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NATIONAL WATER QUALITY LABORATORY TECHNICAL MEMORANDUM 2001.02

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To: Distribution E

From: Gregory B. Mohrman, Chief
National Water Quality Laboratory

Subject: Recalculation of bromide concentration (lab code 1246)

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Revision: None

PURPOSE

The National Water Quality Laboratory (NWQL) will change the calculation used to determine bromide concentration, Lab Code 1246 (Test ID 71870E), for samples logged in after March 31, 2001 (Julian Date 90). The calculation historically used to determine bromide concentration overcorrected for iodide interference, resulting in bromide values that were lower than expected for some samples. (NOTE: Bromide results for Lab Code 1258 are unaffected.)

BACKGROUND

Bromide and iodide are analyzed using colorimetric flow analysis on filtered-untreated (FU) samples. The instrument splits the sample stream, with one part analyzed for bromide and the other part analyzed for iodide. Iodide is a positive interference in the bromide analysis.

Historically, bromide concentration has been calculated as directed by Fishman and Friedman (1989, p. 123) as follows: "Br -1 (mg/L) = mg/L apparent concentration - mg/L iodide concentration". The same reference (p. 121) states "Iodide interferes quantitatively, but in most waters the iodide concentration is negligible."

DISCUSSION

The correct amount of interference caused by iodide is not a simple subtraction of either the measured milligrams or millimoles per liter of iodide. The NWQL investigated and quantified the actual interference that iodide presents in the determination of bromide. Concentrations of several mixes of bromide and iodide were measured multiple times and the correct factor determined.

Data collected between 1/1/98 and 7/15/00 for samples with requests for both bromide and iodide determination were recalculated. Bromide concentration in the majority of the samples did not change. Most large changes in bromide concentration were found in samples collected from a few district sites (California, Maryland, Texas), and these districts have been contacted individually.

EFFECT ON DATA BASE

Iodide concentration must be relatively high compared to the bromide concentration to cause significant change in the previously reported bromide data. Bromide data for samples logged in before April 1, 2001, may be corrected by the user if the bromide and iodide concentrations are known. To correct existing bromide data, use the following equation:

Corrected Bromide result (mg/L) = original Bromide result (mg/L) + 0.6[original Iodide result (mg/L)]

Concern arises if the customer did not request an iodide analysis. The NWQL always analyzes samples for both constituents when either is requested, and can check for the presence of a relatively high concentration of iodide. If you did not request iodide analysis and wish to correct your bromide data, send e-mail to the labhelp@usgs.gov with lab ID or Station ID, date and time for any site in question. The NWQL will charge to look up data for analysis done prior to 1/1/98 as per NWQL Policy Memorandum 99.03. It is the responsibility of district personnel to update results in their local National Water Information System (NWIS) data base based on the knowledge of individual sites. The NWQL will not update results in its data base, unless specifically requested by the District Office.

REFERENCE

Fishman, M. J., and Friedman, L.C., eds., 1989, Methods for determination of inorganic substances in water and fluvial sediments: U.S. Geological Survey Techniques of Water-Resources Investigations, book 5, chapter A1, p. 121 and 123.

Key words: Bromide, Iodide, Interference, Colorimetric analysis.