

Overview of Projects

While there are many projects that threaten the ROI, the two major projects this assessment will focus on are pipeline and mining proposals. The four major **projects** this assessment will focus on are; the Line 3 expansion project, the Line 3 abandonment project, the Polymet and Tamarack Copper, Nickel, and Platinum mining proposals. These **types** have other connected or induced projects that will also impact the ROI.

Enbridge Pipelines

Enbridge seeks to construct a new Line 3. The existing Line 3 is 1,098 miles, 34 inch diameter crude oil pipeline extending from Edmonton, Alberta to Superior, Wisconsin¹. Installed in the 1960s, existing and proposed Line 3 is an integral parts of Enbridge's Lakehead System. The current Line 3 runs along the HWY 2 Enbridge mainline corridor. This corridor currently has 6 active pipelines, the majority having been built in the 1960s. Over the years, these pipelines have developed cracks, pits, and other "integrity anomalies". The proposed new Line 3 consists of 1,031 miles, 36-inch diameter pipeline that would begin in Hardisty, Alberta and end in Superior, Wisconsin². The U.S. portion includes about 13 miles in North Dakota, 337 miles in Minnesota, and 14 Miles in Wisconsin. The Line 3 replacement project involves the abandonment of the existing Line 3 in place, which currently runs through treaty territories of the Red Lake, Leech Lake and Fond du Lac Bands of Ojibwe.

Nearly half of the 337 miles that would run through Minnesota is a greenfield development, following a route where no pipelines currently exist. This route would cross some of Minnesota's most pristine lakes, the headwaters of Mississippi River, numerous wetlands, tribal cultural areas, manoomin gathering areas, tribal communities, sacred sites, sacred landscapes, and unique ecological areas that include endangered species and other treaty resources. This route would follow the paths of numerous cultural significant trails and canoe routes, and threaten the Big Sandy Lake watershed, where hundreds of Anishinaabeg were starved to death in 1850. Regardless of the route chosen, the routing of a pipeline of this magnitude is associated with broader environmental impacts including the eventual release of carbon into the atmosphere.³

There are numerous other pipeline proposals including increasing the capacity of the Minnesota Pipeline Company Line 4 and Line 5. There has also recently been an increase in

¹ According to Enbridge's Pipeline System Configuration Schematic, Q1 2016.

² According to Enbridge's website:

<https://www.enbridge.com/projects-and-infrastructure/projects/line-3-replacement-program-canada> Last accessed 09/05/2017. Please note- despite the new line taking a longer route through Minnesota, the overall replacement line is shorter than the existing route.

³ See Winona LaDuke Testimony at 191-99; Testimony of Don Wedll, Transcript at 199-209.

Line 67 (the Alberta Clipper) and a potential project to reverse the flow and change the transported product of Line 13 (Southern Lights). The cumulative effects of these multiple pipeline proposals intensifies and magnifies the threat to natural resources throughout the northern treaty areas through pipeline construction, operation and potential upset condition.⁴

L3XL

The “Line 3 Replacement” project entails developing an entire new corridor through the heart of the northern treaty areas. This would also include the development of several more pumping stations, with an additional energy demands (load) on the local grid, and a few inter-connected transmission line projects (to handle the increased load). L3XL also ties into several other pipeline systems and feeds into various refineries. One related project, the Minnesota Pipeline, has also included the expansion of the Clearbrook terminal. Enbridge has also recently (planned?) expanded their Superior Terminal. The L3XL project also induces more tar sands expansion.

According to a recent stakeholders presentation, the Enbridge Mainline is the sole supplier for ~1.9 million bpd of refinery demand in the Midwest. They claim that the full capacity of Line 61 (Southern Access) will not come online until 2019, but our on-the-ground report indicate that the final Line 61 pump station is essentially finished. This presentation also claims that Line 61 “connects restored Line 3 volumes.” Enbridge may be treating the new WI pipeline as a twining of Line 61 and calling them the same thing as a way to obscure its intent to construct a new pipeline in WI.

They also boldly state that the Line 3 expansion project can come online in 2019, which assumes a MN PUC approval in June 2018, and a 1.5 year construction period.

Additional planned expansion projects beyond Line 3 include:

- System DRA (drag reducing agent) optimization: + 75,000 bpd
- BEP idle +100,000 bpd
- System Station Upgrades +100,000 bpd
- Line 4 Capacity Restoration +75,000 bpd
- Line 13 Reversal +150,000 bpd
- Total of all above projects +500,000 bpd

It appears that Enbridge has renamed a number of its future expansion projects to obscure what they are. It also appears that Enbridge intends to stop using Line 13 (Southern Lights) to move diluent to Canada and instead plans to use it to move tar sands crude to the US. In summation, Enbridge claims it can increase capacity on the Mainline by 500,000 bpd without its Line 3 Project.

⁴ Written Testimony of Paul Stolen, at p. 3.

Line 3 Abandonment

Daily over 2.5 million barrels of crude oil flow through MN in 8 oil pipelines, 4 of which belong to Enbridge's old Lakehead system. Built in the 50's - 60's using inferior manufacturing and installation processes, Line 3 is now corroding and weeping oil into the surrounding environment. This line was also installed before modern environmental regulations, and before Native Nations had the right to determine what occurred within reservation boundaries.

States, Tribes, and the Federal Government were not well informed of the risks due to the very few environmental regulations were in place. At many points, pipes were never buried, still sitting above ground, their protective coating (single wrap of Polyken 960-13 polyethylene tape with an adhesive backing) corroding and peeling off. This peeling has been shown over and over again to cause ruptures, such as the 2010 Kalamazoo rupture.⁵ This polyethylene tape was also documented in the Canadian Transportation Safety Board (CA TSB) incident report as a cause of the rupture that spilled near Hardisty, Alberta in 2001.⁶ Also documented as a major cause of corrosion on Enbridge's Line 9 pipeline, during their recent application to the TSB of Canada to reverse the direction of that line.⁷ Enbridge's spokesperson Lorraine Little has also cited polyethylene as the cause of the corrosion motivating Enbridge to propose abandonment of their existing Line 3 pipeline, so that they can build a new corridor.⁸ Allowing Enbridge to abandon Line 3 without a sufficient review process will set a dangerous precedent for future infrastructure projects.

In 2003, both the Minnesota Pollution Control Agency (MPCA) and the Minnesota Office of Pipeline Safety (MN OPS) wrote letters to the Pipeline and Hazardous Materials Safety Administration (PHMSA) stating their concern over Line 3. The MPCA's letter included these facts:

- MPCA has records of nearly three dozen non-third-party spills, leaks, or ruptures of Line 3 between 1972 and 2003
- About 87% of the pipeline petroleum spills in Minnesota in the period of 1991-2002 were from Line 3.
- About 48% of all petroleum spilled from all sources in Minnesota was from Line 3

Line 3 was responsible for the 1.7 million gallon spill in 1991 in Grand Rapids and the 2002 250,000 rupture in Cohasset. The Grand Rapids spill was between a college and an apartment building. But for incredible luck an inferno could have resulted. 300,000

⁵ <http://www.nts.gov/investigations/AccidentReports/Pages/PAR1201.aspx>

⁶ <http://www.bst-tsb.gc.ca/eng/rapports-reports/pipeline/2001/p01h0004/p01h0004.pdf>

⁷ http://www.landownerassociation.ca/rsrscs/OPLAFinalArgument_May24_2012.pdf

⁸ <http://www.startribune.com/enbridge-files-to-replace-problem-pipeline-in-minnesota/280528652/>

gallons of the Grand Rapids spill flowed to a river. Luck with the timing of the spill, as the river was iced over, kept hundreds of thousands of gallons of crude oil from entering the Mississippi River. Oil in the Mississippi would likely have fouled St. Cloud, St. Paul, and Minneapolis drinking water intakes for months. Likewise, the Cohasset spill could have easily entered the Mississippi River had it happened in a different segment of Line 3.

