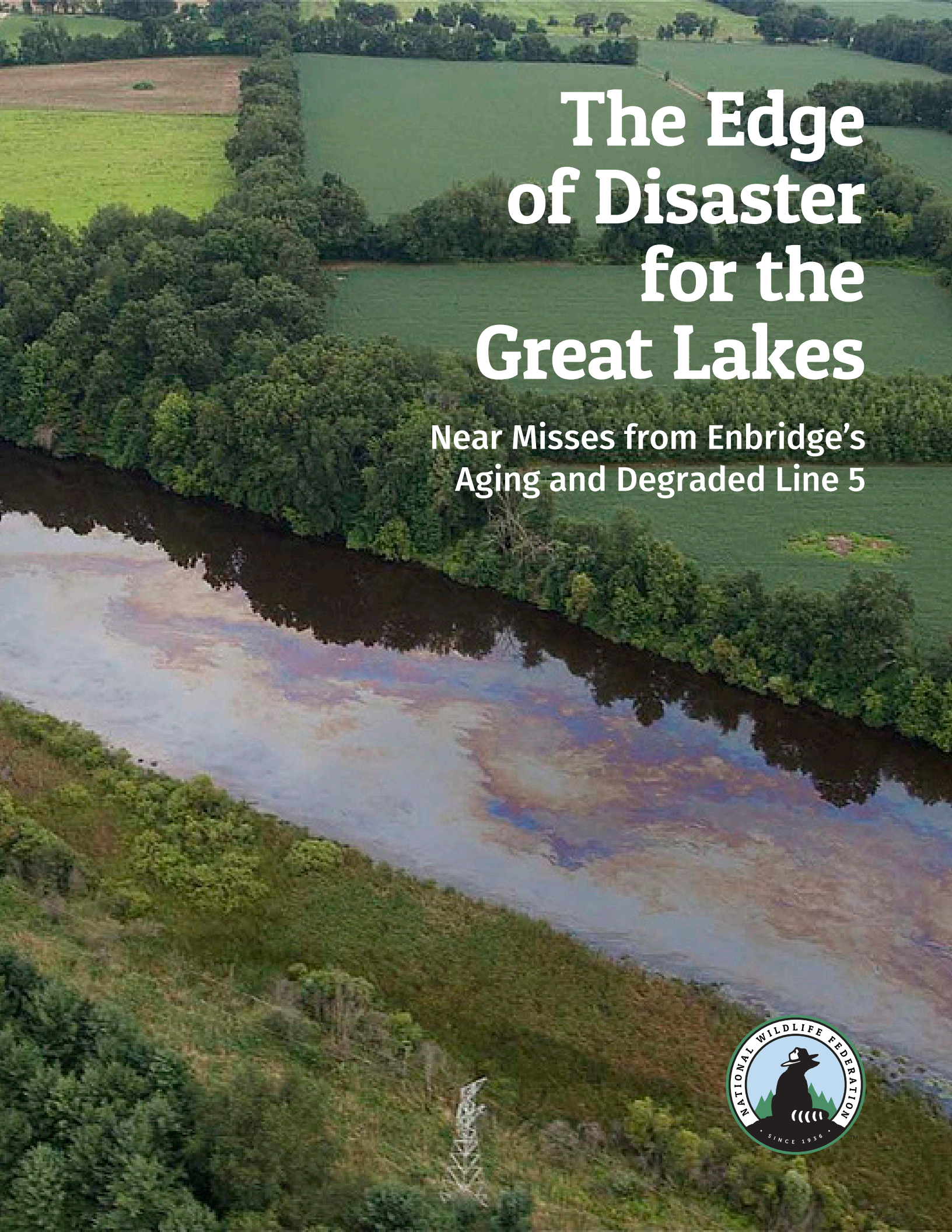

The Edge of Disaster for the Great Lakes

Near Misses from Enbridge's Aging and Degraded Line 5

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Table of Contents

3 Three Strikes and You're Out!

4 A Failed Safety Record, Corroding Pipeline and Corroded Public Trust

5 A Lack of Supports

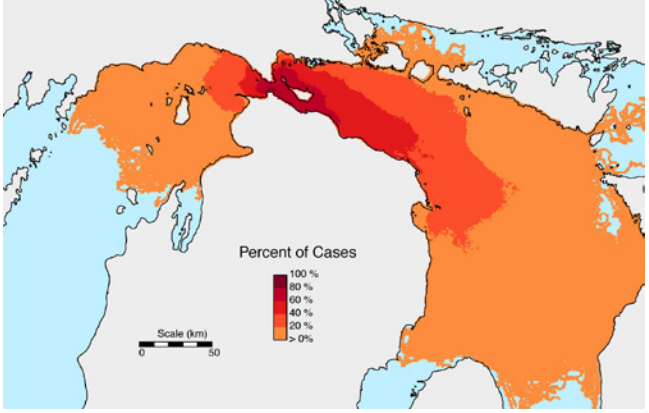
5 Enbridge Lacks Pipeline Integrity and Insurance

6 A Duty to Protect the Great Lakes Now

7 Achieve True Energy Security Through Alternatives

8 What You Can Do

> "[T]he Coast Guard is not *semper paratus* [always prepared] for a major pipeline oil spill in the Great Lakes."
>
> **Admiral Paul Zukunft, Commandant, U.S. Coast Guard**



Source: University of Michigan Water Center

Every day 540,0000 barrels of oil and natural gas liquids are carried along the bottom of the environmentally sensitive Straits of Mackinac, moving through pipelines with walls less than one inch thick. Line 5 runs 645 miles from Superior, Wisconsin to Sarnia, Ontario and was constructed in 1953 with a payment by Enbridge Energy of only $2,450 to the state of Michigan for an easement under the Straits. It is this easement agreement with the state of Michigan, which includes clear requirements for operating the pipeline with due care, that has driven a campaign for transparency and accountability against the operators, Enbridge Energy, to ensure that public trust in the Great Lakes is protected. This report documents recent near disasters, which could have resulted in a catastrophic spill, and are a result of poor oversight and management from both Enbridge and state and federal agencies. Simply put, Enbridge has continuously violated the easement agreement with Michigan and given the risks posed by the presence of Line 