

Summary of Water-Quality Data, October 1987 through September 1997, for Fountain and Monument Creeks, El Paso and Pueblo Counties, Colorado

By Clifford R. Bossong

U.S. GEOLOGICAL SURVEY

Water-Resources Investigations Report 00-4263

Prepared in cooperation with the
COLORADO SPRINGS UTILITIES

Denver, Colorado
2001

**U.S. DEPARTMENT OF THE INTERIOR
GALE A. NORTON, Secretary**

U.S. GEOLOGICAL SURVEY

Charles G. Groat, Director

The use of firm, trade, and brand names in this report is for identification purposes only and does not constitute endorsement by the U.S. Geological Survey.

For additional information write to:

District Chief
U.S. Geological Survey
Box 25046, Mail Stop 415
Denver Federal Center
Denver, CO 80225-0046

Copies of this report can be purchased from:

U.S. Geological Survey
Information Services
Box 25286
Federal Center
Denver, CO 80225

CONTENTS

Abstract.....	1
Introduction.....	1
Purpose and Scope	3
Description of the Study Area	3
Water-Quality Station Characteristics and Sampling History	4
Statistical Summaries.....	4
Methods of Presentation	6
General Water-Quality Characteristics	18
Summary of Water-Quality Characteristics Compared to In-Stream Regulatory Standards.....	25
Summary of Monotonic Trends in Water Quality	30
Methods Used to Evaluate Monotonic Trends.....	30
Seasons	30
Discussion of Monotonic Trends	32
Summary of Monotonic Trends for Regulated Water-Quality Properties and Constituents	32
Summary.....	34
References.....	34
Appendix.....	35

FIGURES

1. Map showing location of study area and sampling sites in study area	2
2–12. Graphs showing:	
2. Sampling frequency for individual stations.....	6
3. Correlation among water-quality properties and constituents within reach 1	19
4. Correlation among water-quality properties and constituents within reach 2.....	20
5. Correlation among water-quality properties and constituents within reach 3.....	21
6. Correlation among water-quality properties and constituents within reach 4.....	22
7. Rank in study area (areal) and station (local) variation of water-quality properties and constituents from samples collected in Fountain and Monument Creeks for the period October 1987 through September 1992	23
8. Rank in study area (areal) and station (local) variation of water-quality properties and constituents from samples collected in Fountain and Monument Creeks for the period October 1992 through September 1997	24
9. Summary of in-stream regulatory standard exceedance for samples from Fountain and Monument Creeks for the period October 1987 through September 1992	26
10. Summary of in-stream regulatory standard exceedance for samples from Fountain and Monument Creeks for the period October 1992 through September 1997	27
11. Seasonal variation of water-quality properties at station 5530	31
12. Summary of nonparametric monotonic trends for samples from Fountain and Monument Creeks for the period October 1987 through September 1997.....	33

APPENDIX FIGURES

A1—A11. Correlation among log-transformed water-quality properties and constituents at:

A1. Station 3700, for the period October 1987 through September 1997	37
A2. Station 3747, for the period October 1987 through September 1997	38
A3. Station 3780, for the period October 1987 through September 1997	39
A4. Station 4000, for the period October 1987 through September 1997	40
A5. Station 4905, for the period October 1987 through September 1997	41
A6. Station 5500, for the period October 1987 through September 1997	42
A7. Station 5530, for the period October 1987 through September 1997	43

A8. Station 5533, for the period October 1987 through September 1997	44
A9. Station 5905, for the period October 1987 through September 1997	45
A10. Station 6300, for the period October 1987 through September 1997	46
A11. Station 6500, for the period October 1987 through September 1997	47

TABLES

1. Characteristics of water-quality sampling stations	3
2. Characteristics of standard water-quality properties and constituents.....	5
3. Distribution of sample-collection times.....	7
4. Distribution of samples in flow-duration intervals for selected stations.....	8
5–12. Univariate statistics for water-quality data collected for:	
5. Reach 1, October 1987 through September 1992	10
6. Reach 2, October 1987 through September 1992	11
7. Reach 3, October 1987 through September 1992	12
8. Reach 4, October 1987 through September 1992	13
9. Reach 1, October 1992 through September 1997	14
10. Reach 2, October 1992 through September 1997	15
11. Reach 3, October 1992 through September 1997	16
12. Reach 4, October 1992 through September 1997	17
13. Cases of in-stream regulatory standard exceedances	28
14. Characteristics of seasons defined and used for trend tests	32

APPENDIX TABLES

A1–A11. Univariate statistics for water-quality data collected for:	
A1. Station 3700, October 1987 through September 1992	48
A2. Station 3747, October 1987 through September 1992	49
A3. Station 3780, October 1987 through September 1992	50
A4. Station 4000, October 1987 through September 1992	51
A5. Station 4905, October 1987 through September 1992	52
A6. Station 5500, October 1987 through September 1992	53
A7. Station 5530, October 1987 through September 1992	54
A8. Station 5533, October 1987 through September 1992	55
A9. Station 5905, October 1987 through September 1992	56
A10. Station 6300, October 1987 through September 1992	57
A11. Station 6500, October 1987 through September 1992	58
A12–22. Univariate statistics for water-quality data collected for:	
A12. Station 3700, October 1992 through September 1997	59
A13. Station 3747, October 1992 through September 1997	60
A14. Station 3780, October 1992 through September 1997	61
A15. Station 4000, October 1992 through September 1997	62
A16. Station 4905, October 1992 through September 1997	63
A17. Station 5500, October 1992 through September 1997	64
A18. Station 5530, October 1992 through September 1997	65
A19. Station 5533, October 1992 through September 1997	66
A20. Station 5905, October 1992 through September 1997	67
A21. Station 6300, October 1992 through September 1997	68
A22. Station 6500, October 1992 through September 1997	69

CONVERSION FACTORS, VERTICAL DATUM, AND ABBREVIATIONS

Multiply	By	To obtain
Length		
foot (ft)	0.3048	meter
mile	1.609	kilometer
Area		
square mile (mi^2)	259	hectare
square mile (mi^2)	2.590	square kilometer (km^2)
Volume		
cubic foot (ft^3)	0.028317	cubic meter (m^3)
Flow		
cubic foot per second (ft^3/s)	0.02832	cubic meter per second (m^3/s)
cubic foot per second per square mile [$(\text{ft}^3/\text{s})/\text{mi}^2$]	0.01093	cubic meter per second per square kilometer [$(\text{m}^3/\text{s})/\text{km}^2$]

Temperature in degrees Celsius ($^{\circ}\text{C}$) may be converted to degrees Fahrenheit ($^{\circ}\text{F}$) as follows:

$$^{\circ}\text{F} = 1.8 (^{\circ}\text{C} + 32)$$

Sea level: In this report “sea level” refers to the National Geodetic Vertical Datum of 1929—a geodetic datum derived from a general adjustment of the first-order level nets of the United States and Canada, formerly called Sea Level Datum of 1929.

Specific conductance is given in microsiemens per centimeter at 25 degrees Celsius ($\mu\text{S}/\text{cm}$ at 25°C).

Concentrations of chemical constituents in water are given either in milligrams per liter (mg/L) or micrograms per liter ($\mu\text{g}/\text{L}$).

Summary of Water-Quality Data, October 1987 through September 1997, for Fountain and Monument Creeks, El Paso and Pueblo Counties, Colorado

By Clifford R. Bossong

Abstract

Fountain and Monument Creeks, which drain parts of El Paso and Pueblo Counties in Colorado, have been sampled systematically by the U.S. Geological Survey for many years to obtain records of water-quality properties and constituents; the data are stored in the National Water Inventory System. Statistical summaries of these data indicate that they have spatial and temporal trends. Comparison of water-quality data to in-stream regulatory standards, some of which were calculated in this report, indicate that some exceedances are widespread in the system and that some occur locally. Nonparametric tests to quantitatively detect monotonic trends in water-quality data indicate that many water-quality properties and constituents do not have significant monotonic trends; detected trends were mostly downward.

INTRODUCTION

Fountain Creek and Monument Creek (fig. 1) are two relatively small streams that drain large parts of El Paso and Pueblo Counties along Colorado's Front Range urban corridor. Headwaters for the streams are in the Rampart Range; headwaters for Fountain Creek also include a small part of Teller County. The streams flow south and southeast, joining in Colorado Springs, a large and developing urban center about 60 miles south of Denver. From Colorado

Springs, Fountain Creek flows south about 40 miles and joins the Arkansas River at Pueblo.

Most flow in the Fountain and Monument Creek Basins is derived from snowmelt and runoff from thunderstorms; however, there are some activities in the basins that affect both the amount and the quality of water. In mountainous areas, Fountain Creek receives modest transbasin diversions and has reservoirs that are used for storage, flood control, and power generation. In urban and Front Range corridor areas, the streams are affected by urban development, flow from wastewater-treatment facilities, and agricultural practices such as diversions for irrigation. Return flows from irrigation also affect Fountain Creek, primarily in its lower reaches.

The U.S. Geological Survey (USGS), in cooperation with Colorado Springs Utilities, has been collecting water-quality data in the Fountain and Monument Creek Basins since about 1975. These data are maintained in the USGS National Water Information System (NWIS) and have been used by local agencies in water-resource planning and management. The USGS has published two reports describing these data. Edelmann (1990), on the basis of 1975 to 1983 data, presented a detailed accounting of water-quality conditions in the study area and their relation to stream classifications established by the Colorado Department of Public Health and Environment (CDPHE). The CDPHE is responsible for classifying State surface waters and for assigning in-stream water-quality standards to classified streams (Colorado Department of Public Health and Environment, 1998). Ruddy (1993), on the basis of 1976 to 1988 data, described variations and trends in water-quality data.

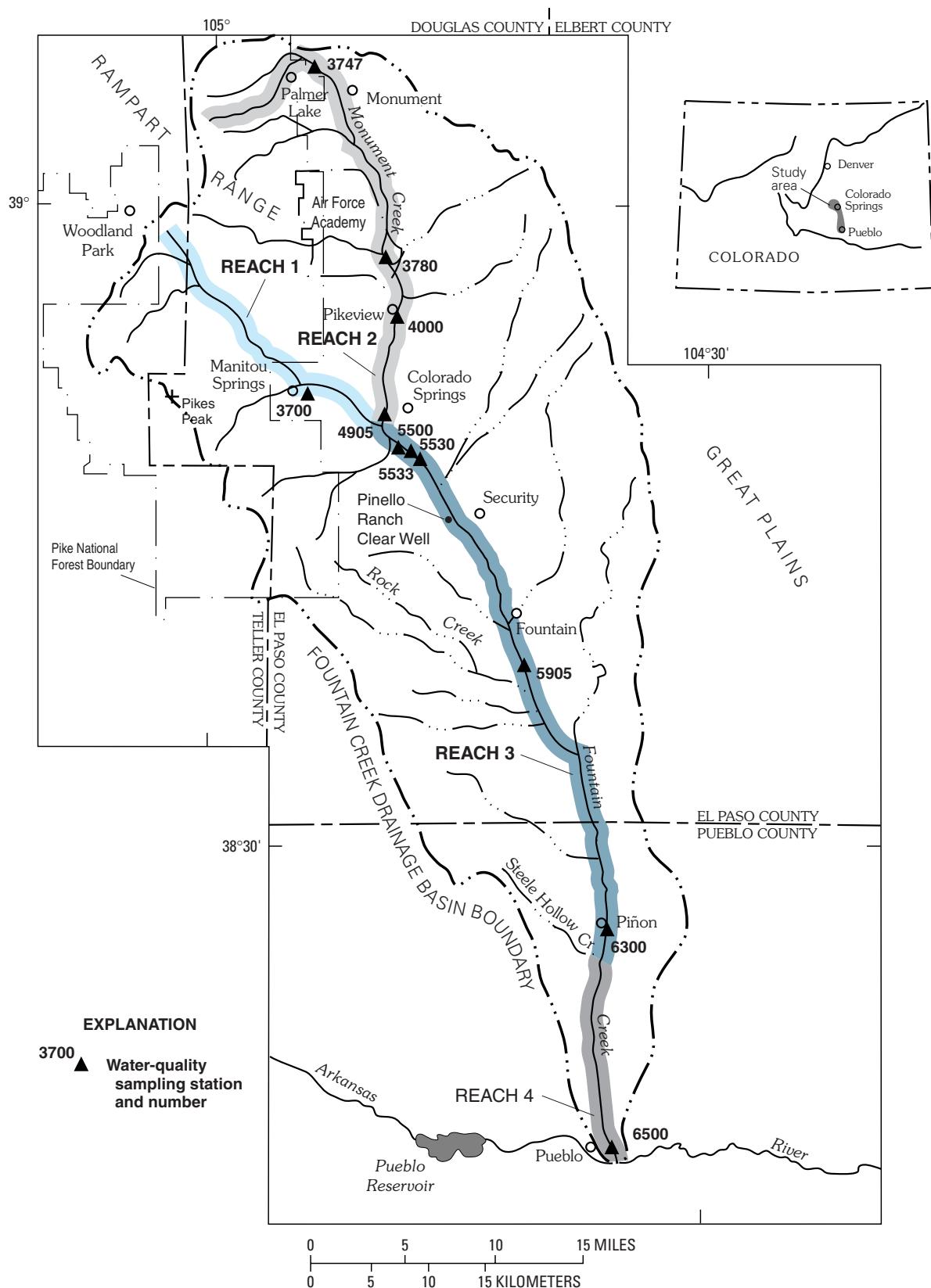


Figure 1. Map showing location of study area and sampling sites in study area.

Purpose and Scope

The purpose of this report is to summarize and describe water-quality data available from 11 stations on Fountain and Monument Creeks for the period October 1987 through September 1997 (table 1). The stations represent four stream reaches (table 1) that have been classified by the CDPHE (Colorado Department of Health and Environment [1998]). The report includes general observations concerning spatial and temporal trends and, for many data, presents summaries for two periods: October 1987 through September 1992 and October 1992 through September 1997. The data were evaluated in these two periods because it was suspected that they may contain temporal trends and because the CDHPE evaluates standards at 5-year intervals.

Description of the Study Area

Fountain Creek originates on the flanks of Pikes Peak near Woodland Park at an elevation of about 8,500 ft. From its headwaters, Fountain Creek generally flows southeast about 10 mi to its confluence with Monument Creek in Colorado Springs (elevation of about 6,050 ft). This upper reach of Fountain Creek corresponds to stream segment 1 in CDPHE stream classifications for the Fountain Creek Basin; it will be referred to as "reach 1" in this report.

Monument Creek originates in the Rampart Range west of Monument at an elevation of about 9,200 ft. From its headwaters, Monument Creek generally flows east about 6 mi to the vicinity of Monument (elevation of about 7,000 ft) and then generally flows south about 12 mi to Fountain Creek

in Colorado Springs. This upper reach of Monument Creek, which includes the area from the Pike National Forest boundary to the confluence of Fountain and Monument Creeks, corresponds to segment 6 in CDPHE stream classifications for the Fountain Creek Basin, will be referred to as "reach 2" in this report.

From the confluence with Monument Creek, Fountain Creek generally flows south from Colorado Springs about 40 mi to Pueblo (elevation of about 4,650 ft), where it joins the Arkansas River. In this report, this lower reach of Fountain Creek is subdivided into two reaches. The first subdivision extends from the confluence of Monument and Fountain Creeks to just upstream from the confluence of Steele Hollow and Fountain Creeks. This reach corresponds to segment 2a in CDPHE stream classifications for the Fountain Creek Basin; it will be referred to as "reach 3" in this report. The second subdivision extends from the confluence of Steele Hollow and Fountain Creeks to the confluence of Fountain Creek with the Arkansas River. This reach corresponds to segment 2b in CDPHE stream classifications for the Fountain Creek Basin; it will be referred to as "reach 4" in this report.

Reaches 1 and 2 originate in mountainous areas where crystalline rocks, such as granite, are predominant. As they leave the mountainous areas, both streams cross a narrow band of Paleozoic sedimentary rocks; both streams then enter an area of highland plains where alluvium predominates but marine sediments of Tertiary age also are present. Reaches 3 and 4 are in the highland plains area. Crystalline rocks sometimes are sources for metallic minerals, whereas sedimentary rocks, especially marine shales, sometimes are sources for sodium, sulfate, and selenium.

Table 1. Characteristics of water-quality sampling stations

[stream segments and classifications are from Colorado Department of Public Health and Environment standards (Colorado Department of Health and Public Environment, 1998); na, not available; AC1, Aquatic life cold - 1; AW2, aquatic life warm - 2; R2, recreation - 2; WS, water supply; A, agriculture; USGS, U.S. Geological Survey]

Station number	USGS used in station report	Station name	Contributing drainage area, in square miles	Reach number	Stream segment	Stream classification
3700	07103700	Fountain Creek near Colorado Springs	103	1	1	AC1, R2, WS, A
3747	07103747	Monument Creek at Palmer Lake	25.9	2	6	AW2, R2, WS, A
3780	07103780	Monument Creek above North Gate Blvd at USAF Academy	81.7	2	6	AW2, R2, WS, A
4000	07104000	Monument Creek at Pikeview	204	2	6	AW2, R2, WS, A
4905	07104905	Monument Creek at Bijou Street, at Colorado Springs	235	2	6	AW2, R2, WS, A
5500	07105500	Fountain Creek at Colorado Springs	392	3	2a	AW2, R2, WS, A
5530	07105530	Fountain Creek below Janitell Road below Colorado Springs	413	3	2a	AW2, R2, WS, A
5533	07105533	Fountain Creek at Circle Drive below Colorado Springs	414	3	2a	AW2, R2, WS, A
5905	07105905	Fountain Creek above Fountain Creek, below Fountain	612	3	2a	AW2, R2, WS, A
6300	07106300	Fountain Creek near Pinon	849	3	2a	AW2, R2, WS, A
6500	07106500	Fountain Creek at Pueblo	926	4	2b	AW2, R2, WS, A

WATER-QUALITY STATION CHARACTERISTICS AND SAMPLING HISTORY

Characteristics of the 11 water-quality stations used in this report are listed in table 1, and their locations are shown in figure 1. Because all stations have the first four characters of their USGS station numbers (0710) in common, the stations will be referred to by the last four characters of their station number. The station numbers increase in downstream order; that is to say, station 3780 is downstream from station 3747. Reach 1 includes one station in the upper Fountain Creek Basin: station 3700. Reach 2 includes four stations in the Monument Creek Basin: stations 3747, 3780, 4000, and 4905. Reach 3 includes five stations in the lower Fountain Creek Basin: stations 5500, 5530, 5533, 5905, and 6300. Reach 4 contains the final station in the lower Fountain Creek Basin, station 6500.

The stations used for analysis in this report have been sampled systematically for many years. In general, all stations were sampled for the list of water-quality properties and constituents listed in table 2 at monthly intervals during the period addressed by this report. A list of standard water-quality properties and constituents addressed by this report is given in table 2. Concentrations for un-ionized ammonia were calculated according to methods described by USEPA (U.S. Environmental Protection Agency, 1987). Table 2 also includes names, abbreviations, reporting units, and in-stream regulatory standards. Additional details regarding in-stream regulatory standards are provided in the "Summary of Water-Quality Characteristics Compared to In-Stream Regulatory Criteria" section.

Sampling frequency through time for each station is shown in figure 2. Some variation in sampling frequency can be observed. These variations typically involve cases where, for instance, a given station may have been sampled twice or more in 1 month, or may not have been sampled in another month, or both. In addition, some samples included analyses for only some of the water-quality properties and constituents listed in table 2 and were collected at an interval that was not monthly or even regular. In order to exclude samples with results for just a few water-quality properties and constituents, only samples that included results for a list of critical constituents were included in this analysis.

The distribution of sample collection time throughout a day is summarized for each station in table 3. Because nearly all samples at all stations were collected between the hours of 0700 and 1600 (or 7 a.m. and 4 p.m.), the data may not describe diurnal patterns in stream conditions (table 3).

The distribution of samples used above for different rates of flow also is characterized with a flow-duration analysis for stations with records of about 5 or more years of record of daily flow. The flow-duration analysis identifies 20 intervals defined by duration levels, where a duration level indicates a percentage of time that the associated flow was exceeded. The 0 to 5 percent interval, for instance, defines the range of flows that were exceeded for 0 to 5 percent of the period of record analyzed; for this analysis, the 0 percentile was assigned the maximum flow associated with a water-quality sample for the study period at a given station. For example, at station 3700, table 4 indicates that 0 percent of samples in period 1 were collected in the 0 to less than 5 duration interval; however, 6.78 percent of samples from period 2 were collected in the same (0 to less than 5) interval. If sample collection were evenly distributed among the 20 duration intervals, then the percentage of all samples collected in each interval would be 5 percent.

The number of samples collected in each of the defined intervals is tabulated for the two periods evaluated in this report. A third period (beginning in October 1982 and continuing through September 1997 [table 4]) also was included in the flow-duration analysis to indicate results for a long-term period. The results indicate that, in the long term (third period), all of the identified intervals are represented; that is, samples were collected in all 20 duration intervals. For shorter periods of time, most, but sometimes not all, duration intervals are represented.

STATISTICAL SUMMARIES

Statistical summaries of water-quality data prepared for this report consist of tables listing univariate statistics, figures describing correlation among water-quality properties and constituents, and figures depicting the spatial and local variations for measurements of water-quality properties and constituents. This information is provided for the

STATISTICAL SUMMARIES

Table 2. Characteristics of standard water-quality properties and constituents

[INST., instantaneous; WH, whole water; CONDF, field specific conductance; CONDL, lab specific conductance; DIS., dissolved; DEG, degree; D., dissolved; NO₂, nitrite; NO₃, nitrate; TOT, total; S, suspended; SED, sediment; CFS, cubic feet per second; US/CM, microsiemens per centimeter; MG/L, milligrams per liter; %, percent; SAT, saturation; COLS, colonies; ML, milliliter; range, 6.5 to 9.0; *, drinking water-supply standard; na, not applicable

Standard listed for NO₂ + NO₃ (nitrite + nitrate) is for nitrate

Unless otherwise noted, listed standards are for the aquatic life classification; in cases with multiple classifications the most stringent standard is listed (stream classifications listed in table 1). The listed in-stream aquatic-life standards for most constituents are fixed values for chronic levels established by Colorado Department of Public Health and Environment (CDPHE, 1999). In-stream aquatic life standards for some metals (dissolved cadmium, chromium, copper, lead, nickel, silver, and zinc) were calculated according to equations developed by the Colorado Department of Public Health and Environment (CDHPE, 1999) using 85th percentile values for hardness as CaCO₃ for the period October 1992 through September 1997, except for station 6500 for which the 85th percentile hardness value was determined using data from October 1987 through September 1997; The point of compliance for the dissolved manganese standard in reach 3 is near Security at the Pinello Ranch Clear Well (location shown on figure 1)

Property or constituent used in this report	Abbreviation	Reporting units	Parameter code	In-stream regulatory standard for individual stations								
				3700	3747	3780	4000	4905	5500	5530	5533	5905
DISCHARGE, INST.	CFS	CFS	00061	na	na	na	na	na	na	na	na	na
SPECIFIC CONDUCTANCE	COND ^F	US/CM @ 25C	00095	na	na	na	na	na	na	na	na	na
SPECIFIC CONDUCTANCE	COND ^L	US/CM @ 25C	90095	na	na	na	na	na	na	na	na	na
PH, WH, FIELD	PH	STANDARD UNITS	0400	range	range	range	range	range	range	range	range	range
WATER TEMPERATURE	TEMP	DEGREES	00010	20.0	na							
OXYGEN DISSOLVED	DO	MG/L	00300	7.00	6.00	6.00	6.00	5.00	5.00	5.00	5.00	5.00
OXYGEN DIS. PERCENT	% DO	% OF SAT	00301	na	na	na	na	na	na	na	na	na
BOD 5-DAY AT 20 DEG	BOD ^S	MG/L	00310	na	na	na	na	na	na	na	na	na
CALIFORNIA FECAL 0.7	FCOL	COLS./100 ML	31625	200	200	200	200	2000	2000	2000	2000	2000
FECAL STPT KF AGAR	FSTRP	COLS./100 ML	31673	na	na	na	na	na	na	na	na	na
CALCIUM DISSOLVED	CA	MG/L AS CA	00915	na	na	na	na	na	na	na	na	na
MAGNESIUM DISSOLVED	MG	MG/L AS MG	00925	na	na	na	na	na	na	na	na	na
ALKALINITY	ALK	MG/L AS CACO ₃	90410	na	na	na	na	na	na	na	na	na
SULFATE DISSOLVED	SO ₄	MG/L AS SO ₄	00945	250	250	250	250	330	330	330	330	490
CHLORIDE DISSOLVED	CL	MG/L AS CL	00940	250	250	250	250	250	250	250	250	250
FLUORIDE DISSOLVED	F	MG/L AS F	00950	2.00*	2.00*	2.00*	2.00*	2.00*	2.00*	2.00*	2.00*	2.00*
HARDNESS TOTAL	HARD	MG/L AS CAO ₃	00900	na	na	na	na	na	na	na	na	na
RESIDUE TOTAL	RES	MG/L	00530	na	na	na	na	na	na	na	na	na
NITROGEN AMMONIA D.	TNH ₃	MG/L AS N	00608	na	na	na	na	na	na	na	na	na
UN-IONIZED AMMONIA	NH ₃ -	MG/L AS NH ₃	99999	0.02	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
NO ₂ + NO ₃ DISSOLVED	NO ₂ 3	MG/L AS N	00631	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
NITROGEN, NITRITE D.	NIT	MG/L AS N	00613	0.05	0.50	0.50	0.50	1.00	1.00	1.00	1.00	5.00
NITROGEN AMM+ORG TOT	TNIT	MG/L AS N	00625	na	na	na	na	na	na	na	na	na
PHOSPHORUS ORTHO D.	OP04	MG/L AS P	00671	na	na	na	na	na	na	na	na	na
ARSENIC DISSOLVED	AS D	UG/L AS AS	01000	50.0*	50.0*	50.0*	50.0*	50.0*	50.0*	50.0*	50.0*	50.0*
ARSENIC TOTAL	AS T	UG/L AS AS	01002	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
BARIUM DISSOLVED	BA D	UG/L AS BA	01005	na	na	na	na	na	na	na	na	na
BARIUM TOTAL	BA T	UG/L AS BA	01007	na	na	na	na	na	na	na	na	na
BORON DISSOLVED	B D	UG/L AS B	01020	750	750	750	750	750	750	750	750	750
BORON TOTAL	B T	UG/L AS B	01022	na	na	na	na	na	na	na	na	na
CADMIUM DISSOLVED	CD D	UG/L AS CD	01025	5.00*	3.09	3.75	5.00*	5.00*	5.00*	5.00*	5.00*	5.00*
CADMUM TOTAL	CD T	UG/L AS CD	01027	na	na	na	na	na	na	na	na	na
CHROMIUM DISSOLVED	CR D	UG/L AS CR	01030	50.0*	50.0*	50.0*	50.0*	50.0*	50.0*	50.0*	50.0*	50.0*
CHROMIUM HEXAVALENT	CR6	UG/L AS CR	01032	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
CHROMIUM TOTAL	CR T	UG/L AS CR	01034	na	na	na	na	na	na	na	na	na
COPPER DISSOLVED	CU D	UG/L AS CU	01040	15.8	9.88	11.4	20.4	29.4	27.6	23.1	31.9	36.0
COPPER TOTAL	CU T	UG/L AS CU	01042	na	na	na	na	na	na	na	na	na
IRON DISSOLVED	FE D	UG/L AS FE	01046	300	300	300	300	300	300	300	300	300
IRON TOTAL	FE T	UG/L AS FE	01045	1000	1000	1000	1000	8000	8000	8000	8000	5100
LEAD DISSOLVED	PB D	UG/L AS PB	01049	6.27	2.89	3.672	9.66	17.6	15.9	11.9	11.9	20.2
LEAD TOTAL	PB T	UG/L AS PB	01051	na	na	na	na	na	na	na	na	na
MANGANESE DISSOLVED	MN D	UG/L AS MN	01056	50.0	71.0	71.0	71.0	50.0	50.0	50.0	50.0	50.0
MANGANESE TOTAL	MN T	UG/L AS MN	01055	na	na	na	na	na	na	na	na	na
MERCURY DISSOLVED	HG D	UG/L AS HG	71890	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
MERCURY, TOT, REC.	HG T	UG/L AS HG	71900	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
MOLBYDENUM DISSOLVED	MO D	UG/L AS MO	01060	na	na	na	na	na	na	na	na	na
MOLBYDENUM TOTAL	MO T	UG/L AS MO	01062	na	na	na	na	na	na	na	na	na
NICKEL DISSOLVED	NI D	UG/L AS NI	01065	100*	81.4	92.7	100*	100*	100*	100*	100*	100*
NICKEL TOTAL	NI T	UG/L AS NI	01067	na	na	na	na	na	na	na	na	na
SILVER DISSOLVED	AG D	UG/L AS AG	01075	0.13	0.05	0.07	0.23	0.47	0.41	0.29	0.29	0.56
SILVER TOTAL	AG T	UG/L AS AG	01077	na	na	na	na	na	na	na	na	na
SELENIUM DISSOLVED	SE D	UG/L AS SE	01145	5.00	5.00	5.00	5.00	5.00	6.00	6.00	6.00	20.0
SELENIUM TOTAL	SE T	UG/L AS SE	01147	na	na	na	na	na	na	na	na	na
ZINC DISSOLVED	ZN D	UG/L AS ZN	01090	140.96	88.7	102	183	261	246	207	207	390
ZINC TOTAL	ZN T	UG/L AS ZN	01092	na	na	na	na	na	na	na	na	na
SULFIDE TOTAL	SLF	MG/L AS S	00745	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
CYANIDE TOTAL	CYN	MG/L AS CN	00720	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
CONCENTRATION, S.SED.	SSD	MG/L	80154	na	na	na	na	na	na	na	na	na
SED-SUSP-SIEVE-.062	SIEV	%	70331	na	na	na	na	na	na	na	na	na

5

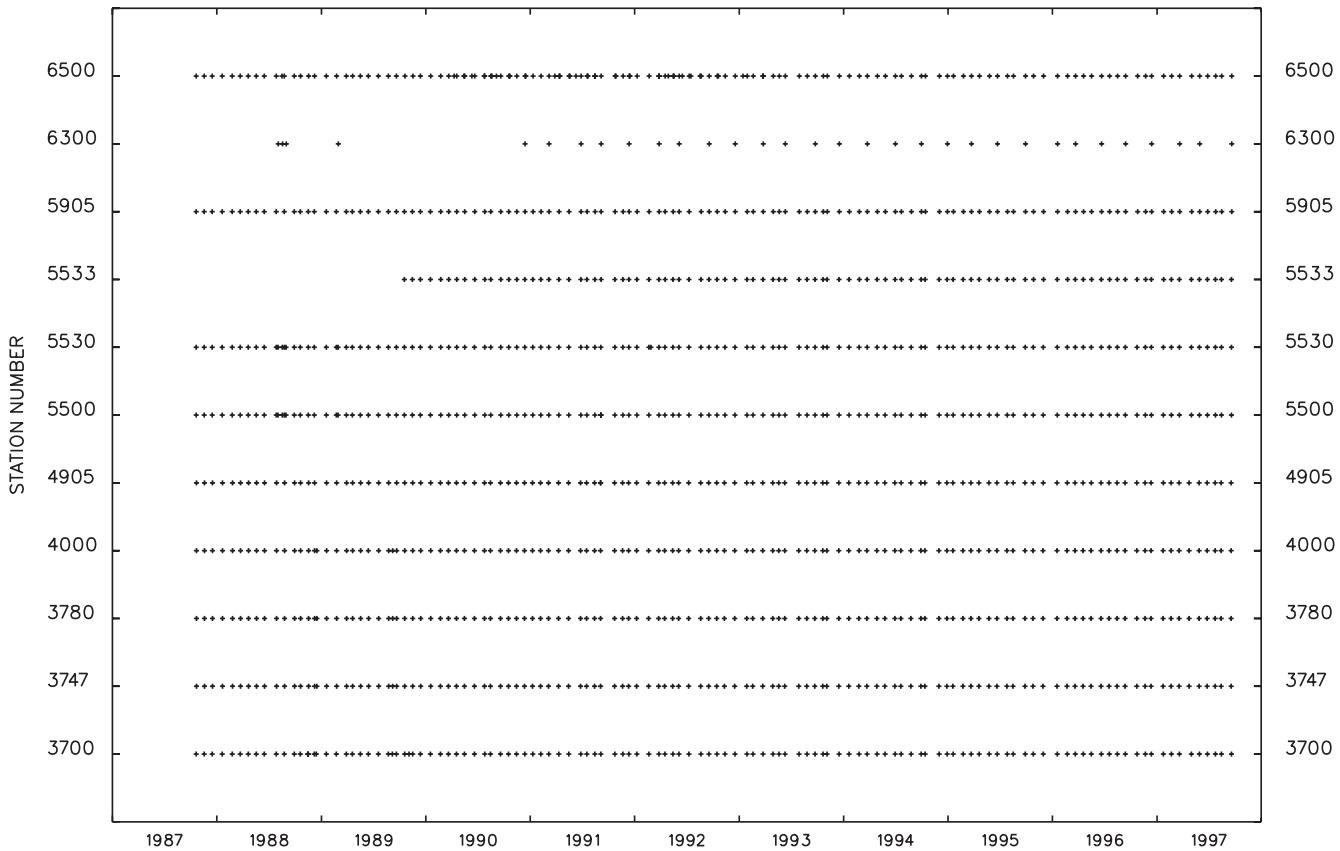


Figure 2. Sampling frequency for individual stations (+ indicates sample).

four identified reaches and for each evaluation period, except for correlation information, which is derived from October 1987 through September 1997 data. Tables of univariate statistics and figures depicting correlation for each station have been included in the Appendix because they provide considerably more detail than the summary figures and tables in the text and will be useful to readers that desire specific information for particular stations.

