

Comments of Ryan E. Emanuel, Ph.D. on the Atlantic Coast Pipeline *

The Atlantic Coast Pipeline is a 36"-42" diameter natural gas pipeline proposed to extend approximately 600 miles from West Virginia's Marcellus Shale to endpoints in Virginia and North Carolina (1). The developer, a partnership of utility corporations, contends that the project is needed to meet the region's growing energy needs and estimates that nearly 80% of the pipeline's capacity would be used to generate electricity for the utilities (1), which have reduced their dependence on coal in recent years. The remaining 20% of the pipeline's capacity would be split between commercial, residential and other purposes (1).

The North Carolina Department of Environmental Quality has been tasked with evaluating the discrete and cumulative water quality impacts of the project under Section 401 of the Clean Water Act. The state has the authority to grant, grant with conditions, deny, or waive its certification of a project based on its review of the application and other relevant materials. My written comments focus on two areas of the developer's Pre-construction Notification to the USACE, and it also summarizes broader concerns that I have spoken and written about before.

Cumulative Impacts

The unusual size and scope of this project requires an appropriately heightened level of scrutiny and oversight by state regulators. This is especially true for linear energy projects, which have relatively small direct footprints but, by their very nature, are designed to have outsized cumulative impacts. In the case of the Atlantic Coast Pipeline, these impacts are best summarized by the primary project purpose, as stated in the final environmental impact statement (1):

*to serve the growing energy needs of multiple public utilities and local distribution companies in Virginia and North Carolina by **using the natural gas to generate electricity for industrial, commercial, and residential uses.** (emphasis added)*

Thus, even though the Atlantic Coast Pipeline directly impacts a narrow corridor through eastern North Carolina, the purpose for which the developer seeks approval (i.e., meeting regional energy needs) implies significant indirect impacts to the region. Moreover, the developer has conducted a multi-year advertising and public relations campaign promoting future economic growth and development along the proposed pipeline corridor fueled by the Atlantic Coast Pipeline (2). Both federal filings (e.g., environmental impact statements) and the developer's advertising and public relations campaign suggest that the cumulative impacts of the Atlantic Coast Pipeline include new development and infrastructure that extend well beyond the linear project corridor.

The developer's claims of industrial and commercial growth are not unrealistic. With no major natural gas pipeline presently crossing eastern North Carolina, it is likely that the Atlantic Coast

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Pipeline would spur new development. Even though direct natural gas consumption by non-utility consumers is expected to use only 9% of the pipeline's capacity, this still leaves a potential for 135 million cubic feet per day of gas available for industries in Virginia and North Carolina.

The developer has provided no specific information about industry sectors that would be attracted by utility-scale natural gas, but the recent (20-30 year) trend toward industrialized meat production in eastern North Carolina suggests this is a logical sector to leverage natural gas. Indeed, Sanderson Farms recent decision to locate their St. Pauls poultry facility - a heat and energy intensive operation - directly along the Atlantic Coast Pipeline corridor is evidence that the project will continue to attract meat processing facilities and accompanying wastewater land application systems and networks of industrial-scale animal sheds. Land application systems and animal sheds bring distinct water quality issues (3). Other industries, including advanced manufacturing bring concerns related to stormwater, emerging contaminants, and more.

The developer's revised Pre-Construction Notification to the USACE states that there is a potential for future impacts associated with the project that have water quality implications. Specifically, the developer responds "Yes" to question F3A: "Will this project (based on past and reasonably anticipated future impacts) result in additional development, which could impact nearby downstream water quality?" Nevertheless, the developer's supplemental materials fail to elaborate on any impacts related to regional economic stimulus alluded to in their federal filings or in their advertising and public relations campaigns. Moreover, the developer inappropriately absolves itself of any cause-and-effect relationship between the pipeline and future development by claiming that future users of gas are:

... separate business entities that will require separate review and approval of the projects proposed or that may be proposed in the future for their customers and business needs. The ACP will transport natural gas to the delivery point, or connection with Atlantic customer. Once the natural gas has been delivered to Atlantic's customer it is no longer under the purview of Atlantic or the FERC review of the ACP.

Denying any link between new energy infrastructure and water quality impacts related to future development stands in contrast to the developer's ongoing advertising and public relations campaign, which focuses intensively on economic development in rural and underserved regions of North Carolina (2). If the pipeline is expected to spur economic development, particularly with respect to industrialized agriculture, it is reasonable and expected that such cumulative impacts will be discussed in the Clean Water Act filings and evaluated by regulators. The nine percent of capacity expected to be made available for industry represents 135 million cubic feet per day, or nearly 50,000 million cubic feet per year (approximately 50% of current industrial gas consumption for North Carolina). Thus, even one third of this estimated industrial gas supply (if split evenly between the three states) would have drastic impacts on industrialization and concomitant water quality impacts in eastern North Carolina. The scale of development that could realistically stem from this project is too great to ignore at this stage.

In the end, the developer can't have it both ways. If the developer-sponsored advertising and public relations campaign wants to make an economic development case for the project, then the

likely impacts of that development should be within the purview of state and federal regulators. If the developer doesn't want to take responsibility for future development spurred by the project, then arguments about economic development in eastern North Carolina should be excluded from further discussion.

Given the expected impact of the Atlantic Coast Pipeline on economic development in eastern North Carolina, the Department of Environmental Quality should not make a decision on Section 401 Certification until these cumulative impacts have been evaluated in greater detail.

Cultural Resources

Section F7a of the Pre-Construction Notification asks "Will the project occur in or near an area that the state, federal, or tribal governments have designated as having historic or cultural preservation status?" The developer responded "Yes" to this question; however, supplemental information provides vague statements about coordination with SHPOs and federally-recognized tribes to comply with Section 106 of the National Historic Preservation Act. There is only one mention of state-recognized tribes in the supplemental information (p. 97), and the supplement only states that they were "contacted for the ACP."

