

Kinnickinnic River Watershed Restoration Plan Fact Sheet
KK-3, Reach 710, Kinnickinnic River Upstream of Confluence with Wilson Park Creek

Data resulting from model runs:

Figure	Overall Project Team Assessment	Analysis
Flashiness index	Good to Moderate	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 slightly high at this location.
Dissolved oxygen v. days per year	Very Good to Good	Typically, aquatic communities need 5 mg/l or more of dissolved oxygen to survive. Concentrations at this site do not fall below this level and are well above the 2 mg/l variance standard.
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 the days are either 'below 400' or 'above 5,000'. A potential goal in this case could be to determine the conditions that create the 'above 5,000' days and discourage recreational use on days that meet these conditions. As there is a variance that allows the fecal coliform counts to reach 2,000, another goal could be to find ways to decrease coliform loads in order to increase the number of days that have fewer than 2,000 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. The concentrations of phosphorus do not exceed 0.35 mg/l on any day.
Suspended solids v. days per year	Very Good	Suspended solids cause water to become cloudy and aesthetically unpleasant. They can clog the gills of fish and invertebrates, make feeding difficult, and lead to sediment deposition (poor habitat). The concentrations on most of the days fall below 25 mg/l. The concentrations do not exceed 150 mg/l on any day.
Monthly dissolved oxygen	Moderate	Dissolved oxygen concentrations are highly variable at this site. Concentrations decline more than would be expected during the winter. This variability suggests that there is organic enrichment and biochemical oxygen demand in the ecosystem. The decline in dissolved oxygen concentrations during the summer is typical due to the decreased solubility of oxygen in warmer water. While the variance standard is not exceeded, the lower concentrations in the winter are an issue.
Monthly fecal coliform	Moderate	While the ranges of values are fairly consistent throughout the year, note that the 75 th percentile concentrations decline during the summer swimming season. This may be related to the die-off of bacteria due to solar radiation. Conditions are particularly poor in March and are likely related to snow melt.
Monthly phosphorus	Moderate	Phosphorus concentrations decline through the late spring, summer, and early fall. This may be related to uptake by plants during the growing season. Concentrations exceed the planning guideline nearly 50% of the time in March, likely related to snow melt.
Monthly suspended solids	Very Good	Suspended solids concentrations fall below the reference concentration most of the time. Most of the higher concentrations are probably related to larger rain or snow melt events that disturb bare soil. As this is a concrete-lined channel, there is little sediment to re-suspend from the stream bed.

Figure	Overall Project Team Assessment	Analysis
Dissolved oxygen by flow	Good	During low flows and dry conditions, dissolved oxygen concentrations are lower relative to other flow conditions. This is likely due to a lack of water agitation (which would allow greater diffusion of oxygen into the water) and high temperatures (low flow conditions are often associated with summer which has higher temperatures and lower oxygen solubility).
Fecal coliform by flow	Moderate to 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 any period with the highest flows, fecal coliform counts exceed the variance standard. During low flows and dry conditions, the variance standard is met all of the time. During these low flows would be the safest time for recreational uses (boating, wading, swimming), although the amount of water in the stream may limit recreational use to wading.
Phosphorus by flow	Moderate	Phosphorus concentrations are highest at high flows. This suggests the prevalence of non-point loads of phosphorus. However, concentrations periodically exceed the 0.1 mg/l planning guideline under moist conditions as well. The similarities between the phosphorus and suspended solids data suggest that the phosphorus may be associated with suspended sediment.
Suspended solids by flow	Good	Suspended solids concentrations increase with increased flows. This suggests a prevalence of non-point sources. Nearly all of the instances when the concentration exceeds the reference condition occur at the high flow condition. These conditions most often occur following large storms or major snow-melt events. The suspended solids may come from runoff that carries a sediment load, from stream bank erosion, or re-suspended stream sediments. Note that this site is located downstream of some concrete-lined reaches within the watershed. As a result, upstream activities such as stream bank erosion and re-suspension of stream sediments likely make less of a contribution to suspended sediment loads at this site compared to sites that are situated downstream of natural reaches that experience these activities.