



# Pinelands Preservation Alliance

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Protecting the Pinelands  
since 1989

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May 8, 2017

Mr. Joseph Rhyner, P.E.  
Chief, Environmental Element 787 CES/CEIE  
2404 Vandenburg Avenue  
Joint Base McGuire-Dix-Lakehurst, NJ 08641

**Re: Comment on Draft Environmental Assessment for Natural Gas Pipeline Easement at Joint Base McGuire-Dix-Lakehurst**

Dear Mr. Rhyner,

I am writing on behalf of the Pinelands Preservation Alliance (PPA) in regard to the Draft Environmental Assessment for the Natural Gas Pipeline Easement for New Jersey Natural Gas's Southern Reliability Link pipeline. PPA is a private nonprofit organization founded in 1989 to protect and preserve the New Jersey Pinelands. The organization represents over 5,000 individuals who are committed to the preservation of the unique ecosystems, clean air and water, and rich history of the Pinelands.

In reviewing the Draft Environmental Assessment, the Pinelands Preservation Alliance has identified numerous flaws and gaps in the review. Most significantly, a review of the available reports on the route through which the pipeline would travel and on gas transmission pipelines clearly demonstrate that the proposed Finding of No Significant Impact is inappropriate and that an Environmental Impact Statement must be conducted. The Air Force must conduct a full Environmental Impact Statement review for this project, because the Environmental Assessment does not address or resolve several key environmental harms and risks which the pipeline would bring, and there is intense public opposition to this very large development.

United States Air Force regulations provide that "substantial environmental controversy concerning the significance or nature of the environmental impact of a proposed action" triggers the preparation of an Environmental Impact Statement. 32 CFR 989.16. For the reasons set forth below, the proposed pipeline easement clearly meets this standard for a more detailed review.

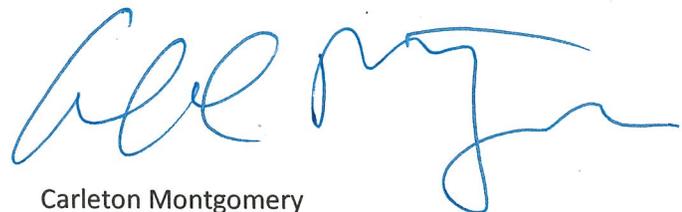
The following points indicate briefly the need for a more rigorous analysis of the proposed easement and will be detailed in the pages to follow:

1. The alternatives analysis of the Environmental Assessment is deficient.

2. The Environmental Assessment ignores issues of soil and groundwater contamination that have recently come to light at Joint Base McGuire-Dix-Lakehurst (JB MDL) and downplays long-standing contamination problems.
3. The Environmental Assessment does not account for the risks that Horizontal Directional Drilling (HDD) poses to the Kirkwood-Cohansey aquifer.
4. The Environmental Assessment fails to account for the fact that significant portions of pipe trench excavation will be below the water table and within the aquifer.
5. The review of impacts to habitat and threatened and endangered species is flawed.
6. The Review of Threatened and Endangered Species habitat is incomplete. The current route of the pipeline threatens habitat of several listed species.
7. The analysis of greenhouse gas emissions and climate change is significantly flawed.
8. The Environmental Assessment does not address the risks of pipeline leaks to natural resources and the people and facilities on JB MDL.
9. The Environmental Assessment fails to consider and evaluate the special conditions on a busy military base in which the proposed pipeline would operate, conditions which increase the chances of pipeline failures, leaks and explosions.
10. The proposed pipeline and easement violates the Pinelands Comprehensive Management Plan and its authorizing federal and state statutes.

This review indicates that the proposed easement would cause a significant environmental impact on Joint Base McGuire-Dix-Lakehurst, and that a more rigorous review is necessary to resolve these risks or determine that an alternative approach, including the option of not building a pipeline through the Base, would be the appropriate means of addressing any changes JB MDL may seek in its natural gas services.

Sincerely,



Carleton Montgomery  
Executive Director  
Pinelands Preservation Alliance

- 1. The alternatives analysis of the Environmental Assessment is deficient.** The alternatives analysis not only assumes that a pipeline is the only way to achieve the purpose and meet the need of the proposed action, but only fully considers one route through the Base.

32 CFR 989.8 indicates that the Air Force must assess “reasonable” alternatives to the proposed action as fully as the proposed action alternative. Reasonable alternatives are defined as “those that meet the underlying purpose and need for the proposed action and that would cause a reasonable person to inquire further before choosing a particular course of action. Reasonable alternatives are not limited to those directly within the power of the Air Force to implement.”

The stated need for the Proposed Action is “to advance implementation of the USAF Energy Strategic Plan... which includes improving energy resiliency and ensuring supply.” The stated purpose of the Proposed Action is “to improve energy resiliency and supply assurance for JB MDL by supporting NJNG’s efforts to add a second primary natural gas supply to service both the region and the installation” (emphasis added).

