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October 19, 2020

The Honorable Liesl Eichler Clark
State of Michigan, EGLE
Water Resources Division
Gaylord Field Office
2100 West M-32
Gaylord, MI 49735

Re: Enbridge Energy Resource Permit Application Number: HNY-NHX4-FSR2Q, AND Enbridge Energy NPDES Permit Application Number: MI0060278

Dear Director Clark,

As you know, I never hesitate to elevate the voices of my residents and Michiganders on critical issues of environmental justice and public health. With the Environmental Protection Agency abdicating responsibility for regulating corporate polluters and enforcing our environmental laws, we know state environmental protection agencies are as important as ever.

I have written the State a number of times regarding my staunch opposition to the continued existence of Line 5 and efforts to extend the lifespan of this threat to the Great Lakes. I write today to once again express that I am wholeheartedly opposed to Enbridge's Great Lakes Tunnel Project, and to reiterate that Line 5 should be shut down as soon as practicable.

Enbridge is simply not a trustworthy corporation, and has a terrible record of environmental stewardship, including one of the most catastrophic inland oil spills in American history right in our backyard. This is not a company we can trust to do right by our natural resources, this is a company motivated only by the pursuit of bigger profits. The deep flaws and omissions in its requests only demonstrate that they are not serious partners for the project they seek to undertake and will cut corners when given the chance.

I co-sign the comment submitted by a coalition of environmental justice groups and Native American representatives, pasted below. I hope that EGLE will take a serious look at the myriad flaws in Enbridge's applications, which taken together demonstrate to me that Enbridge's permit requests should be denied.

Sincerely,

RASHIDA TLAIB
Member of Congress

Oil and Water Don't Mix Campaign Comment

Dear Director Clark,

The undersigned organizations submit the following comments on Enbridge's Resource and NPDES Permit Applications concerning their proposed Great Lakes Tunnel Project. Please note that the undersigned organizations incorporate these comments on behalf of their individual organizations and the Oil and Water Don't Mix campaign as a whole and individual organizations reserve the right to make further individual comments as well.

In these comments we will address significant technical flaws and omissions in both the Resource and NPDES permit requests, and the broader issue that in consideration of these permit requests at this time, EGLE errs by not properly applying the Great Lakes Submerged Lands Act (GLSLA) and Public Trust Doctrine (PTD). EGLE also errs in considering these permit applications administratively complete, despite the lack of critical information that ought to be considered before any review of these permit requests would be proper.

Legal Challenges

We contend that even if these permit requests contained all necessary information for your consideration and the significant technical errors were addressed, the current process for considering the resource permit is contrary to the proper application of GLSLA and PTD. The December 2018 Easement and Tunnel Lease granted by Mackinac Straits Corridor Authority (MSCA) was not authorized under GLSLA and PTD.

Legal precedent is clear that Michigan's authority under PTD extends to all the soils and bottomlands under sovereign waters. It is also clear that any conveyance of a property interest in sovereign waters and bottomlands must conform to the requirements of GLSLA, which specifically incorporates public trust principles including the requirement that any conveyance of an interest in Great Lakes waters and bottomlands is subject to a mandatory determination that the use of public trust lands and waters will not be substantially affected or that the public trust in the same will not be impaired. Since such a determination under GLSLA was not made concerning the 2018 Easement and Tunnel Lease, neither constitutes a legal conveyance of property rights, which must be determined before considering construction impacts or other permits.

Further, Part 303 of NREPA requires EGLE to measure the benefits of the proposed tunnel against its reasonably foreseeable detriments. This would include a determination of public need and a feasible and prudent alternatives analysis, neither of which has been completed. Several studies including the recent report on propane from the Upper Peninsula Energy Task Force (UPETF), point to the fact that Michigan has no need for Line 5, and alternatives to the small amount of light crude and natural gas

liquids that Line 5 provides to Michigan could be easily replaced using alternate infrastructure that is either already in place, or could be in place shortly.

EGLE is also required to follow the Michigan Environmental Protection Act (MEPA) in all of its significant permitting decisions. MEPA requires EGLE to consider and determine whether the tunnel project is consistent with protection of Michigan's natural resources. This also has not been completed for the tunnel proposal, and this project carries with it the likelihood of extreme damage to Michigan's natural resources either during or post-construction from a bentonite slurry release, tunnel collapse, degradation of groundwater quality used as a drinking water source, sinkhole triggering an oil spill from the existing pipeline, explosion, or best case scenario, the release of an estimated 57 million tons of atmospheric carbon annually from the product this tunnel is intended to carry for the next 99 years. All of these potential impacts ought to be considered under MEPA and none of them have.

