Response to Comments on MassDEP's Preliminary BACT Determination on the Weymouth Compressor Station

Background

On October 22, 2015 Algonquin Gas Transmission, LLC ("Algonquin") submitted to the Massachusetts Department of Environmental Protection ("MassDEP") a Non-Major Comprehensive Plan Application for the installation and operation of a natural gas compressor station ("Project") to be located at 50 Bridge Street in Weymouth, Massachusetts ("Facility").

On January 11, 2019, MassDEP issued a Non-Major Comprehensive Air Quality Plan Approval ("Plan Approval") to Algonquin. The Plan Approval was appealed by six Petitioners and an adjudicatory hearing was held over four days in May and June 2019. The Presiding Officer issued a Recommended Final Decision ("RFD") on June 27, 2019 upholding the Plan Approval and the Commissioner of MassDEP issued a final decision on July 12, 2019 affirming the RFD. MassDEP issued a final Plan Approval on August 26, 2019.

Under the Natural Gas Act, Petitioners challenged the final Plan Approval at the United States Court of Appeals for the First Circuit ("First Circuit"). On June 3, 2020, the First Circuit vacated the Plan Approval and remanded the case to MassDEP for consideration of an electric motor drive ("EMD") as Best Available Control Technology ("BACT"). On August 31, 2020, the First Circuit granted Algonquin's Motion for Rehearing and remanded the Plan Approval to MassDEP on the BACT issue, without vacating it.

On July 24, 2020, Algonquin submitted to MassDEP an addendum to the BACT analysis, which considered the use of an EMD as BACT. Additionally, Algonquin considered whether the use of an EMD would redefine the source.

On August 7, 2020, MassDEP issued a proposed determination that the use of an EMD does not represent BACT because the use of an EMD would redefine the source, and even if considered in the BACT analysis, it is not cost-effective.

Pursuant to MassDEP Commissioner's Remand Order (June 12, 2020) and MassDEP Commissioner's Interlocutory Orders Adopting Presiding Officer's Determination and Proposed Remand (June 24, 2020), the proposed determination was subject to a 30-day public comment period, which concluded on September 8, 2020. Public comment was limited to issues in the BACT addendum, specifically: 1. whether the use of an EMD represents BACT and 2. whether the use of an EMD redefines the source in the context of BACT.

MassDEP received 234 timely comments. Please see Attachment A for a list of commenters. This response to comments document ("RTC") summarizes all comments sent to MassDEP through email and U.S. mail and MassDEP's responses to those comments. Each comment is presented and addressed, and paraphrased where appropriate. Where several commenters submitted the same comments the comments are addressed only once.

For MassDEP's responses to the letters from the Town of Weymouth dated August 4, 2020 and August 6, 2020, see the pre-filed direct testimony of Thomas Cushing at https://www.mass.gov/lists/revised-bact-assessment-proposed-determination-algonquin-natural-gas-compressor-station

The following comments were submitted relative to an Electric Motor Drive ("EMD") as Best Available Control Technology ("BACT")

General BACT Comments

Comment 1:

- Regarding the BACT, why has Enbridge not explored the electric motor drive versus the gas fired one?
- How is a zero emissions electric motor not BACT?
- An EMD has zero point-source emissions.
- An electric motor drive would cause fewer emissions than a diesel motor.
- Given the unusually high density area of the location of this compressor station, why would an EMD not be considered high priority as cleaner technology with more viable, commercially proven backup systems as Best Available Technology?
- With all the available scientific facts pertaining to climate change to consider, it would be irresponsible to pursue any infrastructure project without using the technologies that are most sustainable and produce the smallest possible amount of climate altering gases. We are past the 11th hour. There is no more time to be wasted in dithering. An EMD (electric motor drive) would produce fewer emissions than a diesel motor, and so should be the obvious choice for this project, if it must proceed.
- Electric Drive Motors (EMD) are used in other compressor stations that are sited in even more rural areas than Weymouth. This should have been demanded from the start from FERC and MassDEP. The fact of the matter is that Algonquin/Spectra wants to set a new precedence for future compressor stations by showing that they built a traditional compressor station in a highly populated region. If anyone had any ounce of regard for the residents in the Fore River Basin area, they had every opportunity over the past 6 years to tell Algonquin to do it. Quite frankly, as an elected leader in Weymouth, it has been extremely frustrating to have to continue to fight for basic rights such as clean air for my constituents for over five years now. As people sit in Lakeville and continue to approve this compressor station without giving us the very best available technology to ensure the cleanest environment, the only true people who get hurt are those of us who live here. I feel that MassDEP is more concerned about Algonquin's project shippers and bottom line figures than then people that their agency is supposed to help protect.
- EMD is BACT.
- The Addendum does not clearly show why EMD is not BACT.

MassDEP response: MassDEP was directed by the First Circuit Court of Appeals ("the First Circuit") and the Office of Appeals and Dispute Resolution ("OADR") to determine whether the

use of an EMD represents BACT, specifically taking into consideration cost effectiveness. In addition, MassDEP was directed to take into consideration the issue of whether an EMD would "redefine the source," if Algonquin made that argument, which it did.

Several commenters pointed out that an EMD has zero emissions, and asked why that would not be considered BACT. An EMD is not considered BACT because it was determined to not be cost effective based on the results of an analysis conducted in accordance with the procedures in MassDEP's BACT Guidance. A Top-Down BACT analysis is conducted in a 5-step process, namely, 1: Identify all control technologies, 2: Eliminate technically infeasible options, 3: Rank remaining control technologies by control effectiveness, 4: Evaluate most effective controls and document results, 5: Select BACT. An EMD must be evaluated following these steps and in accordance with MassDEP's regulations, BACT guidance, and the United States Environmental Protection Agency's (EPA) BACT guidance.

The BACT addendum submitted by Algonquin to MassDEP on July 24, 2020 ("Addendum") presented the results of a BACT analysis for an EMD, which was conducted in accordance with MassDEP's regulations and guidance and EPA's BACT guidance. Since the BACT analysis was limited in this case to an EMD, it was identified as the only additional "control technology" under step 1. However, MassDEP determined that an EMD is properly excluded in Step 1 of the BACT analysis because it would "redefine the source." For more details, see responses below in "Comments relative to redefining the source". Despite this determination, MassDEP did conduct a BACT analysis for an EMD as directed by the First Circuit and OADR.

Under step 2 of BACT, MassDEP did not eliminate an EMD as technically infeasible. Under step 3, because an EMD has no emissions MassDEP ranked an EMD higher in control effectiveness than the combustion turbine. Under step 4, based on MassDEP's review of the information contained in the Addendum and its own independent analysis, MassDEP found that the use of an EMD does not represent BACT because, even without consideration of capital costs, the cost of an EMD would be $192,505 per ton of nitrogen oxides ("NOx") controlled, which exceeds the cost effectiveness range of $11,000 to $13,000 per ton of NOx controlled as established in MassDEP's June 2011 Best Available Control Technology ("BACT") Guidance. The cost of an EMD with capital costs would be $233,764 per ton of NOx controlled. To review additional details of MassDEP's BACT analysis, see the pre-filed direct testimony of Thomas Cushing at https://www.mass.gov/lists/revised-bact-assessment-proposed-determination-algonquin-natural-gas-compressor-station.

Comments relative to top-case BACT determination

Comment 2:

- DEP staff correctly rejected Algonquin's assertion that an EMD is top-case BACT based on recent air quality plan approvals.

  MassDEP response: MassDEP agrees with this comment.

Comment 3:

- Once again, the Massachusetts DEP is choosing to ignore public health imperatives in favor of a corporate applicant's convenience. The DEP should insist on an electric motor drive (EMD) because it is the best available control technology (BACT) for this site. The DEP has an opportunity to select a BACT to mitigate public health impacts by reducing compressor emissions. The Agawam and the Hopkinton sites are distinguishable and therefore do not apply in a "top case" analysis. The DEP ignores the geographical and meteorological configuration of the Weymouth compressor site. The Weymouth compressor is on a small parcel of just 4.3 acres. The parcel is situated in a densely populated residential area beneath a bridge with a heavily traversed 4-lane roadway. The parcel is coastal land subject to inundation during a category 1 hurricane. The parcel is in a FEMA flood zone subject to coastal inversion, which causes emissions to be trapped close to the ground.
- Algonquin is making the argument that because they did not consider the EMD ("source") in the initial BACT process that required them to identify all possible control technologies in a Top Down BACT evaluation, then Algonquin was not required to consider anything other than what they had concluded they wanted in the first place, i.e. the Solar Taurus 60 gas fired turbine. Therefore, their reliance on Top Case evaluation in Agawam and Hopkinton is invalid because they did not identify all possible control technologies in the beginning as required. Further, Agawam is not a new facility, but is an existing compressor station that is being upgraded. It is conceivable that the Solar Taurus 70 proposed for that facility is, in fact, better that the older technology in place. This does not mean that it is BACT for the Weymouth station. The argument put forth by Algonquin is nonsensical.
- Using Agawam and Hopkinton facilities as Top Case evaluation is deeply flawed because of geographical, meteorological, and demographic differences. Agawam and Hopkinton are both land-locked on many more acres and are in rural areas. They are not subject to coastal zone inversion, which captures pollutants and holds them close to the ground. They are not in flood zones subject to inundation in a category 1 hurricane. They do not have the level of existing industrial infrastructure that is found in the Fore River Basin. Just because the DEP allowed Enbridge to get away with using Grey, Maine as a comparable weather study in regards to wind (Grey is 45 miles inland), does not mean that the Top Case evaluation can be misconstrued in the same manner.

