AGP Lab Blank Analysis and Blank Data Review

1. SCOPE AND APPLICATION

    1.1. This method was developed by laboratory management as part of the quality assurance protocol for Algal Growth Potential (AGP) testing. It is applicable to both freshwater and saltwater AGP tests.

2. SUMMARY OF METHOD

    2.1. Procedure for analyzing laboratory method blanks to monitor contamination of a typical sample. Types of contaminations include nutrients carried over in the inoculum, unwanted materials in DI rinse water, and foreign particles from improperly cleaned sample bottles. These blanks are not to be treated differently from other samples in terms of preparation, set-up, and counting. This method also describes the review and corrective action for data from lab blanks.

    2.2. Interferences:

        2.2.1. Contaminated glassware

        2.2.2. Airborne particulates including dust and microscopic organisms

3. EQUIPMENT AND SUPPLIES

    3.1. General

        3.1.1. Traceable Bench Conductivity Meter, SN 170814827. Calibrated per SOP TA-06.36

        3.1.2. Fisherbrand Accumet AB315 pH/mV Meter. Calibrated per SOP TA-06.43

        3.1.3. Labeling tape

        3.1.4. 30 mL disposable plastic cup, one per blank

        3.1.5. Calibrated thermometer (located in B246 thermometer drawer) or certified digital thermometer. See SOP TA-06.13 and LB-035.

        3.1.6. *AGP Sample Log-in Record* logbook

    3.2. For freshwater

        3.2.1. AGP sample container

    3.3. For saltwater

        3.3.1. Erlenmeyer flask

        3.3.2. Mettler Toledo MS 403TS/00 Balance, SN B815673069 (Calibrated per SOP TA-06.34)

        3.3.3. Small weigh boat

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3.3.4. Metal spatula

3.3.5. Magnetic stir plate

3.3.6. Magnetic stir bar

3.3.7. Stir bar retriever

3.3.8. AGP sample container

4. REAGENTS AND STANDARDS

4.1.1. For freshwater

4.1.1.1. Deionized (DI) water

4.1.2. For saltwater

4.1.2.1. Autoclaved DI water (autoclaved per SOP BG-08)

4.1.2.2. Crystal Sea® Marine Mix Bioassay Laboratory Grade artificial sea salts

5. METHODS

5.1. Blanks are set up at a rate of 1 blank per run and 1 blank per 20 AGP samples. For example, if there are 21 AGP samples being prepped for the same run then 2 Lab Blanks would need to be prepped as well.

5.2. For freshwater blank

5.2.1. Label a clean AGP bottle as “Lab Blank” using tape.

5.2.2. Fill the bottle with DI water from the sink.

5.2.3. Record “Lab Blank” in the *AGP Sample Log-in Record* under the LIMS # column.

5.2.4. Measure conductivity, salinity, and pH with the appropriate meters. Measure temperature with the certified/calibrated digital thermometer. Record the values in the appropriate columns of the *AGP Sample Log-in Record*.

5.2.4.1. See SOP TA-06.43 for measuring pH and TA-06.36 for measuring conductivity and salinity.

5.2.5. Autoclave and filter the blank.

5.2.5.1. Autoclave and filter per SOP TA-08.01 for samples <1.0 ppth salinity.

5.3. For saltwater blank

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5.3.1. Label a clean 500-mL Erlenmeyer flask using tape. Write “Salt Blank”, date collected and analyst's initials on the label.

5.3.2. Fill the flask at least half full with autoclaved DI water.

5.3.2.1. Not filling the flask completely allows room to add DI water for diluting, if necessary.

5.3.3. Scoop an estimated 3-4 grams of artificial sea salts into a weigh boat using the metal spatula. Use balance for weighing if desired.

5.3.4. Place the flask on the magnetic stirrer. Place the stir bar in the flask and turn the stirrer on.

5.3.5. Add a small amount of artificial sea salts to the flask using the metal spatula and wait until the salts are dissolved.

5.3.6. Measure the salinity. (See SOP TA-06.36 for measuring salinity)

5.3.6.1. If the salinity is less than 6.5 ppth (parts per thousand), repeat STEP 5.2.5. above until the salinity measures 7 $\pm$ 0.5 ppth.

5.3.6.2. If the salinity of 7.5 ppth is exceeded, dilute with autoclaved DI water until the salinity is within the range of 7 $\pm$ 0.5 ppth. Repeat salinity measurement as needed.

