

Standard Operating Procedure

Great Salt Lake Water Quality Studies

Seston Sampling

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Purpose

To collect suspended seston from Great Salt Lake water samples for selenium analysis. Water samples are pre-filtered to remove suspended particulate fraction, including *Artemia* and other zooplankton, larger than 125 microns.

Materials

Below are recommended materials for seston sampling. Materials with equal specifications as those listed below may also be used.

- GeoPump™ peristaltic pump
- 1/4 inch Teflon™ lined tubing
- 3/8 inch Masterflex® tubing
- 125 micron stainless steel sieve.
- 3 liter HDPE beaker
- 3 liter HDPE graduated cylinder
- 142 mm polycarbonate in-line filter holder (Geotech).
- 142 mm cellulose acetate 0.45 micron flatstock filter
- Whirl-pak® bags
- Ziplock® recloseable bags

Suppliers

The following are known suppliers of above materials:

Geotech Environmental Equipment, Inc.
8035 East 40th Ave.
Denver, CO 80207
Ph: 800.833.7958
Fax: 303.322.7242
www.geotechenv.com

Cole-Parmer Inc.
625 E. Bunker Ct.
Vernon Hills, IL 60061
Ph: 800.323.4340
Fax: 847.247.2929
www.coleparmer.com

Methods

Laboratory Preparation

Pre-clean Materials:

- Clean all tubing and containers according to USGS protocols.
- Place tubing in ziplock bags.
- Place beaker, sieve and graduated cylinder in plastic tubs for transport.

Filters

- Weigh 142 mm 0.45 micron cellulose acetate filters using four-place balance and record weights.
- Place filters in individual ziplock bag and store flat.

Field Procedures

1. Use clean technique, including wearing powder-free gloves, when handling equipment and materials that are in contact with water samples.
2. Set up peristaltic pump, beaker, sieve, and graduated cylinder.
3. Set up 142 mm filter holder and place pre-weighed filter into holder. Secure and manually tighten opposing nylon swing-away-bolts to achieve even pressure on filter. Ensure that "O-ring" is correctly located in "O-ring" groove to avoid leakage.
4. Pump one liter of water from one meter depth through sieve and into beaker.
5. Discard water.
6. Pump three liters of water through sieve and into beaker as appropriate for the depth of the sample site:
 - Shallow sample site (<3 meters depth): 3 liters from one meter depth.
 - Medium sample site (5-6 meters depth): 1 liter from 1, 3, and 5 meter depth interval.
 - Deep sample site (7-8 meters depth): 1 liter from 1, 3, and 5 meter depth interval.
7. Pour 3 liters of water from breaker into graduated cylinder.
8. Remove tubing from Great Salt Lake and purge tube contents.
9. Rinse exterior of tubing and place into graduated cylinder.
10. Pump approximately 500 mls of GSL water from graduated cylinder through tubing until volume in graduated cylinder contains 2500 mls.
11. Attach discharge end of tubing to intake side of filter holder.
12. Loosen air release valve on filter holder.
13. Place beaker under filter holder discharge end to capture filtered liquid.
14. Begin pumping water through filter holder.
15. Close air release valve when air is purged from filter holder.
16. Continue pumping water through filter until filter is clogged.
17. Record volume of GSL water filtered.
18. If filter is not clogged with 2.0 liters or less, then repeat above procedures (6 to 10) for collecting GSL water and resume pumping water through filter.
19. When filter is clogged remove tubing from filter holder and attach to discharge end of filter holder.

20. Reverse flow of peristaltic pump and pump residual fluid from filter holder.
21. Remove tubing from filter holder.
22. Loosen swing-away-bolts on filter holder then remove upper filter housing.
23. Using pre-cleaned tweezers, fold filter with seston contents inward, then remove from filter holder and place in pre-labeled Whirl-pak® bag.
24. Secure Whirl-pak® bag.
25. Record total volume of GSL water filtered on Whirl-pak® bag and in field notebook.
26. Pump 1 liter of distilled water through tubing and discard water.
27. Rinse 3x filter holder, sieve, beaker, graduated cylinder, and tubing with distilled water.
28. Place Whirl-pak® bag into ice chest and cover with ice.
29. Transport Whirl-pak® bags and filters on ice and then place in freezer immediately upon return to laboratory.
30. Ship Whirl-pak® bags and filters frozen to laboratory for analysis.