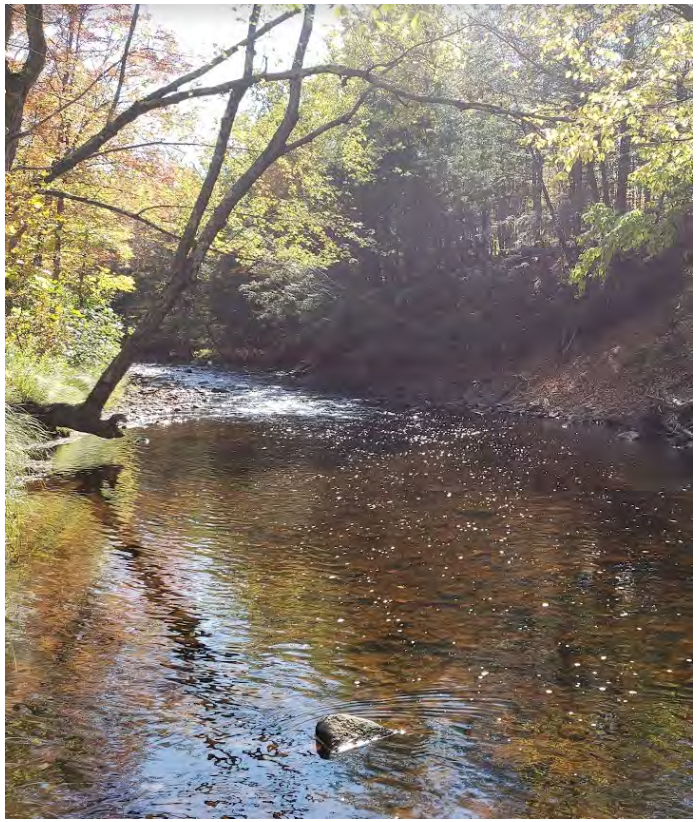
Bad River Band of Lake Superior Tribe of Chippewa Indians

# Project Pollutants that Will Affect Tribal Water Quality

Mashkiiziibii Natural Resources Department Presentation #2 for the Hearing with the US Army Corps of Engineers
May 13, 2025 – St. Paul, MN



# Pollutant: Sediments

**Due to the proposed project, sediment pollution will increase in the impacted waterways to the extent that it will exceed the Tribe's WQS downstream. There will be multiple reasons for the increase in sediment, including but not limited to:**

- Inadvertent Releases (IRs) from Horizontal Directional Drilling (HDD)
- Construction Site Runoff
- Streambank Erosion due to Altered Channels
- Geohazards & Long-Term Maintenance

Photo of the hard armoring of a North Fish Creek Tributary triggered due to the presence of Enbridge's Line 5. Enbridge photo from 11/26/24.



Photo of the dewatering structure and stockpiles of soil from the Enbridge check valve project the on-Reservation during the 2024 growing season. MNRD photo.


Photo of the hard armoring of the Bad River triggered due to the presence of TC Energy's 100 & 200 pipelines. The red circle highlights the area downstream where the bank is eroding at an accelerated rate since the riprap was placed. MNRD photo from 2013.

# Pollutant: Sediments – Construction Site Runoff

**The 41-mile-long pipeline reroute will include:**

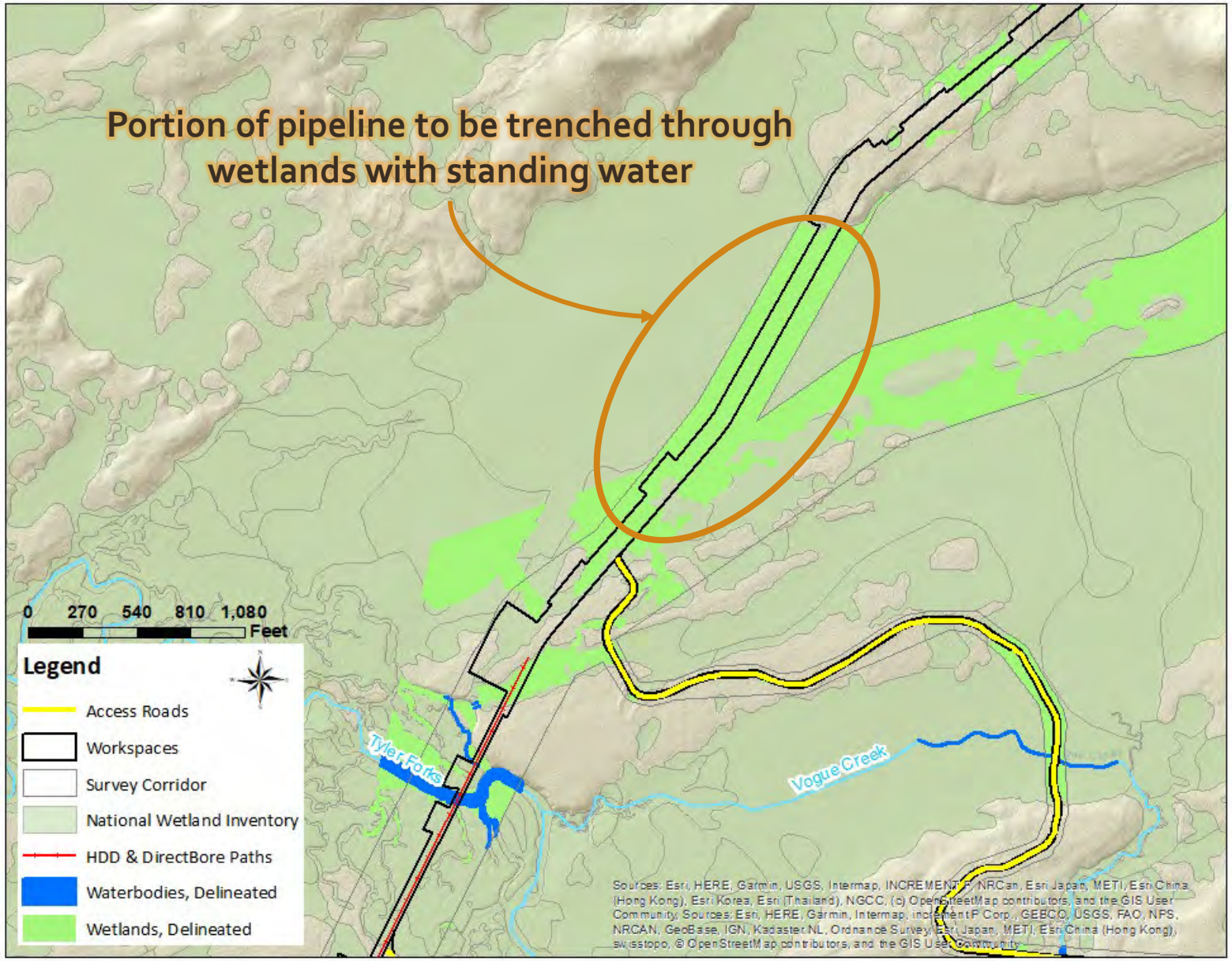
- Trenching the pipeline through approximately 35.09 miles of mostly remote landscape, including:
  - 6.13 miles of wetlands
  - 45 streams, swales, and WDHs
- Constructing approximately 30.97 miles of access roads, including:
  - matting 7.09 miles of wetlands
  - crossing 46 streams, rivers, WDH, and swales
- Impacting approximately 141.58 acres of additional workspace related to pipeyards, 3 valve sites on the existing portion of Line 5, and false right-of-ways associated with HDDs

**All of these activities will disturb soil and require the use of erosion and sediment control best management practices (BMPs).**



Photo (top) of a silt fence failure at a Northern Natural Gas pipeline anomaly dig site upstream of the Reservation that occurred in the Spring of 2025. Photo (bottom) of the workspace for the Enbridge check valve replacement on Reservation where the soil stockpile abutted wetlands on-site; photo from summer 2024.

# Pollutant: Sediments – Construction Site Runoff – ROW Workspace

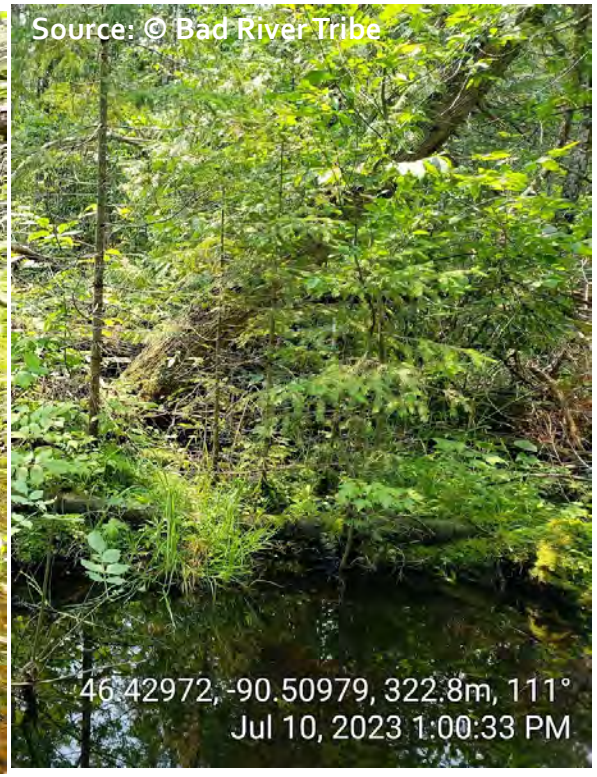





Source: Michels @ https://youtu.be/qYME5vaiVl4

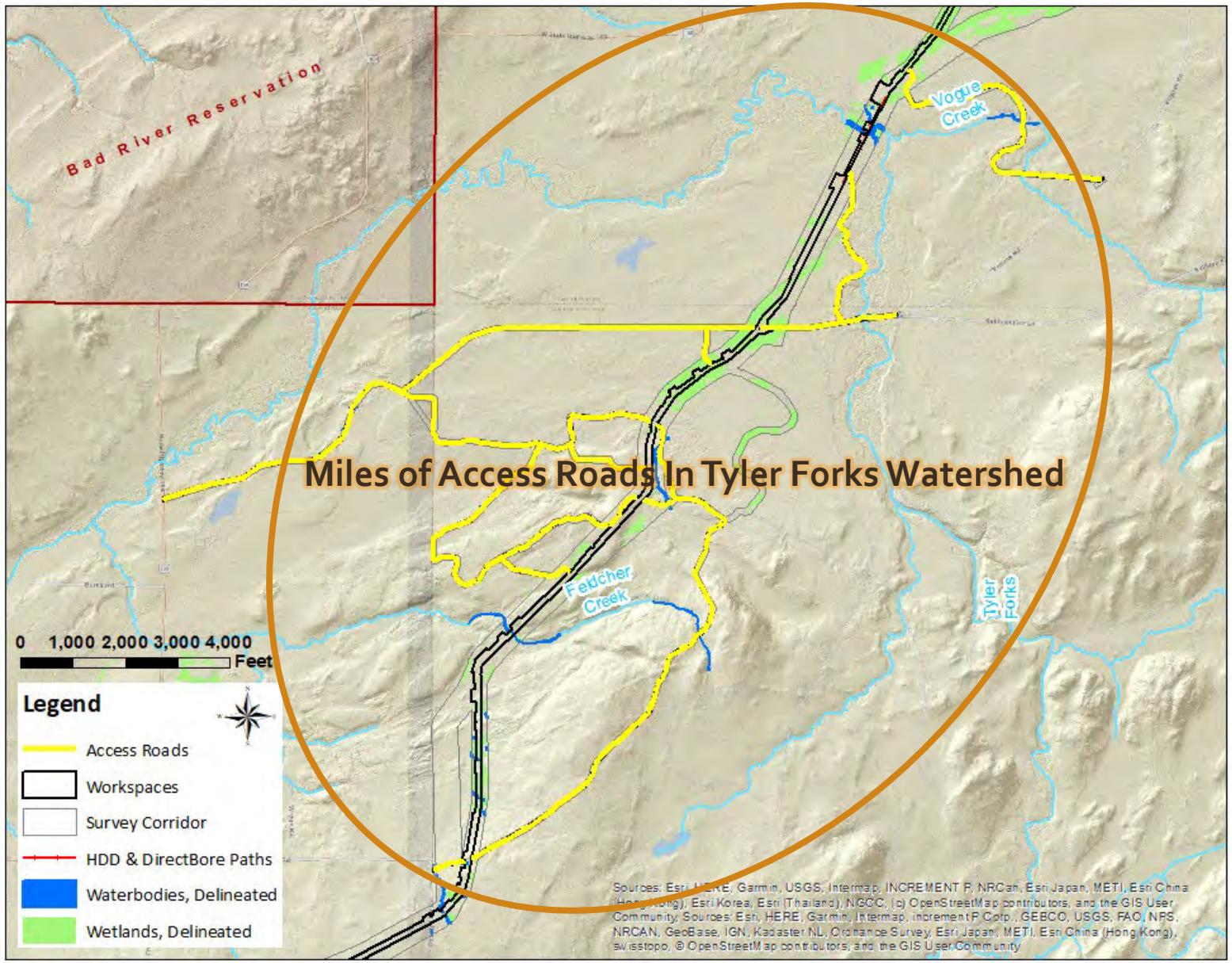
**Trenching results in substantial disturbance.**