32 CFR 989.8 indicates that the Air Force, in considering standards to assess alternatives “must not so narrowly define these standards that they unnecessarily limit consideration to the proposal initially favored by proponents.” By including *within the stated project purpose* the construction of the pipeline as NJNG proposes, the EA improperly limits its analysis to the proposal initially favored by the proponents of the pipeline.

In addition, the claim that the pipeline will service the installation is factually incorrect, as demonstrated below. A more appropriate project purpose would state: “The purpose of the USAF’s Proposed Action is to improve energy resiliency and supply assurance for JB MDL.” The alternatives then could be better designed to serve the needs of JB MDL. JB MDL could be benefitted by a wide variety of alternatives, including different routes for a new pipeline within *or outside* JB MDL, LNG storage on the Joint Base in the unproven eventuality that existing gas supplies to the Base was cut off, and conversion to sustainable energy production. In fact, JB MDL is currently constructing a 16.5 megawatt solar generating facility, which the Environmental Assessment ignores. Moreover, most of JB MDL is served by PSE&G for natural gas, and there is no proposal to build a redundant source for PSE&G’s service. These facts indicate that (a) there is no *genuine* need for a redundant source for the Lakehurst section of JB MDL, the only portion served by New Jersey Natural Gas, and (b) an alternative means of providing redundant gas service to the Lakehurst section would be to connect it to the existing PSE&G service, an alternative not considered at all.

The only alternative fully considered is the alternative put forth by New Jersey Natural Gas in their regulatory filings. The only two alternatives listed are immediately dismissed, and many other potential routes and methods are not even raised. This is a direct violation of 32 CFR 989.8.

- 2. The Environmental Assessment ignores issues of soil and groundwater contamination that have recently come to light at the Base, and downplays long-standing contamination problems.**

The pipeline will be embedded in the Kirkwood-Cohansey aquifer (the shallow groundwater table). However, the Air Force failed to conduct or require any specific studies of the soil contamination, groundwater contamination, geology and water level along the proposed pipeline route within the shallow aquifer.

Instead, the Environmental Assessment relies on *limited, pre-existing* studies of just the Superfund sites along the route, while erroneously implying the pipe will not be embedded in the groundwater. Even for the Superfund sites, the EA fails to cite any current data on the presence or concentrations of contaminants in the shallow and middle levels, and relies instead on vague references to out-of-date and inconsistent well tests. The failure to conduct a specific, current and targeted evaluation of these issues along the proposed construction route is frankly incredible given the magnitude of such a development, to say nothing of the risks that a failure during construction or operation of such a pipeline presents to the Base's mission, personnel and natural resources.

The Air Force recognizes that there are widespread contamination plumes in soil and groundwater on and flowing out of JB MDL, in addition to the existing Superfund sites. However, the Environmental Assessment includes no discussion at all on these contamination issues. For example, it simply ignores the issue of the perfluorinated compounds (PFCs) perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) in surface and ground waters, despite the fact that they are ubiquitous throughout JB MDL. A collection of reports and news articles concerning this contamination is available in Appendix B.

Recently, 160 groundwater samples and 30 surface water samples were collected across JB MDL from 21 sites. The sampling was part of a base-wide site inspection for PFCs. PFOS and PFOA are not regulated under the Safe Drinking Water Act, but the U.S. Environmental Protection Agency has issued health advisory levels (HAs) for these chemicals in 2016. The advisory level is 70 parts per trillion (ppt) for PFOA and PFOS, individually or combined. The New Jersey Department of Environmental Protection (NJDEP) has a guideline of 40 ppt for PFOA. The results of the base-wide study revealed exceedances of the EPA HA for PFOS and/or PFOA at each of the 21 sites.

Pipeline excavation will occur contiguous with Area C. Within this area is the former NATTC (Fire Training Area AT016). This area is also known as PFC Area 18. Groundwater sampling conducted during August 2016 revealed that groundwater in the area of the proposed pipeline excavation contained combined concentrations of PFOA/PFOS of 18,100 ppt and 13,900 ppt respectively in two groundwater well samples within the area. As a result, pipeline excavation within the water table will undoubtedly contact and affect the movement of PFOA/PFOS – a predictable result the development must avoid, but which is simply ignored by the EA.

The failure to conduct any specific evaluation of soil and water contamination along the pipeline route means that the Environmental Assessment's claim that the pipeline route will not touch any contamination issues is unjustified and unreliable.

**3. The Environmental Assessment does not account for risks Horizontal Directional Drilling (HDD) poses to the aquifer.**

Figure 11 of the Environmental Assessment details 21 stream and wetland crossings within the proposed Joint Base easement area. While HDD prevents direct interference with surface water resources, it is certainly not without risk. As Rubin details in his report, submitted with these comments, the most frequent incident occurring during HDD is inadvertent returns of drilling fluids to the surface water. This causes direct contamination of the surface water and may impact groundwater depending on the location of the pipe. There is a particularly high risk of inadvertent releases in shallow, granular soil conditions along which the pipeline travels. Additionally, there is documented heterogeneity in subsurface Pinelands geology that cannot be

determined without extensive surveying.<sup>i</sup> Without knowledge of the conditions in which HDD will take place, the risk of inadvertent returns rises.

