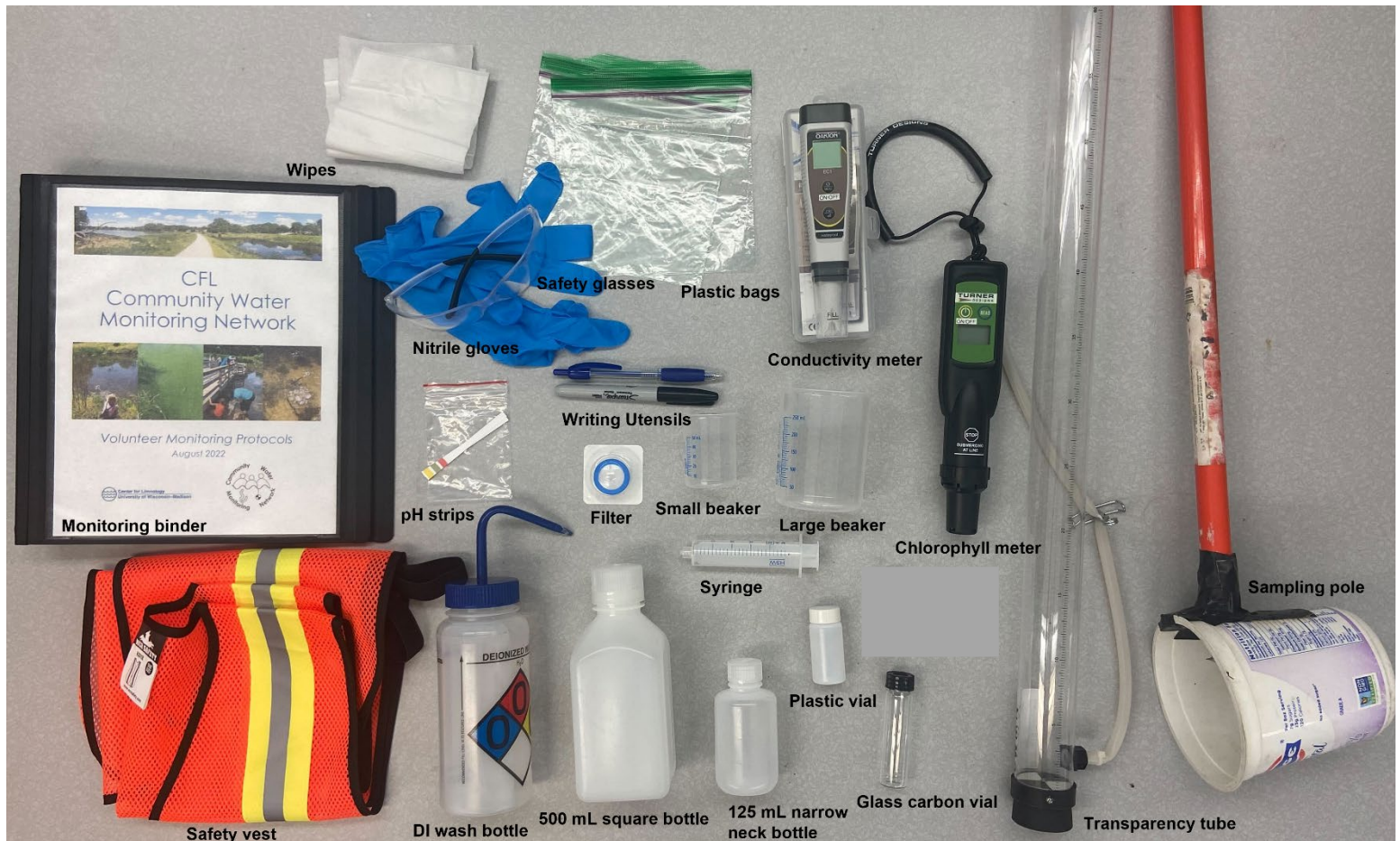


CWMN Volunteer Pond Monitoring Procedure

Version 2.2

Materials:



Sampling Steps:

1. Pond Shoreline Site Visual Observation

- I. Make sure to have all monitoring materials including the sampling pole, transparency tube, and monitoring binder before going out. We strongly recommend monitoring with a partner, checking the weather before you go, and wearing a safety vest when out in the field. Also do not go out if you are feeling unwell. Please use your best judgment!
- II. Upon arrival at the pond, perform a safety assessment. Remember, ***no sample is worth your safety*** – please use caution, trust your instincts, and do not sample if conditions are unsafe. Feel free to call us if there is a question or concern.
 - a. Is there any lightning or other bad weather in the vicinity?
 - b. Has the pond's water level changed drastically (e.g., flooding, exposed sediment) in a way that may impede safe sampling?

CWMN Volunteer Pond Monitoring Procedure

Version 2.2

- c. Scanning around the park, are there other hazards or situations that are making you feel uncomfortable?
 - d. If you have safety concerns that are not emergencies and would like advice on how to proceed, do not hesitate to call us. In an emergency, call 911.
- III. Carefully take equipment to the designated pond shoreline sampling site.
- Fill out the pond visual assessment section of the data sheet. Take a picture from the same position on the shoreline each time.