# Pollutant: Sediments – Construction Site Runoff – ROW Workspace



# Pollutant: Sediments – Construction Site Runoff – Access Roads






**Timber matting along access roads does not eliminate soil disturbance.**

# Pollutant: Sediments – Construction Site Runoff – Access Roads

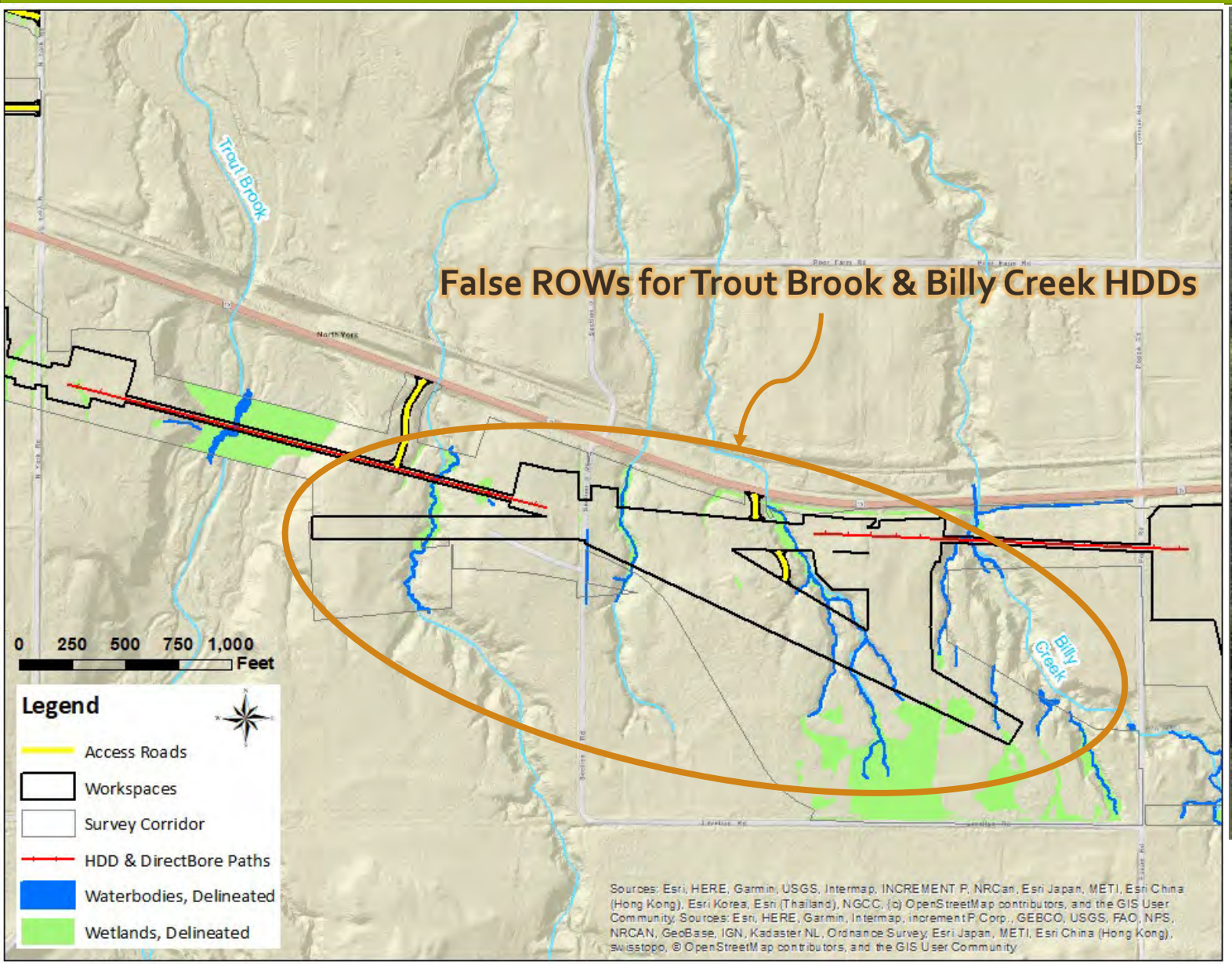
Figure 2. Drone photos of Enbridge clean-up crews trying to contain drill mud released under temporary matting associated with the HDD of the Mississippi River. Photos from Ron Turney included in Attachment 2 of Triplett-Dolph-Turney-Broberg Line 3 Fluid Losses and Aquifer Breaches.


Photo shows a portion of the access route where the construction matting was placed across a wetland and the saturated soil being pushed out from underneath due to the equipment traffic and into a nearby wetland.


Photo shows a portion of the access route where the construction matting was removed in August 2024—in the background, the exposed soil has been "smoothed" with the backhoe bucket while the area in the foreground is still rough and uneven from the matting being installed and its removal.


Photo shows a portion of the access route in April 2025 which still has unvegetated areas where established vegetation did not recover after the removal of the timber mats.

# Pollutant: Sediments – Construction Site Runoff – Other Workspaces





**Sediment release from false ROW workspace even with BMPs installed.**

# Pollutant: Sediments – Construction Site Runoff (continued)

**The research on erosion and sediment control BMPs supports the Band's conclusion that the construction of the proposed 41.1-mile pipeline will affect the Tribe's water quality downstream. Peer-reviewed research agrees on several key points to support this conclusion.**

# Pollutant: Sediments – Construction Site Runoff (continued)

## 1.Oftentimes BMP installation is not completed correctly and/or not maintained correctly.


Inadequate installation of BMPs; WDOT project "*WIS 13, Butterworth Road to US 2"* (2025, MNRD).


Ineffective BMPs; WDOT project "*WIS 13, Butterworth Road to US 2"* (2025, MNRD).

Incorrectly installed silt fence at an active construction site (2020, MNRD).

# Pollutant: Sediments – Construction Site Runoff (continued)

## 2. Even when installed and maintained correctly, BMPs not only fail to meet goals set by regulations, but oftentimes the regulations themselves are inadequate.


Image from US EPA *NPDES: Stormwater Best Management Practice – Silt Fences* shows chain link supported silt fence holding back runoff about to overtop the silt fence.


*Photo of wattles/biologs placed along the access to the Check Valve site underwater during an April 2025 site inspection.*


*Photo of filled sediment basin and failing secondary straw bale containment in a Denomie Creek Tributary. Photo from 7/2021.*

# Pollutant: Sediments – Construction Site Runoff (continued)

## 2. Even when installed and maintained correctly, BMPs not only fail to meet goals set by regulations, but oftentimes the regulations themselves are inadequate. (Further evidence)

Table 2 from Whitman et al. (2019)

**Table 2.** Innovative and Manufactured SB Performance Analysis

| SB Installation | Sediment retained | Impoundment depth (ft) | Flow-through rate[c] ($ft^3/s$ per LF) |
|---|---|---|---|
| HDSF (*15*) | | | |
| I1 | 90% | 1.63 | 0.006 |
| I2 | 91% | 1.38 | 0.006 |
| I3 | 98% | 1.62 | 0.005 |
| Average | 93% | 1.54 | 0.006 |
| GDOT (*20*) | | | |
| I1 | 90% | 1.11 | 0.008 |
| I2[a] | 91% | 1.19 | 0.007 |
| I3[a] | 90% | 1.16 | 0.007 |
| Average | 90% | 1.15 | 0.007 |
| SRSF | | | |
| I1 | 96% | 0.63 | 0.008 |
| I2 | 76% | 0.64 | 0.009 |
| I3 | 82% | 0.84 | 0.008 |
| Average | 85% | 0.70 | 0.008 |
| ALDOT SRB | | | |
| I1 | 90% | 1.58 | 0.004 |
| I2 | 92% | 1.75 | 0.005 |
| I3 | 90% | 1.95 | 0.005 |
| Average | 91% | 1.76 | 0.005 |
| AL HB SRB w/o flocculant | | | |
| I1 | 64% | 0.13 | 0.011 |
| I2 | 63% | 0.18 | 0.011 |
| I3 | 62% | 0.15 | 0.011 |
| Average | 63% | 0.15 | 0.011 |
| AL HB SRB w/ flocculant | | | |
| I1 | 81% | 0.64 | 0.009 |
| I2 | 84% | 0.44 | 0.009 |
| I3 | 85% | 0.49 | 0.010 |
| Average | 83% | 0.52 | 0.009 |
| Straw wattle | | | |
| I1[b] | 82% | 0.30 | 0.010 |
| I2[b] | 84% | 0.42 | 0.010 |
| I3[b] | 81% | 0.43 | 0.010 |
| Average | 82% | 0.38 | 0.010 |
| Compost log | | | |
| I1[a] | 93% | 0.53 | 0.009 |
| I2 | 81% | 0.57 | 0.009 |
| I3[b] | 67% | 0.43 | 0.010 |
| Average | 80% | 0.51 | 0.009 |
| Excelsior block | | | |
| I1[b] | 67% | 0.51 | 0.010 |
| I2 | 95% | 0.91 | 0.009 |
| I3[a] | 90% | 0.88 | 0.009 |
| Average | 84% | 0.77 | 0.009 |

*Note:* [a] minor undermining; [b] major undermining; [c] average effluent flow rate during 30-minute test period for three sequential storm events: 1 ft = 0.3 m; 1 $ft^3/s$ = 0.028 $m^3/s$.


**Table 2.** Innovative and Manufactured SB Performance Analysis

| SB Installation | Sediment retained | Impoundment depth (ft) | Flow-through rate[c] ($ft^3/s$ per LF) |
|---|---|---|---|
| HDSF (*15*) | | | |
| I1 | 90% | 1.63 | 0.006 |
| I2 | 91% | 1.38 | 0.006 |
| I3 | 98% | 1.62 | 0.005 |
| Average | 93% | 1.54 | 0.006 |


Heavy Duty Silt Fence (HDSF), a nonproprietary, wire-backed nonwoven silt fence, had the highest average sediment retention rate at 93%.

