EARTHJUSTICE

May 19, 2023

Via E-filing

Ms. Lisa Felice
Michigan Public Service Commission
7109 W. Saginaw Hwy.
P. O. Box 30221
Lansing, MI 48909

RE: MPSC Case No. U-20763

Dear Ms. Felice:

Attached please find:

- Response Brief on Remand on Behalf of the Bay Mills Indian Community
- Certificate of Service.

Sincerely,

Christopher R. Clark

Christopher R. Clark
cclark@earthjustice.org

STATE OF MICHIGAN
BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

In the matter of the Application of Enbridge Energy, Limited Partnership for Authority to Replace and Relocate the Segment of Line 5 Crossing the Straits of Mackinac into a Tunnel Beneath the Straits of Mackinac, if Approval is Required Pursuant to 1929 PA 16; MCL 483.1 et seq. and Rule 447 of the Michigan Public Service Commission's Rules of Practice and Procedure, R. 792.10447, or the Grant of other Appropriate Relief	U-20763 ALJ Christopher Saunders

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RESPONSE BRIEF ON REMAND

ON BEHALF OF

THE BAY MILLS INDIAN COMMUNITY

MAY 19, 2023

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INTRODUCTION

Enbridge's proposed tunnel presents a grave risk of a catastrophic explosion underneath the Straits of Mackinac. Two renowned, independent and experienced experts testified that the pipeline could fail, Line 5 product could be released within the tunnel, the release and resulting vapors could ignite and explode, and the resulting fire could cause the tunnel to collapse, allowing oil and natural gas to contaminate the Great Lakes.

In response, Enbridge has offered incomplete explanations and analyses in an effort to convince the Commission that the concerns raised by the experts will not occur. In essence, Enbridge asks the Commission to trust that a worst-case scenario—a catastrophic explosion or fire that leads to a breach of the tunnel—will not happen.

But ever-changing probability analyses and a stubborn refusal to consider worst-case scenarios are no substitute for sound engineering and design. The evidence demonstrates that the risks identified by the experts are real, the design of the proposed tunnel is deeply flawed, and building a tunnel underneath the Straits would simply be replacing the risks presented by the dual pipelines with the risk of a catastrophic explosion. Trust in Enbridge's never-before-built tunnel is not warranted, and the Commission should refuse Enbridge's invitation to ignore the risks. The application should be denied.

ARGUMENT

I. ENBRIDGE HAS FAILED TO DEMONSTRATE THAT THE TUNNEL PROJECT MEETS OR EXCEEDS CURRENT SAFETY AND ENGINEERING STANDARDS SO AS TO PREVENT A RELEASE OF PRODUCT FROM REACHING THE WATERS OF THE GREAT LAKES.

After two separate evidentiary hearings, the evidence fails to demonstrate that the tunnel project meets or exceeds current safety and engineering standards so as to prevent a release of product from reaching the waters of the Great Lakes. As a result, the Commission cannot conclude that the application satisfies prong (3) of its Act 16 analysis. Bay Mills addresses each of Enbridge's arguments about the safety and design of its proposed tunnel in the order they are presented in Enbridge's brief.

A. Enbridge's Quantitative Risk Assessment Is Based On A Flawed Probability Analysis And Creates The False Impression That The Tunnel Is Safe.

Enbridge's central argument on remand—that a catastrophic failure in the tunnel is an extremely unlikely event—relies on a quantitative risk assessment that minimizes identified engineering risks by assigning a misleading numeric probability value to suggest that the proposed project is "safe."[1] As Mr. Kuprewicz testified, this assignment of probability estimates to known, identified risks during a permitting process is dangerous because it invites complacency."[2]

This complacency is why Mr. Kuprewicz opined that relying on a quantitative approach during the permitting stage—when design decisions are made, adjusted, and all scenarios are planned for—is not appropriate and is, in fact, dangerous.[3] An operator who adopts a quantitative approach to the construction and, later, to the operation of a pipeline will inevitably drive the line

[1] Kuprewicz Direct Testimony on Remand, 17 Tr. 2622.

[2] *Id.*

[3] *Id.*

toward failure by minimizing, instead of addressing, the risks.[4] And, of course, the failure of any pipeline—but particularly a hazardous liquids pipeline in a high consequence area—has the potential for causing fatalities and immense destruction of the surrounding environment.[5]

The reliance on Mr. Godfrey's quantitative approach by Enbridge and Staff witnesses is problematic for many reasons. It does not present the data relied on in a way that can be replicated or checked for accuracy.[6] It was not offered until after the Commission re-opened the matter, even though the analysis was conducted well before Enbridge witnesses first testified to the probability of a release from the pipeline.[7] It does not account for the fact that the risks inherent in the complicated construction and operation of situating a pipeline in a tunnel are additive, such that to determine the probability of product escaping from the proposed tunnel a probability should be the sum total of all events, not just a reliance on one numerical value attached to one event.[8] And it does not account for the fact that the risks are interactive, such that one event (e.g., a construction defect) may make another event (e.g., axial loading stress) more likely to cause a rupture.[9]

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[4] *Id.*

[5] *Id.* at 2622-2633.

[6] *See* Bay Mills' positions set forth in the Initial Brief on Remand on behalf of the Bay Mills Indian Community at 18-23; and further the Brief in Support of Bay Mills' Application for Leave to Appeal at 12-16.

[7] *See* Godfrey Direct Testimony, 17 Tr. 2436 (stating the FMEDA workshop occurred on November 16 and 18, 2021); Dennis Cross Examination on Remand, 16 Tr. 2211 (stating he attended the workshop); *Id.* at 2213 (stating that he provided inputs for the workshop); cf. Surrebuttal Testimony of Aaron Dennis, 8 Tr. 798-805 (dated January 14, 2022 and includes no mention of a probability of failure analysis).

