.⁷⁴ “HDD techniques will be used to bore under a few of these waterbodies (Beltzville Lake, the Lehigh River/Lehigh Canal the Delaware River/Delaware Canal , two locations along Lockatong Creek, and an unnamed tributary to Woolsey Brook).”⁷⁵

According to analysis by Tom Myers, Ph.D⁷⁶:

“All dry stream crossing construction methods would involve development of a trench across the stream with subsequent backfill. Dry stream crossing techniques involve temporarily diverting the stream from the streambed so that trenching occurs without flowing water, using either a flume or a dam and pump method (RR2, p 2-28; RR1, p 1-84, -85). The method used to trench and install the proposed pipeline would not influence the effect that trench and streambed crossing could have on groundwater/surface water relations near the crossing.”

“As such, the vast majority of the stream crossings require the diversion of stream flow around the construction zone or actively pumping water out of the construction zone. Even when the work area is segregated from the stream by some type of diversion measure, the shallow depth to groundwater relative to the required depth of the pipe trench will require the constant dewatering of the trench. Similar types of acute impacts will also occur in the wetland and riparian areas traversed by the pipeline again due to shallow depth to seasonal highwater (groundwater), standing water or saturated soil conditions.”⁷⁷

“PennEast concludes that the dry crossing method can be conducted in a manner that minimizes potential in-stream turbidity impacts. FERC’s review of the conventional channel cut, flume crossing, and dam-pump crossing techniques reach a similar conclusion. It is FERC’s position that after the pipe is installed and the trench backfilled, the stream channel and stream banks will be adequately restored and the ecological properties of the stream returned to pre-construction conditions.”⁷⁸

⁷³ *Technical Review of Volume I FERC Draft Environmental Impact Statement Submitted for PennEast Pipeline Project*, Princeton Hydro, September 2016.

⁷⁴ DEIS, p 2-9.

⁷⁵ *Technical Review of Volume I FERC Draft Environmental Impact Statement Submitted for PennEast Pipeline Project*, Princeton Hydro, September 2016

⁷⁶ *Technical Memorandum Review of Draft Environmental Impact Statement, Proposed PennEast Pipeline, Docket No. CP15-558-000, FERC/EIS: 0271D*, Tom Myers, Ph.D., August 31, 2016

⁷⁷ *Technical Review of Volume I FERC Draft Environmental Impact Statement Submitted for PennEast Pipeline Project*, Princeton Hydro, September 2016.

⁷⁸ *Technical Review of Volume I FERC Draft Environmental Impact Statement Submitted for PennEast Pipeline Project*, Princeton Hydro, September 2016.

According to Princeton Hydro:

“None of the conclusions reached by either PennEast or FERC are supported by any data. Again the finding of no significant impact is largely based on the assumption that the proposed mitigation measures can be successfully implemented and will lessen the Project’s impact to surface waters. [...] PennEast’s position that impacts can be minimized is inconsequential as the quality, ecological functions, aesthetics and recreational potential of Exceptional Value and Category-1 streams cannot be decreased in any manner.”⁷⁹

These open trench crossing would pose many potential adverse impacts for flooding hazards, as the Myers’ report further explains:

“Trench backfill would have different conductivity than the surrounding alluvium, usually lower if the trench backfill is compacted and the surrounding is alluvium. The trench therefore would hydraulically impede groundwater flowing parallel to the stream and force it to surface into the stream. Depending on conditions downstream of the trench, the surface water would either percolate back into the alluvium or continue flowing as surface water, leaving less water stored in the alluvium than would otherwise be stored there. This could result in lower baseflow downstream of the trench because the trench effectively dams the groundwater flow so that groundwater discharges to the stream at times when the aquifer should be filling with percolating surface water. Each crossing is a different circumstance, but the DEIS has not analyzed the groundwater hydrology near any of the crossings.”⁸⁰

The choice of PennEast to rely on open-trench crossing methods has much higher risk for adverse flood hazard impacts than HDD would, “which would affect the groundwater flow and groundwater/surface water interactions much less than trenches with backfill.”⁸¹ This is simply because the bores have less effect on the overburden above the pipeline and do not interrupt the groundwater flow. This is not to say that there are no risks with HDD, there certainly are as the information from Mariner East 2 we provided indicates. But, when implemented properly and conscientiously, the impacts should be significantly less than open-trenching. For forested watersheds and forested riparian buffers along streams, HDD would be even more critical to consider because of the tree cutting that leads to thermal impacts to waterbodies. HDD should also be considered for longer stretches to better avoid resources. For example, proposed alignments often show pipeline companies drilling under a road or a development with high density development but exit just before a wetland or forest that could also be drilled under by extending the HDD. In this way the companies propose piecemealing from the start to discourage HDD instead of considering the forests and the stream cuts as valuable as the highway or other human structure where they proposed HDD. It is time the agencies fully require companies to drill under these public trust water resources when it can be done safely – a company’s unsupported statement that it is not feasible is not acceptable.

⁷⁹ *Technical Review of Volume I FERC Draft Environmental Impact Statement Submitted for PennEast Pipeline Project*, Princeton Hydro, September 2016.

⁸⁰ *Technical Memorandum Review of Draft Environmental Impact Statement, Proposed PennEast Pipeline, Docket No. CP15-558-000, FERC/EIS: 0271D*, Tom Myers, Ph.D., August 31, 2016

⁸¹ *Technical Memorandum Review of Draft Environmental Impact Statement, Proposed PennEast Pipeline, Docket No. CP15-558-000, FERC/EIS: 0271D*, Tom Myers, Ph.D., August 31, 2016.

The FERC EIS, “fails to disclose impacts to surface water resources due to pipeline construction.” As the Myer’s report explains, the EIS:⁸²

“acknowledges that “clearing and grading of streambanks, in-stream trenching, blasting, trench dewatering, inadvertent returns from HDD operations, and potential spills or leaks of hazardous materials” (DEIS, p 4-55, p 5-6) could affect surface waters. It lists several potential impacts including (DEIS, p 455):

- Modification of aquatic habitat
- Increased runoff and in-stream sediment loading
- Decreased dissolved oxygen
- Releases of pollutants from sediments
- Modification of riparian areas
- Introduction of chemical contaminants to waterways⁸³

Instead of quantifying either the existing conditions or describing how the pipeline would affect the existing conditions, the EIS essentially repeats this:

“noting that the “extent of the impact would depend on sediment loads, stream velocity, turbidity, bank composition, and sediment particle size” (DEIS, p 4-55). It does not quantify either the existing conditions or describe how the pipeline would affect the existing conditions. For each water crossing, the DEIS could easily describe the stream velocities, expected range of flows, bank composition, bed sediment sizes and contaminants present on those sediments, riparian conditions, and stream type (Rosgen and Silvey 1996). Using this information the DEIS could make at least semi-quantitative descriptions of the impacts pipeline construction will cause to the stream. HDD crossings would cause substantially fewer impacts to the stream, especially concerning changes in sediment transport and riparian vegetation (outlined at DEIS p 5-6).”⁸⁴

In order for the Corps to properly assess the impacts to flood hazards that could result from the Project, there must be “detailed analyses for each stream crossing of the potential for the crossing to change flow velocities, sediment transport, and stream type.” There also needs to be discussion of “alternative crossings including underground borings.”⁸⁵ In the absence of this information, the Corps is unable to make a true assessment of these impacts that could support issuance of a 404 permit.

Another potential flood-related hazard that would be exacerbated by the Project is the increased risk of landslides within the Project area. A Technical Review of Volume I

⁸² *Technical Memorandum Review of Draft Environmental Impact Statement, Proposed PennEast Pipeline, Docket No. CP15-558-000, FERC\EIS: 0271D, Tom Myers, Ph.D., August 31, 2016*

⁸³ *Technical Memorandum Review of Draft Environmental Impact Statement, Proposed PennEast Pipeline, Docket No. CP15-558-000, FERC\EIS: 0271D, Tom Myers, Ph.D., August 31, 2016*

⁸⁴ *Technical Memorandum Review of Draft Environmental Impact Statement, Proposed PennEast Pipeline, Docket No. CP15-558-000, FERC\EIS: 0271D, Tom Myers, Ph.D., August 31, 2016*

⁸⁵ *Technical Memorandum Review of Draft Environmental Impact Statement, Proposed PennEast Pipeline, Docket No. CP15-558-000, FERC\EIS: 0271D, Tom Myers, Ph.D., August 31, 2016*

FERC Draft Environmental Impact Statement Submitted For PennEast Pipeline Project conducted by Princeton Hydro explains this risk:⁸⁶

“The DEIS notes that in Pennsylvania, portions of the pipeline’s route traverses areas that are susceptible to landslides. This analysis is limited to areas prone to seismic events that could trigger a landslide. However, landslides often occur in the absence of any seismic event, especially in steeply sloped areas. Such landslides are more commonly associated with intense rainstorms or major snows melts, and increase in likelihood when lands are denuded of vegetation and native soils are disturbed and exposed. The DEIS does not discuss how such events could result in the catastrophic transport of large quantities of soil, rock and debris into sensitive upland, wetland, riparian and water resources.

Within Appendix D of the DEIS (E&SCP), PennEast notes that:

“The primary cause of landslides is when colluvial (loose) soil and old landslide debris on steep slopes give way. The geologic instabilities that cause landslides are often exacerbated by highway projects in which the earth is cut and soil is loosened. Other primary causes of landslides are rainfall or rain-on-snow events that can weaken debris on steep mountain slopes (McCormick Taylor, 2009).”

The PennEast project will create exactly these types of conditions (cut earth and loosened soils) as part of the land clearing and pipeline trenching elements of the Project. The construction phase of the project, when soils are exposed, soils are stock piled and the vegetation has been stripped from the site, offers the greatest potential for the occurrence of a landslide. Neither Sub-Section 5 (Description of Erosion and Sediment Control BMPs) nor Sub-Section 6 (Project Site Runoff Prior to Site Restoration) of the E&SCP (Appendix D of the DEIS) identifies any special actions or measures that will be implemented when conducting work in steep slopes to prevent a landslide.

Additionally, the post-construction alterations of the ROW’s vegetative cover and the inevitable compaction of site soils will increase the rate and volume of runoff generated from the Project ROW. These changes to prevailing soil conditions and alteration in the type of vegetated cover (trees and shrubs to grasses) increase the likelihood for post-construction landslides, especially in steeply sloped areas.”⁸⁷

Potential Flood Hazards to groundwater and surface waters.

“There always exists the possibility that during construction a spill or leaks will occur; for example a fuel spill or that directional drilling, trenching or related construction operations will result in the improper management of drilling fluids or dewatering effluent. These actions, in particular construction related accidents, can pose a threat to local groundwater resources. FERC concludes that any groundwater impacts attributable to

⁸⁶ *Technical Review of Volume I FERC Draft Environmental Impact Statement Submitted for PennEast Pipeline Project*, Princeton Hydro, September 2016

⁸⁷ *Technical Review of Volume I FERC Draft Environmental Impact Statement Submitted for PennEast Pipeline Project*, Princeton Hydro, September 2016

construction related operations will be minimized by PennEast's adherence to and implementation of a Spill Prevention, Control, and Countermeasures Plan."

"The Spill Prevention, Control, and Countermeasures Plan is contained in Appendix D of the DEIS (Erosion and Sediment Control Plan). It is part of an earlier document prepared by PennEast (Draft Erosion and Sediment Control Plan) dated September 2015. The subsection of the plan dealing with spill prevention and control is contained in Sub-Section 13 of the E&SCP, and is a single paragraph consisting of **five (5) simple bullet points**, none of which provide any direction of the actions that must be taken in the event of a spill. The Spill Prevention, Control, and Countermeasures Plan upon which FERC has based their findings is unreasonably simplistic, lacks any detail, and does not account for the highly sensitive and unique environments the pipeline will disturb."

According to the FEIS, the Project would cross the following Flood Hazard Zones:

"The Federal Emergency Management Agency (FEMA) identifies areas subject to flooding and high-volume flows identified as Special Flood Hazard Areas which are located within the 100-year floodplain. The Project mainline would cross 4.9 miles of FEMA Special Flood Hazard Areas, including 3.4 miles in Pennsylvania and 1.4 miles in New Jersey. The Hellertown Lateral would cross less than 0.1 mile of FEMA Special Flood Hazard Areas while the Gilbert and Lambertville laterals would not cross any FEMA Special Flood Hazard Areas. In addition, the pipeline route would cross-regulated flood hazard areas consisting of floodways and flood fringes of waters regulated under the New Jersey Flood Hazard Area Control Act Rules at N.J.A.C. 7:13. No tidally influenced waterbodies would be located within the Project area."⁸⁸

The fact that the Project contains overlap with Flood Hazard Zones increases the potential for adverse impacts to flood hazards on areas of public interest. For all of these reasons, the Corps should find the Project to be contrary to the public interest and deny its 404 application.

i. The proposed Project would adversely impact Floodplain Values in the region, resulting in a detrimental effect on the public interest.

The effect from the Project to floodplain values within the region would be wholly adverse and detrimental to the public interest. No beneficial impacts to floodplain values would result from the Project. Construction and maintenance activities would result in both temporary and permanent impacts to floodplain storage capacities through alteration of riparian vegetation at each stream and wetland crossing; soil compaction; and changes in elevation and contours.

The Project would result in Adverse Impacts to Floodplains, Including Their Permanent Alteration.

The project will permanently remove floodplain vegetation and result in compacted floodplain soils. Both of these, particularly when considered cumulatively across the pipeline project, as well as with the multiple projects in, or proposed for, the same region, are important. Floodplains vegetated with native trees and

⁸⁸ FEIS

shrubs can be four times as effective at retarding flood flows as grassy areas.⁸⁹ In addition, naturally vegetated floodplains provide breeding and feeding grounds for both fish and wildlife, they "create and enhance waterfowl habitat", and they "protect habitat for rare and endangered species."⁹⁰ Naturally vegetated floodplains are generally layered with leaf and organic matter which result in organic soils with high porosity and a greater capacity for holding water.⁹¹ The floodplain, in this natural state, is a riparian ecosystem that needs the overbank flows that the natural watershed's hydrology provides in order to remain healthy and in balance.⁹² According to the U.S. Environmental Protection Agency, the number one source of pollution to our nation's waterways is from nonpoint sources, including pollution from floodwaters, washed from the land in stormwater runoff.⁹³ Floodplains play a key role in reducing stormwater flows and containing floods, filtering out nonpoint source pollution, thereby reducing pollutant loading and protecting water quality.

The benefits of naturally vegetated and healthy floodplains include:

- Storing and slowing floodwaters;
- Intercepting overland flows, capturing sediment;
- Stabilizing streambanks, preventing erosion;
- Protecting wetlands and other critical habitats;
- Replenishing groundwater aquifers;
- Filtering out and/or transforming pollution;
- Providing recreation and education;
- Trees and other riparian vegetation: provide wildlife habitat; process nutrients and other would-be pollutants; shade and cool waterways; provide food for wildlife and stream insects (detritus); provide beauty and refuge.

The Delaware River's health and the health of its tributary streams are threatened by loss of its floodplain's function and the resulting increase in stormwater and floodwater. Adverse impacts to beneficial floodplain values must be considered. These include the accelerated runoff produced along the ROW that will result in more erosion and deposition within streams, increased transport and loading of contaminants, increase in flood peaks due to accelerated runoff (in turn reducing the amount of water entering the ground), decrease in groundwater recharge, blocked or diverted groundwater flow, soil compaction, and the removal of habitat and food sources for wildlife and aquatic life. These impacts can also produce a "ripple" effect by upsetting

⁸⁹ DNREC and Brandywine Conservancy, Conservation Design for Stormwater Management: A Design Approach to Reduce Stormwater Impacts from Land Development and Achieve Multiple Objectives Related to Land Use, September, 1997, p. 2-11.

⁹⁰ DNREC and Brandywine Conservancy, Conservation Design for Stormwater Management: A Design Approach to Reduce Stormwater Impacts from Land Development and Achieve Multiple Objectives Related to Land Use, September, 1997, p. 2-11.

⁹¹ DNREC and Brandywine Conservancy, Conservation Design for Stormwater Management: A Design Approach to Reduce Stormwater Impacts from Land Development and Achieve Multiple Objectives Related to Land Use, September, 1997, p. 2-11.

⁹² Poff, Allan, Bain, Karr, Prestergaard, Richter, Sparks, and Stromberg, "The Natural Flow Regime", BioScience, Vol. 47, No. 11

⁹³ Chester L. Arnold Jr., and C. James Gibbons, "Impervious Surface Coverage, the Emergence of a Key Environmental Indicator", APA Journal, Spring 1996, p. 245

the balanced ecosystem of the landscape through construction activities. The Corps should consider the short term, long-term, and cumulative impacts of these alterations. Unnatural flood levels and flood damages are experienced by communities living along the Delaware River and tributary streams. In addition, removal of vegetation along water systems removes the natural armoring that helps prevent accelerated erosion from unnaturally high flood flows. The ramifications, individually and cumulatively, of the multitude of proposed stream crossings for flooding, flood peaks, flood damages and erosion must be considered.

The Project would result in The Destruction of Naturally Vegetated Buffers Along All Wetlands and Waterways. Healthy and vegetated streamside buffers serve our communities by:

- Providing flood storage,⁹⁴ reducing flood peaks,⁹⁵ and slowing the velocity of floodwaters,⁹⁶ thereby reducing flooding and damaging flows in downstream and nearby communities;
- Protecting and enhancing water quality by preventing and filtering pollution⁹⁷ and enhancing the ability of the neighboring stream to process pollutants,⁹⁸ thereby protecting drinking water supplies, recreational uses of our waterways, commercial and recreational fisheries, ecotourism, and business operations that need clean water;
- Recharging aquifers that supply drinking water and base flow to streams;⁹⁹
- Providing and enhancing birding, fishing, hiking and other recreational opportunities that are so critical to our region's aesthetic beauty and community quality of life;
- Providing and enhancing the quantity and quality of habitat¹⁰⁰ to aquatic life, animals, birds and plants that are important to our watershed ecologically, economically, recreationally and psychologically;
- Providing organic matter critical for supporting aquatic organisms;¹⁰¹

⁹⁴ Tourbier, J. Toby "Open Space Through Stormwater Management, Helping to Structure Growth on the Urban Fringe".

⁹⁵ Army Corps of Engineers WRAP, "Technical and Scientific Considerations for Upland and Riparian Buffers Strips in the Section 404 Permit Process", ERDC-WRAP-01-6, May 2002, citing DeBano and Schmidt 1990; O'Laughlin and Belt 1995".

⁹⁶ Army Corps of Engineers WRAP, "Technical and Scientific Considerations for Upland and Riparian Buffers Strips in the Section 404 Permit Process", ERDC-WRAP-01-6, May 2002, citing DeBano and Schmidt 1990; O'Laughlin and Belt 1995".

⁹⁷ NJAC 7:8 NJDEP Agency Proposal Document at NJAC 7:8-5.5(h), USEPA, "Pesticide Tolerance Reassessment and Re-registration, Terbufos IRED Facts", EPA 738-F-01-015, October 2001;Id.

⁹⁸ Sweeney & Blaine, "Resurrecting the In-Stream Side of Riparian Forests", Journal of Contemporary Water Research & Education, Issue 136, June 2007.

⁹⁹ Castelle, Johnson, Conolly, "Wetland and Stream Buffer Size Requirements –A Review", J. Environ. Qual. 23:878-882 (1994); NJAC 7:8 NJDEP Agency Proposal Document at NJAC 7:8-5.5(h), page 77; Ibid. 38

¹⁰⁰ Army Corps of Engineers WRAP, "Technical and Scientific Considerations for Upland and Riparian Buffers Strips in the Section 404 Permit Process", ERDC-WRAP-01-6, May 2002, citing DeBano and Schmidt 1990; O'Laughlin and Belt 1995", citing DeBano and Schmidt 1990; O'Laughlin and Belt 1995"

¹⁰¹ Army Corps of Engineers WRAP, "Technical and Scientific Considerations for Upland and Riparian Buffers Strips in the Section 404 Permit Process", ERDC-WRAP-01-6, May 2002,, citing DeBano and Schmidt 1990; O'Laughlin and Belt 1995".