Methods of Presentation

Tables of univariate statistics for each reach and period (tables 5–12) include information describing the number of samples collected for each water-quality property or constituent, the percentage of samples reported as less than the method reporting limit (referred to as “censored”), univariate statistics for results reported as greater than method reporting limits, and the mean and median method reporting limits for censored values. The difference between the mean and median reporting limits is an indication of

the variability in reporting limits for a given constituent. For example, table 5 lists that, for dissolved copper, the mean reporting limit is 2.50 micrograms per liter while the median reporting limit is 1.00 microgram per liter, indicating that there are some relatively high value reporting limits present. Some reasons that differences in method reporting limits can occur are changes in equipment performance and analytical methodologies, and dilutions affected as part of analytical procedures. The data used in this study were collected in a systematic fashion, were analyzed at the USGS National Water-Quality Laboratory, and typically have only a small amount of variation in reporting limits for individual water-quality properties or constituents.

The following univariate statistics were computed for all values reported as greater than the method reporting limit: mean, median, geometric mean, 15th and 85th percentiles, standard deviation, minimum, and maximum. Similar tables in the Appendix, for each station, include an in-stream standard, which also is given in table 2.

Table 3. Distribution of sample-collection times

[Hours interval, interval of time, in military hours, for which frequency is reported; PCT, percent of samples in hours interval]

Hours interval	Percentage of samples collected in hours interval for indicated station										
	3700	3747	3780	4000	4905	5550	5530	5533	5905	6300	6500
0000 - 0100	0.4	0.0	0.0	0.2	0.0	0.1	0.0	0.0	0.4	0.4	0.2
0100 - 0200	0.0	0.0	0.0	0.2	0.0	0.4	0.0	0.0	1.1	0.0	0.0
0200 - 0300	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.2
0300 - 0400	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0
0400 - 0500	0.2	0.0	0.0	0.2	0.0	0.1	0.0	0.0	0.7	0.0	0.2
0500 - 0600	0.2	0.0	0.0	0.2	0.0	0.6	0.0	0.0	0.7	0.2	0.0
0600 - 0700	0.5	0.3	0.6	0.2	0.0	0.0	0.0	0.0	0.4	0.0	0.2
0700 - 0800	4.7	4.2	2.2	0.6	0.0	0.3	0.0	1.0	3.9	0.7	1.4
0800 - 0900	7.5	16.0	3.2	1.9	2.8	2.9	0.4	5.2	7.7	1.9	3.3
0900 - 1000	10.9	24.1	8.3	6.6	3.3	10.9	4.8	6.3	15.0	7.5	6.1
1000 - 1100	12.9	20.5	17.5	12.2	8.5	16.8	19.0	1.1	8.4	12.5	8.0
1100 - 1200	13.8	11.2	26.7	9.7	9.4	17.5	18.1	0.0	12.6	15.2	11.1
1200 - 1300	13.2	8.1	19.4	14.9	10.8	15.0	24.2	7.4	12.6	16.1	9.9
1300 - 1400	11.8	5.4	8.3	21.7	9.0	12.1	16.1	24.2	11.9	14.2	16.0
1400 - 1500	8.4	5.4	6.0	16.6	25.0	10.5	8.1	34.7	8.8	14.6	16.5
1500 - 1600	6.6	2.4	5.1	9.1	21.2	5.9	5.6	18.9	8.1	9.4	12.5
1600 - 1700	6.6	1.5	0.3	4.1	8.0	3.1	3.2	1.1	4.2	3.4	9.6
1700 - 1800	1.0	0.3	0.3	1.2	1.9	1.2	0.4	0.0	1.8	1.1	2.6
1800 - 1900	0.5	0.6	0.6	0.0	0.0	0.6	0.0	0.0	0.4	0.9	0.9
1900 - 2000	0.4	0.0	0.3	0.2	0.0	0.6	0.0	0.0	0.0	0.0	0.5
2000 - 2100	0.2	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.7	0.2	0.5
2100 - 2200	0.2	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.7	0.6	0.0
2200 - 2300	0.0	0.0	0.6	0.4	0.0	0.1	0.0	0.0	0.0	0.4	0.0
2300 - 2400	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 4. Distribution of samples in flow-duration intervals for selected stations

[Duration interval, gives the percentile bounds to the duration interval; P, period for analysis (period 1 is October 1987 through September 1992, period 2 is October 1992 through September 1997, and period 3 is October 1982 through September 1997); POR, period of record used to derive duration; CDA, contributing drainage area in square miles; CFS, flow in cubic feet per second for the upper bound of the duration interval; CFSM, flow in cubic feet per second per square mile for the upper bound of the duration interval; N, number of samples; PCT, percent of total samples that were collected in duration interval for given period]

Duration interval	P	Station 3700				Station 3747				Station 3780				Station 4000			
		POR 1982-1997		CDA	103.0	POR 1982-1989		CDA	25.90	POR 1986-1997		CDA	81.7	POR 1983-1987		CDA	204.0
		CFS	CFSM	N	PCT												
0 - <5	1	518	5.03	0	0.00	168	6.49	1	1.64	261	3.19	3	4.84	410	2.01	0	0.00
0 - <5	2	518	5.03	4	6.78	168	6.49	1	1.72	261	3.19	2	3.39	410	2.01	1	1.69
0 - <5	3	518	5.03	7	3.65	168	6.49	4	2.44	261	3.19	13	7.88	410	2.01	4	2.11
5 - <10	1	66	0.64	0	0.00	38.1	1.47	1	1.64	39.9	0.49	3	4.84	149	0.73	2	3.23
5 - <10	2	66	0.64	4	6.78	38.1	1.47	0	0.00	39.9	0.49	7	11.86	149	0.73	0	0.00
5 - <10	3	66	0.64	9	4.69	38.1	1.47	4	2.44	39.9	0.49	12	7.27	149	0.73	5	2.63
10 - <15	1	38.1	0.37	1	1.56	20.9	0.81	1	1.64	25.2	0.31	3	4.84	109	0.54	0	0.00
10 - <15	2	38.1	0.37	4	6.78	20.9	0.81	3	5.17	25.2	0.31	3	5.08	109	0.54	3	5.08
10 - <15	3	38.1	0.37	11	5.73	20.9	0.81	8	4.88	25.2	0.31	10	6.06	109	0.54	6	3.16
15 - <20	1	28.6	0.28	2	3.12	13.9	0.54	3	4.92	18.0	0.22	5	8.06	81.5	0.40	2	3.23
15 - <20	2	28.6	0.28	2	3.39	13.9	0.54	2	3.45	18.0	0.22	6	10.17	81.5	0.40	1	1.69
15 - <20	3	28.6	0.28	10	5.21	13.9	0.54	8	4.88	18.0	0.22	18	10.91	81.5	0.40	7	3.68
20 - <25	1	22.6	0.22	0	0.00	9.96	0.38	0	0.00	14.4	0.18	1	1.61	67.4	0.33	0	0.00
20 - <25	2	22.6	0.22	1	1.69	9.96	0.38	5	8.62	14.4	0.18	1	1.69	67.4	0.33	3	5.08
20 - <25	3	22.6	0.22	5	2.60	9.96	0.38	8	4.88	14.4	0.18	5	3.03	67.4	0.33	7	3.68
25 - <30	1	19.4	0.19	2	3.12	7.49	0.29	2	3.28	11.3	0.14	3	4.84	57.6	0.28	0	0.00
25 - <30	2	19.4	0.19	4	6.78	7.49	0.29	2	3.45	11.3	0.14	3	5.08	57.6	0.28	1	1.69
25 - <30	3	19.4	0.19	10	5.21	7.49	0.29	9	5.49	11.3	0.14	9	5.45	57.6	0.28	2	1.05
30 - <35	1	17.3	0.17	3	4.69	5.64	0.22	2	3.28	9.11	0.11	1	1.61	49.3	0.24	1	1.61
30 - <35	2	17.3	0.17	2	3.39	5.64	0.22	1	1.72	9.11	0.11	4	6.78	49.3	0.24	0	0.00
30 - <35	3	17.3	0.17	9	4.69	5.64	0.22	5	3.05	9.11	0.11	8	4.85	49.3	0.24	4	2.11
35 - <40	1	15.8	0.15	3	4.69	4.60	0.18	1	1.64	7.65	0.09	3	4.84	42.0	0.21	3	4.84
35 - <40	2	15.8	0.15	3	5.08	4.60	0.18	2	3.45	7.65	0.09	2	3.39	42.0	0.21	5	8.47
35 - <40	3	15.8	0.15	8	4.17	4.60	0.18	4	2.44	7.65	0.09	7	4.24	42.0	0.21	11	5.79
40 - <45	1	14.3	0.14	2	3.12	3.89	0.15	2	3.28	6.59	0.08	2	3.23	36.3	0.18	2	3.23
40 - <45	2	14.3	0.14	2	3.39	3.89	0.15	1	1.72	6.59	0.08	1	1.69	36.3	0.18	2	3.39
40 - <45	3	14.3	0.14	11	5.73	3.89	0.15	5	3.05	6.59	0.08	3	1.82	36.3	0.18	8	4.21
45 - <50	1	13.1	0.13	2	3.12	3.20	0.12	3	4.92	5.91	0.07	3	4.84	33.2	0.16	5	8.06
45 - <50	2	13.1	0.13	2	3.39	3.20	0.12	0	0.00	5.91	0.07	4	6.78	33.2	0.16	3	5.08
45 - <50	3	13.1	0.13	8	4.17	3.20	0.12	5	3.05	5.91	0.07	7	4.24	33.2	0.16	12	6.32
50 - <55	1	12.0	0.12	5	7.81	2.80	0.11	0	0.00	5.33	0.07	3	4.84	30.1	0.15	7	11.29
50 - <55	2	12.0	0.12	4	6.78	2.80	0.11	3	5.17	5.33	0.07	1	1.69	30.1	0.15	5	8.47
50 - <55	3	12.0	0.12	13	6.77	2.80	0.11	7	4.27	5.33	0.07	6	3.64	30.1	0.15	13	6.84
55 - <60	1	11.1	0.11	1	1.56	2.41	0.09	6	9.84	4.85	0.06	6	9.68	27.4	0.13	4	6.45
55 - <60	2	11.1	0.11	2	3.39	2.41	0.09	3	5.17	4.85	0.06	10	16.95	27.4	0.13	5	8.47
55 - <60	3	11.1	0.11	10	5.21	2.41	0.09	10	6.10	4.85	0.06	19	11.52	27.4	0.13	11	5.79
60 - <65	1	10.1	0.10	7	10.94	2.07	0.08	2	3.28	3.42	0.04	0	0.00	24.8	0.12	2	3.23
60 - <65	2	10.1	0.10	6	10.17	2.07	0.08	1	1.72	3.42	0.04	0	0.00	24.8	0.12	1	1.69
60 - <65	3	10.1	0.10	21	10.94	2.07	0.08	6	3.66	3.42	0.04	0	0.00	24.8	0.12	5	2.63
65 - <70	1	9.52	0.09	5	7.81	1.78	0.07	3	4.92	4.02	0.05	2	3.23	22.9	0.11	0	0.00
65 - <70	2	9.52	0.09	4	6.78	1.78	0.07	0	0.00	4.02	0.05	2	3.39	22.9	0.11	1	1.69
65 - <70	3	9.52	0.09	9	4.69	1.78	0.07	4	2.44	4.02	0.05	4	2.42	22.9	0.11	6	3.16
70 - <75	1	9.01	0.09	1	1.56	1.53	0.06	4	6.56	3.58	0.04	3	4.84	21.0	0.10	2	3.23
70 - <75	2	9.01	0.09	2	3.39	1.53	0.06	2	3.45	3.58	0.04	8	13.56	21.0	0.10	2	3.39
70 - <75	3	9.01	0.09	4	2.08	1.53	0.06	7	4.27	3.58	0.04	11	6.67	21.0	0.10	6	3.16
75 - <80	1	8.51	0.08	4	6.25	1.34	0.05	0	0.00	3.12	0.04	5	8.06	19.3	0.09	9	14.52
75 - <80	2	8.51	0.08	1	1.69	1.34	0.05	2	3.45	3.12	0.04	4	6.78	19.3	0.09	5	8.47
75 - <80	3	8.51	0.08	6	3.12	1.34	0.05	4	2.44	3.12	0.04	11	6.67	19.3	0.09	18	9.47
80 - <85	1	7.87	0.08	7	10.94	1.16	0.04	2	3.28	2.64	0.03	3	4.84	17.8	0.09	0	0.00
80 - <85	2	7.87	0.08	1	1.69	1.16	0.04	5	8.62	2.64	0.03	1	1.69	17.8	0.09	2	3.39
80 - <85	3	7.87	0.08	11	5.73	1.16	0.04	9	5.49	2.64	0.03	6	3.64	17.8	0.09	7	3.68
85 - <90	1	7.21	0.07	4	6.25	0.99	0.04	5	8.20	2.26	0.03	2	3.23	16.4	0.08	2	3.23
85 - <90	2	7.21	0.07	7	11.86	0.99	0.04	4	6.90	2.26	0.03	1	1.69	16.4	0.08	3	5.08
85 - <90	3	7.21	0.07	11	5.73	0.99	0.04	10	6.10	2.26	0.03	3	1.82	16.4	0.08	8	4.21
90 - <95	1	6.35	0.06	8	12.50	0.83	0.03	8	13.11	1.90	0.02	6	9.68	15.0	0.07	8	12.90
90 - <95	2	6.35	0.06	1	1.69	0.83	0.03	10	17.24	1.90	0.02	3	5.08	15.0	0.07	7	11.86
90 - <95	3	6.35	0.06	9	4.69	0.83	0.03	21	12.80	1.90	0.02	11	6.67	15.0	0.07	19	10.00
95 - 100	1	5.38	0.05	7	10.94	0.52	0.02	15	24.59	1.40	0.02	8	12.90	13.1	0.06	13	20.97
95 - 100	2	5.38	0.05	3	5.08	0.52	0.02	11	18.97	1.40	0.02	1	1.69	13.1	0.06	9	15.25
95 - 100	3	5.38	0.05	10	5.21	0.52	0.02	26	15.85	1.40	0.02	10	6.06	13.1	0.06	31	16.32

Table 4. Distribution of samples in flow-duration intervals for selected stations--continued

[Duration interval, gives the percentile bounds to the duration interval; P, period for analysis (period 1 is October 1987 through September 1992, period 2 is October 1992 through September 1997, and period 3 is October 1982 through September 1997); POR, period of record used to derive duration; CDA, contributing drainage area in square miles; CFS, flow in cubic feet per second for the upper bound of the duration interval; CFSM, flow in cubic feet per second per square mile for the upper bound of the duration interval; N, number of samples; PCT, percent of total samples that were collected in duration interval for given period]

Duration interval	P	Station 5500					Station 6300					Station 6500				
		POR 1983-1987			CDA	392.0	POR 1982-1997			CDA	849.0	POR 1982-1997			CDA	926.0
			CFS	CFSM	N	PCT		CFS	CFSM	N	PCT		CFS	CFSM	N	PCT
0 - <5	1	2170	5.54	0	0.00	5750	6.77	0	0.00	1040	1.12	0	0.00			
0 - <5	2	2170	5.54	2	3.39	5750	6.77	1	5.00	1040	1.12	4	6.56			
0 - <5	3	2170	5.54	2	1.05	5750	6.77	2	3.70	1040	1.12	9	4.25			
5 - <10	1	327	0.83	0	0.00	396	0.47	0	0.00	434	0.47	2	2.44			
5 - <10	2	327	0.83	3	5.08	396	0.47	1	5.00	434	0.47	3	4.92			
5 - <10	3	327	0.83	6	3.16	396	0.47	3	5.56	434	0.47	11	5.19			
10 - <15	1	233	0.59	1	1.67	257	0.30	0	0.00	272	0.29	2	2.44			
10 - <15	2	233	0.59	0	0.00	257	0.30	0	0.00	272	0.29	3	4.92			
10 - <15	3	233	0.59	6	3.16	257	0.30	0	0.00	272	0.29	8	3.77			
15 - <20	1	178	0.45	0	0.00	205	0.24	0	0.00	214	0.23	2	2.44			
15 - <20	2	178	0.45	4	6.78	205	0.24	1	5.00	214	0.23	2	3.28			
15 - <20	3	178	0.45	6	3.16	205	0.24	3	5.56	214	0.23	11	5.19			
20 - <25	1	134	0.34	0	0.00	170	0.20	1	12.50	181	0.20	1	1.22			
20 - <25	2	134	0.34	0	0.00	170	0.20	1	5.00	181	0.20	4	6.56			
20 - <25	3	134	0.34	6	3.16	170	0.20	3	5.56	181	0.20	8	3.77			
25 - <30	1	104	0.27	4	6.67	157	0.18	1	12.50	168	0.18	2	2.44			
25 - <30	2	104	0.27	3	5.08	157	0.18	2	10.00	168	0.18	1	1.64			
25 - <30	3	104	0.27	10	5.26	157	0.18	4	7.41	168	0.18	6	2.83			
30 - <35	1	86.6	0.22	2	3.33	143	0.17	0	0.00	155	0.17	3	3.66			
30 - <35	2	86.6	0.22	0	0.00	143	0.17	1	5.00	155	0.17	6	9.84			
30 - <35	3	86.6	0.22	8	4.21	143	0.17	2	3.70	155	0.17	12	5.66			
35 - <40	1	74.0	0.19	4	6.67	130	0.15	1	12.50	142	0.15	5	6.10			
35 - <40	2	74.0	0.19	1	1.69	130	0.15	2	10.00	142	0.15	6	9.84			
35 - <40	3	74.0	0.19	10	5.26	130	0.15	5	9.26	142	0.15	14	6.60			
40 - <45	1	63.4	0.16	1	1.67	118	0.14	0	0.00	129	0.14	3	3.66			
40 - <45	2	63.4	0.16	5	8.47	118	0.14	2	10.00	129	0.14	3	4.92			
40 - <45	3	63.4	0.16	11	5.79	118	0.14	5	9.26	129	0.14	11	5.19			
45 - <50	1	55.7	0.14	5	8.33	110	0.13	1	12.50	119	0.13	6	7.32			
45 - <50	2	55.7	0.14	4	6.78	110	0.13	0	0.00	119	0.13	5	8.20			
45 - <50	3	55.7	0.14	11	5.79	110	0.13	5	9.26	119	0.13	11	5.19			
50 - <55	1	50.4	0.13	3	5.00	102	0.12	2	25.00	111	0.12	1	1.22			
50 - <55	2	50.4	0.13	3	5.08	102	0.12	2	10.00	111	0.12	2	3.28			
50 - <55	3	50.4	0.13	8	4.21	102	0.12	5	9.26	111	0.12	7	3.30			
55 - <60	1	45.9	0.12	0	0.00	93.8	0.11	0	0.00	102	0.11	6	7.32			
55 - <60	2	45.9	0.12	2	3.39	93.8	0.11	0	0.00	102	0.11	4	6.56			
55 - <60	3	45.9	0.12	5	2.63	93.8	0.11	2	3.70	102	0.11	12	5.66			
60 - <65	1	41.9	0.11	0	0.00	85.8	0.10	0	0.00	92.6	0.10	6	7.32			
60 - <65	2	41.9	0.11	3	5.08	85.8	0.10	2	10.00	92.6	0.10	1	1.64			
60 - <65	3	41.9	0.11	8	4.21	85.8	0.10	4	7.41	92.6	0.10	13	6.13			
65 - <70	1	38.3	0.10	4	6.67	77.3	0.09	0	0.00	83.6	0.09	7	8.54			
65 - <70	2	38.3	0.10	1	1.69	77.3	0.09	0	0.00	83.6	0.09	2	3.28			
65 - <70	3	38.3	0.10	7	3.68	77.3	0.09	0	0.00	83.6	0.09	12	5.66			
70 - <75	1	35.6	0.09	5	8.33	67.3	0.08	0	0.00	74.2	0.08	8	9.76			
70 - <75	2	35.6	0.09	2	3.39	67.3	0.08	2	10.00	74.2	0.08	2	3.28			
70 - <75	3	35.6	0.09	10	5.26	67.3	0.08	2	3.70	74.2	0.08	11	5.19			
75 - <80	1	33.3	0.08	2	3.33	57.3	0.07	0	0.00	64.9	0.07	4	4.88			
75 - <80	2	33.3	0.08	3	5.08	57.3	0.07	2	10.00	64.9	0.07	2	3.28			
75 - <80	3	33.3	0.08	8	4.21	57.3	0.07	2	3.70	64.9	0.07	9	4.25			
80 - <85	1	31.2	0.08	3	5.00	46.2	0.05	2	25.00	54.3	0.06	6	7.32			
80 - <85	2	31.2	0.08	3	5.08	46.2	0.05	1	5.00	54.3	0.06	2	3.28			
80 - <85	3	31.2	0.08	8	4.21	46.2	0.05	4	7.41	54.3	0.06	13	6.13			
85 - <90	1	29.1	0.07	3	5.00	35.0	0.04	0	0.00	40.3	0.04	6	7.32			
85 - <90	2	29.1	0.07	2	3.39	35.0	0.04	0	0.00	40.3	0.04	3	4.92			
85 - <90	3	29.1	0.07	10	5.26	35.0	0.04	1	1.85	40.3	0.04	11	5.19			
90 - <95	1	26.2	0.07	4	6.67	25.5	0.03	0	0.00	28.8	0.03	7	8.54			
90 - <95	2	26.2	0.07	8	13.56	25.5	0.03	0	0.00	28.8	0.03	5	8.20			
90 - <95	3	26.2	0.07	15	7.89	25.5	0.03	1	1.85	28.8	0.03	13	6.13			
95 - 100	1	22.5	0.06	19	31.67	14.7	0.02	0	0.00	16.4	0.02	5	6.10			
95 - 100	2	22.5	0.06	10	16.95	14.7	0.02	0	0.00	16.4	0.02	1	1.64			
95 - 100	3	22.5	0.06	35	18.42	14.7	0.02	1	1.85	16.4	0.02	10	4.72			

Table 5. Univariate statistics for water-quality data collected for reach 1, October 1987 through September 1992

Note: DETECTIONS refers to analyses with results greater than detection limits; CENSOREDS refers to analyses with results less than method reporting limits; Abrv, abbreviations used on figures; Samples, number of samples collected; % < MRL, percent of samples collected less than method reporting limit; G mean, geometric mean, Stddev, standard deviation; 15.0% 15th percentile; 85.0%, 85th percentile; Min, minimum, Max, maximum; na, not applicable; CFS, cubic feet per second, CONDF, specific conductance measured in field; CONDL, specific conductance measured in lab; US/CM, microsiemens per centimeter, MICROSIMENS/C, microsiemens per centimeter; WH, whole water; MG/L, milligram per liter; COLS, colonies; ML, milliliter; DISS, dissolved; D, Dissolved, TOT, total; T, total; AMM, ammonia; HEX, hexavalent

Variable	Abrv	Units	Samples		% < MRL		DETECTIONS						CENSOREDS	
					Mean	Median	G mean	Stddev	15.0%	85.0%	Min	Max	Mean	Median
DISCHARGE	CFS	CFS	144	na	13.5	9.45	10.7	13.6	6.08	19.0	2.60	87.0	na	na
SPECIFIC COND.	COND	US/CM @ 25C	121	na	335	329	322	94.7	232	443	176	649	na	na
SPECIFIC COND.	COND	MICROSIMENS/C	66	na	347	335	335	91.8	242	435	172	604	na	na
PH, WH, FIELD	PH	STANDARD UNITS	67	na	8.27	8.30	8.27	0.17	8.10	8.40	7.90	9.00	na	na
WATER TEMP.	TEMP	DEGREES	123	na	8.43	8.50	na	5.48	1.80	15.0	0	22.0	na	na
OXYGEN DISS.	DO	MG/L	67	na	9.54	9.40	9.44	1.39	7.90	11.3	7.10	11.9	na	na
OXYGEN DIS. %	%DO	% OF SATURATION	65	na	98.5	98.0	98.4	2.91	96.0	101	91.0	106	na	na
BOD 5-DAY	BOD5	MG/L	58	3.45	1.11	0.90	0.85	0.97	0.40	1.69	0.10	5.70	0.50	0.50
COLIFORM FECAL	FCOL	COLS./100 ML	61	4.92	1100	365	222	1990	16.0	2250	2.00	9300	45.7	30.0
FECAL STRPT	FSTRP	COLS./100 ML	60	na	1310	390	398	2640	52.6	1860	7.00	15000	na	na
CALCIUM DISS.	CA	MG/L AS CA	46	na	35.6	34.5	34.0	10.6	25.0	47.0	17.0	65.0	na	na
MAGNESIUM DISS.	MG	MG/L AS MG	46	na	7.04	6.70	6.65	2.38	4.50	9.90	3.20	14.0	na	na
ALKALINITY	ALK	MG/L AS CACO3	60	na	121	120	116	35.0	84.0	160	58.0	227	na	na
SULFATE DISS.	SO4	MG/L AS SO4	62	na	16.5	16.0	15.8	4.62	11.0	21.0	7.30	27.0	na	na
CHLORIDE DISS.	CL	MG/L AS CL	64	na	18.1	16.5	16.7	8.59	11.0	23.3	7.10	66.0	na	na
FLUORIDE DISS.	F	MG/L AS F	25	na	2.57	2.60	2.55	0.31	2.40	2.71	1.50	3.10	na	na
HARDNESS TOTAL	HARD	MG/L AS CAO3	46	na	118	115	112	36.7	81.0	160	58.0	220	na	na
RESIDUE TOTAL	RES	MG/L	60	6.67	28.7	13.0	15.6	35.6	5.00	54.9	2.00	179	1.00	1.00
NITROGEN AMM.	TNNH3	MG/L AS N	0	na	na	na	na	na	na	na	na	na	na	na
UN-IONIZED AMM NH3-	NH3-	MG/L AS NH3	0	na	na	na	na	na	na	na	na	na	na	na
NO2 + NO3 DISS	NO23	MG/L AS N	0	na	na	na	na	na	na	na	na	na	na	na
NITROGEN, NO2	NIT	MG/L AS N	0	na	na	na	na	na	na	na	na	na	na	na
NITROGEN AMM+	TNTN	MG/L AS N	62	32.3	0.41	0.30	0.36	0.25	0.20	0.60	0.20	1.40	0.20	0.20
PHOSPHORUS O	OPO4	MG/L AS P	0	na	na	na	na	na	na	na	na	na	na	na
ARSENIC DISS.	AS D	UG/L AS AS	2	100	na	na	na	na	na	na	na	na	1.00	1.00
ARSENIC TOTAL	AS T	UG/L AS AS	1	100	na	na	na	na	na	na	na	na	1.00	1.00
BARIUM DISS.	BA D	UG/L AS BA	2	na	72.0	72.0	70.4	21.2	na	na	57.0	87.0	na	na
BARIUM TOTAL	BA T	UG/L AS BA	2	50.0	100	100	100	na	na	na	100	100	100	100
BORON DISS.	B D	UG/L AS B	0	na	na	na	na	na	na	na	na	na	na	na
BORON TOTAL	B T	UG/L AS B	0	na	na	na	na	na	na	na	na	na	na	na
CADMIUM DISS.	CD D	UG/L AS CD	38	94.7	1.00	1.00	1.00	0	na	na	1.00	1.00	1.00	1.00
CADMIUM TOTAL	CD T	UG/L AS CD	61	90.2	1.00	1.00	1.00	0	1.00	1.00	1.00	1.00	1.00	1.00
CHROMIUM DISS.	CR D	UG/L AS CR	62	88.7	2.00	1.00	1.46	2.24	1.00	6.00	1.00	7.00	1.31	1.00
CHROMIUM HEX.	CR6	UG/L AS CR	36	86.1	2.60	2.00	2.09	1.82	na	na	1.00	5.00	1.00	1.00
CHROMIUM TOTAL	CR T	UG/L AS CR	37	54.1	1.76	1.00	1.51	1.25	1.00	2.30	1.00	6.00	1.00	1.00
COPPER DISS.	CU D	UG/L AS CU	38	31.6	1.35	1.00	1.26	0.56	1.00	2.00	1.00	3.00	2.50	1.00
COPPER TOTAL	CU T	UG/L AS CU	62	6.45	3.45	3.00	2.97	1.94	2.00	6.00	1.00	11.0	1.00	1.00
IRON TOTAL	FE T	UG/L AS FE	62	na	1260	640	724	1890	290	2360	120	12000	na	na
IRON DISS.	FE D	UG/L AS FE	62	3.23	58.9	37.5	39.0	102	19.2	81.7	5.00	790	10	10
LEAD DISS.	PB D	UG/L AS PB	38	86.8	1.60	1.00	1.32	1.34	na	1.00	4.00	1.00	1.55	1.00
LEAD TOTAL	PB T	UG/L AS PB	61	36.1	4.49	3.00	3.01	5.86	1.00	7.00	1.00	35.0	4.45	5.00
MANGANESE DISS.	MN D	UG/L AS MN	62	na	40.4	40.0	36.3	20.9	20.0	50.0	10	160	na	na
MANGANESE TOT	MD T	UG/L AS MN	62	na	100	80.0	86.2	74.6	50.0	157	40.0	500	na	na
MERCURY DISS.	HG D	UG/L AS HG	0	na	na	na	na	na	na	na	na	na	na	na
MERCURY, TOT	HG T	UG/L AS HG	0	na	na	na	na	na	na	na	na	na	na	na
MOLYBDENUM DIS	MO D	UG/L AS MO	2	100	na	na	na	na	na	na	na	10	10	10
MOLYBDENUM TOT	MO T	UG/L AS MO	2	na	4.50	4.50	4.24	2.12	na	na	3.00	6.00	na	na
NICKEL DISS.	NI D	UG/L AS NI	38	57.9	1.13	1.00	1.09	0.34	1.00	1.45	1.00	2.00	1.82	1.00
NICKEL TOTAL	NI T	UG/L AS NI	38	31.6	2.31	2.00	2.08	1.16	1.00	3.00	1.00	6.00	1.00	1.00
SILVER DISS.	AG D	UG/L AS AG	2	50.0	2.00	2.00	2.00	na	na	2.00	2.00	1.00	1.00	1.00
SILVER TOTAL	AG T	UG/L AS AG	2	100	na	na	na	na	na	na	na	1.00	1.00	1.00
SELENIUM DISS.	SE D	UG/L AS SE	0	na	na	na	na	na	na	na	na	na	na	na
SELENIUM TOTAL	SE T	UG/L AS SE	0	na	na	na	na	na	na	na	na	na	na	na
ZINC DISS.	ZN D	UG/L AS ZN	38	23.7	7.45	6.00	6.71	3.65	4.00	12.5	3.00	16.0	3.00	3.00
ZINC TOTAL	ZN T	UG/L AS ZN	62	29.0	30.5	20.0	22.7	36.8	10	40.0	10	240	10	10
SULFIDE TOTAL	H2S	MG/L AS S	0	na	na	na	na	na	na	na	na	na	na	na
CYANIDE TOTAL	CYN	MG/L AS CN	2	100	na	na	na	na	na	na	na	0.01	0.01	0.01
SUSP SED	SSED	MG/L	80	na	665	42.7	63.0	2250	11.0	398	2.90	11600	na	na
SUSP-SIEVE	SIEV	%	32	na	74.0	78.0	72.3	15.2	53.0	89.1	41.0	98.3	na	na

Table 6. Univariate statistics for water-quality data collected for reach 2, October 1987 through September 1992

Note: DETECTIONS refers to analyses with results greater than detection limits; CENSOREDS refers to analyses with results less than method reporting limits; Abrv, abbreviations used on figures; Samples, number of samples collected; % < MRL, percent of samples collected less than method reporting limit; G mean, geometric mean, Stddev, standard deviation; 15.0% 15th percentile; 85.0%, 85th percentile; Min, minimum, Max, maximum; na, not applicable; CFS, cubic feet per second, CONDF, specific conductance measured in field; CONDL, specific conductance measured in lab; US/CM, microsiemens per centimeter, MICROSIEMENS/C, microsiemens per centimeter; WH, whole water; MG/L, milligram per liter; COLS, colonies; ML, milliliter; DISS, dissolved; D, Dissolved, TOT, total; T, total; AMM, ammonia; HEX, hexavalent