5 along the bottom of the Straits, it is not possible to protect our Great Lakes natural resources from this aging pipeline, which are held in trust for all of us to fish, recreate, and otherwise enjoy. Governor Whitmer has a duty to act urgently to terminate the easement as a result of Enbridge's violations. Termination of the easement and decommissioning Line 5 are necessary to fulfil her public trust obligations to protect natural resources that the state must manage for our benefit.

An NWF FOIA to state officials uncovered Enbridge inspection videos for Line 5, which revealed coating damage and other easement violations.

Owned and operated by the Canadian energy giant Enbridge Energy, Line 5 carries petroleum products from tar sand deposits in Western Canada (and elsewhere) through Wisconsin and Michigan to a refinery in Sarnia, Ontario, where most of the product continues on to refineries and export from Montreal. The original lifespan of this pipeline was 50 years—it is now 17 years beyond its expected term of service. The inland sections of Line 5 have leaked at least 33 times along its route since 1968, discharging more than 1.1 million gallons of oil.[1] Independent monitoring shows the underwater section of Line 5, which transitions from a single 30-inch pipeline inland to two 20-inch pipelines in the open waters of the Great Lakes, is no longer safe in the unique and fragile environment of the Straits. Required transparency has revealed that Line 5's protective coating is currently, or has previously been shown to be, missing in up to 47 locations, at least 16 locations have lacked the required structural support to hold the line safely in place, and the pipelines are covered with quagga mussels—blocking the ability to undertake a full visual inspection.[2]

