Analysis of Mercury in Stream Water Samples Collected September 9, 1999 from the Bayou Creek System

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On September 9, 1999, water samples from Big Bayou Creek (BB), Little Bayou Creek (LB), and Massac Creek (MC) were collected. These included 22 samples from Big Bayou Creek, 8 samples from Little Bayou Creek, and 2 samples from Massac Creek. BB1, BB1A, LB1, and MC were reference sites.

Methods

Water samples for mercury analysis were preserved with approximately 1 mL trace metal grade nitric acid for each 250 mL bottle. 100 mL of each sample were added to each BOD bottle. 2.5 mL trace metal grade nitric acid and 5 mL trace metal grade sulfuric acid were added to each bottle. 15.0 mL 5% potassium permanganate solution ("Baker Analyzed" Reagent) and 8 mL 10% potassium persulfate solution ("Baker Analyzed" Reagent) were added to each bottle. Bottles were heated at 95° C for two hours. After allowing the bottles to cool, 6mL hydroxylamine hydrochloride, 12% solution ("Baker Analyzed" Reagent), was added to each bottle to neutralize the potassium permanganate. Treating each bottle individually, 5 mL 10% stannous chloride solution ("Baker Analyzed" Reagent) was added to each bottle and the mercury analysis aerator was immediately put in place.

Metal analyses

Analyses of the sediment samples were performed by cold vapor atomic absorption spectrophotometry (CVAAS) using a Coleman MAS-50B Mercury Analyzer System. Calibration curves were based on three standards (1.0 µg/L - 4.0 µg/L). Check standards and reagent blanks were run as well.

Quality Assurance

Copies of all chain of custody forms and permanent records are maintained in active files and are available for review by FFOU or the Cabinet for Natural Resources. All glass ware was acid cleaned. Quality assurance for mercury assays included blanks and check standards. (U.S. EPA 1994)

Results

The results of individual assays for Hg in stream water for all 32 samples are given in Table 1. Values for all of the samples, including those from Massac Creek, were below the detection limit of 1.0 µg/L (1.0 ppb), except for sample LB3 replicate 1. That sample was lost through operator error.

Reference

U.S. EPA. 1994. Determination of mercury in water by cold vapor atomic absorption spectrophotometry, Method 245.1, Revision 3. Office of Research and Development Cincinnati, OH.

Table 1: Mercury in water samples collected September 9, 1999

Samples	µgHg/L
BB1 replicate 1	Below Detection Limit
BB1 replicate 2	Below Detection Limit
BB1A replicate 1	Below Detection Limit
BB1A replicate 2	Below Detection Limit
BB2 replicate 1	Below Detection Limit
BB2 replicate 2	Below Detection Limit
BB2A replicate 1	Below Detection Limit
BB2A replicate 2	Below Detection Limit
BB3 replicate 1	Below Detection Limit
BB3 replicate 2	Below Detection Limit
BB4 replicate 1	Below Detection Limit
BB4 replicate 2	Below Detection Limit
BB5 replicate 1	Below Detection Limit
BB5 replicate 2	Below Detection Limit
BB6 replicate 1	Below Detection Limit
BB6 replicate 2	Below Detection Limit
BB7 replicate 1	Below Detection Limit
BB7 replicate 2	Below Detection Limit
BB8 replicate 1	Below Detection Limit
BB8 replicate 2	Below Detection Limit
BB9 replicate 1	Below Detection Limit
BB9 replicate 2	Below Detection Limit
LB2 replicate 1	Below Detection Limit
LB2 replicate 2	Below Detection Limit
LB2A replicate 1	Below Detection Limit
LB2A replicate 2	Below Detection Limit
LB3 replicate 1	Failed, Operator Error
LB3 replicate 2	Below Detection Limit
LB4 replicate 1	Below Detection Limit
LB4 replicate 2	Below Detection Limit
MC replicate 1	Below Detection Limit
MC replicate 2	Below Detection Limit

Detection Limit = 1.0 ug Hg/L (1.0 ppb)