As stated during a state government-sponsored meeting of tribal leaders on August 9, 2017 in Hollister, NC (report from NC Commission of Indian Affairs forthcoming), tribes do not have strong relationships with NC SHPO, and tribes lack resources to seek National Register of Historic Preservation listing for their own cultural and sacred sites. This does not mean such sites do not exist. As stated during the meeting of tribal leaders, the developer's utter failure to engage tribes in the early stages of the planning process has now placed tribes in an "emergency response" situation where tribal leaders are forced to react immediately to comply with state and federal permitting timelines.

For under-resourced tribal communities dealing with chronic poverty, poor health, and the lingering effects of Hurricane Matthew, these timelines represent completely unreasonable expectations for documenting cultural and historic sites. The refusal of federal regulators to acknowledge demonstrated disproportionate impacts on tribes (4) only exacerbates this situation, because it allows federal and state regulators to assume that few if any tribal communities are impacted by the project. In reality, no demographic group will be affected as greatly as Native Americans; they represent 1.2% of North Carolina's population, but make up over 13% of those living within one mile of the proposed route through the state. With 30,000 Native Americans, 25% of North Carolina's indigenous population, affected by the pipeline, there is no other infrastructure project in review in the US today that would have as great an impact on Native Americans as the Atlantic Coast Pipeline.

The Department of Environmental Quality should not make a decision on Section 401 Certification until (1) the disproportionate impacts are formally acknowledged by federal and state regulators, and (2) meaningful consultation occurs between government agencies, tribal governments, and other parties regarding the impacts of this project on Native American populations and on cultural and sacred resources of North Carolina's tribes.

Avoidance

The developer states in Supplement Section D1 that federal environmental review includes treatment of project alternatives. However, the final environmental impact statement published by FERC does not include a meaningful discussion of major alternatives, including the no action alternative. The federal review summarily dismissed the no action alternative and alternative energy solutions because it claims to be incompatible with the purpose of transporting natural gas (1). However, as shown in the quoted text above, the executive summary of the environmental impact statement declares that the primary purpose of the Atlantic Coast Pipeline, and the reason why it seems a certificate of public convenience and necessity, is to generate electricity.

While the pipeline is, indeed, designed to transport natural gas, it is an over-simplification to claim that this is the primary purpose of the project, when the stated motivation for the project is to generate electricity. Existing contracts showing 80% electricity production confirm that the main purpose of the project is to generate electricity. For this reason, the federal environmental review's dismissal of alternative energy solutions seems highly suspect.

The developer's certificate of public convenience and necessity may hinge on the fact that most of the gas will be used for electricity generation. The federal environmental review's curt dismissal of alternatives that do not "transport natural gas" are disingenuous and need to be revisited. The Department of Environmental Quality should not make a decision on Section 401 Certification until a thorough, independent evaluation of alternative energy solutions has been conducted. For example, what would a \$4.5B investment (i.e., the cost of the Atlantic Coast Pipeline) in renewable energy look like for North Carolina, Virginia, and West Virginia?

In lieu of a detailed evaluation of alternative ways to meet electricity needs, the federal environmental impact statement should be revised to reflect the developer's actual project objectives, including transporting natural gas from shale formations to power plants and other facilities owned primarily by the developing partners.

Other Considerations

Finally, I wish to raise additional considerations that involve the Department of Environmental Quality but are broader in scope too, and include the Department of Commerce, the NC Commission of Indian Affairs, and the NC Attorney General's office.

As I mentioned during the public listening session in Lumberton on August 17, 2017, The Atlantic Coast Pipeline's expected economic benefits will be dwarfed by the climate impacts of "business as usual" fossil fuel development (5). This development includes construction of projects such as the Atlantic Coast Pipeline. Health, economic, and other damages associated with climate change under the "business as usual" scenario are expected to cost North Carolina approximately \$18B per year by the end of this century (6). The developer's economic analyses and these climate-related analyses cover different time periods, but it is unlikely that the economic benefits of this project or other fossil fuel infrastructure projects will offset multi-billion dollar annual losses to the state expected from un-checked climate change. North

Carolina agencies should weigh the cost of climate change in their evaluation of the environmental and economic impacts of this proposed pipeline.

While reviewing the developer's proposal, state officials should also weigh reports of unethical easement acquisition practices by agencies representing the pipeline developer. On April 20, 2017, I attended a meeting with the NC Attorney General's staff in Raleigh to hear from landowners along the pipeline route. I would encourage DEQ officials to consult with the Attorney General's staff who attended this meeting as the state of North Carolina seeks to answer the broader question of the extent to which this project serves the public trust.

I am also available for consultation on matters related to water, climate, and environmental justice. I am one of North Carolina's leading scientific experts when it comes to the intersection of these three areas. I am also submitting, for the written record, other documentation that I have provided to FERC and published recently related to the Atlantic Coast Pipeline. They follow the references and notes of this document.

References and Notes:

1. Final Environmental Impact Statement for the Atlantic Coast Pipeline, Federal Energy Regulatory Commission. (December 30, 2016).
2. The Energy Sure Coalition: How was EnergySure created? <http://energysure.com/the-coalition/default.aspx>; Atlantic Coast Pipeline FaceBook public relations site: <https://www.facebook.com/acpipeline/>; Atlantic Coast Pipeline: Economic Benefits: New Industries and Manufacturing Jobs <https://atlanticcoastpipeline.com/about/economic-benefits.aspx>
3. Surface-Water Quality in Agricultural Watersheds of the North Carolina Coastal Plain Associated with Concentrated Animal Feeding Operations, US Geological Survey <https://pubs.usgs.gov/sir/2015/5080/>; Hydrologic Impacts of Municipal Wastewater Application to a Temperate, Forested Watershed <https://dl.sciencesocieties.org/publications/jeq/abstracts/45/4/1303?access=0&view=pdf>
4. Emanuel RE (2017) Flawed Environmental Justice Analyses, *Science* <http://science.sciencemag.org/content/357/6348/260.1>
5. Estimating economic damage from climate change in the United States, *Science* <http://science.sciencemag.org/content/356/6345/1362.full>

Comments to the Federal Energy Regulatory Commission on the Draft Environmental Impact Statement for the Atlantic Coast Pipeline, LLC, Dominion Transmission, Inc. and Atlantic and Piedmont Natural Gas. Co., Inc. (Docket Nos. CP15-554-000, -001; CP15-555-000; and CP15-556-000)

By: Ryan E. Emanuel, Ph.D.