- Providing shading and thereby providing water temperature control¹⁰² important for the quality of the stream including the health of the habitats and aquatic organisms present;
- Reducing flood damages by ensuring structure-free zones devoid of structures to be harmed;
- Protecting public and private lands from erosion and helping streambanks maintain their integrity in order to prevent/minimize the costs and harms of sedimentation and restoration;¹⁰³
- Increasing the market value and marketability of nearby homes and communities;¹⁰⁴
- Increasing the opportunity for and success of ecotourism businesses dependent on the aesthetic beauty of the river and its ecological health; and
- Maintaining the unique ecological and historical qualities of our River and region that are an international draw.¹⁰⁵

The loss of riparian vegetation associated with the PennEast pipeline will make impacted streams more susceptible to erosion events, resulting in the loss of riparian lands (including floodplain). The deforestation caused by the PennEast pipeline will result in increased stormwater runoff which will result in increasing flows in the stream, making stream banks more susceptible to its erosive forces due to the loss of vegetative protection. Loss of riparian protection can also cause channel migration that can have serious implications over long stretches periods of time as the stream continues to erode, downcut, and deposit sediment in order to try and reestablish a stable channel. Extreme flow events will combine with the impacts inflicted by the construction and ongoing land management, including removal of riparian vegetation and forest, associated with the pipeline ROW to intensify the impacts of flooding.

Soil Compaction, Runoff and Recharge impacts will negatively affect floodplain values. The ROW associated with PennEast will be the location of compacted soils and, in the case of natural landscapes like forests, the maintenance of plants that have lesser capacity to infiltrate rainfall. The combination of compacted soils with low growing plants (to the degree they are able to grow in the compacted soils or under PennEast’s ROW management protocols) will result in increased runoff to nearby streams, thereby increasing flows in downstream communities.

According to the expert report *Technical Memorandum Review of Draft Environmental Impact Statement, Proposed PennEast Pipeline* conducted by Tom Myers, Ph.D.:

“Pipeline disturbance to soils includes the removal of vegetation which when present shelters the soil from raindrop erosion and protects/increase its capacity for rainfall recharge; and includes

¹⁰² Army Corps of Engineers WRAP, “Technical and Scientific Considerations for Upland and Riparian Buffers Strips in the Section 404 Permit Process”, ERDC-WRAP-01-6, May 2002., citing DeBano and Schmidt 1990; O’Laughlin and Belt 1995”.

¹⁰³ Water, Science, and Technology Board, Board of Environmental Studies and Technology, “Riparian Areas: Functions and Strategies for Management”, 2002, citing Swanson, et al; Center for Watershed Protection, “Impacts of Impervious Cover on Aquatic Systems”, Watershed Protection Research Monograph No. 1, March 2003; Ibid. 38

¹⁰⁴ Center for Watershed Protection, Better Site Design: A Handbook for Changing Development Rules in Your Community, August, 1998, Pg. 134, Lutzenhiser, M. and N.R. Netusil. “The Effect of Open Spaces on a Home's Sale Price.” Contemporary Economic Policy 19.3 (2001): 291-298.

¹⁰⁵ For example, "Pennypack Park in Philadelphia is credited with a 38% increase in the value of a nearby property." Center for Watershed Protection, Better Site Design: A Handbook for Changing Development Rules in Your Community, August, 1998, p. 134

soil compaction and furrowing caused by construction traffic on the soils which reduces the soil's ability to infiltrate and recharge rainfall and impacts the ability of the soil to support/encourage vegetation regrowth. Highly compacted soils inhibit vegetation regrowth. Even when shrubs and trees are allowed to regrow on compacted soils as part of a pipeline maintenance plan, and are able to regrow, their ability to protect soils from erosion due to a healthy canopy and healthy root growth, as well as their ability to encourage rainfall infiltration and recharge, requires years and often decades to reestablish.”

“After construction, ongoing maintenance activities and inspection with heavy equipment can re-inflict compaction impacts. The impacts of construction of the proposed pipeline on soils, can have significant and enduring ramifications for runoff, erosion, groundwater, stream baseflows and for supporting healthy habitats required by wildlife.”¹⁰⁶

Increased landscapes that are the source of stormwater runoff contributing to flood flows, flood peaks, and more erosive stream flows, could be significant in some areas. It is the combination of damaged upstream habitats, coupled with the damaged floodplains and vegetative buffer areas, that increases the level of compromise to the stream channel and flow levels.

Flooding rivers can scour river bottoms and expose pipelines to powerful water currents and damaging debris. Extreme and erosive flooding events in streams crossed by PennEast will increase the likelihood of stream scour, exposure and rupture. Heavy rains threaten to increase overall stream degradation and channel migration— thereby also exposing buried pipelines.¹⁰⁷

The mitigation statement provided by PennEast in the Corps' Public Notice states that:

“No net loss to wetlands or waterbodies will occur within the pipeline corridor; Penn East will return all wetlands within the pipeline ROW to preconstruction contours and will restore natural flow conditions to all affected waterbodies.”

However, documented observations on the ground following pipeline construction and maintenance demonstrate that this is not the case. Photos taken by DRN volunteer monitors show wetlands that have a changed flow and elevation due to ground disturbance and the pipeline placement.¹⁰⁸ These hydrological changes and harms are permanent damage to these sensitive habitats.

According to Princeton Hydro's *Technical Review of Volume I FERC Draft Environmental Impact Statement Submitted for PennEast Pipeline Project*,

“FERC recognizes that the Project has the potential to permanently alter the physical properties of native soil disturbed by clearing, construction, and maintenance activities,

¹⁰⁶ *Technical Memorandum Review of Draft Environmental Impact Statement, Proposed PennEast Pipeline, Docket No. CP15-558-000, FERC/EIS: 0271D*, Tom Myers, Ph.D., August 31, 2016

¹⁰⁷ See e.g. Fogg, J. and Hadley, H., 2007, Hydraulic Considerations for Pipelines Crossing Stream Channels. Technical Note 423. BLM/ST/ST-07/007+2880. U.S. Department of the Interior, Bureau of Land Management, National Science and Technology Center, Denver, CO. 20 pp. <http://www.blm.gov/nstc/library/techno2.htm>; Doeing, B.J., Williams, D.T. and Bradley, J.B., 1997, Gas Pipeline Erosion Failures: January 1993 Floods, Gila River Basin, Arizona. In Storm - Induced Geologic Hazards, Case Histories from the 1992 - 1993 Winter in Southern California and Arizona; Geological Society of America; Reviews in Engineering Geology, Volume XI (ed. Robert A. Larson).

¹⁰⁸ See attached *DRN Comments –Columbia Gas Line 1278 Line K Replacement in Special Protection Waters-DRBC Docket -D-2014-008-1*

specifically as a result of soil compaction, rutting, and erosion. However, FERC concludes that these impacts can be adequately mitigated through the implementation of the Erosion Control, Revegetation, and Maintenance Plan (Plan) and Wetland and Waterbody Construction and Mitigation Procedures (Procedures). The Cornell Soil Health Test (CSHT) provides a standard for assessing the important physical, chemical and biological processes and functions of disturbed soil. The CSHT was used to evaluate the impacts of a recently constructed pipeline that transected University-owned land. The CSHT analysis definitively showed that soils within the ROW had significantly lower soil quality levels than the soils sampled in the adjacent areas unaffected by the pipeline's construction. This suggests that reliance on standard erosion control and soil handling techniques inadequately compensates for soil compaction issues within the ROW. Compacted soils inhibit the recharge of precipitation leading to a greater amount of stormwater runoff. The added runoff can lead to an increase in the mobilization and transport of pollutants and an increased opportunity for overall soil erosion."

"Recent investigation of another pipeline ROW (Tennessee Gas pipeline as it passes through the Highlands region of New Jersey) conducted by the New Jersey Conservation Foundation¹⁰⁹ found multiple examples of 'restored' sites that were significantly altered from pre-pipeline conditions, even though each had been mitigated in accordance with FERC accepted erosion control and revegetation measures."¹¹⁰

These are only a sample of the documented examples proving pipeline impacts to the floodplain storage capacities are not "temporary in nature" and all construction areas have not been shown to be "restored to pre-construction elevations and contours." The finding "that the proposed mitigation measures will prevent any significant alteration of site soils or can successfully limit impacts attributable to such alterations is inaccurate as based on actual field assessments of 'restored' pipeline ROWs."¹¹¹ As such, it would be irresponsible for the Corps to take these claims from the applicant as fact.

The extensive detrimental impacts caused by the Project's potential adverse effect on flood values outlined above, combined with the many public benefits that rely on an intact floodplain and naturally vegetated buffers that would be lost, and the fact that no potential flood value benefits would result from the Project, provide the Corps with a clear cost-benefit analysis, demonstrating that the Project would not be in the public interest and are reason enough for the Corps to deny the Project 404 permits.

j. The proposed Project would have an adverse effect on Land Use and would be contrary to the public interest.

The proposed Project's construction and maintenance activities would result in significant adverse effects to the existing land uses in the region, including the temporary and permanent loss of forests; wetlands; agricultural land; preserved open space; urban open space and waterways, all of which are of significant value

¹⁰⁹ Emile DeVito, PhD. August 2016. Letter with supporting report and photographs from New Jersey Conservation Foundation to Norman Bay, Chairman, FERC.

¹¹⁰ *Technical Review of Volume I FERC Draft Environmental Impact Statement Submitted for PennEast Pipeline Project*, Princeton Hydro, September 2016

¹¹¹ *Technical Review of Volume I FERC Draft Environmental Impact Statement Submitted for PennEast Pipeline Project*, Princeton Hydro, September 2016

to the public interest. The Project offers no conceivable public benefit to the land use. Additionally, the detrimental impacts to land uses are often unmitigable.

According to the EIS, a total of “1,613.5 acres of land, will be disturbed in order to construct the pipeline and supporting pipeline facilities (aboveground facilities, pipe and contractor ware yards and staging areas, and access roads). Once completed, the long-term operation and maintenance of the pipeline affects 784 acres of land, of which the majority (715 acres) consists of the pipeline ROW, 61 acres in the form of aboveground facilities, and 8 acres associated with new permanent access roads”.¹¹²

GIS analysis conducted by Key-Log economics estimates the acres impacted by the Project will be even greater:

“Impacted acres (area converted temporarily or permanently from its existing use or cover):

- o In the permanent right-of-way (ROW): 717.3
- o In the construction zone (the construction corridor, new temporary roads, pipeyards, and temporary aboveground infrastructure): 1,852.7
- o In new permanent access roads and aboveground infrastructure: 55.8
- o The most heavily affected land cover types: forest (386.8 acres) and cropland (147.0 acres) (ROW only)”¹¹³

As described by Key-Log Economics, the project area includes a wide variety of land uses which currently support an even greater selection of benefits to the public interest:

“This study region encompasses Bucks, Carbon, Luzerne, and Northampton counties in Pennsylvania, as well as Hunterdon and Mercer counties in New Jersey. This 2,961-square-mile region supports diverse land uses, including the Delaware, Lehigh, and Susquehanna Rivers, thriving cities and townships, wetlands, and parks. These natural, cultural, and economic assets are among the reasons more than 1.8 million people call this six-county region home and an even larger number visit each year for hiking, fishing, festivals, kayaking, horseback riding, weddings, and other events.”¹¹⁴

Many of the adverse impacts to land uses in the region, including forests, wetlands, agricultural lands, preserved open space, and waterways, are outlined throughout this comment and the attached reports. However, the full extent of detrimental impacts to land uses in the region cannot be fully known due to the deficient information and analysis available. As documented in the comment from Meliora Design,¹¹⁵ the information provided by PennEast and the FERC EIS:

“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 DEIS fails to comprehensively evaluate each stream

¹¹² FERC DEIS

¹¹³ adapted from *Economic Costs of the PennEast Pipeline*, Spencer Phillips, PhD, et al., Key-Log Economics, LLC. January 2017.

¹¹⁴ *Economic Costs of the PennEast Pipeline*, Spencer Phillips, PhD, et al., Key-Log Economics, LLC. January 2017.

¹¹⁵ *Professional Review & Comment of the Draft Environmental Impact Statement and Supporting Documents Related to Surface Water Impacts of the Proposed PennEast Pipeline Project*, Michelle Adams & Marc Henderson, Water Resources Engineers, Meliora Design, LLC, September 5, 2016.

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 DEIS fails 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.”

While the full extent of adverse impacts to land uses resulting from the Project aren’t accurately portrayed in available information, Key Log Economics estimates the acreage of land affected by the Project according to its land use using GIS data, and provides insight into the massive scale, as shown in Table 4.

TABLE 4: Land Area Affected By PE, Study Region Total (See Also Figure 5)

Land Use	Baseline acreage in ROW	Baseline acreage in the construction zone	Baseline acreage in permanent surface infrastructure and access roads
Barren	4.4	52.1	0
Cropland	147.0	401.8	9.5
Pasture/Forage	77.6	164.0	4.4
Grassland	7.2	17.1	3.0
Shrub/Scrub	31.8	106.6	2.3
Forest	386.8	887.7	33.0
Water	3.5	6.3	0
Wetland	0.7	1.1	0
Urban Open Space	39.6	99.9	2.4
Urban Other	16.4	116.2	1.1
Total	715.0	1,852.7	55.8

Table 4. Acreage of Land affected by PennEast by Land Use¹¹⁶

Further examples of the adverse effects to land use that would result from the proposed Project, as well as resulting adverse impacts on the public interest, include:

- The single largest land use to be disturbed in Pennsylvania is forest – 59% of the pipeline length in Pennsylvania.¹¹⁷
- The ramifications of drought will be dramatically increased by land use changes such as those that will be inflicted by PennEast.
- Permanent, long term changes to land use cover and soil conditions, and corresponding increases in stormwater runoff and erosion. As a result of pipeline construction, there will be permanent long

¹¹⁶ Economic Costs of the PennEast Pipeline, Spencer Phillips, PhD, et al., Key-Log Economics, LLC. January 2017.

¹¹⁷ *Professional Review & Comment of the Draft Environmental Impact Statement and Supporting Documents Related to Surface Water Impacts of the Proposed PennEast Pipeline Project*, Michelle Adams & Marc Henderson, Water Resources Engineers, Meliora Design, LLC, September 5, 2016.

term water quality impacts related to stormwater runoff, including increases in the rate, volume, and frequency of stormwater runoff.

As explained by Princeton Hydro, the adverse impacts to land use that would result from the project are significant and permanent:

“The pipeline’s work corridor right of way (the area disturbed during the survey, site-access and construction of pipeline) varies between 90 and 125 feet in width. Following construction, a 50 foot wide permanent right-of-way (ROW) will run the entire length of the pipeline. This ROW will **remain in a significantly altered state relative to existing conditions**. The temporary and permanent ROWs are part of the overall environmental damage caused by the pipeline. Supporting the “pipeline” are various appurtenant facilities used to transport the gas. These include access/maintenance roads, compressor units, metering stations, regulator stations, delivery stations, holders, valves, and the other infrastructure elements critical to the pipeline’s operations. These components of the pipeline are all above ground and are neither benign nor passive operational elements of the system.”¹¹⁸

The report further emphasizes the fact the mitigation measures proposed by PennEast will not actually allow the affected land to return to pre-construction conditions, including current land uses:

“There is a robust body of data that demonstrates FERC’s standard pipeline mitigation measures are actually often quite ineffective. These measures ... are not capable of restoring project sites to their original environmental state thus preventing the project site from providing its original ecological services and functions conditions.”¹¹⁹

The proposed Project would clearly result in significant adverse effects to the existing land uses in the region, including the temporary and permanent loss of forests; wetlands; agricultural land; preserved open space; urban open space and waterways. These losses would be detrimental to the public. The Project offers no benefit to the land uses to counter these adverse impacts. Additionally, despite PennEast’s claims, the detrimental impacts to land uses are often permanent and cannot be mitigated. As such, the Project would clearly result in adverse impacts that are contrary to the public interest, and the 404 permits should be denied by the Army Corps.

k. The proposed Project would adversely affect Navigation and would be contrary to the public interest.

The Project would cross three navigable waters: Susquehanna River and Lehigh River in Pennsylvania and the Delaware River located in both Pennsylvania and New Jersey.

Both the Lehigh River and the Susquehanna River will be impacted by short term adverse impacts to recreational navigation as the navigable waterway will be crossed using an open-trench with dual cofferdam crossing method, preventing navigation through the waterways during construction. There could be impacts

¹¹⁸ *Technical Review of Volume I FERC Draft Environmental Impact Statement Submitted for PennEast Pipeline Project*, Princeton Hydro, September 2016

¹¹⁹ *Technical Review of Volume I FERC Draft Environmental Impact Statement Submitted for PennEast Pipeline Project*, Princeton Hydro, September 2016

to navigation on the Delaware as well depending on how the proposed HDD were to proceed and whether or not there were any problems that resulted during construction operations.

As such, the proposed Project would adversely affect navigation and would provide no benefits to navigation for the public interest.

I. The proposed Project would adversely affect Shore Erosion and Accretion and would be contrary to the public interest.

The proposed Project would significantly and adversely affect shore erosion and accretion and result in cascading detrimental impacts to the public interest.

The loss of riparian vegetation associated with the PennEast pipeline will make impacted streams more susceptible to erosion events, resulting in the loss of riparian lands (including floodplain) and exacerbating the sedimentation impacts of construction. As noted by experts, the deforestation caused by the PennEast pipeline will result in increased stormwater runoff; this will result in increasing flows in the stream with stream banks more susceptible to its erosive forces due to the loss of vegetative protection. Increased erosion means loss of habitat; channel migration that can have serious implications for riparian lands and vegetation over long distances and long periods of time as the stream continues to erode, downcut and deposit sediment in order to try and reestablish a stable channel; and increased instream sedimentation which is considered a pollutant both legally and scientifically. Erosive and extreme flow events will combine with the impacts inflicted by the construction and ongoing land management, including removal of riparian vegetation and forest, associated with the pipeline ROW to intensify the impacts of both.

As documented by experts in the attached reports, including Meliora Design¹²⁰:

“The proposed pipeline conditions will significantly reduce the land surface’s ability to retain rainfall and facilitate infiltration, and will increase runoff frequency, volumes, and flow rates, including increased surface erosion and sediment transport to Special Protection or C1 waterbodies.”

“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.”¹²¹

At least 43 waterbody crossings have steep slopes that would be cut by the pipeline. These 43 crossings are proposed to have additional temporary workspaces (ATWS) within 50 ft. of sensitive water features, adding

¹²⁰ *Professional Review & Comment of the Draft Environmental Impact Statement and Supporting Documents Related to Surface Water Impacts of the Proposed PennEast Pipeline Project*, Michelle Adams & Marc Henderson, Water Resources Engineers, Meliora Design, LLC, September 5, 2016

¹²¹ *Professional Review & Comment of the Draft Environmental Impact Statement and Supporting Documents Related to Surface Water Impacts of the Proposed PennEast Pipeline Project*, Michelle Adams & Marc Henderson, Water Resources Engineers, Meliora Design, LLC, September 5, 2016

to the potential erosion threats to these steep banks and the nearby sensitive streams where sediment pollution can cause long-term harm.¹²²

According to the report by Princeton Hydro, the Project will lead to “Increased amounts of stormwater runoff, the rate of runoff and the frequency and longevity of erosive flows” and “Increased pollutant loading to wetlands and streams”, as well as “combination of increased runoff volume and increased rate of runoff”, which “has been repeatedly demonstrated as the root cause of stream erosion.”

