

## Menomonee River Watershed Restoration Plan Fact Sheet MN-8, Reach 855, Butler Ditch

Data resulting from model runs:

Figure	Overall Project Team Assessment	Analysis
Flashiness index	Good	The Flashiness Index quantifies the frequency and rapidity of short-term changes in stream flow. The index ranges from 0 to 2, with 0 being constant flow. The flashiness is reasonable at this location.
Dissolved oxygen v. days per year	Moderate	Typically, aquatic communities need 5 mg/l or more of dissolved oxygen to survive. Concentrations at this site fall below this level about 10% of the time.
Fecal coliform v. days per year	Variable (some good, some bad)	For recreational uses, lower fecal coliform counts (a measure of bacteria) are better (preferably under 400 counts / 100ml). The counts on majority of days are either 'below 400' or 'above 5,000'. A potential goal in this case may be to determine the conditions that create the 'above 5,000' days and discourage recreational use on days that meet these conditions. An additional goal could be to find ways to decrease fecal coliform loads in order to increase the number of days that have 'below 400' counts.
Phosphorus v. days per year	Good	Phosphorus is a nutrient that can lead to increased growth of algae. The concentrations on most of the days are at or below the 0.1 mg/l planning guideline. Throughout the year, the phosphorus concentrations do not exceed 0.35 mg/l on any day.
Suspended solids v. days per year	Good	Suspended solids cause water to become cloudy, which is aesthetically unpleasant. They can also clog the gills of fish and invertebrates, make feeding difficult, and lead to sediment deposition (poor habitat). The concentrations are less than 25 mg/l on most of the days, but the concentrations exceed 200 mg/l on some of the days.
Monthly dissolved oxygen	Moderate to Poor	It is normal for dissolved oxygen concentrations to decline during the summer due to the decreased solubility of oxygen in warmer water; however, the ranges of concentrations are wider than would be expected. This may be due to increased oxygen demand from aquatic organisms or from the decomposition of organic matter.
Monthly fecal coliform	Moderate	While the ranges of values are fairly consistent throughout the year, note that the 75 <sup>th</sup> percentile values decline during the summer swimming season. This may be related to the die-off of bacteria due to solar radiation. Also note that the conditions are poorest in March and are likely related to snow melt. There is an increase in the minimum values in July and August – the cause of this is uncertain.
Monthly phosphorus	Good to Moderate	In most months, phosphorus concentrations exceed the planning guideline less than 25% of the time. Note that the 75 <sup>th</sup> percentile values decline during the late spring and summer, possibly related to phosphorus uptake from plants and algae.
Monthly suspended solids	Good	The maximum concentrations for suspended solids are the lowest during the winter. This is likely due to frozen conditions, decreased construction, and low-impact storms (snow doesn't pound the soil like rain).

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Dissolved oxygen by flow	Moderate	Note the decline in dissolved oxygen concentrations at low flows; the standard is met 75% of the time. This is likely due to a combination of decreased water agitation and higher temperatures (low flow conditions are often associated with the warm summer months). This is somewhat natural, but is likely exacerbated by human-caused alterations in the stream and watershed.
Fecal coliform by flow	Poor	Generally, a pollutant that is present at high concentrations during high flows and low concentrations during low flows (fecal coliform, in this case) is attributed primarily to non-point sources. The infrequent sewer overflows (once every 2-5 years) would only contribute during the high flows when substantial non-point loads are already present. Note that during periods with the highest flows, fecal coliform exceeds the regulatory standard. During dry conditions and low flows, the standard is met more than 75% of the time. This would be the safest time for any recreational uses (boating, swimming, wading, etc.), although the amount of water in the stream may limit recreational use to wading.
Phosphorus by flow	Good to Moderate	Concentrations of phosphorus are highest at high flows. This suggests that the phosphorus inputs are primarily non-point sources. Much of the phosphorus is likely associated with sediment. Note the similarities between the phosphorus and suspended solids data.
Suspended solids by flow	Good	The concentrations of suspended solids increase with increased flows, suggesting contributions from non-point sources. The suspended solids may come from runoff that carries a sediment load, from stream bank erosion, or re-suspended stream sediments.