Date: April 6, 2017

1. Introduction

My name is Ryan E. Emanuel, and these are my comments on the draft environmental impacts statement for the Atlantic Coast Pipeline. I hold a Ph.D. in Environmental Sciences, and I am an Associate Professor and University Faculty Scholar in the Department of Forestry and Environmental Resources at North Carolina State University (NC State). NC State is the largest academic institution in the state, and it is one of our two land grant institutions. I lead a research program that focuses on hydrology, ecology, atmospheric science, geoscience and integrated topics, including climate change, socio-ecological systems, and indigenous knowledge. My research program spans North Carolina and extends to other parts of the US and Latin America. I am an enrolled member of the Lumbee Tribe, and I serve the broader American Indian community in various ways, including as an ex officio member of the North Carolina Commission of Indian Affairs' Environmental Justice committee. You can find my curriculum vitae and other information on my website: go.ncsu.edu/water. These comments constitute my professional opinions and do not necessarily reflect the views of NC State, the Lumbee Tribe, or the Commission of Indian Affairs.

My comments principally concern environmental justice, but I also raise issues related to the no-action alternative and attribution of climate change impacts. Of these comments, the environmental justice concerns are most serious; the analysis is fatally flawed and has led to false conclusions regarding disproportionate impacts, particularly concerning American Indians. Section 2 exposes the conceptual and mathematical details of these flaws and discusses the implications. I also provide a basic, but mathematically and conceptually sound analysis of impacts on American Indians, which I offer to regulators as a starting point for new analyses. In it, I reveal that the pipeline stands to impact nearly 30,000 American Indians, representing one quarter of the state's indigenous population and 1% of the US indigenous population. No pending infrastructure project stands to affect as many American Indians as the ACP. In light of these impacts, I explain the importance of tribal consultation. I show that federal and international guidance documents recommend such consultation, even when tribes are not federally recognized.

Section 3 shows that ignoring alternative energy and conservation practices amounts to selective acknowledgement of electricity production as a key purpose of the ACP; electricity production is a widely-touted purpose where it benefits the pipeline, yet it ignored at key junctures in the DEIS. This section also raises systematic issues with absolution of responsibility for climate change impacts during the environmental review process. Ignorance of an effect's magnitude does excuse responsibility, particularly when the direction of the impact (here, a net increase in greenhouse gas emissions) is known. In total, my comments focus on what I believe are at once the weakest but most critical parts of this environmental review. These are the big-picture issues that federal regulators should be best equipped (and most qualified) to handle. Ironically, these seem to be the sections of the DEIS that have received the least attention. There

are no easy fixes to the systemic issues that I raise. Nor should there be; environmental justice and climate change are major challenges of our time. If regulators move forward without acknowledging, remedying, and weighing the implications of (1) fundamental errors in their environmental justice analyses and associated conclusions, (2) selective acknowledgement of electricity production as a valid purpose for some parts of environmental review but not others, or (3) ignoring climate change impacts because the ACP is only one small contributor of greenhouse gases out of many under federal oversight, then they do so with full knowledge that their review is flawed in design and logic, and that present and future generations of poor and minority citizens will suffer because of their oversight. I hope, instead, that regulators choose to revisit these analyses and conclusions, draw additional insight and advice from experts in relevant fields, and produce a clearer, more accurate accounting of the environmental impacts of this project.

2. Environmental Justice Analysis

2.1 Overview

Environmental justice analyses are mandatory in federal Environmental Impact Statements, but there is no standard method for computing disproportionate impacts¹⁻⁴. As such, researchers have raised concerns for many years about potential misapplication of methods or tailoring of methods to support a predetermined outcome^{2,3}. The environmental justice section of the Atlantic Coast Pipeline's draft Environmental Impact Statement (DEIS) appears to be an example of such misapplication. The DEIS concludes there will be no disproportionate impacts on poor or minority communities along the preferred route. However, when the data in Appendix U are analyzed in a statistically appropriate manner, they reveal large disproportionate impacts on American Indians. The failure of the analysis reported in Section 4.9.9 to detect such disproportionate impacts on one particular minority population calls into question its conclusions related to other populations, and it undermines the rigor of environmental justice analysis as a whole.

2.2 Description of Major Flaws

The environmental justice analysis in the DEIS concludes that the preferred route has no disproportionate impacts on minority communities. It draws this conclusion by counting up the number of census tracts with “meaningfully greater” minority populations than the reference populations of the counties in which it they are located. According to the DEIS, this analysis is grounded in guidance from Executive Order 12898 and the EPA; however, this particular approach to analyzing environmental justice impacts has fatal flaws in numerical analysis and overall design that render results un-interpretable and prevent regulators from drawing meaningful (or correct) conclusions about impacts on vulnerable populations.

2.2.1 Mathematically inappropriate comparisons among census tracts

The process of counting census tracts with “meaningfully greater” minority populations fails to account for large differences in population and racial makeup among census tracts and also among counties serving as reference populations. These large differences are described in on p. 4-412 and tabulated in Appendix U¹ of the DEIS. Because the census tracts vary widely in population, one cannot simply compare the number of blocks with “meaningfully greater” minority populations to the number of blocks with smaller minority populations and draw

¹ The DEIS mistakenly refers to Appendix V when referring to results presented in Appendix U.

conclusions about disproportionate impacts. This approach assumes all census tracts carry the same weight in the analysis, but this is not the case in terms of population, area, and many other statistics associated with these census tracts. Such an approach would conclude that a census tract with a population of 1186 predominantly white residents (e.g., WV CT 9601.01) would exactly counterbalance another census tract of 7167 predominantly minority residents (e.g., NC CT 9603). This comparison is mathematically incorrect, and it drastically increases the odds of arriving at false conclusions for the ACP study area, a region where large minority populations in one area can be completely masked out by small, predominantly white populations elsewhere.