Variable	Abrv	Units	Samples	% < MRL	DETECTIONS								CENSOREDS	
					Mean	Median	G mean	Stddev	15.0%	85.0%	Min	Max	Mean	Median
DISCHARGE	CFS	CFS	383	0.26	18.5	13.0	8.52	22.9	1.50	33.8	0.20	222	1.40	1.40
SPECIFIC COND.	COND	US/CM @ 25C	363	na	338	318	296	168	159	513	75.0	949	na	na
SPECIFIC COND.	COND	MICROSIEMENS/C	255	na	354	336	305	184	161	576	76.0	925	na	na
PH, WH, FIELD	PH	STANDARD UNITS	250	na	8.17	8.20	8.17	0.28	7.90	8.40	7.20	8.90	na	na
WATER TEMP.	TEMP	DEGREES	378	na	12.2	12.0	na	8.69	1.00	22.0	0	31.0	na	na
OXYGEN DISS.	DO	MG/L	253	na	8.84	8.60	8.68	1.72	6.81	11.0	5.70	13.4	na	na
OXYGEN DIS. %	%DO	% OF SATURATION	238	na	100	99.0	99.9	5.99	95.0	105	82.0	128	na	na
BOD 5-DAY	BOD5	MG/L	230	0.87	2.05	1.10	1.25	2.41	0.40	3.50	0.10	15.0	3.60	3.60
COLIFORM FECAL	FCOL	COLS./100 ML	244	11.1	950	44.0	49.2	5430	4.00	510	1.00	70000	30.2	2.00
FECAL STRPT	FSTRP	COLS./100 ML	247	0.41	1030	150	167	4210	39.1	879	2.00	50000	80.0	80.0
CALCIUM DISS.	CA	MG/L AS CA	176	na	40.5	32.5	34.8	22.0	18.0	66.0	8.80	98.0	na	na
MAGNESIUM DISS	MG	MG/L AS MG	176	na	6.45	5.20	5.55	3.71	3.11	11.0	1.20	19.0	na	na
ALKALINITY	ALK	MG/L AS CACO3	241	na	93.1	87.0	85.9	36.0	56.0	135	26.0	183	na	na
SULFATE DISS.	SO4	MG/L AS SO4	240	na	54.3	38.0	35.4	47.1	11.0	110	4.00	210	na	na
CHLORIDE DISS.	CL	MG/L AS CL	244	na	14.5	14.5	10.4	11.4	3.30	23.0	0.20	110	na	na
FLUORIDE DISS.	F	MG/L AS F	101	na	1.44	1.50	1.39	0.34	1.00	1.80	0.50	2.10	na	na
HARDNESS TOTAL	HARD	MG/L AS CAO3	176	na	128	100	110	69.8	57.6	210	27.0	310	na	na
RESIDUE TOTAL	RBS	MG/L	240	7.50	156	63.5	48.1	343	8.00	264	1.00	3750	2.78	1.00
NITROGEN AMM	TNH3	MG/L AS N	0	na	na	na	na	na	na	na	na	na	na	na
UN-IONIZED AMM	NH3-	MG/L AS NH3	0	na	na	na	na	na	na	na	na	na	na	na
NO2 + NO3 DISS	NO23	MG/L AS N	0	na	na	na	na	na	na	na	na	na	na	na
NITROGEN, NO2	NIT	MG/L AS N	0	na	na	na	na	na	na	na	na	na	na	na
NITROGEN AMM+	TNIT	MG/L AS N	246	15.0	0.96	0.60	0.64	1.23	0.30	1.40	0.20	9.30	0.20	0.20
PHOSPHORUS O	OPO4	MG/L AS P	0	na	na	na	na	na	na	na	na	na	na	na
ARSENIC DISS.	AS D	UG/L AS AS	0	na	na	na	na	na	na	na	na	na	na	na
ARSENIC TOTAL	AS T	UG/L AS AS	0	na	na	na	na	na	na	na	na	na	na	na
BARIUM DISS.	BA D	UG/L AS BA	0	na	na	na	na	na	na	na	na	na	na	na
BARIUM TOTAL	BA T	UG/L AS BA	0	na	na	na	na	na	na	na	na	na	na	na
BORON DISS.	B D	UG/L AS B	0	na	na	na	na	na	na	na	na	na	na	na
BORON TOTAL	B T	UG/L AS B	0	na	na	na	na	na	na	na	na	na	na	na
CADMIUM DISS.	CD D	UG/L AS CD	144	91.7	1.33	1.00	1.26	0.49	1.00	2.00	1.00	2.00	1.00	1.00
CADMIUM TOTAL	CD T	UG/L AS CD	237	92.0	1.11	1.00	1.08	0.31	1.00	1.00	1.00	2.00	1.00	1.00
CHROMIUM DISS.	CR D	UG/L AS CR	239	85.4	1.37	1.00	1.21	0.97	1.00	2.00	1.00	6.00	1.19	1.00
CHROMIUM HEX.	CR6	UG/L AS CR	145	84.8	2.50	2.00	1.98	1.71	1.00	5.00	1.00	6.00	1.00	1.00
CHROMIUM TOTAL	CR T	UG/L AS CR	141	45.4	4.21	2.00	2.67	5.38	1.00	7.00	1.00	31.0	1.00	1.00
COPPER DISS.	CU D	UG/L AS CU	145	26.2	1.53	1.00	1.36	1.01	1.00	2.00	1.00	9.00	1.00	1.00
COPPER TOTAL	CU T	UG/L AS CU	241	6.64	6.03	4.00	4.38	6.08	2.00	10	1.00	52.0	1.00	1.00
IRON TOTAL	FE T	UG/L AS FE	241	0.41	3350	1300	1550	5630	450	5760	160	50000	10	10
IRON DISS.	FE D	UG/L AS FE	240	7.92	75.0	36.0	33.7	233	8.00	127	4.00	3400	9.42	10
LEAD DISS.	PB D	UG/L AS PB	145	79.3	1.37	1.00	1.13	1.65	1.00	1.00	1.00	10	1.00	1.00
LEAD TOTAL	PB T	UG/L AS PB	239	28.5	7.79	4.00	4.20	13.0	1.00	13.0	1.00	120	4.12	5.00
MANGANESE DISS	MN D	UG/L AS MN	240	9.17	42.0	30.0	22.5	42.3	5.00	79.2	1.00	250	8.36	10
MANGANESE TOT	MD T	UG/L AS MN	241	na	140	100	101	156	50.0	217	10	1400	na	na
MERCURY DISS.	HG D	UG/L AS HG	0	na	na	na	na	na	na	na	na	na	na	na
MERCURY, TOT	HG T	UG/L AS HG	0	na	na	na	na	na	na	na	na	na	na	na
MOLYBDENUM DISS	MO D	UG/L AS MO	0	na	na	na	na	na	na	na	na	na	na	na
MOLYBDENUM TOT	MO T	UG/L AS MO	0	na	na	na	na	na	na	na	na	na	na	na
NICKEL DISS.	NI D	UG/L AS NI	145	35.2	1.94	2.00	1.62	1.48	1.00	2.75	1.00	10	1.00	1.00
NICKEL TOTAL	NI T	UG/L AS NI	145	15.9	4.81	3.00	3.44	5.19	1.45	8.00	1.00	36.0	1.00	1.00
SILVER DISS.	AG D	UG/L AS AG	0	na	na	na	na	na	na	na	na	na	na	na
SILVER TOTAL	AG T	UG/L AS AG	0	na	na	na	na	na	na	na	na	na	na	na
SELENIUM DISS.	SE D	UG/L AS SE	0	na	na	na	na	na	na	na	na	na	na	na
SELENIUM TOTAL	SE T	UG/L AS SE	0	na	na	na	na	na	na	na	na	na	na	na
ZINC DISS.	ZN D	UG/L AS ZN	144	24.3	7.33	6.00	6.59	3.87	4.00	10	3.00	25.0	3.00	3.00
ZINC TOTAL	ZN T	UG/L AS ZN	241	32.8	46.0	23.0	28.9	65.7	10	70.0	10	580	10	10
SULFIDE TOTAL	H2S	MG/L AS S	0	na	na	na	na	na	na	na	na	na	na	na
CYANIDE TOTAL	CYN	MG/L AS CN	0	na	na	na	na	na	na	na	na	na	na	na
SUSP SED	SSED	MG/L	62	na	435	117	117	869	16.4	793	4.00	5820	na	na
SUSP-SIEVE	SIEV	%	31	na	58.7	62.3	55.6	18.2	35.1	78.7	25.4	88.8	na	na

Table 7. Univariate statistics for water-quality data collected for reach 3, October 1987 through September 1992

Note: DETECTIONS refers to analyses with results greater than detection limits; CENSOREDS refers to analyses with results less than method reporting limits; Abrv, abbreviations used on figures; Samples, number of samples collected; % < MRL, percent of samples collected less than method reporting limit; G mean, geometric mean, Stddev, standard deviation; 15.0% 15th percentile; 85.0%, 85th percentile; Min, minimum, Max, maximum; na, not applicable; CFS, cubic feet per second, CONDF, specific conductance measured in field; CONDL, specific conductance measured in lab; US/CM, microsiemens per centimeter, MICROSIEMENS/C, microsiemens per centimeter; WH, whole water; MG/L, milligram per liter; COLS, colonies; ML, milliliter; DISS, dissolved; D, Dissolved, TOT, total; T, total; AMM, ammonia; HEX, hexavalent

Variable	Abrv	Units	Samples		% < MRL		DETECTIONS						CENSOREDS	
					Mean	Median	G mean	Stddev	15.0%	85.0%	Min	Max	Mean	Median
DISCHARGE	CFS	CFS	480	na	97.6	65.7	59.8	166	24.6	133	0.72	2170	na	na
SPECIFIC COND.	COND	US/CM @ 25C	424	na	839	845	789	273	540	1150	218	1570	na	na
SPECIFIC COND.	COND	MICROSIEMENS/C	193	na	799	804	760	234	533	1070	244	1360	na	na
PH, WH, FIELD	PH	STANDARD UNITS	199	na	7.97	7.90	7.96	0.25	7.70	8.30	7.09	8.40	na	na
WATER TEMP.	TEMP	DEGREES	435	na	14.4	14.5	na	7.78	5.50	23.0	0	32.5	na	na
OXYGEN DISS.	DO	MG/L	200	na	7.87	7.90	7.72	1.57	6.20	9.60	3.90	11.7	na	na
OXYGEN DIS. %	%DO	% OF SATURATION	183	na	93.1	94.0	92.6	9.62	82.0	102	67.0	130	na	na
BOD 5-DAY	BOD5	MG/L	179	0.56	10.3	8.55	5.92	8.64	1.40	20.0	0.20	35.0	0.50	0.50
COLIFORM FECAL	FCOL	COLS./100 ML	182	3.30	2050	335	368	6650	58.7	2200	3.00	64000	33.5	33.0
FECAL STRPT	FSTRP	COLS./100 ML	184	na	1920	400	540	5910	125	3000	27.0	66000	na	na
CALCIUM DISS.	CA	MG/L AS CA	151	na	64.5	62.0	61.9	18.3	45.0	84.2	26.0	110	na	na
MAGNESIUM DISS.	MG	MG/L AS MG	151	na	18.2	17.0	17.0	6.63	11.0	25.0	4.60	36.0	na	na
ALKALINITY	ALK	MG/L AS CACO3	153	na	131	135	127	33.8	93.0	164	64.0	214	na	na
SULFATE DISS.	SO4	MG/L AS SO4	153	na	182	170	164	78.1	110	269	14.0	390	na	na
CHLORIDE DISS.	CL	MG/L AS CL	144	na	36.9	31.0	31.0	29.6	17.8	51.0	8.70	260	na	na
FLUORIDE DISS.	F	MG/L AS F	96	na	1.85	1.70	1.82	0.38	1.50	2.30	1.30	3.10	na	na
HARDNESS TOTAL	HARD	MG/L AS CAO3	151	na	237	230	226	71.2	160	310	84.0	420	na	na
RESIDUE TOTAL	RES	MG/L	187	na	133	72.0	81.6	159	36.6	251	1.00	1130	na	na
NITROGEN AMM.	TNNH3	MG/L AS N	13	7.69	3.97	1.97	0.53	4.49	0.02	9.91	0.01	10	0.01	0.01
UN-IONIZED AMM NH3-	NH3-	MG/L AS NH3	11	na	2.65	0.04	na	4.73	0	11.2	0	12.0	na	na
NO2 + NO3 DISS.	NO23	MG/L AS N	13	na	2.20	2.20	2.03	0.92	1.13	3.43	0.93	4.10	na	na
NITROGEN, NO2	NIT	MG/L AS N	1	na	0.02	0.02	0.02	na	na	na	0.02	0.02	na	na
NITROGEN AMM+	TNTN	MG/L AS N	186	2.69	4.97	2.20	2.37	5.45	0.50	11.0	0.20	37.0	0.20	0.20
PHOSPHORUS O	OPO4	MG/L AS P	1	na	2.90	2.90	2.90	na	na	na	2.90	2.90	na	na
ARSENIC DISS.	AS D	UG/L AS AS	30	26.7	1.95	2.00	1.69	1.13	1.00	4.00	1.00	4.00	1.00	1.00
ARSENIC TOTAL	AS T	UG/L AS AS	18	27.8	1.62	1.00	1.45	0.87	1.00	2.00	1.00	4.00	1.00	1.00
BARIUM DISS.	BA D	UG/L AS BA	12	na	45.0	43.0	43.8	11.2	33.0	53.9	32.0	71.0	na	na
BARIUM TOTAL	BA T	UG/L AS BA	0	na	na	na	na	na	na	na	na	na	na	na
BORON DISS.	B D	UG/L AS B	26	na	134	140	121	55.9	60.0	200	50.0	230	na	na
BORON TOTAL	B T	UG/L AS B	16	na	139	145	124	60.4	55.5	210	40.0	220	na	na
CADMIUM DISS.	CD D	UG/L AS CD	171	83.6	1.43	1.00	1.33	0.57	1.00	2.00	1.00	3.00	1.00	1.00
CADMIUM TOTAL	CD T	UG/L AS CD	180	88.3	1.05	1.00	1.03	0.22	1.00	1.00	1.00	2.00	1.00	1.00
CHROMIUM DISS.	CR D	UG/L AS CR	194	64.9	2.31	2.00	1.71	3.08	1.00	3.00	1.00	24.0	1.48	1.00
CHROMIUM HEX.	CR6	UG/L AS CR	159	85.5	1.65	1.00	1.42	1.07	1.00	3.00	1.00	5.00	1.00	1.00
CHROMIUM TOTAL	CR T	UG/L AS CR	156	20.5	4.73	3.50	3.51	4.41	2.00	8.00	1.00	29.0	1.00	1.00
COPPER DISS.	CU D	UG/L AS CU	171	12.3	3.88	3.00	3.30	2.21	2.00	6.00	1.00	11.0	6.29	10
COPPER TOTAL	CU T	UG/L AS CU	183	3.28	9.56	8.00	7.85	11.5	4.00	13.3	2.00	150	1.00	1.00
IRON TOTAL	FE T	UG/L AS FE	183	na	4160	2400	2580	5430	1060	7420	360	38000	na	na
IRON DISS.	FE D	UG/L AS FE	154	6.49	47.4	21.5	20.9	152	7.00	48.3	3.00	1400	6.50	6.50
LEAD DISS.	PB D	UG/L AS PB	171	75.4	1.40	1.00	1.26	0.80	1.00	2.00	1.00	4.00	2.83	1.00
LEAD TOTAL	PB T	UG/L AS PB	180	12.2	10.8	7.00	7.21	12.5	3.00	21.0	1.00	94.0	4.82	5.00
MANGANESE DISS.	MN D	UG/L AS MN	153	0.65	50.7	44.5	35.6	38.5	11.0	93.1	4.00	160	10	10
MANGANESE TOT	MD T	UG/L AS MN	141	na	172	140	145	118	90.0	264	30.0	850	na	na
MERCURY DISS.	HG D	UG/L AS HG	12	66.7	0.30	0.25	0.28	0.14	na	na	0.20	0.50	0.10	0.10
MERCURY, TOT	HG T	UG/L AS HG	0	na	na	na	na	na	na	na	na	na	na	na
MOLYBDENUM DIS	MO D	UG/L AS MO	12	75.0	13.3	10	12.6	5.77	na	na	10	20.0	10	10
MOLYBDENUM TOT	MO T	UG/L AS MO	0	na	na	na	na	na	na	na	na	na	na	na
NICKEL DISS.	NI D	UG/L AS NI	169	18.3	3.65	3.00	3.13	2.31	2.00	5.00	1.00	20.0	4.61	1.00
NICKEL TOTAL	NI T	UG/L AS NI	159	0.63	6.60	6.00	5.52	4.12	3.00	11.0	1.00	27.0	1.00	1.00
SILVER DISS.	AG D	UG/L AS AG	12	100	na	na	na	na	na	na	na	na	1.00	1.00
SILVER TOTAL	AG T	UG/L AS AG	0	na	na	na	na	na	na	na	na	na	na	na
SELENIUM DISS.	SE D	UG/L AS SE	54	na	5.28	5.00	5.14	1.25	4.00	6.75	3.00	9.00	na	na
SELENIUM TOTAL	SE T	UG/L AS SE	36	na	5.31	5.50	5.15	1.24	4.00	6.45	3.00	8.00	na	na
ZINC DISS.	ZN D	UG/L AS ZN	171	4.68	28.9	21.0	20.4	28.4	8.00	43.4	3.00	160	3.00	3.00
ZINC TOTAL	ZN T	UG/L AS ZN	183	1.64	63.4	50.0	49.5	63.5	30.0	90.0	10	650	10	10
SULFIDE TOTAL	H2S	MG/L AS S	15	93.3	1.00	1.00	1.00	na	na	1.00	1.00	0.50	0.50	0.50
CYANIDE TOTAL	CYN	MG/L AS CN	17	94.1	0.01	0.01	0.01	na	na	0.01	0.01	0.01	0.01	0.01
SUSP SED	SSED	MG/L	82	na	1220	259	371	2480	101	2050	36.0	11500	na	na
SUSP-SIEVE	SIEV	%	48	na	69.3	71.5	67.0	16.6	50.3	83.7	33.0	98.0	na	na

Table 8. Univariate statistics for water-quality data collected for reach 4, October 1987 through September 1992

Note: DETECTIONS refers to analyses with results greater than detection limits; CENSOREDS refers to analyses with results less than method reporting limits; Abrv, abbreviations used on figures; Samples, number of samples collected; % < MRL, percent of samples collected less than method reporting limit; G mean, geometric mean, Stddev, standard deviation; 15.0% 15th percentile; Min, minimum, Max, maximum; na, not applicable; CFS, cubic feet per second, CONDF, specific conductance measured in field; CONDL, specific conductance measured in lab; US/CM, microsiemens per centimeter, MICROSIEMENS/C, microsiemens per centimeter; WH, whole water; MG/L, milligram per liter; COLS, colonies; ML, milliliter; DISS, dissolved; TOT, total; T, total; AMM, ammonia; HEX, hexavalent

Variable	Abrv	Units	Samples	% < MRL	DETECTIONS								CENSOREDS	
					Mean	Median	G mean	Stddev	15.0%	85.0%	Min	Max	Mean	Median
DISCHARGE	CFS	CFS	82	na	90.3	79.5	70.4	60.9	28.2	140	8.50	325	na	na
SPECIFIC COND.	COND	US/CM @ 25C	82	na	1320	1320	1300	200	1120	1510	756	1780	na	na
SPECIFIC COND.	COND	MICROSIEMENS/C	83	na	1300	1300	1290	195	1110	1520	751	1710	na	na
PH, WH, FIELD	PH	STANDARD UNITS	80	na	8.32	8.30	8.32	0.16	8.20	8.50	7.80	8.70	na	na
WATER TEMP.	TEMP	DEGREES	81	na	15.8	16.0	na	9.45	4.00	26.7	0	32.0	na	na
OXYGEN DISS.	DO	MG/L	81	na	8.46	8.10	8.25	1.97	6.40	10.8	5.50	13.7	na	na
OXYGEN DIS. %	%DO	% OF SATURATION	80	na	98.6	97.0	98.4	7.42	93.0	105	79.0	132	na	na
BOD 5-DAY	BOD5	MG/L	58	1.72	6.45	3.90	3.98	6.88	1.30	13.6	0.50	34.0	0.50	0.50
COLIFORM FECAL	FCOL	COLS./100 ML	78	3.85	637	160	152	1720	31.2	932	3.00	13000	9.67	5.00
FECAL STRPT	FSTRP	COLS./100 ML	77	1.30	1430	395	466	2880	140	2060	17.0	15000	44.0	44.0
CALCIUM DISS.	CA	MG/L AS CA	23	na	96.7	96.0	95.9	12.8	83.2	110	73.0	120	na	na
MAGNESIUM DISS	MG	MG/L AS MG	23	na	35.6	33.0	34.7	8.22	28.6	46.4	22.0	54.0	na	na
ALKALINITY	ALK	MG/L AS CACO3	23	na	185	192	184	24.0	156	212	146	223	na	na
SULFATE DISS.	SO4	MG/L AS SO4	23	na	383	380	376	77.2	310	478	270	550	na	na
CHLORIDE DISS.	CL	MG/L AS CL	23	na	50.4	52.0	49.8	7.88	40.6	59.0	34.0	62.0	na	na
FLUORIDE DISS.	F	MG/L AS F	9	na	1.89	1.90	1.88	0.14	1.70	2.05	1.60	2.10	na	na
HARDNESS TOTAL	HARD	MG/L AS CAO3	23	na	389	380	384	61.9	326	454	270	510	na	na
RESIDUE TOTAL	RES	MG/L	59	na	519	168	155	1370	29.0	690	7.00	8950	na	na
NITROGEN AMM	TNH3	MG/L AS N	0	na	na	na	na	na	na	na	na	na	na	na
UN-IONIZED AMM	NH3-	MG/L AS NH3	0	na	na	na	na	na	na	na	na	na	na	na
NO2 + NO3 DISS	NO23	MG/L AS N	1	na	4.70	4.70	4.70	na	na	na	4.70	4.70	na	na
NITROGEN, NO2	NIT	MG/L AS N	0	na	na	na	na	na	na	na	na	na	na	na
NITROGEN AMM+	TNIT	MG/L AS N	60	1.67	1.36	1.10	1.06	0.96	0.50	2.40	0.20	3.90	2.10	2.10
PHOSPHORUS O	OPO4	MG/L AS P	0	na	na	na	na	na	na	na	na	na	na	na
ARSENIC DISS.	AS D	UG/L AS AS	1	na	4.00	4.00	4.00	na	na	na	4.00	4.00	na	na
ARSENIC TOTAL	AS T	UG/L AS AS	0	na	na	na	na	na	na	na	na	na	na	na
BARIUM DISS.	BA D	UG/L AS BA	0	na	na	na	na	na	na	na	na	na	na	na
BARIUM TOTAL	BA T	UG/L AS BA	0	na	na	na	na	na	na	na	na	na	na	na
BORON DISS.	B D	UG/L AS B	1	na	220	220	220	na	na	na	220	220	na	na
BORON TOTAL	B T	UG/L AS B	0	na	na	na	na	na	na	na	na	na	na	na
CADMIUM DISS.	CD D	UG/L AS CD	23	60.9	0.24	0.20	0.20	0.16	0.10	0.50	0.10	0.50	0.16	0.10
CADMIUM TOTAL	CD T	UG/L AS CD	21	81.0	1.50	1.00	1.32	1.00	na	na	1.00	3.00	1.00	1.00
CHROMIUM DISS.	CR D	UG/L AS CR	23	87.0	1.33	1.00	1.26	0.58	na	na	1.00	2.00	1.00	1.00
CHROMIUM HEX.	CR6	UG/L AS CR	0	na	na	na	na	na	na	na	na	na	na	na
CHROMIUM TOTAL	CR T	UG/L AS CR	21	14.3	8.39	6.50	6.83	5.14	3.85	16.3	1.00	18.0	1.00	1.00
COPPER DISS.	CU D	UG/L AS CU	23	na	2.35	2.00	2.19	0.94	2.00	3.40	1.00	5.00	na	na
COPPER TOTAL	CU T	UG/L AS CU	20	na	15.6	10.5	10.5	20.9	4.15	23.3	3.00	100	na	na
IRON TOTAL	FE T	UG/L AS FE	20	na	8980	8950	5550	6540	964	18000	230	20000	na	na
IRON DISS.	FE D	UG/L AS FE	22	13.6	11.7	8.00	8.99	10.3	4.00	19.0	4.00	39.0	3.00	3.00
LEAD DISS.	PB D	UG/L AS PB	23	78.3	0.66	0.70	0.65	0.11	na	na	0.50	0.80	0.75	0.50
LEAD TOTAL	PB T	UG/L AS PB	20	na	20.0	14.0	10.8	31.2	2.30	19.0	2.00	140	na	na
MANGANESE DISS	MN D	UG/L AS MN	22	4.55	6.24	3.00	4.15	9.84	2.00	8.10	2.00	48.0	1.00	1.00
MANGANESE TOT	MN T	UG/L AS MN	21	na	359	310	246	402	62.0	460	40.0	2000	na	na
MERCURY DISS.	HG D	UG/L AS HG	1	na	0.50	0.50	0.50	na	na	na	0.50	0.50	na	na
MERCURY, TOT	HG T	UG/L AS HG	0	na	na	na	na	na	na	na	na	na	na	na
MOLYBDENUM DISS	MO D	UG/L AS MO	1	na	8.00	8.00	8.00	na	na	na	8.00	8.00	na	na
MOLYBDENUM TOT	MO T	UG/L AS MO	0	na	na	na	na	na	na	na	na	na	na	na
NICKEL DISS.	NI D	UG/L AS NI	22	na	3.23	3.00	3.13	0.81	2.00	4.00	2.00	5.00	na	na
NICKEL TOTAL	NI T	UG/L AS NI	18	na	14.3	11.5	10.3	16.7	4.00	19.3	3.00	78.0	na	na
SILVER DISS.	AG D	UG/L AS AG	21	95.2	1.00	1.00	1.00	na	na	na	1.00	1.00	1.00	1.00
SILVER TOTAL	AG T	UG/L AS AG	22	90.9	1.00	1.00	1.00	0	na	na	1.00	1.00	1.00	1.00
SELENIUM DISS.	SE D	UG/L AS SE	19	na	21.3	19.0	17.9	12.8	10	33.0	5.00	53.0	na	na
SELENIUM TOTAL	SE T	UG/L AS SE	13	na	25.5	22.0	23.2	12.2	16.0	41.0	11.0	56.0	na	na
ZINC DISS.	ZN D	UG/L AS ZN	23	na	8.00	8.00	6.82	4.68	3.00	12.8	3.00	22.0	na	na
ZINC TOTAL	ZN T	UG/L AS ZN	21	4.76	85.5	75.0	66.5	84.4	31.5	109	20.0	420	10	10
SULFIDE TOTAL	H2S	MG/L AS S	0	na	na	na	na	na	na	na	na	na	na	na
CYANIDE TOTAL	CYN	MG/L AS CN	0	na	na	na	na	na	na	na	na	na	na	na
SUSP SED	SSED	MG/L	22	na	632	545	393	793	108	925	45.0	3930	na	na
SUSP-SIEVE	SIEV	%	22	na	64.5	62.5	62.4	15.8	49.1	84.1	27.5	90.0	na	na

Table 9. Univariate statistics for water-quality data collected for reach 1, October 1992 through September 1997

Note: DETECTIONS refers to analyses with results greater than detection limits; CENSOREDS refers to analyses with results less than method reporting limits; Abrv, abbreviations used on figures; Samples, number of samples collected; % < MRL, percent of samples collected less than method reporting limit; G mean, geometric mean, Stddev, standard deviation; 15.0% 15th percentile; 85.0%, 85th percentile; Min, minimum, Max, maximum; na, not applicable; CFS, cubic feet per second, CONDF, specific conductance measured in field; CONDL, specific conductance measured in lab; US/CM, microsiemens per centimeter, MICROSIMENS/C, microsiemens per centimeter; WH, whole water; MG/L, milligram per liter; COLS, colonies; ML, milliliter; DISS, dissolved; D, Dissolved, TOT, total; T, total; AMM, ammonia; HEX, hexavalent

Variable	Abrv	Units	Samples		% < MRL		DETECTIONS						CENSOREDS	
					Mean	Median	G mean	Stddev	15.0%	85.0%	Min	Max	Mean	Median
DISCHARGE	CFS	CFS	142	na	39.6	15.0	18.5	74.6	7.21	64.8	2.00	518	na	na
SPECIFIC COND.	COND	US/CM @ 25C	118	na	298	293	280	99.4	179	407	129	565	na	na
SPECIFIC COND.	COND	MICROSIMENS/C	59	na	306	301	291	92.4	187	417	138	458	na	na
PH, WH, FIELD	PH	STANDARD UNITS	58	na	8.14	8.20	8.13	0.24	7.80	8.40	7.60	8.50	na	na
WATER TEMP.	TEMP	DEGREES	122	na	7.20	7.25	na	4.80	1.50	13.0	0	17.5	na	na
OXYGEN DISS.	DO	MG/L	58	na	9.74	9.85	9.65	1.27	8.10	11.2	7.70	12.2	na	na
OXYGEN DIS. %	%DO	% OF SATURATION	57	na	97.8	97.0	97.7	3.38	95.0	101	91.0	109	na	na
BOD 5-DAY	BOD5	MG/L	58	3.45	0.61	0.55	0.53	0.38	0.30	0.90	0.20	2.30	0.30	0.30
COLIFORM FECAL	FCOL	COLS./100 ML	54	na	350	135	161	556	50.0	668	8.00	3500	na	na
FECAL STRPT	FSTRP	COLS./100 ML	56	na	415	180	214	682	55.8	735	26.0	4700	na	na
CALCIUM DISS.	CA	MG/L AS CA	59	na	31.8	31.0	30.2	9.93	19.0	43.0	15.0	50.0	na	na
MAGNESIUM DISS.	MG	MG/L AS MG	59	na	6.35	6.20	5.95	2.15	3.69	8.70	2.70	10	na	na
ALKALINITY	ALK	MG/L AS CACO3	59	na	104	105	96.7	37.0	56.2	149	39.0	166	na	na
SULFATE DISS.	SO4	MG/L AS SO4	58	na	14.5	14.6	14.1	3.32	11.0	18.0	7.20	20.0	na	na
CHLORIDE DISS.	CL	MG/L AS CL	58	na	16.6	16.0	15.3	6.32	9.25	24.0	6.30	33.7	na	na
FLUORIDE DISS.	F	MG/L AS F	58	na	2.66	2.70	2.64	0.25	2.50	2.90	1.60	3.10	na	na
HARDNESS TOTAL	HARD	MG/L AS CAO3	59	na	106	100	99.9	33.8	64.0	140	49.0	170	na	na
RESIDUE TOTAL	RES	MG/L	59	3.39	27.1	12.0	10.7	43.2	2.00	42.2	1.00	212	1.00	1.00
NITROGEN AMM.	TNNH3	MG/L AS N	55	60.0	0.02	0.02	0.02	0.008	0.02	0.03	0.01	0.04	0.01	0.01
UN-IONIZED AMM NH3-	NH3-	MG/L AS NH3	22	na	0.01	0.002	na	0.02	0	0.04	0	0.04	na	na
NO2 + NO3 DISS.	NO23	MG/L AS N	55	na	0.83	0.86	0.77	0.27	0.50	1.10	0.12	1.30	na	na
NITROGEN, NO2	NIT	MG/L AS N	55	81.8	0.01	0.01	0.01	0.005	0.01	0.02	0.01	0.02	0.01	0.01
NITROGEN AMM+	TNTN	MG/L AS N	59	76.3	0.31	0.21	0.28	0.15	0.20	0.45	0.20	0.70	0.20	0.20
PHOSPHORUS O	OPO4	MG/L AS P	55	80.0	0.01	0.01	0.01	0.005	0.01	0.02	0.01	0.02	0.01	0.01
ARSENIC DISS.	AS D	UG/L AS AS	0	na	na	na	na	na	na	na	na	na	na	na
ARSENIC TOTAL	AS T	UG/L AS AS	0	na	na	na	na	na	na	na	na	na	na	na
BARIUM DISS.	BA D	UG/L AS BA	1	na	85.7	85.7	85.7	na	na	na	85.7	85.7	na	na
BARIUM TOTAL	BA T	UG/L AS BA	0	na	na	na	na	na	na	na	na	na	na	na
BORON DISS.	B D	UG/L AS B	1	na	45.8	45.8	45.8	na	na	na	45.8	45.8	na	na
BORON TOTAL	B T	UG/L AS B	0	na	na	na	na	na	na	na	na	na	na	na
CADMIUM DISS.	CD D	UG/L AS CD	59	100	na	na	na	na	na	na	na	na	0.99	1.00
CADMIUM TOTAL	CD T	UG/L AS CD	59	100	na	na	na	na	na	na	na	na	1.00	1.00
CHROMIUM DISS.	CR D	UG/L AS CR	59	98.3	3.00	3.00	na	na	na	na	3.00	3.00	1.00	1.00
CHROMIUM HEX.	CR6	UG/L AS CR	59	96.6	1.00	1.00	1.00	0	na	na	1.00	1.00	1.00	1.00
CHROMIUM TOTAL	CR T	UG/L AS CR	59	86.4	1.43	1.20	1.36	0.46	1.00	2.07	1.00	2.10	1.00	1.00
COPPER DISS.	CU D	UG/L AS CU	59	79.7	1.18	1.00	1.13	0.44	1.00	1.46	0.89	2.50	1.00	1.00
COPPER TOTAL	CU T	UG/L AS CU	59	42.4	1.81	1.95	1.63	0.89	1.00	2.95	1.00	4.00	1.00	1.00
IRON TOTAL	FE T	UG/L AS FE	59	na	925	440	541	1180	180	1500	130	5900	na	na
IRON DISS.	FE D	UG/L AS FE	59	5.08	40.9	37.5	31.7	30.9	12.5	60.0	6.52	189	10	10
LEAD DISS.	PB D	UG/L AS PB	59	96.6	1.45	1.33	0.79	na	na	0.89	2.00	1.00	1.00	1.00
LEAD TOTAL	PB T	UG/L AS PB	59	50.8	3.72	2.00	2.81	3.17	1.10	8.00	1.00	12.0	1.00	1.00
MANGANESE DISS.	MN D	UG/L AS MN	59	1.69	30.2	29.1	28.2	10.6	17.0	41.5	9.00	53.0	10	10
MANGANESE TOT	MD T	UG/L AS MN	59	na	86.2	60.0	70.4	68.3	40.0	120	30.0	350	na	na
MERCURY DISS.	HG D	UG/L AS HG	0	na	na	na	na	na	na	na	na	na	na	na
MERCURY, TOT	HG T	UG/L AS HG	0	na	na	na	na	na	na	na	na	na	na	na
MOLYBDENUM DIS	MO D	UG/L AS MO	1	na	2.48	2.48	2.48	na	na	na	2.48	2.48	na	na
MOLYBDENUM TOT	MO T	UG/L AS MO	0	na	na	na	na	na	na	na	na	na	na	na
NICKEL DISS.	NI D	UG/L AS NI	59	93.2	1.32	1.15	1.27	0.47	na	na	1.00	2.00	1.00	1.00
NICKEL TOTAL	NI T	UG/L AS NI	59	64.4	1.68	1.00	1.40	1.39	1.00	2.70	1.00	7.00	1.00	1.00
SILVER DISS.	AG D	UG/L AS AG	1	100	na	na	na	na	na	na	na	0.20	0.20	0.20
SILVER TOTAL	AG T	UG/L AS AG	0	na	na	na	na	na	na	na	na	na	na	na
SELENIUM DISS.	SE D	UG/L AS SE	0	na	na	na	na	na	na	na	na	na	na	na
SELENIUM TOTAL	SE T	UG/L AS SE	0	na	na	na	na	na	na	na	na	na	na	na
ZINC DISS.	ZN D	UG/L AS ZN	59	52.5	4.79	5.00	4.64	1.20	3.15	6.00	3.00	7.00	4.35	3.00
ZINC TOTAL	ZN T	UG/L AS ZN	59	61.0	21.3	20.0	19.0	10.6	10	30.0	10	50.0	10	10
SULFIDE TOTAL	H2S	MG/L AS S	0	na	na	na	na	na	na	na	na	na	na	na
CYANIDE TOTAL	CYN	MG/L AS CN	0	na	na	na	na	na	na	na	na	na	na	na
SUSP SED	SSED	MG/L	51	na	383	31.0	45.1	1400	9.96	315	2.90	8020	na	na
SUSP-SIEVE	SIEV	%	1	na	60.0	60.0	60.0	na	na	60.0	60.0	60.0	na	na