MassDEP response: A BACT proposal by the applicant, and a BACT determination by MassDEP, are required for all Limited and Comprehensive Plan Applications. BACT is established using a top-down BACT analysis which is a five-step process that takes into account the following: 1: Identify all control technologies, 2: Eliminate technically infeasible options, 3: Rank remaining control technologies by control effectiveness, 4: Evaluate most effective controls and document results, 5: Select BACT. In lieu of a top-down BACT analysis, an applicant may propose an emission control limitation by proposing a top level of control from the most recent plan approval or other action issued by MassDEP (top-down BACT).

In its original plan approval application, Algonquin included a top-down BACT Analysis and the Addendum supplements that top-down BACT analysis with regard to an EMD, as directed by the First Circuit, the Commissioner and the Presiding Officer. Therefore, a top-case BACT analysis is not relevant to MassDEP's BACT determination.

Comments Relative to Redefining the Source

Comment 4:

- An EMD does not redesign the project because it does not disrupt the Compressor Station's basic business purpose. Algonquin's Atlantic Bridge Project is for the construction of multiple facilities that will enable its interstate natural gas pipeline to transport gas from points south to points north. The transportation of natural gas pursuant to contracts with shippers is Algonquin's business purpose for that Project. The Weymouth Compressor Station is one of the facilities that comprise that Project. Its purpose is thus coterminous with the Atlantic Bridge Project: to transport natural gas for shippers, with the Compressor Station's specific role to generate and inject hydraulic pressure into the interstate pipeline for the transportation of natural gas. An EMD would not disrupt that business purpose because that purpose is served no matter the means—an EMD, a combustion turbine, or something else—used to drive the compressor to generate that pressure. Indeed, Solar—the manufacturer of the SoLoNOX combustion turbine that Algonquin seeks to use—manufactures an EMD intended to function as a seamless substitute for the proposed combustion turbine on the exact same compressor. Requiring use of a Solar EMD that can easily be substituted in place of a SoLoNOX combustion turbine would not compromise the basic business purpose for this compressor station and would therefore obviously not be a project redesign.

MassDEP response: MassDEP determined that an EMD would redefine the source. The air pollution control regulations do not give MassDEP the role of determining what type of facility or emission unit will be built or the role of dictating the design and scope of a proposed facility or emission unit through the BACT analysis. Instead, MassDEP looks to the applicant to define a proposed facility's or emission unit's purpose and basic design in its plan application. Based on the emissions unit proposed, MassDEP determines what is the best available control technology that can be applied to that emissions unit. Algonquin proposed a natural gas fired combustion turbine designed to combust a portion of the natural gas that it is compressing to achieve the purpose of increasing gas pressure in the pipeline at the facility location. An EMD requires a completely different design compared to a combustion turbine and would not achieve the purpose of using the readily available natural gas flowing through the facility as fuel to power the compressor.

Comment 5:

- Even if an EMD were a project redesign, DEP should exercise its discretion to consider an EMD as an available control technology. Here, there are compelling reasons for the exercise of that discretion. First, exercise of discretion in this fashion is justified based on the additional NOX emission reductions from use of an EMD. Using an EMD would achieve an onsite NOX emissions reduction of 10.03 tons per year ("tpy"). As DEP knows, NOx is both responsible for adverse health effects as an air pollutant and also acts as an indirect greenhouse gas through photochemical reactions in the atmosphere. Where an EMD will eliminate NOX emissions—a significant reduction compared to those emissions from a SoLoNOX turbine—DEP's exercise of its discretion to include it at Step 1 of Top-Down BACT analysis is certainly warranted. Moreover, the proposed natural-gas-fired compressor emits a range greenhouse gases. Eliminating these emissions is important because the Global Warming Solutions Act (GWSA) requires statewide greenhouse gas emissions reduction targets of 10 to 25 percent by 2020 (from a 1990 baseline) and 80 percent by 2050. M.G.L. c.21N, §3. The GWSA also requires reduction targets for 2030 and 2040 that are consistent with the 2050 goal, although these have not yet been set. In April 2020, Governor Baker announced that net zero greenhouse gas emissions is the legal emissions limit for 2050, and that statewide emissions must decrease by at least 85 percent by 2050 (from the 1990 baseline). The GWSA's 85 percent emissions reduction by 2050 requirements means that state-wide emissions must drop from 94.5 million metric tons (MMT) of carbon dioxide "equivalents" (CO2e) in 1990 down to 14.2 MMT in 2050. Today, the Commonwealth's use of natural gas in homes and businesses—not including gas used to generate electricity—results in emissions of about 13 MMT statewide each year. By 2050, the heating and transportation sectors, together, must share a 4.8 MMT budget. The Commonwealth's gas system cannot continue business-as-usual and comply with the GWSA. Any proposal that does not work towards the legally required decrease—such as Algonquin's gas-fired turbine—is fundamentally at odds with the scale of energy transition needed to comply with the mandates of the law. DEP staff's apparent decision not even to contemplate an exercise of its discretion to include an EMD at Step 1 of BACT analysis is unjustified considering the significant NOX reductions and related air pollution benefits that an EMD would achieve.

  MassDEP response: MassDEP did consider an EMD in its BACT analysis. Based on MassDEP's review of the information contained in the Addendum and its own independent analysis, MassDEP found that the use of an EMD does not represent BACT because, even without consideration of capital costs, the cost of control for NOx would be $233,764 per ton , which exceeds the cost effectiveness range of $11,000 to $13,000 per ton of NOx controlled as established in MassDEP's June 2011 Best Available Control Technology ("BACT") Guidance.

Comment 6:

- Did Algonquin consider onsite solar or other behind-the-meter generation options in order to mitigate natural gas delivery disruptions during a power outage? (Town of Weymouth letter, August 6, 2020)

- Can you provide analysis of onsite solar, battery, flywheel, or storage and other behind-the-meter generation options to mitigate natural gas delivery disruptions during power outage and upstream emissions?
- If Algonquin were to install an EMD, then natural gas delivery to the Maritimes system would cease during a power outage, preventing the delivery of natural gas from south of the compressor station to points north. How often in the 20 years of service of the I-9 and I-10 in Weymouth has the power been disrupted? Has it affected the ability of the metering and regulating station in the same area from operating?
- Also, according to the addendum, "The Facility will provide critical compression needs and a step-up in pipeline pressure for reliable delivery to the Maritimes system. If Algonquin were to install an EMD, then natural gas delivery to the Maritimes system would cease during a power outage, preventing the delivery of natural gas from south of the compressor station to points north." What would be the background of the assumption on complete cease of operations with power outage. Will there be citing data and incidents on operation disruptions of metering and regulating stations from the same area?

MassDEP response: MassDEP did not consider onsite solar or other behind the meter generation options that could support an EMD during a power outage. Even if such options were viable MassDEP determined that an EMD would redefine the source since an EMD requires a completely different design compared to a combustion turbine and would not achieve the purpose of using the readily available natural gas flowing through the facility as fuel to power the compressor. See pre-filed direct testimony of Glenn Keith at https://www.mass.gov/lists/revised-bact-assessment-proposed-determination-algonquin-natural-gas-compressor-station.

Comment 7:

- Algonquin's reliance on "reliability" to justify design choices that inflate costs are also improperly cabined to an unsubstantiated concern that unexpected disruptions in the electrical grid will disrupt operation of the EMD. Algonquin supplies no data to quantify that such disruptions are to be expected, much less frequent; provides no significant analysis of engineering options to mitigate their impact; and fails to take into account that an EMD is a more reliable technology than combustion, meaning that use of an EMD will minimize all service disruptions during the equipment's lifetime, when accounting for maintenance, operating breakdowns, and other factors.

MassDEP's response: MassDEP did not rely on Algonquin's arguments regarding system reliability in its determination that an EMD would redefine the source.

Comments Relative to Environmental Impacts

Comment 8:

- How did Algonquin arrive at the fact that upstream emissions would be greater with the EMD? Stating that emissions from power generators needed to run the EMD would, overall, be greater that the emissions from the one turbine does not take into consideration that most new energy sources going into power generation are wind and solar—near zero emission sources. Also, including upstream emissions is outside of the boundary of the BACT consideration since BACT is only looking at the one facility.
- Algonquin's Use of "Indirect Emissions" for an EMD should be Rejected. Algonquin includes, as part of its analysis, indirect emissions that it asserts should be used to evaluate the EMD alternative, such as those from transmission line losses from the point of electric generation to the Compressor Station. It is unclear whether DEP staff relied on this portion of Algonquin's analysis but, in any event, it should not do so. First, Weymouth is unaware of any other DEP BACT determination that engages in such an indirect emissions analysis. Nor is Weymouth aware of any DEP regulation, policy, or other sub-regulatory guidance concerning such an analysis. No reason has been given for DEP to break new ground here, and staff should not do so. Second, and in any event, Algonquin once again inconsistently advances analysis across its Air Quality Plan Approval application to serve its own ends. Nowhere in its BACT analysis for the other alternative does Algonquin engage in this type of analysis. For example, Algonquin has not considered the indirect emissions associated with obtaining the natural gas fuel needed for the turbine or transporting gas to the turbine. If MassDEP includes indirect emissions in its decision-making on EMD, then Algonquin needs to consider indirect emissions for both technologies for their BACT Top-Down analysis to be complete. This would involve estimating the emissions in facilities owned and operated by others to produce and transport the gas needed to power Algonquin's turbine. Third, any "indirect emissions" analysis, if done, should account for the dynamic nature of the electrical grid's future emissions compared to the static nature of installing a combustion turbine at this facility. As previously noted, the GWSA has set emissions goals and targets that the Commonwealth will implement over the coming decades. In so doing, the Commonwealth's electrical grid will become increasingly green and any indirect emissions that may be linked to an EMD will correspondingly decline. That contrasts with Algonquin's proposed combustion turbine. No matter the Commonwealth's progress in its march toward a greener future, that combustion turbine's emissions will not change. Rather, the turbine will endure as a non-green source of NOX.
- The BACT Analysis states that installing an electric motor drive (EMD) instead of a natural gas-fired turbine would "cause substantial upstream air emissions" (p. 4-8),

