

PARTNERS 2004 SAMPLING PROTOCOL

Applies to all rivers except the Yukon

16 February 2004

SAMPLING OVERVIEW

D-96 depth-integrated samples should be collected at 5 stations across the river channel (Figs. 1, 2). The five depth-integrated samples are combined in the Teflon Churn (Fig. 3), resulting in a single composite depth- and width-integrated sample.

Sampling should begin at Station 3. It will take some experimentation with the D-96 sampler transit rate and nozzle sizes to obtain a roughly 3-liter sample at Station 3. Then, the same transit rate and nozzle size should be used at the other stations, even though less than 3-liters of water will be collected. By using this procedure and compositing all five of the Station samples in the Teflon Churn, a single depth- and width-integrated sample is obtained.

Use the water collected in the initial test D-96 drops to rinse the churn.

Great care must be used in order to get high-quality, clean samples. When sampling and processing samples, wear latex gloves and designate a "clean hands" person who only handles the sample bottles and the Teflon D-96 bag. The "dirty hands" person should handle the winch and the D-96 tray. Keep the churn in a plastic bag, inside the white plastic can (shipped to each site). Rinse the churn with surface water before starting to sample. Rinse all sample bottles 3 times before filling. Use ice packs to keep the samples cool after collection. **But be careful - do not place samples to be refrigerated (but not frozen) directly adjacent to the ice packs - they could freeze and be ruined.**

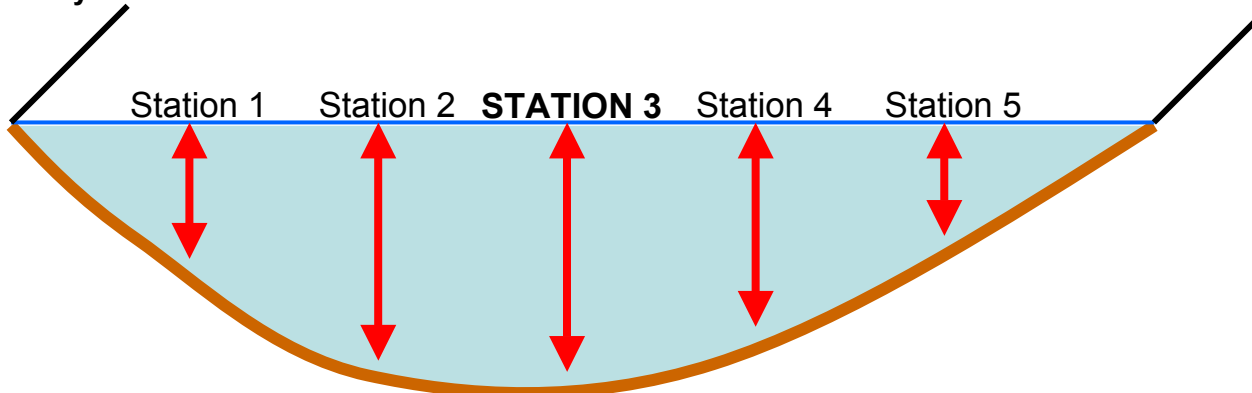


Fig. 1. Cross-sectional view of a river channel. The five sampling stations (facing downstream, station 1 is on the left) should be equally spaced across the channel.



Fig. 2. D-96 depth-integrating sampler.



Fig. 3. Teflon Churn.

FIELD PROTOCOL

Station 3 (SUPPLIES IN BAG A)

At Station 3, surface water temperature and depth of water will be measured, and two D-96 depth-integrated samples will be collected.

SURFACE WATER TEMPERATURE AND WATER DEPTH

Make depth measurements using sonar. Methods for surface water temperature measurement will vary among rivers. Record both temperature and depth data on Field Data Sheet.

D-96 DROP 1

Pour entire contents of D-96 bag into CHURN.

D-96 DROP 2

Bottle 1: pH, Temperature. 250 mL HDPE, fill completely.

Preservation: none: discard sample after measurements are made.

Using the pH meter, make pH and temperature measurements as soon as possible after collecting the sample. Record pH and temperature on Field Data Sheet.

Bottle 2: Guay Trace Elements. 125 mL HDPE, fill completely.

Preservation: Refrigerate.

This bottle is doubled bagged. Keep it in the double bag until sampling, and return it to the double bag after sampling.

Bottle 3: Raymond TOC-14C Sample. 125 mL Polycarbonate, fill to Black Line.

Preservation: Freeze.

This bottle is single bagged. Keep it in the single bag until sampling, and return it to the single bag after sampling.

Bottle 4: Amon Sample. 1000 mL Polycarbonate, fill to Black Line.

Preservation: Freeze.

Bottle 5: Gordeev Trace Element Sample. 500 mL HDPE, fill to Black Line.

Preservation: Freeze. Note: This sample goes to Gordeev in Moscow.

This bottle is single bagged. Keep it in the single bag until sampling, and return it to the single bag after sampling.

Bottle 6: Pavlov Algal Sample. 500 mL HDPE, fill completely.

Preservation: In lab, add 13 drops Lugol's solution, refrigerate.

Note: This sample goes to Dima Pavlov in Borok.

Stations 1, 2, 4, and 5

At Stations 1, 2, 4, and 5, collect one D-96 depth-integrated sample and pour it into the Churn. Also measure surface water temperature and depth at each of these stations, and record data on Field Data Sheet.

LAB PROTOCOL

Set up a “clean” bench in the lab, using one of the large white plastic bags included with the sampling supplies as the work surface. Wear gloves and change gloves often. Rinse all bottles 3 times with sample water before collecting the final sample.

