

**UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION**

**Algonquin Gas Transmission, LLC
Docket No. CP16-9-012
Maritimes and Northeast Pipeline, L.L.C.**

INITIAL BRIEF OF

Greater Boston Physicians for Social Responsibility

Greater Boston PSR (“GBPSR”) is an advocacy organization that counts as members nationally-recognized experts in public health, cancer epidemiology, occupational medicine, environmental health, emergency medicine, disaster preparedness, and the health effects of climate change. For more than three years, GBPSR has drawn attention to the serious health risks posed by the Weymouth compressor station. GBPSR members have visited the site, met with local fire rescue officials, participated in public meetings, and met with officials at the Massachusetts Department of Environmental Protection, Executive Office of Energy and Environmental Affairs and the Department of Public Health. GBPSR has published three in-depth reports on the health, safety, environmental justice and climate risks of this compressor station.

GBPSR raises the following substantive concerns regarding the unsafe operation of the Weymouth Compressor station that warrant further consideration by the Commission and set the matter for paper briefing to address the questions listed below.

GBPSR respectfully submits this brief in response to the Commission’s Order No. 174 FERC ¶ 61,126, issued on February 18, 2021 in the above-referenced proceeding. In Order No. 174 FERC ¶ 61,126, the Commission stated that the concerns raised in an October 23, 2020 request for rehearing “warrant further consideration by the Commission” and “set the matter for paper briefings” due 45 days from the date of the Order. In this brief we address all

four of the questions the Commission posed-- namely, Questions 1,2,3 and 4.

I. BACKGROUND

On September 24, 2020, Commission staff issued an order authorizing Algonquin Gas Transmission, LLC (“the Company”) and Maritimes & Northeast Pipeline, LLC (“Maritimes”) (together, “Applicants”) to place facilities associated with the Atlantic Bridge Project into service (“Authorization Order”). On October 23, 2020, the Fore River Residents Against the Compressor Station (“FRRACS”), the City of Quincy, Massachusetts, Weymouth Councilor Rebecca Haugh, Michael Hayden, and Food and Water Watch (collectively “Petitioners”) filed a timely joint request for rehearing of the Authorization Order. On November 23, 2020, the Commission issued a Notice of Denial of Rehearing by Operation of Law and Providing for Further Consideration, which indicated that the Commission would address the rehearing request in a future order. At a meeting on February 18, 2021, the Commission issued an “Order Establishing Briefing Schedule” (“Briefing Order”). In its Briefing Order, the Commission established a briefing schedule for purposes of evaluating “concerns raised” associated with the Atlantic Bridge Project, and, more specifically, the Weymouth Compressor Station.

II. RESPONSES TO ISSUES RAISED

- 1. In light of the concerns expressed regarding public safety, is it consistent with the Commission’s responsibilities under the Natural Gas Act (NGA) to allow the Weymouth Compressor Station to enter and remain in service?*

Allowing the Weymouth Compressor Station to enter and remain in service would be an abnegation of FERC’s responsibilities to protect and defend the health of the public per its federal mandate: according to the Natural Gas Act Section 717o, FERC has the *obligation to protect health and safety and the power to rescind*.¹

¹ § 717o. [Administrative powers of Commission: rules, regulations, and orders, available at https://www.law.cornell.edu/uscode/text/15/717o](https://www.law.cornell.edu/uscode/text/15/717o)

The many safety concerns of this project are set forth in the attached GBPSR report, *Flammable, High-Pressure Industry in a Populated Coastal Flood Zone? Public Safety and Emergency Response Aspects of a Proposed Methane Gas Compressor in Weymouth* (2019). The manifold hazards presented by the Weymouth compressor were assessed and analyzed by our public health and emergency medicine experts based on their research, expertise, and first-hand knowledge of the risks of the area discovered when they toured the site with first responders in 2019.

Key points:

1. **Potential Impact Radius (PIR) not protective of life.** Residents' houses and a Metering and Regulating (M&R) station, which in essence functions as a small gas compressor, lie within the Potential Impact Radius (PIR) of the Weymouth compressor. PIR, known in the literature as the “incineration” or “death zone,” is designed to model a sudden, isolated infrastructure explosion in a large sparsely inhabited rural area. Compressor stations are generally sited on land plots ranging from 34 acres to 104 acres in sparsely populated zones, while the Weymouth site is located on a mere 4.3 acres in a densely populated area.