  MassDEP response: MassDEP agrees that consideration of "indirect emissions" or "upstream emissions" is inappropriate in this BACT analysis. Algonquin identified the environmental impacts of the EMD as "[a]n increase in indirect air emissions (from the upstream generation of

electricity); [a]n increase in the amount of land disturbed; and [t]he creation of new permanent visual and noise impacts."[1]

As part of its environmental impacts analysis Algonquin quantified upstream air emissions of NOx and SO_2 for the EMD option and compared them to emissions from the SoLoNOx Taurus 60 natural gas fired turbine.[2] The emissions were established using EPA emission factors for the New England subregion, which takes into account the mix of fossil fuel and renewable power generation sources.

MassDEP did not rely on the assessment of upstream air emissions in its BACT determination because the environmental impacts associated with a facility's air emissions are more appropriately based on impacts to ambient concentrations, which are addressed through an air quality impact analysis (emissions modeling). EPA's New Source Review Guidance clearly addresses this issue by stating "[t]he environmental impacts analysis is not to be confused with the air quality impact analysis (i.e., ambient concentrations), which is an independent statutory and regulatory requirement and is conducted separately from the BACT analysis."[3]

- **Comment 9:**The BACT analysis states "[g]iven the existing facilities on the site, the only location where these facilities could be located would be in the southwest portion of the site, which has a large wetland system associated with Worthington Brook" (Appendix A, p. 8 of 50). Where is the proof of this statement? Is there another possible location for these facilities? (quoted from Town of Weymouth letter, August 6, 2020)

  I did some research and there is no Worthington Brook in North Weymouth, it is located at the Agawam Compressor Station Site. Why is this being used as evidence for wetlands and other impacts for the Weymouth Compressor Station, considering the North and South Parcels are mainly uplands?

- Incidentally, the BACT analysis states in Appendix A, p. 8 of 50, "[g]iven the existing facilities on the site, the only location where these facilities could be located would be in the southwest portion of the site, which has a large wetland system associated with Worthington Brook". Worthington Brook is not in Weymouth, but in Agawam, near the site of Tennessee Gas' proposed compressor station expansion. It appears that MassDEP has cut and pasted arguments from one permitting process into another, this one being a glaring factual error. It causes one to wonder how many other points have been cut and pasted from other proceedings, rather than being based on the actual situation at the Weymouth site. I ask that the First District Court vet the assertions made by both MassDEP and Enbridge to assure that they are fact-based.

[1] Amended Addendum to Non-Major Comprehensive Plan Approval Application, Section 4.4.2
[2] Amended Addendum, Table 4-4, page 4-10
[3] EPA NSR Workshop Manual, page B.46.

- Wetlands are crucial for mitigating climate emergencies due to flooding. So, of course, Algonquin wants to put the EMD there!

  MassDEP response: Discussion of Worthington Brook is in the context of the air plan approval for Tennessee Gas Pipeline, issued by MassDEP on January 24, 2020. A copy of the Tennessee Gas Air Plan Approval was included in an appendix to support Algonquin's assertion that BACT for the Facility is based on a "top-case" BACT determination. Wetland issues relative to Worthington Brook pertain solely to Tennessee Gas Pipeline and are not relevant to Algonquin's BACT analysis.

Comments Relative to Project Costs

Comment 10:

- Where is the independent cost estimates from National Grid or Eversource who have major transmission infrastructure close to the property?

  MassDEP response: Algonquin obtained three estimates for the high voltage transmission line which ranged from $8.4 to $8.5 million. These estimates were received from Dashiell Corp., J.L. Allen Services, Inc., and McCourt Construction. Details of these estimates can be found in the pre-filed direct testimony of John Heintz located at https://www.mass.gov/lists/revised-bact-assessment-proposed-determination-algonquin-natural-gas-compressor-station

Comment 11:

- Algonquin proposes construction of a high voltage (115-kV) transmission line from the Edgar substation at the Fore River Energy Center to the Compressor Station to supply electrical power to an EMD. Algonquin, however, provides only conclusory support for that choice over using a medium voltage (13.8-kV) transmission line, which would be sufficient to meet the electrical needs of the make and model EMD it proposes (Solar Spartan EMD Compressor Set). Algonquin's explanation that a high voltage line is needed for reliability lacks any substantial basis since it does not state any basis for concluding that a medium voltage line would be insufficiently reliable for the Compressor Station.

  MassDEP response: Algonquin provided a response to this issue in their August 7, 2020 response document, https://www.mass.gov/lists/revised-bact-assessment-proposed-determination-algonquin-natural-gas-compressor-station. As part of their response, Algonquin (Enbridge) stated it has exclusively provided high voltage (transmission line) power to support its EMD installations in the US since 2008. A list of ten Enbridge EMD-equipped installations in the US since 2008 and the associated voltage for each project was provided as part of the response. EPA guidance allows for standard industry practice in establishing cost effectiveness by stating "Although permit conditions are normally used to make operating assumptions enforceable, the use of 'standard industry practice' parameters for cost effectiveness

calculations (but not applicability determinations) can be acceptable without permit conditions."

MassDEP's evaluation found that the capital cost associated with the transmission line is not a determining factor in the cost effectiveness analysis, so a comprehensive evaluation of alternatives is not necessary for a study-level analysis associated with a BACT analysis.

Comment 12:

- The underground transmission has a significantly higher cost than above-ground lines. Please provide routes and costs of 13.8-kV and 115kV above-ground lines by National Grid and Algonquin.
- I am concerned that you are inflating the cost of the electric turbine by failing to provide the routes of the underground transmission lines, not providing a less costly above ground transmission line or different levels of electricity transmission lines including 13.8 kV and 115kV lines.
- Algonquin needs to supply the following information: origin point; length of the conductor from the origin point to the Compressor Station; route of the conductor, whether the conductor is an overhead transmission line or underground; and the type (e.g. 477AAC), voltage, and amperage rating of the conductor. (Town of Weymouth letter, August 4, 2020)
- What is National Grid's unit cost to install an underground 13.8-rV transmission line? (Town of Weymouth letter, August 4, 2020)
- What is National Grid's unit cost to install an underground 115kV transmission line? (Town of Weymouth letter, August 4, 2020)
- Algonquin proposes installation of an undergrounded transmission line (leaving aside here the issue of whether a transmission line or a distribution line should be utilized). However, it does not justify the use of an undergrounded transmission line instead of an overhead transmission line. Where even high- voltage transmission lines are commonly installed as overhead lines across the Commonwealth, the absence of such an analysis renders Algonquin's EMD BACT analysis incomplete.
- We require confirmation from Algonquin that the Spartan EMD it proposed for the Weymouth Compressor Station includes an input transformer and request that Algonquin supply 13.8 kV distribution voltage, available from the Calpine substation, to the input transformer. (Town of Weymouth letter, August 4, 2020)
- Where is the map that shows the transmission line routes from Calpine to the compressor station? (Town of Weymouth letter, August 4, 2020)
- Algonquin claims that Calpine "does not have the capacity to provide the level of service that would be required to power the EMD." We require the backup information on how Algonquin arrived at this statement. (Town of Weymouth letter, August 4, 2020)
- The analysis states that the medium voltage line at the Weymouth station will cost $693,764 (Appendix C, Table 2). How was this cost arrived at? (Town of Weymouth letter, August 6, 2020)

MassDEP response: A map identifying the route of the underground transmission line evaluated was provided by Algonquin in their correspondence dated August 7, 2020. https://www.mass.gov/lists/revised-bact-assessment-proposed-determination-algonquin-natural-gas-compressor-station

Algonquin's August 7th correspondence to MassDEP states "Algonquin would require 115kV transmission line power to support an EMD alternative consistent with Enbridge's standard practice." And continues by stating "It is Enbridge's standard practice to utilize federally regulated transmission service for EMDs because it considers that more reliable than distribution service." That correspondence is located at https://www.mass.gov/lists/revised-bact-assessment-proposed-determination-algonquin-natural-gas-compressor-station. In evaluating the possibility of distribution level power, MassDEP considered that Algonquin has consistently used transmission level service in each of their ten EMDs installed since 2008 as standard practice. EPA guidance allows for industry standard practice in a BACT cost analysis. As such, MassDEP did not require further evaluation of distribution level power.

In considering the possibility of above-ground utility lines, MassDEP considered that in order to reach the peninsula where the compressor station is located, any above-ground utility lines would need to cross over private, industrialized property and the Fore-River bridge. Additionally, MassDEP's independent evaluation found that the $8,389,950 cost associated with installing the 115 kilovolt ("kV") underground transmission line did not affect the outcome of the cost effectiveness analysis.

