Indigenous Community-Based River Monitoring Standard Operating Procedure: Winter

Updated: November 17th, 2025

The Alberta Lake Management Society (ALMS) Indigenous Community-Based Monitoring (ICBM) program is dedicated to supporting Indigenous communities in the stewardship and protection of their water resources. This initiative focuses on fostering community engagement, enhancing technical capacity, and promoting the sustainable management of water bodies, including lakes, rivers, creeks, and streams, throughout Alberta's major oil sands regions. By collaborating with Indigenous communities to conduct scientific monitoring, the ICBM program aims to braid Traditional Knowledge with Western scientific methods to identify cumulative impacts of oil sands development on traditional use water sources. The program supports Indigenous-led monitoring and centers communities in all aspects of the monitoring process.

The following Standard Operating Procedures (SOP) were developed collaboratively with Alberta Environment and Protected Areas (AEPA), ensuring consistency, accuracy, and reliability in data collection and analysis. This SOP is designed to be a practical guide for field personnel and community members involved in river, creek, and stream monitoring activities.

For more information, please contact: Kurstyn.cappis@alms.ca or the ALMS office at 780-702-2567.

For field sheets, shipping information and training webinars, please visit: www.alms.ca

Equipment

The following table outlines equipment you will need for sampling in the field.

	Year-Round
	Labelled Bottle Sets in Coolers
	Hot water bottle
	Preservatives
	Field data Sheets
	Shipping Supplies (tape, scissors, shipping labels, extra bags, bubble wrap, etc.)
	Calibrated Field Unit Probe
	Probe Charger
	Nitrile gloves
	Ice chipping bar
	Ice auger
	Ice saw
	Snow sled
	Ice scoop
	Insulated, long gloves

**For any machinery used, battery powered is ideal, as fuel/exhaust may compromise sample.

Ensure you pack additional consumable supplies such as gloves, pens, waterproof markers, and any other tools needed for sample collection.

Personal Protective Equipment

The following table is a recommended list of safety equipment that should be brought into the field each trip.

	Winter PPE
	Personal Floatation Device (PFD)
	Additional clothing
	First aid kit
	Communication device
	Throw bag
	Hand warmers
	Waterproof snow pants/boots
	Sunglasses/sunscreen
	Ice cleats

Before You Head Out

1. **Freeze a few ice packs the night before** a sampling trip to have some to bring out with the bottle set and to ship samples back to the office.
2. Make sure your probe is charged (see battery on top right of probe screen).
3. Review your GPS coordinates from the last trip if you have already been out to the site.
4. Plan a timeline for sample return. If you are sampling in the morning, plan to filter Chlorophyll-a either shortly after the trip or in the afternoon before shipping.
5. Bring a small cooler out to the site with your bottle set and an ice pack.
6. Calibrate the probe for Dissolved Oxygen and Conductivity. See next page for calibration instructions.

Calibrating Equipment

The multiprobe meter should be calibrated prior to every field trip. Specific calibration guidelines for different multiprobe meters can be found online or included with the probe. The following calibration instructions are for a YSI ProSolo model.

Dissolved Oxygen

a. Calibrate the multiprobe before heading into the field.

b. Remove the **grey sleeve** (b) from your **probe** (d).

c. Remove the **metal probe guard** (a) and gently wipe any water droplets from the probe with a Kimwipe (supplied tissue).

d. Carefully place the metal guard back over your probe.

e. There is a yellow sponge inside the grey calibration sleeve. Using water from the calibration bottle, wet the **yellow sponge** (c) with a few millilitres of water.

f. Place the grey sleeve (with yellow sponge inside) over the metalguard.

g. Wait five minutes to allow the air in the probe to becomesaturated with moisture from the sponge.

h. Connect your probe to your **handheld unit** (e).

i. Press the green power button on your handheld unit.

j. Press Cal

k. Choose ODO or DO by pressing Enter

l. Choose DO % by pressing Enter

m. Wait one minute or until the lines stabilize in black graph.