CHURN, Unfiltered Whole Water Samples and DNA (*SUPPLIES IN BAG B*)

Remove the white rubber tube and install it into the peristaltic pump. Be very careful to keep the ends of the tube clean (*you can put the ends of the tube inside a latex glove to protect them from contamination*). Samples in Bag B are not filtered, but must be “churned” during collection in order to keep particulates suspended.

Bottle 7: H₂¹⁸O - Rep. 1. 30 mL HDPE, fill completely.
Preservation: Wrap cap with black tape, refrigerate.

Bottle 8: H₂¹⁸O - Rep. 2. 30 mL HDPE, fill completely.
Preservation: Wrap cap with black tape, refrigerate.

Bottle 9: Tritium. 1000 mL HDPE, fill completely.
Preservation: Wrap cap with black tape, refrigerate.

Bottle 10: WRD Particle Size. 250 mL HDPE, fill to Black Line.
Preservation: Freeze.

Bag 11: DNA. Follow directions included in DNA kit.
Preservation: Freeze.

CHURN, Disk Filtered Samples (*SUPPLIES IN BAG C*)

These samples are filtered through plastic “disk filters”, and must be “churned” during collection in order to keep particulates suspended. The filter holders are pre-loaded with the appropriate filters. Do not open the filter holders - after use just freeze the filter holders and the filters together. Pump speed should be set low for these samples to avoid bursting filters.

Bottle 12 and Bag 13: Raymond 14C Samples. 500 mL Polycarbonate and 47 mm GFF filter. Filter water into Bottle 12 (500 mL Polycarbonate bottle, fill to Black Line) using preloaded 47 mm quartz filter. Then filter up to 500 mL additional water into a graduated cylinder (in order to get more material on the filter). Leave filter in filter holder - but try to dry as much as possible by forcing air through filter holder. *Since in the field it is not possible to know exactly how much water was collected in Bottle 12, on the Field Data Sheet just record the additional volume of water filtered into a graduated cylinder but not collected in Bottle 12.*

Preservation: Bottle 12. 500 mL Polycarbonate sample: Freeze.

Bag 13: Leave filter in blue holder, put in its plastic bag, Freeze.

Bag 14: POC/PON Filter. 25 mm GFF filter. Filter water into graduated cylinder, and *record amount of water filtered*. Discard water, save filter (leave filter in filter holder - but try to dry as much as possible by forcing air through filter holder).

Preservation: Filter: Leave filter in blue holder, put in its plastic bag, Freeze.

CHURN, Capsule Filtered Samples (*SUPPLIES IN BAG D*)

All of these samples are filtered with a Capsule Filter. Two capsule filters are included in Bag D. Generally only one capsule filter will be needed, so save the second filter for later sampling trips (they are expensive!).

The capsule filter will be saved (frozen) after use for potential future analysis of particulates. Therefore, it is necessary to "churn" during filtration, and record (on the Field Data Sheet) the *approximate* volume filtered through the capsule filter.

Bottle 15: Alkalinity. 250 mL HDPE, fill completely.
Preservation: Refrigerate.

Bottle 16: Guay Trace Elements. 125 mL HDPE, fill completely.
Preservation: Refrigerate.
This bottle is doubled bagged. Keep it in the double bag until sampling, and return it to the double bag after sampling.

Bottle 17: Amon Sample. 1000 mL Polycarbonate, fill to Black Line.
Preservation: Freeze.

Bottle 18: Nutrients - Rep. 1. 60 mL HDPE, fill to Black Line.
Preservation: Freeze.

Bottle 19: Nutrients - Rep. 2. 60 mL HDPE, fill to Black Line.
Preservation: Freeze.

Bottle 20: DON. 60 mL HDPE, fill to Black Line.
Preservation: Freeze.

Bottle 21: Anions. 60 mL HDPE, fill completely.
Preservation: Refrigerate.

Bottle 22: Cations. 60 mL HDPE, fill to Black Line.
Preservation: Add 60 μ L (3 drops) half-strength HCl, refrigerate.
Note: Half-strength HCl is 50% concentrated HCl and 50% deionized water. It is safer to use than concentrated HCl.

Bottle 23: MBL Archive - Rep. 1. 250 mL HDPE, fill to Black Line.
Preservation: Freeze.

Bottle 24: MBL Archive - Rep. 2. 250 mL HDPE, fill to Black Line.
Preservation: Freeze.

NOTE: BOTTLES 25-28 COLLECTED ONLY AT OB', YENISEY, AND LENA

Bottle 25: CPPI Sample 1. 250 mL HDPE, fill to Black Line.

Preservation: Freeze.

Bottle 26: CPPI Sample 2. 250 mL HDPE, fill to Black Line.

Preservation: Freeze.

Bottle 27: CPPI Sample 3. 250 mL HDPE, fill to Black Line.

Preservation: Freeze.

Bottle 28: CPPI Sample 4. 250 mL HDPE, fill to Black Line.

Preservation: Freeze.

Bag 29: Capsule Filter. After finished with sample filtration, record approximate volume of water filtered through capsule filter, and save capsule filter.

Preservation: Freeze (in Bag 29)

Note: remember to add Lugol's to Bottle 6 (Pavlov field-filled bottles), and to acidify Bottle 22 (Cation sample).

MISCELLANEOUS INFORMATION

1. Always get samples. Even if everything goes wrong (D-96 lost, churn lost, whatever), figure out a way to get samples. Even collect samples from the shore if necessary.
2. If problems occur (and they sometimes will), make note of them on the Field Data Sheet. This information may be important for interpreting unusual results.
3. All samples that will remain in (or go to Russia - samples for CPPI, Gordeev, and Pavlov) have yellow labels, to help distinguish them from other samples.
4. All bottles have a unique number (text on light blue background). This number uniquely identifies each bottle and will be used during sample analysis and for data management.