



March 25, 2015

Ms. Kimberly Bose
Federal Energy Regulatory Commission
Office of the Secretary
888 1st Street, NE
Washington, DC 20428

Re: Docket No. PF14-5: Comments Regarding William's Proposed Atlantic Sunrise Pipeline

Dear Ms. Bose,

The Delaware Riverkeeper Network ("DRN") is providing the following supplemental comments to be considered by the Federal Energy Regulatory Commission ("FERC" or the "Commission") with respect to the proposed Atlantic Sunrise Pipeline project. These comments supplement comments submitted by DRN during the earlier scoping period. The size and scope of the construction activity for this pipeline, stream crossings, and other water resource impacts associated with the project will have a damaging effect on the health and vitality of the habitats and watersheds within the proposed pipeline path. Pipeline projects, such as this, result in significant forest fragmentation, invite and propagate the spread of invasive species, cause degradation of water quality and stream habitats, and degrade the functions and values of the ecosystems traversed. Below, DRN identifies significant concerns related to the cumulative impacts of this project in combination with several other pipeline projects that have been concentrated in the same subwatersheds.

DRN asks that the Commission consider the multitude of environmental impacts associated with this project, including the cumulative impacts of all of the environmental and community harms it will cause. Additionally, we urge that you consider the cumulative impacts associated with existing and other pipeline proposals within the region when reviewing this proposal and drafting the Environmental Impact Statement. And, we urge that you consider the associated and foreseeable impacts that will result from the shale gas extraction the Atlantic Sunrise Pipeline will induce, support and encourage as well as the ramifications of the potential end uses including the LNG exports that are to result given the connection between the Atlantic Sunrise Pipeline and the Cove Point LNG facility approved for foreign export.

Based on information provided by William's Co. in its October 2014 resource reports, the project is designed to be a large scale 42-inch transmission pipeline that will stretch approximately 178 miles. Over 3,507 acres will be impacted during construction of this pipeline, its above ground facilities, and modified above ground facilities. This project will have significant adverse environmental impacts, safety issues (i.e. explosions), economic

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ramifications, permanent impacts on scenery, and threaten drinking water sources, groundwater wells, and septic systems.

The Atlantic Sunrise Pipeline, and others like it, fit into a larger picture of exploding shale gas development in the Marcellus Shale region. The increased development is not limited to the drilling of wells. FERC has reported that 5.6 billion cubic feet per day of pipeline capacity was constructed in the Northeast in 2008 and 2009, and an additional 1.2 billion cubic feet per day will have been constructed in the region by January 2011.¹ Thus, the proposed Atlantic Sunrise Project is both a product of the development of the Marcellus Shale and other shales and a catalyst for further gas development. The impacts of the Project cannot be understood apart from the totality of the past, present, and reasonably foreseeable future actions associated with Marcellus Shale development and the development of other shales such as the Utica shale.

The Atlantic Sunrise project threatens to disturb pristine open space, landscapes of contiguous forest and mountain lands, fertile farmland, threatened and endangered species habitat, and breathtaking vistas in Pennsylvania. FERC needs to question the necessity of this project and provide a comprehensive examination of all primary, secondary, temporary, and cumulative impacts of the proposed project. FERC must evaluate all impacts the Project will have on the resources along the ROW, the ROW buffer, access roads, sites of compressor and valve stations and pipe yards and any secondary and cumulative impacts that will result from project construction. The following comments provide important issues that should be addressed in the EIS by FERC as part of the National Environmental Policy Act (“NEPA”) review process.

Cumulative Impacts Across the Project and Across Multiple Projects, Including Source and End Use of Gas, Must Be Considered

Cumulative impacts caused by “reasonably foreseeable” future actions are recognizable under NEPA. Additionally, FERC must consider the cumulative effects of actions similar to the proposed action, whether existing or reasonably foreseeable. Cumulative impacts are defined as impact[s] on the environment which result from the incremental impact of the action *when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions*. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.² The Council on Environmental Quality has emphasized that cumulative effects analysis includes a “[f]ocus on truly meaningful effects” of “past, present, and future actions” as well as “all federal, nonfederal, and private actions.”³

FERC cannot frame its cumulative impact analysis too narrowly by considering only the immediate vicinity of the proposed pipeline route. The outer bounds of the environmental review area should extend at least as far as the subwatershed through which the pipeline crosses, as opposed to an arbitrary designation of feet or mileage as FERC has identified in the past review documents. A critical consideration in determining the cumulative environmental effects must be the interaction of runoff with other pollutants from all sources and consideration of the impact of the Project when added to other past, present, and reasonably foreseeable future actions, whether federal, non-federal, or private.⁴

The Atlantic Sunrise Pipeline will further facilitate the development of new gas drilling wells, access roads, gathering lines, compressor stations, and other supporting infrastructure,

¹ Fed. Energy Regulatory Comm’n, Winter 2010-11 Energy Market Assessment 10 (Oct. 21, 2010), <http://www.ferc.gov/market-oversight/mkt-views/2010/10-21-10.pdf>.

² 40 C.F.R. § 1508.7 (2010).

³ Council on Env’tl. Quality, Considering Cumulative Effects Under the National Environmental Policy Act 11 (1997), available at <http://ceq.hss.doe.gov/nepa/ccenepa/sec2.pdf>.

⁴ 40 C.F.R. §§ 1508.7-8, 1508.27 (2010).

which will further degrade our environment. Therefore, FERC must consider the impacts of the Project in the context of existing and reasonably foreseeable shale development, including the Marcellus Shale and Utica Shale as well as other shales identified by the US Geological Survey, which includes but is not limited to the hundreds of miles of gathering and transportation pipelines and associated infrastructure (such as valves and compressor stations) that have been and will need to be constructed to move the gas from the thousands of wells that have been and will be drilled to interstate markets. For example, the Commission should determine how many wells the capacity of the project supports, and model the environmental impact of the construction and operation of those wells. Such an estimate would also include an examination of the associated infrastructure supporting the identified wells. Additionally, the Commission should consider other induced development such as the development of small-scale power generation facilities being developed along the pipeline.

Additionally, FERC should examine the cumulative impact of the multiple utility and other linear projects that are being proposed or constructed in the Susquehanna watershed and the vicinity. For example, there are significant concerns related to the cumulative impacts of the continuous water crossings and wetlands disturbance that pipeline construction activity has on the health and vitality of the Susquehanna River basin and its tributaries. These projects do not occur in a vacuum. Each project individually depletes the natural and scenic resources of the region, and the combined impact becomes increasingly more severe, unavoidable, unmitigatable, and irreversible. As such, the Commission must carefully examine these projects holistically in order to satisfy the requirements of NEPA.

The direct, cumulative, and foreseeable impacts resulting from the exportation of the Atlantic Sunrise transported gas must also be considered. This pipeline will interconnect with a pipeline system that would transport its shale gas to the recently approved Cove Point LNG export facility. Given that natural gas can sell for as much as four times the price overseas as compared to domestically, it is both reasonable and foreseeable that Atlantic Sunrise transported gas will be transported to Cove Point for export and Williams has stated this point in their own financial projections to their investors.

Furthermore, by creating an entirely new ROW for this Project the Commission is creating a new industrial corridor that will foreseeably be used in future Williams pipeline upgrades. A quick review of other major pipeline corridors in the region support this assertion as natural gas pipeline operators including Columbia, Tennessee Gas Pipeline, Texas Eastern, and Transcontinental have all within the last three years added looping segments to their pipelines. As such, the NEPA document must account for the potential expansion of the ROW to accommodate future upgrades.

Impacts to and Avoidance of Preserved Open Space Must Be Given Full Consideration

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 or programs like the Pennsylvania Clean and Green Program.

FERC must require the applicant to consider alternative routes that do not impact public open space. Companies routinely propose pipeline routes that impact public open space because these lands are valued at a lower rate when compared to non-preserved lands. FERC must not permit this “savings” to the applicant to drive the siting process. Public and preserved lands must be priced according to their value. FERC must deter this strategy for siting the pipeline and consider the distorted pricing of open space as it evaluates alternative routes for this Project and as it considers the cumulative environmental harms of the proposed pipeline expansion. It is DRN’s position that FERC’s approach to evaluating cumulative impacts gives inadequate consideration to the distorted incentives for pipeline companies to target protected open space –

whether protected through purchase or conservation easements.