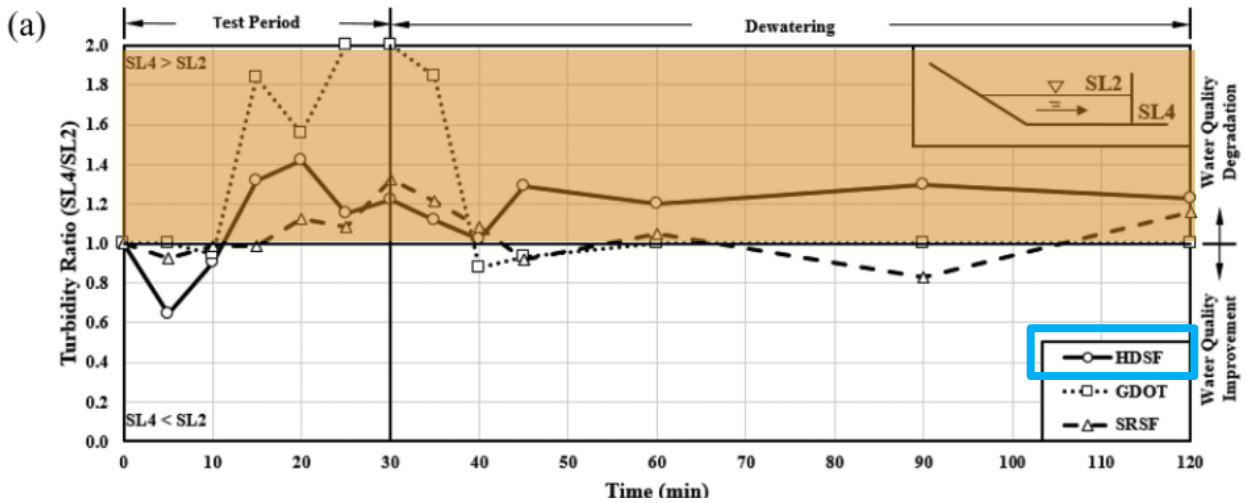

| | | | |
|---|---|---|---|
| AL HB SRB w/o flocculant | | | |
| I1 | 64% | 0.13 | 0.011 |
| I2 | 63% | 0.18 | 0.011 |
| I3 | 62% | 0.15 | 0.011 |
| Average | 63% | 0.15 | 0.011 |

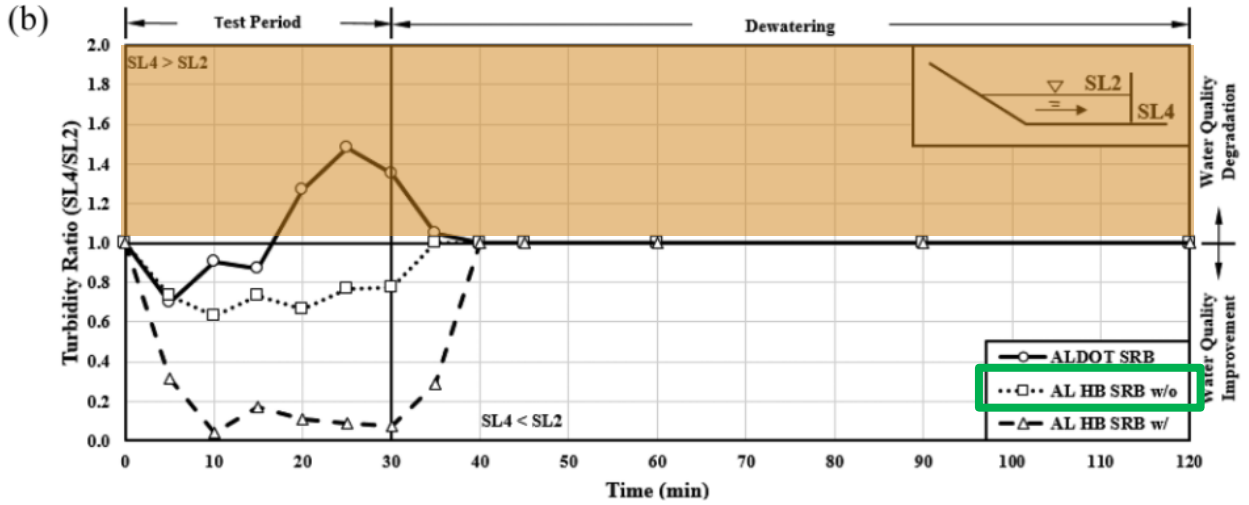

The Alabama Handbook Sediment Retention Basin (AL HB SRB) without flocculent had the lowest average sediment retention rate at 63%.

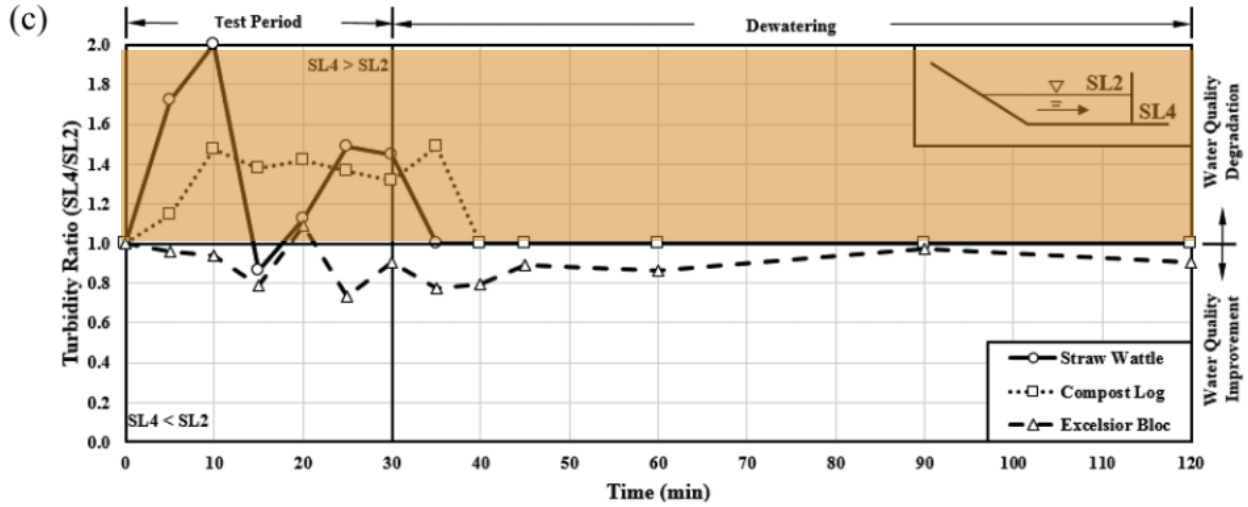
# Pollutant: Sediments – Construction Site Runoff (continued)

## 2. Even when installed and maintained correctly, BMPs not only fail to meet goals set by regulations, but oftentimes the regulations themselves are inadequate. (Further evidence)

"Figure 7. Turbidity ratio comparisons of treatments: (a) manufactured silt fence systems, (b) SRBs, and (c) manufactured SB products." (Whiteman et al., 2019)




Orange boxes highlight when water quality monitoring results showed an increase in turbidity in water leaving best management practices in study.

# Pollutant: Sediments – Construction Site Runoff (continued)

## 3. Failure of a BMP usually causes an instantaneous impact. BMPs can fail even with proper maintenance if not designed to meet unique, very specific site conditions.


Northern Natural Gas BMP failure from sheet erosion. Soils and sediments reached a wetland downslope (left photo) and impacted the stream running through the wetland (right photo). Photos from Spring 2025.



Northern Natural Gas failure from sheet erosion after additional BMPs installed. Wattles between the disturbed wetland and the stream channel (left) and silt fence with new straw bale support (right). Photos from Spring 2025.



Enbridge Check Valve Project. Sediment both sides of straw bales. BMP either not implemented prior to sediment runoff or not installed correctly (2025, MNRD).

# Pollutant: Sediments – Construction Site Runoff (continued)

**4. Sediment is reaching watercourses in watersheds undergoing active development even when BMPs are correctly installed at construction sites. Additionally, even after active construction is completed, developed watersheds still had higher levels of sediment in the watercourses.**


*At the confluence of the White River and Bad River there is a clear difference in turbidity as the White River, having a more developed watershed, it is oftentimes much more turbid.*


*At the confluence of the Marengo River and Bad River there is a clear difference in turbidity as the Marengo has higher sediment loads and is impaired.*

# Pollutant: Sediments – Construction Site Runoff (continued)

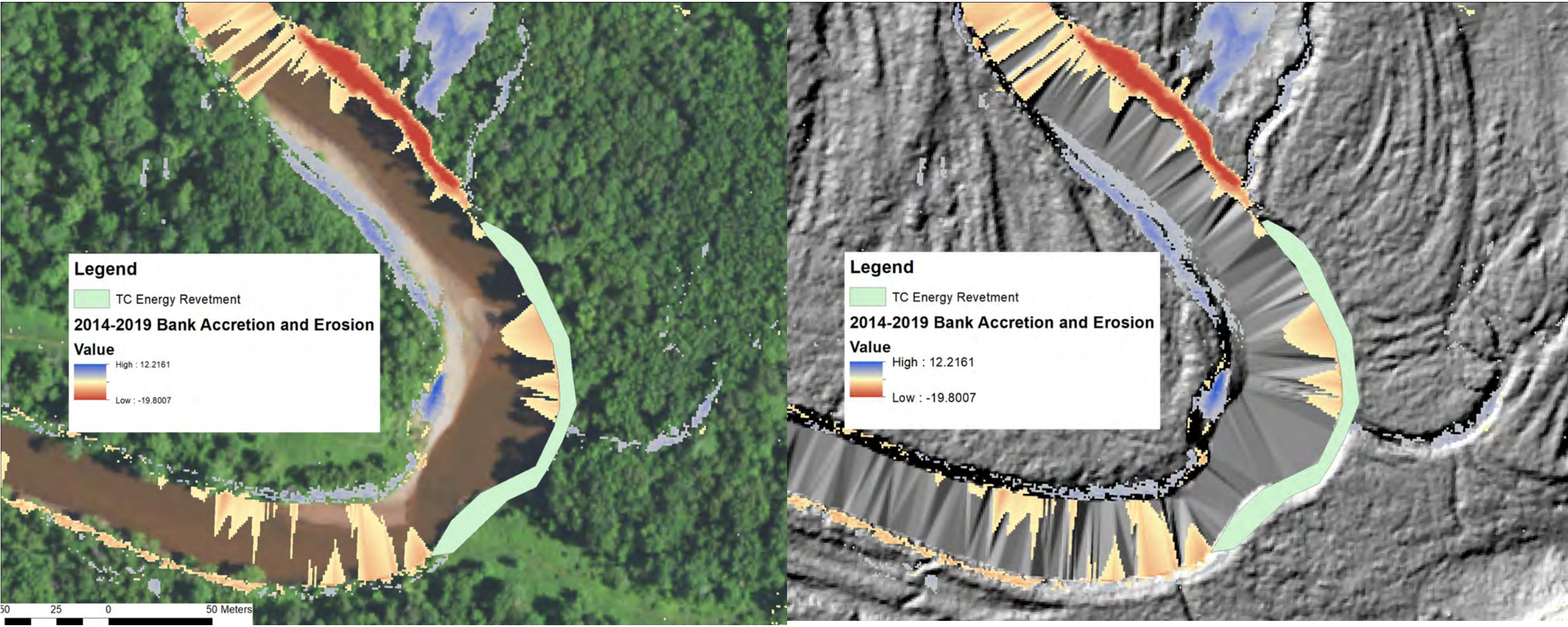
## 5. Sedimentation from human activities causes habitat and biodiversity loss, stream channel aggradation and flooding, and acts as a mobile substrate for other contaminants.


*A wetland impacted by the mud pushed out from underneath the construction matting for the Enbridge Check Valve project, and the sediments released as mud transferred by vehicle traffic is left on the matting and washed off into the nearby wetland amphibians, like the adult frog in the picture, can still be found in the wetland; however, water quality was effected, and the suitability of this wetland for any larval amphibians that may have hatched out in the spring is drastically reduced. (Bad River Tribe/MNRD, 7/2024)*


*Amphibian eggs in standing water along the access route to the Enbridge Check Valve project. While these pools of water may appear suitable to the amphibians spawning, impacts and persisting site conditions left over from the construction project may ultimately mean these pools aren't going to provide the habitat necessary for these eggs to survive. (Bad River Tribe/MNRD, 4/2025)*

# Pollutant: Sediments – Stream Bank Erosion – Example 1

## Case Study: TC Energy 2005/2006 Rock Revetment at the Bad River Crossing




*Above maps show stream bank accretion (positive value) and erosion (negative value), in relation to the TC Energy revetment.*

# Pollutant: Sediments – Stream Bank Erosion – Example 1

## Case Study: TC Energy 2005/2006 Rock Revetment at the Bad River Crossing

TC Energy Crossing in 2005



TC Energy Crossing in 2015

TC Energy Crossing in 2022

# Pollutant: Sediments – Stream Bank Erosion – Example 2

## Case Study: Enbridge on-Reservation Log Jack Activities & Water Quality Impacts, Bad River

Whether eroding due to natural forces, manmade alterations, or some combination thereof, completing "stabilization" of a streambank redirects erosive forces to new reaches.

