

Cumulative Impacts: Past, Present, and Future.

"Seems like people don't want to stick around another thousand years."

-Mike Wiggins, of the Bad River Band of Anishinaabe

"I don't think we can call ourselves sovereign if we can't feed ourselves."

-Paul "Sugarbear" Smith Oneida Territory, Wisconsin

The Anishinaabeg do not possess ecological amnesia, that is so common in western society. Intergenerational transfer of knowledge reaffirm the place of the Anishinaabeg in the world and ensures that nothing is forgotten.

Since the signing of the treaties of 1837, 1854, 1855 and 1867 there has been significant loss of Tribal Cultural Properties due to state management practices and decisions made which caused significant impact to Anishinaabeg communities. This assessment understands this loss as theft.

As the 19th Century gave way to the 20th, more and more problems came to the fore with the deforestation and pollution of the ceded lands, as well as the pollution and destruction of the valuable waterways. This destruction of land would greatly harm the Anishinaabeg ability to relate to the land and its inhabitants in ways that are culturally recognizable. The ability for Anishinaabeg and other American Indian peoples to effectively reproduce their worldview and respective ideologies became strained. Considering the intentionality and the violence with which this strain was implemented in the form of the policies of boarding schools, termination and relocation, this strain is best understood as genocidal.¹

¹ United Nations in its Convention on the Prevention and Punishment of the Crime of Genocide. Article II states: "genocide means any of the following acts committed with intent to destroy, in whole or in part, a national, ethnical, racial or religious group, as such: a) Killing members of the group; b) Causing serious bodily or mental harm to members of the group; c) Deliberately inflicting on the group conditions of life calculated to bring about its physical destruction in whole or in part; d) Imposing measures intended to prevent births within the group; e) Forcibly transferring children of the group to another group."

While it has been argued that the wording of "intentionality" is not necessarily present in the actions taken by the United States Government, the boarding school teachers, nor the doctors performing forcible sterilizations of American Indian women in the mid-20th Century, there is no doubt that these actions have effectively perpetrated the crime of genocide against American Indian peoples. The removals to reservations and the subsequent loss of land and the inability to effectively feed your community from your homeland because of its destruction by means of deforestation and pollution is also part of this genocidal process. --Freeland 2015

*Cumulative impacts to tribal cultures are a combination of pre-existing stressors (existing conditions or co-risk factors) and any other contamination or new activity that affects environmental quality. Characterizing risks or impacts ... entails telling the cumulative story about risks to trust resources and a cultural way of life... This requires improvements in metrics based on an understanding of the unbreakable ties between people, their cultures, and their resources.*²

A tribe's natural resource base is a source of cultural identity and religion, a nutritional and medicinal buffer against poverty, and a reservoir of environmental knowledge and biodiversity. Only tribal cultural experts can explain the magnitude of impact to traditional lifestyles and Trust resources that pollution or other environmental stressors causes. Only these cultural experts can place the proper value on their natural or cultural resources, on songs, place names associated with a particular location or landform, or on an individual resource and its role in the ecological processes that comprise the web of life. This information is often only maintained as oral data and its collection requires a relationship with the expert and an understanding of the culture. There is no way to do an adequate "desktop" cultural survey. Additionally, it should not be up to a company that wants to develop a project to decide which sites are significant. It has been recorded in judicial proceedings that cultural and subsistence practices are no less important to Native Americans than the air they breathe (United States v. Winans, 1905, 198 U.S. 371, 381, 1905).

When a pipeline (or other hazardous developments) are sited near minority communities to avoid affluent communities, that is a risk management decision made to favor the affluent community and their way of life.

There are direct and indirect environmental costs and impacts of the pipelines. Direct impacts include the loss of ecosystems as a result of the construction activities and permanent ROW. Indirect impacts include the massive environmental destruction occurring in the extraction zones. Bakken area. There is also a global cost: climate change, shifting growing seasons and ecotones.

Indicator species can be used to quickly gage the overall health of an ecosystem. These species generally thrive under a very narrow set of conditions and an important tool for measuring ecosystem health. When looking at the global system, specifically human communities, Indigenous communities can be understood as "humanity's indicator species". As all humanity

² "Environmental Justice in Indian Country: Using Equity Assessments to Evaluate Impacts to Trust Resources, Watersheds and Eco-cultural Landscapes" Harris, S and Harper, B. Presented at Environmental Justice: Strengthening the Bridge Between Tribal Governments and Indigenous Communities, Economic Development and Sustainable Communities" Conference sponsored by EPA and Medical University of South Carolina, June 11, 1999.

depends on the environment, Indigenous communities are an indicator of the health of overall human community. Indigenous communities live in much more intimate connection with their surrounding environments and suffer the consequences of environmental degradation first and most severely.

Interspecies Equality

In Anishinaabeg culture,, all “beings on this earth. . . got a spirit,” and are considered “brothers and sisters.”³ Anishinaabeg share an understanding that the well-being of the natural world is integral to the well-being of self.⁴

The Anishinaabe world undulates between the spiritual and physical planes, and reality is defined by this recognition. In the cosmo-genealogy and creation stories, there is an understanding of fluidity and transformation between species. This is demonstrated in the story of how corn first came to the Anishinaabeg as a visitor in human form. Interspecies intelligence plays a significant role in the Dodaem (clan system). This reality creates a need to maintain interspecies equality, as the other species of creation are seen as relatives.

This broader understanding is reflected in most non-western worldviews, where spiritual practices are essential to all cultural practices. This is why in an Anishinaabeg world view, the practices, for instance of “reciprocity”, or making an offering before one harvests, taking only what one needs, and then offering a feast of the first harvest – for the spirits and all to celebrate – displays the practice of spiritual intelligence. As does speaking to relatives who have fins, wings, or roots. The American practice of Thanksgiving is an adaptation of a multi-cultural practice of a harvest feast, resonating with most agriculturally based societies. Indigenous societies have a larger practice of reciprocity for all harvests, which insures sustainability and a balance.

Historic Theft

The degradation of the ROI started in 1837, when Governor Dodge of the Wisconsin Territory signed a treaty with the Anishinaabeg. This treaty opened the pine lands in the St. Croix Valley to industrial exploitation. With that treaty, lumber interests secured the last outpost of the great white pine forests that had once extended from Maine to Minnesota. Within fifty years of the signing of that treaty, 75 million acres of forest had been clearcut.

³ Testimony of Dale Green, Transcript at 16; Applegate Testimony at 75.

⁴ See, e.g., Testimony of Laura Shingobe-Garbow, Transcript at 95 (“Mother Earth . . . [is] everything to me. When I need healing, I go outside. She’s our heartbeat”).

Subsequent treaties further opened the ROI to lumber companies. When all the off reservation lands were cleared, companies turned their eyes to the reservation lands. Laws forwarded by Minnesota Senator Nelson and Representative Steenerson, opened up what remained of Anishinaabeg territory.

“Cruisers of lumber companies also made their examinations and notes. As there were still standing on White Earth reservation some three hundred million feet of pine, as roughly estimated, it was worth their while...”

(Folwell: :267)

In 1889, Minnesota ranked second in the country in logging, with the northwestern section leading the state’s production. In 1889-1890, 11 million board-feet of lumber was taken from the White Earth reservation. In the next year, 15 million board-feet were cut, followed by another 18 million in 1891-92 season.

By 1895, Frederick Weyerhaeuser of Little Falls, Minnesota, owned more acres of timber than anyone else in the world. The Little Falls Daily Transcript would write in 1893:

“Weyerhaeuser’s Pine Tree Lumber company “... is eating a big hole in the forests of northern Minnesota , as it runs steadily, rarely meeting an accident ... The Weyerhaeusers have secured a monopoly of the Mississippi River so far as the driving of logs is concerned ... In 1893, Weyerhaeuser and other lumber interests secured funding from public and other sources to build a railroad from Little Falls into Leech Lake reservation , where Weyerhaeuser had access to 800,000 board feet of standing timber. But in October of 1898, when the Anishinaabeg people on nearby Leech Lake reservation resisted further encroachment, the military came to the defense of lumber companies. Later private Oscar Buckhard was awarded a medal of honor for ‘ distinguished bravery in action against hostile Indians.”

This massive clearing of forests not only denuded the land, but also impacted waterways. The largest log jam in the world occurred in Little Falls, Minnesota, in 1894, a time of the logging of northern reservations. The log jam (according to Theodor Mattson, in the Sister Bernard Coleman et al book, Old Crow Wing) was six-and-a-half miles long north and one-half mile wide and 60 feet deep in most places. Estimated to contain over four billion feet of lumber, it took 150 men, 5 teams of horses, and a steam engine six months to break it up.

Research has shown that these logjams had lasting impacts to stream bank dynamics. Clearing of forests also changed water run-off/infiltration rates and increased sedimentation in waterways. The construction of lumber mills also spurred the

construction of dams throughout the region.

The various long-term impacts of the logging industry was studied in 2006 by the Minnesota Pollution Control Agency and the Ellen River Partners; Research Hydrologist, Emeritus, USDA Forest Service. Their findings are summarized below:

Potential impacts to streams from log jams include: greater peak flows; significant bank erosion and sedimentation; and overall channel destabilization and incision. The Albion River (Northern California) Total Maximum Daily Load for Sediment (USEPA, 2001) stated, "The greatly increased peak flows, combined with the battering-ram effect of thousands of logs, would likely have caused channel erosion and incision." The TMDL goes on to state that in other watersheds, "...the log drives resulted in channel incision... (and) that valley fills have been converted from long-term sediment sinks (floodplains) to substantial sediment sources..."

Riedel et. al (2002) found that historical increases in water yield, particularly bankfull discharge, brought on by historical logging and land use conversion, initiated channel incision in the Nemadji River Watershed in northeast Minnesota.

Verry's research at the Marcell Experimental Forest (Verry et. al, 1983; Verry, 1986) showed that clearing more than 2/3 of a watershed caused snowmelt peak flows to as much as double, and the impact can last 10 to 15 years.

Hydrological impact of historical logging was likely not limited to solely clearing large portions of previously forested land; changes in forest type following disturbance may help explain our observed trends in peak flows and precipitation. The conversion of mature pine forests to aspen can increase net annual precipitation by 15% by simply reducing the canopy interception of rainfall and snowfall (Verry, 1976; as cited by Riedel et. al, 2005).

White Earth: The Appropriation of a Homeland

The White Earth reservation was hit the hardest in terms of ecological damages of clear cutting forested areas. As it continued, in 1897, 50 permits were issued for 70 million board- feet of timber from the reservation. By 1898, in excess of 76 million board-feet were being cut annually. " (LaDuke as quoted in Folwell).

Not content to take just the great pines, the lumber companies and land speculators set their eyes upon the land itself. Mechanisms were set in place to pry land from children at boarding school, blind women living in overcrowded housing, veterans, and those who

could not read or write English. A common saying describing what happened sprung up in nearby Detroit Lakes: “Fleec[ing] the Indian.” (Folwell)

A quarter of a million acres of White Earth land was taken by the state of Minnesota as tax payments. In other cases, minors were persuaded to sell their lands illegally. Through almost every conceivable mechanism, the land changed hands. As one Anishinaabe elder, Fred Weaver, recalls (in Meyer pg 168-70):

We used to have a lot of them lands here around Pine Point. We had eight 80s [80-acre allotments]. Them land speculators came and tricked us out of them lands. My mother had an 80 on Many Point Lake. They tricked her out of that for \$50. Now that’s a Boy Scout camp. And my father-in-law, Jim Jugg, he had land too. The County says it owns them lands, too. All of them. We lived poor a long time, and we should’ve had all of them lands.”⁵

By 1904, 99.5 percent of the remaining reservation lands were allotted, and ten years later, just 14 percent of the original White Earth land was still in Indian hands.

The stolen land was a bonanza to the border towns and the timber industry. Land companies emerged overnight, fly-by-night mortgage outfits held deeds for thousands of acres of lands, and timber companies closed in on leases to clearcut almost a third of the reservation.

*There is a myth, which was created at that time, it was this Paul Bunyan myth, Paul and Babe, and their ability to change the landscape. That myth is in the center of America, and that myth is what we are dealing with today.*⁶

Bob Shimeck

The stories of Paul and Babe were popularized by the Red River Lumber company, which was started by T.B. Walker. Walker, and his partner H.C. Akeley had a dramatic impact on the Northern Forests. Together, they purchased an expanse of land from Akeley to nearly Itasca State Park. They continuously cut lumber for 17 years. At the peak in 1919, over 100 million feet of lumber was removed. To access these areas, logging roads were developed to connect camps and mills. Logging trains and log floats were also used to transport the lumber.

Prior to starting the operations in Akeley, Walker was one of the timber owners in Beltrami

⁵ Meyer, pp. 168-70.

⁶ Interview with Robert Shimek, March 15, 1998.

county. When he moved on to Akeley, he sold his holding to Thomas Shevlin and Frank Hixon. The two named their operation the Crookston Lumber Company. They were instrumental in the extension of the Great Northern Railroad east and the Brainerd and Minnesota Railway north.

In the first year of the Crookston Sawmill #1, which was located on the south shore of Lake Bemidji and ran 24-hours a day, they processed 40 million board feet and the village quadrupled in size⁷

The expansion of the lumber industry also required an expansion of the power grid. In 1909, the Warfield Electric Company built a power dam near the outlet of the Mississippi in Lake Bemidji.

The stripping of the great forests of White Earth began a process that would be devastating to the Anishinaabeg forest culture. Great maple trees and maple sugar-bush moved horizontally toward logging mills, clearcuts replaced biodiverse groves of medicinal plants and trees, basket-makers searched for materials, and birchbark canoe-makers couldn't find the huge trees for the great Anishinaabeg canoes. Anishinaabeg had become "painfully aware of the mortality of wealth which nature bestows and imperialism appropriates," as Latin American scholar Eduardo Galeano wrote in 1973.⁸ "There was quite a forest when I left, before the war started," recalls Bill Gagnon, a White Earth elder, "and when I came back on furlough, there was just a desert. There was no timber left."⁹

*"clearcut logging just hurts everything... I have a place I like to pick strong woods medicines. The medicine I pick in the jackpine forest, it's a lifesaver. The jackpines, they've been butchered. Where they've been butchered, the medicine's gone."*¹⁰

Sunfish Oppegard

In the beginning, the Anishinaabeg people simply crowded together in the remaining houses, as one family was pushed off the land into another family's house. This adaptation was not without consequences, as the recently traumatized refugee population was susceptible to illness. From 1910 to 1920, epidemics of trachoma and tuberculosis swept through the villages on White Earth. Every family was affected, and some families disappeared altogether. As Minnesota historian William Folwell reports, "The principal

⁷ <http://www.lakesnwoods.com/BemidjiHistory2.htm>

⁸ Eduardo H. Galeano, *Open Veins of Latin America*, New York: Monthly Review Press, 1973, p. 13.

⁹ Interview with Bill Gagnon, June 1983.

¹⁰ Laura McLeod interview with Sunfish Oppegard, August 1997, in White Earth Land Recovery Project harvester study.

conditions of the Indians at White Earth the inspectors found to be ‘very bad.’ Fully 60 percent of the people were infected with tuberculosis, from 30 to 35 percent with trachoma, and from 15 to 20 percent with syphilis; and the diseases were on the increase.¹¹

After a few years, the federal government came to view the social experiment of White Earth as a failure and sought to relocate the White Earth people. This was perceived as the final assimilation and the end of a long road for the White Earth people. By 1930, of the total enrolled population of 8,584 persons, only 4,628 remained on the reservation, slightly more than half. In the mid-1930s, more White Earth land was annexed to form the northern half of the Tamarac National Wildlife Refuge, which ostensibly became a hunting area for non-Indians from the South. By 1934, only 7,890 acres, or less than 10 percent of the reservation was in tribal trust, and Indians were being arrested for traditional harvesting on White Earth land that was now considered “private property” requiring permits. In a harvesting economy that had existed for eons, this was a strange transformation.¹²

Removals continued under the so-called Relocation Act of the 1950s, under which tribal members (and native people across the country) were offered one-way bus tickets to major urban areas.

In 1966, as a result of mounting criticism of its management of the estate of Native peoples, the “wards of the federal government”, Congress decided to look at the problem of loss of land and other assets in Native America. It had become clear to the public that in spite of the supposedly vast Native landholdings, Indian people were not doing very well. Every economic, social, and health indicator showed Native people in the lowest percentile.

Title VIII of the U.S. Code, section 2415, mandated a federal investigation into land and trespass issues since the turn of the century on some 40 reservations in the United States. It wasn’t until 1978 that what became known as the “2415 investigation” came to White Earth, and it was 1981 when federal investigators began to interview elders on the reservation, who had first-hand knowledge of how the land had been plied, stolen, or taken.

The investigation revealed the tangled mess that each title to Anishinaabeg land had become. For over 60 years, the Bureau of Indian Affairs (BIA) hadn’t properly recorded the many complex transactions that had occurred during the great transfer of land from Indian to non-Indian hands. Ultimately, it was revealed that the state of Minnesota’s claim to White Earth lands and their subsequent sales and transfers of those lands were, in fact, illegal.

¹¹ Folwell, p. 283.

¹² LaDuke.

Further damning the state's land transactions, the Minnesota Supreme Court ruled, in the 1977 case *State of Minnesota v. Zah Zah*, that the tax forfeitures that removed the Indians from the lands in the late 1800s were also illegal. According to the court, "the removal of the U.S. government's trust responsibility under the 1889 Nelson Act should not have occurred unless the allottee applied for such removal."¹³

In 1982, with less than a third of its research complete, the 2415 investigation team published a preliminary list of several hundred land parcels with questionable title transactions. The title to such parcels was "clouded", they wrote, and thus could not be legally sold or transferred until the title was cleared. This meant that thousands of acres of Minnesota's land, much of which was owned by farmers, could not be used by their erstwhile owners as collateral to secure mortgages or other sorts of loans.

Ininitaagoog: Maple Syrup

"... The lands between Batchewana and Baawaating (Saulte Ste. Marie area), like much of the rest of the Superior basin, have a rocky ridge, which, as Alexander Henry reported in 1776 'is covered with the rock or sugar maple'..." It remains. The trade economy, however, was based on an undervaluing of this asset because it was produced by Native people, and traders wanted to extract more for export.

Abundant in Anishinaabe Akiing, and a major source of nutrition and wealth, the maple syrup industry of the Anishinaabeg was undervalued historically, with unequal trading relations. This put a damper on the economy and has resulted in today's multi-million dollar maple syrup industry being controlled, outside of the region and outside of Indigenous producers. Less than one percent of the maple syrup and products produced in North America come from Native people, and the region of the Great Lakes, is today, far behind Vermont and Quebec in maple syrup production. In fact, today, a maple syrup cartel, as it is considered, dominates the industry. This was not always the case; indeed, the Great Lakes basin, is tremendously wealthy in maple sugar.

*In 1865 alone, the Keweenaw Bay village on Lake Superior sold 453,252 pounds of maple sugar.... for which a ready sale was found."*¹⁴

1866 Annual Report of the Commissioner of Indian Affairs

¹³ Meyer, p. 230.

¹⁴ Annual Report of the Commissioner of Indian Affairs 1866

Land Impacts

Any and all construction, maintenance, and operations of large diameter-hazardous materials pipelines will impact the environment in magnitude of ways. Land clearing and preparation for construction negatively impact large swathes of land, which changes ecosystem dynamics and increases vulnerability to invasive species. The XL3 plan includes the clearing of over 1,500 forested acres, which would guarantee short-term and long-term impacts to wildlife from soil runoff, introduction of invasive species, and habitat loss.¹⁵

Enbridge's mitigation plan for construction impacted areas seems to be "let nature run its course" approach. This does not acknowledge the substantial potential for the corridor to become a pathway for invasive species, or a realistic revegetation timeline. Enbridge's projects an estimated recovery time of 40 years for sites disturbed by construction activities. Studies from Pennsylvania have shown that pipeline impacted forested areas take over 100 years to return to pre-construction states¹⁶. This also ignores the fact that woody vegetation on top of the pipeline will not be allowed to re-grow. Wetland areas may never return to their pre-construction states if there is significant altering of the hydrology. The loss of ecosystem services would also affect a number of downstream communities; such as communities that rely on the Mississippi for drinking water, or those that rely on the headwaters area for flood protection. The full valuation of these ecosystem services need to be incorporated into any permitting process, as well as the impact on tribal rights, resources, and health.

Impacts from construction methods

At every stage of construction, there is potential for impact. The basic construction process is as follows: land clearing, construction of a level work pad (which may involved excavation in hilly terrain), installation of temporary bridges over waterways, installation of temporary erosion control measures, pipe stringing, trench ditching, pipe bending, welding, pipe burial, re-contouring of hillsides (where necessary), installation of permanent erosion control measures, topsoil replacement, and re-seeding. These activities may also require constructing access roads for hard to reach places. Often separate crews are used for the various processes, and interruption of one process can lead to increased impacts.

Vegetation clearing and burning impacts the biodiversity of an area, affect the continuity of ecosystems, and add carbon to the environment (as a common practice is to burn the cut brush). Both construction of access roads and creation of the ROW will fragment landscape. Improper topsoil separation can impact subsoil and surface conditions. In sensitive

¹⁵ Horbacz Testimony at 72.

¹⁶ Kiviat E. 2013. Risks to biodiversity from hydraulic fracturing for natural gas in the Marcellus and Utica shales. Ann. N.Y. Acad. Sci 1286: 1-14.

ecosystems, such as wetlands, the ability to recover from construction impacts is reduced. Revegetation of the corridor can introduce invasive and noxious species.

Paul Stolen, former MN DNR employee with multiple years of regulatory experience related to large pipelines has submitted substantial testimony on the potential impacts of Line 3 (and the Sandpiper). Much of his testimony addresses the issues of constructing on hilly terrains and in where the XL3 would be collocated with the MPL system, specifically the area around the LaSalle Creek. Key points of his testimony are summarized below:

The existing pipeline corridors were developed at a time that pre-dates current environmental protection laws. The mere existence of these lines do not mean those are the most environmentally sound routes. Expanding existing corridors has a negative impact on riparian ecosystems and the wildlife that depend on them for protection. Improper topsoil separation can decrease re-vegetation, making the area more susceptible to invasive species establishment and erosion issues. Shallow buried lines can also heat up the surrounding soil, resulting in earlier spring growth, and the lack of winter snow cover. This effect is higher downstream of pump stations. Construction of work pads in hilly locations can greatly increase the amount of excavated land and increase the overall impacts. Construction methods around waterways and in floodplains can greatly increase impacts. *There is unclear regulations regarding the use of best construction practices.* Even where there are clear regulations, Enbridge does not have a good history in following those regulations and conditions on their permits.

The construction zone defined as anywhere from 120 feet to 750 feet wide (50' of which is permanent ROW). The whole width may or maynot be used for construction activities. Construction zones narrow in wetlands, but the massive machinery used for construction will still be driving through the sensitive areas. This will result in soil compaction and other possible impacts.

Paul Stolen also addresses this issue stating:

Soil compaction occurs when there is repeated heavy equipment traffic on the travel lane. Such compaction can last beyond the life of the project (greater than 50 years) in certain soils that are susceptible to compaction, especially when wet. There has been growing awareness of the seriousness of this issue. For example, compaction layers can prevent roots and moisture from reaching normal depths, and thus decrease productivity.

A short selection of Enbridge's violations:

Line 6b- Michigan

June 12/13, 2013 North Ore Creek, Michigan. Enbridge releases contaminated test water into the creek. This incident occurred during a hydrostatic test of a section of Line 6b. This section was being built to replace the section of 6b where the 2010 rupture in Marshall, MI. According to the 2013 article on the incident by David Hasemyer of Insideclimatenews, a pig (pipeline inspection gauge) had been stuck in the pipeline. To remove the stuck pig, Enbridge pumped air into the line, a procedure that could have displaced additional deposits from inside the pipeline. To relieve the built up pressure, workers opened the line near the creek, which allowed liquid from the pipeline to mix with water in the creek.

On the day of the discharge, a device called a pig—an apparatus inserted into the pipeline and pushed along by the water to check for flaws—got stuck, so Enbridge pumped air into the line to dislodge it, according to MDEQ accounts of the mishap. That procedure could have displaced additional deposits from inside the pipeline.

To relieve the pressure built up in the pipeline by the malfunctioning pig, Enbridge workers opened the line where it came closest to the creek, allowing the water purged from the line to mix with the creek water. The article goes on to state:

The MDEQ cited Enbridge for failing to abide by 11 terms of a permit intended to protect aquatic habitat and prevent waterways from becoming discolored by dirty, yet generally harmless, discharges of water used in the pipeline testing process. Enbridge was cited for not having anyone supervising the discharge, failing to accurately report the discharge, improperly sampling the dirty water and on some days doing no sampling at all.

There are also personal experiences with Enbridge's practices during the construction of this line. Some of these are recorded in the Line 6B Citizen's Blog. These experiences include improper topsoil stockpiling, improper sludge discharge, and mixing of removed vegetation (some trees have value as timber).

A 2014 article in the Oxford Leader discusses an Enbridge contractor that was fined for starting construction prior to 7am (in a violation of local ordinances).

Line 5- Michigan

Line 5 runs from Superior, through the Upper Peninsula, under the Straits of Mackinac, across the Lower Peninsula, ending in Sarnia, ONT. In an Aug 3, 2016 article Keith Matheny of the Detroit Free Press wrote on Enbridge's violations regarding the number of supports on the underwater pipeline. The number of supports has been an issue Enbridge was supposed to resolve in 2014. The lack of proper support and the recent evidence of the

deplorable conditions of the coverings has led to increasing calls for the shutdown of the line.

Line 61- Wisconsin

In the largest settlement of construction violations, Enbridge was fined \$1.1 million for a series of violations during construction of Line 61 in 2007/2008. The violations were numerous, widespread and impacting numerous streams and wetlands. While some of the violations/impacts may have been small it was the cumulative impact that was the most disconcerting. The violations included impacts to wetlands and streambeds; construction practices around bridges; and erosion control near navigable waters and wetlands.

This is the same line that desecrated effigy mounds near Nekoosa, WI. This violation was not included in the State's suit against Enbridge.

Millhurst Fen, Illinois

This occurred back in 1998 when Enbridge was still the Lakehead company. A new line was being constructed using Horizontal Directional Drilling (HDD) techniques when there was a release of drilling mud in the Millhurst Fen. Fens are a rare ecosystem that often contain a number of sensitive species. The Millhurst Fen contained numerous endangered and threatened plant species, and was considered one of the highest quality fens in Illinois. There were at least three releases in this fen. There are a number of fens the XL3 would cross, and a number of places where HDD would be utilized.

There are many different type of permits Enbridge may need to get to proceed with construction. These include; construction stormwater permits, National Pollution Discharge Elimination System (NPDES) permits, and Clean Water Act 404 permits. These are a combination of state and federal permits. It is highly recommended that MCT and the Bands develop their own similar permits for treaty areas.

Horizontal Directional Drilling (HDD)

Referring again to Paul Stolen's testimony:

The techniques involves deep drilling under waterways and sometimes adjacent wetland...Depths can be 25-30 or more feet...length of drills is variable, but can be 3,000 or more feet long..

Unfortunately, this technique can sometimes cause big environmental and construction problems when things go wrong. This happened on a number of locations on Enbridge's proposed Sandpiper/Line 3 route during the construction of the 24-inch MinnCan project.

Drilling mud escaped during the HDDs at a number of the rivers and wetland, including at LaSalle Creek, Mississippi river and Straight River as well as others.

There has also been reports of HDD issues during the construction of the Alberta Clipper. This includes damage to a pipeline where it runs under a water body.

Frac-outs impact the environment through the release of potentially toxic chemicals and bentonite clay. The clay can cause turbidity in aquifers and wells, smother existing vegetation and other aquatic life, and potentially fill a shallow wetland area. These events occur *when when pressurization of the drill hole increases beyond the containment capability of the overburden soil material, which allows the drilling fluid to flow to the ground surface* (MN DOC DEIS 5.2.1.1.3 (page 5-27))

Drilling mud is a mixture of water, bentonite clay, and additives. Exact additives are not always disclosed, and are potentially toxic. The mixture is used to lubricate the drill bit, remove drill cuttings, and stabilize the open hole. Additives are used to control viscosity and lubrication. MN DEIS 5.2.1.2.4 (Ch 5, pg 71).

Landscape fragmentation and edge effect

Landscape fragmentation is created by roads, utility corridors, and other developments that divide continuous ecosystems into discontinuous pieces. Fragmentation can impact wildlife, sensitive plants, and other ecosystem functions. It also creates an edge effect that has many other repercussions. Among these are loss of core forest, noise, dust, invasive species, etc. These edges are also more susceptible to wind damage and can create wind tunnel effects.¹⁷ Landscape fragmentation is an important part of assessing cumulative impacts (11,12) that has not been adequately addressed in state processes. *Loss of habitat causes population losses in forest species. Fragmentation degrades habitat* (Stolen 2014).

Many species occupy the ROI that are important to the Anishinabeg. These include gray owls, northern hawk-owls, wolves, deer, bear, beaver, manoomin, sturgeon, birch and maple

¹⁷

9 Kiviat, E. "Risks to biodiversity from hydraulic fracturing for natural gas in the Marcellus and Utica shales" Ann. N.Y. Acad. Sci. Vol 1286, 2013.

10 Racicot, A; et al. "A Framework to Predict the Impacts of Shale Gas Infrastructure on the Forest Fragmentation of an Agroforest Region" Environmental Management Vol 53, 2014.

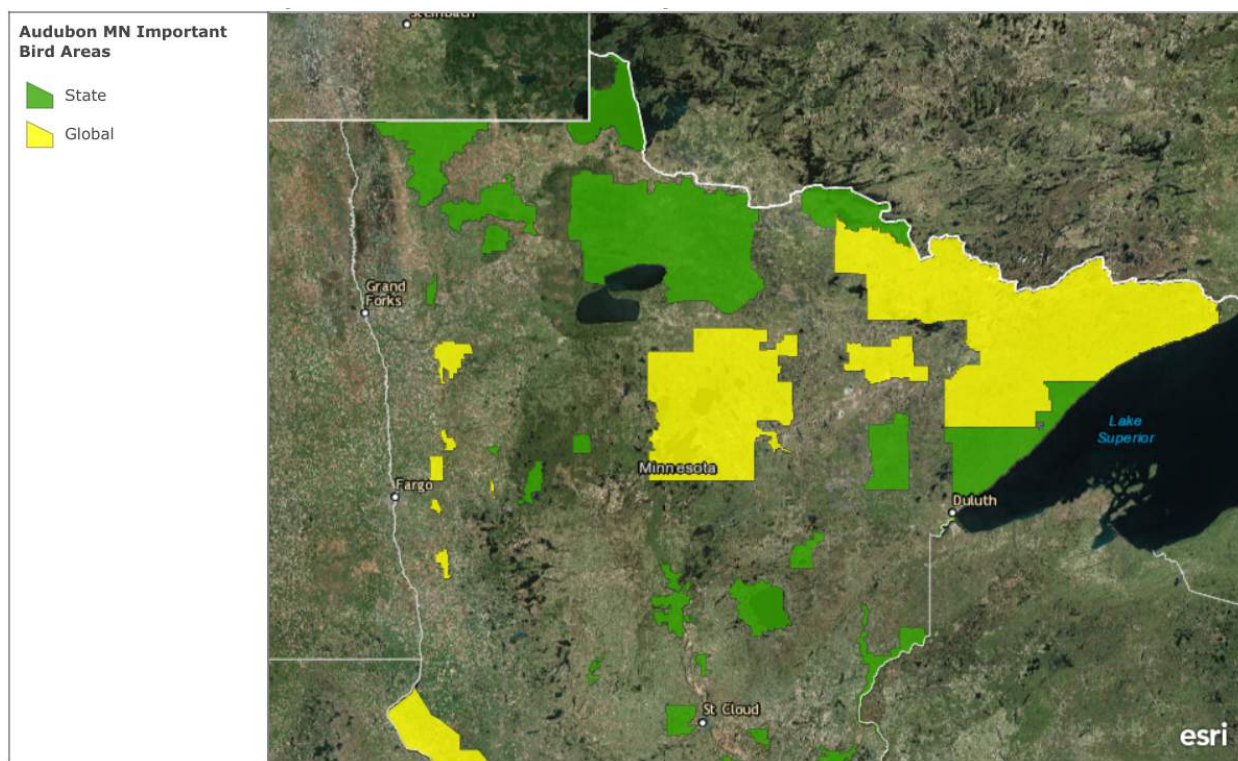
11 Davis, JB; Robinson, GR. "A Geographic Model to Assess and Limit Cumulative Ecological Degradation from Marcellus Shale Exploitation in New York, USA" Ecology and Society Vol 17 (2), 2012.

12 Evans, JS and Kiesecker, JM. "Shale Gas, Wind and Water: Assessing the Potential Cumulative Impacts of Energy Development on Ecosystem Services within the Marcellus Play" PLOS ONE Vol 9 (2), 2014.

trees. The area also features dancing grounds of the sharp-tailed grouse, where conditions must be ideal for the birds to perform their mating dance.

To date, there has not been any comprehensive review of the status of endangered and special species in the 1855 Treaty Area. The XL3 project cannot continue without a full assessment of the conditions and status of these species and their habitat. This assessment should be funded by Enbridge and conducted by the Bands and Nations that have stewardship over the 1855 treaty area.

