IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF WISCONSIN

BAD RIVER BAND OF THE LAKE SUPERIOR TRIBE OF CHIPPEWA INDIANS OF THE BAD RIVER RESERVATION,

Plaintiff,

v.

ENBRIDGE ENERGY COMPANY, INC., and ENBRIDGE ENERGY, L.P.,

Defendants.

ENBRIDGE ENERGY COMPANY, INC., and ENBRIDGE ENERGY, L.P.,

Counter-Plaintiffs,

v.

BAD RIVER BAND OF THE LAKE SUPERIOR TRIBE OF CHIPPEWA INDIANS OF THE BAD RIVER RESERVATION and NAOMI TILLISON, in her official capacity,

Counter-Defendants.

Case No. 3:19-cv-00602-wmc

Judge William M. Conley

DECLARATION OF CHRISTOPHER OLSON AND NOAH GREENBERG ON BEHALF OF WRIGHT WATER ENGINEERS, INC.

We, Christopher Olson and Noah Greenberg, declare the following based on our personal knowledge to which we are competent to testify:

1. Chris Olson, PhD, PE is a Senior Water Resource Engineer at Wright Water Engineers, Inc. (WWE) with over 20 years of experience working in engineering consulting and academia. Dr. Olson is a licensed professional engineer in four states (CO, TX, TN, NE) and has a pending application for licensure in Wisconsin. Dr. Olson has a PhD and masters degree in civil engineering from Colorado State University and a bachelors degree in environmental engineering from the University of Wisconsin-Platteville.

2. Noah Greenberg, PWS is a Senior Water Resources Scientist at WWE with 18 years of consulting experience in addition to 6 years conducting research in academic institutions. Mr. Greenberg has significant experience evaluating the Bad River floodplain in the context of Enbridge's Line 5 pipeline and has conducted approximately 20 site visits to the Line 5 crossing of the Bad River since 2017. Mr. Greenberg has a bachelors degree in biology from Colorado College and a masters degree in ecology and evolutionary biology from the University of Colorado, Boulder.

3. Neither Dr. Olson nor Mr. Greenberg were involved with the litigation between the Bad River Band of the Lake Superior Tribe of Chippewa and Enbridge. They are both familiar with Judge Conley's June 16, 2023 order that Enbridge adopt and implement its December 2022 monitoring and shutdown plan and that Enbridge cease operation of Line 5 on any Band-owned parcel within the Band's tribal territory on which Enbridge lacks a valid right of way within three years of that order.

4. Dr. Olson and Mr. Greenberg understand that Enbridge filed a motion on January 27, 2026, that includes, among other items, a request for an indefinite extension of its ability to

operate Line 5 in its current alignment in the Bad River floodplain until the relocation of Line 5 around the Band's reservation is complete. Part of the rationale offered by Enbridge for this request is that following Judge Conley's June 16, 2023 order, Enbridge installed a check valve (in 2024) and a river bank stabilization project (in 2025). Enbridge asserts that these projects, combined with the court-ordered shutdown and purge protocol and the installation of additional cameras at the meander, safely allow the continued operation of Line 5 beyond June 16, 2026, without significant adverse effects.

The Court-Ordered Shutdown and Purge Protocol

5. For the reasons previously testified to by Ian Paton, P.E. of WWE during the May 18, 2023 emergency hearing in this case, his supporting declaration of May 9, 2023 (Dkt. 632), and the Band's December 23, 2022 alternative proposed monitoring and shutdown protocol (Dkt. 617), WWE does not believe that Enbridge's monitoring and shutdown plan is sufficiently protective to allow indefinite operation of Line 5 in its current location in the Bad River floodplain, even with the modifications ordered by the Court. Among other things, the plan leaves too much room for human error, and the unpredictable nature of the Bad River creates unmanaged risks to pipeline safety.

