

NELAC Interpretation of CBOD Quality Control Requirements

The following is the interpretation of quality control requirements for the carbonaceous BOD (CBOD) test by EPA and the National Environmental Laboratory Accreditation Conference (NELAC).

Interpretation / Decision

If a laboratory is conducting the analysis for CBOD following method 5210B found in the 20th Edition of Standard Methods, then the analyst may over-seed the Glucose-Glutamic Acid (GGA) standard as allowed by the method, but the results must be within the range 198 ± 30.5 mg/l to be considered acceptable. The laboratory may either meet the above criterion as the acceptance range for GGA recovery, or has the option of developing its own acceptance criteria for GGA recovery under the conditions described below:

- 1) The dissolved oxygen uptake from the seed contribution should be between 0.6 - 1.0 mg/l.*
- 2) In establishing in-house GGA control acceptance limits, the laboratory must use accepted statistical treatments of in-house data for no less than 25 GGA checks over a period of weeks or months (Standard Methods 5210B 6.a.).*
- 3) The control limits established by the laboratory must be set at three standard deviations from the derived mean. The relative standard deviation (RSD) must not exceed 7.5%. If the laboratory's calculated acceptance range exceeds 7.5% RSD, the laboratory must default to 7.5% RSD as its control limit range.*
- 4) Any single GGA value determined by the laboratory cannot be less than 150 mg/l.*

Clarification Comments

The 18th, 19th and 20th Editions of Standard Methods all allow for the laboratory to establish their own limits for BOD and CBOD, but only the 20th Edition addresses the quality control criteria for GGA in CBOD in Section 6 of method 5210B.

The laboratory must treat both the GGA standard and all related samples (including QC samples such as seed blanks and PT samples) in the same way. Evaluation of the various components under CBOD is a check on the inhibitor capacity and its effectiveness. The following terms are defined to help clarify the various components and requirements of the cBOD analysis.

- *CBOD Seed Blank* - bottle containing the same amount of seed that is added to the buffered dilution water for each sample plus the nitrification inhibitor.
- *CBOD Seed Controls* - bottle containing larger amounts of seed added to the buffer dilution water plus the nitrification inhibitor, which gives at least 2.0 mg/l depletion.
- *CBOD Seed Contribution* - the calculated amount of depletion from the *CBOD Seed Control* that has been rationed back to the amount of seed added to each sample.