The Straits of Mackinac, which joins two Great Lakes and separates Michigan's two peninsulas, was described by a University of Michigan hydrologist, Dr. Dave Schwab, as the "the worst possible place for an oil spill in the Great Lakes."[3] The confluence of Lake Huron and Lake Michigan has fierce, rapidly changing currents that often are moving in different directions at various depths, with a water flow up to ten times greater than that of Niagara Falls and often high waves that would render oil spill response equipment useless. Arctic-like conditions during Michigan's long winter months include low temperatures and an ice shelf which would make recovery operations near impossible if a spill were to occur. The University of Michigan has shown that over 700 miles of Michigan and Ontario coastline are within range of a Line 5 oil spill,[4] threatening the unique birds, mammals, fish and reptiles which inhabit the Great Lakes. The enormous cost of a spill, estimated at over $6.3 billion, includes losses to Great Lakes tourism, fisheries, natural resources and other damages.[5]

Over the past 8 years the state of Michigan, under Republican and Democratic leadership, has studied the risks from Line 5, including Enbridge's operation of the pipelines as well as alternatives to remove Line 5 from the open waters of the Great Lakes. After nearly a decade, the evidence is clear that Enbridge's operation of Line 5 poses an immediate risk to the health of our source of freshwater, The Great Lakes—which are held in public trust by the state. The risk to the health and vitality of the Great Lakes, the source of drinking water for 40 million people, leaves no question that Line 5 needs to be removed immediately.

> "These steps are a handful of belated half-measures that put far too much faith in a company that has consistently misled the public. This isn't enough, and for the sake of the one million jobs that depend on the health of our Great Lakes, we must do everything in our power to protect them."
>
> **Michigan Governor Gretchen Whitmer**

A strike from an unknown course, likely a boat anchor, mangled Line 5 supports and damaged protective coating. Photo credit: Michigan Department of Natural Resources

Three Strikes and You're Out!

One of the greatest risks to Line 5 is a direct hit from an anchor or other object. The Enbridge funded study by Dynamic Risk estimated this risk to be a 1 in 60 chance, over 30 years. However, in less than two years since that report was issued, we now know Line 5 has had at least 3 separate strikes, two of which decision makers have labeled as near misses from a catastrophic rupture. In 2018, the anchor of a tugboat passing through the Straits struck Line 5, leaving deep gouges in the pipeline.[6] This event opened Michiganders eyes to Enbridge's careless response to assess integrity impacts and the incapability of avoiding this risk. After promises that Enbridge would put into place measures to prevent future strikes, the state learned of two additional events which were only mistakenly discovered by Enbridge because they were working nearby to correct other damage to the pipeline.

While conducting maintenance work, Enbridge divers discovered that a Line 5 anchor support on the east leg of the pipelines had been mangled by an unknown force, likely an anchor, that also physically shifted the pipeline and completely removed its protective coating to bare metal. In addition, it was discovered that the west leg of the pipelines had damage from a separate event that also went undetected and caused coating damage. While Enbridge initially shut down Line 5 after discovering the damage, they almost immediately re-started the line before understanding the full extent of the damage and ignored calls from Governor Gretchen Whitmer to keep the lines shut down until further investigation could prove the lines were safe to operate.

> "To date, Enbridge has provided no explanation of what caused this damage and a woefully insufficient explanation of the current condition and safety of the pipeline as a result of this damage. We cannot rely on Enbridge to act in the best interests of the people of this State so I am compelled to ask the Court to order them to."
>
> **Michigan Attorney General Dana Nessel**

> "An oil spill in the Great Lakes would have catastrophic consequences to Michigan's environment and economy. Michiganders deserve to know the full extent of the damage to Line 5 from last year's anchor strike– because there's simply too much at stake."
>
> **U.S. Senator Gary Peters**

Following these revelations, and Enbridge's defiance to work with state officials to assess damage, the Whitmer administration, along with Attorney General Nessel, sought an emergency injunction against Enbridge that eventually required the shutdown of both the west and east legs of Line 5 and forced Enbridge to carry out an investigation into cause and impact. The proceedings that followed revealed that Enbridge and the federal oversight agency, the Pipeline and Hazardous Materials Safety Administration (PHMSA), did not assess integrity of the pipelines before supporting a partial restart. In fact, PHMSA merely directed Enbridge to restart the pipeline "during daylight" so they could see oil in the water. These actions further justify the State's position that federal oversight over this pipeline continues to be overwhelmingly insufficient.

