

**Results of the U.S. Geological Survey's Analytical
Evaluation Program for Standard Reference Samples
Distributed in September 2001**

By Mark T. Woodworth and Brooke F. Connor

U.S. GEOLOGICAL SURVEY

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Definition of analytical methods, abbreviations, and symbols

Abbreviations and figure symbols

C = Celsius
Fσ = F-pseudosigma - nonparametric statistic for deviation
HCl = hydrochloric acid
Hg - = mercury sample
HNO ₃ = nitric acid
Lh = lower hinge value
L = liter
Lab = laboratory
mg/L = milligrams per liter
mL = milliliter
M - = major ion sample
MPV = most probable value (center line on graphs)
n = number of analyses
N = Normality
N - = nutrient sample
NR = not rated, less than values reported or insufficient data
OLR = overall laboratory rating for each sample type
OWR = overall weighted rating for all sample types
P - = precipitation sample (low ionic-strength, typically <50 μS/cm)
ppm = parts per million
SRS = USGS standard reference sample
T - = trace metal sample
Uh = upper hinge value
USGS = United States Geological Survey
V = number of rated analyses
Z-value = number of F-pseudosigmas from the MPV
μg/L = micrograms per liter
μm = micrometer
μS/cm = microsiemens per centimeter at 25° Celsius
< = less than
-- = not reported

Analytical methods and codes

Code	Method
0	Other
1	Atomic absorption: direct, air
2	Atomic absorption: direct, nitrous oxide
3	Atomic absorption: graphite furnace
4	Inductively coupled plasma
5	Direct current plasma
6	Inductively coupled plasma/mass spectrometry
7	Ion chromatography
8	Atomic absorption: cold vapor
9	Atomic fluorescence
10	Atomic absorption: extraction
11	Atomic absorption: hydride
12	Flame emission
20	Titration: colorimetric
21	Titration: electrometric
22	Colorimetric
40	Ion selective electrode
41	Electrometric [pH and specific conductance]
50	Gravimetric
51	Turbidimetric

Formulas

MPV = median value (excluding less than values)	
F-pseudosigma ($F\sigma$) = $(U_h - L_h)/1.349$	
U_h = median of the upper half of the reported values (excluding less than values)	
L_h = median of the lower half of the reported values (excluding less than values)	
Z-value = $(\text{reported value} - \text{MPV})/F\text{-pseudosigma}$	
OLR = mean of all rated analytes for sample type	
$\text{OWR} = \frac{(\text{OLR} \cdot V_1) + (\text{OLR} \cdot V_2) \dots (\text{OLR} \cdot V_n)}{(V_1 + V_2 + \dots V_n)}$	for each SRS type

Ratings

Rating	Absolute Z-value
4 (Excellent)	0.00 to 0.50
3 (Good)	0.51 to 1.00
2 (Satisfactory)	1.01 to 1.50
1 (Marginal)	1.51 to 2.00
0 (Unsatisfactory)	Greater than 2.00

RESULTS OF THE U.S. GEOLOGICAL SURVEY'S ANALYTICAL EVALUATION PROGRAM FOR STANDARD REFERENCE SAMPLES DISTRIBUTED IN SEPTEMBER 2001

By Mark T. Woodworth and Brooke F. Connor

ABSTRACT

This report presents the results of the U.S. Geological Survey's analytical evaluation program for six standard reference samples -- T-167 (trace constituents), M-160 (major constituents), N-71 (nutrient constituents), N-72 (nutrient constituents), P-37 (low ionic-strength constituents), and Hg-33 (mercury) -- that were distributed in September 2001 to laboratories enrolled in the U.S. Geological Survey sponsored interlaboratory testing program. Analytical data received from 98 laboratories were evaluated with respect to overall laboratory performance and relative laboratory performance for each analyte in the six reference samples. Results of these evaluations are presented in tabular form. Also presented are tables and graphs summarizing the analytical data provided by each laboratory for each analyte in the six standard reference samples. The most probable value for each analyte was determined using nonparametric statistics.

INTRODUCTION

The U.S. Geological Survey (USGS) conducts an interlaboratory analytical evaluation program semiannually. This program provides a variety of standard reference samples (SRSs) to accomplish quality assurance testing of laboratories and to provide an adequate supply of samples that contribute to quality control programs of participating laboratories. Natural-matrix reference materials are preferred for use in this interlaboratory evaluation program. A series of samples are prepared and distributed each spring and fall. The program began in 1962 with a single sample containing major constituents that was prepared from distilled water and reagent-grade chemicals. Twenty-three USGS laboratories participated in the first analytical evaluation program. Since that time, objectives of the program have been to:

- (1) evaluate and improve the performance of USGS and other participating laboratories;
- (2) provide a library of carefully prepared, homogeneous, stable, reference materials for use in the quality control programs of laboratories;
- (3) identify analytical problem areas;
- (4) identify quality assurance needs with respect to environmental analyses and develop new reference materials to meet these needs; and
- (5) evaluate the accuracy and precision of analytical methods.

A total of 270 USGS and non-USGS laboratories are enrolled in the program, which can currently provide 5 different types of SRSs:

1. Trace constituents.
2. Major constituents.
3. Nutrient constituents.
4. Low ionic-strength constituents.
5. Mercury.

Though this is not a laboratory certification program, participation in this continuing quality assurance program is mandatory for all laboratories providing water-quality data for USGS sponsored reports or storage in the USGS national databases. The results from this study can be used to alert participating laboratories of possible deficiencies in their analytical operations and provide reference materials for laboratory quality-control programs. Laboratories that provide data for the USGS are identified while all other laboratories are kept confidential with a laboratory identification number.

A supply of SRSs from previous evaluations, is available. USGS offices and participating laboratories can purchase these SRSs for further testing, continuing quality assurance, and quality-control programs by contacting:

U.S. Geological Survey
Branch of Quality Systems
SRS Purchasing
Denver Federal Center, Bldg. 53
P. O. Box 25046, MS 401
Denver, Colorado 80225-0046
(303) 236-1875

This report summarizes the analytical results submitted by 98 laboratories for the September 2001 evaluation (table 1 and table 2). Analytical results for the following are presented in this report:

T-167	Trace constituents	N-72	Nutrient constituents
M-160	Major constituents	P-37	Low ionic-strength constituents
N-71	Nutrient constituents	Hg-33	Mercury

Laboratories that are providing analytical services to USGS offices are requested to analyze the appropriate SRSs for the same analytes requested by the USGS offices. All laboratories are requested to include the analytical methods used to determine the concentration of each analyte. When analytical method information was provided, it has been included in tables 11-16.

Not all SRSs are requested or necessarily analyzed by all the laboratories; nor do all laboratories enrolled in the program participate in each evaluation.

Table 1. USGS used laboratories that participated in the analyses of standard reference samples distributed in September 2001

Lab	Participating Laboratory	City	State
1	U.S. Geological Survey - National Water Quality Laboratory	Denver	CO
4	U.S. Geological Survey - Utah District Laboratory	West Valley City	UT
12	Metro Wastewater Reclamation District	Denver	CO
16	Oklahoma Department of Environmental Quality	Oklahoma City	OK
21	University of California - Department of Environmental Science & Policy	Davis	CA
23	City of Fort Collins - Water Quality Laboratory	Ft. Collins	CO
25	Kentucky Geological Survey	Lexington	KY
33	U.S. Geological Survey - Georgia District Laboratory	Atlanta	GA
46	Wisconsin State Laboratory of Hygiene	Madison	WI
59	Division of Consolidated Laboratory Services	Richmond	VA
70	University of Iowa Hygienic Laboratory	Des Moines	IA
72	New Jersey Department of Health Laboratory	Trenton	NJ
89	Monroe County Environmental Health Laboratory	Rochester	NY
91	Georgia Department of Natural Resources	Atlanta	GA
93	University of Maine	Orono	ME
102	Heidelberg College	Tiffin	OH
109	North Dakota State Water Commission Laboratory	Bismarck	ND
110	U.S. Geological Survey - New York District Laboratory	Troy	NY
118	Virginia Tech - Occoquan Monitoring Laboratory	Manassas	VA
142	North Dakota Department of Health	Bismarck	ND
147	U.S. Geological Survey - Surface Water Quality Research	Boulder	CO
180	Clean Water Services (formally Unified Sewerage Agency)	Hillsboro	OR
193	Vermont Department of Environmental Conservation Laboratory	Waterbury	VT
198	Maryland Department of Health and Mental Hygiene	Baltimore	MD
205	Olsen Agriculture Laboratory	McCook	NE
208	U.S. Geological Survey - WRD San Diego	San Diego	CA
212	Severn Trent Laboratory	Arvada	CO
224	University of Arkansas - Water Quality Laboratory	Fayetteville	AR
234	City of Wichita Laboratory	Wichita	KS
254	U.S. Geological Survey - NRP	Menlo Park	CA
255	Colorado Springs Utilities - Water Resource Department	Colorado Springs	CO
298	Wisconsin District Mercury Laboratory	Middleton	WI
315	Wisconsin WEBB Laboratory	Middleton	WI
319	Fairfax County Environmental Services	Lorton	VA
330	Kennecott Environmental Laboratory	Magna	UT
332	U.S. Geological Survey - Bullen WEBB Laboratory	Middleton	WI
333	U.S. Geological Survey - WEBB Colorado District Office	Lakewood	CO
334	Acculabs Inc.	Golden	CO
341	Michigan Department of Environmental Quality	Lansing	MI
356	Manchester Environmental Laboratory	Port Orchard	WA
366	TriMatrix Labs	Grand Rapids	MI
370	Guardian Systems, Inc.	Leeds	AL
372	Alabama Power Company	Calera	AL
373	City of Tulsa - Quality Assurance Laboratory	Tulsa	OK

Table 2. Other laboratory participants in the analyses of standard reference samples distributed in September 2001

Participating Laboratory	City	State
Alaska Department of Fish and Game	Soldotna	AK
Albion Environmental	College Station	TX
Aqua Tech Environmental Laboratory	Marion	OH
Armstrong Forensic Laboratory	Arlington	TX
California Department of Water Resources - Bryte Laboratory	West Sacramento	CA
City of Albuquerque - Water Quality Laboratory	Albuquerque	NM
City of Pueblo - Wastewater Treatment Plant	Pueblo	CO
City of Tallahassee - Water Quality Laboratory	Tallahassee	FL
Columbia Analytical Services	Rochester	NY
DB Environmental Laboratory	Rockledge	FL
Denver Water Department	Denver	CO
Desert Research Institute	Reno	NV
District of Columbia Department of Health	Ft Meade	MD
Florida Department of Environmental Protection	Tallahassee	FL
Frontier Geosciences Inc.	Seattle	WA
High Sierra Water Laboratory	Truckee	CA
Institute of Ecosystem Studies	Millbrook	NY
Kansas Geological Survey	Lawrence	KS
Lower Colorado River Authority - Environmental Laboratory Services	Austin	TX
Madison Public Health Laboratory	Madison	WI
Mecklenburg County - Department of Environmental Protection	Charlotte	NC
Montana Bureau of Mines & Geology	Butte	MT
New Hampshire Department of Environmental Services	Concord	NH
Northern Colorado Water Conservation District	Loveland	CO
Old Dominion University - Applied Marine Research Laboratory	Norfolk	VA
Ouachita Baptist University - Department of Biology	Arkadelphia	AR
Rensselaer Polytechnic Institue	Troy	NY
Severn Trent Savannah Laboratory	Tallahassee	FL
South Dakota State University - Northern Great Plains Water Research	Brookings	SD
South Florida Water Management District	West Palm Beach	FL
Southwest Florida Water Management District	Brooksville	FL
Suffolk County Water Authority	Hauppauge	NY
U.S. Bureau of Reclamation	Denver	CO
U.S. Bureau of Reclamation	Boise	ID
U.S. Department of Agriculture - Cooperative Chemical Analytical Lab	Corvallis	OR
U.S. Department of Agriculture - Forest Service	Ft. Collins	CO
University of Georgia - Soil, Plant, & Water Laboratory	Athens	GA
University of Hawaii - Department of Oceanography	Honolulu	HI
University of Maryland - Chesapeake Biological Laboratory	Solomons	MD
University of Maryland - Horn Point Laboratory	Cambridge	MD
University of Tennessee - Department of Civil & Environmental Engineering	Knoxville	TN
West Coast Analytical Services	Santa Fe Springs	CA
Wyoming Department of Agriculture	Laramie	WY

Table 2. Other laboratory participants in the analyses of standard reference samples distributed in September 2001 -- continued

Middle East Participating Laboratory	Location	
College of Science and Technology	Jerusalem	Israel
Geological Survey of Israel Laboratory	Jerusalem	Israel
Mekorot Laboratory	Eylat	Israel
Mekorot Laboratory	Ashqelon	Israel
Mekorot Laboratory, Rosh-Haayn Laboratory	Ramla	Israel
Mekorot Water Co. Ltd. - Central Lab	Nazaret Illit	Israel
Ministry of Agriculture		Israel
Public Health Laboratory	Tel Aviv	Israel
Public Health Laboratory - Ministry of Health	Beer Sheva	Israel
Public Health Laboratory - Sabha Medical Clinic	Gaza	via West Bank
Water Authority of Jordan	Amman	Jordan

PREPARATION OF STANDARD REFERENCE SAMPLES

All of the SRSs used in this evaluation were prepared by USGS personnel located in Lakewood, Colorado, and were analyzed for analyte concentrations and physical property values before mailing. A supply of these SRSs is maintained and are available to purchase by participating laboratories and USGS offices for use in their quality-control programs.

Trace constituents sample T-167 was prepared using water collected from South St. Vrain Creek near Lyons, Colorado. The water was pumped through a 0.2- and 0.1-micrometer (μm) filter into a 1325-liter (L) polypropylene drum. The water was continuously circulated and passed through a 0.1- μm filter and ultraviolet sterilizer for 24 hours. The water was then acidified to a $\text{pH} < 2$ with nitric acid (HNO_3) and chlorinated to 5 parts per million (ppm) free chlorine with sodium hypochlorite. The trace constituent concentrations were adjusted by adding reagent grade chemicals. The sample was circulated through a 0.1- μm filter and an ultraviolet sterilizer for an additional 24 hours prior and during bottling. The 500-milliliter (mL) polypropylene bottles and caps were acid leached with 0.16N HNO_3 , deionized-water rinsed, and autoclave sterilized.

Major constituents sample M-160 was prepared using water collected from Chicago Creek near Idaho Springs, Colorado. The water was pumped through a 0.1- μm filter into a 1325-L polypropylene drum. The water was continuously circulated and passed through a 0.1- μm filter and ultraviolet sterilizer for 24 hours. The water was then chlorinated to 5-ppm free chlorine with sodium hypochlorite. The major constituent concentrations were adjusted by adding reagent grade chemicals. The sample was circulated an additional 24 hours, then allowed to sit for 48 hours. During bottling, the sample was pumped through an ultraviolet sterilizer and a 0.1- μm filter. The 500-mL polypropylene bottles and caps were acid leached with 0.16N HNO_3 , deionized-water rinsed, and autoclave sterilized.

Nutrient constituents sample N-71 was prepared in a 50-L polypropylene carboy using deionized water. This SRS was prepared the week prior to sample distribution. The water was circulated through a 0.1- μm filter and kept chilled with ice (15 degrees Celsius) during the entire preparation procedure. Ultraviolet sterilization was performed up until the addition of reagent-grade chemicals. The 60-mL amber glass vials and teflon-faced rubber-lined caps were acid leached with 0.1N hydrochloric acid (HCl), deionized-water rinsed, and autoclave sterilized.

Nutrient constituents sample N-72 was prepared in a 190-L polypropylene drum using water collected from Fall River near Idaho Springs, Colorado. This SRS was prepared the week prior to sample distribution. The water was circulated through a 0.1- μm filter and kept chilled with ice (15 degrees Celsius) during the entire preparation procedure. Ultraviolet sterilization was performed up until the addition of reagent-grade chemicals. The 250-mL polyethylene bottles were acid leached with 0.1N HCl , deionized-water rinsed, and autoclave sterilized.

Low ionic-strength constituents sample P-37 was prepared in a 600-L polypropylene drum using deionized water that was filtered by a Nanopure system. The desired phosphate and fluoride concentrations were obtained by adding reagent-grade chemicals. Prior and during bottling, the sample was circulated through a 0.1- μm filter and an ultraviolet sterilizer. The 500-mL polypropylene bottles and caps were acid leached with 0.16N HNO_3 , deionized-water rinsed, and autoclave sterilized.

Mercury sample Hg-33 was prepared using water collected from Chicago Creek near Idaho Springs, Colorado. The sample was prepared in a 190-L polypropylene drum. The water was continuously circulated and passed through a 0.1- μ m filter and ultraviolet sterilizer. The sample was then preserved with 4 mL/L 12 N HCl. The desired mercury concentration was obtained by adding a mercury standard solution. The 250-mL borosilicate glass bottles and teflon-lined caps were new, acid leached, and deionized-water rinsed.

LABORATORY ANALYSES

The participating laboratories were asked to determine constituents that are summarized in table 3. The number of analytes range from 28 in T-167 (trace constituents) to 1 in Hg-33 (mercury).

Table 3. Analytes determined in standard reference samples distributed in September 2001

[mg/L, milligrams per liter; µg/L, micrograms per liter; µS/cm, microsiemens per centimeter at 25 degrees Celsius]

Constituent or Property		Units	T-167	M-160	N-71	N-72	P-37	Hg-33
Acidity	Acidity as CaCO ₃	mg/L					X	
Alk	Alkalinity as CaCO ₃	mg/L		X				
Ag	Silver	µg/L	X					
Al	Aluminum	µg/L	X					
As	Arsenic	µg/L	X					
B	Boron	µg/L	X	X				
Ba	Barium	µg/L	X					
Be	Beryllium	µg/L	X					
Ca	Calcium	mg/L	X	X			X	
Cd	Cadmium	µg/L	X					
Cl	Chloride	mg/L		X			X	
Co	Cobalt	µg/L	X					
Cr	Chromium	µg/L	X					
Cu	Copper	µg/L	X					
ROE	Dissolved Solids	mg/L		X				
F	Fluoride	mg/L		X			X	
Fe	Iron	µg/L	X					
Hg	Mercury	µg/L						X
K	Potassium	mg/L	X	X			X	
Li	Lithium	µg/L	X					
Mg	Magnesium	mg/L	X	X			X	
Mn	Manganese	µg/L	X					
Mo	Molybdenum	µg/L	X					
Na	Sodium	mg/L	X	X			X	
NH ₃ as N	Ammonia	mg/L			X	X		
NH ₃ + Org N as N	Ammonia + Organic N	mg/L			X	X		
Ni	Nickel	µg/L	X					
NO ₃ as N	Nitrate	mg/L			X	X		
Pb	Lead	µg/L	X					
pH	pH	unit		X			X	
PO ₄ as P	Orthophosphate	mg/L			X	X	X	
total P as P	Phosphorus	mg/L		X	X	X		
Sb	Antimony	µg/L	X					
Se	Selenium	µg/L	X					
SiO ₂	Silica	mg/L	X	X				
SO ₄	Sulfate	mg/L		X			X	
Sp Cond	Specific Conductance	µS/cm		X			X	
Sr	Strontium	µg/L	X	X				
Tl	Thallium	µg/L	X					
U	Uranium	µg/L	X					
V	Vanadium	µg/L	X	X				
Zn	Zinc	µg/L	X					

Laboratories were requested to identify the method used for each constituent according to analytical method codes in the list of definitions, abbreviations, and symbols (page iv).

Participating laboratories were also asked to identify the method used, such as those references listed next, to further define the methods.