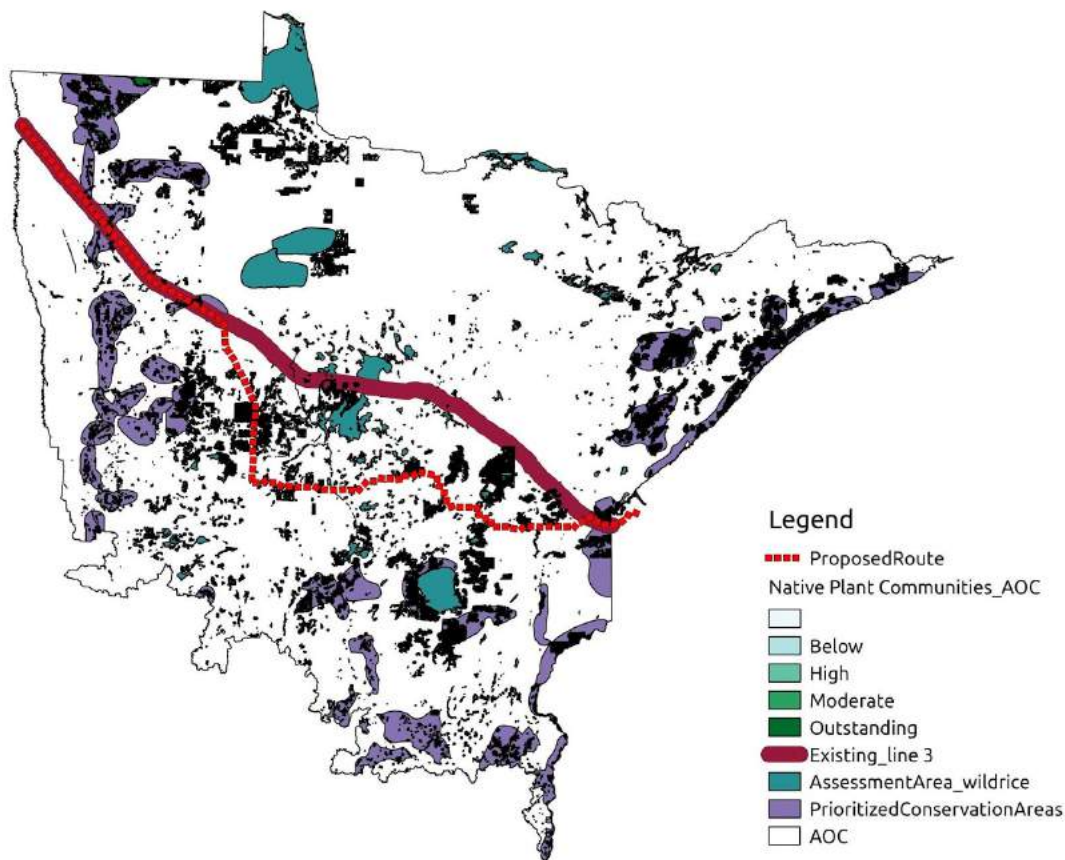
The XL3 would pass within miles of the Rice Lake National Wildlife Refuge, one of the most important stopping points in the US for migratory waterfowl. There are also a number of other important bird areas in Minnesota, as defined by the Audubon Society:



In Wisconsin, Enbridge has requested the USFWS to provide the Project planning recommendations under the MBTA and Bald and Golden Eagle Protection Act (BGEPA; Enbridge 2014). The USFWS should also be consulted in Minnesota.

The Minnesota Biological Survey (MBS) ranks lands of ecological significance based on the number of rare species, the quality of native plant communities, site size and context within the landscape. For aquatic ecosystems, the State of Minnesota has ranked lakes in a similar

manner. Combined with data on trout streams, these three data sources provide details on sensitive ecosystems and species on land and in the water.



Biological importance map, created from MN DNR Native Plant Communities, MN DNR SNA Conservation Opportunity Areas and Marxan Conservation Prioritization, and Wild Rice Lakes Identified by DNR Wildlife.¹⁸

Construction in or near these areas or spills could have a larger impact on sensitive species than similar impacts outside of these areas.

Endangered species in the 1855 treaty area may include:

MAMMALS	INSECTS
---------	---------

¹⁸ <https://gisdata.mn.gov/dataset/biota-dnr-native-plant-comm>,
<https://gisdata.mn.gov/dataset/env-sna-conserv-opportunity-area>,
<https://gisdata.mn.gov/dataset/biota-wild-rice-lakes-dnr-wld>

Canada lynx: threatened and critical habitat designated Gray wolf: threatened Northern long-eared bat: threatened	Dakota skipper: threatened and critical habitat Karner blue butterfly: endangered Poweshiek skipperling: endangered and critical habitat Rusty patched bumble bee - endangered
CLAMS (Freshwater Mussels) Higgins' eye pearlymussel - endangered Sheepnose - endangered Snuffbox - endangered Spectaclecase - endangered Winged mapleleaf mussel - endangered	PLANTS Leedy's roseroot - threatened Minnesota dwarf trout lily - endangered Prairie bush-clover threatened Western prairie fringed orchid - threatened
BIRDS Piping plover: endangered and threatened Red knot - threatened Whooping crane - nonessential experimental population	FISH Topeka shiner - endangered and critical habitat

Species that are federally listed as threatened or endangered are especially sensitive to changes in habitat.

Invasive species

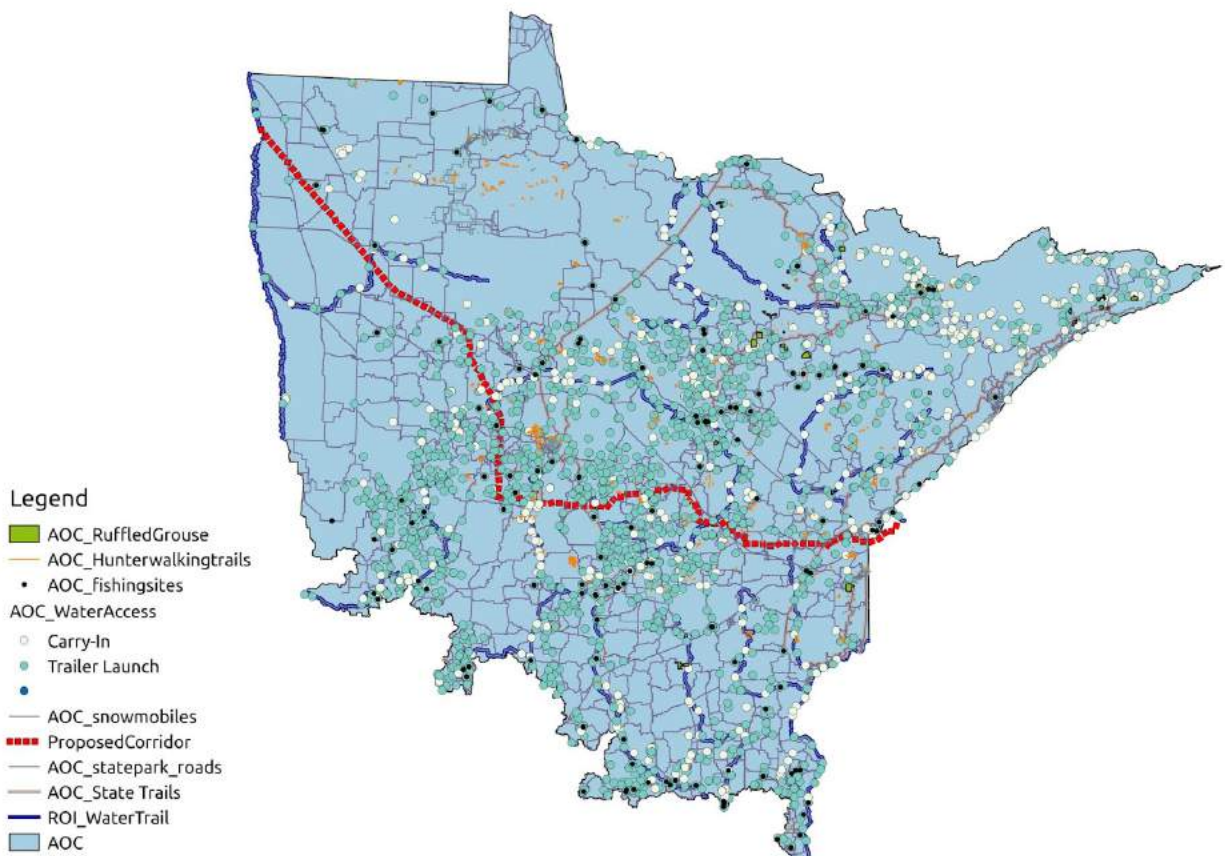
Construction and maintenance activities can introduce invasive species into the environment around the ROW. These can be introduced through seed mixes used for re-vegetation, reduced competition from native species, cross-contamination from construction equipment/workers, etc. There has been reports of noxious and invasive species along the Lakehead corridor. The existence of noxious species can reduce harvesting activities in the ROW.

A vegetation management plan needs to be prepared, detailing the existing noxious plants in the project area, prevention, early detection of invasion and control procedures for each species of concern. If infestations already occur, a weed management plan should be developed (including education, prevention, biological, mechanical, chemical management). Plan should focus on non-chemical treatments first. Yearly review and planning activities for the plans, including evaluation of effectiveness to date. Enbridge should revegetate using native plants that are pollinator species friendly when restoring the ROW after construction.

Hunting and fishing areas

Having large, unbroken areas for hunting activities is vital to traditional lifestyles. The proposed pipeline route cuts through the second and fourth most productive regions for wild turkey hunting in Minnesota. The pipeline would cut through one state designated hunter trail and the buffer would pass alongside another hunter trail and a lake important for waterfowl habitat. Pipeline construction and maintenance activities can also impact access to fishing areas, as well as destroying fish habitat.

A designated state hunter walking trail – White Elk Trail – cuts across the proposed pipeline route and the Salo Marsh Trail is at the edge of the pipeline buffer. The pipeline thus appears to eliminate the White Elk Trail's connectivity. The map below shows the location of various hunting and fishing access points and potential routes.



Turkey harvest

Cass, Clearwater, Hubbard and Wadena counties had the second highest turkey harvest in the state in 2013. To the west, is the fourth highest highest harvest area in the state.

Temporary pipeline construction disturbances and any habitat loss might be the most substantial concerns from the proposed pipeline.

Construction during the spring could have the largest direct impacts on harvest because spring turkey harvest tends to be greater than fall harvest. Seasonal restrictions on construction could be beneficial.

Waterfowl habitat

Though manoomin lakes provide habitat for waterfowl, many of these have not been designated as such by the State of Minnesota. A single lake Upper Rice Lake located along the pipeline buffer is recognized as primary waterfowl habitat. If manoomin lakes are included in the waterfowl habitat classification, the understood potential impact on waterfowl habitat increases.

Fish

In the sense of fish, for instance, I am of the Fish Clan, so there are certain species of fish that I cannot eat, because if I do, I won't be here, because I will have eaten myself.

Again, being Clan is another story. But, to us, the leader of the fish of our clan is the Sturgeon.

The Sturgeon and the Catfish are like first cousins. They have a third cousin that is the Bullhead. I am of the Bullhead Clan. So, I cannot eat Sturgeon, I cannot eat Catfish, I cannot eat Bullhead. And turtle, like all people of the water clans, we don't eat turtle.

With each of those fish, there was a gift that was transmitted into humankind via the giving of the Clans.

Like the Bullhead, the Bullhead was given many gifts. You are supposed to know your clan and clan story. If you are Bear Clan, you are supposed to know why the Bear is your Clan. And, what did the Bear give to humankind in that time of need.

Our story relates the chain and reality of relatedness. So, the fish, likewise, came to be in that manner. The fish could not have survived, if they appeared instantly. They could not have survived, in no way.

So, the story about the fish says that the water and the Earth worked together, so that the fish being giigoo, the underwater beings, would also have food, would also have a food chain. Otherwise they would have eliminated themselves by preying on each other, which does happen in that environment. But, there is a natural balance of that."

*Fish are the thing from the Great Spirit that would take us to the good life.
Giigoonhyag ningii-miinigoonaan aw Gichi-Manidoo da-izhiwinigooyaang owidi
mino-bamaadiziwining.*

*Fish represent everything that was taken away from us.
Giigoonhyag dibishkooo aawiwag gakina gegoo gaa-makamiggoyaang.*

*We were able to take it back.
Ningii-gashkitoomin da-azhenimaagooyang.*

*It is an important part of the cultural mystic that we have.
Gishi-apiitendaagoziwag gidaadizookaaninaanig gashki'esiziwin wii-ayaamang."*

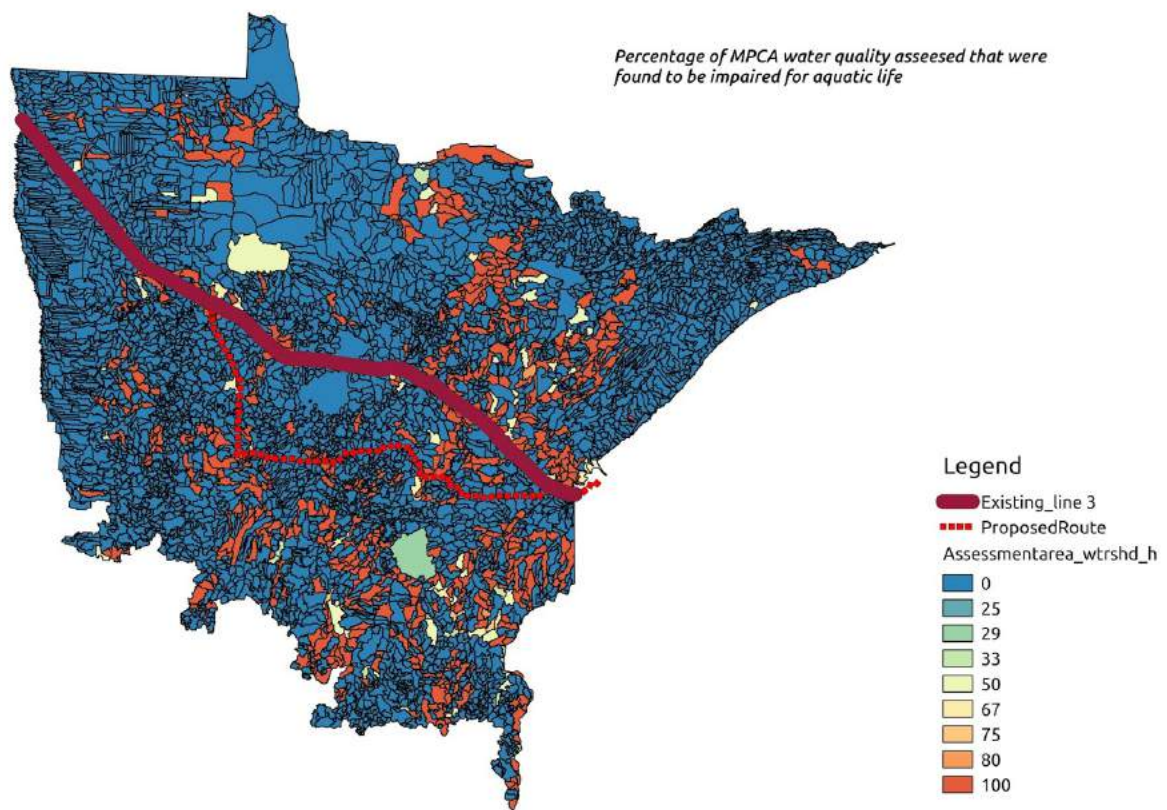
Niib Aubid

¹⁹Fish evolved over a long period of time. There is not one species that did not come to being in that manner. Through what we know as evolution, they evolved. The evidence of that is right before our very eyes, but we never take the time to observe that, and that is what is called the tadpole.

If you ever watch that process, from egg, to polliwog to a tadpole that has a tail on it, that eventually becomes a frog. Again, right there is the lesson of how it all came to be. And the word, boodoon, in our language, means that process. Boodoon becomes makakii. Makakii does not become boodoon. Boodoon become makakii. The tadpole becomes frog. So, again, we see that lesson of evolvement. That is in the whole of creation.

Fish came to be in that manner. Again it is emphasized, they could not have survived if not first, before them came their food and their way of survival.

Foushee, Lea, and Renee Gurneau. Sacred Water: Water for Life. Lake Elmo, MN: North American Water Office, 2010. Pg. 106-108.



As can be seen in the map above, there are currently numerous watersheds in the ROI that are impaired for aquatic life. Installing a hazardous pipeline through these areas can further degrade watershed quality, resulting in less aquatic life. This project would also threaten areas that are not currently impaired.

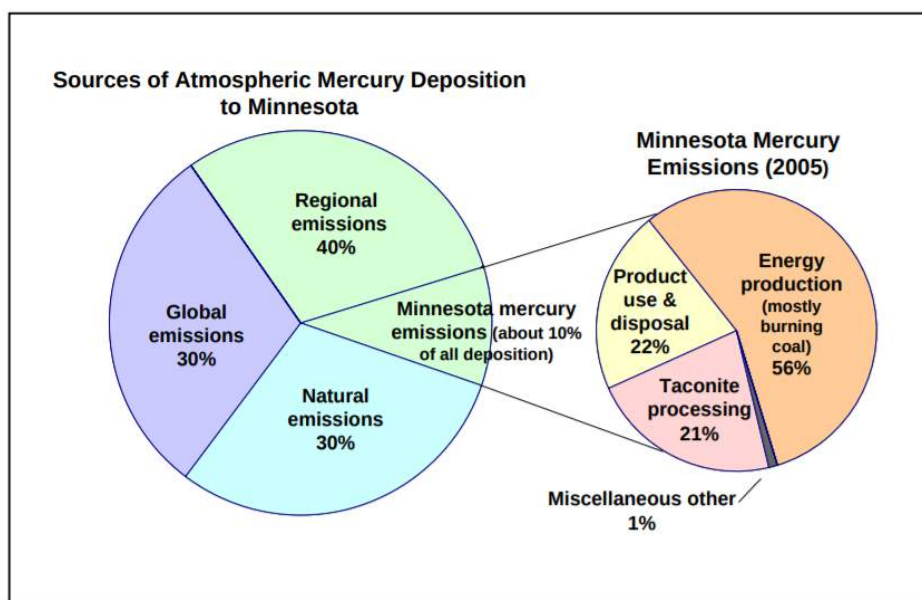
Fish Consumption Advisories

In addition to areas that are not adequate for aquatic life, there is the issue of fish consumption advisories. Mercury contamination is an issue around the world. Minnesota is no different. Mercury is the primary contaminant of concern in Minnesota, although there have been other contaminants found in fish. The primary source of mercury in Minnesota is air pollution. Nearly 70% of the air borne mercury is from coal-fired power plants. Additional pollutants include PCBs. This persistent contaminant was banned in 1976, but can be found in water and sediments to this day. Major rivers, such as the Mississippi, and Gitchi Gummi may have fish that contain PCBs.

Lake Trout from Lake Superior have also been found with traces of toxaphene. Toxaphene is an insecticide, and mixture of 670 chemicals, it was banned in 1990.

Fish across the US are also contaminated with dioxins. According to the MPCA study, Levels in Minnesota are lower than the US average, but there are a few lakes and rivers with higher than average levels.

Perfluorochemicals (PFCs) have also been found in fish in Minnesota. The primary PFC of concern is perfluorooctane sulfonate (PFOS).



From: [Sources of Mercury Pollution and the Methylmercury Contamination of Fish in Minnesota \(PDF: 50KB/2 pages\)](#)

Health impacts of eating contaminated fish

Contaminants can build up in humans over time, fish consumption advisories are developed to allow contaminants to be eliminated between meals. Young children, developing fetuses, and breast-fed babies face the biggest risks from exposures to these contaminants. Mercury can impact the nervous system and impact a child's behaviour and cause learning problems. PCBs can cause infant develop issues, changes in human blood, liver, and immune functions in adults. PCBs have also been shown to cause cancer in laboratory animals. PFOs may decrease high-density lipoprotein (HDL) and impact thyroid hormone levels.

Fish consumption advisories and safe cooking practices

Mercury can be found in all parts of fish, cooking and cleaning will not reduce the amount of mercury. Larger, older fish contain the most amounts of mercury. PCBs and Dioxins concentrate in the fish fat, fatty fish such as carp and catfish can contain the most of these

contaminants. Removing fat through cooking and proper cleaning can help lower the amounts of PCBs and Dioxins in a fish meal. PFOS also can not be removed by cleaning or cooking. PFCs have also been found in many species of wildlife around the world. They are very persistent in the environment, and can easily move through groundwater and the atmosphere.²⁰

Consumption advisories for pregnant women, women that may become pregnant, and children under 15 include:

Once a week, one serving of:

- Bullhead
- Crappie
- Lake Herring
- Lake Whitefish
- Sunfish
- Yellow perch

Once a month:

- Bass
- Catfish
- Lake Trout
- Northern Pike
- Walleye

Do not eat the following:

- Muskellunge

Fish is an important part of Anishinaabeg traditional diets. Further loss of this protein will negatively impact health.

Alteration of wetlands

Clean water was always very important to us, caring for the water. Those Prophecies that were given a long time ago, tell us that we were instructed to migrate westward to where we would find food that grows upon the water. This is the wild rice that we still enjoy today. When I was a little kid, we never put anything in the lake to keep the water pure where the rice grows. Because wild rice was foretold that it would be there. It is considered to be a sacred gift from the Creator. So, where it grows in the water, we always kept that clean. Nothing went into the water except tobacco, an offering of tobacco before we take the sacred gift provided for us. We weren't even allowed to pee

²⁰ <http://www.health.state.mn.us/divs/eh/fish/faq.html>

in the water when harvesting out of respect for the water itself. People that harvest rice have to go to shore to go to the bathroom. They would not want to contaminate it in that way.

Earl Hoagland

Wetlands invaluable ecosystems, and are commonly referred to as nature's liver. They help cleanse waters, provide flood control and abundant habitat. Wetlands also provide services to humans (such as flood control and provision of clean water), and to the Anishinaabeg-provision of food, medicine, and spiritual health/wealth. The permitted destruction of these sacred wetlands represents a breach of contract between United State governments and the Anishinaabeg governments. It has been estimated that in Minnesota, some 90% of the wetlands have been drained. The western third of Minnesota, including the 1855 treaty territory, was once covered with wetlands. Today, even though Minnesota is spending millions annually, the state is still losing more than it restores²¹

When pipelines are built in wetlands, they alter the hydrology. The ROI has a complex hydrology that would be permanently impacted by the construction of an underground pipeline. The pipeline construction process will compact soils, alter terrain, and hydrological regimes.²² If approved these impacts will be permanent. When there are maintenance activities in these areas, future damage can be done.

Paul Stolen's comments on wetland impacts:

The most obvious change can be seen in older pipelines where there is a strip of woody vegetation marking the place where the pipe is buried in the wetland. The cause of this is likely two-fold: Wetland soil compaction, and the fact that the pipeline itself is essentially fill, and thus the wetland surface is raised and becomes drier when the spoil is returned to the trench. Soil compaction in wetlands and whether an amount of wetland soils is removed that approximately equals the volume of the pipe through the wetland. If not removed, changes in wetlands will occur. For example, a 200 foot crossing of a wetland by the 36 inch..pipeline results in 36 cubic yards of fill into the wetland, or about 4 loads of a 9 yard dump truck. This will result in vegetation changes and in many locations and is, or should be, considered fill under wetland regulations.

²¹ (<http://nativenewsonline.net/opinion/dear-governor-dayton/>).

²² Hydrological regime refers to variations in the state and characteristics of a water body which are regularly repeated in time and space and which pass through phases, e.g. seasonal.

The issue which is not discussed by the pipeline company, amongst others, is the impact on a delicate aquatic ecosystem by the installation of the pipes. Studies from Louisiana show pipeline cuts through wetlands can increase in size two fold in five years.²³ This cut is not a static event, it is temporal event, altering the dynamics of wetlands over time.

“Once the oil companies come in and started dredging all the canals, everything just started falling apart”

Joseph Bourgeois, 84²⁴

According to the MPCA, Minnesota currently has 10.6 million acres of wetlands. In a survey of depressional wetlands such as marshes and ponds, nearly half the wetlands had plant communities in poor health. Conditions of aquatic macroinvertebrates (such as aquatic insects, leeches and snails) were much better. Wetlands and the plant communities they support, are already in poor condition. Fracturing these sensitive landscapes with pipelines will add more stress, resulting in the loss of plant communities. Including manoomin.

Wetland Mitigation

Despite federal regulations requiring wetland mitigation occur within the major watershed where the wetland loss occurs, in NE Minnesota, state law allows mitigation in another watershed if mitigation opportunities do not exist in the watershed where the loss occurs. Mitigation regulations require an assessment and replacement of lost functions. Constructed wetlands often do not fulfill the same functions, or contain the same biodiversity of natural wetlands. Enbridge’s wetland mitigation plan is limited to sowing oats in compacted soil. This will not lead to a functioning wetland.

Impacts to Manoomin

“Mininaajitoomin i’iw manoomin. Niinawind nindabiitaamin o’ aki amaa. Niinawind niimijimin o’o manoomin miinawaa nindamwaanaanig ongo giigoonhyag.

We have a relationship with rice. We are the ones that live here. We are the ones that eat the rice and fish.”

“Iw gaye manoomen, memwinzha iw zaaga’igan gii-mooskine, gii-mooskinemagad manoomin, noongom dash agaawaa ayaamagad magizhaa eta ingodwaasing maazhaa ishwaasing endaso-ingodwaak aginjigaadeg chi-bangii jiigibiig.

About the wild rice; we went from a lake that was full of rice to one that has about three to

²³ From Scientific American (Marshall 2014). Note: This loss is exacerbated by saltwater intrusion in the estuary. While this dynamic does not exist in Minnesota, Louisiana is the only place where these long-term studies exist.

²⁴ Ibid

six percent along the shore.”

*Niib Aubid*²⁵

Expert testimony and secondary sources demonstrates the centrality of manoomin to Anishinaabeg culture. It forms the basis of Anishinaabeg cultural understanding of their origins as a people, their relationship to the land, and the practices that make them who they are today.²⁶ “It’s said that one of the reasons why the Anishinaabe came to this particular area or settled here was because of wild rice or manoomin as . . . [they] call it.”²⁷ According to Anishinaabeg traditions, the people migrated westward to the Great Lakes region to fulfill a prophecy, “to find a food that grows on water.”²⁸

Manoomin is one of the few cereals native to North America with well-documented food uses.²⁹ It has been harvested in the Great Lakes Region for thousands of years.³⁰ It now grows abundantly only in the Upper Midwest region, particularly in northern Minnesota and Wisconsin, the Ojibwe homeland.³¹ According to the Minnesota Department of Natural Resources, “[n]o other native Minnesota plant approaches the level of cultural, ecological, and economic values embodied by natural wild rice.”³²

Manoomin is a crop and commodity of significant economic importance to the Anishinaabeg.³³ It remains a staple of Band members’ diet.³⁴ But, “[t]raditional Ojibway life elevates rice above being food simply for consumption or barter.”³⁵ The food is fairly characterized as a “sacred food,” imbued with the character of a “mystique.”³⁶ Elders emphasize “[t]he many benefits, not only economically but spiritually. . . [of] harvest[ing] wild rice.”³⁷ The Ojibwe explicitly reserved the right to harvest manoomin on their

²⁵ Because of the loss of Sandy Lake- from *Sacred Water: Water for Life* by Lea Foushee and Renee Gourneau

²⁶ Thomas Vennum, Jr., *Wild Rice and the Ojibway People* (1988), at 58; “Natural Wild Rice in Minnesota: A Wild Rice Study document submitted to the Minnesota Legislature by the Minnesota Department of Natural Resources” (“MDNR Wild Rice Study”) (February 15, 2008), at 7; Written Testimony of Michaa Aubid.

²⁷ Testimony of David “Niib” Aubid, Transcript at 22.

²⁸ Testimony of Natalie Weyaus, Transcript at p. 145; MNDR Wild Rice Study, at 7.

²⁹ Vennum, at 12.

³⁰ MDNR Wild Rice Study, at 7.

³¹ Vennum, at 32-33; Testimony of David Aubid, pp. 21-22 (“there’s only a few places on the earth where it grows, and this is one of those areas here”).

³² MNDR Wild Rice Study, at 7.

³³ Vennum, at 58; Testimony of Aquatic Biologist Chad Weiss, Transcript at 56.

³⁴ Weiss Testimony at 56; Testimony of Raina Killspotted, Transcript at 154

³⁵ Vennum, at 58; see also Bunting Testimony at 42.

³⁶ Vennum, at 58; Testimony of David Aubid, Transcript at 28.

³⁷ Testimony of David Aubid, Transcript at 23.

traditional lands in treaties with the United States, grounding the tradition in an elevated contractual and property-based set of legal rights.³⁸

It is estimated that 70 percent of the manoomin stands in Minnesota have been destroyed. The 1864 Bureau of Indian Affairs Annual report identified that the Chippewa of the Mississippi, population 3,966 gather 300,000 pounds of manoomin. This creates an average of 75 pounds per person.

The 1866 Bureau of Indian Affairs Annual report identified that the Chippewa of the Mississippi, population 4,065 gathered 390,000 pounds. This created an average of 95 pounds per person. The Bureau's numbers would only be the amount sold to traders by Band members because they had no way of measuring what individual Band members kept to eat.

Research at Mille Lacs Band of Ojibwe in the 1980s pursuant to the Mille Lacs treaty case identified that on an average year, 37.5 pounds of finished manoomin can be harvested per acre. This means that you would need 8,000 and 10,400 acres of manoomin would be required to harvest amounts recorded in 1864 and 1866, respectively. The above numbers are about manoomin that could be sold, the population would also need about 75 pounds per person annually for personal consumption. This would result in an estimated total acreage of manoomin beds needed would be 16,000 to 20,800 acres. These figures represent the “Chippewa of the Mississippi in 1866, with 4,065 tribal members. The successor tribal government to the “Chippewa of the Mississippi” is the White Earth Band, with 20,000 tribal members. This means that the White Earth Band’s present population would require almost 100,000 acres of manoomin itself to sustain a traditional diet and traditional trade economy.

In addition to manoomin manoomin, Anishinaabeg make important use of numerous other native plants.³⁹ These plants, which have significant medicinal and religious significance, are dependent upon high-quality—uncontaminated—water, soil and wetlands.⁴⁰ The XL3 has significant potential to endanger these natural resources. To consider just two examples, Labrador tea, an evergreen shrub traditionally used as medicine for a variety of ailments, grows only in wet woods, swamps and sphagnum bogs, and would be adversely affected by the contamination of wetlands and waterways.⁴¹ Northern white cedar, a tree

³⁸ Treaty with the Chippewa, 7 Stat. 537, Art. 5 (1837).

³⁹ See generally James E. Meeker, Joan E. Elias & John A. Heim, *Plants Used by the Great Lakes Ojibwa* (1993).

⁴⁰ Lippert Testimony at 69.

⁴¹ Lippert Testimony at 71; Meeker et al, at 196.

found along wetlands and waterways, is traditionally used as incense in religious ceremonies as well as a medical treatment.⁴²

Sensitivity of Manoomin

*Manoomin...is considered to be a bio-sentinel for water quality due to its tendency to thrive under specific conditions*⁴³.

According to the MN DNR, any factor that can affect water quality or water levels can also endanger stands of manoomin.⁴⁴ Vegetation clearing and grading during construction is likely to alter the complex ecosystem and increase sedimentation. Dredging of wetlands and waterways for bridges and equipment also has a significant potential to alter water levels, further affecting manoomin.⁴⁵ Operating and maintaining the Pipeline will create further adverse impacts.⁴⁶ In some locations, the quality of surface water is already impacted by sulfates from mining discharges.⁴⁷ Numerous biologists and engineers have submitted comments supporting the conclusion that the construction of Line 3 at the preferred location would significantly impact the manoomin along the route.⁴⁸

⁴² Testimony of Harvey Goodsky, Transcript at 164-65; Meeker et al, at 387.

⁴³ Kjerland, T. 2015. Wild Rice Monitoring Handbook. The University of Minnesota Sea Grant Program.

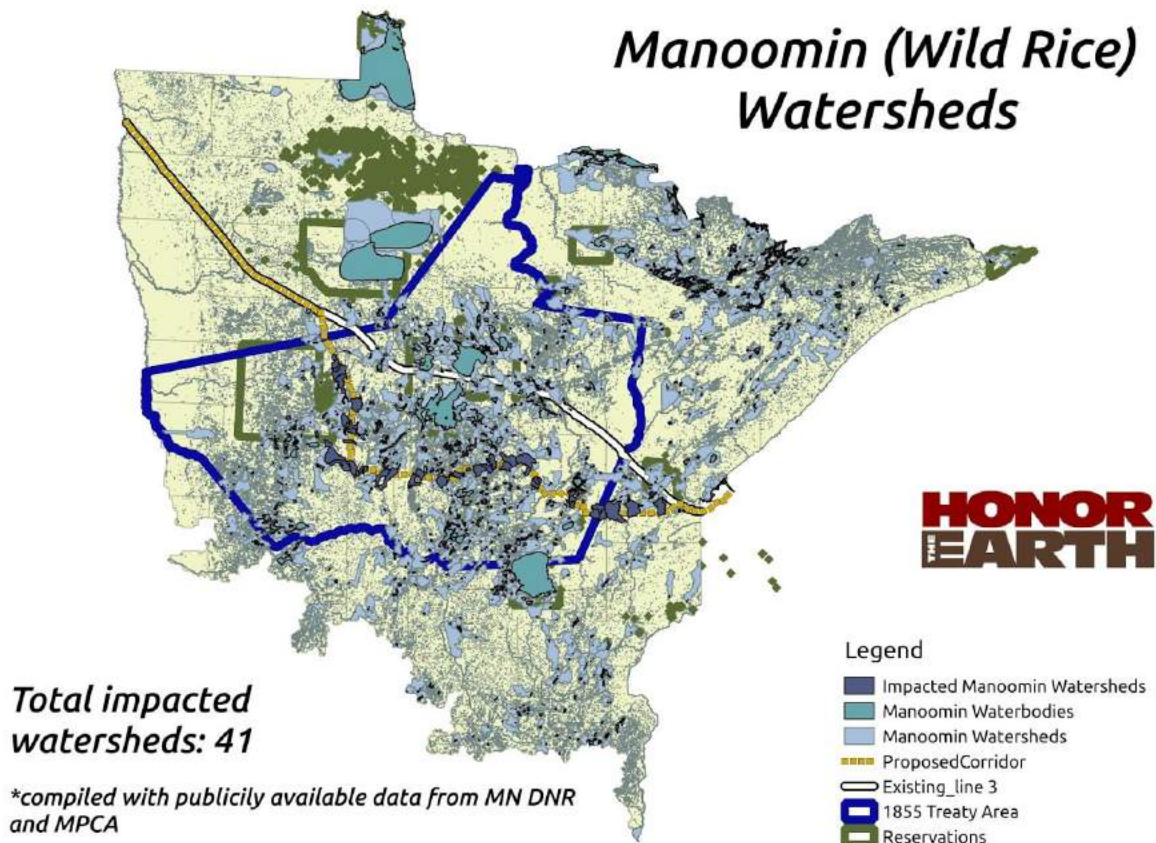
⁴⁴ MDNR Wild Rice Report, at 21.

⁴⁵ Weiss Testimony at 55.

⁴⁶ Id. at 55-56.

⁴⁷ Id. at 25.