Table 10. Univariate statistics for water-quality data collected for reach 2, October 1992 through September 1997

Note: DETECTIONS refers to analyses with results greater than detection limits; CENSOREDS refers to analyses with results less than method reporting limits; Abrv, abbreviations used on figures; Samples, number of samples collected; % < MRL, percent of samples collected less than method reporting limit; G mean, geometric mean, Stddev, standard deviation; 15.0% 15th percentile; Min, minimum, Max, maximum; na, not applicable; CFS, cubic feet per second, CONDF, specific conductance measured in field; CONDL, specific conductance measured in lab; US/CM, microsiemens per centimeter, MICROSIEMENS/C, microsiemens per centimeter; WH, whole water; MG/L, milligram per liter; COLS, colonies; ML, milliliter; DISS, dissolved; TOT, total; T, total; AMM, ammonia; HEX, hexavalent

Variable	Abrv	Units	Samples		% < MRL		DETECTIONS						CENSOREDS	
			Mean	Median	G mean	Stddev	15.0%	85.0%	Min	Max	Mean	Median	Mean	Median
DISCHARGE	CFS	CFS	386	na	27.6	16.0	12.5	44.3	2.70	41.3	0.27	333	na	na
SPECIFIC COND.	COND	US/CM @ 25C	362	na	367	342	325	176	184	526	77.0	901	na	na
SPECIFIC COND.	COND	MICROSIEMENS/C	236	na	383	351	327	203	166	663	75.0	931	na	na
PH, WH, FIELD	PH	STANDARD UNITS	230	na	8.20	8.20	8.19	0.31	7.80	8.50	7.30	9.00	na	na
WATER TEMP.	TEMP	DEGREES	366	na	11.6	11.5	na	8.07	1.53	21.0	0	30.0	na	na
OXYGEN DISS.	DO	MG/L	224	na	8.80	8.60	8.65	1.60	7.00	10.7	5.80	12.6	na	na
OXYGEN DIS. %	%DO	% OF SATURATION	223	na	99.6	99.0	99.5	5.50	95.0	104	86.0	125	na	na
BOD 5-DAY	BOD5	MG/L	234	2.14	0.93	0.80	na	0.73	0.40	1.40	0	5.50	0.64	0.70
COLIFORM FECAL	FCOL	COLS./100 ML	222	2.25	138	45.0	45.0	278	8.70	233	1.00	2480	1.60	1.00
FECAL STRPT	FSTRP	COLS./100 ML	232	0.43	150	86.0	73.8	244	20.8	240	3.00	2100	1.00	1.00
CALCIUM DISS.	CA	MG/L AS CA	236	na	42.9	31.0	36.1	24.7	19.8	76.0	8.70	110	na	na
MAGNESIUM DISS	MG	MG/L AS MG	236	na	6.95	5.13	5.73	4.52	3.26	13.5	1.10	23.0	na	na
ALKALINITY	ALK	MG/L AS CACO3	236	na	97.2	90.0	89.3	37.9	58.0	146	20.0	197	na	na
SULFATE DISS.	SO4	MG/L AS SO4	236	na	58.2	32.2	33.1	56.8	8.17	140	3.00	240	na	na
CHLORIDE DISS.	CL	MG/L AS CL	236	na	18.4	20.0	14.8	9.92	6.16	27.2	1.40	54.0	na	na
FLUORIDE DISS.	F	MG/L AS F	236	na	1.39	1.40	1.36	0.27	1.10	1.70	0.50	2.10	na	na
HARDNESS TOTAL	HARD	MG/L AS CAO3	236	na	136	97.5	114	79.6	63.6	245	26.0	370	na	na
RESIDUE TOTAL	RES	MG/L	235	5.96	104	58.0	34.4	165	5.00	187	1.00	1320	1.00	1.00
NITROGEN AMM	TNH3	MG/L AS N	224	39.7	0.10	0.03	0.04	0.21	0.02	0.15	0.01	1.30	0.01	0.01
UN-IONIZED AMM	NH3-	MG/L AS NH3	130	na	0.04	0.01	na	0.15	0	0.04	0	1.34	na	na
NO2 + NO3 DISS	NO23	MG/L AS N	224	19.6	1.80	1.70	1.03	1.36	0.13	3.40	0.05	4.80	0.05	0.05
NITROGEN, NO2	NIT	MG/L AS N	224	52.7	0.02	0.02	0.02	0.02	0.01	0.03	0.01	0.18	0.01	0.01
NITROGEN AMM+	TNIT	MG/L AS N	236	23.7	0.52	0.40	0.44	0.34	0.30	0.79	0.20	2.00	0.20	0.20
PHOSPHORUS O	OP04	MG/L AS P	224	21.9	0.30	0.11	0.15	0.39	0.05	0.88	0.01	2.10	0.01	0.01
ARSENIC DISS.	AS D	UG/L AS AS	0	na	na	na	na	na	na	na	na	na	na	na
ARSENIC TOTAL	AS T	UG/L AS AS	0	na	na	na	na	na	na	na	na	na	na	na
BARIUM DISS.	BA D	UG/L AS BA	0	na	na	na	na	na	na	na	na	na	na	na
BARIUM TOTAL	BA T	UG/L AS BA	0	na	na	na	na	na	na	na	na	na	na	na
BORON DISS.	B D	UG/L AS B	0	na	na	na	na	na	na	na	na	na	na	na
BORON TOTAL	B T	UG/L AS B	0	na	na	na	na	na	na	na	na	na	na	na
CADMIUM DISS.	CD D	UG/L AS CD	236	99.2	1.50	1.50	1.41	0.71	na	na	1.00	2.00	1.00	1.00
CADMIUM TOTAL	CD T	UG/L AS CD	235	100	na	na	na	na	na	na	na	na	1.00	1.00
CHROMIUM DISS.	CR D	UG/L AS CR	236	95.3	2.10	1.10	1.67	1.66	1.00	4.40	1.00	6.00	1.00	1.00
CHROMIUM HEX.	CR6	UG/L AS CR	234	94.0	1.43	1.00	1.32	0.65	1.00	2.00	1.00	3.00	1.00	1.00
CHROMIUM TOTAL	CR T	UG/L AS CR	232	71.1	2.74	2.00	2.29	2.00	1.40	4.86	1.00	12.0	1.00	1.00
COPPER DISS.	CU D	UG/L AS CU	236	47.5	1.63	1.00	1.42	1.09	1.00	2.00	1.00	7.40	1.01	1.00
COPPER TOTAL	CU T	UG/L AS CU	235	20.4	3.86	3.00	3.01	3.86	2.00	5.08	1.00	33.0	1.00	1.00
IRON TOTAL	FE T	UG/L AS FE	235	na	1940	1100	1130	2670	384	3360	209	20000	na	na
IRON DISS.	FE D	UG/L AS FE	229	19.7	72.5	60.0	38.1	67.9	7.00	140	3.00	310	5.49	3.00
LEAD DISS.	PB D	UG/L AS PB	236	98.3	2.75	2.50	2.34	1.71	na	na	1.00	5.00	1.00	1.00
LEAD TOTAL	PB T	UG/L AS PB	235	42.1	4.81	3.00	3.21	6.43	1.51	7.00	1.00	43.0	1.00	1.00
MANGANESE DISS	MN D	UG/L AS MN	236	5.08	46.7	30.5	21.9	66.3	3.99	70.3	1.00	510	7.75	10
MANGANESE TOT	MN T	UG/L AS MN	235	0.43	109	80.0	87.3	86.7	50.0	160	10	590	10	10
MERCURY DISS.	HG D	UG/L AS HG	0	na	na	na	na	na	na	na	na	na	na	na
MERCURY, TOT	HG T	UG/L AS HG	0	na	na	na	na	na	na	na	na	na	na	na
MOLYBDENUM DISS	MO D	UG/L AS MO	0	na	na	na	na	na	na	na	na	na	na	na
MOLYBDENUM TOT	MO T	UG/L AS MO	0	na	na	na	na	na	na	na	na	na	na	na
NICKEL DISS.	NI D	UG/L AS NI	236	57.6	1.50	1.00	1.39	0.58	1.00	2.00	1.00	3.20	1.00	1.00
NICKEL TOTAL	NI T	UG/L AS NI	233	24.9	2.95	2.00	2.47	2.31	1.20	4.00	1.00	18.0	1.00	1.00
SILVER DISS.	AG D	UG/L AS AG	0	na	na	na	na	na	na	na	na	na	na	na
SILVER TOTAL	AG T	UG/L AS AG	0	na	na	na	na	na	na	na	na	na	na	na
SELENIUM DISS.	SE D	UG/L AS SE	0	na	na	na	na	na	na	na	na	na	na	na
SELENIUM TOTAL	SE T	UG/L AS SE	0	na	na	na	na	na	na	na	na	na	na	na
ZINC DISS.	ZN D	UG/L AS ZN	236	61.9	7.41	6.72	6.54	3.85	4.00	12.0	3.00	20.0	4.10	3.00
ZINC TOTAL	ZN T	UG/L AS ZN	235	44.3	24.6	20.0	19.5	22.3	10	30.0	10	160	10	10
SULFIDE TOTAL	H2S	MG/L AS S	0	na	na	na	na	na	na	na	na	na	na	na
CYANIDE TOTAL	CYN	MG/L AS CN	0	na	na	na	na	na	na	na	na	na	na	na
SUSP SED	SSED	MG/L	20	na	659	125	226	1050	59.6	2160	48.0	3770	na	na
SUSP-SIEVE	SIEV	%	0	na	na	na	na	na	na	na	na	na	na	na

Table 11. Univariate statistics for water-quality data collected for reach 3, October 1992 through September 1997

Note: DETECTIONS refers to analyses with results greater than detection limits; CENSOREDS refers to analyses with results less than method reporting limits; Abrv, abbreviations used on figures; Samples, number of samples collected; % < MRL, percent of samples collected less than method reporting limit; G mean, geometric mean, Stddev, standard deviation; 15.0% 15th percentile; 85.0%, 85th percentile; Min, minimum, Max, maximum; na, not applicable; CFS, cubic feet per second, CONDF, specific conductance measured in field; CONDL, specific conductance measured in lab; US/CM, microsiemens per centimeter, MICROSIEGENS/C, microsiemens per centimeter; WH, whole water; MG/L, milligram per liter; COLS, colonies; ML, milliliter; DISS, dissolved; D, Dissolved, TOT, total; T, total; AMM, ammonia; HEX, hexavalent

Variable	Abrv	Units	Samples		% < MRL		DETECTIONS						CENSOREDS	
					Mean	Median	G mean	Stddev	15.0%	85.0%	Min	Max	Mean	Median
DISCHARGE	CFS	CFS	478	na	144	90.0	82.0	329	29.0	193	4.00	5750	na	na
SPECIFIC COND.	COND	US/CM @ 25C	445	na	818	804	769	262	533	1120	222	1390	na	na
SPECIFIC COND.	COND	MICROSIEGENS/C	195	na	772	772	736	222	530	1020	237	1240	na	na
PH, WH, FIELD	PH	STANDARD UNITS	196	na	8.04	8.00	8.04	0.20	7.90	8.30	7.50	8.40	na	na
WATER TEMP.	TEMP	DEGREES	456	na	13.0	13.0	na	7.15	4.50	21.0	0	29.0	na	na
OXYGEN DISS.	DO	MG/L	196	na	8.37	8.20	8.26	1.42	6.86	10	5.90	12.0	na	na
OXYGEN DIS. %	%DO	% OF SATURATION	194	na	93.8	95.0	93.4	7.93	85.0	101	73.0	125	na	na
BOD 5-DAY	BOD5	MG/L	191	na	7.59	5.30	3.96	7.79	0.80	15.0	0.10	34.0	na	na
COLIFORM FECAL	FCOL	COLS./100 ML	177	0.56	396	200	194	530	50.7	749	9.00	3300	300	300
FECAL STRPT	FSTRP	COLS./100 ML	185	na	423	240	236	535	74.8	801	10	3300	na	na
CALCIUM DISS.	CA	MG/L AS CA	197	na	62.9	62.0	60.3	17.1	45.7	81.0	24.0	100	na	na
MAGNESIUM DISS	MG	MG/L AS MG	197	na	18.1	17.0	16.9	6.17	12.0	25.0	4.00	33.0	na	na
ALKALINITY	ALK	MG/L AS CACO3	197	na	126	127	121	33.3	87.7	160	55.0	205	na	na
SULFATE DISS.	SO4	MG/L AS SO4	197	na	184	170	168	72.9	112	270	32.0	380	na	na
CHLORIDE DISS.	CL	MG/L AS CL	197	na	35.7	37.0	33.0	12.9	20.6	51.0	8.40	59.0	na	na
FLUORIDE DISS.	F	MG/L AS F	197	na	1.83	1.80	1.80	0.31	1.50	2.20	0.80	3.10	na	na
HARDNESS TOTAL	HARD	MG/L AS CAO3	197	na	231	230	221	65.9	160	300	76.0	380	na	na
RESIDUE TOTAL	RES	MG/L	197	na	118	76.0	76.3	151	31.7	177	14.0	1340	na	na
NITROGEN AMM.	TNH3	MG/L AS N	186	14.0	2.24	0.53	0.41	3.12	0.03	6.00	0.01	11.0	0.01	0.01
UN-IONIZED AMM NH3-	NH3-	MG/L AS NH3	159	na	1.67	0.09	na	3.23	0	4.87	0	13.4	na	na
NO2 + NO3 DISS	NO23	MG/L AS N	186	0.54	3.32	3.00	2.90	1.64	1.60	5.30	0.59	7.80	0.05	0.05
NITROGEN, NO2	NIT	MG/L AS N	186	17.2	0.11	0.08	0.07	0.15	0.02	0.20	0.01	1.60	0.01	0.01
NITROGEN AMM+	TNIT	MG/L AS N	197	7.11	3.18	1.20	1.50	3.81	0.30	7.70	0.20	16.0	0.20	0.20
PHOSPHORUS O	OPO4	MG/L AS P	186	1.61	0.67	0.32	0.27	0.75	0.04	1.60	0.02	2.80	0.01	0.01
ARSENIC DISS.	AS D	UG/L AS AS	30	53.3	1.29	1.00	1.22	0.47	1.00	2.00	1.00	2.00	1.00	1.00
ARSENIC TOTAL	AS T	UG/L AS AS	27	18.5	2.30	2.00	2.11	0.98	1.01	3.00	1.00	5.00	1.00	1.00
BARIUM DISS.	BA D	UG/L AS BA	0	na	na	na	na	na	na	na	na	na	na	na
BARIUM TOTAL	BA T	UG/L AS BA	0	na	na	na	na	na	na	na	na	na	na	na
BORON DISS.	B D	UG/L AS B	30	na	115	90.7	95.0	65.0	43.3	194	20.0	230	na	na
BORON TOTAL	B T	UG/L AS B	29	na	113	90.0	97.9	58.0	50.0	185	35.0	230	na	na
CADMIUM DISS.	CD D	UG/L AS CD	197	99.5	2.00	2.00	2.00	na	na	na	2.00	2.00	1.00	1.00
CADMIUM TOTAL	CD T	UG/L AS CD	197	100	na	na	na	na	na	na	na	na	1.00	1.00
CHROMIUM DISS.	CR D	UG/L AS CR	197	92.4	1.52	1.20	1.42	0.62	1.04	2.36	1.00	3.00	1.00	1.00
CHROMIUM HEX.	CR6	UG/L AS CR	196	94.9	2.20	2.00	2.02	0.92	1.00	3.35	1.00	4.00	1.00	1.00
CHROMIUM TOTAL	CR T	UG/L AS CR	195	30.8	2.40	2.00	2.05	1.76	1.20	3.32	1.00	15.0	1.00	1.00
COPPER DISS.	CU D	UG/L AS CU	197	17.3	2.50	2.00	2.16	1.54	1.00	4.00	1.00	12.1	1.00	1.00
COPPER TOTAL	CU T	UG/L AS CU	197	1.02	5.94	5.00	5.03	3.72	3.00	9.00	1.00	28.0	1.00	1.00
IRON TOTAL	FE T	UG/L AS FE	197	na	2860	1700	1800	4370	690	4630	280	45000	na	na
IRON DISS.	FE D	UG/L AS FE	197	12.7	30.8	20.0	18.2	62.0	6.00	42.1	3.00	770	5.80	3.00
LEAD DISS.	PB D	UG/L AS PB	197	97.0	1.33	1.00	1.20	0.82	1.00	2.90	1.00	3.00	1.00	1.00
LEAD TOTAL	PB T	UG/L AS PB	197	1.02	6.17	4.00	4.13	7.30	2.00	10	1.00	50.0	1.00	1.00
MANGANESE DISS	MN D	UG/L AS MN	197	2.54	42.9	32.4	29.9	32.1	11.0	79.1	2.00	150	8.20	10
MANGANESE TOT	MD T	UG/L AS MN	197	na	136	110	117	91.2	70.0	180	30.0	809	na	na
MERCURY DISS.	HG D	UG/L AS HG	0	na	na	na	na	na	na	na	na	na	na	na
MERCURY, TOT	HG T	UG/L AS HG	0	na	na	na	na	na	na	na	na	na	na	na
MOLYBDENUM DIS	MO D	UG/L AS MO	0	na	na	na	na	na	na	na	na	na	na	na
MOLYBDENUM TOT	MO T	UG/L AS MO	0	na	na	na	na	na	na	na	na	na	na	na
NICKEL DISS.	NI D	UG/L AS NI	197	18.3	2.54	3.00	2.26	1.20	1.00	3.67	1.00	9.00	1.00	1.00
NICKEL TOTAL	NI T	UG/L AS NI	196	1.53	4.41	4.00	3.86	2.59	2.00	6.00	1.00	22.0	1.00	1.00
SILVER DISS.	AG D	UG/L AS AG	0	na	na	na	na	na	na	na	na	na	na	na
SILVER TOTAL	AG T	UG/L AS AG	0	na	na	na	na	na	na	na	na	na	na	na
SELENIUM DISS.	SE D	UG/L AS SE	94	2.13	4.15	4.00	3.86	1.48	2.60	6.00	1.00	8.00	1.00	1.00
SELENIUM TOTAL	SE T	UG/L AS SE	0	na	na	na	na	na	na	na	na	na	na	na
ZINC DISS.	ZN D	UG/L AS ZN	197	19.3	16.5	15.0	13.4	9.99	5.36	29.0	3.00	50.0	4.47	3.00
ZINC TOTAL	ZN T	UG/L AS ZN	197	3.05	36.0	30.0	31.2	21.5	20.0	50.0	10	200	10	10
SULFIDE TOTAL	H2S	MG/L AS S	30	93.3	0.80	0.80	0.80	0	na	na	0.80	0.80	0.66	0.50
CYANIDE TOTAL	CYN	MG/L AS CN	30	100	na	na	na	na	na	na	na	na	0.01	0.01
SUSP SED	SSED	MG/L	49	na	663	149	199	1760	63.5	630	44.0	10200	na	na
SUSP-SIEVE	SIEV	%	1	na	46.0	46.0	46.0	na	na	na	46.0	46.0	na	na

Table 12. Univariate statistics for water-quality data collected for reach 4, October 1992 through September 1997

Note: DETECTIONS refers to analyses with results greater than detection limits; CENSOREDS refers to analyses with results less than method reporting limits; Abrv, abbreviations used on figures; Samples, number of samples collected; % < MRL, percent of samples collected less than method reporting limit; G mean, geometric mean, Stddev, standard deviation; 15.0% 15th percentile; 85.0%, 85th percentile; Min, minimum, Max, maximum; na, not applicable; CFS, cubic feet per second, CONDF, specific conductance measured in field; CONDL, specific conductance measured in lab; US/CM, microsiemens per centimeter, MICROSIEMENS/C, microsiemens per centimeter; WH, whole water; MG/L, milligram per liter; COLS, colonies; ML, milliliter; DISS, dissolved; TOT, total; T, total; AMM, ammonia; HEX, hexavalent

Variable	Abrv	Units	Samples		DETECTIONS							CENSOREDS		
			Mean	Median	G mean	Stddev	15.0%		85.0%		Min	Max	Mean	Median
							15.0%	85.0%	Min	Max				
DISCHARGE	CFS	CFS	63	na	177	122	113	266	41.2	262	11.0	2040	na	na
SPECIFIC COND.	COND	US/CM @ 25C	63	na	1210	1220	1180	256	957	1470	591	2030	na	na
SPECIFIC COND.	COND	MICROSIEMENS/C	61	na	1220	1200	1190	253	960	1490	656	2040	na	na
PH, WH, FIELD	PH	STANDARD UNITS	61	na	8.31	8.40	8.31	0.13	8.20	8.40	7.90	8.50	na	na
WATER TEMP.	TEMP	DEGREES	63	na	14.4	14.5	na	8.23	4.80	24.4	0	30.5	na	na
OXYGEN DISS.	DO	MG/L	61	na	8.62	8.40	8.49	1.55	6.73	10.4	6.10	11.6	na	na
OXYGEN DIS. %	%DO	% OF SATURATION	61	na	98.7	98.0	98.6	4.11	95.0	103	90.0	115	na	na
BOD 5-DAY	BOD5	MG/L	59	na	3.85	2.40	na	4.27	0.80	7.10	0	22.0	na	na
COLIFORM FECAL	FCOL	COLS./100 ML	56	na	370	135	144	564	28.1	836	10	2800	na	na
FECAL STRPT	FSTRP	COLS./100 ML	58	na	518	160	195	810	47.2	1240	10	3200	na	na
CALCIUM DISS.	CA	MG/L AS CA	3	na	100	100	100	9.50	na	na	91.0	110	na	na
MAGNESIUM DISS	MG	MG/L AS MG	3	na	36.7	37.0	36.5	4.51	na	na	32.0	41.0	na	na
ALKALINITY	ALK	MG/L AS CACO3	4	na	196	196	195	21.2	na	na	173	220	na	na
SULFATE DISS.	SO4	MG/L AS SO4	3	na	380	370	377	55.7	na	na	330	440	na	na
CHLORIDE DISS.	CL	MG/L AS CL	3	na	58.0	56.0	57.9	4.36	na	na	55.0	63.0	na	na
FLUORIDE DISS.	F	MG/L AS F	0	na	na	na	na	na	na	na	na	na	na	na
HARDNESS TOTAL	HARD	MG/L AS CAO3	3	na	400	400	399	40.0	na	na	360	440	na	na
RESIDUE TOTAL	RES	MG/L	58	1.72	333	194	186	481	71.0	436	6.00	2410	1.00	1.00
NITROGEN AMM	TNH3	MG/L AS N	57	26.3	0.15	0.03	0.05	0.31	0.02	0.24	0.02	1.50	0.01	0.01
UN-IONIZED AMM	NH3-	MG/L AS NH3	41	na	0.04	0.02	na	0.11	0	0.05	0	0.71	na	na
NO2 + NO3 DISS	NO23	MG/L AS N	58	na	5.10	5.20	4.82	1.58	3.01	7.02	2.00	7.50	na	na
NITROGEN, NO2	NIT	MG/L AS N	56	46.4	0.03	0.02	0.02	0.02	0.01	0.05	0.01	0.09	0.01	0.01
NITROGEN AMM+	TNIT	MG/L AS N	59	na	1.05	0.80	0.80	0.94	0.40	1.60	0.20	4.60	na	na
PHOSPHORUS O	OP04	MG/L AS P	56	na	0.52	0.40	0.42	0.35	0.25	0.95	0.11	1.50	na	na
ARSENIC DISS.	AS D	UG/L AS AS	0	na	na	na	na	na	na	na	na	na	na	na
ARSENIC TOTAL	AS T	UG/L AS AS	0	na	na	na	na	na	na	na	na	na	na	na
BARIUM DISS.	BA D	UG/L AS BA	0	na	na	na	na	na	na	na	na	na	na	na
BARIUM TOTAL	BA T	UG/L AS BA	0	na	na	na	na	na	na	na	na	na	na	na
BORON DISS.	B D	UG/L AS B	0	na	na	na	na	na	na	na	na	na	na	na
BORON TOTAL	B T	UG/L AS B	0	na	na	na	na	na	na	na	na	na	na	na
CADMIUM DISS.	CD D	UG/L AS CD	3	66.7	0.10	0.10	0.10	na	na	na	0.10	0.10	0.10	0.10
CADMIUM TOTAL	CD T	UG/L AS CD	3	100	na	na	na	na	na	na	na	na	1.00	1.00
CHROMIUM DISS.	CR D	UG/L AS CR	3	66.7	2.00	2.00	2.00	na	na	na	2.00	2.00	1.00	1.00
CHROMIUM HEX.	CR6	UG/L AS CR	0	na	na	na	na	na	na	na	na	na	na	na
CHROMIUM TOTAL	CR T	UG/L AS CR	3	na	6.33	3.00	4.38	6.66	na	na	2.00	14.0	na	na
COPPER DISS.	CU D	UG/L AS CU	3	na	2.33	2.00	2.29	0.58	na	na	2.00	3.00	na	na
COPPER TOTAL	CU T	UG/L AS CU	3	na	8.33	8.00	8.32	0.58	na	na	8.00	9.00	na	na
IRON TOTAL	FE T	UG/L AS FE	3	na	4500	4700	4340	1410	na	na	3000	5800	na	na
IRON DISS.	FE D	UG/L AS FE	3	na	11.3	13.0	10.8	3.79	na	na	7.00	14.0	na	na
LEAD DISS.	PB D	UG/L AS PB	3	66.7	0.80	0.80	0.80	na	na	na	0.80	0.80	0.50	0.50
LEAD TOTAL	PB T	UG/L AS PB	3	na	11.3	8.00	9.86	7.57	na	na	6.00	20.0	na	na
MANGANESE DISS	MN D	UG/L AS MN	3	na	5.00	5.00	4.72	2.00	na	na	3.00	7.00	na	na
MANGANESE TOT	MN T	UG/L AS MN	3	na	200	200	197	40.0	na	na	160	240	na	na
MERCURY DISS.	HG D	UG/L AS HG	0	na	na	na	na	na	na	na	na	na	na	na
MERCURY, TOT	HG T	UG/L AS HG	0	na	na	na	na	na	na	na	na	na	na	na
MOLYBDENUM DIS	MO D	UG/L AS MO	0	na	na	na	na	na	na	na	na	na	na	na
MOLYBDENUM TOT	MO T	UG/L AS MO	0	na	na	na	na	na	na	na	na	na	na	na
NICKEL DISS.	NI D	UG/L AS NI	3	na	2.67	3.00	2.62	0.58	na	na	2.00	3.00	na	na
NICKEL TOTAL	NI T	UG/L AS NI	3	na	6.33	7.00	6.26	1.15	na	na	5.00	7.00	na	na
SILVER DISS.	AG D	UG/L AS AG	3	100	na	na	na	na	na	na	na	1.00	1.00	1.00
SILVER TOTAL	AG T	UG/L AS AG	3	100	na	na	na	na	na	na	na	1.00	1.00	1.00
SELENIUM DISS.	SE D	UG/L AS SE	31	3.23	16.5	14.5	15.0	7.64	8.94	26.0	6.00	38.0	1.00	1.00
SELENIUM TOTAL	SE T	UG/L AS SE	3	na	23.7	21.0	23.1	6.43	na	na	19.0	31.0	na	na
ZINC DISS.	ZN D	UG/L AS ZN	3	na	8.67	9.00	8.41	2.52	na	na	6.00	11.0	na	na
ZINC TOTAL	ZN T	UG/L AS ZN	3	na	30.0	40.0	25.2	17.3	na	na	10	40.0	na	na
SULFIDE TOTAL	H2S	MG/L AS S	0	na	na	na	na	na	na	na	na	na	na	na
CYANIDE TOTAL	CYN	MG/L AS CN	0	na	na	na	na	na	na	na	na	na	na	na
SUSP SED	SSED	MG/L	3	na	352	365	343	91.7	na	na	254	436	na	na
SUSP-SIEVE	SIEV	%	3	na	43.9	54.3	36.8	25.8	na	na	14.6	62.9	na	na

Figures describing correlations among water-quality properties and constituents for each reach (figs. 3–6) were compiled from correlation matrices for all stations in a given reach. Individual matrices, which are shown graphically in the Appendix, were reviewed to extract pairs having correlation coefficients with an absolute value greater than or equal to 0.80. A natural log transformation was applied to all values for the correlation exercise; the transformation sometimes provides more significant results for water-quality properties or constituents that range from very low values to very high values. The differences between the correlation matrices derived without the transformation and those presented in this report were generally minor except for one property, flow (shown as CFS in figures). Correlations of flow with other properties and constituents had higher absolute values when computed with transformed data than when computed with untransformed data.

Summaries depicting the spatial, or areal, relations as a function of relative station rank within the study area, and station, or local, variation for water-quality properties and constituents for each station during each evaluation period are presented in figures 7 and 8. The figures were prepared using station means to represent areal ranks and the 15th and 85 percentile of station values to describe local variations (from station means) for each water-quality property or constituent. To indicate areal variability within the study area, the rank for a given station is expressed as a percentage of the range of means for the given water-quality property or constituent from all stations in the study area. For example, figure 7 indicates that, based on the samples collected, the mean flow (indicated as CFS) at station 4905 is less than the mean flow at station 5500, which is downstream from station 4905, and that both are substantially greater than the mean flow at station 3700 at the beginning of reach 1.

To indicate local variation, or variation in measurements made at a given station, 15th and 85th percentiles were compared to the station mean. The position of the mean value in the distribution for all values measured at a given station is indicated with a horizontal bar, and the distance from the mean to the 15th and 85th percentiles is indicated with vectors or “whiskers” drawn from the mean. The length of each whisker is directly proportional to the difference between the mean value and the 15th (whisker going

downward) and 85th (whisker going upward) percentiles. For example, figure 7 indicates that the difference between the mean value and the 85th percentile for flow at station 5500 is very small compared to the difference between the mean and the 15th percentile. This indicates that the distribution of the series of flow measurements is not symmetrical about the mean as described in the next paragraph.

Figures 7 and 8 provide information about relative relations between water-quality properties and constituents for a given station and between stations. To assign quantitative values to information provided in figures 7 and 8, it is necessary to refer to the tables of univariate statistics in the Appendix. For example, table A6 indicates that, for station 5500 (1987 to 1992), the mean value for flow (discharge) was 92.6 cubic feet per second. The table also indicates this mean value is a little more than 2.5 times the median value of 35.5 cubic feet per second and that the mean is influenced by the maximum of 2,170 cubic feet per second. Readers that are concerned about what results might be affected by this bias toward high flow can look at figure 3 and determine that discharge is correlated with specific conductance, calcium, magnesium, alkalinity, and hardness.

General Water-Quality Characteristics

Edelmann (1990) described many of the basic processes affecting water-quality conditions and the resulting phenomena in the study area. The observations made in that report remained applicable during the analysis period for this report. Figures 7 and 8 highlight many of the phenomena described by Edelmann, and some are briefly reviewed here.

Some water-quality properties and constituents show a clear and almost steady increase from the headwater portion of the system to the end of the system. Flow is an excellent example of this phenomenon. Figures 7 and 8 clearly show that mean values of flow increase through the system. The more detailed summary data in table 4 provide an indication that flow is related to drainage area. For instance, selection of almost any duration interval shows that flow in cubic feet per second increases steadily through the system but that flow expressed as cubic feet per second per square mile (cfsm in table 4), which normalizes the effect of drainage area, stays relatively constant through the system.

