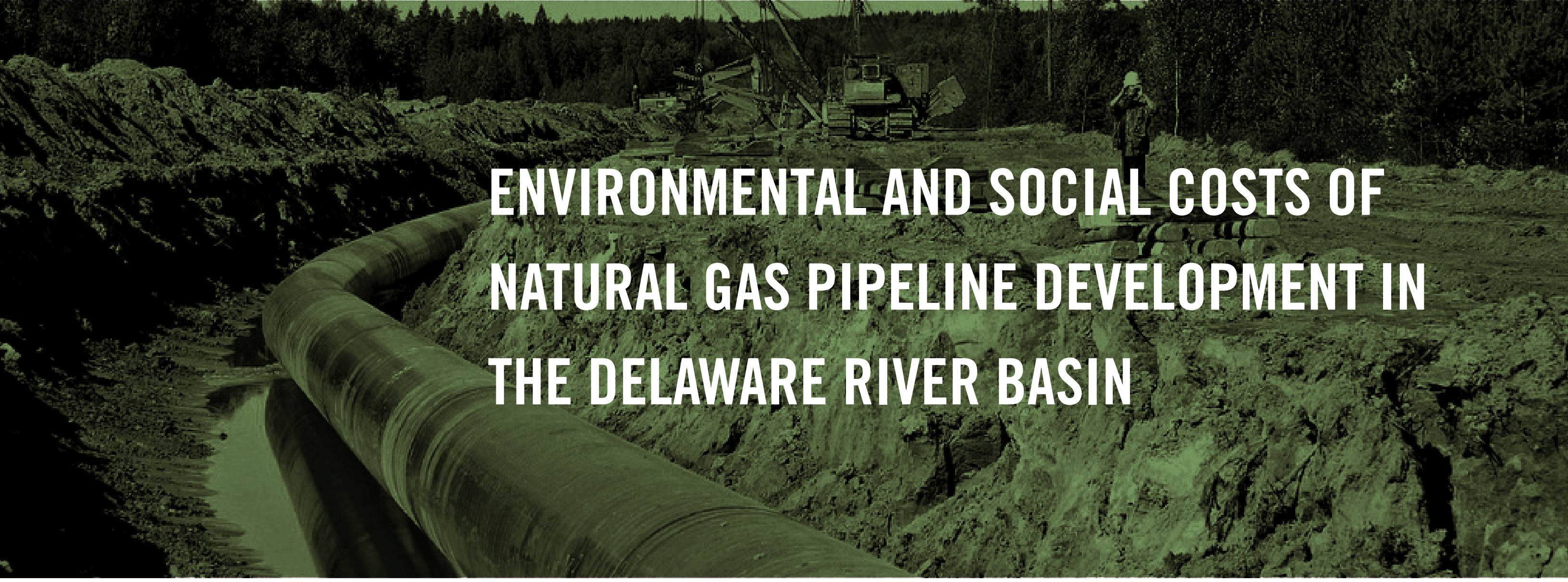

ENVIRONMENTAL AND SOCIAL COSTS OF NATURAL GAS PIPELINE DEVELOPMENT IN THE DELAWARE RIVER BASIN

New Jersey Conservation
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Development of natural gas pipelines and associated infrastructure is resulting in significant costs to the environment and communities in the Delaware River Basin (DRB). The costs that can be quantified could be as much as $2.4 billion for two pipelines alone—in addition to costs that can't yet be quantified. Such costs should not be overlooked by regulatory agencies making decisions about pipeline development in the region.

An analysis, conducted by The Cadmus Group LLC for New Jersey Conservation Foundation, focused on the PennEast, Mariner East 2, and Mariner East 2X pipelines and documents their environmental and social costs. Spanning portions of New York, New Jersey, Pennsylvania, and Delaware, the Basin covers 42 counties and 838 municipalities. It is home to a plethora of land uses and provides drinking water to more than 15 million people.

Quantifiable costs include loss of ecosystem services from land-cover changes in the pipeline right of way, greenhouse gas emissions that would result from construction and long-term operation of the PennEast pipeline and from the long-term operation of the two Mariner East pipelines, lost recreation days resulting from pipeline construction, and lost investment associated with protected land that would be cleared to build the pipelines.

Very real, important costs that could not be monetized or estimated include water quality degradation and treatment or procurement of new sources, stream quality and aquatic habitat degradation, loss of property value, and such construction disruptions as noise, vibrations, and aesthetics.