After several months of investigation, the cause of these latest strikes, and when they actually occurred, is still unknown. Enbridge has, however, revealed that their own vessels could be to blame. Enbridge now claims their self-assessment of the damage proves no additional integrity issues and they have been allowed to restart Line 5 through a settlement with the State. Despite this narrow settlement, Michigan's Attorney General continues to pursue the lawsuit to remove Line 5 from the Straits of Mackinac because it is a public nuisance, because of the many violations of the easement that allows Line 5 to be located along the Straits, and because removing Line 5 is the only way for our state government to protect natural resources that it manages for the public's benefit.

A Failed Safety Record, Corroding Pipeline and Corroded Public Trust

> "I am no longer satisfied with the operational activities and public information tactics that have become status quo for Enbridge. It is vitally important that Enbridge immediately become much more transparent about the condition of Line 5 and their activities to ensure protection of the Great Lakes."
>
> **Former Governor Rick Snyder**

Michiganders are aware of the devastation that Enbridge's pipelines can cause. In 2010, when their Line 6b pipeline was allowed to deteriorate to the point of rupture, citizens near Marshall, Michigan, watched as their backyards became ground zero for one of the worst inland oil spills in US history. That disaster was a result of Enbridge's negligence to address stress corrosion cracking on Line 6b, which both Enbridge and PHMSA were aware of at least 5 years prior to the rupture. The federal investigations into that spill not only pointed to a failure to properly maintain their pipelines, but a failure of Enbridge to learn from past mistakes and improve their safety culture.

These cracks formed when the protective coating on Line 6b peeled away, allowing moisture and sediment to contact the bare metal. The small cracks eventually merged into the six-foot gash that ruptured Line 6b, dumping more than one million gallons of crude oil into Talmadge Creek and Kalamazoo River near Marshall, Michigan, polluting nearly 40 miles of river and closing the impacted river for years.[7] This disaster, which was made worse by Enbridge's failure to detect the spill for 17 hours, sickened hundreds of people, killed thousands of wildlife and caused 150 families to leave their homes forever. In the 10 years that have passed, Enbridge continues to violate settlements and agreements which were made to ensure pipeline safety and environmental protection for the continued operation of their aging pipelines found throughout the Great Lakes. Days before the 10-year anniversary of the Kalamazoo River oil spill, the EPA announced that Enbridge failed to meet settlement agreements on pipeline safety and was issued a $6.7 million fine, which was the second fine of this nature for this settlement. The first fine, of $1.8 million, was issued in 2018 and was a result of Enbridge failing to inspect vulnerable pipelines in their Lakehead pipeline system, including Line 5.

Pipeline integrity reports obtained for parts of the inland sections of Line 5 also reveal stress corrosion cracking as a major integrity issue, which threatens hundreds of waterways that Line 5 crosses as it travels through Wisconsin and Michigan, including major tributaries to Lake Superior. Through the Pipeline Safety Advisory Board (PSAB) formed under former Governor Rick Snyder, Enbridge was also required to reveal that sections of Line 5 crossing the Straits have been dented and bent, parts of the twin pipelines have a loss of wall thickness, a majority of both lines are covered in quagga mussels and the required protective coating continues to fail at alarming rates and from unknown causes. These integrity issues are made worse by Enbridge's limited ability to undergo external inspections of the pipeline, which are restricted to a few months in the year given extreme weather conditions at the Straits, including winter ice cover and frequent high wave events. Enbridge has also admitted before the PSAB that their internal inspection tools have failed to detect deficiencies within the pipelines that are easement violations, including detecting when the protective coating has peeled away. In recent years, when Enbridge is capable of external inspections, they continuously uncover additional integrity issues, which begs the question: **Has the maintenance for Line 5, to sustain basic integrity standards, surpassed Enbridge's capabilities?**

Photo credit: National Transportation Safety Board

Enbridge's history as a corporation is fraught with withholding information or underplaying the severity of situations with their oil pipelines that threaten the Great Lakes. And when Enbridge is required to carry out further investigation, more often than not, the severity of those issues reveals to be much more dire than originally stated. For example, Enbridge first claimed they discovered coating damage the size of a Band-Aid, but as the state required additional information it was quickly uncovered that Enbridge had dozens of locations with coating loss, some of which were several square feet.