Additionally, the process of counting up the number of census tracts with “meaningfully greater” minority populations and comparing this to the total number of census tracts along the proposed route fails to account mathematically for the effects of changing baseline conditions from one county to the next. County-level data certainly provide valuable comparison statistics for census tracts, but when the baseline data change for each county (as is the case here), one loses the ability to draw meaningful mathematical comparisons across county lines. For example, the DEIS states on p. 4-412 for North Carolina, “In 13 of the 42 census tracts, the minority population is meaningfully greater than that of the county in which it is located.” The implied interpretation here is that since the number of census tracts with large minority populations is smaller than the number of census tracts with few minority residents, there must be no disproportionate impact on minorities. However, this interpretation is only valid if the baseline demographics used to compute “meaningfully greater” populations are the same for each county. In this case, the 42 census tracts within North Carolina use eight different reference populations to determine “meaningfully greater.” If the baseline demographic data change from county to county (and they do, based on Appendix Table U1), any attempt to draw conclusions about the proportion of census tracts with large minority populations is invalid outside of a single county. However, this is exactly what the present environmental justice analysis attempts to do. Moreover, as differences in baseline data increase among counties, the risk of under-predicting (or over-predicting) impacts on minority populations increases. Because county-level demographics vary widely over the proposed pipeline route, the environmental justice conclusions of the DEIS cannot be supported by the current analysis in section 4.9.9.

The existing environmental justice analysis hinges on assumptions that census tracts are uniform in population sizes and that reference areas are uniform in demographic characteristics. These assumptions are not stated in the DEIS; rather, the mathematical method chosen for this analysis demands that these assumptions be met. In fact, these assumptions are simply untrue, and this has led to invalid comparisons of census tracts in the environmental justice section of the DEIS. At face value, it may seem that census tracts are similar units that can be compared side by side. However, the census tract statistics that have been chosen for comparison cannot be tallied up, because they ignore both the weighting effects of actual population sizes and the mathematical constraints of shifting baselines.

The design of the existing analysis, which involves simply comparing the number of census tracts above or below a threshold, fails to provide a means to evaluate statistical significance of the results. A statistically robust analysis would, minimally, involve pooling all of the impacted census tracts for each state, and comparing this test population with a suitable reference population drawn from each state. This method would allow regulators to (1) compute disproportionality rates from the demographic profiles of test and reference populations and (2) determine whether these rates are statistically significant using tests such as the Wilcoxon Rank-

Sum test or the T-test. This method can be conducted for minority population as a whole and for specific racial or ethnic categories.

2.2.2 Ambiguous definition of “meaningfully greater”

The method for determining “meaningfully greater” poses mathematical problems for comparing census tracts. Footnote 20 (p. 4-412) defines “meaningfully greater” as ten percentage points higher than the comparison group. By defining differences in terms of percentage points, the analysis masks relevant information in areas where minority (or poor) populations are either very small or very large. At the small end of the scale, a reference population that comprises, say, 2% minority individuals would require that the test population be at least 12% minority in order to identify a disproportionate impact. In this example, the proportion of minority residents of a census tract would have to be six times greater than the reference proportion before the tract registers as “meaningfully greater.” This places an unusually high (6x) detection threshold on the census tract, and it increases the risk of overlooking a disproportionate impact in predominantly white areas of a study region.

At the other end of the spectrum, regions with predominantly minority (or poor) populations include census tracts that are already surrounded by large minority (or poor) populations. If a reference population is already, say, 65% minority, then the present analysis requires a census tract to have a minority population of 75% before it is classified as disproportionately impacted. Here, the analysis forces a strange proposition – census tracts with some of the highest minority populations along the entire route are excluded from the “meaningfully greater” category in the broader analysis simply because they are situated in a majority-minority county. Indeed, Table U1 reveals census tracts in North Carolina with minority populations in excess of 75% that do not count towards the disproportionate impacts of the project as whole because they are situated a county with a disproportionately large minority population (70%) compared to the rest of the study area. This example highlights a key problem with the present environmental justice analysis. Whether the analysis uses a fixed percentage point exceedance or some other metric, correct identification of a reference population is crucial for determining the scale at which the analysis may be interpreted.

In the case of the ACP, use of county-level reference populations in the “meaningfully greater” computation means that counties cannot be compared directly with one another. More specifically, the definition of “meaningfully greater” must be further defined as “meaningfully greater than the county in which the census tract is located.” Given this mathematically constrained definition, the present analysis is incapable of determining disproportionalities for the project as a whole; it simply answers a series of county-by-county questions about disproportionate impacts on minority populations. One purpose of federal oversight on projects of this scale is to ensure that the project as a whole does not place disproportionate impacts on vulnerable populations. This purpose simply cannot be achieved by the present analysis.

2.3 Implications of Flaws

The inability of the environmental justice analysis to evaluate disproportionate impacts for the project as a whole raises serious concerns about its utility. Given that a key purpose of an environmental justice analysis is to reveal the extent to which poor and minority populations may bear a disproportionate share of a project’s environmental cost, an analysis that concludes no impacts for a project traversing large regions with substantial minority populations (e.g., Halifax, Northampton, Robeson Counties, NC) and poor populations (e.g., Brunswick, Buckingham