The protection of open space is necessary to preserve the remarkable resources of Pennsylvania. Natural areas are critical for water quality, have more stable soils, provide habitat for plants and animal species, 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 that the presence, or even the potential presence, of an interstate transmission pipeline of the size proposed by Atlantic Sunrise adversely impacts the marketability of nearby homes. FERC must fully and fairly consider these harms and require quantifiable and documented data to support any assertions/findings. Potential impact blast zones (PIRs) and the environmental and property harm it would cause along the entire pipeline corridor if an accident were to happen must also be considered in the analysis.

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. For example, "Pennypack Park in Philadelphia is credited with a 38% increase in the value of a nearby property."⁵ 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."⁶ 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.⁷ To the extent the Atlantic Sunrise 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 as far as 300 feet back on either side of the ROW, the impacts to home market values and marketability must be accounted for.

Water Resources (Including Surface Water and Groundwater) and Wetland Impacts Must be Fully Considered, Including Providing a Full Accounting of the Number of Waterways and Wetlands to be Crossed and Irreparably Altered

Williams company October Resource reports have identified 201 wetlands (44.59 acres of wetlands) and 300 streams that may be affected by the project. It is imperative that these resources are field-truthed and checked by FERC and the required agencies to ensure no waterbodies and wetlands have been omitted. Past review and on the ground field work by DRN on similar large pipeline projects have found waterbody omissions. Project Resource Reports and USGS topographic maps indicate that in some cases, streams will be traversed multiple times. Among the waterways to be crossed are the Swatara Creek, Conestoga River, and Susquehanna Rivers and numerous tributaries to these rivers, many of which are designated as High Quality or Exceptional Value. The Susquehanna also has rare and protected freshwater

⁵ Center for Watershed Protection, *Better Site Design: A Handbook for Changing Development Rules in Your Community*, August, 1998, p. 134

⁶ Center for Watershed Protection, *Better Site Design: A Handbook for Changing Development Rules in Your Community*, August, 1998 Citing two studies by Morales and Weyerhauser

⁷ Cheryl Kollin, "Designing with Nature and Showing the Benefits", *Land Development*, National Association of Home Builders, Winter, 1997

mussels present which must be given the strongest protections. Furthermore, Williams October 2014 resource reports state that at least 11 stream crossings would be located upstream of important potable drinking water sources and at least 18 surface water intakes and 16 groundwater intakes are located less than 3 miles downstream from the potential pipeline cuts. Transco states that these crossings would be protected with E&S controls but its important FERC recognize failure of these BMPs on past similar pipeline projects and consider those impacts in the EIS. Many of the waterbodies proposed to be cut across also are listed with TMDL's for siltation impacts, metals, nutrients. Since pipelines can cause increased siltation especially if open cuts are allowed, these already impaired waterways would be further degraded from this project. CLP South alone has 11 impaired waterbodies that could be further degraded from this project.

Recently identified alternative routes may increase the number of waterways and wetlands; they may also cut through an increased level of forest acreage. The EIS consideration of alternative routes needs to carefully consider the actual number of streams, wetlands, forest acres, preserved lands, conservation easements, and active recreation areas crossed, as well as fully and fairly considering the damages of each route. It appears already that not only is Atlantic Sunrise under-counting and under-valuing the resources harmed, but that it is also proposing alternative routes based on political maneuvering rather than reducing harms.

The proposed Atlantic Sunrise 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.

There is also potential for chemical contamination of water resources. Current practices call for the ROW to be clear of vegetative matter. Herbicides are frequently used to accomplish this task. Creating and maintaining the ROW could result in increased and repeated herbicide use on the federal, state, and county parklands along the ROW and, as run-off capacity will be intensified in the ROW due to lack of vegetation and forest cover and due to increased soil compaction resulting from pipeline construction, there will be an increased level of herbicides discharging directly (or through stormwater systems) into tributary streams, wetlands and the Susquehanna River Basin. In addition, the removal of vegetation and increased soil compaction will create a direct route for stormwater runoff from neighboring lands which may be treated by other property owners with herbicides, pesticides, fertilizers and/or other chemicals that could/would then be transported and discharged into nearby water bodies either directly or through stormwater collection systems. The EIS must consider and question the necessity of the proposed width of permanent clearance considering the harms it poses to the environment. The ease of aerial inspection of the pipeline should not, and cannot, trump the resulting environmental harms associated with gratuitously wide ROW permanent clearings.

Beyond chemical contamination, water quality impacts will also result from an increase in suspended solids in the water due to erosion resulting from the increased volume of stormwater runoff that will result from removal of vegetation and increased soil compaction and from the removal of streamside vegetation thus depriving streams of the natural armoring of vegetative root systems. Upon entering the stream ecosystem, this increase in suspended solids will result in a reduction to the streams' water bearing capacity, in turn reducing oxygen availability and impacting aquatic plant and animal species, including habitat for fish reproduction and macroinvertebrate diversity. Each of these factors must be individually reviewed at all water crossings.

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 alteration will decrease the water resources available to support wetland hydrology and stream

base flow in the summer and fall dry season.”⁸ The compacted soils resulting from pipeline construction increase rainfall runoff and reduce ground water infiltration. This can cause further negative impacts on wetland hydrology and stream baseflow in the area of the pipeline.⁹ “Increased runoff as a result of compacted soils, and increased drainage of shallow ground water” around a pipeline, due to previous and proposed construction practices, can increase “surface water flow and groundwater discharge in the wet winter and spring seasons and decrease summer and fall ground water discharge which supports wetland hydrology and stream base flow.”¹⁰ The result of reduced groundwater discharge during the dry summer and fall months can decrease the size of supported wetlands. So the result is too much or too little depending on the time of year. Another result of the altered flows can be to decrease stream baseflow that supports aquatic life and trout habitat in headwater streams in the dry summer and fall period.

Furthermore, the installation of the Project will involve drilling, blasting and digging into the bedrock, the potential effects of this must be considered. If these activities result in interception of the water table, dewatering activities would result in the localized drawdowns of water table elevation and could impact local wells. Construction activities may also result in contamination of groundwater by creating a direct flow of contaminants, including herbicides, into local aquifers. FERC must determine whether any of the aquifers along the ROW are sole-source as this would magnify any negative impacts of construction. Protection of groundwater is a crucial concern for residents being impacted by the gas pipeline, and therefore, the negative impacts to groundwater quality and quantity must be heavily weighted in FERC’s review of the public necessity of this Project. This review must also take into account any costs that would be borne by these municipalities if the Project depleted the quality of the water supply and groundwater to a point that water treatment facilities become necessary.

Furthermore, increasing the runoff potential of soils due to compaction will negatively impact groundwater recharge areas surrounding the ROW. By removing the topsoil layer and associated forest litter and humus, runoff will decrease the soil porosity and moisture retention capacity. This will induce even greater levels of runoff and will damage the groundwater recharge capabilities of the ecosystem. The decreased ability to absorb water resulting in runoff and sedimentation severely decreases water quality. Previous FERC jurisdictional projects have resulted in significant soil compaction issues. The EIS must identify ways in which previous soil compaction problems can be avoided or properly remediated. A restatement of previous practices would be unacceptable.

To determine current water quality, the NEPA document must include a survey of the established benthic community in potentially impacted streams. This should include the composition, quantity, and diversity of the community using standardized sampling protocols consistent with the state’s assessments. Anti-degradation streams that have special designations warrant special attention and protection, especially when a tributary has Category 1, Exceptional Value or High Quality designation. Furthermore if a stream has an existing TMDL and is not meeting its existing water quality, more attention is also warranted. Potential water quality impacts should also be evaluated including construction related impacts that include the possibility of fuel spills, compaction from parking and staging equipment and contamination of runoff and further erosion and sedimentation. Any potential channel relocations that occur due to construction must be studied as an impact. Installing the Project will require stream diversions that will also impact wetland areas. These areas of stream channel modification must be identified so that the impacts on wildlife resources be can fully examined with the coordination

⁸ Affidavit of Peter M. Demicco, DRN v. PA DEP an TGP NEUP, 2012.

⁹ Id.

¹⁰ Id.

of NPS, Fish and Wildlife Service, and New Jersey and Pennsylvania environmental agencies.

Adverse impacts to the multiple wetlands to be crossed need greater due care, attention and assessment than we have seen with previous pipeline environmental reviews

Atlantic Sunrise October Resource Reports claim 201 wetlands would be impacted. Of those, 26 are forested wetlands which studies have indicated would lead to permanent detrimental and thermal impacts if mature trees are cut in these wetlands and HDD is not required¹¹. Despite their tremendous value, more than half of America's original wetlands have been lost to development, agriculture, mining, hydrology alterations and pollution.¹² And, each year we continue to decimate nearly 500,000 additional acres of wetlands.¹³

Loss of wetlands increases soil erosion, damages water quality and allows increased sedimentation and polluted runoff into streams.¹⁴ Increased stormwater flows can upset the "dynamic equilibrium" that exists between wetlands and the surrounding watershed. Changes in volume or quality of runoff to wetlands can affect the biological community and ecological functions of a wetland. Generally, wetlands work as an integrated system with other wetlands in a watershed. When assessing the value, or lost value, of wetlands, it is important to recognize this critical interrelationship.¹⁵ Below are just some of the benefits of wetlands that FERC must fully assess in its review.