1. American Public Health Association, American Water Works Association, and Water Environment Federation, 1995, Standard methods for the examination of water and wastewater (19th ed.): Washington, D.C., American Public Health Association, variable pagination.
2. American Society for Testing and Materials, 1995, Annual book of ASTM standards: Philadelphia, v. 11.0, and v. 11.02.3.
3. Kopp, J.F., and McKee, G.F., 1979, Methods for chemical analysis of water and wastes: Cincinnati, U.S. Environmental Protection Agency, EPA 600/4-79-020, rev. 1983, 460 p.
4. Fishman, M.J., and Friedman, L.C., eds., 1989. Methods for determination of inorganic substances in water and fluvial sediments (3rd ed.): U.S. Geological Survey Techniques of Water-Resources Investigations, Book 5, Chapter A1, 545 p.
5. Miscellaneous manufacturer's instrument manuals or references.

STATISTICAL PRESENTATION OF DATA

Data in this report are evaluated using nonparametric statistics as described by Hoaglin and others (1983). This statistical approach is a resistant statistic because outliers have less influence on the median, than does the mean in traditional parametric statistics. Analytical data for each analyte are presented in tabular and graphical forms in tables 11 - 16. Tabulated data for each analyte include the laboratory identification number; reported values; analytical method; most probable value (MPV); number of reported analyses, excluding less than values, (n); data range; the F-pseudosigma; and the Z-value. The Z-value is equivalent to the Z-score of traditional statistics. The F-pseudosigma approximates the standard deviation (σ) of traditional statistics when the data has a Gaussian distribution. If an analyte has at least five analyses by a given method, the median and F-pseudosigma are reported in the block of data listed for each method.

The median value calculated from the reported results is the MPV. The F-pseudosigma is calculated by dividing the fourth-spread (analogous to interquartile range) by 1.349; therefore the smaller the F-pseudosigma the more precise the determinations. The 1.349 value is derived from the Empirical Rule that defines 1 standard deviation as 67.45% or 0.6745 of the data; 2 standard deviations contains 95% or 1.349. Based on an assessment of analyte data (Keith Long, Branch of Quality Systems, verbal comm., 1998), when the F-pseudosigma is less than 5 percent of the MPV, the rating criterion is set to 5 percent of the MPV; as shown in table 11, T-167 Barium.

The graphical plot of the reported data is shown in figure 1. The upper and lower boundaries of the graphical plots are +3 and -3 F-pseudosigma deviations from the median. Reported values are grouped by analytical method in ascending order of value.

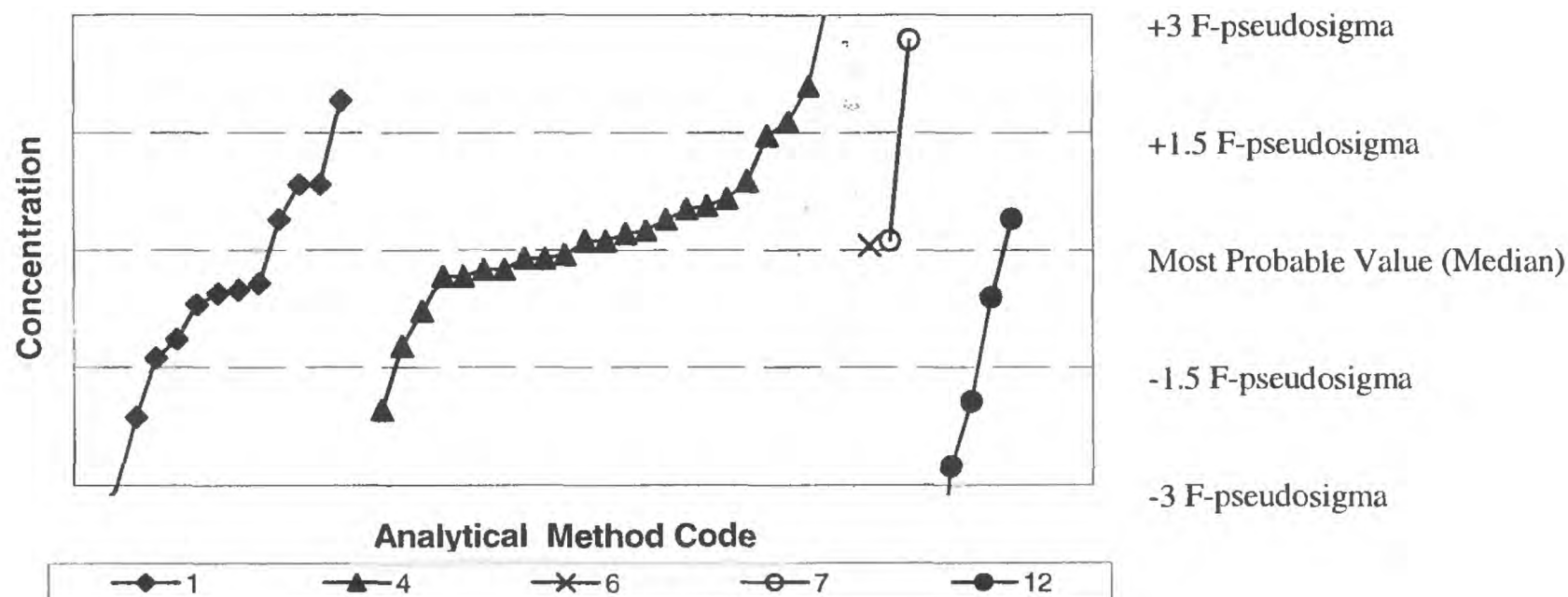
The term "suspect data" is used in the mercury tables because the data are highly variable. It is suspected that the preservation method is inadequate for the sample over 30 days old.

LABORATORY PERFORMANCE RATINGS

To facilitate laboratory intercomparison, laboratory performance ratings are included in tables 4 - 16 in this report. For each SRS, averages of all the analyte ratings and the number of rated analyses are given for each participating laboratory. The actual reported values by all the laboratories were used to calculate the statistical results and performance ratings presented in the report. Laboratory determination of each analyte is rated on a scale 4 to 0, based on the absolute Z-value. The listing of ratings and Z-values are presented in the list of analytical methods, abbreviations, and symbols given on page iv and in tables 5 - 10.

Laboratories reporting "less than" values are not performance rated unless their less than value is less than the MPV and has a Z-value greater than 2. In this case, the laboratory would receive a rating of 0 for that analyte.

A laboratory rating that is greater than or equal to 2.0 is considered acceptable, whereas ratings less than 2.0 are considered unacceptable. Ratings are based on the relative performance of laboratories on specific samples and should be reviewed and evaluated on a case-by-case basis for each laboratory considering such factors as methods used and data needs of specific USGS projects using the laboratory data.



NOTE: vertical scale is the concentration value of the individual analyte in appropriate units (see table 3). Horizontal scale is the laboratory reported values separated by method (different symbols) and plotted by increasing values. Numbers next to each symbol at the bottom of the figure are analytical method codes as described on page iv. Laboratory-reported results outside ± 3 F-pseudosigma from the median are not shown on the graphs.

Figure 1. Statistical parameters shown on data graphs in tables 11-16

REFERENCE

Hoaglin, D.C., Mosteller, F., and Tukey, J.W., Eds. 1983, Understanding robust and exploratory data analysis: New York, NY, John Wiley, Inc., p. 38-41.

Table 4. Overall laboratory performance ratings for standard reference samples distributed September 2001

[SRS, standard reference sample; Lab, laboratory; OWR, overall weighted rating for all sample types; OLR, overall laboratory rating for sample type; V/66, number of rated analyses out of 66 from all sample types; V/28, V/16, V/5, V/5, V/11, and V/1 are number of rated analyses for each sample type (T-167, M-160, N-71, N-72, P-37, HG-33) respectively; --, not reported.]

Lab	SRS=		T-167		M-160		N-71		N-72		P-37		HG-33	
	OWR	V/66	OLR	V/28	OLR	V/16	OLR	V/5	OLR	V/5	OLR	V/11	OLR	V/1
1	3.5	62	3.8	28	3.1	15	3.8	5	3.6	5	3.1	9	--	0
2	3.8	9	--	--	--	--	--	--	--	--	3.8	9	--	--
4	4.0	1	--	--	4.0	1	--	--	--	--	--	--	--	--
5	1.9	58	1.7	26	2.1	15	3.0	4	1.3	4	2.0	9	--	--
10	3.3	31	2.7	9	3.6	12	3.0	5	3.8	5	--	--	--	0
12	2.1	33	1.7	12	2.4	11	1.6	5	3.0	5	--	--	--	0
16	2.8	51	3.1	26	2.6	15	2.0	5	2.6	5	--	--	--	0
21	3.8	6	4.0	1	--	--	3.8	5	--	--	--	--	--	--
23	3.0	48	3.2	19	3.2	12	0.5	2	2.8	5	3.1	10	--	0
24	3.2	31	2.8	18	3.7	13	--	--	--	--	--	--	--	--
25	1.7	53	1.5	19	1.8	15	1.8	4	1.6	5	2.0	10	--	--
31	3.8	5	--	--	--	--	3.8	5	--	--	--	--	--	--
32	3.3	43	3.6	27	2.9	16	--	--	--	--	--	--	--	0
33	2.4	12	--	--	--	--	2.0	3	2.0	3	2.8	6	--	--
38	3.0	27	--	--	3.1	9	2.8	5	2.8	5	3.1	8	--	--
42	2.8	49	2.9	28	2.8	15	1.3	3	3.3	3	--	--	--	--
45	2.4	20	1.7	9	2.9	11	--	--	--	--	--	--	--	--
46	3.5	21	3.5	12	--	--	3.3	4	3.8	5	--	--	--	0
50	3.3	36	3.4	22	3.2	14	--	--	--	--	--	--	--	0
51	3.6	5	--	--	--	--	3.6	5	--	--	--	--	--	--
53	2.0	4	--	--	--	--	2.0	2	2.0	2	--	--	--	--
59	3.2	52	3.5	18	3.6	15	3.4	5	3.6	5	1.7	9	--	0
64	3.4	29	3.6	5	3.3	9	2.0	3	3.7	3	3.8	9	--	--
70	2.9	47	3.3	24	3.2	13	0.6	5	2.2	5	--	--	--	--
72	0.7	10	--	--	--	--	0.4	5	1.0	5	--	--	--	--
76	3.8	19	3.9	15	3.8	4	--	--	--	--	--	--	--	--
84	2.9	17	3.4	7	2.9	7	--	--	2.0	3	--	--	--	--
85	3.4	35	--	--	3.3	15	3.2	5	3.8	5	3.5	10	--	--
86	3.2	36	3.4	19	2.6	9	--	--	2.7	3	4.0	5	--	--
89	2.6	57	2.1	22	3.1	14	3.2	5	3.8	5	2.2	11	--	0
91	3.0	7	--	--	--	--	2.3	3	3.5	4	--	--	--	--
93	3.1	43	3.1	15	2.8	11	3.3	4	3.5	4	3.3	9	--	--
96	3.3	27	3.4	11	3.0	7	3.0	4	3.6	5	--	--	--	0
97	2.6	39	2.1	24	3.4	15	--	--	--	--	--	--	--	0
100	2.0	48	2.4	25	2.1	15	0.5	4	1.3	4	--	--	--	--
102	3.0	5	--	--	--	--	--	--	3.0	5	--	--	--	--
109	2.0	17	1.3	6	2.4	11	--	--	--	--	--	--	--	--
110	3.4	16	3.7	6	--	--	1.0	2	--	--	3.8	8	--	--
113	3.5	52	3.3	20	3.7	14	4.0	4	4.0	5	3.3	9	--	--
118	3.1	15	--	--	3.4	5	2.6	5	3.4	5	--	--	--	--
121	2.7	19	2.5	13	3.2	6	--	--	--	--	--	--	--	--
138	3.6	61	3.6	25	3.7	16	4.0	5	3.8	5	3.3	10	--	0
142	2.9	52	2.9	26	3.1	16	1.6	5	3.2	5	--	--	--	0
146	2.8	44	3.0	21	2.8	13	2.0	5	3.0	5	--	--	--	0
147	4.0	7	4.0	7	--	--	--	--	--	--	--	--	--	0
149	2.7	3	--	--	2.7	3	--	--	--	--	--	--	--	--
155	3.1	21	--	--	3.1	7	4.0	5	3.6	5	1.3	4	--	--
180	3.0	44	3.2	24	--	--	2.8	5	3.8	5	2.2	10	--	0
190	3.4	49	3.6	16	3.3	13	3.6	5	3.8	5	2.9	10	--	--
193	2.9	34	2.9	13	2.9	7	3.0	4	2.8	4	3.0	6	--	0

Table 4. Overall laboratory performance ratings for standard reference samples distributed September 2001

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[SRS, standard reference sample; Lab, laboratory; OWR, overall weighted rating for all sample types; OLR, overall laboratory rating for sample type; V/66, number of rated analyses out of 66 from all sample types; V/28, V/16, V/5, V/5, V/11, and V/1 are number of rated analyses for each sample type (T-167, M-160, N-71, N-72, P-37, HG-33) respectively; --, not reported.]

Lab	SRS=		T-167		M-160		N-71		N-72		P-37		HG-33	
	OWR	V/66	OLR	V/28	OLR	V/16	OLR	V/5	OLR	V/5	OLR	V/11	OLR	V/1
198	3.2	30	3.2	22	--	--	2.8	4	4.0	4	--	--	--	0
205	2.0	2	--	--	--	--	--	--	2.0	2	--	--	--	--
208	2.5	6	--	--	4.0	2	--	--	2.0	2	1.5	2	--	--
212	3.1	42	3.0	26	3.4	16	--	--	--	--	--	--	--	0
224	2.1	51	1.5	18	2.5	13	0.8	5	2.4	5	3.3	10	--	--
227	2.6	17	3.0	6	3.0	6	--	--	1.6	5	--	--	--	--
228	3.3	8	--	--	--	--	--	--	--	--	3.3	8	--	--
234	3.5	51	3.7	27	3.8	16	1.0	4	3.0	4	--	--	--	0
245	3.5	0	--	--	--	--	--	--	--	--	--	--	--	0
247	2.3	44	2.7	23	--	--	2.8	5	1.2	5	1.7	11	--	0
254	3.1	30	3.1	20	3.2	10	--	--	--	--	--	--	--	--
255	2.5	21	2.6	14	2.6	5	--	--	--	--	2.0	2	--	--
256	2.5	34	2.3	20	2.8	14	--	--	--	--	--	--	--	0
259	3.5	31	3.5	17	3.5	14	--	--	--	--	--	--	--	0
263	3.6	8	--	--	3.6	8	--	--	--	--	--	--	--	--
265	3.4	44	3.3	28	3.7	10	--	--	--	--	3.5	6	--	--
266	3.3	12	--	--	3.3	12	--	--	--	--	--	--	--	--
269	4.0	3	--	--	4.0	3	--	--	--	--	--	--	--	--
270	1.4	8	1.5	2	2.0	4	--	--	--	--	0.0	2	--	--
277	1.3	30	0.6	15	2.2	10	--	--	--	--	1.8	5	--	--
279	2.5	11	3.0	4	2.7	3	--	--	--	--	2.0	4	--	--
298		0	--	--	--	--	--	--	--	--	--	--	--	0
301	1.5	6	2.3	4	--	--	--	--	0.0	2	--	--	--	--
304	3.5	21	3.5	21	--	--	--	--	--	--	--	--	--	0
307	2.2	21	1.5	12	3.5	6	--	--	2.7	3	--	--	--	0
313	3.1	8	--	--	--	--	4.0	3	2.6	5	--	--	--	--
315	1.3	18	1.5	6	1.5	6	--	--	--	--	1.0	6	--	--
316	3.6	5	--	--	--	--	3.6	5	--	--	--	--	--	--
317	1.2	6	--	--	--	--	0.7	3	1.7	3	--	--	--	--
318	3.0	5	--	--	--	--	3.0	5	--	--	--	--	--	--
319	4.0	2	--	--	4.0	2	--	--	--	--	--	--	--	--
320	3.3	9	--	--	--	--	3.5	4	3.2	5	--	--	--	--
326	3.0	33	3.1	17	2.9	10	--	--	--	--	3.2	6	--	--
328	2.0	64	2.1	28	2.3	16	1.5	4	1.4	5	1.7	11	--	0
330	2.8	37	2.7	26	3.1	11	--	--	--	--	--	--	--	--
331	1.7	34	1.0	22	2.8	12	--	--	--	--	--	--	--	0
332	2.1	22	1.8	13	2.8	5	--	--	--	--	2.3	4	--	--
333	3.6	13	--	--	3.7	3	4.0	2	--	--	3.5	8	--	--
334	2.7	44	2.7	28	2.7	16	--	--	--	--	--	--	--	0
336	0.6	21	0.2	5	1.3	9	--	--	--	--	0.0	7	--	--
341	3.1	24	--	--	3.1	14	3.0	5	3.0	5	--	--	--	--
356	3.0	29	3.0	24	--	--	--	--	2.8	5	--	--	--	--
366	2.7	20	--	--	2.9	11	2.3	4	2.4	5	--	--	--	--
368	4.0	2	--	--	--	--	4.0	2	--	--	--	--	--	--
369	1.8	4	--	--	--	--	1.8	4	--	--	--	--	--	--
370	1.8	55	1.5	21	1.7	15	0.5	4	3.0	5	2.6	10	--	0
372	1.3	63	0.3	26	2.2	16	2.0	5	1.8	5	1.8	11	--	0
373	3.4	5	--	--	--	--	3.4	5	--	--	--	--	--	--

Table 5. Laboratory performance ratings for standard reference sample T-167 (trace constituents)

[MPV, most probable value; Lab, laboratory number; OLR, overall laboratory rating for all rated analyses; µg/L, micrograms per liter; mg/L, milligrams per liter; V/28, number of rated analyses out of 28 possible; RV, reported value; <, less than; NR, not rated; --, not reported.]