Princeton Hydro also states:

“The acute erosion problems caused by the PennEast Pipeline are not limited to upland areas. Some of the more potentially severe acute and long-term impacts occur where the pipeline crosses through wetlands and streams. These areas are characterized by persistent standing water, actively flowing water or saturated soils. Such conditions present especially difficult conditions for the proper installation of erosion and sediment control measures. Such conditions also decrease the functionality of most erosion and sediment control measures, which by design are meant to work in dry environments.”¹²³

PennEast states that completed E&S Control Plans by agencies will adequately avoid harms but this is a false conclusion as can be seen on other pipeline projects where severe sediment pollution harmed local waterbodies, many of which had special protection designations¹²⁴. Because most agencies require quick establishment of groundcover to stabilize soils, which takes the place of establishing more desired and diverse native habitats, biodiversity and soil health is lost. Once soil chemistry, soil porosity, and soil layering (horizons) that took eons to form are destroyed by the construction process, erosion control measures usually require lime and fertilizer to be applied so that seed mixes grow rapidly. The addition of lime and fertilizer are like poison to what were once forest soils of low pH and low nutrients. This essentially ruins the chance that the soil will ever revert to a native plant community again. Alien invasive weeds of all kinds thrive on the nutrient-enriched, topsy-turvy soil layers in the aftermath of construction. Native herbaceous plants and shrubs almost never outcompete weeds in these altered, nutrient-enriched, high pH soils. Just like on abandoned farmland, these construction sites act as "post-agricultural soils," and just like our abundant forests on post-agricultural soils, the herbaceous and shrub layers will be dominated by alien weeds virtually forever, especially with overabundant deer in the equation.¹²⁵

In addition to the examples listed here, numerous attached reports outline the many ways the proposed Project would adversely affect erosion and sedimentation, as well as the ways in which this will lead to cascading detrimental impacts to the public interest. As such, the Corps should reject the 404 permits for the Project as it would be contrary to the public interest.

¹²² *Field Monitoring Report, Pipeline Construction & Maintenance Irreparably Harms Rivers, Wetlands and Streams. Addendum to Comment for the PennEast Pipeline*, Delaware Riverkeeper Network.

¹²³ *Technical Review of Volume I FERC Draft Environmental Impact Statement Submitted for PennEast Pipeline Project*, Princeton Hydro, September 2016

¹²⁴ *Field Monitoring Report, Pipeline Construction & Maintenance Irreparably Harms Rivers, Wetlands and Streams. Addendum to Comment for the PennEast Pipeline*, Delaware Riverkeeper Network.

¹²⁵ Dr. Emile DeVito, New Jersey Conservation Foundation, Email Correspondence Re: Tennessee Gas Pipeline practices. July 14, 2015.

m. The proposed Project would adversely affect Recreation and would be contrary to the public interest.

The proposed Project would significantly and adversely affect recreation and result in cascading detrimental impacts to the public interest. The project will cross a number of highly used recreational and special interest areas. Because site-specific crossing plans and impact analyses are sorely lacking and/or missing in the materials provided, it is difficult to assess full impacts. But given that hiking, birding, boating, fishing, hunting and other recreational enjoyments are dependent on beautiful and healthy habitats to be attractive for recreational use, and because PennEast will harm these attributes, both enjoyment and economic impacts are inevitable and could be significant. The open cut stream crossings will impact boating, fishing, birding and other recreational uses in the areas – both during construction but also during operation and maintenance due to the changed natural conditions from the permanent and repeatedly maintained footprint. The crossing of the Appalachian Trail by the proposed route is in a section that is only feet away from a scenic overlook and cliff outcropping – it is hard to imagine a more damaging location for harming this important recreational and cultural resource. This area is also prime rattlesnake habitat.

We know that the recreational ramifications of PennEast are well recognized by the citizenry and of high concern as well. According to Key Log’s analysis: “In a review of comments collected through the DEIS, 99.4% of people who mentioned recreation and tourism businesses, 100% of commenters mentioning health (either related to the pipeline or the compressor station), and 93.3% of people mentioning the environment believed the PE would have a negative effect.”

The recreation supported by the region—and particularly by the water resources and preserved natural areas in the region, many of which are targeted by PennEast—are also an important part of the local economy. According to the attached Key Log analysis: “Tourists spent about \$4.5 billion in the study region in 2015. The companies that directly served those tourists employed 40,896 people, or 5.7% of total private employment in the region (Tourism Economics, 2015 & 2016).”

As further observed by Key Log: “A loss of scenic and recreational amenities, the perception and the reality of physical danger, and environmental and property damage resulting from the PE could discourage people from visiting, relocating to, or staying in the region. Workers, businesses, and retirees who might otherwise choose to locate along the PE’s proposed route will instead pick locations that have retained their character, their productive and healthy landscapes, and their promise for a higher quality of life.” “This is already occurring in the region. With the possibility of the PE looming, business plans are stalling and the real estate market is slowing.”

Other examples of the many adverse impacts to recreation on both public and private lands within the region are well explored in the attached reports.

The FERC EIS does not consider the adverse impacts to recreation and ecotourism so vitally important to the impacted region. As a result, given that the Corps relied heavily on that document for its analysis, the Corps has similarly not given due consideration to this important public interest, recreational, environmental and economic interest.

In light of the many ways the proposed Project would adversely affect recreation, as well as the ways in which this will detrimentally impact to the public interest, the Corps should reject the 404 permits for the Project as it would be contrary to the public interest.

n. The proposed Project would have significant adverse effects on Water Supply and Conservation, which would be both detrimental and contrary to the public interest.

The PennEast Pipeline will cross multiple water sources including aquifers, wellhead protection areas, and the Delaware River. PennEast prepared a Well Monitoring Plan stating that the company will conduct pre- and post-construction water quality monitoring within 150 feet of the construction corridor. However, the New Jersey Department of Environmental Protection commented in response to the plan, that a monitoring distance of 150 feet of the pipeline is inadequate, instead, suggesting a 1,000 feet monitoring radius (New Jersey Department of Environmental Protection, 2015). While the Corps is only looking at the Pennsylvania portion of the project, this observation by the NJDEP is an equally sound recommendation for the Pennsylvania portion. The Environmental Protection Agency also submitted a comment about drinking water concerns and deficiencies in information in the DEIS. Specifically they stated PennEast Pipeline Company should work with state water agencies to account more thoroughly for any potential contamination.

There are several public and private wells along the construction corridor, with dozens of communities already passing resolutions opposing construction of the pipeline.¹²⁶ During public comment on the project, there have been numerous findings regarding potential and serious impacts to drinking water sources. Additionally, a significant amount of inaccurate or missing information has been identified. The extent to which it relied on PennEast and Corps documents where these multiple and serious deficiencies existed.

“The proposed pipeline route passes through rural areas where many residents obtain their drinking water from onsite wells. One of the most widely recognized functions of wetlands is their ability to absorb or filter pollutants such as nitrogen, phosphorus, and sediments and thereby to provide an important water quality benefit. When wetlands are located above or along private drinking water supplies, that water quality enhancement function is particularly significant.”¹²⁷

“Schmid analysis “identified properties and specific landowners in Pennsylvania where there are (confirmed), or where there are likely to be, springs or drinking water wells located 10 within 150 feet of the proposed pipeline construction workspace. Examples include: at MP 58.2 along E. Dannersville Road in Moore Township, Northampton County; at MP 57.8 along W. Beersville Road in Moore Township, Northampton County; near MP 53 along North Cottonwood Road in Danielsville, Northampton County; near MP 45.75 east of Beers Lane, Towamensing Township, Carbon County.”¹²⁸

“Thus, FERC's statement that "there are no private water supply wells or springs located within 150 feet of the pipeline construction workspace in Pennsylvania" (DEIS, page ES-5) is false. This is a problem in its

¹²⁶ Spencer Phillips, PhD, et al. *Economic Costs of the PennEast Pipeline*. January 2017. Key-Log Economic, LLC.

¹²⁷ *The Effects of the Proposed PennEast Pipeline on Exceptional Value Wetlands in Pennsylvania, Prepared for the Delaware Riverkeeper Network*, Schmid and Company, July 2016

¹²⁸ Letter dated September 9, 2016 written by Schmid & Company, Consulting Ecologists to Maya K. van Rossum, the Delaware Riverkeeper.

own right, because there can be direct impacts to private water supplies if construction activities are not done carefully, or if leaks occur during operation of the pipeline. In addition, the fact that there are private springs and wells used for water supply within 150 feet of the proposed ROW in Pennsylvania suggests that there very well may be additional Exceptional Value Wetlands not yet identified that meet the PADEP criterion at §105.17(1)(iv) regarding association with existing public or private water supplies.”¹²⁹

Given that the Palmerton Water Company has four production wells at the foot of Blue Mountain that supply water to thousands of people living in the towns of Palmerton and Aquashicola, an analysis of groundwater impacts and potential threats to this important drinking water supply needs to be earnestly and scientifically considered by the DEIS; as written, it is not.

The DEIS should, but did not, provide a plume map of groundwater contamination and a map showing soils contamination from the Palmerton Zinc Pile Superfund site assessing the implications of the various proposed pipeline routes for water, groundwater and drinking water contamination.¹³⁰

The information provided by PennEast and the FERC EIS is too deficient for the Corps to make any meaningful assessment of the proposed Project’s true and full impacts on water supply and conservation:

- FERCs statement that "there are no private water supply wells or springs located within 150 feet of the pipeline construction workspace in Pennsylvania" (DEIS, page ES-5) is false. Delaware Riverkeeper Network experts have “identified properties and specific landowners in Pennsylvania where there are (confirmed), or where there are likely to be, springs or drinking water wells located within 150 feet of the proposed pipeline construction workspace.”
- The EIS does not provide data and references supporting the assertion that there is “no indication that common construction activities that involve shallow excavation, such as home construction, has resulted in increased arsenic concentrations in water supply wells” (DEIS, p 4-12).
- The EIS does not provide a plume map of groundwater contamination and a map showing soils contamination from the Palmerton Zinc Pile Superfund site assessing the implications of the various proposed pipeline routes for water, groundwater and drinking water contamination.
- The EIS fails 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 trenching, and groundwater drawdown caused by trenching.
- The EIS fails to consider how the project construction would affect recharge rates, which are highly variable given the underlying geology, soil type and thickness, and topography controlling the actual recharge location.

¹²⁹ Letter dated September 9, 2016 written by Schmid & Company, Consulting Ecologists to Maya K. van Rossum, the Delaware Riverkeeper.

¹³⁰ *Technical Memorandum Review of Draft Environmental Impact Statement, Proposed PennEast Pipeline, Docket No. CP15 558-000, FERC\EIS: 0271D*, Tom Myers, Ph.D., August 31, 2016

- The EIS fails to analyze as part of an analysis of preferential flow the potential for trench backfill to facilitate the movement of contaminants through the groundwater .
- The EIS fails to consider the pipeline trench as a pathway for contamination.
- The EIS lacks information regarding the standards used to guide HDD water withdrawals that prevent impacts on downstream ecological or human uses and needs.
- The EIS fails to include a table of bedrock aquifers including relevant properties, specific capacity statistics or well yields, and conductivity, where available.
- The EIS fails to include maps, 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.
- The EIS fails to include a complete inventory of springs and seeps within a quarter mile of the pipeline that adequately considers the changes which could occur due to pipeline construction.
- The EIS fails to present both the result of a final karst study for the area and plans for mitigating problems caused by constructing through karst by rapid contaminant transport within karst.
- The EIS fails to include data or information regarding the mineral content of the soils to be crossed by the proposed pipeline, nor does it include the results of leaching tests which are required.
- The EIS fails to assess the potential for pipeline construction to result in acid generation or leached metals in all areas where it crosses mine spoil.
- The EIS fails to present avoidance and mitigation discussions focused on preventing the leaching and transport of acid and metals from the site.
- The EIS fails to provide the data and references supporting the assertion that “shallow groundwater ... generally have (sic) low arsenic concentrations and that high arsenic concentrations ... are the result of more mature groundwater interacting with geochemically susceptible and arsenic-enriched water bearing zones, which are often deeper wells” (DEIS, p 4-12).

Given the extensive lack of data critical to the public interest, it would be irresponsible for the Corps to approve 404 permits for the project.

The destruction of naturally vegetated buffers along all wetlands and waterways resulting from the Project would have harmful impacts on a number of public interest concerns, including the health and safety of drinking water supplies:

- Protecting and enhancing water quality by preventing and filtering pollution, and enhancing the ability of the neighboring stream to process pollutants, thereby protecting drinking water supplies,

recreational uses of our waterways, commercial and recreational fisheries, ecotourism, and business operations that need clean water;

- Recharging aquifers that supply drinking water and base flow to streams;

Additionally, the water withdrawals and discharges within the Delaware River watershed could result in significant and adverse impacts to the water supply and conservation for the region, and the public interest. PennEast anticipates using approximately 33 million gallons of water for hydrostatic testing,¹³¹ including withdrawals and discharges.

PennEast is subject to DRBC jurisdiction and docket review as a result of the Project's substantial effects on water resources of the Basin—including, through its substantial land disturbance, its impact on Comprehensive Plan Areas, and its impact on Special Protection Waters, among others—and is therefore required to be submitted for Commission review. The jurisdiction of the Delaware River Basin Commission over the PennEast Pipeline project extends the entire length of the project as it passes through the boundaries of the Delaware River watershed.

The DRBC articulated in its November 14, 2014 letter to PennEast that it intends to enforce its authority and that “DRBC review and approval are required prior to the commencement of any water withdrawal, discharge, or earth disturbance activities.” April 23, 2015, the DRBC sent a letter to FERC that included a request for FERC to consider a joint public meeting and DRBC public hearing on the captioned project. On April 25, 2016, the DRBC withdrew that request. The DRBC will conduct its public process independently of FERC's.

PennEast submitted its application to DRBC for the PennEast Pipeline Project (“Project”) on February 8, 2016 and has since submitted supplemental material and responses to DRBC comments on April 1, 2016; July 25, 2016; May 23, 2016; November 1, 2016, April 17, 2017, and May 12, 2017.

However, PennEast has not yet developed a hydrostatic test plan that identifies the final hydrostatic test water sources and discharge locations,¹³² including the water volume that would be withdrawn and discharged as both a Project-total amount, and a daily amount, for each pipeline segment.

Such significant withdrawals can adversely affect water conservation at the expense of the public interest, especially in exceptionally dry periods when low flow conditions may be encountered.

Discharges of hydrostatic test water would be regulated by a state SPDES permit, and the classification of the receiving waters (as applicable) would be identified as part of the permitting process. As such, water should be prevented from being discharged into state-designated exceptional value waters, waterbodies that provide habitat for federally listed threatened or endangered species, or waterbodies designated as public water supplies. However, the fact that expert analysis and field monitoring to date has demonstrated that PennEast has falsely characterized or excluded the mention of these protected resources in its materials raises concerns.

¹³¹ FERC EIS

¹³² FERC EIS

Due to this high potential for the project to adversely impact water supply and conservation, and the detrimental impacts to the public interest that would result, the Corps should deny the Project's 404 applications.

o. The proposed Project would adversely affect Water Quality resulting in a detrimental impact on the public interest.

The project would result in severe and adverse impacts to water quality which would be contrary to the public interest.

Examples of some of the many adverse impacts to water quality that would result from the Project include:

- Due to land use changes and soil alteration, there will be permanent long-term water quality impacts related to stormwater runoff, including increases in the rate, volume, and frequency of stormwater runoff.¹³³
- At least 43 waterbody crossings have steep slopes that would be cut by the pipeline. These 43 crossings are proposed to have additional temporary workspaces (ATWS) within 50 ft. of sensitive water features, adding to the potential erosion threats to these steep banks and the nearby sensitive streams where sediment pollution can cause long term harm.¹³⁴
- Pipeline construction results in the loss of riparian (streamside) vegetation.¹³⁵ For each of the pipeline construction techniques there is a resulting loss of vegetation and foliage associated with clearing the stream banks – the PennEast pipeline is no exception. At least 255 streams will be crossed with the vast majority being crossed via open trench methods which result in permanently denuded streambanks. Riparian vegetation is an important part of a healthy ecosystem and protects the land adjoining a waterway which in turn directly affects water quality, water quantity, and stream ecosystem health.
- The loss of riparian vegetation along streams will, among other impacts, remove shading and result in increased stream temperatures. Many of the streams being cut by PennEast are smaller, headwater streams with high water quality. The loss in vegetation will magnify increased stream temperature and thereby reduce its quality and suitability for aquatic life. For some species, the resulting change in temperature could have dramatic impacts.
- Furthermore, the loss of riparian vegetation associated with the PennEast pipeline will make impacted streams more susceptible to erosion events, resulting in the loss of riparian lands (including floodplain) and exacerbating the sedimentation impacts of construction. As noted by experts, the

¹³³ *Professional Review & Comment of the Draft Environmental Impact Statement and Supporting Documents Related to Surface Water Impacts of the Proposed PennEast Pipeline Project*, Michelle Adams & Marc Henderson, Water Resources Engineers, Meliora Design, LLC, September 5, 2016

¹³⁴ *Field Monitoring Report, Pipeline Construction & Maintenance Irreparably Harms Rivers, Wetlands and Streams. Addendum to Comment for the PennEast Pipeline*, Delaware Riverkeeper Network.

¹³⁵ Norman, *supra*.

deforestation caused by the PennEast pipeline will result in increased stormwater runoff; this will result in increasing flows in the stream with stream banks more susceptible to its erosive forces due to the loss of vegetative protection. Increased erosion means loss of habitat. Channel migration can have serious implications for riparian lands and vegetation over long stretches and long periods of time as the stream continues to erode, downcut and deposit sediment in order to try and reestablish a stable channel; and increased instream sedimentation which is considered a pollutant both legally and scientifically.

- “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.”¹³⁶

Erosion and sedimentation controls and best management practices do not prevent adverse impacts.

- FERC states that completed E&S Control Plans by agencies will adequately avoid harms. This is a false conclusion as can be seen with pipeline projects where severe sediment pollution harmed local waterbodies, many of which had special protection designations,¹³⁷ as explained further above.
- “The proposed pipeline conditions will significantly reduce the land surface’s ability to retain rainfall and facilitate infiltration, and will increase runoff frequency, volumes, and flow rates, including increased surface erosion and sediment transport to Special Protection or C1 waterbodies.”¹³⁸
- “although erosion and sediment control measures could be implemented, the topography of sections of the pipeline’s route will limit the effectiveness of soil and sediment control measures. Therefore, even with the best developed soil erosion and sediment control plan in place there will be sediment and soil erosion impacts given the scale of the project and the sensitivity of the environments traversed by the pipeline.”¹³⁹

Compliance with Section 401 Water Quality Certification.

¹³⁶ *Professional Review & Comment of the Draft Environmental Impact Statement and Supporting Documents Related to Surface Water Impacts of the Proposed PennEast Pipeline Project*, Michelle Adams & Marc Henderson, Water Resources Engineers, Meliora Design, LLC, September 5, 2016

¹³⁷ *Field Monitoring Report, Pipeline Construction & Maintenance Irreparably Harms Rivers, Wetlands and Streams. Addendum to Comment for the PennEast Pipeline*, Delaware Riverkeeper Network

¹³⁸ *Professional Review & Comment of the Draft Environmental Impact Statement and Supporting Documents Related to Surface Water Impacts of the Proposed PennEast Pipeline Project*, Michelle Adams & Marc Henderson, Water Resources Engineers, Meliora Design, LLC, September 5, 2016

¹³⁹ *Technical Review of Volume I FERC Draft Environmental Impact Statement Submitted for PennEast Pipeline Project*, Princeton Hydro, September 2016

In accordance with Section 401 of the Clean Water Act, a Water Quality Certificate is necessary from the State government in which the work is located. As of now, the New Jersey Department of Environmental Protection (NJDEP) has not issued a Water Quality Certificate for the portion of the project located in the State of New Jersey.

On April 26, 2017 the NJDEP issued a determination that the PennEast application materials submitted to the state were significantly deficient and incomplete. Subsequently, on June 28, 2017, NJDEP determined the PennEast Pipeline Company's application for state approval of its project to be "administratively closed" due to the company's failure to remedy significant identified deficiencies and its failure to provide full information in a timely fashion for Clean Water Act decision making. In its determination letter, the NJDEP wrote:

"...given the complexity of the remaining deficient items, and the lack of demonstrated progress on the part of the applicant, it appears that it would be unlikely that an additional 60 days would allow substantial progress on the application. This application will be deemed 'administratively closed' as of the date of this letter."

While the applicant did obtain a 401 Water Quality Certification on February 7, 2017, from the Pennsylvania Department of Environmental Protection (PADEP), the Delaware Riverkeeper Network is currently involved in ongoing litigation with the state over this determination and its failure to apply appropriate state standards for determining whether a 401 Water Quality Certification was proper.