The Check Valve Project

6. Mr. Greenberg was involved, on behalf of the Band, in the 2024 check valve installation project on the Band's reservation. Mr. Greenberg is familiar with WWE's work supporting the development of the check valve project. He personally reviewed the check valve project permit application (including the Environmental Protection Plan and stormwater pollution prevention plans), observed Enbridge's implementation of the check valve project (including access, construction, check valve installation, demobilization, and post-project

restoration), and reviewed additional Enbridge-provided reports on Environmental inspection and remediation in order to provide guidance to the Band concerning these issues.

7. WWE, including Mark Weesner, P.E. (working as a sub-consultant to WWE), provided support to the Band that helped guide Enbridge to develop a proposal to install an emergency flow restriction device (EFRD) in a manner that would minimize adverse effects to the environment, including wetlands. WWE recommended the Band's Mashkiiziibii Natural Resources Department (MNRD) request Enbridge to explore the use of a non-motorized EFRD which limited permanent impacts (including roads and power supply) while maximizing reductions in potential oil losses. WWE also provided MNRD with information on a vendor that could supply the non-motorized EFRD (aka check valve) in a much shorter time than Enbridge's original estimates.

8. Based on email correspondence between Enbridge and the Band, WWE understands that Enbridge's interest in installing the EFRD was, in part, to comply with current Pipeline and Hazardous Materials Safety Administration (PHMSA) requirements concerning the maximum distance between valves and the placement of protective valves near major floodplains.

9. While the 2024 check valve project provides a degree of safety in that it reduces the potential volume of oil that would be released into the Bad River in the event of a rupture, the installation project resulted in adverse surface impacts to wetland and non-wetland areas on the Band's reservation, including through the construction and use of a temporary road that was more than one mile long to enable personnel and heavy machinery to access the remote location where the check valve was installed. Enbridge installed wooden mats over the existing vegetation and ecosystems along this entire road length. WWE observed the matts sinking into

the soil and causing discharges of disturbed material into adjacent wetlands and surface drainages. WWE subsequently visited the check valve project repeatedly in 2025 and observed that many of the project areas have not recovered from the environmental disturbance of the project, as measured by vegetative cover, compared to pre-project conditions.

Development of the Log Jack Concept

10. Both Dr. Olson and Mr. Greenberg participated in the log jack project during design, permitting, installation, and post-installation phases. They are both knowledgeable about the Bad River floodplain (including conditions prior to and following log jack installation), the risk of Line 5 exposure (before and after log jack installation), the Band's environmental regulations and management approach, and considerations regarding leaving the log jack structure in place beyond September 2026.

11. **Figure 1** and **Figure 2** depict the log jacks as installed.

Figure 1: The Log Jacks from the Upstream End (May 8, 2025)

Figure 2: The Log Jacks from the Opposite Bank (May 8, 2025)

12. It is Mr. Greenberg's understanding that prior to the initiation of the log jack project development, Enbridge had proposed multiple bank stabilization projects, which were not compliant with the Band's water quality regulations due to their permanence and/or their potential to release pollutants into the Bad River, which is a designated Outstanding Tribal Resource Water (OTRW) at the Line 5 pipeline crossing. Several of the Band's concerns stemmed from Enbridge's inability to provide assurance that the bank stabilization projects would work as planned.

13. In late 2024, Mr. Greenberg and Ian Paton, P.E. of WWE were asked by the Band to explore alternative approaches to bank stabilization at the meander that, unlike Enbridge's proposals, would be removable and would not permanently impede the natural migration of the Bad River, while effectively reducing the risk of rupture until the June 16, 2026 court-ordered shutdown date.

14. In making its request to WWE, the Band expressed extreme concern about the risk of rupture for the remaining two years that Enbridge would continue pumping oil through Line 5 on the Band's reservation, and the sufficiency of the shutdown plan to mitigate that risk during that time. WWE shared these concerns.

15. WWE evaluated a wide range of potential bank stabilization project concepts, which included a re-review of those previously proposed by Enbridge (and which did not meet the stringent water quality criteria applicable to this section of the Bad River). WWE also evaluated the feasibility of the use of jetties, concrete jacks, engineered log jams, and other measures never proposed by Enbridge.