This illustrates the point that even if the permit requests contained all necessary information and the significant technical flaws were addressed, issuing these permits currently would not be proper due to the significant legal flaws in the permitting process to date. However, these permit requests contain incomplete information and several technical flaws which have been identified by geological and hydrogeological experts and are outlined below. These flaws and omissions are further reasons to deny these permit requests.

Technical Flaws and Omissions

I. Geotechnical Issues

Enbridge's consultant that completed the geotechnical borings and analysis for this project, WSP, is a highly respected engineering firm with a long history of tunneling under their predecessor, Parsons Brinckerhoff. Parsons published *Tunneling Beneath Open Water - A Practical Guide for Risk Management and Site Investigations (TBOW)* in April 2011. While Enbridge has invested significant resources in the *Line 5 Replacement and Tunnel Project (L5RTP) Geotechnical Data Report* (GDR), the GDR and associated supporting plans and subsequent permit applications fail to follow much of the recommendations included in TBOW which concludes "*open water tunnels are risky enterprises, where the difficulties of characterizing the unknown and preparing for the unforeseen present tremendous challenges. It is the intent of this monograph to provide design practitioners and engineers for these projects with tools to best manage this risk*". The lead author of the GDR warned in a 2010 publication *Thoughts on Fault Zone Characterization for Tunneling* "*...tunnel depth, difficult topography, limited access and meager budgets often preclude the possibility to characterize fault zone as completely as would be desired by the geotechnical engineer or engineering geologist".* Appendix E.5 Tunnel Risk Factors, Page E-7 of the October 26, 2017 Alternatives Analysis for the Straits Pipelines - Final Report prepared for the State of Michigan by Dynamic Risk noted *"One potentially large risk would be inadequate subsurface exploration along the tunnel route, and/or laboratory testing, leading to poorly defined geotechnical conditions for the shaft and tunnel excavation. This risk would be mitigated by conducting a thorough geotechnical program, with a large enough borehole drilling plan to effectively characterize the route. The borehole program would be supplemented with a significant seismic investigation as well."*

Unfortunately, Enbridge and WSP failed to follow key guidelines and lessons learned from their experience with opening water tunneling and fault zone characterization for tunneling and the Dynamic Risk recommendations. Because of these significant failures, EGLE cannot rely upon Enbridge's GDR and related supporting work to make informed decisions on the safety, effectiveness, constructability and permitability of the Line 5 tunnel project at this time.

When planning to construct a tunnel beneath open water, the more geotechnical research that is accomplished, the better. Industry standards, and the recommendations in TBOW indicate that geotechnical boring samples ought to be taken roughly every 50-200 feet. More boring samples are better, especially when dealing with the kinds of poor-quality rock formations found in the Straits of Mackinac. Enbridge completed roughly one boring for every 950 feet. The TBOW also recommends completing at least 1.5 feet of borings for every 1 feet of tunnel. Enbridge completed less than 5,000 feet of borings over the roughly 19,000 feet of open water crossing. They should have completed 28,000 feet of borings per the rule of thumb. It's clear Enbridge planned to complete eight additional borings within the waters of the Straits. This would have increased the number of borings by 40 percent and while it would still be less than the recommendations in the TBOW, it would have certainly reduced the uncertainties related to the project geology. Enbridge has fallen well short of the industry standards, the Dynamic Risk assumptions and their own consultant's recommendations for geotechnical research. Enbridge completed no borings on the northern terminus of the tunnel and the aquifer testing completed at the southern terminus of the tunnel indicates the bedrock is so highly fractured that it behaves like sand or gravel and not solid rock.

The borings Enbridge completed in the water have exhibited "Very Poor" or "Poor" Rock Quality Designation (RQD) values in roughly two thirds of the rock core samples measured. RQD values this low are considered "Red Flags" and warrant additional borings to further characterize the bedrock quality. Less than 25 percent of the rock cores were characterized as "Good" to "Excellent", which is what the Dynamic Risk report assumed "*Good rock conditions and minimal water inflow are anticipated at the Straits.*" However, based on the core logs and aquifer testing most of the rock the tunnel will encounter will be "Poor" and the groundwater inflow will be much greater than previously anticipated.

Contrary to Enbridge's public statements, this tunnel may not be drilled entirely through bedrock. While Enbridge would like to complete a tunnel within bedrock, there is much uncertainty regarding where the top of rock is in the middle of the Straits because they have not advanced enough borings or completed significant seismic investigation of this area. Because Enbridge has proposed to drive the tunnel to within 25 feet of the top of bedrock it is quite plausible that that the tunnel will breach the top of bedrock in the submerged bedrock valley. A Tunnel Boring Machine (TBM) cannot be "turned on a dime" and if it does breach the bedrock envelope the tunnel will have to be completed in the unconsolidated sediments that overlay the bedrock are part of the Straits bottomlands. **Enbridge failed to hit bedrock in boring BH19-24** which is located in the middle of the Straits, so it is certainly possible the TBM may encounter the same. Geotechnical research is critical because without a complete understanding of the geological formations that will be encountered, the likelihood of encountering serious problems while building the tunnel increases.

