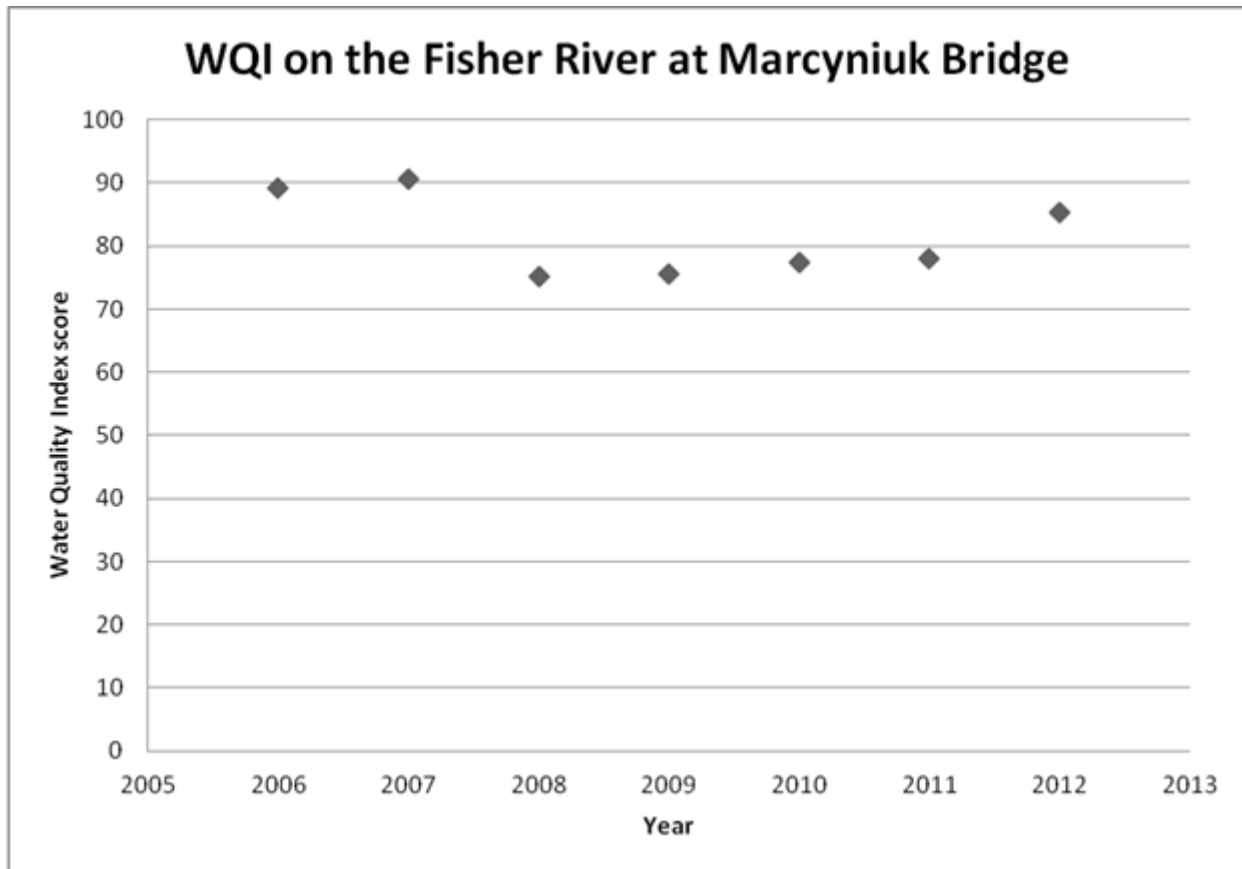


## Water Quality Fisher River IWMP Technical Submission:

### 1. How has water quality in the Fisher River changed over time?

An annual Water Quality Index (WQI) was calculated for the Fisher River at the Marcyniuk Bridge, which is the station within the Fisher River Watershed which has been monitoring for the longest consecutive period. The WQI compares measured physical and chemical properties to Manitoba's water quality guidelines for the protection of aquatic life: when a water quality guideline is exceeded, the water quality rating is lowered. Water quality in the Fisher River ranged from Fair to Good. In 2006 and 2007, only Total Nitrogen and Total Phosphorus exceeded guidelines in some samples. Lower scores were calculated for 2008 through 2011, because of increased frequency and severity of exceedances of the guidelines for pesticides including MCPA, metals such as manganese, the bacteria *E. coli*, dissolved oxygen, and total suspended solids. The 2012 WQI score shows an improvement, because no metals, pesticide, or microbiological guidelines were exceeded.



