GREAT SHIPS INITIATIVE

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STANDARD OPERATING PROCEDURE:
Procedure for Labeling Bench-Scale Samples

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BACKGROUND

The Great Ships Initiative (GSI) is a collaborative effort to end the problem of ship-mediated invasive species in the Great Lakes-St. Lawrence Seaway System through independent research and demonstration of environmental technology, financial incentives and consistent basin-wide harbor monitoring. To that end, the GSI has established a shore-based high-flow Research, Development and Technology Evaluation (RDTE) facility in Superior, Wisconsin to provide intensive testing services to vendors of ballast treatment prospects suitable to Seaway-sized vessels. The RDTE facility includes two pairs of 200 m^3 control and treatment water storage tanks and a mobile field laboratory, and is equipped for collecting zooplankton, phytoplankton (algae/small protozoa) and microbial samples. Treatment/control intake and post-retention treatment/control discharge water are sampled at designated in-line sample points. At each sample point (SP) there are three sample ports with a center-located 3.8 cm internal diameter (ID) elbow-shaped pitot tube connected to a 3.8 cm ID PVC transfer pipe carrying the sample water to one of six collection tubs, located at a centralized sampling station. Intake sampling uses two sample ports at the paired intake sample points on the control (SP2) and treatment (SP3) tracks for concurrent sample water collection. Discharge sampling uses three ports at the discharge sampling point (SP9), with sequential sampling of control and treatment water. The mobile field laboratory, housed at the facility, provides on-site bench-scale capabilities to support these shore-based tests.

EQUIPMENT LIST

- Self Adhesive Labels
- Computer
- Printer
- Labeling Tape
- Waterproof Markers

PROCEDURE

All samples will be labeled in a clear and precise way for proper identification in the laboratory. A test ID will be assigned for each test being run. Unique sample codes will be assigned for each sample and these codes will be used for the sample containers, data sheets, log books, and data entries.

Sample Codes

1. Bench-scale Test ID Codes will include the following information.

(a) Two or three letter code for the treatment system being tested. (SK=Seakleen)

(b) Trial Number -Assigned sequentially from 1 to n. Ideally each test will be run once, but in the event a test must be run again, or have several trials, a new trial number will be given.

(c) A one or two letter code for **Test Type** (DG=Degradation, EF=Dose-effectiveness, RT=Residual Toxicity)

(d) A two letter **Species Code** for organism, if testing dose-effectiveness or toxicity (HA=Hyalella azteca, SE=Selanastrum, CD=Ceriodaphnia dubia, etc.)

Examples of Test ID Codes:

SK 1 EF HA
(a) (b) (c) (d)

SK 2 DG SE
(a) (b) (c) (d)

2. Bench-scale Sample ID codes will include the following information:

(a) A one or two letter code for **Water Type**- (L=Lab, S=Salt, H= Duluth/Superior Harbor water, FH = Filtered Duluth/Superior Harbor water)

(b) LT or DK – for light or dark, depending on where the samples are placed

(c) The temperature (ºC) at which testing occurs – (15=15 ºC**)**

(d) The concentration of treatment in mg/L-(10=10mg/L) Control sample concentration will be zero.

(e) Replicate number – assigned sequentially from 1 to n. (1, 2, or 3 if three replicates are used).

Examples of Sample ID Codes:

L LT 15 10 1
(a) (b) (c) (d) (e)

S DK 25 100 1
(a) (b) (c) (d) (e)

3. Once the sample is ready for analysis, portions of the sample may need to be analyzed for different endpoints (hardness alkalinity, microbial analyses, etc.) or samples may be split and analyzed in duplicate. An analysis ID portion will be added to the sample ID above in order to identify samples throughout the analysis process.

(a) For **duplicate analysis** in the laboratory, LDUP is added to the end of the sample ID

(b) A code for the **Type of analysis** being done is added to the end of core sample ID. (HPLC or for Microbial Analysis: HPC=heterotrophic plate count, ECO= E. coli, ENT=Enterococcus enumeration, For water quality parameters, HAR=hardness, ALK= Alkalinity, etc.)

(c) If sample is filtered or diluted, **the volume or concentration** used is added to the Sample ID after the type of analysis. (10mL, $10^{-1)}$
(d) If pseudoreplicates, or several subsamples are being analyzed (For example: the same volume filtered twice or three plates for one dilution) the **pseuodreplicate number** follows the volume or concentration.
(e) Spiked samples are labeled with the sample ID followed by the analysis ID and **SPK** in the corresponding portion of the sample ID.

4. Coinciding blank samples are labeled as BLK followed by the replicate number assigned sequentially from 1 to n.

5. Coinciding Standards are labeled STD followed by the Concentration and replicate number assigned sequentially from 1 to n. (STD 10 1=standard with concentration of 10mg/L –replicate one.)

Sample Labels

1. Sample labels will be prepared and placed on sample containers prior to test initiation.

2. Label will be created by hand using labeling tape and a waterproof marker, or computer printed on self adhesive labels. If printed labels are used, a piece of sealing tape will be placed over the label to secure it to the sample container and prevent water from reaching the label.

3. Sample Labels will include the Test ID code, the sample ID code, and the **test start date** in the following format: Month-Day-Year.

Test ID: **SK 1 EF HA**
Sample ID: **L LT 15 10 1**
Start Date: **06-17-08**

Seakleen trial one dose effectiveness test with *Hyallela azteca*. This sample was in lab water, in the light, at 15ºC, with a concentration of Seakleen at 10mg/L. This is replicate one. The test was initiated on June 17, 2008.

4. Labels made for the analysis process will contain the test ID, sample ID, analysis ID and analysis date. For ease of keeping the samples organized, the analysis ID is printed on a second line on the label and may be color coded if desired.

Test ID: **SK 1 EF HA**
Sample ID: **L LT 15 10 1**
Analysis ID: **ECO_10mL_1** Analysis Date: **06-18-08**

Data Sheets

1. Test, sample and analysis information will be entered on all field and laboratory data sheets using the codes assigned above.

QUALITY ASSURANCE/QUALITY CONTROL

1. Label information will be checked independently by a second individual to ensure that the same codes are not used for more than one individual sample.

REFERENCES

Cangelosi, A.A. 2006. RDTE Facility for the Great Ships Initiative (GSI) (OAR-SG-2006-20000364). Project Proposal to the National Oceanic and Atmospheric Administration/U.S. Fish and Wildlife Service.

Great Ships Initiative website: www.greatshipsinitiative.org; Standard Operating Protocols/Procedures: http://www.nemw.org/GSI/protocols.htm.