Comment 13:

- Please supply the wholesale electrical rates along with current wholesale gas rates. If comparisons are to be made, the data must be clear.
- How are electric rates calculated and from what sources are those data derived? Are there potential discrepancies in the stated rates and what is the rationale for the rates that are included in the analysis?
- Electric rates as quoted are not realistic in regards to market availability and prices. We need to see data that reflect current wholesale above ground electric rates as well as current wholesale gas rates.
- When comparing the operation costs between the EMD and the proposed Taurus 60 gas turbine. Algonquin used lower wholesale price of Natural Gas in its most recent study while listing an industrial retail price of the electricity that is higher than what was listed by the U.S. Energy Information Administration as of May 2020. More background based on the assumptions would be much appreciated to understand the relevance of the conclusion.

MassDEP response: In reviewing economic impacts, MassDEP evaluated the electric and gas rates available to Algonquin for the turbine and an EMD. Algonquin's contracts with its customers contemplate that an estimated percentage of natural gas will be collected from the

customers by Algonquin for fuel, including Algonquin's compression units along the natural gas pipeline system. Converting the volume of gas used into dollar value is based on city-gate price, which represents Algonquin's cost for the natural gas.[4]

There is no recovery of electric power costs included in the Atlantic Bridge Project Cost of Service & Rates or the rates Algonquin negotiated with its customers.[5] As such, Algonquin pays Industrial retail rates for all electricity.

The electric power rate of $0.1437 per kilowatt-hour ("kW-hr") used by Algonquin was an average industrial electric rate for calendar year 2019 (www.eia.gov). The use of electric rates based on a single month's data during a shoulder season (May 2020 as noted by the commenter), which was during a time when Covid-19 restrictions were in place, does not provide representative electric pricing for a unit which would be operating year-round. The EPA Air Pollution Control Cost Manual succinctly addresses this issue "[t]he basis of direct costs and recovery credits is one year, as this period allows for seasonal variations in production (and emissions generation) and is directly usable in financial analyses.

Comment 14:

- Algonquin's supplemental BACT analysis overstates capital and operating costs for an EMD. As an initial matter, DEP staff should have rejected all cost calculations furnished by Algonquin in its EMD BACT analysis because they are inconsistent with prior application submissions in a way that compromises the applicant's credibility. In its original application materials, Algonquin calculated the cost of natural gas fuel associated with its SoLoNOX turbine with selective catalytic reduction ("SCR") using the industrial retail rate for such fuel instead of a wholesale rate. Because the industrial retail rate is more than the wholesale rate, this resulted in a higher per-ton cost for removal of NOX using SCR. That, of course, favored Algonquin as it advanced the argument that SCR is not cost-effective for the Weymouth compressor station. Now, in its EMD BACT Analysis, Algonquin has taken the opposite approach—using the wholesale rate—because that rate favors its current position that an EMD is economically infeasible. Algonquin got it right the first time. The EPA Control Cost Manual (7th Edition), in the context of preparing BACT cost-effectiveness calculations, specifies that the wholesale utility cost should be used only by producers (electric power generators or natural gas producers), and the retail cost should be used by all other parties. Since Algonquin is not a producer, it was wrong to use the retail cost in its BACT analysis DEP staff should not tolerate this selective and inconsistent use of input data, in the same BACT application, solely to engineer a result favorable to Algonquin's position. It undermines Algonquin's credibility and the integrity of DEP's decision-making. DEP

[4] See the Pre-filed Direct Testimony of Christopher Harvey for a more detailed discussion on establishing the wholesale price of natural gas.
[5] Pre-filed direct testimony of Christopher Harvey, paragraph 11.

staff should reject Algonquin's EMD BACT analysis on this basis, alone, as the credibility and reliability of the EMD BACT Analysis is irretrievably compromised.

- In the 2018 BACT analysis, Algonquin used the Massachusetts statewide industrial retail natural gas rate (in 2015 dollars, $11.34/MMBtu) when calculating BACT costs. In the EMD BACT Analysis, however, Algonquin changes that price assumption to what appears to be the wholesale rate--a much lower rate: $3.04 MMBtu. What is the rationale for using a different rate? (Town of Weymouth letter, August 4, 2020)

MassDEP response: In preparing the cost effectiveness determination, Algonquin relied on site-specific information for natural gas prices as opposed to average cost data.[6] EPA's Air Pollution Control Cost Manual addresses the use of average cost data and site-specific information as follows:

> "The industrial user is more likely to have site-specific and detailed information than the average cost and sizing information used in a study estimate. The methodology laid out in this Manual can provide cost estimates that are more accurate when using detailed site-specific information. The anecdotal evidence from most testimonials volunteered by industrial users indicates that much greater accuracy than 30 percent probable error can be attained. However, this Manual does not assume that detailed site-specific information will always be available to estimate costs associated with installing and operating pollution abatement equipment at a much higher accuracy level. This Manual retains the conclusion that the cost methodology laid out in this chapter and information in each control measure chapter with 30% probable error is relevant to be used in air pollution control cost estimation for permitting actions. It is the affected industry source that bears the burden of providing information of sufficient quality that will yield cost estimates of at least a study-level estimate for permitting decisions pertaining to their facilities."

Even though the use of site-specific gas rates could result in a more refined analysis than would the use of average cost data from the US Energy Information Administration, EPA acknowledges that the use of average cost data is sufficient for a study-level estimate associated with a BACT analysis.

A commenter referenced EPA guidance and argues that only producers should use wholesale rates and all other parties should use retail rates in their cost analysis. The relevant EPA guidance states "Industrial plants should use the electricity price from their latest utility bill, while electricity generators should use the busbar rate." As discussed above, Algonquin's contracts with its customers contemplate that an estimated percentage of natural gas will be used by Algonquin, which is converted into a dollar value based on city-gate price. This is effectively their utility bill.

[6] https://www.epa.gov/economic-and-cost-analysis-air-pollution-regulations/cost-reports-and-guidance-air-pollution#cost%20manual

Comment 15:

- Algonquin computes its annualized capital costs using its rate of return, rather than the cost of borrowing for those capital costs. Using a proper borrowing cost—i.e., the nominal borrowing rate for Algonquin—would substantially reduce the capital costs for an EMD. While Algonquin asserts that EPA Guidance supports its approach, it does not.

- In calculating the annualized capital cost, the Addendum applies a "nominal interest rate" of 10.137%, which "represents Algonquin's current after-tax real rate of return[.]" The Addendum asserts that the selection of the 10.137% rate "aligns with the basis for interest rates as recommended in the [Manual]." A reading of the Manual indicates otherwise.

  Section 2.5.2 of the Manual, entitled "Interest Rates," clearly indicates that the interest rate that is selected should reflect a company's borrowing costs, not its rate of return: "The interest rate at which a firm borrows is a key component in estimating the total costs of compliance." (Emphasis added.) The Manual states, further, that; "the correct interest rate to use is the nominal interest rate, which is the rate firms actually face." (Emphasis added.) The Manual indicates that, in the absence of firm-specific data as to borrowing costs, the appropriate rate to use is the Federal Reserve's bank prime rate:

  "For permit applications, if firm-specific nominal interest rates are not available, then the bank prime rate can be an appropriate estimate for interest rates given the potential difficulties in eliciting accurate private nominal interest rates since these rates may be regarded as confidential business information or difficult to verify. The bank prime rate is published by the Board of Governors of the Federal Reserve System."

  As of September 3, 2020, the bank prime rate, as published by the Federal Reserve, is 3.25%. See "Selected Interest Rates (Daily) - H.l 5", published by the Board of Governors of the Federal Reserve System, available at https ://www.federalreserve. aov/releases/hl 5/.

  Using an amortization schedule calculator available at https://financial-calculators.com/amortization-schedule. It is possible to determine that Algonquin's projected annualized capital cost of $1,250,993 is based on a 50-year loan at an interest rate of 10.137%, with interest compounded annually and the first annual payment due on the first anniversary of the loan. Applying an interest rate of 3.25% instead, while keeping all other factors the same, results in an annualized capital cost of $498,623. Thus, Algonquin's use of an incorrect interest rate overstates the annualized capital cost for the EMD by $752,370 per year.

  MassDEP's response: MassDEP disagrees with these comments. The capital costs were annualized over a fifty-year period, using an interest rate based on current after-tax real rate of return, as calculated using Algonquin's 2019 FERC Financial Report Form No.2. It should be noted that the longer the service life and the lower the interest rate, the lower the annualized capital costs and the lower the cost effectiveness in dollars per ton. The interest rate of 10.137% is consistent with the EPA guidance, which states "The value used in most control costs

analyses is 10 percent in keeping with current EPA guidelines and Office of Management and Budget recommendations for regulatory analyses." The interest rate of 10.137% represents Algonquin's true cost of capital, which comports well with EPA guidance, which states "In assessing these private decisions, interest rates that face firms must be used, not social rates."

The EPA guidance that MassDEP relies upon does allow for the use of prime rate in the absence of a project specific interest rate but cautions against using prime rate by stating "Analysts should use the bank prime rate with caution as these base rates used by banks do not reflect entity and project specific characteristics and risks including the length of the project, and credit risks of the borrowers."

Comment 16:

- The EMD BACT Analysis states that "electric driven compression would necessitate the construction of a new building, electric substation, and ancillary equipment within TGP's existing CS 261 site." (Appendix A, p. 8 of 50). We would like proof of this statement and all capital costs involved. (quoted from Town of Weymouth letter, August 6, 2020).
- A breakdown of the costs associated with the related structures needed to install an EMD alternative.