- Wetlands provide productive and diverse ecosystems for both aquatic and terrestrial wildlife¹⁶ and they produce biomass for the base of the food chain.¹⁷ Wetlands of all sizes, both large and small, have been demonstrated to provide important habitat for a wide variety of plants and animals, many of which could not survive without them.¹⁸ Forty-two percent of the "total U.S. threatened and endangered species depend upon wetlands for survival."¹⁹ Wetlands provide a diverse and complex set of ecosystems -- niches that function as an irreplaceable ecological unit.²⁰
- Wetlands act as a natural pollution filter thereby providing irreplaceable water quality benefits. The dense vegetation found in wetlands filters out sediment, nutrients and other pollutants.²¹ Wetlands can also filter pesticides and heavy metals and can reduce water-borne bacterial contamination through microbial action.²²

¹¹ : Schmid and Company Inc. (2014). The effects of converting forest or scrub wetlands to herbaceous wetlands in Pennsylvania. Prepared for the Delaware Riverkeeper Network, Bristol, Pennsylvania.

¹² "America's Wetlands, Our Vital Link Between Land and Water", US EPA Office of Wetlands Protection, Office of Water, Doc. No. OPA-87-016, February 1988, p. 6.

¹³ Michael J. Caduto, Pond and Brook, A Guide to Nature in Freshwater Environments, University Press of New England, 1985

¹⁴ Clean Water Network and NRDC, "Wetlands for Clean Water, How Wetlands Protect Rivers, Lakes and Coastal Waters from Pollution", April 1997

¹⁵ *Ibid.* 15, p. 4

¹⁶ National Wildlife Federation Fact Sheet -- nwf.org/wetlands/facts/benefits.html

¹⁷ Michael J. Caduto, Pond and Brook, A Guide to Nature in Freshwater Environments, University Press of New England, 1985, p. 29

¹⁸ National Wildlife Federation, "Status Report of Our Nation's Wetlands", October 1987.

¹⁹ 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.

²⁰ *Ibid.* 21

²¹ Clean Water Network and NRDC, "Wetlands for Clean Water, How Wetlands Protect Rivers, Lakes and Coastal Waters from Pollution", April 1997

²² *Id.*

- Wetlands provide flood control, erosion control and groundwater recharge. Wetlands are part of nature's sponge, holding water, feeding plants, and slowly recharging aquifers. Wetlands effectively absorb and hold floodwaters thereby protecting adjacent and downstream properties from flood damage.²³ Depending on the soil type, wetlands can contain 1 to 1.5 million gallons of water per acre, thereby alleviating flooding by holding excess water like a sponge.²⁴ At the same time, wetland vegetation helps to slow the speed of floodwaters - this in combination with the storage capabilities of wetlands can both lower flood heights and reduce the erosive potential of floodwaters.²⁵ Wetlands can also desynchronize flood peak flows and velocities during small runoff events.²⁶

Wetland delineations and assessment of values and functions of wetlands impacted by Atlantic Sunrise directly or indirectly are needed. As part of this analysis, hydrology, vegetation, and soils must be examined. Assessment of function and value should consider all ecosystem services being provided that are listed above, such as groundwater recharge, water quality and sedimentation, wildlife habitat, flood protection, biological diversity, recreation, and aesthetics, so that potential impacts, alternatives, and avoidance of wetlands and their important natural buffers can be properly assessed.²⁷

The NEPA document must fully assess impacts to wetlands including, but not limited to changes in water levels, flow characteristics, and circulation patterns, the impacts of temporary and permanent alteration of vegetation in and around wetlands, altered temperatures, changed light, altered humidity, altered groundwater or surface water flows, and/or altered flooding frequencies due to the Project. Changes in substrate conditions may affect the ability of the wetland to sustain vegetation and wildlife populations including sensitive amphibian populations. For example, repeated maintenance and lagging restoration practices that span over multiple seasons/years could impact important amphibian and fish migrations and critical reproduction periods if biological windows are not considered. It has been observed and documented by DRN and Conservation District staff around prior pipeline projects that once the pipeline is moving gas, the final restoration phases by the operator are often not a priority leading to inflicted or unnecessary additional harm to sensitive species, due to improper timing or unnecessary delays. Increased run-off as addressed above may introduce contaminants or more sedimentation to the ecosystem. Increased nutrient loading could produce algal blooms and reduce available oxygen in the water. Any impacts to the physical characteristics of wetlands resulting from the construction and operation of Atlantic Sunrise and any associated appurtenances of land, water, air or light transformations must be included in any analysis.

Adverse Impacts to Floodplains, Including Their Permanent Alteration, Must Be Given Full Consideration

Floodplains vegetated with trees and shrubs can be four times as effective at retarding flood flows as grassy areas.²⁸ 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."²⁹ Naturally vegetated floodplains are generally

²³ *Ibid.* 15, p. 4

²⁴ Bob Schildgen, "Unnatural Disasters", *Sierra*, June 1999

²⁵ *Ibid* 15, p. 4

²⁶ *Ibid* 22

²⁷ See attached: Schmid and Company Inc. (2014). The effects of converting forest or scrub wetlands to herbaceous wetlands in Pennsylvania. Prepared for the Delaware Riverkeeper Network, Bristol, Pennsylvania.

²⁸ *Ibid* 22

²⁹ *Ibid* 22

layered with leaf and organic matter which result in organic soils with high porosity and a greater capacity for holding water.³⁰ 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.³¹ 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.³² About 40% of the nation's waterways are polluted as a result.³³ 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:

- Stores and slows floodwaters;
- Intercepts overland flows, capturing sediment;
- Stabilizes streambanks, preventing erosion;
- Protects wetlands and other critical habitats;
- Replenishes groundwater aquifer;
- Filters out and/or transforms pollution;
- Provides 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 Susquehanna River 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 the balanced ecosystem of the landscape through construction activities. The NEPA document should consider the short term, long-term, and cumulative impacts of these alterations.

Unnatural flood levels and flood damages are experienced by communities where the pipeline would cut. For example, Pine Grove Borough has had substantial flooding damage and any cuts of tributaries in Pine Grove Township must be reviewed for potential increased flooding impacts. 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 Destruction of Naturally Vegetated Buffers Along All Wetlands and Waterways Must Be Given Full Consideration

Healthy and vegetated streamside buffers serve our communities by:

³⁰ *Ibid* 22

³¹ Poff, Allan, Bain, Karr, Prestergaard, Richter, Sparks, and Stromberg, "The Natural Flow Regime", *BioScience*, Vol. 47, No. 11

³² Chester L. Arnold Jr., and C. James Gibbons, "Impervious Surface Coverage, the Emergence of a Key Environmental Indicator", *APA Journal*, Spring 1996, p. 245

³³ *Id.*

- Providing flood storage,³⁴ reducing flood peaks,³⁵ and slowing the velocity of floodwaters,³⁶ and thereby reducing flooding and damaging flows in downstream and nearby communities;
- Protecting and enhancing water quality by preventing and filtering pollution³⁷ and enhancing the ability of the neighboring stream to process pollutants,³⁸ 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;³⁹
- 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 habitat⁴⁰ 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;⁴¹
- Providing shading and thereby providing water temperature control⁴² 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;⁴³
- Increasing the market value and marketability of nearby homes and communities;⁴⁴
- 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.⁴⁵

³⁴ Tourbier, J. Toby "Open Space Through Stormwater Management, Helping to Structure Growth on the Urban Fringe".

³⁵ 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".

³⁶ *Id.*

³⁷ 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.*

³⁸ Sweeney & Blaine, "Resurrecting the In-Stream Side of Riparian Forests", Journal of Contemporary Water Research & Education, Issue 136, June 2007.

³⁹ 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

⁴⁰ *Ibid.* 38, citing DeBano and Schmidt 1990; O'Laughlin and Belt 1995"

⁴¹ *Ibid.* 38, citing DeBano and Schmidt 1990; O'Laughlin and Belt 1995".

⁴² *Ibid.* 38, citing DeBano and Schmidt 1990; O'Laughlin and Belt 1995".

⁴³ 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

⁴⁴ 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.