> "The only viable permanent solution to the continuing danger of pipeline damage is decommissioning."
>
> **Dr. Dave Schwab, retired hydrologist with the University of Michigan**

A Lack of Supports

> "This thing is such a patched-up engineering mess, that there is no way to determine how safe or risky this thing is and because of that it's likely that it isn't insurable."
>
> **Ed Timm, former senior scientist at Dow Chemical**

Another example of Enbridge's failure to address or disclose critical integrity issues surrounds the missing supports for Line 5 in the Straits, which literally left the pipelines hanging in the unforgiving conditions found in this location. Enbridge's easement with the state of Michigan requires the pipelines in the Straits to be supported when they are not directly lying on the bottom of the lakes. Supports must be in place at least every 75 feet. In 2017, unearthed integrity reports from Enbridge contractors revealed that Line 5 remained in operation while spans of the pipeline went unsupported for years, with some spans surpassing 200 feet. This easement requirement is in place to prevent bending and bucking of the pipeline, which could lead to rupture. Sadly, these types of defects are already known on Line 5, which could be a biproduct of historical neglect to follow the terms of the easement.

This information was not shared with state officials for years and Enbridge, time and time again, downplayed the severity of the easement violation. After it was discovered that Enbridge had neglected to adhere to the terms of the easement agreement, Enbridge requested permission to install dozens of new anchor supports for Line 5, which a lawsuit argues changes the design of the pipeline and because Enbridge has failed to study the redesign, the Great Lakes could be at even higher of a risk of rupture. This new design, which lifts the pipeline off the lakebed, has never been analyzed for integrity impacts or risk, including assessing if there's an increased risk of rupture due to additional exposure to anchors.

Enbridge Lacks Pipeline Integrity and Insurance

In addition to Enbridge's failure to properly maintain Line 5 per the easement agreement, and prior to the recent discovery that Line 5 continues to sustain damage from undetected strikes, Enbridge is under scrutiny from the Whitmer administration for their refusal to correct agreements with the state to guarantee they would cover the cost of a spill. Previous agreements, developed under the Snyder administration, vowed to cover the cost of a spill but were signed by Enbridge subsidiaries. Alarmingly, a recent state investigation of those agreements noted that Enbridge testified in 2018, in a Minnesota hearing on the Line 3 replacement, that Enbridge Inc. is "not contractually obligated to stand behind the indemnity agreements of a subsidiary." In that hearing, Enbridge was fighting the Minnesota Department of Commerce, which found that they lack appropriate insurance to cover the cost of a spill. Ultimately, Enbridge avoided the required coverage in Minnesota by successfully lobbing the Minnesota state legislature to pass a bill that prevented such requirements. Meanwhile in Michigan, Enbridge has continuously refused to work with the Whitmer administration to correct previously signed agreements ensuring Enbridge will cover the cost of a spill. Unlike Minnesota's battle, Enbridge's refusal to sign new agreements, and work with the state to fully insure Line 5, is a clear violation of the easement and clear grounds for

termination. But setting aside easement violations, not having this assurance could leave Michiganders on the hook to pay for a spill response short and long term, which experts at Michigan State University have said could reach upwards of $6 billion in damages for a moderate size spill.

> "In the event of a catastrophic oil spill, the people of the state of Michigan could be left holding the bag for more than a billion dollars in unfunded liability."
>
> **Michigan Attorney General Dana Nessel**

A Duty to Protect the Great Lakes Now

The disclosure of ongoing safety hazards such as anchor strikes, coupled with the growing list of known integrity issues and easement violations, has forced Enbridge to change its position on how to operate Line 5. After years of claiming the existing Line 5 is safe, the company has now proposed to replace the aging pipeline with an expensive, uncertain tunnel project under the Straits of Mackinac. Unfortunately for Enbridge, this proposed alternative does not address the urgent risk Michigan faces now because of their continued operation of this vintage pipeline.