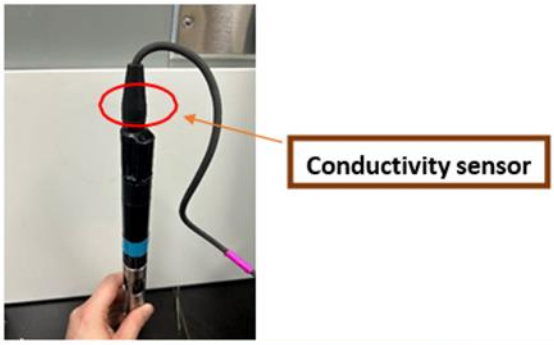
n. Record the Barometer value on the front of your field sheet.

o. Choose 'Accept Calibration' by pressing Enter.

p. Press escape until you see the 'log one sample 'screen.

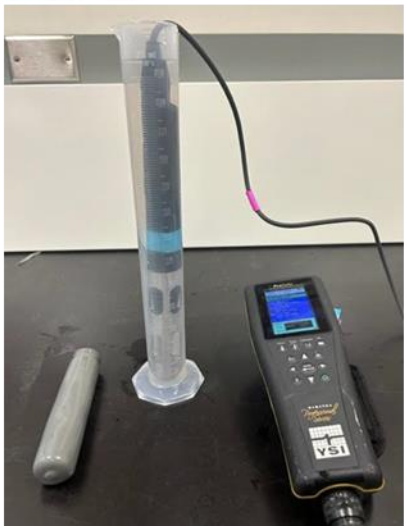
q. Keep the metal guard on the probe but keep the grey sleeveoff as the probe needs to be calibrated for conductivity next.

Conductivity



a. Calibrate your probe before heading into the field.
b. Remove the **grey sleeve** (b) from your **probe** (d) and place inside the graduated cylinder.
c. Fill up the graduated cylinder to the top with the conductivity calibration solution, so that the conductivity sensor (see below) is submerged. Let sit for 5 minutes.
d. If not done already, connect your probe to your **handheld unit** (e).
e. Turn on the handheld unit, and navigate to the conductivity calibration window: Press Cal 

f. Choose Conductivity by pressing Enter.
g. Choose Sp. Conductance by pressing Enter.
h. Change the "Calibration value" to the conductivity calibration solution used (this will be marked on the bottle, units are in µS/cm). **Record this value on the field sheet as well.**



i. Watch the line on the bottom and wait 1 minute, or until the line stabilizes and then press "Accept Calibration".
j. Calibration is complete. Rinse the probe with water before putting the grey sleeve back on the probe.
k. Press 'ESC' until back at the home screen. Power down the handheld.

Do not re-use the conductivity solution

Sampling Procedures

Datasheets/Site Set-Up

GPS Coordinates Instructions & Documentation

Go to https://www.googlemaps.com/maps, and find your watercourse (search its name).

Using your mouse, right click on the location of the watercourse where you collected your sample.

Choose "What's Here?"

The GPS coordinates will appear at the bottom of your screen in the format of 55.217876, -113.252806. Record these coordinates exactly as they appear from your device, onto the field sheet.

- Degree Minutes Seconds example: 53°29'06.5"N 113°27'54.6"W
- Decimal Degrees example: 53.485127, -113.465178
- Degree Decimal Minutes example: 53°29.1076'N, 113°27.9107'W

If you plan on sampling the same site more than once in the summer, use the table below to record your site GSP from the first sampling event to be used for the next sampling events. Use bottom depth as another reference for locating same approximate site location.

Site Name (example: Lily Creek)	Latitude	Longitude	Notes/Comments of Sampling Location*

* Characteristics of the sampling location to help someone relocate the site. For example: sample taken from boat launch, or sample taken near the river bend.

General Instructions

1. Never touch the inside of a cap or bottle when handling sample bottles. Clean and decontaminated sampling gloves are required to be worn when collecting samples. Long-arm sampling gloves are provided with the bottles; however, nitrile gloves can be used in an emergency.
2. Label all bottles provided with the Lake Name, Date & Time (**use the same start time for all bottles**).
3. Take the cap off, fill the bottle full of the water, replace the cap, and put into cooler with a cold ice pack. Bottles should be filled under the surface, at least 10 cm (4 inches), with the opening **facing upstream.**
4. **Special bottles with specific instructions:**
    - **Total Ammonia** (inside bubble pack): this bottle is pre-charged (preservative is already inside vial), please DO NOT fill in water. Use "Routine" bottle to carefully fill up onshore, without overfilling. Place back inside the bubble pack to prevent breakage.
    - **G2-Preserved & TOC**: Requires adding preservative. A yellow-capped 2 mL vial of sulfuric acid is attached to these bottles. Remove the vial before filling the plastic bottle in the water. Wearing gloves, carefully add the preservative into the bottle and invert a couple of times to mix.
    - **Microcystin**: Only fill ¾ full to leave some head space.
5. Amber bottles (besides mercury bottles – see below) do not require rinsing. Once filled, do not pour out and refill.