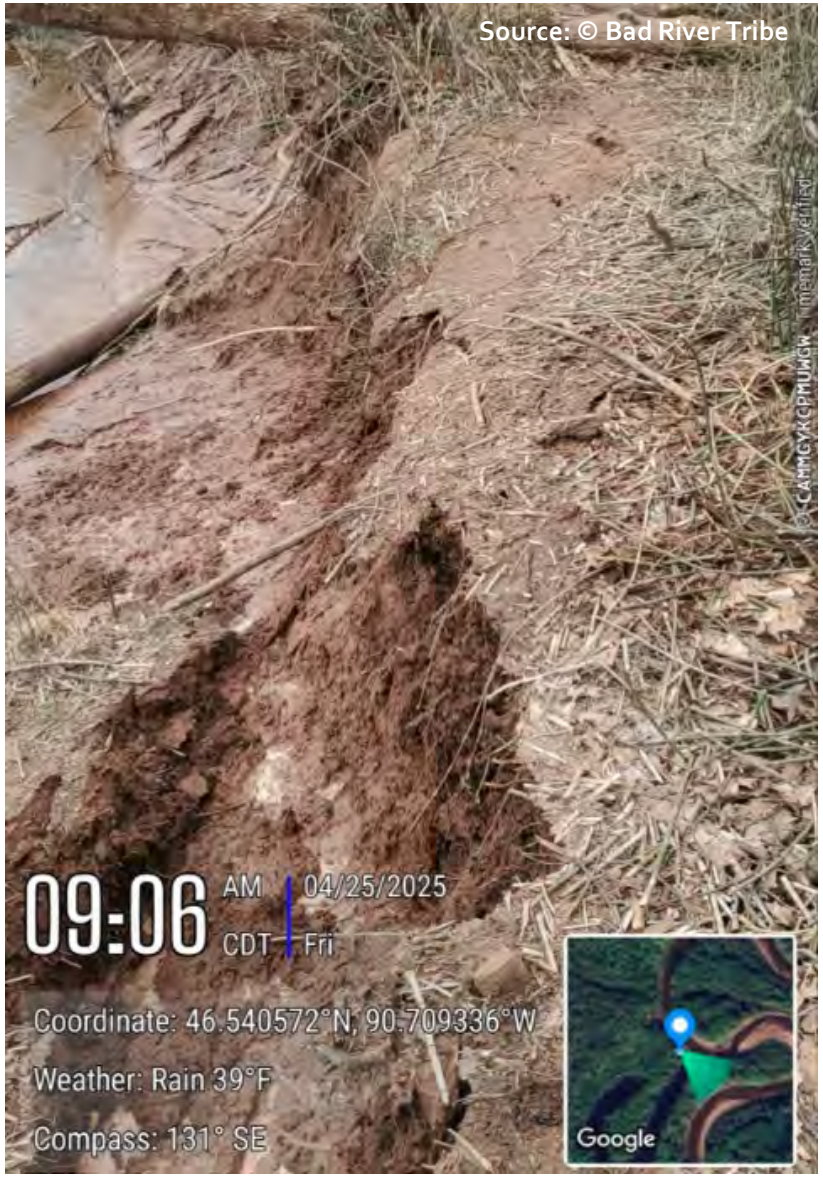



*Photo of the stretch of the left bank of the Bad River on the outer part of the next bend where erosion has increased since the log jacks were placed. (5/2025)*

*Photo of the stretch of the right bank of the Bad River (looking north across the river) where the log jacks were placed. (5/2025)*

# Pollutant: Sediments – Geohazards & Long-Term Maintenance

**The 41-mile-long pipeline reroute will include:**

- 49 potential geohazard areas are already flagged along the proposed route.
  - High Risk Geohazards: 5
    - Including:
      - Beartrap and Little Beartrap Creek have identified geohazards / hydro-geo hazards relating to bank failure.
      - Bay City Creek  at the pipeline crossing during the geohazard survey had "Northern slope has active landslide originating from stream bank undercutting" (Table 5.6 -14 of the FIES)
  - Moderate Risk Geohazards: 10
    - Most of these had some form of pervious or active bank erosion being noted.
      - With an unnamed tributary to Deer Creek having "Stream bank erosion. Pipe alignment  passing through eroded meander." (Table 5.6 -14 of the FIES)
  - Low Risk Geohazards: 13
  - N/A Geohazards: HDD Sites

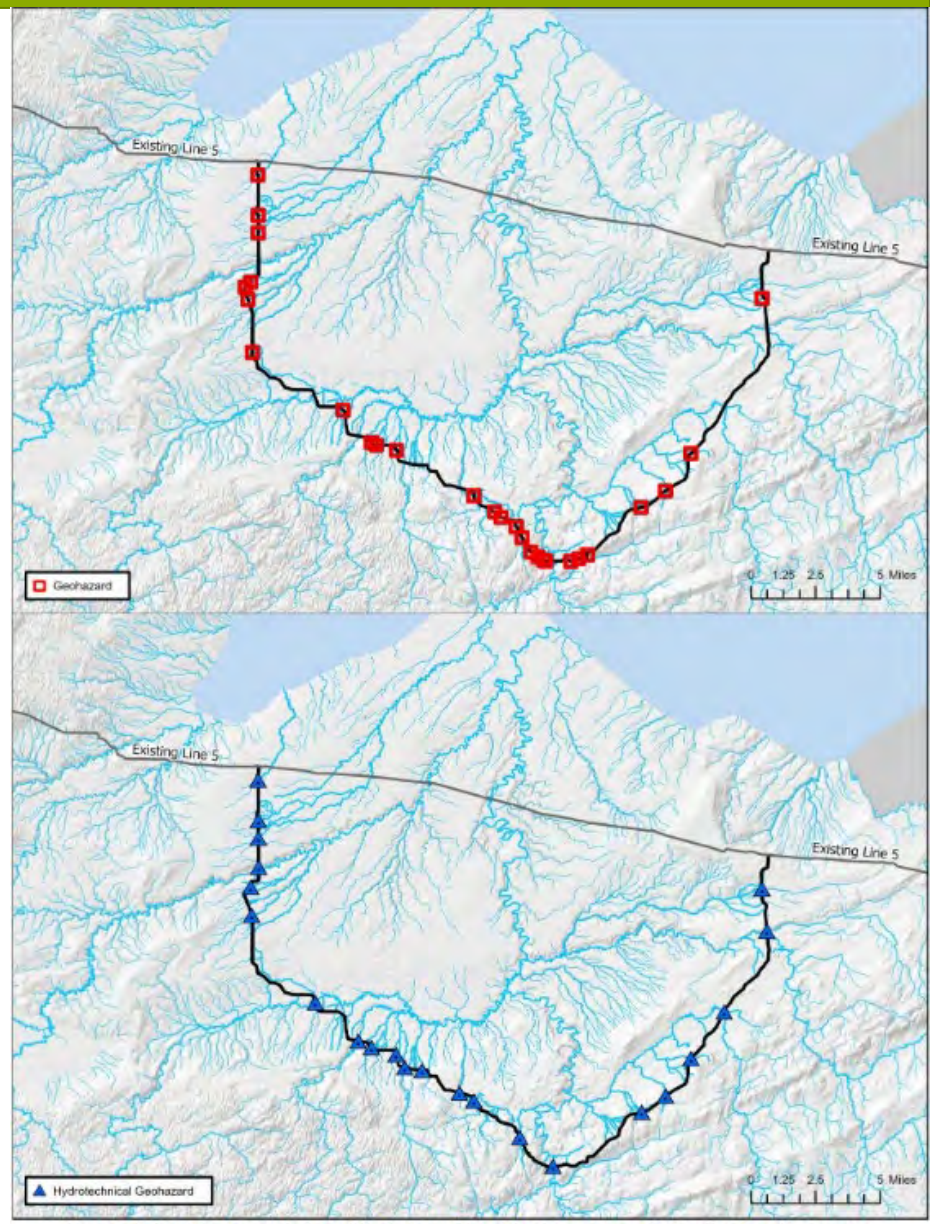



**Figure 2.1-9 Geohazards identified along Enbridge's proposed Line 5 relocation route.**
Top: Geohazards; Bottom: Hydrotechnical geohazards.
Source: Enbridge

# Pollutant: Sediments – Current Conditions in Tribal Waters

**Sediments in surface waters on the Reservation have been monitored for decades by the Mashkiiziibii NRD in streams, rivers, and wetlands. Parameters monitored include total suspended solids (TSS mg/L) and turbidity (NTU).**

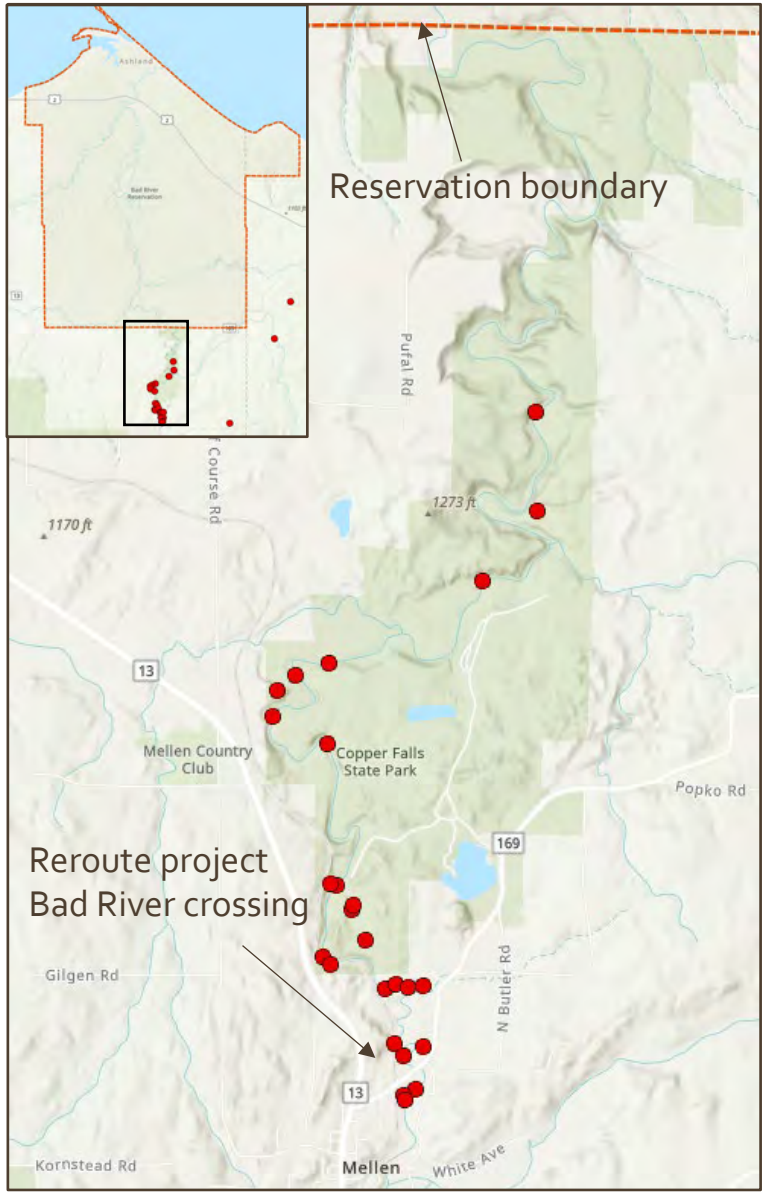
- Current conditions in the river and streams on the Reservation

| Name | Ranking | OTRW | ORW | ERW |
|---|---|---|---|---|
| Vaughn Creek | Impaired | | X | |
| Potato River | Outstanding | X | | |
| Tyler Forks River | Outstanding | | X | |
| Bad River | Outstanding | X | X | |
| Silver Creek | Impaired | | | X |
| Billy Creek | Impaired | | | X |
| Trout Brook | Impaired | | | X |
| Brunsweiler River | Impaired | | X | |
| White River | Impaired | | X | |
| Beartrap Creek | Impaired | X | X | |
| Marengo River | Impaired | | X | |


Vaughn Creek 8/03/2011


Beartrap Creek 8/03/2011

# Pollutant: Biological Materials – NLBs: Reed Canary Grass




Map of reed canary grass populations at the Bad River crossing of the proposed project

Reed canary grass growing in various conditions, photo from Ontario Invasive Plants

Reed Canary Grass can tolerate growing on sites that are submerged in water.
Photo courtesy of Dave Featherstone.

Reed Canary Grass can be found along riverbanks.
Photo courtesy of Dave Featherstone.

Reed Canary Grass also grows in wet ditches/wetlands.
Photo courtesy of Dave Featherstone.