[8] When the probability of two events is considered, the calculation of the probability of either Event A or Event B occurring is expressed as: P(A or B) = P(A) + P(B) – P(A and B). *See also* Exhibit A-28, Part 1 at 425-474 "Evaluation of Anchor Strike Prevention and Protection Measures for the Line 5 Crossing of the Mackinac Straits," prepared by C-FER Technologies. The C-FER Report calculates the probability of failure of the dual pipelines for several different scenarios and then adds the probabilities together to reach a conclusion about the overall likelihood of failure. Notably, Godfrey's failure to do that here makes a comparison to the dual pipelines impossible.

[9] Mr. Kuprewicz noted that: "Mr. Godfrey does not take into account the interactive threats between the unusual and abnormal loading that this design will place on [the] pipeline's girth welds and HAZs. Enbridge has not demonstrated it is taking the unique threat of catastrophic failure at girth welds or heat affected zones seriously."

Even more troubling, however, is that Mr. Godfrey's quantitative approach does not address the primary engineering concern raised by Mr. Kuprewicz about the proposed tunnel design. Mr. Kuprewicz testified that a pipeline installed on rollers and anchored in the middle of the tunnel will place unusual abnormal loading on the pipeline's girth welds and HAZs.[10] This loading can result in a full bore pipeline rupture.[11] This concern is heightened by the use of X-70 pipe.[12] Mr. Godfrey, as well as MPSC Staff witnesses, respond by stating that the rollers will alleviate the "longitudinal" stress placed on the pipeline. – i.e. the stress along the pipeline's length. But there is nothing in the record about the axial shear stress the pipeline will experience from the resulting longitudinal movement that places the girth welds and HAZs at heightened risk.[13] Notably, Enbridge did not provide engineering calculations on this point and their Engineer of Record, Arup, provided no testimony. The concern that a pipeline moving on rollers will experience abnormal axial shear loading is far too important to be dismissed as an unlikely event based on Enbridge's insufficient record.

Last, Godfrey's decision to adjust his calculated probability down by an entire order of magnitude lacks any credible explanation or analysis and is undermined by the very data upon

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Kuprewicz Direct Testimony on Remand, 17 Tr. 2632. Mr. Kuprewicz's testimony about the girth welds is illustrative of the broader point: comprehensive risk assessment must consider the interactive nature of events and not just reach conclusions based on the calculated probability of one type of failure.

[10] *Id.* at 2631.

[11] *Id.*

[12] See Exh. BMC-43 (Joint Industry Report titled *Enhanced Girth Weld Performance for Newly Constructed Grade X70 Pipeline* dated May 29, 2020); Exh. BMC-54 ("Pipeline Safety: Potential Low and Variable Yield and Tensile Strength and Chemical Composition Properties in High Strength Line Pipe," 74 Fed Reg 23930 (May 21, 2009)); Exh. BMC-55 ("Pipeline Safety: Girth Weld Quality Issues Due to Improper Transitioning, Misalignment, and Welding Practices of Large Diameter Line Pipe," 75 Fed Reg 14243 (March 24, 2010)).

[13] Kuprewicz Direct Testimony on Remand, 17 Tr. 2631-2632 (explaining how the welded portion of the pipe affects its ability to tolerate various abnormal loading stresses and, further, how Mr. Godfrey's analysis fails to take this into consideration).

which he relies.[14] A review of the Pipeline and Hazardous Materials Safety and Administration ("PHMSA") reportable incident database reveals that, during the years 2002 through 2022, Enbridge experienced 20 incidents attributed to operator error– an average of one incident per year.[15] Nevertheless, Godfrey makes his order-of-magnitude probability adjustment because he stated, without support, that Enbridge has an Integrity Management program that prevents failures from occurring and detects them should they occur. In essence, Godfrey suggests that Enbridge should be given a probability "credit" because, in his view, Enbridge is unlikely to experience "operator error."[16] The numerous operator errors attributed to Enbridge in the PHMSA database suggest that such an adjustment is completely unwarranted.

The State of Michigan has felt the effects of Enbridge's overconfidence in its own ability to control operator error when the Line 6B rupture continued to spill oil for seventeen hours while the release went undetected; the spill from Line 6B happened only a few days after Enbridge made assurances to Congress that it had procedures in place to prevent such a failure from occurring.[17] Simply put, Mr. Godfrey's "order of magnitude" adjustment is nothing more

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[14] *See* Exh. A-29 at 7 (adjusting the probability calculation from $3.77x10^{-6}$ to $3.77x10^{-7}$).

[15] The data can be viewed through the link provided by Mr. Godfrey, choosing "Operator Information," and then utilizing the dashboard to search for Enbridge (Operator ID 11169). Click on the Operator Dashboard Link, open the Incidents Tab, and adjust the Year criteria accordingly. *See* https://www.phmsa.dot.gov/data-and-statistics/pipeline/distribution-transmission-gathering-lng-and-liquid-accident-and-incident-data.

[16] MPSC Staff conclude that Mr. Godfrey's order of magnitude adjustment is "a reasonable assumption for a risk assessment at this time, pending assumptions derived from future integrity assessments during operation and maintenance." MPSC Staff Initial Reopened Record Brief at 6. Yet, the Staff offers no explanation as to why the assumption is reasonable. Furthermore, the Staff's suggestion that this kind of unsupported assumption is acceptable "at this time," is exactly what leads to the "Space Shuttle Syndrome" that Mr. Kuprewicz warns can lead to disaster. *See* Kuprewicz Direct Testimony on Remand, 17 Tr. 2643 (explaining that "Space Shuttle Syndrome refers to what occurs when people ignore or underestimate risk to drive to a preordained decision to the point where they dismiss or ignore very real risk in favor of going forward with a project.")

[17] *See* Initial Brief on Remand on behalf of the Bay Mills Indian Community at 8, 28; Exhibit BMC-59; Kuprewicz Direct Testimony on Remand, 17 Tr. 2636-2639.

than a biased assertion by a witness employed by a company whose financial interest is tied to Enbridge.[18]

B. Enbridge's Argument That The Tunnel Will Withstand An Explosion Fails To Consider A Worst Case-Scenario.

The evidence demonstrates that an explosion could cause the tunnel structure to fail. Initially, Enbridge refused to provide any information about the tunnel's ability to withstand an explosion. The Commission observed in its July 7 Order that "there [was] no information on the record regarding the concrete's ability to withstand the effect of a high-pressure air impact from an explosion."[19] Enbridge filed its witnesses' direct testimony on October 21, 2022, and did not address the Commission's observation about lack of evidence regarding the concrete's ability to withstand a high-pressure event. The MPSC Staff then served a discovery request on Enbridge requesting the same information about the concrete's ability to withstand the impact of a high-pressure event.[20] Enbridge objected and, through its counsel, again refused to provide the information.[21] It was not until *after* Bay Mills provided testimony that the Commission found was absent from the record, that Enbridge provided Mr. Ferrara's rebuttal testimony and his "Explosion Study."