Collection Steps: Sampling on Ice

1. Always fill up the hot water bottle and place inside the probe kit to prevent the probe from freezing.
2. Using an ice pick or a sounding stick, check the ice thickness as you walk across the surface. If needed, drill holes along the way for a depth check. Check each time you walk on ice as ice quality and thickness may change throughout the season.
3. The Canadian Red Cross recommends that ice should be at least 10 cm (4 in.) thick to walk on.

4. Choose a location in the middle of the main flow of water as this is the most representative sample of your river. Avoid eddies, or stagnant water. **Do not collect a sample if there is no noticeable flow.**
5. When working in or on the river, minimize disturbing the riverbed to prevent sediment contamination. When collecting grab samples, try to avoid stirring up sediment.
6. Water samples should be collected upstream of the sampler and beneath the water's surface at a depth of ~10cm (4 inches).
7. Avoid collecting floating debris (e.g. ice and snow) or insects, etc. in your bottles. Avoid contamination of the sample by not introducing pollutants, such as fuel, oils, or smoking during sampling.
8. If preservation is required for specific analyses, follow the appropriate methods, such as adding preservatives or keeping the samples cool. See table below for information on preservatives.
9. Measure and record water temperature at the time of sampling, as it can be an important parameter for certain analyses.
10. All sample bottles should be clearly labelled with Location, Date and the **same time as recorded on your field sheet**. Store and transport all samples at 4 ºC in a closed cooler. Hot water bottles can be used during transport to keep samples from freezing in cold environments. Ice packs/bagged ice should be added to the cooler to maintain temperature during shipping. If using bagged ice, place it in a Ziploc-style bag to keep the melting water contained.
11. Note any relevant field conditions, such as snow depth, ice thickness, water depth under ice, weather, flow rate water colour/odor, and observations about the surroundings, which may help in interpreting the results.

Bottles and Sampling Techniques

Please visit www.alms.ca/icbm for the Safety data sheet (SDS) for preservatives. See the Definitions/Descriptions Section in Appendix (3) for further description of the parameters being sampled.

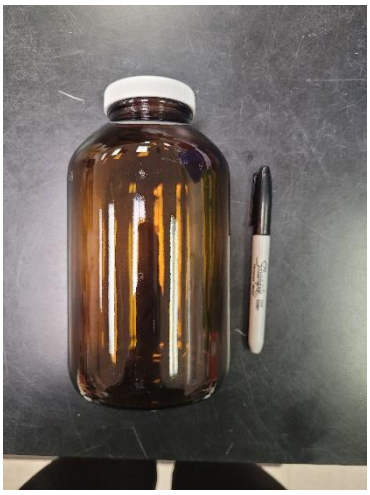
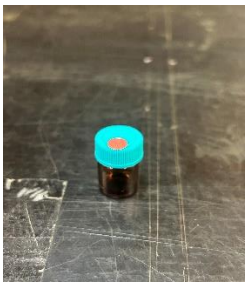
Image	Number of Bottles in Set	Description	Sampling Procedure	Preservatives/Notes
	3	**Polycyclic Aromatic Compounds (PACs) Only collected once per season.** 950 ml Wide-mouth amber bottle	This bottle **does not require rinsing.** Remove bottle from the plastic bag and fill. Leave some room to add preservative. Replace in plastic bag.	 Sodium azide (powder)
	2	**Total Mercury (THg) Only collected once per season.** 2x 118 ml (4 oz) amber bottle, double bagged.	These bottles **require triple rinsing.** Requires **<u>2</u>** people to complete clean hands/dirty hands protocols. Both people should be wearing nitrile gloves (provided). **Dirty Hands:** One person holds the outside bag and does not touch inside the bag. This person usually adds the preservatives. **Clean Hands:** One person handles the inside bag and the bottle filling, making sure not to touch the outside (dirty hands) bag.	Hydrochloric Acid (HCl)  Red (0.25 ml) for mercury (small bottle) Yellow (1 mL) for the methylmercury (larger bottle) **CLEAN HANDS/DIRTY HANDS protocols**