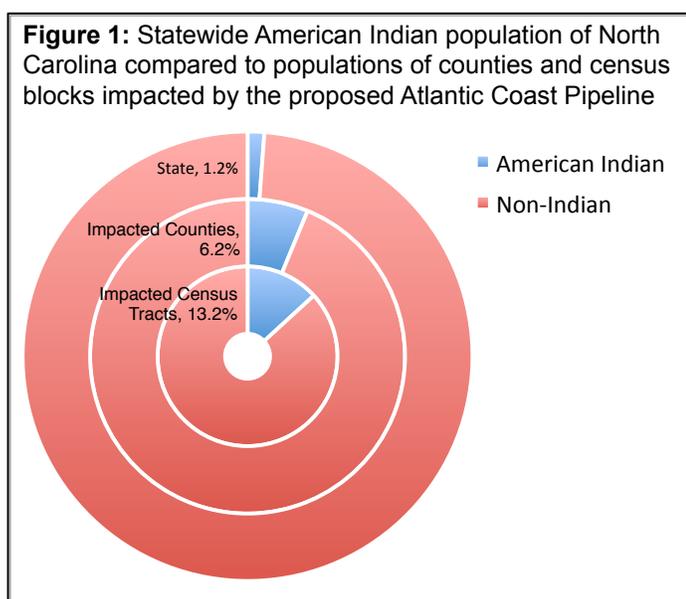
Counties, VA) while skirting adjacent whiter, wealthier areas (e.g., Albemarle, VA; Wake, NC) should raise serious concerns among regulators. In the case of the ACP, this is not a hypothetical scenario. Not only does the project cross areas of high poverty in rural Appalachia, but it also runs through the so-called “Black Belt”⁵ of Virginia and North Carolina. Both regions have borne disproportionate shares of environmental burdens throughout US history, and their local populations live with an unfortunate legacy of past environmental decision making in which they have had little or no part. These are, quite literally, the textbook study regions for environmental justice. Federal regulators should be first to acknowledge these large-scale, multi-state patterns of inequity and to hold petitioners accountable for their activities in these regions. Instead, the environmental justice conclusions of this DEIS hinge on what is essentially a series of county-level calculations, combined in a mathematically indefensible fashion, and hard-wired to ignore important regional demographic patterns that frame the project as a whole.

2.4 Realistic Environmental Justice Analysis

In the previous sections, I offered technical suggestions for remediating the flawed design of the current environmental justice analysis. Here I provide an example of a more realistic environmental justice analysis that pools census tract data in a statistically appropriate manner. This example analysis could be expanded and applied to other demographics throughout the study area as a whole. Data from Appendix U show that in North Carolina alone, approximately 30,000 American Indians live in census tracts along the route. To place this number in a larger demographic context, it represents one quarter of the state’s American Indian population and 1% of the entire American Indian population of the US. To put this in qualitative terms, there is no other energy project currently under federal review that stands to impacts as many American Indians as the ACP.

When populations are summed for census tracts along the North Carolina portion of the pipeline route, I find that 13.2% of the total population of these census tracts identifies as American Indian. For the North Carolina counties in which these census tracts are located, American Indians constitute 6.2% of the population. American Indians constitute 1.2% of the entire population of the state of North Carolina. Figure 1 compares aggregate census tract, county, and state-level statistics.

Using either the county-level data or the state-level data as a baseline, we find that the proposed route impacts American Indian populations at disproportionate rates. Within the affected counties, the proposed route is 2.1 times as likely to impact American Indians as expected based on the appropriate reference population. In this case, the appropriate reference is the total population of the selected counties. Within the state of North Carolina, the proposed route is 11 times as likely to impact American Indians as expected based on the appropriate reference



population. Here, the appropriate reference is the state-level population.

When data from Table U are properly aggregated, and when appropriate reference populations are selected, we find that the proposed route undoubtedly imposes disproportionate impacts on American Indians. By comparing the state-level, county-level, and tract-level results further, we can begin to understand the underlying reasons. Specifically, comparing state-level data to the impacted counties reveals the large-scale route of the pipeline through North Carolina's "Black Belt," where many of the state's American Indians have maintained continuous settlements for centuries. The Meherrin, Haliwa-Saponi, Coharie, and Lumbee tribes in particular claim ancestral territories in North Carolina's Coastal Plainⁱⁱ, and the proposed pipeline route passes, preferentially, through their ancestral territories relative to other regions of the state. Hence, it is no surprise that a pipeline through this region of the state would impact American Indians disproportionately.

At a finer scale, the data show that the pipeline would still impact American Indians disproportionately, even in a region of the state where their populations are already high relative to the state as a whole. Many of these census tracts surround the historic Lumbee community of Prospect. This community is situated within a larger cultural landscape of historical and spiritual importance to many Lumbee people. This community is also the southern terminus of the proposed pipeline. Why the developers would plan to route the project through this community or locate its terminus here is unknown. Nevertheless, the choice to route the pipeline through this culturally significant landscape and through other areas of significance to other tribes explains, in part, why American Indians, who continue to live in and around these culturally significant landscapes, are impacted disproportionately by this project. In providing this analysis, I hope to demonstrate to regulators how an appropriate choice of reference population, combined with culturally relevant knowledge about the pipeline route can provide a more accurate view of environmental justice concerns related to American Indians.

2.5 Tribal Consultation and Environmental Justice

Given the disproportionate impacts on American Indians revealed in the previous section, I recommend that the regulatory agency engage in formal consultations with governments of the Meherrin, Haliwa-Saponi, Coharie, and Lumbee Tribes in North Carolina and with tribal governments in Virginia as wellⁱⁱⁱ. The four tribes listed above are recognized by the state of North Carolina, and the pipeline crosses each tribe's ancestral territory. Tribes have lived in these areas for many centuries, and they maintain unique cultural and religious attachments to specific lands and waters of their ancestral homelands. Given relatively weak relationships between North Carolina tribes and the state's Historic Preservation Office, and given lack of resources available to tribal governments, little information is publicly available about cultural or religious sites of importance to these tribes. Thus, regulators should be proactive in approaching these tribes to learn, firsthand, about their needs and priorities.

ⁱⁱ The Waccamaw Siouan tribe also inhabits the Coastal Plain, but the proposed route does not appear to pass through their territory. It would be safest to contact them as well as all Virginia tribes.

ⁱⁱⁱ The list of tribes is not exhaustive. North Carolina recognizes four additional tribes, and it is possible that members of these tribes or members of other federal or non-federal tribes may be among those impacted. Several tribes are currently based in Virginia as well.