Enbridge has proposed to use a slurry balanced TBM, which must operate at the right pressure for the type of rock (or soil) formations and water pressures that it will drill through. Without fully knowing where the top of rock is and the thickness of the overlying rock as well as faults and other geologic hazards, the TBM has the potential to cause a blow out of the slurry to the bottomlands or a blow in of rock and soil into the tunnel, endangering the integrity of the tunnel, the lakebed, and the lives of any workers inside the tunnel. A TBM that is not properly balanced, or drilling through both rock and sediments or other geologic hazards has the potential for jamming and getting stuck. Since these machines do not go backwards, the standard practice is to drill a large hole (recovery shaft) from the surface and either fix the TBM in place, or remove it, fix it, and place it back inside the tunnel. This sort of an operation is difficult enough on land, and it is not clear that this sort of retrieval would be possible in the Straits of Mackinac. Having to repair or remove a TBM that has become disabled could add months if not years to the project and could result in the tunnel plan being abandoned altogether.

Further, even with the minimal geotechnical research that was completed, traces of methane were

discovered in the groundwater samples collected, which is potentially very dangerous. The 2017 Dynamic Risk report assumed that "*No hazardous contamination or natural toxic gases are expected in the shaft or tunnel subsurface materials, and extra mitigation measures to overcome this risk are not included in the cost analysis*." One of the largest industrial accidents in Michigan history was caused in 1971, when a pocket of methane was encountered while drilling a water intake tunnel beneath Lake Huron. A spark with the methane release caused an explosion that killed 22 workers. Where methane is discovered, hydrogen sulfide is also likely to be found, which also presents a potentially lethal danger to workers inside the tunnel, and workers at the surface when tunnel air is discharged near the South Portal or north Retrieval Shaft.

Either an explosion in the tunnel, a blow out or blow in, or a sinkhole developing due to drilling would be catastrophic, resulting in the potential release of oil from the existing Line 5, a bentonite slurry release into the surface water which would devastate plant and animal life, and/or pose a lethal threat to workers in the tunnel.

II. Tunnel Planning Challenges

The current tunnel design is fraught with potential difficulties including but not limited to the concave design, potential groundwater infiltration and pumping issues, and its proposed alignment underneath the current west leg of Line 5. It is also worth noting that the current tunnel design bears little resemblance to the tunnel design examined in the risk analysis of the 2017 Dynamic Risk report. The risk analysis assumed "*The risk of discharge of the pipeline fluid from the welded steel pipe during system operation is not predicted to be a concern, given the construction methodology of the surrounding the product pipe by grout, surrounded by a gasket sealed concrete segmental liner, surrounded by contact grout, surrounded by sound bedrock.*" **However, the Enbridge design is an open tunnel and has eliminated filling the tunnel air space with grout and the tunnel will clearly not be completed in "sound" bedrock. Not filling the tunnel airspace with grout means the tunnel will be susceptible to catastrophic leaks from the product pipeline, tunnel collapse, flooding, groundwater infiltration, fires and explosions. The current Enbridge design is susceptible to complete failure by a fire of the pipeline product. It would be nearly impossible to extinguish a fire in the tunnel, the fire would spall the concrete liner and expose the steel reinforcement rods which would then melt and the tunnel would collapse and the product could be released into the overlying rock and sediments of the Straits. This scenario was not evaluated by Dynamic Risk in 2017.**

The concave design of the tunnel ensures that both during and after construction, water (or oil from a pipeline leak) in the tunnel will collect at the lowest point which is the middle of the ancient river valley in the Straits of Mackinac, the least accessible point in the tunnel. Gas pipelines and most tunnels are designed to have their highest point in the middle to allow product or water to drain to the endpoints in a convex shape. It is always better to drive a tunnel uphill as this will allow water that will inevitably enter the tunnel. When driving a tunnel downhill you will be fighting water infiltration all the way as water collects at the TBM or the lowest point of the tunnel, and will have to be pumped to the exit shafts from the middle of the tunnel. This is a hazard during and after construction, increasing the likelihood of the tunnel flooding. If the tunnel floods during construction when the TBM is driven past the midpoint, workers could be stranded near the TBM with no means of egress through the flooded middle section. If the tunnel design were convex, water would settle at low points by either exit shaft, and be much easier to pump out.