MassDEP response: These comments were erroneously quoted from MassDEP's January 24, 2020 Air Plan Approval issued to Tennessee Gas Pipeline, which was included as Appendix A in the BACT addendum. Algonquin did not contemplate the construction of a new building.

Comment 17:

- Algonquin does not analyze how responsibility for capital costs are apportioned between it, National Grid, and/or Eversource. The latter two entities are public utility companies subject to state law governing their operations and oversight by state agencies. Algonquin's EMD BACT analysis contains no discussion of either of those entities' policies, tariffs, and other authorities—approved by state agencies—governing respective responsibilities for electrical infrastructure capital costs and how they are apportioned, including through construction advances and otherwise. Indeed, the communication that Algonquin supplied to DEP in response to DEP's inquiry states that "the circuit between Edgar and the Point of service would be constructed, owned and operated by National Grid" and that "[a]ll substation modifications would be constructed, owned and operated by Eversource." Algonquin's EMD BACT Analysis does not explain how it squares with this underlying communication.
- Algonquin must explain whether and to what extent National Grid will be responsible for any costs referenced in the EMD BACT Analysis for electric power supply infrastructure including interconnection with the proposed Compressor Station. This must include all D.P.U.-approved and other National Grid documents relevant to those costs and calculations, including the

relevant D.P.U.-approved tariff and National Grid connection terms and conditions. (Town of Weymouth letter, August 4, 2020)

MassDEP's response: MassDEP disagrees with the first comment. Although the comment correctly quotes an email from National Grid that was provided as part of Algonquin's August 7, 2020 correspondence, the same email states "Enbridge would be responsible for all the costs associate [sic] with the service." As to the second comment, National Grid will not be responsible for any of the costs.

Comment 18:

- Algonquin provides two bid responses in support of its capital costs analysis, one each from contractors in Illinois (J.L. Allen Services, Inc.) and Texas (Dashiell Corporation). Algonquin, however, does not explain the process that led to these responses, whether additional responses from other contractors were solicited or received, the underlying request (and associated requirements) that yielded these bids, or information sufficient to evaluate whether these bids justify the cost analysis.

  MassDEP's response: In accordance with EPA guidance, a BACT analysis is designed to produce study-level estimates of costs incurred. The BACT evaluation is not to be confused with a detailed estimate, which according to EPA guidance relies on complete drawings, specifications, and site surveys. As such, a detailed bid process is unnecessary and inappropriate.

Comment 19:

- In the First Circuit court decision vacating the permit, presiding officer Jane Rothchild repeatedly referred to "costs" of the electric motor, but the only costs that factored into that decision were dollars to Enbridge, rather than the more important costs to human health, and the lungs of the thousands of children living in the communities adjacent to the compressor station site. Such human costs should be the most important factor in considering any permit for this compressor station.
- Overall concern for the omission of up-to-date cost factors which should be used as part of the basis for determining the feasibility of the BACT by the project proponent Algonquin.
- Even bracketing the moral calculus, the financial cost in health care, climate driven disasters and mitigation makes a BACT preference for a gas-fired motor absurd. Do the math - all of the math. A cost-benefit analysis that considers only the costs to the corporation, while those borne by impacted communities and the environment are defined away as "externalities" is disingenuous at best. The very least MassDEP and the court can do is to insist on an electric motor as obvious BACT choice.

MassDEP's response: A BACT evaluation considers, among other factors, economic impacts (i.e., cost effectiveness), which is defined in the EPA's New Source Review Manual (page B.31) as "the dollars per ton of pollutant emissions reduced." The cost of control is established using the methodology outlined in the EPA Air Pollution Control Cost Manual, which only considers the cost of controls and not other costs. MassDEP's evaluation determined that Algonquin did use appropriate cost factors in its BACT analysis. Other potential impacts of a proposed facility (such as to public health) are taken into account in the air emissions impact analysis, which must demonstrate that all health-based standards and requirements are met. However, the air emissions impact analysis is not part of the BACT analysis.

Comment 20:

- The Right of Way land purchase cost for the transmission line is listed as $619,460 (Appendix C, Table 2). How was this figure arrived at? (Town of Weymouth letter, August 6, 2020)

MassDEP's response: The methodology of developing the cost associated with the right of way acquisition is detailed in the pre-filed direct testimony of Nancy Kist, https://www.mass.gov/lists/revised-bact-assessment-proposed-determination-algonquin-natural-gas-compressor-station. The estimate includes costs associated with the acquisition of 1). a 15 foot wide permanent easement, running 0.4 miles from the Edgar Substation to Route 3A, 2) 50 feet of temporary workspace running the same length, 3) an additional area 100 feet wide by 265 feet in length of additional temporary workspace, and 4) permitting for installing the underground electrical transmission lines under route 3A.

The estimate was based on an assessed value of $19 per square foot, which was obtained from the Town of Weymouth On-line Property Records Viewing System. (http://pv.weymouth.ma.us/search/properties/). Permanent easements were based on 50% of the assessed value and temporary easements were based on 12.5% of the assessed value. The cost of permitting was estimated to be $5,000.

Comment 21:

- Financial considerations actually do not count in consideration of BACT according to the MassDEP guidance (In other words, if similar processes have been built and are operating with an established level of BACT, you may not argue that you cannot afford to provide the same level of air pollution control that they do.)

MassDEP's response: MassDEP disagrees with the commenter's interpretation of the BACT Guidance. The relevant paragraph states, in full: "*EPA's New Source Review Workshop Manual instructs that primary consideration should be given to quantifying the cost of control and not the financial standing of an individual facility owner/operator. This simple precept goes a long way toward ensuring a level playing field for similar types of processes. In other words, if similar*

processes have been built and are operating with an established level of BACT, you may not argue that you cannot afford to provide the same level of air pollution control that they do."

The affordability issue pertains to an individual company's financial ability to implement BACT and does not pertain to the cost effectiveness evaluation.

Comments Relative to Baseline Emissions

Comment 22:

- Algonquin's supplemental BACT analysis fails to use a controlled baseline emissions rate.

  DEP measures a BACT alternative's economic feasibility by comparing that alternative's cost per ton of pollutant removed to monetary effectiveness ranges DEP developed in 1990. That calculation requires identifying a baseline uncontrolled emissions rate, which serves as the denominator fin the average cost effectiveness formula. The uncontrolled emissions rate is therefore a critical input in determining whether an alternative is cost feasible.

  Algonquin's EMD BACT Analysis improperly uses the controlled emissions rate of a dry/low NOX turbine (of which SoLoNOX is Solar's proprietary model) as its baseline rate. That is error—one revealed by its simple illogic in relation to Algonquin's own application materials. Refer to Algonquin's original application materials to which its EMD BACT Analysis is a supplement. Algonquin's application sets forth a BACT control hierarchy that lists the controlled emissions for less effective alternatives (such as water injection). Where a baseline uncontrolled emissions rate is meant to be an emission unit's emissions without any control technology, to provide a common denominator to calculate the average cost effectiveness of all available alternatives in such a hierarchy, Algonquin's position must be wrong. In fact, the uncontrolled baseline emissions rate must be higher than the alternatives proposed in Algonquin's hierarchy, including that of any form of dry/low NOX turbine.

  MassDEP response: Baseline emissions for NOx are based on the use of a dry low NOx ("SoLoNOx") burner design, which limits NOx emissions to 9 ppmvd.

  SoLoNOx is a combustion design, which is inherent to the turbine's design and is not an add-on pollution control. SoLoNOx cannot be disengaged, and the turbine cannot be operated without SoLoNOx (at ambient temperatures above approximately 0°F). The EPA NSR Manual, which MassDEP relies upon, requires baseline emissions to be established at design capacity, without control. "The baseline emissions rate represents a realistic scenario of upper boundary uncontrolled emissions for the source." Because SoLoNOx technology is part of the physical design of the turbine, the NOx emissions of 9 ppmvd from that unit as designed, at maximum capacity, is used to calculate baseline emissions.

MassDEP also evaluated a compressor turbine with higher NOx emission rate as a higher alternative baseline. MassDEP's evaluation found that 25 ppmvd is an appropriate alternative baseline. Correspondence from Solar Turbines states "Solar Turbines offers the Taurus 60 7802S with three different emissions levels for natural gas pipeline applications in the U.S.: 25, 15 and 9 ppm NOx @15% O2." As such, the alternative "worst-case" baseline for NOx emissions should be 25 ppmvd.

Comments Relative to Energy Impacts

Comment 23:

- Algonquin calculated certain electrical grid efficiency losses as part of its EMD BACT analysis. Algonquin did not calculate any analysis of natural gas pipeline transmission losses, including in the form of compressor station power demand and natural gas consumption at compressor stations from the source of the natural gas to Weymouth. (Town of Weymouth letter, August 4, 2020)
- Algonquin should provide this analysis. Algonquin must also provide the gearbox efficiency for the Solar Taurus 60 combustion turbine proposed for the Weymouth compressor station.

MassDEP response: Algonquin presented electrical grid efficiency as part of its energy impacts assessment and environmental impacts assessment of the EMD within the BACT analysis. The grid efficiency was used to calculate upstream air emissions associated with generation of the electricity necessary to power the EMD. According to EPA guidance, the evaluation of upstream air emissions is not an appropriate consideration in a BACT analysis and as such was not a factor in MassDEP's evaluation. The request for equivalent natural gas pipeline losses associated with the operation of the turbine is not necessary as the scope of the BACT analysis is limited to evaluation of an EMD.