2007-2008, a focus group within Enbridge recommended that segments of Line 3 be replaced because of the high density of identified anomalies. At that time, the optimal maintenance approach was determined to be lowering the pressure on the pipeline in successive steps, which deferred the immediate need for pipeline replacement. In 2008, Line 3's capacity was 503,000 bpd of mixed service, and by 2010, it had been lowered to a capacity of 390,000 bpd of light crude oil.⁹ This lowered pressure maintained a safety factor on the line, deferred some of the maintenance work on the anomalies, and still allowed the pipeline to function, albeit at a much reduced rate.

Enbridge did a number of projections to determine costs of repairing the line in place vs. building an all new line in a new route. They estimated, in the U.S. alone, approximately 4,000 integrity digs over 15 years to maintain Line 3 at its reduced level of operation. Dig and repair costs were forecasted to exceed \$6 billion through the year 2026, and replacing the segments in the worst integrity condition would only lower the forecasted cost to \$4.3 billion. Further pressure reductions could not be implemented because the pipeline was already operating at the lowest operable pressures.

In testimony submitted to the MN PUC, they admitted that it may be possible to restore Line 3 to its original operating capacity if Enbridge invested nearly \$8 billion in repairs over the next 15 years in Canada and the U.S., with approximately \$2 billion in the U.S. alone. They further stated that this is not feasible as it would greatly impact the environment and landowners along the pipeline. Since the total estimated cost to replace Line 3 is \$7.5 billion (approximately \$2.1 billion for the U.S. portion), they determined an entirely new corridor would have a smaller impact on the environment and landowners.

One of the reasons Enbridge has given to prove the need for a new line 3 is the consent decree they have signed for the settlement of the CWA violation for the 2010 spill. Compliance with this decree will include more integrity digs and assessments. Enbridge has estimated that the expenses could be in the range of \$5 million to \$40 million per year in the U.S. starting in 2018. Additionally, they estimate an increase in operating expenses (mainly for ILI) of \$8.5 million per year in the U.S.

According to Enbridge's most recent publicly disclosed inspection records:

- Over 70 percent of the 140,000 pipe sections between welds (referred to as "pipe joints") are experiencing external corrosion;

⁹ Many of these pressure reductions were mandated because of the numerous spills on the line.

- Corrosion deeper than 50 percent of the pipe wall thickness would increase to affect over 3,000 of the pipe joints in 2016 – an increase from approximately 900 pipe joints in 2012; and
- Over 25,500 pipe joints will have a corrosion depth of 50 percent or greater by 2030 – an increase from approximately 18,000 pipe joints forecast for 2027
- Ten times as many corrosion anomalies per mile (with a depth of more than 20 percent of the pipe wall thickness) than any other Enbridge pipeline in the same corridor.
- SCC affecting over 15 percent of the pipe joints, and five times as many SCC anomalies per mile (with a depth of more than 10 percent of the pipe wall thickness) than any other Enbridge pipeline in the same corridor.

Line 3 in the U.S. was built in 1962/1963 with two characteristics that make this pipeline particularly susceptible to three integrity threats. First, on Line 3 in Minnesota, 84 percent of the coating is Polyethylene (“PE”) tape, which has been found to disbond from the pipe, making the pipeline more susceptible to both external corrosion and SCC. Second, 53 percent of the longitudinal welds are flash welded (“FW”), which was a pipe manufacturing process that has an inherently higher susceptibility to the formation of defects along the long seam of the pipe. Although not all FW pipe contain manufacturing defects, there are FW segments of Line 3 where the combination of these defects and internal pipeline pressure developed into long-seam cracking and contributed to some of the historical failures, including the 1991 1,700,000 gallon Grand Rapids Spill- the largest inland spill in U.S. history.

Their current plans do not include any removal of the existing pipes or restoration activities along the existing corridor. As mentioned above, this is not a single aging line in the corridor, and there will be other abandonments in the future. Additionally, when Enbridge does transition completely away from fossil fuels, there is the question of what will happen to this corridor at that time? Who is accountable, the company or the community? Enbridge’s calculations that a new corridor is more desirable than the re-use of the existing corridor should also be address and critically analyzed.

Line 3 currently has a Presidential Permit that allows for the transport of liquid hydrocarbons.¹⁰ The permit, first issued in 1968 and renewed in 1991, does not have an express limit on the amount of oil that can be transported, but the permit expressly says that “*no substantial change in the location of the United States facilities or in the operation authorized by this permit until such changes shall have been approved by the President of the United States.*”¹¹ The permit also expressly states that line is permitted for a width of 34-inches. Proposed Line three would include a change in diameter of the pipeline.

¹⁰ Office of the President of the United States . Presidential Permit Authorizing Lakehead Pipe Line Company . 1991

¹¹ Line 3 Presidential Permit, Issued Jan, 22, 1968 . [1991 PERMIT]

The new line will be 36 inches wide instead of 34 inches wide, with the exception of 17.4 mile stretch across the border. The replacement line would also follow a vastly different route than the current line, diverting from its historic course south of Clearbrook County to follow a new corridor. It would seem as though such a substantial operational change would require a new permit from the US State Department. Enbridge convinced the State Department that no review is needed and this major project is covered under the existing permit. The company did this with two points, first, Enbridge contends that its replacement and relocation of line is simply “maintenance.” Second, Enbridge argues that the permit only covers the border crossing, and, thus, the 34 inch limit only applies to the border crossing. So for the small border crossing segment, instead of laying the 36 inch pipe planned for the rest of the line, Enbridge has installed reinforced 34-inch pipe that can handle higher pressures and volumes of oil through the 17.4-mile stretch that spans the border.¹² The company has already replaced the border crossing section of the line with new pipe to allow for the Alberta Clipper double cross scheme.¹³ Neither the new line nor the existing Line 3 has ever undergone an environmental review under National Environmental Policy Act (NEPA).¹⁴ Tribal Nations and conservation groups have challenged the replacement of the border segment without any federal environmental review.¹⁵ Once the new line is built, Enbridge plans to decommission the existing Line 3 and abandon it underground. According to the company, the line will be purged of as much oil as possible, filled with nitrogen gas, and sealed.¹⁶ Through the public meeting process, many people have commented on the fact that there are rules and regulations that deal with underground storage tanks that should be applied to this abandoned pipeline (Minnesota statute Minnesota Statute § 103I.681¹⁷).

Enbridge has provided no guarantee of how long the line will remain structurally sound in once it is abandoned. In the Canadian Association of Energy Pipeline Landowner Association's (CAEPLA) summer 2016 magazine, there was an article about aging pipelines, what are the risks. And it's an article about independent research that is co-sponsored between Enbridge and CAEPLA.

*"Enbridge has acknowledged that the extensive disbonding of the Line 3 polyethylene tape pipe coating will render cathodic protection ineffective to prevent corrosion and has estimated time to through-wall penetration at **25 to 50 years.**"*

¹² Enbridge, Inc . Letter, Enbridge Energy, Limited Partnership, to North Dakota Public Service Commission . 2014 .

<https://www.sierraclub.org/sites/www.sierraclub.org/files/blog/2014-05-02%20Enbridge%20ND%20Segment%20Replacement.pdf>

¹³ Shaffer, D . Pipeline changes will send more Canadian oil into Minnesota . 2014

<http://www.startribune.com/pipeline-changes-will-send-more-canadian-oil-into-minnesota/272089211>

¹⁴ Day, J . Enbridge says Line 3 oil sands pipeline won't need new presidential permit . IHS Energy Blog . 2014

<http://blog.ihs.com/enbridge-says-line-3-oil-sands-pipeline-wont-need-new-presidential-permit>

¹⁵ White Earth Nation, et al . v . Kerry, Civ . No . 14 4726, Mem . Op . and Order at 15 . 2015 .