Bay Mills' expert Brian O'Mara[22] testified that if a fire damaged the tunnel to the extent that the secondary containment system was breached, Line 5 product would overcome the

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[18] *See* Cross Examination of Ray Philipenko, 16 Tr. 2286 (testifying that Enbridge's CPM system has been built on DNV's computer software for the last 25 years and that Enbridge continues to have a licensing agreement and pay DNV an annual support fee).

[19] July 7 Order at 45.

[20] Exh. BMC-62.

[21] *Id.*

[22] Enbridge takes repeated aim at Mr. O'Mara's professional experience yet its attempts to discredit Mr. O'Mara are refuted by the evidence of his unimpeachable qualifications. Mr. O'Mara is a Geological Engineer with a degree from Michigan Technological University. His professional experience spans more than 30 years of experience in environmental consulting specializing in geotechnical and hydrogeologic investigation—including tunnel and shaft

hydrostatic pressure outside of the tunnel and migrate upwards into the waters of the Straits.[23] Mr. O'Mara then opined that Enbridge's response to his testimony, by way of an "Explosion Study," was inadequate because Dr. Ferrara did not model inputs that reflect a worst-case scenario.[24] The results of the "Explosion Study," as Mr. O'Mara explained, only suggest that a tunnel—about seven-times smaller than the one proposed[25]—can withstand the overpressure generated by an explosion following a pinhole release; it proves nothing more.

Enbridge spins the facts and states that "the overpressure created by worst-case explosion scenarios could not cause tunnel failure."[26] But if Dr. Ferrara's "computer model [was] of the worst-case scenario,"[27] as Enbridge claims, he would have used inputs representative of a full-bore rupture of the pipeline. To be clear, Dr. Ferrara *chose* data that he input into a computer model and his choice of data was based on "the work carried out in the previous DNV Probability of Failure Analysis."[28] He chose to run a model based on a tunnel that was level and only 1000 meters long; a release from a single hole that was 0.315 inches in diameter; a vapor cloud width, length, and height that did not fill the tunnel; and a constant atmospheric

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construction and hydrocarbon contaminant fate and transport, containment, capture and treatment solutions. He has a proven track record of providing insightful and practical solutions to complex site investigations. His public sector clients include the Detroit Water and Sewerage Department; the Milwaukee Metropolitan Sewerage District; the US Air Force; US Army Corps of Engineers; and the USEPA. His private sector clients include 3M; BASF; Consumers Energy, CSX Transportation; DTE Energy; Ford; General Electric; General Motors; Marathon Petroleum; Northrup Grumman; and law firms, including Miller Canfield, Dickinson Wright, and Kirkland & Ellis. *See generally* Exh. BMC-61.

[23] *See generally* O'Mara Direct Testimony on Remand, 18 Tr. 2664-2682.

[24] *See generally* O'Mara Sur-Rebuttal Testimony on Remand, 18 Tr. 2700-2704.

[25] The explosion study contemplates a tunnel and pipeline segment that is 1000 meters (or 0.6 miles) long, but the proposed tunnel will be over 4 miles long. Exh. A-35 at 11.

[26] Enbridge Initial Brief on Reopening at 10-11.

[27] *Id.*

[28] Exhibit A-35 at 5.

temperature, all of which were provided by Enbridge.[29] The computer then ran the model based on Dr. Ferrara's chosen inputs and reached its conclusion.

Without including inputs that reflect a full bore rupture of the pipeline along a 4 mile inverted tunnel, it is inaccurate to conclude that the overpressure generated in the tunnel created by an explosion from an ignition of NGL ("natural gas liquids") product is 0.386 barg, and misleading to state that the conclusion is "conservative."[30] As a result, the Commission should afford Dr. Ferrara's rebuttal testimony little weight, and it should reject Enbridge's attempts to overstate Dr. Ferrara's conclusions.[31]

Whether the tunnel will be able to maintain secondary containment in the event of an explosion is a crucial question. Yet, Enbridge, after initially refusing to provide the information, modeled a release from a hole the size of a pencil eraser with assumptions that are not representative of the proposed tunnel project. Following the Line 6B disaster, the National Transportation Safety Board concluded that Enbridge had failed to adequately plan for a response to a worst-case discharge.[32] The consequence was that emergency response workers were not prepared, heightening the environmental damage.[33] Here, Enbridge is following the same path.[34]

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[29] Exhibit A-35 at 8, 11.

[30] O'Mara Sur-Rebuttal Testimony, 18 Tr. 2700-2704.

[31] To find an example of a worst-case scenario, one need only look to Bellingham, Washington or Marshall, Michigan, or the recent Keystone Pipeline failure in Kansas, among many other historical examples of pipeline ruptures. Those disasters were not caused by a pinhole release the size of a pencil eraser—as Dr. Ferrara modeled. Each disaster involved a chain of events that culminated in a full-bore rupture of the pipeline, a massive spill and, in the case of the Olympic Pipeline release—an unintended ignition event. *See* Exh. BMC-52; Exh. BMC-58; Exh. BMC-64.

[32] *See* Exh. BMC-58 at 14.

[33] *Id.*

[34] Staff is likewise following the same path by accepting Enbridge's choreographed version of a hypothetical release and refusing to consider a true worst-case scenario involving a massive hydrocarbon fire, multiple explosions and loss of secondary containment—and the resulting devastation. *See* Staff's Initial Reopened Record Brief at 13.

C. Enbridge's Argument That There Is No Evidence To Suggest Methane Will Cause An Explosion Is Not Supported By The Record.