⁴⁸ Bunting Testimony at 39-45; Rupp Testimony at 45-53; Weiss Testimony at 53-58; Testimony of brownfield coordinator Todd Moilanen at 58-65; Testimony of chemical engineer and chemist Charles Lippert, Transcript at 65-71; Testimony of forester Jacob Horbacz at 71-74; Testimony of wildlife biologist Kelly Applegate, Transcript at 75-78



Watershed-level analysis is one of many tools regional planners use to assess impacts and health of watersheds. The potentially impacted watersheds were defined by intersecting the proposed route with watersheds of manoomin waterbodies, as defined by the DNR and MPCA publicly available GIS datasets. Through this process, 41 manoomin watersheds were identified as potentially impacted.

In addition to a complete disregard to the nature of manoomin, throughout this process, Enbridge (and the PUC and DOC) demonstrate a complete lack of understanding of how ecological restoration occurs. At no point has there been an explicit explanation of how Enbridge will protect Manoomin waters, or restored a damaged bed.

Surface waters

Water is very important to Anishinaabe people ... A part of the Creation Story, interpreted into English says, When the winds blow and the water flows free, we walk with the Sun and Moon, and in darkened times we shine. This is talking about the winds of life that blow within each of us as an individual. We are made up of four parts physical, mental, emotional, and spiritual. When we come into this world, at the time of birth, the four parts are equal. So, when the winds blow and the water flows free, is talking about the water before birth. Before any life

can take place, there needs to be the presence of water.

There is a song about that. It says Manido Nibi, anji bimaadisiyan, meaning, spirit of the water is why there is life. (Sings the song). The song connects with those Prophecies and the importance of the water itself, the spirits of the water. Memegwesiiwag is what we refer to them in our Anishinaabe language. We call upon them for help. We make a lake offering in the spring and the fall. We put out offerings to ask Memegwesiiwag to watch over the person and put belongings onto the raft..."

Earl Hoagland

Anishinaabeg live in a land surrounded by and saturated with water. Clearly, for a group of people to not only survive, but to thrive in such a place necessitates a deeply held reverence for water. For the Anishinaabeg, that means an important ceremonial relationship with this part of their environment. This important relationship to water is primarily held by the anishinaabekwe of our communities, the women. Women are tasked with keeping this important relationship strong by singing the water songs in ceremony, among many other responsibilities

The Great Lakes region represents one fifth of the world's' freshwater and that freshwater is increasingly scarce. Historic exploitation of water resources, creation of wastewater and contamination has placed us in a very precarious position in terms of water for future generations. That is water, which is not just for humans, but for all of the relatives, whether they have wings, fins, roots, or paws.

There have been a number of impacts to the waters since colonization. These include dams, loss of water quality, and loss of critical ecosystems.

Dams and the US Army Corps of Engineers

"In building the dams on the Mississippi River, which runs through our reservation, 42,000 acres of land were flooded. We are water people. Our villages and burial sites were next to the lakes and rivers. When the settler society built its dams to provide energy for the mills in St. Paul and Minneapolis, and also to help float the logs downriver to support the logging industry, the Ojibwe people were not asked how we would be affected. The effects were devastating, destroying our wild rice beds, cranberry bogs, villages, and flooding our gravesites" ⁴⁹

⁴⁹ Nanaboozhoo and the Wiindigo: An Ojibwe History from Colonization to the Present

Volume 28, No. 3 - Spring 2017

Bezhibobinesikwe Elaine Fleming ♦ February 19, 2017 [Tribal College, Journal of American Indian Higher Education]

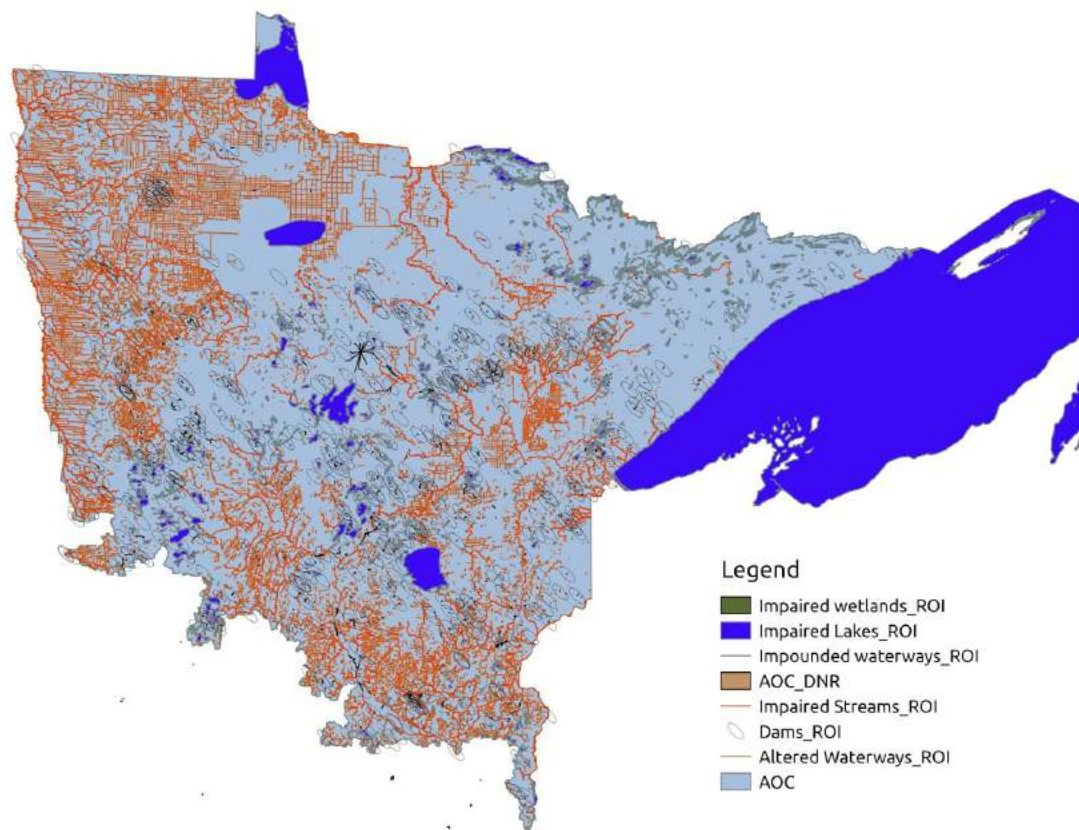
In 1878, the Secretary of War was directed to examine the practicality and cost of a system of reservoirs. The survey was completed Captain Charles J. Allen of the Corps of Engineers. He recommended dams at Lake Wiinibiigoshish, Leech Lake and Pokegama Falls. In 1882, work began on the dams. Part of the construction costs included an estimation of any damages that might occur on *the property of friendly Indians; for such damages the Indians were to be reimbursed, but not for in excess of ten percent of the amount appropriated for the reservoir project.* A total sum of \$15,466.90 was approved by the Department of Interior. *The Indians would not touch a dollar of it, the award being in their judgement altogether inadequate. There was much indignation in the violation ...*

“The Indian Spokesmen had evidently reached an understanding beforehand and were unanimous in their demand. This was their country they said, “ it was their right to say what the Great Father should pay for the injuries to their people. The dams would utterly destroy all their means of living- their rice fields, their cranberry marshes, their meadows, and their sugar bushes. They must have \$250,000 every six months. They refused to give any definite information as to the amounts or values of crops and other property that would be damaged. The commissioners found it impossible to arrive at any reasonable conclusion with the Indians and had to depend upon a small body of desultory evidence and such general information as they could pick up. They concluded, however that the damages would probably be great and estimated them at \$26,800 a year without term. As if to suggest the best way out of the matter, they tacked on as to their report a suggestion that all these Indians ought to be moved to White Earth. The Commissioner of Indian Affairs and the Secretary of Interior approved the award and recommended a settlement of \$10,000 for property destroyed during the prosecution of the work on the reservoirs and an annual appropriation of \$26,800...” (Folwell : 211)

The three dams were completed in 1885. The fourth dam on the Pine River was finished in 1887.

Dams have numerous downstream impacts. Stream morphology changes, as well as sedimentation. Water levels drop and can impact sensitive species. Fish lose access to spawning grounds, and historic fishing sites can be lost.

Below is a map of existing impaired waters the location of dams.



XL3 will have numerous impacts to surface waters. In addition to the impacts listed in other sections; increased levels of sedimentation, changes in streamflow dynamics, accidental releases of drilling fluid, etc., there are further dangers of routing pipelines through flood zones.

Again, from Paul Stolen:

The most serious problem occurred on the Alberta Clipper route on a Grant Creek crossing just west of Bemidji. I was directly involved in this site, and provided several written documentations as to what occurred. At this site, Grant Creek flows south through a narrow gap in an railroad grade. Upstream of this gap Grant Creek flows through a large expanse of wetland. The creek is also subject to numerous beaver dams upstream. The railroad bridge at this site had collapsed into the gap, which was also filled with segments of a five foot concrete culvert.

Immediately below the gap are 5 or 6 large pipelines, with the first being within just a few feet of the steep railroad grade. Grant Creek then takes sharp turn to the east, actually following the pipeline in a parallel manner, until again turning south where it flows over the trenched

pipes. I observed bank erosion had removed 6 to 7 feet of the bank, and that this had all occurred since the previous summer. Therefore, this large pipeline was not only protected by about 5 feet of riverbank.

A large and rare rainfall event in the drainage above this site would have taken out beaver dams, and added to the flow through this narrow gap. It is likely that the first pipeline would have easily been exposed. In addition, the heavy concrete sections could have been eroded in the pipelines, threatening ruptures...This site should be thoroughly assessed for susceptibility to scour-- since it is an ideal site for down-cutting caused by human activity restricting the floodplain of this river.

Where the XL3d would pass between the Big Sandy Lake and Rice Lake watersheds it travels through a “high flood hazard risk areas.” Flood events can transport contaminants much future and can also increase scour and erosion. Extreme flood events can also damage or shift lines.

Pineland Sands Conversion and Toxic Taters

We have a lot of contaminants and pollution in the water, today, that were not there a long time ago. On White Earth Indian Nation, for example, about half of our reservation is woodland on the East and the Western half is farm country. Whatever they put on their fields in the way of herbicides and pesticides comes to us in the winter from the prevailing westerly winds. Much of the soil from their field blows into the wooded areas and contaminates the water. Sometimes in the winter after a strong west wind, we can see a dirty film of soot on the snow. It is coming from the farmers' fields, when they plowed up and the fine dust and dirt blows into the wooded areas to the East. This has an effect on the wild rice. It affects other animals and people that are using the water, using the fish, eating things from the water, gathering roots or rice or animals that are living in the water or around the water. There are things at the bottom of that food chain that eat and accumulate more and more contaminants.”

Earl Hoagland

Agricultural activities, such as by R.D.Offutt, in and near the Straight River Basin have created significant impacts on water quality. XL3 will threaten the already degrading integrity of the Straight River Basin and Crow Wing Watershed. R.D.Offutt has potato farm operations across Minnesota, with new and expanding projects in the Pinelands Sands Aquifer region. R.D. Offutt Company (RDO) and affiliates is the largest potato growing

business in the United States and supplier to the McDonald's restaurant chain. The North Dakota-based potato processor, RDO, has been purchasing and clearing the forest land in four counties: Becker, Cass, Hubbard and Wadena. The MN DNR estimates that the processor has already purchased about 12,000 acres of pine forests. Some of this land has already been bulldozed, and the remainder is slated for clearing and conversion to irrigated croplands. The MN DNR estimates that another 15,000 acres of pine forests have the potential to be sold and converted to crops.

Pine-to-potatoes land transformation threaten water supplies, fish, rare plants and wildlife. In 2015, when RDO applied for 21 groundwater appropriation permits and a request for 33 preliminary well assessments, the Commissioner of the Department of Natural Resources (DNR) issued an order for a document known as a Discretionary Environmental Assessment Worksheet (EAW). The ordered discretionary EAW was to evaluate the potential impacts of RDO's groundwater appropriations. If granted, the permits would have resulted in the conversion of approximately 7,000 acres of Pinus forests to irrigated agriculture (Minnesota Department of Natural Resources 2015).

To avoid the EAW process RDO withdrew all but five groundwater appropriation permit applications. This 5 permits were then reviewed as individual projects, rather than part of a larger landscape conversion. It is commonly accepted that RDO will continue to pursue its expansion plans. This expansion could impact groundwater and surface water through withdrawals for irrigating crops and the impacts from land use conversion.⁵⁰

RDO's expansion could impact nearly 42 square miles. This is the approximate size of Bemidji, Brainerd, and Detroit Lakes combined. This is a rate of forest loss not seen since the timber grab of the 1800s. The area of potential expansion is underlain by sandy, permeable soil atop a large, vulnerable aquifer. This aquifer could be polluted by agricultural chemicals and depleted by crop irrigation. The potential impacts include the risk of crop fertilizers, fungicides, herbicides, and pesticides contaminating soils, groundwater and local water supplies, pesticide drift, groundwater overuse, pollinator decline, and impacts to fish, rare plants and wildlife. The land conversion process destroys habitat and dramatically alters natural ecosystems. Runoff and groundwater infiltration containing agricultural chemicals are of great concern.

During a Minnesota Department of Health Environmental Health Tracking and Biomonitoring Program Advisory Panel Meeting, Robert Shimek, Executive Director of the

⁵⁰ <http://www.dnr.state.mn.us/input/environmentalreview/pinelands/index.html>
http://files.dnr.state.mn.us/input/environmentalreview/pineland/eaw_order.pdf

White Earth Land Recovery Project outlined a request for a biomonitoring study indicating the chemical body burden of major agricultural chemicals in communities living near potato fields. This study, paired with targeted and systematic air monitoring during times of pesticide applications, might give the community much needed insight about what might be contributing to the health problems in a significant portion of Minnesota, including Becker, Cass, Crow Wing, Hubbard, Mahnomen, Otter Tail, Todd, and Wadena Counties. Shimeck's concerns stem from RDO's use of a number of toxic chemicals.

Pesticide spraying started around 1968 in the community of Pine Point on White Earth Reservation. As explained in "The Frequency of Detection of Chlorothalonil, a Fungicide Used on Potatoes, at Sites Across 6 Towns from 2006-2009," scope of the spraying has increased over the decades crops, as well as the levels of chemical added to crops. Chemicals are also used on corn, wheat, and sunflowers in the area. The major chemical of concern Chlorothalonil.

"This chemical fungicide was applied every 5-7 days during the potato-growing season, while different herbicides were used to kill the vines in the fall."

These chemical are very mobile and quickly disperse through the environment. During the rain, they can volatilize and enter the atmosphere. There is also concern that the chemicals and their breakdown products are in the soil and water of the area. The community of Pine Point on the White Earth reservation is in the heart of these potato fields. The community is marked by a high number of infant deaths, miscarriages, cancers, and other diseases. Within this small community, there is an entire block of people with cancer, no one over age 62 left in an area due to cancer deaths, and numerous people with immune system disorders.

It has been hard for community members to address this issue. Data on exposure and diseases is hard to track. According to Bob Shimek:

"Many of those with cancer from western Minnesota went to Fargo to die and it was reported there...We do not have hospitals on the reservations, so most people went outside of the reservation for treatment."

"Biomonitoring for pesticides was very difficult. Some metabolized quickly, some transformed into something else, so it was not exact. Biomonitoring in this area to look at the mix of all of these exposures together, the crops and the chemicals."

According to the 2014 Annual Public Water Supply Compliance Report by the Minnesota Department of Health, Arsenic, Nitrate + Nitrite Nitrogen, and Coliform were found in the groundwater of the Hubbard, Becker, Cass, Otter Tail, and Wadena Counties⁵¹. These are the same counties that been or are surrounded by the RDO fields. Minnesota's Department of Agriculture's overview of Nitrate Levels in private wells in Hubbard County revealed 10.5% wells over the health standard out of 1,106 wells tested in 6 vulnerable townships⁵².

A 2012 Pesticide Action Network and Toxic Taters Report shares that the fungicide Chlorothalonil, heavily used by Offutt, was detected on 64% of potatoes tested in Frazee, Minnesota, a township located on the borders of Otter Tail and Becker counties.⁵³ While the exact toxicity levels through ingestion are still being researched, communities surrounded or near these potato and other agricultural fields are demonstrating serious health effects, ranging from respiratory issues to early deaths and high cancer rates.⁵⁴ The highest toxicity of Chlorothalonil is associated with inhalation, but the likely effects of pesticide runoff and groundwater exposure speak for themselves.

Combined with construction impacts and the risk of spills and leaks XL3 poses serious threats to communities already suffering from compromised water, air, and soil. The effects of the existing toxins cannot be understated. The World Health Organization reports that Arsenic skin pigmentation changes, skin thickening, and cancer of the skin, bladder, lungs, and kidney.⁵⁵ According to the Minnesota Department of Health, high levels of nitrates in the water can lead to early infant death through 'Blue Baby Syndrome.'⁵⁶ Environmental excess nitrates and nitrites in water can cause an an overstimulation of growth of aquatic plants and algae, using up dissolved oxygen as they decompose and blocking light to deeper waters. Lake and reservoir eutrophication can occur, creating excess scums of algae on the water surface, occasionally fish kills, and a lake 'kill' through oxygen deprivation.⁵⁷ Coliform

⁵¹Annual Public Water Supply Compliance Report. Rep. Saint Paul: n.p., n.d.[Http://www.health.state.mn.us/](http://www.health.state.mn.us/). Minnesota Department of Health, 24 Feb. 2015. Web.

⁵² United States. Minnesota Department of Agriculture. *Hubbard County: Overview of Nitrate Levels in Private Wells (2016)*. N.p., n.d. Web.

⁵³ Tupper, Karl, Susan Kegley, Neva Jacobs, Emily Marquez, Stephanie Jim, Sara Bjorkqvist, Andrew Wang, and Kaja Kaastrup. *Pesticide Drift Monitoring in Minnesota, June 13, 2006- August 13, 2009*. Rep. San Francisco: Pesticide Action Network North America, 2012. Web.

⁵⁴United States. Environmental Health Tracking and Biomonitoring Program. *Advisory Panel Meeting Summary*. Minnesota Department of Health, 9 Feb. 2016. Web.

⁵⁵*Arsenic in Drinking-water Background Document for Development of WHO Guidelines for Drinking-water Quality*. Working paper. World Health Organization, 2011. Web.

⁵⁶ "Wells and Borings." *Nitrate in Well Water*. Minnesota Department of Health, n.d. Web. 2017.

⁵⁷ Perlman, USGS Howard. "Nitrogen and Water." *Nitrogen and Water: USGS Water Science School*. The US Geological Survey, 2017. Web. 2017.

bacteria in water usually indicates pathogens in the water, often *E. coli*, a fecal coliform.⁵⁸ *E. coli* has commonly known impacts such as diarrhea, urinary tract infections, and even death.⁵⁹

Groundwater

Many Anishinaabeg continue to rely on groundwater as their primary drinking water source.⁶⁰ Some reservation homes may even still utilize standpipes, which tap into shallow aquifers that are more susceptible to contamination. In the case of Pine Point on White Earth Reservation, this aquifer is already contaminated by the spraying activities of RDO. The XL3 would run through areas with the highest susceptibility to groundwater contamination in the state.⁶¹ Aquifer sensitivity in the area is considered high because of the local geological setting.⁶² Construction and operation of the Pipeline—to say nothing of a potential release – has significant potential to introduce petroleum and other contaminants into proximate aquifers and impact beneficial uses.⁶³

⁵⁸ <http://www.doh.wa.gov/Portals/1/Documents/Pubs/331-181.pdf>

⁵⁹ <https://www.healthlinkbc.ca/health-topics/hw133795>

⁶⁰ Rupp Testimony at 47

⁶¹ Rupp Testimony at 46; Weiss Testimony at 55; EERA, at 68-70, at B-1.

⁶² Rupp Testimony 48

⁶³ Rupp Testimony at 46.

In a letter to the PUC from the Mille Lacs Band of Ojibwe it is noted that the present proposal and analysis provided by Enbridge is entirely inaccurate:

*“Ground disturbance associated with pipeline construction is primarily limited to the upper ten feet which is above the water table in most of the region’s aquifers...’
Enbridge’s generalized claim depicting the water table as ten feet deep is not accurate in the Big Sandy or Rice Lake watersheds. Based on NRCS soil data, the depth of the water table in these watersheds is measured in inches , not feet...”*

Straight River Basin

The Straight River Basin is a portion of the Pineland Sands outwash plain. In March, 2017 the MN DNR designated the Straight River Basin the third Minnesota Groundwater Management Area (GWMA). In his introduction to the document DNR Commissioner Landwehr states:

“Minnesota is rich in water resources. With more than 10,000 lakes, thousands of miles of rivers and streams, and many thousands of acres of wetlands, it might be natural to think that our water is essentially unlimited. But in some parts of the state, the unseen, underground aquifers that make up our groundwater resources are under pressure to meet growing needs for domestic water supplies, irrigation, industrial and other uses. These groundwater resources also are interconnected with lakes, streams and wetlands that we value for commerce, recreation, and water supplies. Those surface waters also provide the habitat needed by many animals and plants. If we are not careful in how we use water, both economic development and ecosystems could be put at risk.”

The GWMA plan (Plan) page 1-1 states:

“Groundwater can be at risk of overuse and contamination anywhere in the state, and in some areas this risk is more urgent. To address concerns about long term sustainable use of groundwater in three of these areas, the DNR is establishing Groundwater Management Areas (GWMA) and developing management plans.”

The Plan page 1-2 states:

“As part of a statewide analysis of groundwater resources, the DNR identified the Straight River area as an area of specific concern where groundwater resources are at risk of overuse and degraded quality.”

Furthermore, the GWMA Plan page 3-8 adds:

“A Watershed Restoration and Protection Strategy report was prepared by MPCA in 2015 as the final phase of the Crow Wing River watershed assessment process. The

report notes that “changes in the groundwater and surface water interactions in the streams, particularly near Park Rapids, are resulting in altered stream hydrology that is stressing fish communities.”⁶⁴

The Plan identifies one of the concerns to be “contamination reduction in the availability of clean groundwater.”

Though a sufficient supply of water may be available, it needs to be suitable for human consumption and other uses such as agricultural food production.

Beginning on page 2-2, the Plan describes the Straight River hydrology. It states:

Hydrogeology defines the natural conditions and boundaries of the groundwater system. Groundwater moves through the geologic system both laterally (side to side) and vertically (up and down). In three dimensions, the geologic formations found in the Straight River GWMA form a complex groundwater system that is interrelated with the surface water in the area. The surface water resources in this area are streams, lakes, and wetlands. The primary stream is the Straight River, a designated trout stream .. Analyses by Stark et al (1994), Helgesen (1977), LaBaugh et al (1981), Siegel (1980) and Walker et al (2009) have shown that groundwater and surface water in this area is interconnected and heavily dependent on recharge from precipitation.

The Plan describes the Straight River stratigraphy and hydrogeology as follows:

Two main aquifer types are found in the Straight River GWMA: water table aquifers (Quaternary Water Table Aquifers, or QWTA), which are the uppermost aquifers; and buried aquifers (Quaternary Buried drift Artesian Aquifers, or QBAA), which are found at various depths below the water table aquifer. The QWTA is a laterally extensive unconfined aquifer and is part of the Pinelands Sands aquifer (Helgesen, 1977) that extends through Becker, Cass, Hubbard, and Wadena counties. This outwash formation was deposited by flowing water during the melting of ice at the end of the most recent glacial event approximately 10,000 to 12,000 years ago. Groundwater from both the QWTA and QBAA aquifers is the source of groundwater supply in the Straight River area. The water table aquifer and deeper buried drift aquifers occur in the Straight River GWMA and share a hydraulic relationship. This relationship has been understood through various scientific studies that include analysis of climate, aquifer testing and long term water level measurement collected from observation wells. A County Geologic Atlas does not yet exist for this area but is in process. When complete, the atlas should provide more information on the connectivity of these aquifers. The basin

⁶⁴ GWMA 4-8

is the result of a number of glacial ice advances and retreats. During warming, the glacial lobes would stagnate and melt, receding as they melted. As the glacial sheets melted and receded, meltwater would run off the glacier carrying sediments which were deposited in front of the glaciers.

Stream channels can fluctuate back and forth by weather changes, over short periods of time, from day to day and diurnally (day to night). The geologic phenomena is termed anastomosis, channels cut through previous sediments, causing inhomogeneous stratigraphy, resulting in channels of more granular material within the finer sands. At times, outlets were blocked and proglacial lakes would form, depositing clay sediments. The sequence of anastomosis would again begin once the proglacial lake drained. When channels containing higher hydraulic conductivity such as gravel are within an aquifer, they become conduits, forming flow paths and creating gradient sinks to which the surrounding groundwater flows. The channels may also erode through the previously deposited clay layer, creating windows through the clay confining layer, connecting the upper and lower aquifers. Because of the multiple glacial advances, melting, and the anastomosis phenomena, the Pineland Sands outwash aquifer system is highly complex. Harris, Knaeble, and Berg (1999) mapped some of the buried channels in the Pineland Sands and Straight River outwash. They show an intricate system of buried stream channels. In Minnesota, with similar conditions, expected contamination plume migrations have not occurred as expected become missing. (Tracy Lund, personal communication, June 27, 2017). It is possible in places that a plume migrated to one of these high hydraulic conductivity channels and traveled in a direction not anticipated different than expected.

Agricultural irrigation is the predominant water use within the GWMA. The Plan documents that permitted water use grew 85% over the last 25 years. The majority of the expansion came from agricultural irrigation. In comparison, the statewide water demand increase during the same period was 35%. The Stark study was initiated in response to an increase in irrigation from 1974 to 1988. In 1974, the Straight River Basin contained 5 irrigation wells. By 1988, forty eight wells were installed, an approximately 9 fold increase over 14 years. The past increases in irrigation are expected to continue. In response to R.D. Offut's planned irrigation expansion in the Pineland Sands area, DNR Commissioner Landwehr ordered a discretionary environmental impact worksheet (EAW) on June 15, 2015. Because Offut reduced his number of applications, the EAW was vacated on September 2015. www.dnr.state.mn.us/input/environmentalreview/pinelands/index.html

Offut's reduction in applications does not suggest a reduction in their expansion goals. It was in response to the EAW; Offut reduced the applications to curtail the EAW. The GWMA Plan identifies actions DNR intends to take to ensure the groundwater, surface water, and

ecosystems are not harmed. Substantial financial and staff resources will be required to reach the objectives. Though the GWMA identifies the Straight River Basin as one of the most important Minnesota aquifers and significant scientific studies to have been completed for the area, the DEIS ignores its importance.

XL3 is designed to travel through the heart of this highly sensitive and irrigated basin. How were these studies, the discretionary EAW, and the GWMA ignored? The DEIS uses a 1,000 foot corridor to identify irrigation wells along the APR to represent potential operational impacts. This is an incorrect assumption in the Straight River Basin for several reasons:

- It only considers lateral (horizontal) migration and excludes the vertical component.
- Because of the highly permeable soils and his extensive DNR hydrogeology field work, including multiple pump tests and water level monitoring, Jay Frischman stated irrigation well cones of depression can be expected to result in groundwater level drawdowns $\frac{1}{4}$ mile from the pumping well. If multiple nearby wells are pumping at one time, overlapping cones of depression will occur. Under these circumstances, effects can result in groundwater level declines $\frac{1}{2}$ mile from the wells (Jay Frischman, personal communication, June 23, 2017).
- Historic increases in irrigation pumping and irrigated acres will continue to increase.

Figure 1 depicts a well cone of depression. Once a well begins pumping, the groundwater level drops, generally causing the surrounding water level to form a conical shape. Most people think well water is supplied by the pump sucking water from the surrounding formation. In actuality, the water level drawdown causes a gradient much like a hill. The water cascades towards the pump down the cone and flows to the well as show in Figure 1. Figure 2 depicts overlapping cones of depression from multiple wells operating at one time. The figure illustrates multiple cones of depression causing an increased water level drawdown. Both Figures 1 and 2 are from the Oregon State Water Well Program (<http://wellwater.oregonstate.edu/groundwater-and-wells>)

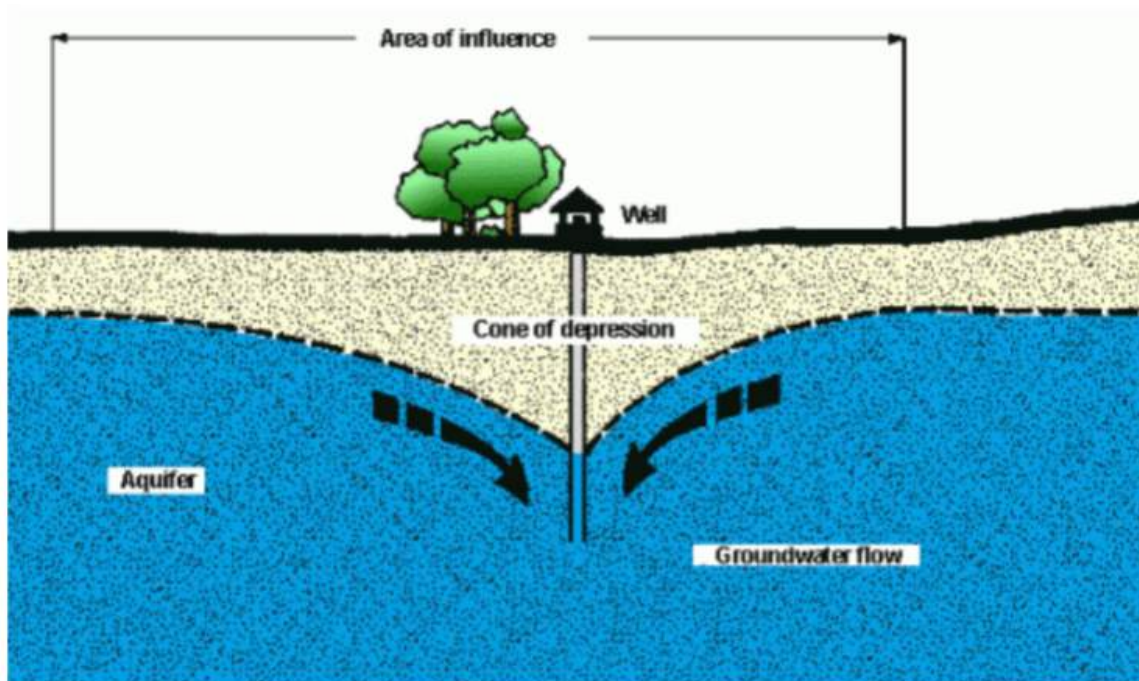


Figure 1

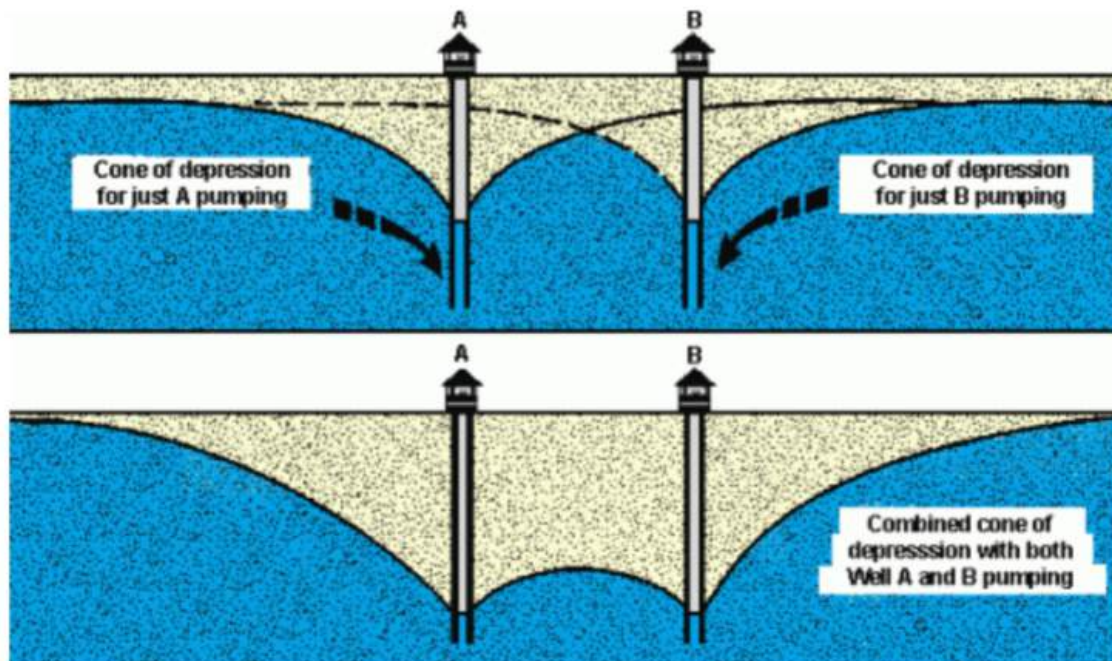
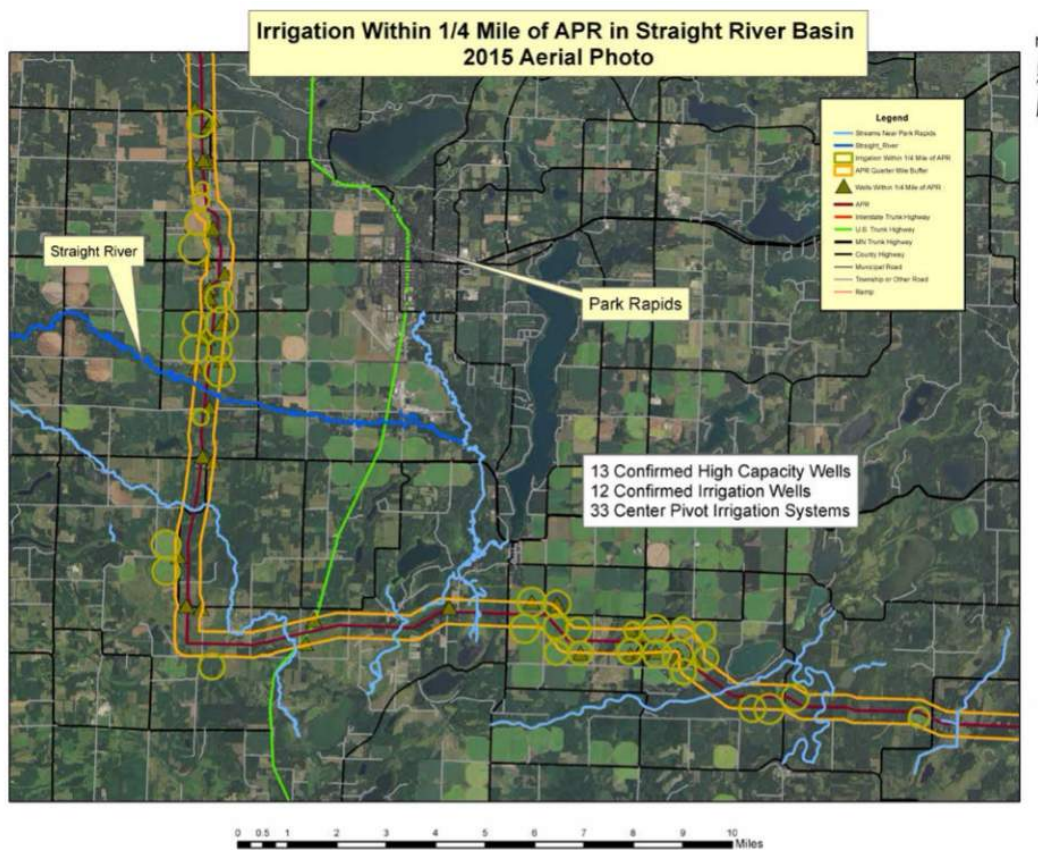


Figure 2

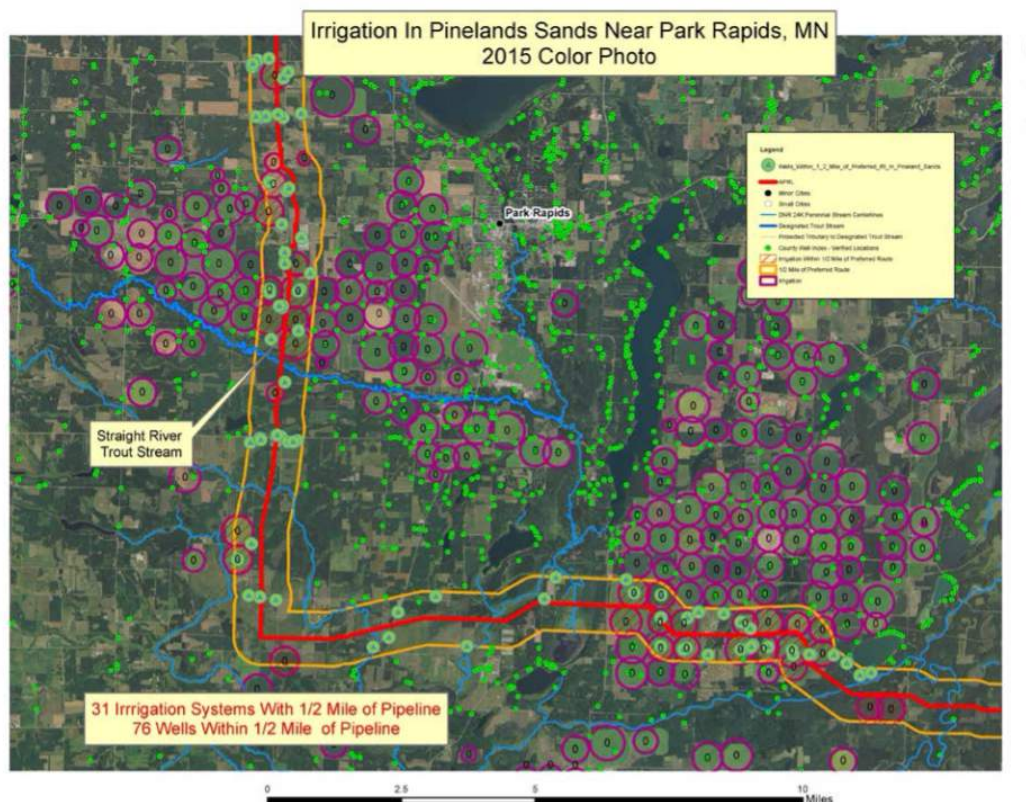
The images below are Google Earth photos looking north from south of the Straight River along the proposed new Line 3 alignment; the lower photo is a zoomed-in version of the

upper photo. The circular shapes are irrigated 40 acre parcels containing circle pivot irrigation systems. Each circle pivot requires a high capacity well capable of pumping up to 1,0000 gallons per minute (gpm).