5.3.7. Remove the flask from the stirrer and turn the stirrer off. Use the stir bar retriever to remove the stir bar from the flask.

5.3.8. Record “Salt Blank” in the *AGP Sample Log-in Record* under the LIMS # column.

5.3.9. Measure conductivity, salinity, and pH with the appropriate meters. Measure temperature with the certified/calibrated digital thermometer. Record the values in the appropriate columns of the *AGP Sample Log-in Record*.

5.3.9.1. See SOP TA-06.43 for measuring pH and SOP TA-06.36 for measuring conductivity. Record the final salinity as measured in Step 5.2.6.

5.3.9.2. The comments section for the “Salt Blank” should mention the amount of marine mix salt added to 500 mL of Autoclaved DI water.

5.3.10. Filter the blank.

5.3.10.1. Filter per SOP TA-08.01 using a 0.45 µm filter.

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6. DATA REVIEW

6.1. Select the blank result that will be connected to the run based on SOP TA-08.07, Section 4.15. Also, determine if lab blank results passed or failed based on the MDLs listed in SOP TA-08.07, Section 2.2.

6.1.1. This should be done before each run's printed Excel file is verified in case the data must be qualified.

6.2. If the lab blank's maximum value exceeds the MDL (0.300 for freshwater and 3.00 for saltwater), and the sample results are less than 10 times the blank value, then all samples from that batch should be qualified with a "V" qualifier, which indicates that the analyte was detected in both the blank and the sample.

6.3. If the lab blank's maximum value exceeds the MDL (0.300 for freshwater and 3.00 for saltwater), and the sample results are greater than 10 times the blank value, then a comment should be added that says, "The laboratory blank failed but the result is > 10 times the blank result."

6.4. If multiple blanks in a row exceed the corresponding MDL, analyses should stop while possible causes of contamination and error in method are examined.

7. DATA ARCHIVAL

7.1. Use a black, waterproof pen for all bench sheets and logbooks.

7.2. Record information in *AGP Sample Log-in Record* logbook.

7.3. To correct raw data entries, place a single line through the incorrect or illegible entry, write the corrected entry near the error, date and initial the correction. Do not overwrite entries.

7.3.1. The corrected entry is written as near as possible to the error or in the comment box on the appropriate bench sheet.

7.3.2. If the correction requires an explanation, write a comment and reference the error. Initial and date the explanation. Do not attempt to put all information (correction and comments) into a small space.

7.4. Use sequential alphabetical annotation to identify errors and corresponding comments (use A for first error and use A for corresponding explanatory comment; use B for second error, etc.).

8. QUALITY CONTROL

8.1. Refer to the DEP Laboratory Quality Assurance Manual for corrective action and handling out-of-control data.

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9. SAFETY/HAZARDOUS WASTE MANAGEMENT

9.1. Proper laboratory personal protection, including lab hood or ventilation system, lab coat, gloves, and safety glasses, is required when working with chemicals and unprocessed samples.

9.2. Refer to Laboratory Quality Assurance Manual for sample disposal

9.3. Refer to the Laboratory Health and Safety Manual

10. REFERENCES

10.1. DEP Laboratory Quality Assurance Manual

10.2. DEP Laboratory Health and Safety Manual

10.3. DEP SOP TA-06.13, Thermometer Accuracy Check and Use.

10.4. DEP SOP TA-06.34, Calibration and Use of Mettler Toledo 403TS/00 Balance.

10.5. DEP SOP TA-06.36, Calibration and Use of the Fisherbrand™ Traceable™ Bench Conductivity Meter for Conductivity and Salinity.

10.6. DEP SOP TA-06.43, Calibration and Use of Fisherbrand™ accumet™ AB315 pH/mV Meter.

10.7. DEP SOP TA-08.01, Initial Algal Assay Sample Handling.

10.8. DEP SOP TA-08.07, Data Verification and LIMS Upload for Algal Growth Potential Tests.

10.9. DEP BG-08, STERIS AMSCO Series 250LS Autoclave Calibration and Use

10.10. DEP LB-035, Calibration of Lab Thermometers Using a Constant Temperature Calibration Bath.

APPENDIX OF CHANGES

12/20/2007 Added Scope and Application; Summary of Method, and Appendix of Changes.

01/28/2015 Formatted for 508 compliance.

09/03/2020 Split equipment and reagents sections. Updated data archival section with universal language.

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