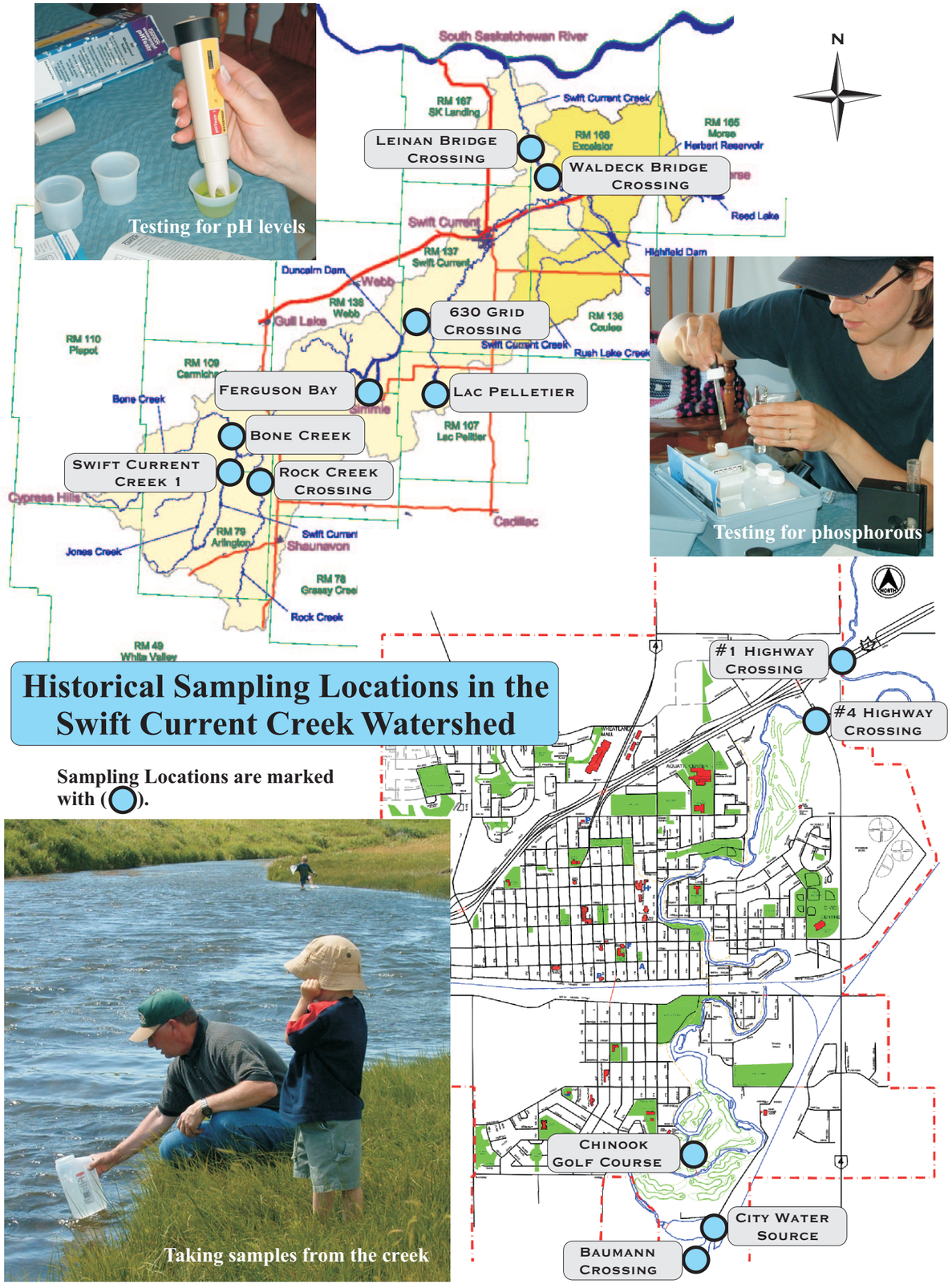

Historical Sampling Locations in the Swift Current Creek Watershed

Sampling Locations are marked with ( ).

SWIFT CURRENT CREEK
Watershed Stewards

What is Watershed Monitoring?

Watershed monitoring is a tool used for assessing the health of a watershed. This tool has two parts; first, water quality testing or assessing the amount and type of minerals and bacteria that are in water. Second, biological monitoring or assessing the riparian area (plants) and the aquatic life (bugs & fish) at the sampling sites. In the Swift Current Creek Watershed, the focus for most monitoring has been water quality testing. However, some monitoring groups are beginning to use biological monitoring tools as well.

Water Quality

Water quality sampling is the process of determining the presence and quantity of specific chemicals and bacteria. Sampling is essential for assessing the health of a watershed and determining the suitability of the tested water for use. Saskatchewan Environment identifies five different water uses: Drinking, Aquatic Life and Wildlife, Livestock Watering, Crop Irrigation, and Recreation. The types of parameters tested are: Major Ions (TDS, Sodium, etc), Nutrients (Phosphate, Ammonium, etc), Physical characteristics (Total Suspended Solids, etc), Gut Bacteria (Total Coliforms, Fecal Coliforms, etc), Heavy Metals (Mercury, Arsenic, etc) and Pesticides (MCPA, Carbaryl, etc).

Plants

Monitoring of the riparian area is essential in determining water quality and the impact of land use management. The riparian area is the transition zone between the land and water that acts as a living filter, sponge, and retaining wall. The vegetation along the riparian area is lush green and made up of water loving species. These native plants are resilient to frequent increases in water levels, making them better adapted to this environment than other plant life. A vast network of intertwined plant root systems act like twine around a bale, holding the soil together and preventing erosion of the natural stream banks.