Rather than 5 irrigation wells along the proposed route as reported by the DEIS, the Park Rapids area (Pineland Sands) contains 12 irrigation wells and 33 center pivot systems, respectively, within ¼ mile of the proposed route. Additionally, 24 irrigation wells and 33 center pivot systems are situated within ½ mile of the proposed route in the Park Rapids vicinity.



Because of the highly permeable soils and irrigation well cones of depression which cause create steep gradients, groundwater movement is significantly altered. If a pinhole leak occurs along any stretch of the APR within the Pineland Sands, contaminant may rapidly move vertically to the groundwater table and horizontally away from the pipeline due to the altered groundwater table conditions. If pipeline contaminant reaches the groundwater surface, it can be incorporated into the irrigation water, contaminating the irrigated crops and transporting the product further from the pipeline. When the product is spread onto the porous field, it moves downward through the soils, eventually reaching the water table further down gradient of the pipeline. Transport of the pollutant from one system to another is possible, contaminating more soil and dispersing the pollutant away from the pipeline. Irrigation wells cycle on and off, causing a surging effect on the water table. When the well is shut off, water levels with a contaminant on its surface rebounds. This contaminates the soils within the cone of depression. When the irrigation is again begun,

the pollutant is further incorporated into the water column causing mixing and greater contamination of the groundwater, expanding the plume.

Air Quality

From EPA response to MN PUC DEIS:

Impacts to air quality can occur from construction, abandonment, modification, operation or maintenance of a petroleum products pipeline and associated facilities. Project's potential effect on: 1) all criteria pollutants under the National Ambient Air Quality Standards (NAAQS), including ozone; 2) any significant concentrations of hazardous air pollutants; and 3) protection of public health. Describe any required air permits and permitting agency. Project proponents need to consider whether there may be opportunities to use clean diesel equipment, vehicles and fuels in construction and abandonment activities associated with the project.

Enbridge has also had issues with air quality violations in the past. In 2010 they agreed to pay \$1,000,000.00 for a series of air violations at the superior terminal. Violations included: operating the facility without the proper air pollution control operation permit, commencing construction without a construction permit, failing timely to repair seals on storage tanks and to report the repairs, failing to conduct timely inspections of the internal floating roofs on the tanks, maintaining noncompliant stack dimensions, noncompliant tank seals, noncompliant operation of automatic bleeder vents and un-gasketed fittings on the tanks, failing to maintain up-to-date design drawings and tank documentation, failing to timely complete painting one tank roof white, and underpaying air emission fees.⁶⁵

Interaction with other ROWs

For much of its length, XL3 is collocated either with other pipelines or high-voltage transmission lines. Existing conditions in these corridors must be fully understood. To completely understand the existing situation, all existing ROWs should be delineated, as well as access roads, and age, product and condition of all existing pipelines. Connections between pipelines within a ROW, types and amounts of products transported, their maximum capacity, and schedules/timelines for proposed abandonment and/or replacement of all existing pipelines need to be identified. All known corridor/ROW pipeline leaks/spills and their cleanup status need to be identified. Vegetations management plans of corridor/ROW owner need to be discussed, as well as current status of invasive species within the existing corridor/ROW. Of particular concern are areas experience “pipeline fatigue”.

⁶⁵

<https://www.doj.state.wi.us/news-releases/enbridge-energy-settles-state-lawsuit-over-air-pollution-violations-1000000>

From Paul Stolen:

The portion of the route between Clearbrook and Park Rapids already contains three pipelines. I raise the question as to what “worst-case” scenario should be used when there are four pipelines in close proximity in remote areas and at least somewhat susceptible to natural or intentional damage, perhaps to all of them at one time? The portion of the route between Clearbrook and Park Rapids was fraught with problems during construction of the MinnCan pipeline, which were at least partially due to the corridor being created for a small pipeline long before modern environmental laws were passed.

“Corridor fatigue” is a term that has been used to talk about what happens when multiple linear facilities such as pipelines and High Voltage Power Lines reach a point where cumulative impacts, objections from people nearby, and crowding of various sensitive areas along the edge of corridors began to be more and more apparent.

Collocating utilities can also increase third party damage to pipelines. This can occur when another operator must perform maintenance activities and is not properly informed of the location of the pipeline. Another major issue with collocation is induced voltage from power lines. From the 2013 Report on the Root Causes and Contributing Factors to Corrosion Anomalies on the Keystone Pipeline:

TransCanada identified a segment of the 30-inch liquids transmission line which had significant In Line Inspection (ILI) external corrosion indications in the Salisbury to Patoka segment in the area of Mile Post 995 to Mile Post 1000 in St. Charles County, Lincoln County and Audrain County, Missouri. The ILI run that was completed in September, 2012 identified several joints with external metal loss anomalies; some reported to be greater than 50% of the nominal pipe wall.

TransCanada completed several direct examinations of the identified anomalies in response to the ILI results and retained Mears Group, Inc. (Mears) to assess the Root Cause and contributing factors to the observed corrosion.

The 30-inch Keystone Pipeline experienced localized external corrosion wall loss due to D-C stray current interference⁶⁶. The corrosion induced wall loss occurred at an accelerated rate that can only be attributable to D-C stray current interference, microbiologically influenced corrosion (MIC), or Induced A-C corrosion. MIC may have

⁶⁶ Stray current corrosion may occur during construction as the pipeline is being installed, but has not been provided protection. PHMSA has issued an advisory bulletin to Operators offering guidance on this subject.

played a role in some of the observed corrosion however it was not the primary cause. Induced A-C corrosion did not play a role in the observed corrosion.

Cathodic protection, which applies electric current to the pipeline in order to protect it from corrosion caused by nearby utility lines, will not be installed on the XL3 for up to 1 year after pipeline construction (MN DOC DEIS 2.3.2.3). Lack of cathodic protection is what caused the corrosion found in the Keystone pipeline. The 92 miles the XL3 would follow the existing HVTTL is through some of the highest concentration of manoomin. This is a recipe for disaster. Even the US Army Corps's rubber-stamp approval of the Dakota Access pipeline required the cathodic protection system to be installed within 6 months.

In addition to this issue, many of the pipelines have been stockpiled for years. Research has also shown this can contribute to corrosion issues.

Exposed pipes

Exposed pipes run the risk of being damaged, no law currently requires companies to rebury them. Risks increase the longer a line is exposed, the level of risk this is currently determined by Enbridge, not the Office of Pipeline Safety (OPS).⁶⁷ Although federal regulations specify how deep pipelines must be buried, the rules only apply during initial construction, and there is absolutely no law to require Enbridge to rebury a pipe if it has become exposed.⁶⁸ There are exposed pipes all along the existing Enbridge corridor, and the lack of regulations on abandonment, this company can and will leave exposed pipes when they abandon lines in this corridor. Exposed pipes will limit revegetation and reuse of the corridor, and over time empty pipes become more buoyant and continue to work their way out of the ground.

Exposed pipes at river crossings can also change the dynamics of river systems. River crossing issues will continue to grow as the climate continues to change. Alterations of waterways (such as floods), changes in freeze/thaw cycles, are all features of climate changing. The rapidly shifting climate can increase scour in river beds, which would increase the likelihood of a spill at river crossings.

In 2014, Minnesota Public Radio (MPR) report showed that 3 of the 6 Enbridge crude oil pipelines crossing Minnesota's Tamarac River were exposed by floodwater erosion years

⁶⁷ The Office of Pipeline Safety "Office of Pipeline Safety inspects natural gas, propane and hazardous liquid pipelines, and investigates leaks and accidents. This office enforces the "Call Before You Dig" laws." <https://dps.mn.gov/divisions/ops/about/Pages/default.aspx>

⁶⁸ Jon Wolfram, chief engineer for the Minnesota Office of Pipeline Safety

beforehand, but were still exposed.⁶⁹ None of the pipes had failed at that point, but one was being propped up by steel legs. A study last year by the Pipeline and Hazardous Materials Safety Administration found "depletion of cover" was a factor in 16 significant pipeline spills at river crossings since 1991.⁷⁰



Exposed Enbridge crude oil pipeline in the Tamarac River in Marshall County, MN.
(Photo: Dan Gunderson/MPR News)

Enbridge has stated that since the lines 2 and 13 were installed, the Tamarac River has shifted its position. As such, there are now four locations where those pipes are exposed where the river crosses them. They would like to replace the lines and move them parallel to their existing mainline. They state that: In accordance with Minnesota Statutes 2016G.02, subd 3(c) and Minnesota Rules 7852.0300, subpart 1(D), this Project qualifies as an exclusion from the Commission's rules governing the routing of pipelines under Minnesota Statutes 216.G.02 and the Minnesota Rules 7852. Enbridge has applied for and received all applicable federal and state environmental permits, and all affected landowners have agreed to the relocation of these pipeline segments.

⁶⁹ <http://www.mprnews.org/story/2014/07/29/enbridge-pipelines-exposed>

⁷⁰

http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Rep_to_Congr_on_Res_of_Haz_Liq_Incid_at_Cert_In_Wat_Cross_Stu_Final_8_27_13.pdf

No mention of if they are going to remove the pipes or leave in place.

Spills and Leaks

Aside from the landscape level impacts from the construction and operation and maintenance of the the pipeline, there is the very real risk of accidental releases. These can range from small, pin-hole leaks to catastrophic spills. There is a 100% chance/likelihood this pipeline will release oil into the environment. The question is where, when and how much.

Impact of Spills

The XL3 would carry dilbit (diluted bitumen), as viscous, toxic mixture of tar sands crude and diluents. Dilbit has more viscous makeup, than conventional crude and it must be pumped at higher pressure and temperatures than conventional crude oil. The toxic diluents are added to allow the product flow. This mixture can also contain sand, garnering the description of “*fast-hot-toxic liquid sandpaper*.” A recently released National Academy of Sciences Report (NASR) document shows how uniquely dangerous the transportation of tar sands oil is for water-rich regions. The report, entitled “*Spills of Diluted Bitumen from Pipelines: A Comparative Study of Environmental Fate, Effects, and Response*”⁷¹ provides unprecedented data documenting the grave environmental, economic, and public health impacts of dilbit spills, especially in places with abundant freshwater resources such as Wisconsin and Minnesota. A primary point is that tar sands spills constitute a completely different situation than that of any other type of crude oil spill. Dilbit spills can result in cataclysmic ecological effects when coming in contact with water.

Dilbit is much denser, viscous and adhesive than conventional crude. These characteristics cause it to behave different than conventional crude in the environment. These properties can cause dilbit to persist in the environment much longer and be much more difficult to remove. In fact, the NASR report documents the alarming lack of methods for cleaning up dilbit spills.

Downstream impacts may occur from dissolved fractions and submerged fractions of the product that defeat containment designed to collect floating fractions. Heavy metals, like mercury, could move through the environment through natural methylation in aquatic environments and eventual uptake into the food chain including fish, predators, and humans. Dilbit and other dense, non-aqueous phase liquids (DNAPLs) are exceedingly resistant to clean up from groundwater and sensitive wetlands, which happen to be the environments the preferred route runs through.

⁷¹ National Academies Press, <http://www.nap.edu/21834>

In the event of an oil spill, which could occur during a rain event, contamination would be likely to affect multiple watersheds. Moreover, were an upset condition to occur during a flood event, lack of access or late discovery due to inaccessibility would likely magnify the extent and intensity of the release.⁷²

If the spill were to occur in the vicinity of manoomin beds, the manoomin would be contaminated for an unknown amount of time or destroyed completely. Manoomin has been shown to be hyper-accumulator of certain metals, including arsenic. While the actual hydrocarbons may be degraded by the microbial community, heavy metals in the oil may be up-taken by the rice stands. This issue was not addressed anywhere in Enbridge's project submissions. Manoomin has very narrow growing conditions, alterations to the nearby hydrological regime will affect its growth. Add of more chemicals to manoomin environment would impact its growth, or its nutritional value. This is a direct threat to the lives and livelihoods of the Tribes that depend on it for their substance, and which is guaranteed in treaties from the United States (See section Title, Rights, & Interests).

Enbridge's Safety Record

The possibility of an upset condition is not remote or speculative. Enbridge has a poor safety record, this is augmented by the general insecurity of their pipelines and their lack of ability to protect wetlands and waters of the tribal and national communities.

The Natural Resources Defense Council (NRDC) has studied spill records and has noted that that pipelines in the upper Midwest that transport tar sands crude have spilled 3.6 times more oil per pipeline mile than the U.S. average⁷³.

According to a United States Department of Transportation (USDOT) study, an average pipeline has a 57% chance of a major spill in a ten-year period. This study used actual spill data from the Pipeline and Hazardous Materials Safety Association (PHMSA).⁷⁴

From "Pipelines Safety and Security: Is It No More Than a Pipe Dream" (Bell 2015)⁷⁵:

"... Today the nation is crisscrossed with 505 mile of transmission pipeline and counting. The industry average of 0.34 to 0.5 incidents per 1000 miles per year translates

⁷² Rupp Testimony at 49-51; Killspotted Testimony at 157-59.

⁷³ http://www.oilandwaterdontmix.org/the_bigger_picture

⁷⁴ <https://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Press%20Release%20Files/Leak%20Detection%20Study.pdf>

⁷⁵ Bell, Trudy. "Pipelines Safety and Security: Is It No More Than A Pipe Dream?" The Bent of Tau Beta Pi. Winter, 2015

to 170 to 250 incidents per year somewhere in the nation- **a number actually about half of what is observed.** Statistically, the record shows that several per year are catastrophic. PHMSA data from 2001 to 2011.. conclude(s) “ the average pipeline therefore has a 57% probability of experiencing a major leak, with consequences over the \$1 million range in a ten year period...”

Using that same PHMSA data, the US State Department found Enbridge’s annual spill rates, which are higher than the industry average.

Table S-6. Incident Rate Summary

Pipeline Operator	Annual Incident Rate Per 1,000 Miles of Pipeline				Total Volume Spilled (bbl)
	Small Spills	Medium Spills	Large Spills	Catastrophic Spills	
Industry Average	2.75	0.55	0.07	0.01	182,672
Enbridge	2.80	0.20	0.16	0.03	39,637

Source: PHMSA 2016a, 2016c

Note: This table presents a summary of incident rates for the period 2010 to 2015.

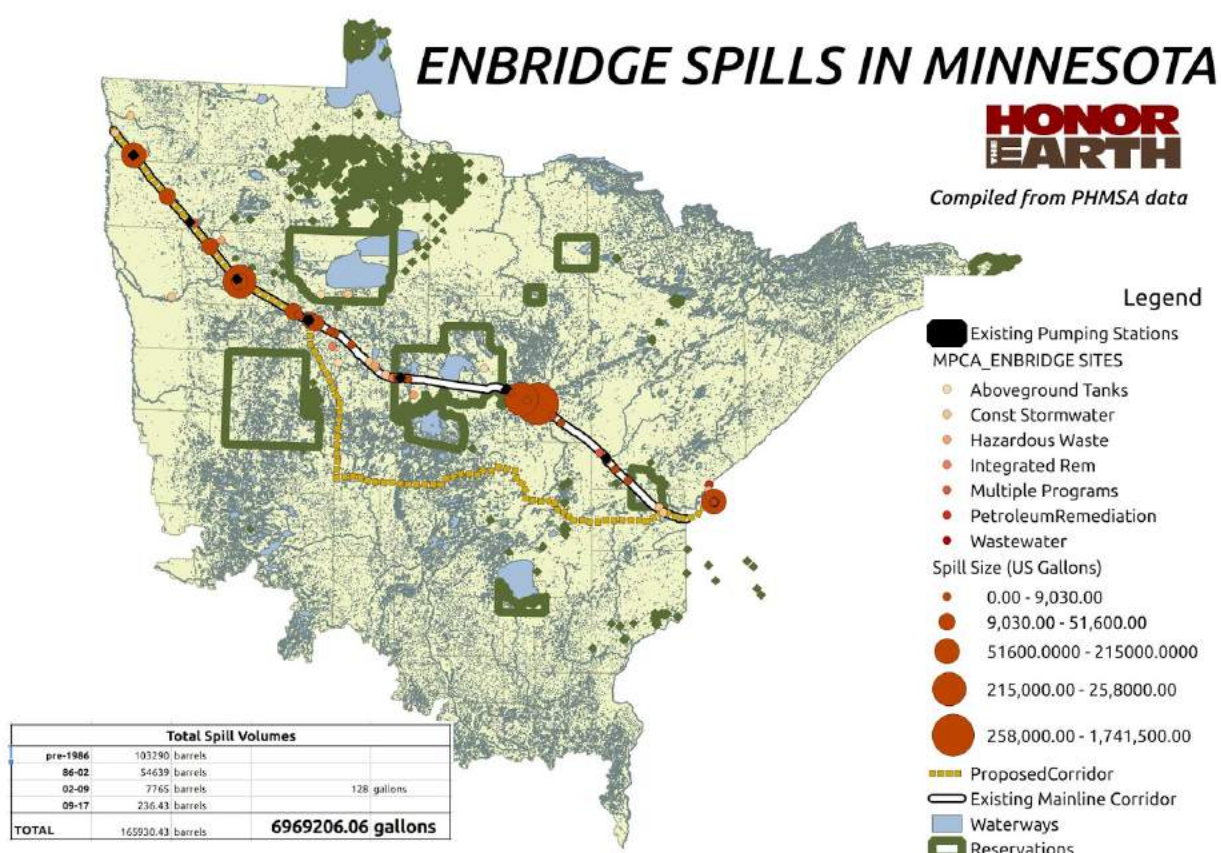
Using these averages, XL3 would experience an average of .94 small spills, 0.0674 medium spills, 0.05 large spills and 0.01 catastrophic spills annually.

Using data from Enbridge’s own reports, the Polaris Institute calculated that 804 spills occurred on Enbridge pipelines between 1999 and 2010. These spills released approximately 161,475 barrels (25,672.5 m³) of crude oil into the environment.⁷⁶ There is missing data from this source, study did not include undiscovered leaks. One major example was discovered in Cass Lake, which released more than 11,000 barrels over an unknown number of years into the environment.⁷⁷

⁷⁶Girard, Richard and Roberts Davis, Tanya. “Out on the Enbridge Mainline: Mapping Enbridge’s Web of Pipelines” Polaris Institute Report. May 2010 (partially updated, March 2012)

⁷⁷ This leak was in the existing Line 3. Drennan, D.M., Bekins, B.A., Warren, E., Cozzarelli, I.M., Baedecker, M.J., Herkelrath, W.N., Delin, G.N., Rosenbauer, R.J., and Campbell, P.L., 2010, Fate and transport of petroleum hydrocarbons in the subsurface near Cass Lake, Minnesota: U.S. Geological Survey Scientific Investigations Report 2010-5085, 33 p.

Year	Number of spills	Quantity of barrels spilled
1999	54	28,760
2000	48	7,513
2001	34	25,980
2002	48	14,683
2003	62	6,410
2004	69	3,252
2005	70	9,825
2006	68	5,734
2007	65	13,777
2008	92	2,842
2009	103	8,441
2010	91	34,258
Total	804	161,475 (Approximately 25.67 million litres, or 6.8 million gallons)



For a more local picture, the map above represents the total number of spills and leaks from Enbridge in Minnesota. These spills represent over 7 million gallons released into the environment. Also shown are tank farms, remediation sites and other sites of interest to the MPCA. Created from publicly available data downloaded from PHMSA and MPCA Enbridge sites from: MPCA Agency Interests.⁷⁸

⁷⁸ <https://gisdata.mn.gov/dataset/env-mPCA-agency-interests>

Enbridge has been responsible for three of the largest inland oil spills in the US. Two of which occurred in Minnesota. A catastrophic spill from XL3 would decimate manoomin and aquatic species the Anishinaabeg people depend on.⁷⁹ Toxins could remain in the sediment for decades, absorbing fully into the soil and water where it would pose continuing health risks to the ecosystem at all levels in the food chain.⁸⁰

Spill Modeling Methodology

In past assessments Enbridge has under-represent their spills, so an independent verification of maximum potential spills should be conducted. Honor the Earth enlisted the help of CJE to prepare a review of Enbridge's spill projections. The majority of his work was focused on reviewing the testimony of Ray Wuolo and the Stantec Pinhole Release Assessment. Ray Wuolo is employed by Barr Engineering. His testimony was used to support the reports prepared by Barr for the DEIS. There are a number of errors, omissions, and misrepresentation in Mr. Wuolo's testimony that were then included in the reports, and the DEIS. Findings of this review are discussed below:

Mr. Wuolo did not, at any time, challenge the incorrect assertion that a release from a pipeline was unlikely which calls into question the objectivity of his testimony.

Mr. Wuolo states that the Barr report did not consider "... the broader set of factors such as site-specific conditions, seasonality, crude oil type and volume, or response time." If these site specific condition are not part of the evaluation, the impact of a release cannot be assessed.

Mr. Wuolo presumes to assess the susceptibility of the water-table aquifers along the preferred pipeline route. For this evaluation he relies on the Minnesota Department of Health (MDH) Water Table Susceptibility Map published in 2015. However, Mr. Wuolo omits an important fact. MDH classified lacustrine sediments as having medium susceptibility. Barr arbitrarily reclassified these sediments as having low susceptibility. No scientific explanation, nor any other explanation, is given for this reclassification. Further, Barr and Mr. Wuolo do not state how many pipeline sites were reclassified. It appears that this arbitrary reclassification was made only to reduce, without justification, the threat posed by releases from the pipeline.

Mr. Wuolo and Barr cite a release of contamination from an Enbridge pipeline in Bemidji to show that migration of released crude oil is contained by natural attenuation. Neither the Barr report nor Mr. Wuolo's testimony demonstrate that the environmental conditions at the Bemidji

⁷⁹ Rupp Testimony at 46; Weiss Testimony at 56.

⁸⁰ Weiss Testimony at 56.

release are equivalent to the environmental conditions at any place along the proposed pipeline route. Further, the environmental conditions along the proposed pipeline route are highly variable, and the Bemidji release cannot be used to estimate the affects of a release for the entire pipeline.

The information on which Barr and Mr. Wuolo base their speculative statement that any release would be contained by natural attenuation is incomplete. Although Mr. Wuolo and Barr rely heavily on the Bemidji study, they ignore the data published by the United States Geological Survey (USGS) in 2015 which shows the release at the Bemidji site has non-volatile dissolved organic compounds (NVDOC) which have migrated further than the volatile compound plume and are not contained by natural attenuation.

Mr. Wuolo states that the "...water quality of the higher permeability water table aquifers tends to be already degraded by fertilizers, herbicides, and pesticides from agricultural operations. Mr. Wuolo does not compare the relative toxicity of the contaminants to the toxicity of crude oil, he does not cite the concentrations of these contaminants, and he does not provide locations of the contaminants. His statement on the pollutants is, at best, incomplete and has no relevance to the pipeline issue. Adding pollutants to an aquifer is always unacceptable and can only increase the impact to the aquifer. Mr. Wuolo offers no analysis of the potential impact to the aquifer or justification for ignoring the added pollution.

CJE also reviewed the Stantec Pinhole Release Assessment. XL3 is particularly vulnerable to pinhole leaks, as the pipes have been compromised by years of outdoor stockpiling and the lack of cathodic protection for a full year after installation. CJE's major finding are:

In Section 2.1, Stantec gives the following definition of a pinhole release. For the purposes of this document, a pinhole release is defined "as a slow and small leak of crude oil from the proposed pipeline, or its remote facilities (e.g., pump station valves) that might not be immediately detected by the leak detection systems".

In Section 2.3, Stantec claims that the sensors to be used for the pipeline are capable of detecting a release of one percent of the flow through the pipeline. At the maximum flow rate of 760,000 barrels per day, a release of less than 7,600 barrels per day (bpd) would not be detected. Yet they select a release rate of 28 bpd to assess pinhole leaks, which is 0.37 percent of the smallest release detectable by the automated sensors.

The assumption is made that a release from a 36-inch diameter pipe will spread out over a 36-inch-diameter circle under the pipe. ...there is no correlation between the diameter of the pipe and the area under and lateral to the pipe impacted by a release. The trench dimensions are

better used to estimate the impacts.

Stantec used an infiltration rate of 0.21 gallons per day per square foot which they state is typical for “permeable sand.” This equates to an infiltration rate of 0.014 inches per hour as shown below.

0.21 gallons per day = 0.028 cubic feet per day

The height of 0.028 cubic feet of liquid in an area of one square foot is 0.028 feet.

An infiltration rate of 0.028 feet per day = 0.34 inches per day = 0.014 inches per hour

The source of the infiltration rate used for “permeable sand” is not cited. However, the Minnesota Pollution Control Agency Stormwater Manual shows that an infiltration rate of 0.014 inches per hour is typical of a clayey soil and that a sandy soil would have an infiltration rate of approximately 0.8 inches per hour or 57 times greater than the number used by Stantec. Again, Stantec does not provide a source for the estimated infiltration rate of 0.21 gallons per day per square foot. Unless Stantec can justify their estimate of infiltration, the entire discussion of infiltration rates is invalid.

Stantec uses their infiltration rate to determine that any release from a pinhole leak would “quickly” daylight. The term “quickly” is not defined. The use of such inexact and subjective terms is not appropriate in an EIS.

Stantec does not appear to consider lateral migration within the trench. The trench is to be backfilled with natural materials. Unless extraordinary measures are taken to compact the soil around the pipe, a permeable pathway will exist along the sides and bottom of the pipe. I am unable to find any description of the backfilling operations in the EIS or in Appendix E to the EIS which suggests that any extraordinary backfilling measures will be undertaken. The lateral migration along the pipeline will increase the volume that will remain underground and also increase the area available for infiltration at the bottom of the trench. Finally, Stantec does not include lateral migration of the oil through the trench walls in their evaluation. Migration through the trench walls will also serve to delay the daylighting of a release of crude oil.

Table 2-2 gives a release volume of 1,760 bpd for a release rate of 0.5 percent of the throughput. Based on the information given by Stantec, the actual volume would be 3,800 bpd and the amount released using the Stantec estimate would be 7,600 barrels, not 3,500 barrels.

Stantec also uses the incorrect infiltration rates to justify a detection time of 28 days for “small” releases. The infiltration rates are much higher for areas where the soil has a high sand content. The conclusions drawn with regard to detection time cannot be justified or verified using the

extremely low infiltration rates estimated by Stantec.

A circle three feet in diameter was used as the limit of infiltration. The discussion in these sections ignores the possibility of lateral migration of the crude oil in the trench. The discussion quoted below from Section 3.2 demonstrates that lateral migration of the crude oil should have been considered.

“Typically the principal direction of transport is downward in permeable sediments under the force of gravity; however, in a pinhole release within a pipeline trench where the native soils are less permeable than the trench fill material, oil may preferentially follow the path of least resistance filling the relatively higher permeability materials within the trench. For a buried pipe, this could result in filling of the pipe trench and ultimately surface expression of the oil. Lateral migration of the oil along the length of the pipeline could occur within the trench, which could extend the time until surface expression of the leaking oil occurs.”

Stantec also fails to assess what environmental receptors may lay within the “few hundred feet.” What is in the plume may be more important than the plume length.

Stantec makes the following statement:

“Preferential dissolution of the more soluble and volatile components of the crude oil will lead to plumes that are often dominated by BTEX components (Bowers and Smith 2014; Thornton et al. 2013). However, the less soluble and typically more biodegradable aromatic hydrocarbons such as toluene, ethylbenzene and xylenes often develop dissolved-phase plumes that are restricted to the source area.”

It is unclear what is meant by this statement. Stantec first states that “...the more soluble and volatile components of the crude oil will lead to plumes that are often dominated by BTEX components...” Stantec then states that the “less soluble” toluene, ethylbenzene, and xylenes “...develop dissolved-phase plumes that are restricted to the source area. Toluene, ethylbenzene, and xylenes are the TEX in BTEX. It defies logic to suggest that they can be both less soluble and more soluble at the same time and restricted to the source area while not being restricted to the source area.

Stantec makes the following statement:

“Numerous multi-site studies conducted since the 1990s have presented results that indicate dissolved-phase hydrocarbon plumes stabilize at relatively short distances from

the source area and are unlikely to be greater than a few hundred feet in length (Newell and Connor 1998; Connor et al. 2015)."

Stantec again fails to show that the environmental conditions at the sites in the studies are comparable to the L3RP route.

Stantec makes the following statement:

"Based on professional judgment, lacustrine materials were considered low vulnerability in this analysis. Lacustrine deposits are typically composed of fine-grained sediments and such deposits have low permeability."

Stantec used the Minnesota Department of Natural Resources (MDNR) Pollution Sensitivity of Near-Surface Materials to assess the sensitivity of the land along the L3RP route. However, based on "professional judgment", lacustrine materials were changed from medium vulnerability to low vulnerability. This was based on the Stantec determination that lacustrine deposits are typically fine grained and have low permeability. Unless Stantec has collected site specific samples to obtain data to prove their hypothesis, it is problematic that they have arbitrarily assumed that they are more qualified than the DNR scientists to evaluate the vulnerability of lacustrine sediments. Further, lacustrine sediments can show a wide variation in grain size. The assertion that lacustrine sediments are typically fine grained is unsupported speculation.

ENBRIDGE ENERGY LIMITED PARTNERSHIP LINE 3, BEMIDJI

Stantec touts the success of natural attenuation at this site. In particular, they note the stabilization of the plume of contamination at 650 feet downgradient from the point of release. They do not discuss, however, the extent to which the limit of the migration of the plume is due to the removal of over 75 percent of the release of crude oil. It is possible that the plume would have extended much further had the biggest part of the release not been removed.

While it has been postulated that the plume of contamination is stable, this reflects only the BTEX compounds (benzene, toluene, ethylbenzene, and xylenes) and diesel range organics (DRO) that have been found in the plume. There is also evidence that the BTEX and DRO plume is still slowly expanding. Sampling has also been undertaken for nonvolatile dissolved organic carbon (NVDOC) by B. A. Bekins, et al. (Groundwater, 2016) of the United States Geological Survey (USGS). NVDOC includes the metabolites of crude oil biodegradation. Analyses for NVDOC are not routinely carried out because of the lack of knowledge about the NVDOC compounds and the lack of governmental requirements to conduct NVDOC analyses at release sites. The NVDOC plume in Bemidji has been shown to be expanding at a rate faster

than the BTEX plume and is found in concentrations 10 times higher than benzene and two to three times higher than DROs. While the toxicity of these compounds is not well understood, there is evidence that NVDOCs are toxic to aquatic life and mammals. Given that an Enbridge pipeline was the source of the release of the crude oil at Bemidji, it is somewhat puzzling that Stantec did not include this information in their report.