¹⁶ Enbridge Inc . Line 3 Pipeline Replacement Project . 2015

<http://www.enbridge.com/~media/www/Site%20Documents/Delivering%20Energy/Projects/US/2015-04 Pipeline Decommissioning 8 5X11.pdf?la=en>

¹⁷ <https://www.revisor.mn.gov/statutes/?id=103I.681>

"Progressively greater agricultural surface loads increase the potential for pipeline collapse and ground subsidence. In addition to health and safety concerns and related costs and liabilities, topsoil loss upon ground subsidence will result in permanent long term production losses."

According to the State's DEIS, the creation of a water conduit from the existing Line 3 would be prevented by "cathodic protection and cementing the pipeline". In appendix B, on page 26, it states:

"Line 3 is externally coated with polyethylene tape. A Gas Research Institute report published in 1992, provides information that, "The most common problem reported by the pipeline operators who had used tape coating on their pipeline systems were poor field application, failure of adhesive, poor resistance to soil stress and high susceptibility to shielding the current of the cathodic protection system."

The end of the second paragraph:

"Once the wrinkles form, water is able to seep under the disbonded coating and is carried along the pipeline's steel surface by capillary action. Permeation of the CP current is limited due to high dielectric strength of the polyethylene tape shielding the current."

In short, the DEIS notes, yet does not connect the fact that, the cathodic protection is already disbonding from the pipeline. Simply put- the main protection against the creation of water conduits isn't even functioning correctly current. How will this system work once the pipeline is abandoned when it is not even functioning now?

This appendix goes on to states on page 29: *"Based on this information, the worst case time to failure from the original installation is estimated at 51 years. Based on this, it would be assumed that the pipeline is already penetrated or is likely to be within the next five years considering an in-service date of 1968."* Now, it does say: *"This demonstrates the over-conservative nature of the corrosion rates presented in the PTAC Model when compared to the corrosion rates experienced on Line 3."* Based on the existing corrosion rates, what time frame are we looking at? "Figure 4.8, yields estimates of time to through wall penetration based on the PTAC Model between 25 to 50 years from 2011." So finally, after digging through all of that, we see that, yes, actually 25 to 50 years is how long we could have through wall corrosion because of the limited functioning of the cathodic protection system.

This will pose hazards to future users of affected land and would wreak havoc at water crossings, as a corroded abandoned pipeline can act a water conduit. Since federal law does not regulate pipelines once they are abandoned, Band could accumulate costs related to eventual removal of abandoned pipe and additional cleanup of oil leaks discovered after abandonment. The case is different in Canada, where abandonment is a much more regulated and expensive process for pipeline companies and some small sections of Line 3 are slated for removal and land restoration. Following Canada's lead could be one possible solution, policy and regulations that include restoration of land used for companies like Enbridge.

Existing Issues along the corridor:

Exposed Pipes:

There are numerous areas where the existing line 3 is exposed. Either because they were not properly buried, or they have worked their way to the surface due to frost heaving. In many cases, they are exposed at water crossings and in wetland areas. These exposed pipes are even visible from Google Earth. Fond du Lac Band members and employees raised concerns about these exposed pipes in MN PUC proceedings regarding Enbridge's pipeline route restoration practices in 2008,¹⁸ but to no avail.

Once abandoned, these exposed pipes can lead to many other issues. In the DEIS, it was stated that:

"Whether subsidence occurs, and the extent to which it occurs, depends on the structural integrity of the pipe and on the loads applied to the pipe that could cause it to deform and fail. In general, loads at the pipe level (underground) are less than live loads at the surface (like those from a heavy truck), because part of the load is shared with the surrounding soil. If there is a dearth of surrounding soil, or if the cover for the pipeline is relatively shallow, the pipeline bears more of the load and, all things being equal, is more likely to fail."

There is no indication of how the currently exposed pipes (or shallowly buried) may impact subsidence. In fact, Enbridge seems not be aware of the extent of the exposed lines, claiming that they:

"would monitor for exposed pipeline and, if found, would work with relevant agencies and authorities to develop site-specific mitigation measures, which could include removing a segment of pipeline, grouting, and continued monitoring."

In addition, it is acknowledged that pipes will rise in the ground without the heavy oil there is no effort made to graph per year or estimate what percentage of the pipes will become exposed. Will they experience an initial bump up in the soil and then gradually continue rising forever? Is there an expected date when most of the pipe will be exposed that isn't depressed by a road, railway, or added grout or aggregate.

Existing Spill/leak/weep sites

Many governmental reports and newspaper articles refer to Lines 3 and 4 as a single unit, which makes accurate aggregating spill amounts difficult. It is known that Enbridge has spilled over 7 million gallons of oil in Minnesota. This number may be even larger, as the data used to compile these numbers comes from PHMSA, and it is not clear if spill amounts from reservation lands is included in this data.

¹⁸ [concerns about these exposed pipes in MN Public Utilities Commission proceedings regarding Enbridge's pipeline route restoration practices in 2008](#)

Abandoning the pipeline in place allows Enbridge to avoid opening the ground and potentially uncovering unknown/unreported contamination. If Enbridge is not required to remove the pipeline and fully remediate any contaminated soil or water, there will never be accountability for contamination surrounding pipelines. This contamination would become the responsibility of the Band, the State, or nearby landowners.

Invasive Species

There are also reports that there are several places where invasive species have encroached on harvesting areas as a direct result of Right of Way (ROW) maintenance activities. If Enbridge is not required to restore the damaged ecosystems, who will be responsible for restoring these

Enbridge promises to maintain the pipelines in perpetuity, no infrastructure that is 50 + years is still in existence now without ongoing maintenance. In Canada, it has been determined that there is a very real risk that pipeline companies would not have money available forever and would eventually stop maintenance with the result that some landowner in the future would be stuck with a decaying pipeline causing drainage, subsidence, erosion and contamination, and no way to get the oil industry to pay for its mess.¹⁹ The Bands needs to develop a set of abandonment regulations to avoid passing on this incredible liability to our future generations.

Connected Transmission Line Projects.

The Line 3 expansion includes a number of new pumping stations. These pumping stations will often require new transmission lines for their electricity needs. These new lines will create new ROWs in the landscape, increase energy demand in the state and potential affect residential consumers' rates.

Why these projects are needed:

During a motor start, there is a large increase in current that will result in a larger voltage drop across the system. This means that there can be large momentary voltage drops system-wide. If the system does not have a strong enough voltage source, the motor itself may not start. Meanwhile, the rest of the customers served from the same 34.5 kV system will see suppressed voltages.

19

https://docs.neb-one.gc.ca/ll-eng/llisapi.dll/fetch/2000/90464/90552/92263/2404881/2545522/2955931/2949686/Volume_1_-_Our_Decisions_and_Recommendations_-_OH-001-2015_-_A4Z5U2.pdf?nodeid=2949922&vernum=-2



Bull Moose 115 kV Transmission Line²⁰

Who: Great River Energy (wholesale electric supplier to Crow Wing Power and 27 other electric cooperatives)

Size: 115 kilovolt (kV)

Where: Interconnect with an existing Minnesota Power 115 kV transmission line approximately 4-miles southwest of the City of Backus. From there the line would run northeast for one quarter-mile to the existing ± 250 kV Direct Current (DC) transmission line owned by Minnesota Power. The line would then run east for 2.25-miles, paralleling on the south side the DC Line. From there the line would turn north and cross under the DC line to terminate at the proposed pump station location just west of 48th Ave SW Backus, MN. (2.5 miles total)

Tie in to Line 3: Needed to provide electric power to a new petroleum pump station (Backus Station) being proposed by Enbridge. The Enbridge pump station is part of a pipeline replacement project that will require permits from the Minnesota Public Utilities Commission.