EXPLANATION

Number of correlations with absolute value greater than or equal to 0.80 based on at least 6 paired observations (with log transform) for the period October 1987 through September 1997

Note: water-quality property and constituent abbreviations described in table 2

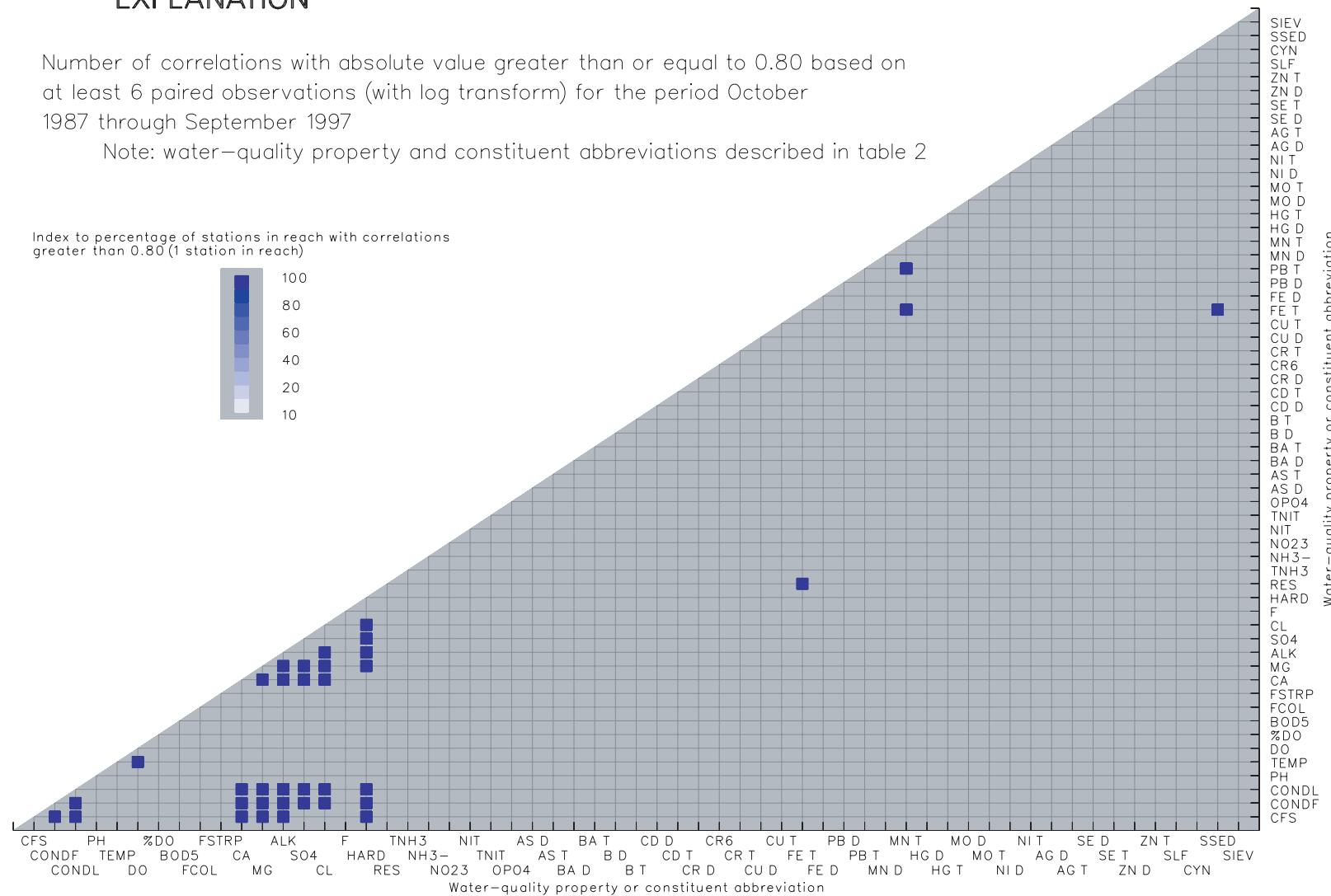


Figure 3. Correlation among water-quality properties and constituents within reach 1.

EXPLANATION

Number of correlations with absolute value greater than or equal to 0.80 based on at least 6 paired observations (with log transform) for the period October 1987 through September 1997

Note: water-quality property and constituent abbreviations described in table 2

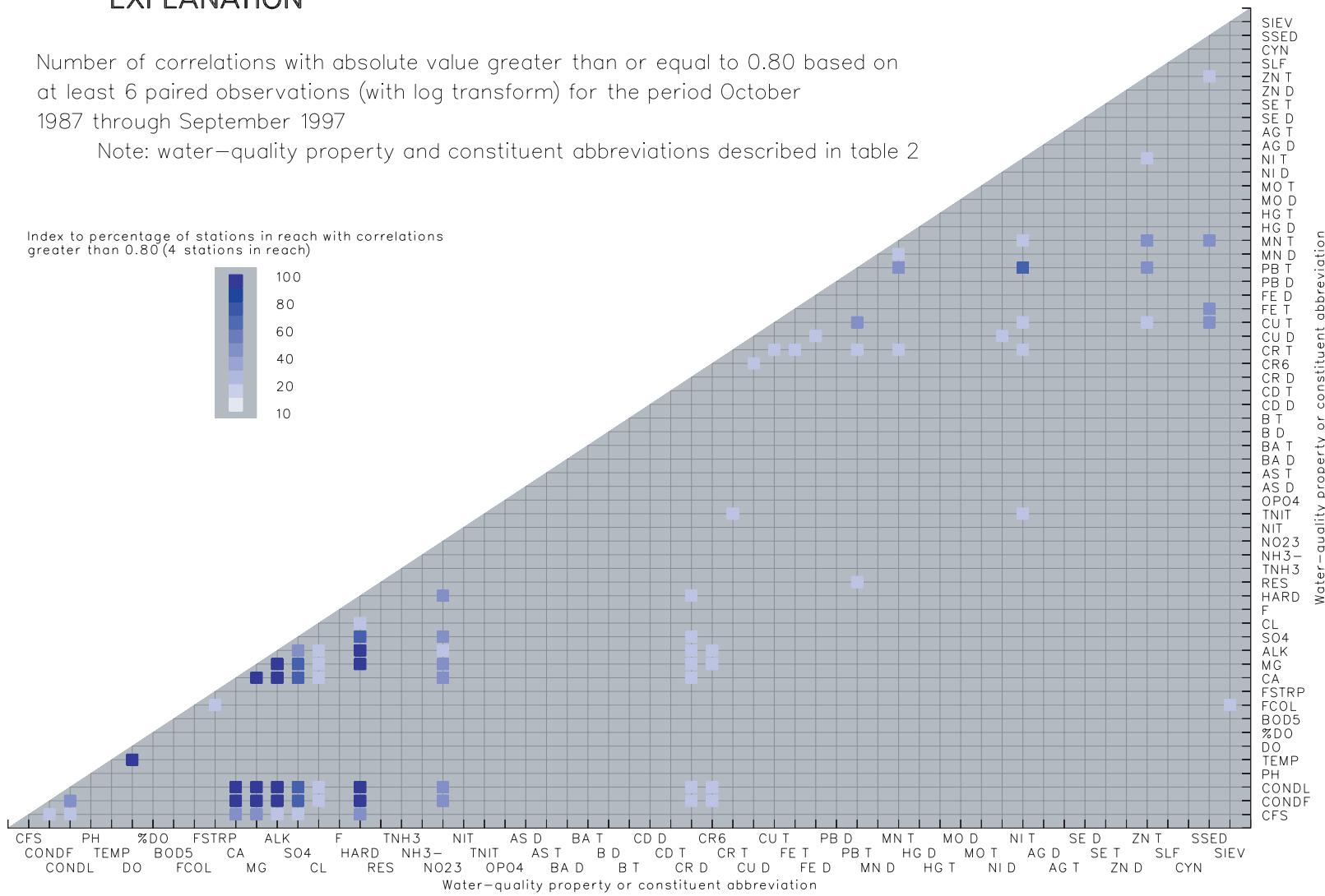


Figure 4. Correlation among water-quality properties and constituents within reach 2.

EXPLANATION

Number of correlations with absolute value greater than or equal to 0.80 based on at least 6 paired observations (with log transform) for the period October 1987 through September 1997

Note: water-quality property and constituent abbreviations described in table 2

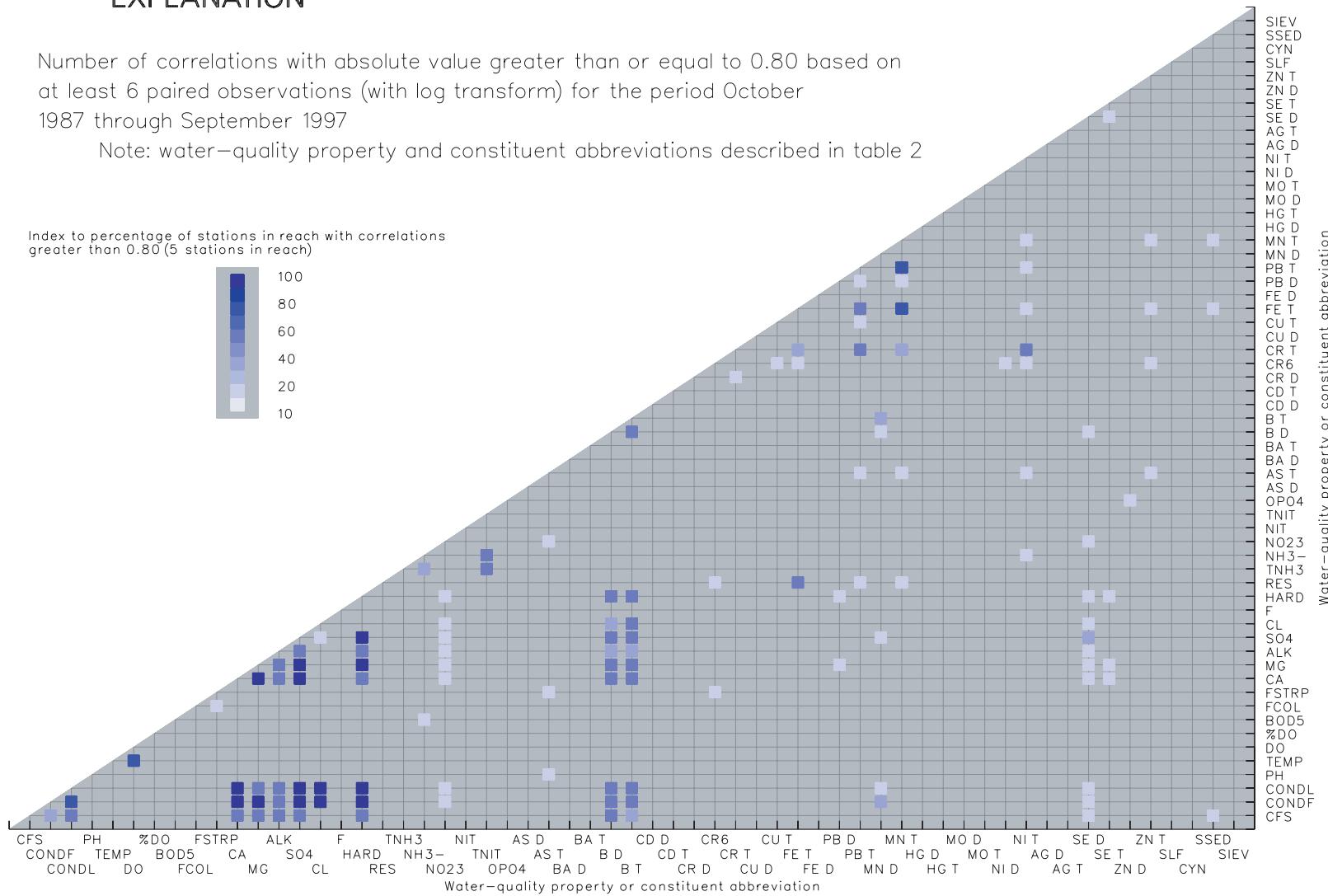


Figure 5. Correlation among water-quality properties and constituents within reach 3.

EXPLANATION

Number of correlations with absolute value greater than or equal to 0.80 based on at least 6 paired observations (with log transform) for the period October 1987 through September 1997

Note: water-quality property and constituent abbreviations described in table 2

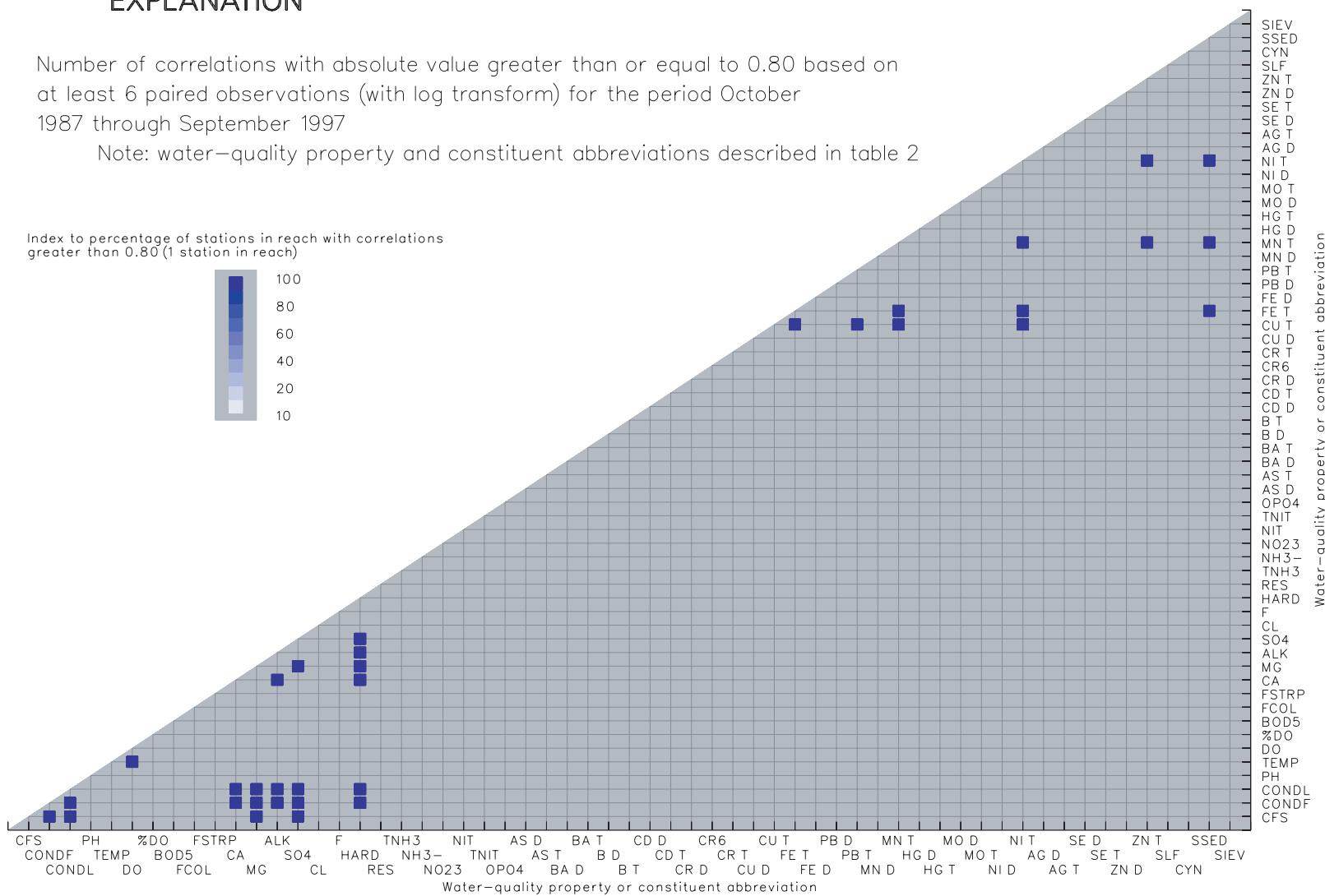


Figure 6. Correlation among water-quality properties and constituents within reach 4.

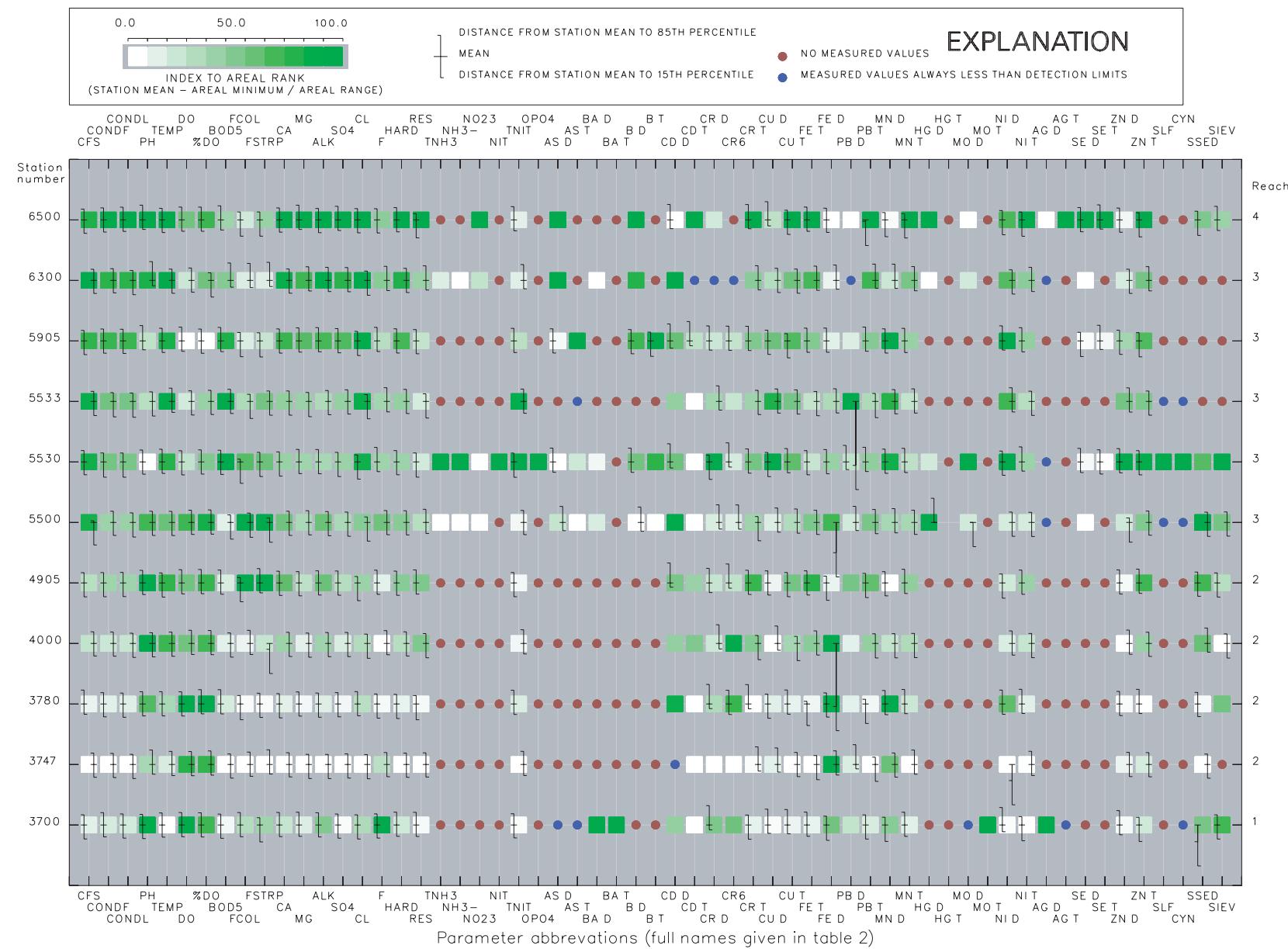


Figure 7. Rank in study area (areal) and station (local) variation of water-quality properties and constituents from samples collected in Fountain and Monument Creeks for the period October 1987 through September 1992.

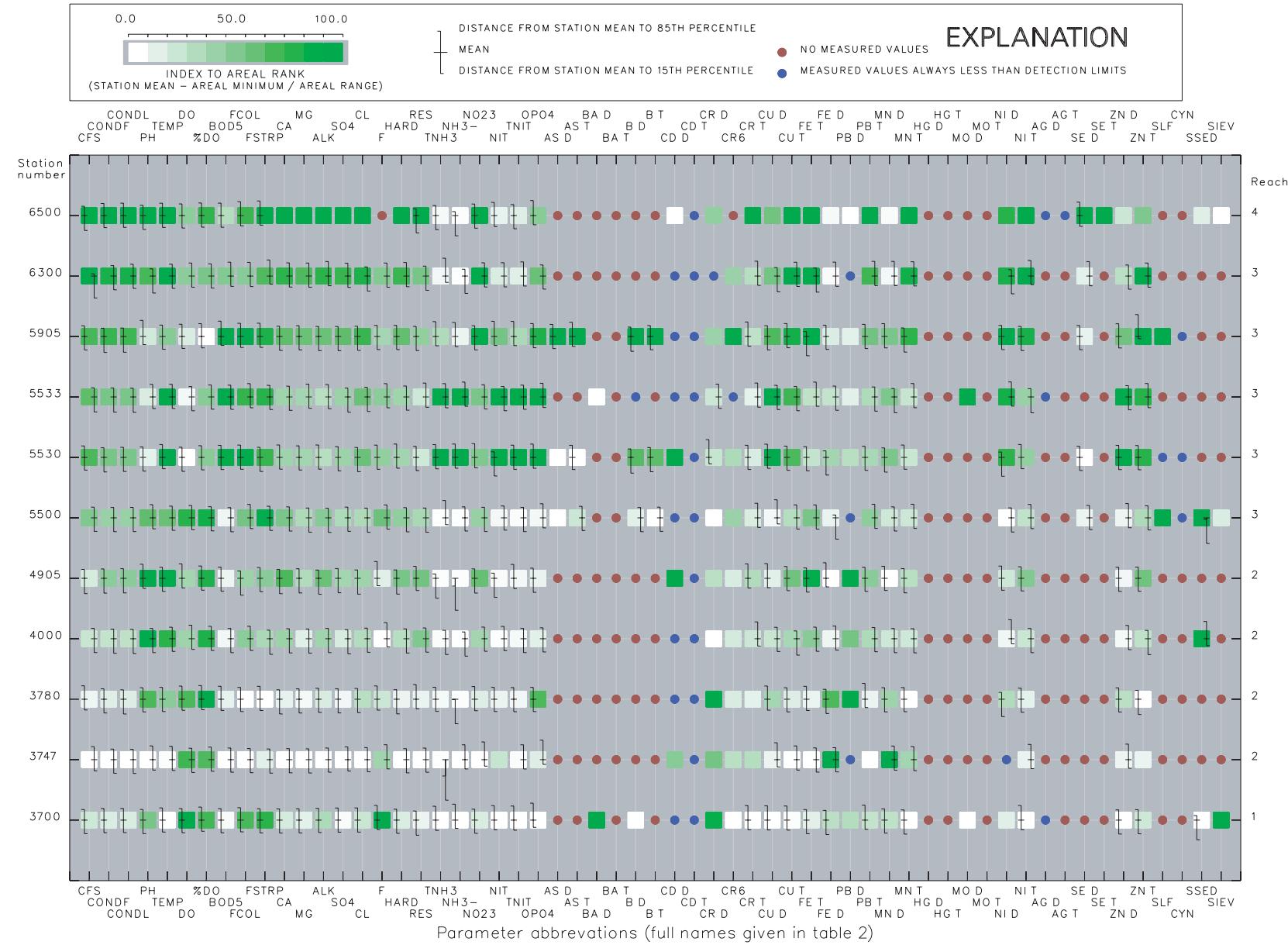


Figure 8. Rank in study area (areal) and station (local) variation of water-quality properties and constituents from samples collected in Fountain and Monument Creeks for the period October 1992 through September 1997.

The correlation summaries presented in figures 3–6 indicate that flow is correlated fairly well only with specific conductance and most of the available major ions such as calcium, magnesium, and sulfate; flow also correlates fairly well with some major-ion-related properties such as alkalinity and hardness. Increases in these properties and constituents are more complicated to explain than the relatively simple example of flow; however, they are certainly related to changes in geology, land use, and water use.

Another very prominent phenomenon present in the system is changes in water-quality properties and constituents downstream from station 5500 (figs. 7 and 8). In this area, some water-quality properties such as pH and dissolved oxygen noticeably decreased. Other water-quality properties and constituents such as 5-day biochemical oxygen demand; chloride; nutrients such as nitrogen ammonia, un-ionized ammonia, and orthophosphorus; and minor elements such as boron, copper, nickel, and zinc noticeably increased.

SUMMARY OF WATER-QUALITY CHARACTERISTICS COMPARED TO IN-STREAM REGULATORY STANDARDS

Regulatory criteria that can be used to assign in-stream regulatory standards to classified streams are established by the CDPHE (Colorado Department of Public Health and Environment, 1998). In-stream regulatory standards are referred to simply as “standards” in this section. Reaches 1, 2, 3, and 4 correspond to stream segments classified by CDPHE for standards (table 1). Standards normally apply throughout the reach; however, the reach 3 standard for dissolved manganese has a point of compliance, the Pinello Ranch Clear Well, located downstream from the beginning of the reach (fig. 1). Most standards can be compared to concentrations determined from individual samples to evaluate water-quality conditions in streams; however, the CDPHE recommends that, for fecal coliform, the geometric mean (listed in tables 5–12 and Appendix tables) be used rather than individual concentrations.

In this report, results were compared to the most stringent standard available, which in most cases was the chronic standard for aquatic life. Many standards for aquatic life are straightforward fixed values. Other standards, specifically for the following metals—cadmium, chromium, copper, lead, nickel,

silver, and zinc—are calculated values. Fixed and calculated standards are periodically reviewed and updated by the CDPHE. Calculated standards for the listed metals are a function of hardness values. The CDPHE guidelines for calculating standards provide some flexibility in determining what hardness value to use for the calculations; however, the guidelines do specify that a hardness value that is representative of low-flow conditions should be used in the calculation. The hardness values used to calculate the standards for this report were the 85th percentile, based on data from October 1992 through September 1997, except for station 6500, which had relatively few values, so the period was extended back to October 1987. Because hardness and flow have an inverse relation in the study area (figs. A1–11), the 85th percentile hardness values are representative of low-flow conditions. The fixed and calculated standards used in this report are listed in table 2 and also are included in tables of univariate statistics for each station included in the Appendix.

It should also be noted that there is a standard for nitrate. In this report, concentrations of nitrate plus nitrite have been compared to the nitrate standard. Concentrations for nitrite are typically a very small component of this sum, and the use of nitrate plus nitrite concentrations as a surrogate for nitrate is acceptable.

Water-quality properties and constituents for each evaluation period were compared to the standards listed in table 2. The results of the comparison are shown graphically in figures 9 and 10; measurements of water-quality properties and constituents that exceeded standards are also summarized in table 13.

For many water-quality properties or constituents that have standards, the samples collected showed no exceedances. Some water-quality properties and constituents—fecal coliform, total iron, and dissolved manganese—showed widespread exceedances with incidence rates that were usually relatively low. For example, figure 10 shows that, for the second evaluation period, results from samples analyzed for fecal coliform exceeded standards at almost every station in the system. Table 13 indicates that the percentage of samples at a given station that exceeded the fecal coliform standard, except for station 6300 where no exceedances were noted, was as little as about 2 percent to as much as about 40 percent, and that 64 percent of the stations had incidence rates of less than 15 percent.

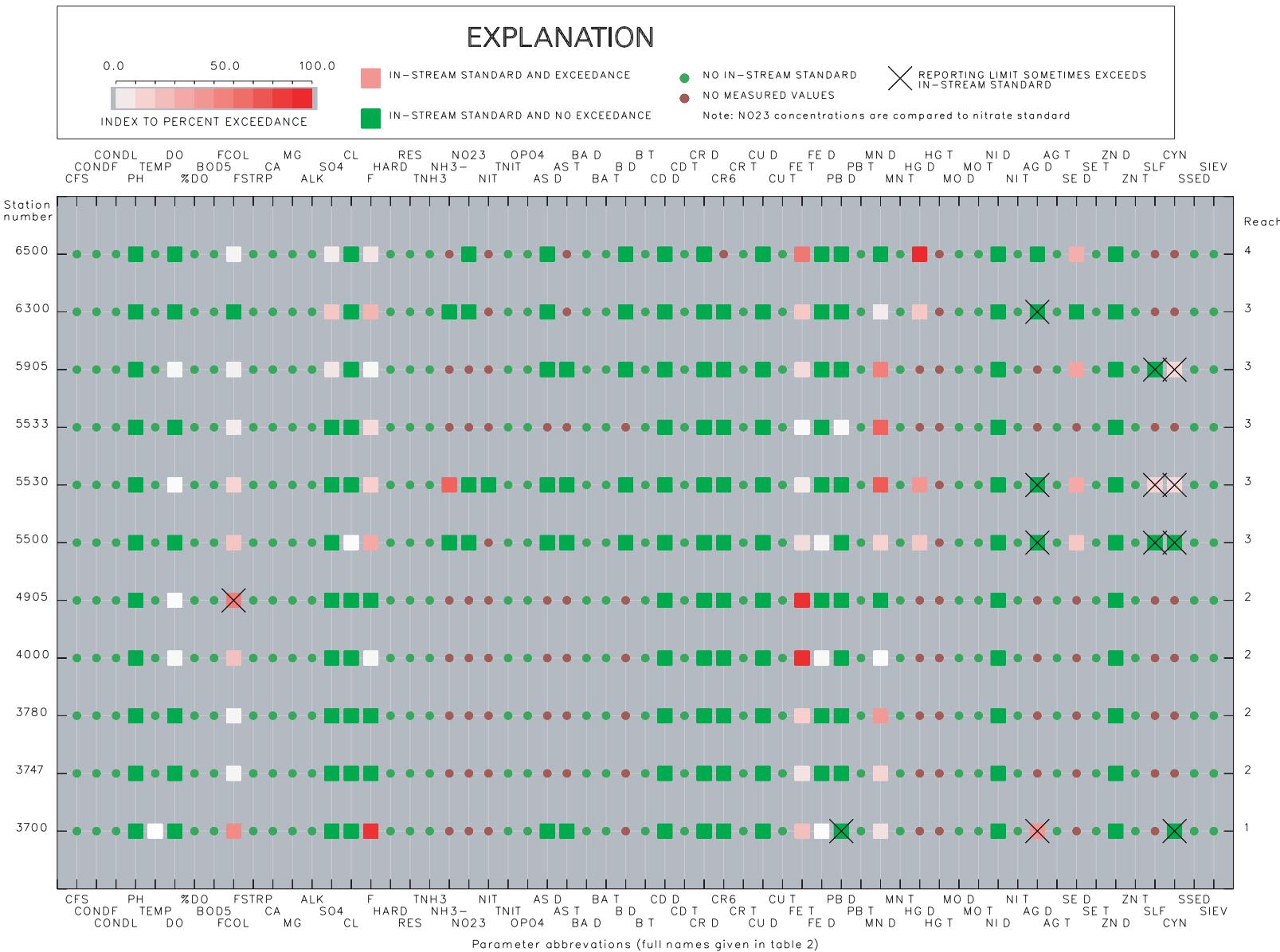


Figure 9. Summary of in-stream regulatory standard exceedance for samples from Fountain and Monument Creeks for the period October 1987 through September 1992.



Figure 10. Summary of in-stream regulatory standard exceedance for samples from Fountain and Monument Creeks for the period October 1992 through September 1997.