16. WWE's evaluation of Bad River bank stabilization alternatives considered environmental impacts, compatibility with the Band's environmental management values,

structure removability, compatibility with the Band's water quality regulations, ability to slow future bank loss, and other criteria deemed important to the Band's selection of a preferred option for protecting the Bad River from Line 5 until Enbridge ceased operation of this reach of Line 5 in June 2026.

17. It was through this process that WWE examined a river stabilization project in Washington State on the Newaukum River ("Newaukum River Project") that used pre-assembled log jacks and which was recognized by the American Public Works Association as the 2022 Project of the Year in the Emergency Category.

18. Although the Newaukum River Project was still relatively new at the time of WWE's research, it demonstrated initial success at reducing river bank erosion and appeared to have the potential to be able to provide a measure of erosion protection while still complying with the Band's water quality regulations that apply to OTRWs. WWE concluded that a project using the log jack approach used in the Newakum River Project best satisfied the above criteria, and on that basis WWE identified that project as the preferred alternative to protect the Bad River from exposing Line 5.

19. WWE presented its findings on the Newakum River Project to the Band. The Band asked it to further develop a log jack concept specific to the meander, including measures to reduce construction risks (including risk of harm to the pipeline) such as the possibility of installation by helicopter rather than cranes, the use of non-polluting assembly materials, and a means by which the log jacks could be removed once they had served their purpose.

20. WWE did so in June 2024. The Band identified that WWE's log jack concept, which could be installed and removed using a helicopter, would minimize adverse environmental effects to the Bad River floodplain when compared to previously proposed river stabilization

approaches and presented an opportunity to protect the river from the Line 5 pipeline using temporary and removable structures. Mr. Greenberg understands that these were important considerations for the log jack project's potential compliance with the Band's water quality regulations.

21. At the time of the trial in this case, the distance between the Bad River and the Line 5 pipeline was approximately 26 or 27 feet. By June 2024, the measured distance from the top of the Bad River bank to the Line 5 pipeline had been reduced to roughly 11 feet, in large part due to high flows during the spring 2023 runoff. Thus, the loss of bank between the time of the trial and June 2024 was greater than the remaining bank between the river and the pipeline in June 2024. WWE understands that the Band's awareness of this rate of bank loss and the relatively high potential for pipeline exposure after one more high flow event contributed to it making the difficult decision to consider the log jack bank stabilizing project at the meander as an emergency measure to protect the Bad River.

Outreach to Enbridge to Develop the Log Jack Project from the Concept Developed by WWE

22. On July 5, 2024 the Band presented WWE's concept to Enbridge by letter from the Tribal Chairman, Robert Blanchard, and invited Enbridge's cooperation to develop the details and implement the project.

23. It is Mr. Greenberg's understanding that the Band invited Enbridge to cooperate on the development of the log jack project because the Band anticipated that Enbridge would continue to operate the Line 5 pipeline in the Bad River floodplain until the June 2026 shutdown date set by the Court's order, and because the Band believed that the expected adverse environmental effects associated with log jack installation were outweighed by the reduced risk of a catastrophic pipeline failure that the log jack project could provide.

24. On July 10, 2024, Mr. Greenberg and Mr. Paton helped MNRD present the concept of the log jack project in further detail to Enbridge and its consultant, Barr Engineering ("Barr"). During that presentation it was explicitly identified that a key goal for the project included the protection of the Bad River and floodplain so long as Enbridge perpetuated its trespass, as Judge Conley's June 16, 2023 order did not require Enbridge to cease operations on the Reservation until June 16, 2026. And, once the project had served its purpose (i.e., preventing exposure of Line 5 until Enbridge was no longer perpetuating its trespass), the presentation specified that the project must be removable.

25. Beginning in early July and throughout the summer and fall of 2024, Enbridge, Barr, MNRD, and WWE coordinated extensively on the log jack project design and permit application package. The coordination consisted of technical meeting calls, emails, and detailed review and comment on Enbridge and Barr submittals. A goal of this coordination was to encourage Enbridge and Barr to develop a log jack project design that would provide adequate protection to the Bad River and satisfy the environmental permitting requirements at this location on the Band's reservation.