Without knowing the precise geology and hydrology of the pipeline route, it is also impossible to assume that the pipeline will not alter the movement of water in the aquifer or pierce local confining layers that sustain surface waters. This issue is more fully discussed below.

Only by studying the specific hydrogeology of the proposed route can the impacts of the pipeline be predicted. The failure to do so in this case invalidates the EA's conclusion that the pipeline will have no significant impact.

**4. The Environmental Assessment fails to account for the fact that significant portions of pipe trench excavation will be within the water table.**

Because the EA assumes without basis – and in fact contrary to the evidence that does exist – that the pipeline will be above the water table, the EA underestimates environmental impacts from trench dewatering on nearby wetlands, mobilization of known ground water contaminants, disposal of contaminated groundwater and post-construction dewatering of wetlands from pipeline construction.

The EA states that it is "reported" that groundwater is encountered at depths greater than 10 feet. However, the EA provides no citation for this claim. The claim, moreover, is contradicted by 15 to 25 years of groundwater investigations conducted in Areas I & J, and Area C. For example, based on groundwater levels obtained during February 1992 for Areas I & J the depth to groundwater along Boundary Road ranged from one foot below ground surface (bgs) to 6.5 feet bgs.<sup>ii</sup> Similarly, groundwater levels obtained during February 1997 also indicated that along Boundary Road the depth to groundwater was encountered at depths just below the ground surface.<sup>iii</sup>

Similar findings were noted for Area C. Water level measurements obtained during December 1991 also indicated that along Boundary Road groundwater was encountered at depths ranging from 1 to 5 feet bgs.<sup>iv</sup>

Within the area of JB MDL and Boundary Road, the shallow Kirkwood-Cohansey aquifer provides approximately 90 percent of the baseflow to area streams and wetlands.<sup>v</sup> Wetlands and streams in the area are therefore the surface expression of the shallow groundwater table. Boundary Road is flanked by vast areas of wetlands and streams. Along Boundary Road between Route 539 to the where the proposed pipeline exits JB MDL property to the east, over 8,100 feet of wetlands are contiguous with the road. It is therefore, logical that pipe trench excavations will encounter groundwater. The following must therefore be considered given the high groundwater table:

- **Potential Impacts to Wetlands from Trench Dewatering** - Given the high groundwater table along Boundary Road and the neighboring areas, a dewatering assessment of the specific proposed route must be conducted. Without an assessment, potential impacts to nearby wetlands from dewatering will remain unknown. This could result in a violation of the New Jersey Freshwater Wetlands Protection Act (and therefore the federal Clean Water Act) and the Pinelands Protection Act and its federal authority in the National Parks and Recreation Act of 1978.

- **Potential Mobilization of Known Groundwater Contamination** - A dewatering analysis also needs to be conducted to determine if dewatering will increase the vertical hydraulic gradient in area of known groundwater contamination. Dewatering can alter flow not only in a horizontal direction, but vertically as well. Particularly in Area I & J for volatile organic compounds, and in Area C for PFOA's.
- **State Water Allocation Permit Requirements** - Without knowing the anticipated volume of water that will be removed during trench excavation it is possible that the work will be conducted in violation of the state's water allocation rules. Depending on the volume removed a Water Allocation Permit or Water Use Registration will be required. The EA fails to address this point.
- **Effects of Altering Subsurface Geology and Hydrology** – In the Pinelands, subsurface geology typically consists of a mosaic of sands, gravels and clay formations. The specific subsurface geology of each areas determines the movement of water within the aquifer and in surface waters, which are hydrologically connected to the aquifer. Clay formations, for example, play a key role in creating and sustaining wetlands. HDD construction may pierce and thereby alter the subsurface geology, so altering the local hydrology above and below the surface. Without knowing the specific geology and hydrology along the pipeline route, it is impossible for the EA justifiably to assume the pipeline would have no substantial impact on streams, wetlands and associated habitats.
- **Post-Construction Dewatering** - It is anticipated that the bottom of the pipeline will be a minimum of 7-feet below ground surface. There is a real concern that construction activities within the groundwater table around the pipeline will result in higher permeability preferential flow paths around the pipeline. This could result in the pipeline backfill acting as a dewatering system lowering groundwater onsite and near wetlands by sending groundwater offsite. This scenario would *permanently* result in less water being available for the wetlands and stream baseflow. This risk needs to be addressed, but is ignored by the EA.