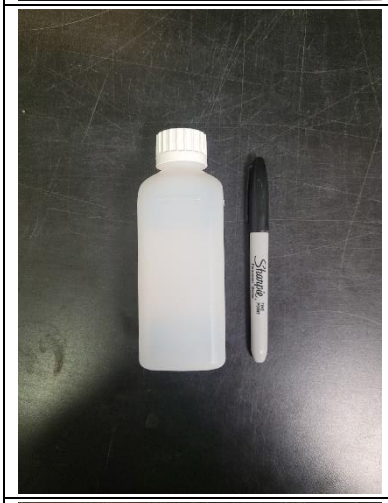
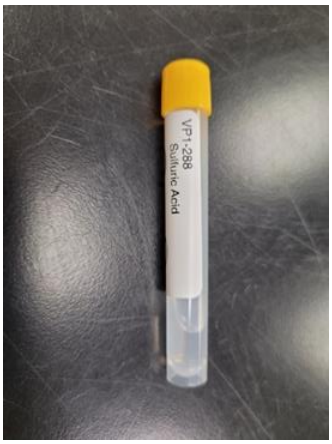
Image	Number of Bottles in Set	Description	Sampling Procedure	Preservatives/Notes
	1	**Routine** 1 L cylindrical plastic bottle	Fill up in the water.	None
	1	**G1-TSS** 250 ml squared plastic bottle	Fill the bottle up in the water to the raised line: 	None
	1	**G2-Preserved** 250 ml squared plastic bottle	Fill the bottle up in the water to the raised line:  Add the preservative.	Sulfuric acid 

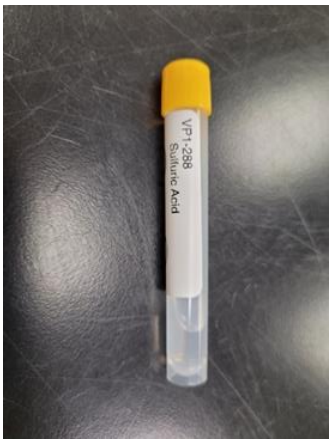
Image	Number of Bottles in Set	Description	Sampling Procedure	Preservatives/Notes
	1	**Dissolved Organic Carbon (DOC)** 125 ml squared plastic bottle	Fill the bottle up in the water to the raised line: 	None
	1	**Total Organic Carbon (TOC)** 125 ml squared plastic bottle	Fill the bottle up in the water to the raised line:  Add the preservative.	Sulfuric acid 
	1	**Dissolved Ammonia**	Fill the bottle up in the water.	

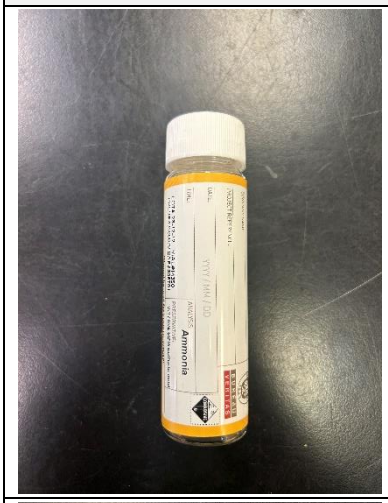
Image	Number of Bottles in Set	Description	Sampling Procedure	Preservatives/Notes
	1	**Total Ammonia**	Fill this vial using water out of the **"Routine"** bottle. DO NOT fill in the water body.	**This bottle is <u>pre-charged</u> with the preservative. Very important to not triple rinse in water body and carefully fill up to not allow the preservative to flow out of the bottle.**
	1	**Total and Dissolved Metals (collected only once per season)** 125 ml cylindrical plastic bottle	Fill the bottle up in the water.	None
	1	**Isotopes** 30 ml plastic bottle	Fill the bottle up in the water.	None

Image	Number of Bottles in Set	Description	Sampling Procedure	Preservatives/Notes
	1	**Chlorophyll-a** 1 L brown plastic bottle	Fill the bottle up in the water.	No preservatives – Must be filtered **within 24 hours of collection.** See Chlorophyll-a Filtering Section on page 12 (appendix 1) for more information.
	1	**Microcystin** 125 ml cylindrical plastic bottle	Fill the bottle only **¾ full.**	This bottle is preserved in the freezer so recommended to only fill ¾ full to prevent the bottle from bursting.