Regulators are not compelled by law to enter into high-level consultations with state recognized (i.e., non-federal) tribes, but NEPA and NHPA guidance documents^{iv} advise regulators to engage non-federal tribes in formal consultation in light of the unique, place-based relationships that indigenous peoples hold with their traditional landscapes and natural resources. In the case of the ACP, regulators have already set a precedent for offering consultation status to entities other than federally recognized tribes when they granted consultation status to the Nelson County (VA) Board of Supervisors under Section 106 of the NHPA. If a non-indigenous group can receive consultation status under a federal law that protects cultural landscapes, surely indigenous tribes, regardless of their federal status, can receive similar consideration.

In addition to federal law, the United Nations Declaration on the Rights of Indigenous Peoples affirms the right of all indigenous peoples to give “free, prior, and informed consent” to governments before they undertake activities that affect indigenous lands and life ways. The Declaration provides additional guidance on the nature of consultation with indigenous peoples, and the US has endorsed the Declaration since 2010. Earlier this year, a UN Special Rapporteur on the rights of indigenous peoples visited the US to document issues surrounding energy development, tribes, and consultation. Her initial report^v highlights deficiencies in federal policy surrounding tribal consultation and points to larger structural problem in federal-tribal relations. In particular, the rapporteur notes:

“The goal of tribal consultation is not simply to check a box, or to merely give tribes a chance to be heard. Rather, the core objective is to provide federal decision makers with context, information, and perspectives needed to support informed decisions that actually protect tribal interests.”

I urge regulators to take the rapporteur’s advice seriously and engage in meaningful consultation that surpasses form letters or emails. Even a basic environmental justice analysis that handles data appropriately (e.g. Section 2.4 above) reveals disproportionate impacts of the ACP on indigenous peoples. The impacted tribes of North Carolina and Virginia, regardless of their federal recognition status, deserve appropriate high-level consultation with regulators given the fact that their ancestors once owned most of the region under discussion. Through a long history of war, dishonest dealings, disenfranchisement, segregation, and environmental racism, their land holdings were diminished and degraded to the small fractions that remain today. Yet their spirits and voices have not been so diminished. Engage in meaningful discussion to learn about the cultural landscapes, sensitive ecosystems, and historical contexts that underlie tribal interests and concerns related to this project. Recognize the vast asymmetry that exists between federal resources and tribal resources in areas of finance, personnel, and information. Send FERC tribal liaison, Elizabeth Molloy to meet with individual tribal governments and with the North Carolina Commission of Indian Affairs – the state-authorized body dealing with issues of concern to all American Indian tribes within North Carolina.

^{iv} Advisory Council on Historic Preservation, *Consultation with Indian Tribes in the Section 106 Review Process: A Handbook*, June 2012; National Environmental Justice Advisory Council, *Guide on Consultation and Collaboration with Indian tribal governments and the public participation of indigenous groups and tribal members in environmental decision making*, November 2000.

^v End of Mission Statement by the United Nations Special Rapporteur on the rights of indigenous peoples, Victoria Tauli-Corpuz of her visit to the United States of America, March 2017.

Engagement and consultation between regulators and tribes should take place in a way that is fundamentally different from outreach efforts that have occurred to date. Here I refer to efforts led primarily by pipeline developers. Their in-person efforts to engage tribal communities through open houses and other presentations might best be classified as marketing activities. Far from high-level discussions with tribal leaders and elders, activities occurring since 2014 in and around tribal communities could be described as marketing efforts by pipeline developers aimed at emphasizing potential advantages of the project while downplaying risks. One key objective of these efforts appears to be the collection and dissemination of endorsements from communities along the pipeline. The ever-growing body of online advertisements leveraging endorsements from individuals, local governments, and other groups suggests that pipeline developers treat community interactions as opportunities to fuel public relations and advertising campaigns. A list of endorsers on Dominion's website^{vi} points to this mindset as well. Interestingly, as of April 6, 2017, the website still lists the Haliwa-Saponi Tribe of North Carolina among "ACP Supporters" even though the tribe formally revoked its support months ago after learning about pipeline impacts not revealed by corporate representatives during outreach activities.

Developers have every right to pursue outreach and public relations activities that portray their projects favorably, but these activities are not consultation as defined by the Advisory Council on Historic Preservation, the National Environmental Justice Advisory Council or the United Nations. Dissemination of information and material in tribal communities that deliberately highlights advantages and downplays risks of a project while simultaneously seeking to leverage public endorsements for future advertising cannot be construed as consultation by any definition. These activities, together with developers' strategic gift giving in communities along the pipeline route, could be described more accurately as asymmetric power plays by corporations that made decisions long ago without input from vulnerable communities. Now these corporations seek to check the proverbial box of consultation in the exact manner that UN Special Rapporteur Tauli-Corpuz warned against. Such one-sided corporate engagement efforts together with untenable analytics have now placed pipeline developers and regulators in a difficult position to defend: On one hand the DEIS claims no disproportionate impacts on minority communities, but on the other hand the project would impact a substantial fraction of the largest indigenous population of the eastern United States.

The stark disconnect between the environmental justice analysis and reality not only reflects major flaws in the present study, but it also bears resemblance to some of the factors underlying indigenous resistance to the Dakota Access Pipeline (DAPL). In that case, Energy Transfer Partners pursued public relations-oriented outreach with the Standing Rock Sioux Tribe, but the proposed route was strongly criticized by tribal leaders in 2014. Federal regulators (here, USACE) missed important opportunities to understand and weigh tribal priorities and concerns pertaining to NHPA Section 106 and other regulations. Had meaningful consultation occurred, ideally during the route-planning portion of the project, changes could have been made to address tribal concerns. Mass demonstrations, protests, and public outcry against DAPL may not have occurred. In this respect, DAPL serves as a cautionary tale to developers and regulators who may view consultation as an obstacle to overcome rather than an opportunity to learn more about the communities being asked to shoulder the cultural and environmental burdens of such projects.