⁴⁵ 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

Vegetated buffers and floodplain areas are an important food source for aquatic microorganisms, invertebrates and fish.⁴⁶ In small headwater streams, as much as 60 to 90 percent of the organic food base comes from surrounding forests.⁴⁷ The life cycles of the aquatic invertebrates and in turn the fish are closely tied to these organic inputs from the forest.⁴⁸ In the larger waterbodies the vegetation provides refuge as well as havens where the smaller fish can find food.⁴⁹ The roots, fallen logs, pools, overhanging branches and other habitats that vegetation along the banks creates provides important habitat for fish young to old.⁵⁰

Multiple studies have documented that waterways surrounded by mature woodlands provide a greater variety of important aquatic habitat, support a greater diversity of fish species, and support fish in healthier physical condition than waterways where the forest cover has been removed.⁵¹ Forested streams also provide temperature protections important for aquatic life.⁵² The overhead cover provided by forested streamside lands provides shading and temperature control – this directly affects the amount of oxygen the water can support.⁵³ Increased temperatures have been found to alter the release rate of nutrients from suspended sediments.⁵⁴ Just small increases in temperature can increase substantially the amount of phosphorous released into water.⁵⁵

Shading from buffers reduces overall temperatures but also reduces the daily and seasonal fluctuations in stream temperature. Moderation of stream temperatures is important for healthy habitat. Studies have concluded that removal of streamside vegetation can result in a stream temperature increase of 6 to 9 degrees Centigrade.⁵⁶ Just a 9 degree increase can cause heavy growth of filamentous algae.⁵⁷ Growth of parasitic bacteria is also encouraged by warmer temperatures.⁵⁸ And some species simply cannot survive in warmer water so even seemingly slight temperature changes (the 6 to 9 degree range) can shift the structure of the aquatic community.⁵⁹

Removal of forests and vegetation results in polluted runoff, which because of the lack of a vegetated buffer, will enter directly the neighboring stream or river. This kind of polluted runoff includes sediment, nutrients, pesticides, animal waste and more. Too many nutrients in a waterbody, including both phosphorous and nitrogen, encourages an overgrowth of algae and other aquatic plants. Buffers are beneficial also for protecting waterways and communities from other pollutants such as herbicides and pesticides.

Vegetation on stream banks can help filter sediment-laden runoff that would otherwise enter a stream and can reduce and prevent non-natural erosion resulting from increasing stormwater runoff levels upstream and introducing more sediment into the water column. Sediment can block the penetration of light in water, affecting the growth and reproduction of

⁴⁶ J.C. Klapproth & J.E. Johnson, Virginia Cooperative Extension, Understanding the Science Behind Riparian Forest Buffers: Effects on Plan and Animal Communities, October 2000, Publication number 420-152.

⁴⁷ *Id.*

⁴⁸ *Id.*

⁴⁹ *Id.*

⁵⁰ *Id.*

⁵¹ *Id.*

⁵² *Id.*

⁵³ *Id.*

⁵⁴ *Id.*

⁵⁵ *Id.*

⁵⁶ Leavitt, J. 1998. The Functions of Riparian Buffers in Urban Watersheds”, page 4, Master of Science Degree Report, University of Washington, Seattle, WA.

⁵⁷ *Ibid.* 49

⁵⁸ *Ibid.* 49

⁵⁹ *Ibid.* 49

aquatic plants.⁶⁰ When sediment settles it can cover stream bottom habitats interfering with the feeding or reproduction of fish and aquatic insects dependent upon them.⁶¹ Too much sediment can clog the gills of fish and, if at high enough levels, result in fish death.⁶²

When reaches of a stream with natural function are intersected with dysfunctional reaches there is a net loss in the ability of the stream to provide their water cleaning and protection benefits including processing of nutrients, pesticides, and organic matter.⁶³

Vegetated buffers prevent erosion of stream banks and adjacent lands – including both public lands and private lands. Root systems of woody shrubs and trees do a better job of anchoring these soils — this is a function that turf grass, or low growing vegetation as is often found at pipeline stream crossings, simply cannot do effectively.⁶⁴ Stream reaches that are forested “exhibit 20 – 33% slower channel migration and lower floodplain accretion rates of sediment and thereby provide more stability than deforested channels.”⁶⁵

Research has concluded that forested buffer systems, as opposed to grassed systems or other herbaceous plants, provide an enhanced ability to sequester contaminants instream and to degrade them; this is primarily due to increased biological activity. Increased nitrogen attenuation and pesticide degradation are particularly associated with forested stream buffers.⁶⁶

The removal of healthy forested buffers along the many stream crossings proposed by Atlantic Sunrise must be assessed – individually and cumulatively. In addition, when the stream crossing includes a cut through a pre-existing mature and healthy forest the degradation of the forest on either side of the Right of Way that results from this forest fragmentation needs also to be considered, both in terms of stream impacts and forest impacts.

Fishery Impacts Need Full Consideration

Benthic invertebrates are impacted during the construction phase of a pipeline whenever any of the open trench cut methods are used. Changes in downstream diversity and structure of benthic invertebrate communities can result. While, in time, the benthic community generally restores, that does not diminish or negate the ecosystem effects during the time of damage including the other cascading affects to other ecosystem services otherwise provided by the invertebrates – including 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.⁶⁷ These impacts must be thoroughly considered.

Using the open trench cut method of crossing can also affect fish, including direct harm but also by reducing the suitability of habitat including for eggs, juveniles and overwintering.⁶⁸ Fish exposed to elevated suspended solids levels can experience reduced feeding rates, physical

⁶⁰ David Welsch, Riparian Forest Buffers, US Dept of Agriculture Forest Service, NA-PR-07-91, <http://www.na.fs.fed.us/spfo/pubs/n%5Fresource/riparianforests/>

⁶¹ David Welsch, Riparian Forest Buffers, US Dept of Agriculture Forest Service, NA-PR-07-91, <http://www.na.fs.fed.us/spfo/pubs/n%5Fresource/riparianforests/>

⁶² *Id.*

⁶³ B.W. Sweeney, Bott, Jackson, Kaplan, Newbold, Standley, Hession and Horwitz, Riparian deforestation, stream narrowing, and loss of stream ecosystem services, Proceedings of the National Academy of Sciences of the United States of American, Vol 101, No. 39, Sept 28, 2004.

⁶⁴ National Research Council. 2002. Riparian Areas: Functions and Strategies for Management. Water, Science, and Technology Board, Board of Environmental Studies and Technology, National Academy Press, Washington, DC. Also see Stroud Water Research Center, Protecting Headwaters: The Scientific Basis for Safeguarding Stream and River Ecosystems, 2008.

⁶⁵ Sweeney, et al, Riparian deforestation, stream narrowing, and loss of stream ecosystem services. 2003.

⁶⁶ Sweeney, B. W., et al. 2004. Riparian deforestation, stream narrowing, and loss of stream ecosystem services. PNAS, September 2004; 101: 14132–14137.

⁶⁷ *Id.*

⁶⁸ *Ibid* 1.

discomfort or damage from the abrasive materials on their gills, decreased instream visibility, reduced food supply, and increased competition as fish attempt to move to cleaner waters.⁶⁹ For example, the filling of riffles not only can have adverse impacts for invertebrates and fish, in terms of taking important habitat, but it can also diminish the ability of the riffles to help create oxygen important for aquatic life.⁷⁰ Over time these impacts can depress the immune system of fish, result in lower growth rates, result in increased stress on individuals and populations, cause damage to the gills – all of which can result in a decline in fish and population health and survival rates.⁷¹ This of course all gets compounded by adverse effects to the suitability of habitat for eggs and juveniles necessary to support the overall community and population.⁷² Additionally, downstream sedimentation and also disruption of flows during crossing activities can result in areas of the stream that are shallower or dewatered, thereby taking preferred habitat.⁷³ These impacts must be thoroughly considered – including both short term and long term impacts.

All of the aquatic, fish, amphibian and invertebrate species located in and/or around the streams, rivers and/or wetlands to be crossed or impacted by the project must be thoroughly catalogued, their population status considered, and the ramifications of the Atlantic Sunrise pipeline construction and operation on aquatic individuals and communities must be analyzed. For example, the headwater streams impacted by the Project must be surveyed for native brook trout. The crossing of multiple streams, including trout waters, will have a large impact on the trout populations and spawning in the region, especially during construction, and will degrade the waterways long after the Project is completed. Not only must the impact on present species be assessed, but the impact on habitat potential for species that once inhabited the area, or could inhabit it in the future if properly protected must also be considered.