PADEP has also sent a series of three incompleteness review letters to PennEast for its Chapter 105 and Chapter 102 permits. Each of the letters has indicated the applications submitted are not yet considered to be complete by PADEP and that they cannot commence technical review until the applications are complete. The incompleteness letters were sent on April 26, 2016, and again September 19, 2016 and December 23, 2016. On June 26, 2017, DEP received a request for an extension from PennEast Pipeline Company, LLC. PennEast requested additional response time to the December 23, 2016 incompleteness review letters, indicating that they "do not anticipate submitting the information requested to complete the applications until December 29, 2017." On August 10, 2017, DEP granted the requested extension. PennEast then asked for two more extensions and did not provide PADEP with the requested materials until December 26, 2018 and then changed the route two months later in February 2019.

The missing information that PADEP requires for their Chapter 105 Water Obstruction and Encroachment Permits and Chapter 102 Erosion and Sediment Control permits is extremely relevant to the water quality impacts that the Corps is required to consider as part of its 404 public interest review.

Information gaps that risk adverse impact to water quality:

- The arsenic analysis provided in the EIS is insufficient to indicate that arsenic leaching from pipeline construction in the Newark Basin would not be a problem for shallow groundwater and therefore needs to legitimately and scientifically analyze this issue.
- PennEast and FERC have not included HDD water discharge details including the specific discharge method and impacts on receiving streams;

- Investigation is incomplete for vernal pools; in Pennsylvania, survey work is 21% **incomplete**; in New Jersey, it is 74% **incomplete**.

Water quality effects of crossings specific to the Philadelphia District review:

According to the original 2017 Public Notice from the Philadelphia District, the project would include the following waterbody crossings and impacts:

IP-1: Pipeline crossing of Bear Creek and unnamed tributaries of Bear Creek. The crossing will impact a total of 1.06 acres. Specifically, the crossing will impact 0.15 acre of water ways. The waterways will be crossed in a dry condition created by the construction of a cofferdam and bypassing the water around the work area via pumps or a flume. Once a dry condition is established the pipeline will be installed via traditional open trench methods.

IP-2: Pipeline crossing of the Lehigh River. The crossing will impact a total of 1.01 acres of the waterway. The Lehigh River will be crossed in a dry condition created by the construction of a cofferdam and bypassing the water around the construction area via pumps or a flume. Once a dry condition is established the pipeline will be installed via traditional open trench methods. Once the crossing is restored there will be no loss of the waterway.

IP-3: Pipeline crossing of unnamed tributaries to Laurel Run. The crossing will impact a total of 1.83 acres of waters and wetlands. Specifically, the crossing will impact 0.10 acre of waterways. The waterways will be crossed in a dry condition created by the construction of a cofferdam and bypassing the water around the work area via pumps or a flume. Once a dry condition is established the pipeline will be installed via traditional open trench methods. Once the crossing is restored there will be no loss of waterway or wetland area.

IP-4: Pipeline crossing unnamed tributary to Stony Creek. The crossing will impact a total of 1.19 acres. Specifically, the crossing will impact 0.11 acre of waterways. The waterways will be crossed in a dry condition created by the construction of a cofferdam and bypassing the water around the work area via pumps or a flume. Once a dry condition is established the pipeline will be installed via traditional open trench methods. Once the crossing is restored there will be no loss of waterway or wetland area.

IP-5: Pipeline crossing of PFO wetlands, the Delaware Canal, and the Delaware River. The crossing will be constructed via Horizontal Directional Drill (HDD) methods. The HDD will extend from an upland field approximately 1,200 feet west of the Delaware River to an upland field approximately 1,100 feet east of the Delaware River. In addition to crossing under the Delaware Canal, the Delaware River, and a PFO wetland, the HDD will go under State Route 611 in Pennsylvania, Old River Road, the Riegelsville Milford Road and a railroad line New Jersey. There are no surface impacts to waters and wetlands associated with this crossing.

Each of these crossings would have serious adverse impacts to the water quality in the region. For example, even the HDD crossing of the Delaware River raises concerns. Alternate crossing techniques such as horizontal directional drilling (HDD) are often used to minimize the likelihood of sedimentation impacts. The HDD method is typically used in larger stream crossings and requires a significant amount of work space to store the equipment on both sides of the stream. These work spaces are described as temporary but the impacts associated with the clearing of this land can be permanent. While often touted as environmentally-friendly, HDD is an unproven method that frequently leads to spills and brings inherent

risks to the environment. The recent spilling issues with the Mariner East 2 Pipeline is proof of this. Between April 2017 and August 2017, there have been 90 spills releasing over 202,000 gallons of HDD drilling fluids into the environment from Mariner East 2.¹⁴⁰

These drilling fluids largely consist of non-toxic bentonite, leading many to believe that it is safe. However, non-toxic does not mean completely safe for the environment. Drilling fluids substantially increase suspended solids in a stream, interfering with fish gill development and function, reducing the quality of fish spawning and rearing areas, reducing fish refuge sites, reducing food availability to upper trophic levels, smothering and displacing macroinvertebrates, and filling interstitial spaces in substrates.¹⁴¹ Furthermore, drilling mud deposition rates far exceed the rates of natural sediment deposition and erosion.³ Even with Erosion & Sediment Control BMPs in place, these measures frequently fail and cannot be relied upon as effective protection. DRN has witnessed these failures countless times, particularly recently with the Mariner East 2 Pipeline, as evidenced in the pictures below from Huntingdon County in May of 2017.



¹⁴⁰ Legere, L. (2017). Some drilling allowed to resume on Mariner East pipeline after spills. *Harrisburg Bureau*, August 4, 2017.

¹⁴¹ Crowell, H. (2014). Ecological Impacts of Inadvertent Returns from Horizontal Directional Drilling (HDD). HullRAC Science Summit, February 4, 2014.

Finally, there is evidence that the acoustic impacts from construction activities, such as those described for this project, can significantly harm fish. The effects of underwater sounds created by construction activity on fish may range from a brief acoustic annoyance to instantaneous lethal injury depending on many factors.¹⁴² Even at non-lethal levels, low levels of acoustic damage may result in the fish not being able to swim normally, detect predators, stay oriented relative to other fish in the school, or feed or breed successfully. This is a potential threat to all fish in the vicinity of the construction.

The proposed open-trench crossing of the Susquehanna, even when considered in isolation from the Project, poses such serious adverse impacts on water quality that it is sufficient basis for the Corp to determine the Project is contrary to public interest and deny its 404 permits.

The Susquehanna River Crossing will result in 12.97 acres of temporary impacts to the Susquehanna River. At the crossing, PennEast proposes to:

“use a dual cofferdam system to construct the Susquehanna River crossing ... Preliminary engineering of this crossing would involve installing a Portadam® at the upstream tip of Monocanock Island, which is located in the river's center, to divert flow to one side of the river...Secondary cofferdams would be installed adjacent to the pipeline trench for further dewatering.”¹⁴³

Penn East anticipates that construction of the Susquehanna River crossing would be completed within 45 days, including cofferdam construction, dewatering, pipeline construction, and restoration. Trenching, pipeline construction, and backfilling will take 6 days (3 days for each side of the river). According to the notice, PennEast “provided the following justification written below for the need of an open-cut installation across the North Branch of the Susquehanna River, in lieu of directional drilling under the river”:

“The Susquehanna River, as it flows through Wilkes-Barre in Luzerne County, presented a challenge to the Project with its existing geologic setting and historic coal workings that occurred throughout the area. PennEast has extensively investigated this regional geohazard, and implemented field investigations and project routing that supports the design and planning for construction and long-term operation of the Project.”

These “field investigations” described by PennEast consisted of meetings with PADEP Bureau of Abandoned Mine Reclamation (BAMR), desktop analysis of historical underground mine catalogs, and maps and records; as well as two geotechnical boring investigations in exploratory holes to determine the nature of the ground conditions beneath the Susquehanna River.

As a result of the desktop analysis, PennEast found that there was not sufficient clearance between the ground surface and previously worked coal seams for HDD without the potential for intersecting the coal worked seams, and risking “inadvertent return of borehole fluid into the mine seams which, in turn, could surface into the River or purge acid mine drainage existing in the mine into the River.” Additionally, the results of their boring investigations found that soil conditions were such that “drilling fluids within the HDD bore cannot be controlled or maintained, resulting in drilling fluid migration into the surrounding soils...Therefore, based on the geotechnical conditions observed in the boreholes and knowledge of historic

¹⁴² California Department Of Transportation (2001). San Francisco – Oakland Bay Bridge East Span Seismic Safety Project, Pile Installation Demonstration Project, Fisheries Impact Assessment, August 2001.

¹⁴³ Corps Public Notice

mine workings in the area, traditional open-cut method of installation is proposed at the Susquehanna River crossing.”

While the Delaware Riverkeeper Network agrees that HDD does not seem like a safe option for crossing the Susquehanna, we are also concerned by the risks that would result from an open-trench crossing in this area, particularly in light of the gaps in site specific information and the existing mine-impacted soil pollution, including acid mine drainage (AMD) in the area. These include:

Lack of site specific information:

PennEast’s statement that “Additional design detail and supporting engineering analyses will be submitted to the USACE Baltimore District and the PADEP in the application update after all surveys are complete” is of great concern. It would be completely irresponsible for the Corps to permit this 404 crossing prior to the completion of PennEast’s site surveys, engineering analysis, and design details.

As stated in Robert Hughes comments to FERC: “abandoned mines and an underground mine pool is located in that area and should be a cause for some concern and should be looked at much more closely should any trenching or excavation be done in that area.”¹⁴⁴ Mine mapping in the region is incomplete, inaccurate, and in some cases, maps don’t even exist. This is due in part to coal operators going “wildcatting,” or mining in areas without properly documenting what they were doing.¹⁴⁵

Additionally, the known existing mines and their proximity to the riverbed and open trench seem to pose serious risks. “PennEast discovered that ten named coal seams are present beneath the proposed Susquehanna River crossing location or surrounding areas. Four mine entrances were identified near the proposed Susquehanna River crossing location. The historic mine shafts which exist in close proximity to the River are not intersected by the currently proposed Project alignment. At the specific crossing of the Susquehanna River, there is estimated to be significantly greater than 60 feet of clearance between the ground surface and previously worked coal seams which exist closer toward the eastern bank of the Susquehanna River.” According to PennEast, “This clearance between the top of seams and the bottom of the proposed trench depth is considered sufficient clearance to ensure that trenching operations will not intersect historic workings”. However, even if the historic maps reviewed are correct and there is a 60 foot clearance between the ground and coal seams, we are concerned whether this would be sufficient clearance to safely trench when also considering the depth required for an open trench cut of a 36” pipe in a major river. As Princeton Hydro explains, the depth and disturbance of this open-trench crossing would be significant:

“The trench depth for the 36” diameter PennEast Pipeline must conform to the Department of Transportation’s Pipeline and Hazardous Materials Safety Administration (PHMSA). For safety reasons it must be buried deep enough to avoid accidental punctures and to deal with seasonal frost issues. The PHMSA requires pipelines transporting conventional and unconventional gas to typically be covered by 30 to 36 inches of soil overburden. The thickness of soil cover may be greater when the pipeline runs under a roadway or when it runs under a stream, river or lake. PHMSA may require additional cover (48 inches to 60 inches) when the pipeline runs under agricultural lands. Less cover however may be allowed (as little as 18 inches) when the pipeline cuts through a consolidated area

¹⁴⁴ January 27, 2015 Comment of Robert E. Hughes Executive Director Eastern PA Coalition for Abandoned Mine Reclamation to FERC Re PennEast pre-filing docket no. PF15-1. Accession no. 20150127-5018.

¹⁴⁵ "River concerns surface about pipeline," Elizabeth Skrapits, The Citizen's Voice. March 9, 2015.

<http://citizensvoice.com/news/river-concerns-surface-about-pipeline-1.1845246>

of bedrock. Nonetheless the amount of excavation required to properly trench the pipe is significant.”¹⁴⁶

The added risk of scour in the backfilled trench could add to the risks of the river both intersecting coal seams and exposing coal-related pollution in the soil. This risk would seem to be potentially exacerbated by the pervious gravel soils found during boring investigations:

“The geotechnical conditions beneath the river were found to be of deep alluvial deposits underlain by sedimentary rock. The overburden conditions observed were primarily stiff silts; however, layers of soft clay and highly permeable gravels were also encountered during drilling... **Gravel deposits, similar to the river deposits observed in the borings, present a pervious pathway for drill fluid and therefore increase the risk of an inadvertent return.** The presence of gravels also present challenges associated with bore stability, raveling and inducing steering corrections to maintain a proposed design alignment.”¹⁴⁷

Mine-impacted soil and open-trench concerns:

“Because the placement of the pipe in the trench takes time there is the need to stockpile the excavated soil in areas adjacent to the trench. Each stockpile represents another opportunity for offsite soil migration. This happened during the construction of the Tennessee Gas pipeline in Northern New Jersey leading to the impact of streams, wetlands and large recreational lakes located adjacent to the pipeline ROW.”¹⁴⁸

“There are numerous mines near the centerline of the proposed pipeline, beginning at about MP 5.1 and continuing to MP 11.2, as noted in DEIS Table 4.1.4-1. None apparently are operating. The soils table in RR7 (Table 7.1-1) lists various soils in this reach as ‘mine dump’ or ‘strip mine, burned’. Partially shown on Figure 7, mine-affected soils cover substantial areas on the east side of the Susquehanna River crossing. Excavating or otherwise disturbing mine spoil can release contaminants, including acid mine drainage (AMD) if sulfides are present.”

“However, the DEIS does not present any discussion of minerals that could be present in these soils or discuss whether minerals or other contaminants including AMD could result from meteoric water leaching through or running off of these soils. The mine spoil identified in RR7 is considered to have high conductivity (RR7, Table 7.1-1 for Luzerne County), which means the potential for contaminants to be released by construction disturbance is relatively high. It also has the potential for high erosion when disturbed (RR7, p 7-16). But the DEIS fails to discuss the pollution potential that will result.”¹⁴⁹

In order for the Corps to make a responsible evaluation of the crossing, FERC must “provide 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”; “assess the potential for pipeline construction to generate acid

¹⁴⁶ *Technical Review of Volume I FERC Draft Environmental Impact Statement Submitted for PennEast Pipeline Project*, Princeton Hydro, September 2016

¹⁴⁷ Army Corps Public Notice (emphasis added)

¹⁴⁸ *Technical Review of Volume I FERC Draft Environmental Impact Statement Submitted for PennEast Pipeline Project*, Princeton Hydro, September 2016

¹⁴⁹ *Technical Memorandum Review of Draft Environmental Impact Statement, Proposed PennEast Pipeline, Docket No. CP15-558-000, FERC/EIS: 0271D*, Tom Myers, Ph.D., August 31, 2016

generation or leach metals in all areas where it crosses” mine spoil”; and “present avoidance and mitigation discussions focused on preventing the leaching and transport of acid and metals from the site.”¹⁵⁰

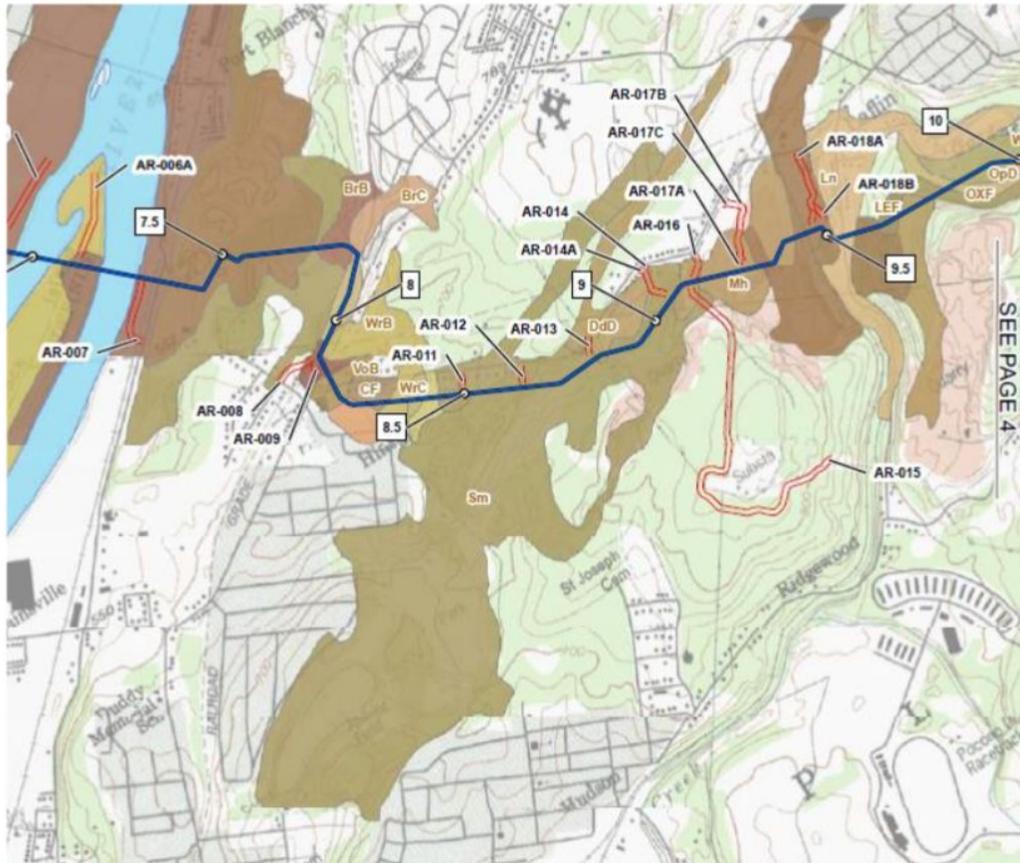


Figure 7: Snapshot of soils map (RR7, Figure 2.1-1) showing MP 7.0 to 10.0. Soil SM is strip mine.

Figure 1. Soils map referenced by Myers Report.¹⁵¹

Adverse impacts of open-trench waterbody crossings must be considered.

These impacts and concerns are in addition to the adverse impacts that would result from a successful open-trench crossing, including:

“The dewatering of the site [required] to allow the measure to be installed or constructed. This in itself creates an impact to the stream or wetland ecosystem and resident organisms by significantly altering the hydrologic regime.”¹⁵²

“Open-cutting is a traditional stream crossing method that is still heavily utilized, particularly for minor to intermediate stream crossings. Open-cut crossings typically result in an elevation of downstream sediment loads during and shortly after the period of construction. Sediment released during instream construction can cause negative

¹⁵⁰ Technical Memorandum Review of Draft Environmental Impact Statement, Proposed PennEast Pipeline, Docket No. CP15-558-000, FERC/EIS: 0271D, Tom Myers, Ph.D., August 31, 2016

¹⁵¹ Technical Memorandum Review of Draft Environmental Impact Statement, Proposed PennEast Pipeline, Docket No. CP15-558-000, FERC/EIS: 0271D, Tom Myers, Ph.D., August 31, 2016

¹⁵² Technical Review of Volume I FERC Draft Environmental Impact Statement Submitted for PennEast Pipeline Project, Princeton Hydro, September 2016

changes to downstream aquatic life and their habitats. These negative effects include reductions in the abundance of fish populations, reductions in the abundance and diversity of benthic invertebrate communities, and alterations to streambed conditions.”¹⁵³

“The trench depth will be at least 5-6 feet below existing stream grade, and could be even deeper to avoid thermal impacts to the stream or to protect the pipe from high-energy event scour and exposure. Overall, this type of construction is very disruptive to the stream and will negatively affect its ecological functionality. The current mitigative measures planned by PennEast, while perhaps addressing short-term erosion and sedimentation impacts, do nothing to restore the streams to their pre-disturbance ecological complexity and functionality. In order to justifiably state that the pipeline will cause ‘no impact’ at each stream crossing, the subject stream must have its stream channel restored to the pre-construction width, depth, slope and substrate. This entails the collection of detailed stream data and seasonal sampling of the stream’s biota, neither of which is proposed by PennEast or recommended by FERC. The restored substrate would also have to mirror the pre-construction composition of the streambed and bank materials and condition, including restoration of the kind, quantity and quality of rock, sediment, woody debris and vegetation. Additionally, the stream’s restoration must allow for natural channel migrations, flows, sediment transport, and stream channel evolutions typical of natural stream flows. None of the mitigation measures discussed by FERC within the DEIS satisfy these requirements or demonstrate the ability to fully restore the streams to pre-construction conditions.”¹⁵⁴

According to the FERC EIS:

“The Susquehanna River has water quality impairment related to metals and a fish consumption advisory for PCBs...PennEast has not conducted sediment analysis to determine if PCBs are present in the sediment at the specific water crossing locations; however, prior to construction, PennEast would sample sediment within the proposed workspace for PCB concentration in the waterbodies identified in table 4.3.2-5. If PCBs are found to be present within the Project area, PennEast would consult with the appropriate agencies to determine whether additional precautions should be undertaken to prevent releasing PCBs into the water column. PennEast presented this sampling plan and site-specific crossing plan to PADEP and USACE in its Luzerne County Joint Permit Application.”