2. Water Clarity

- I. From the designated shoreline sampling site, use the extendable pole to get a water sample from as far out as possible. Submerge the bucket as fully as possible without disturbing the sediments.
- II. Make sure that the drainage tube at the bottom of the transparency tube is clamped shut. Carefully pour the water down the side of the tube until the 60 cm line at the top.
- III. Without sunglasses on, stand directly over the tube and look down. Hold the tube from the top to minimize shading.
 - a. If the Secchi disk (white and black diamond pattern) is visible, record water clarity as >60 cm.
 - b. If not, slowly drain the water until the Secchi disk pattern becomes visible. If the water level goes below 5 cm, hold the drainage tube above that line to avoid it continuing to empty.
 - c. Record the water depth on the side of the tube on the data sheet. Pour out the rest of the water away from where it is collected.

3. Conductivity & Water Temperature

- I. From the same spot, use the extendable sampling pole to get a new water sample from as far out as possible. Submerge the bucket as fully as possible without disturbing the sediments. If the sediments were disturbed from the transparency tube sampling, move down the shoreline a couple of feet to avoid sampling the disturbed zone.

From now until step 7, the procedures are best performed on a flat surface like a lawn, bench, or sidewalk.

CWMN Volunteer Pond Monitoring Procedure

Version 2.2

- II. Rinse the small beaker three times with sample water. You do not need to use a lot of water for rinsing.
- III. Fill the small beaker about halfway. Uncap the gray Oakton conductivity meter and turn it on by pressing the “power symbol/MEAS” button for less than 2 seconds. Remove the clear cap.
- IV. Making sure conductivity is being displayed in $\mu\text{S}/\text{cm}$, submerge the probe into the beaker of water. Do not rest the probe on the bottom of the beaker. Swirl the probe around the beaker slowly three times and then wait about 30 seconds for the readings to stabilize. The stability icon “☺” will remain on screen when it is time to record.
- V. Record the conductivity reading under Rep # 1 on the data sheet in $\mu\text{S}/\text{cm}$. Record the water temperature under Rep # 1 on the data sheet in $^{\circ}\text{C}$.
- VI. Remove the probe from the water, wait 30 seconds, then place back into the water sample. Repeat step III to record a second reading for conductivity and water temperature under Rep # 2 on the data sheet.
- VII. Rinse the probe with DI water from the wash bottle. Put the cap back on. Turn it off by pressing the “power symbol/MEAS” button for more than 2 seconds then place the cap back on.
- VIII. Empty the small beaker and refill about halfway with new sample water.

4. pH



CWMN Volunteer Pond Monitoring Procedure

Version 2.2

- I. Place two pH strips in the water with the three stripes submerged (they can rest on the bottom of the beaker). Wait one minute for the color to stop changing. Compare to the chart above and [record the two replicates on data sheet](#). If the colors are between two chart options, record exactly halfway in between (i.e., between 7.5 and 8 = 7.75).
- II. Place the used pH strips in the waste bag. Empty the small beaker and rinse three times with DI water from the wash bottle.

5. Chlorophyll (skip this section if your monitoring kit does not include a chlorophyll meter)

- I. Rinse the large beaker three times with sample water then fill to the 250 mL line. Place the large beaker on the white sheet of paper for best results.
- II. Turn on the black Fluorosense chlorophyll meter by pressing the “power symbol”. Leaving the cap on, submerge the meter in the water sample up until the white line (do not rest on the bottom of the beaker). Shake the meter gently to remove any bubbles.
- III. Press “READ” and confirm that the blue light has turned on. [Record the value in µg/L on the data sheet under Rep #1.](#)
- IV. Remove the meter from the water, wait 30 seconds, then place back into the water sample. [Repeat Step III to record a second value under Rep #2 on the data sheet.](#)
- V. Turn off the meter and rinse the capped end with the wash bottle. Carefully wipe dry and place the used wipe in the waste bag.
- VI. Empty the large beaker. Rinse three times with DI water from the wash bottle.

6. Grab Water Samples, Filtering & Preservation

- I. From the same designated shoreline sampling spot, use the extendable pole to get a new water sample from as far out as possible. Submerge the bucket fully if possible and do not disturb the sediments. If the sediments were disturbed from sampling, move down the shoreline a couple of feet to avoid sampling the disturbed zone.
- II. [Triple rinse the 500 mL square grab bottle and total nutrient 125 mL narrow mouth bottle with water from the sample bucket.](#)