Rating		Absolute Z-value		Rating		Absolute Z-value	
4 (Excellent)		0.00 - 0.50		1 (Marginal)		1.51 - 2.00	
3 (Good)		0.51 - 1.00		0 (Unsatisfactory)		greater than 2.00	
2 (Satisfactory)		1.01 - 1.50		NR (Not Rated)			

Analyte =			Silver		Aluminum		Arsenic		Boron		Barium	
MPV =			6.70 µg/L		21.5 µg/L		22.1 µg/L		24.3 µg/L		20.6 µg/L	
F-pseudosigma =			0.445		5.89		1.41		3.63		0.85	
Lab	OLR	V/28	RV	Rating	RV	Rating	RV	Rating	RV	Rating	RV	Rating
1	3.8	28	6.61	4	20.3	4	21.2	3	24.5	4	20.7	4
5	1.7	26	8.91	0	40.6	0	23.9	2	22.4	3	19.4	2
10	2.7	9	--	--	--	--	21.2	3	--	--	--	--
12	1.7	12	5.8	0	--	--	21	3	--	--	--	--
16	3.1	26	7	3	49	0	22	4	21	3	20	3
21	4.0	1	--	--	--	--	--	--	--	--	--	--
23	3.2	19	6.36	3	--	--	12.15	0	--	--	20.45	4
24	2.8	18	--	--	--	--	--	--	24	4	21	4
25	1.5	19	<17	NR	<87	NR	22	4	21	3	17	0
32	3.6	27	6.7	4	20.6	4	23	3	24.3	4	20.4	4
42	2.9	28	6.39	3	21	4	21.2	3	23.1	4	19.8	3
45	1.7	9	--	--	--	--	--	--	--	--	--	--
46	3.5	12	--	--	--	--	21.9	4	--	--	19.9	3
50	3.4	22	5.62	0	23.2	4	22.3	4	22.4	3	21.5	3
59	3.5	18	< 10	NR	< 50	NR	22.6	4	23.1	4	20.5	4
64	3.6	5	--	--	--	--	--	--	--	--	--	--
70	3.3	24	6.47	3	21.4	4	22	4	--	--	21.1	4
76	3.9	15	--	--	--	--	21.98	4	--	--	--	--
84	3.4	7	--	--	--	--	--	--	--	--	--	--
86	3.4	19	6.32	3	26.1	3	--	--	--	--	20.5	4
89	2.1	22	6	1	17.6	3	24.2	2	--	--	< 50	NR
93	3.1	15	--	--	23.2	4	21.1	3	--	--	20.2	4
96	3.4	11	6.65	4	--	--	22.8	4	--	--	<100	NR
97	2.1	24	7.1	3	78.2	0	25.2	0	--	--	20.6	4
100	2.4	25	7.18	2	21.5	4	23.5	3	38.7	0	21.5	3
109	1.3	6	--	--	--	--	--	--	--	--	--	--
110	3.7	6	--	--	20.453	4	--	--	--	--	--	--
113	3.3	20	7.1	3	22.7	4	22.4	4	--	--	20.3	4
121	2.5	13	--	--	--	--	--	--	--	--	22	2
138	3.6	25	6.56	4	22.8	4	23.7	2	24.4	4	20.1	4
142	2.9	26	6.59	4	<30	NR	23.3	3	<30	NR	20.6	4
146	3.0	21	6.88	4	40	0	22.2	4	--	--	21.8	2
147	4.0	7	--	--	21.1	4	21.6	4	--	--	--	--
180	3.2	24	6.71	4	18.4	3	21	3	27.6	3	20.3	4
190	3.6	16	6.3	3	20.4	4	21.4	4	--	--	--	--
193	2.9	13	6.6	4	--	--	21.1	3	--	--	--	--
198	3.2	22	7	3	19.9	4	22.6	4	--	--	21.3	3
212	3.0	26	6.1	2	<100	NR	21.9	4	32.2	0	21.4	3
224	1.5	18	10.1	0	<30	NR	24.8	1	--	--	<18	0
227	3.0	6	--	--	--	--	--	--	--	--	--	--
234	3.7	27	6.58	4	20.3	4	22.6	4	25.8	4	20.9	4
247	2.7	23	6.33	3	21.5	4	25.2	0	<51	NR	20.2	4
254	3.1	20	--	--	<100	NR	22.8	4	23.8	4	--	--
255	2.6	14	7	3	--	--	21	3	29	2	--	--
256	2.3	20	6.95	3	19.1	4	6.83	0	--	--	19.2	2

Table 5. Laboratory performance ratings for standard reference sample T-167 (trace constituents) -- continued

[MPV, most probable value; Lab, laboratory number; OLR, overall laboratory rating for all rated analyses; µg/L, micrograms per liter; mg/L, milligrams per liter; V/28, number of rated analyses out of 28 possible; RV, reported value; <, less than; NR, not rated; --, not reported.]

<u>Rating</u>	<u>Absolute Z-value</u>	<u>Rating</u>	<u>Absolute Z-value</u>
4 (Excellent)	0.00 - 0.50	1 (Marginal)	1.51 - 2.00
3 (Good)	0.51 - 1.00	0 (Unsatisfactory)	greater than 2.00
2 (Satisfactory)	1.01 - 1.50	NR (Not Rated)	

Analyte =			Silver		Aluminum		Arsenic		Boron		Barium	
MPV =			6.70 µg/L		21.5 µg/L		22.1 µg/L		24.3 µg/L		20.6 µg/L	
F-pseudosigma =			0.445		5.89		1.41		3.63		0.85	
Lab	OLR	V/28	RV	Rating	RV	Rating	RV	Rating	RV	Rating	RV	Rating
259	3.5	17	6.9	4	--	--	22.5	4	--	--	21.3	3
265	3.3	28	6.8	4	18	3	22	4	26	4	21.5	3
270	1.5	2	--	--	--	--	--	--	--	--	--	--
277	0.6	15	5.5	0	19.1	4	--	--	--	--	17.2	0
279	3.0	4	--	--	--	--	--	--	--	--	--	--
301	2.3	4	--	--	--	--	--	--	--	--	--	--
304	3.5	21	6.72	4	22.2	4	23.1	3	43.1	0	21	4
307	1.5	12	7.28	2	--	--	20.4	2	--	--	--	--
315	1.5	6	--	--	--	--	--	--	--	--	--	--
326	3.1	17	--	--	--	--	23.7	2	24.6	4	20.9	4
328	2.1	28	6.5	4	51	0	23	3	47	0	23	0
330	2.7	26	6.71	4	19.6	4	23.5	3	11	0	21.3	3
331	1.0	22	4.98	0	35.5	0	--	--	27.3	3	18.5	0
332	1.8	13	--	--	35.92	0	--	--	23.82	4	24.08	0
334	2.7	28	6.9	4	30	2	24	2	20	2	21	4
336	0.2	5	--	--	--	--	--	--	--	--	--	--
356	3.0	24	6.81	4	19.8	4	21.1	3	<50	NR	21.9	2
370	1.5	21	8.54	0	<100	NR	21.4	4	<500	NR	<50	NR
372	0.3	26	<2	0	<6	0	6	0	3	0	16	0

Table 5. Laboratory performance ratings for standard reference sample T-167 (trace constituents) -- continued

[MPV, most probable value; Lab, laboratory number; OLR, overall laboratory rating for all rated analyses; µg/L, micrograms per liter; mg/L, milligrams per liter; V/28, number of rated analyses out of 28 possible; RV, reported value; <, less than; NR, not rated; --, not reported.]

Rating	Absolute Z-value	Rating	Absolute Z-value
4 (Excellent)	0.00 - 0.50	1 (Marginal)	1.51 - 2.00
3 (Good)	0.51 - 1.00	0 (Unsatisfactory)	greater than 2.00
2 (Satisfactory)	1.01 - 1.50	NR (Not Rated)	

Analyte = MPV = F-pseudosigma =		Beryllium 10.8 µg/L 0.59		Calcium 5.15 mg/L 0.245		Cadmium 10.4 µg/L 0.50		Cobalt 6.80 µg/L 0.282		Chromium 22.6 µg/L 1.07	
Lab		RV	Rating	RV	Rating	RV	Rating	RV	Rating	RV	Rating
1		11	4	5.17	4	10.4	4	6.83	4	22.6	4
5		9.88	1	4.75	1	10.1	3	10.4	0	22	3
10		--	--	--	--	10.1	3	--	--	21	2
12		--	--	5.1	4	8.6	0	--	--	--	--
16		11	4	4.9	3	10	3	7	3	24	2
21		--	--	--	--	--	--	--	--	--	--
23		10.81	4	5.09	4	10.02	3	--	--	22.63	4
24		--	--	4.96	3	11	2	7.6	0	24	2
25		10	2	2.41	0	11	2	7	3	11	0
32		11.1	4	5.2	4	10.7	3	6.8	4	23	4
42		9.7	1	5.33	3	9.91	3	6.41	2	21.9	3
45		--	--	5.32	3	--	--	--	--	--	--
46		10.4	3	5.24	4	9.64	2	--	--	21.8	3
50		10.8	4	--	--	10.6	4	7.13	3	23.3	3
59		10.9	4	4.72	1	10.5	4	6.67	4	22.5	4
64		--	--	5.01	3	--	--	--	--	--	--
70		10.8	4	5.38	3	10.2	4	6.53	3	22.3	4
76		--	--	5.133	4	10.03	3	6.792	4	23.6	3
84		--	--	5.16	4	--	--	--	--	--	--
86		10.4	3	5.2	4	10.4	4	6.78	4	22.1	4
89		13.9	0	3.72	0	12.4	0	6.9	4	23.9	2
93		10.9	4	5.06	4	9.42	1	--	--	22.8	4
96		10.6	4	--	--	10.6	4	<10	NR	23.8	2
97		11.3	3	5.08	4	10.8	3	5.4	0	24.6	1
100		11	4	5.33	3	8.3	0	6.57	3	14	0
109		--	--	5.88	0	--	--	--	--	--	--
110		--	--	5.09	4	--	--	--	--	--	--
113		11.3	3	5	3	10.6	4	--	--	22.7	4
121		--	--	5.08	4	9	0	--	--	--	--
138		10.5	4	5.06	4	10.7	3	6.9	4	22.4	4
142		11.4	2	4.85	2	11.1	2	6.8	4	22.4	4
146		10.8	4	5.15	4	10.5	4	7.43	1	23.5	3
147		--	--	--	--	10.4	4	--	--	--	--
180		10.4	3	5.25	4	10.5	4	6.38	2	21.3	2
190		--	--	4.82	2	10.7	3	--	--	23	4
193		9.25	0	5.24	4	13.3	0	--	--	21.6	3
198		11.6	2	5.19	4	10.7	3	7.1	3	22.7	4
212		10.2	2	5.23	4	10.5	4	6.3	2	23.3	3
224		9.2	0	4.988	3	8.9	0	<6	0	25.3	0
227		--	--	5.3	3	10.4	4	--	--	--	--
234		10.8	4	5.3	3	10.4	4	6.93	4	23.2	3
247		8.74	0	4.48	0	10.1	3	6.74	4	21.4	2
254		--	--	4.97	3	10.4	4	6.7	4	35.2	0
255		--	--	5.54	1	10.4	4	--	--	23.2	3
256		11.27	3	--	--	10	3	6.72	4	23.07	4

Table 5. Laboratory performance ratings for standard reference sample T-167 (trace constituents) -- continued

[MPV, most probable value; Lab, laboratory number; OLR, overall laboratory rating for all rated analyses; µg/L, micrograms per liter; mg/L, milligrams per liter; V/28, number of rated analyses out of 28 possible; RV, reported value; <, less than; NR, not rated; --, not reported.]

Rating	Absolute Z-value	Rating	Absolute Z-value
4 (Excellent)	0.00 - 0.50	1 (Marginal)	1.51 - 2.00
3 (Good)	0.51 - 1.00	0 (Unsatisfactory)	greater than 2.00
2 (Satisfactory)	1.01 - 1.50	NR (Not Rated)	

Analyte =			Beryllium		Calcium		Cadmium		Cobalt		Chromium	
MPV =			10.8 µg/L		5.15 mg/L		10.4 µg/L		6.80 µg/L		22.6 µg/L	
F-pseudosigma =			0.59		0.245		0.50		0.282		1.07	
Lab	OLR	V/28	RV	Rating	RV	Rating	RV	Rating	RV	Rating	RV	Rating
259	--	--	--	--	5.13	4	10.6	4	6.9	4	23.2	3
265	--	--	11	4	5.4	3	10	3	7	3	22	3
270	--	--	--	--	--	--	--	--	--	--	--	--
277	--	--	--	--	5.5	2	8.8	0	6.1	0	19.8	0
279	--	--	--	--	4.67	1	--	--	--	--	--	--
301	--	--	--	--	7.14	0	--	--	--	--	--	--
304	--	--	11.4	2	--	--	10.1	3	6.68	4	22.5	4
307	--	--	--	--	--	--	11.2	1	--	--	21.7	3
315	--	--	--	--	6.17	0	--	--	--	--	--	--
326	--	--	--	--	5.02	4	10.8	3	7.7	0	24.2	2
328	--	--	10.8	4	5.4	3	11	2	11	0	29	0
330	--	--	10.6	4	6	0	11.3	1	6.99	3	22.4	4
331	--	--	9.5	0	4.61	0	9.75	2	5.6	0	21.1	2
332	--	--	--	--	5.34	3	--	--	--	--	--	--
334	--	--	10	2	5	3	11	2	6.7	4	22	3
336	--	--	--	--	7.12	0	14.5	0	--	--	--	--
356	--	--	10.4	3	5.29	3	10.2	4	6.49	3	22.1	4
370	--	--	10.8	4	5.36	3	10.23	4	9.33	0	24	2
372	--	--	5	0	4.97	3	<2	0	<2	0	17	0

Table 5. Laboratory performance ratings for standard reference sample T-167 (trace constituents) -- continued

[MPV, most probable value; Lab, laboratory number; OLR, overall laboratory rating for all rated analyses; µg/L, micrograms per liter; mg/L, milligrams per liter; V/28, number of rated analyses out of 28 possible; RV, reported value; <, less than; NR, not rated; --, not reported.]

Rating	Absolute Z-value	Rating	Absolute Z-value
4 (Excellent)	0.00 - 0.50	1 (Marginal)	1.51 - 2.00
3 (Good)	0.51 - 1.00	0 (Unsatisfactory)	greater than 2.00
2 (Satisfactory)	1.01 - 1.50	NR (Not Rated)	

Analyte =		Copper		Iron		Potassium		Lithium		Magnesium	
MPV =		20.6 µg/L		56.1 µg/L		4.76 mg/L		13.6 µg/L		4.80 mg/L	
F-pseudosigma =		1.00		4.23		0.222		0.82		0.189	
Lab		RV	Rating	RV	Rating	RV	Rating	RV	Rating	RV	Rating
1		20.5	4	56.6	4	4.73	4	12.7	2	4.84	4
5		15.4	0	55.9	4	5.36	0	13.2	4	4.31	0
10		20.1	4	55	4	--	--	--	--	--	--
12		20	3	--	--	3.8	0	--	--	5.5	0
16		20	3	55	4	4.8	4	--	--	4.7	4
21		--	--	56.71	4	--	--	--	--	--	--
23		19.82	3	55.9	4	4.79	4	--	--	4.82	4
24		23	0	60.5	2	4.75	4	--	--	4.63	3
25		20	3	55	4	4.37	1	17	0	2.34	0
32		22.1	2	--	--	4.8	4	14.1	3	5.05	2
42		19.9	3	62.2	2	4.54	3	12.4	2	4.74	4
45		20	3	39	0	4.35	1	--	--	4.22	0
46		20.9	4	--	--	4.81	4	--	--	4.71	4
50		21.1	4	53.1	3	--	--	13.3	4	--	--
59		20.8	4	< 100	NR	4.82	4	--	--	4.66	3
64		--	--	--	--	4.74	4	--	--	4.65	3
70		20.2	4	46.8	0	4.64	4	--	--	4.92	4
76		--	--	--	--	4.85	4	13.59	4	4.72	4
84		19.7	3	59.3	3	--	--	--	--	4.88	4
86		21.6	3	--	--	4.83	4	--	--	4.89	4
89		20.8	4	55.6	4	4.55	3	--	--	4.49	2
93		--	--	53.9	3	--	--	--	--	4.78	4
96		21.5	3	51	2	--	--	--	--	--	--
97		20.8	4	60	3	4.64	4	--	--	4.72	4
100		19.2	2	51.2	2	4.79	4	<50	NR	5.05	2
109		--	--	54.5	4	3.69	0	--	--	4.5	2
110		--	--	--	--	4.93	3	--	--	4.561	3
113		20.6	4	56.9	4	4.6	3	--	--	4.6	3
121		22	2	57	4	--	--	--	--	4.8	4
138		20.5	4	58	4	4.55	3	--	--	4.8	4
142		20.3	4	56	4	5.03	2	14.3	3	4.87	4
146		21.6	3	59	3	4.76	4	--	--	4.83	4
147		20.8	4	56.1	4	--	--	--	--	--	--
180		19.5	2	60.9	2	4.8	4	--	--	4.8	4
190		21.3	3	56.1	4	4.94	3	--	--	4.8	4
193		20.5	4	<125	NR	4.98	3	--	--	4.8	4
198		21.3	3	51	2	4.79	4	--	--	4.85	4
212		21	4	63.7	1	4.83	4	15.9	0	4.81	4
224		19.8	3	53	3	4.939	3	--	--	4.965	3
227		22	2	--	--	--	--	--	--	4.9	4
234		21.3	3	56.4	4	4.72	4	12.8	3	4.93	3
247		19.3	2	53.3	3	4.71	4	<10.2	0	4.49	2
254		20.1	4	56.6	4	4.76	4	15.8	0	4.84	4
255		20.6	4	62	2	--	--	--	--	5	3
256		34.08	0	52.32	3	--	--	<20	NR	--	--

Table 5. Laboratory performance ratings for standard reference sample T-167 (trace constituents) -- continued

[MPV, most probable value; Lab, laboratory number; OLR, overall laboratory rating for all rated analyses; µg/L, micrograms per liter; mg/L, milligrams per liter; V/28, number of rated analyses out of 28 possible; RV, reported value; <, less than; NR, not rated; --, not reported.]

Rating	Absolute Z-value	Rating	Absolute Z-value
4 (Excellent)	0.00 - 0.50	1 (Marginal)	1.51 - 2.00
3 (Good)	0.51 - 1.00	0 (Unsatisfactory)	greater than 2.00
2 (Satisfactory)	1.01 - 1.50	NR (Not Rated)	

Analyte =		Copper		Iron		Potassium		Lithium		Magnesium	
MPV =		20.6 µg/L		56.1 µg/L		4.76 mg/L		13.6 µg/L		4.80 mg/L	
F-pseudosigma =		1.00		4.23		0.222		0.82		0.189	
Lab		RV	Rating	RV	Rating	RV	Rating	RV	Rating	RV	Rating
259		21.5	3	49.5	1	4.71	4	--	--	4.8	4
265		21	4	58	4	4.75	4	12	1	4.7	4
270		--	--	--	--	4.6	3	--	--	--	--
277		16.3	0	47	0	4	0	--	--	5.2	1
279		--	--	--	--	4.59	3	--	--	4.7	4
301		--	--	--	--	4.97	3	--	--	4.61	3
304		20.8	4	--	--	--	--	13.3	4	--	--
307		21.8	2	<38.3	0	--	--	--	--	--	--
315		--	--	75.4	0	5.12	1	--	--	4.95	3
326		20.1	4	54.3	4	3.52	0	--	--	4.99	3
328		24	0	53	3	5.2	1	14	4	5	3
330		20.9	4	<300	NR	5.3	0	--	--	5	3
331		17.6	0	53.6	3	--	--	15	1	4.53	2
332		--	--	84.8	0	4.9	3	13.58	4	4.89	4
334		22	2	60	3	4.5	2	14	4	4.6	3
336		--	--	--	--	3.9	0	--	--	12.5	0
356		16.6	0	58.9	3	4.75	4	--	--	4.81	4
370		13.4	0	61.6	2	6.9	0	<500	NR	5.06	2
372		17	0	68	0	5.01	2	<3	0	4.56	3

Table 5. Laboratory performance ratings for standard reference sample T-167 (trace constituents) -- continued

[MPV, most probable value; Lab, laboratory number; OLR, overall laboratory rating for all rated analyses; µg/L, micrograms per liter; mg/L, milligrams per liter; V/28, number of rated analyses out of 28 possible; RV, reported value; <, less than; NR, not rated; --, not reported.]

