Environmental Consultant, Foth, Unable to Prevent or Contain Water Pollution at Reclaimed Flambeau Mine

-Laura Gauger, Chair, Deer Tail Scientific\(^1\), April 2024

The Flambeau Mine was a small open pit copper-sulfide mine that operated on the banks of the Flambeau River near Ladysmith, Wisconsin in the mid-1990s. When production ceased in 1997, the Flambeau pit was backfilled with waste rock, some of it mixed with limestone. No tailings are stored at the site, since all ore was shipped by rail to Canada for processing.

Touted as state-of-the-art, the Flambeau Mine was owned by Rio Tinto/Kennecott and operated by their subsidiary, Flambeau Mining Company (FMC). The primary environmental consultant for the project was Foth, an engineering firm located near Green Bay, Wisconsin. Foth was involved in the permitting, development and reclamation of the mine and continues to oversee various remediation activities at the polluted project site to the present day.

Mining companies looking to develop the following new projects in the Great Lakes region have hired the same environmental consultant, Foth, to help bring their projects across the finish line:

- **NorthMet (MN):** St. Louis River watershed → Lake Superior
- **Twin Metals (MN):** Rainy River watershed → Boundary Waters
- **Tamarack (MN):** Big Sandy Lake / Mud Lake / Tamarack River watersheds → Mississippi River
- **Back Forty (MI/WI Border):** Menominee River → Lake Michigan
- **Copperwood (MI):** Lake Superior shoreline

When promoting their new mining projects to the public, Foth officials have pointed to the Flambeau Mine as “an exemplary project, demonstrating that economic growth can coexist with stringent environmental regulations” (Foth, 2024; Screenshot). Unfortunately, the facts show otherwise.

Foth’s inability to prevent or successfully contain surface and groundwater pollution at the very small Flambeau Mine is well documented (see list of examples starting on page 4). As a result, there is legitimate concern over what might happen to Lake Superior and other public waters throughout the Great Lakes region if the much larger and more complicated projects being overseen by the same consultant move forward and, as was the case at Flambeau, Foth is unable to prevent or successfully contain emergent pollution problems.

Before reviewing the examples of how Foth got it wrong at Flambeau, please take a look at the following two charts that compare key characteristics of the Flambeau Mine to the other Foth projects in the area (Table 1 and Table 2).

\(^1\) Deer Tail Scientific is a 501(c)3 nonprofit organization founded in 2017. As stated in its bylaws: The mission of Deer Tail Scientific is to educate the public, government officials and tribal sovereign nations with fact-based information on: (1) the permitting, development, reclamation, environmental performance and economics of Wisconsin’s Flambeau Mine; and (2) how the Flambeau Mine compares to other mines (closed, currently operating or proposed) in the Great Lakes region and beyond.
Table 1. Flambeau Mine Key Characteristics Compared to Other Mines Proposed in the Great Lakes Region