**5. The review of restoration and maintenance along the pipeline route is incomplete and raises questions about the quality and efficacy of such efforts.**

Section 4.2 of the Environmental Assessment states, “Unpaved areas where the pipeline is to be located consisting of open land would be graded, revegetated, and restored to pre-existing conditions following construction thus maintaining their existing land use”. Missing from this section is a discussion as to how revegetation will occur, what species will be used and the provenance of selected plant stock. Restoring unpaved areas to pre-existing conditions through revegetation would require the species selection to resemble the plant community present prior to construction. More importantly, experience shows that restoration in Pinelands conditions is a significant challenge due to the unique soil evolution and structure that mark this region. Yet the EA includes no discussion as to how the restoration will restore existing conditions and habitats. It even fails to discuss whether the necessary species are commercially available and the provenance of potentially available seed.

Section 4.4 described how excavated material would be used as backfill and how 1,875 square feet of herbaceous land around valve sites will be converted to gravel. These activities are

described under a section that states, "Construction of the pipeline segment on JB MDL would result in temporary and minor effects on geology, topography, and soils." In addition to a complete failure to recognize the difficulties of restoring the soil structure once it is destroyed in construction, this section of the EA fails to describe how the introduction of non-native gravel and lower strata soil as back fill will change the soil chemistry by elevating the natural pH of the soil. A change in the chemistry of the soil in this fashion will have long term effects and will limit the competitiveness of native plant species effectively allowing non-native species colonization. These consequences of construction will increase the disturbance associated with this project and were not addressed in the Environmental Assessment.

Section 4.5 continues the restoration discussion and identifies mulching and the addition of fertilizers as activities associated with vegetative restoration. The addition of organic matter and fertilizers will also change the natural condition of the soil, favoring non-native species and constitute unintended, longer term effects of this project that warrant greater discussion in the document. In fact, this discussion highlights how poorly the authors of the EA understand, much less know how to deal with, the conditions in which the work will take place.

Section 4.6 discusses potential impacts to biological resources. This section identifies March and September as the months in which the two mowing activities along the pipeline easement will occur. Given that several native plant species continue to flower and set seed into November, September is too soon to mow without negatively impacting the surrounding flora. Consideration of floral phenology must be taken into account when developing management schedules. Yet the EA fails to do so.

**6. Review of Threatened and Endangered Species habitat is incomplete. The current route of the pipeline threatens the habitat of several listed species.**

Sickle-leaf Golden-aster (*Pityopsis falcata*; S3) was identified in several locations along the proposed pipeline, with one occurrence partially located on a proposed "lay down" area. The Threatened and Endangered Species Habitat Assessment Report was inconsistent in its description of this population by stating first that "each plant cluster and/or individual plant was identified," then later referring to the population as an estimate and offering an approximate number of individuals. In order to assess the potential impact of a "lay down" area to this population, the report must differentiate between a plant cluster and individual, how and when these determinations were made, and the methodology used to estimate the population. The report identifies that approximately 456 plants are located within the "lay down area." This constitutes approximately 9% of the estimated population which is below the 10% threshold of impact identified in the report. Without clarity on the methods used in the population estimate, or a measure of sampling or extrapolation error, it cannot be concluded that less than 10% of the population will be impacted by construction.

Following the population estimate, the Threatened and Endangered Species Habitat Assessment Report states, "Based on information provided by AECOM, disturbance to the laydown area is temporary and will not result in permanent disturbance." Based on the restoration methods described in the Environmental Assessment and points raised earlier in this document, disturbance in terms of soil chemistry and nutrients is likely to be long-lasting, which would negatively impact the remaining plants of this population and limit their ability to recolonize areas lost during construction. Furthermore, the report states that the use of matting "will ensure there is no permanent disturbance to the soil that is currently the source of the sickle-

leaved golden aster seed bank. After the project is complete and the matting is removed, the seed bank will remain, as well as the plants, for re-growth during the next growing season.” The report, however, provides no authority or basis for this assumption. In order to function under the assumption that a seed bank will become activated following construction and will begin the process of repopulating that area with Sickle-leaf Golden-aster, the report must provide citations that focus on the seed banking capabilities of this species and conditions suitable for repopulation.

Surveys for the federally listed Knieskern’s Beaked-rush (*Rhynchospora knieskernii*; S2) concluded in the month of August. As established by the US Fish and Wildlife Service, however, mature fruit is needed to identify this otherwise inconspicuous species, requiring that surveys be conducted through September. The report’s finding on this point, therefore, is unreliable and invalid.

The Threatened and Endangered Species Habitat Assessment Report identified a Pine snake (*Pituophis melanoleucus*; State Threatened) nest within 100 feet of a proposed “lay down area”. Timing for the use of this lay down area must exclude the nesting season and neonate dispersal from June through November. Neonates emerging in September will be present above ground until their first shed, then begin dispersing in the vicinity in search of a winter hibernacula. Active use of the lay down area during this time frame will put either the nest or emerging snakes in jeopardy. Because of the potential impacts to a known nesting location of a threatened species, the proposed “lay down area” should be relocated.

