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United States Department of the Interior

U.S. GEOLOGICAL SURVEY

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NATIONAL WATER QUALITY LABORATORY TECHNICAL MEMORANDUM 1998.12

September 29, 1998

Subject: Graphite Furnace Atomic Absorption Spectrophotometry (GFAAS) to replace Hydride Generation Atomic Absorption Spectrophotometry (HGAAS) for the Determination of Antimony in Filtered and Whole Water Recoverable Water Samples

**Effective Date
of Change:** October 1, 1998

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Revision: None

PURPOSE

The National Water Quality Laboratory (NWQL) has been determining antimony (dissolved I-2055, whole-water-recoverable I-4055) using the automated-hydride generation atomic absorption (HGAAS) spectrophotometric methods since the mid-1970's. A widely used alternative technique, graphite furnace atomic absorption spectrophotometry (GFAAS), is now available and provides a more efficient and reliable method than the hydride AAS, and chemical waste is minimized.

SCOPE

Effective October 1, 1998, the NWQL will replace the hydride generation method for the determination of filtered and whole water recoverable (WWR) antimony in water samples with EPA method 200.9, a GFAAS method. All samples logged in after October 1, 1998, for the analysis of filtered and WWR antimony will be analyzed by the GFAAS method documented in U.S. Environmental Protection Agency (1994). The GFAAS method detection limit is 0.8 microgram per liter ($\mu\text{g/L}$); the HGAAS method detection limit is 1.0 $\mu\text{g/L}$. The method reporting level will be 1 $\mu\text{g/L}$, identical to the HGAAS method for water samples.

The lab codes for dissolved and WWR antimony determinations by HGAAS will no longer be valid. The hydride lab codes will be replaced by the new lab codes listed in the following table.

	Antimony	
	Hydride	GFAA
	Labcode	Labcode
Filtered	77	2318
WWR	80	2338

To request an antimony analysis by GFAAS, a customer may simply request the appropriate lab code on the Analytical Services Request (ASR) form. The NWQL will update all existing schedules that include HGAAS methods for antimony with the new lab codes and prices using GFAAS. Pricing information is available in the NWQL catalog.

Filtered antimony will still require the filtered-acidified (FA) sample type, and WWR antimony will require the unfiltered-acidified sample type, labeled as ERA. (More specific information about EPA method bottle types and requirements are in NWQL Technical Memorandum 97.05). If the sample is not specifically for drinking-water analysis, do not affix the fluorescent orange sticker to the bottle cap, and do not check the "drinking-water" box on the ASR form.

Laboratory comparison data between the hydride method and EPA 200.9 show that bias and variability are equivalent to or better than the existing hydride method. No change in data quality is expected from the method changes. The NWQL expects decreased turnaround time for the analysis, substantial improvements in laboratory efficiency, and large decrease in waste disposal costs.

CITED REFERENCE

U.S. Environmental Protection Agency, 1994, Methods for the determination of inorganic substances in environmental samples: Method 200.9, revision 2.2.

Effect on Data Base: None

/signed/
 Robert S. Williams, Jr., Chief
 National Water Quality Laboratory
 Branch of Analytical Services

Supersedes: None

Key Words: Antimony, Graphite Furnace Atomic Absorption Spectrophotometry, Hydride Generation Atomic Absorption Spectrophotometry, EPA 200.9

Distribution: E and <http://www.nwql.cr.usgs.gov/USGS>