

**DPLA Water Quality Assessment Branch
Standard Operating Procedure for
Chlorophyll-a Sampling Method:
Field Procedure***

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1.0 Scope and Application

This procedure will be used to filter chlorophyll-a samples from Delta channels and agricultural drains.

2.0 Summary of Method

A representative water sample is collected either with a Van Dorn bottle or with a flow through pump (depending on the sampling objective), and filtered by vacuum filtration in dim light. The goal is to filter 1000mL of sample water through two filters. If the water is too turbid and it is not feasible to filter the full 1000mL within 10 minutes, a smaller volume will then be filtered. The filters will be folded and inserted in a pre-labeled opaque envelope. The envelope will be placed in a cooler with dry ice to be transported to Bryte Laboratory for extraction and analysis. Rinse the filter funnels with DI water between sampling stations.

3.0 Apparatus

Three port vacuum manifolds, with one port closed
Two plastic filter funnels, Gelman or equivalent
Vacuum system with one two-liter flask
Glass fiber filters e.g. Whatman (47 mm), 1.0 μm
Plastic wash bottle, 500 mL, for demineralized water
Plastic wash bottle, 500 mL, for MgCO_3
Blunt filter forceps
Graduated cylinder or volumetric flask, 250 mL

4.0 Reagents

Saturated magnesium carbonate solution will be provided by Bryte or can be made as follows: Add 10 grams magnesium carbonate to 1000 mL of deionized water. Mix well and allow 48 hours settling time if possible. Decant the clear solution into a clean squirt bottle for subsequent use. Preferably, only the clear "powder free" solution will be used during subsequent steps.

5.0 Sample Handling and Preservation

Turn off interior vehicle lights and block off any direct sunlight from the filtration area. The entire procedure should be carried out as much as is possible in subdued light to prevent photodecomposition. The frozen samples should also be protected from light during storage for the same reason. During the filtration process, the samples are treated with $MgCO_3$ solution to eliminate acid induced transformation of chlorophyll to its degradation product, pheophytin. After filtration, the filters should be removed from the filtration apparatus with forceps and folded in half (preferably in quarters) with plankton side inward. Place folded filters into an individual envelope labeled with station, date, depth, volume filtered and operator. Transport to Bryte Laboratory in a cooler with dry ice. Analysis should be performed as soon as possible following sampling. However, if this is not possible, the filters may be kept frozen and analyzed within 28 days of collection.

6.0 Field Procedure

- 6.1 Using forceps, place two 1.0 μm filters, textured side up on each of two filter funnel platforms. Assemble the filtration apparatus just prior to filtration.
- 6.2 Collect a water sample at the appropriate depth. If a Van Dorn bottle is used, slowly invert the bottle 4-5 times to thoroughly mix the sample. Rinse a one-gallon sample container as follows: drain about half a pint of sample into the sample container, swirl the container and discard. Repeat the process three times. (Note: If it is not possible to rinse sample container with sample water, use distilled water). In subdued light, empty about a gallon of water from the Van Dorn Bottle into the rinsed sample container and gently rotate to mix. Pour the sample into a 250 mL graduated cylinder or volumetric flask. Add about 5mL of saturated $MgCO_3$.
- 6.3 Pour contents into one of the two-filtration funnels.
- 6.4 Close the unused port on the vacuum manifold. Turn vacuum pressure on, and do not exceed 10 inches of mercury.
- 6.5 After the first 250 mL of sample is filtered through each filter, repeat the procedure until a total of 1000mL have been filtered (500mL through each filter). If the filters clog up (filtration time exceeds 10 minutes) before the full 1000mL can be filtered, proceed as follows:
 - 6.51 If the filters clog up when less than 500mL have been filtered (i.e. less than 250mL in each filter), note the approximate volume filtered, stop the process and discard the filters.

Start the procedure with new filters. Filter a sample volume approximately equal to the amount processed in the previous step before the filters clogged up. **Note: A duplicate sample must be processed if less than 500mL have been filtered.**

6.52 If the filters clog up when more than 500mL have been filtered through the two filters, note the approximate volume filtered, stop the process and discard the filters. Start the procedure with new filters. Filter a sample volume approximately equal to the amount processed in the previous step before the filters clogged up.

6.6 When approximately 10-50 mL of sample remains on each filter, add about 1 mL of MgCO₃ solution using one squirt from the bottle. Thoroughly rinse the filter apparatus using the wash bottle containing MgCO₃. Dry the filters by maintaining the vacuum for 30 seconds after all the water has been filtered.

6.7 With the vacuum pump running, use forceps to remove and fold each top filter either in half (preferably in quarters) and carefully place into the pre-labeled envelope. Immediately place envelope in a cooler with dry ice to freeze. All the above procedures should be completed in subdued light. Rinse the filter funnels with DI water. **Note:** Write down the final volume filtered on both the chlorophyll envelope (in pencil) and field sheet.

7.0 Quality Control

The following controls are to be collected:

Control -----	Frequency -----
Field Dupe.	Once/batch
Sample Dupe	Sample volume is <500mL

Bryte Lab will supply DI water that will be stored in the mobile laboratory's DI water tanks. One station per run will be duplicated and submitted blind to Bryte Lab for analysis.

*This SOP has been compiled using the following sources:

- I. Grace Analytical Laboratory, Chicago Illinois, 1996
- II. Florida Department of Environmental Protection, Bureau of Laboratories, Biology Section. 1997
- III. Standard Methods for the Examination of Water and Wastewater, 19th Edition, 1995

DPLA Phytoplankton Field Sheet

Site Information

Station Name:	Date:
Sample Number:	
Sampling Crew:	Time (PST):

Site Conditions

Weather	Wind
	Flow/Tides
	Clouds

Sampling Information

Sampling Method: Van Dorn Bucket

Sample Depth (Ft)	
Station Depth (Ft) —surface to bottom	
Secchi Depth (Ft)	
Fluorescence (Discreet samples)	
Sample Volume Filtered	
Comments: E.g. Turbidity problems, equipment problems, other	