The calculated PIR of the Weymouth compressor is 774 feet; the closest house lies at 700 feet, which is within the PIR ($PIR = 0.69 \times D \times \text{SQRT}(\text{MAOP})$). The presence of other highly flammable infrastructure within the PIR increases the PIR significantly; however the additive effect of this additional flammable infrastructure was not included in the Company's PIR calculation.

Moreover, it is not uncommon for pipeline explosions' actual burn radius to be twice the PIR. A relevant example is the Salem Township fire in Pennsylvania, where a 30-inch Company pipeline, identical in diameter to the one just placed in Weymouth and pressurized to a comparable psi, exploded within 2 miles of the Delmont compressor station, sending a fireball hundreds of feet into the air, leveling a house and stripping utility poles of phone cables and power lines. The radius of the explosion, at 0.25 miles, was twice the estimated PIR. It scorched 40 acres of farm fields. One man was taken to the ER with severe burns requiring the partial amputation of a leg and spent months in the hospital; his house was decimated. The fire melted the siding of three other houses. The [fire rescue team commented](#), “It looks like hell is what I'd compare it to. The phone, the cable lines...burned off... all the telephone poles. It looks like a bomb went off.”² The fire

² Available at:

<https://www.wtae.com/article/it-was-like-looking-into-hell-natural-gas-explosion-sparks-large-fire-in-salem-township/7479756>

was attributed to corrosion of the tape used to weld the joints. The cause of the accident

was similar to the O-ring failure at Weymouth in October of 2020 that led to the leakage of almost 300,000 cubic feet of gas, a leak that officials said could easily have led to an explosion.

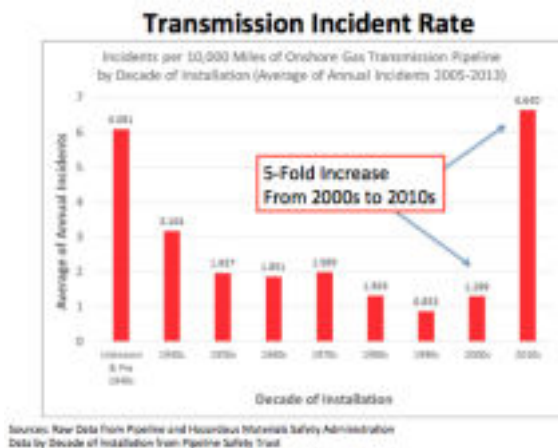
Given that the PIR can be quite inaccurate--as in the above example where it was off by more than two-fold--locating this infrastructure so close to homes is not protective of human health. There are 984 households within a half mile and 3,100 students attend school within a mile of the compressor. Compressor stations are, just for this reason, located in rural areas. The approval of this infrastructure did not adequately take into consideration the risk of severe injury and vast loss of life due to the proximity of residents' habitations and the compounding effect on PIR of nearby explosive industrial infrastructure.

Mr. Donald Deaver, a mechanical engineer with three decades of experience in the pipeline industry, investigated the explosion of a 30-inch pipeline in San Bruno, TX. He commented that too often this infrastructure is located near homes and schools. According to Deaver, "Each one of these is a precursor of what can happen out there. A 30-inch, high-pressure pipeline is capable of creating a zone of death of 700 to 800 feet."³

As concerning, newer pipelines appear to be more susceptible to explosion than even the very oldest pipelines. According to a study by the Pipelines Hazardous Materials Safety Administration (PHMSA), when analyzed by decade of installation, there has been a five-fold increase in transmission pipeline explosions or "incidents" since the early 2000s (Figure 1); even more concerning, industry has no explanation for why this should be the case. The two accidents at the Weymouth compressor would appear to corroborate these data: a compressor not yet put into service suffered two major accidents in its first 100 days despite the fact that the infrastructure was newly installed.