# Pollutant: Biological Materials – NLBs: Garlic Mustard


Proposed reroute in area with garlic mustard

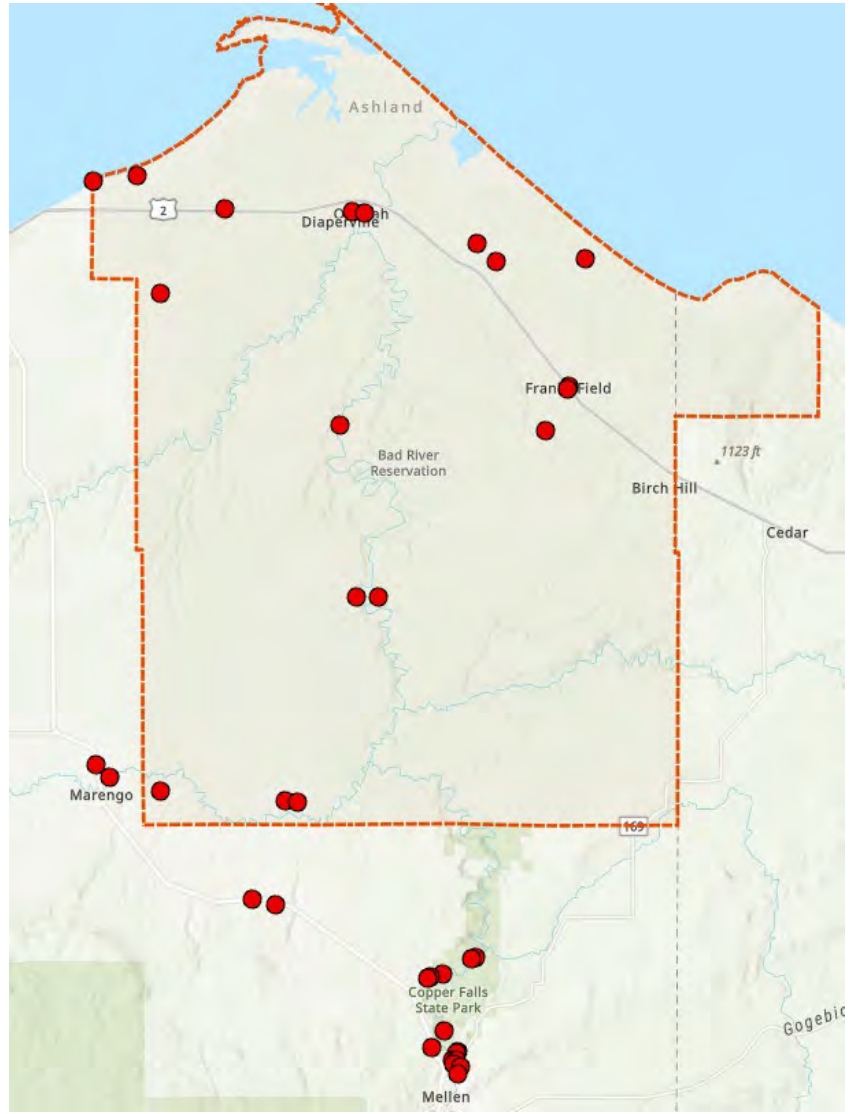

Mapped garlic mustard populations from EDDmaps


Hydrological connection of garlic mustard population to Reservation waters

# Pollutant: Biological Materials – NLBs: Common Buckthorn

Common buckthorn (*Rhamnus cathartica*)


Buckthorn fruits, photo from Woody Invasives of the Great Lakes Collaborative




Map of common buckthorn, off-Reservation data from EDDMaps

# Pollutant: Biological Materials – NLBs: Non-Native Cattail

Non-native cattail (*Typha angustifolia, Typha X glauca*)


Cattail infestation on the Bad River Reservation

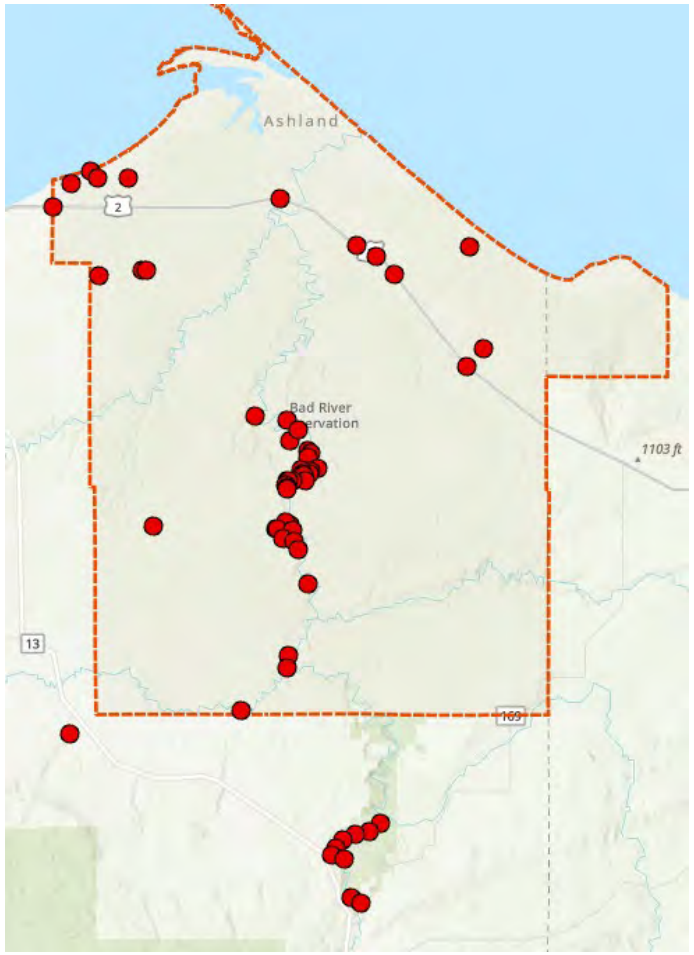

Cattail seeds on the water's surface, photo from Gould & Valdez 2024

# Pollutant: Biological Materials – NLBs: Purple Loosestrife

Purple Loosestrife (*Lythrum salicaria*)

Photo of purple loosestrife growing on the Line 5 corridor west of Pine Flats Road on the Reservation. (2023 MNRD)


Photo of purple loosestrife seeds next to pencil tip. Photo from Minnesota Department of Agriculture




Map of purple loosestrife on Reservation and along neighboring waterways (EDDmaps supplied off-Reservation data)

# Pollutant: Biological Materials – NLBs: Wild Parsnip

Wild parsnip (*Pastinaca sativa*)


Photo of wild parsnip growing on the Line 5 corridor on the east side of Government Road on the Reservation (2023 MNRD)


Photo of another angle of the wild parsnip growing on the Line 5 corridor on the east side of Government Road on the Reservation (2023 MNRD)

A burn caused by wild parsnip, photo from Lacrosse Tribune 2013

# Pollutant: Biological Materials – NLBs & Permit Conditions

WDNR's 401 Water Quality Certification Conditions (85, 89, 92, 93) are not adequate to prevent the discharge of NLBs to Reservation waters.


Photo of wild parsnip growing on the Xcel distribution line north of Star Route Road in Northeastern Bayfield County. (2023 GLIFWC, personal communication)


Photo of sweet clover growing at Denomie Creek site after construction activities highlighted in the red ovals.

# Pollutant: Hydrologic Changes

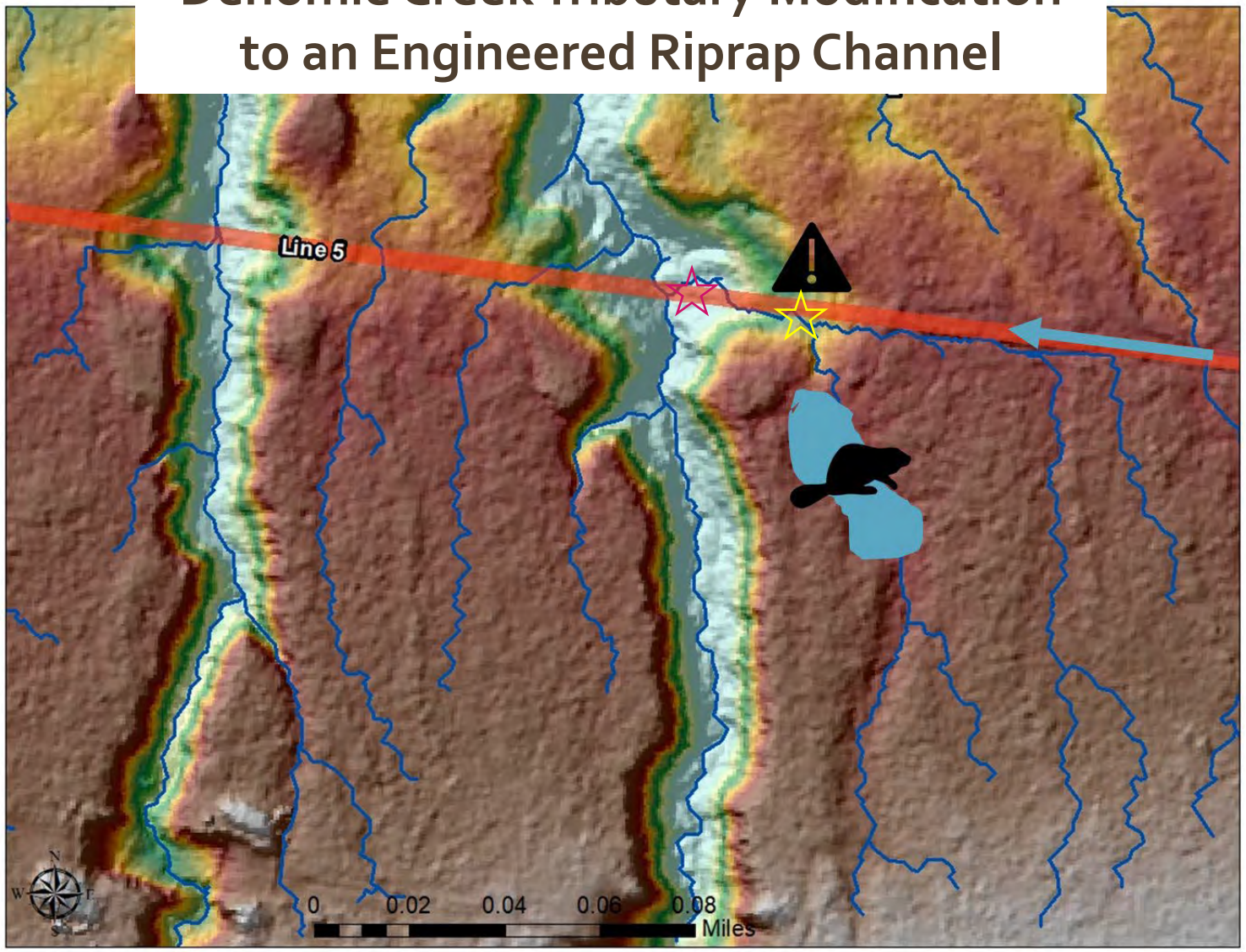
**The proposed project will change hydrology and will affect the water quantity, flow, and water quality in Reservation waters. There will be multiple reasons for the hydrologic changes, including but not limited to:**

- Wetlands will be permanently filled (0.02 acres) and wetlands will be permanently converted to different types with reduced functions (33.92 acres)
- Blasting will result in hydrologic alterations, including altering groundwater levels, flow paths, and groundwater/surface water interactions
- Conversions of land cover will result in hydrologic changes
- The mats needed to support heavy equipment and other traffic will compact soil
- Non-local beings discharged into waters will invade and change wetland hydrology and alter functions


> 6 inches of compaction from < 90 days of deployment at Enbridge check valve project on Reservation