¹⁵³ Reid, S.M., & Anderson, P.G. (1999). Effects of Sediment Released During Open-Cut Pipeline Water Crossings. *Canadian Water Resources Journal*, Vol. 24, No. 3.

¹⁵⁴ *Technical Review of Volume I FERC Draft Environmental Impact Statement Submitted for PennEast Pipeline Project*, Princeton Hydro, September 2016

TABLE 4.3.2-5						
Impaired Waterbodies or Waterbodies with Contaminated Sediments Crossed by Pipeline Facilities						
Waterbody	MP <u>a</u> /	Impaired Designated Use(s) - 305(b) List	Pollutant(s) - 303(d) List	Water Quality Management Plan	Crossing Length (feet)	Pipeline Crossing Method
Pennsylvania						
Susquehanna River	7.2	Aquatic Life, Fish Consumption	Source Unknown - Mercury, AMD -Metals, Source Unknown - PCB	TMDL, 2002 (PCB, pH, siltation, metals)	1,056	Dry Crossing

Table 5. Impaired Waterbodies or Waterbodies with Contaminated Sediments Crossed by Pipeline Facilities, adapted from the FEIS.

In FERC’s own description of the crossing, PennEast will “minimize” “in-water resuspension of contaminated sediments in the water column during construction”. Given the severity of the contamination present and the associated risks to the public interest, it is not enough for PennEast to “minimize”, but not avoid, this contamination.

The FERC EIS also states that:

“Abandoned mine drainage (AMD) is a potential source of contaminated sediments within impaired waterbodies. Two waterbody crossings (Gardner Creek and Susquehanna River) have sediment-related impairment issues related to the presence of metals which are potentially from AMD. ... Susquehanna River PennEast proposes a dry crossing of the Susquehanna River at MP 7.1. The proposed crossing location is bordered by an airport and flood-control berm to the south and a newly constructed highway bridge to the north. The proposed crossing is in proximity to the historic 1959 Knox Mine disaster where the river bed collapsed into the mine.”

“Additionally, sediment-related impairment issues regarding the Susquehanna River are related to the presence of metals which are potentially caused by AMD.”

As stated in a January 27, 2015 letter to FERC from the Executive Director Eastern PA Coalition for Abandoned Mine Reclamation regarding the Project:

“Anthracite underground mining has definitely occurred extensively in this region underground and at the surface on multiple coal veins, both along the floodplain of the Susquehanna River, and even under portions of the Susquehanna River, although that was not encouraged since it was outside of the safety zone for mining coal, overburden, and other roof support material/rock. The historic mine maps show the geographic representation of how much of the workings have been mined out, pillars removed, pillars drilled through, areas that have been flushed, slurried, left intact (solid barrier pillars of coal), and the depth at which the mining has occurred.”

“This area of the crossing is not something that can be completed in the short period of time that is available to provide comments. EPCAMR is of the opinion that based on the best available mapping that is out there without conducting a full hydrogeological investigation and mapping and mine pool investigation, which is something that PennEast

should possibly consider, there could be the potential for a great deal of environmental concern for pollution, leaks into the underground mine pools, subsidence, and or instability issues at the surface depending on the infrastructure needed to create the pipeline crossing.”

“EPCAMR believes that PennEast should seriously consider the abandoned underground mining implications and potential risk for mine subsidence and mine pool contamination for this project in this area prior to moving forward...abandoned mines and an underground mine pool [are] located in that area and should be a cause for some concern and should be looked at much more closely should any trenching or excavation be done in that area.... [PennEast] should be concerned greatly that there could be the potential for mine subsidence, infiltration of surface water into the underground workings through fractured rock, excavation into the mine pool which could cause a new discharge to created, or a possible breach into the levee system.”

Given the

- unreliability of desktop reviews for historic coal mines due to “wildcat” mining;
- the lack of actual surveys complete and design detail and supporting engineering analyses;
- the pervious soils found during boring tests; and the
- proximity of the project activities to coal mines and AMD

The risks associated with this crossing and the potential for extremely adverse impacts to the water quality and the public interest are too great a burden to put on the public—especially in light of the fact that there is no public benefit that would come as a result. The Corps must reject the Project’s 404 permit applications based on the potential adverse impacts of this crossing alone.

p. The proposed Project would have an adverse effect on energy needs and would result in detrimental impacts on the public interest.

PennEast and FERC’s assertion of need is contradicted by the preponderance of the evidence and is largely a statement of industry desires rather than public need.

The DEIS asserts the proposed pipeline is necessary to serve New Jersey and eastern Pennsylvania communities and some unidentified “surrounding states.” It is asserted that the project is needed to “provide low cost natural gas produced from the Marcellus Shale region.” The DEIS asserts that there is a need to displace Gulf Coast gas with cheaper and reliable access to Marcellus shale gas. It is asserted that there is a need for the project in order to “provide enhanced competition among natural gas suppliers and pipeline transportation providers.” The DEIS asserts there is a need in order to allow “supply flexibility,” “diversity,” “reliability,” better pricing, and to allow direct access to long lived dry gas reserves.

However, none of these are “needs.” These are industry desires, goals, hopes, dreams, wishes and wants. However you look at it, these claims do not assert a “need” for the gas. They assert a desire by the pipeline company to be able to provide a different source of gas in order to make money. These are very clearly private corporate goals and gains. These are not “needs” of the public; they are desires of private industry.

In fact, there is no need for the gas PennEast would carry to New Jersey and Pennsylvania; both states are fully supplied. PennEast broadly asserts it is delivering the gas to other unknown, unidentified states -- in order to substantiate this claim and subject it to the public process that is required by NEPA, more detail is required that actually identifies the states and the users.

As noted in the attached expert report from Arthur Berman:¹⁵⁵

“Natural gas consumption for New Jersey has been relatively flat for the past four years at average rate of 1.8 billion cubic feet of gas per day (Bcf/d), somewhat below the higher levels of the late 1990s. Although consumption increased slightly in 2013 compared to the three previous years, New Jersey cannot be called a growth market....”

“The proposed PennEast Pipeline would deliver an additional 1 Bcf/d of natural gas to New Jersey potentially creating a 53% supply surplus above the current level of consumption.” and
“...Pennsylvania has no unfulfilled demand...”

“Pennsylvania was already grossly over-supplied and that the proposed additional 1 Bcf/d supply would result in an oversupply for New Jersey of approximately 53%,” and there is no evidence that PennEast will result in lowered costs for consumers.¹⁵⁶

“Because of the lack of demand for Marcellus gas in Pennsylvania and adjacent New Jersey, it is possible that PennEast and its committed suppliers have an unstated intent to send gas to other markets not specified in their proposal....”

“There is no evidence...that more gas supply [would] result[] in lower costs to consumers” “All leading companies in the Marcellus and Utica plays reported net losses for the second quarter of 2015”.

A second report issued by Arthur Berman further clarifies that:¹⁵⁷

“There is no evidence...that more gas supply [would] result[] in lower costs to consumers”

“All leading companies in the Marcellus and Utica plays reported net losses for the second quarter of 2015”

“U.S. gas production is declining and shale gas output is down almost 2.5 Bcf per day”

In comments submitted on the FERC docket on September 12, 2016, the New Jersey Division of Rate Counsel, in substantive comments, supported by an expert affidavit, similarly challenged the claimed need for the project. According to their comments there is in fact no objectively demonstrated need for the project. In fact, the NJ Division of Rate Counsel effectively makes the case that the “forecasted demands of

¹⁵⁵ *Professional Opinion of Proposed PennEast Pipeline Project*, Arthur E. Berman, Petroleum Geologist, Labyrinth Consulting Services, Inc., February 26, 2015

¹⁵⁶ *Professional Opinion of Proposed PennEast Pipeline Project*, Arthur E. Berman, Petroleum Geologist, Labyrinth Consulting Services, Inc., February 26, 2015 and September 11, 2016.

¹⁵⁷ *Opinion on the PennEast Pipeline*, Arthur Berman, Petroleum Geologist, Labrynth Consulting Services, Inc., September 11, 2016

the LDCs that PennEast is designed to supply are already being met by existing gas supply arrangements and available transportation capacity.”¹⁵⁸

The New Jersey Division of Rate Counsel well documents the self-dealing evidence provided by PennEast attempting to support its need claim. Given the self-dealing nature of this evidence the NJ Division of Rate Counsel urges FERC to conduct an independent analysis into the need claim which has not been done. While there is ample evidence and expert analysis on the record to document no genuine need for the project that would justify the significant community, environmental and economic costs it will inflict, at a minimum, it is incumbent on the Corps to conduct such an independent review.

An additional expert report generated by Skipping Stone (attached here) similarly finds a lack of need for the capacity of PennEast. According to this report, PennEast obtains many of its clients by commitments to switch from one pipeline to the other, which means unfilled excess capacity, not more needed gas delivered. According to Skipping Stone, similar to Labyrinth Consulting:¹⁵⁹

“Local gas distribution companies in the Eastern Pennsylvania and New Jersey market have more than enough firm capacity to meet the needs of customers during peak winter periods. Our analysis shows there is currently *49.9% more capacity than needed to meet even the harsh winter experienced in 2013*”

This demonstration of a lack of need is complemented by the predictions and concerns of experts that the industry is proposing an “overbuild” of pipelines from the Marcellus and Utica shales:¹⁶⁰

“Speaking to attendees at the 21st Annual LDC Gas Forums Northeast conference in Boston Tuesday, Braziel said an evaluation of price and production scenarios through 2021 suggests the industry is planning too many pipelines to relieve the region’s current capacity constraints.”

“What we’re really seeing is the tail end of a bubble, and what’s actually happened is that bubble attracted billions of dollars’ worth of infrastructure investment that now has to be worked off,” Braziel said.

Lack of “need” for gas in Pennsylvania is also asserted by a Labrynth Consulting reaction to a recently released report advocating for more pipelines for similar goals, to fulfill an asserted need for gas and to reduce prices in the region. In this responsive analysis, the assertion of a need for the gas was proven false with facts:

“First, Pennsylvania exported 3.23 Bcfd to other regions of the country in 2015 an amount almost equal to its 2014 consumption of 3.3 Bcfd. There is plenty of existing pipeline capacity to meet Pennsylvania’s demand and enough left over to send out of the state.”¹⁶¹

¹⁵⁸ Comments submitted by New Jersey Division of Rate Counsel, Sept 12, 2016, to FERC Docket No. CP15-558

¹⁵⁹ *Analysis of Public Benefit Regarding PennEast*, Skipping Stone, March 9, 2016

¹⁶⁰ *Marcellus/Utica on Pace for Pipeline Overbuild*, Says Braziel, Natural Gas Intelligence, June 8, 2016

¹⁶¹ Labrynth Consulting responding to “A Pipeline For Growth Report”

The assertion that PennEast is intended to provide “enhanced competition” and cheaper pricing for industry users is not a need – it is a corporate desire. It is an abuse of process and power for FERC to allow PennEast to claim that cheaper prices and setting the PennEast companies up to better compete with other industries fulfills the requirement of “need.” Approving construction of a pipeline project, granting it exemption from state and local laws, giving it the power of eminent domain so it can take private property, so it can take publicly preserved parks, forests and natural lands, in order to inflict unmitigatable and irreparable harms, all so the pipeline company can achieve its independent goal of greater profits and other industries can save a buck on the backs of the rest of us, subjecting communities to the threat and reality of pipeline accidents, incidents and explosions (which happen with concerning regularity) does not characterize a legitimate need that warrants the property takings and associated harms.

The assertion that PennEast is necessary to provide greater reliability is also not a “need.” There is no evidence that New Jersey, Pennsylvania, and the undisclosed other states do not have reliable access to energy sources, gas or otherwise. The reports above document that in fact both states are already fully and reliably served. It is incumbent upon PennEast to demonstrate there is a reliability problem and that the proposed project will necessarily ameliorate this problem. They have not done so.

Regarding the claim that PennEast is “needed” to provide direct access to long lived reserves, this claim is neither explored nor demonstrated by the DEIS document. In fact, there is a wealth of analysis which documents that shale gas will soon be on a swift decline and as such is not in fact a long term reliable source of energy; to the contrary it is a short term fix that will quickly run dry and require replacement with other energy sources. As the Post Carbon Institute’s *Drilling Deeper* report fully documents, the shale gas and tight oil industries have a short life, one that is only a few decades long.¹⁶² Multiple experts reach similar conclusions when reflecting on EIA figures, current production rates, and other objective data, e.g. findings of Labrynth consulting when reacting to a recently released report titled, “A Pipeline For Growth” found:

Official EIA proven developed producing shale gas reserves for the Marcellus Shale are 84.5 trillion cubic feet (Tcf) and, for the Utica Shale, 6.4 Tcf (Table 1). That suggests approximately 18 years of supply at current production rates. There are approximately 27 years of supply including proven undeveloped reserves (PUD).¹⁶³

Construction of a 40-year pipeline for an energy source that will peak by 2020 and be on decline thereafter is irrational and cannot be said to fulfill the definition of a “need”.

The claim that this pipeline is “needed” in order to provide lower cost gas to New Jersey and Pennsylvania customers is not a “need” (as discussed above and in the attached expert reports), but in addition, it cannot be an expected outcome of this project. The construction of the PennEast pipeline may, to the contrary, contribute to an increase in gas prices for many in PennEast’s identified service area.

The New Jersey Division of Rate Counsel (2016) found that “forecasted demands of the LDCs that PennEast is designed to supply are already being met by existing gas supply arrangements and available transportation capacity” (p. 8).¹⁶⁴

¹⁶² *Drilling Deeper: A Reality Check on U.S. Government Forecasts for a Lasting Tight Oil and Shale Gas Boom*, J. David Hughes, Post Carbon Institute, October 2014

¹⁶³ Labrynth Consulting responding to “A Pipeline For Growth Report”

¹⁶⁴ *Economic Costs of the PennEast Pipeline*, Spencer Phillips, PhD, et al., Key-Log Economics, LLC. January 2017.

Natural gas prices are lowest in the regions in which gas is produced. For many years, the lowest natural gas prices in the East were found at Henry Hub, located near the Gulf of Mexico where much of the natural gas in the United States was produced. With the increase in shale gas production, however, the lowest natural gas prices in the country are now found at trading points in and around the Marcellus and Utica shale plays in Pennsylvania, West Virginia, and Ohio. Availability of pipeline infrastructure to send natural gas to other regions has a direct impact on the price of natural gas in those regions—greater gas take-away capacity allows more natural gas to be produced, and an increase in supply will lead to a decline in price in those regions that receive additional gas. The improved access to higher priced markets via additional pipeline infrastructure will raise the price of natural gas in the producing region, which also will increase production – in this case the producing region is Pennsylvania. Therefore, it is not a given that prices would in fact reduce. In addition, while generally speaking increasing the supply in a non-producing region (such as NJ) from a lower cost producing region (Pennsylvania) may be expected to lower prices in the downstream market, one recent study that was specific to the PennEast Pipeline showed how gas rates for some customers in NJ may increase due to other pipelines increasing their transportation rates.¹⁶⁵

The claim that increased pipeline capacity will necessarily result in reduced gas prices is challenged by other experts considering the issue when responding to claims that pipeline capacity is needed to reduce prices for Eastern Pennsylvania end users:

“The correlation between volume of gas production and the price of gas for power generation is poor because there are other factors besides production volume that affect the price of gas. Still it seems unlikely that more gas production in Pennsylvania would result in a cost reduction since production already exceeds consumption by almost 100%.”¹⁶⁶

Further, as information regarding actual asserted customers for PennEast is revealed, it is increasingly clear that the claim of need is largely self-manufactured. For example, Spectra Energy Partners is a “member company” in PennEast Pipeline Company, LLC and 10% owner of the PennEast Pipeline proposal. Spectra Energy is currently planning for and proposing a new project called the Texas Eastern Marcellus to Market project (M2M). Spectra has made clear that the proposed PennEast pipeline will be the primary source of gas that the M2M project will transport. Specifically, according to the Spectra Energy website, the new M2M pipeline would receive the majority of its gas, 62.5%, (up to 125,000 dekatherms per day (Dth/d)) from the PennEast pipeline (this equates to over 11% of PennEast’s anticipated capacity). In other words, Spectra, as part of PennEast, is asserting the PennEast pipeline needs to be built in order to service the Texas Eastern M2M customer which is, in fact, Spectra. The end users of the M2M project are not identified in the DEIS or anywhere else in the record, and have not, in fact, demonstrated a need for that project. Again we are dealing with self-serving speculation of need rather than a demonstration of a genuine public need for the project. Of the 12 shippers PennEast identifies as demonstrating a need for the pipeline and thereby helping to game the system in this way, at least five are PennEast owners: PSEG, Spectra (Texas Eastern Transmission), South Jersey Gas, UGI, and Elizabethtown Gas (Pivotal Utility Holdings).

Making the artificial argument of “need” for the PennEast project is used to craft an artificial justification for imposing extreme and unnecessary harm on the environment and communities. The asserted “need” for PennEast is really an argument for a project that will allow the PennEast companies to achieve their private goals of generating a profit – it does not support a genuine “need” for the PennEast pipeline. Given the

¹⁶⁵ Lander, Gregg. “Analysis of Public Benefit Regarding PennEast Pipeline”, New Jersey Conservation Foundation. March 9, 2016. Available at: <http://njconservation.org/docs/PennEastNotNeeded.pdf>

¹⁶⁶ Labrynth Consulting responding to “A Pipeline For Growth Report”

significant level of impacts that will be inflicted by the PennEast pipeline on the water resources of Pennsylvania and New Jersey and that the project will necessarily result in unavoidable and unmitigatable harm to the environment and communities, this lack of need for the PennEast pipeline project is a fatal flaw. It is improper for the DEIS to presume “need” rather than require the project applicant to affirmatively demonstrate it.

FERC has made it clear that it does not “look behind the contracts to determine whether the customer commitments represent genuine growth in market demand” or need. *See also NE Hub Partners, L.P.*, 90 FERC ¶ 61,142 (2000). Such an arbitrary review process, when taken to its logical conclusion, leads to absurd results. Indeed, to the extent the contracts are artificially manufactured and do not represent “genuine growth in market demand” FERC essentially admits that such fraudulent representations are sufficient for a decision approving the certificate. Here, substantial questions have been raised regarding the underlying contracts, and to the extent FERC fails to make a determination on “genuine market growth” and subsequent approval provided by FERC is arbitrary and capricious.

Furthermore, eminent domain originated as a way for governments to build necessary public infrastructure projects such as national highways and public buildings. It also enables governments to create parks and other public recreation areas. While eminent domain is considered an inherent power, it is subject to constitutional limitations. Among those limitations is that the land acquisition must be for “public use”.¹⁶⁷ The power of eminent domain is abused when it is used to benefit powerful interest groups at the expense of the less powerful. Supreme Court justices have recognized that the beneficiaries of this abuse “are likely to be those...with disproportionate influence and power in the political process, including large corporations and development firms.”¹⁶⁸ At its best, eminent domain allows for the acquisition of private property to create national parks for all to enjoy, and at worst, it exploits less politically and economically powerful groups. In the latter instance, the government acts as a henchman for private corporations, and this is not the intent of eminent domain. However, this is precisely what is happening at the behest of pipeline companies including PennEast. As noted, there is no genuine need for this project; the true goals are not to serve the public but to help the six companies that comprise the PennEast Pipeline, LLC to meet their corporate goals and to generate profits. This amounts to a government subsidization of a private company’s profits, at the expense of the public.