### 2. Have any water quality objectives / guidelines / standards ever been exceeded in this watershed?

A total of 136 samples were taken in the Fisher River watershed, at 11 stations on the Fisher, West Fisher, and East Fisher Rivers. Most of these samples were taken between 1994 and

1996. Since 2006, samples have been taken at least four times per year at one station, the Fisher River at Marcyniuk Bridge.

Exceedences were determined by comparing measured values to the objectives and guidelines for freshwater aquatic life, drinking water maximum acceptable concentrations, recreation, and livestock. Objectives and guidelines for irrigation and drinking water aesthetic concerns were not considered.

Nutrients:

- The Tier I Water Quality Standard for total phosphorus in streams (0.05 mg/L) was exceeded in 88% of samples.

Metals:

- The Tier III Water Quality Guideline for aluminum for freshwater aquatic life (100 µg/L for pH above 6.5) was exceeded in every sample.
- The Tier III Water Quality Guidelines for iron for freshwater aquatic life and for drinking water (300 µg/L) were exceeded in 82% of samples.
- The Tier III Water Quality Guideline for manganese for drinking water (0.05 mg/L) was exceeded in 32% of samples.

(Metals exceedances, particularly aluminum, are routine in Manitoba and may not be a direct result of land management practices.)

Physicals:

- The Tier II Water Quality Objective for an instantaneous minimum concentration of dissolved oxygen (<5.0 mg/L) was exceeded four times (13% of samples).

Microbiology:

- The Tier II Water Quality Objective for fecal coliform bacteria / *E. coli* for recreation (200 colony forming units per 100mL) was exceeded once (<1% of samples).
- The Tier II Water Quality Objective for fecal coliform bacteria / *E. coli* for drinking water (0 colony forming units per 100mL) was exceeded in 99% of samples.

Pesticides:

- The Tier III Water Quality Guideline for the pesticide MCPA for freshwater aquatic life (2.6 µg/L) was exceeded in 13% of samples.

**3. Is the current level of water quality monitoring adequate? Are any new monitoring sites required – is there any monitoring which is redundant or of little value?**

The current level of monitoring is adequate. Presently, one site is being sampled quarterly (with increased frequency during flood or other irregular conditions). This intensity of monitoring regime is commensurate with sampling programs on other Manitoba watersheds of similar scale. The short-term nutrient study conducted in the 1990s at ten additional sites within the Fisher River watershed suggest that the one sampling site which has since been maintained is sufficient to characterise the water quality of the watershed as a whole. There are no redundant stations.

**4. Which land management practices have the most negative impact on water quality in this watershed?**

**5. Where should East Interlake Conservation District focus its BMP programs?**

The biggest threats to water quality in this watershed come from the nutrients nitrogen and phosphorus; so BMPs which address reductions to point- and non-point sources of these nutrients would be an important area of focus. Such BMPs might relate to appropriate treatment and containment of wastewater, appropriate fertiliser use, manure practices, etc.

The agricultural application of pesticides is another land management practice which has a negative impact on this watershed: for example, the broad-leaf herbicide MCPA contributed to lowered WQI scores for a majority of the years of record. BMPs focussed on reducing or optimising the timing of pesticide application could be of benefit.

Finally, suspended solids contributed to lowered WQI scores in several years of record. BMPs targeting erosion control would be an appropriate area of focus.

**6. What are the potential impacts of peat mining on water quality within the watershed and in Lake Winnipeg?**

The effects of peat mining in Manitoba have not been well-studied. However, peat mining causes major changes in local hydrology, which may lead to changes in water quality including physical characteristics such as pH and turbidity, and chemical characteristics including nutrient concentrations. Water outflows from peat mined sites may be higher than from similar naturally vegetated areas. As water spends less time in the natural filtration system of peat-forming vegetation, there is the potential for outflows to be more turbid and higher in the nutrients nitrogen and phosphorus – this has been seen in some American peatlands. The Province of Manitoba is currently developing a Peatland Strategy, which will provide guidance for future peatland management.