Rating	Absolute Z-value	Rating	Absolute Z-value
4 (Excellent)	0.00 - 0.50	1 (Marginal)	1.51 - 2.00
3 (Good)	0.51 - 1.00	0 (Unsatisfactory)	greater than 2.00
2 (Satisfactory)	1.01 - 1.50	NR (Not Rated)	

Analyte =		Manganese		Molybdenum		Sodium		Nickel		Lead	
MPV =		18.5 µg/L		20.1 µg/L		7.34 mg/L		12.0 µg/L		21.5 µg/L	
F-pseudosigma =		0.78		1.42		0.345		0.52		1.33	
Lab		RV	Rating	RV	Rating	RV	Rating	RV	Rating	RV	Rating
1		19	3	20	4	7.36	4	11.6	3	21.4	4
5		16.6	0	12.4	0	7.36	4	<10.0	0	21.2	4
10		19	3	--	--	--	--	--	--	20	2
12		--	--	24	0	7.7	3	--	--	22	4
16		18	4	20	4	6.8	2	12	4	20	2
21		--	--	--	--	--	--	--	--	--	--
23		18.3	4	20.72	4	9.3	0	11.41	3	20.49	3
24		19	3	21	3	7.13	3	12	4	--	--
25		18	4	--	--	6.84	2	14	0	18	0
32		19.1	3	19.8	4	7.5	4	12.2	4	20.9	4
42		17.8	3	19.7	4	7.25	4	11.2	2	20.5	3
45		20	1	--	--	8.47	0	--	--	21.3	4
46		18.2	4	--	--	7.05	3	--	--	21.9	4
50		19	3	19.6	4	--	--	12	4	21.5	4
59		18	4	18.3	2	7.34	4	11.8	4	--	--
64		--	--	--	--	7.3	4	--	--	--	--
70		18.3	4	20.4	4	7.62	3	11.5	3	21.7	4
76		18.25	4	20.25	4	--	--	12.15	4	21.15	4
84		17.9	3	--	--	7.2	4	--	--	22.5	3
86		18.3	4	19.1	3	7.44	4	12.7	2	22.2	3
89		18	4	--	--	7.17	4	11.8	4	19.6	2
93		17.8	3	--	--	6.22	0	11.1	2	20.5	3
96		<20	NR	--	--	--	--	12.3	4	22.4	3
97		22.6	0	21	3	7.12	3	13.8	0	26.6	0
100		18.9	4	13.7	0	7.33	4	23.1	0	23.2	2
109		12.57	0	--	--	7.8	2	--	--	--	--
110		--	--	--	--	7.182	4	--	--	--	--
113		18.4	4	20.7	4	6.7	1	12.8	2	22.7	3
121		19	3	--	--	7.2	4	15	0	--	--
138		18.1	4	21	3	7.18	4	12	4	20.9	4
142		20	1	20.1	4	5.77	0	12	4	20.2	3
146		19.1	3	21.3	3	7.66	3	13.1	1	21.6	4
147		--	--	--	--	--	--	--	--	21.1	4
180		17.7	3	19.8	4	7.5	4	11	1	20.7	3
190		18.6	4	--	--	7.67	3	12	4	20.8	4
193		--	--	--	--	7.47	4	12.8	2	22.3	3
198		18.9	4	22.8	1	7.55	3	11.7	4	21.8	4
212		18.8	4	20.3	4	7.73	2	11.9	4	21.9	4
224		14.9	0	19.9	4	7.101	3	--	--	38.3	0
227		--	--	--	--	--	--	--	--	23.1	2
234		18.6	4	20.1	4	7.3	4	12	4	20.4	3
247		19.2	3	18.2	2	7.22	4	11.7	4	21.7	4
254		17.7	3	17.6	1	7.28	4	12.2	4	20.3	3
255		20	1	--	--	--	--	12.2	4	22.5	3
256		19.78	2	20.94	3	--	--	12.11	4	22.93	2

Table 5. Laboratory performance ratings for standard reference sample T-167 (trace constituents) -- continued

[MPV, most probable value; Lab, laboratory number; OLR, overall laboratory rating for all rated analyses; µg/L, micrograms per liter; mg/L, milligrams per liter; V/28, number of rated analyses out of 28 possible; RV, reported value; <, less than; NR, not rated; --, not reported.]

Rating	Absolute Z-value	Rating	Absolute Z-value
4 (Excellent)	0.00 - 0.50	1 (Marginal)	1.51 - 2.00
3 (Good)	0.51 - 1.00	0 (Unsatisfactory)	greater than 2.00
2 (Satisfactory)	1.01 - 1.50	NR (Not Rated)	

Analyte =		Manganese		Molybdenum		Sodium		Nickel		Lead	
MPV =		18.5 µg/L		20.1 µg/L		7.34 mg/L		12.0 µg/L		21.5 µg/L	
F-pseudosigma =		0.78		1.42		0.345		0.52		1.33	
Lab		RV	Rating	RV	Rating	RV	Rating	RV	Rating	RV	Rating
259		19	3	19.9	4	--	--	12.5	3	21.7	4
265		19	3	19	3	7.25	4	11	1	21	4
270		--	--	--	--	10.5	0	--	--	--	--
277		15.7	0	--	--	--	--	10.1	0	16.7	0
279		--	--	--	--	7.29	4	--	--	--	--
301		--	--	--	--	7.54	3	--	--	--	--
304		18.1	4	20.4	4	--	--	11.8	4	21.7	4
307		9	0	--	--	7.35	4	9.28	0	22.2	3
315		18	4	--	--	8.06	1	--	--	--	--
326		18.8	4	--	--	7.32	4	12.1	4	21.2	4
328		22	0	30	0	7.7	3	23	0	21	4
330		18.5	4	10.9	0	8	1	12.2	4	22.3	3
331		16.9	1	23.7	0	6.8	2	10.1	0	20	2
332		15.3	0	--	--	7.6	3	--	--	24.47	0
334		20	1	21	3	6.7	1	13	1	23	2
336		--	--	--	--	8	1	--	--	--	--
356		19.7	2	18.8	3	7.51	4	12	4	22.7	3
370		19.4	2	18	2	8.35	0	11.9	4	17.9	0
372		7	0	<2	0	4.53	0	<2	0	12	0

Table 5. Laboratory performance ratings for standard reference sample T-167 (trace constituents) -- continued

[MPV, most probable value; Lab, laboratory number; OLR, overall laboratory rating for all rated analyses; µg/L, micrograms per liter; mg/L, milligrams per liter; V/28, number of rated analyses out of 28 possible; RV, reported value; <, less than; NR, not rated; --, not reported.]

Rating	Absolute Z-value	Rating	Absolute Z-value
4 (Excellent)	0.00 - 0.50	1 (Marginal)	1.51 - 2.00
3 (Good)	0.51 - 1.00	0 (Unsatisfactory)	greater than 2.00
2 (Satisfactory)	1.01 - 1.50	NR (Not Rated)	

Analyte =		Antimony		Selenium		Silica		Strontium		Thallium	
MPV =		22.1 µg/L		3.67 µg/L		5.90 mg/L		41.2 µg/L		22.0 µg/L	
F-pseudosigma =		1.52		0.615		0.244		1.85		0.99	
Lab		RV	Rating	RV	Rating	RV	Rating	RV	Rating	RV	Rating
1		21.7	4	3.53	4	5.92	4	42.1	4	21.8	4
5		31.9	0	3.67	4	5.65	3	39	2	--	--
10		--	--	3	2	--	--	--	--	--	--
12		--	--	2	0	--	--	--	--	--	--
16		21	3	3	2	--	--	40	3	21	3
21		--	--	--	--	--	--	--	--	--	--
23		22.71	4	4.35	2	--	--	--	--	22.77	3
24		--	--	--	--	6.05	4	41.1	4	--	--
25		--	--	<16	NR	5.11	0	<39	NR	19.6	0
32		21.3	4	4	3	5.95	4	41	4	21.8	4
42		20.6	3	3.29	3	5.64	3	47.5	0	21.1	3
45		--	--	4.12	3	--	--	--	--	--	--
46		--	--	--	--	--	--	--	--	--	--
50		23	3	3.82	4	--	--	40.6	4	23.2	2
59		25	1	<10	NR	--	--	41.2	4	--	--
64		--	--	--	--	5.9	4	--	--	--	--
70		22.2	4	5	0	5.93	4	--	--	22	4
76		--	--	--	--	--	--	41.03	4	21.74	4
84		--	--	--	--	--	--	--	--	--	--
86		--	--	--	--	--	--	40.4	4	--	--
89		33.3	0	2.78	2	5.9	4	--	--	26.3	0
93		--	--	--	--	--	--	--	--	--	--
96		22.3	4	<5	NR	--	--	--	--	21.4	3
97		21	3	5.12	0	6.3	2	40.3	4	24.3	0
100		23.1	3	3.86	4	7.07	0	42.8	3	22.2	4
109		--	--	--	--	--	--	--	--	--	--
110		--	--	--	--	5.763	4	--	--	--	--
113		21.6	4	--	--	--	--	40.6	4	20.2	1
121		--	--	--	--	5.9	4	40	3	--	--
138		21.2	3	3.92	4	--	--	38.7	2	22.8	3
142		23.9	2	4.27	3	6.4	1	41.5	4	21.1	3
146		25.9	0	<10.0	NR	--	--	--	--	22.3	4
147		--	--	--	--	--	--	--	--	--	--
180		21.2	3	3.57	4	--	--	--	--	21.5	4
190		--	--	3.6	4	5.9	4	--	--	--	--
193		22.5	4	<5	NR	--	--	--	--	--	--
198		23	3	4.21	3	--	--	--	--	23.3	2
212		20.7	3	<5.0	NR	6.02	4	42.1	4	22.5	4
224		--	--	--	--	5.779	4	--	--	--	--
227		--	--	--	--	--	--	--	--	--	--
234		21.5	4	3.24	3	5.94	4	41.7	4	21.9	4
247		20.3	2	<4.08	NR	--	--	40.6	4	22.5	4
254		--	--	--	--	6.27	2	43.1	3	--	--
255		--	--	3.2	3	--	--	--	--	--	--
256		24.04	2	3.14	3	5.45	1	45.7	0	28.9	0

Table 5. Laboratory performance ratings for standard reference sample T-167 (trace constituents) -- continued

[MPV, most probable value; Lab, laboratory number; OLR, overall laboratory rating for all rated analyses; µg/L, micrograms per liter; mg/L, milligrams per liter; V/28, number of rated analyses out of 28 possible; RV, reported value; <, less than; NR, not rated; --, not reported.]

Rating	Absolute Z-value	Rating	Absolute Z-value
4 (Excellent)	0.00 - 0.50	1 (Marginal)	1.51 - 2.00
3 (Good)	0.51 - 1.00	0 (Unsatisfactory)	greater than 2.00
2 (Satisfactory)	1.01 - 1.50	NR (Not Rated)	

Analyte =		Antimony		Selenium		Silica		Strontium		Thallium	
MPV =		22.1 µg/L		3.67 µg/L		5.90 mg/L		41.2 µg/L		22.0 µg/L	
F-pseudosigma =		1.52		0.615		0.244		1.85		0.99	
Lab		RV	Rating	RV	Rating	RV	Rating	RV	Rating	RV	Rating
259		--	--	--	--	5.8	4	42.2	4	--	--
265		22	4	4	3	5.6	2	42	4	21	3
270		--	--	--	--	--	--	--	--	--	--
277		--	--	--	--	--	--	--	--	--	--
279		--	--	--	--	--	--	--	--	--	--
301		--	--	--	--	--	--	--	--	--	--
304		22.1	4	3.63	4	--	--	39.5	3	21.9	4
307		--	--	4.9	1	--	--	--	--	--	--
315		--	--	--	--	--	--	--	--	--	--
326		--	--	--	--	--	--	42.4	3	--	--
328		22	4	3.5	4	6.11	3	43	3	22	4
330		23.5	3	4.21	3	6.3	2	42.8	3	22.9	3
331		21.6	4	--	--	--	--	36.3	0	--	--
332		--	--	--	--	--	--	47.86	0	--	--
334		25	1	3.8	4	5.78	4	38	1	22	4
336		--	--	--	--	--	--	--	--	--	--
356		21.3	4	3.55	4	--	--	47.6	0	22.4	4
370		20.9	3	<5	NR	2.9	0	49.4	0	27.3	0
372		<2	0	<5	NR	5.16	0	31	0	5	0

Table 5. Laboratory performance ratings for standard reference sample T-167 (trace constituents) -- continued

[MPV, most probable value; Lab, laboratory number; OLR, overall laboratory rating for all rated analyses; µg/L, micrograms per liter; mg/L, milligrams per liter; V/28, number of rated analyses out of 28 possible; RV, reported value; <, less than; NR, not rated; --, not reported.]

Rating	Absolute Z-value	Rating	Absolute Z-value
4 (Excellent)	0.00 - 0.50	1 (Marginal)	1.51 - 2.00
3 (Good)	0.51 - 1.00	0 (Unsatisfactory)	greater than 2.00
2 (Satisfactory)	1.01 - 1.50	NR (Not Rated)	

Analyte =		Uranium		Vanadium		Zinc	
MPV =		4.00 µg/L		16.8 µg/L		3.90 µg/L	
F-pseudosigma =		0.222		1.19		0.600	
Lab		RV	Rating	RV	Rating	RV	Rating
1		3.75	2	16.8	4	3.61	4
5		--	--	19.3	0	4.28	3
10		--	--	--	--	5	1
12		--	--	--	--	3.4	3
16		4	4	17	4	3	2
21		--	--	--	--	--	--
23		--	--	--	--	--	--
24		--	--	17.5	3	3.4	3
25		--	--	<19	NR	<3	NR
32		3.7	2	17.8	3	4	4
42		3.84	3	15.9	3	3.59	3
45		--	--	--	--	--	--
46		--	--	--	--	--	--
50		--	--	17.3	4	3.76	4
59		--	--	16.4	4	< 10	NR
64		--	--	--	--	--	--
70		4.76	0	16.4	4	<20.0	NR
76		--	--	16.91	4	--	--
84		--	--	--	--	--	--
86		--	--	17	4	5.08	1
89		--	--	25.3	0	3.1	2
93		--	--	16.4	4	3.35	3
96		--	--	<40	NR	<10	NR
97		--	--	15.6	3	<5.0	NR
100		--	--	16	3	<5	NR
109		--	--	--	--	--	--
110		--	--	--	--	--	--
113		--	--	--	--	--	--
121		--	--	18	2	10	0
138		--	--	16.4	4	4.01	4
142		3.73	2	16.8	4	4.24	3
146		--	--	17.2	4	<20.0	NR
147		--	--	--	--	3.71	4
180		--	--	15.6	3	3.8	4
190		--	--	--	--	--	--
193		--	--	--	--	<25	NR
198		--	--	17.7	3	--	--
212		4.2	3	16.5	4	5.2	0
224		--	--	12.7	0	<7	NR
227		--	--	--	--	3.58	3
234		--	--	16.6	4	3.78	4
247		--	--	15.7	3	<5.1	NR
254		3.9	4	17.8	3	<5	NR
255		--	--	--	--	2.5	0
256		--	--	18.36	2	--	--

Table 5. Laboratory performance ratings for standard reference sample T-167 (trace constituents) -- continued

[MPV, most probable value; Lab, laboratory number; OLR, overall laboratory rating for all rated analyses; µg/L, micrograms per liter; mg/L, milligrams per liter; V/28, number of rated analyses out of 28 possible; RV, reported value; <, less than; NR, not rated; --, not reported.]

Rating	Absolute Z-value	Rating	Absolute Z-value
4 (Excellent)	0.00 - 0.50	1 (Marginal)	1.51 - 2.00
3 (Good)	0.51 - 1.00	0 (Unsatisfactory)	greater than 2.00
2 (Satisfactory)	1.01 - 1.50	NR (Not Rated)	

Analyte =		Uranium		Vanadium		Zinc	
MPV =		4.00 µg/L		16.8 µg/L		3.90 µg/L	
F-pseudosigma =		0.222		1.19		0.600	
Lab		RV	Rating	RV	Rating	RV	Rating
259		--	--	--	--	--	--
265		3.8	3	17	4	4	4
270		--	--	--	--	--	--
277		--	--	--	--	3	2
279		--	--	--	--	--	--
301		--	--	--	--	--	--
304		--	--	16.3	4	3.38	3
307		--	--	--	--	8	0
315		--	--	--	--	--	--
326		--	--	--	--	4.3	3
328		4	4	16	3	5	1
330		4.03	4	16.7	4	3.94	4
331		--	--	14.9	1	6	0
332		4.24	2	--	--	--	--
334		4.1	4	16	3	3.9	4
336		--	--	--	--	--	--
356		--	--	18.7	1	4.3	3
370		--	--	29.3	0	<30	NR
372		--	--	5	0	<2	0

Table 6. Laboratory performance ratings for standard reference sample M-160 (major constituents)

[MPV, most probable value; Lab, laboratory number; OLR, overall laboratory rating for all rated analyses; mg/L, micrograms per liter; mg/L, milligrams per liter; mS/cm, microsiemens per centimeter at 25 degrees Celsius; V/16, number of rated analyses out of 16 possible; RV, reported value; <, less than; NR, not rated; --, not reported.]

Rating		Absolute Z-value		Rating		Absolute Z-value	
4 (Excellent)		0.00 - 0.50		1 (Marginal)		1.51 - 2.00	
3 (Good)		0.51 - 1.00		0 (Unsatisfactory)		greater than 2.00	
2 (Satisfactory)		1.01 - 1.50		NR (Not Rated)			

Analyte =			Alkalinity		Boron		Calcium		Chloride		Fluoride	
MPV =			74.0 mg/L		89.0 µg/L		13.7 mg/L		74.7 mg/L		0.240 mg/L	
F-pseudosigma =			2.93		5.11		0.94		2.34		0.0237	
Lab	OLR	V/16	RV	Rating	RV	Rating	RV	Rating	RV	Rating	RV	Rating
1	3.1	15	78.4	2	102	0	14	4	73.2	4	0.215	2
4	4.0	1	74	4	--	--	--	--	--	--	--	--
5	2.1	15	71.57	3	78.3	0	12.8	3	74.7	4	0.13	0
10	3.6	12	74.6	4	--	--	13.6	4	69.2	2	0.25	4
12	2.4	11	70	2	--	--	14	4	76	4	--	--
16	2.6	15	71	3	92	3	13	3	78.9	2	0.19	0
23	3.2	12	70	2	--	--	14.4	3	75	4	0.252	4
24	3.7	13	75	4	89	4	13.7	4	72.9	4	0.247	4
25	1.8	15	160	0	80	1	10.1	0	67.5	1	0.28	1
32	2.9	16	72.3	4	85	3	14	4	76.6	4	0.249	4
38	3.1	9	36.04	0	--	--	14.53	3	--	--	--	--
42	2.8	15	74	4	88.3	4	14.3	3	77.1	3	0.25	4
45	2.9	11	72	3	--	--	13.5	4	75.1	4	0.2	1
50	3.2	14	84.4	0	84.6	3	13.8	4	75	4	0.164	0
59	3.6	15	72.1	3	82.3	2	13.5	4	76	4	0.24	4
64	3.3	9	--	--	--	--	13.7	4	74.4	4	--	--
70	3.2	13	73	4	--	--	13	3	73.3	4	0.43	0
76	3.8	4	--	--	--	--	13.65	4	74.57	4	--	--
84	2.9	7	--	--	--	--	13.5	4	79	2	0.19	0
85	3.3	15	73.4	4	90	4	13.7	4	73.5	4	0.27	2
86	2.6	9	--	--	100	0	13.71	4	--	--	--	--
89	3.1	14	74.9	4	--	--	12.8	3	74.7	4	0.27	2
93	2.8	11	75.9	3	--	--	13.4	4	76.7	3	--	--
96	3.0	7	73	4	--	--	--	--	76.7	3	0.196	1
97	3.4	15	74.1	4	--	--	13.1	3	74.7	4	0.242	4
100	2.1	15	91.8	0	85.2	3	10.3	0	75.1	4	0.22	3
109	2.4	11	105.75	0	--	--	14	4	58.5	0	0.22	3
113	3.7	14	72.6	4	--	--	13.4	4	74.5	4	0.246	4
118	3.4	5	75.4	4	--	--	--	--	--	--	--	--
121	3.2	6	--	--	--	--	12.5	2	--	--	--	--
138	3.7	16	75.1	4	84.4	3	13.2	3	74.1	4	0.235	4
142	3.1	16	81	1	89.3	4	14.1	4	77.7	3	0.26	3
146	2.8	13	72.7	4	--	--	12.9	3	78.9	2	0.236	4
149	2.7	3	72	3	--	--	--	--	--	--	--	--
155	3.1	7	72	3	--	--	15.1405	1	--	--	--	--
190	3.3	13	73	4	--	--	12.6	2	74.1	4	0.225	3
193	2.9	7	77.5	3	--	--	14.3	3	--	--	--	--
208	4.0	2	--	--	--	--	--	--	74.1	4	--	--
212	3.4	16	71.7	3	93.8	3	13.6	4	73.2	4	0.22	3
224	2.5	13	68	1	--	--	74.649	0	74.49	4	0.338	0
227	3.0	6	73.5	4	--	--	--	--	69.48	2	--	--
234	3.8	16	76	3	90	4	13.8	4	73.5	4	0.27	2
254	3.2	10	--	--	87.4	4	14.44	3	74	4	--	--
255	2.6	5	--	--	92	3	15	2	--	--	0.231	4
256	2.8	14	75	4	--	--	13.03	3	75.57	4	0.4	0

Table 6. Laboratory performance ratings for standard reference sample M-160 (major constituents) -- continued

[MPV, most probable value; Lab, laboratory number; OLR, overall laboratory rating for all rated analyses; mg/L, micrograms per liter; mg/L, milligrams per liter; mS/cm, microsiemens per centimeter at 25 degrees Celsius; V/16, number of rated analyses out of 16 possible; RV, reported value; <, less than; NR, not rated; --, not reported.]