Stantec states that 62 percent of the pipeline crosses low-vulnerability aquifers. This statement is based on changing the MDNR classifications without supporting data, inventing a new classification using an arbitrary and unsupported criterion of a depth to groundwater of greater than 40 feet, and assigning classifications based on the midpoints of one mile segments along the L3RP route.

Stantec states that a variety of techniques available to remediate the release. In the report, Stantec described the remedial methods, but there is no evaluation of the impact of a release on any of the several environmental settings along the pipeline route, no evaluation of the impact of moving and operating equipment at the release site, and no evaluation of the effectiveness of the remedial methods in restoring the land to the original condition, particularly in sensitive areas such as fens, wetlands, and peatlands. The conclusion in this paragraph is that natural attenuation will resolve all pollution problems. However, studies by the USGS show that the understanding of the effectiveness of natural attenuation is not fully understood. Stantec also assumes that by limiting the extent of the plume of contamination, all problems associated with the release are eliminated. Stantec fails, however, to assess the impact of the release on receptors inside the plume of contamination. The affected population is more important than the extent of the plume.

Stantec also misinterprets PHMSA data which address the time from detection to shutting the pipeline down rather than the time from onset of the leak to detection of the leak.

Pipeline operators are not required to have electronic leak detection systems. Instead, they use a system of weights and balances to determine if their system is losing volume. Part of these management systems include the “smart pigs” that inspect the pipelines from the inside out. Currently, regulations do not govern a standard response time for leak detection. Small leaks are the most difficult to detect; “Even the best leak detection systems may not be able to detect small leaks under 3% of the volume of the flow through the pipeline”.

Integrity Management is the set of rules that operators follow regarding the identification and assessment of all threats to a particular pipeline segment, be they from internal or external corrosion, flooding, landslides, excavation damage, weld or construction defects,

etc. As part of this set of rules, they must also produce a specific Integrity Management plan designed to routinely assess those threats. This plan must also cover the undertaking of any necessary repairs or replacements, the improvement of cathodic protection, and outline other actions necessary to maintain the pipeline's safety.

These Integrity Management rules, however, are not applicable toward all pipelines. The rules are only implemented for pipelines that could affect a "High Consequence Area" (HCA) in the event of a spill. For liquid lines, HCAs include defined densities of populated "Unusually Sensitive Areas" (USAs) such as: drinking water sources, commercial or recreational fishing areas, and commercially navigable waterways. Each HCA pipeline segment must be re-assessed at least every five years. About 44% of all hazardous liquid pipelines fall within HCAs.

Limitations of Smart Pigs⁸¹

Despite the industry's reliance and touting of smart pigs, there are several limitations associated with the process. Every five years may not be frequent enough. The data that is collected by the pigs are not analyzed in real time and can take up to nine months for staff to go through. Even with a detection rate of 90% pigs can, and do, miss things. For example, corrosion and tiny cracks that follow a welded seam are commonly missed. This data gap has been indicated as a primary cause of the 2012 ExxonMobil Pegasus pipeline rupture, when one hundred and thirty-four million gallons of oil were released into a neighborhood in Mayflower, AR.

"Damage was so extensive that many people opted never to return home."

- (PST White Paper)

Another limitation of the pigs is that depth of corrosion can be misreported. After the San Bruno spill of 2015⁸², it was discovered that a recent pigging had underrepresented the depth of corrosion by 35%. It is also worth noting that not all pipelines are piggable. Narrow diameters, tight turns, or changes in diameters can all restrict the usability of pigs. Lastly, even in the best possible conditions, operators still need to respond to results in a timely manner. This has not always been the case with Enbridge.

Leak Detection Systems

Supervisory Control And Data Acquisition systems (SCADA) are often used as leak detection systems, though they were not originally designed for that purpose. They collect and

⁸¹ From: Bell, Trudy E. "Pipelines Safety and Security: Is It No More Than a Pipe Dream?" copyright 2014.

⁸² From "The Trouble with Inspection Tools for Oil Pipelines". The Wall Street Journal. <https://www.wsj.com/articles/pipeline-inspection-tools-are-far-from-perfect-1435875737>

display real-time data and sound alarms if pressure drops, or metered-out quantities do not match metered-in. They also allow operators to remotely control pump stations and valves.

The most reliable leak detection systems include acoustic and pressure wave analysis, fiber optic cables, hydrocarbon sensors, and thermal imaging. Unfortunately, when these systems are not utilized, it is often because they do not offer a 1 to 5 year return on investment (ROI). The industry also does not weigh the avoidance of costs for cleanup and fines in their ROI equations. From an engineering standpoint, the best process would be to implement at least two methods that rely on entirely separate physical principles. Utilizing a ten-year horizon, these detection systems would yield a valuable ROI.

Human Error⁸³

As pointed out above, even with the best leak detection systems, there is still room for human error and mismanagement. This room includes the selection of the testing tools, interpreting test results, and response to detected issues. In a report by Richard Kuprewicz of AccuFacts, Inc, he stated:

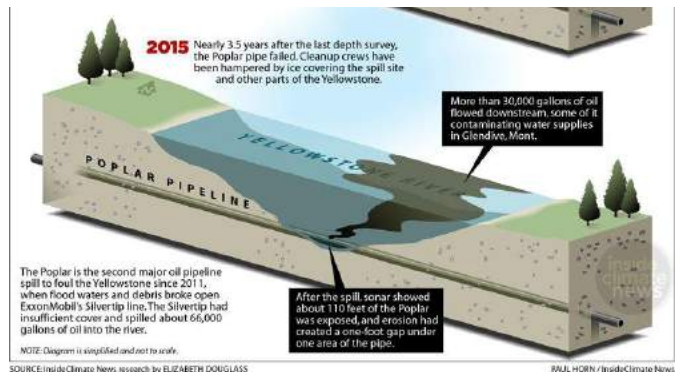
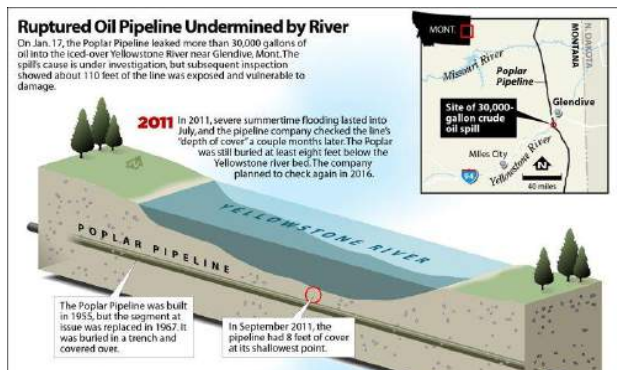
“In 40 years of doing this, I’ve yet to run across a true accident- a random event the pipeline operator had no real control over... Even when a test highlights a problem with a pipeline, executives have to be willing to sign off on fixes instead of delaying expensive repairs.... You can have a smart pig, smart people, and dumb management.”

The US EPA has also commented on the modeling. They recommended that seven representative sites be chosen for the modeling. They is also recommended that the models be run under a variety of weather conditions, and not just “blue sky” scenarios. The ability of local communities to respond to spills should also be analyzed, as local first responders are first line of defense.

There are several areas that this assessment considers high consequence areas and/or Unusually Sensitive areas. These include: Upper Rice Lake, Straight River aquifer, Pine River, Whitefish Chain, Spire Valley, crossing at Mississippi River and Big Sandy River, Kettle River (the western tributary to the St. Croix National Scenic Riverway), and Lake Superior. The Band should push for special protection of these areas.

⁸³ IBID

River Crossings



Crude oil pipeline river crossings pose distinct and significant risks to freshwater resources. The Yellowstone River spill in 2015 showed how unpredictable river beds can be and suggesting that there is no safe way for pipelines to cross rivers. The Poplar Pipeline had been monitored in 2011 and measured to be more than 8 feet below the river bed at its shallowest point, in 2015 it was suddenly entirely exposed to the river's current for more than 100 feet along its length.⁸⁴ It actually had a foot of river water flowing underneath the pipe. It ruptured, spilling more than 30,000 gallons into the river (See Fig x and y)

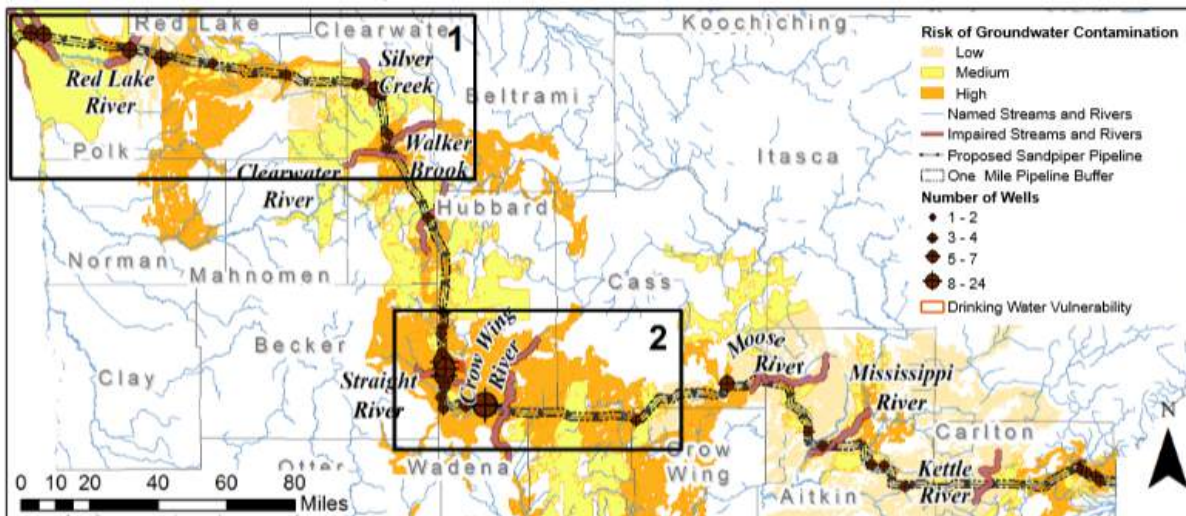
A spill at a river crossing could contaminate the Twin Cities water or other drinking water sources.

Groundwater impact

Referring to areas of groundwater vulnerability, map x "*Risk of Groundwater Contamination*" shows areas along the proposed pipeline route that could be vulnerable to groundwater contamination due to spills. As shown in box 2 this section should high risk (orange) and a large number of wells in multiple locations in box 2, this portion of the map has a large number of industrial irrigation wells, which can spread the contamination at an even quicker rate.

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<http://insideclimatenews.org/news/06022015/yellowstone-oil-spills-expose-threat-pipelines-under-rivers-nationwide>



Data Sources: Risk of groundwater contamination takes into account soils and geology, available at http://www.dnr.state.mn.us/waters/groundwater_section/mapping/gwcontam_susceptibility.html. Data date: 1989. Impaired streams for all chemicals, available at <https://gisdata.mn.gov/dataset/env-impaired-streams-2012>. County well data, which excludes public drinking water supplies, available at <http://www.mngeo.state.mn.us/chouse/metadata/wells.html>. Data date: 2011. Drinking water vulnerability areas showing chance of chemical contaminating local supplies, available at <http://www.mngeo.state.mn.us/chouse/metadata/wells.html>. Data date: 2014.

Generally in events of pipeline spills, private wells will be more at risk from contamination since they are not regulated by EPA and are sparsely inspected after they are installed. Shallow wells are more likely to be affected by a surface or shallow spill, and older wells are likely to be corroded, making it easier for contaminated water to advance into well water. Sandpoint wells, commonly used in Minnesota, also have a heightened risks. While a GIS data for these wells, which range from 15 to 30 feet deep, is not available, owners must report their installation to the Minnesota Department of Health. XL3 is expected to be placed 36 to 54 inches below ground; a pipeline rupture would affect shallow wells in the fractured pipeline.

Response

The Pipeline and Hazardous Materials Safety Administration (PHMSA) regulations, 49 CFR § 194.115, requires only that a pipeline company identify a first wave of equipment that it claims can arrive at the scene of a spill within six hours. Here's more on that regulation and implications:

§ 194.115 Response resources⁸⁵.

(a) Each operator **shall identify** and ensure the resources necessary to remove a worst case discharge and to mitigate or prevent a substantial threat of a worst case discharge.

⁸⁵ HISTORY: 58 FR 253, Jan. 5, 1993. AUTHORITY: 33 U.S.C. 1231, 1321(j)(1)(C), (j)(5) and (j)(6); sec. 2, E.O. 12777, 56 FR 54757, 3 CFR, 1991 Comp., p. 351; 49 CFR 1.53.

(b) An operator **shall identify** in the response plan the resources which are available to respond within the time specified, after discovery of a worst case discharge, or to mitigate the substantial threat of such a discharge, as follows:

	Tier 1	Tier 2	Tier 3
High volume area	6 hrs	30 hrs	54 hrs
All other areas	12 hrs	36 hrs	60 hrs

This regulation clearly states that a pipeline operator **need only identify** available resources that can “respond” within the specified timeframe, one that only begins when the spill is “officially” discovered. This can be hours or even days after it actually happens. According to the Wall Street Journal, an estimated 80% of spills are actually detected by civilians, despite pipeline companies’ faith in their leak detection systems.⁸⁶

This regulation does not specify the **amount** of resources needed to respond to a worst case discharge. The PHMSA regulation leaves this decision entirely up to the pipeline companies. There are no other regulations that cover this topic, although the Oil Pollution Act does allow states to institute additional and more stringent response plan requirements.

Public Oversight

The Pipeline Safety Act (PSA) and its regulations are drafted to as to exclude all public involvement in the regulation of pipelines. The law and its regulations were drafted to avoid triggering the hearing requirements of the Administrative Procedures Act (APA) and the environmental review and public participation requirements in the National Environmental Policy Act (NEPA). For oil pipelines, the routing and construction permitting process relies on a mishmash of state and federal laws, which also fractures the review process and complicates public understanding.

PHMSA is not even required to have documentation related to operators’ violations. PHMSA’s enforcement efforts are limited to going to a pipeline company’s office and reviewing paper files on site that show compliance with law. Sometimes after a leak or spill, PHMSA will collect information from companies, though PHMSA is very generous with exempting information if a company wants it exempted. **It is nearly impossible to**

⁸⁶ <http://thinkprogress.org/climate/2014/01/21/3186261/pipeline-spills-discovered-people/>

acquire any information about the adequacy of company compliance with the Pipeline Safety Act standards before something bad happens.

Confidentiality and transparency

PHMSA's oil spill planning duties arise under the Oil Pollution Act (OPA), which is a part of the Clean Water Act. In theory all of the normal citizen participation requirements of the APA and NEPA apply to regulation of oil spill planning and cleanup. **The foundation of all oil spill planning under the OPA is the worst case discharge calculation, because it determines how much equipment and personnel a company must have available to respond to a spill.** PHMSA has determined that worst case discharge amounts are confidential, even though they are not difficult to calculate based on publicly available information.

PHMSA also determined that the location and amount of an operator's spill response equipment are also confidential. This means that publicly available, operator spill plans only include boilerplate language – generic “how to respond to an oil spill” information that can be found in any training course on oil spill response. It also means that citizens now have no meaningful access to the guts of facility response plans, which makes practical review and civic oversight of these plans nearly impossible. The company simply wants to spend as little as possible on buying spill response equipment and hiring spill response personnel.

The truth is that bigger pipelines are likely to cause bigger spills.

Response

The real way the system works is that smaller vendors own small amounts of spill response equipment mostly to respond to small spills. If there is a big spill from a pipeline, the pipeline company calls a general contractor who hires a bunch of these small companies to come from all over the county to work mopping up the mess. **The pipeline company itself usually itself owns relatively small amounts of spill response equipment.** This scheme keeps the cost down for pipeline companies and generally means that the industry is poorly equipped to arrive at the site of a big spill quickly with the right equipment. **In remote rural areas, the spill response plans have little to do with containing a spill and consist almost entirely of cleaning up as cheaply as possible.**

A federal audit of Enbridge's 2010 spill in Marshall, MI, showed that Enbridge does not know the best way to control anomalies in their lines. The audit showed that Enbridge could not prove that it knew how to monitor and repair pipeline cracks forming from

corrosion - the key factor that had led to two major Enbridge oil spill disasters in 2007 and 2010. As it were, Enbridge lobbied hard to demand the NEB remove the most incriminating parts of that report, and covered up two secret environmental documents.

Enbridge has lobbied aggressively against responsible spill response regulations in Minnesota. In an October 2014 letter to the Environmental Quality Board, a number of Minnesota legislators pointed out Enbridge's determination to thwart any safety regulations by the state of Minnesota. The letter, from Minnesota Senators Steve Dribble and John Marty, and Representatives Frank Hornstein and Jean Wagenius, stated:

*"Enbridge and the pipeline industry were **unwilling to agree to:***

- Provide a **qualified company employee** to advise public sector incident commander by telephone within one hour of a major pipeline oil discharge;*
- Provide **monitoring equipment** within three hours of a discharge, or to develop an annual plan to deliver monitoring equipment to a discharge site to comply with the provision;*
- Provide **qualified personnel** to advise incident commanders at the discharge site within three hours of a major spill;*
- Provide **containment booms** from land across sewer outfalls, creeks, ditches and other places where oil and other hazardous substances may drain in order to contain leaked material before it reaches those resources;*
- To **have capability to deliver containment booms, boats, oil recovery equipment and trained staff** within eight hours of a confirmed discharge to recover 10% of a worst case discharge, including protection of listed sensitive areas and potable water intakes within one mile of a discharge site*
- **Deliver equipment to protect sensitive environmental areas and drinking water intakes, within 60 hours of a major spill***
- Provide updated disaster prevention and response plans to the Pollution Control Agency every three years..."*

In 2014, Public Safety Commissioner Mona Doman told House Transportation Finance Committee members that firefighters and others first responders are not equipped to deal with oil disasters⁸⁷. They do not have the equipment or training need to fight explosive dilbit fires. President Chris Parsons of the Minnesota Professional Firefighters stated that *"If an oil disaster occurs in Minnesota, it is likely to result in loss of life and property loss on a massive scale."*

⁸⁷ <http://www.grandforksherald.com/content/minnesota-could-face-oil-disaster-loss-massive-scale>

An oil disaster is “low frequency, high risk,” said Savage Fire Chief Joel McColl. ***Preparing for oil disasters is especially hard for smaller volunteer fire departments.*** Fire officials have said that in such cases all they can do is evacuate anyone who might be in danger and wait for help from nearby communities and the state. Brooklyn Park Fire Chief Ken Prillaman said the state has given money to form and equip regional hazardous materials teams, but provides no money to maintain the equipment. He warned legislators not to hand fire departments “additional unfunded mandates.”

Why should the burden of responding to oil disasters fall to local first responders?

Local, state, and federal agencies are already spread thin with budget cuts and staff limitations. There are very few people on the ground who are trained to inspect and monitor crude oil pipelines, including their construction, operations, and impacts. Each of these aspects are covered by a different state or federal agency and there is little communication or coordination between agencies. The following table is a summary of these agencies in Minnesota:

Agency	Regulatory authority (hazardous material/pipelines)	Level of Government
Pipeline and Hazardous Materials Safety Administration (PHMSA)	PHMSA “develops regulations and standards for the classifying, handling and packaging of...shipments of hazardous materials within the United States.”	Federal
Minnesota Office of Pipeline Safety	The Office of Pipeline Safety ensures safety in the design, construction, operation, maintenance, and spill response planning of America's 2.6 million miles of natural gas and hazardous liquid transportation pipelines.	State
Minnesota Pollution Control Agency (MPCA)	The MPCA monitors environmental quality, offers technical and financial assistance, and enforces environmental regulations in the State of Minnesota.	State
United States Army Corps of Engineers (USACE)	Issues federal Clean Water Act 404 permits, required for construction in wetlands or across navigable waterways.	Federal

United States Environmental Protection Agency (US EPA)	Ultimately responsible for adherence to federal environmental policy, however, much of its actual regulatory authority has been sub-granted to other agencies. (For example, 404 permits: USACE, OPA/PSA: PHMSA).	Federal
National Response Center (under US Coast Guard)	The designated federal point of contact for reporting all oil, chemical, radiological, biological, and etiological discharges into the environment.	Federal
Minnesota Department of Natural Resources (MN DNR)	Their mission is to work with citizens to conserve and manage the state's natural resources, to provide outdoor recreation opportunities, and to provide for commercial uses of natural resources in a way that creates a sustainable quality of life.	State
Minnesota Public Utilities Commission (MN PUC)	The Minnesota Public Utilities Commission (PUC) is responsible for the routing of certain energy facilities, including power plants, transmission lines, wind farms, and pipelines. The Minnesota Legislature has established state policy to locate energy facilities in an orderly manner compatible with environmental preservation and the efficient use of resources.	State
Minnesota Department of Commerce (MN DOC) Energy Environmental Review and Analysis (EERA) Unit.	The Energy Environmental Review and Analysis (EERA) unit conducts environmental review of large energy projects for which the Department of Commerce is the responsible governmental unit.	State
Soil and Water Conservation Districts	SWCDs are local units of government that manage and direct natural resource management programs at the local level. Districts work in both urban and rural settings, with landowners and with other units of government, to carry out a program for the conservation, use, and development of soil, water, and related resources.	Local
County Commissioners	County and other local government units in the United States take their basic form from similar units developed in the original 13 English colonies in this country and are similar in form to government institutions existing in England at	Local

	that time. Can enact zoning laws and benefit from property taxes from right of ways.	
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Overlaying all these federal, state, and local agencies are the various Tribal governments and communities that these federal, state, and local agencies should be in collaborative use agreements with. In reality, Tribal regulatory authority is often an afterthought and very rarely is there free, prior, and informed consent before massive industrial projects are undertaken.

Enbridge has two levels of emergency response plan, Integrated Contingency Plan (ICP), and Emergency Response Actions Plans (ERAP). The ICP consists of two parts. **Part 1** is the Core Plan that serves as the overall response tool. **Part 2** is a series of annexes based on the geographical Response Zone (or Region), which provides detailed supporting information and regulatory compliance documentation for each of the four Enbridge Response Regions in the United States (North Dakota, Superior, Chicago and Cushing). XL3 will be within the Superior Region. The ICP utilizes the Incident Command System (ICS), which is a system that often pushes responsibility to local first responders.

The ICP is used by Enbridge responders to manage an emergency anywhere within Enbridge's United States system. Those responders include the Regional Incident Management Teams (IMTs), which are groups of Enbridge employees located in each region with training in the ICS, and the Spill Management Teams (SMTs), which are groups of Enbridge employees in each region with specialized training in containment and recovery operations.

In addition to ICP, Enbridge developed an Emergency Response Action Plan (ERAP) for each of the four United States regions. The ERAP is a region-specific, condensed version of the ICP tailored to the unique features of the region. The ERAP is a publicly available document that is distributed to Enbridge personnel and emergency response agencies. The ERAPs are also available to the public (www.emergencyresponderinfo.com). Registration is required to obtain a copy of the ERAP so that Enbridge can provide any updates to the ERAP to those individuals that have requested the ERAP in the past.

Enbridge maintains its own Tier 1 response resources as defined in the USCG Oil Spill Removal Organization (OSRO) classification regulations. Enbridge's Enterprise Emergency Response Team, responds to large-scale events in North America.

Enbridge has established Pipeline Maintenance (PLM) shops located in Superior, WI, Bemidji, MN and Thief River Falls, MN. Assuming the Preferred Route is approved, Enbridge plans to add one new PLM Shop in the Project area east of Clearbrook. PLM shops are equipped with

emergency response equipment; tools, repair materials, vacuum trucks, boats, other specialized vehicles, containment booms and related equipment, skimmers, pumps, generators, and pre-positioned and packed response trailers. These are the main repositories of Enbridge owned emergency response equipment. Detailed lists of equipment maintained at each station are provided in Section 6.3.2 of the ERAP for each region. Similar equipment will be available at the new PLM locations. Enbridge also locates response trailers at pump stations and district offices located along the pipeline rights-of-way to provide faster access to essential equipment.

Enbridge limits its response resources at staffed stations, instead “mobilizing” response assets from contracted OSRO companies and other OSRO companies as needed. Local suppliers are also used for equipment rentals and purchases of ATVs and boats.

Enbridge has had to improve their response capabilities after the 2010 spill in Marshall, MI. From 2012 to 2013, Enbridge invested \$50 million to improve its equipment, training, and overall response capabilities, this investment includes new equipment ranging from containment booms to boats – that is deployed across its systems. Enbridge spent over \$4.5 million in the Superior Region to improve response capabilities. Major items purchased include:

- Excavator, including truck and trailer to haul excavator, for Thief River Falls;
- Marsh Master utility vehicle for Bemidji
- Wildlife Response Trailer for Bemidji, which contains bird deterrents, cages, pools, and other equipment used to keep animals away from any released product or to rehabilitate a contaminated animal
- ASV skid loader for Bemidji
- Vacuum truck for Bemidji
- Lake assault boom vessels for Superior and Escanaba

Additionally, Enbridge will station a helicopter in Bemidji, Minnesota. The helicopter will be used for pipeline inspections and emergency response.

Enbridge often relies on local first responders and public emergency response agencies along the routes of its pipelines. They often “donate” to local emergency response agencies through its Safe Community Program, the claims these as charitable giving, when they are actually investments in their ICP plans. No word if these “donations” are included in the \$4.5 million investment in Superior Region improvements.

In addition, in the event that the ICP Team determines additional resources are required to respond, Enbridge has developed a relationship with other contractors along the route who have been trained and have agreed to provide resources and participate in responding to any incident when called upon by Enbridge. For example, to assist with clean up, Enbridge could call on

those companies that Enbridge contracts with on a regular basis, such as vacuum truck vendors and rental companies to provide additional equipment and personnel.

All of these resources described above have been identified and have agreed to participate or assist in the event Enbridge asks for their assistance. Any contractor involved in a response, will first be trained and at the incident will be part of the ICS response. Enbridge enters into arrangements with hotels so that housing and conference space used during regular business operations is also available during emergency response.^{88 89}

Enbridge has not demonstrated they are capable of properly remediating a spill to Tribal determined levels.

Abandonment

All infrastructure has a lifespan, and the Lakehead System is nearing the end of its lifespan, evident by the request by Enbridge to abandon existing Line 3. Current abandonment regulations do not require Enbridge to do an assessment of the soil around the pipe, which will leave landowners, local governments and taxpayers responsible for legacy contamination created and ensured by Enbridge.

In the 1960's, when the original Lakehead System was developed, there was not much public knowledge around the environmental issues of pipeline development. Decades after construction there is a better understanding of the impact of these infrastructure projects. This impacts include the risk of spills, the impact on landscape fracture, and hydrological disturbances. Now approaching the era of pipeline abandonment, the potential long-term impacts of leaving corroding infrastructure in the environment must be analyzed before permitting corporations to walk away from this remaining responsibilities. Enbridge is trying to avoid the responsibilities of soil testing and remediating contaminated soil, or restoring historical hydrological states. Abandonment for Enbridge would translate into the general public absorbing the responsibilities of this major company to clean up their infrastructure.

Line 3 was placed in by the Lakehead Pipeline Company (now Enbridge) in 1961 and has experienced significant structural integrity problems. It spans over 300 miles of Northern Minnesota, crossing part of the Red Lake, Leech Lake and Fond du Lac Reservations and the 1855 and 1842 treaty areas.

⁸⁸ From Enbridge's Line 3 Application to MNPUC

⁸⁹ Line 3 Replacement Project Pipeline Routing Permit Application
MPUC Docket No. PL-9/PPL-15-137 Appendix D- Pipeline Safety Report

Enbridge has gathered extensive integrity data on Line 3 throughout its years of operation. The integrity data shows a high number of integrity anomalies – specifically, corrosion and long seam cracking. Because of its integrity anomalies, Line 3 has experienced a number of failures during its more than 50-year history. As a result, Line 3 requires a high level of integrity monitoring and an extensive on-going integrity dig and repair program to maintain safe operation of the line. For example, approximately 4,000 integrity digs in the United States alone are currently forecasted for Line 3 over the next 15 years to maintain its current level of operation. This would result in year-after-year impacts to landowners and the environment, and may result in repeated impacts to the same landowners and environmental features.

Potential long-term consequences of abandonment

Long-term financial liability of pipeline⁹⁰

Once a pipeline is designated as abandoned, pipeline owners and operators no longer incur the expense of maintaining easements with expensive mowing and caretaking. And, they no longer have to paint posts and put up new signs to mark the pipeline. All of these responsibilities are expensive and time consuming.

Another huge bonus for abandoning a pipeline is reduction of taxes or total elimination of ad valorem, school, county and other jurisdictional levies. Generally speaking, taxes are almost non existent for abandoned pipelines. But still, if a landowner wants to claim the pipeline on his or her property, the pipeline company will likely claim it is their property and explain that the pipeline is only “idled” as opposed to a “given up entirely” type of abandonment.⁹¹

A dictionary definition for abandonment means to “give up entirely.” Defined in terms of federal regulations, abandonment means “permanently removed from service.” In federal pipeline safety jargon, an abandoned pipeline is a pipeline that is “physically separated from its source of gas and is no longer maintained,” or in another federal agency glossary, “no longer connected to the system and is no longer maintained. The pipeline can be abandoned in place, by removal, or sold.” In still another set of federal guidelines, abandoned property means “a property that, because of its general disrepair or lack of activity, a reasonable person could believe that there is intent on the part of the current owners to surrender their rights to the property.” All of these definitions apply to gas and hazardous liquid pipelines that are interstate and fall under federal jurisdiction.

⁹⁰ From: <http://www.pipelineandgasjournal.com/who-owns-abandoned-pipelines>

⁹¹ From: <http://www.pipelineandgasjournal.com/who-owns-abandoned-pipelines>

At the state level, there are no abandonment guidelines or definitions for intrastate gas, liquids, or oil pipelines, and there are no abandonment guidelines or definitions for intrastate oil or gas gathering systems. Any mention of abandonment of pipeline procedures follows federal guidelines of disconnecting from active gas service and purging of any hazardous substance⁹².

Corrosion issues⁹³

“Corrosion of buried pipelines occurs through an electrochemical reaction that involves the loss of metal in one location (called the anode) through the transfer of the metal ions to another location on the pipeline (called the cathode). The rate of metal transfer depends on a number of factors such as the quality of the pipeline coating, soil aeration (which supplies oxygen to the pipe to allow the corrosion process to occur), types and homogeneity of soils, soil moisture, and electrical factors which create the potential differences for a corrosion cell to be established.”⁹⁴

Subsidence

The degree of subsidence associated with larger-diameter pipelines is highly dependent on pipeline diameter, depth of cover, and local soil conditions, but can be expected in many cases to be in a tolerable range. It should be noted that tolerance to soil subsidence is in itself a site-specific issue, as it depends on land use and the local environmental setting. Any pipeline owner/operator considering the abandonment-in-place of a larger-diameter pipeline should therefore conduct a site specific analysis in order to evaluate both the degree and tolerability of any long-term subsidence that might be expected. Such analyses should take into account the potential for heavy vehicular loadings (e.g. farm equipment or logging trucks).

Potential soil and groundwater contamination

Decommissioning activities can also introduce contamination into the environment.

Potential sources of contamination include:

⁹² <http://www.pipelineandgasjournal.com/who-owns-abandoned-pipelines>

⁹³

[https://docs.neb-one.gc.ca/ll-eng/llisapi.dll/fetch/2000/90463/501473/501488/501198/515103/A1F2Z4_-_TNS_Tech_Guidelines_on_Abandonment_\(r12\)_April_10_07_JKK.pdf?_gc_lang=en&nodeid=515104&vernum=0&redirect=3](https://docs.neb-one.gc.ca/ll-eng/llisapi.dll/fetch/2000/90463/501473/501488/501198/515103/A1F2Z4_-_TNS_Tech_Guidelines_on_Abandonment_(r12)_April_10_07_JKK.pdf?_gc_lang=en&nodeid=515104&vernum=0&redirect=3)

⁹⁴

[https://docs.neb-one.gc.ca/ll-eng/llisapi.dll/fetch/2000/90463/501473/501488/501198/515103/A1F2Z4_-_TNS_Tech_Guidelines_on_Abandonment_\(r12\)_April_10_07_JKK.pdf?_gc_lang=en&nodeid=515104&vernum=0&redirect=3](https://docs.neb-one.gc.ca/ll-eng/llisapi.dll/fetch/2000/90463/501473/501488/501198/515103/A1F2Z4_-_TNS_Tech_Guidelines_on_Abandonment_(r12)_April_10_07_JKK.pdf?_gc_lang=en&nodeid=515104&vernum=0&redirect=3)

- the substances produced from the reservoir in the hydrocarbon stream and deposited on the walls of the pipeline;
- treatment chemicals which could enter the pipeline and be deposited;
- the line pipe and associated facilities;
- pipeline coatings and their degradation products;
- possible PCB contamination, if PCBs were used in the pump or compressor lubricants at some point in the history of the pipeline.
- Pipe coatings

Drainage or sinkhole issues, including the creation of water conduits

Abandoned pipelines can act as water conduits, resulting in unnatural drainage and material transport. An abandoned in place pipeline will eventually corrode to the point that it will allow water infiltration. This could lead to the drainage of muskegs, sloughs, marshes and other water bodies. Alternatively, low lying areas could be flooded by water exiting an abandoned pipeline.

If there is residual contaminants in the pipeline, these can be moved with infiltrated water. If the point of exit is a waterbody, this waterbody can be contaminated. Soil could also be contaminated in the same manner, depending on the nature of the contaminant. In an article in the Oil and Gas Pipeline Journal by David Howell, Senior Right of Way Agent, International Right of Way Association (2009 article), he notes the problem of jurisdiction is immense and a major concern...

“The issue (is) ownership. The pipeline company claimed ownership, but did not assume responsibility for maintenance or removal of the pipeline. For some reason, the pipeline company determined that the landowner ought to be responsible for removal expenses and that a qualified environmental company of their choosing ought to be used for the removal. Why was this? Was there an unknown environmental hazard?”