Bottle Storage and Shipping

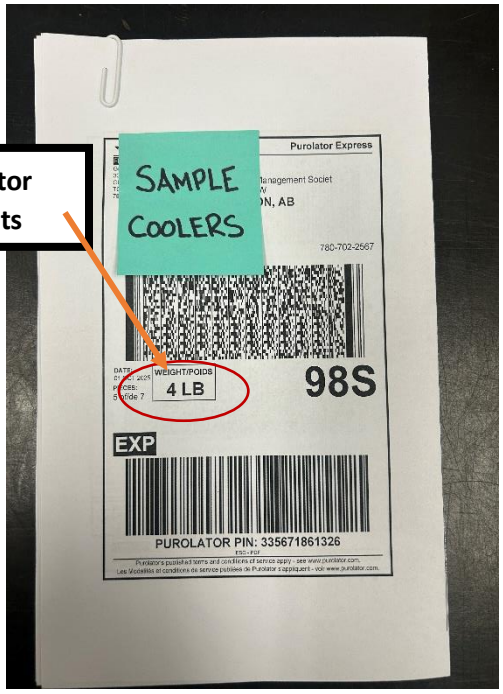
Sample Management

1. Keep samples cool, typically 4°C or lower (without freezing). Use coolers, ice packs (in the summer), to maintain the desired temperature during transport. At the office or home, samples can be stored in a fridge until they are shipped. They may also be held in the coolers, as long as the temperature is maintained.
2. Secure lids tightly to prevent evaporation, contamination, or spills during transport.
3. Have all sample bottles standing up and avoid laying them to the side in case of damage or spillage. Do not stack bottles on top of each other. Amber/glass bottles should have a protective wrap around them (bubble wrap is ideal) to protect from breakage during transport.

Bottles	Hold Times	How to Store Until Shipment
Routine, G1-TSS, G2-Preserved, DOC, TOC, Total Ammonia, Dissolved Ammonia, Isotopes, PACs, Metals	**3 days**	Store in fridge to keep cold, **DO NOT FREEZE**
Mercury	**48 hours**	Store in fridge to keep cold, **DO NOT FREEZE**
Microcystin	**3 months when frozen**	**Store in freezer** after returning from the sample site
Chlorophyll-a	***Filtering must be done within 24 hours of collection time***	**Before filtering:** Store in fridge to keep cold **After filtering:** All 3 filters can be stored in a Ziploc bag in the freezer *Refer to Chlorophyll Filtering guide on page 12

Shipping Samples

1. Pack all your bottles, including the chlorophyll filters and microcystin bottle from the freezer, into a cooler.
2. Make sure to include an ice pack or two depending on the size of your cooler.
3. Please **include a copy of the field sheet in a Ziploc bag** and email/text a copy.
4. Tape the cooler shut.
5. Use the appropriate **provided return label** (i.e., probe kit, filter kit or sample cooler) and place inside the provided sleeves with the barcode visible for scanning. Pull the tabs off the back, close the top of the sleeve and stick the label top of the cooler. Make sure the label is sticking well. Add extra tape if needed. Please send a picture of the **tracking number** to Kurstyn.cappis@alms.ca or by text message.
6. Drop off at your nearest Purolator location.



Purolator weights

1. Field sheet in Ziploc bag

2. Frozen ice packs

3. All bottles including frozen microcystin and Chlorophyll filters (if relevant)

Dropping Off Samples

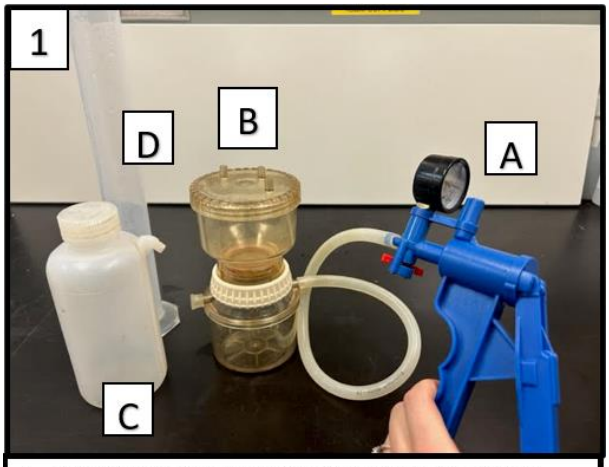
1. Pack all your bottles, including the chlorophyll filters and microcystin bottle from the freezer, into a cooler.
2. Make sure to include a frozen ice pack or two depending on the size of your cooler.
3. Please **include a copy of the field sheet in a Ziploc bag** and email/text a copy.
4. Dropoff at the ALMS office**: 4816 89 St NW**, Edmonton, AB, T6E 5K1 between Monday to Friday 9:00 AM-4:30 PM. Please let the Program Coordinator know an estimated time of arrival.