Among the impacts resulting from construction of the Project, the NEPA document must also examine impacts to all aquatic ecosystems caused by the channelization of groundwater and surface water to new areas as it runs parallel to the new pipeline. For example, a gas pipeline installation that crossed the Musconetcong River in Asbury, New Jersey resulted in an alteration in the channelization of groundwater running parallel with the pipeline and away from the river, decreasing water levels in the river and negatively impacting trout spawning and macroinvertebrate populations.

Impacts to Vegetated Habitats and Dependent Species Needs Full Cataloguing, Consideration and Review

The Project, as proposed, requires the removal of vegetation from the ROW. This will have a multitude of direct and secondary effects including increased runoff and soil erosion, encroachment and establishment of invasive species, and destruction of wildlife habitat, loss of biodiversity, loss of forest cover and forest edge impacts to the remaining forest, and increased use of herbicides along the ROW that will impact the surrounding ecosystem. The impacts of modifying the various vegetative ecosystems along the length of the project must be assessed, including both direct and indirect effects of project construction and operation. Among the vegetative and ecosystem impacts in need of careful consideration is the impact of forest ecosystems. These impacts must all be identified and accounted for in the EIS.

⁶⁹ Pipeline Associated Watercourse Crossings, 3rd Edition, publication prepared for CAPP, CEPA, and CGA by Tera Environmental Consultants

⁷⁰ *Ibid* 1.

⁷¹ *Ibid* 1.

⁷² *Ibid* 1.

⁷³ *Ibid* 1.

Pipeline construction results in the loss of riparian (streamside) vegetation.⁷⁴ For each of the pipeline construction techniques, there is a resulting loss of vegetation and foliage associated with clearing the stream banks. 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 body of scientific research indicates that stream buffers, particularly those dominated by woody vegetation that are a minimum 100 feet wide, are instrumental in providing numerous ecological and socioeconomic benefits.⁷⁵ Simply put, riparian corridors protect and restore the functionality and integrity of streams. A reduction in streamside healthy and mature streamside vegetation reduces stream shading, increases stream temperature and reduces its suitability for incubation, rearing, foraging and escape habitat.⁷⁶ While horizontal directional drilling may move the construction footprint further away from the stream, it too results in vegetative losses and soil compaction that can have direct stream impacts.

The loss of vegetation also makes the stream more susceptible to erosion events, exacerbating the sedimentation impacts of construction. In crossings that result in open forest canopies, increases in channel width, reduced water depth, and reduced meanders have persisted in the years after using an open cut method of installation.⁷⁷

Forest fragmentation and habitat loss is a serious consequence of pipeline construction. Damage to a forest ecosystem includes the direct and actual location of the foot print of the ROW, roadways, construction areas, and above ground aperture locations. An additional 300 feet of forest on either side of the ROW is also impacted. “[F]orest clearing creates an associated edge effect” whereby “increased light and wind exposure creates different vegetation dynamics”⁷⁸.

The Nature Conservancy has determined that “[t]he expanding pipeline network could eliminate habitat conditions needed by “interior” forest species on between 360,000 and 900,000 acres as new forest edges are created by pipeline right-of-ways.”⁷⁹

Wildlife Impacts Must Be Fully Assessed.

All animal species located on or that utilize habitats for any portion of the year and their life cycle in, around and/or impacted by the proposed ROW, construction areas and/or project apertures (such as compressors and valve stations) must be thoroughly catalogued, their population status considered, and the ramifications of the Atlantic Sunrise pipeline construction and operation analyzed. Not only must the impact on present species be assessed, but the impact on habitat potential for species that once inhabited the area, or could inhabit it in the future if properly protected and preserved, must also be considered.

Among the impacts to be considered is the impact to interior forest species, such as black-throated blue warblers, salamanders, and many woodland flowers, that require shade, humidity, and tree canopy protection that only deep forest environments can provide.⁸⁰

A pipeline ROW corridor “inhibits the movement of some species, such as forest interior nesting birds, which are reluctant to cross openings where they are more exposed to predators.”⁸¹

⁷⁴ James Norman, et al., Utility Stream Crossing Policy, ETOWAH AQUATIC HABITAT CONSERVATION PLAN, July 13, 2008,

⁷⁵ See e.g. Newbold et al. 1980, Welsch 1991, Sweeney 1992, Sweeney and Newbold 2014

⁷⁶ Canadian Association of Petroleum Producers, Canadian Energy Pipeline Association, and Canadian Gas Association, Pipeline Associated Water Crossings, 1-4 (2005).

⁷⁷ Ibid 1.

⁷⁸ 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.

⁷⁹ Nels Johnson, et al., Natural Gas Pipelines, The Nature Conservancy, 1 (December 2011).

⁸⁰ *Id.*

While some species may be inhibited from travelling up or across an open pipeline ROW, others will readily travel up and over, increasing the level of harm – this includes all terrain vehicles (ATVs) that continue to impact areas. The clearing of forest for pipelines can also result in the introduction and linear and outward spread of invasive species (such as Japanese knotweed, Japanese stiltgrass, multiflora rose, *Phragmites* and hay scented fern) resulting in further decline of native wildlife species, and the creation of microclimates that degrade forest health through sunscald and wind-throw. For example, the pipeline corridor becomes a path for ATVs, and seeds of invasives can spread along the corridor in vehicular tires. These invasive plants, if tolerant to shade, can also then colonize surrounding woodlands, decreasing habitat and diversity within the adjacent forest habitat.

FERC must use the best available science to ensure protection of wildlife and avoid jeopardy to wildlife habitat. Failure to employ the best available science to determine the biological baseline and evaluate potential impacts would thwart the purposes of NEPA.

The scope of study for impacts to species cannot be limited to the ROW. The ROW forest buffer, access roads, construction areas, staging areas, areas of aperture placement and operation, and buffers must be examined for species and habitat. The effects of increased forest edge and habitat degradation due to the impacts of construction and permanent impairment of resources on these species must be analyzed as well. The ramifications of noise, light, air and heat impacts from operation of the pipeline and associated apertures such as compressor stations must be fully considered.

Endangered and Threatened Plant and Animal Species Must Be Thoroughly Catalogued and Considered

The region where the pipeline would cut is home to a significant number of endangered, threatened, and rare species, including plant, fish, mammal, reptile, and amphibian species. There are additional state threatened and endangered species some of which are included on the List of Threatened and Endangered Species that are Critically Dependent on Regulated Waters for Survival.

Among the federally listed species already identified that could be impacted by the project are the Bog Turtle, the Indiana Bat, the Dwarf Wedge Mussel and the Northern Long-eared Bat and the little brown bat which have been proposed-for-listing.⁸² In addition to those directly impacted, numerous other federally listed species that may be impacted by the Project including Striped Bass, New Jersey Chorus Frog, Coastal Plain Leopard Frog, Red-bellied Turtle, Longtail Salamander, Wood Turtle, Eastern Small-footed Bat, Vesper, Cliff, Grasshopper, and Savana Sparrows, Osprey, Peregrine Falcon, Bald Eagle, and Upland Sandpiper.

The NEPA document must assess how the project would affect these species including impacts on habitats, vegetation, reproduction, water quality and other ecological impacts such as increased sedimentation of waterways, increased water temperatures, increased soil temperatures, multiple disturbances over time, mortality due to increased traffic, and impacts to groundwater recharge. All possible impacts to these species resulting from the Project must be studied.

Species monitoring is an extensive process and the timeframe for conducting these

⁸¹ *Id.*

⁸² See attached: Hein, C. D. 2012. Potential impacts of shale gas development on bat populations in the northeastern United States. An unpublished report submitted to the Delaware Riverkeeper Network, Bristol, Pennsylvania by Bat Conservation International, Austin, Texas.; and Kunz, T. H., & Reichard, J. D. (2010). Status review of the little brown myotis (*Myotis lucifugus*) and determination that immediate listing under the endangered Species Act is scientifically and legally warranted. Boston University, Boston, MA. Available at: http://www.biologicaldiversity.org/campaigns/bat_crisis_white-nose_syndrome/pdfs/Final-Status-Review.pdf

studies must not be cut short simply to satisfy the applicant's desired in-service date. More time may be needed to study the true impacts to these threatened, rare, and endangered species if this Project moves forward. The NEPA document must carefully assess whether this Project can proceed without disrupting this habitat or resulting in the taking of any federal or state protected species. Furthermore, FERC should require Atlantic Sunrise to mitigate for the loss of habitat. FERC must ensure full compliance with the Federal Endangered Species Act. The EIS document should clarify that any disturbed areas that will result in compensation, will involve resources that have substantially the same values and functions as those impacted.