# Pollutant: Hydrologic Changes

## Denomie Creek Tributary Modification to an Engineered Riprap Channel





☆August 2018*


Nov. 5, 2018

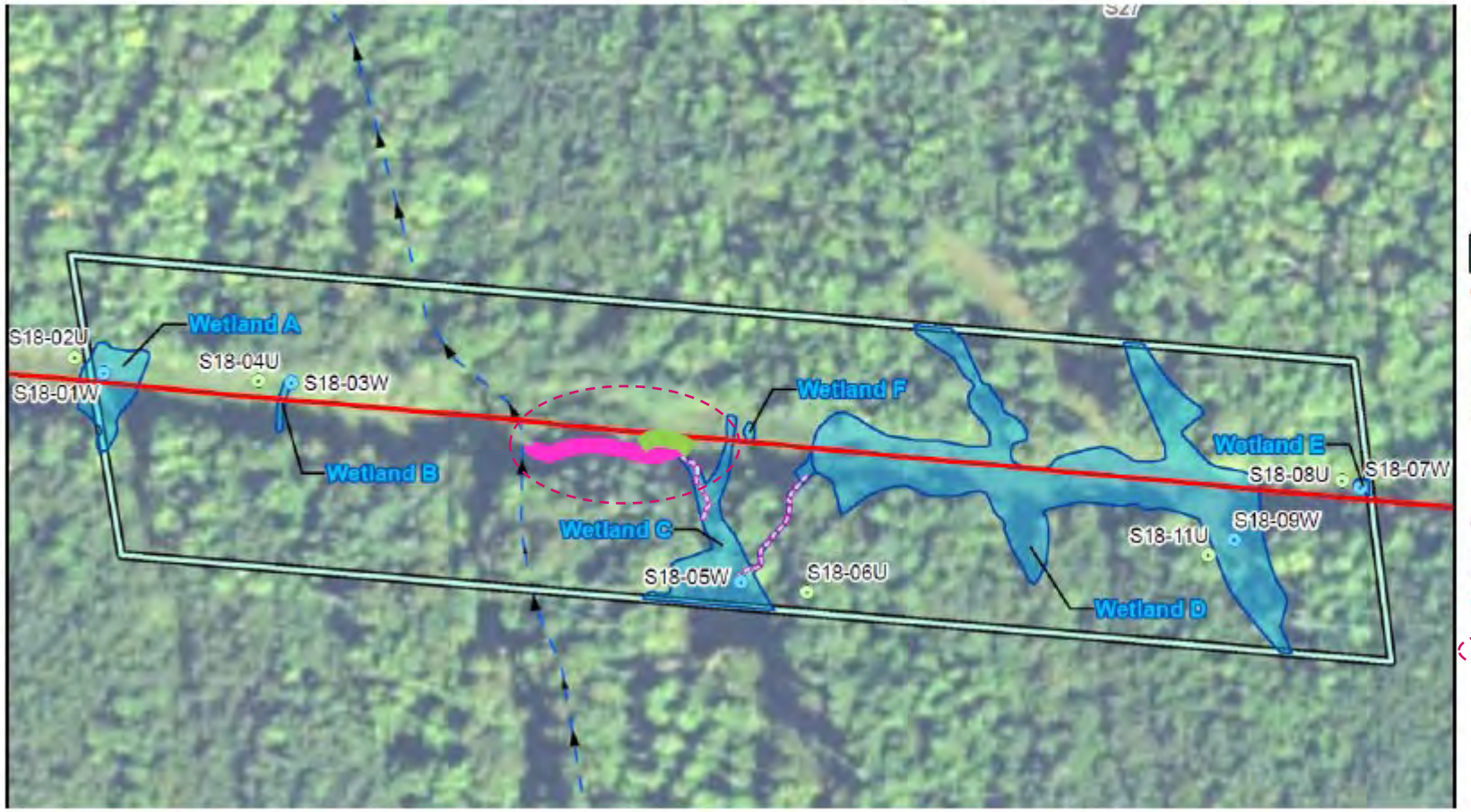

☆May 7, 2019


May 9, 2019

# Pollutant: Hydrologic Changes

## *Denomie Creek Tributary Modification to an Engineered Riprap Channel Case Study*

Inadequate mapping and delineation



# Pollutant: Hydrologic Changes

## *Denomie Creek Tributary Modification to an Engineered Riprap Channel Case Study*


May 5, 2023

Denomie Creek Post Engineered Riprap Channel installation.

October 10, 2023

# Pollutant: Hydrologic Changes

## *Enbridge Check Valve Installation Project Case Study*

The use of the construction matting and vehicle activity beyond the matting resulted in soil compaction.
Soil compaction and dispersion from construction matting increases runoff and lessen infiltration.


Wetland impacts due to approved matting area and vehicle traffic outside of approved matting areas (2024, MNRD).


Soil pushed out from under construction matting into adjacent wetlands. Mats sinking into soft substrate of wetland (2024, MNRD).


Enbridge crew member operating a tracked vehicle off the construction matting (2024, MNRD).

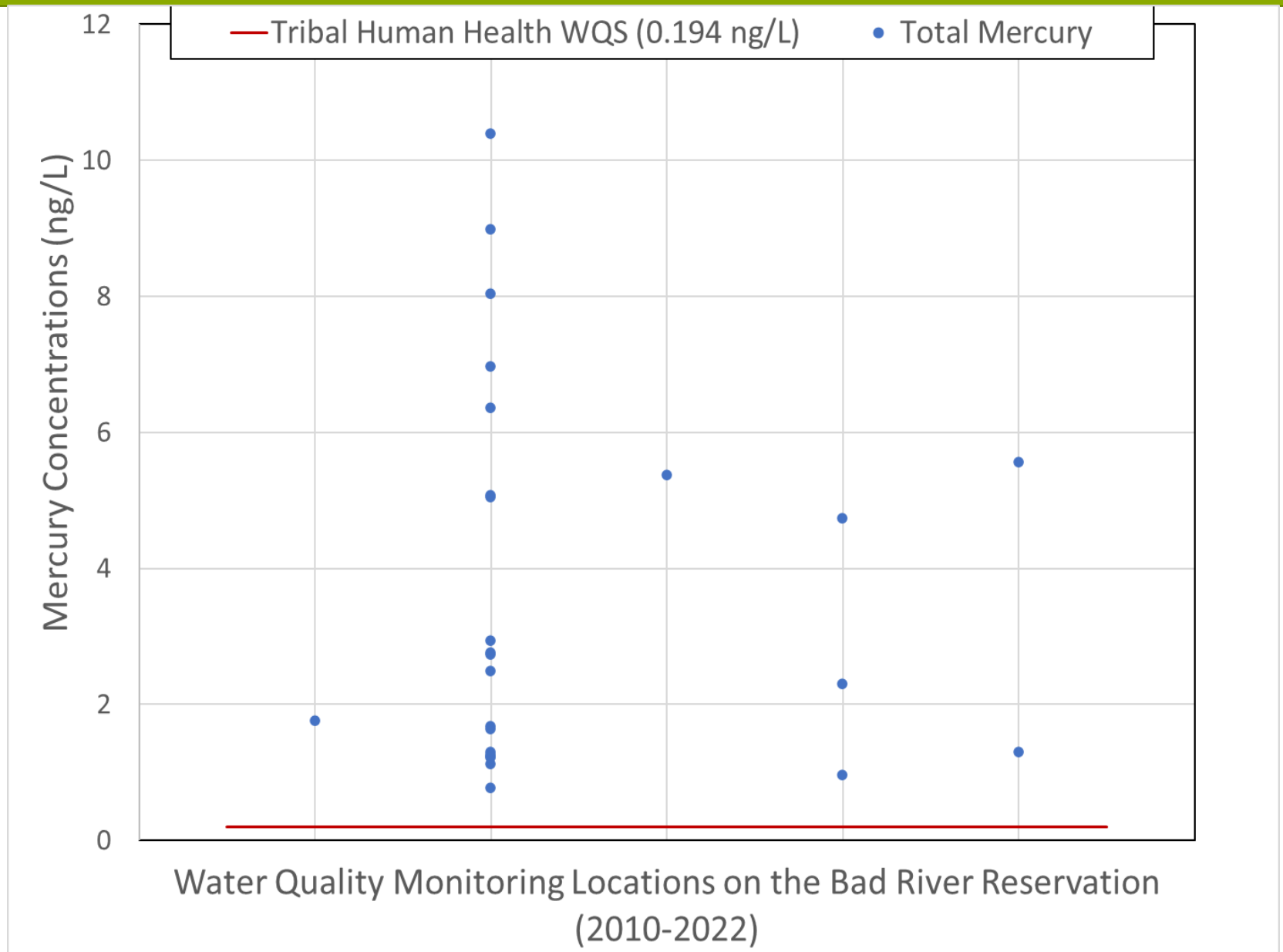
# Pollutant: Mercury and Methylmercury

**Due to the proposed project, mercury pollution will increase in tribal waters, and tribal waters already exceed the Band's water quality criteria. The proposed project will increase transport and methylation of mercury in Reservation waters by:**

- Blasting residue
- Using excess rock from blasting as fill for trench materials
- Modifying upstream wetland hydrology via trenching, blasting, and other project activities, which increases mobilization of mercury and methylmercury from wetland soils and peat.

| | Mean Concentration (ng/L) | Median Concentration (ng/L) | Maximum Concentration (ug/l) | Minimum Concentration (ug/l) | Tribal Water Quality Criterion (ug/l) | Number of Samples |
|---|---|---|---|---|---|---|
| **Total Mercury** | 4.2 | 4.3 | 10.4 | 0.34 | 0.194 | 60 |

# Pollutant: Mercury and Methylmercury




Tribal Surface Waters already exceed the Band's mercury criteria, which are more stringent than WI's criteria.

More expert testimony on mercury to follow.

# Pollutant: Mercury and Methylmercury

https://apps.dnr.wi.gov/fishconsumptionadvisoryquery/

Wisconsin Department of Natural Resources

**Find the advice for eating fish from Wisconsin waters**

**County** Ashland

**Advisory Area** LAKE SUPERIOR INCLUDING TRIBUTARIES UP TO THEIR 1ST IMPASSABLE BARR

**Advice for eating fish from the area you selected:**

County: Ashland, Bayfield, Douglas, Iron

Advisory Area: LAKE SUPERIOR INCLUDING TRIBUTARIES UP TO THEIR 1ST IMPASSABLE BARRIER (DAM OR FALLS)

Includes: LAKE SUPERIOR

**Women up to age 50 (child bearing age) and children (under age 15) may safely eat:**

| | |
|---|---|
| **1 Meal Per Week** | brown trout, burbot, chinook salmon, chubs, coho salmon, lake herring, lake whitefish, rainbow trout, yellow perch |
| **and** | |
| **1 Meal Per Month** | lake sturgeon larger than 60", lake trout, rainbow smelt, siscowet lake trout, walleye |

**All men (15 and older) and older women (50 and older) may safely eat:**

| | |
|---|---|
| **Unrestricted** | coho salmon, lake herring, rainbow trout, yellow perch |
| **1 Meal Per Week** | brown trout, burbot, chinook salmon, chubs, lake whitefish, walleye |
| **and** | |
| **1 Meal Per Month** | lake sturgeon larger than 60", lake trout, rainbow smelt, siscowet lake trout |

The above advice is due to the following pollutants:MERCURY, PCB, PFOS

Date of Query:May 04 2025

Photo copyright of the Bad River Tribe.

Source: Wisconsin DNR

# Pollutant: Mercury and Methylmercury

**Bad River Tribal members rely on harvesting Ogaa (Walleye) for feeding themselves and their families. The Bad River is the closest and most reliable location to harvest Ogaa.**

If the Mercury concentrations continue to increase to even more unsafe levels, a tribal member **would have to travel on average around 45 minutes to harvest Ogaa** with current comparable Mercury levels (excluding Mille Lacs). These lakes also have lower quantities of Ogaa reducing the amount of Ogaa a member could harvest each year.

**Recommended Maximum Number of Ogaa Meals per Month for Lakes Harvested by Bad River**

**SORTING AND LABELING *OGAA* PRIOR TO FREEZING**

When Cleaning *Ogaa*:

- Put *ogaa* under 20 inches in bags labeled "under 20 inches."
- Put *ogaa* over 20 inches in bags labeled "over 20 inches."
- Label bags with the lake name.
- Follow the advice below for maximum number of meals per month.

**USING THIS CHART TO FIND SAFER *GIIGOONH***

MAXIMUM NUMBER OF MEALS PER MONTH

Advice is for all lakes combined. For example, if you eat four meals in a month from green lakes you should not eat any other meals of *ogaa* in that month.

MEAL SIZE

Meal size is based on 8 ounces. An average 19-inch *ogaa* will have 8 ounces of meat. If your meal size is larger, you should eat fewer meals of *ogaa*. If it is smaller, you can eat more meals of *ogaa*.