³ Pittsburgh Tribune, "Salem Township neighbors, land heal year after pipeline explosion", available at <https://archive.triblive.com/local/westmoreland/salem-township-neighbors-land-heal-year-after-pipeline-explosion>

Figure 1. Transmission Incident Rate (by decade of installation)



2. **Climate and geophysical hazards.** The entire site is located in a known hurricane floodplain, in an area already known to be susceptible to active flooding. It is also located on a man-made promontory made out of coal ash and petroleum products. As a man-made piece of land, it is subject to geologic phenomenon known as subsidence, or the gradual caving in or sinking of an area of land. The three processes--subsidence, the known rising sea levels due to climate change, and the location in a known flood zone--will work together synergistically to make this an exceptionally unstable and unsafe location for this highly explosive infrastructure.

3. **No means of evacuation.** There is no way to safely evacuate this area. In the event of an explosion, the massive Fore River Bridge would be compromised since the base and pylons of the bridge are also in the PIR. There is only one major road that offers ingress and egress; and according to first responders from the area, inhabitants would be trapped in a dangerous and potentially life-threatening situation. A safety assessment was promised in a letter from Governor Baker to local elected officials before project approval but the promised safety assessment, calculating, for example, the additional effect of nearby explosive infrastructure on PIR, was never carried out.

4. **Accidents.** Two major accidents have already occurred at the facility, one resulting in the release of over 300,000 cubic feet of gas due to an O-ring failure, the other, due to a failure in the emergency shutdown system. This infrastructure is at high risk of becoming a preventable human tragedy as historic as the failure of the O-rings on the space shuttle Challenger. The intended operating pressure of this compressor is 1,440 pounds per square inch (psi). Since the two accidents at the station, the Weymouth compressor was ordered to reduce pressures by about half. Yet even with a pressure of 720 psi, the calculated PIR is 555ft. Given the thermal energy of such a fire and the proximity of adjacent explosive infrastructure that would likely be ignited, the actual PIR in the event of an explosion would be vastly greater than the calculated PIR.

2. Should the Commission reconsider the current operation of the Weymouth Compressor Station in light of any changed circumstances since the project was authorized? For example, are there changes in the Weymouth Compressor Station's projected air emissions impacts or public safety impacts the Commission should consider? We encourage parties to address how any such changes affect the surrounding communities, including environmental justice communities.

The following issues have come to light since the FERC approval of this project, viz:

Environmental justice communities and health impacts. The surrounding communities include vulnerable populations. Within 1.5 miles of the compressor station, lie communities *IN THE TOP QUARTILE STATEWIDE FOR:*

- Oral and pharyngeal cancer
- Lung cancer
- Hodgkin's Lymphoma
- Laryngeal cancer
- Leukemia
- Non-Hodgkin's lymphoma
- Asthma hospitalization
- COPD ER visits and hospitalization
- Heart attack rates
- Nonwhite population
- Over 65, under 5
- Population density
- Lowest median quartile income

This fact raises **significant environmental justice concerns**: the compressor is located in an area that includes two environmental justice tracts in the highest quartile for lower median household income and thus higher poverty level than the state as a whole; highest quartile for population density; and large immigrant communities and communities of color.

Elevated cancer rates. Two adjacent communities, Germantown and Quincy Point, are designated environmental justice areas. According to the health impact assessment performed by the Commonwealth of Massachusetts, the lung cancer rates in the two Environmental Justice census tracts of the Fore River Basin are already 39% higher than the rest of Massachusetts, while the risk factors cited in the report for said cancers (smoking) are similar to those in the rest of Massachusetts.

Within 1.5 miles of the compressor station, lie communities in the top quartile of the state for six types of cancers, heart attack rates, and COPD and asthma hospitalizations. Cancer risk for the Fore River Basin, calculated using data collected by MassDEP, ranges from

74.3-110 total cancer risk per million, which exceeds the Massachusetts Contingency Plan threshold of 10 per million.