Rating	Absolute Z-value	Rating	Absolute Z-value
4 (Excellent)	0.00 - 0.50	1 (Marginal)	1.51 - 2.00
3 (Good)	0.51 - 1.00	0 (Unsatisfactory)	greater than 2.00
2 (Satisfactory)	1.01 - 1.50	NR (Not Rated)	

Analyte =			Potassium		Magnesium		Sodium		pH		Residue on Evaporation	
MPV =			2.20 mg/L		15.0 mg/L		72.5 mg/L		10.2		299 mg/L	
F-pseudosigma =			0.156		0.59		2.48		0.24		8.9	
Lab	OLR	V/16	RV	Rating	RV	Rating	RV	Rating	RV	Rating	RV	Rating
259	--	--	2.28	3	15.7	3	75.1	3	10.17	4	300	4
263	--	--	--	--	14.8	4	--	--	10.2	4	300	4
265	--	--	2.1	3	14.9	4	72.5	4	--	--	--	--
266	--	--	2.2	4	14.1	2	73	4	10.23	4	305	4
269	--	--	--	--	--	--	--	--	--	--	--	--
270	--	--	2.2	4	--	--	73.4	4	--	--	--	--
277	--	--	2.7	0	15.8	2	67.5	2	10.05	4	305	4
279	--	--	2.44	1	--	--	72.4	4	--	--	--	--
307	--	--	--	--	--	--	74.3	4	10.38	4	--	--
315	--	--	2.48	1	15.1	4	71.2	4	--	--	--	--
319	--	--	--	--	--	--	--	--	--	--	--	--
326	--	--	2.72	0	15.54	3	71.97	4	10.32	4	--	--
328	--	--	1.8	0	16	2	71	4	10.2	4	296	4
330	--	--	2.3	3	15	4	79	1	10.3	4	296	4
331	--	--	--	--	14.7	4	69.8	3	9.71	3	318	2
332	--	--	2.06	3	14.82	4	75.72	3	--	--	--	--
333	--	--	--	--	--	--	--	--	--	--	--	--
334	--	--	2	2	15	4	69	3	10.52	3	310	3
336	--	--	1.83	0	21.82	0	73.5	4	9.35	1	297	4
341	--	--	2.06	3	14.6	3	69.3	3	10.39	4	300	4
366	--	--	2.1	3	14.5	3	68.8	2	9.96	3	284	3
370	--	--	3.96	0	15.7	3	81.8	0	10.2	4	398	0
372	--	--	2.23	4	14.8	4	58.7	0	10.5	3	304	4

Table 6. Laboratory performance ratings for standard reference sample M-160 (major constituents) -- continued

[MPV, most probable value; Lab, laboratory number; OLR, overall laboratory rating for all rated analyses; mg/L, micrograms per liter; mg/L, milligrams per liter; mS/cm, microsiemens per centimeter at 25 degrees Celsius; V/16, number of rated analyses out of 16 possible; RV, reported value; <, less than; NR, not rated; --, not reported.]

Rating		Absolute Z-value		Rating		Absolute Z-value	
4 (Excellent)		0.00 - 0.50		1 (Marginal)		1.51 - 2.00	
3 (Good)		0.51 - 1.00		0 (Unsatisfactory)		greater than 2.00	
2 (Satisfactory)		1.01 - 1.50		NR (Not Rated)			

Lab	Analyte =		Silica		Sulfate		Specific Conductance		Strontium		Phosphorus as P	
	MPV =		3.96 mg/L		73.3 mg/L		560 µS/cm		43.9 µg/L		0.152 mg/L	
	F-pseudosigma =		0.274		3.59		22.2		2.08		0.0148	
	RV	Rating	RV	Rating	RV	Rating	RV	Rating	RV	Rating	RV	Rating
1	3.93	4	72	4	559	4	45.5	3	--	--	--	--
4	--	--	--	--	--	--	--	--	--	--	--	--
5	3.68	2	68.9	2	508	1	42.1	3	--	--	--	--
10	3.8	3	72	4	575	3	--	--	--	--	--	--
12	--	--	60	0	510	1	--	--	0.16	3	--	--
16	--	--	66.5	1	443	0	44	4	0.144	3	--	--
23	3.8	3	74.8	4	586	3	--	--	0.28	0	--	--
24	4.14	3	74.6	4	572	4	45.4	3	--	--	--	--
25	3.08	0	75.7	3	574	4	43	4	0.14	3	--	--
32	4.25	2	73.5	4	609	1	44	4	0.525	0	--	--
38	--	--	--	--	540.1	3	--	--	0.152	4	--	--
42	3.66	2	76.8	3	549	4	51.5	0	0.147	4	--	--
45	--	--	74	4	560	4	--	--	--	--	--	--
50	3.94	4	76.5	3	560	4	--	--	0.151	4	--	--
59	--	--	74.5	4	540	3	43	4	0.142	3	--	--
64	4.09	4	75.5	3	577	3	--	--	--	--	--	--
70	4.14	3	75.5	3	569	4	--	--	0.179	1	--	--
76	--	--	75.66	3	--	--	--	--	--	--	--	--
84	--	--	71.1	3	--	--	--	--	--	--	--	--
85	4.2	3	78.2	2	536	3	--	--	0.157	4	--	--
86	--	--	--	--	582	3	41.6	2	0.134	2	--	--
89	4.4	1	73.4	4	552	4	--	--	0.15	4	--	--
93	4.55	0	76	3	544.5	3	--	--	0.144	3	--	--
96	--	--	71	3	600	2	--	--	--	--	--	--
97	3.99	4	66.3	1	553	4	43.8	4	0.14	3	--	--
100	4.64	0	75.6	3	529	2	42.7	3	--	--	--	--
109	--	--	67	1	545.8	4	--	--	--	--	--	--
113	3.597	2	72.6	4	575	3	43.2	4	0.152	4	--	--
118	3.87	4	--	--	570	4	--	--	--	--	--	--
121	3.72	3	--	--	--	--	42	3	--	--	--	--
138	3.89	4	73.9	4	542	3	43.3	4	0.15	4	--	--
142	4.26	2	77.9	2	582	3	44	4	0.161	3	--	--
146	--	--	78.5	2	523	2	--	--	0.199	0	--	--
149	--	--	--	--	600	2	--	--	--	--	--	--
155	3.9861	4	--	--	545	3	--	--	0.153	4	--	--
190	3.8	3	73.8	4	587	3	--	--	0.152	4	--	--
193	4.3	2	--	--	578	3	--	--	--	--	--	--
208	--	--	73	4	--	--	--	--	--	--	--	--
212	3.9	4	73.2	4	532	3	45.1	3	0.089	0	--	--
224	4.024	4	72.556	4	549	4	--	--	0.17	2	--	--
227	--	--	70.63	3	--	--	--	--	0.141	3	--	--
234	4	4	72.3	4	567	4	43.3	4	0.16	3	--	--
254	4.19	3	74	4	--	--	50.1	0	--	--	--	--
255	--	--	67.1	1	--	--	--	--	--	--	--	--
256	3.63	2	75.42	3	586	3	45.58	3	0.227	0	--	--

Table 6. Laboratory performance ratings for standard reference sample M-160 (major constituents) -- continued

[MPV, most probable value; Lab, laboratory number; OLR, overall laboratory rating for all rated analyses; mg/L, micrograms per liter; mg/L, milligrams per liter; mS/cm, microsiemens per centimeter at 25 degrees Celsius; V/16, number of rated analyses out of 16 possible; RV, reported value; <, less than; NR, not rated; --, not reported.]

Rating	Absolute Z-value	Rating	Absolute Z-value
4 (Excellent)	0.00 - 0.50	1 (Marginal)	1.51 - 2.00
3 (Good)	0.51 - 1.00	0 (Unsatisfactory)	greater than 2.00
2 (Satisfactory)	1.01 - 1.50	NR (Not Rated)	

Analyte =		Silica		Sulfate		Specific Conductance		Strontium		Phosphorus as P	
MPV =		3.96 mg/L		73.3 mg/L		560 µS/cm		43.9 µg/L		0.152 mg/L	
F-pseudosigma =		0.274		3.59		22.2		2.08		0.0148	
Lab		RV	Rating	RV	Rating	RV	Rating	RV	Rating	RV	Rating
259		4.03	4	74	4	575	3	45.2	3	--	--
263		--	--	75.6	3	574.5	3	--	--	--	--
265		3.7	3	72	4	--	--	44	4	--	--
266		3.9	4	74.5	4	570	4	--	--	--	--
269		--	--	--	--	571	4	--	--	--	--
270		--	--	--	--	--	--	--	--	--	--
277		--	--	72.1	4	644	0	--	--	--	--
279		--	--	--	--	--	--	--	--	--	--
307		--	--	68.2	2	--	--	--	--	0.141	3
315		--	--	5.36	0	--	--	--	--	--	--
319		--	--	--	--	--	--	--	--	--	--
326		--	--	70.66	3	--	--	42.7	3	--	--
328		4.11	3	68	2	565	4	47	2	0.14	3
330		4.2	3	76	3	--	--	--	--	--	--
331		--	--	72.3	4	546	4	452	0	--	--
332		--	--	--	--	--	--	50.98	0	--	--
333		4.17	3	--	--	--	--	43.5	4	--	--
334		3.83	4	66	1	550	4	41	2	0.14	3
336		--	--	58.58	0	--	--	--	--	--	--
341		--	--	77	3	555	4	39	0	0.154	4
366		--	--	72.2	4	542	3	--	--	0.133	2
370		1.91	0	74.9	4	560	4	54.7	0	0.17	2
372		3.81	3	67.2	1	580	3	34	0	0.181	1

Table 6. Laboratory performance ratings for standard reference sample M-160 (major constituents) -- continued

[MPV, most probable value; Lab, laboratory number; OLR, overall laboratory rating for all rated analyses; mg/L, micrograms per liter; mg/L, milligrams per liter; mS/cm, microsiemens per centimeter at 25 degrees Celsius; V/16, number of rated analyses out of 16 possible; RV, reported value; <, less than; NR, not rated; --, not reported.]

Rating	Absolute Z-value	Rating	Absolute Z-value
4 (Excellent)	0.00 - 0.50	1 (Marginal)	1.51 - 2.00
3 (Good)	0.51 - 1.00	0 (Unsatisfactory)	greater than 2.00
2 (Satisfactory)	1.01 - 1.50	NR (Not Rated)	

Analyte = Vanadium			
MPV = 14.1 µg/L			
F-pseudosigma = 1.26			
Lab	RV	Rating	
1	14.7	4	
4	--	--	
5	14.5	4	
10	--	--	
12	--	--	
16	14	4	
23	--	--	
24	--	--	
25	<19	NR	
32	14.4	4	
38	--	--	
42	13.2	3	
45	--	--	
50	--	--	
59	13.9	4	
64	--	--	
70	--	--	
76	14.26	4	
84	--	--	
85	11	0	
86	17.9	0	
89	20.7	0	
93	--	--	
96	--	--	
97	12.5	2	
100	15	3	
109	--	--	
113	--	--	
118	--	--	
121	15	3	
138	13.3	3	
142	14.7	4	
146	12.8	2	
149	--	--	
155	--	--	
190	--	--	
193	--	--	
208	--	--	
212	13.8	4	
224	--	--	
227	--	--	
234	14.6	4	
254	14.9	3	
255	--	--	
256	14.48	4	

Analyte = Vanadium			
MPV = 14.1 µg/L			
F-pseudosigma = 1.26			
Lab	RV	Rating	
259	--	--	
263	--	--	
265	14	4	
266	--	--	
269	--	--	
270	--	--	
277	--	--	
279	--	--	
307	--	--	
315	--	--	
319	--	--	
326	--	--	
328	7	0	
330	--	--	
331	--	--	
332	--	--	
333	--	--	
334	13	3	
336	--	--	
341	13	3	
366	--	--	
370	50.8	0	
372	2	0	

Table 7. Laboratory performance ratings for standard reference sample N-71 (nutrient constituents)

[MPV, most probable value; Lab, laboratory number; OLR, overall laboratory rating for all rated analyses; mg/L, milligrams per liter; V/5, number of rated analyses out of 5 possible; RV, reported value; <, less than; NR, not rated; --, not reported.]

Rating	Absolute Z-value	Rating	Absolute Z-value
4 (Excellent)	0.00 - 0.50	1 (Marginal)	1.51 - 2.00
3 (Good)	0.51 - 1.00	0 (Unsatisfactory)	greater than 2.00
2 (Satisfactory)	1.01 - 1.50	NR (Not Rated)	

		Analyte =		Ammonia as N		Ammonia + Organic N as N		Nitrate as N		Phosphorus as P		Orthophosphate as P	
		MPV =		0.063 mg/L		0.091 mg/L		0.067 mg/L		0.068 mg/L		0.064 mg/L	
		F-pseudosigma =		0.0074		0.0715		0.0052		0.0037		0.0037	
Lab	OLR	V/5	RV	Rating	RV	Rating	RV	Rating	RV	Rating	RV	Rating	
1	3.8	5	0.057	3	0.069	4	0.065	4	0.069	4	0.065	4	
5	3.0	4	0.073	2	--	--	0.069	4	0.064	2	0.063	4	
10	3.0	5	0.06	4	0.08	4	0.08	0	0.068	4	0.067	3	
12	1.6	5	0.355	0	0.34	0	0.068	4	0.06	0	0.064	4	
16	2.0	5	0.11	0	0.053	3	0.08	0	0.069	4	0.067	3	
21	3.8	5	0.0625	4	0.0729	4	0.0643	3	0.0679	4	0.0637	4	
23	0.5	2	0.133	0	<0.50	NR	0.077	1	<0.10	NR	<0.10	NR	
25	1.8	4	<0.02	0	<0.07	NR	0.068	4	0.07	3	0.08	0	
31	3.8	5	0.0625	4	0.0729	4	0.0643	3	0.0679	4	0.0637	4	
33	2.0	3	0.061	4	--	--	0.073	2	--	--	0.056	0	
38	2.8	5	0.091	0	0.11	4	0.063	3	0.07	3	0.063	4	
42	1.3	3	--	--	--	--	0.07	3	0.0744	1	0.053	0	
46	3.3	4	0.06	4	--	--	0.06	2	0.067	4	0.066	3	
51	3.6	5	0.06	4	0.063	4	0.06	2	0.067	4	0.065	4	
53	2.0	2	--	--	--	--	0.067	4	--	--	0.106	0	
59	3.4	5	0.06	4	0.096	4	0.07	3	0.064	2	0.064	4	
64	2.0	3	0.08	0	--	--	0.07	3	--	--	0.067	3	
70	0.6	5	0.17	0	0.178	2	0.059	1	0.124	0	0.03	0	
72	0.4	5	0.03	0	0.19	2	0.24	0	0.035	0	0.05	0	
85	3.2	5	0.064	4	0.07	4	0.063	3	0.073	2	0.062	3	
89	3.2	5	0.06	4	0.156	3	0.061	2	0.066	3	0.064	4	
91	2.3	3	0.059	3	<0.1	NR	0.067	4	0.059	0			
93	3.3	4	0.066	4	--	--	0.066	4	0.067	4	0.058	1	
96	3.0	4	0.064	4	<0.150	NR	0.068	4	0.07	3	0.058	1	
100	0.5	4	0.28	0	0.89	0	0.06	2	--	--	<0.05	0	
110	1.0	2	0.041	0	--	--	0.061	2	--	--			
113	4.0	4	0.063	4	<0.5	NR	0.068	4	0.069	4	0.065	4	
118	2.6	5	0.055	2	0.061	4	0.06	2	0.065	3	0.06	2	
138	4.0	5	0.061	4	0.0712	4	0.0666	4	0.0692	4	0.0645	4	
142	1.6	5	0.0897	0	0.0836	4	0.0654	4	0.088	0	0.0716	0	
146	2.0	5	0.067	3	0.143	3	0.0698	3	0.0621	1	0.094	0	
155	4.0	5	0.06065	4	0.06507	4	0.064694	4	0.06806	4	0.06506	4	
180	2.8	5	0.064	4	0.059	4	0.056	0	0.07	3	0.062	3	
190	3.6	5	0.066	4	0.104	4	0.067	4	0.064	2	0.064	4	
193	3.0	4	0.06	4	0.11	4	0.05	0	0.069	4			
198	2.8	4	0.063	4	--	--	0.063	3	0.0665	4	0.0539	0	
224	0.8	5	0.18	0	0.205	1	0.076	1	0.085	0	0.068	2	
234	1.0	4	0.104	0	--	--	0.073	2	0.073	2	0.074	0	
247	2.8	5	0.0634	4	0.124	4	0.0708	3	0.0709	3	0.0805	0	
313	4.0	3	--	--	--	--	0.0675	4	0.0697	4	0.0642	4	
316	3.6	5	0.0654	4	0.0919	4	0.0631	3	0.065	3	0.0636	4	
317	0.7	3	0.053	2	--	--	0.117	0	--	--	0.095	0	
318	3.0	5	0.042	0	0.0723	4	0.0677	4	0.0669	4	0.0669	3	
320	3.5	4	0.067	3	--	--	0.065	4	0.065	3	0.065	4	
328	1.5	4	0.07	3	0.78	0	--	--	0.07	3	0.21	0	

Table 7. Laboratory performance ratings for standard reference sample N-71 (nutrient constituents) -- continued

[MPV, most probable value; Lab, laboratory number; OLR, overall laboratory rating for all rated analyses; mg/L, milligrams per liter; V/5, number of rated analyses out of 5 possible; RV, reported value; <, less than; NR, not rated; --, not reported.]

Rating	Absolute Z-value	Rating	Absolute Z-value
4 (Excellent)	0.00 - 0.50	1 (Marginal)	1.51 - 2.00
3 (Good)	0.51 - 1.00	0 (Unsatisfactory)	greater than 2.00
2 (Satisfactory)	1.01 - 1.50	NR (Not Rated)	

Ammonia +												Orthophosphate	
Analyte =			Ammonia as N		Organic N as N		Nitrate as N		Phosphorus as P		as P		
MPV =			0.063 mg/L		0.091 mg/L		0.067 mg/L		0.068 mg/L		0.064 mg/L		
F-pseudosigma =			0.0074		0.0715		0.0052		0.0037		0.0037		
Lab	OLR	V/5	RV	Rating	RV	Rating	RV	Rating	RV	Rating	RV	Rating	
333	4.0	2	0.065	4	--	--	0.067	4	--	--			
341	3.0	5	0.062	4	0.08	4	0.062	3	0.071	3	0.057	1	
366	2.3	4	0.053	2	<0.10	NR	0.072	3	0.056	0	0.065	4	
368	4.0	2	--	--	--	--	--	--	0.067	4	0.063	4	
369	1.8	4	<0.1	NR	0.2	1	0.06	2	0.076	0	0.063	4	
370	0.5	4	<0.1	NR	0.46	0	0.09	0	0.08	0	0.06	2	
372	2.0	5	0.06	4	0.09	4	0.04	0	0.093	0	0.06	2	
373	3.4	5	0.066	4	0.051	3	0.066	4	0.063	2	0.064	4	

Table 8. Laboratory performance ratings for standard reference sample N-72 (nutrient constituents)

[MPV, most probable value; Lab, laboratory number; OLR, overall laboratory rating for all rated analyses; mg/L, milligrams per liter; V/5, number of rated analyses out of 5 possible; RV, reported value; <, less than; NR, not rated; --, not reported.]