A dictionary definition for abandonment means to “give up entirely.” Defined in terms of federal regulations, abandonment means “permanently removed from service.” In federal pipeline safety jargon, an abandoned pipeline is a pipeline that is “physically separated from its source of gas and is no longer maintained,” or in another federal agency glossary, “no longer connected to the system and is no longer maintained. The pipeline can be abandoned in place, by removal, or sold.” In still another set of federal guidelines, abandoned property means “a property that, because of its general disrepair or lack of activity, a reasonable person could believe that there is intent on the part of the current owners to surrender their rights to the property.” All of these

definitions apply to gas and hazardous liquid pipelines that are interstate and fall under federal jurisdiction.

Corrosion of the line into the surrounding soil will occur, as will the negative impacts of the eventual abandonment of the new Line 3. Additionally, treatment chemicals in the existing line, pipeline coatings and degradation chemicals produced, historical leaks and spills along the line, potential PCB contamination, and substances deposited on the walls of the pipeline must be taken into account with regard to the surrounding soil composite and effects. If Proposed Line 3 is approved, Enbridge should include stipulations which insure clean up of old lines and creation of trust funds to clean up future abandoned lines after service. Nationally there is a no-net wetlands loss policy, which does not address issue of historic loss, policy should include costs for this historic debt, including restoration of impacted ecosystems. The Mississippi headwaters area is vitally important to both the economy of Minnesota and as a drinking water source and should be valued more than an addiction to a dirty, inefficient fuel source.

Health Impacts

"The most fundamental feature of the Anishinaabe worldview is the Spirit. The spirit is always central and always works in relationship to the other levels of being.

The human person is a "Spirit-walking-through-this-world." The Anishinaabe person is a spiritually motivated person, and the Anishinaabe culture is spiritual at its core. Spirituality is a way of being-in-the-world that is spirit-based and spirit-driven. This is the Anishinaabe way of being, knowing, perception, behaving, and of living in the world.

All things are shaped into actuality, unfold and evolve into being-in-the world because of the spirit. The Anishinaabe psychology and Anishinaabe culture can only be fully and properly understood from this belief: that spirit is the central and primary energy, cause and motivator of life.⁹⁵

This spirit can also be understood as the "life-energy" of the land. In Anishinaabemowin, is called manidoo. Manidoo is understood as the agency of the rest of life, an energy that is not dependent on humans. Manidoo imbues trees, plants and other animals of the woods and prairie. This consciousness or life-energy in the land, with its own agency, interacts with us as we go about our activities on the land.

⁹⁵ Foushee, Lea, and Renee Burneau. Sacred Water: Water for Life. Lake Elmo, MN: North American Water Office, 2010. Pg. 28.

The 2006 Indigenous World International Working Group for Indigenous Affairs states the following: “Indigenous peoples remain on the margins of society: they are poorer, less educated, die at a younger age, are much more likely to commit suicide, and are generally in worse health than the rest of the population” (Stidsen 2006: 10). This is particularly true for indigenous groups “whose original ways of life, environment, and livelihoods have been destroyed and often replaced with the worst of Western lifestyle – i.e., unemployment, poor housing, alcoholism, and drug use” (Stephens et al. 2005: 11).

In recent years, the interconnectedness of the mind, body, and spirit has gained acceptance, particularly in the fields of psychoneuroimmunology (Lyons and Chamberlain 2006), and epigenetics (Jasienska 2009; Krieger 2004, 2005; Olden and White 2005), as well as with particular psychophysiological health outcomes including cardiovascular (Kuzawa and Sweet 2009), inflammation disorders, and neuroendocrine and immune functions (Seeman et al. 2003).

Although the relationships among land, wellness, and health are well articulated in Indigenous origin stories and tribally specific Original Instructions (Deloria 1992, 1995; Pierotti and Wildcat 2000), only recently have these relationships been empirically examined in the health sciences (Burgess et al. 2005; Oneha 2001; Wilson 2003).

Although classic social determinants of health, such as poor socioeconomic status, substandard housing, and poor access to appropriate health care all contribute to poor health among IP, these factors do not sufficiently explain the high rates of poor health and mental health, particularly with respect to post traumatic stress disorder (PTSD), anxiety, and depression among IP, specifically American Indians and Alaska Natives (Walters et al. 2002). As a result, indigenous scholars have turned their attention to examining how historical and societal determinants of health, particularly the role of place-based historically traumatic events (e.g., forced relocation and land loss), environmental microaggressions (discrimination distress based on land desecration), and disproportionate exposures to high rates of lifetime trauma, not only are hazards to contemporary IP health but may also persist for generations (Evans-Campbell and Walters 2006; Evans-Campbell 2008; Krieger et al. 2010).

Embodiment

Over the last several decades, there has been an emergence of the body as a key focus in the social sciences. Researchers are centralizing the body in questions of inequities in health and investigating aspects of embodiment as influenced by social, cultural, political, and economic processes (Krieger 2001; Krieger and Davey 2004). As such, it can be inferred

that the body is directly impacted by place and what happens in places. In the past, bioarchaeological studies produced important information about the everyday lives of individuals and groups. From evidence of habitual motion left on bones, scientists could discern social status, race, gender, and age (Joyce 2005; Krieger 2004). Like most legacies of scientific engagement, there has historically been a split of inner and outer body as centered questions, but by looking at social epidemiological trends in health status, scientists are finding clear links between what is going on in the social world and the biological corporeal world.

For example, low-birth-weight babies, a frequent problem experienced by indigenous populations, and certain bacterial infections are associated with conditions of poverty, sanitation, and access to health services (Krieger and Davey 2004). In essence, what is happening outside of the body is reflected inside and vice versa; the body is just as affected by the policies, structures, and processes that shape daily living conditions as by individual biological processes. As such, the boundaries of “the body” and the spatial context around it are now being described as “inextricably linked” (Joyce 2005: 149). Shifting from theoretical and practical investigation of “bodies” to “embodiment” allows for deeper understanding of the complexities involved in the human experience as both biological and social creatures. While bodies are sites – records of process, animated stories of lived experience, visual/textual narratives of past and present, embodiment “is the articulation of agency and structure, causality and meaning, rationality and imagination, physical determinations and symbolic resonances” (Meskell, as cited in Joyce 2005: 151). In this way, bodies can be seen simultaneously as cultural artifacts, political entities, and representations of lived experiences (Joyce 2005; Krieger 2001, 2004). In ecosocial theory and epidemiological research, the concept of embodiment is seen as a central component in understanding the human process of being both social and biological creatures (Krieger 2001, 2004; Krieger and Davey 2004). Emerging research and scholarship pays attention to “how actualization and suppression of people’s agency, that is, their ability to act within their bodies, intimately depends on socially structured opportunities for, and threats to, their well-being” and “in the case of social inequalities and health, it likewise presumes that observed differences reflect biologic expressions of social inequality” (Krieger and Davey 2004: 95). Embodiment is an important construct that illuminates key processes for explaining the complicated ways that social worlds get lived out in bodies.

As Chief Sealth (aka Seattle), Chief of the Suquamish (1786–1866) noted: You must teach your children that the ground beneath their feet is the ashes of your grandfathers. So that they will respect the land, tell your children that the earth is rich with the lives of our kin. Teach your children what we have taught our children, that the earth is our mother. Whatever befalls the earth befalls the sons of the earth. If men spit upon the ground, they spit upon themselves.

Mother Earth...we come from her, so we are part of her and she is part of us. If she is sick, I am sick, and vice versa. Gonzales and Nelson (2001: 497)

Indigenous knowledge recognizes place as integral to one's sense of being, which is also central to both individual and collective spiritual health and wellness. Conversely, for IP, loss of place (i.e., displacement) is akin to loss of spirit or identity....when displacement occurs, social and spiritual upheaval ensues for Native people, leading to mental and physical health crises. Historically and contemporarily, displacement (being without place/spirit) of IP from their original lands and ongoing exploitation of contemporary lands have led and continue to lead to ill health and dis-ease.

Specifically, Cajete (1999: 17) notes that indigenous communities have drifted or been forced from a...practiced and conscious relationship with place, or direct connection with their spiritual ecology. The results for many Indian communities are 'existential' problems, such as high rates of alcoholism, suicide, abuse of self and others, depression and other social and spiritual ills...Tewa people call this state... pingeh heh (split thinking, or doing things with only half of one's mind). In other words, as much as connectedness to place is ensoulment, displacement is literally, a form of "soul loss" (Cajete 2000: 188).

Historic and Contemporary Trauma

For IP, cumulative historical trauma events are coupled with high rates of contemporary acute lifetime trauma and interpersonal violence (Greenfeld and Smith 1999), as well as high rates of chronic stressors such as dealing with an ongoing barrage of microaggressions and daily discriminatory events (Chae and Walters 2009; Walters et al. 2008). Together, these historical and contemporary events undermine indigenous identity, health, and well-being (Evans-Campbell 2008) in complex and multifaceted ways.

At the individual level, the impact of historical trauma on health and wellness includes impairments in family communication (Felsen 1998), symptoms of PTSD, survivor guilt, anxiety, and depressive symptomatology (Evans-Campbell 2008; Whitbeck et al. 2004). At the community level, collective responses include the disruption of traditional customs, languages, and practices (Evans-Campbell 2008; Wardi 1992) and self-reported intergenerational historical trauma (Balsam et al. 2004). Notably, despite exposure to historical and cumulative traumatic stressors, many Native people do not manifest psychopathology. This is largely attributed to the continuation of traditional Anishinaabeg and Indigenous spiritual and cultural practices.

Mikwendaagoziwag - They are remembered

The XL3 and L3A cross exceptional important historic lands. These lands include historic hunting, fishing and gathering areas; our historic homelands and for many miles, follows the route of our historic removal route and the site of the Sandy Lake Tragedy.

The reservation system often provided a boon to local traders, as reservations required the development of Indian agencies and schools. The distribution of annuity goods were often handled by local traders. Minneostat based traders realized this potential and in the 1840's began to push for moving Anishinaage from Wisconsin and the Upper Peninsula of Michigan (1837 and 1842 ceded areas) onto unceded lands in Minnesota. This economic potential created political pressure, and in 1850, a plan was hatched.

Officials moved the annuity payments from Mooningwanekaaning (Madeline Island), a traditional heartland and gathering area, to Sandy Lake. The thought was that once tribal members reached this hard to access areas, they would not return home. By November 10th, 1850 nearly 4,000 Anishinaabeg had arrived at Sandy Lake. Upon reaching the location, it was discovered annuity payments were not waiting for them. Tribal members had to wait over six weeks with inadequate food and shelter. Over 150 died during this time from dysentery, measles, and exposure. After the annuities were distributed on December 2nd, many left and began the trek home. An estimated 250 more died on this journey.

This tragedy increased opposition to the removal policies and resulted in Chief Buffalo and Benjamin Armstrong traveling to Washington DC to meet with President Fillmore. After that journey, the removal policy was halted. Annuity payments were also returned to Mooningwanekaaning.^{96 97}

"It's estimated that 1,500 of the 5,500 Ojibwe who camped out at Sandy Lake were from northern Minnesota. We don't know for certain how many of them made it back alive, having to walk 120 miles in early December back to Leech Lake, or 140 miles to Cass Lake. But we do have our stories about their experience. Child writes about a family who walked home to Leech Lake. There was a father, the mother, the mother's brother, a 10-year-old son, and a 2-year-old daughter. Halfway home, the mother's brother got sick and died. They stopped to bury him. Two days from Leech Lake, the children got sick. The son died and the father carried his dead son on his back. Next, the 2-year-old daughter died. The mother carried her dead

⁹⁶ http://www.chiefbuffalo.com/buffalo/Sandy_Lake_Tragedy.html,

<https://chequamegonhistory.wordpress.com/category/sandy-lake-tragedy-and-ojibwe-removal/>

<http://www.colinmustful.com/sandy-lake-tragedy/>

⁹⁷ http://www.chiefbuffalo.com/buffalo/Sandy_Lake_Tragedy.html

daughter on her back, and both parents returned home to Leech Lake carrying their dead children. Sandy Lake became known as the place where their people died. Like the parents carrying their dead children on these trails of death, historical trauma is carried in the memories and bodies of the people. Those who were originally traumatized pass the trauma down to their children, and they to their children, and so on."

(Fleming, February 19, 2017)⁹⁸.

It is said that the east side of Sandy Lake was full of birchbark coffins of the hundreds who perished in this intentional act of the President. This historic trauma has not been forgotten by the Anishinaabeg, and each year is commemorated in a gathering.

Removal to White Earth

Not learning their lesson from the Sandy Lake tragedy, the US government decided to try and move all the Anishinaabeg and Lakota in Minnesota to White Earth. The 1867 Treaty with the Mississippi Band of Chippewa (now White Earth Nation) created this reservation. This area was never the historic homeland of any Anishinaabeg band. Many Bands did not want to move and give up their homelands. In 1868, the Gull Lake Band were the first group to come and settle around White Earth Village. By 1920, White Earth contained 4,856 people including 1,308 from Mille Lacs, 1,218 from Pillager Bands, 472 from the Pembina, and 113 from Fond du Lac of the Superior Band.

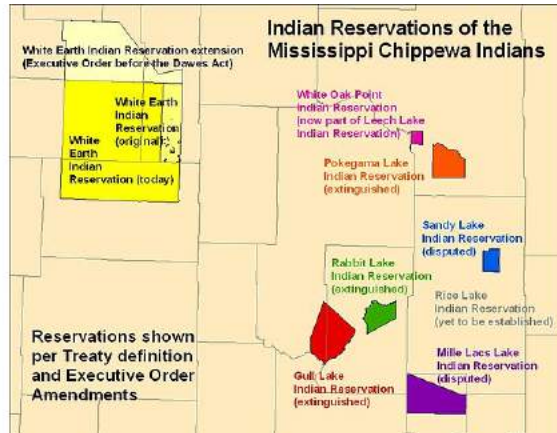
Different areas of the reservation were settled by the various Bands. The different bands tended to settle in different areas of the reservation. Mille Lacs members moved to the northeastern part of the reservation, around Naytahwaush and Beaulieu. Pillager Band members settled around Pine Point in the southeast. Pembina Band members moved to a township on the western side of the reservation. A community concentrated in the Village of White Earth where the government agency was located.⁹⁹

The paths and routes these various bands followed to reach the White Earth reservation are scattered throughout the 1855 Treaty area. The map below shows some of the distinguished reservations and the original size of the White Earth reservation.

⁹⁸ Nanaboozhoo and the Wiindigo: An Ojibwe History from Colonization to the Present

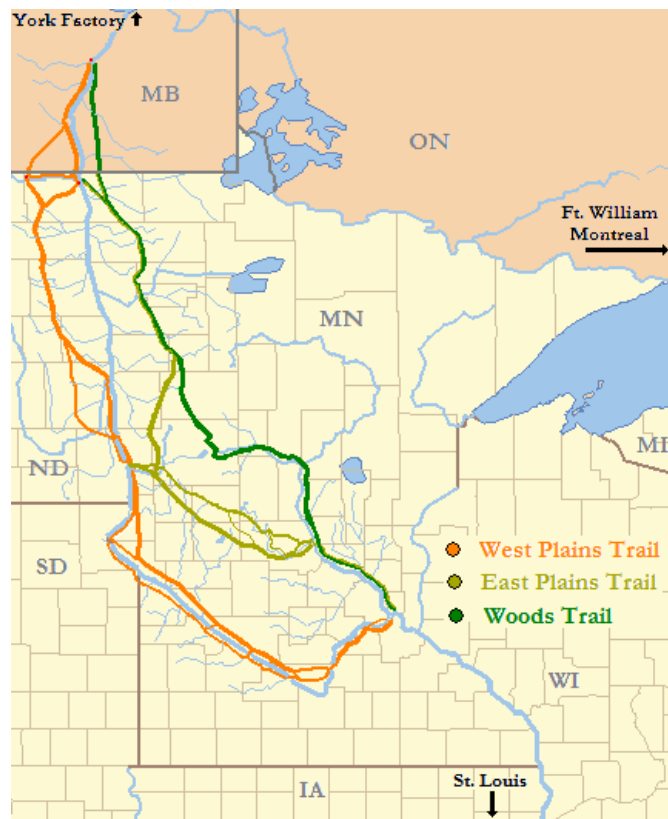
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⁹⁹ https://mn.gov/indianaffairs/tribes_whiteearth.html



Attribution: [CJLippert](#) at [English Wikipedia](#)

The routes and trails these groups of people followed are undoubted old ox-trails (which followed buffalo routes) and the current day water trails. The XL3 would follow the path of one of these historic routes, were it follow MN route 87. As is the case in many states, present day transportation routes (roads, railways, ect) follow historic Native American trails.



Source: US Census, Ruhrfisch, Kablammo¹⁰⁰

¹⁰⁰ https://commons.wikimedia.org/wiki/File:Red_River_Trails_Locator_Map_cropped.PNG#file

Intergenerational Trauma

A related field, intergenerational trauma, also recognizes collective traumatic events but is inclusive of natural disasters and other traumatic events (e.g., famine) that are man-made but not targeted with intention upon a particular group for social, cultural, ethnic, or political decimation or annihilation. Climate change risks pose such an impending trauma, and factor into Indigenous concerns and Anishinaabe concerns: *Where will my food be?*

“That Ojibwe man who slew the Wiindigo has always lived here. Leech Lake is 50% water, lakes, streams, swamps, and the Mississippi River. We have 44 wild rice producing beds on our reservation, and more wild rice naturally grows here than anywhere else in the United States. In our legends, it says that someday, there might come a time of great hardship when food won’t be readily available to us. Consequently, we store 100,000 pounds of finished wild rice and can feed our people for 10 to 15 years with it”¹⁰¹

Although the study of historical trauma and intergenerational trauma is still in the nascent stage of empirical examination, preliminary research indicates that the impact of these events may persist for some individuals or families over generations (Bar-on et al. 1998; 176; Walters et al. ; Nagata et al. 1999; Yehuda 1999), that the trauma may have a more pernicious effect on descendants of survivors if both parents experienced the event (Karr 1973), that the trauma may be differentially experienced by women compared to men (Lichtman 1984; Brave Heart 1999), and that the trauma can literally become embodied, manifesting as poor mental (e.g., depressive symptomatology) and physical health outcomes (e.g., CVD or birth outcomes) in later generations (e.g., Barocas and Barocas 1980; Jasienska 2009; Kuzawa and Sweet 2009).

Research with diverse populations shows that descendants of survivors are not more likely than others to have poor mental health. Rather, they may have a higher vulnerability to stressful events, and when faced with a lifetime stressor, descendants may be more likely than others to develop PTSD or PTSD symptomatology (Solomon et al. 1988; Yehuda 1999).

Individually, each of these events is profoundly traumatic; taken together, they constitute a history of sustained cultural and ethnic disruption and destruction directed at IP (Evans-Campbell and Walters 2006). The resulting trauma is often conceptualized as collective in that it impacts a significant portion of a community, and compounding, as

¹⁰¹ Nanaboozhoo and the Wiindigo: An Ojibwe History from Colonization to the Present
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multiple historically traumatic events occurring over generations join in an overarching legacy of assaults.

A multitude of additionally traumatic experiences, including boarding schools, federal relocation programs, termination programs, repression of religious institutions, theft of significant cultural items and patrimony, increased morbidity rates from American induced chemicals and diseases, has contributed to a significant traumatic experience for the Anishinaabeg.

Epigenetics and Historical Trauma

Extreme environmental stress in one generation can alter health outcomes for descendant generations (Walters et al. 2011). Specifically, as Walters et al. (2011:11) note, “these scholars point to the amassing of evidence at the cellular level that powerful stressful environmental conditions can leave an imprint or “mark” on the epigenome of cellular genetic material that can be carried into future generations with devastating consequences”. For example, inadequate prenatal maternal nutrition at key gestational developmental periods can lead to descendant offspring developing CVD in adulthood (Kuzawa and Sweet 2009).

Several animal, and more recently, human studies have demonstrated pervasive and enduring effects of the neurobiological toll of stress on neurodevelopmental delays, hypothalamic-pituitary-adrenal ~HPA axis dysfunction, metabolic syndrome, CVD, immune system dysfunction, major depressive disorder, PTSD, compromised reproductive health and transgenerational effects of stress exposure on the health of offspring generations (Brand et al. 2010; Yehuda and Bierer 2009). Moreover, different changes in HPA axis and related neuroendocrine systems are linked with different disease outcomes (Matthews and Phillips 2010). For example, hypercortisolemia ~ abnormally high levels of cortisol increases susceptibility to depression, hypertension, and diabetes whereas hypocortisolemia ~ abnormally low levels of cortisol increases susceptibility to chronic fatigue syndrome, fibromyalgia, and PTSD (Matthews and Phillips 2010).

Duress of Mega Projects

Indigenous communities, in both the United States and Canada are already at-risk communities, as evidenced by their high-rates of suicide and persistent poverty.¹⁰²

*Native American youth 15-24 suicide rate more than 3 times more than national average
Suicide leading cause of death for those 10-34*

¹⁰² <http://www.mcgilldaily.com/2016/03/reactive-measures-not-a-solution-to-cross-lake-suicide-crisis/>

<http://www.theglobeandmail.com/news/national/attawapiskat-four-things-to-help-understand-the-suicidecrisis/article29583059/>

Reservations among the poorest places in the nation
Rates of depression twice national average
Alcoholism 5.5 times national rates
*Heart disease twice national average*¹⁰³

Numerous studies and reports have linked these conditions directly to historic trauma, the history of colonization, and negative impacts of mega-projects.¹⁰⁴ The largest pipelines in North America, and the extreme extraction they support, are undoubtedly mega-projects. Studies have also shown that impacts on Indigenous communities are consistently underestimated, as the methodologies used to analyze risk are based on healthy white-males, not at-risk peoples that live off the land. Recently, suicide crises have hit First Nations communities in Canada, with a direct link being drawn between large infrastructure projects and their impacts on the communities¹⁰⁵.

The psychological and social impacts of siting a project in an at-risk community is very significant. Widespread studies and stories from Canadian and other Indigenous Nations who have faced or become victims of mega-projects indicates that there is significant social and psychological trauma, resulting in additional deaths from these projects.¹⁰⁶

For example, more than 43 % of victims of the Exxon Valdez oil spill, compared to 23 % of non-victims, had one or more psychological disorders (specifically depression, generalized anxiety disorder, or PTSD) one year after the oil spill (Palinkas et al. 1993). These psychological consequences persisted; six years later disaster victims had substantially higher than normative rates for depression, anxiety, and PTSD (Arata et al. 2000). Indeed, a review of studies assessing the psychological consequences of

¹⁰³ McLeigh JD. 2014. What are the policy issues related to the mental health of Native Americans? PsycINFO.

¹⁰⁴ Luginaah et al (2010). Surrounded by Chemical Valley and 'living in a bubble': the case of the Aamjiwnaang First Nation, Ontario. Journal of Environmental Planning and Management, 53(3) 2010.

Tobias, J., Richmond, C., Luginaah, I. (2014) "That Land Means Everything to us". Environmental Dispossession and Resilience on the North Shore of Lake Superior. Health and Place (29), 26-33.

McDoweel, G. (2014). The socio ecological dimensions of hydrocarbon development in the disko bay region of Greenland: opportunities, risks, and trade- offs. Applied Geography, 46. 98.

¹⁰⁵<http://www.theglobeandmail.com/news/national/manitoba-premier-apologizes-to-first-nation-for-damage-done-by-dam/article22541829/>

¹⁰⁶ Hoover E, et al. 2012. Indigenous Peoples of North America: Environmental Exposures and Reproductive Justice. Envir Heal Pers 120: 1645- 1649.; Tobias JK, Richmond CAM. 2014. "That land means everything to us as Anishinaabe...": Environmental dispossession and resilience on the North Shore of Lake Superior. Health & Place 29: 26-33.

disasters invoking human culpability concluded that their psychological consequences are worse than for natural disasters (Norris et al. 2002)¹⁰⁷.

Studies from previous oil spills have shown a marked decrease in traditional practices following a spill due to perceived contamination.¹⁰⁸ Recently there has been a suicide epidemic in both Pimicikimak (Cross Lake Manitoba) and Attawapiskat (Ontario) which are Northern Canadian Indigenous Nations.

"...The Pimicikamak Cree Nation in Manitoba, also known as Cross Lake, declared a state of emergency on March 9, in the wake of six suicides over the past two months and over 140 attempts in the community of 8,365 in the last two weeks alone... The suicide crisis, however, cannot be resolved without considering the other hardships affecting Cross Lake, including the destruction of its land by a Manitoba Hydro station and a lack of economic security with an 80 per cent unemployment rate. In order to seriously confront Cross Lake's suicide crisis, the government must, in consultation with the Nation, address the systemic roots of this crisis..."

"Aboriginal youth in Canada have a suicide rate 50 times higher than the general population. Attawapiskat, another Cree community in the north has a suicide epidemic... In both cases, Pimicikamik Cree and Attawapiskat Cree, the background of colonialism, and injustice -whether in health access or housing access is foundational to the present suicide crisis. The crisis is worsened significantly by the destruction of the primary territory by the dam projects."

McGill Daily (Canada April 5 2016)

Environmental Justice

Previous chapters and sections have described and explained the myriad of stressors that impact IP, both globally and regionally. These existing stressors place Anishinaabeg communities at high health risks. The Amherst Wilder Foundation report on health inequities in Minnesota found that Native Americans suffered from structural racism with regards to health disparities, and are a high risk population.

¹⁰⁷ Cline RJW, Orom H, Chung JE, and Hernandez T. 2014. The Role of Social Toxicity in Responses to a Slowly-Evolving Environmental Disaster: The Case of Amphibole Asbestos Exposure in Libby, Montana, USA. *Am J Comm Psychol* 54: 12-27.

¹⁰⁸ Gill DA, Picou JS, Ritchie LA. 2012. The Exxon Valdez and BP Oil Spills: A Comparison of Initial Social and Psychological Impacts. *Amer Beh Sci* 56: 3-23.

Miraglia R. 2002. The Cultural and Behaviour Impact of the Exxon Valdez Oil Spill on the Natives Peoples of Prince William Sound, Alaska. *Spill Sci & Tech Bull* 7: 75-87.

“The evidence strongly suggests that social and economic conditions and structural racism contribute significantly to the relatively poor health outcomes of the American Indian population in Minnesota. *“Therefore, we feel that policy makers should take these critical factors into account in a systematic and transparent way when making decisions that potentially have wide ranging impacts...”*¹⁰⁹

In the 2014 Advancing Health Equity report, the Minnesota Department of Health found the “years of potential life lost” as a result of heart disease and stroke is 165 percent higher for American Indians than for whites in Minnesota.¹¹⁰ The report also highlighted structural racism as a key contributor to health inequities in our state:

*“Structural racism — the normalization of historical, cultural, institutional and interpersonal dynamics that routinely advantage white people while producing cumulative and chronic adverse outcomes for people of color and American Indians — is rarely talked about. Revealing where structural racism is operating and where its effects are being felt is essential for figuring out where policies and programs can make the greatest improvements”.*¹¹¹

The method of classifying high consequence areas and unusually sensitive areas are example of structural racism as they place more importance on population and discreet location of sensitive species.

Both White Earth and Mille Lacs Reservation, suicides are higher than the state average, along with many other health conditions.

The Extended Areas of Concern

Extraction Communities

This pipeline, and the network of oil infrastructure it represents enables and connects to the extraction and refining sites. Both of these areas are subjected to countless chemicals, noise pollution, and violence. Communities and workers in the oil patch are being exposed to known carcinogens, endocrine disruptors and other toxic chemicals.¹¹²

¹⁰⁹ Wilder Letter June 4, 2015

¹¹⁰ Minnesota Department of Health (2014): Advancing Health Equity. Retrieved from: <http://www.health.state.mn.us/divs/chs/healthequity/aheexecutivesummary.pdf>

¹¹¹ Advancing Health Equity in Minnesota: Report to the Legislature, February 1, 2014: Health’s Commissioner’s Office.

¹¹² <http://www.eesi.org/articles/view/new-research-documents-frackings-health-effects-on-workers-and-communities>, Colborn T, Kwiatkowski C, Schultz K and Bachran M. 2011. Natural Gas Operations from a Public Health Perspective. Hum Eco Risk Asses: an Inter Journ. Available at: <http://www.tandfonline.com/doi/abs/10.1080/10807039.2011.605662#preview>

Crude coming from the Bakken primarily takes place on Mandan, Hidatsa, and Arikara territories, near the Ft. Berthold Reservation. This is “fracked” oil, extracted by blasting millions of gallons of water and a slurry of toxic chemicals deep into the bedrock of these communities. It is extreme extraction, proven to cause earthquakes and poison aquifers and has been banned in a long list of cities, states, provinces, and countries around the world. Members of the Three Affiliated Tribes are facing epidemics of health problems, drug and sex trafficking, violent crime, and traffic deaths.¹¹³

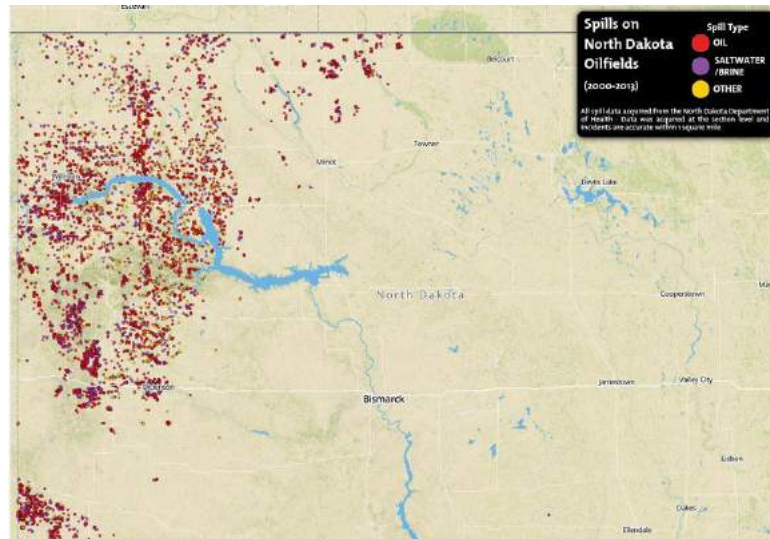
Crude coming from the tar sands area is primarily the territory of the Cree and Dene. This oil is extracted through surface mining or steam assisted gravity drainage. The mining/extraction process results in acres and acres of toxic tailing ponds. These ponds can leak into the environment and are a hazard to migratory birds. The communities around these areas have lost traditional use areas and are facing epidemics of rare cancers.

The hydro-fracking and tar sands boom of the last decades has occurred so quickly that long-term impacts are not well understood. This is especially true for delicate ecosystems such as the boreal forests in Alberta. Long-term remediation prospects for this area does not look good. Often oil companies do not focus much on remediation and restoration, as there are few laws that require them to do so. Throughout the Bakken fields and the Alberta tar sands, surface waters are becoming polluted from spills, run-offs, leaks and improper disposals.

The Bakken Oil Fields

Fracking involves the use of immense amounts of water hundreds of millions of gallons per well. Water used by fracking companies is laced with over 600 toxins and carcinogens. Those chemicals are considered trade secrets and are not subjected to scrutiny. Much of that water is being pumped into deep underground caverns, by the trillions of gallons. In Colorado, there is one injection well which is over a trillion gallons. Injected. The data from North Dakota is hard to come by but it is emerging, but Colorado’s data has been probed by a host of concerned citizens.

¹¹³ <http://earthfirstjournal.org/newswire/2014/05/26/sexual-assault-in-the-bakken-shale-man-camps>, Gilbertson, Lydia. Letter: End Human Trafficking Wherever It’s Happening. *Bakken News*, May 23, 2014. <http://bakken.com/news/id/182654/letter-end-human-trafficking-wherever-happening/>. McLaughlin, Shaymus. “Rise in Sex Trafficking on Bakken Oil Patch Poses New Challenges,” Minnesota Public Radio Interview with Bryan Lockerby, Administrator of the State’s Department of Criminal Investigation. May 2014.



A report released in June 2012 by ProPublica found, “over the past several decades, U.S. industries have injected more than 30 trillion gallons of toxic liquid deep into the earth, using broad expanses of the nation’s geology as an invisible dumping ground. “During its investigation of the EPA’s oversight of the nation’s injection wells, ProPublica found that the EPA “has not counted the number of cases of waste migration or contamination in more than 20 years”, and that “the agency often accepts reports from state injection regulators that are partly blank, contain conflicting figures or are missing data” (Lustgarten).

Shane Davis, director of a Colorado organization, Fractivist, lives surrounded by fracking. There are 54,000 wells presently in Colorado, and in Weld County, where Shane lived, there were 22,000 wells, some 75 within a mile radius from his house. Shane has suffered numerous health impacts, including serious rashes, going blind for a week, serious gastrointestinal problems, and a year and a half of a bloody nose.

“I conducted an investigative study using un-redacted, official COGCC spill/release reports and found that 43 percent of all oil and gas related spills resulted in ground water contamination with chemicals like benzene, toluene, xylene, ethyl-benzene and many more in Weld County, Colorado.”

Shane Davis

Simply stated, once water has been used in fracking, it is no longer living water. It is dead, and it is lethal.

A biologist by training, his findings were confirmed by Colorado agencies in 2013. Shane explained, “Colorado’s largest aquifer was also contaminated by thermogenic methane and toluene in 2009. The aquifer was never cleaned, the oil and gas operator was fined \$46,200 and the public was never informed by the state about this atrocity. Citizens drank benzene

contaminated water, people's homes have abandoned oil and gas wells in their back yards and they do not know about them, homes have been built on top of abandoned wells which leaked gases that subsequently exploded and sent the occupants to the burn center. Billions and billions of gallons of toxic, endocrine disrupting chemicals have been discharged in Colorado's rivers, lands and airways for years with no end in sight...". An interesting question was asked by reporters Joel Dyer and Jefferson Dodge in the Boulder Weekly, "with more than 30 trillion gallons of toxic waste having been injected into the inner earth, what happens if our belief that what goes down can't come up is wrong"?

Airborne Contamination from Hydraulic Fracking:

According to the Bloomberg News, "on a percentage basis, more gas was flared in the state (North Dakota) than in any other domestic oil field and at a level equal to Russia and twice that in Nigeria". This has huge economic as well as health implications, which will very soon be reflected in policy changes.