The scope of study for impacts to threatened, endangered, and rare species cannot be limited to the ROW. The ROW forest buffer, access roads, construction areas, staging areas, areas of aperture placement and operation, and buffers must be examined for species and habitat. The effects of increased forest edge and habitat degradation due to the impacts of construction and permanent impairment of resources on these species must be analyzed as well. The ramifications of noise, light, air and heat impacts from operation of the pipeline and associated apertures such as compressor stations must be fully considered.

Invasive Species Impacts Must Be Given Due Attention

Invasive vegetation out-competes native vegetation and spreads rapidly through forest openings.⁸³ The entire Project would create edge impacts on forest communities that will be disturbed or re-disturbed by the project. The newly-created forest edge will be a direct impact of the Project and will be a prime spot for invasive species infestation on the newly-created edge. Moreover, the Project's disturbance of vegetation in the ROW, access roads, and temporary workspaces will require re-vegetation following construction, which will itself introduce new invasive species.

The damaged and/or changed habitat ecosystems will also be an invitation for invasive wildlife species that can also have near term and long term impacts on the region, all of which must be fully considered.

The spread of invasive species, whether already established and able to find new favorable habitats due to the Project, or resulting from project construction, would have a major impact on the biodiversity of ecosystem through widespread loss of native vegetation and/or native species. The loss of biodiversity is a tragedy in its own right, but it will also affect visitor experience and may result in less utilization of the affected areas by flora enthusiasts, birders, wildlife viewers, hikers, hunters and/or boaters in favor of more biologically diverse sites elsewhere. The reestablishment of native vegetation, especially considering the effects of deer herbivory, will take many years, and until reestablishment is achieved the area will be susceptible to further invasive species infestation. FERC must consider these impacts in the NEPA document.

Moreover, NEPA review must also encompass the impacts of invasive species on groundwater recharge. Invasive species often have shallower root systems than native plants, which allow the soil to erode more readily and to degrade the quality of watersheds by adding to "suspended sediment loads and turbidity."⁸⁴

Finally, the financial impacts of invasive species management must be considered. If the applicant does not commit to conducting permanent invasive species management outside the ROW in the associated forest buffer, the National Park Service, State Park agencies, county park programs, private homeowners and others will be required to fund future eradication programs

⁸³ New Jersey Audubon Society, Forest Health and Ecological Integrity Stressors and Solutions: Policy White Paper (March, 2005), available at <http://www.njaudubon.org/Portals/10/Conservation/PDF/ForestHealthWhitePaper.pdf>.

⁸⁴ T. Stohlgren, C. Jarnevich & S. Kumar, Forest Legacies, Climate Change, Altered Disturbance Regimes, Invasive Species and Water, *Unasylva* 229, 2007, at 44, 47-8.

through money or activity. The NEPA document must consider the Project in light of the unavailability of government resources to ensure the applicant's mitigation and restoration projects are successful on public trust lands.

The Atlantic Sunrise Pipeline is likely to result in new and additional encroachment of undesirable invasive vegetation and animals species into forests, park lands, and other publicly or privately preserved areas destroying biodiversity, reducing the effectiveness of groundwater recharge, and driving away recreational visitors. This will in turn result in a loss of the economic values that accompany high recreational and aesthetic values of a region.

Landscape Connectivity Impacts Must Be Fully Considered

The ROW will create fragmentation of the forest, allowing edge species, including white-tail deer and cowbirds, to encroach deeper into the core forest. These edge effects can negatively impact plant and animal species at least 300 feet within the forest boundary.⁸⁵ These impacts must be examined to ensure plant and animal species, including but not limited to rare, threatened, and endangered plant species populations can be maintained in the ecosystem surrounding the ROW. Among the issues to be considered is whether any portions of the planned ROW are an essential functional portion of a species' overall habitat requirements, such as nesting or feeding, and therefore could not or would be very difficult to replace. Furthermore, species requiring large integral home ranges will be negatively impacted and coordination with NPS and the U.S. Fish and Wildlife Service is necessary to identify whether such species will be impacted by further forest fragmentation.

Geology and Soil Impacts Could be Significant and Must Be Considered

FERC's analysis should include a full examination of the geological formations that will be impacted by construction activities, such as groundwater aquifers and water table depth, sinkholes, and springs. FERC must disclose how this Project will avoid all negative impacts to these features.

Blasting for stream crossings with bedrock can be proposed by pipeline operators. Instream blasting causes direct mortality to fish and aquatic organisms.⁸⁶ Trenching and blasting result in short term increases in sediment and turbidity levels that are higher than allowed by most regulatory agencies.⁸⁷ Pipeline water crossings have been shown to greatly decrease available fish cover and habitat complexity in the ROW in the longer term. The elimination of pools, riffles, and other stream characteristics caused by pipeline construction can have serious impacts on fish populations by reducing the available area for feeding, breeding, rearing and resting.⁸⁸ DRN has also observed and documented short term well water impacts to homeowners located near blasting and trenching operations of a pipeline ROW when turbidity and sediment in the well has made the water unpotable without treatment.

Areas of steep slopes will be traversed by the Project. Steep topography maximizes the potential for erosion, rock slides and even avalanches caused by construction of the Project.

⁸⁵ Janzen, D.H., The Eternal External Threat, in Conservation Biology, The Science of Scarcity and Diversity (Soulé, M. E., ed. 1986).

⁸⁶ Reid S, Jalbert A, Metikosh S, Bender M. 2002. "A performance measurement framework for pipeline water crossing construction". In Environmental Concerns in Rights-of-Way Management: Seventh International Symposium. Elsevier Science Ltd. p.697-703.

⁸⁷ Harper, HW and Trettel R. (2002). Theoretical modeling of suspended sediment, turbidity dynamics, and fishery impacts during pipeline construction across streams. In Environmental Concerns in Rights-of-Way Management: Seventh International Symposium. Elsevier Science Ltd. P. 753-763.

⁸⁸ Brown, CM, et al. (2002). Effects of pipeline rights-of-way on fish habitat at two Alberta stream crossings. In Environmental Concerns in Rights-of-Way Management: Seventh International Symposium. Elsevier Science Ltd. P. 705-715.

Significant permanent scarring of the geological resources could occur, with geologic impacts far more severe than would occur in level topography. Therefore, the feasibility of erosion control mechanisms in these areas must be evaluated taking into account local topography.

The digging of trenches for the Project will involve excavating tons of soil and requires that soil surveys be conducted in relation to the Project. Construction and re-establishment of vegetation along the ROW provides an opportunity for run-off and the loss of productive soil. Construction activities will change the drainage patterns along the ROW and necessitate detailed studies of impacts to water resources. Expansion of the ROW has the potential to affect the physical properties of the soil along and adjacent to the ROW by clearing land cover, thus changing the sunlight exposure and moisture content of the soil. Reduction in soil moisture increases the risk of wind erosion. ROW expansion will also result in increased use of herbicides for ROW maintenance, which will chemically alter soil composition. Spillage of fuel oil and the creation of trench breakers during construction activities may also result in the chemical alteration of soil. Furthermore, natural gas pipelines increase localized soil temperatures; therefore, the EIS must examine the impact to soils within the vicinity of the pipeline that experience this warming effect. The Commission has previously ignored this issue and cannot continue to do so for this Project.

Construction activities will also necessitate the removal and disposal of material. The NEPA document should address where the removal will be conducted and where the material will be disposed, whether digging to install the pipeline is likely to intercept the water table, and what effects the resultant pumping will have.

It has already been brought to the attention of FERC, via other commenters, that there are abandoned mine areas that could be crossed by the pipeline project and streams with acid mine drainage. The ramifications for these coal extraction impacts, including the increased potential for a pipeline break, sinkholes, release and disturbance of heavy metals, coal fires and hazards associated with having a high pressure line near these areas must all be considered. EPCAMR Eastern Pennsylvania Coalition of Abandoned Mine Reclamation has provided information on the record about these potential hazards⁸⁹.

The Proposed Pipeline Will Have Air Quality Impacts That Must Be Considered and Addressed

This Project will have serious impacts on the air quality along the ROW, ROW buffer, access roads, and surrounding landscape. Air quality degradation needs to be examined in relation to its health and safety impacts for nearby, full-time residents as well as for visitors to the region, plant life and wildlife.

Compressors and pipelines associated with shale gas are also sources of air pollution including methane, ethane, benzene, toluene, xylene, carbon monoxide and ozone.⁹⁰ Compressor stations have also been found to emit formaldehyde, another known carcinogen.

Diesel emissions during construction will be among the air quality impacts to residents, visitors and wildlife. Further increases in diesel emissions as a result of the Project may lead to a higher level of ozone along the ROW as the cleared ROW provides more sunlight for nitrogen oxides and reactive organic gases to combine.

