1. Procedure summary

Procedure for obtaining the dry weight of a sample expressed in g/L. These samples are prepared and then dried in an oven.

Related Procedures

AFDW (GL-07-003-004)
Harvest Dry Weights (GL-07-003-002)

Procedure impacts and concerns

Safety	Heat resistant gloves are required when removing samples from the oven due to high oven temperatures.
Quality	All samples are run in triplicate and should be within 14% RSD of each other or less. Weather events or anything that causes excessive flocculation by the algae can result in a higher %RSD for triplicate values.
Delivery	Dry weights are required to determine which ponds to harvest and the amount of flocculent to add. Samples must be analyzed and data returned within the same day. In addition, dry weights are used to calculate pond productivity. All reported QA/QC data must be accurate. Questionable data must never be reported.
Environmental	NA
Cost	Whatman filters are $1.03 per filter, Wyvern are $0.59 per filter.
Compliance	NA

Responsibilities and owners

Document Owner	Manage content and distribution	Ron Treminio
Process Owner	Responsible for content and process validation	Tonia Lane
Plant Manager	Responsible for implementation and conformance	Rebecca White (IABR) Becky Ryan (LCTS)

2. Process

2.1 Process description

Dry weights are a measure of the total suspended solids (TSS) within a sample. The measurement is gravimetric and consists of filtering a known volume of sample using a pre weighed filter paper that will retain solids larger than the pore size of the filter. This filter paper is then dried to remove all moisture, allowed to cool and then weighed. The increased weight of the filter paper represents the total suspended solids in the sample. This measurement is used to determine pond productivity as well as to inform when a pond needs to be harvested and the amount of flocculent needed for harvest.

2.2 Process diagram: Work Instruction

2.3 Equipment and Supplies

- GF/C filters (Whatman #1822-047) (Wyvern #C4700)
- Squirt bottle filled with pure water (nano or DI)
- Disposable aluminum weigh dishes (Fisher #08-732-102)
- Forceps
- 25mL Serological pipets
- Pipet Aid
- Squirt bottle filled with 2 ppthousand ammonium bicarbonate
- Heat shielding gloves
- Oven trays
- Magnetic Filter Funnel 47mm system
- Analytical Balance
- Yamato DX600 Drying Oven
- Desiccator
- Mesh Sink Trap

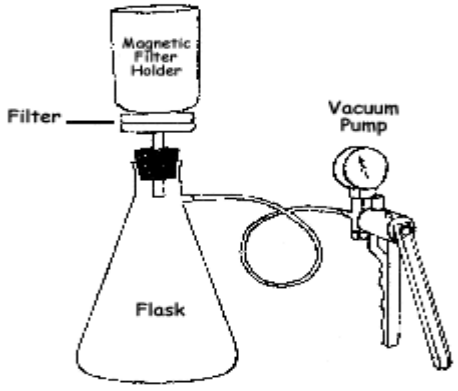

Figure 1. Magnetic Filter Funnel apparatus

2.4 Process steps

2.4.1 Filter preparation

1. Label aluminum weigh dishes for all samples and place on oven trays. Remember each sample will be run in triplicate.
2. Set up the Magnetic Filter Funnel apparatus without the funnel head. (See Figure 1)
3. Place a new GF/C filter on the filter screen.
4. Apply vacuum (up to 100 kPa) and rinse the filter with a generous amount of water.
5. Remove the filter with forceps and place it in the aluminum weigh dish.
6. Repeat steps 3-5 for all samples.
7. Place trays in the oven at 105°C to dry for at least 1 hour. Check that the oven is set at the correct temperature.
8. Transfer the trays of dried filters to the desiccator to cool using heat shielding gloves.
9. Allow the trays to cool for a minimum of 10 minutes.
10. Weigh each dish using an analytical balance.
11. Record these values as the Filter+Tray Weight.

2.4.2 Filtering samples

1. Set up the Magnetic Filter Funnel apparatus without the magnetic filter holder. (See Figure 1)
2. Using forceps, place a prepared filter from process 2.4.1 on the filter screen.
3. Place the magnetic filter holder on top of the filter.
4. For IABR samples, place a mesh on top of the funnel head to act as a pre-filter for the sample. This helps with data quality in cases where the sample is contaminated with excessive silt and or non-algal organic material (e.g. plant and bug matter).
5. Mix samples by shaking.
6. Using a serological pipet dispense 25mL of culture into the cup.
7. Turn on the vacuum and allow liquid to flow through the filter. Please note that if the system is air tight then the vacuum pump can be turned off once a vacuum is established.
8. Rinse the sides of the cup and the filter with 2ppthousand ammonium bicarbonate using a squirt bottle.
9. Remove the magnetic filter holder and mesh trap and place the filter back in the aluminum weigh dish using forceps.
10. Repeat steps 2-9 for all samples.
11. When all samples have been filtered place trays in the oven to dry for at least 1 hour. (Check that the oven is set at 105°C)
12. Transfer trays of dried filters to the desiccator using heat shielding gloves.
13. Allow trays to cool for a minimum of 10 minutes.
14. Weigh each dish using an analytical balance.
15. Record these values as the Tray+Dry Weight.

2.4.3 Dry weight calculations

1.Calculate the dry weight in g/L using the Tray+Filter and Tray+Dry Weight recorded values and the Dry Weight Data Template

Dry Weight=((Tray+Dry Weight – Tray+Filter Weight)/25mL)*1000)

2.4 Preparation of Reagents & Solutions

2.4.4 AMMONIUM BICARBONATE (2ppt)

Ammonium Bicarbonate	4 g
DI water	Dilute to 2 L

i. Dissolve 4.0 g ammonium bicarbonate in about 1.5 L DI water in a 2 L beaker or flask.
ii. Mix until reagent is completely dissolved.
iii. Dilute to 2 L.
iv. Can be stored at room temperature for at least 2 weeks.

3. Required documents

NA

Output documents
Excel or OSI-PI data spreadsheet

4. Document control

Revision history

R0 – Initial Release – Nicole Heaps, Tonia Lane, Kari Mikkelson	11/29/12

Document approval

Nicole Heaps	9/14/12
Becky Ryan (LCTS)	9/14/12
Rebecca White (IABR)	9/14/12

Document reviewers

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Becky Ryan	9/14/12
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5. Risk analysis