Rating		Absolute Z-value		Rating		Absolute Z-value	
4 (Excellent)		0.00 - 0.50		1 (Marginal)		1.51 - 2.00	
3 (Good)		0.51 - 1.00		0 (Unsatisfactory)		greater than 2.00	
2 (Satisfactory)		1.01 - 1.50		NR (Not Rated)			

Lab	Analyte =		Ammonia as N		Ammonia + Organic N as N		Nitrate as N		Phosphorus as P		Orthophosphate as P	
	MPV =		0.740 mg/L		0.780 mg/L		0.630 mg/L		0.749 mg/L		0.711 mg/L	
	F-pseudosigma =		0.0510		0.0600		0.0226		0.0293		0.0208	
	OLR	V/5	RV	Rating	RV	Rating	RV	Rating	RV	Rating	RV	Rating
1	3.6	5	0.707	3	0.769	4	0.609	3	0.748	4	0.707	4
5	1.3	4	0.73	4	--	--	0.688	1	0.883	0	0.794	0
10	3.8	5	0.72	4	0.78	4	0.64	4	0.764	4	0.738	3
12	3.0	5	0.766	3	0.92	0	0.623	4	0.749	4	0.703	4
16	2.6	5	0.76	4	0.66	1	0.58	1	0.724	3	0.711	4
23	2.8	5	0.69	3	0.784	4	0.568	1	0.799	2	0.701	4
25	1.6	5	0.65	1	1.46	0	0.63	4	0.59	0	0.69	3
33	2.0	3	0.811	2	--	--	0.624	4	--	--	0.591	0
38	2.8	5	0.837	1	0.76	4	0.638	4	0.685	1	0.693	4
42	3.3	3	--	--	--	--	0.613	3	0.753	4	0.744	3
46	3.8	5	0.722	4	0.804	4	0.635	4	0.762	4	0.746	3
53	2.0	2	--	--	--	--	0.747	0	--	--	0.717	4
59	3.6	5	0.735	4	0.805	4	0.652	3	0.715	3	0.712	4
64	3.7	3	0.74	4	--	--	0.65	3	--	--	0.72	4
70	2.2	5	0.84	1	0.782	4	0.59	2	0.886	0	0.71	4
72	1.0	5	0.67	2	0.95	0	0.94	0	0.66	0	0.68	3
84	2.0	3	0.79	3	--	--	0.6	3	--	--	0.81	0
85	3.8	5	0.744	4	0.79	4	0.63	4	0.78	3	0.7	4
86	2.7	3	0.619	0	--	--	0.629	4	0.758	4		
89	3.8	5	0.706	3	0.803	4	0.64	4	0.748	4	0.704	4
91	3.5	4	0.69	3	0.73	3	0.633	4	0.766	4		
93	3.5	4	0.708	3	--	--	0.645	4	0.74	4	0.689	3
96	3.6	5	0.739	4	0.725	3	0.658	3	0.757	4	0.717	4
100	1.3	4	0.53	0	2.02	0	0.57	1	--	--	0.7	4
102	3.0	5	0.801	2	0.78	4	0.62	4	0.734	4	0.653	1
113	4.0	5	0.718	4	0.78	4	0.645	4	0.745	4	0.7	4
118	3.4	5	0.74	4	0.752	4	0.686	1	0.736	4	0.711	4
138	3.8	5	0.715	4	0.813	3	0.634	4	0.731	4	0.711	4
142	3.2	5	0.716	4	0.842	2	0.61	3	0.781	3	0.716	4
146	3.0	5	0.765	4	0.832	3	0.625	4	1.01	0	0.697	4
155	3.6	5	0.7706	3	0.7905	4	0.64426	4	0.75781	4	0.74287	3
180	3.8	5	0.74	4	0.762	4	0.63	4	0.755	4	0.73	3
190	3.8	5	0.732	4	0.774	4	0.645	4	0.726	3	0.723	4
193	2.8	4	0.7	3	0.6	0	0.63	4	0.741	4		
198	4.0	4	0.764	4	--	--	0.636	4	0.749	4	0.726	4
205	2.0	2	0.8033	2	--	--	0.672	2	--	--		
208	2.0	2	--	--	--	--	0.7	0	--	--	0.7	4
224	2.4	5	0.919	0	0.685	1	0.629	4	0.74	4	0.73	3
227	1.6	5	0.948	0	0.66	1	0.625	4	2.9	0	0.73	3
234	3.0	4	0.76	4	--	--	0.6	3	0.816	1	0.724	4
247	1.2	5	0.883	0	0.886	1	0.653	3	0.593	0	0.749	2
301	0.0	2	--	--	--	--	0.348	0	--	--	0.587	0
307	2.7	3	0.848	0	--	--	0.616	4	0.744	4		
313	2.6	5	0.665	2	0.522	0	0.617	4	0.769	3	0.715	4
317	1.7	3	0.65	1	--	--	0.662	2	--	--	0.762	2

Table 8. Laboratory performance ratings for standard reference sample N-72 (nutrient constituents) -- continued

[MPV, most probable value; Lab, laboratory number; OLR, overall laboratory rating for all rated analyses; mg/L, milligrams per liter; V/5, number of rated analyses out of 5 possible; RV, reported value; <, less than; NR, not rated; --, not reported.]

<u>Rating</u>	<u>Absolute Z-value</u>	<u>Rating</u>	<u>Absolute Z-value</u>
4 (Excellent)	0.00 - 0.50	1 (Marginal)	1.51 - 2.00
3 (Good)	0.51 - 1.00	0 (Unsatisfactory)	greater than 2.00
2 (Satisfactory)	1.01 - 1.50	NR (Not Rated)	

Ammonia +												Orthophosphate	
Analyte =			Ammonia as N		Organic N as N		Nitrate as N		Phosphorus as P		as P		
MPV =			0.740 mg/L		0.780 mg/L		0.630 mg/L		0.749 mg/L		0.711 mg/L		
F-pseudosigma =			0.0510		0.0600		0.0226		0.0293		0.0208		
Lab	OLR	V/5	RV	Rating	RV	Rating	RV	Rating	RV	Rating	RV	Rating	
320	3.2	5	0.76	4	0.751	4	0.63	4	0.786	3	0.652	1	
328	1.4	5	0.79	3	1.42	0	0.59	2	0.7	2	2.15	0	
341	3.0	5	0.698	3	0.78	4	0.63	4	0.744	4	0.61	0	
356	2.8	5	0.691	3	0.651	0	0.649	3	0.749	4	0.719	4	
366	2.4	5	0.773	3	0.721	3	0.589	2	0.663	0	0.721	4	
370	3.0	5	0.76	4	1.2	0	0.64	4	0.78	3	0.7	4	
372	1.8	5	0.68	2	0.95	0	0.59	2	0.809	1	0.7	4	

Table 9. Laboratory performance ratings for standard reference sample P-37 (low-ionic strength constituents)

[MPV, most probable value; Lab, laboratory number; OLR, overall laboratory rating for all rated analyses; mg/L, milligrams per liter; mS/cm, microsiemens per centimeter at 25 degrees Celsius; V/11, number of rated analyses out of 11 possible; RV, reported value; <, less than; NR, not rated; --, not reported.]

<u>Rating</u>	<u>Absolute Z-value</u>	<u>Rating</u>	<u>Absolute Z-value</u>
4 (Excellent)	0.00 - 0.50	1 (Marginal)	1.51 - 2.00
3 (Good)	0.51 - 1.00	0 (Unsatisfactory)	greater than 2.00
2 (Satisfactory)	1.01 - 1.50	NR (Not Rated)	

Analyte =			Acidity		Calcium		Chloride		Fluoride		Potassium	
MPV =			9.01 mg/L		1.03 mg/L		3.10 mg/L		0.103 mg/L		0.500 mg/L	
F-pseudosigma =			4.744		0.116		0.148		0.0297		0.0385	
Lab	OLR	V/11	RV	Rating	RV	Rating	RV	Rating	RV	Rating	RV	Rating
1	3.1	9	--	--	1.03	4	3.24	3	0.098	4	0.479	3
2	3.8	9	--	--	1.029	4	3.167	4	0.102	4	0.516	4
5	2.0	9	--	--	0.927	3	3.14	4	0.09	4	<1.00	NR
23	3.1	10	--	--	1.6	0	3.1	4	0.102	4	0.56	1
25	2.0	10	9.01	4	0.98	4	2.6	0	0.14	2	0.59	0
33	2.8	6	--	--	--	--	3.08	4	0.078	3	--	--
38	3.1	8	0.1	1	1.08	4	--	--	--	--	0.5	4
59	1.7	9	--	--	0.74	0	2.52	0	0.11	4	0.41	0
64	3.8	9	--	--	1.02	4	3.18	3	--	--	0.48	3
85	3.5	10	--	--	0.92	3	3.2	3	0.13	3	0.49	4
86	4.0	5	--	--	0.998	4	--	--	--	--	0.504	4
89	2.2	11	3.2	2	0.79	0	2.97	3	0.155	1	0.5	4
93	3.3	9	--	--	1.01	4	3.2	3	--	--	0.47	3
110	3.8	8	--	--	1	4	3.255	3	--	--	0.5	4
113	3.3	9	--	--	1.048	4	3.05	4	0.09	4	0.525	3
138	3.3	10	--	--	1.01	4	2.66	0	0.086	3	0.479	3
155	1.3	4	--	--	1.2249	1	--	--	--	--	--	--
180	2.2	10	--	--	1.11	3	3.27	2	0.382	0	0.665	0
190	2.9	10	--	--	0.685	0	3.05	4	0.09	4	0.537	3
193	3.0	6	--	--	1.24	1	--	--	--	--	0.524	3
208	1.5	2	--	--	--	--	3.2	3	--	--	--	--
224	3.3	10	--	--	0.943	3	3.04	4	0.103	4	0.4944	4
228	3.3	8	--	--	1.01	4	3.1	4	--	--	0.452	2
247	1.7	11	4	2	0.343	0	2.82	1	0.0779	3	0.523	3
255	2.0	2	--	--	1.11	3	--	--	<0.17	NR	--	--
265	3.5	6	--	--	1.05	4	3	3	--	--	0.5	4
270	0.0	2	--	--	--	--	--	--	--	--	0.4	0
277	1.8	5	--	--	--	--	2.8	1	0.11	4	--	--
279	2.0	4	--	--	0.88	2	--	--	--	--	0.44	1
315	1.0	6	--	--	1.14	3	3	3	--	--	0.62	0
326	3.2	6	--	--	1.09	3	2.88	2	--	--	0.473	3
328	1.7	11	10	4	1.1	3	4.8	0	0.12	3	0.7	0
332	2.3	4	--	--	1.08	4	--	--	--	--	0.74	0
333	3.5	8	--	--	1.07	4	3.19	3	--	--	0.52	3
336	0.0	7	--	--	2.62	0	8.51	0	--	--	0.402	0
370	2.6	10	10	4	1.26	1	3.16	4	0.13	3	<1	NR
372	1.8	11	10	4	0.894	2	3.29	2	0.17	0	0.376	0

Table 9. Laboratory performance ratings for standard reference sample P-37 (low-ionic strength constituents)

-- continued

[MPV, most probable value; Lab, laboratory number; OLR, overall laboratory rating for all rated analyses; mg/L, milligrams per liter; mS/cm, microsiemens per centimeter at 25 degrees Celsius; V/11, number of rated analyses out of 11 possible; RV, reported value; <, less than; NR, not rated; --, not reported.]

Rating	Absolute Z-value	Rating	Absolute Z-value
4 (Excellent)	0.00 - 0.50	1 (Marginal)	1.51 - 2.00
3 (Good)	0.51 - 1.00	0 (Unsatisfactory)	greater than 2.00
2 (Satisfactory)	1.01 - 1.50	NR (Not Rated)	

Analyte =		Magnesium		Sodium		pH		Orthophosphate as P		Sulfate	
MPV =		0.506 mg/L		0.800 mg/L		4.61		0.101 mg/L		1.44 mg/L	
F-pseudosigma =		0.0289		0.0660		0.152		0.0084		0.193	
Lab		RV	Rating	RV	Rating	RV	Rating	RV	Rating	RV	Rating
1		0.507	4	0.865	3	4.97	1	--	--	1.46	4
2		0.509	4	0.857	3	4.441	3	--	--	1.467	4
5		0.441	0	0.763	3	6.45	0	0.13	0	1.63	3
23		0.51	4	0.78	4	4.66	4	0.103	4	1.72	2
25		0.49	3	0.84	3	5.12	0	0.113	2	<5	NR
33		--	--	--	--	4.52	4	0.082	0	1.41	4
38		0.484	3	0.77	4	4.6	4	0.1	4	--	--
59		0.42	0	2	0	4.64	4	--	--	1.28	3
64		0.5	4	0.79	4	4.68	4	0.103	4	1.49	4
85		0.5	4	0.82	4	4.59	4	0.1	4	1.5	4
86		0.502	4	0.785	4	--	--	--	--	--	--
89		0.55	1	0.73	2	4.46	3	0.101	4	0.14	0
93		0.5	4	0.75	3	4.67	4	0.1	4	1.44	4
110		0.477	3	0.777	4	4.61	4	--	--	1.436	4
113		0.524	3	--	--	4.56	4	0.102	4	1.94	0
138		0.506	4	0.778	4	4.7	4	0.101	4	1.4	4
155		<0.581	NR	--	--	4.1	0	0.1097	2	--	--
180		0.519	4	0.89	2	4.47	3	0.1	4	1.92	0
190		0.571	0	0.826	4	4.36	2	0.099	4	1.43	4
193		0.492	4	0.79	4	--	--	--	--	1.24	2
208		--	--	--	--	--	--	--	--	2.1	0
224		0.492	4	0.742	3	4.38	3	0.456	0	1.444	4
228		0.471	2	0.82	4	4.58	4	--	--	1.23	2
247		<0.204	0	1.05	0	4.66	4	0.128	0	1.62	3
255		0.553	1	--	--	--	--	--	--	<20	NR
265		0.53	3	0.8	4	--	--	--	--	1.34	3
270		--	--	1.3	0	--	--	--	--	--	--
277		--	--	--	--	6.09	0	--	--	1.37	4
279		0.46	1	0.8	4	--	--	--	--	--	--
315		0.87	0	1.1	0	--	--	--	--	0.1	0
326		0.506	4	0.736	3	--	--	--	--	1.38	4
328		0.5	4	0.9	1	7.29	0	0.25	0	4.1	0
332		0.54	2	0.86	3	--	--	--	--	--	--
333		0.53	3	0.83	4	4.57	4	--	--	1.49	4
336		8.64	0	0.56	0	3.86	0	--	--	0.77	0
370		0.54	2	1.14	0	4.73	3	0.1	4	1.66	2
372		0.393	0	0.272	0	4.7	4	0.1	4	3.11	0

Table 9. Laboratory performance ratings for standard reference sample P-37 (low-ionic strength constituents)

-- continued

[MPV, most probable value; Lab, laboratory number; OLR, overall laboratory rating for all rated analyses; mg/L, milligrams per liter; mS/cm, microsiemens per centimeter at 25 degrees Celsius; V/11, number of rated analyses out of 11 possible; RV, reported value; <, less than; NR, not rated; --, not reported.]

Rating	Absolute Z-value	Rating	Absolute Z-value
4 (Excellent)	0.00 - 0.50	1 (Marginal)	1.51 - 2.00
3 (Good)	0.51 - 1.00	0 (Unsatisfactory)	greater than 2.00
2 (Satisfactory)	1.01 - 1.50	NR (Not Rated)	

Analyte =		Specific Conductance	
MPV =		28.3 μ S/cm	
F-pseudosigma =		1.87	
Lab	RV	Rating	
1	26	2	
2	28.04	4	
5	25	1	
23	28.9	4	
25	31	2	
33	30.6	2	
38	25.2	1	
59	27.6	4	
64	27.8	4	
85	26	2	
86	28.31	4	
89	28.9	4	
93	25.2	1	
110	27.7	4	
113	29.2	4	
138	27	3	
155	26.25	2	
180	28.9	4	
190	29.1	4	
193	28.3	4	
208	--	--	
224	29.2	4	
228	28.28	4	
247	30.1	3	
255	--	--	
265	--	--	
270	--	--	
277	23.6	0	
279	--	--	
315	--	--	
326	--	--	
328	29	4	
332	--	--	
333	30	3	
336	--	--	
370	30	3	
372	28	4	

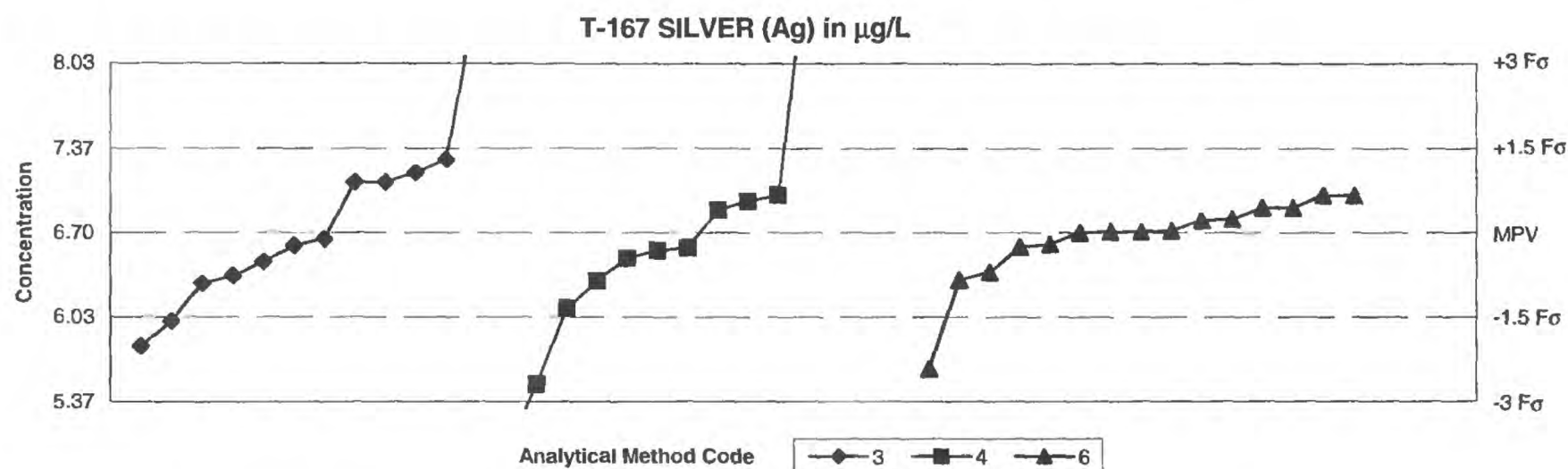
Table 10. Laboratory performance ratings for standard reference sample HG-33 (Mercury)

[MPV, most probable value; Lab, laboratory number; OLR, overall laboratory rating for all rated analyses; µg/L, micrograms per liter; V/1, number of rated analyses out of 1 possible; RV, reported value; <, less than; NR, not rated; --, not reported.]