To further explain, "every single day more than 100 million cubic feet of natural gas is flared away. That's enough to heat half a million homes. That's as much carbon dioxide emitted as 300,000 cars," Kandi Mossett, Ft Berthold Tribal member explains. There is twice as much flaring on the reservation as off the reservation. That's to say that the lack of infrastructure has been surpassed by the speed of extraction. Natural gas burned in flaring is a byproduct of crude oil. Without enough pipelines to transport the gas, at a state level, a third of what's released each day, worth \$1.4 million, goes up in smoke. Tribal members say as much as 70 percent of gas from wells on the reservation is flared. Ironically, this past winter, Debbie Dogskin in nearby Standing Rock reservation froze to death in the polar vortex and a nationwide propane shortage (in part caused by the oil industry's restructuring for tar sands oil), the Bakken flared gas rich in propane. Despite tribal concerns, companies are not investing in infrastructure.

This brings you to what we don't see. "These are called VOC's, or volatile organic compounds. , Kandi Mossett explains, "they, the companies, have generously put up signs for us, to tell us that the toxins are present in the air. What do we do? Just stop breathing, when we go by?" A Colorado School of Public Health study, by Dr. Lisa McKenzie found, airborne hydrocarbons near oil and gas facilities. Those include carcinogenic chemicals and endocrine disrupting chemicals being released one half mile away from the oil and gas facilities, at levels which would increase human cancer rates exponentially. Dr. Theo Colburn completed an air chemistry study which similarly found high levels of endocrine disrupting chemicals (EDC's) being released by the fracking industry. Those make you sterile, and a few other things. They are not to be trifled with.

Industry suggests minimal toxic emissions don't occur but studies indicate that between 2 and 100 tons per year per well pad are emitted into the air. That includes benzene, toluene, naphthalene, xylene, and many more. Those are largely invisible to the eye. But, they are not invisible to your body, nor an infrared camera. Davis began using some military infrared cameras to document the escaping gases. Those are pretty extensive, and can be viewed online, in a website called Fractivist.org.

Davis asserts "a huge portion of the chemicals used in the fracking industry are protected as trademark secrets. This becomes important because, if an active oil and gas well pad has an onsite issue, such as a blow out, or spraying chemicals in communities, or elsewhere, where there are animals or humans, the victims would not know the nature of the chemical contamination, and thus puts the patient and the doctor in jeopardy. If there is an issue with a well pad, the emergency response people do not know the chemical they are responding to, and consequently will not have the appropriate equipment for this response. Every operator has a different cocktail which they are using in that fluid, there are trade secrets they are using. A huge concern is that the burden of expense has been shifted to the general public to pay for the emergency response, and so the oil and gas industry does not have to really get involved." Stating the obvious, rural and tribal health facilities are not prepared, and the regulatory scenario will change soon, particularly as increasing concern is noted by public health officials.

As a national note, there is increasing concern by physicians on the lack of disclosure and regulation in fracking. This will only increase as the impacts increase.

From a statement by Physicians for Social Responsibility:

"Physicians for Social Responsibility (PSR) is focusing on the multiple threats to human health posed by the technologies and processes associated with hydraulic fracturing, also known as "hydrofracking" or "fracking," used to extract natural gas and other fossil fuels from underground formations. These threats to health include industrial scale water consumption and contamination; air pollution, particularly by volatile organic compounds (VOCs) and methane; seismic effects, and the generation and management of large quantities of toxic liquid waste. Long-term impacts on freshwater aquifers are a poorly understood potential threat to our limited drinking water supplies that requires a precautionary approach until impacts are known.

PSR supports a precautionary approach that includes a moratorium on the use of hydraulic fracturing until such time as impartial federal agencies such as the U.S. Environmental Protection Agency develop and implement enforceable rules that provide adequate protection for human health and the environment from fossil fuel extraction processes that use hydraulic

fracturing.

In order to achieve such protection, the oil and gas extraction industry must fully disclose the chemicals used in hydraulic fracturing, the amount of waste generated by their operations, and the waste management procedures utilized for disposing of those wastes. Furthermore, industry must promulgate and execute appropriate strategies to manage safely the threats to health that arise in the hydraulic fracturing process. The costs of such health-protective measures are the costs of this business and should not be paid by the general public..."

There is not a complete understanding of the impact of fracking in the Bakken because health and other outcomes can take years or decades to manifest. Since the boom in the Bakken, there has been an increase in drilling waste, water usage, and spills and leaks, many of which have gone unreported.¹¹⁴ A recent study from Duke University found widespread and persistent contamination from fracking, which will affect the area for millennia to come.¹¹⁵ Reports have shown that methane emissions are much larger than previously suspected, with 275,000 tons leaked annually.¹¹⁶ The third major greenhouse gas, ethane, is also on the rise (after a decades long decrease) specifically because of the oil boom Bakken, which is the third largest emitter of ethane on the planet.¹¹⁷ Communities and workers in the oil patch are being exposed to known carcinogens, endocrine disruptors and other toxic chemicals.¹¹⁸

Since 2006, extraction from the Bakken formation in ND has increased to more than 1.2 million barrels per day. Environmental regulations at the tribal and state level are significantly underdeveloped and under-enforced. An estimated 300 spills went entirely unreported in 2012 and 2013 alone.¹¹⁹ A pipeline rupture in January 2015 spilled 3 million gallons of saltwater drilling waste into the watersheds near Williston ND, spill contained heavy metals and radioactive materials.

¹¹⁴ http://serc.carleton.edu/NAGTWorkshops/health/case_studies/hydrofracking_w.html

¹¹⁵ "Brine Spills Associated with Unconventional Oil Development in North Dakota". Lauer, Nancy E., Harkness, Jennifer S., and Vengosh, Avner. *Environ. Sci. Technol.*

¹¹⁶ <http://phys.org/news/2016-05-bakken-oil-field-leaks-tons.html>

¹¹⁷

<https://www.minnpost.com/earth-journal/2016/05/bakken-wells-drove-sudden-reversal-global-decline-ethane-emissions>

¹¹⁸ <http://www.eesi.org/articles/view/new-research-documents-frackings-health-effects-on-workers-and-communities>, Colborn T, Kwiatkowski C, Schultz K and Bachran M. 2011. Natural Gas Operations from a Public Health Perspective. *Hum Eco Risk Asses: an Inter Jor*n. Available at: <http://www.tandfonline.com/doi/abs/10.1080/10807039.2011.605662#preview>

¹¹⁹ http://www.huffingtonpost.com/2013/10/28/pipeline-spills-north-dakota_n_4170133.html

The Bakken has 3.73 billion barrels of oil in it.¹²⁰ The US consumed 6.8 billion barrels in 2012, the Bakken represents 6 months of oil. That's not energy independence. The land, water, and bodies of the Mandan, Hidatsa, and Arikara tribes of rural ND are experiencing unprecedented and irreversible damage.

The man camps created by the fracking boom increase sex trafficking of women, girls, boys, and Native peoples are affected disproportionately.¹²¹ The same ethic that allows oil companies to feel entitled to desecrate sacred lands allows them to feel entitled to the bodies of our women and children.

"Violence against the earth begets violence against women."

- Melina Laboucan-Massimo (Lubicon Cree First Nation).

Assaults in Dickinson, North Dakota, are up 300 percent.¹²² Rapes in North Dakota alone increased 17 percent statewide from 2011 to 2012.¹²³ In 2012 the tribal police department of Fort Berthold reported more murders, fatal accidents, sexual assaults, domestic disputes, drug busts, gun threats, and human trafficking cases than any year before. This was in direct correlation to the population doubling with non-Native oil workers who were brought in to work on the Bakken oil fracking operations.¹²⁴ "Sexual assaults on the male population have increased by 75% in that area," said Former Rosebud Sioux Tribe Police Chief Grace Her Many Horses.¹²⁵ From March to May 2014, eleven men were charged with offering children for sex in Dickinson. Two individuals were arrested for prostituting immigrants out of a massage parlor in Minot. Two men were charged with the attempted sex trafficking of children in the Oil Patch.¹²⁶

Particularly in the Bakken, much of the trafficking reported involved both male and female minors. Bryan Lockerby, administrator of the state's Department of Criminal Investigation said statistics show 70 percent of female prostitutes were brought into the sex trade via illegal human trafficking, often as young teenagers and recruited by pimps.¹²⁷ Many Native women are forced into prostitution, or become victims of trafficking due to factors relating to intergenerational

¹²⁰ "USGS Releases New Oil and Gas Assessment for Bakken and Three Forks Formations" May 2013.

http://www.usgs.gov/blogs/features/usgs_top_story/usgs-releases-new-oil-and-gas-assessment-for-bakken-and-three-forks-formations/

¹²¹

http://www.fbi.gov/news/news_blog/human-trafficking-prevention-month-raises-awareness-of-enforcement-and-victim-assistance-efforts

¹²² http://www.bozeman-magpie.com/perspective-full-article.php?article_id=495

¹²³ http://www.huffingtonpost.com/georgianne-nienaber/man-camps-and-predator-ec_b_3700640.html

¹²⁴ Sierra Crane Murdoch, The Atlantic, "On Indian Land, Criminals Can Get Away With Almost Anything". Feb 22, 2013.

¹²⁵ <http://earthfirstjournal.org/newswire/2014/05/26/sexual-assault-in-the-bakken-shale-man-camps>

¹²⁶ Gilbertson, Lydia. Letter: End Human Trafficking Wherever It's Happening. *Bakken News*, May 23, 2014.

<http://bakken.com/news/id/182654/letter-end-human-trafficking-whenever-happening/>

¹²⁷ McLaughlin, Shaymus. "Rise in Sex Trafficking on Bakken Oil Patch Poses New Challenges." Minnesota Public Radio Interview with Bryan Lockerby, Administrator of the State's Department of Criminal Investigation. May 2014.

trauma and continued conditions of colonization.¹²⁸ As non-native oilfield workers flock to the local reservations of the Three Affiliated Tribes, they have been immune from prosecution by tribal governments. As one told the Atlantic, “You can do anything short of killing somebody.” In Williston, a single term catches both views: workers here overwhelmingly call this place ‘the Wild West.’

Tribal leaders said their police forces are underfunded, understaffed, and ill-equipped to combat the Mexican cartels that have infiltrated the region and are well-organized and armed with heavy weaponry, including machine guns.¹²⁹ 5,000 criminal cases were dismissed by the Ft Berthold Tribal Court judge because of an inadequate tribal court system, as there were not enough tribal prosecutors to prosecute the avalanche of criminal cases. Due to lack of jurisdiction, Tribal police have not been able to arrest the national or international drug rings operating within the Fort Berthold boundaries. Only 10% of law enforcement in the Bakken region have been trained to deal with sex trafficking.¹³⁰

August 2014, in response to this crisis, the Justice Department’s Office on Violence Against Women announced \$3 million in grants to address violence against women in rural and tribal communities in the Bakken region.¹³¹

The impacts of the sex trafficking boom in the Bakken oil fields are not limited to the local area. A 2009 report by the Minnesota Indian Women’s Resource Center showed that the Twin Ports of Duluth, Minnesota and Superior, Wisconsin, have played a role in cross-border human trafficking to feed the market for sex in the Bakken specifically.¹³² Many women come from the surrounding reservations or are smuggled across the border from Thunder Bay, Ontario. A 2013 report by the Minnesota Indian Women’s Sexual Assault Coalition was the first study to detail the personal experiences of Native women who have been prostituted and trafficked in Minnesota. Based on interviews with 105 Native women in Minneapolis, St. Paul, Duluth and Bemidji, it found that 98 percent were homeless at the time, 92 percent said they wanted to leave their situation immediately, and 62 percent saw a connection between prostitution and

¹²⁸

<http://indiancountrytodaymedianetwork.com/2012/01/17/minnesota-report-examines-sex-trafficking-native-women-72637>

¹²⁹ <http://www.tulalipnews.com/wp/2014/09/04/tester-begins-hearings-on-sex-trafficking-in-indian-country/>

¹³⁰ McLaughlin, Shaymus. “Rise in Sex Trafficking on Bakken Oil Patch Poses New Challenges, Minnesota Public Radio Interview with Bryan Lockerby, Administrator of the State’s Department of Criminal Investigation. May 2014.

¹³¹ <http://www.justice.gov/opa/speech/remarks-associate-attorney-general-antonio-acciaresi-four-corners-conference>

¹³² Alexandra Pierce. “Shattered Hearts: The Commercial Sexual Exploitation of American Indian Women and Girls in Minnesota.” Minnesota Indian Women’s Resource Center. 2009.

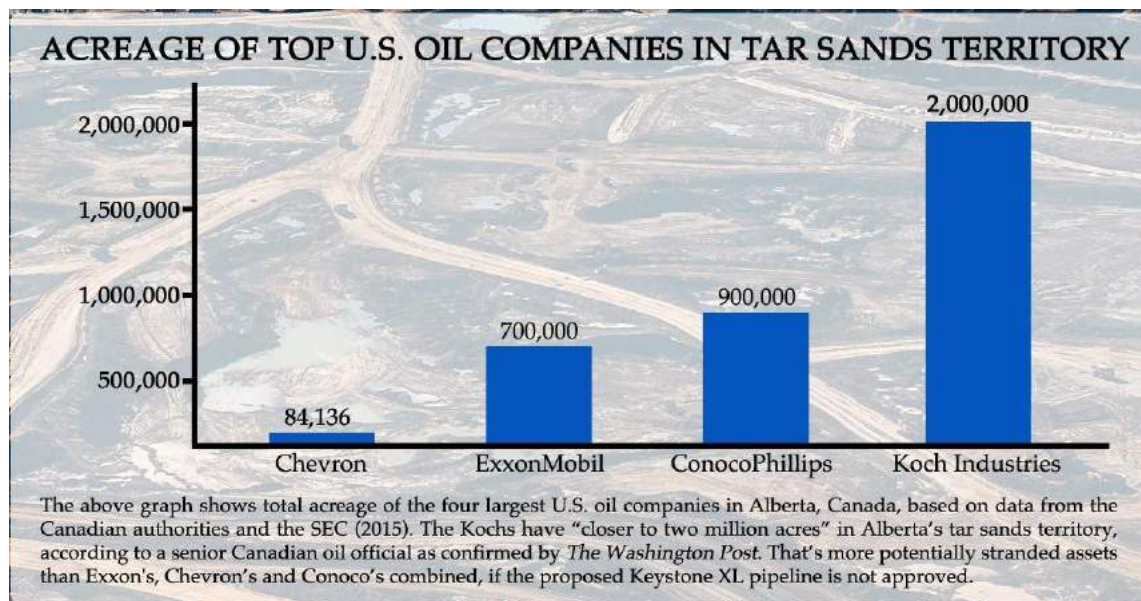
colonization, “and explained that the devaluation of women in prostitution was identical to the colonizing devaluation of Native people.”¹³³

The impacts also reach large metropolitan centers in the region. A landmark 2014 study of trafficking in Minneapolis found that 75 percent of juvenile trafficking cases in Minneapolis in 2013 involved Native American victims, although Native Americans make up only 2 percent of the city's population.¹³⁴ The largest percentage of buyers were white.

The Athabasca Oil Sands of Northeastern Alberta

The Cree, or Eeyou Aski, is a territory under attack by the tar sands industry. The Tar Sands are Big Oil's last big grab at profits. Referred to as the most polluting form of crude oil on the planet, the mining and upgrading process has destroyed millions of acres in the Canadian Boreal Forest.

Who wants the tar sands oil out of Canada and what do they expect to gain?



Koch Industries expect to double their wealth by selling and transporting this oil out Canada. It is assumed the biggest market for this oil is Asia. The current push for pipeline

¹³³ Minnesota Indian Women's Sexual Assault Coalition, and Prostitution Research and Education. “Garden of Truth: The Prostitution and Trafficking of Native Women in Minnesota.” October 2013.

¹³⁴ Martin & Pierce et al. (2014). “Mapping the Market for Sex with Trafficked Minor Girls in Minneapolis: Structures, Functions, and Patterns.” Full report: Preliminary Findings (available at aturoc.umn.edu/sextrafficking). September 2014

capacity is to facilitate this transport to Asia. The Koch Industries 2 million acres of tar sands lands translates to 101 billion barrels of oil. The profit on a sale of a barrel of oil was \$2.00 Koch Industries would make \$202 Billion. This amount of oil would release 51.7 million metric tons of carbon into the atmosphere with a total cost to remove this carbon at \$31 Trillion. This would translate to a cost for the world population of \$4,306.00 per person.

To further look at this system there is some 54,000 sq. miles of land that comprise these tar sands. These lands are inhabited by native people Cree and Dene, they hunt and live off the land. They will be totally displaced by the mining of the crude oil (bitumen). They bore a disproportionate amount burden of this development. Clearing 54,000 sq. miles of these people's lands is a gross injustice. The boreal forest ecosystem will take 1,000s of years to clean and reestablish itself.

Millions of acres of boreal forest have been destroyed by the tar sands industry. This ecologically important land is converted to toxic landscapes of barren land, and settling ponds. On the fringe of the tar sands fields are Indigenous communities that suffer from high cancer rates and other diseases. These communities also face threats in the form of sexual abuse and trafficking.

Oil sands are also one of the dirtiest fuel sources on the planet, and have caused leading scientists to call for a moratorium on further tar sands development, including infrastructure projects.¹³⁵ Over 100 scientists have signed on the call for a moratorium, all of whom are leaders in climate change research, economics, geophysicists and biology.¹³⁶ Some of the concerns they have highlighted include:

1. Environmental protections and baseline data lacking and existing regulations are not well enforced. Human and environmental health come 2nd to the expansion of the tar sands.
2. Persistent toxins from the tar sands development permeate the land, water and air of the Canadian boreal landscape. These chemicals are carcinogenic and toxic (e.g., heavy metals, polycyclic aromatic compounds). They reach the atmosphere from smokestacks and evaporation, and the groundwater from leaching of tailings ponds. This pollution harms terrestrial and aquatic ecosystems and the species within them.
3. Less than 0.2% of the area affected by Canadian oil sands mining has been reclaimed, and none restored to its original state (Government of Alberta 2014).
4. Development and transport of oil sands is inconsistent with the title and rights of many Aboriginal Peoples of North America. Rapid expansion of the oil sands in Canada violates or puts at risk nation-to-nation agreements with Aboriginal peoples.

¹³⁵ <http://www.oilsandsmoratorium.org/>

¹³⁶ <http://www.oilsandsmoratorium.org/wp-content/uploads/2015/06/Oil-Sands-Moratorium-Message.pdf>

In Alberta, oil sands mining is contributing to the degradation and erosion of treaty and constitutionally protected rights by disrupting ecological landscapes critical to the survival of Aboriginal culture, activities, livelihoods, and lifeways (Passelac-Ross and Potes 2007, Foote 2012, ACFN). In the US, proposed infrastructure projects threaten to undermine Treaty agreements between the federal government and Native American tribes (Mufson 2012, Hart 2014). In both countries, contamination of sacred lands and waters, disruption of cultural sites, lack of consultation, and long-term effects of climate change undermine sustainable social, ecological, and economic initiatives involving Aboriginal peoples across the continent and constitute violations of Native sovereignty (Passelac-Ross and Potes 2007, Foote 2012, Mufson 2012, Hart 2014, Irvine et al. 2014, McLachlan 2014, Wohlberg 2014, Athabasca Chipewyan First Nation, Tsleil-Wautath Nation).

Although the First Nation community of Canada is heavily impacted by this violence and sex trafficking, has little to no protection. The violence committed by employees of mega-project industries are causing displacement of women who must flee these communities. This has led to increased homelessness and violence in large cities such as Vancouver, a place "notorious for sexual assault and its high number of missing and murdered women"³.

"[A]ttention must be paid to the social ways in which industry and development are impacting the right to life, sexual rights and sexual health, and the right to live a life free of violence. Indigenous communities continue to articulate that the introduction of resource extractive industries, including mining, drilling, logging et cetera has resulted in increased sexual violence and sexual exploitation of Indigenous women and girls in many communities."¹³⁷

This tragedy is augmented by the continued murders and disappearance of Native women, particularly in Canada, where open cases of over 1,000 Indigenous women have disappeared or been murdered in the past decade.

Article 22 of the United Nations Declaration on the Rights of Indigenous Peoples states:

Particular attention shall be paid to the rights and special needs of indigenous elders, women, youth, children and persons with disabilities in the implementation of this Declaration. States shall take measures, in conjunction with indigenous peoples, to ensure that indigenous women and children enjoy the full protection and guarantees against all forms of violence and discrimination.

¹³⁷ Native Youth Sexual Health Network. (March 11, 2014). *Joint Statement on Environmental Violence and Reproductive Health in the 25th session of Human Rights Council*. <http://www.nativeyouthsexualhealth.com/march112014.pdf>

Enbridge and refinery companies such as Murphy Oil and BP clearly state that the tar sands projects are all connected, one necessitating the other. The pipelines have no reason to be built if the tar sands are not going to be refined and burned in the U.S. The refineries' planned expansions are not necessary without the pipeline delivering this new source of crude.

Social and Ecological Costs of Refinement

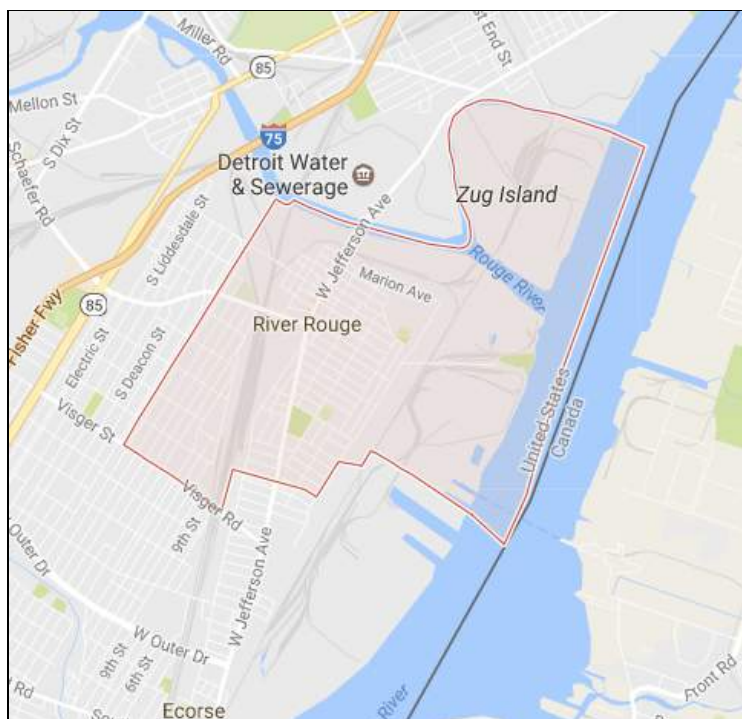
Marathon Detroit is located in zip code 48217, the most polluted in the state, where the Michigan Department of Health has documented consistently elevated rates of cancer, respiratory disease, heart disease, and kidney failure. According to data collected by Wayne State University between 2005 and 2012, asthma rates in 48217 have increased by over 2%. Emma Lockridge, a nearby resident, says “We don’t live next to the refinery, we live IN the refinery...it is just horrific. We are a sick community.” A reporter asked her what tar sands smell like, and she said “it smells like death. And that’s what it is.”



Not far from where Lockridge lives, in River Rouge, a city of approximately 7,000 that borders zip code 48217 to the east, the air is described by Zoe Schlanger, in *Newsweek's* March 2016 article, "Choking to Death In Detroit: Flint Isn't Michigan's Only Disaster," as having "the acrid stench of rotten eggs" and that "the smell acquired notes of burnt plastic and gasoline."

Within a 3-mile radius of River Rouge there are 52 sites of heavy industry, including Marathon Detroit. Schlanger reports that 22 of these sites "either produce over 25,000 pounds or handle more than 10,000 pounds of toxic chemical waste, putting them on the Environmental Protection Agency's Toxics Release Inventory Program." River Rouge and the surrounding area have long been "out of compliance" with federally established rules for sulfur dioxide (SO₂) emissions.

The Rouge River, a 127 mile river that passes through the industrial sector of Detroit, including 48217 and River Rouge, empties into the Detroit River at Zug Island. When the Rouge River caught fire in 1969, it was the most polluted river in the US. In 1975, as Fairlane Town Center was being constructed on its floodplain, the Army Corps of Engineers built a V-shaped concrete tunnel to prevent flooding. The construction of this tunnel has created more problems for the Rouge River's pollution levels, as Dustin Walsh's article in *Crain's Detroit Business* reports, "the impervious concrete surfaces prevent pollutants from being filtered by the adjacent plant life, exacerbating the river's existing pollution problem."



River Rouge, Zug Island, and the Rouge River (Google Maps)

While pollution levels in the Rouge River have decreased in recent years, due in part to the passage of the Clean Water Act in 1972 and the formation of Friends of the Rouge in 1986, the river continues to be used as a place to dump raw sewage and, according to Walsh, "smells of sulfur and other strong scents emanating from the factories lining its shores."

Today, clean up efforts by The Rouge River National Wet Weather Demonstration Project, implemented in 1992, are are

ongoing and the watershed is managed by The Alliance of Rouge Communities, an organization of governmental and non-governmental entities established in 2006.

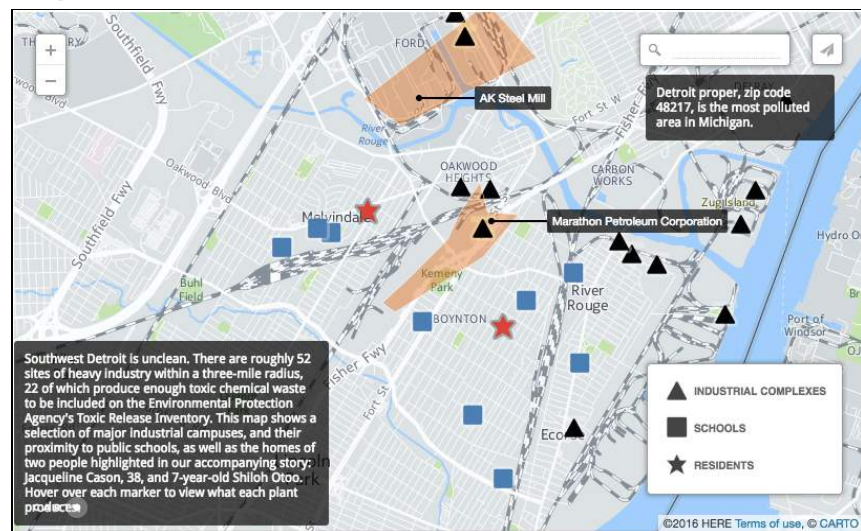
In 2012, Marathon Oil completed the \$2.2 billion Detroit Heavy Oil Upgrade Project (DHOUP) on its 81-year-old Detroit facility in order to process tar sands bitumen into oil. As a result, the refinery's crude oil capacity increased by 14,000 barrels per calendar day (bpcd) and its heavy crude oil processing capacity by 80,000 bpcd, with a total capacity to process 123,000 barrels per calendar day. In addition, petcoke, a high-carbon, high-sulfur byproduct of Marathon's refining process, is burned as a fuel source by Michigan's coal-fired power plants, including DTE Energy which is located just north of 48217. A 2009 study, commissioned by the Michigan Environmental Council, found that air pollution generated by Michigan's coal plants creates more than \$1 billion in health care costs and damages each year.

When the refinery switched from conventional oil to tar sands, Marathon bought the homes of approximately 275 people in the mostly white neighborhood of Oakwood Heights, which is not directly in the prevailing path of emissions, unlike the mostly black neighborhood of Boynton. Jim Lynch reports in a 2014 article, "Detroiters Left Out of Marathon Buyouts Feel Neglected" published in *The Detroit News*, that "in the 20 or so blocks of Boynton bounded by I-75, Pleasant Street, Schaefer Highway and Bassett Street" residents were not offered buyouts and, "Only a handful of homeowners here, roughly 10 whose homes are across a street from the plant, were given the chance to leave."

Marathon has left the people of color in Boynton to suffer, consistently denying their

requests for buyouts and emergency evacuation. In Lynch's article, Lockridge adds: "If a white community gets upset about something, people will respond and they will get a response . . . As a black community, we have never been able to get an attorney to represent anything we try to do in terms of getting after Marathon. They do not care." Furthermore,

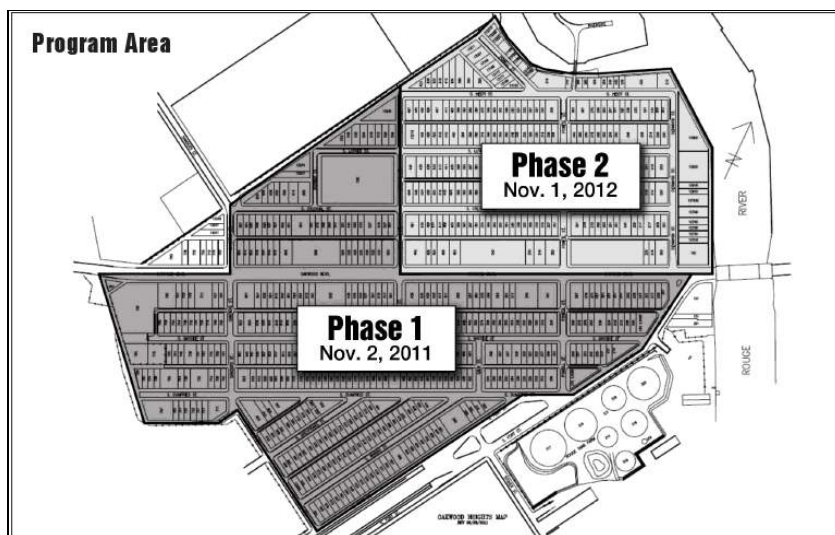
From "Choking to Death in Detroit: Flint isn't Michigan's Only Disaster" (Newsweek, 2016)



Schlanger reports that adults living in Detroit have a 29 percent higher rate of asthma and are hospitalized more frequently than adults located in other parts of Michigan, but “Being black ups the rate significantly: Black Detroiters are hospitalized for asthma at a rate more than 150 percent that of their white neighbors.”

According to Lynch, Boynton residents are “dealing with abandoned homes, increased crime and the odor, noise and dust that come with living near a refinery. Residents in both areas routinely complain of respiratory issues and high incidences of cancers.” Lockridge says: “There’s 10 empty houses on my block . . . people don’t even want the houses. We can’t even get squatters.” She says the message from Marathon and state regulators is clear: “Walk away or die . . . at the end of the day, they’re killing us.” There’s an orange and black soot on her white house, from the refinery discharge. “I have had kidney failure. Neighbor died of dialysis. Neighbor next door with dialysis. Neighbor across the street has kidney failure. The chemicals in our pipelines and are in our water will be the same chemicals that come through your land and can break and contaminate. We have cancer, we have autoimmune illnesses, we have MS, we have chemicals that have come up into our homes through the sewer. Those are from the companies, they end up in the public water and sewer system . . . They are poisoning us. When you step outside now, it feels as if you strike a match the air will explode. The chemicals come into our homes, come into our basements and we smell it all the time. Don’t let them put that pipeline here. I mean, it has always been bad, but not this bad,” says Emma Lockridge. “The air is just unbearable. It’s like living inside a refinery.”

Jorge Acevedo, a DEQ senior environmental engineer, told Lynch that “winds normally blow from west to east in this area, which carries Marathon's fumes and particulate matter toward this portion of Boynton.” Outside of Adrienne Crawford-Hill’s house, located one block from the Marathon refinery, Lynch reported: “the chemical smell in the air was overpowering.”



Marathon Phase 1 and 2 Buyout Map (*Curbed Detroit*, 2012)

Marathon recently put in a request for a controversial permit from the MI Department of Environmental Quality to increase emissions of at least eight air pollutants, including sulfur dioxide, in order to produce cleaner-burning vehicle fuel as required by new federal Tier 3 low-sulfur fuel standards that took effect in 2017. In addition to the 16.5 tons of sulfur dioxide that Marathon was already allowed to emit under an existing permit with the DEQ, the latest permit requested permission to emit an additional 22 tons of sulfur dioxide into the air.

In other words, the neighborhood of Boynton, as well as other communities located within the 48217 zip code, are further being sacrificed in order to reduce pollution elsewhere. Detroit Mayor Mike Duggan, speaking at a community meeting, was quoted in a CBS Detroit report: “You cannot raise the pollutant levels on a poor area and the most polluted to benefit everybody else,” as to do so would be “a civil rights violation.” In response to the permit request, Mayor Duggan also threatened a lawsuit against Marathon Detroit and a statement from a coalition of state senators was issued calling on the DEQ to reject it, comparing the situation to the poisoned water crisis in Flint.

Residents filed a class-action lawsuit against Marathon in US District Court on February 23, 2016. After holding meetings with residents and negotiating with both the city and the MI Department of Environmental Quality, Marathon voluntarily agreed to take measures to reduce their emissions. Moving forward, Marathon is “expected to reduce actual refinery emissions of sulfur dioxide by a ton per year; sulfuric acid mist emissions by 0.5 ton per year, and nitrogen oxide emissions by 6.6 tons per year,” according to Keith Matheny’s article in the Detroit Free Press, “DEQ approves Marathon Refinery Permit Lowering Emissions.”

Marathon’s voluntary emission reductions of sulfur dioxide, under the new permits, are enforceable by the MI DEQ. Matheny reported that Marathon Detroit “emitted 211 tons of the pollutant in 2014, but previously had approval to emit up to 400 tons per year.” In response, Mayor Duggan was quoted in a news release via Matheny’s article as saying that permit agreement was “very good news for the families who live near this refinery.” While Theresa Landrum, who lives blocks away from the Detroit Marathon refinery, responded: “I don’t consider this a victory; I consider this a first step.”

Global Impacts

Many of the principles of western science are based on a type of logic and mindset which require hierarchical thinking. Non-reciprocal causality, for instance, requires that one think of phenomena in the following way, according to Marayama as cited by Cajete:

*“That for every effect there is one single cause which can be objectively observed and described given the proper tools, the correct hypothesis and appropriate experimentation.’ Non reciprocal, or what has been popularly termed ‘linear thinking’ conditions for ‘mono-polarization’ in both thinking and personality development . ‘Mono explanation’ is defined as a ‘psychological need to believe that there is one universal truth, and to seek out, find secret in, and hang onto one authority, one theory , uniformity, homogeneity, and standardization’”.*¹³⁸

In TEK systems, there is a more holistic understanding of cause and effect. There is an understanding that cause A and effect B cannot be isolated from cause B and effect B in a system. This is known as “mutualistic logic” and “reciprocal causality”.¹³⁹ In practical terms, this is the difference between examining the increase of GHG from a pipeline project (by direct emission, replacement increases, etc) and examining the impact increased investment in fossil fuel infrastructure will have on future generations.