Currently, the tunnel is supposed to be drilled almost directly beneath the west leg of the existing Line 5 pipeline. This siting is concerning especially combined with the lack of geotechnical analysis. The lack of geotechnical analysis all but ensures that unexpected rock formations will be encountered while

drilling, which increases the potential for TBM failures including blow ins, which can lead to sinkhole formation of the bottomlands and the tunnel itself to cave in during construction. Should either of these happen, disruption on the bottomlands could cause the west leg of Line 5 to shift, possibly causing an oil spill into the Straits of Mackinac. It would be much safer to shut down the existing pipeline throughout construction.

The proposed alignment is also very close to a recently discovered indigenous archeological site dating back thousands of years. Considering the poor rock quality and high risks associated with this proposal, drilling the tunnel could impact this rare archeological find which holds deep historical and cultural significance that must be preserved.

III. Wastewater Issues

The NPDES permit application for this project is also lacking in pertinent information and unclear in regards to what chemicals will be used in the process, anticipated groundwater migration, surface water infiltration, and exact treatment protocols that will be put in place to protect surrounding ground and surface water resources. On September 9, 2020, OWDM sent a request for 15 different categories of additional information to aid in our review of the NPDES permit, but the request was never answered. The TBM will use a bentonite slurry, which raises several wastewater concerns. Bentonite drilling slurry often contains more than just bentonite and a SDS listing detailing bentonite slurry ingredients, flocculants, polymers, concrete and grout blend plus misc. other ingredients (e.g. fly ash) used for sealing, water treatment additives, pH adjustment chemicals, and mechanical shop miscellaneous products and chemicals are not contained in the publicly available documents related to the NPDES permit and our request for this information was not answered.

Without answers to these critical resource impact questions, a full review of the NPDES permit is simply not possible. Another critical question that has gone unanswered is the exact process for treating wastewater before release into Lake Michigan. There are no plans detailing how the bentonite slurry would be separated from the wastewater and bentonite released into the Lake either because of inadequate treatment or stormwater overflows would be catastrophic. Further, it is unclear whether or not the slurry pits will be lined and covered. If they are unlined, there could be issues with drilling waste contaminating groundwater. If they are uncovered, stormwater could cause the pits to overflow, potentially contaminating the surface waters of Lake Michigan. Currently, detailed stormwater retention basin plans are not available to assure ground and surface water protection.
There is also a lack of research into potential groundwater migration that could be caused by dewatering for the boring and operation of the proposed tunnel. With multiple Part 201 and 213 sites on both the north and south sides of the Straits, it is unclear whether or not contaminated groundwater could migrate, impacting residential wells and contaminating surface water. Also, the close proximity to the Mackinaw City wellhead protection zone for the municipal wells indicates the very real potential to adversely impact the groundwater quality used as a source of municipal drinking water.

In addition to the potential to exacerbate contamination from the Part 201 and 213 sites of contamination, the dewatering for the construction and operation of the tunnel will most likely result in the intrusion of surface water into the aquifer and drinking water. Groundwater is usually safe to drink without treatment because the soil filters out contaminants and the lack of oxygen kills most things that could make us ill. Not so for surface water. The pumping test conducted at the south construction zone did note the influx of lake water at only 30 gpm in about one day of pumping. Enbridge does not know how much water will need to be withdrawn because the pumping test was inconclusive. The rocks beneath the straits are highly variable in hydraulic conductivity and any estimate of groundwater withdrawal is just a guess.

The dewatering will most likely have an impact on the regulated wetlands, especially at the north construction site where a vertical shaft up to 200 ft deep will need to be dewatered. This will act like a very large diameter water well and create a huge capture zone drawing groundwater in from a distance away, including surface water from the Straits.

There is also the potential for the dewatering for the tunnel to pull highly mineralized groundwater into the freshwater aquifer rendering it unusable. This is mentioned in the 1958 Department of Conservation publication, Reconnaissance *of the Ground-Water Resources of Mackinaw County.*

There is a lack of information regarding the designs of the retention and detention basins. The hydraulic properties of the soil or rock needs to be determined as well as the depth to groundwater. There needs to be a demonstration that infiltration to groundwater for the disposal of wastewater will work. In the case of detention basins, the depth to groundwater must be known to ensure a partially empty basin will not "float" on the groundwater.

With so many unanswered questions, errors, and legal challenges in relation to both Enbridge's NPDES and Resource permits, it would be irresponsible of EGLE to approve these permit requests. We strongly recommend that these permit requests be denied. Should Enbridge wish to continue with this project, they should be required to submit complete, new permit applications and the public must be given a comparable or longer amount of time to review those requests and comment. The role of this department is not to rubber stamp permit requests regardless of potential impacts, but to protect the natural resources and public trust treasures that Michigan residents rely on and value. All available evidence points to the fact that Enbridge has already cut corners on this proposal by failing to conduct adequate research, selecting the cheapest tunnel design instead of a safer option, and failing to fully and accurately address the challenges posed by this project in their permit applications.

Signed,

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