Table 13. Cases of in-stream regulatory standard exceedances

[Constituent and property abbreviations shown in table 2; Standard, in-stream standard as listed in table 2, all standards units indicated in table 2; NS, number of samples; NE, number of exceedances; Percent, percentage of samples that exceeded standard]

Station	Constituent	Standard	October 1987 - September 1992			October 1992 - September 1997		
			NS	NE	Percent	-----		Percent
						NS	ND	
3700	WATER TEMPERATURE	20.0	123	1	0.81	122	0	0.00
4000	OXYGEN DISSOLVED	6.00	65	2	3.08	56	0	0.00
4905	OXYGEN DISSOLVED	6.00	59	1	1.70	57	1	1.75
5530	OXYGEN DISSOLVED	5.00	65	1	1.54	58	0	0.00
5905	OXYGEN DISSOLVED	5.00	59	2	3.40	59	0	0.00
3700	COLIFORM FECAL	200	61	34	55.74	54	21	38.90
3747	COLIFORM FECAL	200	62	3	4.83	55	1	1.82
3780	COLIFORM FECAL	200	63	3	4.76	56	1	1.79
4000	COLIFORM FECAL	200	62	17	27.42	56	16	28.57
4905	COLIFORM FECAL	200	57	35	61.41	55	20	36.36
5500	COLIFORM FECAL	2000	57	15	26.31	53	0	0.00
5530	COLIFORM FECAL	2000	58	11	18.97	56	4	7.14
5533	COLIFORM FECAL	2000	34	3	8.82	55	1	1.82
5905	COLIFORM FECAL	2000	59	4	6.78	53	2	3.77
6500	COLIFORM FECAL	2000	78	4	5.13	56	2	3.57
5905	SULFATE DISSOLVED	330	36	4	11.11	59	2	3.39
6300	SULFATE DISSOLVED	330	12	3	25.00	20	3	15.00
6500	SULFATE DISSOLVED	490	23	2	8.70	3	0	0.00
5500	CHLORIDE DISSOLVED	250	62	1	1.61	59	0	0.00
3700	FLUORIDE DISSOLVED	2.00	25	23	92.00	58	56	96.55
3747	FLUORIDE DISSOLVED	2.00	25	0	0.00	59	1	1.70
4000	FLUORIDE DISSOLVED	2.00	25	1	4.00	59	0	0.00
5500	FLUORIDE DISSOLVED	2.00	30	12	40.00	59	24	40.68
5530	FLUORIDE DISSOLVED	2.00	29	6	20.69	59	10	16.95
5533	FLUORIDE DISSOLVED	2.00	25	4	16.00	58	13	22.41
5905	FLUORIDE DISSOLVED	2.00	25	1	4.00	59	5	8.48
6300	FLUORIDE DISSOLVED	2.00	12	4	33.33	20	3	15.00
6500	FLUORIDE DISSOLVED	2.00	9	1	11.11	0	0	0.00
5530	UN-IONIZED AMMONIA	0.10	4	1	75.00	55	23	41.82
5533	UN-IONIZED AMMONIA	0.10	0	0	0.00	54	25	46.30
5530	NITROGEN, NITRITE	1.00	1	0	0.00	56	1	1.79
5533	NITROGEN, NITRITE	1.00	0	0	0.00	55	1	1.82
3700	IRON DISSOLVED	300	62	1	1.61	59	0	0.00
3747	IRON DISSOLVED	300	60	0	0.00	58	2	3.45
4000	IRON DISSOLVED	300	60	2	3.33	58	0	0.00
5500	IRON DISSOLVED	300	65	3	4.62	59	0	0.00
5530	IRON DISSOLVED	300	41	0	0.00	59	1	1.70

Table 13. Cases of in-stream regulatory standard exceedances--continued

[Constituent and property abbreviations shown in table 2; Standard, in-stream standard as listed in table 2, all standards units indicated in table 2; NS, number of samples; NE, number of exceedances; Percent, percentage of samples that exceeded standard]

Station	Constituent	Standard	October 1987 - September 1992			October 1992 - September 1997		
			NS	NE	Percent	NS	ND	Percent
3700	IRON TOTAL	1000	62	18	29.03	59	14	23.73
3747	IRON TOTAL	1000	60	7	11.67	58	3	5.17
3780	IRON TOTAL	1000	60	13	21.67	59	12	20.34
4000	IRON TOTAL	1000	60	57	95.00	59	56	94.92
4905	IRON TOTAL	1000	61	57	93.44	59	51	86.44
5500	IRON TOTAL	8000	61	9	14.75	59	2	3.39
5530	IRON TOTAL	8000	57	5	8.77	59	1	1.70
5533	IRON TOTAL	8000	36	1	2.78	59	0	0.00
5905	IRON TOTAL	8000	57	9	15.79	59	7	11.86
6300	IRON TOTAL	8000	8	2	25.00	20	2	10.00
6500	IRON TOTAL	5100	20	13	65.00	3	1	33.33
3780	LEAD DISSOLVED	3.67	36	0	0.00	59	1	1.70
5533	LEAD DISSOLVED	11.9	36	1	2.78	59	0	0.00
3700	MANGANESE DISSOLVED	50.0	62	8	12.90	59	1	1.70
3747	MANGANESE DISSOLVED	71.0	60	11	18.33	59	29	49.15
3780	MANGANESE DISSOLVED	71.0	60	29	48.33	59	3	5.09
4000	MANGANESE DISSOLVED	71.0	60	1	1.67	59	0	0.00
5500	MANGANESE DISSOLVED	50.0	65	13	20.00	59	2	3.39
5530	MANGANESE DISSOLVED	50.0	40	31	77.50	59	39	66.10
5533	MANGANESE DISSOLVED	50.0	36	27	75.00	59	40	67.80
5905	MANGANESE DISSOLVED	50.0	36	22	61.11	59	33	55.93
6300	MANGANESE DISSOLVED	50.0	12	1	8.33	20	0	0.00
5500	MERCURY DISSOLVED	0.10	4	1	25.00	0	0	0.00
5530	MERCURY DISSOLVED	0.10	4	2	50.00	0	0	0.00
6300	MERCURY DISSOLVED	0.10	4	1	25.00	0	0	0.00
6500	MERCURY DISSOLVED	0.10	1	1	100.00	0	0	0.00
3700	SILVER DISSOLVED	0.13	2	1	50.00	1	0	0.00
5500	SELENIUM DISSOLVED	5.00	4	1	25.00	28	10	35.71
5530	SELENIUM DISSOLVED	5.00	25	10	40.00	28	2	7.14
5905	SELENIUM DISSOLVED	5.00	21	9	42.86	29	4	13.80
6500	SELENIUM DISSOLVED	20.00	19	7	36.84	31	6	19.36
5500	SULFIDE TOTAL	0.002	6	0	0.00	10	1	10.00
5530	SULFIDE TOTAL	0.002	5	1	20.00	10	0	0.00
5905	SULFIDE TOTAL	0.002	4	0	0.00	10	1	10.00
5530	CYANIDE TOTAL	0.005	6	1	16.67	10	0	0.00
5905	CYANIDE TOTAL	0.005	6	1	16.67	10	0	0.00

Figures 9 and 10 indicate that some water-quality properties and constituents have localized exceedances. This is apparent for sulfate, in the lower part of reach 3 and in reach 4, and dissolved selenium in reach 4. In addition, figure 10 indicates that un-ionized ammonia, nitrite, and dissolved manganese have localized exceedances in reach 3 downstream from station 5500 and that these exceedances attenuate downstream. Figures 9 and 10 indicate a tendency for fluoride to exceed standards in reach 2 that remains through the rest of the system, although it does attenuate.

The percentages for exceedances listed in table 13 also can be used to make general and qualitative observations concerning temporal trends. The side-by-side comparisons for many water-quality properties and constituents for the two evaluation periods shown in table 13 indicate that, for cases where pairs were available, the percentage of exceedance decreased 51 out of 66 times, or about 77 percent, from the first evaluation period to the second.

SUMMARY OF MONOTONIC TRENDS IN WATER QUALITY

The presence or absence of monotonic trends was tested to provide some quantitative evaluation of temporal change within the system. The tests were made for the period of October 1987 through September 1997.

Methods Used to Evaluate Monotonic Trends

A nonparametric test was selected to evaluate monotonic trends. Nonparametric tests do not involve assumptions about normality required for parametric tests and also are robust to outliers and do not present computational problems when dealing with censored values.

The test selected for use in this report is known as Sen's test (Gibbons, 1994). The test evaluates trends by computing a slope between all possible pairs of data for a given constituent, ranking the resultant series of slopes, and then assigning the median value of the ranked series as the representative slope for the entire series of measurements.

To assign confidence, a nonparametric variance is calculated and used to define confidence intervals. If the hypothesis is that there is no slope, and the sign of computed slopes changes or remains zero within the defined interval, then the hypothesis that there is no slope is accepted. If the sign of the computed slopes remains the same, then the hypothesis that there is no slope is rejected and one-sided methods are used to test for direction at the desired confidence. The reader is referred to Gibbons (1994) for additional details concerning the mechanics of Sen's test.

All tests in this report were made at the 95-percent confidence interval. A seasonal adjustment was made as described in the "Seasons" section. A positive slope was interpreted as an upward monotonic trend, and a negative monotonic slope was interpreted as a downward trend. Only the direction of trend is considered in this report.

Seasons

Many of the water-quality properties and constituents addressed by this report typically demonstrate seasonal variations. To address potential seasonality in the study area, multiyear records of daily values for flow, water temperature, specific conductance, and dissolved oxygen for several stations in the system were evaluated. In this evaluation, the mean of all values, for a given day in the series of 1-year periods, was plotted. The results for station 5530 are shown in figure 11; these results have been used to define three sets of conditions for the seasons used in this report (table 14). Perhaps most prominent is increased flow during the period from about April 15 through June. This period is sometimes generally called spring runoff and is associated with snowmelt processes in the headwater portions of the system. The influx of water derived from snowmelt, which is relatively low in dissolved solids, also lowers specific conductance.

Following spring runoff, flow recedes to a base of steady flows punctuated by short periods of precipitation-derived runoff. During this second period, from the beginning of July through about the middle of September, stream temperatures are relatively high, dissolved oxygen levels are relatively low, and specific conductance is higher than in the first period.

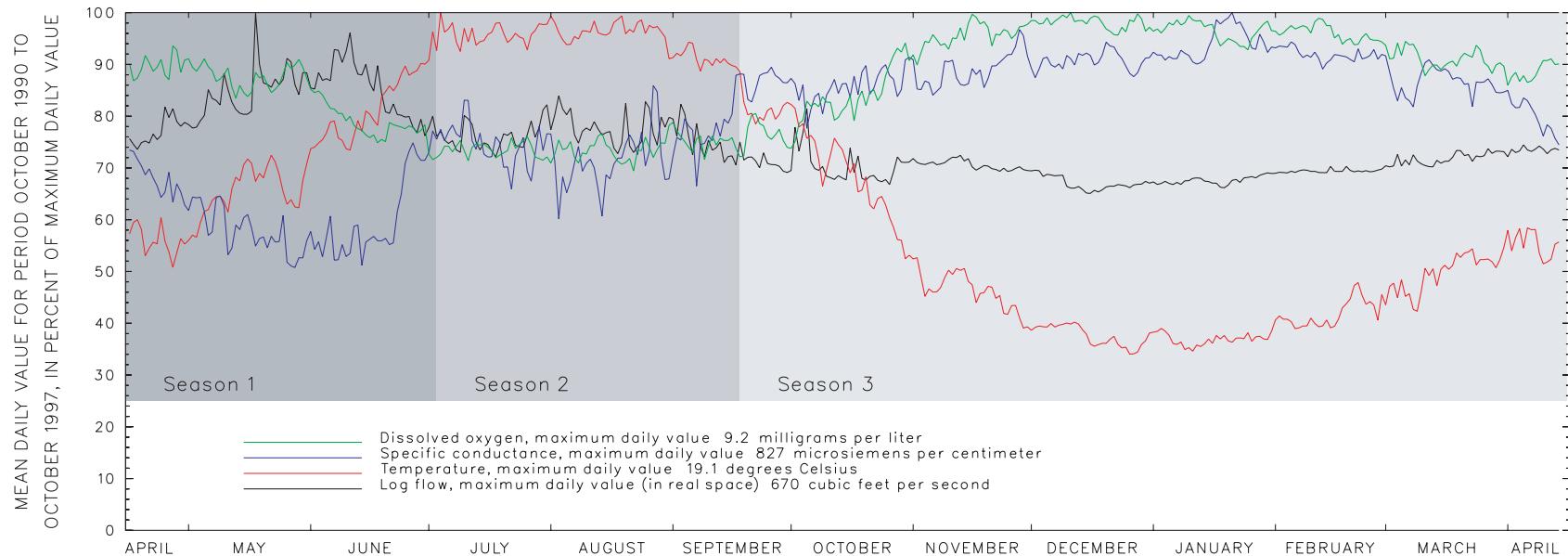


Figure 11. Seasonal variation of water-quality properties at station 5530.

Table 14. Characteristics of seasons defined and used for trend tests

Season number	Periods included	Flow	Status of distinctive characteristics		
			Specific conductance	Stream temperature	Dissolved oxygen
1	April 15 through June 30	high	low	variable	variable
2	July 1 through September 15	low	high	high	low
3	September 16 through April 14	low	high	low	high

For the remainder of the year, from September 15 through April 15, flow conditions were similar to those in the second period; however, stream temperatures decreased and dissolved oxygen levels were relatively high. These three seasons were evaluated independently. To adjust for these seasons, all values for each annual given season were aggregated and represented by their mean; Sen's test was applied to these means.

Discussion of Monotonic Trends

Figure 12 portrays the results from trend tests. The reader should note that, for water-quality properties or constituents that do not have samples for the same season for at least 3 years, the results will be shown as "too few," even though there may be several samples.

The figure indicates that many water-quality properties and constituents do not have monotonic trends that can be identified with 95-percent confidence. The figure also indicates that when trends are detected, they are usually negative, or downward, monotonic trends. The results of the trend tests permit additional general observations regarding cases where monotonic trends were detected with 95-percent confidence. Some of these observations are briefly discussed here.

When downward or upward trends for a given water-quality property or constituent are detected, they are generally local; that is, they do not occur through the entire system. For instance, many constituents, including most nutrients and many minor elements, showed downward trends downstream from station 5500. In addition, detectable monotonic trends

are not always the same for all three seasons. For instance, figure 12 indicates that, for stations 5500 through 6300, orthophosphorus tends to have a downward trend for periods other than spring runoff (season 1).

The station with the most upward trends was station 3747 where ammonia nitrogen and both dissolved and total manganese showed upward trends for two seasons, or most of the year. The station with the most downward trends was station 5530, downstream from station 5500, where many nutrients and minor elements showed downward trends.

Summary of Monotonic Trends for Regulated Water-Quality Properties and Constituents

Some of the most prominent trends for water-quality properties and constituents occurred downstream from station 5500 at station 5530 where nutrients, such as ammonia nitrogen, un-ionized ammonia, total nitrogen, and orthophosphorus, all showed downward monotonic trends, mostly at times other than spring runoff. It is likely that advanced wastewater-treatment procedures designed to control concentrations of nitrogen-related compounds implemented by Colorado Springs Utilities are related to some of these downward trends. Minor elements such as chromium, copper, lead, nickel, and zinc also had decreasing monotonic trends downstream from station 5500 at station 5530, again mostly at times other than spring runoff. During periods of low flow in the winter (season 3), fluoride showed a tendency to increase at station 5530.

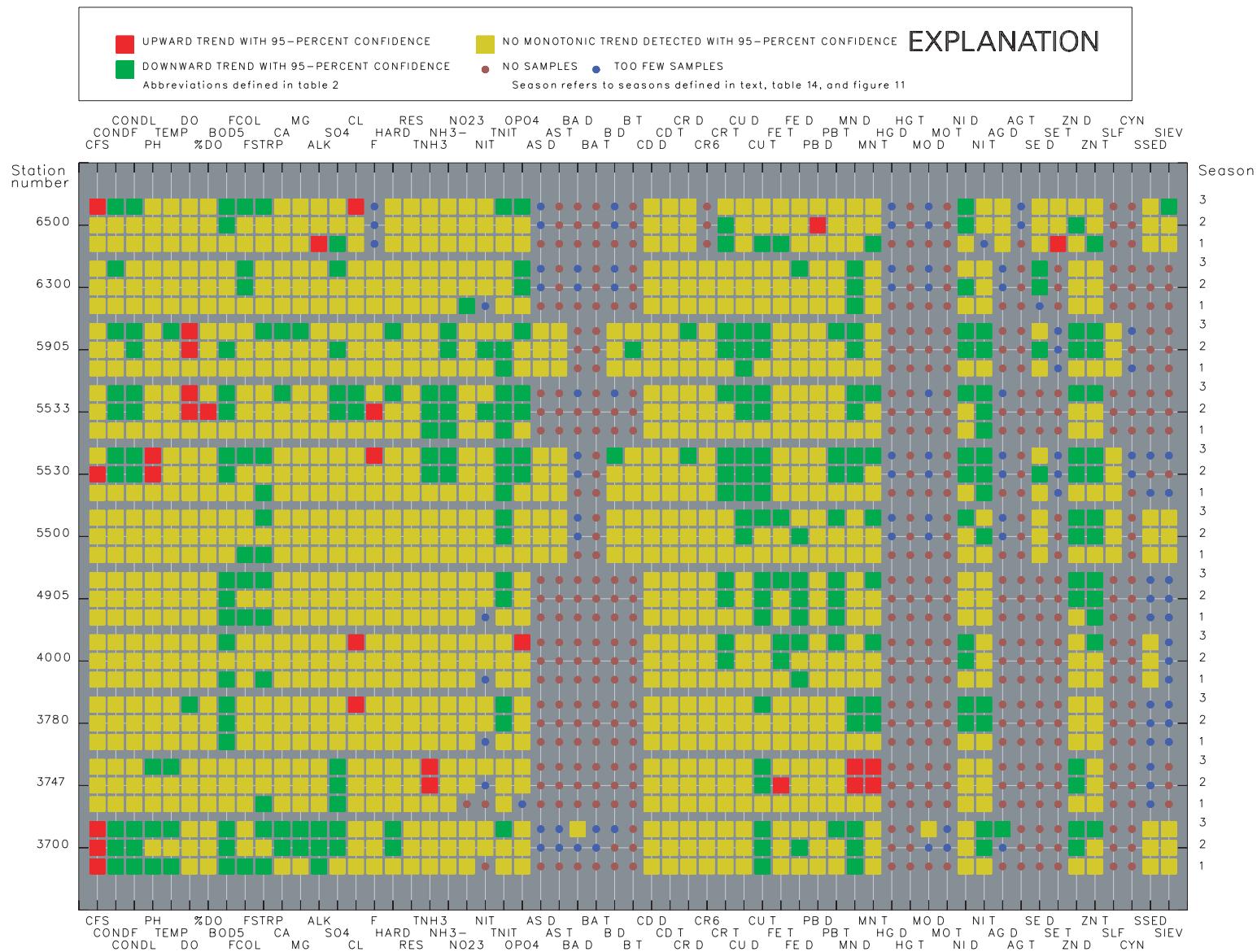


Figure 12. Summary of nonparametric monotonic trends for samples from Fountain and Monument Creeks for the period October 1987 through September 1997.

SUMMARY

Samples analyzed for water-quality properties and constituents have been collected at 11 stations on Fountain and Monument Creeks for many years. From October 1987 through September 1997, most samples were collected at about a monthly interval between the hours of about 7 a.m. and 4 p.m. All intervals of flow defined in a simple flow-duration analysis were evenly represented in the long term. For shorter time periods, most intervals are represented; however, there was a tendency for some intervals of flow to be sampled more than others.

Statistical summaries of these data indicate that some water-quality properties and constituents such as flow, specific conductance, most major ions, alkalinity and hardness, generally showed steady increases through the system. Some properties and constituents showed local changes in their values, some increasing and some decreasing. The pH and dissolved oxygen content of water decreased downstream from station 5500. Nitrogen ammonia, un-ionized ammonia, orthophosphorus, and 5-day biochemical oxygen demand, as well as some minor elements, all increased downstream from station 5500.

In-stream regulatory standards were exceeded for some water-quality properties and constituents. Exceedances for sulfate, un-ionized ammonia, and selenium occurred locally, mostly in the lower parts of the system. Fecal coliform and total iron exceedances were widespread throughout the system. Simple comparison of incidence rates from one period to another indicates that many rates of incidence have decreased.

A nonparametric test to detect monotonic trends that was applied to identified seasons indicates that there were many water-quality properties and constituents for which monotonic trends could not be identified with 95-percent confidence. For cases when trends were identified, most were negative or downward. In addition, detected trends sometimes were local and did not always occur in all of the seasons. In addition, many regulated constituents showed a tendency to have downward trends.

REFERENCES

- Colorado Department of Health and Public Environment, 1998, Regulation No. 32, Classification and numeric standards for Arkansas River basin: Colorado Department of Public Health and Environment, Water Quality Control Commission, variously paged.
- Edelmann, P.F., 1990, Water quality of Fountain and Monument Creeks, south-central Colorado, with emphasis on relation of water quality to stream classifications: U.S. Geological Survey Water-Resources Investigations Report 88-4132, 99 p.
- Gibbons, R.D., 1994, Statistical methods for groundwater monitoring: New York, John Wiley and Sons, 286 p.
- Ruddy, B.C., 1993, Water-quality variations and trends in Monument and Fountain Creeks, El Paso and Pueblo Counties, Colorado, water years 1976–1988: U.S. Geological Survey-Resources Investigations Report 91-4176, 66 p.
- U.S. Environmental Protection Agency, 1987, Quality criteria for water 1986 [update 2]: U.S. Environmental Protection Agency, Office of Water Regulations and Standards, EPA Report 440/5-86-001, variously paginated.

APPENDIX

EXPLANATION

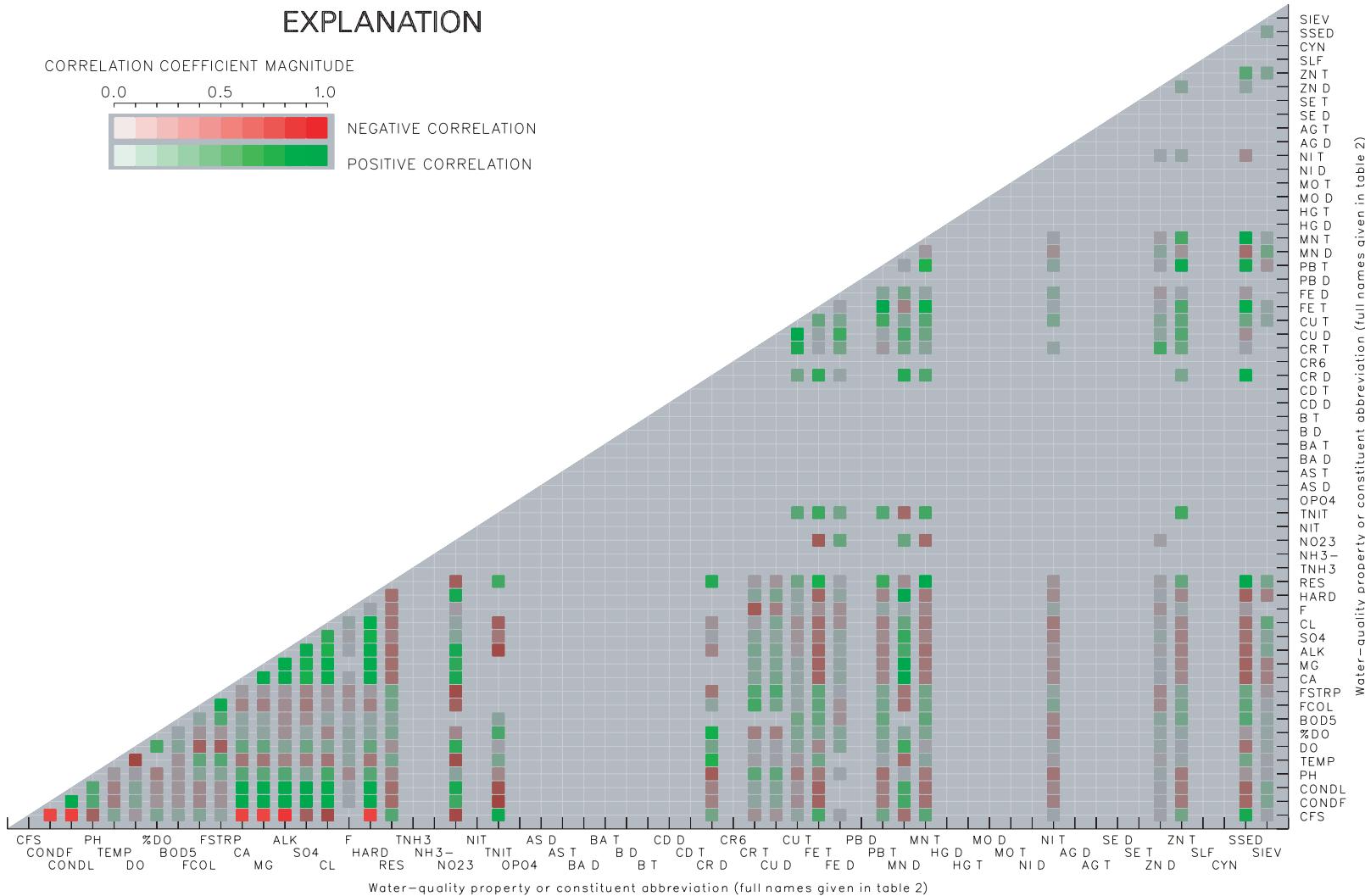


Figure A1. Correlation among log-transformed water-quality properties and constituents at station 3700, for the period October 1987 through September 1997.

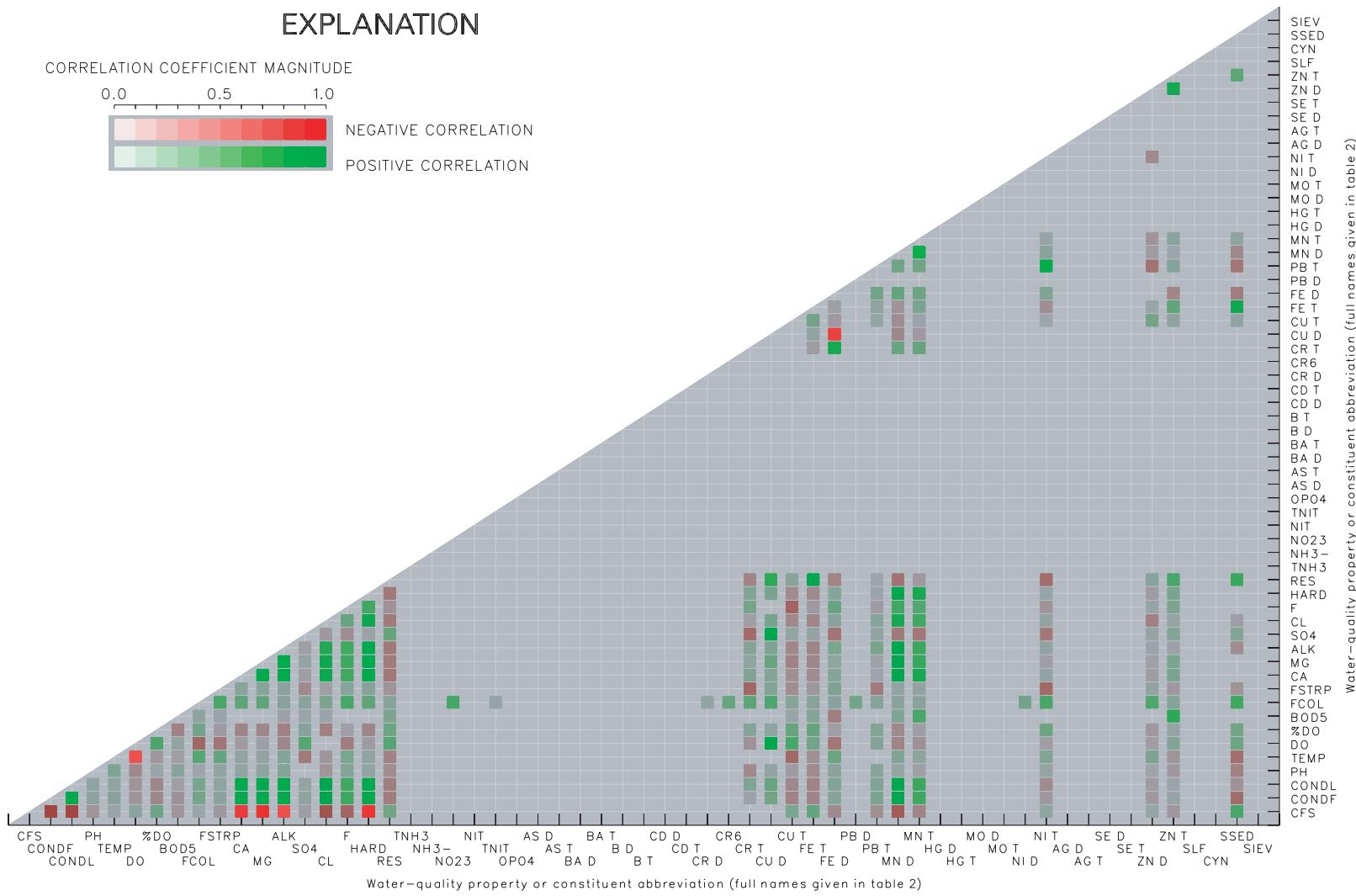


Figure A2. Correlation among log-transformed water-quality properties and constituents at station 3747, for the period October 1987 through September 1997.

EXPLANATION

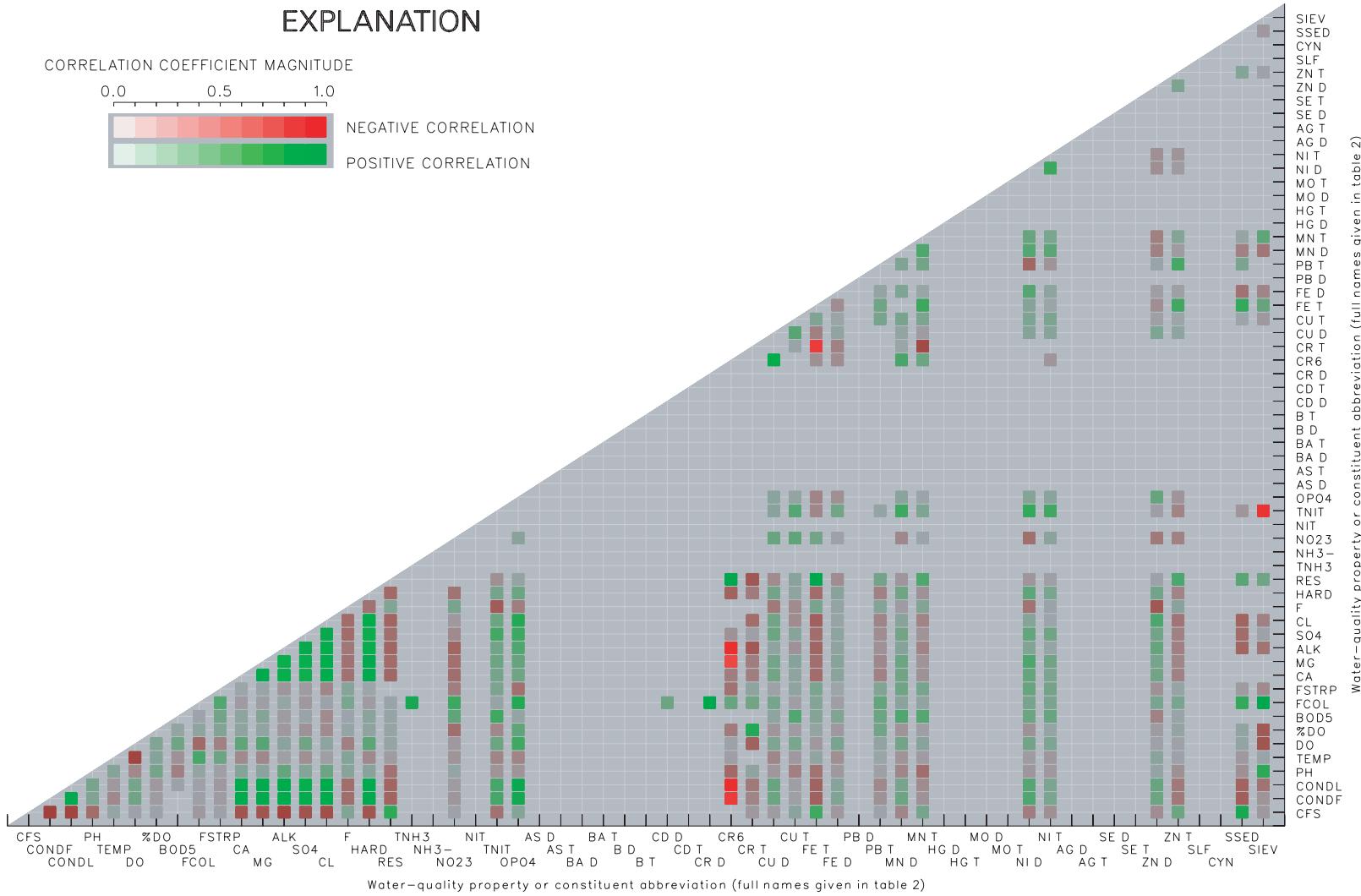


Figure A3. Correlation among log-transformed water-quality properties and constituents at station 3780, for the period October 1987 through September 1997.

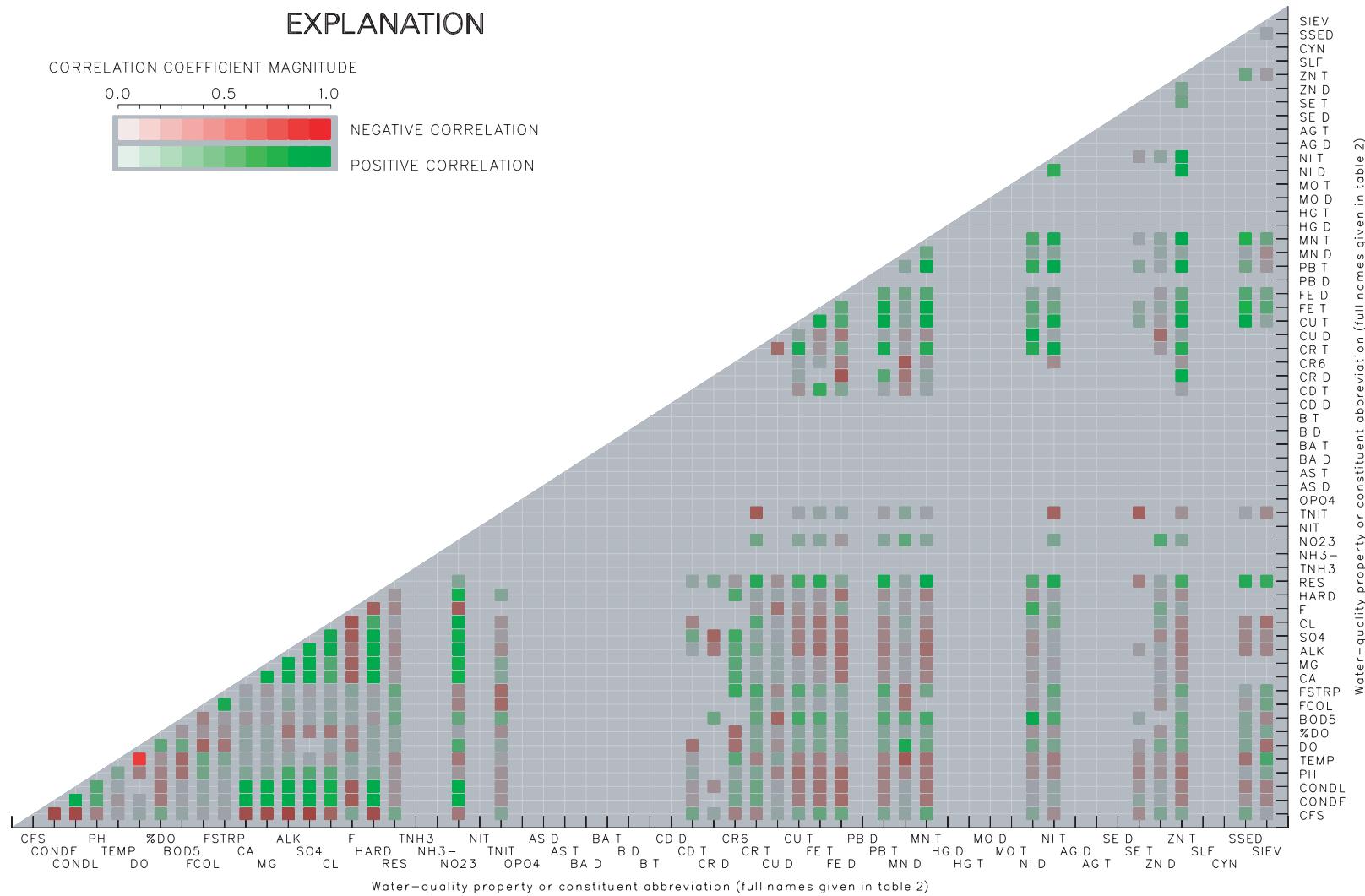


Figure A4. Correlation among log-transformed water-quality properties and constituents at station 4000, for the period October 1987 through September 1997.