Global impacts from this and other fossil fuel projects include:

- climate change
- refugees
- opportunities forgone

A robust analysis is especially important for these the XL3 project as the Alberta tar sands are one of the most carbon-intensive fuels on the planet. Methane and ethane are greenhouse gases that also cause climate change and are being released through extraction activities in the Bakken. Reports have shown that methane emissions are much larger than previously suspected, with 275,000 tons leaked annually.¹⁴⁰ Ethane, is also on the rise (after a decades long decrease) specifically due to the Bakken oil boom, which is the third largest emitter of ethane on the planet.¹⁴¹

Pound for pound, the comparative impact of CH₄ (methane) on climate change is more than 25 times greater than CO₂ over a 100-year period.....Because gas is often

¹³⁸ Cajete, A. Gregory. Igniting the Sparkle: An Indigenous Science Education Model. Michigan: Kivaki Press, 1999.

¹³⁹ IBID.

¹⁴⁰ <http://phys.org/news/2016-05-bakken-oil-field-leaks-tons.html>

¹⁴¹

<https://www.minnpost.com/earth-journal/2016/05/bakken-wells-drove-sudden-reversal-global-decline-ethane-emissions>

found alongside petroleum, the production, refinement, transportation, and storage of crude oil is also a source of CH₄ emissions.¹⁴²

What happens in North America will set a precedent for efforts to reduce carbon pollution and address climate warming elsewhere. The choices we make about the oil sands will reverberate globally, as other countries decide whether or how to develop their own large unconventional oil deposits (Balouga 2012). Strong North American leadership is needed now, because the impacts of current decisions will be felt for decades and centuries. It is clear that the US and Canadian federal leadership is lacking. It is up to the Anishinaabeg and other Native Nations to fill this leadership vacuum.

Climate Change

Earth's climate have been observed over the past century with a global temperature increase of 1.5 degrees Fahrenheit between 1880 and 2012. This warming has coincided with increased level of GHGs in the atmosphere. In order for the Earth's heat and energy to remain at a steady state, the solar energy that is incoming must equal the energy that is radiated into space. GHGs contribute to trapping out-bound radiation within the stratosphere (the layer of the atmosphere closest to the Earth's surface), this is called the greenhouse effect. Beginning with the Industrial Revolution, the rate and amount of GHGs have increased as a direct result of human activity. The additional GHGs intensify the greenhouse effect, resulting in a greater amount of heat being trapped within the atmosphere. The Intergovernmental Panel on Climate Change (a group of 1,300 independent scientific experts from countries around the world) published their Fifth Assessment Report that concludes that global warming in the climate system is based on measured increases in temperature, decrease in snow cover, and rising sea levels. In recent years there has been a dramatic rise in wildfires, floods and other severe weather events. These weather events have a direct correlation to climate change.

Pipelines contribute significantly to the increase in GHGs through several mechanisms. They are, as follows:

- Emissions from extraction points, these include the methane and ethane emissions from the Bakken drill sites, the carbon released during mining the tar sands, other emissions associated with the mining and drilling activities
- Emissions from the construction activities, including any land clearing
- Emissions from the transportation, including electricity production for the pump stations and any other fugitive emissions
- Emissions from the refining process
- Emissions from combustion of the refined product

¹⁴² <https://www3.epa.gov/climatechange/ghgemissions/gases/ch4.html>

Methane flaring is when fracking has exposed poor infrastructure in the state, which leads drillers to burn or “flare” much of the gas that cannot be captured or shipped. In a single month of 2014, gas wells burned 10.3 billion cubic feet of natural gas. The burning released millions of metric tons of CO₂ into the atmosphere, contributing to climate change. In 2012, burned gas added 4.5 million metric tons of CO₂ to the atmosphere, which was roughly the equivalent of adding one million cars to U.S. highways. It has also been shown that methane leaking is much greater in the Bakken than previously reported, and that drilling in the Bakken has reversed a global decline in ethane emissions.¹⁴³

The tars sands present an even greater threat to the climate. The State Department’s SEIS for the Alberta Clipper found that carbon emissions from tar sands is 20% greater than conventional crude.¹⁴⁴ As an industry, the tar sands emits more greenhouse gases than the combined countries of New Zealand and Kenya. Burning all remaining tar sands could add 240 billion metric tons of carbon to the atmosphere. The amount recoverable by today’s technologies represents 22 billion metric tons of carbon. The mining and upgrading of tar sands can emit 79 to 116 kilograms of GHG per barrel. The higher end of this scale is for the steam assisted gravity drainage method of extraction. This process has become more prevalent than surface mining, leading the Pembina Institute to warn: *Emissions have doubled since 1990 and will double again by 2020*. The approval of new pipelines lock us into this carbon intensive fuel and delays investment in greener energy sources. During the refining process, more carbon is released as the long-chain hydrocarbons are cracked into the shorter chains used for gasoline, diesel, and jet fuel. The by product of this process, pet coke, is concentrated carbon, the use of which can emit 30% more CO₂ than the dirtiest coal. Between the US and Canadian refineries over 71 million metric tons are created annually.¹⁴⁵

Climate change is not an event in the future, climate change was 30 years ago, presently we are living in climate chaos. Globally experiences include unprecedented human conflict, natural disasters, and mass extinctions. A major contributor to climate change is the use of petroleum and petroleum byproducts.

Continued expansion of oil sands and similar unconventional fuels in Canada and beyond is incompatible with limiting climate warming to a level that society can handle without widespread harm.

¹⁴³ <http://phys.org/news/2016-05-bakken-oil-field-leaks-tons.html>
<https://www.minnpost.com/earth-journal/2016/05/bakken-wells-drove-sudden-reversal-global-decline-ethane-emissions>

¹⁴⁴ <https://insideclimatenews.org/news/04042017/tar-sands-greenhouse-gas-emissions-climate-change-key-stone-xl-pipeline-donald-trump-enbridge>

¹⁴⁵ <https://www.scientificamerican.com/article/tar-sands-and-keystone-xl-pipeline-impact-on-global-warming/>

Oil sands should be one of the first fuel sources we avoid using as society moves to non-polluting forms of energy, not the next carbon-intensive source we exploit. Extracting, refining, transporting, and burning oil-sands energy produces among the most greenhouse gases of any transport fuel per unit energy delivered (Brandt 2011, Gordon et al. 2015). Expansion of oil sands production will exacerbate the problem of carbon pollution and slow the transition to cleaner energy (Unruh 2000).

Controlling carbon pollution will not derail the economy. Most leading economists now agree that limits on carbon pollution – using mechanisms such as carbon taxes, cap-and-trade systems, or regulations – can facilitate a transition over several decades to low-emission energy without a dramatic reduction in global economic growth (Global Energy Assessment 2012, IPCC 2014, Nordhaus 2014).

Natural Disasters

At the time of writing this, one of the worst hurricane seasons on record is decimating islands and the American south. Wildfires have been raging across the American West, and an area of Greenland has recently burned. In the last two decades, North America has seen a dramatic increase in the number of wildfires and the total number of acres burning each year, as a result of climate change. In 2015, there were over 10 million acres burned by wildfire in the United States alone, approximately 67% more than the average for a given year.¹⁴⁶ According to the National Interagency Fire Center 9 of the 10 worst years for acres burned in the U.S. have occurred since 2000.¹⁴⁷ The IPCC determined this increase will continue to accelerate. Wildfires, which already burn more than 350 million hectares globally and cause an estimated 340,000 deaths annually, will double in number in the near future.

One of the recent drastic examples of these wildfires is the early May 2016 fires that destroyed most of the town of Ft. McMurry, Alberta. This inferno was only fully extinguished in August of 2017. The fire also destroyed tar sands industry infrastructure.¹⁴⁸ It caused significant air quality concerns all across the region and resulted in a significant

¹⁴⁶ <https://www.nifc.gov/fireInfo/nfn.htm>

¹⁴⁷ <http://www.usatoday.com/story/weather/2016/01/06/wildfires-burned-record-10-million-acres/78362786/>

¹⁴⁸

<http://www.wsj.com/articles/canada-wildfire-prompts-new-evacuation-of-oil-sands-workers-in-northern-alberta-1463473452>

decline of tar sands production.¹⁴⁹ Experts say fires such as these will be a continuing reality in our new global climate, and will also increase in intensity.¹⁵⁰

The estimated financial costs of climate change related disasters are high. According to Munich Re, the world's largest re-insurer, claim that by the year 2020, we will be spending 20% of world GDP on climate change related disasters. All of this means that investments into pipelines will be folly for investors. The financial stability of the Enbridge and other tar sand industries will be diminished significantly, however, Minnesota as the host site, and the Anishinaabeg as the keeper of these lands will retain responsibilities of these pipelines, overtime changing from assets to liabilities of major magnitude.

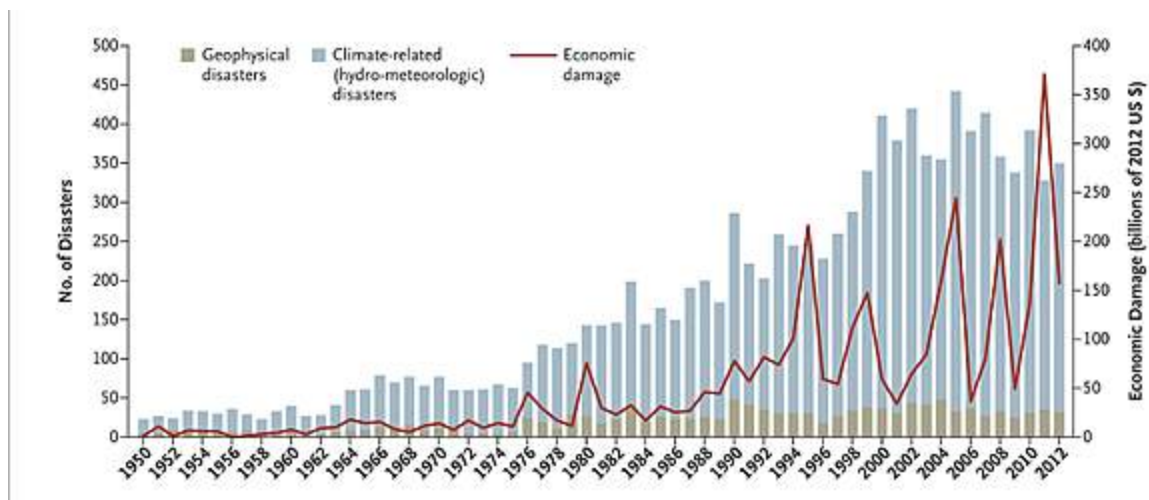


Image above courtesy of EM-DAT International Disaster Database, Center for Research on Epidemiology of Disasters, University of Louvain.

Climate Refugees

Climate refugees are people who must leave their homes and communities because of the effects of climate change and global warming.¹⁵¹ In 2013, there were an estimated 22 million people displaced by natural disaster.¹⁵² There is consensus that these numbers will continue to rise.¹⁵³

¹⁴⁹

<http://www.nytimes.com/2016/05/06/world/americas/canadian-wildfires-curtail-oil-sands-production.html?r=0>

¹⁵⁰ Toronto Globe and Mail February 19, 2012

¹⁵¹ <http://nationalgeographic.org/encyclopedia/climate-refugee/>

¹⁵²

<http://www.internal-displacement.org/publications/2014/global-estimates-2014-people-displaced-by-disasters/>

¹⁵³ <http://www.unhcr.org/pages/49e4a5096.html>

Indigenous peoples across the globe will be significantly impacted, and will soon become climate change refugees.

Kivalina

The northwestern Alaskan village of Kivalina is perched on a remote and narrow strip of sand next to the frigid waters of the Chukchi sea. Its 400 residents are Iñupiat. The U.S. Army Corps of Engineers predicts that Kivalina will be completely uninhabitable by 2025, a victim of melting ice, coastal erosion and rising sea levels. This village is just one of three Inuit settlements that scientists believe will be destroyed by the effects of climate change. At least eight more are at serious risk.¹⁵⁴

Isle de Jean Charles

The Band of Biloxi Chitimacha Choctaw tribe in Southern Louisiana has literally watched its land disappear out from under it. Long impacted by the oil and gas industry, the bayous of southern Louisiana are disappearing at an alarming rate.¹⁵⁵ This land loss is caused by three factors: 1) the US ACE's damming, leveeing, and otherwise altering the natural flow of the US's waterways, 2) the dredging of canals through the fragile wetlands for pipelines and other O&G infrastructure, and 3) increasing storm surges. The situation is aggravated by the fact that the Isle de Jean Charles Band of Biloxi Chitimacha Choctaw do not have federal recognition. Of the 16 tribes present in Louisiana, only four tribes — the Chitimacha, Choctaw, Coushatta and Tunica-Biloxi tribes — are federally recognized.¹⁵⁶

The First Nations of Manitoba

The Sioux Valley Dakota Nation, Lake St. Martin First Nation, Long Plain First Nation, Peguis First Nation, and Fisher River Cree Nation have all been facing flooding for years. The Lake St. Martin First Nation has now been displaced for over five years from a flooding event. These floods are linked to climate change and will only continue to worsen if we do not transition from fossil fuels.

Opportunities forgone

In the time of catastrophic climate change and environmental contamination, society must prepare and prevent additional harm, while working to establish sustainable infrastructure. According to Jim Hansen: *the world "could actually come in well under 2 degrees, if we make*

¹⁵⁴ New York Daily News July 30, 2013 Carolyn Kuruvilla

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<http://www.theguardian.com/environment/2016/mar/15/louisiana-isle-de-jean-charles-island-sea-level-resettlement>

¹⁵⁶ <http://www.shreveporttimes.com/story/news/2016/02/19/fight-federal-recognition/79643970/>

the price of fossil fuels honest.¹⁵⁷ That could be achieved by changing the market price of gasoline and other products derived from fossil fuels to reflect the enormous costs that burning those fuels currently externalized onto society. Economists have advocated achieving this by putting a rising fee or taxes on fossil fuels. This would give businesses, governments, and other consumers an incentive to shift to non-carbon fuels such as solar, wind, or geothermal, which would increase energy efficiency. Serving the public interest would be investment in urban public transportation, fuel efficiency, and the elimination of large, corrupt energy providers.

The U.S. energy system is extremely inefficient, wasting 61-86% of available energy.¹⁵⁸ The U.S. transportation system, with its heavy reliance on personal automobiles, powered by inefficient internal combustion engines is a perfect example of this. Not only are there more efficient ways to move people (mass transit, bicycles, walking) but there are more efficient engine designs.¹⁵⁹ The time is now to say no to more dirty oil infrastructure.

Energy Return on Investment

Energy Return on Investment (EROI) is a way to calculate the ratio between energy units used to produce energy, and the energy eventually utilized. The higher EROI means the more 'bang for your buck', meaning less energy was invested in the energy utilized. Globally, EROIs have been declining, as remaining fossil fuel resources have become harder to find and extract. Tar sands have been found to have an EROI of 4:1 to 7:1 (Lambert et al., 2012).¹⁶⁰ The various elements of EROI estimation are shown below.

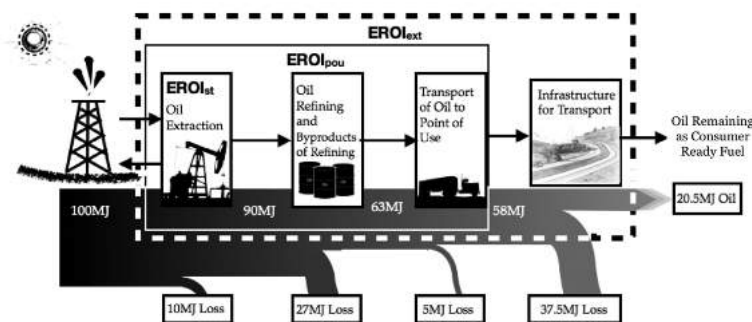


Fig. 1. Boundaries of various types of EROI analyses and energy loss associated with the processing of oil as it is transformed from "oil at the well-head" to consumer ready fuels (figure from Lambert and Lambert (in preparation) based on calculations by Hall et al. (2009)).

¹⁵⁷ HIGH TIDE 07.20.151:00 AM ET Climate Seer James Hansen Issues His Direst Forecast Yet
James Hansen's new study explodes conventional goals of climate diplomacy and warns of 10 feet of sea level rise before 2100. The good news is, we can fix it.

¹⁵⁸ <http://cleantechnica.com/2013/08/26/us-wastes-61-86-of-its-energy/>

¹⁵⁹ <https://www.fueleconomy.gov/feg/atv-ev.shtml>

¹⁶⁰ From C.A.S. Hall et al. EROI of different fuels and the implications for society. Energy Policy 64 (2014) 141–152

There is much difficulty in determining EROIs, as there is uncertainty around choices of systems boundaries (where do the calculations start and end). For example:

oil shale is only a minor net energy producer if one includes internal energy (energy in the shale that is used during the process) as an energy cost. The energy return on investment (EROI) for either of these methods is roughly 1.5:1 for the final fuel product. The inclusion or omission of internal energy is a critical question. If only external energy (energy diverted from the economy to produce the fuel) is considered, EROI appears to be much higher.¹⁶¹

Often these estimates do not include the energy required to remediate and restore extraction points.

Economic Impacts

Anishinaabeg on manoomin for nutritional, economic and spiritual sustenance, and for economic support. As noted, the proposed XL3 would run through the heart of the manoomin ecosystems and nearly bisects 1855 Treaty Areas. This area and the Tribal Cultural Properties it contains is a major repository of wealth for the Anishinaabeg people.

Enbridge claims the XL3 project will create thousands of jobs, generate hundreds of millions of dollars in tax revenue, and contribute billions to the GDP of Canada and the United States via direct, indirect, and induced benefits.

These estimated benefits are:

- Minnesota: \$34 million (2011)
- Wisconsin: \$26.2 million (2014)
- North Dakota: \$3.9 million (2014)
- U.S. total: \$64.1 million

Missing from their calculations are millions of dollars they are demanding back from several northern counties. Neither do these estimates include the loss of taxes counties face due to the abandonment of the existing Line 3. There is also not a comparison between the estimated benefit from abandonment in place vs removal. It is unclear These estimates do not include back taxes issues in MN (are there similar issues in WI or ND), or loss of tax revenue for counties facing abandonment.

¹⁶¹ From Energy Return on Investment (EROI) of Oil Shale Cutler J. Cleveland * and Peter A. O'Connor, Sustainability 2011, 3, 2307-2322; doi:10.3390/su3112307

Sources of “benefits” include employment opportunities and goods and services purchases to support construction and ongoing operations and suppliers of accommodation and food for workers.

Minnesota specific benefits include estimated 13,600 jobs, \$864 million in labor income, and total economic output of \$2.2 billion. That claim includes approximately 1,500 construction jobs. This calculations do not capture the impact to the Anishinaabeg through the loss of access to land, destruction of ecosystems, or mental anguish.

Insurance Issues

The State of Minnesota acknowledges that the risk of a pipeline failure would cause significant cost to the State. The MN Department of Commerce has arranged for expanded insurance, but ignores the needs of Tribal communities. This protection for the State of Minnesota makes no allowances for tribal communities already exposed to social, economic, and structural racism. There is, in fact, no insurance that could compensate these communities for the impacts of the XL3, as the loss of TCP is incalculable. In addition to the construction impacts and induced trauma, there is no way to recover lost manoomin in the case of a catastrophic spill.

Stranded Assets

Stranded assets must be included in costs, especially given the liability concerns of pipeline abandonment. Most major players in the Alberta Tar Sands have either delayed, put on hold, and some firms, such as Statoil, have pulled out of the tar sands altogether.

Stranded assets are defined as “assets that have suffered from unanticipated or premature write-downs, devaluations or conversion to liabilities”. According to the Stranded Assets Programme at the University of Oxford’s Smith School of Enterprise and the Environment, some of the environment-related risk factors that could result in stranded assets:

- Environmental challenges (e.g. climate change, natural capital degradation)
- Changing resource landscapes (e.g. shale gas abundance, phosphate scarcity)
- New government regulations (e.g. carbon pricing, air pollution regulation, carbon bubble)
- Falling clean technology costs (e.g. solar PV, onshore wind, electric vehicles)
- Evolving social norms (e.g. fossil fuel divestment campaign) and consumer behavior (e.g. certification schemes)
- Litigation (e.g. carbon liability) and changing statutory interpretations (e.g. fiduciary duty, disclosure requirements)

In the context of upstream energy production, the International Energy Agency (IEA) defines stranded assets as, ‘those investments which are made but which, at some time prior to the end of their economic life (as assumed at the investment decision point), are no longer able to earn an

economic return, as a result of changes in the market and regulatory environment.' The International Energy Agency and other financial and technical forums are recognizing the decarbonizing of the economy as a significant economic need for the upcoming years, and the present pipeline proposal will fall into this quagmire. The IEA has noted that “... *decarbonizing the economy will save \$71 trillion by 2050. Economic growth can be decoupled from emissions, while natural gas could lose ‘low carbon’ status by 2025 as renewables boom ...*”

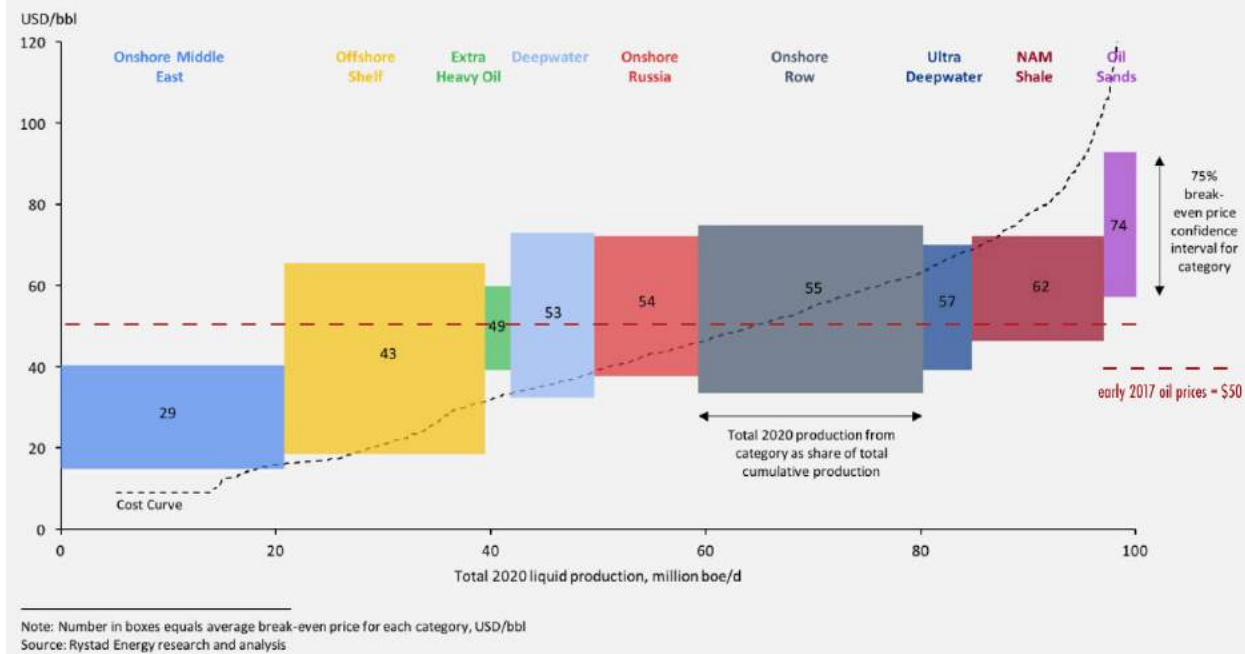
Because of high extraction costs and low oil prices, the mining of the Alberta Tar Sands is a rapidly dying industry. Many companies are withdrawing their investments. Those that remain are borrowing against future generations, taking on massive amounts of debt to pay false dividends to shareholders and prevent them from fleeing. Despite an overly optimistic industry forecast of increased production that justifies 1 new pipeline carrying tar sands out of Canada in the next 4-5 years, a total of 4 new pipelines are currently proposed. Every one of them must cross tribal lands, and every one of them faces bold resistance. At the same time, Enbridge's proposal to simply abandon its old, crumbling Line 3 pipeline risks setting dangerous precedent, and raises serious questions about who will be left holding the bill for this industry's slow painful death, toxic legacy and stranded assets. Now is the time for tribal governments to come together and take bold action to protect the natural and cultural resources future generations will depend on.

A Dying Industry:

Compared to conventional oil, tar sands crude is a lot more expensive to extract. New oil development in the tar sands costs over \$80/barrel(bbl). But since the end of 2014, oil prices have only ranged between \$30 and \$60/bbl, with current prices around \$50/bbl. So tar sands extraction is simply not economically viable in the long term. If gasoline prices don't return to \$3.00-\$3.50/gal (equivalent to crude oil at \$70-\$85/bbl), the oil industry will go bankrupt. And tar sands producers will go first.

Tar Sands are the Most Expensive Type of Oil to Produce

Supply Cost Interval by Category



As a result, major oil companies have been withdrawing investments from the tar sands steadily over the past two years. Many tar sands companies have gone bankrupt, and an early 2016 Deloitte report estimated that about one third of all oil producers were at risk of bankruptcy. The 3 largest in the US - Exxon, Chevron, and Conoco/Phillips - have posted dramatic declines in income, and dramatic increases in long-term debt.

These companies cannot keep piling up debt forever, and the price jump they need to stay afloat doesn't seem likely. Market demand is dropping in the United States, down 6% from a 2007 peak (and dropping rapidly in Minnesota, down 19% from a 2004 peak). The largest emerging markets in the world - India, China, Brazil, etc - are developing renewables and electric cars at accelerating rates. Meanwhile, working people continue to get relatively poorer, and many economists forecast an economic recession soon. All of these factors decrease demand, which in the short term keeps prices low. Also, OPEC producers can manipulate oil prices in order to maintain their market dominance by pricing out higher cost shale and tar sands producers.

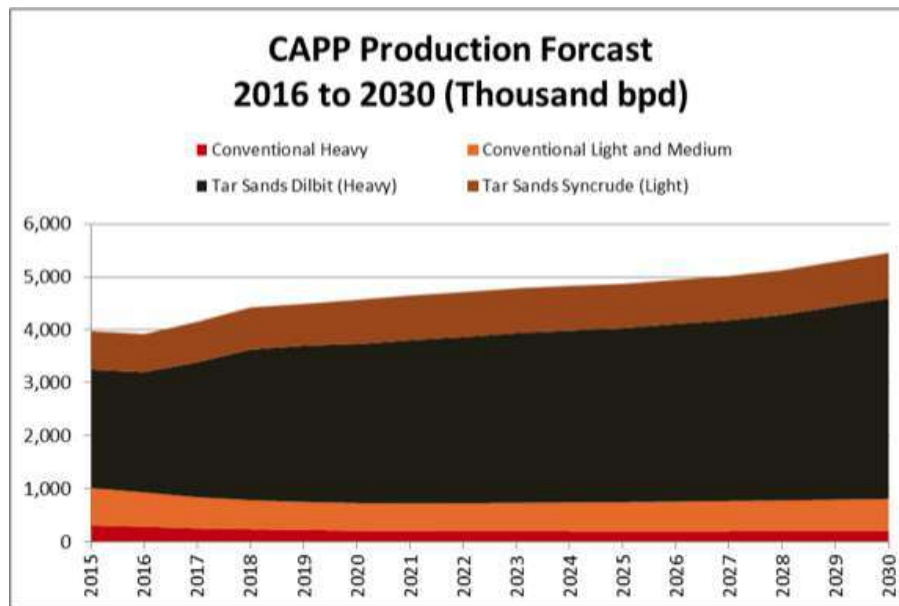
So if US demand is declining, then where is all this North American oil going? It's being exported overseas. The mining of the Alberta Tar Sands has nothing to do with energy independence. In fact, it was this steep rise in exports that flooded global markets with a glut of oil, which is part of what is keeping prices so low.

Despite the bad economics, four new pipelines are proposed to transport tar sands oil out of Canada by 2019-2020, with a total additional capacity of over 3.4 million barrels per day:

- Line 3 “Replacement” (Enbridge) – from 390,000 to 915,000 bpd
- Trans Mountain Expansion (Kinder Morgan) – from 300,000 to 900,000 bpd
- Keystone XL (TransCanada) – up to 900,000 bpd
- Energy East (TransCanada) – 1,200,000 bpd



However, the Canadian Association of Petroleum Producers forecast only a 644,000 barrel per day increase in production by 2020, a small fraction of the proposed 3.4 million bpd of additional pipeline capacity. This means that the customers for these projects themselves only see economic justification for one of these 4 proposed new pipelines, even after ignoring all the social and ecological costs. Indeed, Enbridge CEO Al Monaco has even admitted that only 2 of the pipelines are needed through the middle of the 2020s (the Trans Mountain Expansion is scheduled to start construction before Line 3).



Conclusions

Since the signing of the treaties with the US government, Anishinaabeg Akiing has gone through numerous changes. The policies of the US government has limited Anishinaabeg to their Traditional Cultural Properties. These same policies and actions are a major source of historic trauma for the Anishinaabeg contribute to contemporary health conditions. Manoomin, a sensitive aquatic plant the Anishinaabeg rely on for cultural identity, nutrition, and economic needs is further threatened by a number of industrial proposals. Manoomin is an integral part of the Anishinaabeg migration story and continued cultural existence.

The proposed XL3 would pass through and threaten a significant cultural and spiritual area. It would also follow the route of historic trade and migration routes, including a route used during the removal era. This route represents an important example of a major period of US history. It is clear Enbridge does not understand spiritual matters, as a company this is not their task, but employees and policy makers should have a grasp on respecting religious spaces in Minnesota. Threats of pipeline leaks aside, the construction is damaging to sacred landscapes. Additionally, Tribal members have different risk factors than commonly used by US State/Federal agencies. These same agencies have routinely neglected their trust/treaty responsibilities.

Through the Native American Graves Protection and Repatriation Act (NAGPRA), Congress has recognized the obligation of federal agencies to ensure the repatriation of Native American cultural items—human remains, funerary objects, sacred objects, and objects of cultural patrimony—to lineal descendants and culturally-affiliated tribes.¹⁶² If XL3 is built there is a level

¹⁶² 25 U.S.C. § 3001 et se

of certainty that these types of cultural items will be encountered, as they have during past construction projects in the area.¹⁶³ Only Anishinaabeg, in particular the Tribal Historic Preservation Officers have sufficient knowledge and expertise to identify areas likely to contain cultural items, and ability to identify burials, human remains, and other cultural resources once uncovered.¹⁶⁴ Even with adequate consultation the XL3 could result in the loss and obliteration of these culturally significant sites and burials. Plainly this pipeline project has the potential to destroy Anishinaabeg cemeteries. Unfortunately, Enbridge's process has not been adequate, as evidenced by the recent resignation letter of the DOC's Tribal Liaison Officer, Danielle Oxendine Molliver:

There are a multitude of reasons why I have come to this decision. The single most important one is the failure of the State of Minnesota to fulfill its obligations of good faith and fair dealing with the tribes in connection with the Line 3 Project. The State has failed to comply with its tribal consultation mandates, as put forth by Governor Dayton in Executive Order 13 10. The Executive Order obliges the State to meaningful and transparent consultation with Minnesota's eleven sovereign tribes...

The Department of Commerce has not fulfilled its public duty to act in a fair, genuine, professional, respectful, or transparent manner as required. Consistent with my liaison duties to advise management, I have provided expertise and attempted to work with Commerce to address these concerns. However, Commerce has not shown a willingness to address them.

The communities of Rice Lake and East Lake, which are most directly impacted by the preferred proposed pipeline route, are already at risk. These projects are placing significant additional stress on these communities, increasing health inequities and cause additional harm. Throughout this process, at public meetings and hearings, community members have become emotional while addressing the possible impacts of the XL3 project. In the case of East Lake, the community is facing not only the XL3, but also the proposed Tamarac Copper mine.

The Bureau of Indian Affairs and United States Environmental Protection Agency (US EPA) have unique responsibilities to protect tribal resources. Within US EPA there is an Indian Policy adopted in 1984. This Policy has developed into a series of Environmental Programs to support and protect tribal environments. This can occur either through primacy to the Tribal Government or direct implementation by EPA. One of those programs is the sole source aquifer program to protect Mille Lacs Reservation drinking water. It is believed that

¹⁶³ Weyaus Testimony at 146-47.

¹⁶⁴ Testimony of Charles Sam, Transcript at 150-51; Testimony of Commissioner Susan Klapel, Transcript at 150-152.

this aquifer extends up into the region of the proposed XL3 corridor.

The US Army Corps of Engineers also has a trust responsibility to protect tribal waters and resources. The priorities for the Corps is first to provide for navigable waters. The second priority is the protection of tribal trust resources, either developed through Treaties or acts of Congress. This would include manoomin. The Sandy Lake, Mississippi River and Rice Lake Refuge in Aitkin County are directly affected by this corridor and Corps has a unique obligation to protect this area against potential impact because of the Tribal Trust resources. This obligation is authorized under Executive Order, general laws of the United States, and internal legal review by the St. Paul District.

The federal government recognized the importance of Traditional Cultural Properties in this region and bought a series of manoomin camp sites throughout the 1855 ceded territory so that tribal people could continue to gather manoomin in this region. These campsites are still used today as tribal people can move from one manoomin bed to another. It was understood that using these sites were authorized under terms and agreement created by Treaties with the United States. The manoomin is a spiritual, culture food for the Anishinaabeg people and has provided a grain for a subsistence diet and economic wellbeing. This grain when eaten daily provides a gluten free dietary meal. The disruption of these manoomin beds or the pollution would have a significant impact on tribal health, welfare and life style. Surely, the manoomin beds and the culture they support are high consequence areas/unusually sensitive areas that require as much protection as a highway. Shifting risk to the Anishinaabeg is the exact definition of environmental injustice and will not be tolerated.

As Trump and his friends unroll their plans to make the US oil industry great again, in part by building pipelines that are not needed and likely will never be needed, it is critical that alternatives are clearly articulated. The global energy transformation is already upon us. There is increasing evidence that jobs in renewable energy and the restoration economy provide more jobs than the fossil fuel sector. With innovative design, the earth can be healed and jobs can be created. Tribal governments are uniquely positioned to help lead the graceful transition to a clean energy economy. Now is the time to take action to protect our future generations.