The cumulative impact analysis should include consideration of the incremental impact of the Project on air quality, added to the air quality impacts of existing and reasonably foreseeable Marcellus Shale development in the region, including other pipeline construction, and the end use of the gas, including potential shipping as LNG. Natural gas and oil production

⁸⁹ <http://citizensvoice.com/news/river-concerns-surface-about-pipeline-1.1845246.March 9, 2015>.

⁹⁰ *Ibid.* 82

and transmission emit substantial amounts of air pollution, including volatile organic compounds (VOCs), nitrogen oxides (NOx), and toxic air pollutants. The toxic air pollutants include benzene, a known carcinogen; toluene, nhexane, and xylenes, which can lead to nervous system effects; and ethylbenzene, which can cause blood disorders. VOCs and NOx contribute to local and regional ozone pollution, which has serious impacts on human respiratory and cardiovascular health as well as on vegetation and forest ecosystems. Particulate matter, whether directly emitted from exhaust and fugitive dust during construction, from operation of diesel-fired engines, or indirectly created from interactions of NOx emissions in the atmosphere, also affects respiratory and cardiovascular health.

The NEPA document should assess air emissions and particulate deposition from the construction and operation of the Project and its infrastructure based on the cumulative impact of the proposed line's emissions *together with* air emissions from existing and reasonably foreseeable Marcellus development and end uses of the gas delivered by the pipeline.

Noise Impacts from Pipeline Construction and Operation Need Full and Fair Consideration

FERC must explore the impacts of construction, operation, and maintenance of the Project on residents, wildlife and visitors. Noise associated with construction can have a devastating impact on wildlife. Certain species depend on hearing for courtship and mating behavior, prey location, predator detection, or homing and will suffer serious detrimental impacts from construction and/or ongoing operation of compressor stations. Such impacts must be considered.

Noise impacts to year round residents as well as visitors must also be examined as sensitivity to noise is very variable and these impacts may lead to less utilization of the associated parklands by the public, decreased quality of life by residents, health impacts to those repeatedly exposed, and/or a reduction of nearby wildlife impacting recreation.

FERC must include construction impacts in the scope of its environmental review. To determine these impacts, the applicant must be asked to provide specific details on construction activities, including the type of equipment that will be used and when it will be used, what season and time of day construction activities will occur, and the specific noise-producing attributes of each piece of equipment.

The possibility of ground-borne vibration and noise impacts related to construction activities on habitat, steep slopes, etc. must be studied. Resources near the Project will be especially susceptible to ground-borne vibration as the applicant is proposing to construct an underground pipeline that will require the creation of a trench across an extremely sensitive landscape.

Noise impacts to the landscape will be exacerbated by the creation of the ROW and the removal of vegetation. As the ROW expands, noise from construction, operation, and maintenance of the pipeline will penetrate farther into the forest, affecting additional wildlife. FERC must assess the severity and nature of this impact throughout the different seasons and the overall lifetime of the project.

The movement of construction equipment and long-term maintenance vehicles may impact sensitive receptors in the surrounding local communities along utilized roadways and access roads. Further, if detours are used during the construction project, the roadways that bear the re-directed traffic may be impacted by the increased noise. The NEPA document must address both of these secondary noise impacts.

The ongoing noise at proposed compressor stations must be fully considered as must the ongoing vibration impacts of operation of the pipeline as gas passes through it.

Viewsheds Are an Important Part of The Impacted Community That Must be Considered

Viewshed impacts should be examined in a way that describes any physical changes to the landscape, examines consistency with the objectives of the NPS, and state and county parkland management plans to preserve scenic resources, and considers the ramifications for community planning documents and zoning, compatibility in mass, scale, and prominence, and degree of contrast in line, color, and form.

Viewer sensitivity will be extremely high to viewshed impacts as the lands impacted by the Project are some of the last remaining contiguous forests in New Jersey and Pennsylvania and are preserved lands highly utilized by recreational visitors and highly prized by both residents and potential homebuyers. Altering the natural visual environment on these lands through the construction of a gas pipeline would be adverse to user's expectations that the area will have natural, wild viewsheds. These impacts must be heavily weighted.

To properly assess these impacts, the Commission should consider, but not be limited to, the following issues: probable viewers and their viewer sensitivity, all significant vistas and viewsheds that could be impacted by any of the alternatives, and the dominant elements of the current viewsheds and how each alternative will impact that viewshed or vista. Moreover, the construction activities, the ROW, and clearing of access roads will produce localized scenic resource impacts that must be assessed in the NEPA document. The document should address all foreground, middle-ground, and background vistas in its analysis of impacts.

Climate Change and Greenhouse Gases

Carbon sequestration in forest cover is a critical mechanism in combating climate change. Forests serve as carbon sinks, removing excess carbon dioxide from the atmosphere and storing the compound over several decades. The applicant estimates 3,507.36 acres to be impacted by the project. Some of these areas include mature forest which means clear-cuts for areas like Second Mountain on the CPL South line for example, decreasing the landscape's ability to provide carbon sequestration services. This impact must be addressed in the NEPA document.

The construction of the Project will require a large amount of fossil fuel to power construction equipment. The NEPA document must explore what impact construction vehicle emissions will have on climate change.

Further, FERC should consider the cumulative impacts of the Project's direct and indirect greenhouse gas ("GHG") emissions. Direct emissions may include but are not limited to carbon dioxide (CO₂) and nitrous oxide (N₂O) emissions from compressor engines, line heaters, and generators; fugitive methane emissions from compressors and pipelines; and black carbon emissions from diesel vehicles and equipment. Notably, methane is 84 times and N₂O is 280 times more warming than CO₂ over a twenty-year period, while black carbon is estimated to be 2,200 times more warming than CO₂ over the same period.⁹¹

Additionally, large amounts of methane leak into the atmosphere during the "transport, storage and distribution" phases of the natural gas delivery process including during transmission through interstate pipelines.⁹² Even conservative estimates of leakage during gas transmission,

⁹¹ United Nations Framework Convention on Climate Change, Global Warming Potentials http://unfccc.int/ghg_data/items/3825.php (last visited Nov. 10, 2010). L. Bruce Hill, Clean Air Task Force, The Carbon Dioxide-Equivalent Benefits of Reducing Black Carbon Emissions from U.S. Class 8 Trucks Using Diesel Particulate Filters: A Preliminary Analysis 3

⁹² R. Howarth, D. Shindell, R. Santoro, A. Ingraffea, N. Phillips, A. Townsend-Small, Methane Emissions from Natural Gas Systems, Background Paper Prepared for the National Climate Assessment, Reference number 2011-0003, Feb. 25, 2012.; See also U.S. EPA 1997. Methane Emissions from the Natural Gas Industry. USEPA National Risk Management Research Laboratory, June 1997, EPA-600-SR-96-080.

storage and distribution have given a range of up to 3.6%.⁹³ If additional processing is required before the gas can be transported through a pipe then as much as 0.19% more of the gas can be lost.⁹⁴ The majority of emissions from the transmission segment come from leaks on compressor components. Leaks of methane from the pipelines are also caused by disturbances from earth movement, the breakdown of joints, corrosion, and natural processes that degrade softer elements in the pipe. After the gas moves through transmission lines, underground distribution pipelines move the gas from the local gas utility/ distribution company to the end user, the residential or commercial customers. These greenhouse gas emissions must be fully, fairly and conservatively assessed.

Furthermore, indirect effects of the Project's transportation of natural gas from the Marcellus Shale region should be analyzed including, but not limited to the impact of this gas when combusted for use, releasing GHG that cause climate change. This effect is not only reasonably foreseeable, it is certain. Since NEPA analyses of GHG sources must take into account all phases of the proposed action, such certain downstream effects of a gas pipeline should be assessed. Moreover, cumulative impact analysis requires that these GHG emissions be considered in the context of GHGs emitted from the aggregate of natural gas that have been and will reasonably foreseeably be extracted from the Marcellus Shale region.

The production of the pipes, mining of metal and supplies to manufacture the pipelines, and the transport of those pipes from the production facility to the final pipe destination need also be considered in the impacts as all of these manufacturing processes are labor and fossil fuel dependent.