26. Early in the design process, Enbridge represented to the Band that it would suffice to run the log jacks only to the edge of Enbridge's property adjacent to the narrowest point of the meander.

27. Based on the Bad River's geometry and expected erosional processes, WWE and MNRD questioned the rationale of abruptly terminating the log jacks at that arbitrary location and encouraged Enbridge to modify the design to extend upstream, onto the adjacent Band-owned parcel, to promote the integrity of the project.

Log Jack Project Design Process and Limitations

28. From the time of the initial July 2024 meeting among MNRD, WWE, Enbridge, and Barr, in which MNRD and WWE presented the log jack concept and purpose, and extending through the Band's final approval of the log jack project in December 2025, the possibility that the log jacks would remain in place beyond 2026 was never proposed by Enbridge, nor did WWE evaluate the log jack project's engineering suitability or adverse environmental effects if it were to remain in place beyond 2026.

29. Instead, to balance environmental impacts against the short-term purpose of the project, the log jack project was designed with a short-term lifetime in mind and was not designed to mitigate risks associated with very low probability, extreme conditions (e.g., a 100-year flow event). Based in part on the short-term nature of its intended use, the log jack project design was evaluated, using engineering models, under lower, more frequent flow conditions, including (1) when the flows reach the top of the river bank (i.e., the "bankfull condition") (approximately 6,500 cubic feet per second (cfs)); and (2) the 10-year flow condition (approximately 15,400 cfs). Hydraulic modeling results provided by Enbridge's consultants and reviewed by WWE showed the potential for increased channel and bank erosion at various locations in the immediate vicinity of the log jack structure but did not predict increased erosion at more distant locations.

30. At the log jack project location, the bankfull flow condition (i.e., 6,500 cfs) has an approximate 57 percent probability of occurring (or being exceeded) in any given year. The 10-year flow condition (i.e., 15,400 cfs) has a 10 percent probability of occurring in any year. The probability of those flow events occurring (or being exceeded) increases for each additional year the log jacks remain in place. Specifically, the bankfull flow rate has an approximate 57 percent

probability of occurring in a single year, but a 98.5 percent chance of occurring (or being exceeded) at least once over a 5-year period. Similarly, over the course of the initially anticipated 2-year lifespan of the log jacks, the chance of a 10-year flow event would be 19 percent. Over the course of five years, that risk would increase to nearly 41 percent.

31. Mr. Greenberg, Mr. Paton, and Dr. Olson helped develop the parameters and reviewed engineering modeling conducted by Barr on behalf of Enbridge during the log jack project design and permitting process in 2024. Barr's modeling evaluated conditions only immediately following log jack installation.

32. One goal of Barr's modeling was to identify the extent and nature of hydraulic effects of the log jack project immediately after installation and whether the proposed structure would be expected to result in changes to erosion beyond the immediate footprint of the structure. The modeling effort evaluated the conditions following log jack installation and did not explore effects that could arise over time.

33. For example, while Barr's model predicted that, following log jack project installation, Bad River flow velocities would decrease along the meander bank near Line 5 (thus reducing forces on the meander bank nearest the pipeline), the modeling predicted that flow velocities would increase in the center of the channel. Barr's modeling did not explore the consequences over time of that increased velocity in the center of the channel, including the potential re-alignment of the Bad River and the potential for new or increased erosion as a result of that change in river alignment. In this respect, the information provided to the Band in support of Enbridge's log jack project did not and could not support any determination of the effects or risks of the project on the Bad River and its floodplain in the longer term. As discussed above, the project was not designed or intended to protect the river from the pipeline beyond June 2026.

The Log Jacks Have Not Been Subjected to Heavy Flows, and It Is Uncertain How They Will Respond.