Dr. Vitton's opinion that methane does not present a risk to this project is contradicted by the evidence. Mr. O'Mara testified that the presence of methane could cause an explosion during construction or during the continued operation of the replacement pipeline.[35] He testified that his concern was informed by his professional experience and training;[36] his review of the Geotechnical Data Report;[37] and well-documented historical reports of methane and related tunnel disasters throughout the Great Lakes region.[38]

Mr. O'Mara's concerns are well-founded. The evidence demonstrates that:

- The United States Geological Survey, an agency within the United States Department of the Interior and the nation's largest water, earth, and biological science, and civilian mapping agency, published a Fact Sheet in June of 2020 which identified 290 million barrels of shale oil in the Ordovician Collingwood Formation.[39] Not only does this geologic formation directly underlie the Straits of Mackinac, but the Straits area is also where this formation is the thickest and closest to the surface.[40]

- Enbridge's geotechnical investigation did not reach rock at the deepest part of the Straits.[41] As a result, no data was gathered at the deepest elevation of the tunnel path and the conditions there remain unknown.

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[35] O'Mara Direct Testimony on Remand, 18 Tr. 2670.

[36] O'Mara Direct Testimony on Remand, 18 Tr. 2665-2668; *See also* BMC-61.

[37] O'Mara Direct Testimony on Remand, 18 Tr. 2677; O'Mara Redirect Examination, 18 Tr. 2757; *See also* Exh. MM4 at 2496-2624 and Appendix A attached to the Initial Brief on Remand on Behalf of the Bay Mills Indian Community (extracted boring logs from Exhibit MM4).

[38] O'Mara Direct Testimony on Remand, 18 Tr. 2677-2678.

[39] Subsurface oil and gas deposits are sources of methane and, because it is lighter than air, methane rises through fractures in bedrock or, when under pressure, moves in different directions. Vitton Cross-Examination, 17 Tr. 2544-2545, 2552.

[40] *See* Exh. BMC-70. Dr. Vitton responded that "there's nothing in this paper to suggest there is or are deposits there." Vitton Cross-Examination, 17 Tr. 2562. That is not accurate. For clarification, the Fact Sheet refers to "undiscovered, technically recoverable" oil and gas resources. Exh. BMC 70 at 1. The USGS assesses "undiscovered, technically recoverable resources" as those which are estimated to exist based on geological knowledge and theory. *See* https://www.usgs.gov/faqs/what-difference-between-assessed-oil-and-gas-resources-and-reserves#:~:text=The%20USGS%20assesses%20%E2%80%9Cundiscovered%2C%20technically,on%20geologic%20knowledge%20and%20theory.

[41] Redirect Examination of Brian O'Mara, 18 Tr. 2754-2755 (noting that Boring number BH19-24, which is the

- Despite quality control issues with the geological data that was sent to the laboratory, methane was nonetheless detected in 19% of the samples.[42]

Thus, the evidence suggests that methane could pose a risk to the construction and operation of the replacement pipeline.

Although Enbridge and Dr. Vitton now claim that there are no sources of methane in the Straits, they previously recognized that methane does pose a potential risk. Enbridge acknowledged a potential hazard from explosive gases, including methane and hydrogen sulfide, in a report it submitted to the State of Michigan in 2018.[43] Dr. Vitton was a contributor to this research, and was specifically tasked with assisting "in the collection and analysis of existing geological and geotechnical information for the project site."[44] Despite this prior acknowledgement of research indicating that explosive gases pose a risk, Dr. Vitton's rebuttal testimony makes no mention of this prior conclusion, nor does it explain why the research and historical records that "indicate potential hazards from explosive gases" were not considered. Instead, Vitton makes inaccurate statements, including that there is a "lack of oil and gas field or

boring representing the deepest part of the Straits, did not even encounter rock); Exh. MM4 at 34 (Table 5.4: Deepwater Drilling Program identifying N/A at the rock depth drilled for BH19-24).

[42] Enbridge claims that Mr. O'Mara did not provide his calculations or the significance for this fact. The calculation is straightforward and based on Dr. Vitton's testimony: 21 samples were sent to the lab, divided by the 4 samples that detected methane, equals 0.19 or 19 percent. *See* Vitton Rebuttal Testimony, 17 Tr. 2465. The significance is also straightforward: "Enbridge has made statements that methane was not detected in the Straits, but that position is directly contradicted by its own Geotechnical Data Report (GDR)." O'Mara Direct Testimony on Remand, 18 Tr. 2677. Further, "[g]iven the small number of samples tested (less than one per 1000-feet of tunnel length), it is likely that more methane will be encountered in areas that have not been tested." *Id.*

[43] Exh. A-9 at 31.

[44] *Id.* at 11.

coalbeds in the Straits,"[45] and overbroad conclusions based on irrelevant studies of methane levels in the water column of the Great Lakes.[46]

There is no credible way that Enbridge can assert that methane poses no risk to the project. Nevertheless, Enbridge continues to dismiss the threat.[47] Even more troubling is that Aaron Dennis confirmed that Enbridge has no plans to conduct further geological investigations beyond what was conducted in 2019,[48] and Dr. Vitton opined that no mitigation measures need to be done aside from following standard OSHA procedures.[49] The bottom line is that methane presents a risk to the tunnel project and, here again, Enbridge is presenting incomplete and inaccurate analysis to convince the Commission to approve the project despite the risk.

D. Enbridge's Argument That There Is No Circumstance Under Which Product From Line 5 Could Escape The Tunnel Fails To Consider A Worst-Case Scenario.

Enbridge's argument that there is "no conceivable scenario" in which Line 5 product could escape the confines of the tunnel and migrate into the Straits again demonstrates Enbridge's unwillingness to consider the impact of a worst-case scenario. As Mr. O'Mara explained, "[h]ydrostatic pressure is the downward force exerted by gravity from the water, sediment and rock present above the proposed tunnel."[50] The hydrostatic pressure outside the tunnel will naturally push fractured rock, sediment, and water against the intact tunnel, or into a compromised tunnel, because the pressure inside the tunnel is essentially zero and the material

[45] Vitton Rebuttal Testimony on Remand, 17 Tr. 2469.