Exposed Pipelines and Associated Risk of Rupture

Because open trench pipeline installations may unnaturally alter both stream bank and streambed (i.e., channel) stability, there is an increased likelihood of scouring within backfilled pipeline trenches. Flooding rivers can scour river bottoms and expose pipelines to powerful water currents and damaging debris. Additionally, unusually heavy rains possibly associated with climate change, threaten to increase overall stream degradation and channel migration – thereby exposing shallowly buried pipelines. Exposure of the pipeline raises a greater risk of pipeline damage, breakage and pollution; with pipeline breakage resulting in the catastrophic discharge of its contents into the natural stream system. Soil erosion and channel migration reduces the soil cover over a pipeline, resulting in the formation of a scour hole which makes the pipeline vulnerable to rupture. Lateral migration of stream channels can also heighten the risk of pipeline exposure.

Scour hole development proximal to pipelines is well-documented in both stream and seabed settings.⁹⁵ Federal regulations require that pipelines crossing rivers be buried at least four feet underneath most riverbeds.⁹⁶ An expert at HydroQuest has determined that, at a minimum, any pipeline installed using the open trench cut method needs to be installed at least 24 feet below the stream bed in order to prevent exposure from scour.⁹⁷

⁹³ Howarth, R. W. (2014). A bridge to nowhere: methane emissions and the greenhouse gas footprint of natural gas. *Energy Science & Engineering*.; *See also* R.W. Howarth, R. Santoro, A. Ingraffea, Methane and the greenhouse-gas footprint of natural gas from shale formations, A letter, *Climatic Change*, March 13, 2011.

⁹⁴ R.W. Howarth, R. Santoro, A. Ingraffea, Methane and the greenhouse-gas footprint of natural gas from shale formations, A letter, *Climatic Change*, March 13, 2011.

⁹⁵ 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>.

⁹⁶ *Billings Gazette*, July 21, 2011: http://billingsgazette.com/news/state-and-regional/montana/article_c8d20d9e-b391-11e0-941f-001cc4c002e0.html

⁹⁷ Expert Report from HydroQuest.

Another significant environmental risk associated with both wet and dry trench methods of gas pipeline crossings of rivers and streams is the potential of releasing hydrocarbons or other contaminants directly into surface water and fragile downstream ecosystems, including hydrocarbon-laced liquids such as benzene that are part of the gas being delivered by the pipeline. Hydrocarbon-laced condensate or natural gas liquids (NGLs) associated with natural gas (e.g., benzene) pose an environmental risk if pipe rupture occurs (e.g., to potential bog turtle habitat and travel corridors, fisheries, downstream drinking water supplies as well as underlying aquifers recharged by stream water). Clean up associated with pipeline breaks can be extremely expensive.

The potential for scour, pipeline exposure, pipeline rupture and resulting impacts must be full consideration in NEPA review, especially given the high number of stream crossings slated for this project.

Energy Impacts Require Assessment

Energy impacts must also be examined in the NEPA document. Aspects of the Project that should be studied for their energy impact include: all energy-consuming equipment and processes that will be used during the construction and operation of the Project; the energy efficiency of required materials, fuels, and equipment; the number of maintenance trips necessary for maintaining the ROW over its intended life; the mode of transportation and use of fuel for these activities; and an estimate of the total energy requirements for each proposed alternative.

The NEPA documents should also examine the impacts of increased energy consumption that will result from upgrading the natural gas pipeline. Part of this analysis should discuss how bringing more energy to other markets and abroad markets will affect future energy conservation efforts.

Energy consumption impacts should be calculated for the lifetime of the proposed Project and Project alternatives, and should be an aspect of the irreversible commitment of resources section of the NEPA document.

The impacts of this project on clean energy investments as well as the ability of clean energy options to provide the energy needs targeted should also be part of the NEPA assessment.

Impacts to Recreation, Aesthetics, Art and the Resulting Economics Must All be Considered

In studying impacts to water quality, wetlands, parklands, forest land, naturally vegetated areas, and/or any of the landscapes, water resources, open space areas, conserved lands or parklands impacted by Atlantic Sunrise, the ramifications for the beauty of the region and the recreational use and value of the region must also be considered. For example, consideration of the direct and indirect impacts must also be given to how diminished water quality would affect recreational and visitor uses and state and county parklands (e.g., boating, canoeing, aesthetic qualities, and degradation of fisheries), tributaries valued for their birding, boating and fishing. The market value of homes, the success of recreational ventures, the economic success of the many recreationally and aesthetically dependent businesses of the region will all be impacted by the land, water, landscape, aquatic life and wildlife impacts of the project. All of these issues must be considered.

When considering alternative routes the short and long-term implications of disturbing and fragmenting natural areas must be given greater weight than consideration of manicured, active recreation areas.

Additionally, the rural character of the region is highly favored and utilized by artists because of its beauty, its unparalleled ecological values and visuals, and the community it has

attracted and supported. The ramifications for art, artists and art related businesses and nonprofits must also be given due consideration and valuation.

Proposed Mitigation and Co-Location Measures Must Be Considered in Context and Effectiveness

As with all mitigation measures, to determine a proposed mitigation measures' efficacy FERC must examine the effectiveness of proposed mitigation that has been implemented for other FERC jurisdictional projects around the area where the proposed Project will be constructed and operated. Such a comparison is necessary in any environmental review document produced by the Commission.

It must also be honestly recognized that co-location of a project with existing ROWs, as is being considered for a portion of the project, does not avoid the forest fragmentation, waterway, wetland, habitat, soil compaction, increased runoff, air pollution, invasive species or other harms that pipeline construction and operation bring. So to the extent there is any co-location there must be full consideration of the impacts.

Infrastructure, Access, and Circulation

FERC must examine the potential degradation of roadways due to utilization by construction vehicles. The heavy construction machinery and high traffic volumes associated with Project construction activities ruins roads, leaving taxpayers to pay for repairs, particularly given that PA exempts pipeline companies from taxation. FERC should consider this eventual tax burden as it weighs alternatives during the NEPA process.

Moreover, construction traffic will impact visitor experience at federal, state, and county parklands as portions of these parks will be completely inaccessible or will require detours. Visitors will have to fight congestion to access the parks, and the messy sight of construction activity will greet them once they arrive. Park visitation may well decrease, causing an adverse impact on the local economy.

FERC must also address localized impacts along access roads arising from the removal of vegetation, which will in turn lead to loss of forest connectivity, increased edge effects on the core forest, and increased erosion. The heavy construction equipment utilizing these roads will compact the soil, leading to a degradation of groundwater recharge capabilities. Finally, the installation of fill materials along these roads will also import invasive species to the ROW. The NEPA document must examine these long-term effects.

The impacts to roadways and residents from roadway collapse due to pipeline construction must also be assessed. For example, construction of the Northeast Upgrade project resulted in a roadway cave in during HDD activities, and the threat of sinkholes, has even greater potential to impact roads and traffic.

Ongoing Impacts of Pipelines

The ongoing impacts of the pipeline ROW and operation of the pipeline for transporting natural gas must be assessed. As proposed, the ROW will be kept clear of vegetation. This ongoing absence of healthy vegetation and the methods used for maintenance, including the use of herbicides, has ongoing adverse impacts on the community and ecosystem.

The air quality impacts associated with methane leakage, the stormwater runoff and loss of groundwater recharge associated with vegetation loss and soil compaction, the impacts of forest fragmentation and invasive species are also enduring.

There are reports that farmers have reduced crop yields in the areas where their properties are crossed by pipelines – the cause and size of the food and economic impact of this affect must be thoroughly assessed. In public meetings regarding Atlantic Sunrise one farmer said an

existing pipeline crossing on his farm reduced his crop yield by 30% with measurements and data to support his assertion – these farming impacts must be considered for Atlantic Sunrise as well.

Conclusion

FERC’s EIS must analyze the extensive and egregious impacts the Project threatens on water resources, forest ecosystems, habitats, air quality, and parks and open space. The NEPA document must also assess cumulative and secondary impacts. To do so, the analysis must be thorough and objective. Given the dramatic growth of natural gas development in the Marcellus Shale, and the significant environmental degradation resulting from that development, FERC has an obligation to consider the cumulative impacts of this Project across the length of the project itself but also in conjunction with other known and planned projects advertised for this region. Furthermore, the alternatives analysis must include alternative construction practices that can greatly avoid and minimize community and environmental harm.⁹⁸

Thank you for the opportunity to comment on the proposed project. We look forward to full participation in the forthcoming environmental review process.

Respectfully,



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Enclosures:

Sauer, L. (2014). An Overview of Pipeline Construction Impacts with Recommendations for Reducing Environmental Damage. An Expert Report Prepared for the Delaware Riverkeeper Network, May 2014, Bristol, Pennsylvania

⁹⁸ See attached report entitled “Achieving Higher Quality Restoration Along Pipeline Rights-of-Way: An Overview of Pipeline Construction Impacts with Recommendations for Reducing Environmental Damage