Enbridge's Line 5, A Disaster Waiting to Happen

The Great Lakes are one of the United States' greatest natural resources. Formed nearly twenty-thousand years ago by receding ice sheets, the Great Lakes contain nearly twenty percent of the world's freshwater supply and provide drinking water to over forty million US and Canadian residents. More than three and a half thousand plant and animal species inhabit the region, contributing to a commercial and sport fishing industry valued at over five billion dollars annually. Cutting right through the center, however is the Line 5 oil and natural gas pipeline. Concerned citizens, lawmakers, and scientist have grown increasingly worried about what might happen if the line accidentally ruptured and the effects a spill would have on the lakes and surrounding region. Based on their conclusions, the Line 5 pipeline under the Mackinac Straits should be permanently shut down due to the disastrous impact that a potential spill could have on the local environment, the Great Lakes ecosystem, and the regional economy as a whole.

Built in 1953, Line 5 is a 645-mile, 30-inch diameter pipeline traveling from Superior, Wisconsin to Sarnia, Ontario. Where it crosses the Straits of Mackinac, the division between Lake Michigan and Huron and Michigan's Upper and Lower peninsulas, the line splits into two pipes and makes the five-mile crossing just west of the Mackinac Bridge. The line, at capacity, can carry 540,000 barrels of oil or natural gas per day, helping to fulfill the insatiable energy demands of the Midwest and Canada. Recently, however, local residents have begun to question the safety and reliability of this sixty-five-year-old piece of infrastructure passing right through their backyard, fearful of what might happen if the line ruptured.

The US is no stranger to large, unintentional oil spills. The 2010 Deepwater Horizon spill in the Gulf of Mexico and the 1989 Exxon Valdez spill in Alaska, two of the largest and most devastating spills in American history, captured the world's attention and outraged the general

public. The Deepwater Horizon spill, in particular "fouled more than 1,300 miles of coastline, caking seabirds and killing sea creatures and other wildlife, leading to huge financial losses for the tourism and fishing industries" (Milman). British Petroleum, the company that owned and operated the oil rig responsible for the spill, was ultimately found at fault for the disaster as reports emerged alleging they had cut corners and acted recklessly in regard to safety. The company paid an unprecedented $5.5 Billion clean water act penalty and was responsible for up to $8.8 Billion in natural resources damage ("Deepwater Horizon – BP Gulf of Mexico Oil Spill."). The spill embodied the stereotypic image of corporations prioritizing the needs of shareholders over the needs of their workers and the environment. In the immediate aftermath of both the Deepwater Horizon and Exxon Valdez spills, the public demanded accountability, and government regulators pressured the industry to change its ways. In response, oil companies paid large fines and restitution to victims of the disaster and promised to prioritize safety and environmental health over profits. After media attention faded, however, the industry largely continued with business as usual, assuring concerned citizens that they would do better.

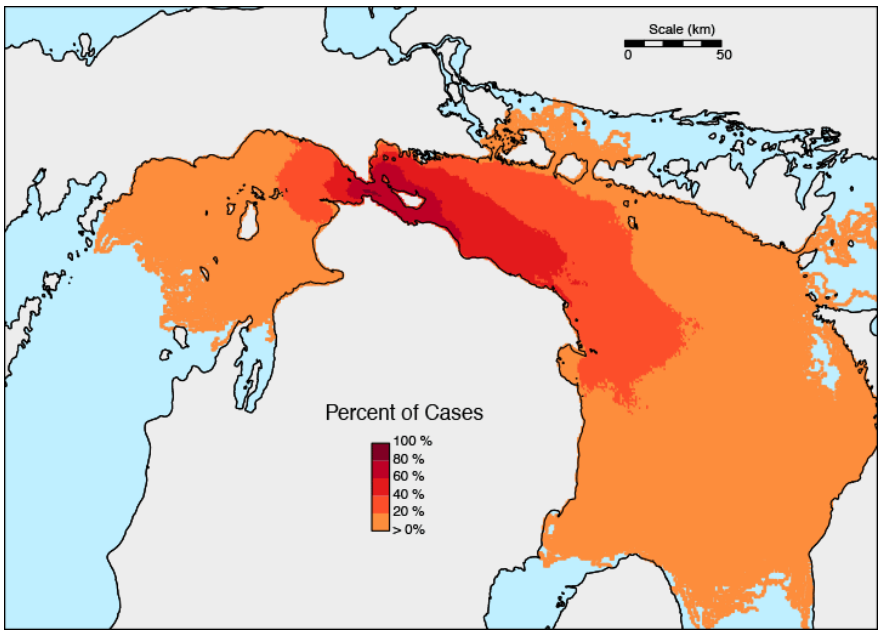
The oil spills, however, have not stopped. According to the US National Oceanic and Atmospheric Administration (NOAA), since 1969 there have been forty-four oil spills greater than 10,000 barrels (about 420,000 gallons) affecting US waters. These spills, spread across every corner of the US, have affected millions of acres of land and water habitat and resulted in billions of dollars in damage to local economies and the environment.

