

Analysis of Chickasaw Creek Concentrations and Loads: Summary of Major Findings
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Concentrations:

- Parameters analyzed were flow, suspended solids, total phosphorus, dissolved reactive phosphorus, nitrate nitrogen, total Kjeldahl nitrogen, and chloride.
- Concentrations of all parameters analyzed, except for suspended solids, were higher in Chickasaw Creek than in Rock Creek and Lost Creek, two comparison watersheds in Northwest Ohio. Concentrations of dissolved parameters (dissolved reactive phosphorus, nitrite nitrogen, and chloride) are particularly high relative to their values in Rock Creek and Lost Creek.
- Moderate to high concentrations, particularly of the dissolved constituents, are often seen in Chickasaw Creek under conditions of moderate to low flow. This is not true of Rock Creek and Lost Creek
- In Chickasaw Creek, total phosphorus concentrations exceeded the Ohio EPA draft Warm Water Habitat standard (0.1 mg/L) on more than 80% the days sampled, and nitrate nitrogen exceeded the draft standard for dissolved nitrogen (1.0 mg/L) on nearly 70% of the days sampled. The corresponding figures for Rock Creek were 29% and 51%, respectively.
- Total phosphorus has a greater percentage of dissolved reactive phosphorus in Chickasaw Creek than in Rock and Lost Creeks. Dissolved reactive phosphorus is more potent in supporting algal growth than other forms of phosphorus included in the total phosphorus analysis.

Loads:

- Loads are very unevenly distributed in time, with most of the annual loading occurring on only a few days with high flows. These conditions are associated with rainfall and/or snowmelt. Recent application of fertilizer or manure to the surface of agricultural fields can make loads even higher, though no analysis was done to determine whether and/or when this occurred in WY2009.
- On a per-hectare basis, daily loads of suspended solids from Chickasaw Creek were generally less than loads from Rock Creek. Loads of total phosphorus and total Kjeldahl nitrogen were approximately equal. Loads of dissolved reactive phosphorus, nitrate nitrogen, and chloride from Chickasaw Creek were on average 2 to 4 times those from Rock Creek.
- Annual loads of total phosphorus and nitrate nitrogen observed in WY2009 were substantially less than those estimated in the Grand Lake St. Marys TMDL (TP 60%, NO3 40%). However the WY2009 loads were much greater than the TMDL target loads (TP 11 times the target load, NO3 18 times).
- The TMDL has target loads keyed to flow regime. The percentages of daily loads that **exceeded** the TMDL targets in 2009 are shown below.

Flow regime:	Upper 10%	90% to 60%	60% to 40%	40% to 10%	Lower 10%
Total Phosphorus	97%	61%	61%	46%	14%
Nitrate Nitrogen	100%	96%	72%	28%	0%