METHOD #: 236.1	Approved for NPDES (Editorial Revision 1974, 1978)
TITLE:	Iron (AA, Direct Aspiration)
ANALYTE:	CAS # Fe Iron 7439-89-6
INSTRUMENTATION:	AA
STORET No.	Total 01045 Dissolved 01046 Suspended 01044
Optimum Concentration Range:	0.3-5 mg/L using a wavelength of 248.3 nm
Sensitivity:	0.12 mg/L
Detection Limit:	0.03 mg/L

1.0 Preparation of Standard Solution

1.1 Stock Solution: Carefully weigh 1.000 g of pure iron wire (analytical reagent grade) and dissolve in 5 mL redistilled HNO_3, warming if necessary. When solution is complete make up to 1 liter with deionized distilled water. 1 mL = 1 mg Fe (1000 mg/L).

1.2 Prepare dilutions of the stock solution to be used as calibration standards at the time of analysis. The calibration standards should be prepared using the same type of acid and at the same concentration as will result in the sample to be analyzed either directly or after processing.

2.0 Sample Preservation

2.1 For sample handling and preservation, see part 4.1 of the Atomic Absorption Methods section of this manual.

3.0 Sample Preparation

3.1 The procedures for preparation of the sample as given in parts 4.1.1 thru 4.1.4 of the Atomic Absorption Methods section of this manual have been found to be satisfactory.

4.0 Instrumental Parameters (General)

4.1 Iron hollow cathode lamp
4.2 Wavelength: 248.3 nm
4.3 Fuel: Acetylene
4.4 Oxidant: Air
4.5 Type of flame: Oxidizing

5.0 Analysis Procedure

5.1 For analysis procedure and calculation, see "Direct Aspiration", part 9.1 of the Atomic Absorption Methods section of this manual.

6.0 Notes

6.1 The following lines may also be used:
248.8 nm Relative Sensitivity 2
271.9 nm Relative Sensitivity 4
302.1 nm Relative Sensitivity 5
252.7 nm Relative Sensitivity 6
372.0 nm Relative Sensitivity 10

6.2 Data to be reported into STORET must be reported as μg/L.

6.3 The 1,10-phenanthroline colorimetric method may also be used (Standard Methods, 14th Edition, p. 208).

6.4 For concentrations of iron below 0.05 mg/L, either the Special Extraction Procedure given in part 9.2 of the Atomic Absorption Methods section or the furnace procedure, Method 236.2, is recommended.

7.0 Precision and Accuracy

7.1 An interlaboratory study on trace metal analyses by atomic absorption was conducted by the Quality Assurance and Laboratory Evaluation Branch of EMSL. Six synthetic concentrates containing varying levels of aluminum, cadmium, chromium, copper, iron, manganese, lead and zinc were added to natural water samples. The statistical results for iron were as follows:

Number of Labs	True Values μg/Liter	Mean Value μg/Liter	Standard Deviation μg/Liter	Accuracy as % Bias
82	840	855	173	.8
85	700	680	178	-2.8
78	350	348	131	-0.5
79	438	435	183	-0.7
57	24	58	69	141
54	10	48	69	382