**7. The analysis of greenhouse gas emissions and climate change in sections 4.3 and 5.2.2 is significantly flawed.**

The EA unaccountably fails to address the well-established occurrence of fugitive emissions from the transmission and storage sector of natural gas systems, emissions that contribute greenhouse gases to the atmosphere. A recent study estimates methane emissions from this sector (within the United States) at 1,503 Gg/year.<sup>vi</sup> The EA includes the carbon emissions from the operation of the associated compressor station and does briefly mention the release of greenhouse gases, but immediately and without basis dismisses these releases as negligible. In fact, compressor stations are known to have significant greenhouse gas emissions, and transmission and storage accounts for 34% of the greenhouse gas emissions from natural gas systems.<sup>vii</sup> A study of 45 compressor stations throughout the United States natural gas system found a range of methane emissions from the stations of 2-880 SCFM.<sup>viii</sup> The dismissal of such emissions as negligible is inaccurate and unjustified.

The EA also does not account for leaks along the route and dismisses releases from the valves as negligible, without providing any basis or citation for that assumption. Methane leakage is a growing field of research, and recent studies indicate that methane leaks are substantial. While few researchers have examined solely gas transmission pipelines, studies of aggregated infrastructure indicate an alarming rate of leakage. A study of the downstream sector, including transmission, distribution, and end use found a 2.7% rate of loss to leaks throughout the system.<sup>ix</sup> It is essential that the Environmental Assessment include leaks along the route in the climate change analysis.

Moreover, the EA does not include emissions resulting from the end use of the natural gas transmitted by the pipeline. The CEO of New Jersey Natural Resources has indicated that the

pipeline is designed to service growth in Ocean County (Appendix C). Servicing these growth areas and any increased or reliability needs of existing consumers with natural gas, as opposed to alternate renewable sources of energy, must be considered in the environmental assessment of the greenhouse gas and climate change impacts of the proposed action.

**8. The Environmental Assessment does not address the risks of pipeline leaks to natural resources and the people and facilities on JB MDL.**

The risks of pipeline leaks are illustrated by the record of natural gas transmission pipeline accidents kept by the federal Pipeline and Hazardous Materials Safety Administration and pipeline accident briefs from the National Transportation Safety Board. Such risks include leaks of liquid methane and methane gas as well as ruptures and explosions. The rate of such incidents has increased over roughly the past two decades, as indicated by an analysis of the available Pipeline and Hazardous Materials Safety Administration (PHMSA) data from 1997 to 2015.

An analysis of only significant incidents demonstrates a similar increase over the study period. This controls for reporting, as these incidents are those required to be reported.<sup>1</sup> The data are normally distributed (Shapiro-Wilk,  $n=19$ ,  $p = .325$ ), and show a slight positive trend (Coefficient =  $.0054$ ,  $p < .0005$ ). Even controlling for expansion of onshore transmission pipelines, the significant incident rate has increased over just the past twenty years. This adds to findings in other analyses and reports.<sup>x</sup>

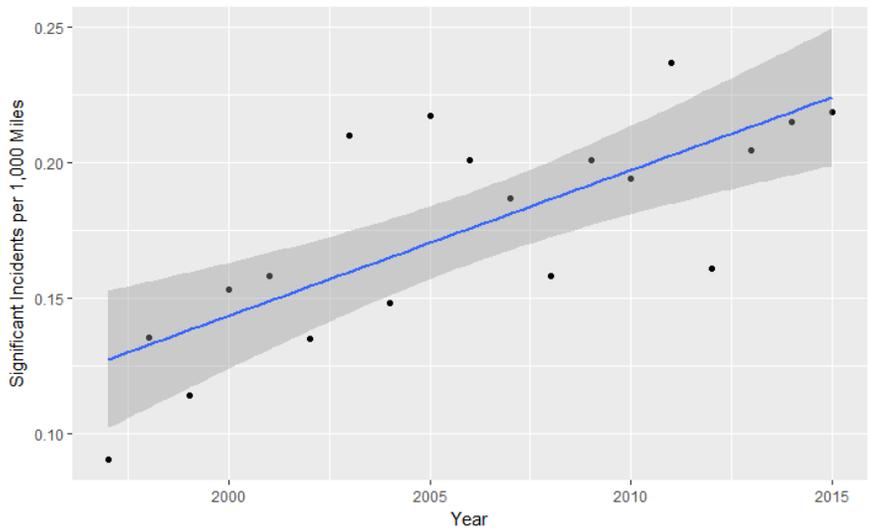


Fig. 1: Onshore gas transmission pipelines significant incident rate 1997 through 2015. Data for pipeline mileage and significant incidents per year from PHMSA. Trend line is a linear regression model with coefficient  $.0054$ ,  $p < .0005$ .