Michigan residents, wary of the number of pipelines crisscrossing their state, have begun to question if the next major oil spill could happen in their neighborhood. The Line 5 section in the Straits of Mackinac, owned and operated by Canadian company Enbridge Inc., has caused the most concern among residents due to its location and age. In response to their constituents'

fears, State of Michigan regulators have begun looking into the possibility of a spill and the impact that such a spill would have on the local environment and economy. Rick Snyder, the governor of Michigan, commissioned a team of researchers at Michigan Technological University's Great Lakes Research Center to complete a risk analysis of the Line 5 pipeline in the Straits. The report, released in July 2018, sought to quantify the effects of a worst-case scenario oil spill on the local ecosystem, as well as the financial impact to the regional economy and cleanup costs incurred by the state and federal government. The team, composed of forty-one experts in hydrology, ecology, engineering, and risk assessment at various universities across the US, performed more than 4,300 computerized spill simulations to model the movement of oil in the Straits. The researchers found that a worst-case scenario spill in the Straits would be devastating. "...a rupture to both Straits pipelines with concurrent failures of primary valves on each pipeline and secondary safety valves, could release 32,000 to 58,000 barrels of crude oil" (Meadows). The oil would not just stay in the Straits of Mackinac, however. A spill of this scenario would be felt broadly around the Great Lakes basin and affect communities up and down the coasts of both Lake Michigan and Huron.

Currents and wind patterns between Lake Michigan and Lake Huron are notoriously unpredictable and would have a complex effect on oil dispersion. A study, completed by the Graham Sustainability Institute at the University of Michigan, used computer models of wind and water currents to simulate the distribution of oil from a potential Line 5 spill. The results, released in March 2016, indicate a widespread distribution of oil along the coasts of both Lake Michigan and Huron. The worst-case scenario modeled, a spill of 25,000 barrels of crude oil from Line 5, showed that "More than 700 miles of shoreline in Lakes Michigan and Huron and on their islands are potentially vulnerable to an oil release in the Straits that would result in

accumulation requiring cleanup" (Schwab). Furthermore, and perhaps more worrying, "More than 15% of Lake Michigan's open water (3,528 square miles) and nearly 60% of Lake Huron's open water (13,611 square miles) could be affected by visible oil from a spill in the Straits" (Schwab). The map below, released as part of the study, shows the probability of oil being present at any time after a release at various locations around the Straits.



A spill of 25,000 barrels, less than half as much as the 58,000-barrel worst case scenario estimated by researchers at Michigan Tech, would spread toxic oil widely throughout the Great Lakes basin, affecting hundreds of thousands of citizens and requiring extensive cleanup.

A worst-case scenario spill would devastate the sensitive local environment both immediately and for decades after the release as well. Crude oil, the type typically carried in Line 5, contains over two-thousand different chemical compounds, each with varying degrees of toxicity and degradation lifespans in natural environments. Michigan Tech researchers estimated that a spill of this magnitude would detrimentally affect forty-seven different species of concern and put approximately 60,000 acres of sensitive habitat at risk. A spill would not just have a

local impact on the ecological environment of the Straits either. “The distinctive habitats and tightly coupled food webs in and around the Straits of Mackinac are linked to lake-wide distributions of fishes and hemisphere-wide migrations of birds. Thus, the consequences of an oil spill would reach far beyond the zone initially touched by oil” (Meadows). Quite simply, the Straits have an incredibly complex influence on regional ecosystems, and the ecological effects of the spill would spread broadly and unpredictably around the region.

