October 17, 2023

ENBRIDGE RESPONSE TO EPA'S OCTOBER 5, 2023 COMMENTS/QUESTIONS ON "ENBRIDGE LINE 5 WISCONSIN SEGMENT RELOCATION PROJECT 22-P-216493 CONSTRUCTION ASSESSMENT: SEDIMENT DISCHARGE MODELING REPORT"

EPA Question No. 1: P. 26. RPS identified 20 mg/L Total Suspended Solids (TSS) as a reasonable non-storm background condition based on data from three USGS gages on the White and Bad rivers. According to the equation in Figure 3-6, 20 mg/L TSS as background would equal 6.77 NTU turbidity as background. Bad River Band's water quality standards contain a turbidity criterion that allows 5 NTU increase over background conditions (when background is < 50 NTU). Assuming that the equation and threshold is representative and accurate, the target turbidity would be 11.71 NTU and 39.35 mg/L TSS, which should not be exceeded in Bad River Band's waters. Does RPS/Enbridge agree with this assessment? Do the results of the modeling report confirm that these levels will not be exceeded in Reservation waters?

Enbridge Response: RPS does not agree with the assessment that a target turbidity of 11.71 NTU and 39.35 mg/L TSS is the definitive threshold for the waterway. One needs to consider that the standards note exceedances of 5 NTU when background is 50 NTU or less, or would not exceed 10% more than background, when turbidity was >50 NTU. The entire premise of this point is predicated on an understanding that the natural background TSS values of this river change a lot throughout the year and over many years. These two dynamic river systems have ***background values*** that can vary by 4 to 5 orders of magnitude (near zero to over 10,000 mg/L).

On page 26, RPS identified 20 mg/L Total Suspended Solids (TSS) as a reasonable non-storm background condition based on data from three USGS gages on the White and Bad Rivers. This value was based upon the intent of the assessment, which attempted to maximize the potential for effects following sediment disturbance. To do this, RPS used multiple sets of conservative assumptions to maximize potential sediment disturbance values from operations and to minimize background concentrations, which would in turn maximize the difference between the two.

From Figure 3-5, it was identified that one third of TSS observations were less than 20 mg/L. While not reported directly in the report, the median value of TSS from observations was approximately 125 mg/L and the mean value was approximately 255 mg/L. The TSS to NTU data was used to fit a line with an R^2 of 0.8806 (a strong general trend). The equation in Figure 3-6 can be rearranged such that:

$$\frac{TSS + 6.194}{3.8696} = Turbidity$$

Using the equation, the background concentration in NTU can be calculated:

- Background of 20 mg/L (lowest 1/3 of observations) = 6.77 NTU
- Median background value of 125 mg/L = 33.90 NTU
- Mean background value of 255 mg/L = 67.5 NTU

If construction were to take place at any one of these times, a threshold exceedance would be predicted to occur if the sediment concentration within the water column were in excess of:

- Background of 20 mg/L (lowest 1/3 of observations): **11.77 NTU** (an increase of 5 NTU)

- Median background value of 125 mg/L: **38.90 NTU** (an increase of 5 NTU)
- Mean background value of 255 mg/L: **74.25 NTU** (an increase of 6.75 NTU)

Using this same relationship, and the data contained in Figure 3-5, one can also determine from the TSS observation data that a background value of 50 NTU (187.29 mg/L) is exceeded approximately 43% of the time (246 out of a total of 567 observations).

Further, the results of the modeling report confirm that water quality standards will not be exceeded within the Reservation's waters. RPS provided maximum predicted TSS (mg/L) in small (Table 5-1) and medium (Table 5-6) watercourses (provided below). These values are "in exceedance of background values," meaning that the total concentration of TSS in would be the background value plus the predicted maximum TSS values in the table. If one were to assume that the background TSS was low (<50 NTU), then an increase of 5 NTU over background would equate to an increase in TSS of 13.154 mg/L over background. In Table 5-1, an increase of 13.154 mg/L would not be predicted beyond 500-1,000 m downstream in the simulated small watercourse scenarios. Similarly, in Table 5-6, this increase would not be predicted beyond 250 m in any simulated medium watercourse scenario. From the proposed route, the downstream distance to the nearest point of the Reservation boundary is approximately 2 km. Because the predicted values of TSS above background fall below 13.154 mg/L well before 2 km, the modeling report confirms that water quality standards will not be exceeded within the Reservation's waters.

Table 5-1: Maximum predicted TSS concentrations as a function of distance from the source for all small watercourse scenarios.

Distance From Upstream Dam (m)	Maximum TSS (mg/L) – Small Watercourse					
	Low Flow		Average Flow		High Flow	
	Coarse	Fine	Coarse	Fine	Coarse	Fine
0-5	18.6	46	34	35	24	29
50	<1	39	<1	33	24	18
100	<1	39	<1	27	23	14
250	<1	30	<1	25	21	15
500	<1	30	<1	20	19	12
1,000	<1	<1	<1	<1	<1	<1

Table 5-6: Maximum predicted TSS concentrations as a function of distance from the source for all medium watercourse scenarios.