CWMN Volunteer Pond Monitoring Procedure

Version 2.2

- a. Pour a little bit of water into the bottle, cap it and shake around to cover the whole inside with water.
 - b. Pour out and repeat two more times.
- III. Fill out the labels on the total nutrient 125 mL narrow mouth bottle, the plastic dissolved nutrient vial, the plastic chloride vial, and the glass carbon vial.
- IV. Fill the 500 mL square grab bottle and the total nutrient 125 mL narrow mouth bottle to the shoulders (where the bottle narrows to the neck at the top). **Refill the sample bucket as needed.** When filling the bottles, avoid getting sediments, dust, or other particles in the sample bottles or on the caps. Cap the 500 mL square bottle and slowly invert it 15 times.
 - a. From that bottle, use the syringe to draw ~10 mL of water and fill the rest with air.
 - b. Shake to rinse and dispose of the water. [Repeat the syringe rinse procedure 3 times.](#)
- V. Fill the syringe with sample water and place a filter tip on the end. [Press down on the syringe to fill the dissolved nutrient 20 mL plastic vial, the chloride 20 mL plastic vial, and the glass carbon vial.](#) More than one filter may be required to fill the vials. This step will be more difficult the greener the water is. Try to push as much water through as possible before replacing filters. The filter might break if too much pressure is applied and then the process would need to start over.
 - a. The dissolved nutrient 20 mL plastic vial should be filled to the shoulder and capped. Do not touch the inside of the cap with your fingers and avoid getting sediment, dust, or other particles on the cap or in the vial while filling. **Place the filled plastic vial in its marked bag when finished.**
 - b. The total nutrient 125 mL plastic bottle should be filled to the shoulder and capped. Do not touch the inside of the cap with your fingers and avoid getting sediment, dust, or other particles on the cap or in the vial while filling. **Place the filled plastic vial in its marked bag when finished.**
 - c. The chloride 20 mL plastic vial should be filled to the shoulder and capped. Do not touch the inside of the cap with your fingers and avoid getting sediment, dust, or other particles on the cap or in the vial while filling. **Place the filled plastic vial in its marked bag when finished.**

CWMN Volunteer Pond Monitoring Procedure

Version 2.2

- d. The carbon glass vial should be filled all the way to the top so that there is no air or bubbles. Carefully place the cap on the vial. The rubber septa in the middle may bulge a little under the pressure – this means the vial is full which is what we need. Again, do not touch the inside of the cap or the vial and avoid getting particles in the vial while filling. **Place the filled glass vial in its marked bag when finished.**
 - VI. Place the total nutrient plastic bottle, dissolved nutrient plastic vial, chloride plastic vial, and glass carbon vial back in the kit for later sample pick up and lab analysis. Empty the 500 mL bottle and triple rinse with the DI wash bottle. Empty the syringe and place used filters in the waste bag. Pack up the monitoring kit.
- 7. Inlet & Outlet Visual Observation (skip this section if it does not apply to your site)**
- I. Bring the data sheet to the designated inlet and outlet of the pond and fill out the remaining visual assessment sections.
 - II. Take a picture from the same position at each site.
 - III. When finished, check that the data sheet is fully filled out and make sure to record end time at the top. Make sure the four filled sample bottles are properly labelled.

Take everything with you from the pond. Wash your hands when you arrive home.

Equipment Maintenance:

- I. After returning from monitoring, rinse the following equipment with sink water and leave out to dry completely before packing away.
 - a. Transparency tube
 - b. Sampling bucket
 - c. Large beaker
 - d. Small beaker
 - e. 500 mL square bottle
 - f. Syringe (can fill a beaker with water then rinse)

Check that the other equipment in the monitoring kit is dry before packing away. Try to minimize moisture in the bins as much as possible.

CWMN Volunteer Pond Monitoring Procedure

Version 2.2

- II. Empty the waste bag and make sure there is an extra ready to go for the next monitoring event.
- III. Store the 20 mL plastic dissolved nutrient vial and the 125 mL total nutrient bottle (**in their marked bags**) in the freezer until pickup. Check that the bottles are properly labelled.
- IV. Store the glass carbon vial and the 20 mL plastic chloride vial (**in its marked bag**) in the refrigerator until pickup. Check that the bottles are properly labelled.
- V. Refill the DI wash bottle with deionized water to be ready for the next monitoring event.
- VI. Contact us if you need help with meter troubleshooting or need replacement batteries.

Submit Data & Sample Pickup:

- I. Submit data from a computer after each monitoring event. Go to the CWMN website (<https://cflwaternetnetwork.limnology.wisc.edu>) and click on the Resources tab.
- II. Access the Data Upload Google Form. Enter your data into the form from the monitoring event following each category on the data sheet.
- III. Upload the photos from the shoreline, inlet, and outlet in the corresponding sections.
 - i. Please label photos in this format:
PondName_mmddyyyy_Shore/Inlet/Outlet i.e. Elver_09012022_Shore
- IV. Submit your data. Let us know if you believe you made a data entry error or missed something after submission and we can get that fixed.
- V. Hold on to the physical data sheets in the monitoring binder.

When ready, contact us to schedule sample pick-up and refresh supplies. We will plan pick-up within the week following your monitoring event.

Thank you and great work!