Data on the fatalities, injuries, and cost in 2016 U.S. dollars from significant incidents along onshore gas transmission lines is available in Table 1. Paul Rubin provides a more detailed

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<sup>1</sup> Significant Incidents include any incidents in which there is a fatality, in-patient hospitalization, \$50,000 or more in total costs (1984 USD), release of 5 barrels of highly volatile liquid releases or other liquid releases of 50 barrels or more, or liquid releases resulting in an unintentional fire or explosion.

analysis on the impact a pipeline failure could have on JB MDL and the surrounding area (appendix A). Specifically, analysis by Sklavounos and Rigas calculates a minimum safety distance of 800 meters based on jet fire scenarios for a pipeline of this size and pressure. As it stands, the pipeline route could put thousands of employees and residents at JB MDL and residents of Lakehurst Borough at risk in the event of a catastrophic pipeline failure. The data indicate that pipeline safety cannot be simply glossed over, as it is in Section 4.12.1 of the Environmental Assessment. A detailed investigation is particularly necessary given the unique conditions of the path along which the pipeline is routed.

Table 1: Summary of significant incidents along onshore gas transmission pipelines within the United States as reported to the PHMSA

<b>Year</b>	<b>Significant Incidents</b>	<b>Fatalities</b>	<b>Injuries</b>	<b>Cost (2016 USD)</b>
<b>1997</b>	26	1	5	12,895,038
<b>1998</b>	40	1	11	46,767,171
<b>1999</b>	33	2	8	20,062,791
<b>2000</b>	45	15	16	19,681,683
<b>2001</b>	45	2	5	15,104,246
<b>2002</b>	40	1	4	18,174,586
<b>2003</b>	62	1	8	49,621,353
<b>2004</b>	44	0	2	8,790,883
<b>2005</b>	64	0	5	221,009,148
<b>2006</b>	59	3	3	28,743,581
<b>2007</b>	55	2	7	35,718,360
<b>2008</b>	47	0	5	118,709,035
<b>2009</b>	60	0	11	44,558,043
<b>2010</b>	58	10	61	638,248,044
<b>2011</b>	71	0	1	114,181,315
<b>2012</b>	48	0	7	49,394,093
<b>2013</b>	61	0	2	44,862,432
<b>2014</b>	64	1	1	42,435,963
<b>2015</b>	65	6	14	48,944,400

In addition to the direct safety risks the pipeline poses to those living and working at JB MDL, data collected on methane leaks indicate that the pipeline poses a significant risk to the shallow Kirkwood-Cohansey aquifer that lies under the Base. As laid out above, the pipeline sits within the aquifer not only within the Horizontal Directional Drilling sections of the pipeline, but within many stretches of the trench excavation in which the water table is sufficiently shallow.

From 2010 to 2015, the PHMSA reports 50 recorded incidents of liquid methane leakage from gas transmission pipelines. Even within so-called dry natural gas pipelines, it is common for liquid condensates of hydrocarbons to form, creating the possibility of leakage. Liquid methane leakage is particularly dangerous given its ability to immediately impact the aquifer.<sup>xi</sup> The EA completely fails to address this leakage scenario.

Gas leakage is extremely common among gas transmission lines. Methane emissions from the transmission and storage sector account for 34% of the non-combustion greenhouse gases released as part of the natural gas industry.<sup>xii</sup> Of the 792 gas transmission pipeline incidents (both onshore and offshore) reported from 2010 to 2015 to PHMSA, 747 of them included an unintentional release of natural gas.

A pipeline failure along the base would cause direct harm to the aquifer, as demonstrated by Coppola's analyses of methane transport and impact on groundwater. This is a significant risk even when the pipeline is situated above the water table, as downward and lateral migration of the gas is likely under situations similar to that of the Pine Barrens. Increased levels of methane in ground and surface pose a danger to aquatic organisms and are poorly studied with regard to human health.<sup>xiii</sup>

**9. The Environmental Assessment fails to consider and evaluate the special conditions on a busy military base in which the proposed pipeline would operate,** conditions which increase the chance of pipeline failures, leaks and explosions. These conditions include at least the following:

- The stress caused by the takeoff and landing of jet aircraft along the portion of the route that lies directly at the edge of a jet taxiway and the stress caused by heavy road usage by vehicles, including heavy-duty military vehicles. This type of usage results in an increased external load, which stresses the pipeline. Regular usage by trucks, machinery, and jets results in a much larger live load than would be necessary along a highway shoulder or right of way. PHMSA data compiled by the National Transportation Safety Board (Table 2) demonstrate that equipment actions are the top cause of gas transmission pipeline incidents. Other outside forces, such as large external loads, are also a substantial contributor to pipeline failures.
- The routing of the pipeline in highly acidic groundwater and acidic soil. Groundwater within the Kirkwood-Cohansey aquifer system has a median pH of 5.1 with decreasing pH from the coast to the western edge of the Kirkwood-Cohansey Aquifer.<sup>xiv</sup> The soil is also quite acidic; average pH of soil within the Pine Barrens is 4.0.<sup>xv</sup> Low pH is correlated with an increased risk of external pipeline corrosion and failure.<sup>xvi, xvii, xviii</sup> An assessment of the Kirkwood-Cohansey aquifer found that the area where the pipeline would travel is highly corrosive based on the Aggressive Index, which relies on pH, alkalinity, and calcium hardness, as established by the American Water Works Association.<sup>xix</sup> A review of the available PHMSA data from 2010 to 2015 indicates that corrosion is the most

frequent cause of significant incidents and one of the most common causes of all incidents (Table 2).