FERC has stated that “[e]ven though the compensation received in [an eminent domain proceeding] . . . is deemed legally adequate, the dollar amount received as a result of eminent domain may not provide a satisfactory result to the landowner and this is a valid factor to consider in balancing the adverse effects of a project against the public benefits.” *See Order Clarifying Statement of Policy*, 90 FERC ¶ 61,128, at 61,398. FERC has made clear that “[u]nder the Certificate Policy Statement, FERC will not authorize the construction of a project, with the concomitant right to obtain the necessary rights-of-way through either negotiation or the eminent domain process, unless it first finds that the overall public (not private) benefits of the project will outweigh the potential adverse consequences.” *See Order Clarifying Statement of Policy*, 88 FERC ¶ 61,748, at 50. Here, a significant portion of the landowners have refused PennEast access to their property, which will require PennEast to acquire vast tracts of property via eminent domain. As such, this significant adverse impact supports a finding that the adverse effects of the Project outweigh its questionable benefits to the public.

¹⁶⁷ U.S. Const. Amend. V

¹⁶⁸ *Kelo v. City of New London*, 545 U.S. 469 (2005), O’Connor Dissent

The Corps is required to consider “The relative extent of the public and private need for the proposed structure or work” in the evaluation of every application. (33 C.F.R. § 320.4(a)(2)) as part of this cost-benefit analysis required for a public interest review. Without a public need for the project, in light of the many adverse impacts to the environment and the public interest, the Project is clearly contrary to the public interest and the Corps should reject its 404 permit.

q. The proposed Project would adversely affect the Safety of those in the region, and would therefore have a detrimental impact on the public interest.

There are many adverse safety impacts that would result from the Project and which would detrimentally impact the public interest.

Proximity to compressor stations has inflicted health harms, quality of life impacts and property damage, as well as lost property value, and has had impacts so severe that in at least one documented case it forced a family to abandon their \$250,000 investment in the home rather than suffer the health, safety and other harms they were experiencing.

According to the Pipeline and Hazardous Materials Safety Administration, in the most recent six years found on PHMSA’s data portal for gas transmission lines (onshore) there have been over 100 fatalities or injuries requiring hospitalization and over \$880 million in damage as the result of 622 pipeline incidents.

When explosions happen, the harm to people, property and the environment can be severe and costly. And the risk of accident, incident and harm is increasing. In addition to the actual physical harm that happens when there is an accident or incident, there is the ongoing psychological burden inflicted by the fear of accident, incident or explosion for those who are forced to live next to a gas pipeline, including those who are forced to live with a pipeline because of the power of eminent domain exercised by a pipeline company.

According to a report by Pipeline Safety Trust, “The gas transmission lines installed in the 2010s had an annual average incident rate of 6.64 per 10,000 miles over the time frame considered, even exceeding that of the pre-1940s pipes. Those installed prior to 1940 or at unknown dates had an incident rate of 6.08 per 10,000 miles.”

FERC’s improper determination that pipelines constructed more recently are safer resulted in a flawed analysis and discussion of the health and safety ramifications of the proposed PennEast pipeline for communities. The focus of the DEIS on compliance with regulations does not excuse the failure to assess the fact that accidents, incidents and explosions are higher than in older, pre-1940 pipelines, and the need to consider why safety is on the decline and whether PennEast will be subjected to the same construction approaches that have made more modern pipelines less safe and more prone to catastrophic events.

In the EIS FERC and PennEast use the assertion that, “the majority of fatalities from natural gas pipelines are associated with local distribution pipelines. These pipelines are not regulated by FERC; they distribute natural gas to homes and businesses after transportation through interstate transmission pipelines. In general, these distribution lines are smaller-diameter pipes and/or plastic pipes that are more susceptible to damage” to diminish the serious health and safety threats and harms of pipelines.

Given that distribution pipelines are a normal and needed consequence of an interstate transmission line in order to take the induced fracked gas from the well pads into interstate commerce, the harms inflicted by

distribution lines must be equally assessed and accounted for in the EIS as a foreseeable, direct and induced consequence of the PennEast pipeline.

The effort by the EIS to dismiss the devastation that gets inflicted when a pipeline explodes or does damage to a community through an accident or incident is, frankly, disgusting. The EIS tries to dismiss the devastation to people and families suffered from an explosion of a pipeline, for example, by asserting that the harms associated with pipelines are less than with other activities:

“The nationwide totals of accidental fatalities from various anthropogenic and natural hazards are listed in table 4.11.3-2 in order to provide a relative measure of the industry-wide safety of natural gas transmission pipelines. Direct comparisons between accident categories should be made cautiously because individual exposures to hazards are not uniform among all categories. As indicated in table 4.11.3-2, the number of fatalities associated with natural gas facilities is much lower than the fatalities from natural hazards such as lightning, tornados, floods, earthquakes, etc.”

In addition to the effort to diminish the devastation to a person or family suffered during an explosion by a natural gas pipeline, the dismissal fails to give the necessary context or assessment to fairly compare these uses. The necessary comparisons of potential for an incident to occur amongst different threats versus the actual reality of a hazard is lacking in the EIS analysis. Comparing apples to oranges does not work here.

“Based upon experience with other pipelines it can be anticipated that, for example, just in Carbon County where 560 people live within 2 miles of the proposed compressor station (US Census Bureau, 2015), there will be on the order of “504 people experiencing odor events, 398 people experiencing respiratory impacts, 325 people experiencing sinus problems, and 218 people experiencing sleep disturbances and/or severe headaches.”

Additional adverse safety effects and considerations from the Key-Log Economics analysis:

“**Evacuation Zone:** The evacuation zone is defined by the distance beyond which an unprotected human could escape burn injury in the event of the ignition or explosion of leaking gas (Pipeline Association for Public Awareness, 2007, p. 29). There would be a potential evacuation zone with a radius of at least 3,157 feet (962.48 m). (See map, Figure 2, for a close-up of these zones in part of the study region.)

Residents and housing units in the evacuation zone: 54,579 people, 23,293 homes

Compressor Station: The proposed compressor station is likely to have separate effects on property value and on human health. Based on the experience of homeowners near a compressor station in Hancock, New York, we consider the possibility of a property value effect within one half mile of the proposed compressor station in Kidder Township, Carbon County (Catskill Citizens for Safe Energy, 2015). This zone overlaps the ROW and the evacuation zone, and because we assume that the more acute and ever present effect of proximity to the compressor station would dominate all other effects, we ignore the ROW and evacuation zone effects for these particular properties.

Compressor stations have also been associated with various human health effects at distances up to two miles away (Subra, 2009, 2015). Further epidemiological research would allow estimation of the costs of

those effects for the proposed station in Kidder Township, however, without such research, we do not include the potential public health costs in the present study.”¹⁶⁹

As such, the proposed Project would adversely affect the Safety of those in the region, and would therefore have a detrimental impact on the public interest.

r. The proposed Project would adversely affect Food and fiber production that would have a detrimental impact on the public interest.

We have learned from farmers, and it has been documented on the record, that crop production goes down by as much as 30% when a pipeline cuts through farm crop lands. PennEast and FERC’s EIS figures do not consider harms to other local businesses, such as the 7th generation nursery business reported in the press that said their ability to continue to operate would be harmed if PennEast passes through their property as is under consideration.

In addition to providing exaggerated and false claims of benefit, the EIS ignores the economic harms inflicted by construction and operation of PennEast. Among its many deficiencies, the DEIS analysis does not consider the adverse impacts to recreation and ecotourism, so vitally important to the impacted region; the analysis fails to consider the implications for future investment in open space preservation and the adverse impacts thereof as communities realize that preserved lands are not protected from pipeline construction; the economic damage to agricultural crop production is overlooked as are harms to other businesses.

The threat of increased drought from climate change is significant depending on how quickly the U.S. reduces climate changing emissions— and given that we are commenting on yet another proposal for a fossil fuel based gas pipeline—it is unlikely that emissions will significantly reduce in sufficient time to prevent these consequences from coming to fruition. According to the Union of Concerned Scientists:

“On a higher-emissions pathway, a short seasonal drought can be expected every year in most of New England by the end of this century, while the frequency of longer droughts could triple to once every 6 to 10 years in parts of New York, Pennsylvania, and Maine— the region’s key agricultural states.”

An additional effect discussed but not quantified by the Key-Log Economics analysis is the

“long-standing harm to agricultural productivity due to soil compaction, soil temperature changes, and alteration of drainage patterns due to pipeline construction. Rob Fulper, a farmer in West Amwell, Hunterdon County, New Jersey, noticed that corn planted over two existing pipelines buried on his 100-year-old family farm during World War II that now transport natural gas produce lower yields (Colaneri, 2015). Separately, agronomist Richard Fitzgerald (2015) concludes, ‘it is my professional opinion that the productivity for row crops and alfalfa will never be regenerated to its existing present ‘healthy’ and productive condition [after installation of a pipeline].’ Thus, the true loss in food and other ecosystem service value from pasture/forage acreage would be larger than our estimates reflect.”¹⁷⁰

¹⁶⁹ *Economic Costs of the PennEast Pipeline*, Spencer Phillips, PhD, et al., Key-Log Economics, LLC. January 2017.

¹⁷⁰ *Economic Costs of the PennEast Pipeline*, Spencer Phillips, PhD, et al., Key-Log Economics, LLC. January 2017.

The definitively lower crop yield that these farmers have faced due to the permanent ecological changes in the land disprove the claim by FERC and pipeline companies that any effects would be “temporary in nature” and that all areas will be “restored to agricultural use after construction.” The reality felt on the ground by farmers is that these adverse impacts to food and fiber production cannot be reversed.

As such, with no public benefits to food and fiber production to possibly come from the Project, and a significant adverse impact to be suffered by the public, particularly those who live in and depend on the agricultural areas the pipeline would pass through, the Corps should find the Project contrary to the public interest and deny the 404 permit.

s. The proposed Project would adversely affect Mineral Needs, resulting in an adverse impact to the public interest.

The information provided by FERC fails to forecast the way in which natural gas fits into the United States’ energy mix in the future. For example, by some estimates all shale plays have peaked and older plays, like the Barnett Shale and Haynesville Shale, are in a gradual decline as the industry as a whole has seen a roughly 4% decline since early 2016.¹⁷¹

Indeed, in a long-term outlook published in June of 2017, Bloomberg New Energy Finance predicted that the natural gas market share in global power generation will “drop from 23 percent last year to 16 percent by 2040, and that gas-fired power generation capacity will start to decline after 2031.”¹⁷²

With these emerging forecasts in mind, the Project, which would result in infrastructure for the transport of shale gas, a rapidly declining energy source for the country, would have an adverse impact on the mineral needs of the public interest.

t. The proposed Project would adversely affect Considerations of Property Ownership, resulting in a detrimental impact to the public interest.

The proposed Project would cause extreme adverse impacts on Considerations of Property Ownership in relation to the public interest. Most significantly, property ownership would be forcibly taken away from any landowner in the path of the pipeline. This adverse impact is even harder for the public to bear in light of the fact that there is no public need for the project. Additionally, property value, which is an essential consideration and component to property ownership, would be greatly decreased for property in proximity to the Project.

Approving construction of a pipeline project, granting it exemption from state and local laws, and giving it the power of eminent domain, so it can take private property and e publicly preserved parks, forests and natural lands, in order to inflict unmitigatable and irreparable harm, in order to achieve the pipeline

¹⁷¹ See Hughes, J. David, *2016 Shale Gas Reality Check*, Post Carbon Institute (December 2016), available at: http://www.postcarbon.org/wpcontent/uploads/2016/12/Hughes_2016-Shale-Gas-Reality-Check-2016.pdf.

¹⁷² Farhy, Jack, *What if Big Oil’s Bet on Gas is Wrong*, Bloomberg (July 18, 2017), available at: <https://www.bloomberg.com/news/articles/2017-07-17/big-oil-sees-salvation-ingas-but-what-if-it-s-the-wrong-bet> (noting that “[w]ind and solar are just getting too cheap, too fast’ for gas to play a transitional role, said Seb Henbest, lead author of the BNEF report”).

company's independent goal of greater profits and so other industries can save a buck on the backs of the rest of us, subjecting communities to the threat and reality of pipeline accidents, incidents and explosions (which happen with concerning regularity) does not characterize a legitimate need that warrants the property takings and associated harms.

Eminent domain originated as a way for governments to build necessary public infrastructure such as national highways and public buildings. It also enables governments to create parks and other public recreation areas. While eminent domain is considered an inherent power, it is subject to constitutional limitations. Among those limitations is that the land acquisition must be for "public use".

The power of eminent domain is abused when it is used to benefit powerful interest groups at the expense of the less powerful; Supreme Court justices have recognized that the beneficiaries of this abuse "are likely to be those...with disproportionate influence and power in the political process, including large corporations and development firms."

At its best, eminent domain allows for the acquisition of private property to create national parks for all to enjoy and at worst, it exploits less politically and economically powerful groups. In the latter instance, the government acts as a henchman for private corporations, and this is not the intent of eminent domain. However, this is precisely what is happening at the behest of pipeline companies including PennEast. As noted, there is no genuine need for this project; the true goals are not to serve the public but to help the six companies that comprise the PennEast Pipeline LLC to meet their corporate goals and to generate profits. This amounts to a government subsidization of a private company's profits, at the expense of the public.

FERC has stated that "[e]ven though the compensation received in [an eminent domain proceeding] . . . is deemed legally adequate, the dollar amount received as a result of eminent domain may not provide a satisfactory result to the landowner and this is a valid factor to consider in balancing the adverse effects of a project against the public benefits." *See Order Clarifying Statement of Policy*, 90 FERC ¶ 61,128, at 61,398. FERC has made clear that "[u]nder the Certificate Policy Statement, FERC will not authorize the construction of a project, with the concomitant right to obtain the necessary rights-of-way through either negotiation or the eminent domain process, unless it first finds that the overall public (not private) benefits of the project will outweigh the potential adverse consequences." *See Order Clarifying Statement of Policy*, 88 FERC ¶ 61,748, at 50. Here, a significant portion of the landowners have refused PennEast access to their property, which will require PennEast to acquire vast tracts of property via eminent domain. As such, this significant adverse impact supports a finding that the adverse effects of the Project outweigh its questionable benefits to the public.

Key-Log Economics Analysis found the following Adverse Impacts to Land Price resulting from similar projects:

"To say the impacts and potential impacts of the PennEast Pipeline on private property value are important to people along its proposed route would be an extreme understatement. Key-Log Economics and Delaware Riverkeeper Network are conducting an analysis of all comments submitted through the closing of the DEIS comment period on September 12, 2016. Of 1977 total comments reviewed thus far (a sample), 99.8% of comments mentioning property value believed the PE would have a negative impact."¹⁷³

¹⁷³ *Economic Costs of the PennEast Pipeline*, Spencer Phillips, PhD, et al., Key-Log Economics, LLC. January 2017.

“Landowners and Realtors along the proposed route of the Mountain Valley Pipeline, a 42” high-pressure natural gas pipeline designated to transport gas from fracked wells in the Marcellus through West Virginia and Virginia, report abandoned building plans, lower than expected appraisals, and buyers walking away from properties potentially affected by the construction (Adams, 2016). At least one ROW landowner was told by insurance agencies that their rates would likely increase if coverage remains available at all (Roston, 2015).”

“While it is impossible to know precisely how large an effect the specter of the PE has already had on land prices, there is strong evidence from other regions that the effect would be negative. In a systematic review, Kielisch (2015) presents evidence from surveys of realtors, home buyers, and appraisers demonstrating natural gas pipelines negatively affect property values for a number of reasons. Among his key findings relevant to the PE:

- 68% of Realtors believe the presence of a pipeline would decrease residential property value.
- Of these Realtors, 56% believe the decrease in value would be between 5% and 10%. (Kielisch does not report the magnitude of the price decrease expected by the other 44%.)
- 70% of Realtors believe a pipeline would cause an increase in the time it takes to sell a home. This is not merely an inconvenience, but a true economic and financial cost to the seller.
- More than three quarters of the Realtors view pipelines as a safety risk.
- In a survey of buyers presented with the prospect of buying an otherwise desirable home with a 36-inch diameter gas transmission line on the property, 62.2% stated that they would no longer buy the property at any price. Of the remainder, half (18.9%) stated that they would still buy the property, but only at a price 21%, on average, below what would otherwise be the market price. The other 18.9% said the pipeline would have no effect on the price they would offer.
- Not incidentally, the survey participants were informed that the risks of “accidental explosions, terrorist threats, tampering, and the inability to detect leaks” were “extremely rare” (2015, p. 7). The survey participants had, in other words, realistic information about the probability of pipeline accidents and were not responding out of overblown fears.
- Considering only those buyers who are still willing to purchase the property, the expected loss in market value would be 10.5%.¹⁷⁴ This loss in value provides the mid-level impact in our estimates. A much greater loss (and higher estimates) would occur if one were to consider the fact that 62% of buyers are effectively reducing their offer prices by 100%, making the average reduction in offer price for all potential buyers 66.2%.¹⁷⁵ In our estimates, however, we have used the smaller effect (-10.5%) based on the assumption that sellers will eventually find one of the buyers still willing to buy the pipeline-easement-encumbered property.

¹⁷⁴ Half of the buyers would offer 21% less, and the other half would offer 0% less; therefore the expected loss is $0.5(-21\%) + 0.5(0\%) = -10.5\%$.

¹⁷⁵ This is the expected value calculated as $0.622*(-100\%) + 0.189*(-21\%) + 0.189*(0\%)$.

- Based on five “impact studies” in which appraisals of smaller properties with and without pipelines were compared, “the average impact [on value] due to the presence of a gas transmission pipeline is -11.6%” (Kielisch, 2015, p. 11). The average rises to a range of -12% to -14% if larger parcels are considered, possibly due to the loss of subdivision capability.
- These findings are consistent with economic theory about the behavior of generally risk-averse people. While would-be landowners who are informed about pipeline risks and nevertheless decide to buy property near the proposed PE corridor could be said to be “coming to the nuisance,” one would expect them to offer less for the pipeline-impacted property than they would offer for a property with no known risks.
- Kielisch’s findings demonstrate that properties on natural gas pipeline rights-of-way suffer a loss in property value. Boxall, Chan, and McMillan (2005), meanwhile, show that pipelines also decrease the value of properties lying at greater distances. In their study of property values near oil and gas wells, pipelines, and related infrastructure, the authors found that properties within the “emergency plan response zone” (EPZs) of sour gas¹⁷⁶ wells and natural gas pipelines faced an average loss in value of 3.8%, other things being equal.”¹⁷⁷

“The PE has both a high consequence area and an evacuation zone radiating from both sides of the pipeline defined by health and safety risks. Whether disclosed or not by sellers, prospective buyers are likely to become informed regarding location of the property relative to the PE’s HCA and evacuation zones or, at a minimum, regarding the presence of the PE in the study region.

“The compressor station proposed for Kidder Township in Carbon County would likely cause its own more severe reduction in the value of nearby properties. We apply the percentage reduction awarded in the Hancock, New York case (25%) to properties that are (as the properties were in that case) within half a mile of the proposed compressor station (“Proximity of Compressor Station Devalues Homes by as much as 50%,” 2015). The stations can also be noisy, with low-frequency noise cited as a constant nuisance (“Proximity of Compressor Station Devalues Homes by as much as 50%,” 2015). These issues led some homeowners to pull-up stakes and move away and to reduced property value assessments for others (Cohen, 2015; “Proximity of Compressor Station Devalues Homes by as much as 50%,” 2015).”¹⁷⁸

“Existing studies suggest negative impacts on land value from various types of nuisances that impose noise, light, air, and water pollution, life safety risks, and lesser human health risks on nearby residents (Sun, 2013; Bolton & Sick, 1999; Boxall et al., 2005). In addition to the emerging body of evidence demonstrating a negative relationship between natural gas infrastructure and property value, well established analyses strongly reveal the opposite analog. Namely, amenities such as scenic vistas, access to recreational resources, proximity to protected areas, cleaner water, and others convey positive value to property.¹⁷⁹ The bottom line is that people derive greater value from, and are willing to pay more for, properties that are closer to positive amenities and farther from negative influences, including health and safety risks.”¹⁸⁰

¹⁷⁶ “Sour” gas contains high concentrations of hydrogen sulfide and poses an acute risk to human health.