<u>Rating</u>	<u>Absolute Z-value</u>	<u>Rating</u>	<u>Absolute Z-value</u>
4 (Excellent)	0.00 - 0.50	1 (Marginal)	1.51 - 2.00
3 (Good)	0.51 - 1.00	0 (Unsatisfactory)	greater than 2.00
2 (Satisfactory)	1.01 - 1.50	NR (Not Rated)	

Analyte = Mercury MPV = suspect data F-pseudosigma =				
Lab	OLR	V/1	RV	Rating
1		0	1.53	NR
10		0	0.48	NR
12		0	0.8	NR
16		0	0.85	NR
23		0	0.5	NR
32		0	<0.1	NR
46		0	0.314	NR
50		0	0.54	NR
59		0	0.25	NR
89		0	0.258	NR
96		0	0.747	NR
97		0	0.98	NR
138		0	0.332	NR
142		0	0.41	NR
146		0	0.511	NR
147		0	1.49	NR
180		0	0.699	NR
193		0	0.362	NR
198		0	2.13	NR
212		0	0.25	NR
234		0	0.88	NR
245		0	1.14	NR
247		0	0.291	NR
256		0	0.935	NR
259		0	0.59	NR
298		0	1.22	NR
304		0	0.285	NR
307		0	1.15	NR
328		0	0.77	NR
331		0	0.38	NR
334		0	0.41	NR
370		0	1.04	NR
372		0	0.37	NR

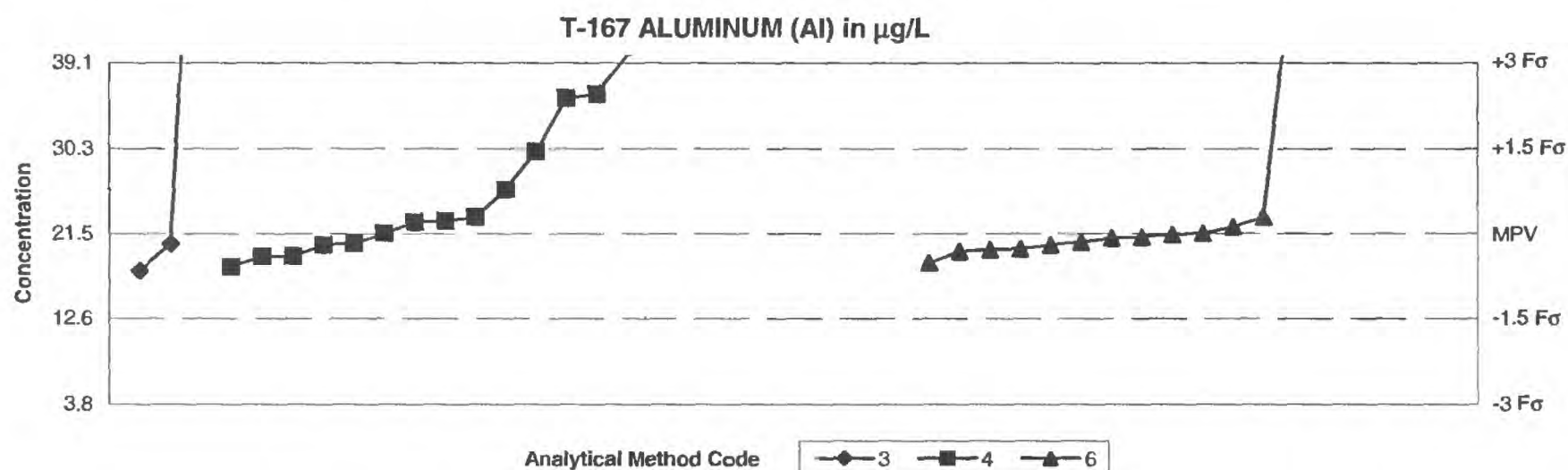
Table 11. Statistical summary of reported data for standard reference sample T-167 (trace constituents)



SUMMARY				Methods	Statistics
	3	4	6	Method Codes	
n =	12	12	15	03 Atomic absorption: graphite furnace	MPV = 6.70 µg/L
Minimum =	5.8	4.98	5.62	04 Inductively coupled plasma	F-pseudosigma = 0.445
Maximum =	8.54	10.1	7	06 Inductively coupled plasma/mass spectrometry	n = 39
Median =	6.63	6.57	6.71		Uh = 6.98
F-pseudosigma =	0.600	0.567	0.189		Lh = 6.38

Method Codes						Method Codes					
Lab	Rating	Z-value	3	4	6	Lab	Rating	Z-value	3	4	6
1	4	-0.20	--	--	6.61	370	0	4.14	8.54	--	--
5	0	4.97	--	8.91	--	372	0	-10.57	--	<2	--
12	0	-2.02	5.8	--	--						
16	3	0.67	--	7	--						
23	3	-0.76	6.36	--	--						
25	NR	--	--	<17	--						
32	4	0.00	--	--	6.7						
42	3	-0.70	--	--	6.39						
50	0	-2.43	--	--	5.62						
59	NR	--	--	--	<10						
70	3	-0.52	6.47	--	--						
86	3	-0.85	--	6.32	--						
89	1	-1.57	6	--	--						
96	4	-0.11	6.65	--	--						
97	3	0.90	7.1	--	--						
100	2	1.08	7.18	--	--						
113	3	0.90	7.1	--	--						
138	4	-0.31	--	6.56	--						
142	4	-0.25	--	--	6.59						
146	4	0.40	--	6.88	--						
180	4	0.02	--	--	6.71						
190	3	-0.90	6.3	--	--						
193	4	-0.22	6.6	--	--						
198	3	0.67	--	--	7						
212	2	-1.35	--	6.1	--						
224	0	7.64	--	10.1	--						
234	4	-0.27	--	6.58	--						
247	3	-0.83	--	--	6.33						
255	3	0.67	--	--	7						
256	3	0.56	--	6.95	--						
259	4	0.45	--	--	6.9						
265	4	0.22	--	--	6.8						
277	0	-2.70	--	5.5	--						
304	4	0.04	--	--	6.72						
307	2	1.30	7.28	--	--						
328	4	-0.45	--	6.5	--						
330	4	0.02	--	--	6.71						
331	0	-3.87	--	4.98	--						
334	4	0.45	--	--	6.9						
356	4	0.25	--	--	6.81						

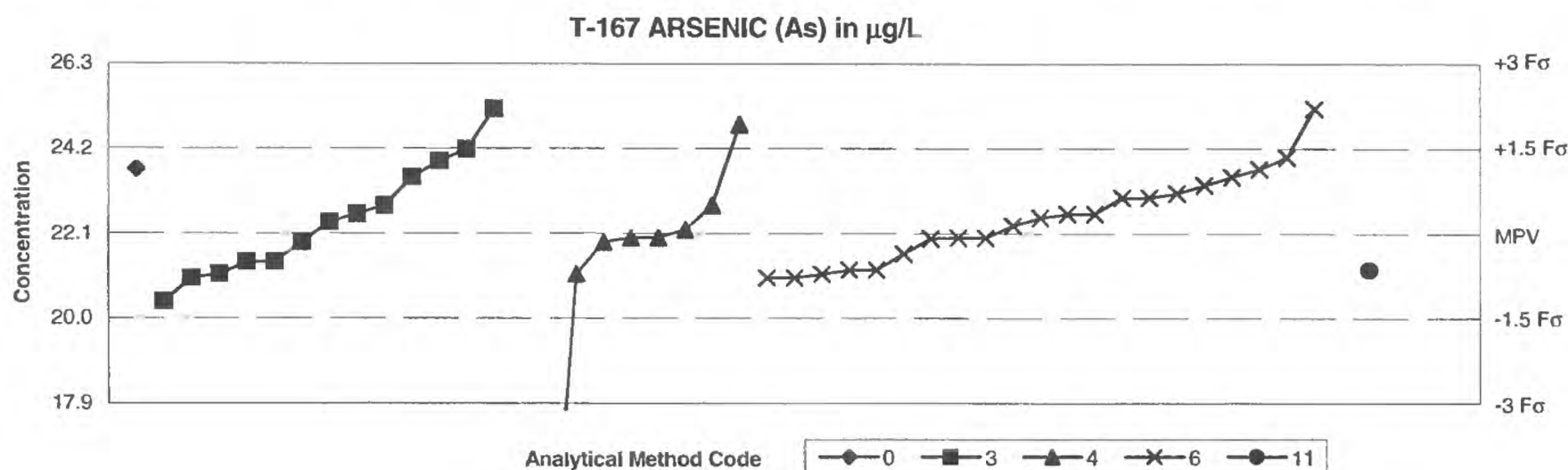
Table 11. Statistical summary of reported data for standard reference sample T-167 (trace constituents) -- continued



SUMMARY	Methods			Statistics
	3	4	6	
n =	3	16	13	MPV = 21.5 µg/L
Minimum =	17.6	18	18.4	F-pseudosigma = 5.89
Maximum =	78.2	49	51	n = 32
Median =		23.0	21.0	Uh = 28.1
F-pseudosigma =		11.4	1.19	Lh = 20.1

Method Codes					
Lab	Rating	Z-value	3	4	6
1	4	-0.20	--	--	20.3
5	0	3.25	--	40.6	--
16	0	4.67	--	49	--
25	NR	--	--	<87	--
32	4	-0.14	--	--	20.6
42	4	-0.08	--	--	21
50	4	0.30	--	--	23.2
59	NR	--	--	--	< 50
70	4	-0.01	--	--	21.4
86	3	0.79	--	26.1	--
89	3	-0.65	17.6	--	--
93	4	0.30	--	23.2	--
97	0	9.63	78.2	--	--
100	4	0.01	--	21.5	--
110	4	-0.17	--	20.45	--
113	4	0.21	--	22.7	--
138	4	0.23	--	22.8	--
142	NR	--	--	<30	--
146	0	3.15	--	40	--
147	4	-0.06	--	--	21.1
180	3	-0.52	--	--	18.4
190	4	-0.18	20.4	--	--
198	4	-0.26	--	--	19.9
212	NR	--	--	<100	--
224	NR	--	--	<30	--
234	4	-0.20	--	20.3	--
247	4	0.01	--	--	21.5
254	NR	--	--	<100	--
256	4	-0.40	--	19.1	--
265	3	-0.59	--	18	--
277	4	-0.40	--	19.1	--
304	4	0.13	--	--	22.2
328	0	5.01	--	--	51
330	4	-0.31	--	--	19.6
331	0	2.38	--	35.5	--
332	0	2.46	--	35.92	--
334	2	1.45	--	30	--
356	4	-0.28	--	--	19.8
370	NR	--	--	<100	--
372	0	-2.62	--	<6	--

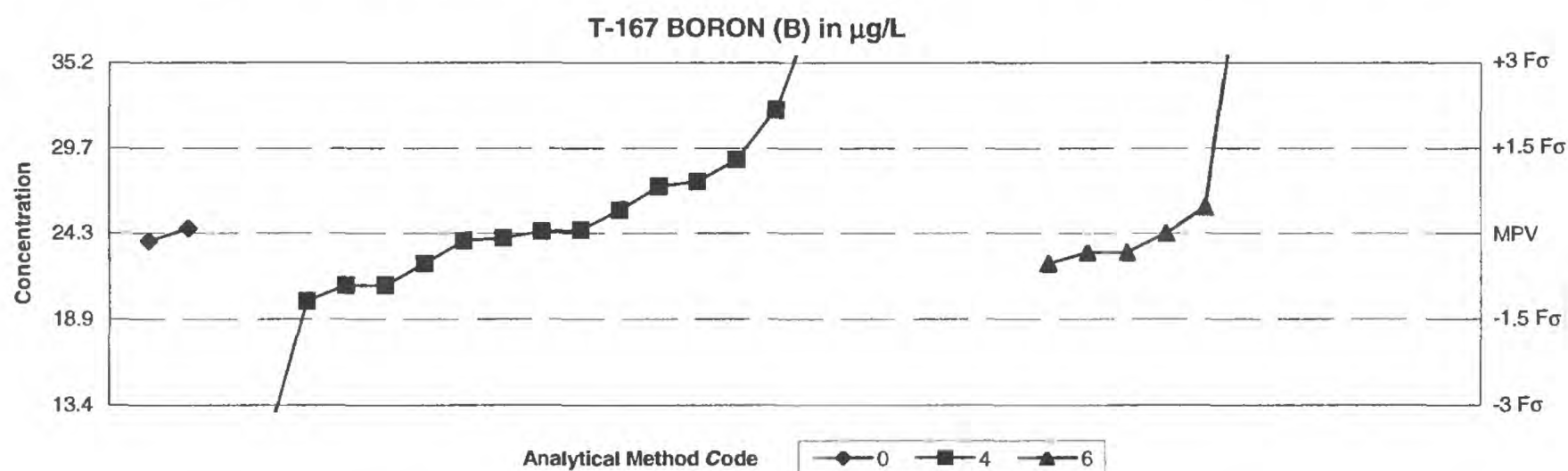
Table 11. Statistical summary of reported data for standard reference sample T-167 (trace constituents) -- continued



SUMMARY	Methods						Statistics	
	0	3	4	6	10	11	Method Codes	
n =	1	13	9	21	1	1	00 Other	MPV = 22.1 µg/L
Minimum =	23.7	20.4	6	21	6.83	21.2	03 Atomic absorption: graphite furnace	F-pseudosigma = 1.41
Maximum =		25.2	24.8	25.2			04 Inductively coupled plasma	n = 46
Median =		22.4	22.0	22.5			06 Inductively coupled plasma/mass spectrometry	Uh = 23.1
F-pseudosigma =	1.56	0.815	1.11				10 Atomic absorption: extraction	Lh = 21.2
							11 Atomic absorption: hydride	

			Method Codes									Method Codes					
Lab	Rating	Z-value	0	3	4	6	10	11	Lab	Rating	Z-value	0	3	4	6	10	11
1	3	-0.64	--	--	--	21.2	--	--	328	3	0.64	--	--	--	23	--	--
5	2	1.28	--	23.9	--	--	--	--	330	3	0.99	--	--	--	23.5	--	--
10	3	-0.64	--	--	--	--	--	21.2	334	2	1.35	--	--	--	24	--	--
12	3	-0.78	--	21	--	--	--	--	356	3	-0.71	--	--	--	21.1	--	--
16	4	-0.07	--	--	22	--	--	--	370	4	-0.50	--	21.4	--	--	--	--
23	0	-7.06	--	--	12.15	--	--	--	372	0	-11.43	--	--	6	--	--	--
25	4	-0.07	--	--	22	--	--	--									
32	3	0.64	--	--	--	23	--	--									
42	3	-0.64	--	--	--	21.2	--	--									
46	4	-0.14	--	21.9	--	--	--	--									
50	4	0.14	--	--	--	22.3	--	--									
59	4	0.36	--	--	--	22.6	--	--									
70	4	-0.07	--	--	--	22	--	--									
76	4	-0.09	--	--	--	21.98	--	--									
89	2	1.49	--	24.2	--	--	--	--									
93	3	-0.71	--	--	21.1	--	--	--									
96	4	0.50	--	22.8	--	--	--	--									
97	0	2.20	--	25.2	--	--	--	--									
100	3	0.99	--	23.5	--	--	--	--									
113	4	0.21	--	22.4	--	--	--	--									
138	2	1.14	--	--	--	23.7	--	--									
142	3	0.85	--	--	--	23.3	--	--									
146	4	0.07	--	--	22.2	--	--	--									
147	4	-0.36	--	--	--	21.6	--	--									
180	3	-0.78	--	--	--	21	--	--									
190	4	-0.50	--	21.4	--	--	--	--									
193	3	-0.71	--	21.1	--	--	--	--									
198	4	0.36	--	--	--	22.6	--	--									
212	4	-0.14	--	--	21.9	--	--	--									
224	1	1.92	--	--	24.8	--	--	--									
234	4	0.36	--	22.6	--	--	--	--									
247	0	2.20	--	--	--	25.2	--	--									
254	4	0.50	--	--	22.8	--	--	--									
255	3	-0.78	--	--	--	21	--	--									
256	0	-10.84	--	--	--	--	6.83	--									
259	4	0.28	--	--	--	22.5	--	--									
265	4	-0.07	--	--	--	22	--	--									
304	3	0.71	--	--	--	23.1	--	--									
307	2	-1.21	--	20.4	--	--	--	--									
326	2	1.14	23.7	--	--	--	--	--									

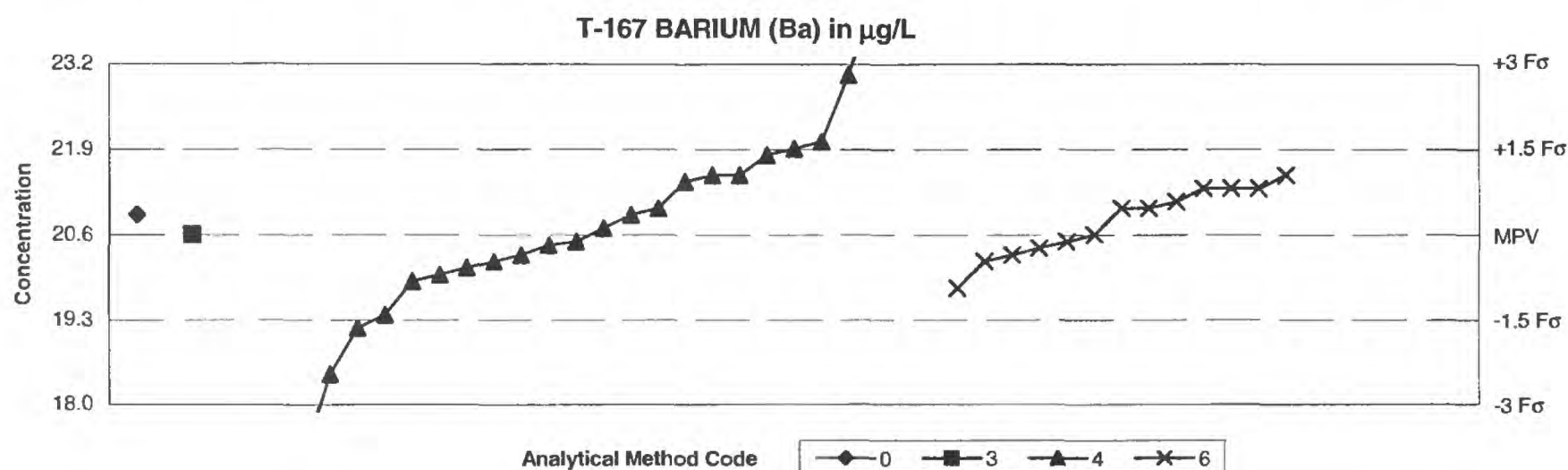
Table 11. Statistical summary of reported data for standard reference sample T-167 (trace constituents) – continued



SUMMARY	Methods			Statistics
	0	4	6	
n =	2	17	6	MPV = 24.3 µg/L
Minimum =	23.8	3	22.4	F-pseudosigma = 3.63
Maximum =	24.6	47	43.1	n = 25
Median =		24.4	23.7	Uh = 27.3
F-pseudosigma =		4.89	2.15	Lh = 22.4

Method Codes					
Lab	Rating	Z-value	0	4	6
1	4	0.06	--	24.5	--
5	3	-0.52	--	22.4	--
16	3	-0.91	--	21	--
24	4	-0.08	--	24	--
25	3	-0.91	--	21	--
32	4	0.00	--	--	24.3
42	4	-0.33	--	--	23.1
50	3	-0.52	--	--	22.4
59	4	-0.33	--	--	23.1
100	0	3.96	--	38.7	--
138	4	0.03	--	24.4	--
142	NR	--	--	<30	--
180	3	0.91	--	27.6	--
212	0	2.17	--	32.2	--
234	4	0.41	--	25.8	--
247	NR	--	--	<51	--
254	4	-0.14	23.8	--	--
255	2	1.29	--	29	--
265	4	0.47	--	--	26
304	0	5.18	--	--	43.1
326	4	0.08	24.6	--	--
328	0	6.25	--	47	--
330	0	-3.66	--	11	--
331	3	0.83	--	27.3	--
332	4	-0.13	--	23.82	--
334	2	-1.18	--	20	--
356	NR	--	--	<50	--
370	NR	--	--	<500	--
372	0	-5.86	--	3	--