Information regarding turbine gearbox efficiency was not necessary. The EMD's gearbox efficiency is an essential part of the calculations necessary to calculate the electrical demand of an EMD at an equivalent power output to the turbine. On the other hand, gearbox efficiency information for the Solar turbine is not necessary because fuel use is based on manufacturer's data at 100% rated capacity.

Other Comments Related to BACT

Comment 24:

- Page 4-7 of the Addendum states: "Algonquin proposes to install one Solar Taurus [70] gas-fired compressor unit providing the necessary horsepower to meet the pressure requirements for the required deliveries into the Maritimes system. To ensure system reliability, the gas turbine will

be equipped with an emergency generator that is fueled by the same gas that the turbine is compressing, and sufficiently sized to run the compressor station in the event of an electrical outage." All other references to the Solar Taurus turbine are for the Solar Taurus 60 turbine with an output of 7700 HP, not the Solar Taurus 70 which has a beginning output of 9500 HP. Please clarify the discrepancy. The numbers for the Solar Taurus 70 are significantly different than those for the Solar Taurus 60.

MassDEP response: As indicated on page 4-7, footnote 18, the quotation is attributed to "Resource Report 10, Atlantic Bridge Project, Pre-Filing Draft," March 2015, Spectra Energy Partners, FERC Docket No.PF15-12-000, p. 10-20." The Air Plan Approval Application submitted to MassDEP was based on a Solar Taurus 60 turbine; the subsequent Air Plan Approval is specific to a Solar Taurus 60. Additionally, the Solar Taurus 60 was used as the basis of comparison in evaluating the use of an EMD as BACT.

Comment 25:

- "Natural gas delivery to the Maritimes system would cease during a power outage, preventing the delivery of natural gas from south of the compressor station to points north" (p. 4-7). Since the Solar 60 is also reliant on electric power, how would this be any different should the power go out using the gas turbine? What back up plans for power does Algonquin have in the case of a power outage in general? Does not Algonquin have generators on-site?

  MassDEP response: The MassDEP Air Plan Approval issued on August 26, 2019 states there would be one emergency generator on site to provide electricity in the event that power from the grid is lost. The emergency generator, powered by a 585 horsepower natural gas fired engine, is too small to power an EMD. The Addendum, page 4-7, footnote 18 states, in part, "For the avoidance of doubt, the emergency generator discussed here was intended to provide modest station backup power, not power to drive the compressor."

Comment 26:

- What is the potential of EMD to reduce the total emission rate for NOx?

  MassDEP response: An EMD would eliminate all NOx emissions that otherwise would be emitted by the combustion turbine.

Comment 27:

- In general, have the data and information used in the BACT analysis been independently verified, by parties without direct ties to the fossil fuel industry?

  MassDEP response: The application, submitted by Algonquin, was prepared by Trinity Consultants. The cost estimates were prepared by third party contractors. Additionally, the balance of the data relies on verifiable information. MassDEP has also reviewed the data and conducted independent cost calculations.

Comment 28:

- The Pre-filed Direct Testimony of John Heintz, on page 3, refers to "communications in June 2020 with representatives from National Grid. We require copies of those communications and copies of any and all communications between Algonquin and National Grid in order to understand what technical information Algonquin is relying on from NG. (Town of Weymouth letter, August 4, 2020)

  MassDEP Response: The communication with National Grid can be found in the response to a request for information from Algonquin dated August 7, 2020 https://www.mass.gov/lists/revised-bact-assessment-proposed-determination-algonquin-natural-gas-compressor-station

Comment 29:

- However, as a faith leader and Weymouth resident, I challenge the BACT analysis because its cost-benefit analysis leaves out the most significant costs. It ignores the cost of a gas motor's emissions to the health of local residents. It ignores its contributions to climate heating gases that violate Mass.' legal commitment to GWSA goals, and contribute to an unfolding climate catastrophe already costing the global economy hundreds of billions of dollars a year. As you know, MassDEP chose to ignore the significant baseline pollution in the Basin when considering Enbridge's Air Quality Permit. It was allowed, but not required, to do so. Even the hearing officer, Ms. Rothchild, noted that this practice was unfair, and in need of change.

  MassDEP response: Health and climate impacts of the natural gas fired turbine are outside the scope of the supplemental BACT analysis, which is limited to whether an EMD is BACT for the proposed project and whether the use of an EMD would redefine the source.

Comments in General Opposition to the Weymouth Compressor Station

Comment 30:

- I am writing to add my public comment on the BACT analysis for Enbridge's compressor station, as part of the Air Quality Permit consideration by the First Circuit Court. There are many technical reasons why an electric motor meets BACT criteria, while a gas-fired motor does not. The most obvious is that the electric motor would not add additional methane emissions, VOC's, PM2.5, and other carcinogens and neurotoxins to the toxic soup already compromising the health of Fore River Residents. During the COVID-19 pandemic, studies show that these emissions are also making us more susceptible to the virus and its worst consequences. For additional technical reasons that an electric motor is the BACT choice, and for challenges to unsubstantiated assertions by Enbridge and MassDEP that require a response, I refer you to the Town of Weymouth letter of August 6, 2020.

- Your agency is not protecting the environment and is not protecting the people of North Weymouth, Quincy, Braintree. and Hingham whose health will be worsened by this unneeded compressor station, particularly, if the compressor is powered by burning "natural" gas. You should be ashamed of your failure to live up to the name of your agency. You are charged with protecting the environment, not protecting the interests and profits of corporations that are not even based in Massachusetts.
- Why is DEP supporting this project?
- I am very concerned about hazardous air pollution coming from the North Weymouth compressor station and its effects on the health of the Weymouth residents who are unfortunate enough to live close to the North Weymouth compressor station.
- The site is heavily residential and includes an environmental justice area. This needs to be stopped or at least heavily amended. Ample protection must be put in place and guaranteed.
- Former DEQE employee in the air group. I know how important it is that all work and research is finished before a permit is granted. A permit should not be granted until the analysis is completed. Stop commissioning activities.
- I am writing to express my frustration with Mass DEP's lack of transparency and thoroughness during their re-evaluation of Enbridge's previously-vacated air quality permit. As you were joint defendants with Enbridge in the First Circuit case which originally vacated the air quality permit, I was skeptical of your response to the ruling at the onset. I hoped that your department would set aside the existing state of construction at the compressor site and objectively scrutinize Enbridge's re-calculated BACT analysis based on all of the concerns raised by the First Circuit judges as well as the plaintiffs in the case, concerned members of the public, and numerous elected officials which have opposed this tortured fossil fuel infrastructure development process. I was disappointed that instead, Enbridge's "re-calculated" BACT analysis was rubber stamped with questions remaining and lives on the line.

  MassDEP response: MassDEP acknowledges the opposition to this facility.

<u>Comments Outside the Scope of the Request for Comment</u>

Comment 31:

- DEP's NOX economic effectiveness range fails to account for inflation or changes to equipment costs since 1990.
- Given that admittedly unfair, practice, I would expect MassDEP to argue that a gas motor's emissions alone are insignificant to public health, just as MassDEP argued that a compressor station alone is not a threat to public health. But as you know, considering each new emitter separately for permitting purposes does not change physics and chemistry. It results in sacrifice zones, almost always in communities of color and/or low wealth, considered expendable for the cause of economic growth. Because background pollution was not considered by MassDEP in the Fore River Basin, Environmental Justice law and policies that would have prevented siting Enbridge's facility here were not triggered, and those communities were left without the protection to which they were entitled. This makes MassDEP's practice functionally racist,

classist, and it ignores the science of public health and of climate change. Fore River Residents, especially those in Environmental Justice Communities, are *literally* sick of being a sacrifice zone. Any BACT analysis that ignores this context is morally bankrupt.

- Just how far afield did they look for another site?
- Ensure project will not cause a violation of the NAAQS
- In this Southwest Institute industry presentation from February 2012, http://www.gaselectricpartnership.com/GFuture%20Compression%20Station%20Final.pdf) pages 37-50, the case for EMD is quite clear and shows that operators like Algonquin have not used this technology simply because it would require a change in thought process between mechanical and electrical engineering.
- Nuisance noise during operation in the context of BACT has been understated and overlooked, citing the noise policy and prior testimony
- where is documentation of the projected NOX emissions on public health from a gas turbine, as compared with zero emissions on site of the EMD alternative?
- From page 4-7 of the Addendum: In considering an EMD option initially, Algonquin concluded that the installation of the required infrastructure would significantly impact the project schedule and thereby not meet the delivery needs of the Project Shippers. Also, the electricity rates are significantly higher than wholesale rates for natural gas that is already available at the Facility site, and therefore are not compatible with the existing Atlantic Bridge Project contract requirements. In this new analysis, Algonquin fails to consider the contracts already lost due to the protracted fight against the placement of this station and the relative worthlessness of gas in these economic times. The delivery needs of the Project Shippers no longer apply.
- As indicated in Table 3-1, the maximum emission rate for the new turbine during normal operation will be 9 ppmvd of NOx at 15 percent O_2 on a 3-hour average. Since this is a new technology and the resulting NOX emissions are dependent on site-specific factors, Algonquin and Solar are requesting an extended shakedown period to fully evaluate and tune the new turbine installation to achieve the very low NOX BACT emission rate. Based on information from the vendor, Algonquin expects a 6-month shakedown period before the 9 ppmvd technology will be installed and fully operational on the turbine. Why was this "shakedown" period not addressed in the BACT analysis when the 9 ppmvd for NOx cannot be guaranteed?
- In multiple instances in the Addendum, Algonquin states that the compressor is needed to raise the pressure of the gas from the I-9 to the I-10 (Maritimes & Northeast). And yet, Algonquin has been successfully shipping gas northward on the I-10 for the past three years. So why is this pressure increase necessary? Is there additional risk to the public and to the environment with this increase? For example, does this increase the blow-down actions?
- Have you done analysis on greenhouse gas emissions and resiliency for the electric motor vs. gas turbine as described in Executive order 569?
- Why is the DEP appearing to support the interests of the Enbridge pipeline project, a project that does not benefit the southern Massachusetts environment and waterways instead of guarding the health and safety of the citizens in the neighboring communities of Weymouth, Quincy, Braintree, Hingham, and beyond. The Weymouth site for this archaic project is already

overloaded with dangerous contaminants and should be cleaned up. Why is Enbridge allowed to push forward in their opening when the safety of this project is questionable? All people deserve clean air. There is a strong possibility of explosions given the proximity of the storage tanks with gasoline, diesel and other explosives.