<table>
<thead>
<tr>
<th>Feature</th>
<th>Flambeau Mine (Operational 1993-97)</th>
<th>Back Forty Project (as proposed in 2010)</th>
<th>Copperwood Project (as proposed in 2018)</th>
<th>Twin Metals Project (as proposed in 2021)</th>
<th>NorthMet Project (as proposed in 2015)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Life of Mine (yr)</td>
<td>4</td>
<td>11</td>
<td>26</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Distance to River, Lake or Public Lands (ft)</td>
<td>Mined pit was 140 feet from Flambeau River</td>
<td>Proposed mine pit is 150 feet from Menominee River</td>
<td>The above-ground boundary of the project abuts Lake Superior shoreline and the western edge of Porcupine Mountains Wilderness State Park.</td>
<td>The project is located within the Superior National Forest. It abuts Birch Lake, the South Kawishiwi River and Keesey Creek near the edge of the Boundary Waters Canoe Area Wilderness.</td>
<td>The project is located within the Superior National Forest. Numerous wetlands and creeks within and around the project area flow into the nearby Partridge and Embarrass Rivers which, in turn, flow into the St. Louis River.</td>
</tr>
<tr>
<td>Wetlands Destroyed</td>
<td>8 acres</td>
<td>11 acres</td>
<td>9 acres</td>
<td>913 acres</td>
<td></td>
</tr>
<tr>
<td>Additional Wetlands Actually or Potentially Impacted</td>
<td>11 acres</td>
<td>17 acres</td>
<td>3.3 acres (within project site)</td>
<td>Acreage not disclosed</td>
<td>6,569 - 7,694 acres</td>
</tr>
<tr>
<td>Sulfide Waste Rock (tons)</td>
<td>8.6 million</td>
<td>49 million</td>
<td>3.7 million</td>
<td>308 million</td>
<td></td>
</tr>
<tr>
<td>Tailings (Tons)</td>
<td>0</td>
<td>15 million tons (total); 12 million tons stored in a tailings dam that will cover 125 acres and have a max height of about 135 ft.; 3 million tons disposed in the underground workings as a paste backfill.</td>
<td>29 million tons Tailings Dam will cover 315 acres and have a max height of about 130 ft.</td>
<td>177 million tons (total); 106 million tons stored above the surface in a dry stack that will cover 430 acres and have an average height of 130 ft.; 71 million tons pumped underground for disposal as a thickened slurry.</td>
<td>&lt;225 million tons</td>
</tr>
<tr>
<td>Environmental Consultant</td>
<td>Foth (Green Bay, WI)</td>
<td>Foth (Green Bay, WI)</td>
<td>Highland Copper Company (preceded by Orvana)</td>
<td>Highland Copper Company (preceded by Orvana)</td>
<td>Glencore / Teck (preceded by Polymet)</td>
</tr>
<tr>
<td>Owner</td>
<td>Kennecott / Rio Tinto</td>
<td>Gold Resource Corporation (preceded by AquaResourcex)</td>
<td>Highland Copper Company</td>
<td>Twin Metals Minnesota / Antofagasta</td>
<td>Glencore / Teck (preceded by Polymet)</td>
</tr>
<tr>
<td>Life of Mine (yr)</td>
<td>4</td>
<td>11</td>
<td>26</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Method</td>
<td>32-acre Open Pit (Max Depth = 225 ft)</td>
<td>~90 acres Open Pit developed over 5 years, followed by 6 years of underground mining</td>
<td>Underground (Max Depth = 900 ft)</td>
<td>Underground (Max Depth = 4500 ft)</td>
<td>3 Open Pits totaling 528 acres (Max depth = 700 ft)</td>
</tr>
<tr>
<td>Footprint (acres)</td>
<td>181</td>
<td>~900 acres on the surface</td>
<td>~2100 acres on the surface</td>
<td>~5000 acres on the surface</td>
<td>~1800 acres underground</td>
</tr>
</tbody>
</table>

**Notes:**
- Data Sources: Final Environmental Impact Statement for Flambeau Copper Mines Co, Copper Mines Co, Wisconsin DNR, 1999; 2097 Backfilling Plan for Stump Spatula Type 4 Materials; PAC / Foth & Van Dyke, March 1997; and Surface Water Quality Assessment of the Flambeau Mine Site, Wisconsin Department of Natural Resources, April 2012.
- **Method:**
  - 32-acre Open Pit (Max Depth = 225 ft)
  - ~90 acres Open Pit developed over 5 years, followed by 6 years of underground mining
  - Underground (Max Depth = 900 ft)
  - Underground (Max Depth = 4500 ft)
  - 3 Open Pits totaling 528 acres (Max depth = 700 ft)
- **Footprint (acres):**
  - 181
  - ~900 acres on the surface
  - ~2100 acres on the surface
  - ~5000 acres on the surface
  - ~1800 acres underground
- **Distance to River, Lake or Public Lands (ft):**
  - Mined pit was 140 feet from Flambeau River
  - Proposed mine pit is 150 feet from Menominee River
  - The above-ground boundary of the project abuts Lake Superior shoreline and the western edge of Porcupine Mountains Wilderness State Park.
Table 2: Flambeau Mine Key Characteristics Compared to Tamarack Proposal