34. The log jack installation was completed in March 2025. The maximum recorded Bad River discharge at the nearby United States Geological Survey (USGS) gage[1] since that time was approximately 3,700 cfs and occurred on April 22, 2025. That recorded maximum flow was approximately 57 percent of the bankfull flow rate and 24 percent of the 10-year flow rate. Based on the recorded flow data, the Bad River has not yet experienced flow rates approaching bankfull or 10-year conditions since the log jacks were installed in early 2025. Thus, the satisfactory performance of the log jacks in 2025 occurred during lower flows and should not be interpreted as evidence that the structure will continue to provide similar protection under the range of possible high flows that could occur in coming years.

35. Dr. Olson has reviewed information that indicates that peak runoff in 2026 could exceed what was observed in 2025, during the log jack project's first spring runoff.

36. While peak river flows are subject to multiple unpredictable variables, the snow water equivalent (SWE) metric is one variable that can be used for potential peak runoff estimates. The SWE measures the volume of water in the watershed snowpack and thus, can be used to predict the volume of water which will contribute to spring runoff flows in the Bad River.

37. Earlier this month, we analyzed the SWE for the Bad River watershed upstream of the log jack project for several different years to understand the relationship between SWE and peak Bad River flows at the nearby USGS gage. The analysis was performed using data obtained from the National Oceanic and Atmospheric Administration (NOAA) Snow Data

[1] https://waterdata.usgs.gov/monitoring-location/USGS-04027000/#dataTypeId=continuous-00065-0&period=P7D&showFieldMeasurements=true.

Assimilation System and processed using geographic information system (GIS) tools. As of February 9, 2026, the current average SWE in the Bad River watershed was approximately 3.9 inches. By contrast, last year (on February 9, 2025), the average SWE was approximately 1.0 inches. Based on SWE values as of early February 2026, peak runoff in 2026 might be greater than 2025. However, late winter and early spring conditions should continue to be monitored to better predict the magnitude of the peak Bad River flows during spring runoff.

38. To provide context, despite the significant erosion at the meander during the high flows in the spring of 2023, those flows reflected less than a 10-year condition. There is reasonable potential that, within the next several years, flows equal to or greater than those experienced in 2023 could test the log jacks.

39. Each additional runoff season that the log jack project is installed adds to the probability that critical flows will occur and adds further uncertainty to the effects and efficacy of the project for preventing exposure of Line 5.

40. In sum, the long term functionality of the log jack project was not studied by the Band or MNRD. The log jacks have not yet been subject to critical (i.e., bankfull to 10-year or greater) flows, and although there is potential the log jacks could perform well under these (and possibly higher) flows, they have not been tested under those extreme conditions and the Band did not authorize the log jack project so that Enbridge could test the long-term viability of log jacks against these risks.

The Developing Uncertainty and Risks from the Log Jack Project

41. Mr. Greenberg and Dr. Olson are familiar with changes to the Bad River in the vicinity of the log jack project that occurred in 2025 through their onsite observations and review of imagery and topographic information collected in 2025. **Figure 3,** below, depicts Bad River

conditions prior to the log jack project in 2024, and **Figure 4** depicts those conditions following the installation of the log jack project in 2025.

42. These images reveal that, with the installation of the log jacks, the Bad River's migratory patterns over the previous 40 years have locally reversed in the vicinity of the structure.