- Who will take responsibility of posting, on the Fore River Bridge and in the local and Boston News, when blow-downs will occur so citizens can determine their risk for exposure? Will this be done in a timely manner? People use the water and environment for recreational purposes and the Boston Harbor Islands are in close proximity
- Where is the evacuation plan published? Will evacuation be a possibility?
- Will increased toxins is [sic] the air enhance the possibility of acquiring Covid especially in environmental justice communities?
- There is no excuse in building new energy infrastructure that relies on a fossil fuels like fracked gas which pollutes our environment (air, water, and land), communities, and atmosphere. Natural gas is mostly methane, and methane is much worse for the climate than carbon dioxide: 86 times worse over 20 years according to the Intergovernmental Panel on Climate Change (IPCC). Renewable energy options like a zero emissions turbine are the solutions that we need to invest in for the future of our community and climate, and renewable energy has shown to be the most affordable and economically viable energy option in 2020
- This compressor station does not belong here. The safety, health and economic hazards for those of us who live in the area are genuinely frightening. The due diligence in planning and execution in building this monstrosity was/is /roughshod.
- For the lives of the people who live here, we demand comprehensive and unbiased review.
- I was relieved to hear that an impartial court has set aside your decision to allow Enbridge's subsidiary Algonquin to pollute the air in the already overburdened Fore River Basin. The BACT seems to be powering the compressor with an electric motor. The objections to it all break down to finances. The real question is: are Enbridge's profits more important to you than the lives and health of my family and neighbors.
- The Air Quality Permit was VACATED by the first district court for A Reason We do not accept a Fracked Gas Turbine at that site when a safer alternative is available to YOU! We Are citizens of Weymouth and Quincy And We do not want the DEP to put the lives of our families & neighbors in Harm's Way! Do your job that You get paid to do! Use the electric Turbine and electric support pipes. As American voters and Tax payers We do Not want this Canadian Enbridge Company to pollute our community and make our children and elders sick! We don't use their FRACKED gas but we will be paying for it in our local taxes. The US DEP (YOU) is intentionally putting American lives at risk to mollify & ENRICH the pro fossil fuel politicians (Gov. Baker, Mayor Walsh, Mayor Hedlund) and the pro FRACKING GAS lobbyists in Washington. I hope You understand that the Whole World Is Watching you right now. Do the Right Thing = Stop this Polluting Monster.
- I am deeply disturbed that the Weymouth compressor station is still under consideration in any form when the people who are most affected by it have spoken overwhelmingly against it for years. It could not be more obvious to me that this egregious project will put the Fore River

Basin community in acute danger from disasters, deepen the chronic levels of pollution that my neighbors have suffered for decades, and double down on the fossil fuel infrastructure that's wrecking our climate and putting us all in peril.

- The fact that the DEP has allowed this project to get to this point is astounding to me. It seems that your department will bend over backward to side with polluters over endangered citizens. Your job is to protect our environment. I am begging you: do your job. Stop this disastrous project. There is still time, and it is entirely within your power. History will judge you well if you do. If you don't, and a disaster inevitably happens, as we have seen with gas infrastructure here in Massachusetts and around the nation, history will remember that you let it happen.
- Please do not give the proposed No, Weymouth Compressor Station a legal Air permit for this facility. This permit should not be okayed because all air pollution data already collected has not been made public and properly analyzed. Too many dangers could result. I revoke this air permit strongly.
- Shut the whole thing down.
- This project has long term health consequences for the Fore River neighborhood so I hope you will give this matter a thorough review before coming to a decision.
- no compressor station!!
- Please add to all of your account balances the high cost of catastrophic global warming. Right now rising sea levels and frequent strong storms are inflicting economic costs as well as enormous human suffering. Global warming will cause the irreversible wholesale death of life on Earth unless we humans stop using all fossil fuels very rapidly.
- Please ask yourself these questions: Why did I choose to work for the Massachusetts DEP? Is my job to protect the environment and the people of Massachusetts or to defend the polluters of the environment and to save them money? Will I sleep well at night, knowing that I consciously made the wrong choice just to please my boss? You can make the right choice here. You can protect us. You can do your job correctly in this situation, and live up to your agency's name (Department of Environmental Protection). It's very simple. The choice is yours.
- Isn’t the purpose of the Mass DEP to protect the environment, as well as public safety?
- who will be responsible for illness and explosions? who will take responsibility for posting when there are blowdowns? where will the evacuation plan be published? will increased toxins increase the possibility of getting COVID?
- In the middle of a pandemic, after a major holiday weekend, it is disappointing that Enbridge is allowed to turn on the compressor station and commence "commissioning activities" as an inauguration of the facility before the BACT analysis public processes are finished. The Fore River Basin is already overburdened with air pollution and respiratory illnesses that is being compounded by the COVID 19 pandemic. Coronavirus is a respiratory illness. Air pollution is well documented to cause worse health outcomes for the virus including higher death rates. The process has been really sad to see. Cumulative emissions in the Fore River Basin was not taken into account in the permitting process. The legislature recognized this and passed legislation that included stronger environmental justice language to strengthen your regulations to do this analysis. This is currently in the conference committee. Additionally the Fore River HIA by MAPC

was bungled so badly that they had to procure an independent audit, the results of which are not yet public. On a personal note, my father got the coronavirus. We live in East Braintree. Thankfully he had mild symptoms, however we all had to self isolate in our home in separate rooms. It is horrible to be scared of your own home and to be scared that your loved ones may be in harm's way. Enbridge and MassDEP is putting us in more danger from the safety risk of explosion, and the chronic respiratory illnesses that come from cumulative emissions in the Fore River Basin that will be exacerbated by the blowdowns and fracked gas powered turbine of the Weymouth Compressor. My 83 year old grandmother lives in the adjacent environmental justice community of Quincy Point. She has a chronic respiratory illness with an inhaler and we worry every day about potentially exposing her to the virus. We help take care of her, bring her food, take her to doctors appointments wearing masks. This compressor station will not help out vulnerable residents like her and my family.

- In OADR's ruling to deny the Air Permit appeal, Hearing Officer Jane Rothchild repeatedly referred to the "costs" of the electric motor. It is telling that in this ruling "cost" referred only to the financial cost to a multi-billion dollar corporation, Enbridge, and completely ignored any consideration of the cost in terms of human health and the lives of 3,100 children breathing the toxic air that this facility will emit. This is just shameful coming from a so-called Department of Environmental "Protection". The least you can do is reduce the harm by acknowledging that the value of human health and life of the MA residents who pay your salary is more valuable than a small reduction in profits to the corporation whose representatives donated $117K to Charlie Baker.
- Every step of this project has been a slap in the face to the citizens of Weymouth, Quincy, and Braintree, as well as the global community dealing with the climate crisis. Normal standards for compressor station siting have been ignored; environmental studies have been undertaken unwillingly and only under pressure; important tests have been omitted; data that was collected has been willfully ignored; and the most obvious choices, such as this one, have inexplicably (or maybe much too explicably) been removed from consideration. How can a toxic greenhouse-gas emitting gas-powered turbine possibly be superior to an electric motor -- to anyone but the shareholders? Why have all permitting agencies associated with this project sided with Enbridge at every turn? You have to admit it appears awfully suspicious.
- We are presently in a worldwide pandemic. Is this also to be ignored by MADEP in making decisions that will actually increase our susceptibility to the COVID-19 virus? Science has provided evidence that increased pollution increases the likelihood of infection. In fact, Particulate Matter 2.5 acts as "carriers" for the virus. What no mention of this in your BACT analysis?? Why not? This is an unprecedented health emergency in a densely populated area including environmental justice areas in Quincy Point and East Braintree. Will the MA DEP allow the 6 month "shake down" period Algonquin/Enbridge has described to happen during a pandemic?? A period where there are no known outcomes as they calibrate a never-been-used-before Gas Compressor? The 950 families who live nearby will become guinea pigs as Algonquin/Enbridge experiments with emissions from their new turbine! How will the toxic emissions be regulated? How much will get into the air? Which ones? Benzene? (already over

the limits). Formaldehyde? Nitrous Oxides? Will MA DEP allow this or demand the postponement of the shake down until the health emergency is over? Where are the MADEP "long standing policies" to protect the citizens of the COMMONWEALTH during a pandemic?