There are important distinctions between DAPL and ACP related to indigenous peoples, including the fact that most indigenous peoples along the ACP route belong to non-federal tribes

^{vi} <https://www.dom.com/about-us/news-center/natural-gas-projects-and-initiatives/atlantic-coast-pipeline>

and are not entitled to consultation by law. However, federal agency guidance and federally endorsed international guidance (Footnotes iv and v) advise consultation with indigenous peoples regardless of recognition status. The social, political, and historical reasons explaining why tribes lack federal recognition are many and complex, but tribes' claims to their ancestral territories are demonstrable and significant. Given that the indigenous population along the ACP is more than double the combined population of the Standing Rock Sioux Tribe and Cheyenne River Sioux Tribe (the two tribes leading legal opposition to the DAPL), a prudent approach for ACP developers and regulators would involve immediate and meaningful consultation with governments of all tribes whose citizens stand to be affected by this project.

3. Alternative Energy and Climate Change

Alternative energy sources are not considered in the no-action alternative (Section 5.1.15) because regulators claim that generation of electricity is beyond the scope of the proposed project. Specifically, the DEIS states that “the purpose of ACP and SHP is to transport natural gas” (p. ES-13, 5-26). However, this statement does not accurately reflect the primary purpose of the project, as defined by the petitioner. According to Section 1.1, the primary purpose for the project is electricity generation (p. 1-2). Indeed, most of the gas (79%) is intended for electricity generation. That the petitioner adds “by using the natural gas to generate electricity” to its purpose statement does not negate the fact that the principal motivation for this project is electricity generation. The DEIS contains numerous discussions that emphasize the project's intended purpose of generating electricity. The DEIS highlights the growing need for electricity in the region (p. ES-2), the economic advantages of gas-derived electricity (p. 3-3, 4-408), the greenhouse gas advantages of gas-derived electricity over coal (4-512), and improvements to regional air quality as electricity production shifts from coal to gas (ES-13). The principle petitioners, Duke Energy and Dominion Power, are mainly in the business of producing electricity. According to Duke Energy's most recent annual investor report^{vii}, the company's electricity entities – Duke Energy Carolinas and Duke Energy Progress – will be the pipeline's principle customers.

A reasonable reading of the DEIS alone or in combination with corporate materials reveals that electricity generation is, unquestionably, the overarching motivation for this project and the principle counterbalance for all of the environmental and socioeconomic impacts identified during the review. With this in mind, to claim that conservation and alternative energy cannot be considered in the environmental review because the purpose of the project “is to transport natural gas” is, at best, disingenuous. If the scope of this environmental review is limited to transporting natural gas, then all of the aforementioned benefits of gas-derived electricity should be struck from the DEIS. If these benefits remain in the review, then regulators implicitly acknowledge that the purpose of the project is to generate electricity, and they are obliged to carefully consider both alternative energy and conservation measures throughout the review. Either acknowledge electricity generation consistently in the DEIS, or ignore it altogether. Selective ignorance is indefensible.

Including alternative energy in the environmental review is important given North Carolina's emerging role as a national leader in solar and wind energy. Utility-scale and smaller initiatives are underway across the state, and a major influx of new natural gas supplies has the potential to serve as a double-edged sword. On one hand, as developers will correctly argue,

^{vii} https://www.duke-energy.com/_/media/pdfs/our-company/investors/de-annual-reports/2016/2016annualreport.pdf

natural gas may serve as a steady-load complement to less predictable inputs of wind and solar projects. On the other hand, new pipeline infrastructure will lock the region into decades of continued dependence on an unsustainable and, ultimately, dangerous source of energy in terms of its climate change potential.

The best available science suggests that greenhouse gas emissions need to be curtailed significantly and immediately. Replacing coal with natural gas may result in a relative decrease in greenhouse gas emissions, but when fugitive methane emissions are considered together with the added combustion capacity described in the DEIS, the ACP still results in a net increase in greenhouse gas emissions over 2017 and moves us toward the worst-case scenario of climate change^{viii}. The DEIS acknowledges that greenhouse gas emissions associated with the ACP will contribute incrementally to climate change, but it fails to assign the project any responsibility for those incremental changes (p. 4-511). Although we may not be able to determine the magnitude of climate change assignable to the ACP, we know the sign of its impacts. In other words, the ACP will unquestionably sustain the release of carbon dioxide and methane into the atmosphere over the project's lifetime. Inability to quantify the degree of change attributable to a particular project does not absolve the project from any responsibility whatsoever, particularly when the direction of change is unquestionable.

Federal regulators are fully aware of the greenhouse gas implications of natural gas development, including the development of shale gas from central Appalachia^{6,7}, and I will not provide a detailed review of those implications here. Instead, I point out that ignoring all climate change implications simply because we cannot assess the degree of contribution is unsustainable and irresponsible policy. If each fossil fuel infrastructure project is reviewed by this standard, then the federal agency responsible for reviewing and authorizing such projects will never have an opportunity to weigh in on the most serious, cumulative impact of the totality of such projects.

4. Conclusions and Recommendations

The DEIS contains a thorough review of many topics of environmental concern to stakeholders along the pipeline route. However, the review process, in its current form, has failed to ensure that its environmental justice obligations have been met. A poor environmental justice analysis failed to detect important demographic patterns that manifest as disproportionate impacts on poor and minority communities (particularly American Indian communities) at multiple spatial scales. In terms of consultation with American Indian tribes, regulators and petitioners have been demonstrably active, but the activities described in the DEIS are strongly geared toward public relations and marketing by petitioners and should not be misconstrued as consultation. Although regulators are not bound by law to consult with most of these tribes because of their non-federal status, federal and international guidance documents recommend doing so.

The broader question of whether the review of this project has satisfied its environmental justice obligations demands that American Indian tribes and other vulnerable communities along the pipeline route have a seat at the decision making table. A seat at the table means that these

^{viii} Globally, we are tracking the RCP8.5 emissions scenario from the latest round of general circulation model projections. The scenario shows that human greenhouse gas emissions will drive warming globally, and this will manifest as climate change (e.g., warmer summers in the Southeast, declining snowpacks in the American West, more extreme weather globally, etc.) RCP8.5 is commonly referred to as the "worst case scenario" and is generally accepted by scientists and most of the world's decision makers as an unsustainable trajectory.

communities' perspectives matter, not only on the back end (i.e., after the route has been determined) but on the front end as well. Whether regulators acknowledge it or not, these communities are the least equipped to deal with either guaranteed or probably impacts of climate change. Along the ACP, these impacts include, most notably, a significant increase in summer peak-load electricity usage due to increasing summer temperatures⁸.