Important Reminders:

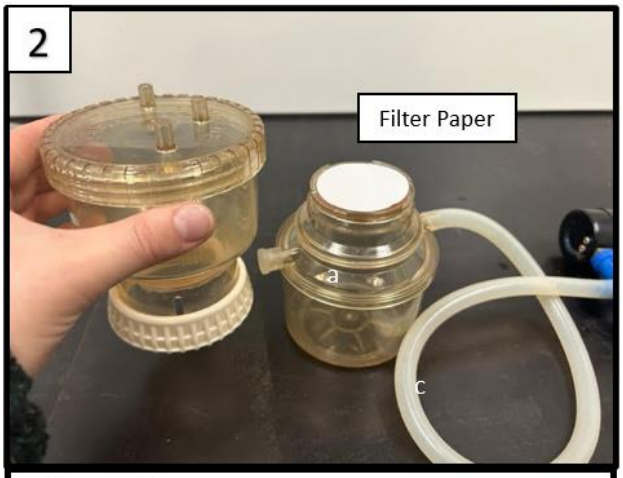
- Check with your courier for the daily cutoff times for overnight shipments. Samples must be submitted before these times if they are to arrive at our office the next day.
- Sampling any day between Sunday-Wednesday is ideal and will ensure samples are received before hold times. Thursday mornings can work if samples can be shipped by the afternoon and before the courier cutoff time.
- Our office will be closed for holidays from **December 22nd to January 4th and February 16th** and cannot receive samples.

Appendix

(1) Chlorophyll-A Filtering Steps

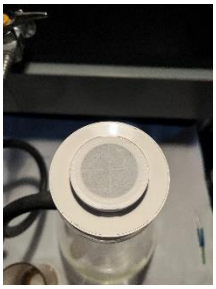


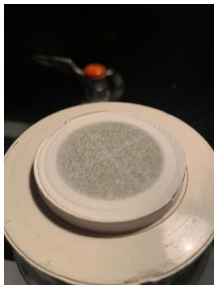
A. Hand pump connected with rubber tubing to filtration system
B. Filtration system
C. Wash bottle
D. Graduated cylinder

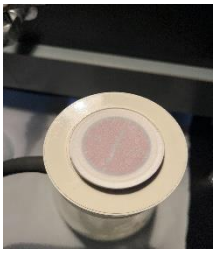


1. Unscrew filter top
2. Place filter paper on filter bottom
3. Screw top back on
4. Begin filtering process (page 11)

1. Label petri dishes with provided labels
2. Tape petri dishes closed
3. Wrap petri dishes in aluminum foil
4. Put into freezer until ready to ship







Examples of filter paper colour you may see. Colour is not limited to these though. There may be no colour after 300 mL filtration.

Filtering Instructions

1. Filtering must be done away from direct light and on a level surface within 24hrs of collecting water. Keep the chlorophyll bottle cold in the fridge until ready to filter. Put on disposable gloves to avoid contamination.
2. Set up the chlorophyll filtering apparatus as shown above. Make sure the tubing is connected tightly. You will need the following pieces: 500 mL filter apparatus, hand pump, filter paper, graduated cylinder, pure water poured into your squirt bottle and tweezers.