KEY FINDINGS

Ecosystem Services

- The Mariner East 2 and PennEast pipelines will disrupt approximately 2,200 acres of land in the DRB for pipeline construction and long-term operation. These costs would result in a present value loss of ecosystem services (such as climate regulation and water purification) in the DRB of approximately $11 million for Mariner East 2 and $43 million for PennEast.

Waterbody Degradation

- The PennEast pipeline would result in 135 stream crossings in the DRB, and the Mariner East 2 pipelines have 72 stream crossings in the DRB. PennEast would cross 80 streams with high-value designations, and Mariner East 2 crosses 30 such streams. These crossings pose concerns for stream health, as well as concerns for the health of trout and long-tailed salamander populations during both construction and operation.
- As of February 2019, there have been approximately 240 inadvertent returns of drilling fluid to land and water along the Mariner East 2 pipeline route, and the Pennsylvania Department of Environmental Protection had issued 94 notices of permit violations.

KEY FINDINGS (Cont.)

- Sediment moving from streams into the Delaware River may create additional costs for surface water treatment systems. Pipeline rights of way contribute the most to erosion and sedimentation in the natural gas development process, exceeding the erosion and sedimentation effects of well pads and roads.
- Approximately one million people consume water from public water systems that could be at risk of contamination or degradation due to the PennEast pipeline, and another 85,000 due to the Mariner 2 pipeline. PennEast and Mariner East 2 would also risk contamination to about 800 domestic wells each.

Air Quality and Greenhouse Gases

- The total cost of greenhouse gas emissions for construction and operation of the PennEast pipeline, using the average social cost of carbon, would range from about $470 million to $1.4 billion over the life of the pipeline. This does not include the cost of downstream emissions, which PennEast estimates to be 21.3 million metric tons per year.
- The cost of emissions associated with operation of Mariner East 2 at one pump station and operations at the Marcus Hook facility will be approximately $260 million to $800 million. These estimates do not include emissions associated with construction or long-term operation of many other pump stations along the pipeline and, therefore, underestimate potential emissions from the Mariner East 2 pipelines.

THE DRINKING WATER FOR APPROXIMATELY 1.2 MILLION COULD BE AT RISK OF CONTAMINATION OR DEGRADATION DUE TO THE PENNEAST AND MARINER EAST 2 PIPELINES.

Recreation and Protected Lands

- Mariner East 2 and PennEast could cost recreation goers approximately $2.8 million in lost recreation enjoyment in the DRB as the pipelines are constructed.
- Overall, one quarter of the land the PennEast pipeline is proposed to pass through in the DRB is protected in fee or preserved under conservation easements. Total costs of the acres of preserved land that would be cleared for the temporary and permanent right of way for PennEast is approximately $4 million.

Property Value

Contrary to claims made by pipeline companies, recent studies suggest that transmission pipelines reduce property values in the short term. Pipeline construction has been demonstrated to have detrimental effects on the quality or value of the property as a result of contaminated wells, alterations to the land, and proximity to the pipelines and operating equipment. Proximity to pipelines may also affect insurance rates or availability.

- The economic value of farmland disturbed by the PennEast and Mariner East 2 pipelines totals approximately $4 million, based on average farm real estate values in Pennsylvania and New Jersey.
- Based on the area cleared for the pipeline in the right of way, the estimated total value of land that would have to be cleared for PennEast in Hunterdon County alone is approximately $1.4 million.

Wildlife

- Six federally-listed and 25 state-listed species would face habitat disruption as a result of the PennEast pipeline's construction and operation activities.
- The proposed PennEast route passes through Baldpate Mountain in Mercer County, an important bird area supporting numerous migrating and breeding species, including 28 ranked by the American Bird Conservancy as birds of conservation concern. PennEast would cross or come within 100 feet of six important bird areas; the Mariner East pipelines cross or come within 100 feet of four.

Analysis of Job Creation by PennEast Pipeline and Other Sources

- One study determined that the PennEast economic impact analysis likely overestimated job creation potential of the pipeline by two thirds.
- Even using a relatively high jobs factor, all the renewable energy or energy conserving options evaluated would be expected to create more jobs than PennEast—from 2,744 to 13,719 additional jobs for the same level of investment.
- There are higher levels of employment associated with energy efficiency than electric generation in New Jersey and Pennsylvania, and more people are working in solar generation than natural gas and other types of generation.

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