These data substantiate **significant concerns that environmental justice communities’ existing health inequities were ignored in the siting of the compressor station.**

Benzene and other air toxics: elevated risk for cancer and respiratory disease. Since FERC issued the permit for the compressor station in 2017, air monitoring in the Fore River Basin conducted by the Massachusetts Department of Environmental Protection has revealed levels of air toxics elevated above state regulatory thresholds. **FERC may not have been aware** that existing levels of air toxics such as Group 1 carcinogen benzene is already elevated above regulatory levels in that area; in the case of benzene, at 400% above regulatory levels. This is pertinent to this case because benzene is a Group 1 carcinogen that is known to exert health effects at every level of exposure. The Weymouth compressor station, according to the GBPSR analysis, “will be the most significant emitter of seven air toxics in the Fore River basin” and the second largest benzene emitter. The size of this compressor station, at 7,700hsp, is average for the US. The following table from the GBPSR report is illustrative:

Figure 2: Weymouth Compressor Station will be a significant emitter of toxics

Table 6. Average emissions from U.S. natural gas compressor stations compared to emissions from 14 NEI facilities in Braintree, Weymouth, and Quincy.

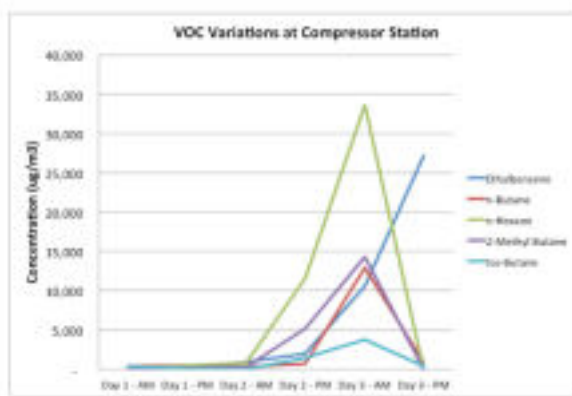
Pollutant	Average Emissions from U.S. Compressor Stations (in tons)	Ranking Among All Sources in Braintree, Weymouth, and Quincy ⁴³	Emissions from the Next Largest Source (in tons)
1,3-Butadiene	0.07	1/4	0.0002
Acetaldehyde	0.67	1/5	0.011
Acrolein	0.59	1/6	0.002
Benzene	0.18	2/9	0.003
Ethylbenzene	0.03	3/6	0.009
Formaldehyde	3.8	1/8	0.2
Naphthalene	0.01	2/9	0.0004

For four of these seven air toxics (1,3-butadiene, acetaldehyde, acrolein and formaldehyde), a compressor station with the average U.S. compressor station emissions located in the Braintree-Weymouth-Quincy area would rank **first** among all facilities in the area – emitting up to 350 times more of certain air toxics than the next largest source in the Fore River Basin. For the other three air toxics, it would rank second or third. Therefore, if the proposed compressor station emissions are comparable to the average emissions of U.S. compressor stations, **the proposed facility will be among the most significant emitters of these seven air toxics in the Fore River Basin.**

According to these data, the Weymouth compressor would be the #1 emitter in the area of formaldehyde, another Group 1 carcinogen. Benzene will be emitted 24 hours a day by this

facility, and at times of blowdowns, at markedly higher levels than normal operations. This is important, because **average emissions numbers hide peak values seen during blowdowns**. As illustrated in the graph below, benzene is one of the top emitters at compressor stations, and acute health impacts (burning eyes and throat, skin irritation, bloody nose, and headaches) are strongly associated with peak exposures.

Figure 4. **Data on average emissions numbers hide high peak values seen during blowdowns.**



Source: Human Exposure to Unconventional Natural Gas Development, [J Environ Sci Health A Tox Hazard Subst Environ Eng](#) 2016

Blowdowns constitute the large scale release of gases from compressor stations in response to a dangerous buildup of pressure. On average, one blowdown emits 15 million cubic feet of gas into the atmosphere. Over one year, compressor station emissions create 118 peak exposure levels. Environmental Protection state hearing officer Janet Rothschild in June 2019 ordered the Company to limit compressor station blowdowns to two per year. However, since blowdowns must by definition be carried out both as an emergency release of pressure as well as in routine maintenance, how this stipulation can be adhered to in practice is not clear.

In sum, the Weymouth compressor station introduces additional risk to the health and safety to one of the most vulnerable, economically disadvantaged populations in the state and will only deepen health inequities.