Palisade 115 kV Transmission Project

Who: Great River Energy

Size: 13-miles of new overhead 115 kilovolt (kV) transmission line and a new 115 kV breaker station

Location: run between Enbridge's proposed Palisade Pump Station, east of U.S. Highway 169 and south of 510th Lane, and a new Rice River Breaker Station, west of U.S. Highway 169 and south of 390th Street. The Project will connect to the existing Minnesota Power Cromwell to Riverton (the "13 Line") 115 kV transmission line.

Tie to the Line 3: To serve the proposed Enbridge Palisade pump station.

²⁰ http://greatriverenergy.com/wp-content/uploads/2016/01/Bull-Moose-fact-sheet_20160330.pdf

Deer River Transmission Project²¹

Who: Minnesota Power

Size: 0.3-mile double-circuit 230 kV High Voltage Transmission Line (HVTL), 0.9-miles of 115kV line to be restructured. The Existing Deer River 115/23 kV substation will be replaced with a new substation.

Location: One from the Boswell Substation near Cohasset, Minnesota, the other from the Cass Lake Substation near Cass Lake, Minnesota. The 0.9-miles of existing 115 kV HVTL proposed to be restructured and reconducted will extend south from the proposed substation location and then turn west and terminate near an existing industrial facility substation owned by Enbridge immediately south of US Hwy

Tie into Line 3: Needed to feed Enbridge Pipeline's Deer River Pumping Station

Clearbrook-Clearbrook West 115 kV Transmission Line²²

Who: Minnkota Power Cooperative, Inc. (Minnkota Power)

Size: 5.3-mile 115 kilovolt (kV) transmission line and a new 115/4.16 kV substation.

Location: This proposed project will start in Leon Township by tapping an existing 115 kV line and ending in Pine Lake Township at the new Clearbrook West Substation.

Tie into Line 3: Need for project was stated to be for a new pumping station needed for the Sandpiper project, and Minnkota has ostensibly withdrawn their application. However, they have also submitted a new application for a pumping station for the Minnesota Pipeline Project (covered later).

Other related pipelines

Minnesota PipeLine (MPL) Reliability Project

"The Minnesota Pipeline is a series of crude oil pipelines originating in Clearbrook, Minnesota, carrying tar sands crude to Koch's (Flint Hills) Pine Bend Refinery and Marathon Petroleum in the southern Twin Cities metro area. The pipeline is operated by Koch Pipeline Company L.P. The MinnCan Project is a current, large expansion of that capacity in order to carry tar sands crude to the Twin Cities refineries. Id. The Minnesota Pipeline system, including the new MinnCan pipeline, are fed by the Enbridge system where it comes into Clearbrook. Enbridge clearly induces and enables the MinnCan pipeline and increased refining in the Twin Cities area"²³

MPL Line 4 was originally designed with a capacity of approximately 350,000 barrels of crude oil per day, but it currently transports approximately 165,000 barrels per day. The MPL Reliability Project will add six pump stations to MPL Line 4 and upgrade two existing stations to allow the pipeline to operate at its original design capacity. The total volume of crude oil reaching the market is not expected to change significantly as a result of this Project.

²¹ <http://mn.gov/commerce/energyfacilities/Docket.html?Id=33156>

²² <http://mn.gov/commerce/energyfacilities/Docket.html?Id=33970>

²³ Janette K. Brimmer, the Legal Director of the Minnesota Center for Environmental Advocacy, comments on Line 67 expansion

The new pump stations will be located in rural areas along the MPL Line 4 route in Hubbard, Wadena, Morrison, Meeker, McLeod and Scott counties. The proposed pump station related to the Menahga Area 115 kV Project is the “Sebeka” pump station in Wadena County. The MPL System is operated and maintained by Koch Pipeline Company, L.P. The MPL Reliability Project is an estimated \$125 million private investment that will only 40 to 50 new construction jobs will be created as a result of the MPL Reliability Project.

Connected Transmission Lines

Minnkota Power Cooperation MPL-Laporte Project²⁴

Who: Minnkota Power Cooperative

Size: 115 kV HTVL, 9.4-miles, and new distribution station

Location: route and Substation site are located in Itasca Township in Clearwater County and Lake Hattie and Lake Alice Townships Hubbard County. The route originates in Section 12 of Township 144N, Range 36W in Itasca Township.

Hubbard County

MPL Tie-in: Will serve industrial load for new pumping station.

Menahga Area Project²⁵

Who: Great River Energy

Size: 115 kV upgrade of existing 34.5 kV system. Affects Blueberry Substation, Red Eye Substation.

Location:

MPL Tie-in: To serve the Sebeka pump station- will include three 4500 horsepower electric motors that would create an electric demand of 10 MW at full output.

Clearbrook and Superior Terminal Expansion projects

A crucial element in petroleum infrastructure are tank farms and terminals. These are locations where product (crude, natural gas, etc) can be stored, moved into other systems, or transferred to other transportation systems. In the ROI, the two biggest tank farms/terminals are the Clearbrook tank farm in Minnesota, and the Superior Terminal in Wisconsin. Both are owned by Enbridge. Both terminals/tank farms have been expanded either for the Alberta Clipper (Line 67), the MinnCann project or in anticipation of the new lines.

²⁴ <https://mn.gov/commerce/energyfacilities/Docket.html?Id=34468>

²⁵

<http://mn.gov/commerce/energyfacilities/documents/33985/Section%205,%20Project%20Need%20and%20Purpose.pdf>

<http://mn.gov/commerce/energyfacilities/Docket.html?Id=33985>

In Clearbrook, there is one more Enbridge line coming in than going out. Line 65 only runs from Cromer, ND to Clearbrook, MN. This line carries Bakken crude. Originated from this tank farm is the MPL system, running from Clearbrook to southern refineries by the Twin Cities. Clearbrook has been the site of many accidents, including an explosion in 2007. Enbridge is painted on the sides of the tanks, the farm is listed a crucial part of it's system, however, when permits for the most recent round of expansions were applied for, MPL was the company applying for the permits.²⁶ Why is MPL, as the "operator" of the terminal applying for the permits, and not Enbridge, the owner and main user of the terminal applying for the permits? Enbridge expansion plans are even mentioned in this application, including potential "Enbridge" Clearbrook Terminal expansions. There is only one terminal in Clearbrook. Why does MPL not recognize their Clearbrook is the same as Enbridge's Clearbrook?²⁷

This facility lays in between a stream and wetlands, and each expansion further threatens this area. There is a very real risk of spills, leaks, and fires at terminals/tank farms. Clearbrook has a history of accidents, and a negligent response plan (which basically entails letting a tank that has caught fire burn out). While unlikely at this location, a powerful flood can shift tanks off their foundations. This happened in New Orleans after Katrina- the Murphy Oil Spill- released over 8 million gallons of oil into the environment.²⁸

Enbridge brings 2.31 million barrels (97 million gallons) into its Superior terminal each day and pumps 1.87 million barrels out of Superior, WI. The difference, 438,600 barrels (18.4 million gallons) per day, goes to the Calumet or Plains Midstream facilities in Superior, or is stored in Enbridge tanks. The much larger Superior Terminal is much closer to a much larger body of water- Gitchi Gummi (Lake Superior) and the Nemadji River. This terminal has experienced a few issues, including the 2003 spill.²⁹ As a result of this spill, a reported 450 barrels (18,900 gallons) reached the Nemadji River. In 2012, the City of Duluth experienced a record setting flood, roads and bridges were washed out, zoo animals were killed and trees were uprooted. The total estimated cost ended up being \$100 million.³⁰ If this flooding had disturbed the Superior Terminal, what would the impact have been?