OTHER *GIIGOONH*

*Giigoonh* such as muskellunge, largemouth bass, smallmouth bass, and northern pike will have more mercury than *giigoonh* such as lake whitefish, herring, bluegill, sunfish, crappie or perch. Try to choose safer *giigoonh*.

| LAKE | COUNTY | SENSITIVE: Anyone who is pregnant or nursing, could become pregnant, and children under 15 — Maximum number of meals per month | GENERAL: Anyone who CANNOT become pregnant, is NOT nursing, and is over 15 — Maximum number of meals per month |
|---|---|---|---|
| AMBER L | VILAS | 1 | 2 |
| ANNABELLE L | VILAS | 0 | 2 |
| BEAR L | ASHLAND | 1 | 2 |
| BIRCH L | VILAS | 1 | 2 |
| BLACK OAK L | VILAS | 1 | 4 |
| BOND L | DOUGLAS | 1 | 4 |
| CHAIN L | RUSK | 1 | 4 |
| CONNORS L | SAWYER | 1 | 4 |
| CRAB L | VILAS | 1 | 2 |
| DIAMOND L | BAYFIELD | 1 | 2 |
| DOWLING L | DOUGLAS | 0 | 2 |
| ECHO L | IRON | 1 | 4 |
| ENGLISH L | ASHLAND | 0 | 2 |
| EVERGREEN L | SAWYER | 2 | 8 |
| FISHER L | IRON | Not Enough Information | |
| FOREST L | VILAS | 1 | 2 |
| GORDON L | ASHLAND | Not Enough Information | |
| HARRIS L | VILAS | 1 | 4 |
| HEMLOCK L | BARRON | Not Enough Information | |
| HIGH L | VILAS | 1 | 4 |
| HOLCOMBE | CHIPPEWA | 1 | 4 |
| ISLAND L | RUSK | 2 | 8 |
| L GALILEE | ASHLAND | 1 | 4 |
| L MINNESUING | DOUGLAS | 0 | 2 |
| L OF THE FALLS | IRON | Not Enough Information | |
| L OWEN | BAYFIELD | 1 | 4 |
| L WISSOTA | CHIPPEWA | 1 | 4 |
| LAC SAULT DORE | PRICE | 2 | 4 |
| LONG L | PRICE | 1 | 4 |

| LAKE | COUNTY | SENSITIVE: Anyone who is pregnant or nursing, could become pregnant, and children under 15 — Maximum number of meals per month | GENERAL: Anyone who CANNOT become pregnant, is NOT nursing, and is over 15 — Maximum number of meals per month |
|---|---|---|---|
| LONG L | IRON | 0 | 2 |
| LONG L | CHIPPEWA | 2 | 4 |
| LOST LAND L | SAWYER | 2 | 4 |
| LYNX L | VILAS | 0 | 2 |
| MAMIE L | VILAS | 1 | 4 |
| MASON L | SAWYER | 2 | 8 |
| MILLE LACS L | MILLE LACS | 2 | 8 |
| MINERAL L | ASHLAND | 1 | 2 |
| N TURTLE L | VILAS | 1 | 2 |
| NAMEKAGON L | BAYFIELD | 1 | 4 |
| NELSON L | SAWYER | 1 | 4 |
| OXBOW L | VILAS | 0 | 2 |
| PIKE L | PRICE | 1 | 4 |
| PINE L | IRON | 0 | 2 |
| PRESQUE ISLE L CHAIN | VILAS | 2 | 8 |
| RAINBOW FL | ONEIDA | 1 | 2 |
| RIB L | TAYLOR | 1 | 4 |
| ROUND L | PRICE | 1 | 4 |
| S TURTLE L | VILAS | 0 | 2 |
| SISKIWIT L | BAYFIELD | 0 | 2 |
| SOLBERG L | PRICE | 1 | 2 |
| SPIDER L | IRON | 0 | 2 |
| TEAL L | SAWYER | 1 | 4 |
| TENDERFOOT L | VILAS | 1 | 4 |
| TRUDE L | IRON | 0 | 2 |
| TURNER L | PRICE | 1 | 4 |
| TURTLE-FLAMBEAU FL | IRON | 1 | 2 |
| WHITEFISH L | DOUGLAS | 1 | 4 |

Source: GLIFWC

# Pollutant: PFAS

**Due to the proposed project, PFAS pollution will increase in tribal waters, and tribal waters already will exceed the Band's water quality criteria. The proposed project will increase PFAS due to:**

- Use of drilling fluid in HDD that contains PFAS compounds, especially in proprietary blends
- Coatings, solvents, surfactants, fertilizers, and herbicides utilized during project implementation
- Cleaning products used on construction equipment to rid them of invasive/non-local beings (bakaan ingoji gaa-ondadaag)
- The source water itself, used for filling herbicide sprayers, cleaning construction equipment, and used in HDD may contain PFAS

Will Affect Letter, Figure 3. Source: EPA, 2017. HDD inadvertent release – Tuscarawas River, Ohio.

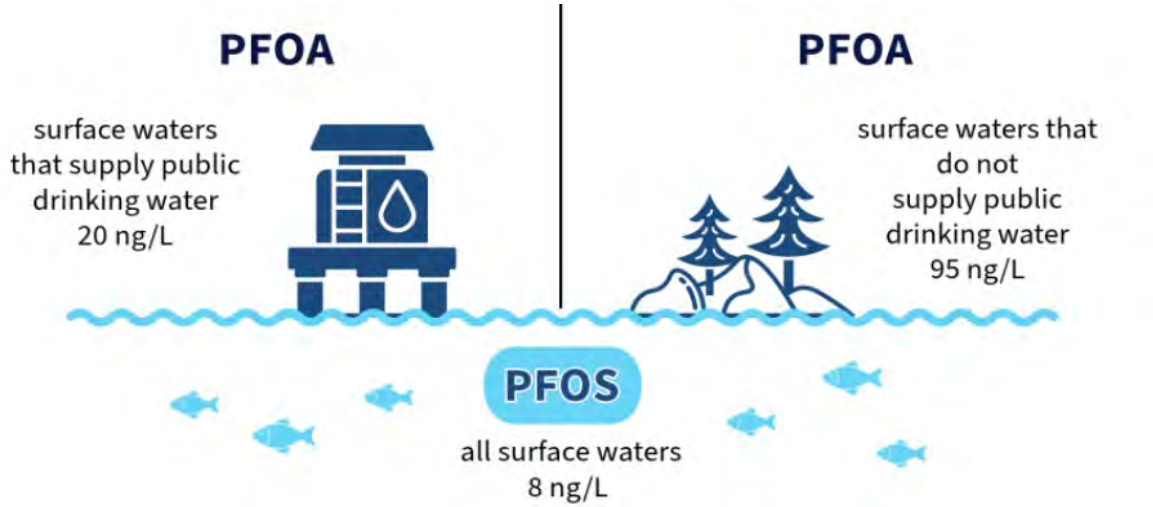
# Pollutant: PFAS

## PFAS CURRENT CONDITIONS FOR RESERVATION WATERS

- PFAS compounds identified during a 2020 WI DNR sampling event of the Bad River at US HWY 2.
- Fish advisories are in effect to protect public health by eating less fish due to contaminants, including PFOS (a type of PFAS).
- PFAS bioaccumulates and causes or contributes to adverse effects to aquatic organisms and those who consume them, including the human population. The project will discharge and alter background conditions of harmful pollutants including PFAS.

| Chemical | Maximum Contaminant Level Goal (MCLG) | Maximum Contaminant Level (MCL) |
|---|---|---|
| PFOA | 0 | 4.0 ppt |
| PFOS | 0 | 4.0 ppt |
| PFHxS | 10 ppt | 10 ppt |
| HFPO-DA (GenX chemicals) | 10 ppt | 10 ppt |
| PFNA | 10 ppt | 10 ppt |
| Mixture of two or more: PFHxS, PFNA, HFPO-DA, and PFBS | Hazard Index of 1 (unitless) | Hazard Index of 1 (unitless) |

US EPA 2024 PFAS Drinking Water Regulation

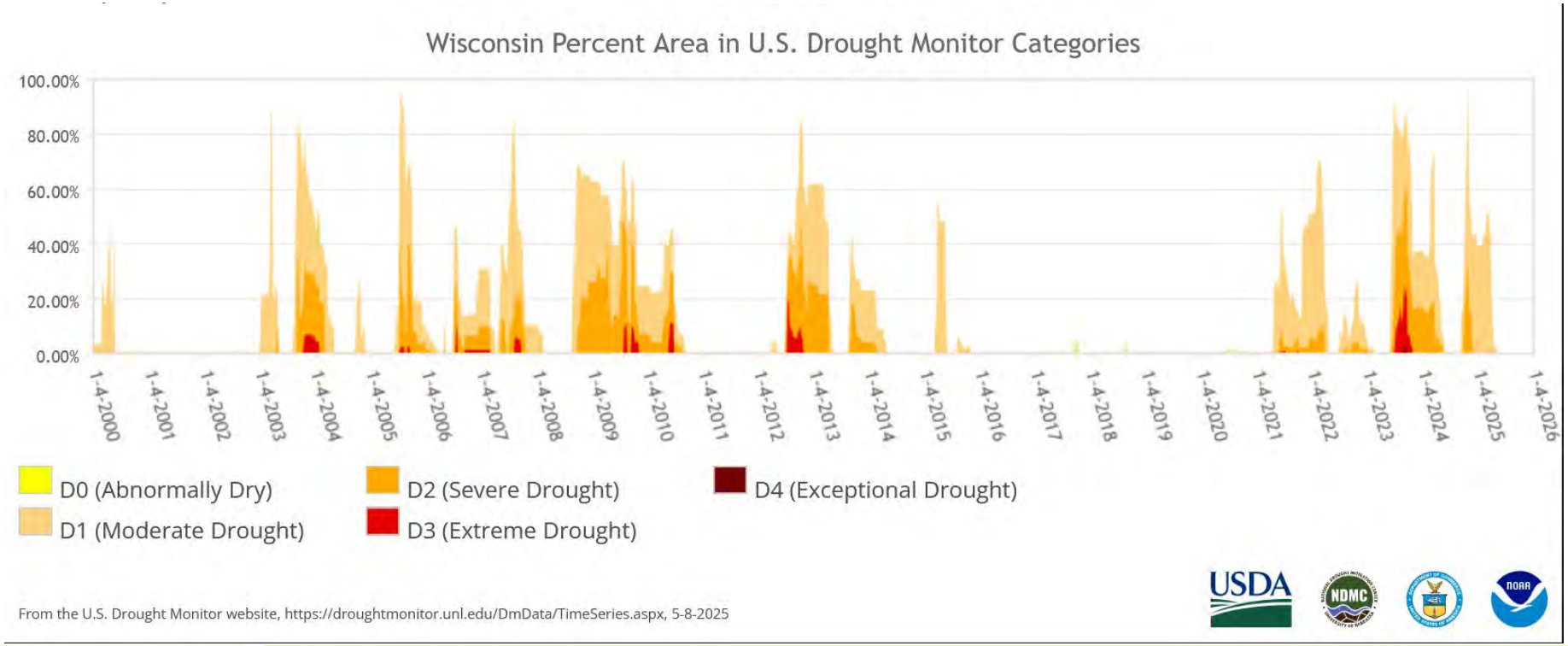



WI DNR: PFOS & PFOA Surface Water Quality Criteria. Rule effective Aug. 1, 2022.