[46] *Id.* at 2470. Here, Vitton directly contradicts the conclusion set forth in Exh. A-9 and presumably offered by him given the subject matter that he was contributing to, that research "indicate[s] potential hazards from explosive gases including methane and hydrogen sulfide," stating that "[s]cientific research supports the lack of methane in the Straits."

[47] Staff, too, dismissed the threat of methane by exclusively relying on the faulty data in Enbridge's GDR to reach its conclusions in Exh. S-37.

[48] Dennis Direct Testimony on Remand, 16 Tr. 2234

[49] Vitton Cross-Examination on Remand, 17 Tr. 2532.

[50] O'Mara Direct Testimony on Remand, 18 Tr. 2679

under higher pressure will move into a space with lower pressure—that is physics. However, Enbridge's "law of physics" argument[51] is only valid if one assumes a collapse of only a small portion of the tunnel, which is far from a worst-case scenario and does not address Mr. O'Mara's testimony.

An explosion is an uncontrolled event.[52] An explosion in the confines of a tunnel has the potential to be catastrophic: an explosion could ignite a product fire resulting in a fuel-rich flame from a large pool of hydrocarbons that burns for hours, *not 180 minutes*, and triggers additional explosions and fires throughout the length of the 4-mile-long pipeline filled with hazardous liquids.[53] As Mr. O'Mara explained, this kind of catastrophic failure with intense heat could result in a "pancake failure," or a failure where the weight of the rock, sediment and water above the tunnel will cause the weakened portions of the tunnel segmented liner to fail and collapse inward.[54]

In the event of a pancake failure or a catastrophic total collapse where the tunnel roof crashes down, the tunnel interior will comingle and be filled with rock, sediment, and water from what was formerly outside the tunnel.[55] At this point, the secondary containment provided by the tunnel for the pipeline will be lost—indeed, much of the structure will be lost—and the pressure at the points of collapse will quickly equilibrate to the hydrostatic pressure. However, the product in the pipeline will remain at its operating pressure which, by all accounts, will

[51] Enbridge Initial Brief on Reopening at 17.

[52] Kuprewicz Cross-Examination, 10 Tr. 1386. As Mr. Kuprewicz testified based on his experience, first responders are "scared as hell of explosions because explosions are an uncontrolled event, and they get it, they don't want to be in an explosion environment." 10 Tr. 1385-1386.

[53] Enbridge experienced an explosion along Line 5 when a vapor cloud exploded in Crystal Falls, Michigan. The explosion ignited a fire that burned for 36 hours. Kuprewicz Direct Testimony, 10 Tr. 1329-1330.

[54] O'Mara Direct Testimony on Remand, 18 Tr. 2672.

[55] *Id.* at 2680-2681.

significantly exceed the hydrostatic pressure.[56] As product continues to flow out of the pipe under pressure—a not unheard-of scenario considering it took Enbridge 17 hours to correctly interpret the alarms sounding during the Line 6B disaster—it will continue to "pump" or spew product out at pressures greater than the hydrostatic pressure until the release is ultimately stopped—which will be considerable time in the event of a rupture.[57]

Therefore, in the event of an explosion and/or fire that leads to a collapse and loss of the secondary containment, Line 5 product will be released into the surrounding environment because the pipeline will no longer be isolated from the exterior and the operating pressure of the pipeline will exceed the hydrostatic pressure.[58] This, too, is physics.

E. Enbridge's Ignores The Fact That Its Leak Detection System Will Not Prevent A Catastrophe.

Enbridge states that it is "confident" in its ability to detect any release within the tunnel, but Enbridge's track record with respect to its leak detection system indicates that such assurances should be viewed with deep skepticism. To convince the Commission that it will detect any release within the tunnel, Enbridge points to its Leak Detection Alarm Manager ("LDAM") system that it claims will require an investigation of any alarms within ten minutes.[59] Enbridge further states that if any one of three control room employees identifies a leak trigger,

[56] *Id.* Further, Enbridge takes aim at Brian O'Mara for using the design maximum operating pressure of 1440 psi in his example. However, Enbridge's stated maximum operating pressure of 463 psi does not advance their argument; 463 psi is still greater than the hydrostatic pressure at the deepest part of the tunnel.

[57] *Id.*; see also Exh. BMC- 58.

[58] O'Mara Direct Testimony on Remand, 18 Tr. 2680-2681.

[59] Enbridge Initial Brief on Reopening at 19.

the system will "request" an emergency shutdown.[60] Enbridge also notes that if an alarm has not been invalidated, an automatic shutdown occurs at the 11-minute mark.[61]

But we have heard this story about quick response times and automatic shutdowns before. When he testified before Congress in July 2010, Mr. Richard Adams, Enbridge's Vice President of U.S. Operations, Liquid Pipelines, made similar assurances about the company's control room processes and automatic shutdown systems:

> Certainly, our response time from our control center can be almost instantaneous, and our large leaks are typically detected by our control center personnel. They have enough experience and training that, with usually a leak of any size, they can view that there is a change in the operation system, and there are provisions that, if there is uncertainty, they have to shut down within a period of time, and that would include the closing of automatic valves.[62]

Yet, days later, the Marshall, Michigan leak went undetected for hours.[63] Enbridge's assurances are further undermined by the fact that, as discussed in Section I.A above, over the past 22 years, Enbridge has experienced over 20 releases due to operator error. Based on this track record, Enbridge's boastful confidence in its leak detection system is not warranted.

But, even more importantly, even if Enbridge's leak detection systems and response procedures work as intended, a full-bore rupture or other high rate-of-release event will fill the tunnel with tons of product in a matter of minutes. So, even if the release is detected, and even if the control room personnel act quickly in response, an explosive environment will have been created within the tunnel, setting the stage for a possible catastrophe. Here again, Enbridge is not considering a worst-case scenario.

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[60] *Id.*

[61] *Id.* at 20.

[62] Exh. BMC-59 at 39.

[63] Exh. BMC-58 at 13-15.