²⁶ <https://www.pca.state.mn.us/sites/default/files/p-ear2-69a.pdf>

²⁷ <http://www.startribune.com/a-river-of-oil-runs-through-small-minnesota-town/167441665/>
<http://www.startribune.com/clearbrook-terminal/167441655/>
<http://www.bemidjipioneer.com/news/local/3248306-crossroads-crude-clearbrook-terminal-key-compone-nt-enbridges-minnesota-plans>

²⁸ <https://www.facingsouth.org/2015/08/the-katrina-oil-spill-disaster-a-harbinger-for-the.html>

²⁹ <http://bulktransporter.com/archive/incident-wisconsin-terminal-spills-2500-barrels-crude-oil>

³⁰ <http://www.nytimes.com/2012/06/23/us/millions-in-damage-from-duluth-flooding.html?mcubz=3>

These are not the only terminals/tank farms in Enbridge's system. These include: Flanagan/Chicago, IL; Cushing, OK; and Houston/Port Arthur, TX. There are many other smaller terminals and tank farms, including a new one in Stockbridge, MI. This farm, started in 2014, has the capacity to handle about 70 million gallons crude. This farm was developed to support the flow of Line 6B (also know for it's 2010 rupture). The new tanks and pumps are a \$371 million investment in the plans to move crude from Canada and North Dakota to eight regional refineries, including one in Detroit and two in Toledo.³¹ This project ignored local zoning regulations, and resulted in a lawsuit by the Ingham Township.

"They made an offer," Township Clerk Mary Wilson said recently. "It was take it or leave it. It was not negotiable."

This is yet one more example of Enbridge trying to avoid local ordinances and government oversight by intimidation and through their much larger pocketbooks. This is also another example of how the piecemeal permitting project allows Enbridge (and other oil industry businesses) to undertake large expansion projects without federal oversight. It is important that the various First Nations across Turtle Island expand their collaboration on these issues, as they are the only government entities with a mandate to protect Mother Earth.

31

<http://www.lansingstatejournal.com/story/news/local/2015/09/25/enbridge-pipeline-tank-farm-expanding-stockbridge/72733860/>

Other projects outside the Northern Treaty Areas



Enbridge Great Lakes System Configuration

GXL

The L3XL is just one project in Enbridge’s system-wide expansion plans. As is the case with many for-profit corporation, Enbridge must continually grow to create profit for their shareholders. While numerous sources have indicated the fossil fuel economy is dying, including statements from Enbridge’s own CEO, Enbridge remain committed to expanding their pipeline empire. In Wisconsin, Enbridge has been expanding since 2006. At this time, they built Line 61, connecting the Superior, WI terminal to lines and refineries further south. This project was faced with opposition, as the route crosses undeveloped areas, and sacred effigy mounds.

Line 61 begins on the shore of Lake Superior, crosses the headwaters of the St. Croix River—a National Scenic and Wildlife River, southeast across the Wisconsin River, and the Rock River in Southern Wisconsin. These major waterways hold high value in the state, supporting fishing, providing drinking water, and contributing substantially to Wisconsin’s

\$18 billion tourism economy.³² Significant damage to any of these critical waterways could impair the health of the communities as well as Wisconsin's economy as a whole.

Much of Line 61 also crosses through Anishinabeg land, and further south, Ho-Chunk territory. This area is also home to numerous effigy mounds that are sacred to all the peoples of Turtle Island. These mounds are found across Turtle Island and tell the story of our ancestors travels across this land. When Enbridge routed Line 61, the neglected to notice that they were crossing right through a grouping of these mounds.

Despite community opposition and the impact to sacred landscapes, the Wisconsin Department of Natural Resources (WDNR) permitted the project. Once the project was underway, Enbridge demonstrated an alarming disregard for the environment. Violations of state environmental regulations designed to protect impacted waterways during construction of Line 61 resulted in one of the largest settlements for a wetlands and waterways case in Wisconsin history.³³ Ultimately, Enbridge was forced to pay \$1.1 million for over 100 violations across the state, prompting Attorney General J.B. Van Hollen to report that *"...the incidents of violation were numerous and widespread, and resulted in impacts to the streams and wetlands throughout the various watersheds."*³⁴

After the completion of the construction of Line 61, Enbridge announced plans to increase the capacity of the line, from 400,000 bpd to 1.2 million bpd. This is a constant tact of the pipeline industry, build a pipeline for a large capacity, but only utilize a small part of it initially. This achieves two things: 1) the initial application will often have the true capacity buried, making the project seem not as large as it is and 2) allow the company to get two expansions out of one project, artificially increasing their growth to their shareholders.

This planned increase was faced with public opposition, including an initiative in Dane County to require Enbridge to carry additional insurance on this line.³⁵ This expansion project would include building new pump stations. The efforts of Dane County were blocked by the state legislature, a blatant collusion between the state and Enbridge.³⁶

In the midst of the battle to prevent the expansion of Line 61, plans for a "twinning" of Line

³² Wisconsin Department of Tourism . Economic Impact .
<http://industry.travelwisconsin.com/research/economic-impact>

³³ Associated Press . Enbridge Energy to pay state \$1 .1 million for waterways violations during pipeline construction . 2009
<http://www.twincities.com/2009/01/02/enbridge-energy-to-pay-state-1-1-million-for-waterways-violations-during-pipeline-construction/>

³⁴ Ergquist, L . Pipeline builder to pay state \$1 .1 million for violations .2009
<http://www.jsonline.com/news/wisconsin/37009324.html>

³⁵

http://host.madison.com/wsj/news/local/environment/enbridge-pipeline-expansion-larger-than-keystone-drawing-some-dane-county/article_6e0902a9-cf15-5fcc-8bf6-81ce96f370ba.html last accessed 09/05/2017

³⁶ <https://wisconsinsafeenergy.org/more-information/line-61/>

61 started to surface.³⁷ This new project, Line 66, would also be 42-inches and vastly increase the amount of tar sands crude that Enbridge could transport. While Enbridge publicly denies these plans, their investor materials continue to include this new line.^{38 39}

LINE 9 AND PMPL

As Alberta (the source of the Canadian Tar Sands) is landlocked, companies must find a way to get their products to a coast and onto the world market. After losing the battle to reach the west coast, and nearly maxing out the capacity of the southern coast, Enbridge has turned to the east coast. In 2008, Enbridge and the Exxon-owned Portland Pipe Line Company proposed a plan to move tar sands oil from the Michigan/Ontario border to Portland, Maine. This project, dubbed “Trailbreaker” consisted of two parts: reversing Line 9 (an Enbridge line), and reversing the Portland/Montreal pipeline (an Exxon pipeline). Line 9 runs from Sarnia, Ontario (within Anishinaabeg Akiing) to Montreal. This line, initially installed in the 70’s first carried oil west to east, but was switched to flow east to west to carry cheaper foreign oil. Now, with lower prices for tar sands oil, it has been switched once again.⁴⁰

This project faced (and continues to face) opposition in both Canada and the United States. In Canada, the Chippewa of the Thames brought a lawsuit to stop the project. The pipeline runs through their traditional territory and they weren’t consulted when the pipeline was first approved, nor when the reversal was approved.⁴¹ This lawsuit resulted in several solidarity demonstrations, yet the Canadian Supreme Court ruled against the First Nation.⁴² These demonstrations included several pipeline walks and valve closures.⁴³

Line 9 is also exposed where it crosses the Rouge River in Toronto’s Rouge Park.⁴⁴

³⁷

http://host.madison.com/news/local/environment/enbridge-mapping-possible-twin-of-major-tar-sands-line-through/article_92474239-5df3-5042-946c-3ffbf528fb09.html

³⁸ Enbridge First Quarter 2015 Financial & Strategic Update, Page 17 . 2015

http://www.enbridge.com/~/_media/www/Site%20Documents/Investor%20Relations/2015/2015_Q1_ENB_Presentation.pdf