State agencies and officials are now stating that tunnel construction is anticipated to take 5-7 years and this timframe does not consider permitting hurdles that will take the timeline much close to a decade away, if ever. In fact, Enbridge has already drawn out the timeline for permitting by fighting required permits with the Michigan Public Service Commission that would assess environmental impacts and evalute the need for the project. In addition, Enbridge has yet to complete the tunnel design and regional tunneling experts have spoken out about the lack of feasibility and geotechnical assessments provided to state agencies, which will likely cause additional delays. **The fact remains that Michigan can't wait upwards of a decade to address the urgent risk these nearly 70-year-old pipelines pose now.** Line 5 threatens precious natural resources, risks billions in income for Michigan workers and businesses, and the state and its residents receive little benefit from the oil and gas that moves through the pipeline.

> "The next ecological disaster awaiting Michigan is likely not another dam–it's 67-year-old Line 5, under the Straits of Mackinac, endangering both the Great Lakes and the economy of Northern Michigan… it will take years to build this tunnel. That's why the members of the Chippewa Ottawa Resource Authority, representing tribes whose members' fishing culture would be devastated by Line 5 rupture, call on the state and for Enbridge to shut down the pipeline immediately, to prevent another Edenville Dam situation."
>
> **Bryan Newland, chairperson for Bay Mills Indian Community**

Achieve True Energy Security Through Alternatives

> "The bulk of the oil that goes through Line 5 goes from Canada back to Canada. The risk is being given to the state of Michigan; the profitability flows to Enbridge."
>
> **Gary Street, former Dow chemical engineer and FLOW technical adviser**

A likely reason why Enbridge continues to fight the permitting process is because they know a thorough review of alternatives would show, yet again, that the tunnel proposal is not needed for Michigan and that Michigan can transition away from Line 5 with little effort. Ninety to 95 percent of Line 5 oil and natural gas liquid is delivered to Canada for export or for use in Toronto, Montreal and other population centers. A tiny fraction—less than ¼ of one percent—is used to supply propane to rapid river where it is distributed, via truck, to households in Michigan's Upper Peninsula.[8] In addition, the process of delivering this small amount of product to Rapid River only began in 1996. Prior to that time, most propane was delivered by truck and a majority of the U.P. population still receives propane via rail and truck alternatives. Several studies have now said the U.P. can offset the current use of Line 5 by adding a handful of trucks a day. To improve energy diversity, reliability and affordability, Michigan needs to immediately support a number of alternatives including rail and truck delivery, increase storage options, incentivize off-season propane fill-ups, support growth in renewable options and consider the newly proposed propane pipeline that does not plan to cross the Great Lakes. The fact of the matter is that oil and propane are fungible commodities and the market will adjust naturally with minimal intervention from the state of Michigan. That said, the outlined efforts above are already being reviewed by the U.P. Energy Task Force, which was established in part to ensure the area has a reliable and affordable energy supply in case Line 5 experiences an oil spill or is no longer in operation.

As Michigan continues face a health and economic crisis, a rupture from Line 5 would be the final nail in the coffin for many struggling businesses trying to survive. In 2018 alone, tourism in Michigan supported 1 out of every 16 jobs and generated $2.8 billion in state and local taxes. If the nearly 70-year-old oil pipeline were to rupture, sending millions of gallons of oil throughout the shores of Lake Michigan and Lake Huron, northern Michigan businesses could be decimated along with property values, fresh drinking water, critical wildlife habitat and our way of life.