F. Enbridge's "One in One Million" Argument Misrepresents The Record.

In its Initial Brief on Reopening, Enbridge utterly—and falsely—mischaracterizes prior testimony offered by Aaron Dennis in which he repeatedly testified that "the likelihood of a release is less than 0.000001."[64] When he testified in the first phase of the case, Mr. Dennis could provide no basis for this number. Indeed, the Commission noted in the July 7 Order: "[T]he Commission finds that Enbridge did not provide record evidence of the data and methodology used to calculate the Replacement Project's alleged on in one million risk of release, and therefore the parties and the Commission are unable to review the calculation."[65] It appears that Enbridge pulled a number out of thin air and submitted it as evidence in the hope that the Commission would rely upon it in granting its application.

In response to the Commission's observation that the record lacked any support for the one-in-one-million testimony, Enbridge has decided to switch horses and rely on the flawed probability analysis of Mr. Godfrey instead of the unsupported statements of Mr. Dennis. With respect to Mr. Dennis's prior testimony, Enbridge now argues for the first time that the "one in a million figure is a reliability target for managing the reliability of the Line 5 replacement segment through Enbridge's Integrity Management Program,"[66] not the actual probability of release. This characterization amounts to revisionist history as it is directly at odds with Enbridge's prior arguments about the testimony.[67] As Mr. Dennis acknowledged on cross-

[64] *See e.g.*, Dennis Surrebuttal Testimony, 8 Tr. 800-802; Dennis Cross-Examination, 8 Tr. 822 ("the likelihood of a release at the pipeline inside the tunnel is at one in a million").

[65] July 7 Order at 45.

[66] Enbridge Initial Brief on Reopening at 20.

[67] It is also contrary to Enbridge's prior arguments about this number. In their Initial Brief following the first evidentiary hearing, Enbridge states "the design and inspection regime for the replacement segment makes the likelihood of a release from that segment to be one in a million." Enbridge Initial Brief at 22.

examination: "I said the likelihood of release at the pipeline inside the tunnel is one in a million."[68] Mr. Dennis never stated that the one in one million figure was a "target."

G. Enbridge Fails To Justify The Use Of Less Stringent Electrical Standards In The Tunnel.

Enbridge's arguments about the type of electrical equipment to be used in the tunnel ignore the Commission's request for information on this important topic. Mr. Kuprewicz testified that the use of the more stringent Class 1, Division 1 electrical equipment—instead of Class 1, Division 2—would reduce the risk of an ignition event occurring in the proposed tunnel.[69] In the July 7 Order, the Commission stated that it was "necessary" for Enbridge to provide information "regarding the feasibility of exceeding the minimum OSHA standards and designing the electrical equipment in the tunnel to Class I, Division 1. . . ."[70]

Enbridge failed to provide the requested feasibility information. Instead, in its post-hearing brief, Enbridge states that "[i]t is unclear whether it is even feasible to design the electrical equipment to meet the more stringent standards for Class I, Division 1."[71] It states that it is also "unclear" where the Tunnel Service Vehicle could be designed to meet the safer standard.[72] And, it argues that the use of Class I, Division 1 equipment would "perhaps" require a redesign of the tunnel to accommodate the spacing needs.[73] The only reason the feasibility of using a more stringent electrical classification for the proposed tunnel remains *unclear* is because

[68] Dennis Cross-Examination, 8 Tr. 822.

[69] Kuprewicz Rebuttal Testimony, 10 Tr. 1328-29.

[70] July 7 Order at 45-46.

[71] Enbridge Post-Hearing Brief at 24.

[72] *Id.*

[73] *Id.* at 25.

Enbridge, as the applicant, failed to supply the information that the Commission ordered it to produce.

Instead of providing the requested feasibility information, Enbridge incorrectly argues that Class I, Division 1 electrical equipment is not appropriate.[74] The Class I, Division 1 classification is more stringent than the Class I, Division 2 standard[75] and is used to reduce the risk of an ignition event in a location where hazardous gases may exist, or in a location where a breakdown of equipment or processes might release ignitable concentrations of flammable gases or vapors, and might also cause simultaneous failure of electric equipment—such as in the event of an explosion. It would be entirely appropriate to use equipment that is better suited for such circumstances. Enbridge's argument to the contrary should, therefore, be rejected.

H. The Evidence About The Ventilation System Does Not Support The Conclusion That It Will Protect The Tunnel From An Explosive Event.

Enbridge's ventilation system will not, and is not designed to, prevent a catastrophic event in the tunnel. Due to the unique design of the proposed tunnel, released hydrocarbons and/or vapor will accumulate in the lowest part of the tunnel elevation.[76] As Mr. Kuprewicz testified: "One intended purpose of the ventilation system is to sweep any released fuel vapor out of the tunnel or reduce the amount of released fuel vapor so that it is out of the flammability range, such that it will not ignite and detonate."[77] But due to the large diameter of the tunnel, it will be difficult to control the fuel air mixture within the tunnel, "which increases the possibility of multiple detonations/explosions within the tunnel."[78]

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[74] Enbridge Initial Brief on Reopening 24-45.

[75] Kuprewicz Rebuttal Testimony, 10 Tr. 1327-28.

[76] Kuprewicz Rebuttal Testimony, 10 Tr. 1327.

[77] *Id* at 1328.

[78] *Id.*

When the Commission requested additional information about the ventilation system,[79] Enbridge clarified that the purpose of the ventilation system was not to mitigate the risk of a fire or explosion, but strictly to provide "breathable air" when maintenance personnel are in the tunnel.[80] Enbridge's stated purpose of the ventilation system, however, confirms that it will not be able to sweep released fuel vapor up and out of the tunnel so that it is out of flammability range—leaving, instead, an unmoving explosive atmosphere. For example, a release of hydrocarbon vapors may occur and settle at the low point of the tunnel, undetected and unmoving, *until* the ventilation system is turned on to clear the air for maintenance personnel. An ignition event could occur at any time before maintenance personnel are set to enter the tunnel.