¹⁷⁷ *Economic Costs of the PennEast Pipeline*, Spencer Phillips, PhD, et al., Key-Log Economics, LLC. January 2017

¹⁷⁸ *Economic Costs of the PennEast Pipeline*, Spencer Phillips, PhD, et al., Key-Log Economics, LLC. January 2017

¹⁷⁹ Phillips (2004) is an example of a study that includes an extensive review of the literature on the topic.

¹⁸⁰ *Economic Costs of the PennEast Pipeline*, Spencer Phillips, PhD, et al., Key-Log Economics, LLC. January 2017

“Land Value Effects of Compressor Stations: Compressor stations like the three-unit, 47,700 hp station proposed for Kidder Township can cause decreases in home values and have even forced some homeowners to move away from the noise, smells, and illnesses associated with living near stations. In one case from Minisink, New York, a family of six moved to escape the effects of a much smaller (12,600 hp) compressor station operated by Millennium Pipeline, L.L.C. After two years of headaches, eye irritation, and lethargy among the children and even lost vigor in their fruit trees, the couple, unable to find a buyer for their home, moved away, leaving their \$250,000 investment in the property on the table with their bank holding the balance of the mortgage (Cohen, 2015).”

“Claims That Pipelines Have No Effect on Property Value Are Invalid: The DEIS (Federal Energy Regulatory Commission, 2016b) and PE LLC cite studies purporting to show that natural gas pipelines (and in one case a liquid petroleum pipeline) have at most an ambiguous and non-permanent effect on property values (Allen, Williford & Seale Inc., 2001; Fruits, 2008; Palmer, 2008; Diskin et al. 2011). While the studies differ in methods, they are similar in that they fail to take into account two factors potentially voiding their conclusions entirely.”¹⁸¹

The following two tables adapted from the Key-Log Economics analysis outline the estimated loss in property that would result from the project as well as the resulting loss in tax revenue:¹⁸²

¹⁸¹ *Economic Costs of the PennEast Pipeline*, Spencer Phillips, PhD, et al., Key-Log Economics, LLC. January 2017

¹⁸² *Economic Costs of the PennEast Pipeline*, Spencer Phillips, PhD, et al., Key-Log Economics, LLC. January 2017

Table 10: Summary of Land Value Effects, by Zone and County

Area	Effects in Right-of-Way (2015\$)			Effects in Evacuation Zone (2015\$)
	Realtor Survey (4.2%)	Buyer Survey (10.5%) ^a	Impact Studies (13.0%)	Boxall Study (3.8%)
Study Region	-8,420,100	-21,050,250	-26,062,214	-149,890,650
<i>Pennsylvania Portion</i>	-4,400,237	-11,000,593	-13,619,782	-77,656,828
Bucks	-24,305	-60,761	75,228	-334,798
Carbon	-411,78	-1,029,459	-1,274,568	-3,690,122
Luzerne	-2,709,525	-6,773,812	-8,386,625	-36,044,026
Northampton	-1,254,624	-3,136,560	-3,883,360	-37,587,882
<i>New Jersey Portion</i>	-4,019,863	-10,049,657	-12,442,433	-72,233,822
Hunterdon	-2,326,511	-5,816,278	-7,201,106	-30,734,752
Mercer	-1,693,352	-4,233,380	-5,241,327	-41,499,070

Table 10: Continued

Area	Effects Near Compressor (2015\$)	Total of ROW, Compressor Station, and Evacuation Zone Effects (2015\$)		
	Hancock, NY Finding (25%)	Low	Medium	High
Study Region		-159,698,484	-172,328,634	-177,340,598
<i>Pennsylvania Portion</i>	-1,387,734	-83,444,799	-90,045,155	-92,664,344
Bucks	n/a	-359,103	-395,560	-410,027
Carbon	-1,387,734	-5,489,639	-6,107,315	-6,352,424
Luzerne	n/a	-38,753,551	-42,817,838	-44,430,651
Northampton	n/a	-38,842,506	-40,724,442	-41,471,242
<i>New Jersey Portion</i>	n/a	-76,253,685	-82,283,479	-84,676,255
Hunterdon	n/a	-33,061,263	-36,551,029	-37,935,857
Mercer	n/a	-43,192,422	-45,732,450	-46,740,397

Table 11: Effects on Local Property Tax Revenue

Source: Property Taxes by State (propertytax101.org, 2016).

Area	Median Tax Rate (% of Home Value) ^a	Lost Property Tax Revenue (2015\$)		
		Low	Medium	High
Study Region		-2,719,343	-2,932,534	-3,017,134
<i>Pennsylvania Portion</i>		-1,215,386	-1,310,614	-1,348,403
Bucks	1.27%	-4,561	-5,024	-5,207
Carbon	1.56%	-85,638	-95,274	-99,098
Luzerne	1.40%	-542,550	-599,450	-622,029
Northampton	1.50%	-582,638	-610,867	-622,069
<i>New Jersey Portion</i>		-1,503,95	-1,621,920	-1,668,731
Hunterdon	1.91%	-631,470	-698,125	-724,575
Mercer	2.02%	-872,487	-923,795	-944,156

u. The Proposed project would result in adverse impacts to the general needs and welfare of the people and as such, would be contrary to the public interest.

The proposed Project would result in many adverse impacts to the general needs and welfare of the people. As demonstrated by their own comments, the public clearly does not want the pipeline and have voiced all these concerns. The Delaware Riverkeeper Network and Key-Log Economics released a new report documenting the overwhelmingly negative public comments submitted to FERC regarding the PennEast Pipeline. The study, which used crowd sourced reviewers to analyze 3,443 written messages to FERC, found that 76.7% of all commenters expressed a negative attitude toward the proposed PennEast Pipeline—and of those living along the proposed pipeline route, 92.6% expressed a negative sentiment toward the pipeline.¹⁸³ One of the most significant of those is the affect the Project would have on public health.

The analysis by Key-Log Economics found the following Adverse Impacts Public Health Effects of the proposed Project:¹⁸⁴

“Natural gas transmission releases toxins, smog forming pollutants, and greenhouse gases that have a negative impact on public health (Fleischman, McCabe, & Graham, 2016). Emissions from the natural gas industry have been tied to a myriad of health concerns, however, more concrete epidemiological studies are needed to determine the extent to which natural gas transmission causes public health concerns.”

“More recent emerging literature is beginning to quantify just how large of an effect the industry can have on public health. For example, a study by the Clean Air Task Force (2016) estimated that in 2025, increases in ozone levels due to pollution from the oil and gas industry will cause 750,000 additional asthma attacks in children under the age of 18, add an additional 2,000 asthma-related emergency room visits and 600 respiratory related hospital admissions, cause children to miss 500,000 days of school annually, and cause adults to deal with 1.5 million days of forced rest or reduced activity due to ozone smog.”

Air Pollution from the Proposed Compressor Station:

“The PennEast Pipeline impacts air quality by converting forests, which remove normal levels of impurities from the air, to other land uses. There is also concern for impacts that would occur due to the dumping of excess impurities into the air in the first place. While there is a chance leaks could occur at any place along the proposed route, leaks and major releases of gas and other substances (lubricants, etc.) would certainly occur at the 47,700 hp compressor station proposed for Kidder Township, Carbon County, Pennsylvania. Leaks in seals on the moving parts of natural gas compressors produce a significant amount of VOC emissions (Fleischman, McCabe, & Graham, 2016).”

“The negative effects of the compressor station include noise and air pollution from everyday operations plus periodic “blowdowns,” or venting of gas in the system to reduce pressure. As a recent study by the New York Department of Environmental Conservation indicates, pollution around compressor stations is common and severe (Lucas, 2015). The five-state study found that “more than 40% of the air samples from compressor stations exceeded federal regulations for certain chemicals like methane, benzene, and hydrogen

¹⁸³ *Citizen Input Regarding the PennEast Pipeline*. Cara Bottorff & Spencer Phillips, PhD. Key-Log Economic, LLC. March 2017.

¹⁸⁴ *Economic Costs of the PennEast Pipeline*, Spencer Phillips, PhD, et al., Key-Log Economics, LLC. January 2017

sulfide” (Lucas, 2015). The study also found high rates of illnesses such as nosebleeds and respiratory difficulties among people living near the stations.

“While more definitive epidemiological studies are needed to determine the extent to which natural gas compressor stations add to background rates of various illnesses, these stations are implicated as contributing to a long list of maladies. According to Subra (2015), individuals living within 2 miles of compressor stations and metering stations experience respiratory impacts (71% of residents), sinus problems (58%), throat irritation (55%), eye irritation (52%), nasal irritation (48%), breathing difficulties (42%), vision impairment (42%), sleep disturbances (39%), and severe headaches (39%). In addition, some 90% of individuals living within 2 miles of these facilities also reported experiencing odor events (Southwest Pennsylvania Environmental Health Project, 2015). Odors associated with compressor stations include sulfur smell, odorized natural gas, ozone, and burnt butter (Subra, 2009). Furthermore, compressors emit constant low-frequency noise, which can cause negative physical and mental health effects (Luckett, Buppert, & Margolis, 2015).”

“In Carbon County, 560 people live within 2 miles of the proposed compressor station (U.S. Census Bureau, 2015). Translating the findings from Subra (2015), 504 people would experience odor events, 398 people would experience respiratory impacts, 325 people would experience sinus problems, and 218 people would experience sleep disturbances and/or severe headaches. In addition to the health impacts discussed above, this pollution can cause damage to agriculture and infrastructure. One study found that shale gas air pollution damages in Pennsylvania already amount to between \$7.2 and \$30 million, with compressor stations responsible for 60-75% of this total (Walker & Koplinka-Loehr, 2014). Using the low estimate of 60%, that is between \$4.32 and \$18 million in damages associated with compressor stations.”

In light of the many, significant adverse impacts outlined in this comment, the Corps must deny a Section 404 permit when issuing the permit would be “contrary to the public interest,” 33 C.F.R. § 320.4(a)(1). Given the lack of need, the self-serving interests of the PennEast companies (AGL Resources; NJR Pipeline Company; PSEG Power; SJI Midstream; Spectra Energy Partners; UGI Energy Services) to advance this project, the high level of environmental, community and economic harm that will be inflicted, the use of eminent domain purely for private gain, and the threat and harms to the health, safety and natural resources of the communities impacted today, as well as to future generations, this project cannot be said to meet the standards for the Corps’ public interest review necessary to issue a 404 permit for the proposed Project.

II. PennEast’s Proposed Project Conflicts With The Requirements Of A Water Quality Certification Issued Pursuant To Section 401 Of The Clean Water Act.

Both Pennsylvania’s Chapter 105 Water Obstruction and Encroachment permit and New Jersey’s Freshwater Wetlands Protection Act permit constitute the approval of a Water Quality Certification under Section 401 of the Federal Water Pollution Act (also known as the Clean Water Act or “CWA”). However, PennEast’s proposed Project violates a number of the requisite conditions of Chapter 105 of the Pennsylvania Code and New Jersey’s Freshwater Wetlands Protection Act pursuant to NJAC 7:7:A. (NJAC 7:7:A-2.1(d)) and, therefore, does not qualify for a Section 401 Water Quality Certification. The Corps may not issue a 404 permit for any project unless the project applicant secures and complies with a Water Quality Certification. As a result, any issuance of a section 404 permit by the Corps for the proposed Project is arbitrary, capricious, and an abuse of discretion.

CWA Section 401 authorizes states to ensure that federal permits meet state water quality standards after a site specific environmental review. The CWA relies on states to establish water quality standards to be approved by the United States Environmental Protection Agency. *See* 33 U.S.C. § 1342; *Arkansas, supra*; *PUD No. 1, supra*. The CWA also specifically preserves state law authority, in certain respects, to condition certification of water quality under state law standards in general and under NEPA. *See* 33 U.S.C. §§ 1341(d), 1370, and 1371(c).

Furthermore, CWA Section 401 forbids a federal agency from granting a “license or permit” unless the certification has been obtained or waived. *Id.* CWA Section 401 provides, “No license or permit shall be granted if certification has been denied by the State” *Id.* Further, CWA Section 401(d) states that:

Any certification provided under this section shall set forth any effluent limitations and other limitations, and monitoring requirements necessary to assure that any applicant for a Federal license or permit will comply with any applicable effluent limitations and other limitations, under section 1311 or 1312 of this title . . . and **with any other appropriate requirement of State law set forth in such certification** and shall become a condition on any Federal license or permit, subject to the provisions of this section.

33 U.S.C. § 1341(d) (emphasis added). *See PUD No. 1 of Jefferson County*, 511 U.S. at 707-708, 711 (explaining that Section 401(d) “expands the state’s authority to impose conditions on the certification of a project,” including “appropriate state law requirements.”).

The State’s authority under CWA Section 401(d) to condition a federal permit under state law has been broadly read to include conditions “affecting water quality in one manner or another.” *American Rivers, Inc. v. FERC*, 129 F.3d 99, 107 (2nd Cir. 1997); *see also Roosevelt Campobello Int’l Park Comm’n v. US EPA*, 684 F.2d 1041, 1056 (1st Cir. 1982) (finding Maine’s CWA Section 401 certification conditions to be appropriate requirements of state law and related to water quality). As noted by the U.S. Supreme Court:

State certifications under § 401 are essential in the scheme to preserve state authority to address the broad range of pollution, as Senator Muskie explained on the floor when what is now § 401 was first proposed:

No [person] will be able to hide behind a Federal license or permit as an excuse for a violation of water quality standard[s]. No [person] will be able to make major investments in facilities under a federal license or permit without providing assurance that the facility will comply with water quality standards. No State water pollution control agency will be confronted with a *fait accompli* by an industry that has built a plant without consideration of water quality requirements.

S.D. Warren Co. v. Maine Bd. of Env’tl. Protection, 547 U.S. 370, 386 (2006). The Supreme Court noted that these “are the very reasons that Congress provided the States with power to enforce ‘any other appropriate requirement of State law,’ 33 U.S.C. § 1341(d), by imposing conditions on federal licenses for activities that may result in a discharge.” *Id.*

NJDEP and PADEP have already found PennEast’s application materials to be incomplete.

On April 26, 2017 the NJDEP issued a determination that the PennEast 401 application materials submitted to the state were significantly deficient and incomplete. Among the deficient materials were:

- Delineations of all freshwater wetlands, transition areas and open waters;
- Soil borings and/or other physical indicators of wetlands, transition areas or open waters;
- Other identified information pertaining to wetlands, open waters and transition areas;
- An amended Phase I Archaeological Survey Report investigating the entire proposed alignment for the PennEast Pipeline project occurring in the State of New Jersey.

Subsequently, on June 28, 2017, NJDEP determined the PennEast Pipeline Company's application for state approval of its project to be "administratively closed" due to the company's failure to remedy significant identified deficiencies and its failure to provide full information in a timely fashion for Clean Water Act decisionmaking. In its determination letter the NJDEP wrote:

"...given the complexity of the remaining deficient items, and the lack of demonstrated progress on the part of the applicant, it appears that it would be unlikely that an additional 60 days would allow substantial progress on the application. This application will be deemed 'administratively closed' as of the date of this letter."

While the applicant did obtain a 401 Water Quality Certification on February 7, 2017, from the Pennsylvania Department of Environmental Protection (PADEP), the Delaware Riverkeeper Network is currently involved in ongoing litigation with the state over this determination and its failure to apply appropriate state standards for determining whether a 401 Water Quality Certification was proper. Multiple comments and expert reports attached to this comment outline the many ways in which the Project does not meet the requirements for 401 Certification from PA.

Additionally, PADEP has also sent a series of three incompleteness review letters to PennEast for its Chapter 105 and Chapter 102 permits. Each of the letters has indicated the applications submitted are not yet considered to be complete by PADEP and that they cannot commence technical review until the applications are complete. The incompleteness letters were sent on April 26, 2016, September 19, 2016 and December 23 2016. On June 26, 2017, DEP received a request for an extension from PennEast Pipeline Company, LLC. PennEast requested additional response time to the December 23, 2016 incompleteness review letters, indicating that they "do not anticipate submitting the information requested to complete the applications until December 29, 2017." On August 10, 2017, DEP granted the requested extension. On December 27, 2017 and June 28, 2018, PennEast requested additional time extensions. PennEast finally supplied PADEP with updated materials from the incompleteness review on December 26, 2018. PADEP determined that all Chapter 102 and 105 applications were complete on January 25, 2019.

However, this determination was issued prematurely because on February 15, 2019, FERC issued a Notice of Application for Amendment to amend the certificate of public convenience and necessity for the PennEast pipeline. Among these amendments were four modifications to the Pennsylvania portion of the Project design, route, workspace, and construction methods. The amendments still contained incomplete bog turtle and EV wetland information, incomplete surveys for other threatened and endangered species, unresolved consultations between PennEast and state and federal agencies, incomplete surveys for water wells and springs, 13 additional Wild Trout Waters crossed, a widened ROW, missing alignment sheets, and new implications for additional cumulative impacts because of the four route modifications. The missing information that PADEP requires for their Chapter 105 Water Obstruction and Encroachment Permits and Chapter 102 Erosion and Sediment Control permits are extremely relevant to the water quality impacts that

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the Corps is required to consider as part of its 404 public interest review. It is impossible to issue permits when PennEast keeps changing the route and creating more gaps of missing information on top of the ones they have already ignored and refuse to address.

a. The PennEast Pipeline does not meet the requirements necessary for a New Jersey 401 Certification pursuant to the Clean Water Act

The proposed PennEast Pipeline clearly cannot and will not meet the requirements necessary to secure a 401 Water Quality Certification from the State of New Jersey, given the high level of harm the project will inflict on the water and wetland resources of the state and the absolute lack of need for the project in order to serve local, state or even national demand.

In order to secure a 401 Water Quality Certification from the State of New Jersey, the PennEast Pipeline company must meet the standards and procedures for securing a Freshwater Wetlands Protection Act permit from the State of New Jersey pursuant to NJAC 7:7:A. (NJAC 7:7:A-2.1(d)).

There is no public, private, or compelling need for the gas to be carried by the proposed PennEast Pipeline, NJ regulations prohibit 401 Water Quality Certification.

New Jersey communities have no public or private need for the gas that would be delivered by the PennEast Pipeline, and certainly has no compelling public need for the gas. As noted in the attached expert report from Arthur Berman:

“Natural gas consumption for New Jersey has been relatively flat for the past four years at average rate of 1.8 billion cubic feet of gas per day (Bcf/d), somewhat below the higher levels of the late 1990s. [] Although consumption increased slightly in 2013 compared to the three previous years, New Jersey cannot be called a growth market...”

“The proposed PennEast Pipeline would deliver an additional 1 Bcf/d of natural gas to New Jersey potentially creating a 53% supply surplus above the current level of consumption.”

(Professional Opinion of Proposed PennEast Pipeline Project, Arthur E. Berman, Petroleum Geologist, Labyrinth Consulting Services, Inc., February 26, 2015)

Given that NJ has no need for the gas the PennEast pipeline would carry and that delivery of the gas proposed by PennEast, if it in fact were to be delivered to NJ entities (PennEast has provided no evidence of where or who the specific final end users will be, and instead have only provided general assertions of broad markets), would create a natural gas surplus in the state, the requisite demonstration of need pursuant to 7:7A-7.2(b)(1) & (12) and/or 7:7A-7.5 cannot be met. The natural gas needs of New Jersey are already being met and the public and private energy needs of New Jersey can now and in the near future be better met with clean energy alternatives that would have a less adverse impact on the environment, open waters and wetlands. As a result, the PennEast pipeline is not an appropriate candidate for a NJ 401 Water Quality Certificate.