- The groundwater in which the pipeline will sit may contain toxic chemicals due to soil and water contamination at JB MDL. This includes volatile organic compounds, petroleum hydrocarbons, and perflouronated compounds. While these contaminants themselves are not known to pose corrosion risks, their presence is due to release of specific materials, such as firefighting foam, which carry with them ions that reduce the resistivity of soils, particularly those, like in the Pine Barrens, that are prone to infiltration due to their loose nature. The reduction in resistivity makes the pipeline more suitable to corrosion.<sup>xx</sup> Once again, the EA completely ignores this risk.

Table 2: Causes of pipeline incidents as reported to the PHMSA, 2010-2015

Cause	Significant Incidents	All Incidents	Percentage of Significant Incidents	Percentage of All Incidents
Corrosion	147	172	0.29	0.22
Material Failure	80	98	0.16	0.12
Equipment	93	212	0.19	0.27
Excavation	64	106	0.13	0.13
Operations	22	37	0.04	0.047
Natural Forces	36	62	0.072	0.078
Other Outside Forces	32	51	0.064	0.064
Other	28	52	0.056	0.066
<b>Total</b>	<b>502</b>	<b>792</b>		

The Air Force must conduct a thorough assessment of the geology and geochemistry to determine the additional risk factors JB MDL and the Pinelands pose to the pipeline, particularly the issues of external corrosion and external loading.

**10. The proposed pipeline and easement violates the Pinelands Comprehensive Management Plan and its authorizing federal and state statutes.**

Pinelands rules permit development in JB MDL only if it is “associated with the function” of JB MDL itself. See N.J.A.C. 7:50-5.29(a). In this case, the pipeline just uses JB MDL as a path from one side of the Pinelands to the other and is not genuinely associated with the function of the Base. The Air Force is bound by these rules pursuant to the National Parks and Recreation Act of 1978 and the New Jersey Pinelands Protection Act.

The Air Force has determined that existing natural gas supplies to JB MDL are adequate. In 2012, the Air Force completed an Installation Development Plan to guide and focus the development of JB MDL. In this, they assessed existing capacities of utilities including natural gas. New Jersey

Natural Gas only provides gas to the Lakehurst Section of JB MDL. The Air Force states that the natural gas systems of all three sections of the Base are “considered adequate” and that “supply capacity is not considered an issue for future growth.”<sup>xxi</sup> This demonstrates not only that the existing supply is adequate for current activities, but will be able to provide for expansion on the base as needed. Neither JB MDL nor New Jersey Natural Gas has conducted analysis to determine whether a redundant gas service infrastructure is needed for JB MDL.<sup>xxii</sup> The Environmental Assessment only *speculates* that the Lakehurst Section of JB MDL *might* have some *undefined* use for more gas at *some unstated time* in the future.

The pipeline is not specifically designed to serve or even capable of serving JB MDL in particular. JB MDL is just one out of hundreds of thousands of NJNG customers and uses only a miniscule amount of the gas NJNG distributes. The Air Force has identified the annual gas usage for the Lakehurst section of JB MDL as 246.481 MMcf.<sup>xxiii</sup> This represents less than four-tenths of one percent of the pipeline’s capacity of more than 180,000 dth/d.<sup>xxiv</sup>

New Jersey Natural Gas has repeatedly stated in its regulatory submissions and discovery documents that the pipeline will have no connection to any facility on the Base along its path. As New Jersey Natural Gas has stated in discovery filings (appendix D), “no tariff customers are served directly from the Company’s intrastate transmission systems. JB MDL will benefit from the reliability of the SRL like all of the Company’s tariffed customers in the Company’s Central and Ocean Divisions.”<sup>xxv</sup> This is in line with NJNG’s plans, which do not indicate any interconnection stations. An interconnection station would be required to connect a distribution line to the larger transmission line. NJNG also does not have any intention to change the system, as they have stated: “there are no changes or additions planned to the SRL in the first five years of operation.”<sup>xxvi</sup>

Second, the pipeline route through JB MDL lies in the Pinelands Preservation Area established by the federal and state statutes as the most precious natural resource area (N.J.S.A. 13:18A-11a.). The pipeline would violate the Pinelands rule that new development on JB MDL must be located only in the Pinelands *Protection Area* wherever feasible, and *not* in the Preservation Area as it is proposed to do. See N.J.A.C. 7:50-5.29(a). A pipeline that was truly designed to serve JB MDL need not be located in the Preservation Area.