³⁹ Verburg, S . Enbridge mapping possible ‘twin’ of major tar sands line through Wisconsin . Wisconsin State Journal . 2015

http://host.madison.com/wsj/news/local/environment/enbridge-mapping-possible-twin-of-major-tar-sands-line-through/article_92474239-5df3-5042-946c-3ffbf528fb09.html

⁴⁰ <http://www.enbridge.com/ECRAI.aspx>

⁴¹ <http://www.cbc.ca/news/canada/london/chippewas-line9-court-ruling-1.4219737>

⁴²

<http://kitchener.ctvnews.ca/green-light-for-line-9-reversal-supreme-court-says-indigenous-communities-consulted-1.3519588>

⁴³ <http://globalnews.ca/news/3134386/montrealers-demonstrate-against-enbridge-line-9-pipeline/>
<https://www.therecord.com/news-story/6218473-pipeline-sabotage-someone-tampered-with-valve-on-enbridge-fuel-pipeline-near-cambridge/>

⁴⁴

<http://grandrivermc.ca/content/daily-grrr-august-4-2014-%E2%80%9Cmonday-morning-edition%E2%80%9D>

In the US, the plan faced opposition along the entire length of the Portland-Montreal Pipeline. However, the US State Department once again sided with Enbridge, claiming that reversing the line and converting the system to tar sands crude did not require a new permit or environmental review.⁴⁵ In Maine, after substantial community organizing, in 2014, the City of South Portland, passed a “Clear Sky” ordinance that would effectively block the reversal project. This ordinance has since been challenged, and is still in the courts.⁴⁶

Mining

The US government has never claimed to hold or control Anishinaabeg land “by right of conquest”. Rather it claims to have legally acquired Anishinaabeg and other lands by mutual agreement. Some of the first incursions on to Anishinaabeg land were to secure access to iron and copper deposits. By 1800, representative of both the Queen of England and the emerging US had “discovered” a 2500 pound boulder of naturally occurring copper called the “Ontonogan Boulder” resting on the south shore of Lake superior in Anishinaabeg territory, in what is now known as the Kewanee Peninsula. In the 1820s, the federal government had decided to do a comprehensive study of the “mineral assets” of the Lake Superior area and study of Indian title to the land therein. Within a very short period, four treaties were signed, each providing for access to and mining in Anishinaabeg territory. These treaties covered both the Kewanee Peninsula and the Mesabi “Sleeping Giant” iron ore belt in northern Minnesota.

By mid century, more than 100 copper companies had been incorporated in Minnesota , Wisconsin and Michigan territories. As early as 1849, copper production at Kewanee Peninsula ceded by the Anishinaabeg in the treaty of 1842, led the world. Similarly beginning in 1890 and continuing for nearly fifty years, mining at Mesabi accounted for 75 percent of all US iron ore production.

Mining, and mining proposals continue today, representing a major impact on Anishinaabe Akiing. While there are numerous existing mines (and types of mines) in the ROI, the projects covered in this document are the PolyMet and Tamarack sulfide mine projects. Both these mines are in the proposal phase and are attempting to get at copper and platinum group elements. At both these locations, the metals and elements are found with sulfuric rocks, often in small quantities. This results in large amount of rock needing to be removed to get at the valuable metals/elements. These processes also result in a large amount of waste water, which is stored in “tailing ponds”. These ponds often have life-spans that vastly exceed the life of the mine.

A major stumbling block to the further development of the mining industry has been the

⁴⁵ Gallogly, S. J . Letter from Stephen J . Gallogly, Director, Office of International Energy and Commodities, U .S . Dep’t of State to David H . Coburn, Esq ., and Sara Beth Watson, Esq ., Steptoe & Johnson, LLP .2008

⁴⁶

<http://www.pressherald.com/2017/08/25/federal-judge-validates-pipelines-plan-to-reverse-flow-to-south-portland/>

state's sulfide standards. These standards are in place to protect manoomin and as they stand, would not allow the mining proposals to move forward.

PolyMet

PolyMet Mining's North Met Mine, located between Babbitt and Hoyt Lakes, is the first of what may become many sulfide mine proposals. The majority stakeholder is multinational mining giant Glencore International (Glencore). This proposed copper mine will involve the transfer of some public 6,700 acres under an act being forwarded by MN Senator Amy Klobuchar called the Superior National Forest Land Adjustment Act. The U.S. Forest Service owns the surface rights to the land, but not the mineral rights. The underlying purpose of this bill would be to benefit the mining company by eluding steps in the standard land exchange process which includes public comment and environmental review.⁴⁷

PolyMet is a microcosm of the inefficiency of the mining proposals of the Great Lakes region. Glencore, the \$155 billion multi-national corporation that is PolyMet's primary investor and joint venturer is notorious for illegal dealings with rogue states (Iraq, Zambia), along with financial manipulation to evade local taxes, human rights and labor violations, and pollution from mines and smelters worldwide.

"Glencore is perhaps most well known for two specific past business relationships. First, it was implicated in the infamous Oil-for-Food scandal that involved the payment of kickbacks to Saddam Hussein's regime."⁴⁸ In response to the scandal, the United Nations authorized Paul Volcker to chair an independent Commission to investigate the matter. The Independent Inquiry Committee's report concluded that Glencore was one of the top four financiers of Iraqi oil, contracting for over \$243,000,000⁴⁹Glencore's Mopani copper mine in Zambia, Africa has created both economic and environmental risks to its host community.....In 2008 and 2009 over 1,000 jobs were cut at the Mopani mine when Mopani froze operations due to global fluctuations in the price of copper. The price, however, was still over \$2,000 a ton—higher than when the mine was opened."

(Richardson, 2011).⁵⁰

⁴⁷ <http://www.sosbluewater.org/oberstar.htm>

⁴⁸ See, Independent Inquiry into the United Nations Oil-for-Food Programme, Manipulation of the Oil-for-Food Programme by the Iraqi Regime, 3 (2005), <http://www.iic-offp.org/documents/Final%20Report%2027Oct05/IIC%20Final%20Report%20-%20Chapter%20One.pdf> (last visited Feb. 11, 2011)

⁴⁹ Independent Inquiry into the United Nations Oil-for-Food Programme, Oil Sales Summary by Contracting Company and Contract, 19 (2005), <http://www.iic-offp.org/documents/CommitteeTables27oct05/Table%202%20-%20Committee%20oil%20company%20table.pdf> (last visited Feb. 11, 2011)

⁵⁰ http://waterlegacy.org/Glencore_PolyMet_Report

Glencore owns the rights to all production from the PolyMet sulfide mine and plant for at least the first five years of operations. Their market: As a condition with its 2013 merger with the Xstrata mining company, Glencore must continue to supply China with copper concentrate for the next eight years.⁵¹

Energy Demands

Polymet's website says it estimates the NorthMet Project ore reserve at 694 million tons grading .074 copper equivalent.⁵² Copper mining is the most inefficient product to produce from a big dig, recovery ratio for copper is 0.16%, much smaller than the average for other metals (4.5%). In other words, you need to remove 1,000,000,000 tons of material to recover 1.6 tons of copper. The only substance with a lower recovery rate is gold.

Metals mining consumes more energy than both coal and mineral mining, also between the three is the least efficient.⁵³ The energy needed for this massive mine would come from Minnesota Power (MP). The vast majority of their electricity comes from coal-fired power plants. This has a number of implications which are not discussed in the Polymet Environmental Impact Statement.

Minnesota Power burns coal at five coal-fired power plants:

- 1) Boswell Energy Center
- 2) Laskin Energy Center
- 3) Hibbard Renewable Energy Center
- 4) Rapids Energy Center
- 5) Taconite Harbor Energy Center

These coal-fired power plants installed their first units from the years 1917-1958, which makes the power plants 55 years and older.