The human impact from a potential spill would also be notable, particularly on the local economy of the Mackinac Straits. The area surrounding the Straits is heavily reliant on tourism, regularly seeing millions of vacationers in the summer season. Hotel operators, tour companies, local merchants, and their employees are dependent on the natural resources of the Mackinac Straits to attract tourists and support their livelihood. The Michigan Tech study asserted “for the impacts we were able to quantify, our estimated worst-case economic damages range from $450 million to $1.37 billion depending on the direction and spread of the spill” (Meadows). The study goes on to discuss the toll on cultural resources that are impossible to quantify monetarily, and asserts that the impact to citizens livelihoods from such a release cannot be overstated. Cleanup costs of a Line 5 spill, which are of particular concern to legislators and taxpayers, were also estimated in the study. “Using the government costs associated with the Marshall, Deepwater Horizon, and Exxon Valdez (adjusted for inflation) oil spills...estimates based on shoreline miles oiled ranged from $123 to $535 million depending on weather conditions” (Meadows). These costs would likely be reimbursed by Enbridge as the party responsible for the release, but researchers estimated tax revenue lost due to decreased economic activity at $262.5 million, which would not be reimbursable.

While the Michigan Tech study evaluated the potential consequences experienced by a Line 5 spill, they were explicitly prohibited from calculating the probability of such a release occurring. Enbridge has capitalized on this uncertainty by undertaking a large public relations campaign to assure state officials and citizens alike that the pipeline is safe and well maintained. Enbridge asserts that they inspect the pipeline's interior every five years, do visual inspections on the outside every two years, and monitor the pipeline 24/7 using both human and automated systems. Enbridge, however, has a dubious safety record, with an indisputable history of numerous incidents on their pipelines.

One such incident occurred on Sunday, July 25, 2010, when Enbridge suffered a rupture on its Line 6B, a pipeline running just outside of Marshall, Michigan. The rupture occurred during a planned shutdown of the line, and although Enbridge personnel were immediately notified of a loss of pressure in the line, the operators assumed it to be a false alarm. Alarmingly, the technicians twice restarted the pipeline and were only notified of the rupture more than seventeen hours later by an outside caller complaining of an odor. In an official report generated by the National Transportation Safety Board on the incident, an estimated 843,444 gallons of crude oil were released, making this spill the second largest inland oil spill in US history. The rupture occurred in a section of the pipe running beneath Talmadge creek, a tributary to the Kalamazoo river, with oil detected more than thirty-five miles downstream of the pipe. Cleanup crews were deployed along the entire length of the river, with large portions of it needing to be dredged to collect oil that had sunk to the bottom. Cleanup costs for the spill were estimated at $1.21 billion, with Enbridge paying the sum in its entirety. Additionally, 320 people reported health symptoms consistent with oil exposure to local health department officials.

In the NTSB's report, it attributed the entirety of the disaster to Enbridge, stating "The rupture and prolonged release were made possible by pervasive organizational failures at Enbridge Incorporated" ("Enbridge Incorporated Hazardous Liquid Pipeline Rupture and Release."). Among its criticisms of the company, the officials blamed Enbridge for failing to repair six cracks caused by corrosion in the pipe, ranging in size 9.3 to 51.6 inches. It argued that these cracks were well documented and discovered nearly five years earlier during inspections, but that Enbridge had failed to repair them until the rupture. The method of inspection Enbridge used in Line 6B, is also the same method the company uses to inspect Line 5 in the Straits. Although cracks have been discovered in Line 5, Enbridge asserts that they are within safety margins and do not need repair. Regarding Line 6B, Officials also faulted the company for failing to adequately train technicians to recognize a pipeline rupture. A section of the report details the sequence of events occurring at the control center shortly after the rupture:

> During the July 25 shutdown, the control center staff attributed the alarms to the shutdown and interpreted them as indications of an incompletely filled pipeline (known as column separation). On July 26, the control center staff pumped additional oil into the ruptured pipeline for about 1.5 hours during two startups. The control center staff received many more leak detection alarms and noted large differences between the amount of oil being pumped into the pipeline and the amount being delivered, but the staff continued to attribute these conditions to column separation. An Enbridge supervisor had granted the control center staff permission to start up the pipeline for a third time just before they were notified about the release. ("Enbridge Incorporated Hazardous Liquid Pipeline Rupture and Release.")

This timeline of events is especially troubling considering how just days earlier “an Enbridge official testified [before congress] that the company was able to detect a leak ‘almost instantaneously’ after it occurred” (Killian). In congressional testimony following the spill, the CEO of Enbridge lamented the fact that the spill had happened and vowed to try and prevent another spill from happening in the future, while simultaneously denying that his company had broken any laws.