The PennEast Pipeline would cause and contribute to violations of applicable state water quality standards and will cause and contribute to degradation of ground and surface waters. PennEast will also be unable to comply with the mandates of the stormwater management and flood hazard rules. These are among the conditions under which NJ regulations prohibit granting 401 Water Quality Certification.

There are significant environmental impacts which result from pipeline crossing and construction activities regardless of mitigation techniques used. The list of impacts includes, but is not limited to: erosion and sedimentation, loss of riparian vegetation, habitat loss and fragmentation, air quality impacts, safety concerns, groundwater impacts, soil compaction, increased stormwater runoff, wetland degradation, and cumulative environmental impacts along the length of the project. The proposed Project would inflict severe and irreparable harm on NJ aquatic resources, vegetation, fish, wildlife, aquatic circulation, wetlands and hydrologic patterns. These impacts to the environment are not limited to the time period in which the right-of-way is disturbed, but can result in long lasting consequences.

The PennEast company will impact 54 wetlands and 87 surface waterbodies. Many of the New Jersey waterways crossed/cut are Category One (C1) waters.

The proposed PennEast Pipeline project, as demonstrated by the installation of other pipeline projects in our region and nation, will create new pathways for water flow, thereby altering the hydrologic pattern of the watershed and adversely impacting (in both quantity, quality and seasonal timing) streams, wetlands and drinking water sources.

During the construction of the PennEast pipeline stream crossings there will be high levels of suspended sediments from blasting, trench excavation, and backfilling. Sedimentation will also result from the removal of vegetation and activity that takes place on the stream-adjacent (riparian) lands. The resulting sedimentation will have serious consequences for the benthic invertebrates and fish species whose vitality is crucial for healthy aquatic ecosystems – including, but not limited to, filling in the interstitial spaces of the streambed, changing its porosity and composition, and thereby increasing embeddedness and reducing riffle area and habitat quality. As with other pipelines, there will be reductions in benthic invertebrate densities, changes to the structure of aquatic communities, changes in fish foraging behavior, reductions in the availability of food, and increases in fish egg mortality rates. In addition to the stream crossing construction activity, the associated new road construction increases the risk of erosion and sedimentation.

Even in instances where the impacted benthic community restores itself, that does not diminish or negate the ecosystem effects during the time of damage including the cascading effects to other ecosystem services otherwise provided by the invertebrates – including serving as food for other dependent species, the water quality benefits provided by invertebrates helping with nutrient breakdown, and the breakdown of instream detritus creating food for other species.

Pipeline construction activity requires the clearing of vegetation in and around wetlands, which has degrading impacts. After construction, the PennEast pipeline company will maintain the right-of-way along its length, including in wetland areas, by preventing woody vegetation from re-establishing. For forested wetlands this will mean a permanent conversion of the forested wetland to an emergent wetland. This conversion will adversely impact the functions and values of the impacted wetlands. Certified wetlands specialists have found a measurable “decrease” or “loss” in functionality as a result of the permanent conversion of forested wetlands to emergent wetlands. This will be the outcome with the PennEast Pipeline as well if it is allowed to cut through NJ wetlands.

A functional conversion of wetlands from forested wetlands to emergent wetlands will result in decreases to above ground biomass, structural diversity of the wetland, and local climate amelioration. The conversion will also result in a loss of forest interior habitat, visual and aural screening from human activity, suitability of shade-loving plant species, and the production of mast (such as acorns) for wildlife. Moreover, these conversions will cause an increased wetland exposure to wind, ice and sun and increase the localized effects

of global warming on biota. Wetland functions involving drainage patterns, water quantity, and water quality will also be adversely impacted by a functional conversion of forested wetlands to emergent wetlands. Specifically, emergent wetlands provide decreased soil stabilization, streambank anchoring against erosion, nutrient storage, and temperature maintenance when compared to forested wetlands. As a result, erosion and sedimentation can be expected to increase as a result of the conversion. The function of storm damage shielding can also be expected to decrease as a result of this conversion.

For each of the pipeline construction techniques used there will be a resulting loss of riparian buffer vegetation, foliage, waterway protection and habitat. As a result, the PennEast pipeline will fail to meet the buffer mandates of NJ regulations.

Pipelines are conduits for diverting groundwater from its natural path. According to expert observation, pipeline trenches can divert groundwater and as a result permanently alter the hydrologic cycle in the vicinity of the pipeline right-of-way. This will be no less true for the PennEast pipeline than every other pipeline that has cut through our ecological systems and communities. This alteration will decrease the water resources available to support wetland hydrology and stream base flow in the summer and fall dry season.

The compacted soils resulting from pipeline construction will increase rainfall runoff and reduce ground water infiltration further harming wetland hydrology and stream baseflow.

In addition the 84" total construction depth of the pipeline will, in a number of New Jersey communities, impact groundwater through the disturbance of shallow bedrock, causing bedrock channels to close up wells or springs as much as a mile away. In addition, the blasting that will be needed for PennEast will have significant impacts for water resources that will be unavoidable.

The adverse impacts to wetlands, forests, and both surface and groundwater is detrimental, far reaching and in many instances permanent. Recreation and aesthetic values of both the public and private lands and ecosystems impacted will be greatly diminished both near term and long term.

In addition, research is increasingly showing that there will be adverse economic impacts to private properties that will be cut by PennEast with some studies showing adverse impacts by as much as 30 to 50%. The harm to open space preservation is also significant – not only will the communities, aesthetic, recreational and ecological values of the open spaces crossed be diminished, but the future desire of communities to invest in open space preservation for the benefits of waterway, wetlands, aquatic life and wildlife live will also be undermined. Who will want to invest in preserving land if they know it will be turned over to a pipeline company?

PennEast will have significant cumulative impacts on the water resources and ecological communities cut by the project and located adjacent to or downstream of it. The large amount of land disturbance created during pipeline construction results in increased stormwater runoff, sedimentation, and erosion of the land and stream channels. The disturbance of the land, including loss of forested and healthy ecological vegetation, the adverse impacts to wetlands, and the soil compaction that results from construction in both the permanent footprint as well as the supposed temporary construction areas, are permanent as is the water quality and ecological harm they inflict.

The capacity of NJ waterways and habitats to recover from the multitude of impacts inflicted by PennEast will most certainly be exceeded.

The cumulative impacts will not just result from the direct cuts and footprints across the landscape, but will be compounded by the resulting air pollution and climate changing impacts of the pipeline's operation. Additionally, the potential of pipelines to rupture and leak raises a greater risk of human health concerns and serious water contamination issues.

It is clear that the PennEast Pipeline cannot meet the mandates of 401 Water Quality Certification in New Jersey. Therefore, any concurrent issuance of a 404 permit by the Corps would be arbitrary, capricious, and an abuse of discretion.

III. The Project Information that The Corps Relies on Fails To Provide An Adequate Baseline From Which A Public Interest Review Can Proceed

The Corps must also deny a Section 404 permit when issuing the permit would be “contrary to the public interest,” 33 C.F.R. § 320.4(a)(1). The Corps has utterly failed to properly designate wetlands pursuant to the Pennsylvania state code, properly identify and classify wetland types, and accurately account for the expected ground disturbance impacts that will result from the construction activity of the project. As a result, the Corps is unable to accurately establish a foundational baseline from which it can begin to balance the potential benefits of the project against its harms and costs in a public interest review. Therefore, any issuance of a 404 permit for the proposed Project would be arbitrary, capricious, and an abuse of discretion.

During a public interest review, the Corps must consider “all the facts” and then deny a permit if “the costs of the project outweigh[] its potential benefits and . . . the public interest would best be served by denying the permit.” *Buttrey v. United States*, 690 F.2d 1170, 1185 (5th Cir. 1982). To evaluate the project's effects on the public interest, the Corps must balance the “benefits which reasonably may be expected to accrue from the proposal” against the “reasonably foreseeable detriments.” 33 C.F.R. § 320.4(a)(1). This “careful weighing” considers “[a]ll factors which may be relevant to the proposal . . . including the cumulative effects thereof.” *Id.* As in any such analysis, “[s]imple logic, fairness, and the premises of cost-benefit analysis . . . demand that a cost-benefit analysis be carried out objectively.” *Sierra Club v. Sigler*, 695 F.2d 957, 979 (5th Cir. 1983). For example, the Corps' public interest review may not “mention the positive anticipated impact of the proposal on jobs and municipal taxes” but “sidestep [] any consideration of adverse economic effects.” *Hough v. Marsh*, 557 F. Supp. 74, 86 (D. Mass. 1982).

The Corps' regulations list over twenty factors to evaluate during a public interest review, including “conservation, economics, aesthetics, general environmental concerns, [and] wetlands.” 33 C.F.R. § 320.4(a)(1). Every permit decision must also consider “the public and private need” for the work, “the practicability of using reasonable alternative locations and methods to accomplish the objective of the . . . work,” and “[t]he extent and permanence of the beneficial and/or detrimental effects” of the proposed project. *Id.* § 320.4(a)(2).

The Project information provided to the Corps by PennEast and FERC, as well as the limited information available in the Corps' Public Notice of PennEast's 404 application, is filled with key data gaps, misrepresentations, misinformation, missing information, inaccurate information, false information, and conflicting information. As a result, the Corps is unable to accurately establish a foundational baseline from which it can begin to balance the potential benefits of the project from its harms and costs in a public interest review. Therefore, any issuance of a 404 permit for the proposed Project would be arbitrary, capricious, and an abuse of discretion.

Specifically, the FERC's EIS fails to establish an accurate baseline from which a determination can be made regarding the significance of the impacts resulting from construction and operational activity of the Project, the DEIS fails to examine the cumulative and induced development that would result from the approval of the Project, the DEIS improperly segments its environmental analysis with regard to other interdependent projects, the DEIS does not sufficiently account for climate change impacts, the DEIS's alternatives analysis is unlawfully narrow, and the DEIS fails to sufficiently establish need for the Project. Additional deficiencies are noted throughout this comment letter, and the attached expert reports. The quality of information cannot support any conclusion whatsoever.

The missing and inaccurate information is a fundamental failing of the Project materials, and it prevents the Corps, as well as other agencies and the public, from having the data and information they need to assess the impacts of the proposed pipeline on water resources, habitat, wildlife, drinking water and human communities. This comment and the attached reports contain many examples of assertions that are false, inaccurate, misleading and/or deficient, including, but not limited to:

Spot checks and field-truthing indicate inadequate and incomplete mapping of sensitive wetlands along the proposed ROW. Along one 0.5 mile of the proposed route in sensitive State Gamelands, at least 12 vernal pool complexes or groundwater seeps were identified while PennEast tables only indicate 2 vernal pool habitats along the same proposed route and no groundwater seeps.¹⁸⁵

"72% of the proposed pipeline alignment in New Jersey and 23% in Pennsylvania has not yet been field investigated for wetlands and other water resources."¹⁸⁶

"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, including information discussed further in this memo. Important site-specific information is located in different Resource Report volumes and other documents, and not easily correlated or evaluated. [...] The project selection of stream and wetland crossing locations and construction methods cannot be clearly evaluated in the form in which it is presented in the DEIS and supporting documents."

In addition, it is clear that this DEIS cannot be relied upon by any government agency—not FERC, not the US Fish & Wildlife Service, not the U.S. Army Corps of Engineers, not the U.S. Environmental Protection Agency, not the NJ Department of Environmental Protection, not the PA Department of Environmental Protection, not the Delaware River Basin Commission—for evaluation or decision-making purposes. And for any agency to do so would subject them to successful legal challenge.

The missing and inaccurate information is a fundamental failing of FERC's EIS, and it prevents other state, federal and regional watershed agencies, and the public from having the data and information they need to assess the impacts of the proposed pipeline on water resources, habitat, wildlife, drinking water and human communities. The DEIS is designed to help inform sound decision-making, in its current deficient state this document is worthless for assessment and decision-making purposes.

¹⁸⁵ Delaware Riverkeeper Network. *Field-Truthing and Monitoring of the Proposed PennEast Pipeline, FERC Draft EIS, Docket No. CP15-558*, September 2016.

¹⁸⁶ *The Effects of the Proposed PennEast Pipeline on Exceptional Value Wetlands in Pennsylvania, Prepared for the Delaware Riverkeeper Network*, Schmid and Company, July 2016; Letter dated September 9, 2016 written by Schmid & Company, Consulting Ecologists to Maya K. van Rossum, the Delaware Riverkeeper.

The Corps must “independent[ly] verif[y]” the applicant's data and conclusions. *Utahns for Better Transp.*, 305 F.3d at 1186; *Sierra Club v. Van Antwerp*, 362 F. App'x 100, 106 (11th Cir. 2010) (“[T]he Corps may rely on information submitted by the applicant but must *independently verify such information.*” (emphasis added)). The Corps' duty of independent verification is especially strong when the Corps “receives particularized objections to material upon which it importantly relied in its review.” *Van Abbema v. Fornell*, 807 F.2d 633, 640 (7th Cir. 1986) *49 (considering a challenge to a Corps permit under NEPA). If the Corps bases its permitting conclusions on insufficient, unverified, or false information, the Corps' conclusions are “arbitrary and capricious.” *Id.* at 639 (holding the Corps may not base its conclusions on “entirely false premises or information”); *Utahns for Better Transp.*, 305 F.3d at 1187 (holding the Corps may not rely on insufficient information or unverified cost estimates).

As noted above, when the Corps is presented with particularized objections to the material on which it relies, as such, the Corps must independently verify the accuracy of the information on which it will base its decision. Without an accurate and verified baseline any public interest review contained in a decisional document issued by the Corps is arbitrary, capricious, and an abuse of discretion.

IV. Conclusion.

In addition to this comment and attached reports, the Delaware Riverkeeper Network incorporates by reference all information in the footnotes cited and all information provided by other commenters concerned about/opposed to construction, operation and maintenance of the PennEast pipeline.

For the reasons stated herewith the Delaware Riverkeeper Network and Clean Air Council respectfully request that the Corps deny the pending 404 permit. In the alternative, we request that the Corps grant a public hearing to further evaluate the numerous unresolved issues and problems that riddle PennEast's application. Finally, we request a JD to reevaluate all wetland delineations because the drawings by PennEast consultants have been field verified as being inaccurate.

By: /s/ Maya K. van Rossum

[The Delaware Riverkeeper](#),

Delaware Riverkeeper Network

925 Canal St., Suite 3701

Bristol, PA 19007

215.369.1188

Joseph Otis Minott, Esq.

Executive Director and Chief Counsel

Clean Air Council

135 South 19th Street, Suite 300

Philadelphia, PA 19103

215.567.4004

Attachments:

1. *Field Monitoring Report, Pipeline Construction & Maintenance Irreparably Harms Rivers, Wetlands and Streams. Addendum to Comment for the PennEast Pipeline*, Delaware Riverkeeper Network.
 - a. DRN Field Reports for Tennessee Gas 300 Line (Restoration Phase) –Dated 10/1/12 to 3/12/2013 (59 pages)
 - b. DRN Field Reports for Tennessee Gas Northeast Upgrade Project Dated 7/18/12 to 5/23/13 (60 pages)
 - c. DRN Letters to FERC and other agencies Regarding Mapping, Pollution and Construction Concerns from the Field (Subset)
 - d. NOV summary table of Pike County Conservation District Inspections and Violations
 - e. Selected Expert Reports
2. *Economic Costs of the PennEast Pipeline*, Spencer Phillips, PhD, et al., Key-Log Economics, LLC, January 2017.
3. Letter dated September 9, 2016 written by Key-Log Economics to Secretary Kimberly Bose & Deputy Secretary Nathaniel J. Davis.
4. *Professional Review & Comment of the Draft Environmental Impact Statement and Supporting Documents Related to Surface Water Impacts of the Proposed PennEast Pipeline Project*, Michelle Adams & Marc Henderson, Water Resources Engineers, Meliora Design, LLC, September 5, 2016.
 - a. Table A Attachment to *Professional Review & Comment...*, Meliora Design, LLC, September 5, 2016
5. *Technical Memorandum Review of Draft Environmental Impact Statement, Proposed PennEast Pipeline, Docket No. CP15-558-000, FERC\EIS: 0271D*, Tom Myers, Ph.D., August 31, 2016
6. *Technical Review of Volume I FERC Draft Environmental Impact Statement Submitted for PennEast Pipeline Project*, Princeton Hydro, September 2016
7. *The Effects of the Proposed PennEast Pipeline on Exceptional Value Wetlands in Pennsylvania, Prepared for the Delaware Riverkeeper Network*, Schmid and Company, July 2016
8. Letter dated September 9, 2016 written by Schmid & Company, Consulting Ecologists to Maya K. van Rossum, the Delaware Riverkeeper.
9. *Opinion on the PennEast Pipeline*, Arthur Berman, Petroleum Geologist, Labrynth Consulting Services, Inc., September 11, 2016
10. *Professional Opinion of Proposed PennEast Pipeline Project*, Arthur E. Berman, Petroleum Geologist, Labyrinth Consulting Services, Inc., February 26, 2015
11. *Analysis of Public Benefit Regarding PennEast*, Skipping Stone, March 9, 2016

12. *Review of PennEast Pipeline Project Economic Impact Analysis*, Jannette Barth, Pepacton Institute, April 4, 2016
13. *Expert Report on the PennEast Pipeline Project Economic Impact Analysis for New Jersey and Pennsylvania*, The Goodman Group Report, Nov 4, 2015
14. *Report on Phase I Bog Turtle Survey for Wetlands Associated with Hunters Creek, Towamensing Township, Carbon County, Pennsylvania*, Jason Tesauro, September 5, 2015
15. *Cumulative Land Cover Impacts of Proposed Transmission Pipelines in the Delaware River Basin*, Lars Hanson and Steven Habicht, May 2016
16. *Pennsylvania Energy Impacts Assessment*, Nels Johnson, the Nature Conservancy, November 15, 2010
17. *Review of INGAA Foundation Report, "Pipeline Impact to Property Value and Property Insurability"*, Key-Log Economics, March 11, 2015
18. *Fulper Farm Grain Harvest Graphics*, 4 Images, 2008-2012
19. Table A-1. Active, proposed and reported natural gas wells in Pennsylvania, by county
20. *Marcellus/Utica on Pace for Pipeline Overbuild, Says Braziel*, Natural Gas Intelligence, June 8, 2016
21. *Drilling Deeper: A Reality Check on U.S. Government Forecasts for a Lasting Tight Oil and Shale Gas Boom*, J. David Hughes, Post Carbon Institute, October 2014
22. *A Bridge Too Far: How Appalachian Basin Gas Pipeline Expansion Will Undermine U.S. Climate Goals*, Oil International, July 2016
23. *Achieving Higher Quality Restoration Along Pipeline Rights of Way*, Leslie Sauer, May 2014
24. *Climate Change Impacts and Solutions for Pennsylvania*, Union of Concerned Scientists, 2008
25. *The Changing Northeast Climate*, Union of Concerned Scientists, 2006
26. *The Potential Environmental Impact from Fracking in the Delaware River Basin*, Steven Habicht, Lars Hanson, and Paul Faeth, August 2015
27. *Climate Change in Pennsylvania: Impacts and Solutions for the Keystone State*, Union of Concerned Scientists, October 2008
28. *Climate Change Impacts in the United States*, Radley Horton and Gary Yohe, May 2014
29. *Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews*, Christina Goldfuss, Council on Environmental Quality, August 1, 2016

30. *Natural Gas Price Increase Inevitable*, Art Berman, The Petroleum Truth Report, February 21, 2016
31. *Revealed: Contractors Hired by FERC to Review A New Spectra Energy Pipeline Work for Spectra on a Related Project*, Itai Vardi, Desmog, May 26, 2016
32. *Citizen Input Regarding the PennEast Pipeline*. Cara Bottorff & Spencer Phillips, PhD. Key-Log Economic, LLC. March 2017.
33. *Better Site Design: A Handbook for Changing Development Rules in Your Community*, Center for Watershed Protection, August, 1998.
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37. Dr. Emile DeVito, New Jersey Conservation Foundation, Email Correspondence Re: Tennessee Gas Pipeline practices. July 14, 2015.
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