SAMPLE COLLECTION AND FIELD ANALYSIS

Field Trip, Friday September 21st, 2018
Brannen Lake Boat Launch Access

The field trip will be organized into four teams of students. Each group is responsible for;
1. Collecting and submitting a sample for a specific analyte/s,
2. Measuring a water quality parameter using a field metering device, and
3. Measuring a water quality parameter using either a spectrophometric or digital titrator method.

Dress warmly, expect rain and wear appropriate footwear for working outside.

GROUP 1
Sean Andrew
Rebekah Aplin
Melynda Bergen

Sampling: Filter 1 L of raw surface water through 0.45 μm glass fibre filter. Save filter residue for Total Suspended Solids (TSS) and Particulate Organic Carbon (POC) analysis and the filtrate for subsequent spectroscopic methods and titrator methods with colour endpoints.

Metering: Check the secondary turbidity calibration standards. Measure and record the turbidity of the surface water.

Spectroscopic Method: Measure and record the concentration of nitrate ion using the Hach DR2800 portable spectrophotometer.

GROUP 2
Jennifer Dionne
Simiao Guo
Heather Hewitt
Russell Lederer

Sampling: Filter 1 L of deionized water through 0.45 μm glass fibre filter. Save filter residue for *field blank* Total Suspended Solids (TSS) and Particulate Organic Carbon (POC) and the filtrate for subsequent spectroscopic methods and titrator methods with colour endpoints.

Metering: Calibrate pH meter. Measure and record the pH of the surface water.

Spectroscopic Method: Measure and record the concentration of ortho phosphate ion using the Hach DR2800 portable spectrophotometer.

GROUP 3
Mark Mai
Olivier Mathieu
Steven Moore

Sampling: Filter raw surface water through 0.45 μm glass fibre filter into 40 mL glass vial using syringe and stainless steel filter holder for DOC analysis. Replace filter and filter deionized water into a second 40 mL vial as a DOC *field blank*.

Metering: Calibrate the conductivity meter and record the cell constant. Measure and record the specific conductivity of the surface water.

Digital titrator: Measure and record the concentration of dissolved oxygen using the digital titrator and a calibrated dissolved oxygen meter.

GROUP 4
Cedric St-Denis
Csilla Vasarhelyi
Melissa Verhoeks
Daniel Zuloaga

Sampling: Filter 250 mL of raw surface water through 0.45 μm cellulose filter membrane for analysis of dissolved metal analysis. Preserve filtrate with 0.5 mL of a 1:1 preservative grade HNO_3.

Metering: Measure and record the oxidation reduction potential (ORP) of surface water.

Digital titrator: Measure and record the concentration of total alkalinity and total hardness using digital titrator methods.

FIELD TRIP LAB ASSIGNMENT:
In addition to submitting a **properly labeled** Sample and Summary Table of Results, students within each group work together to generate is 2-3 report that includes the following.

Group 1:

Define TSS and POC and provide a rationale for the *Procedures and Protocols* in their collection (one paragraph).
Describe the *Principles of Operation* of a nephelometric turbidity meter including the field calibration or calibration check process (one paragraph plus figure).
Write a *Principle of Method* for spectrophotometric determination of nitrate ion (~one page - outlining the chemistry, the measurement and how the measured signal is related to concentration).
Submit Table of Results.

Group 2:

Define TSS and POC and provide a rationale for the *Procedures and Protocols* in the collection of a *field blank* (one paragraph).
Describe the *Principles of Operation* of a pH meter including the field calibration or calibration check process (one paragraph plus figure).
Write a *Principle of Method* for spectrophotometric determination of ortho phosphate ion (~one page - outlining the chemistry, the measurement and how the measured signal is related to concentration).
Submit Table of Results.

Group 3:

Define DOC and provide a rationale for the *Procedures and Protocols* in the collection of a sample and *field blank* (one paragraph).
Describe the *Principles of Operation* of a conductivity meter including the field calibration or calibration check process (one paragraph plus figure).
Write a *Principle of Method* for volumetric determination of dissolved oxygen.
Submit Table of Results (~one page - outlining the chemistry, the measurement and how the measured signal is related to concentration).

Group 4:

Define *dissolved metals* and provide a rationale for the *Procedures and Protocols* in their collection (one paragraph).
Describe the *Principles of Operation* of an oxidation reduction potential (ORP) meter, including the calibration or calibration check process (one paragraph plus figure).
Write a *Principle of Method* for volumetric determination of total hardness (~one page - outlining the chemistry, the measurement and how the measured signal is related to concentration).
Submit Table of Results.

The Principles of Operation should briefly describe the principles of how an instrument or device works and is calibrated. It may include a schematic showing the working components (see further Lab Manual, Metering Devices).

The Principle of Method describes the theory involved in a chemical analysis. It should begin with a statement of the class of analytical strategy (e.g., volumetric, gravimetric, spectrophotometric etc) and go on to include any chemistry involved in quantifying the analyte, a description of how the 'measured signal' is related to a chemical concentration and any additional information related to quantification (e.g., standardization of titrants, end-point indicators, instrument principles, etc). See for example Appendix 3, Page 3.