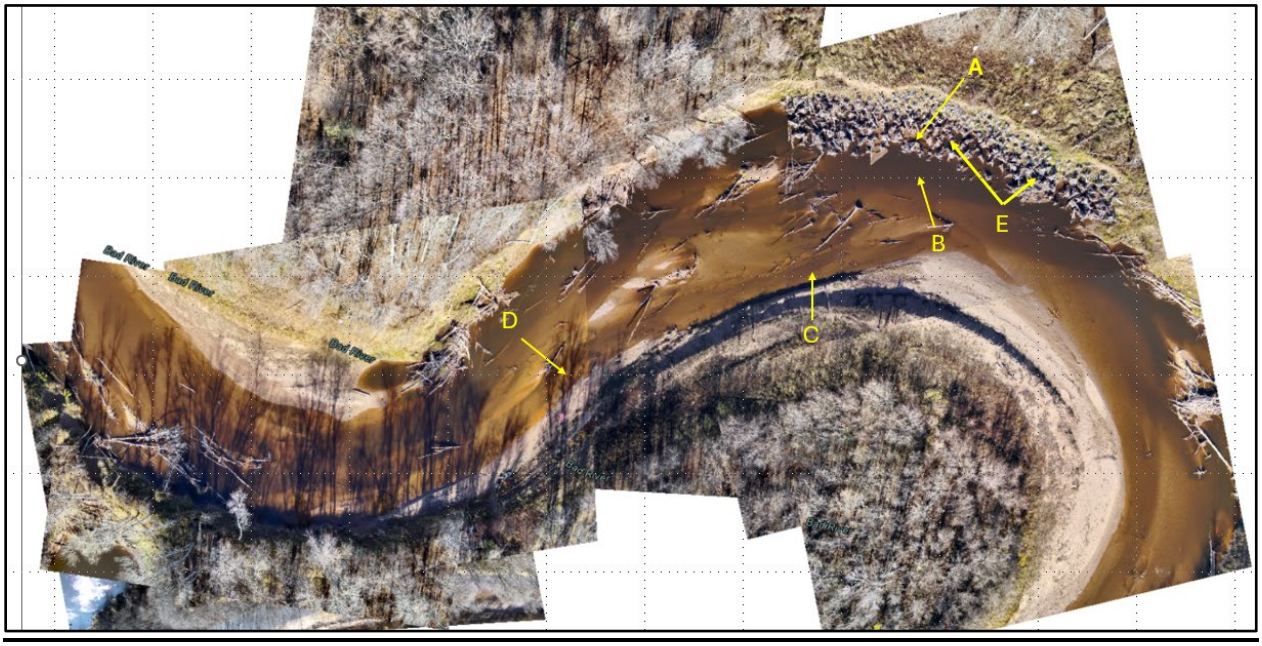
43. Specifically, prior to the installation of log jacks, the Bad River was migrating northward at this location. It was progressively eroding the north bank of the river, at the meander near Line 5, while depositing sand on the opposite, south bank of the Bad River.

44. But after the log jacks were installed in 2025, WWE observed that the local pattern reversed and the sand bar opposite the meander neck that had been developing over the past 40 years was substantially smaller compared to its size in 2024.

Figure 3: Aerial Photograph Before the Log Jacks (September 21, 2024)

45. In Figure 3, above, **A** indicates that the main thalweg—that is, the deepest part of the river channel and location of highest river flow velocities—is against the outer bend of the river nearest the pipeline. **B** indicates the location of shallow water over silt/sand in the middle of the river channel, with lower flow velocities at that location. **C** and **D** indicate the sand bar.

Figure 4: Drone Imagery Mosaic After Installation of the Log Jacks (November 5, 2025)



46. In Figure 4, **A** indicates that the location where the main thalweg was in 2024 is now occupied by the log jack structure, **E**. **B** indicates where the shallow, slow-moving water was in 2024. This area is now deeper dark-toned water, reflecting the new location of the river thalweg. **C** and **D** indicate where the sandbar was in 2024. In 2025, this area is now part of the river channel.

47. Dr. Olson and Mr. Greenberg also observed changes along the south bank of the Bad River in 2025 that are easily seen in the available drone imagery. In particular, they observed a loss of bank between an oxbow lake[2] and the current channel of the Bad River. At its narrowest section, the remaining bank width between the river and the oxbow lake is an estimated five feet. Although WWE has not performed a quantitative model to confirm, it has observed that the Bad River channel flows appear to be directed at that narrowest section of bank between the existing channel and the oxbow under some flow conditions in 2025.

[2] The oxbow lake is a location where the channel of the Bad River had previously flowed prior to migrating to the current alignment.

48. Enbridge collected significant topographic information of the Bad River floodplain in the vicinity of the log jacks, including the oxbow lake, in 2025. These efforts included LiDAR, bathymetry surveys, and drone-acquired photogrammetry. This post-log jack installation information could be used to evaluate current erosional conditions relative to those present prior to the installation of the log jacks.