Bugs

Aquatic macroinvertebrates are good indicators of the health of their aquatic habitat because they have different pollution tolerances. Most species of water bugs can be classified as either pollution tolerant, mid-tolerant or intolerant. Looking at the types of bugs found in a particular sample from a certain area can provide information on water quality. By identifying and counting the bugs, one can develop a short term assessment of the health, at that location, within the watershed.

Fish

Fish are also a very good indicator of water quality, as they can tell a story of water and aquatic habitat quality over their entire lifetime. Saskatchewan Environment conducts surveys to determine the fish species within communities at many locations throughout the Swift Current Creek Watershed. The most recent fish community survey was conducted in August of 2003.

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SCCWS-Fact Sheet 2003-01

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Water quality parameters defined

Six examples of parameters that have been commonly monitored within the Swift Current Creek watershed (see maps on back) are outlined below. All of the samples were taken from surface water that was not treated and were collected by the City of Swift Current, Saskatchewan Environment (SE) and Saskatchewan Watershed Authority (Prairie Water Care-PWC) from 1985-2002.

Total Dissolved Solids (TDS)	
What is TDS?	Total dissolved solids (TDS) is made up of inorganic salts (originating from not living material-rocks) and small amounts of organic matter (originating from non living material-plants) that are dissolved in water.
What is the effect of TDS on Drinking Water?	The concentration of TDS may cause water to be corrosive, salty- tasting or to form scale that may interfere with the efficiency of water heaters.
How common of a problem is TDS in the Swift Current Creek Watershed?	The TDS results meet the recommended guidelines for recreational use and aquatic life & wildlife use. For drinking and livestock watering, there are some locations where TDS did not meet the guidelines. For irrigation use, several sites commonly exceeded the guidelines.

Arsenic (As)	
Where does Arsenic come from?	Arsenic occurs in water supplies due to weathering of deep underground rocks, gravel or sandy soils. It is common to find levels the exceed the guidelines in the well water in Saskatchewan.
What is the effect of Arsenic on Drinking Water?	Long term consumption of drinking water containing the toxin arsenic at levels higher than the guidelines may increase the risk of skin cancer and tumors of the bladder, kidney, liver and lung.
How common of a problem is Arsenic in the Swift Current Creek Watershed?	Arsenic levels meet the recommended guidelines for drinking water use, aquatic life and wildlife use, livestock watering use, irrigation use, and recreational use for all samples considered.

Mercury (Hg)	
Why do we test for Mercury?	Mercury is a very dangerous bioaccumulative toxin, which means that as it passes through the food chain (from plants to bugs to fish) the concentration of mercury can increase to a toxic level. Mercury attacks the central nervous system and adversely affects the mouth, gums, and teeth. High exposure over long periods of time will result in brain damage and ultimately death.
What is the effect of Mercury on Aquatic Life & Wildlife?	Mercury can cause severe health and reproductive problems in fish and animals that get food from the creek. Mercury in runoff sediments can contaminate the water for long periods of time.
How common of a problem is Mercury in the Swift Current Creek Watershed?	Mercury levels meet the recommended guidelines for aquatic life and wildlife use, livestock watering use, irrigation use and recreational use for all samples considered.

How are water quality parameters determined?

Water quality parameters are determined according to the type of water use. Saskatchewan Environment (SE) produced two guides that outline the parameters for water quality testing according to each of the five water uses. These guidelines are (i) the Surface Water Quality Objectives (1997) and (ii) Saskatchewan's Drinking Water Quality Standards and Objectives (2002).

Manganese (Mn)	
What is the effect of Manganese on Drinking Water?	Manganese is most common in groundwater. Manganese is not toxic, but can cause mineral deposits that may block pipes.
What is the effect of Manganese on Irrigation Water?	Manganese is an essential element in the growth process of many crops; however, high concentrations, (as can occur in an acidic soil), may become toxic to the crop.
How common of a problem is Manganese in the Swift Current Creek Watershed?	Manganese levels do not meet the recommended guidelines for drinking water use and for irrigation use in most of the samples considered.

Nitrate ($N0_3$)	
What is the effect of Nitrate on Drinking Water?	Nitrate interferes with the blood's ability to transport oxygen. This causes an oxygen deficiency, which can result in a dangerous life threatening condition called "Blue Baby Syndrome".
What is the effect of Nitrate on Livestock Water?	Chronic nitrate toxicity can depress appetite and reduce weight gain, and increase susceptibility to infection and abortion, and may even cause death.
How common of a problem is Nitrate in the Swift Current Creek Watershed?	Nitrate levels meet the recommended guidelines for aquatic life and wildlife use, livestock watering use, irrigation use and recreational use for all samples considered.

Coliform (Total & Fecal)	
Why do we test for Coliforms?	If large numbers of coliforms are found, there is a high probability that other pathogenic bacteria, like *Salmonella,* or protozoic organisms such as *Giardia* and *Cryptosporidium* (which can cause beaver fever and other forms of gastroenteritis), are also present in the water.
What is the effect of Coliforms on Recreational Water?	Water with high levels of fecal coliforms may cause illness from pathogens entering the body through the mouth, nose, ears or cuts.
How common of a problem are Coliforms in the Swift Current Creek Watershed?	Coliform numbers meet the recommended levels for recreational water use but for irrigation use and aquatic life and wildlife use, the samples sometimes did not meet the objectives. When compared to drinking water guidelines, samples taken directly from the creek always fail to meet the recommended guidelines suggesting that residents should be careful not to drink untreated water from the creek.

To find the guides on the web:

www.se.gov.sk.ca/environment/protection/water/Drinking_Water_Standards_post.pdf www.se.gov.sk.ca/environment/protection/water/MB110_Surface_Water_Quality_Objectives_b.pdf