<table>
<thead>
<tr>
<th></th>
<th>Flambeau Mine (Operational 1993-97)</th>
<th>Tamarack Project (as proposed in 2023)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Wisconsin: Flambeau River</td>
<td>Minnesota: Big Sandy Lake / Mud Lake / Tamarack River Watersheds</td>
</tr>
<tr>
<td>Life of Mine</td>
<td>4 yr</td>
<td>7-10 yr</td>
</tr>
<tr>
<td>Method</td>
<td>32-acre Open Pit Max Depth ~ 225 ft</td>
<td>Underground Max Depth ~1500 ft</td>
</tr>
<tr>
<td>Footprint</td>
<td>181 acres</td>
<td></td>
</tr>
<tr>
<td>Distance to River, Lake or Public Lands</td>
<td>140 ft from Flambeau River</td>
<td>The project area consists of a combination of water-rich state and private lands located within the 1855 Treaty boundary. It includes roughly 300 acres of wetlands spanning the Big Sandy Lake / Mud Lake / Tamarack River watersheds.</td>
</tr>
<tr>
<td>Ore (tons)</td>
<td>1.9 million</td>
<td>~8 million</td>
</tr>
<tr>
<td>Metals</td>
<td>Copper, Silver, Gold, Zinc</td>
<td>Nickel, Copper, Iron</td>
</tr>
<tr>
<td>Wetlands Destroyed</td>
<td>8 acres</td>
<td>22 acres wetlands; Lineal feet of destroyed channels/ditches not disclosed</td>
</tr>
<tr>
<td>Additional Wetlands Actually or Potentially Impacted</td>
<td>11 acres</td>
<td>? G, H</td>
</tr>
<tr>
<td>Water Treatment Plant Discharge Channel</td>
<td>~ 6 miles (to Tamarack River)</td>
<td>~ 0.2 mile (to Flambeau River)</td>
</tr>
<tr>
<td>Sulfide Waste Rock (tons)</td>
<td>8.6 million</td>
<td>? J</td>
</tr>
<tr>
<td>Water Treatment Plant Sludge (tons)</td>
<td>? K</td>
<td>? K</td>
</tr>
<tr>
<td>Tailings (Tons)</td>
<td>0 L</td>
<td>0 M</td>
</tr>
<tr>
<td>Environmental Consultant</td>
<td>Foth (Green Bay, WI)</td>
<td>Foth (Green Bay, WI)</td>
</tr>
<tr>
<td>Owner</td>
<td>Kennebecot / Rio Tinto</td>
<td>Talon Metals / Kenneccot / Rio Tinto</td>
</tr>
</tbody>
</table>

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Key Characteristics:

- **Flambeau Mine (Operational 1993-97)**
  - Wisconsin: Flambeau River
  - Life of Mine: 4 yr
  - Method: 32-acre Open Pit Max Depth ~ 225 ft
  - Footprint: 181 acres

- **Tamarack Project (as proposed in 2023)**
  - Minnesota: Big Sandy Lake / Mud Lake / Tamarack River Watersheds
  - Life of Mine: 7-10 yr
  - Method: Underground Max Depth ~1500 ft
  - Footprint: 181 acres

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*Notes:

1. Data Sources: [Final Environmental Impact Statement for Flambeau Mining Co. Copper Mine, Wisconsin DNR, 1990; 1997 Backfilling Plan for Stockpiled Type II Material, Flambeau Mining Company / Foth & Van Dyke, March 1997; and Surface Water Quality Assessment of the Flambeau Mine Site, Wisconsin Department of Natural Resources, April 2012.]
2. Data Sources: [Tamarack Nickell Project Overview, Minnesota Department of Natural Resources, 2023; Environmental Assessment Worksheet (EAW) – Tamarack Mining Project, Talon, Oct 2023: Narrative, Figure 1, Figure 3 and Figure 5; and Environmental Assessment Worksheet, Tamarack Mining Project, Talon, June 2023, Figure 11.]
3. The 263-acre footprint on the surface includes 83 acres of long-term developed surfaces (buildings, stockpiles, parking areas, industrial stormwater pond, railway spur, etc.) and 180 acres of temporarily utilized surfaces (areas for staging of equipment and materials during construction, placement of cranes and utility lines, equipment maneuvering, etc.).
4. Most of the mine’s 225 acres of underground workings are not located directly beneath the 263-acre surface footprint but rather to the east of it. Talon states there is a 41-acre overlap between the two, resulting in a sum total of 447 acres for the project: Surface Footprint (263 acres) + Underground Footprint (225 acres) minus Overlap (41 acres).
5. According to Talon’s Oct 2023 EAW, the company “plans to extract ore at a rate of up to 800,000 short tons (2,000 lbs/short ton) per year over an approximately 7- to 10-year period of mine production.”
6. In its Oct 2023 EAW, Talon identifies nickel, copper and iron as the primary metals targeted for extraction, but they also acknowledge that cobalt, platinum, palladium and gold are present in the metal-sulfide orebody.
7. Talon states in its Oct 2023 EAW that there are 302 acres of wetlands, shallow lakes and ditches within the 447-acre project boundary, including 1.1 miles of channelized ditches. They also acknowledge that: (1) “there is a potential for the Project to result in indirect wetland impacts” due to “wetland fragmentation, changes in wetland hydrology, and atmospheric deposition from dust or other air emissions”; and (2) “existing ditches may be diverted and rerouted around Project features, and/or filled.” Estimated acreages in potentially impacted wetlands, shallow lakes and ditches, however, were not disclosed.
8. Talon states in its Oct 2023 EAW that the Project “could result in indirect impacts to downstream hydrology due to discharge of treated water, alteration of upstream tributary watersheds, and stormwater management.” A map of the roughly 6-mile-long proposed water treatment plant discharge route is provided in the EAW (Figure 5), but no estimate of the extent or nature of anticipated impacts.
9. Talon states in its Oct 2023 EAW that waste rock will be classified into three categories based on sulfur content (Class 1 = lowest sulfur; Class 2 = mid-range sulfur; Class 3 = highest sulfur), but actual sulfur percentages or tonnages are not disclosed, nor is the estimated height of the waste rock stockpile. Class 1 and Class 2 materials are to be used as backfill in the underground workings; Class 3 materials will either: (1) be blended with lower sulfur rock to decrease the final sulfur concentration of the material before backfilling; or (2) be shipped by rail to a facility in Mercer County, North Dakota.
10. Sludge volumes generated by the Flambeau Mine’s water treatment plant were not disclosed in any of the company’s annual reports, but the 1990 EIS for the project stated that roughly 45,000 cubic yards of “metal and sulfur enriched sludge” (up to 124 tons per day) would be produced over the life of the mine. At the end of operations, the sludge was backfilled into the unlined mine pit along with the mine’s sulfide-containing waste rock that had been stockpiled during operations.
11. Talon states that the sludge from the mine’s water treatment plant will be evaluated for potential use as backfill but does not disclose the anticipated volume of sludge or its metal and sulfur content.
12. Flambeau ore was shipped by rail to Canada for processing, so there is no tailings storage at Flambeau.
13. Talon plans to transport the mined ore by rail to a facility in Mercer County, North Dakota for processing and tailings disposal, so there will be no tailings storage at the Tamarack project site.
Considering how small the Flambeau Mine was in comparison to the other projects proposed in the region and the fact that Flambeau does not have a tailings dam (the tailings are buried somewhere in Canada), any attempt to compare the Flambeau Mine to the NorthMet, Twin Metals, Back Forty or Copperwood projects is seriously flawed. Copperwood, for example, would generate an estimated 29 million tons of toxic tailings that the owner plans to store in a 315-acre tailings dam reaching a height of 130 feet. Even if Flambeau were not a polluting mine, there can be no legitimate comparison between the two. It’s apples and oranges.

Comparing Flambeau to the Tamarack project also has its problems. While Tamarack, like Flambeau, would not have a tailings dam, the project area is primarily classified as wetlands whereas the Flambeau site primarily consisted of forest and farmland. Tamarack is also a much larger operation than Flambeau, anticipated to produce roughly four times the amount of ore and presumably much larger volumes of waste material including not only sulfide-containing waste rock, but metal and sulfur enriched sludge from water treatment plant operations.

The Tamarack project, located in the Big Sandy Lake / Mud Lake / Tamarack River watersheds, is not the kind of mine that can afford any miscalculations or mishaps. The same can be said for the NorthMet project (located in the headwaters of Lake Superior’s largest U.S. tributary, the St. Louis River), the Back Forty project (located on the banks of the Menominee River), the Twin Metals project (located in the headwaters of the Boundary Waters Canoe Area Wilderness) and the Copperwood project (abutting Lake Superior and Porcupine Mountains Wilderness State Park).

Yet, as documented below, the environmental consultant being relied upon to oversee these new projects (Foth) demonstrably got it wrong at Flambeau, a much smaller and less-complicated mine that utilized modern technologies. It certainly brings into question the advisability of moving forward with these other projects.

Here, then, are just a few examples of how Foth got it wrong at Flambeau:

- Hydrogeological modeling developed by Foth for the Flambeau project proved to be flawed.

  When FMC was seeking its permits to mine, one of Foth’s duties was to develop a groundwater model for the project that would, among other things, predict the concentrations of various contaminants expected in groundwaters exiting the backfilled mine pit and entering the nearby Flambeau River.