49. **Figure 5** is an aerial image depicting the location of the oxbow lake near the meander and the narrow strip of bank that separates them.

Figure 5: Drone Image of Meander and Oxbow Lake (View Toward Southeast) (April 2025)

50. In Figure 5, **A** shows the location of the log jacks (partially submerged at the time). **B** shows the narrow bank/berm separating the oxbow from the river under normal flow conditions.

51. Because the water in the oxbow lake is higher than the surface of the river under most flow conditions, the loss of the remaining bank between the oxbow lake and the river would result in the lake draining at least partially to the river.

52. This could have wildlife impacts, as the draining of the lake would substantially modify habitat (trumpet swans and beaver are regularly observed in the oxbow lake).

53. In terms of river dynamics, the loss of the remaining bank between the lake and the river would potentially further disrupt Bad River flows and erosion processes because the breach of the separation between the lake and the river would release sand and clay from the oxbow lake and bank into the Bad River channel. The potential changes to Bad River flows and bank erosion that would occur following this future breach were not evaluated during the log jack project design or review process and could create new or additional risks to the Line 5 crossing of the Bad River floodplain.

54. One of those risks is that the changes to the river could increase erosion rates at other nearby locations where the pipeline is vulnerable. Several hundred feet west of the meander, after the pipeline crosses beneath the Bad River, the pipeline climbs out of the Bad River floodplain in a location Enbridge refers to as Slope 6. Slope 6 was identified as having a high potential for mass failure by Enbridge contractor Tetra Tech following a 2024 slope crossing inspection performed for Enbridge. That report identifies historic slides, recent slumping, and signs of groundwater seepage.

55. In light of Tetra Tech's report, WWE, MNRD, Enbridge, and its contractors flagged the possibility of impacts to Slope 6 during initial log jack design discussions.

56. The changing river dynamics resulting from retaining the log jacks for the long term could impact Slope 6 through a variety of channel movements and flow velocity changes that are difficult to anticipate in this complex system. For example, the sediment introduced into the Bad River from the draining of the oxbow lake, discussed above, may redirect river forces to the foot of Slope 6 and accelerate erosion at the toe of the slope.

Response to Enbridge's Experts

57. In his January 16, 2026 declaration, Enbridge's expert, Mr. Hammish Weatherly, points to the performance of a project on the Snoqualmie River during high flows. It is WWE's opinion that there should be limited confidence that the meander log jack project will perform similarly well under high flows. The ability to compare the Snoqualmie River project to the Bad River meander log jack project is impaired due to significant differences between these two projects, which have not been studied. Perhaps the most notable difference is that the Bad River meander log jack project is located at the neck of a river meander and high flows across that neck have the potential to erode vertically down (and toward the pipeline) as the river continues its natural evolution of abandoning the meander (known as avulsion). That condition at the Bad River meander, which increases the risk of pipeline exposure during high flows (even with the addition of log jacks), is not present at the Snoqualmie Project. Further, the Snoqualmie Project is intended to protect the Tolt pipeline which conveys water and presents a lower risk to the receiving environment in the event of a rupture. The consequences of failure are different here, where failure could result in rupture of a major crude oil pipeline.

58. Enbridge's motion also employs very questionable technical analysis to assert that continued operation of Line 5 at the Bad River has acceptable and low risk of consequences.

59. For example, in Mr. Weatherly's January 16, 2026 declaration he states that there is a less than 1 percent probability that Line 5 would be exposed due to bank erosion at the meander before June 2027 "*based on the bank erosion monitored since 2015, the extent and design of the Bad River log jacks, the efficacy of log jacks installed at other rivers, and my experience working with rivers of all types over the past 30 years.*" We are not aware of any analyses by Mr. Weatherly or anyone else that actually examine, rather than simply state, the

potential for Line 5 to be exposed at the meander following the log jack installation. Nor does Mr. Weatherly or Enbridge reference any such analyses.

60. WWE is also not aware of any such analyses or opinions informing the design and monitoring of the log jack project. For example, after reviewing Enbridge's hydraulic modeling of the log jack project by Enbridge contractor Barr Engineering, WWE, through MNRD, provided Enbridge with extensive commentary and specifically requested a response regarding potential erosion on the meander bank should flows overtop the log jack installation.