Minnesota Power has nine large customer contracts, each serving requirements of 10 megawatts (MW) or more of customer load. These industrial consumers are primarily in taconite mining, iron concentrate, paper/pulp/wood products, and pipeline industries. (2012 10-K Form).

Arcelor Mittal - Minorca Mine	USS Corporation	UPM, Blandin Paper Mill
-------------------------------	-----------------	-------------------------

⁵¹ “Glencore Wins China’s Blessing for Its \$30 Billion Takeover of Xstrata,” New York Times (Apr. 16, 2013))

⁵² <http://www.polymetmining.com/northmet-project/overview/>

⁵³ Mining industry energy bandwidth study. Prepared by BCS Incorporated; US Dept of Energy, Industrial Technologies Program. June 2007

Hibbing Taconite Co.	Mesabi Nugget	New Page Corporation-Duluth Mill
United Taconite	Boise White Paper LLC	Sappi Cloquet LLC

Coal consumption in 2012, for electric generation at Minnesota Power’s coal-fired generating stations, was approximately 4.6 million tons. The present coal generating facilities are not only aging they are polluting. The coal generation which occurs for the benefit of these large consumers comes from coal elsewhere, which has further environmental, social, economic and health implications. Minnesota Power spends more than \$20 billion importing coal from out-of-state (Conservation Minnesota). As of December 31, 2012, Minnesota Power had a coal inventory of 0.8 million tons. Minnesota Power’s primary coal supply agreements have expiration dates through 2015. (2012 10-K form).

The potential expansion of mining in the region will result in an increase in energy generation demands on Minnesota Power, these demands will have environmental implications. Minnesota Power’s coal-fired generating facilities serving the Iron Range region, produce carbon, mercury and a slew of additional pollutants. Many of these, particularly mercury end up in shared waterways and have will dire consequences on health of shared ecosystems.

Great Northern Transmission Line⁵⁴

Who: Minnesota Power

Source: Manitoba Hydro

Size: 500 kV

Where: From the Minnesota-Manitoba border to the Blackberry 500 kV Substation near Grand Rapids, Minnesota, as well as associated substation facilities and transmission system modifications at the existing Blackberry 500 kV Substation site.

DOE documents suggest that, “...the average copper mine (600 million ton deposit handling 68,493 tons/day) consumes 4,701,000,000 Btu/day.” This suggests that NorthMet Mine would consume 47.63 trillion Btu over the course of its lifetime (694,000,000 tons/68,493 tons per day= 10,132 days x 4,701,000,000 Btu= 47,632,517,191,538 Btu= ~47.63 Trillion Btu).

“Efficiencies in handling more material per day are likely to have been created since then, meaning more than 68,493 tons/day are handled, but this could be offset by

⁵⁴ From: <http://www.greatnortherneis.org/>

either increased energy efficiency or just shorter mine life (i.e. the estimated 20 years mine life as opposed to the above quickly calculated estimate of 10,132 days/365 days per year= ~28 years)..."

(Colin Cureton, Interview 2014)

Tamarack Mine

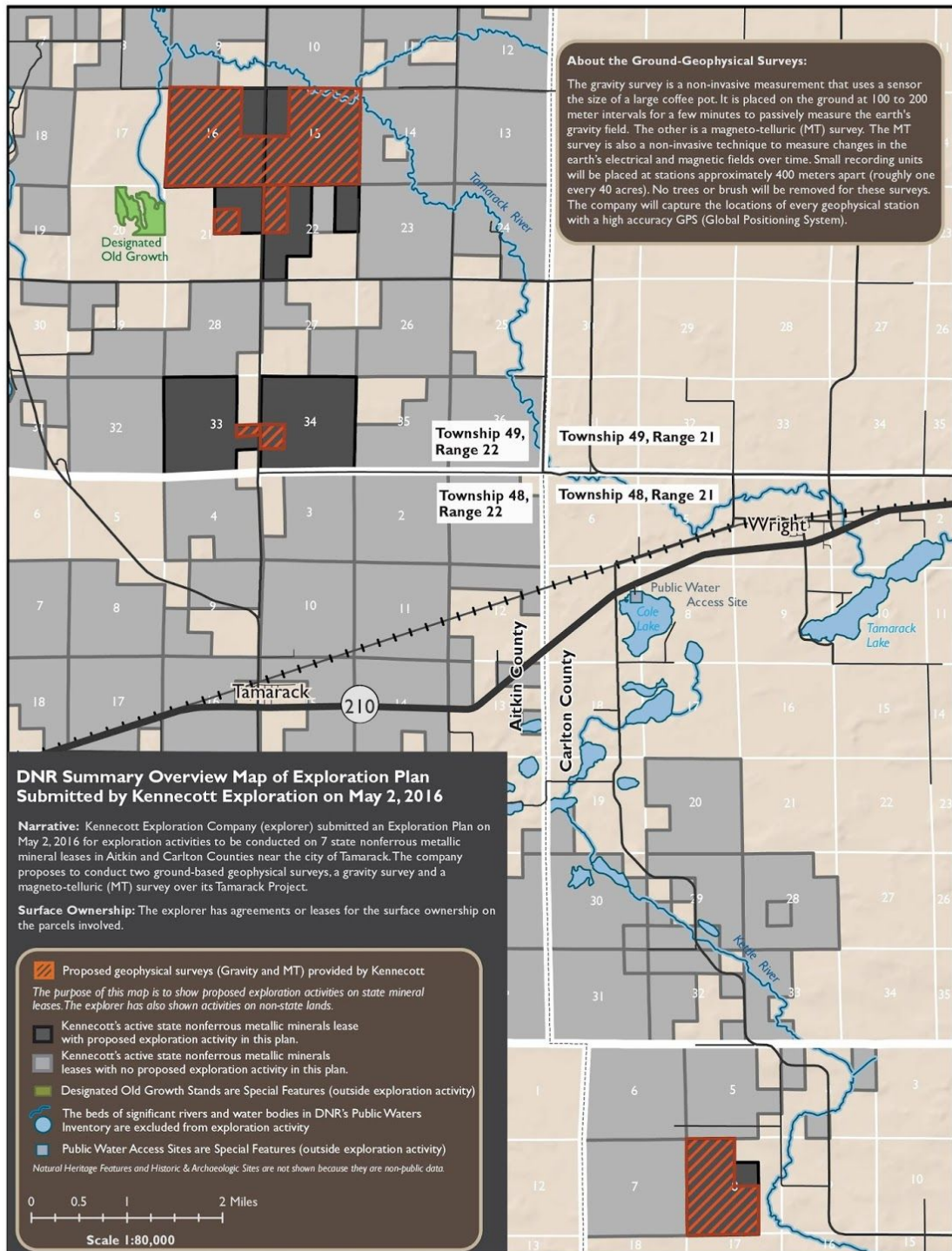
Talon metals and Kennecott exploration are engaged in exploratory digs and other activities related to the Tamarack Igneous Formation. This is a potential Ni-Cu-PGE yielding formation, similar to that being explored by Polymet. These formations (and others, such as the formation at Eagle Mine in MI, Noril'sk-Talnakh in Russia, and Voisey Bay in Labrador) are predominantly sulfuric rock, with the metals found dispersed within. To reach the metals, massive amounts of rocks need to be mined and processed. In addition to any surface or subsurface impacts, a major concern with this type of mining is acid mine drainage.

Currently, there is non-drilling exploration on 27 sites. This is part of a 15 year quest to find copper in the area. There has been exploratory drilling done in the area, and there are at least 20 more proposed by the company. These exploratory drills can strike water, resulting in alterations of hydrology and the loss of groundwater for other areas. Talon metals is a subsidiary of Rio Tinto- an international copper mining company. Kennecott claims to have identified a strip of copper-nickel-platinum group metal deposits deep underground. It is said to be 12 miles long and 2 miles wide. Mineralization of the metals is not consistent through the whole area, and grades vary. It is believed that some is high-grade that could be valuable.⁵⁵

From the map below, created by the MN DNR, it can be seen how close the proposed project is to old growth forests and various water bodies.