# Pollutant: Minerals Mobilized from Blasting

**Due to the proposed project blasting through 5.5 acres of shallow bed rock, several pollutants will increase in tribal waters and already will exceed the Band's water quality criteria. The proposed project will release these pollutants through the following methods:**

- Blasting will expose fresh rock face sulfide minerals to weathering. This will generate pollution similar to mine pits which would contaminate surface and ground water systems.
  - Both the blasted trench walls as well as the excess rock being used as backfill will contribute to this

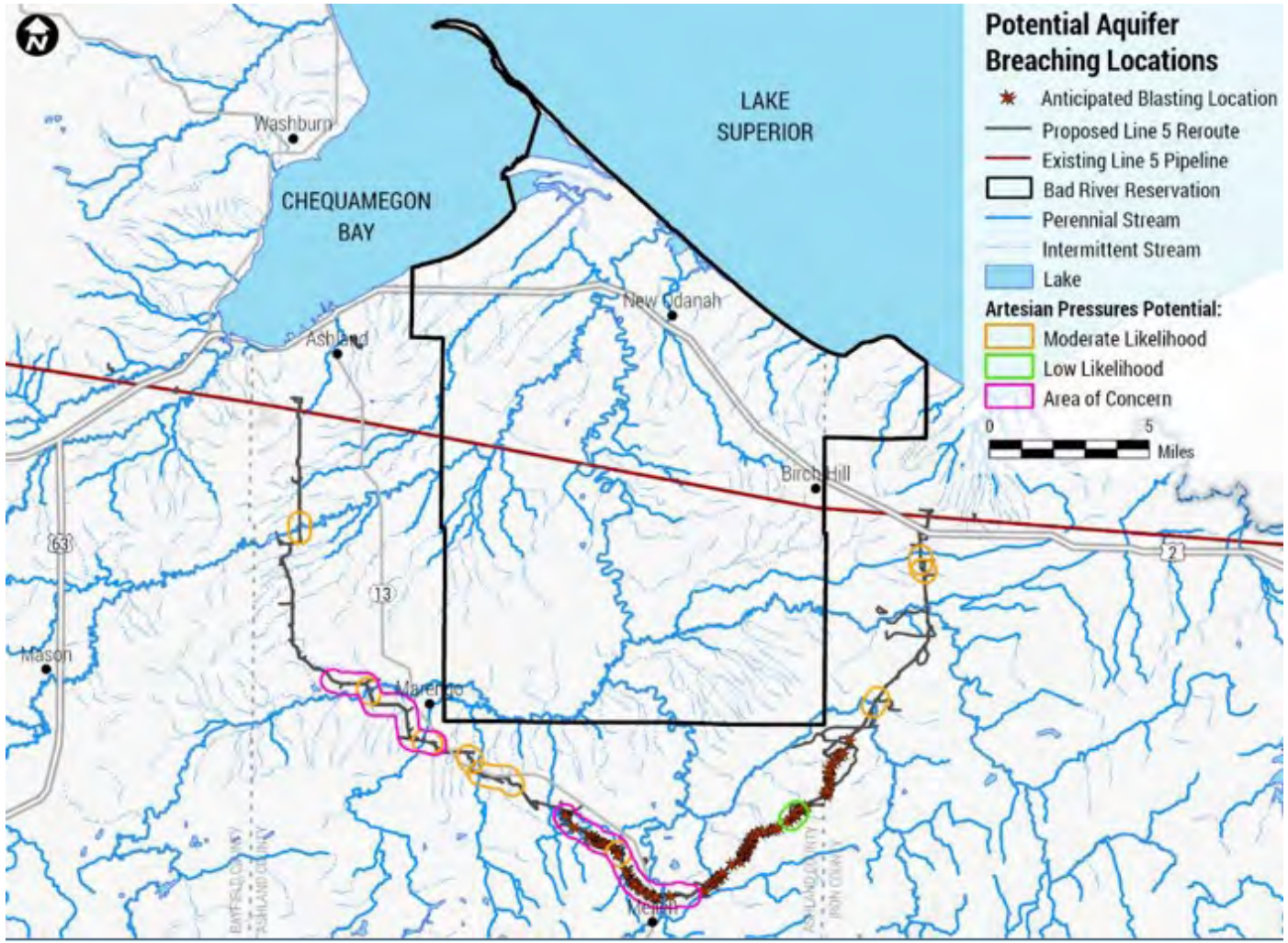



# Pollutant: Minerals Mobilized from Blasting

**Due to the proposed project blasting through 5.5 acres of shallow bed rock, several pollutants will increase in tribal waters and already will exceed the Band's water quality criteria. The proposed project will release these pollutants through the following methods:**

- Additional nitrogenous compounds will be introduced into the water using Ammonium Nitrate Fuel Oil( ANFO).
- Heavy Metals such as Lead, Selenium, Uranium, Copper, and others are known to occur within the Penokee Range, but specific amounts and locations are not well documented.
- These elements would not be trapped by BMPs but instead released into the surface waters.


*These photos of radiation readings were taken at Morgan Falls which is part of the Mellen Intrusive complex.*

# Pollutant: Thermal

**E.6.ii.g. Temperature – No measurable change (increase or decrease) in temperature from other than natural causes shall be allowed that causes or contributes to an adverse effect to the natural biological community. For those waters designated as a Cold Water Fishery, there shall be no measurable increase in temperature from other than natural causes.**

- Corps DCDD only mentioned temperature three times
- DCDD also lacked the Corps' justification and analysis of evaluating potential changes in water temperature due to the Project
- DCDD did not recognize that changes in water temperatures can be caused by the Project beyond the removal of vegetation at waterbody crossings


Screenshot from a drone flight over an exposed natural gas pipeline on Reservation, showing both an aerial and white-hot thermal image side-by-side. Thermal imaging is showing a temperature difference between the pipeline and the surrounding area. (Bad River Tribe, Will Affect Letter, Figure 13)

# Pollutant: Thermal

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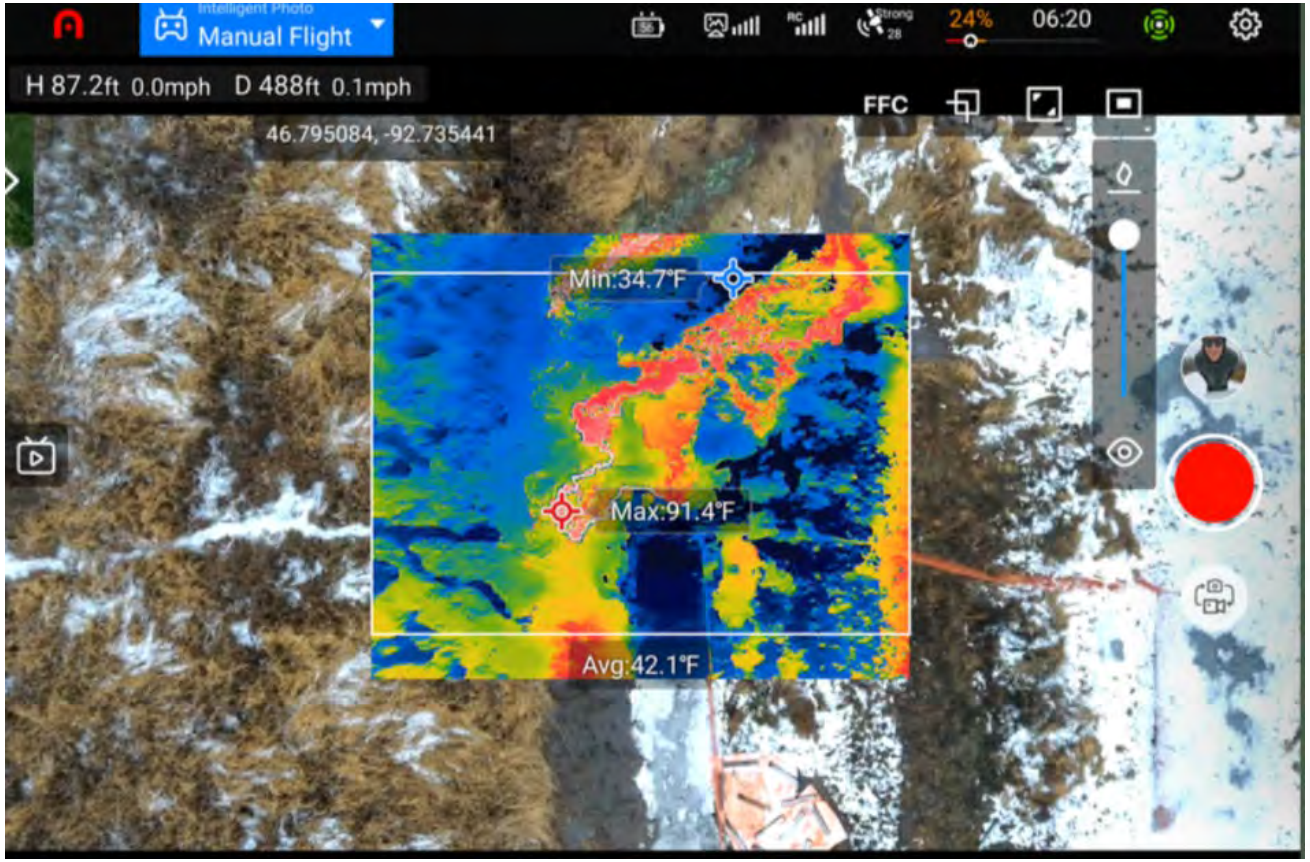
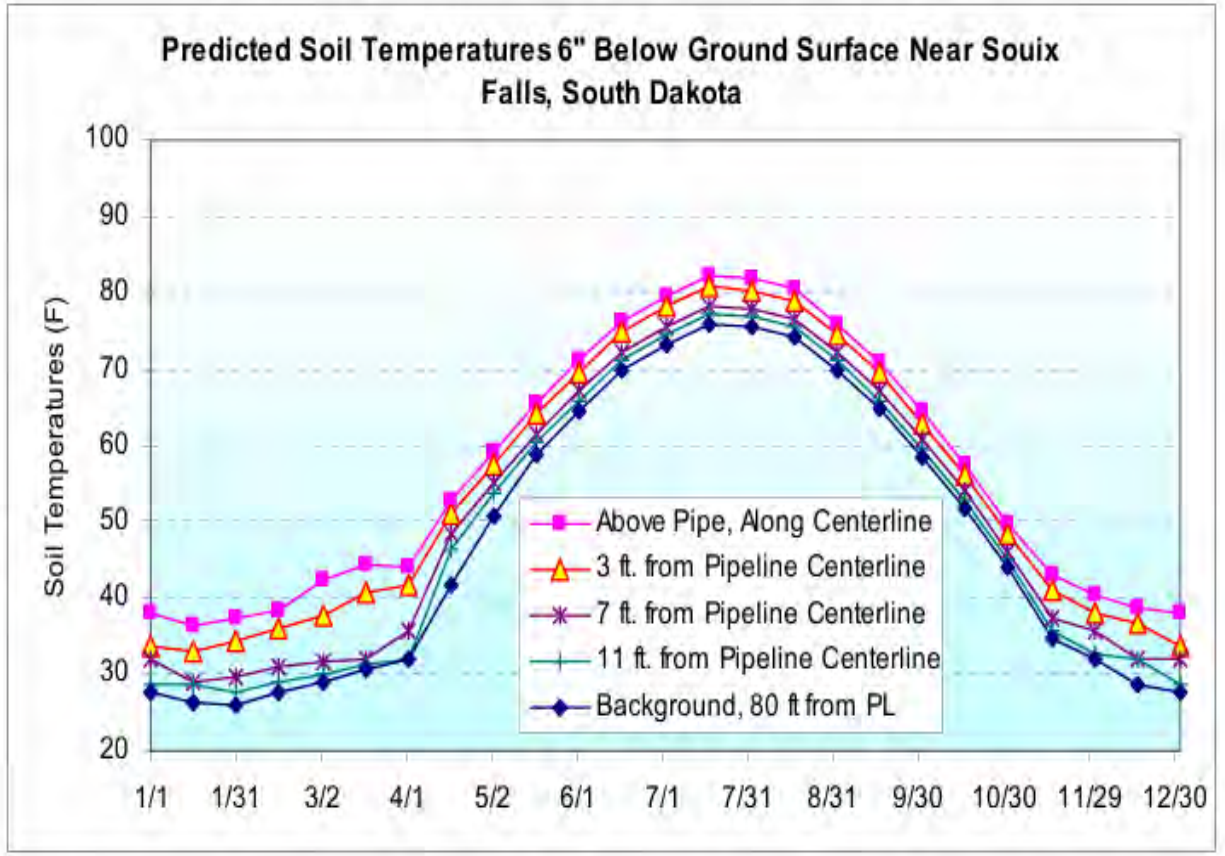



Attachment 2 of MNRD WQS Report, December 2021 near Fond du Lac Reservation – thermal flyover.




Reference Page 52, Will Affect Letter. Source: Figure 36, Keystone XL Project. Appendix S, Pipeline Temperature Effects Study. Final Supplemental Environmental Impact Statement for the Keystone XL Project Executive Summary, January 2014.

# Miigwech