- Over 100 Massachusetts Boards of Health, representing over half the population of Massachusetts wrote Governor Baker about their concerns about the health impacts of natural gas infrastructure. Harvard University and MIT have published multiple studies about the health impacts of air pollution and its costs. When considering the Best Available Control Technology why didn't you consider the health co-benefits of the electric drive motor? How is a zero-emissions electric motor not BACT?
- We need to put air quality first in this densely populated area! Many children and senior citizens live VERY close to this site and no one is putting their health before profits.
- I DO NOT WANT TO SEE CANCER CASES RISE IN CHILDREN OR ANY HUMAN BECAUSE OF WEYMOUTH COMPRESSOR. THERE NEED TO BE MORE TESTING AND THE USE OF AN ELECTRIC TURBINE INSTEAD OF GAS. THE BASIN HAS TOO HIGH A POPULATION FOR THE BLOW DOWNS.
- Residents' immunity impacted by air pollution in Weymouth/Braintree area. The compressor station itself will add a great deal to this air pollution. Anything that can be done to mitigate the effects of this station, such as an electric motor which will eliminate combustion emissions, ought to have a high priority in decision-making
- Covid 19 concerns involved with air pollution, specifically shake downs. Will affect nearby EJ communities
- The DEP should weigh the gas turbine's contribution to negative health impacts imposed on a densely populated community with significant percentage of people already dealing with cardio-respiratory diseases.
- how exactly is the Department of ENVIRONMENTAL PROTECTION approving new dirty fossil infrastructure and resulting increased air pollution on the south shore during a respiratory virus pandemic and climate crisis from methane & other GHG emissions? You should be resigning in protest - does anyone in the fossil fuel protection corner have children??? Our tax dollars are now paying for DEP to approve the further poisoning of our communities and increased climate chaos.
- I will NEVER FORGET the farce of an HIA that DEP helped shepherd through that led to the approval of the air permit.
- With regard to environmental impacts, the cleanest outcome is required unless it can be eliminated based on technological or economic infeasibility. You cannot "model out of BACT" by simply showing that the modeled results of an inferior-to-Top Case air quality control technique will not result in a NAAQS violation.—MassDEP Guidance. The DEP, as noted by Ms. Rothchild in the original Air Quality appeal, has been relying on a thirty-year-old EPA "guidance" that states that you do not have to consider ambient air quality when permitting a facility. Ms. Rothchild also noted in her conclusions that this practice should be reconsidered going forward. As the Weymouth compressor abuts two Environmental Justice neighborhoods and the compressor will put the Basin dangerously close to violations of the Clean Air Act with regard to the NAAQS for NO2 and because the DEP also does not include the fugitive emissions of the diesel tankers,

bridge and roadway traffic, and because the DEP allowed Enbridge to rewrite the plan approval to consider certain emissions as fugitive in the operation of the station, the EMD must be considered to be BACT. The fugitive emissions above will put the Basin in violation of the CAA.

- Any arguments used by Algonquin that the plot for the station is too small to consider the EMD due to the need for a substation is moot because Algonquin knew the North Parcel was too small to develop as a compressor station site from the beginning. According to Mike Tyrell, TRC Project Manager contracted by Algonquin, when asked about the acreage required for a compressor station stated, under oath (Waterways Ch. 91 appeal before the OADR, August 1, 2018), "we like to use 10 acres as sufficient acreage for our evaluation. Some are less, some are more. Can it fit the facilities." The acreage of the buildable North Parcel is 4.3 acres—the smallest in the United States for a transmission compressor station. Again, Algonquin did not consider the EMD because they backed into the conclusion that the gas fired turbine had to be used on so small a plot of land. The argument is invalid.

MassDEP response: MassDEP acknowledges these comments but notes that they are outside the scope of the request for comment which was limited to 1. Whether the use of an EMD would redefine the source, and 2. Whether the use of an EMD is BACT.

Attachment A

Elected officials

Councilor Becky Haugh, Weymouth Town Council
Sen. John Keenan
State Representative Joan Meschino (9-8)
Sen. Patrick O'Connor
Senator Walter Timilty

First Name	Last Name
NK	Acevedo
Sarah	Alessandro
Edie	Allen
Allen	Altman
Penny	Altman
Dorothy	Anderson
Alice	Arena
Wendy	Balder
Maiyim	Baron
Karyn	Barry
Carolyn	Barthel
Jessica	Becker
Margaret	Bellafiore
Bryan	Bertram
Kacey	Bongarzone
Laura	Borth
Cheryl	Brandwein
Ann	Braoudakis
Sierra	Bright
Carolyn	Britt
Charles	Broggi
Suzanne	Brothers
Marjorie	Brown
Justin	Brown
Sarah	Burgess
Steven	Burke
Cindy	Callaway
Peter	Carey
Darlene	Carpenter
Angela	Carter
M.S.	Chenven
April	Churchill
Mernie	Clifton
Elizabeth	Connelly

Deborah	Cook
Mike	Cotter
Rose	Coveney
Lia	Cowley
Edythe	Cox
Eileen	Craffey
Timothy	Cronin
Kelly	Cusson
Margo	Custer
Peter	Cutting
Anna	Dalton
Barbara	Darling
Anita	Das
Johanna	Deery
Peter	Delano
Ida	DelVecchio
Donald	Di Russo
Jonna	Dondaro
Daniel	Donovan
Andrea	Doremus Cuetara
Doreen	Du
Christa	Dunn
Stephen	Durkin
Seth	Evans
Laurel	Facey
Nicholas	Feda
Christina	Fitzpatrick
Laura	Foley
Joe	Foley
MaryAnna	Foskett
Courtney	Foster
Stan	Franzeen
Laurie	Freeman
David	Freeman
Andrew	Friedman
Terrence	Gibbons
Judith	Gitelson
Shayna	Gleason
Rusty	Glicksman
John	Goldrosen
Inbal	Goldstein
Sara	Gordon

Bonnie	Gorman
Wendy	Graca
Jessica	Greenwood
Mary Jane	Griffiths
Susan	Harden
Meghan	Harrington
Kaitlin	Harwood
Michael	Hayden
Eli	Hegeman
Amy	Henry
Lise	Hilderbrandt
Kit	Hoffmann
Katherine	Hogan
Katherine	Hogan
Andrea	Honore
Linda	Illes
Samuel	Inman
Steven	Iszauk
T	Jablon
Ronald	Jantzen
Virginia	Jastromb
Kristine	Jelstrup
Carol	Johnson
Steve	Jones
Brian	Joynt
Paula	Kahakalau
Robert	Kearns
Robert	Kearns
Kathy	Keefe
Colin	Kenny
Patricia	Keoughan
Kathleen	Kilcoyne
Pamela	Knight
Judy	Kolligian
Aiham	Korbage
Chris	Kramer
Andee	Krasner
Cathy	Kristofferson
Jean	Krulic
Miriam	Kurland
Jack	Kyper
Paul	L

Yvonne	Lamothe
Robert	Lamothe
LJ	Lanfranchi
Anthony	Lauretto
Liz	Leberman
Susan	Lees
Rick	Lent
M	Leszczynski
Felicia	Levister
Michelle	Lindholm
Alan	Linov
Jordan	Longever
Jeanne	Lucas
Roger	Luckmann
Cindy & Peter	Lydon
Robert	MacDonald
John	MacGibbon
June	Mackenzie
Carol	Madigan
Michel	Magaletta
Elizabeth	Maglio
Lenore	Maloney
Lyssa	Manning
Tracy	Manzella
Carmen and Edith	Mariano
Patrick	Martinec
Annelise	Matias
Sally	Mavroides
John	McDevitt
Henry	McDonald
J. Sidney	McDonough
Melany	Mcfadden
Deborah	McMartin
Lorraine	Mehl
Vince	Mendieta
Alex	Mercado
Leon	Merian
Donald	Meyer
Egan	Millard
Richard	Monarch
Donald Neill	Monty
Phoebe	Morad

Elizabeth	Moulds
Robert	Muhlhausen
Karry	Muzzey
Joanne	Neale
Darrell	Neft
Michael	Nunziato
Tim	Oswald
Rebecca	Pasley
Nili	Pearlmutter
Marilyn	Pelrine
Gary	Peters
Brian	Phelps
Nathan	Phillips
Jack	Pierce
Alex	Place
Ed	Popielarczyk
Deborah	Porter
Susan	Purser
Susan	Redlich
David	Reich
Dan	Remick-Cook
Ruthy	Rickenbacker
Gerard	Ridella
Ellen	Robertson
Beth	Rodio
Ann	Rossman
Valerie	Russo
Kerry	Ryan
Michael	Sales
Helene	Sansoucy
Jeff	Schwefel
Eleanor	Seigneur
Sara	Sezun
Marie	Shaw
Susan	Sheinfeld
Lisa	Sherman
Jenne	Sindoni
Steve	Sketo
Jessica	Skyleson
Tali	Smookler
Laraine	Snooks
Betty	Southwick

Betsy	Sowers
Demie	Stathoplos
Judith	Stetson
Jennifer	Stratford
Connie	Tandy
Chartis	Tebbetts
Dawn	Tesorero
Mary	Thames
Corinne	Thomas
Deborah	Toal
Sylvia	Tolley
Susan	Tornheim
Suzanne	Torres
Jeremiah	Treanor
Molly	Tully
Caroline	Vallee
Sue	Velez
Tracy	Wallace
Richard	Warren
Judith	Weiler
Jennifer	Wexler
Nancy	Wilson
Esther	Wolk
Thomas	Wolslegel
Angela	Woodin
Sara	Zwicker
Ann	