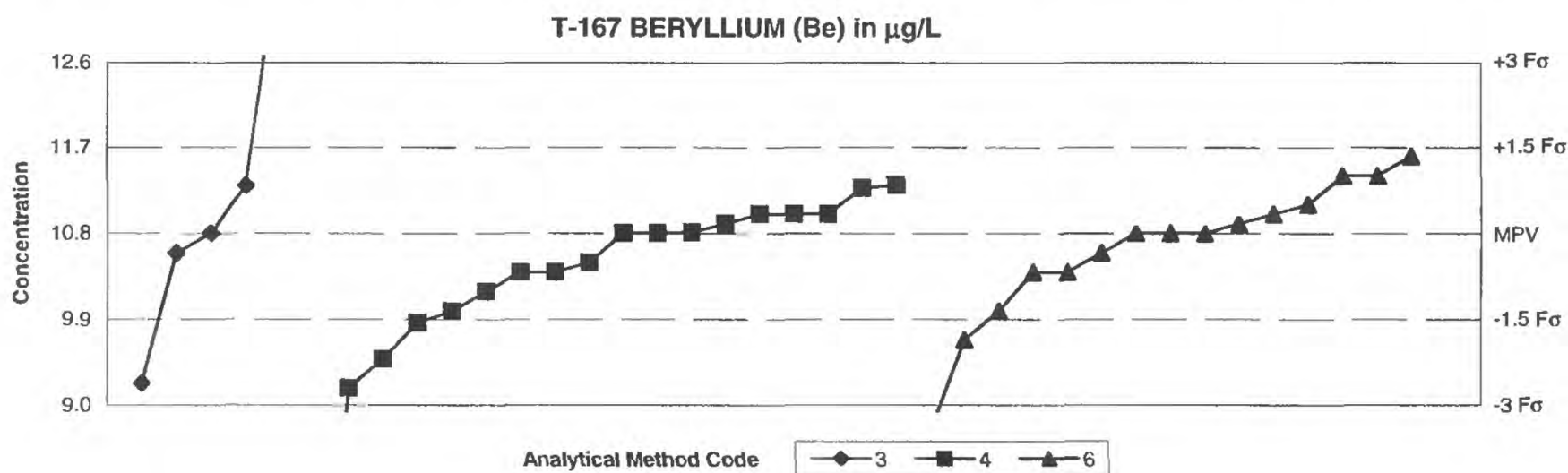
Table 11. Statistical summary of reported data for standard reference sample T-167 (trace constituents) -- continued



SUMMARY	Methods					Statistics	
	0	2	3	4	6	Method Codes	
n =	1	0	1	24	13	00 Other	MPV = 20.6 µg/L
Minimum =	20.9	0	20.6	16	19.8	02 Atomic absorption: direct, nitrous oxide	F-pseudsigma = 0.85
Maximum =				24.08	21.5	03 Atomic absorption: graphite furnace	Rating criterion = 1.03
Median =				20.5	21.0	04 Inductively coupled plasma	n = 39
F-pseudsigma =				1.37	0.667	06 Inductively coupled plasma/mass spectrometry	Uh = 21.3
							Lh = 20.2

Method Codes								Method Codes							
Lab	Rating	Z-value	0	2	3	4	6	Lab	Rating	Z-value	0	2	3	4	6
1	4	0.10	--	--	--	20.7	--	356	2	1.26	--	--	--	21.9	--
5	2	-1.17	--	--	--	19.4	--	370	NR	--	--	--	--	<50	--
16	3	-0.58	--	--	--	20	--	372	0	-4.47	--	--	--	16	--
23	4	-0.15	--	--	--	20.45	--								
24	4	0.39	--	--	--	21	--								
25	0	-3.50	--	--	--	17	--								
32	4	-0.19	--	--	--	--	20.4								
42	3	-0.78	--	--	--	--	19.8								
46	3	-0.68	--	--	--	19.9	--								
50	3	0.87	--	--	--	--	21.5								
59	4	-0.10	--	--	--	--	20.5								
70	4	0.49	--	--	--	--	21.1								
86	4	-0.10	--	--	--	20.5	--								
89	NR	--	--	--	< 50	--	--								
93	4	-0.39	--	--	--	20.2	--								
96	NR	--	--	<100	--	--	--								
97	4	0.00	--	--	20.6	--	--								
100	3	0.87	--	--	--	21.5	--								
113	4	-0.29	--	--	--	20.3	--								
121	2	1.36	--	--	--	22	--								
138	4	-0.49	--	--	--	20.1	--								
142	4	0.00	--	--	--	--	20.6								
146	2	1.17	--	--	--	21.8	--								
180	4	-0.29	--	--	--	--	20.3								
198	3	0.68	--	--	--	--	21.3								
212	3	0.78	--	--	--	21.4	--								
224	0	-2.52	--	--	--	<18	--								
234	4	0.29	--	--	--	20.9	--								
247	4	-0.39	--	--	--	--	20.2								
256	2	-1.36	--	--	--	19.2	--								
259	3	0.68	--	--	--	--	21.3								
265	3	0.87	--	--	--	21.5	--								
277	0	-3.30	--	--	--	17.2	--								
304	4	0.39	--	--	--	--	21								
326	4	0.29	20.9	--	--	--	--								
328	0	2.33	--	--	--	23	--								
330	3	0.68	--	--	--	--	21.3								
331	0	-2.04	--	--	--	18.5	--								
332	0	3.38	--	--	--	24.08	--								
334	4	0.39	--	--	--	--	21								

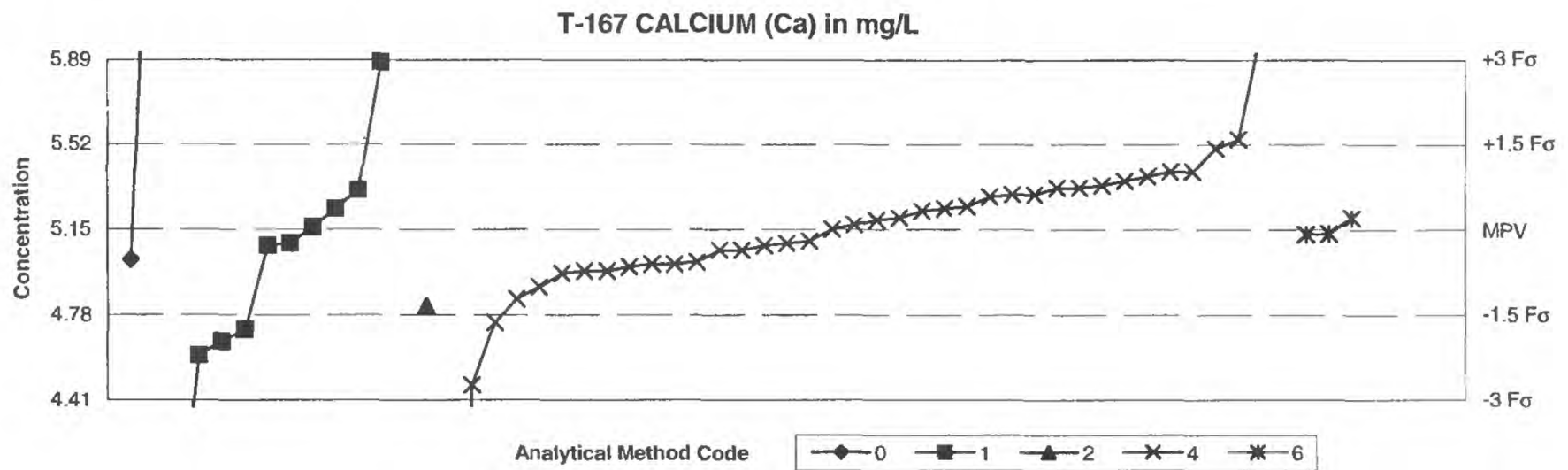
Table 11. Statistical summary of reported data for standard reference sample T-167 (trace constituents) -- continued



SUMMARY	Methods			Statistics
	3	4	6	
n =	5	18	15	MPV = 10.8 µg/L
Minimum =	9.25	5	8.74	F-pseudosigma = 0.59
Maximum =	13.9	11.3	11.6	n = 38
Median =	10.8	10.7	10.8	Uh = 11.0
F-pseudosigma =	0.519	0.741	0.482	Lh = 10.2

Lab	Rating	Z-value	Method Codes		
			3	4	6
1	4	0.34	--	--	11
5	1	-1.55	--	9.88	--
16	4	0.34	--	11	--
23	4	0.02	--	10.81	--
25	2	-1.35	--	10	--
32	4	0.51	--	--	11.1
42	1	-1.85	--	--	9.7
46	3	-0.67	--	10.4	--
50	4	0.00	--	--	10.8
59	4	0.17	--	--	10.9
70	4	0.00	--	--	10.8
86	3	-0.67	--	10.4	--
89	0	5.23	13.9	--	--
93	4	0.17	--	10.9	--
96	4	-0.34	10.6	--	--
97	3	0.84	11.3	--	--
100	4	0.34	--	11	--
113	3	0.84	--	11.3	--
138	4	-0.51	--	10.5	--
142	2	1.01	--	--	11.4
146	4	0.00	--	10.8	--
180	3	-0.67	--	--	10.4
193	0	-2.61	9.25	--	--
198	2	1.35	--	--	11.6
212	2	-1.01	--	10.2	--
224	0	-2.70	--	9.2	--
234	4	0.00	--	10.8	--
247	0	-3.47	--	--	8.74
256	3	0.79	--	11.27	--
265	4	0.34	--	11	--
304	2	1.01	--	--	11.4
328	4	0.00	--	--	10.8
330	4	-0.34	--	--	10.6
331	0	-2.19	--	9.5	--
334	2	-1.35	--	--	10
356	3	-0.67	--	--	10.4
370	4	0.00	10.8	--	--
372	0	-9.78	--	5	--

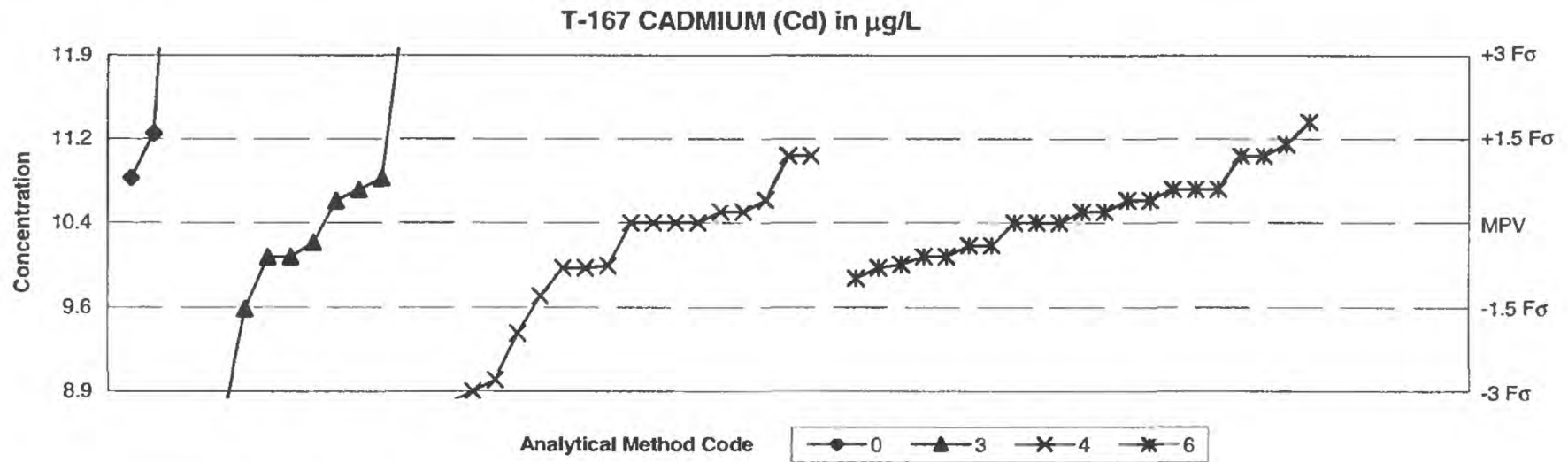
Table 11. Statistical summary of reported data for standard reference sample T-167 (trace constituents) -- continued



SUMMARY	Methods					Statistics	
	0	1	2	4	6	Method Codes	
n =	2	11	1	38	3	00 Other	MPV = 5.15 mg/L
Minimum =	5.02	3.72	4.82	2.41	5.13	01 Atomic absorption; direct, air	F-pseudosigma = 0.245
Maximum =	7.12	7.14		6.17	5.2	02 Atomic absorption; direct, nitrous oxide	Rating criterion = 0.258
Median =		5.09		5.18		04 Inductively coupled plasma	n = 55
F-pseudosigma =		0.434		0.245		06 Inductively coupled plasma/mass spectrometry	Uh = 5.33
							Lh = 4.99

Method Codes								Method Codes							
Lab	Rating	Z-value	0	1	2	4	6	Lab	Rating	Z-value	0	1	2	4	6
1	4	0.08	--	--	--	5.17	--	265	3	0.97	--	--	--	5.4	--
5	1	-1.55	--	--	--	4.75	--	277	2	1.36	--	--	--	5.5	--
12	4	-0.19	--	--	--	5.1	--	279	1	-1.86	--	4.67	--	--	--
16	3	-0.97	--	--	--	4.9	--	301	0	7.73	--	7.14	--	--	--
23	4	-0.23	--	5.09	--	--	--	315	0	3.96	--	--	--	6.17	--
24	3	-0.74	--	--	--	4.96	--	326	4	-0.50	5.02	--	--	--	--
25	0	-10.64	--	--	--	2.41	--	328	3	0.97	--	--	--	5.4	--
32	4	0.19	--	--	--	--	5.2	330	0	3.30	--	--	--	6	--
42	3	0.70	--	--	--	5.33	--	331	0	-2.10	--	4.61	--	--	--
45	3	0.66	--	5.32	--	--	--	332	3	0.74	--	--	--	5.34	--
46	4	0.35	--	--	--	5.24	--	334	3	-0.58	--	--	--	5	--
59	1	-1.67	--	4.72	--	--	--	336	0	7.65	7.12	--	--	--	--
64	3	-0.54	--	--	--	5.01	--	356	3	0.54	--	--	--	5.29	--
70	3	0.89	--	--	--	5.38	--	370	3	0.82	--	--	--	5.36	--
76	4	-0.07	--	--	--	--	5.133	372	3	-0.70	--	--	--	4.97	--
84	4	0.04	--	5.16	--	--	--								
86	4	0.19	--	--	--	5.2	--								
89	0	-5.55	--	3.72	--	--	--								
93	4	-0.35	--	--	--	5.06	--								
97	4	-0.27	--	5.08	--	--	--								
100	3	0.70	--	--	--	5.33	--								
109	0	2.83	--	5.88	--	--	--								
110	4	-0.23	--	--	--	5.09	--								
113	3	-0.58	--	--	--	5	--								
121	4	-0.27	--	--	--	5.08	--								
138	4	-0.35	--	--	--	5.06	--								
142	2	-1.17	--	--	--	4.85	--								
146	4	0.00	--	--	--	5.15	--								
180	4	0.39	--	--	--	5.25	--								
190	2	-1.28	--	--	4.82	--	--								
193	4	0.35	--	5.24	--	--	--								
198	4	0.16	--	--	--	5.19	--								
212	4	0.31	--	--	--	5.23	--								
224	3	-0.63	--	--	--	4.988	--								
227	3	0.58	--	--	--	5.3	--								
234	3	0.58	--	--	--	5.3	--								
247	0	-2.60	--	--	--	4.48	--								
254	3	-0.70	--	--	--	4.97	--								
255	1	1.51	--	--	--	5.54	--								
259	4	-0.08	--	--	--	--	5.13								

Table 11. Statistical summary of reported data for standard reference sample T-167 (trace constituents) -- continued



SUMMARY		Methods					Statistics	
		0	1	3	4	6	Method Codes	
n =	3	1	10	17	21		00 Other	MPV = 10.4 µg/L
Minimum =	10.8	8.3	8.6	8.8	9.91		01 Atomic absorption: direct, air	F-pseudosigma = 0.50
Maximum =	14.5		13.3	11	11.3		03 Atomic absorption: graphite furnace	Rating criterion = 0.52
Median =			10.4	10.4	10.5		04 Inductively coupled plasma	n = 52
F-pseudosigma =			0.519	0.556	0.371		06 Inductively coupled plasma/mass spectrometry	Uh = 10.7
								Lh = 10.0

			Method Codes								Method Codes				
Lab	Rating	Z-value	0	1	3	4	6	Lab	Rating	Z-value	0	1	3	4	6
1	4	0.00	--	--	--	--	10.4	265	3	-0.77	--	--	--	--	10
5	3	-0.58	--	--	10.1	--	--	277	0	-3.08	--	--	--	8.8	--
10	3	-0.58	--	--	10.1	--	--	304	3	-0.58	--	--	--	--	10.1
12	0	-3.46	--	--	8.6	--	--	307	1	1.54	11.2	--	--	--	--
16	3	-0.77	--	--	--	10	--	326	3	0.77	10.8	--	--	--	--
23	3	-0.73	--	--	--	10.02	--	328	2	1.15	--	--	--	--	11
24	2	1.15	--	--	--	11	--	330	1	1.73	--	--	--	--	11.3
25	2	1.15	--	--	--	11	--	331	2	-1.25	--	--	--	9.75	--
32	3	0.58	--	--	--	--	10.7	334	2	1.15	--	--	--	--	11
42	3	-0.94	--	--	--	--	9.91	336	0	7.88	14.5	--	--	--	--
46	2	-1.46	--	--	9.64	--	--	356	4	-0.38	--	--	--	--	10.2
50	4	0.38	--	--	--	--	10.6	370	4	-0.33	--	--	10.23	--	--
59	4	0.19	--	--	--	--	10.5	372	0	-16.15	--	--	--	<2	--
70	4	-0.38	--	--	--	--	10.2								
76	3	-0.71	--	--	--	--	10.03								
86	4	0.00	--	--	--	10.4	--								
89	0	3.85	--	--	12.4	--	--								
93	1	-1.88	--	--	--	9.42	--								
96	4	0.38	--	--	10.6	--	--								
97	3	0.77	--	--	10.8	--	--								
100	0	-4.04	--	8.3	--	--	--								
113	4	0.38	--	--	--	10.6	--								
121	0	-2.69	--	--	--	9	--								
138	3	0.58	--	--	--	--	10.7								
142	2	1.35	--	--	--	--	11.1								
146	4	0.19	--	--	--	10.5	--								
147	4	0.00	--	--	--	--	10.4								
180	4	0.19	--	--	--	--	10.5								
190	3	0.58	--	--	10.7	--	--								
193	0	5.58	--	--	13.3	--	--								
198	3	0.58	--	--	--	--	10.7								
212	4	0.19	--	--	--	10.5	--								
224	0	-2.88	--	--	--	8.9	--								
227	4	0.00	--	--	--	10.4	--								
234	4	0.00	--	--	--	10.4	--								
247	3	-0.58	--	--	--	--	10.1								
254	4	0.00	--	--	--	10.4	--								
255	4	0.00	--	--	--	--	10.4								
256	3	-0.77	--	--	--	10	--								
259	4	0.38	--	--	--	--	10.6								