3. Unscrew the top piece of the filter apparatus and use the tweezers to place one filter paper on the funnel covering all the holes. Screw the top back on.
4. Wet the filter paper with pure water, provided in the kit.
5. Use the hand pump to gently increase pressure and allow water to filter through to the flask underneath.
6. Shake the Chlorophyll-a bottle to mix the water, measure 50 mL of water using the graduated cylinder and pour onto filter paper. Maintain pressure while pouring water onto the filter paper. Pump until all the water has drained.
7. Repeat step f until there is only a SLIGHT colour visible on the filter paper. Do not filter more than 300mL (since you only have 1L of water in the bottle). If you can't tell if the paper has colour, gently pick it up with tweezers and look at it. Record the colour observed on the first filter paper on the back side of the field sheet under the 'Chlorophyll-A Filter Volumes' table.
8. Once enough water has been filtered, triple rinse the graduated cylinder and inside filter apparatus with **pure water** onto the filter paper. Pump as you go.
9. If the filter flask becomes too full, remove the top piece, discard the water, and continue filtering. **Make sure the flask does not get full enough to reach the pump tubing.**
10. Once you are done filtering and rinsing, fill in total volume of filtered sample water on Chlorophyll-a filter section on the backside of the field sheet (Filter #1,2 ,3).
11. Add three drops of magnesium carbonate ($MgCO_3$) onto the filter paper, pumping as you go.
12. Using tweezers, fold the filter paper in half twice. Avoid touching any portion of the paper that has chlorophyll.
13. Finally, place the folded filter paper into a petri dish using tweezers. Using a sharpie, and the provided filter labels, label the dish with the watercourse name, location, date, and total volume of water filtered.
14. Wrap the petri dish in aluminum foil to protect it from light.
15. Place a new filter paper on the apparatus and repeat steps (c) to (o) **two more times to obtain three filter papers total.**
16. Excess water at the end of filtering can be discarded back into the watercourse, or outside, **not down the drain**.
17. Store in a **Ziploc baggie** within a **freezer** until ready to ship out with other bottles.

(2) Field Sheet (example)

Indigenous Community-Based Monitoring

Office Use Only
Date Received:
Time Received:
Site Name:

ICBM Summer Program RIVER FIELD SHEET
(Updated June 24th, 2024)

SAMPLING INFORMATION:

RIVER NAME:	**DATE:**
LOCATION NAME: (Where on the lake the sample is from. Can use basin, nearby summer village, park etc.)	**TIME:**
KIT NUMBER:	**HOURS SPENT SAMPLING:** (including calibration, transportation, sampling, filtering)

ENVIRONMENTAL OBSERVATIONS:

Air Temperature (°C)	
Wind Speed (km/hr)	
Wind Direction	
Cloud Cover Estimate (as a %)	
24 Hour Rain Fall (Visit acis.alberta.ca)	Yes ☐ No ☐ Amount: _____ mm
Water Flow	Stagnant (no flow) ☐ Slow ☐ Moderate ☐ Fast ☐
Water Clarity (describe)	
Water Colour	Colourless ☐ Green ☐ Brown ☐ Yellow ☐ Other ☐ _____
GPS Coordinates (record as many digits as possible) **Formats:**	Lat: Long:
Degree Minutes Seconds	☐ (eg, 53°29'06.5"N 113°27'54.6"W)
Decimal Degrees	☐ (eg, 53.485127, -113.465178)
Degree Decimal Minutes	☐ (eg, 53°29.1076'N, 113°27.9107'W)

PROBE CALIBRATION:

DISSOLVED OXYGEN:

Barometer:

CONDUCTIVITY:

Calibration Solution:

Classification: Protected A

Indigenous Community-Based Monitoring

YSI PROBE MEASUREMENTS

Cable is already marked in meters

Depth (m)	Temp (°C)	DO (mg/L)	Cond. (uS/cm)
0.1			

Chlorophyll-A Filter Volumes:

Chlorophyll-A Filter #	Filter Volume (mL)
1	
2	
3	
Colour of Filter:	

Additional Comments: (difficulty with water access, observed water levels, issues with equipment, vegetation types, water quality, etc.):

Technician/Monitor Names:

Did You Remember To?

- ☐ Calibrate your probe for DO and Conductivity?
- ☐ Preserve your G2-Preserved and TOC bottles?
- ☐ Place G2-Preserved, TOC, DOC, Ammonia and Routine in the fridge or on ice for shipment?
- ☐ Filter for Chlorophyll and place all **3** Chlorophyll-a filters in the freezer?
- ☐ Label your petri dishes?
- ☐ Record GPS location of site sampled?
- ☐ Notify ALMS of your sample completion and send the shipment tracking number? (email: kurstyn.cappis@alms.ca)

(4) Definitions/Descriptions

Below are descriptions of what the data and samples collected through the ICBM Program will be used for, and how they relate to better understandings watercourses in the summer. Also provided is where the data will eventually be used and reported.