Even if the ventilation system is turned on to provide "breathable air" for maintenance workers, Enbridge did not prove that the ventilation system for the Replacement Project is adequate for the diameter of the tunnel. Rather, Enbridge calculated the critical velocity needed to be achieved to provide personnel with an exit path clear of smoke in the event of a fire.[81] However, the "design fire size" used in the calculation was "10 MW."[82] That measurement is "representative of a large vehicle fire."[83] The size of a large vehicle fire cannot be said to be comparable to the size or intensity of a fire resulting from a breach of Line 5, and even less so to a full-bore rupture of the line—a 4-mile-long segment transporting 540,000 barrels per day—

[79] *See* July 7 Order at 46 requesting "the data and the methodology demonstrating that the ventilation system planned for the Replacement Project is adequate for the diameter of the tunnel" and "the process for the activation of the ventilation system in the event of a release of Line 5 products in the tunnel."

[80] *See* Exhibit A-31 at 4 ("The ventilation system is active while maintenance personnel are inside the tunnel to provide them with breathable air while they remain in the confined space of the tunnel.").

[81] Exhibit A-31 at 4.

[82] *Id.*

[83] *Id.*

releasing roughly 16,000 gallons per minute.[84] Enbridge has suggested only that its proposed ventilation system will allow workers a path out of the tunnel in the event of a car fire; it has proved nothing more.

I. Enbridge's Argument That Its Fire and Repair Systems Meet and Exceed Current Safety and Engineering Standards Ignore the Volume and Intensity of a Massive Hydrocarbon Fire.

Enbridge's fire safety plans for the tunnel are inadequate. The issue of fire safety in the tunnel comes down to whether it is appropriate to rely on Enbridge's proposed passive fire suppression system that seals off the ends of the tunnel so as to "starve [a] fire of oxygen,"[85] or, as Mr. O'Mara testified, a Fixed Fire Fighting System (FFFS) and advanced ventilation systems that can quickly extinguish or limit fires and facilitate the removal of smoke so firefighters can rescue trapped workers and extinguish fires.[86] Enbridge's reasoning as to why an active fire suppression system should not be used is wholly inadequate. It is based on an unexplained need to reduce workers in the tunnel and the premise that a fire in the tunnel is a "remote risk."[87] However, the evidence in the record proves that maintenance workers will routinely enter the tunnel.[88] The evidence further proves that a fire is not as remote of a risk as Enbridge claims and, further, that in the event of a full bore rupture of the pipeline, a fuel-rich fire could have catastrophic consequences.[89] Given the stakes involved, Enbridge has not proved that its fire suppression system meets or exceeds safety and engineering standards.

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[84] *See* Pastor Pre-Filed Direct Testimony, 7 Tr. 564

[85] O'Mara Direct Testimony on Remand, 18 Tr. 2674

[86] *Id.*

[87] Enbridge Initial Brief on Reopening at 28.

[88] Dennis Cross Examination on Remand, 16 Tr. 2194 (testifying that individuals will routinely enter the tunnel to visually inspect various systems).

[89] *See generally* Kuprewicz Direct Testimony, 10 Tr. 1326-1330; O'Mara Direct Testimony on Remand, 18 Tr. 2669-2682.

II. THE EVIDENCE DEMONSTRATES THAT THE PROPOSED TUNNEL WILL NOT ELIMINATE THE ENVIRONMENTAL RISKS POSED BY THE DUAL PIPELINES.

The record is insufficient for the Commission to conclude that the proposed tunnel satisfies prong (2) of its Act 16 analysis. In its July 7, 2022 Order, the Commission stated that, as part of its prong (2) analysis, it "must be able to determine whether the Replacement Project is designed and routed in a manner that alleviates the many complications of maintaining and ensuring the safety of the dual pipelines and that the Replacement Project will significantly reduce or eliminate the environmental risk posed by the dual pipelines to the Great Lakes, which is Enbridge's stated purpose for the Replacement Project."[90] The evidence about the numerous troubling concerns about the safety of Enbridge's proposed design, as discussed in Section I above, demonstrates that the tunnel substitutes one set of risks for another. Therefore, it is impossible for the Commission to conclude that the tunnel reduces or eliminates the environmental threat posed by the dual pipelines.

The argument that a tunnel will "make an already safe Line 5 crossing of the Straits even safer" ignores both the urgency of the threat that the dual pipelines currently pose and the evidence that the proposed tunnel will introduce an entirely new set of risks into the Great Lakes.

The dual pipelines are not safe. In fact, they were shut down by court order in the Summer of 2020.[91] Then, in November of 2020, the State of Michigan revoked and terminated the 1953 Easement that Enbridge relied on to operate the dual pipelines in the Straits of Mackinac.[92] The State further required Enbridge to cease operation of Line 5 in the Straits—

[90] July 7 Order at 27.

[91] Ryan Jarvi, *Judge Orders Line 5 to Cease Operations*, Michigan Department of Attorney General (June 25, 2020), https://www.michigan.gov/ag/news/press-releases/2020/06/25/judge-orders-line-5-to-cease-operations.

[92] Exh. ELP-18.

which Enbridge ignored.[93] Despite the State of Michigan ordering Enbridge to cease operating in the Straits, the threat posed by the dual pipelines continues because Enbridge refuses to comply with an executive order.

But the proposed tunnel is not the answer.

Enbridge argued that the replacement pipeline situated in the tunnel will no longer be subject to the same risks as the dual pipelines—anchor strikes and bending stresses caused by the fact that the dual pipelines are now suspended in the water.[94] But, although these risks may be alleviated by the tunnel project, Bay Mills' experts identified specific risks and engineering concerns that are unique to the construction and operation of the proposed tunnel. As discussed above and in prior briefs, Mr. Kuprewicz explained how an explosion within the tunnel could be caused by a hydrocarbon release from the pipeline that generates a heavier than air vapor release which then settles in the low spots of the tunnel and is ignited by an electrical spark within the air/fuel cloud.[95]

As Mr. Kuprewicz testified how the risks and engineering concerns can lead to a catastrophic explosion:

> It is important to note that crude oil, and especially propane, in a confined space can generate a tremendous amount of pressure, especially upon detonation. Propane has a broad flammability range coupled with a lower autoignition temperature which makes this material easier to detonate or explode. In this way, propane differs from water or other materials that are typically transported through pipelines.[96]

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[93] *Id.*

[94] Godfrey Rebuttal Testimony on Reopening, 17 Tr. 2446.