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<sup>i</sup> Rubin, January 24, 2017, *Environmental and Geotechnical Considerations Regarding the Proposed South Jersey Gas Natural Gas Pipeline Crossing through the Pinelands of New Jersey*.

<sup>ii</sup> Naval Air Warfare Center, July 8, 1993, *Proposed Plan, Remedial Action Areas I & J Groundwater*.

<sup>iii</sup> Naval Air Engineering Station, June 11, 1999, *Final Proposed Plan for Areas 1 & J Groundwater*.

<sup>iv</sup> Naval Air Engineering Station, August 16, 1995, *Proposed Plan Area C Soil & Groundwater*.

<sup>v</sup> United States Geological Survey, 1997, Robert S. Nicholson & Watt, *Simulation of Ground-Water Flow in the Unconfined Aquifer System of the Toms River, Metedeconk River and Kettle Creek Basing, New Jersey*.

<sup>vi</sup> Zimmerle et al., 2015, Methane Emissions from the Natural Gas Transmission and Storage System in the United States, *Environmental Science and Technology*, 94: 9374-9383.

<sup>vii</sup> United States Environmental Protection Agency, April 15, 2015, *Inventory of U.S. Greenhouse Gas Emissions and Sinks*.

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- <sup>viii</sup> Subramanian et al., 2015, Methane Emissions from Natural Gas Compressor Stations in the Transmission and Storage Sector: Measurements and Comparisons with the EPA Greenhouse Gas Reporting Program Protocol, *Environmental Science and Technology*, 49: 3252-3261.
- <sup>ix</sup> McKain et al., 2015, Methane emissions from natural gas infrastructure and use in the urban region of Boston, Massachusetts, *Proceedings of the National Academy of Sciences*, 112(7): 1941-1946.
- <sup>x</sup> National Transportation Safety Board, January 27, 2015, *Integrity Management of Gas Transmission Pipelines in High Consequence Areas*.
- <sup>xi</sup> Rubin, January 24, 2017, *Environmental and Geotechnical Considerations Regarding the Proposed South Jersey Gas Natural Gas Pipeline Crossing through the Pinelands of New Jersey*.
- <sup>xii</sup> United States Environmental Protection Agency, April 15, 2015, *Inventory of U.S. Greenhouse Gas Emissions and Sinks*.
- <sup>xiii</sup> Coppola, October 17, 2015, *The Risks to Waters within the Pinelands from the Proposed South Jersey Gas Natural Pipeline*.
- <sup>xiv</sup> U.S. Geological Survey, 1993, *Corrosiveness of Ground Water in the Kirkwood-Cohansey Aquifer System of the New Jersey Coastal Plain*.
- <sup>xv</sup> National Conservation Training Center, Fish and Wildlife Service, *Significant Habitats and Habitat Complexes of the New York Bight Watershed*, [https://nctc.fws.gov/pubs5/web\\_link/text/nj\\_pine.htm](https://nctc.fws.gov/pubs5/web_link/text/nj_pine.htm).
- <sup>xvi</sup> Gleeson, 1941, Fundamentals of Corrosion, *American Water Works Association*, 33(7): 1249-1262.
- <sup>xvii</sup> Shehata, Elboujdaini, and Revie, 2008, Initiation of Stress Corrosion Cracking and Hydrogen-Induced Cracking in Oil and Gas Line-pipe Steels in *Safety, Reliability and Risks associated with Water, Oil and Gas Pipelines*, eds. G. Pluvinage and M.H. Elwany, 115-129.
- <sup>xviii</sup> De Waard and Milliams, 1975, Carbonic Acid Corrosion of Steel, *Corrosion*, 31(5): 177-181.
- <sup>xix</sup> U.S. Geological Survey, 1993, *Corrosiveness of Ground Water in the Kirkwood-Cohansey Aquifer System of the New Jersey Coastal Plain*.
- <sup>xx</sup> Doyle and Grabinsky 2003, Applying GIS to a Water Main Corrosion Study, *American Water Works Association*, 95(5): 90-104.
- <sup>xxi</sup> United States Air Force, 2014, *Final Environmental Assessment of Installation Development at Joint Base McGuire-Dix-Lakehurst, New Jersey*.
- <sup>xxii</sup> NJNG Discovery Document 01-08-16, Appendix D.
- <sup>xxiii</sup> EHS Technologies for United States Air Force, 2013, *Environmental Assessment, Communications-Electronics Research, Development and Engineering Command (CERDEC) Flight Activity Facility at the Joint Base McGuire-Dix-Lakehurst, New Jersey*.
- <sup>xxiv</sup> NJNG Petition to New Jersey Board of Public Utilities.
- <sup>xxv</sup> NJNG Discovery Document 01-08-16, Appendix D.
- <sup>xxvi</sup> Ibid.