  As noted in a 2019 outside review of the Flambeau project that was authored by hydrogeologist Robert E. Moran (Michael-Moran Associates, Golden, CO), Foth predicted relatively low concentrations of copper (14 ppb), iron (320 ppb) and manganese (550 ppb) in the waters exiting the backfilled mine pit. Now that actual levels of contaminants are being measured in the wells at Flambeau, individual wells within the backfilled pit have registered median dissolved concentrations as high as the following (Moran, 2019):

  - Copper = 503 ppb (35 times higher than predicted by Foth)
  - Iron = 14,000 ppb (43 times higher than predicted by Foth)
  - Manganese = 33,500 ppb (60 times higher than predicted by Foth)

  It is also noteworthy that Foth offered no predictions at all for the concentrations of ARSENIC that might be expected in the monitoring wells at Flambeau. Prior to mining, wells across the project site registered arsenic concentrations of less than 5 ppb (i.e., the toxin was undetectable). That is no longer the case.

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2 Critical figures regarding the anticipated volumes, sulfur percentages and overall composition of the waste rock and sludge that will be generated, stockpiled and eventually backfilled into Tamarack’s underground workings have yet to be disclosed by Foth.

3 Dr. Robert Moran’s professional resume includes more than 45 years of domestic and international experience in conducting and managing water quality, geochemical and hydrogeologic work for private investors, industrial clients, tribal and citizens groups, NGO’s, law firms, and governmental agencies at all levels. His complete resume can be viewed online at: https://remwater.org/.
Now that the Flambeau mine pit has been backfilled with waste rock and sludge from the mine’s water treatment plant, individual wells within the backfilled pit have registered arsenic concentrations as high as 83 ppb (8.3 times the public health standard of 10 ppb). Wells located outside the pit and within 140 feet of the Flambeau River have gone as high as 32 ppb (3.2 times the public health standard).

Despite all of the above, Foth continues to refer to Flambeau as an “exemplary project.”

- The waste disposal program designed and implemented by Foth to avert groundwater contamination problems at the Flambeau Mine project site failed to prevent significant degradation of groundwater quality.

Foth’s answer to protecting groundwater reserves at the Flambeau Mine project site from contamination was to add limestone to the mine’s waste rock as it was being backfilled into the mine pit. Unfortunately, the elaborate backfilling plan developed by Foth, which entailed mixing about 30,000 tons of limestone with the mining waste, failed to achieve the goal. As noted by Dr. Moran in his report referenced earlier:

“Roughly 20 years after the cessation of active mining, Flambeau Mine groundwaters are contaminated by past Flambeau Mining Company (FMC) activities. ... FMC wells within the backfilled pit have median dissolved concentrations as high as the following (2014-16): Copper = 503 μg/L; Iron = 14,000 μg/L; Manganese = 33,500 μg/L; Zinc = 1,200 μg/L; Arsenic = 23 μg/L; Sulfate = 1,600 mg/L; Alkalinity = 610 mg/L; Hardness = 2,150 mg/L; Total Dissolved Solids = 3,110 mg/L; Specific Conductance = 3,180 μS/cm. These values greatly exceed baseline data and relevant water quality standards and aquatic life criteria.”

Despite the above, Foth continues to refer to the Flambeau Mine as an “exemplary project.”

- Stormwater management systems designed by Foth to handle polluted runoff from the Flambeau Mine project site failed to prevent the impairment of a nearby Flambeau River tributary.

Over the past 25 years, Foth has designed and implemented six different work plans at Flambeau to deal with contaminated stormwater runoff from the project’s industrial outlot that has polluted a nearby Flambeau River tributary identified as Stream-C on company drawings. The reason there have been so many different work plans is because none of them have succeeded in reducing copper concentrations in the tributary to a safe level.

Copper concentrations as high as 77 ppb were measured in Stream C in 2008, compared to the legal limit of 3 ppb for chronic exposure. Citizens eventually succeeded in getting the tributary added to the EPA’s list of Impaired Waters in 2012 due to ongoing elevated levels of copper. As of 2024, Stream C remains listed as impaired by the EPA and State of Wisconsin.

Despite the above, Foth continues to refer to Flambeau as an “exemplary project.”

- Environmental monitoring plans designed by Foth for the Flambeau project have been characterized by some as “Don’t Ask. Don’t Tell.”

FMC continues to claim in annual submissions to the Wisconsin Department of Natural Resources that “the Flambeau River remains fully protected and Flambeau remains in full compliance with its permit standards.” Please, however, consider the following:

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4 The public health enforcement standard for manganese in drinking water is 300 ppb. Elevated concentrations have been associated with causing Parkinson’s-like nerve damage.