Chlorophyll-a: Water from this bottle is used to determine the levels of chlorophyll-an in-river water. Chlorophyll-a is a green pigment found in all algae and cyanobacteria and is used in photosynthesis. Chlorophyll-a levels are used to understand the number of algae and cyanobacteria in watercourses. Higher levels, in conjunction with high nutrient levels, may indicate nutrient pollution, or reflect the watercourse's natural ability to support high levels of algal and cyanobacterial growth. Chlorophyll-a levels compared with temperature change will also improve the understanding of what influences algae and cyanobacteria growth.

Dissolved Organic Carbon (DOC): Measures the amount of organic carbon compounds dissolved in water bodies, indicating water quality. It originates from natural sources like plant and soil matter, as well as human activities, and helps assess ecosystem health and potential water treatment challenges.

Environmental Observations: 'Air Temperature,' 'Wind Speed/Direction,' 'Percent Cloud Cover' and '24 Hour Rain Fall' are all collected to put the data collected in context of the summer environment in which they were collected. Most of these can all be collected through a weather app. Regarding 'Percent Cloud Cover,' this can be estimated by observing the visible watercourse and giving a general percentage of cloud cover over it. 'Water Flow, Clarity and Colour' are used to indicate the status and condition of the flowing water body.

G1-TSS: Water from this bottle is used to measure the amount of Total Suspended Solids (TSS) in the watercourse. High TSS can have a negative effect on dissolved oxygen and temperature levels within the water, which can lead to a negative impact on fish habitat and plant growth. TSS is related to turbidity, but where turbidity measures how well light can pass through the water, TSS is a more quantitative measure of the number of suspended particles in the water.

G2-Preserved: Water from this bottle is used to determine total phosphorus and total nitrogen levels, which are important nutrients for algae, cyanobacteria, and aquatic plant growth. High levels of these nutrients may indicate pollution and contextualize the amount and type of algae and cyanobacteria present. Preserved with sulfuric acid.

Metals: Metals can be introduced into freshwater systems naturally through weathering of rocks and soils, or from human activities such as mining or refining processes. Common metals that can be found are arsenic, nickel, zinc, lead, and chromium. Some metals can bioaccumulate within aquatic organisms, which can lead to a potential risk to human health. The water in this bottle will be analyzed for any presence of metal contaminants in the watercourse.

Mercury: Mercury is a pollutant which can cause neurological damage to fish, wildlife, and humans at higher concentrations. Mercury can enter freshwater systems through atmospheric deposition (rain or snow) but also can enter directly from industrial and mining wastes nearby. It can easily be absorbed into the food chain and will lead to bioaccumulation of more toxic levels within fish populations. This is why it is important to test for mercury levels within a lake or stream.

Polycyclic Aromatic Hydrocarbons (PAHs): Water from this bottle will be analyzed to look for any presence of PAH concentrations in the watercourse. PAHs are a class of chemicals that naturally occur in coal, crude oil and gasoline and are released by the burning of fossil fuels and carbon-containing materials (e.g., wood and coal). PAHs do not dissolve or break down easily but will bind to sediment particles and can enter water bodies through atmospheric deposition, surface runoff, petroleum spills, storm water runoff and industrial discharges. In high concentrations, certain compounds of PAHs can be toxic to fish, wildlife, and humans.

Routine: Water from this bottle is used to determine pH, a parameter that is used to understand the acidity of water and is important for evaluating fish habitat and general water chemistry. Conductivity and chloride are also determined from the Routine sample bottle and are parameters that help understand the levels of salts in water. Salt levels are an important aspect of habitat for aquatic invertebrates and fish. Levels can indicate groundwater connectivity, road salt pollution, and may also increase during times of low rainfall and snowmelt.

Total Organic Carbon (TOC): High levels of TOC can indicate the presence of pollutants and contaminants, such as pesticides, herbicides, sewage, and industrial chemicals.

Watercourse Measurements: Temperature readings are used to understand the water chemistry, dissolved oxygen levels, and for evaluating habitat for plants and animals. Dissolved oxygen readings are also taken to understand fish habitat. Low oxygen levels can impact nutrient levels. Conductivity readings help determine water quality, identify impurities in a water sample and can indicate changes in water levels over time.