

Table 1: Distance to Line 5 from Upstream and Downstream Channel Banks between 1963 and 2025

Year	Information Source	Upstream Bank		Downstream Bank	
		Distance from Line 5 (feet)	Approximate Erosion Rate (feet per year)	Distance from Line 5 (feet)	Approximate Erosion Rate (feet per year)
1963	USGS Aerial	310	3.8–5.1	410	3.4–4.7
1983	USGS Aerial	230		310	
1992	USGS Aerial	200		260	
2005	NAIP Aerial	120		240	
2008	NAIP Aerial	110		230	
2010	NAIP Aerial	100		220	
2010	NAIP Aerial	100	5.7–9.1	220	1.3–4.7
2013	NAIP Aerial	70		210	
2015	Ashland County	70		210	
2016	DigitalGlobe	50		200	
2018	Field Measurement	35		--	
2019	Field Measurement	28		190*	
2020	Field Measurement**	26.5		190***	
2022	Field Measurement**	25.8	187**		
2023	Field Measurement**	11			
2025	Field Measurement**	11			
Long-term Erosion Rate (1963-2020) (feet per year)		4.7–5.3		3.6–4.1	

*Downstream distance is based on June 2019 Bad River Band LiDAR

** Measured by Enbridge contractor

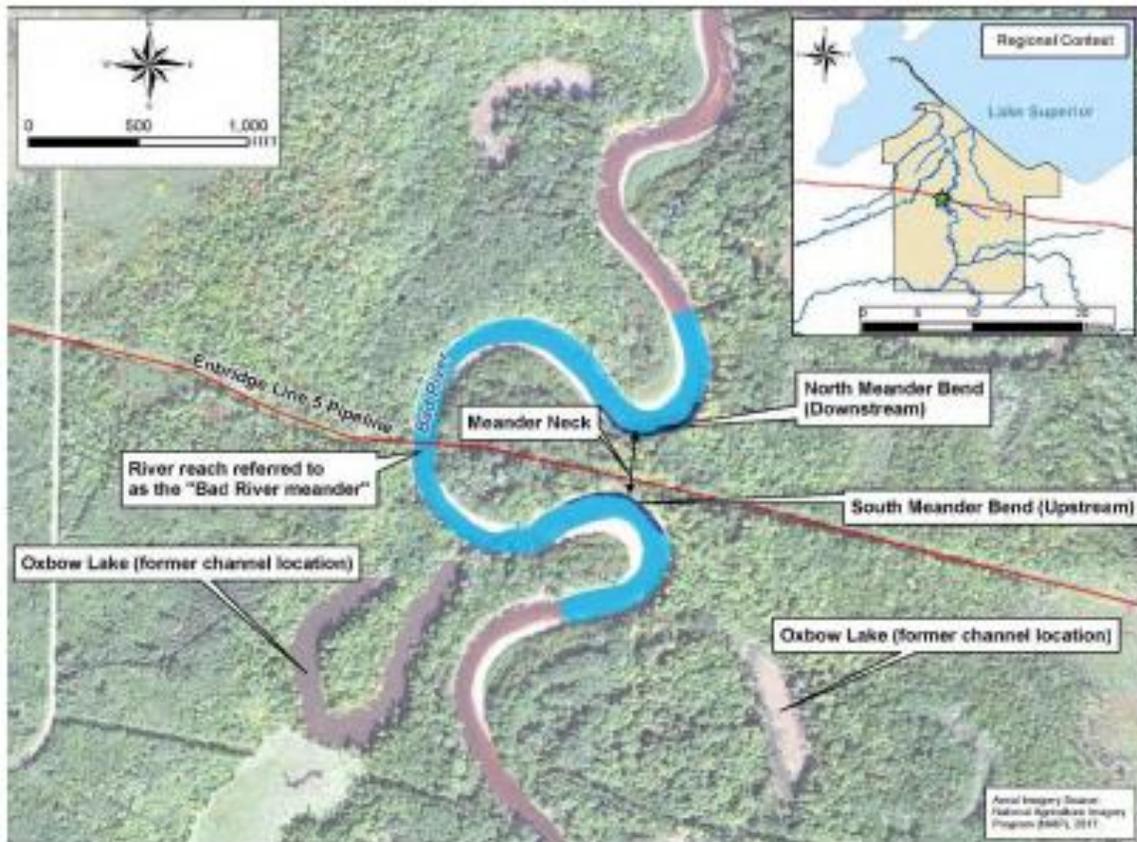
*** Based on Enbridge LiDAR

Notes:

1. All measurements from aerial imagery rounded to the nearest ten feet.
2. Field-collected measurements are rounded to the nearest foot.
3. The greatest source of measurement uncertainty is aerial image georeferencing (± 5 meters or 16.4 feet). Erosion rates are presented as a range to reflect uncertainty. For example, in 1963 the upstream bank could have been between 294 and 326 feet from the pipeline (310 ± 16 feet). In 2010, the upstream bank could have been between 84 and 116 feet from the pipeline (100 ± 16 feet). The maximum erosion rate between 1963 and 2010 is if the 1963 measurement overestimates the true distance from the bank (326 feet) and the 2010 measurement underestimates the true distance from the bank (84 feet), resulting in a rate of 5.1 feet per year (242 feet over 47 years). Conversely, the minimum erosion rate would be if the 1963 measurement underestimates the true

distance from the bank (294 feet) and the 2010 measurement overestimates the true distance from the bank (116 feet), resulting in a rate of 3.8 feet per year (178 feet over 47 years).

4. DigitalGlobe imagery is commercial satellite imagery from July 28, 2016.
5. 2018 field measurement collected by NRE in July 2018. 2019 field measurement collected by WWE in October 2019. 2020 field measurement collected by Enbridge contractor in September 2020. Measurement is for upstream bank distance only.
6. 2022 and 2025 field measurement collected by Tetra Tech in September.
7. 2023 field measurement collected in by Enbridge and MNRD in May.



(WWE Rep. (dkt. #268) 29, Fig. ES-2, *Bad River Meander Overview Map.*)