Distance From Upstream Dam (m)	Maximum TSS (mg/L) – Medium Watercourse					
	Low Flow		Average Flow		High Flow	
	Coarse	Fine	Coarse	Fine	Coarse	Fine
0-5	127	132	125	128	117	116
50	6	16	6	8	12	9
100	4	15	1	5	9	4
250	2	11	<1	5	6	3
500	1	7	<1	5	5	3
1,000	1	7	<1	4	4	3

EPA Question No. 2: In Figure 3-6, RPS developed an equation for predicting the TSS associated with a particular value of turbidity. EPA notes that the y-intercept was not used in calculating the threshold identified. Based on the equation, an increase of 5 NTU over background would equate to an increase of 13.154 mg/L TSS over background. Please clarify why the intercept was not used in the calculation of the threshold.

Enbridge Response: RPS developed the relationship between TSS and NTU based upon a set of limited (n=34) and collocated observations within the Bad River, near Odanah. As noted in the response to Question 1, it is understood that the natural background values of TSS within the Bad River vary by several orders of magnitude. Therefore, the threshold of concern will vary alongside the naturally dynamic background concentrations. It is also understood that NTU is not only a measure of suspended solids within the water column, but may include tannins, biological material, and other naturally occurring substances within the water column. Rather than using the y-intercept, which would provide an unnaturally low threshold that would only mathematically be associated with the lowest hypothetical concentration (0 mg/L), RPS chose a different approach. RPS noted that TSS varied from approximately 1 to 200 mg/L as the corresponding NTU varied between 0 and approximately 50 (note the "imperfect" R2 of 0.8806), with increasing variability in the 20-50 NTU range. Because RPS included a 1 mg/L threshold in their analysis (four thresholds including: 1, 19, 100, and 200 mg/L were assessed for each release) to bound the low end (which maximized effects using this threshold), they wanted to find the maximum mg/L disturbance that would be possible based upon Bad River noted standard of 5 NTU over a background of 50 NTU. The 19 mg/L threshold was therefore identified as a "representative calculated TSS threshold." However, please refer to the response to Question 1 noting how this threshold would change, as the background TSS concentration naturally changed within the system.

EPA Question No. 3: RPS obtained data from three USGS gages on the White and Bad rivers. These data were apparently used to define background conditions. A subset of data from the USGS gage on the Bad River near Odanah was used to develop predictive relationships for TSS and turbidity. EPA notes that there are dozens more sites with paired TSS and turbidity data from the Bad River watershed from

the Water Quality Portal (waterqualitydata.us). These data may be relevant to determining background/thresholds for TSS and turbidity across the range of stream sizes that will be crossed by the pipeline and roads associated with the relocation. In examining paired TSS and turbidity data from area streams and rivers from the Water Quality Portal (most from the Bad River Band), and restricting to sites with more than 35 observations, EPA notes that relationships between TSS and turbidity vary substantially, with linear R2 values ranging from 0.00 to >0.90 and with similar variability in slope values. Given the potential for site-specific relationship between TSS and turbidity, and the fact that "background" suspended sediment conditions will differ from waterbody to waterbody, please explain the rationale for using a single threshold value for all modeled scenarios.

Enbridge Response: RPS is aware of *some* additional data around the area, but is surprised to hear that there are "dozens of sites" with paired TSS and turbidity data that are: 1) publicly available; 2) are A (approved) and not P (preliminary) data; and 3) are of a quality that are considered defensible in court. The Bad and White Rivers are the main conduits through which suspended sediment could be transported into the Reservation through construction activities along their tributaries.

RPS recently requested additional data within the Project area (through USGS and others) and were responded to with a notice that not all data is available, were preliminary, and were considered "non-defensible in court." Even after visiting http://www.waterqualitydata.us, RPS found that the data used in the sediment modeling report includes the vast majority of available data and is appropriate for the analysis that was conducted.

As noted in the previous two responses, the sediment dispersion assessment, and Bad River standards are all predicated on an understanding of a dynamic river system that has background values that vary by several orders of magnitude. There is also an understanding that background TSS values vary by watercourse. RPS used the available data to assess the magnitude and range of background conditions and developed relationships that sufficiently assessed the range of variability in the system. Additional data is always welcome, however, additional data would not affect the predicted concentrations from the sediment dispersion analysis and is extremely unlikely that any additional data would affect the predicted range of background TSS or the relationship between predicted TSS vs. background TSS in such a way as that would change the predicted outcomes of the assessment.

RPS did ***not*** only use a single threshold value for all modeled scenarios. In addition to the 19 mg/L threshold, additional TSS concentration thresholds of 1, 100, and 200 mg/L above background were used as reporting thresholds to interpret model predicted results over greater distances. The range provided by these four thresholds expanded the assessment to more conservative levels (e.g., 1 mg/L), as well as those that could be considered closer to values that may be associated with the potential for biological effects (e.g., 100 and 200 mg/L) depending on duration of exposure.