Air pollution and vulnerable populations: increased mortality from respiratory and cardiac disease. People most at risk of health complications from breathing polluted air include children, older adults and people who have underlying health conditions like asthma and COPD. This area is in the TOP quartile of the state for percentages of residents over age 65, under age 5 AND for rates of COPD and asthma. Children are more sensitive to air pollution than healthy adults because they have a higher lung surface to body weight ratio, higher breathing rates and are more

active and spend more time outdoors than adults; they are also more vulnerable because they have developing respiratory and immune systems. The 3,100 children who live and go to school within a mile of the compressor will therefore be exposed to higher levels of air pollution and be at higher risk of respiratory illnesses--particularly given the fact that 12.5% of those children have asthma. Another air pollutant, particulate matter, will be emitted from the compressor station on a daily basis; like benzene, it is classified by WHO and the IARC as a Group 1 carcinogen, and has known neurologic, cardiac, and respiratory disease impacts.

A flawed health impact assessment: known health impacts ignored. Prior to issuing the Air Quality Permit in Massachusetts, the Governor called for a Health Impact Assessment (HIA). The Health Impact Assessment (HIA) conducted by the Metropolitan Area Planning Council (MAPC) found that there would be deleterious impacts on the health of the environmental justice communities abutting the project, and that these should be considered; but this data was *deleted from the final report*.⁴ For his Boston Globe spotlight article, reporter Mike Stanton used a FOIA to determine that the HIA initially included a statement to the effect that “the “public health implications” of continued investments in gas should be considered — and “to integrate more

⁴Boston Globe, “In Weymouth, a brute lesson in power politics,” available at <https://www.bostonglobe.com/2020/12/12/metro/was-it-ever-fair-fight/> health-protective considerations into permitting gas facilities”--particularly environmental justice considerations. “But,” he writes “*that paragraph was deleted from the final report.*” (<https://www.bostonglobe.com/2020/12/12/metro/was-it-ever-fair-fight/>)

An independent review of the HIA by Public Health by Design concluded that the HIA did not properly consider the cumulative health effects of the respiratory carcinogens that would be emitted by the compressor. It concluded that the HIA failed to include a quantitative analysis of the *combined* pollutant burden on cancer risk, non-cancer risk, and all-cause mortality using EPA risk estimates. In a formal statement, the MAPC stated its opposition to the construction of this compressor station both on safety grounds, due to lack of an evacuation plan or any formal consideration of safety concerns, and for its additional contribution to climate change, and has emphasized that MAPC was *not* tasked with evaluating the safety or climate risks of this location.

In sum: the Weymouth compressor station represents an unacceptable risk to public health. GBPSR public health experts and advocates, including Dr. Philip Landrigan, Dr. Douglas Dockery, Dr. Richard Clapp, Dr. Matt Bivens, Dr. Regina LaRocque, Dr. Kea Van der Ziel and Dr. Brita Lundberg, have testified to the Massachusetts EEA, DEP and DPH that the operation of this compressor station in North Weymouth, MA poses significant hazards to public health. Daily emissions and blowdowns emissions from the compressor will release carcinogens, oxides of nitrogen and VOCs that become smog. These known respiratory irritants exacerbate asthma, have

the potential to cause cancer and will affect many living within the airshed of the compressor, a 10-mile radius; these emissions will not just impact those living in the vicinity, but those crossing the Fore River Bridge and especially the many children who live and attend schools nearby.

Please see the three attached GBPSR reports below on the health and safety impacts of the proposed compressor.

3. Are there any additional mitigation measures the Commission should impose in response to air emissions or public safety concerns?

The Commission should reverse its approval of this project because there is no way to allow it to go forward that would be protective of the health and safety of the surrounding communities. Locating this compressor station in a dense urban area whose population is already burdened with high rates of respiratory illness and cancer is a threat to the health and safety of thousands of people in the surrounding communities, including two environmental justice tracts.

