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-06.34-1.0)

        3.3.3. Small weigh boat (plastic if available)

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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

4. REAGENTS AND STANDARDS

4.1.1. For freshwater

4.1.1.1. Deionized (DI) water

4.1.1.1.1. Distilled water can be substituted for DI water at the analyst's discretion (ex. problems with DI water system).

4.1.2. For saltwater

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

4.1.2.1.1. Program 3 for large media cycle (121.0, S=0:30).

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

5. METHODS

5.1. Blanks are setup at a rate of 1 blank per run and 1 blank per 20 AGP samples. In example, if there is 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.

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5.3. For saltwater blank

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-06.25 for measuring salinity)

5.3.6.1. If the salinity is less than 6.8 ppth (parts per thousand), repeat STEP 5.2.5. above until the salinity measures 7 ± 0.2 ppth.

5.3.6.2. If the salinity of 7 ± 0.2 ppth is exceeded, dilute with autoclaved DI water. Repeat salinity measurement as needed.

5.3.6.2.1. If dilution is needed, gradually add DI water to the mixture. Swirl to mix, then repeat the salinity measurement.

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), 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 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 QA manual for corrective action and handling out-of-control data.

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 Manual for sample disposal

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9.3. Refer to the Laboratory Health and Safety Manual and Hazardous Waste Management

10. REFERENCES

10.1. DEP Laboratory Quality Manual

10.2. DEP Laboratory Health and Safety Plan

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

10.4. DEP SOP TA-08.02, Algal Growth Potential (AGP) and Limiting Nutrient (LN) Algal Assay Set-Up

10.5. DEP SOP TA-08.07, Algal Growth Potential and Limiting Nutrient Data Verification and LIMS Upload

10.6. DEP SOP TA-08.09, Sample Custody, Logbook Labels and Prep Worksheet Manager for Algal Growth Potential (AGP) Samples

10.7. DEP SOP TA-06.34, Calibration and Use of the Mettler Toledo PB403-TS/00 Balance

10.8. DEP SOP TA-06.43, Calibration and Use of Fisherbrand Accumet AB315 pH/mV Meter

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

10.10. DEP SOP BG-01, Data-Entry Verification

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

10.12. 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.

10/08/2013 Reformatted SOP.

09/11/2014 Changed temperature measurement to digital thermometer.

01/28/2015 Formatted for 508 compliance.

08/17/2015 Updated links. Added instrument Serial Numbers.

09/15/2016 Updated links and references.

09/14/2017 Updated the Control Chart file location in the Data Review section.

09/05/2018 Changed font to Calibri; minor formatting correction; included new meters in Equipment and Supplies section; removed reference to Tox telephone location in

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	Sec 3.1.5; removed reference to Prep Worksheet label from Sec 4.1 and 4.2; clarified Sec 5.1; removed section about AGP results getting V-qualified.
08/02/2019	Updated links
09/03/2020	Split equipment and reagents sections. Updated data archival section with universal language.
07/08/2021	Updated links for current updates. Updated control chart directions based on updated version.
09/07/2022	Updated links, updated pathways, and checked for grammar.
09/07/2023	Updated links. Added general autoclave SOP. Updated tape colors. Added comment notes for “Salt Blank.” Added to SOP section.

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