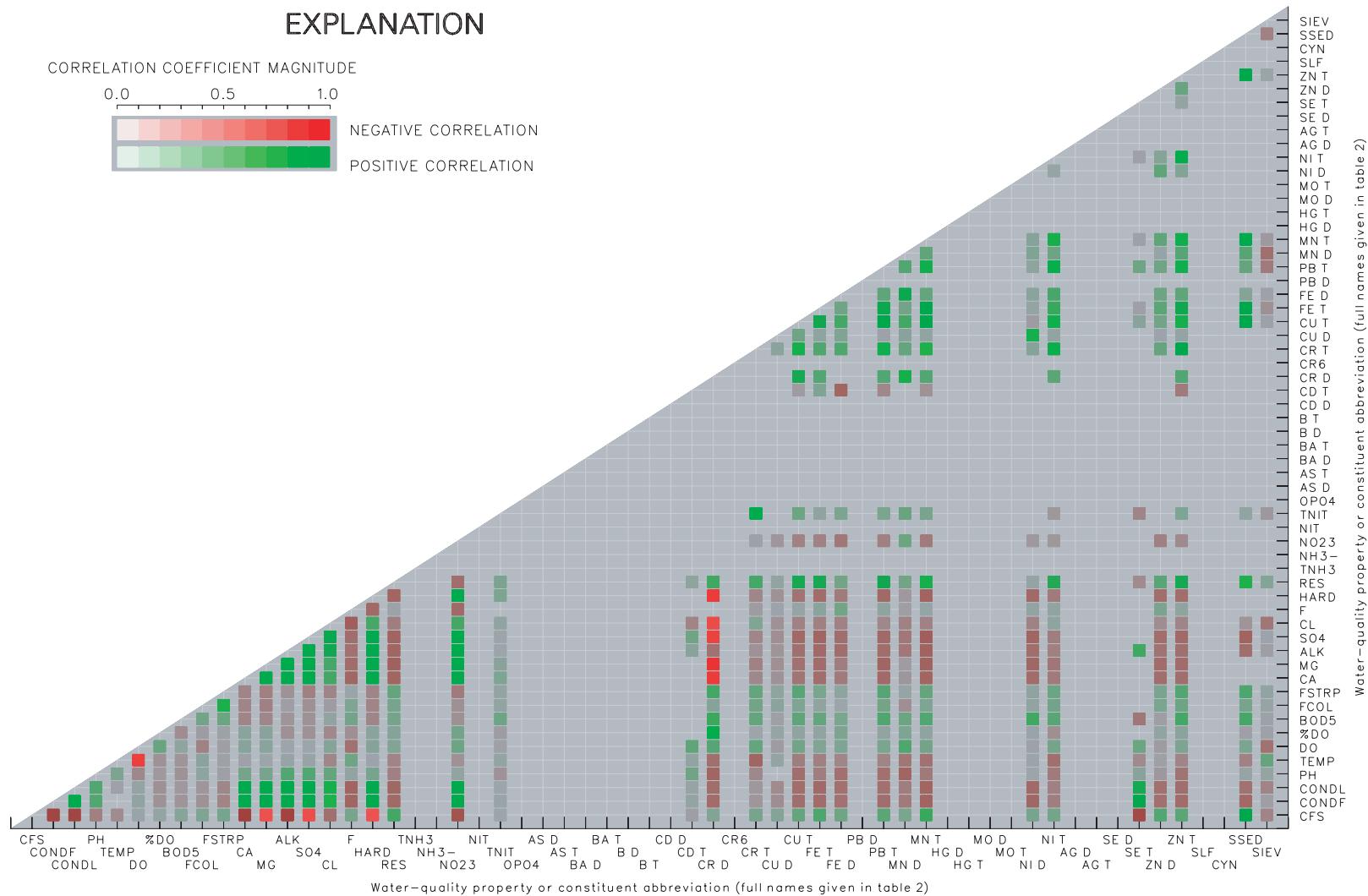


Figure A5. Correlation among log-transformed water-quality properties and constituents at station 4905, for the period October 1987 through September 1997.

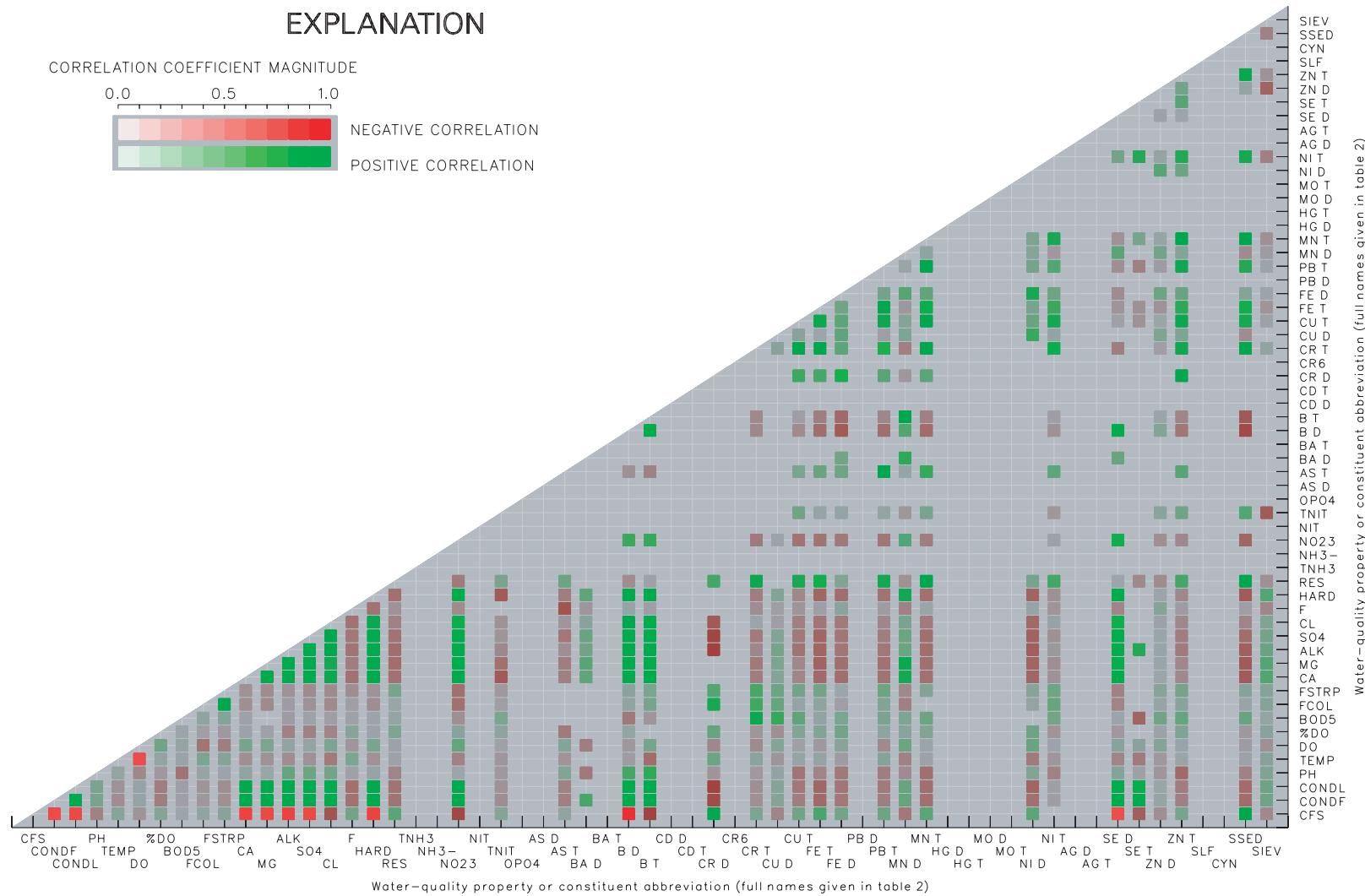


Figure A6. Correlation among log-transformed water-quality properties and constituents at station 5500, for the period October 1987 through September 1997.

EXPLANATION

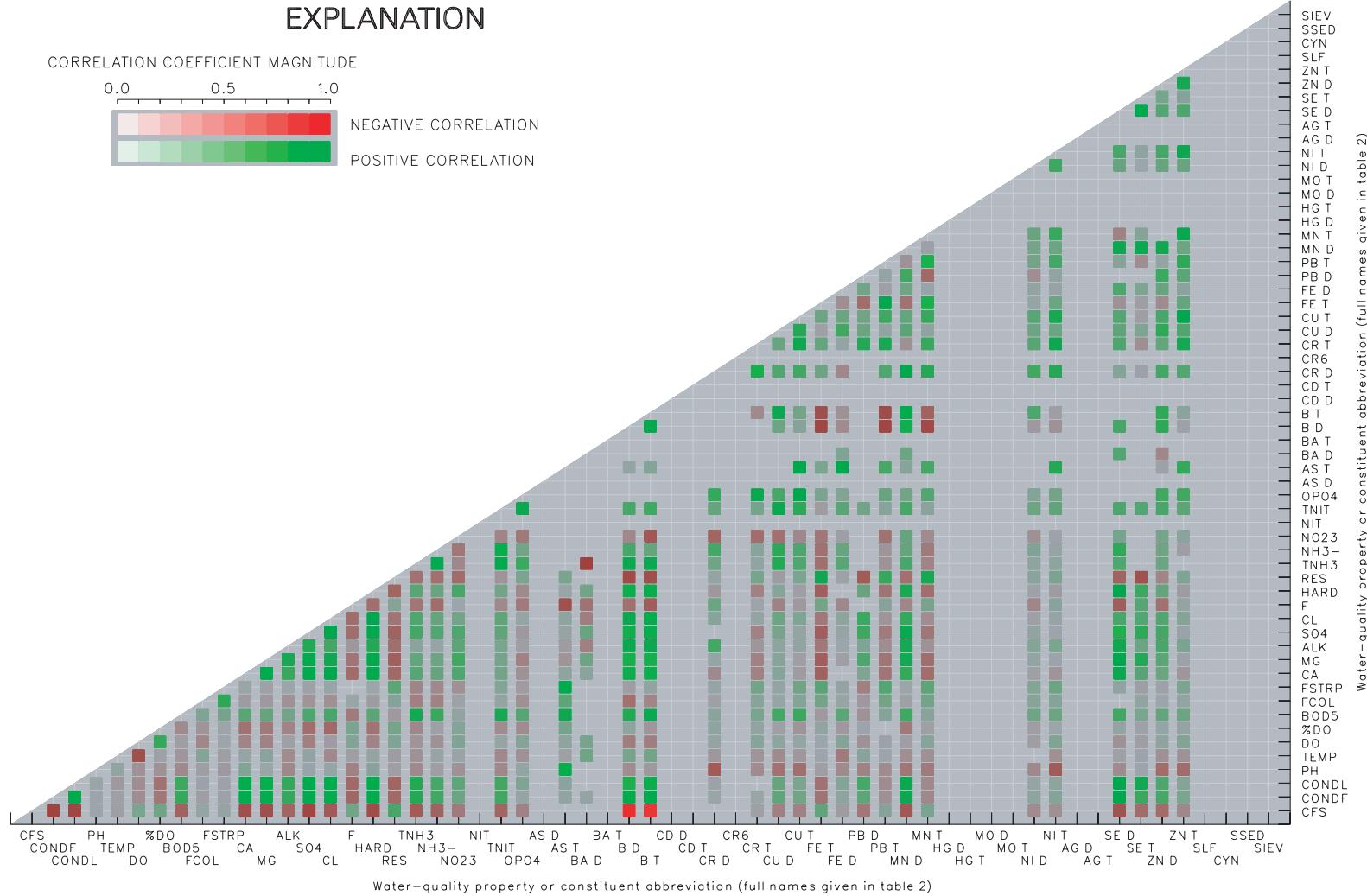


Figure A7. Correlation among log-transformed water-quality properties and constituents at station 5530, for the period October 1987 through September 1997.

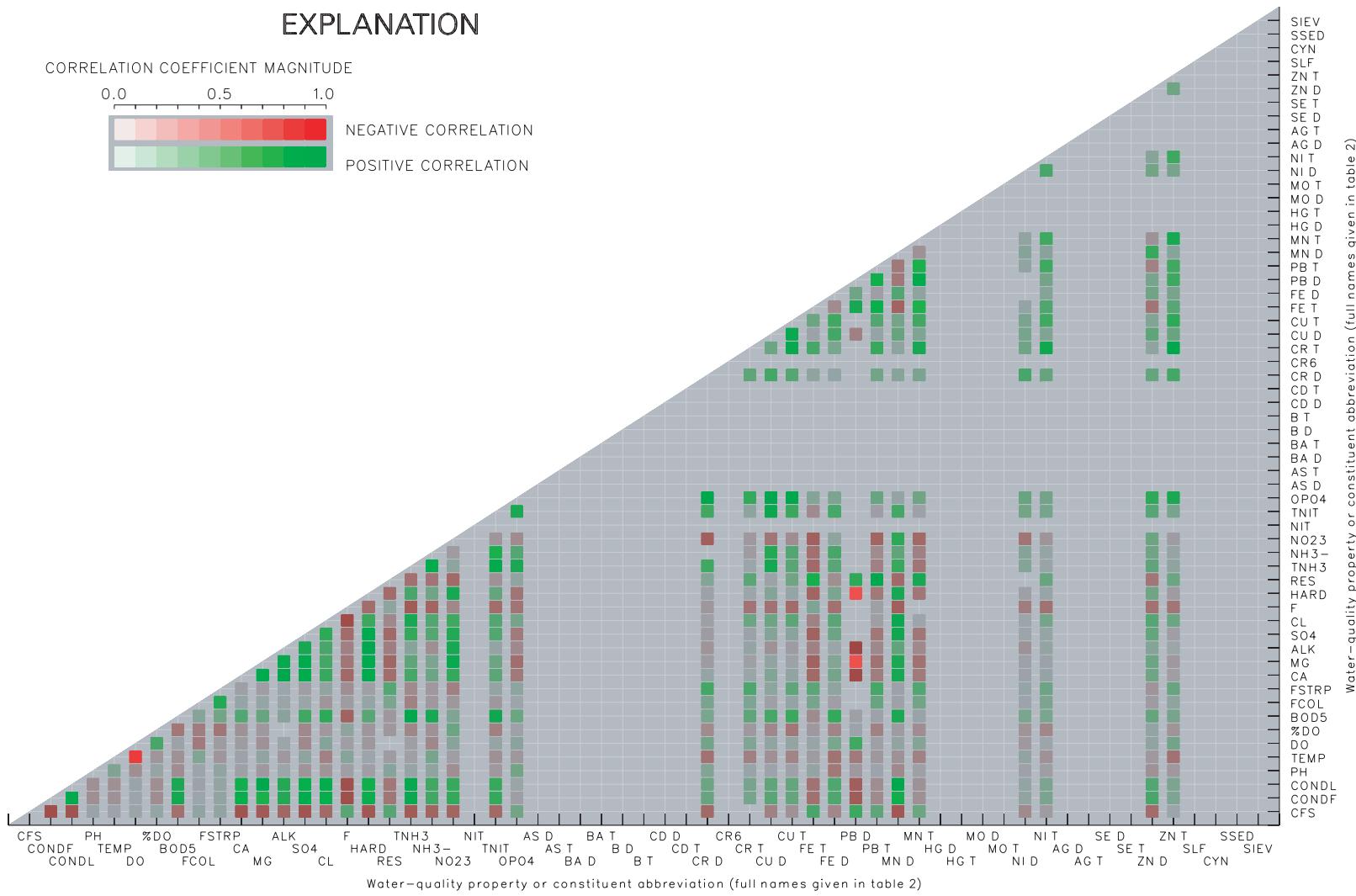


Figure A8. Correlation among log-transformed water-quality properties and constituents at station 5533, for the period October 1987 through September 1997.

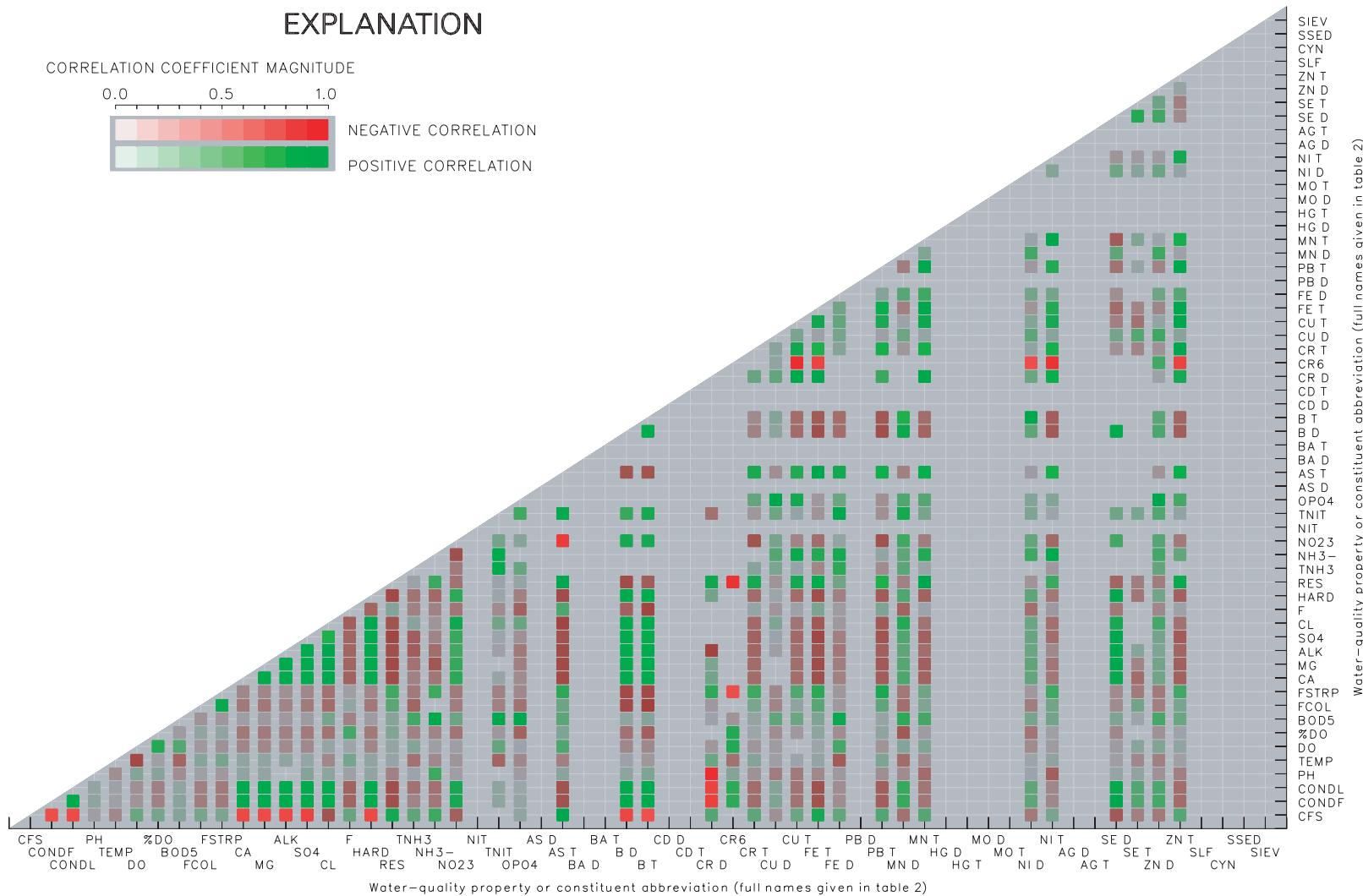


Figure A9. Correlation among log-transformed water-quality properties and constituents at station 5905, for the period October 1987 through September 1997.

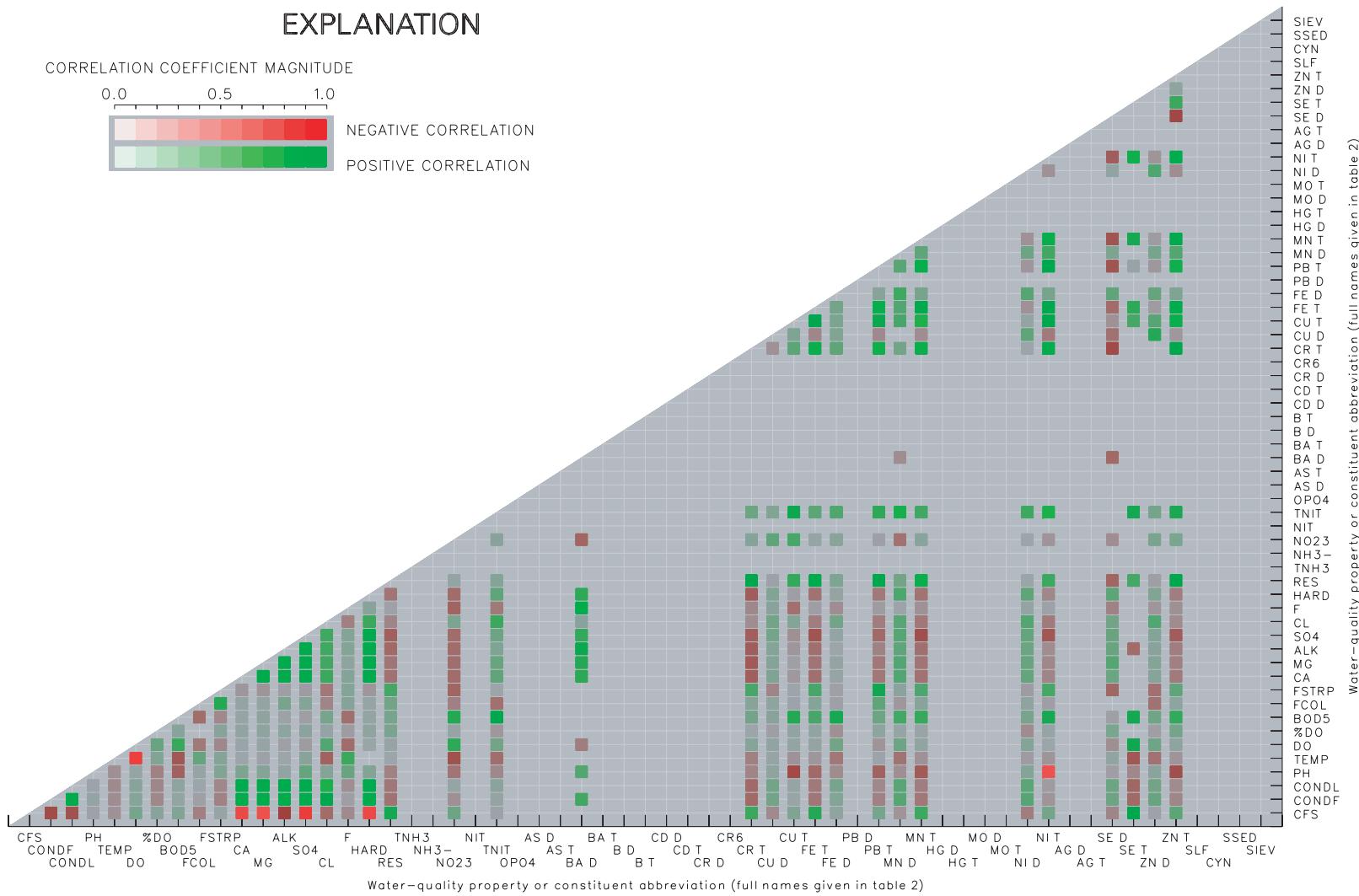


Figure A10. Correlation among log-transformed water-quality properties and constituents at station 6300, for the period October 1987 through September 1997.

EXPLANATION

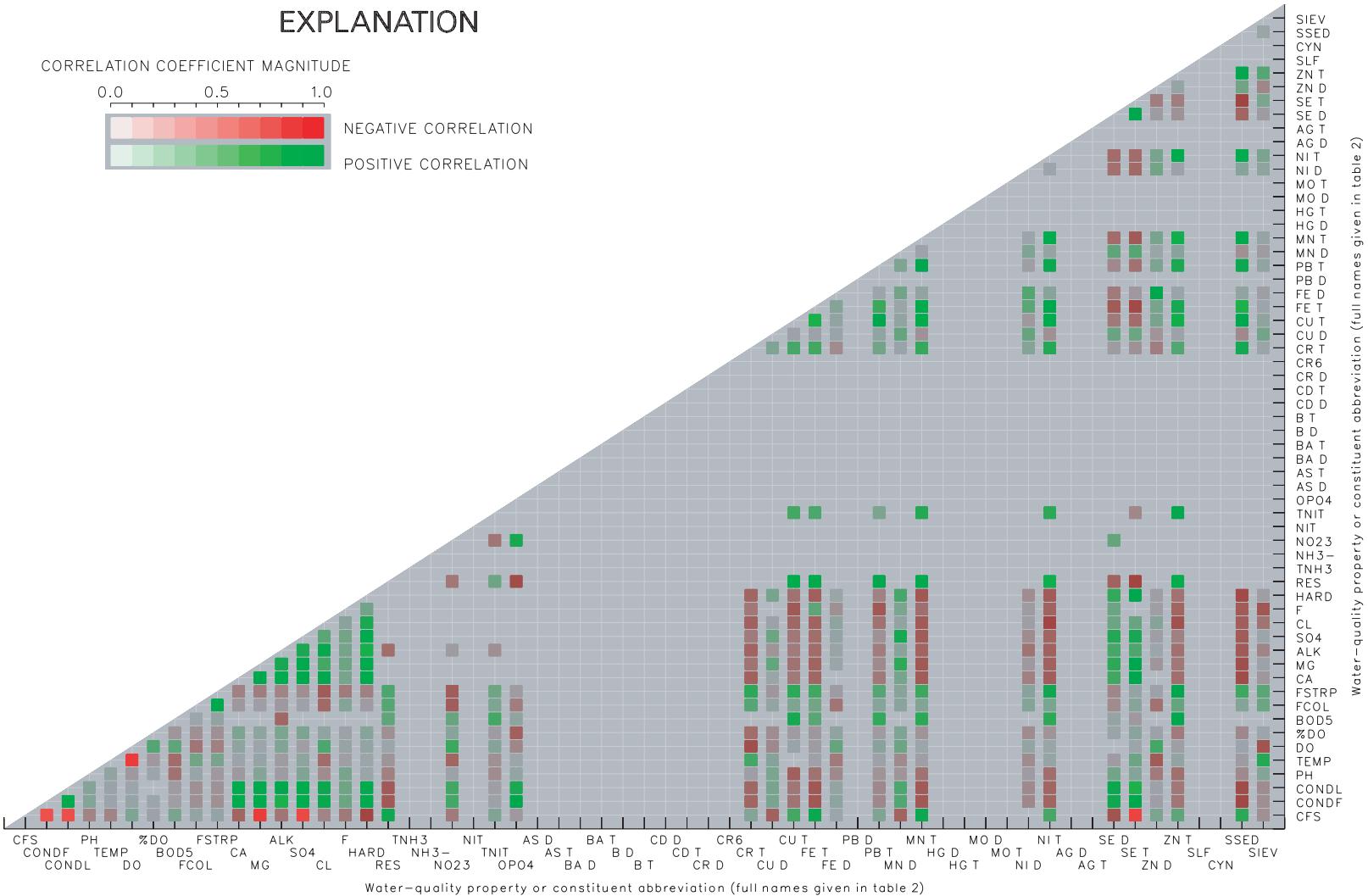


Figure A11. Correlation among log-transformed water-quality properties and constituents at station 6500, for the period October 1987 through September 1997.