5 The surface water quality standard for sulfate in wild rice waters is 10 mg/L.
Foth’s monitoring plans for the Flambeau project contain no provisions for any biological or surface water quality testing in the stretch of the Flambeau River immediately adjacent to the backfilled pit where, according to their own modeling, contaminated groundwaters from the pit are entering the river through fractured bedrock. Foth isn’t even testing the river water for arsenic, now known to be present in elevated concentrations in several wells within 140 feet of the river.

Foth’s monitoring plans for the Flambeau project contain no provisions for testing the groundwater for uranium, nickel, cobalt or aluminum even though all four toxic metals were known to be present in Flambeau waste rock, now crushed and in the backfilled pit.

Foth’s monitoring plans for the Flambeau project call for all groundwater samples collected for analysis to be filtered before running them in the lab. This, of course, removes some if not most of the contaminants, thereby lowering the reported concentrations. It is also problematic because most families using private wells or springs and all farms, livestock, wildlife, fish and vegetation, etc. use and consume unfiltered water.

Foth’s monitoring plans include no provisions for testing groundwater quality on the west side of the Flambeau River (opposite side from pit) to determine if the plume of groundwater contamination emanating from the backfilled pit and headed in that direction has traveled through fractured bedrock beneath the relatively-shallow riverbed to properties on the other side.

The Flambeau Mine is encircled by a so-called “compliance boundary” that was established by the State of Wisconsin during the permitting process to mark the location where groundwaters emanating from the mine site have to be in compliance with the state’s groundwater protection law. Foth’s monitoring plan, however, included no provisions for placing any wells along the boundary. Hence, there is no way for the state to detect or hold the mine’s owner accountable for any violations of drinking water standards that may be occurring at the compliance boundary.

Despite all of the above, Foth continues to refer to Flambeau as an “exemplary project.”

- **Foth’s forthrightness with the public has been brought into question.**

Perhaps this point can best be made by way of two examples. Consider the following:

1. During the 1989-90 permitting process for the Flambeau Mine, local citizens voiced concerns that groundwater polluted with heavy metals from the Flambeau Mine would get into the nearby Flambeau River. In response, FMC distributed a brochure claiming the bedrock between the mine pit and river would provide a barrier “stronger than the Hoover Dam.” The company reiterated the claim on a plaque displayed at the project site in the mid-1990s” (Figure 1).

**Figure 1.** Plaque posted at the Flambeau Mine project site during operations in the mid-1990s (Photo by Kira Henschel, circa 1995).
Years later, a public records request unearthed a technical report that Foth had submitted to the Wisconsin DNR in 1989 as part of the permitting process – a report that stated the rock between the pit and river was “fractured” and that contaminated groundwater leaving the mine pit would “flow directly into the bed of the Flambeau River” (Foth, 1989). The public had been duped.

2. When citizens voiced concerns during the Flambeau Mine permitting process about what might happen to groundwaters beyond Flambeau’s project boundary (which abuts the Flambeau River), Foth distributed a memo in which they stated the following:

“The river is in the way. It is clearly impossible, then, for any activities at the mine, on one side of the river, to affect any water wells on the other side of the river” (Foth, 1988).

Years later, when Dr. Moran conducted his aforementioned review of historical and modern Flambeau Mine documents, he commented on Foth’s memo, characterizing it as “groundwater foolishness.” In particular, he noted that the Flambeau River is “only about 5 feet deep in the vicinity of the 225-foot deep mine pit” and that “the overall hydrogeological relationships suggest the deeper groundwaters may be migrating under the river sediments via fractures and faults” (Moran, 2019).

Dr. Moran, who examined not only the above issues related to ground and surface water pollution at the Flambeau project site but a host of other important issues addressed by Foth during the permitting process, concluded the following:

“The narrative ‘predictions’ made by FMC’s main Wisconsin consultant in the various permit-related and Annual Reports appear to be largely naïve geochemically and hydrogeologically. ... Such statements are most useful for obtaining permits, less so for generating quantitatively-reliable predictions.”

In summary, Foth’s inability to prevent or successfully contain surface and groundwater pollution at the very small and state-of-the-art Flambeau Mine and the consultant’s apparent lack of forthrightness with the public on various issues of concern does not bode well for the much larger and more complicated projects being overseen by Foth in the Great Lakes region.

References:
Foth, 1988. The Effect of the Flambeau River as a Hydraulic Barrier to Groundwater Underflow, 4 pg.