Although Enbridge may be negligent in the way it inspects and maintains its pipelines, perhaps the biggest threat to Line 5 comes from a factor outside of the company’s control, anchor strikes. The Straits of Mackinac are one of the busiest maritime shipping lanes in the country and serve as a gateway for ships passing from the Atlantic Ocean to Chicago and the Mississippi river. Thousands of ships make the passage through the Straits every year and some, particularly tugboats, drop their anchors to the lakebed below. Weighing thousands of pounds each, anchor strikes from passing ships represent the largest hazard to the Line 5 pipeline. In early April of this year, an electrical transmission cable suffered an anchor strike in the Straits, only a short distance away from Line 5. The cable was struck by an anchor dropped by a vessel passing through the area, causing over five-hundred gallons of a toxic coolant known as mineral spirits to be released below the ice-covered straits. Furthermore, days after the anchor strike “the state was informed by Enbridge that three small dents exist in Line 5, likely due to the same vessel activity that may have caused the damage to another line that released mineral spirits into the water (Snyder press release)”. Although Enbridge insists the dents caused by the anchor are small and likely don’t pose a risk to the line, this incident shows how vulnerable Line 5 is to factors outside of the company’s control. This event almost certainly could have caused a rupture in the pipeline, resulting in an environmental catastrophe in the Straits.

Perhaps motivated by this most recent event, Enbridge and the State of Michigan, in early October, signed an agreement to improve Line 5 infrastructure. Among other improvements, the agreement would permanently close the Line 5 crossing beneath the Straits of Mackinac and create a new tunnel adjacent to the current line. The tunnel would house a new Enbridge pipeline as well as communication and transmission lines from other companies. The project, expected to cost between $350 Million and $500 Million, would be completed over a seven to ten year period, while "Enbridge would pay for all design, construction, operation and maintenance of the tunnel for up to 99 years, subject to approvals by the Mackinac Bridge Authority" ("Agreement Paves Way for Enbridge to Permanently Shut down, Replace Line 5 in Straits of Mackinac."). Additionally, the tunnel would be owned by the Mackinac Bridge Authority with Enbridge being required to lease space in the tunnel to house a pipeline.

While a study on the risks associated with the new tunnel proposal hasn't been released, several community members and governmental leaders have already come out against the proposed plan. Chief among them is Barbara J. Brown, the Vice Chair of the Mackinac Bridge Authority and the government official charged with oversight of the proposed tunnel. In an October letter to the editor of the St. Ignace News, Brown argues "It should never be the business of the Mackinac Bridge Authority to own and, thus, be responsible and liable for an energy tunnel that serves shareholder owned energy companies. It is not why the bridge authority was created, and it is not what we do" (Brown). While it remains to be seen how Mrs. Brown's concerns will affect the proposed project, it will likely be many years before construction begins on the tunnel, with Line 5 presumably remaining in operation during this time.

Little more than a month after the agreement was signed by Governor Snyder and Enbridge, however, the State of Michigan held elections to choose a new governor and attorney

general. The electorate picked democrat Gretchen Whitmer to serve as governor, casting even more uncertainty on the proposed tunnel. In Whitmer's "Clean Water for Michigan" policy released during her campaign for governor, she takes the following stance:

> When it comes to Line 5 we need to evaluate Michigan's energy needs and how much Michigan really benefits from such a pipeline versus Canada. What we do know conclusively is that an oil spill in the Great Lakes would be absolutely devastating to our environment and our economy. We can't afford to sit around and wait for disaster to strike. On the day I take office, I will initiate necessary steps to remove dangerous oil pipelines from the Great Lakes and protect our water and protect Michigan jobs. (Whitmer)

While it remains to be seen what steps she will take while in office regarding the pipeline, Enbridge will likely encounter an uphill battle in its quest to keep Line 5 operating in the Straits.

The Great Lakes are a national treasure that cannot afford to be desecrated by an oil spill. The lakes provide livelihoods for millions of Americans and Canadians, both in the tourism and commercial fishing sectors, and directly nourish thousands of agricultural and municipal water supplies. A spill from Line 5 would negatively affect both local and regional ecosystems and impact thousands of acres of sensitive plant and animal habitat, while cleanup costs would likely soar into the billions of dollars. Although Enbridge insists steps are being taken to protect and maintain the line, the company has shown gross negligence in the past regarding pipeline safety, resulting in one of the largest inland oil spills in US history. The threat of unintentional damage to the line due to maritime activity can also not be overemphasized, with one incident already showing how vulnerable the pipe is to an anchor strike. Although new upgrades to the Line 5 infrastructure are being proposed, the threat to the region is pervasive and likely will be for the

foreseeable future. Considering the significance that a spill would have on the region and the increasing probability that a release will happen, it is clear how dangerous and irresponsible the continued operation of Line 5 in the Straits of Mackinac is, and the line should be immediately decommissioned before a disaster occurs.

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