⁵⁵ Duluth News Tribune article:

<http://www.duluthnewstribune.com/business/mining/3938238-kennecott-adds-more-exploration-near-tamarack>



Kennecott Exploration Company Exploration Plan 05/02/2016, page 3/3

Map by DNR - Lands and Minerals Division 05/05/2016

Mining process and potential impacts:

Explosions and blasts to break up ore-yielding rocks (after "overburden" removal)

Metal bearing rocks crushed, then ground
Metals extracted from through leaching or floatation
Metals are smelted, then refined.

Each step creates waste that must be dealt with, often times the waste outlives the life of the mine. In some cases, mines can fill up with water and acid mine drainage is created.

Tailing ponds/piles are also another source of amd

- Tailings are the waste materials that remain after precious minerals have been removed from ore. They include ground-up rock, water, metals, hydrocarbons, and other chemicals used in the extraction process
- Companies try to limit tailings exposure to oxygen, as that is how AMD is created. One method is to dump tailings underwater in a nearby pond or lake. Dams and waterproof liners prevent the tailings from entering other waterways and from seeping into the ground below the pond.
 - Tailing ponds may attract wildlife, which brings them into contact with toxic material and may lead to sickness or death.
 - Breaches can occur in the pond liner and allow tailings to contaminate surrounding areas.

From Emish/Tasiujatsoak :

Vale Inco pumps Voisey's Bay tailings into Headwater Pond, about nine kilometres east of the mine. To prepare the site, the company built 12-metre high dams at the head and mouth of the pond, installed a pond liner, and relocated fish from Headwater Pond into another body of water, known as Pond 61. Despite these efforts, accidents have occurred. A breach in the pond liner in May 2006 released approximately 1,100 cubic metres of tailings water into nearby Camp Pond Brook. In November 2007, equipment failure along the pipeline carrying tailings from the concentrator to the pond caused about 50 cubic metres of tailings slurry to spill onto a road and a nearby bog.

Acid Mine Drainage:

- Rocks that contain useful metals commonly contain sulfide minerals - minerals that combine metal with sulfur
- The most common sulfide mineral is pyrite - or "Fool's Gold" - a combination of iron and sulfur.
- When pyrite (iron sulfide) comes in contact with oxygen in air or water, it "oxidizes" and turns into rusty iron oxides and sulfuric acid. Certain bacteria make this process go faster.
- Sulfuric acid from oxidation of pyrite causes nearby soil and water to be acidic (acid rock drainage) and can harm habitat.
- AMD is a legacy of mining, and can be found across the world at old mine sites.

Other potential impacts {from Emish (Innu); Tasiujatsoak (Inuit); and Voisey's Bay (outsiders)}

<http://www.heritage.nf.ca/articles/economy/voiseys-bay-environment.php>

- Large quantities of fuel, oil, and other hazardous materials are required to separate metals
 - fuels, oils, grease, aerosols, antifreeze, methanol, and equipment batteries
 - substances may accidentally spill into the natural environment
 - Petroleum spills are among the most serious concerns linked to the mining industry because large quantities of fuels, oils, greases, and other hydrocarbons are required to power and maintain the machinery involved.
- Dust generated at the mine and the concentrator could compromise air quality and penetrate nearby lakes and rivers, which would damage fish species.
 - Land clearing, bulldozing, blasting, crushing and conveying ore, trucking materials along unpaved roads, ship loading, and a variety of other activities can all cause dust, which becomes suspended in the air.
 - Dust particles may include heavy metals and toxic chemicals
- The location of the mine and its associated shipping routes could also interfere with the overall wellbeing of the surrounding ecosystem
 - Mining operations can interfere with local animal species by destroying or altering habitat, releasing pollutants into the environment, and creating noise and other disturbances.
 - There is also concern that the project may contaminate foodstuffs traditionally harvested by local communities.
- Mines produces a variety of other hazardous wastes, including old batteries, oil filters, empty aerosol containers, antifreeze, greasy rags, waste methanol, waste carbon, and a range of other chemicals and materials.
- Other major air pollutants created at mining sites are greenhouse gases including nitrous oxide and carbon dioxide.
 - released by burning fuel to operate vehicles and machinery, and to perform other tasks.
 - Vale Inco: its diesel-powered generating station created about 96,000 megawatt-hours of electricity for the Voisey's Bay site in 2007; this indicates a fuel consumption of over 24 million litres. A megawatt hour is equal to 1,000 kilowatts supplied for a period of one hour. In addition are the gases released by trucks, marine vessels, and other vehicles and machinery needed to excavate, process, and ship Voisey's Bay ore.

Water usage

Mines use large quantities of water to process the ore, which is then treated at wastewater treatment plant (?)

Though Vale Inco studies in 2007 showed that the bay's water quality had not been affected by this practice, the possibility does exist that wastewater might harm the health

of fish and other marine life. For example, the company found evidence in 2007 which suggested that discharged water reduced the weight of juvenile and adult mussels.

From “Metal Mining and the Environment”, AGI Environmental Awareness Series 3, Travis L. Hudson, Frederick D. Fox, Geoffrey S. Plumlee, American Geological Institute Alexandria, Virginia (In cooperation with Society of Economic Geologists Society for Mining, Metallurgy, and Exploration, Inc., U.S. Department of the Interior, U.S. Geological Survey), 1999.

Potential Environmental Impacts of Mining

- physical disturbances to the landscape
 - mine workings, such as open pits and the associated waste rock disposal areas
 - These impacts remain on the landscape until the disturbed areas are stabilized and reclaimed (often times, these “reclaimed” landscapes do not have the same level of biodiversity that existed prior to establishment of the mine. There can many reasons for this, such as improper top soil storage, or lack of adequate restoration plans.)
 - Mining facilities such as offices, shops, and mills, which occupy a small part of the disturbed area, are usually salvaged or demolished when the mine is closed.
- waste rock disposal
 - Some waste rock areas, if not properly managed, can be sources of significant environmental impacts, such as stream sedimentation if erosion occurs, or the development of acidic water containing metals.
 - As the amount of waste rock in open pit mines is commonly two to three times the amount of ore produced, tremendous volumes of waste rock are removed from the pits and deposited in areas nearby.
- development of metal-bearing and acidic soils and waters
 - If not properly managed, erosion of mineralized waste rock into surface drainages may lead to concentrations of metals in stream sediments. This situation can be potentially harmful, particularly if the metals are in a chemical form that allows them to be easily released from the sediments into stream waters. When this occurs, the metals are considered to be “mobilized” and “bioavailable” in the environment. In some cases, bioavailable metals are absorbed by plants and animals, causing detrimental effects
 - if acid rock drainage is not prevented from occurring and if it is left uncontrolled, the resulting acidic and metal-bearing water may drain into and contaminate streams or migrate into the local groundwater.
 - significant levels of dissolved constituents can remain, inhibiting its use for drinking water or irrigation.
 - Where acid rock drainage occurs, the dissolution and subsequent mobilization of metals into surface and groundwater is probably the most significant environmental impact associated with metallic sulfide mineral

mining. Acidic and metal-bearing groundwater occurs in abandoned underground mine workings and deeper surface excavations that encounter the groundwater of a mineralized area

- Because they are usually located at or below the water table, underground mines act as a type of well which keeps filling with water. Removal and treatment of this accumulated water in underground mines must be continuous in order to conduct operations. However, after mining ceases, the mine workings will fill up with water and some of the water may discharge to the surface through mine openings. Because these waters migrate through underground mine workings before discharging, they interact with the minerals and rocks exposed in the mine.
- public safety.