61. Enbridge's response did not include information sufficient, or even relevant, to quantify a probability of Line 5 exposure with the log jacks installed. Instead, Barr pointed to the possibility of adding more log jacks, in reference to the adaptive management approach that was recommended by WWE and agreed upon by MNRD to provide for the repair and expansion of the log jacks in the future.[3]

62. It does not appear, then, that Enbridge and Mr. Weatherly have used science-based quantitative analysis to develop their conclusions of quantitative probabilities. Instead, their probabilistic statements appear conjectural.

63. Enbridge and Mr. Weatherly's use of unsubstantiated probabilities to generate a false sense of safety do not conform to sound scientific or engineering practice. As a result, their

[3] Specifically, Barr stated that "*[e]rosion is not expected to occur on the bank side of the log jacks during high/overtopping flow. However, in the unlikely event that erosion does occur behind the original log jack protection footprint, the approach for addressing it would be contingent upon the amount of erosion. For erosion areas that are less than the size of a small log jack, placement of additional woody material would be evaluated, potentially attaching the woody material to the adjacent log jack for additional stability. For the even more unlikely occurrence of erosion resulting in a larger area than the size of a small log jack, additional small log jacks could be placed, as determined by the agreed upon adaptive management plan. It is further noted that the log jacks are designed to be self-ballasting and adapt to the occurrence of localized erosion by assuming stable positions, independently from the neighboring log jacks.*"

conclusions cannot meaningfully inform an assessment of the risks of retaining the log jacks in place beyond June 2026.

Environmental Impacts of the Log Jack's Continued Alteration of the Bad River's Migration

64. The dynamic and mobile nature of the Bad River is widely accepted by experts working for both Enbridge and the Band. The Band's environmental management strategy is to largely allow the Bad River to migrate within the floodplain without intervention. The log jacks modify the river's migratory nature and have reversed an observed decades-long process of channel migration to the north and sand bar deposition to the south. While this observed short-term outcome is good for the prevention of Line 5's exposure, it is deleterious to the ecological integrity of the Bad River floodplain.

65. Irrespective of the log jack project's potential ability to prevent Line 5 exposure if left in place for the foreseeable future, as proposed by Enbridge, the degree to which the project modifies Bad River channel processes and overall floodplain dynamics will increase the longer the structure is left in place, as discussed above.

66. The Band's nature-based approach to river management is important to the ecological integrity of the Bad River, including downstream wild rice in the Bad River Slough and fisheries in Lake Superior. As the river migrates and abandons oxbow channels (like what is expected to occur at the meander), it creates off-channel oxbow lakes (like the one just downstream of the log jack project). These oxbow lakes provide protected habitats for nesting water fowl, amphibians, turtles, and other wildlife species. Over time, these oxbow lakes fill in with sediment and become low-lying wetlands that support diverse assemblages of plants and which function to capture stormwater runoff and promote pollutant sequestration. Closer to the newly formed river channel, sand bars are deposited on the inner bank of river meanders,

creating ideal habitat for nesting turtles and early successional riparian vegetation. When considered over longer periods of time, the Bad River floodplain is a constantly shifting matrix of diverse habitats which provide unique and important services for wildlife, fisheries, plant diversity, flood attenuation, base flow maintenance, and water quality.

67. When the river is stabilized in a fixed alignment (as attempted by the log jack project), there is a disruption to the formation and regeneration of these diverse habitats. While the disruption of these complex processes was viewed by the Band as a necessary consequence to prevent Line 5 exposure until June 2026, the long-term disruption associated with prolonged log jack project installation was neither authorized nor contemplated by the Band.

I declare under penalty of perjury that the foregoing is true and correct.

Dated: February 13, 2026

Christopher Olson
Senior Water Research Engineer
Wright Water Engineers, Inc.

Noah Greenberg
Senior Water Resources Scientist
Wright Water Engineers, Inc.