The good news is that there is overwhelming public support to close Line 5 immediately. An EPIC-MRA poll carried out in the heated 2018 gubernatorial race, where Line 5 remained a top environmental issue facing the state, came in with 87% of Michigan voters, Republican and Democrats alike, concerned about Line 5 and over half wanting the lines shut down. This public support, backed by a campaign led by the National Wildlife Federation and partner organizations, has resulted in commitments by public officials:

- Attorney General Nessel has been an incredible champion of the Great Lakes by following through on her campaign commitment to shutdown Line 5. She's taken many actions, but most importantly she filed a lawsuit, seeking to decommission Line 5 as a violation of public trust and a public nuisance. This legal action, which documents the company's repeated violations of the original 1953 easement, has won backing from state attorneys general in Minnesota, Wisconsin and California.[9]
- Governor Gretchen Whitmer has a duty to "immediately file to enjoin the easement and begin the process to decomission Line 5. In good faith, the Governor attempted to negotiate with Enbridge on two critical issues: an end date for the current operation of Line 5 in the open waters and requesting Enbridge provide financial assurances to cover the cost of a rupture. In both cases, Enbridge walked away from discussions and they are now actively working to strip Michigan of its oversight authority under the easement. In 2019, the Governor instructed the state's Department of Natural Resources (DNR) to review Enbridge's compliance with the 1953 easement, which we know has already had substantial historical violations.[10]

> "Our most important ingredient is pure water, and we depend on the state of Michigan to help ensure i ts purity. A rupture of Line 5, and the resulting contamination of Lakes Michigan and Huron, would cement Michigan's reputation of having the worst water in the U.S., and be devastating for the many of jobs that depend on our Pure Michigan appeal– including those in the brewing industry."
>
> **Larry Bell, president of Bells Brewery, Inc.**

In 2010, the National Wildlife Federation witnessed the first-hand devastation that a rupture from Enbridge's pipelines can cause. When Line 6b spilled over a million gallons of tar sands oil into the Kalamazoo River, a state of emergency was issued to prevent that oil from reaching Lake Michigan. This disaster opened our eyes to Line 5 and we have stood behind our mission and goals to require transparency, accountability, improved safety and action to protect the Great Lakes from another Enbridge oil spill. After 10 years of leadership on this issue we know without a doubt that Line 5 can no longer operate in this location—the risk is unjustifiable. The National Wildlife Federation supports Governor Gretchen Whitmer in her effort to decommission the pipeline and calls for the Michigan Legislature to work together to build an energy future beyond Line 5.

What You Can Do

- **Call Gov. Whitmer at 517-373-3400.** Thank her for her leadership to protect the Great Lakes and support her immediate action to revoke the easement, including join the Attorney General in her legal efforts to decommission Line 5.
- **Call Attorney General Nessel at 517-335-7622 or email at miag@michigan.gov.** Thank her for protecting our Great Lakes and urge her to continue all available legal actions and appeals to win the immediate shutdown of Line 5.
- **Contact your Michigan state legislators.** Urge them to work with the governor to address the urgent threat immediately and support energy policies that move Michigan beyond Line 5. Find your Michigan House represenative here and your Michigan state senator here.
- **Ask your local government, civic organization, congregation or other group to pass a resolution calling for the immediate shutdown of Line 5**, which can no longer wait for Enbridge's insufficient alternative proposals.

Endnotes

1 MLive.com, "Enbridge Line 5 has spilled at least 1.1M gallons in past 50 years," April 26, 2017.

2 Groundwork, "Canadian Profits, Michigan Risk," May 2018.

3 University of Michigan press release, "More than 700 miles of Great Lakes shoreline potentially vulnerable to Straits of Mackinac oil spills," March 31, 2016.

4 Ibid

5 Michigan State University, Dept of Community Stability, "Oil Spill Economics: Estimates of the Economic Damages of an Oil Spill in the Straits of Mackinac in Michigan," My, 2018.

6 Detroit Free Press, "Damage of anchor strike to Straits of Mackinac pipeline finally revealed," May 15, 2019.

7 Michigan Radio, "TIMELINE: 15 moments to note since the biggest inland oil spill in U.S. history," July 25, 2015.

8 Oil and Water Don't Mix, "Doesn't the Upper Peninsula Need Line 5's Propane?" June 26, 2019.

9 MLive.com, "3 states file briefs backing Michigan AG's lawsuit to shut down Enbridge's Line 5," November 14, 2019.

10 Gov. Gretchen Whitmer, "Statement from Governor Whitmer's Office on Today's Legal Filings Regarding Line 5," June 27, 2019.

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