To remedy issues raised with the DEIS, I recommend that regulators first create a new environmental justice analysis, ideally in partnership with federal staff or academic researchers who are familiar with common challenges of such analyses. The National Environmental Justice Advisory Council would be a logical place to begin the search for a partner. Once the new analysis has been performed, I encourage regulators to grapple with tough questions that will likely arise due to disproportionate impacts on poor and minority populations along the route, particularly in North Carolina. While it is true that the petitioners have already worked for years to secure easements along the proposed route, their ignorance of environmental justice obligations or reliance on flawed methodologies does not excuse the requirement to perform the analysis correctly and take the results seriously.

Furthermore, I recommend that the FERC immediately set up in-person meetings between its tribal liaison and governing bodies of impacted tribes along the proposed route. This issue is too important to relegate to emails or form letters (ask the USACE or the Standing Rock Sioux Tribe). During meetings, the liaison should inquire about prior interaction between tribes and petitioners, including open houses, informational meetings, and gift giving activities in and around indigenous communities. This information will provide valuable context and help regulators understand the status of relationships and interactions between tribes and petitioners. In addition to meeting with tribes, I recommend the liaison attend an upcoming quarterly meeting the North Carolina Commission of Indian Affairs. This body informs and advises the state government on all issues of concern to tribes, including issues related to environment, economic development, and public health.

I also advise regulators to correct the logical inconsistency in the DEIS dealing with the selective failure to consider electricity production as the main purpose of the ACP. The petitioners themselves promote this purpose, and DEIS states that this is the purpose in many instances where it promotes a benefit or offsets an impact. Please also reconsider the failure to weigh climate change impacts simply because the magnitude of impact cannot be determined. This is shortsighted policy and logically inconsistent. If this practice continues in environmental reviews, global society will pay a heavy toll due to our unwillingness to count the cost of our continued reliance on fossil fuels.

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LETTERS

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Flawed environmental justice analyses

In December 2016, the Federal Energy Regulatory Commission (FERC) issued a draft environmental impact statement (DEIS) for the Atlantic Coast Pipeline, a natural gas pipeline proposed to run approximately 1000 km from West Virginia to end points in Virginia and North Carolina (1). The developer, a partnership of utility corporations, contends that the project is needed to meet the region's growing energy needs.

The proposed route crosses territories of four Native American tribes in North Carolina. Because poor and minority communities have long been excluded from environmental decision-making (2), all federal agencies must now identify and address environmental justice issues during formal assessments and reviews of projects such as the Atlantic Coast Pipeline (3). Such projects can have wide-ranging impacts on human communities associated with land rights and property values, public safety in the event of leaks and explosions, and regional climate change exacerbated by fugitive methane emissions (4) and combustion of natural gas.

In addition to these issues, Native American tribes have unique concerns deriving from their status as indigenous peoples. Tribes have deep connections to ancestral and modern-day territories, and these connections are often important to tribal concepts of identity, history, culture, spirituality, and governance. Sacred sites, archaeological resources, and natural

features integrate to form cultural landscapes that are unique to each tribe.

The Atlantic Coast Pipeline developer's preferred route disproportionately affects indigenous peoples in North Carolina. The nearly 30,000 Native Americans who live within 1.6 km of the proposed pipeline make up 13.2% of the impacted population in North Carolina, where only 1.2% of the population is Native American [Appendix U in (1)]. Yet, the DEIS reported that fewer than half of the areas along the proposed route had minority populations higher than county-level baseline proportions (1). The discrepancy stems from the DEIS's failure to account for large differences in population size in the studied areas; large minority populations in some places were masked by much smaller nonminority populations elsewhere. The analysis also failed to account for large differences in baseline demographics among counties, where minority populations range from less than 1% to nearly 70% [Appendix U in (1)]. These large differences prevented meaningful comparisons among areas in different counties. Together, these flaws rendered FERC's analysis incapable of detecting large Native American populations along the route, leading to false conclusions about the project's impacts. Notably, the analysis conformed to the generic guidelines prescribed by the U.S. Environmental Protection Agency (1).

Environmental justice analyses are meant to help regulators and developers identify and address disparate impacts on vulnerable populations at an early stage in the decision-making process (3, 5, 6). Analyses unable to detect such impacts are essentially faulty instruments that fail to warn decision-makers about potential problems ahead. In the case of the Atlantic Coast Pipeline, a

Members of North Carolina's Lumbee tribe prepare to perform a traditional dance in 2004. Their lands lie in the path of the planned Atlantic Coast Pipeline.

more thorough analysis might have alerted regulators to large Native American populations along the proposed route and the need to consult with tribal governments.

The Dakota Access Pipeline controversy (7) demonstrates that all parties suffer when environmental justice analyses and tribal consultation are treated as meaningless rote exercises. Tribes suffer erosion of sovereignty and damage to cultural landscapes, federal-tribal relations deteriorate, and developers incur setbacks.

Developers and regulators of the Atlantic Coast Pipeline still have a window of opportunity to take these lessons to heart. Regulators can consult with tribes before making a final decision on the project later this year, and they can acknowledge the project's true impacts on vulnerable populations by addressing the flawed environmental justice analysis. Scientists can help by sharing rigorous methods, providing oversight, and partnering with vulnerable communities. It is not too late to work toward environmental justice for all.

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Mexico's basic science funding falls short

During his inauguration address in December 2012, Mexico's President Enrique Peña Nieto vowed to move the country forward by investing in education as well as in science and technology (S&T). In two government documents (1, 2), he pledged to increase the S&T federal expenditure (which had been lingering for years at about 0.4% of the gross domestic product) up to a minimum of 1% by 2018 (2, 3). A few months earlier, the National Autonomous University of Mexico, together with the