None of the potential mitigation strategies is sufficient to ensure that this compressor station can safely operate, given its highly exposed location to flood zones and other explosive infrastructure. The mitigation measures that have been proposed include: increased monitoring, emission controls, noise and vibration (LFN) controls, home value compensation, establishment of baseline resident health and ongoing monitoring, independent baseline testing of air, water and noise pollution, automated notification call system with 48 hour notice of planned events and updates on any issues and emergencies, confirmation of MAOP, determination of pipe diameter and wall thickness of pipeline, current operating pressure, enacting all PHMSA rules, requiring use of best available engineering practices, requiring an electric-driven compressor or enforcement of new station efficiency requirements, and listing all the transmission leaks.

None of these potential mitigation strategies, however, is sufficient to reduce the risk of explosion nor can these strategies reduce the air pollution that already exceeds regulatory thresholds in the area. None of these strategies can ensure that this compressor station can be safely made operational given its highly exposed location adjacent to multiple explosive infrastructure. Its daily emissions and blowdown emissions will increase morbidity and mortality in a community already in the top quartile of the state for serious health conditions in an area that already experiences high levels of air toxics in excess of state regulatory levels. According to statements by gas utilities National Grid and Eversource, the natural gas from the compressor station is not needed in Massachusetts. State projections for gas use are declining in this state and in Maine. The danger to thousands of people in the Commonwealth far outweighs the need for an infrastructure that poses unacceptable risks to this densely populated area and to the environmental justice communities living in the shadow of the compressor.

4. What would the consequences be if the Commission were to stay or reverse the Authorization Order?

The health of the entire community would benefit were the Commission to reverse the Authorization Order. In the Fore River Basin, thousands of people living within the airshed of the compressor station would be safer and healthier.

This project is unnecessary; it is dangerous to the public's health; and it poses unacceptable safety risks to a vulnerable community.

There is currently no need in Massachusetts for the increased levels of natural gas that this compressor makes available: projections for gas use in Maine and Massachusetts show that use of gas is in decline. There would be no adverse effect on people in the Commonwealth currently using natural gas to heat their homes and cook. In the Fore River Basin, thousands of people living within the airshed of the compressor station would be safer. Additionally, the Commonwealth of Massachusetts could make use of this opportunity to address the known existing elevated levels of air toxics that put people in the Fore River Basin at higher risk for respiratory disease and cancer, very serious health concerns that it identified in its own Health Impact Assessment. Mobilizing the public health department to address the very serious consequences of existing air pollution rather than increasing those levels is particularly critical in light of the COVID-19 pandemic and the observed association between areas of high air pollution and increased mortality from COVID-19.⁵

III. CONCLUSION

For the reasons set forth herein, the Commission should suspend operations of the facility and grant the Petitioners' request for rehearing on the issues identified.

Respectfully submitted,

**Brita E. Lundberg, M.D.
Chair of the Board, Greater Boston Physicians for
Social Responsibility,
on behalf of GBPSR**

April 2nd, 2021

Attached: Three reports by Greater Boston Physicians for Social Responsibility detailing the manifold health, safety, and climate risks of the Weymouth Compressor station.

- 1. A report examining the flawed health impact assessment: [A Comprehensive Assessment of the Potential Human Health Impacts of a Proposed “Natural” Gas Compressor Station in Weymouth, Massachusetts](#) September 24, 2019**
- 2. Climate and Safety report: [Public Safety Report on Proposed Weymouth Compressor](#), May 13, 2019**
- 3. [Health Risks of a Proposed Compressor Station in Weymouth, Massachusetts](#), February 7, 2019**

Additional references:

⁵Liang D, et al. Urban air pollution may enhance COVID-19 case-fatality and mortality rates in the United States. *Cell*: 10/8/2020.

Weymouth Compressor Has Emergency Shutdown Just Days after Starting Testing. September 13, 2020.

<https://www.patriotledger.com/news/20200913/weymouth-compressor-station-has-emergency-shutdown-just-days-after-starting-testing>.

Russo PN, Carpenter DO. Health Effects Associated with Stack Chemical Emissions from NYS Natural Gas Compressor Stations: 2008–2014. Southwest Pennsylvania Environmental Health Project 2017. https://www.albany.edu/about/assets/Complete_report.pdf.

WHO. Air Pollution and Child Health: Prescribing Clean Air. 2018.

<https://apps.who.int/iris/bitstream/handle/10665/275545/WHO-CED-PHE-18.01-eng.pdf?ua=1>.