[95] Kuprewicz Rebuttal Testimony, 10 Tr. 1327.

[96] *Id.* at 1329.

Mr. O'Mara further identified the risk of methane in the tunnel project and identified risks during construction and operation based on Enbridge's faulty geotechnical data.[97] He also explained how an explosive event or fire within the tunnel could result in a collapse of the tunnel lining and breach of the secondary containment system.[98] The product pushed out from the ruptured pipeline would escape the confines of the collapsed tunnel and migrate into the surrounding rock and sediment, ultimately reaching the water of the Straits of Mackinac.[99]

Thus, while tunnels can be safely constructed[100] and hazardous liquid pipelines exist, Enbridge's proposal *combines* a hazardous liquids pipeline with a confined underground environment. This combination has never been attempted before and the evidence in this matter demonstrates it has the potential to create a catastrophe in the Great Lakes.

[97] *See generally* O'Mara Direct Testimony on Reopening, 18 Tr. 2663-2682.

[98] *Id.*

[99] *Id.*

[100] Enbridge seized upon one phrase in comments submitted by Mr. O'Mara regarding Line 5 in which he stated that tunnels can be safely constructed. O'Mara Redirect Examination, 18 Tr. 2768-2769 (noting that the comments were "multiple pages;" "7 pages in one" and "another one is 16"). It comes as no surprise that Mr. O'Mara endorses the use of tunnels; he has spent his decades-long career involved in the construction of tunnels and shafts. *See* Exh. BMC-61. However, Mr. O'Mara's statement was made with an important qualifier: a *properly designed and constructed tunnel* has the potential to be safe. Mr. O'Mara explained (as he did in his written comments to EGLE and the MPSC) that there were numerous ways that Enbridge's proposed tunnel is not properly designed. *See e.g*. O'Mara Cross-Examination,18 Tr. 2725 (Noting the fundamental problem with the design is that it is an open utility tunnel; the Alternatives Analysis assumed the tunnel would be completely backfilled which is what the design was when they concluded there was a negligible risk, and further, that Enbridge relied on the conclusion that there was a negligible risk but did not adopt that design). Mr. O'Mara further explained (as he did in his written comments to EGLE and the MPSC) that Enbridge's proposal is not on track to being properly constructed. O'Mara Redirect Examination,18 Tr. 2754-2760 (explaining the faulty geotechnical data and unresolved risk of methane in the Straits). Enbridge's use of Mr. O'Mara's opinion, without appreciating his qualifying language, is misleading.

RESPONSE TO BRIEF FILED BY MICHIGAN LABORERS' DISTRICT COUNCIL AND BRIEF FILED BY MICHIGAN PROPANE GAS ASSOCIATION AND NATIONAL PROPANE GAS ASSOCIATION

The initial post-hearing brief filed by the Michigan Laborers' District Council ("MLDC") and the initial post-hearing brief filed jointly by the Michigan Propane Gas Association and National Propane Gas Association (collectively, the "Propane Intervenors") are improper and should be stricken. The Michigan Administrative Code states:

> Briefs containing factual allegations claimed to be established by the evidence shall include a reference to the specific portions of the record where the evidence may be found.[101]

The rule is clear—factual assertions in briefs must be supported by citation to the record.

MLDC's brief fails to comply with Rule 434. The brief includes a two-page section titled "Michigan Jobs and Talent Retention" that includes numerous factual assertions that MLDC claims support the notion that constructing a tunnel will generate jobs in the state of Michigan. The section includes no citations to the record in support of its factual assertions.[102] It also includes a section titled "Michigan Commerce and Environmental Safety that likewise includes factual assertions without record citations.[103] The absence of record citations is not surprising as the alleged impact of the tunnel project on jobs and the Michigan economy is outside of the scope of the case and outside the purview of this Commission. For this reason also, the brief should be stricken.

The brief filed by Propane Intervenors suffers from the same deficiency. The brief includes factual assertions regarding the delivery and use of propane to locations in Michigan.[104]

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[101] Michigan Administrative Code R. 792.10434.

[102] MLDC Initial Brief, at 4-5.

[103] MLDC Initial Brief, at 5-6.

[104] Propane Intervenors Initial Brief, at 3-4.

But, the factual assertions are not supported by record citations and are, therefore, improper. The brief should be stricken.

CONCLUSION

Based on the record evidence submitted in both phases of this contested case, and for the reasons stated above, in Bay Mills' initial brief on remand, and in the initial brief and response brief submitted by the Tribal Intervenors[105] at the conclusion of the initial phase of these proceedings, the Bay Mills Indian Community respectfully requests that the Commission **deny** Enbridge's application to construct and operate the project.

May 19, 2023

Respectfully Submitted,

By: */s/ Christopher R. Clark*

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[105] At the conclusion of the first phase of the case, four tribal intervenors (the Bay Mills Indian Community, the Little Traverse Bay Bands of Odawa Indians, the Grand Traverse Bay Band of Ottawa and Chippewa Indians, and the Nottawaseppi Huron Band of the Potawatomi) collectively filed an initial brief and response brief detailing their arguments in opposition to the application.

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STATE OF MICHIGAN

BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

In the matter of the Application of Enbridge Energy, Limited Partnership for the Authority to Replace and Relocate the Segment of Line 5 Crossing the Straits of Mackinac into a Tunnel Beneath the Straits of Mackinac, if Approval is Required Pursuant to 1929 PA 16; MCL 483.1 et seq. and Rule 447 of the Michigan Public Service Commission's Rules of Practice and Procedure, R 792.10447, or the Grant of other Appropriate Relief	U-20763 ALJ Christopher S. Saunders

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PROOF OF SERVICE

On May 19, 2023, an electronic copy of *Bay Mills Indian Community's Response Brief on Remand* was served on the following parties:

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