Table A1. Univariate statistics for water-quality data collected for station 3700, October 1987 through September 1992

Note: DETECTIONS refers to analyses with results greater than detection limits; CENSOREDS refers to analyses with results less than method reporting limits; Abrv, abbreviations used on figures; Samples, number of samples collected; % < MRL, percent of samples collected less than method reporting limit; G mean, geometric mean, Stddev, standard deviation; 15.0% 15th percentile; 85.0%, 85th percentile; Min, minimum, Max, maximum; na, not applicable; CFS, cubic feet per second, CONDF, specific conductance measured in field; CONDL, specific conductance measured in lab; US/CM, microsiemens per centimeter, MICROSIEGENS/C, microsiemens per centimeter; WH, whole water; MG/L, milligram per liter; COLS, colonies; ML, milliliter; DISS, dissolved; D, Dissolved, TOT, total; T, total; AMM, ammonia; HEX, hexavalent; Standard, Colorado Department of Public Health and Environment chronic in-stream standard (standard listed for NO23 is for nitrate)

Variable	Abrv	Units	Samples	% < MRL		DETECTIONS							CENSOREDS		
				Mean	Median	G mean	Stddev	15.0%	85.0%	Min	Max		Mean	Median	Standard
DISCHARGE	CFS	CFS	144	na	13.5	9.45	10.7	13.6	6.08	19.0	2.60	87.0	na	na	na
SPECIFIC COND.	COND	US/CM @ 25C	121	na	335	329	322	94.7	232	443	176	649	na	na	na
SPECIFIC COND.	COND	MICROSIEMENS/C	66	na	347	335	335	91.8	242	435	172	604	na	na	na
PH, WH, FIELD	PH	STANDARD UNITS	67	na	8.27	8.30	8.27	0.17	8.10	8.40	7.90	9.00	na	na	na
WATER TEMP.	TEMP	DEGREES	123	na	8.43	8.50	na	5.48	1.80	15.0	0	22.0	na	na	20.0
OXYGEN DISS.	DO	MG/L	67	na	9.54	9.40	9.44	1.39	7.90	11.3	7.10	11.9	na	na	7.00
OXYGEN DIS. %	%DO	% OF SATURATION	65	na	98.5	98.0	98.4	2.91	96.0	101	91.0	106	na	na	na
BOD 5-DAY	BOD5	MG/L	58	3.45	1.11	0.90	0.85	0.97	0.40	1.69	0.10	5.70	0.50	0.50	na
COLIFORM FECAL	FCOL	COLS./100 ML	61	4.92	1100	365	222	1990	16.0	2250	2.00	9300	45.7	30.0	200
FECAL STRPT	FSTRP	COLS./100 ML	60	na	1310	390	398	2640	52.6	1860	7.00	15000	na	na	na
CALCIUM DISS.	CA	MG/L AS CA	46	na	35.6	34.5	34.0	10.6	25.0	47.0	17.0	65.0	na	na	na
MAGNESIUM DISS	MG	MG/L AS MG	46	na	7.04	6.70	6.65	2.38	4.50	9.90	3.20	14.0	na	na	na
ALKALINITY	ALK	MG/L AS CACO3	60	na	121	120	116	35.0	84.0	160	58.0	227	na	na	na
SULFATE DISS.	SO4	MG/L AS SO4	62	na	16.5	16.0	15.8	4.62	11.0	21.0	7.30	27.0	na	na	250
CHLORIDE DISS.	CL	MG/L AS CL	64	na	18.1	16.5	16.7	8.59	11.0	23.3	7.10	66.0	na	na	250
FLUORIDE DISS.	F	MG/L AS F	25	na	2.57	2.60	2.55	0.31	2.40	2.71	1.50	3.10	na	na	2.00
HARDNESS TOTAL	HARD	MG/L AS CAO3	46	na	118	115	112	36.7	81.0	160	58.0	220	na	na	na
RESIDUE TOTAL	RES	MG/L	60	6.67	28.7	13.0	15.6	35.6	5.00	54.9	2.00	179	1.00	1.00	na
NITROGEN AMM	TNH3	MG/L AS N	0	na	na	na	na	na	na	na	na	na	na	na	na
UN-IONIZED AMM NH3-	MG/L AS NH3	0	na	na	na	na	na	na	na	na	na	na	na	0.02	na
NO2 + NO3 DISS	NO23	MG/L AS N	0	na	na	na	na	na	na	na	na	na	na	na	10
NITROGEN, NO2	NIT	MG/L AS N	0	na	na	na	na	na	na	na	na	na	na	na	0.05
NITROGEN AMM+	TNIT	MG/L AS N	62	32.3	0.41	0.30	0.36	0.25	0.20	0.60	0.20	1.40	0.20	0.20	na
PHOSPHORUS O	OPO4	MG/L AS P	0	na	na	na	na	na	na	na	na	na	na	na	na
ARSENIC DISS.	AS D	UG/L AS AS	2	100	na	na	na	na	na	na	na	na	1.00	1.00	50.0
ARSENIC TOTAL	AS T	UG/L AS AS	1	100	na	na	na	na	na	na	na	na	1.00	1.00	50.0
BARIUM DISS.	BA D	UG/L AS BA	2	na	72.0	72.0	70.4	21.2	na	na	57.0	87.0	na	na	na
BARIUM TOTAL	BA T	UG/L AS BA	2	50.0	100	100	100	na	na	na	100	100	100	100	na
BORON DISS.	B D	UG/L AS B	0	na	na	na	na	na	na	na	na	na	na	na	750
BORON TOTAL	B T	UG/L AS B	0	na	na	na	na	na	na	na	na	na	na	na	na
CADMIUM DISS.	CD D	UG/L AS CD	38	94.7	1.00	1.00	1.00	0	na	na	1.00	1.00	1.00	1.00	5.00
CADMIUM TOTAL	CD T	UG/L AS CD	61	90.2	1.00	1.00	1.00	0	1.00	1.00	1.00	1.00	1.00	1.00	na
CHROMIUM DISS.	CR D	UG/L AS CR	62	88.7	2.00	1.00	1.46	2.24	1.00	6.00	1.00	7.00	1.31	1.00	50.0
CHROMIUM HEX.	CR6	UG/L AS CR	36	86.1	2.60	2.00	2.09	1.82	na	na	1.00	5.00	1.00	1.00	11.0
CHROMIUM TOTAL	CR T	UG/L AS CR	37	54.1	1.76	1.00	1.51	1.25	1.00	2.30	1.00	6.00	1.00	1.00	na
COPPER DISS.	CU D	UG/L AS CU	38	31.6	1.35	1.00	1.26	0.56	1.00	2.00	1.00	3.00	2.50	1.00	15.8
COPPER TOTAL	CU T	UG/L AS CU	62	6.45	3.45	3.00	2.97	1.94	2.00	6.00	1.00	11.0	1.00	1.00	na
IRON TOTAL	FE T	UG/L AS FE	62	na	1260	640	724	1890	290	2360	120	12000	na	na	1000
IRON DISS.	FE D	UG/L AS FE	62	3.23	58.9	37.5	39.0	102	19.2	81.7	5.00	790	10	10	300
LEAD DISS.	PB D	UG/L AS PB	38	86.8	1.60	1.00	1.32	1.34	na	na	1.00	4.00	1.55	1.00	6.27
LEAD TOTAL	PB T	UG/L AS PB	61	36.1	4.49	3.00	3.01	5.86	1.00	7.00	1.00	35.0	4.45	5.00	na
MANGANESE DISS	MN D	UG/L AS MN	62	na	40.4	40.0	36.3	20.9	20.0	50.0	10	160	na	na	50.0
MANGANESE TOT	MN T	UG/L AS MN	62	na	100	80.0	86.2	74.6	50.0	157	40.0	500	na	na	na
MERCURY DISS.	HG D	UG/L AS HG	0	na	na	na	na	na	na	na	na	na	na	na	0.10
MERCURY, TOT	HG T	UG/L AS HG	0	na	na	na	na	na	na	na	na	na	na	na	0.01
MOLYBDENUM DIS	MO D	UG/L AS MO	2	100	na	na	na	na	na	na	na	10	10	na	na
MOLYBDENUM TOT	MO T	UG/L AS MO	2	na	4.50	4.50	4.24	2.12	na	na	3.00	6.00	na	na	na
NICKEL DISS.	NI D	UG/L AS NI	38	57.9	1.13	1.00	1.09	0.34	1.00	1.45	1.00	2.00	1.82	1.00	100
NICKEL TOTAL	NI T	UG/L AS NI	38	31.6	2.31	2.00	2.08	1.16	1.00	3.00	1.00	6.00	1.00	1.00	na
SILVER DISS.	AG D	UG/L AS AG	2	50.0	2.00	2.00	2.00	na	na	2.00	2.00	1.00	1.00	0.13	na
SILVER TOTAL	AG T	UG/L AS AG	2	100	na	na	na	na	na	na	na	1.00	1.00	na	na
SELENIUM DISS.	SE D	UG/L AS SE	0	na	na	na	na	na	na	na	na	na	na	5.00	na
SELENIUM TOTAL	SE T	UG/L AS SE	0	na	na	na	na	na	na	na	na	na	na	na	na
ZINC DISS.	ZN D	UG/L AS ZN	38	23.7	7.45	6.00	6.71	3.65	4.00	12.5	3.00	16.0	3.00	3.00	141
ZINC TOTAL	ZN T	UG/L AS ZN	62	29.0	30.5	20.0	22.7	36.8	10	40.0	10	240	10	10	na
SULFIDE TOTAL	H2S	MG/L AS S	0	na	na	na	na	na	na	na	na	na	na	na	0.002
CYANIDE TOTAL	CYN	MG/L AS CN	2	100	na	na	na	na	na	na	na	0.01	0.01	0.005	na
SUSP SED	SSED	MG/L	80	na	665	42.7	63.0	2250	11.0	398	2.90	11600	na	na	na
SUSP-SIEVE	SIEV	%	32	na	74.0	78.0	72.3	15.2	53.0	89.1	41.0	98.3	na	na	na

Table A2. Univariate statistics for water-quality data collected for station 3747, October 1987 through September 1992

Note: DETECTIONS refers to analyses with results greater than detection limits; CENSOREDS refers to analyses with results less than method reporting limits; Abrv, abbreviations used on figures; Samples, number of samples collected; % < MRL, percent of samples collected less than method reporting limit; G mean, geometric mean, Stddev, standard deviation; 15.0% 15th percentile; 85.0%, 85th percentile; Min, minimum, Max, maximum; na, not applicable; CFS, cubic feet per second, CONDF, specific conductance measured in field; CONDL, specific conductance measured in lab; US/CM, microsiemens per centimeter, MICROSIEMENS/C, microsiemens per centimeter; WH, whole water; MG/L, milligram per liter; COLS, colonies; ML, milliliter; DISS, dissolved; D, Dissolved, TOT, total; T, total; AMM, ammonia; HEX, hexavalent; Standard, Colorado Department of Public Health and Environment chronic in-stream standard (standard listed for NO23 is for nitrate)

Variable	Abrv	Units	Samples		% < MRL		DETECTIONS						CENSOREDS		
					Mean	Median	G mean	Stddev	15.0%	85.0%	Min	Max	Mean	Median	Standard
DISCHARGE	CFS	CFS	82	1.22	3.36	1.40	1.44	5.93	0.40	6.00	0.20	40.0	1.40	1.40	na
SPECIFIC COND.	COND	US/CM @ 25C	73	na	154	157	149	38.0	105	196	75.0	235	na	na	na
SPECIFIC COND.	COND	MICROSIEMENS/C	65	na	156	162	151	36.0	108	190	76.0	231	na	na	na
PH, WH, FIELD	PH	STANDARD UNITS	64	na	7.96	8.00	7.96	0.19	7.80	8.20	7.50	8.40	na	na	na
WATER TEMP.	TEMP	DEGREES	82	na	9.55	8.00	na	7.31	1.50	19.0	0	26.5	na	na	na
OXYGEN DISS.	DO	MG/L	64	na	9.02	9.00	8.91	1.40	7.48	10.8	6.40	11.6	na	na	6.00
OXYGEN DIS. %	%DO	% OF SATURATION	55	na	99.1	99.0	99.0	3.23	96.0	103	92.0	108	na	na	na
BOD 5-DAY	BOD5	MG/L	58	1.72	0.54	0.50	0.45	0.32	0.20	0.80	0.10	2.10	0.50	0.50	na
COLIFORM FECAL	FCOL	COLS./100 ML	62	14.5	29.8	8.00	7.98	57.4	1.00	59.9	1.00	240	1.67	1.00	200
FECAL STRPT	FSTRP	COLS./100 ML	64	na	117	66.5	65.7	145	22.8	263	3.00	950	na	na	na
CALCIUM DISS.	CA	MG/L AS CA	44	na	18.6	18.0	18.1	4.51	13.8	23.3	8.80	29.0	na	na	na
MAGNESIUM DISS.	MG	MG/L AS MG	44	na	3.28	3.45	3.13	0.91	2.10	4.13	1.20	5.10	na	na	na
ALKALINITY	ALK	MG/L AS CACO3	60	na	59.2	61.0	56.6	16.6	37.0	74.9	26.0	93.0	na	na	na
SULFATE DISS.	SO4	MG/L AS SO4	59	na	10.5	10	10.0	3.10	7.20	13.0	4.00	20.0	na	na	250
CHLORIDE DISS.	CL	MG/L AS CL	62	na	3.12	3.15	2.72	1.49	1.49	4.26	0.20	8.30	na	na	250
FLUORIDE DISS.	F	MG/L AS F	25	na	1.65	1.70	1.64	0.20	1.50	1.80	1.00	2.00	na	na	2.00
HARDNESS TOTAL	HARD	MG/L AS CAO3	44	na	60.0	58.5	58.0	14.9	43.3	74.8	27.0	93.0	na	na	na
RESIDUE TOTAL	RES	MG/L	60	23.3	16.4	10	9.82	18.3	3.00	28.8	1.00	99.0	1.00	1.00	na
NITROGEN AMM.	TNH3	MG/L AS N	0	na	na	na	na	na	na	na	na	na	na	na	na
UN-IONIZED AMM	NH3-	MG/L AS NH3	0	na	na	na	na	na	na	na	na	na	na	na	0.10
NO2 + NO3 DISS	NO23	MG/L AS N	0	na	na	na	na	na	na	na	na	na	na	na	10
NITROGEN, NO2	NIT	MG/L AS N	0	na	na	na	na	na	na	na	na	na	na	na	0.50
NITROGEN AMM+	TNIT	MG/L AS N	62	54.8	0.29	0.30	0.28	0.10	0.20	0.40	0.20	0.60	0.20	0.20	na
PHOSPHORUS O	OPO4	MG/L AS P	0	na	na	na	na	na	na	na	na	na	na	na	na
ARSENIC DISS.	AS D	UG/L AS AS	0	na	na	na	na	na	na	na	na	na	na	na	50.0
ARSENIC TOTAL	AS T	UG/L AS AS	0	na	na	na	na	na	na	na	na	na	na	na	50.0
BARIUM DISS.	BA D	UG/L AS BA	0	na	na	na	na	na	na	na	na	na	na	na	na
BARIUM TOTAL	BA T	UG/L AS BA	0	na	na	na	na	na	na	na	na	na	na	na	na
BORON DISS.	B D	UG/L AS B	0	na	na	na	na	na	na	na	na	na	na	na	750
BORON TOTAL	B T	UG/L AS B	0	na	na	na	na	na	na	na	na	na	na	na	na
CADMIUM DISS.	CD D	UG/L AS CD	35	100	na	na	na	na	na	na	na	1.00	1.00	1.00	3.09
CADMIUM TOTAL	CD T	UG/L AS CD	59	88.1	1.00	1.00	1.00	0	1.00	1.00	1.00	1.00	1.00	1.00	na
CHROMIUM DISS.	CR D	UG/L AS CR	59	88.1	1.00	1.00	1.00	0	1.00	1.00	1.00	1.00	1.17	1.00	50.0
CHROMIUM HEX.	CR6	UG/L AS CR	36	88.9	1.25	1.00	1.19	0.50	na	1.00	2.00	1.00	1.00	1.00	11.0
CHROMIUM TOTAL	CR T	UG/L AS CR	35	68.6	1.27	1.00	1.21	0.47	1.00	2.00	1.00	2.00	1.00	1.00	na
COPPER DISS.	CU D	UG/L AS CU	36	47.2	1.63	1.00	1.26	1.89	1.00	3.00	1.00	9.00	1.00	1.00	9.88
COPPER TOTAL	CU T	UG/L AS CU	60	16.7	2.68	2.00	2.20	2.14	1.00	4.35	1.00	14.0	1.00	1.00	na
IRON TOTAL	FE T	UG/L AS FE	60	na	641	475	495	679	250	871	190	4800	na	na	1000
IRON DISS.	FE D	UG/L AS FE	60	na	96.1	80.0	72.7	66.7	31.0	180	8.00	270	na	na	300
LEAD DISS.	PB D	UG/L AS PB	36	69.4	1.18	1.00	1.13	0.41	1.00	2.00	1.00	2.00	1.00	1.00	2.89
LEAD TOTAL	PB T	UG/L AS PB	60	48.3	1.84	2.00	1.63	1.04	1.00	2.20	1.00	5.00	3.62	5.00	na
MANGANESE DISS.	MN D	UG/L AS MN	60	1.67	49.6	43.0	38.8	35.6	16.0	80.0	7.00	180	10	10	71.0
MANGANESE TOT	MN T	UG/L AS MN	60	na	71.2	60.0	61.6	40.3	40.0	117	20.0	na	na	na	na
MERCURY DISS.	HG D	UG/L AS HG	0	na	na	na	na	na	na	na	na	na	na	na	0.10
MERCURY, TOT	HG T	UG/L AS HG	0	na	na	na	na	na	na	na	na	na	na	na	0.01
MOLYBDENUM DISS	MO D	UG/L AS MO	0	na	na	na	na	na	na	na	na	na	na	na	na
MOLYBDENUM TOT	MO T	UG/L AS MO	0	na	na	na	na	na	na	na	na	na	na	na	na
NICKEL DISS.	NI D	UG/L AS NI	36	66.7	1.08	1.00	1.06	0.29	1.00	1.05	1.00	2.00	1.00	1.00	81.4
NICKEL TOTAL	NI T	UG/L AS NI	36	47.2	2.37	1.00	1.72	2.50	1.00	4.00	1.00	10	1.00	1.00	na
SILVER DISS.	AG D	UG/L AS AG	0	na	na	na	na	na	na	na	na	na	na	na	0.05
SILVER TOTAL	AG T	UG/L AS AG	0	na	na	na	na	na	na	na	na	na	na	na	na
SELENIUM DISS.	SE D	UG/L AS SE	0	na	na	na	na	na	na	na	na	na	na	na	5.00
SELENIUM TOTAL	SE T	UG/L AS SE	0	na	na	na	na	na	na	na	na	na	na	na	na
ZINC DISS.	ZN D	UG/L AS ZN	36	22.2	8.65	7.50	7.62	4.88	4.00	13.3	4.00	22.0	3.00	3.00	88.7
ZINC TOTAL	ZN T	UG/L AS ZN	60	65.0	28.9	10	18.2	40.5	10	47.0	10	180	10	10	na
SULFIDE TOTAL	H2S	MG/L AS S	0	na	na	na	na	na	na	na	na	na	na	na	0.002
CYANIDE TOTAL	CYN	MG/L AS CN	0	na	na	na	na	na	na	na	na	na	na	na	0.005
SUSP SED	SSED	MG/L	14	na	23.3	17.0	17.4	21.9	8.25	34.8	5.00	91.0	na	na	na
SUSP-SIEVE	SIEV	%	0	na	na	na	na	na	na	na	na	na	na	na	na

Table A3. Univariate statistics for water-quality data collected for station 3780, October 1987 through September 1992

Note: DETECTIONS refers to analyses with results greater than detection limits; CENSOREDS refers to analyses with results less than method reporting limits; Abrv, abbreviations used on figures; Samples, number of samples collected; % < MRL, percent of samples collected less than method reporting limit; G mean, geometric mean, Stddev, standard deviation; 15.0% 15th percentile; 85.0%, 85th percentile; Min, minimum, Max, maximum; na, not applicable; CFS, cubic feet per second, CONDF, specific conductance measured in field; CONDL, specific conductance measured in lab; US/CM, microsiemens per centimeter, MICROSIEGENS/C, microsiemens per centimeter; WH, whole water; MG/L, milligram per liter; COLS, colonies; ML, milliliter; DISS, dissolved; D, Dissolved, TOT, total; T, total; AMM, ammonia; HEX, hexavalent; Standard, Colorado Department of Public Health and Environment chronic in-stream standard (standard listed for NO23 is for nitrate)

Variable	Abrv	Units	Samples	% < MRL		DETECTIONS							CENSOREDS		
				Mean	Median	G mean	Stddev	15.0%	85.0%	Min	Max	Mean	Median	Standard	
DISCHARGE	CFS	CFS	115	na	10.5	5.00	5.52	13.6	1.64	22.4	0.39	74.0	na	na	na
SPECIFIC COND.	COND US/CM @ 25C		111	na	272	275	257	86.3	162	368	121	474	na	na	na
SPECIFIC COND.	COND MICROSIEMENS/C		65	na	282	285	267	87.9	167	376	123	501	na	na	na
PH, WH, FIELD	PH STANDARD UNITS		64	na	8.13	8.10	8.13	0.29	7.88	8.40	7.40	8.90	na	na	na
WATER TEMP.	TEMP DEGREES		114	na	11.0	10	na	8.29	1.00	21.3	0	29.0	na	na	na
OXYGEN DISS.	DO MG/L		65	na	9.40	9.60	9.28	1.49	7.80	11.0	6.70	11.8	na	na	6.00
OXYGEN DIS. %	%DO % OF SATURATION		62	na	104	102	104	8.07	97.0	114	87.0	128	na	na	na
BOD 5-DAY	BOD5 MG/L		56	1.79	2.91	2.20	2.29	2.04	1.04	5.60	0.40	8.40	6.70	6.70	na
COLIFORM FECAL	FECOL COLS./100 ML		63	15.9	85.2	32.0	23.5	225	3.10	129	1.00	1600	2.70	2.00	200
FECAL STRPT	FSTRP COLS./100 ML		63	na	161	82.0	74.4	251	16.0	278	2.00	1600	na	na	na
CALCIUM DISS.	CA MG/L AS CA		44	na	26.4	28.0	25.8	5.23	18.8	32.0	14.0	34.0	na	na	na
MAGNESIUM DISS	MG MG/L AS MG		44	na	4.42	4.50	4.29	1.00	3.38	5.45	2.00	6.30	na	na	na
ALKALINITY	ALK MG/L AS CACO3		60	na	73.6	72.0	71.1	19.0	51.2	92.0	37.0	118	na	na	na
SULFATE DISS.	SO4 MG/L AS SO4		60	na	25.8	25.0	23.3	14.2	13.2	37.0	10	110	na	na	250
CHLORIDE DISS.	CL MG/L AS CL		62	na	16.2	15.0	14.1	8.11	7.78	25.0	3.70	40.0	na	na	250
FLUORIDE DISS.	F MG/L AS F		25	na	1.35	1.40	1.33	0.24	1.00	1.60	0.80	1.70	na	na	2.00
HARDNESS TOTAL	HARD MG/L AS CAO3		44	na	84.0	88.0	82.0	17.2	59.8	100	43.0	110	na	na	na
RESIDUE TOTAL	RES MG/L		60	5.00	27.9	14.0	14.9	42.8	6.70	39.1	1.00	243	1.00	1.00	na
NITROGEN AMM	TNH3 MG/L AS N		0	na	na	na	na	na	na	na	na	na	na	na	na
UN-IONIZED AMM NH3-	MG/L AS NH3		0	na	na	na	na	na	na	na	na	na	na	0.10	na
NO2 + NO3 DISS	NO23 MG/L AS N		0	na	na	na	na	na	na	na	na	na	na	na	10
NITROGEN, NO2	NIT MG/L AS N		0	na	na	na	na	na	na	na	na	na	na	na	0.50
NITROGEN AMM+	TNIT MG/L AS N		62	1.61	1.75	1.00	1.12	1.95	0.43	3.49	0.30	9.30	0.20	0.20	na
PHOSPHORUS O	OPO4 MG/L AS P		0	na	na	na	na	na	na	na	na	na	na	na	na
ARSENIC DISS.	AS D UG/L AS AS		0	na	na	na	na	na	na	na	na	na	na	na	50.0
ARSENIC TOTAL	AS T UG/L AS AS		0	na	na	na	na	na	na	na	na	na	na	na	50.0
BARIUM DISS.	BA D UG/L AS BA		0	na	na	na	na	na	na	na	na	na	na	na	na
BARIUM TOTAL	BA T UG/L AS BA		0	na	na	na	na	na	na	na	na	na	na	na	na
BORON DISS.	B D UG/L AS B		0	na	na	na	na	na	na	na	na	na	na	na	750
BORON TOTAL	B T UG/L AS B		0	na	na	na	na	na	na	na	na	na	na	na	na
CADMIUM DISS.	CD D UG/L AS CD		36	88.9	1.75	2.00	1.68	0.50	na	na	1.00	2.00	1.00	1.00	3.75
CADMIUM TOTAL	CD T UG/L AS CD		59	94.9	1.00	1.00	1.00	0	na	na	1.00	1.00	1.00	1.00	na
CHROMIUM DISS.	CR D UG/L AS CR		60	86.7	1.63	1.00	1.25	1.77	1.00	4.25	1.00	6.00	1.17	1.00	50.0
CHROMIUM HEX.	CR6 UG/L AS CR		36	80.6	3.00	3.00	2.48	1.83	1.00	5.60	1.00	6.00	1.00	1.00	11.0
CHROMIUM TOTAL	CR T UG/L AS CR		35	57.1	1.20	1.00	1.15	0.41	1.00	2.00	1.00	2.00	1.00	1.00	na
COPPER DISS.	CU D UG/L AS CU		36	13.9	1.71	2.00	1.53	0.90	1.00	2.20	1.00	5.00	1.00	1.00	11.4
COPPER TOTAL	CU T UG/L AS CU		60	8.33	3.69	3.00	3.22	1.97	2.00	6.00	1.00	10	1.00	1.00	na
IRON TOTAL	FE T UG/L AS FE		60	na	1040	745	845	984	562	1100	310	5900	na	na	1000
IRON DISS.	FE D UG/L AS FE		60	1.67	86.9	72.0	73.5	53.2	36.0	130	19.0	260	10	10	300
LEAD DISS.	PB D UG/L AS PB		36	75.0	1.00	1.00	1.00	0	1.00	1.00	1.00	1.00	1.00	1.00	3.67
LEAD TOTAL	PB T UG/L AS PB		60	40.0	2.61	2.00	1.89	3.80	1.00	3.00	1.00	24.0	4.17	5.00	na
MANGANESE DISS	MN D UG/L AS MN		60	na	79.9	70.5	70.2	44.2	40.0	130	20.0	250	na	na	71.0
MANGANESE TOT	MD T UG/L AS MN		60	na	128	110	117	54.9	80.0	199	60.0	290	na	na	na
MERCURY DISS.	HG D UG/L AS HG		0	na	na	na	na	na	na	na	na	na	na	na	0.10
MERCURY, TOT	HG T UG/L AS HG		0	na	na	na	na	na	na	na	na	na	na	na	0.01
MOLYBDENUM DIS	MO D UG/L AS MO		0	na	na	na	na	na	na	na	na	na	na	na	na
MOLYBDENUM TOT	MO T UG/L AS MO		0	na	na	na	na	na	na	na	na	na	na	na	na
NICKEL DISS.	NI D UG/L AS NI		36	22.2	3.04	2.00	2.52	2.13	1.35	5.30	1.00	10	1.00	1.00	92.7
NICKEL TOTAL	NI T UG/L AS NI		36	8.33	3.58	3.00	3.09	1.90	2.00	6.00	1.00	9.00	1.00	1.00	na
SILVER DISS.	AG D UG/L AS AG		0	na	na	na	na	na	na	na	na	na	na	na	0.07
SILVER TOTAL	AG T UG/L AS AG		0	na	na	na	na	na	na	na	na	na	na	na	na
SELENIUM DISS.	SE D UG/L AS SE		0	na	na	na	na	na	na	na	na	na	na	na	5.00
SELENIUM TOTAL	SE T UG/L AS SE		0	na	na	na	na	na	na	na	na	na	na	na	na
ZINC DISS.	ZN D UG/L AS ZN		35	8.57	6.88	6.00	6.38	2.68	3.99	10	3.00	14.0	3.00	3.00	102
ZINC TOTAL	ZN T UG/L AS ZN		60	48.3	18.7	10	15.5	13.4	10	32.0	10	60.0	10	10	na
SULFIDE TOTAL	H2S MG/L AS S		0	na	na	na	na	na	na	na	na	na	na	na	0.002
CYANIDE TOTAL	CYN MG/L AS CN		0	na	na	na	na	na	na	na	na	na	na	na	0.005
SUSP SED	SSED MG/L		16	na	50.5	43.0	35.2	50.3	15.3	82.7	4.00	213	na	na	na
SUSP-SIEVE	SIEV %		5	na	69.4	75.0	66.6	20.5	na	na	39.2	88.8	na	na	na

Table A4. Univariate statistics for water-quality data collected for station 4000, October 1987 through September 1992

Note: DETECTIONS refers to analyses with results greater than detection limits; CENSOREDS refers to analyses with results less than method reporting limits; Abrv, abbreviations used on figures; Samples, number of samples collected; % < MRL, percent of samples collected less than method reporting limit; G mean, geometric mean, Stddev, standard deviation; 15.0% 15th percentile; 85.0%, 85th percentile; Min, minimum, Max, maximum; na, not applicable; CFS, cubic feet per second, CONDF, specific conductance measured in field; CONDL, specific conductance measured in lab; US/CM, microsiemens per centimeter, MICROSIEMENS/C, microsiemens per centimeter; WH, whole water; MG/L, milligram per liter; COLS, colonies; ML, milliliter; DISS, dissolved; D, Dissolved, TOT, total; T, total; AMM, ammonia; HEX, hexavalent; Standard, Colorado Department of Public Health and Environment chronic in-stream standard (standard listed for NO23 is for nitrate)

Variable	Abrv	Units	Samples		% < MRL		DETECTIONS						CENSOREDS		
			Mean	Median	G mean	Stddev	15.0%		85.0%		Min	Max	Mean	Median	Standard
							15.0%	85.0%	Min	Max					
DISCHARGE	CFS	CFS	125	na	28.6	22.4	23.6	20.9	12.9	43.3	7.42	127	na	na	na
SPECIFIC COND.	COND	US/CM @ 25C	120	na	388	405	373	97.5	282	484	104	577	na	na	na
SPECIFIC COND.	COND	MICROSIEMENS/C	65	na	408	428	396	91.7	296	490	184	584	na	na	na
PH, WH, FIELD	PH	STANDARD UNITS	63	na	8.32	8.30	8.32	0.20	8.10	8.50	7.70	8.80	na	na	na
WATER TEMP.	TEMP	DEGREES	122	na	14.0	15.3	na	8.78	2.73	24.0	0	28.5	na	na	na
OXYGEN DISS.	DO	MG/L	65	na	8.47	8.20	8.28	1.80	6.50	10.8	5.80	11.7	na	na	6.00
OXYGEN DIS. %	%DO	% OF SATURATION	63	na	98.2	97.0	98.1	4.44	94.0	103	89.0	112	na	na	na
BOD 5-DAY	BOD5	MG/L	58	na	2.00	1.20	1.40	2.23	0.70	3.00	0.30	13.0	na	na	na
COLIFORM FECAL	FCOL	COLS./100 ML	62	8.06	240	66.0	70.0	419	10	513	3.00	2500	10.8	5.00	200
FECAL STRPT	FSTRP	COLS./100 ML	63	na	804	240	226	3510	67.6	660	16.0	28000	na	na	na
CALCIUM DISS.	CA	MG/L AS CA	44	na	49.7	52.0	48.3	11.1	35.0	62.3	21.0	67.0	na	na	na
MAGNESIUM DISS	MG	MG/L AS MG	44	na	6.50	6.70	6.34	1.34	4.60	7.93	2.80	8.60	na	na	na
ALKALINITY	ALK	MG/L AS CACO3	60	na	107	111	104	22.7	77.5	131	51.0	146	na	na	na
SULFATE DISS.	SO4	MG/L AS SO4	60	na	59.6	62.5	57.1	16.2	38.2	77.6	27.0	87.0	na	na	250
CHLORIDE DISS.	CL	MG/L AS CL	62	na	17.3	16.0	15.8	8.99	10.5	21.6	6.10	72.0	na	na	250
FLUORIDE DISS.	F	MG/L AS F	25	na	1.32	1.30	1.24	0.44	0.80	1.91	0.50	2.10	na	na	2.00
HARDNESS TOTAL	HARD	MG/L AS CAO3	44	na	152	160	147	33.2	110	190	64.0	200	na	na	na
RESIDUE TOTAL	RES	MG/L	59	1.69	268	144	144	512	67.9	405	1.00	3750	33.0	33.0	na
NITROGEN AMM	TNH3	MG/L AS N	0	na	na	na	na	na	na	na	na	na	na	na	na
UN-IONIZED AMM	NH3-	MG/L AS NH3	0	na	na	na	na	na	na	na	na	na	na	0.10	na
NO2 + NO3 DISS	NO23	MG/L AS N	0	na	na	na	na	na	na	na	na	na	na	na	10
NITROGEN, NO2	NIT	MG/L AS N	0	na	na	na	na	na	na	na	na	na	na	na	0.50
NITROGEN AMM+	TNIT	MG/L AS N	62	3.23	0.73	0.50	0.57	0.58	0.30	1.30	0.20	2.70	0.20	0.20	na
PHOSPHORUS O	OP04	MG/L AS P	0	na	na	na	na	na	na	na	na	na	na	na	na
ARSENIC DISS.	AS D	UG/L AS AS	0	na	na	na	na	na	na	na	na	na	na	na	50.0
ARSENIC TOTAL	AS T	UG/L AS AS	0	na	na	na	na	na	na	na	na	na	na	na	50.0
BARIUM DISS.	BA D	UG/L AS BA	0	na	na	na	na	na	na	na	na	na	na	na	na
BARIUM TOTAL	BA T	UG/L AS BA	0	na	na	na	na	na	na	na	na	na	na	na	na
BORON DISS.	B D	UG/L AS B	0	na	na	na	na	na	na	na	na	na	na	na	750
BORON TOTAL	B T	UG/L AS B	0	na	na	na	na	na	na	na	na	na	na	na	na
CADMIUM DISS.	CD D	UG/L AS CD	36	94.4	1.00	1.00	1.00	0	na	na	1.00	1.00	1.00	1.00	5.00
CADMIUM TOTAL	CD T	UG/L AS CD	59	93.2	1.25	1.00	1.19	0.50	na	na	1.00	2.00	1.00	1.00	na
CHROMIUM DISS.	CR D	UG/L AS CR	60	86.7	1.38	1.00	1.25	0.74	1.00	2.65	1.00	3.00	1.17	1.00	50.0
CHROMIUM HEX.	CR 6	UG/L AS CR	36	86.1	3.60	4.00	3.13	1.67	na	na	1.00	5.00	1.00	1.00	11.0
CHROMIUM TOTAL	CR T	UG/L AS CR	35	37.1	4.68	3.00	3.32	6.14	2.00	6.00	1.00	31.0	1.00	1.00	na
COPPER DISS.	CU D	UG/L AS CU	36	30.6	1.28	1.00	1.21	0.46	1.00	2.00	1.00	2.00	1.00	1.00	20.5
COPPER TOTAL	CU T	UG/L AS CU	60	1.67	7.25	6.00	5.64	7.39	3.00	9.00	2.00	52.0	1.00	1.00	na
IRON TOTAL	FE T	UG/L AS FE	60	na	4500	3350	3280	4280	1420	7860	270	25000	na	na	1000
IRON DISS.	FE D	UG/L AS FE	60	15.0	93.9	11.0	14.9	476	6.00	30.4	4.00	3400	11.1	10	300
LEAD DISS.	PB D	UG/L AS PB	36	86.1	1.00	1.00	1.00	0	na	na	1.00	1.00	1.00	1.00	9.66
LEAD TOTAL	PB T	UG/L AS PB	59	15.3	9.60	5.00	6.25	16.9	3.00	14.0	2.00	120	5.00	5.00	na
MANGANESE DISS	MN D	UG/L AS MN	60	8.33	22.1	19.0	16.7	22.0	6.40	32.8	4.00	160	10	10	71.0
MANGANESE TOT	MN T	UG/L AS MN	60	na	160	100	117	196	61.5	230	30.0	1400	na	na	na
MERCURY DISS.	HG D	UG/L AS HG	0	na	na	na	na	na	na	na	na	na	na	0.10	na
MERCURY, TOT	HG T	UG/L AS HG	0	na	na	na	na	na	na	na	na	na	na	na	0.01
MOLYBDENUM DISS	MO D	UG/L AS MO	0	na	na	na	na	na	na	na	na	na	na	na	na
MOLYBDENUM TOT	MO T	UG/L AS MO	0	na	na	na	na	na	na	na	na	na	na	na	na
NICKEL DISS.	NI D	UG/L AS NI	36	25.0	1.48	1.00	1.38	0.58	1.00	2.00	1.00	3.00	1.00	1.00	100
NICKEL TOTAL	NI T	UG/L AS NI	36	8.33	4.88	4.00	3.66	5.93	2.00	6.90	1.00	36.0	1.00	1.00	na
SILVER DISS.	AG D	UG/L AS AG	0	na	na	na	na	na	na	na	na	na	na	na	0.23
SILVER TOTAL	AG T	UG/L AS AG	0	na	na	na	na	na	na	na	na	na	na	na	na
SELENIUM DISS.	SE D	UG/L AS SE	0	na	na	na	na	na	na	na	na	na	na	na	5.00
SELENIUM TOTAL	SE T	UG/L AS SE	0	na	na	na	na	na	na	na	na	na	na	na	na
ZINC DISS.	ZN D	UG/L AS ZN	36	41.7	6.24	6.00	5.73	2.70	4.00	9.00	3.00	13.0	3.00	3.00	183
ZINC TOTAL	ZN T	UG/L AS ZN	60	11.7	46.2	30.0	31.8	78.7	20.0	69.0	10	580	10	10	na
SULFIDE TOTAL	H2S	MG/L AS S	0	na	na	na	na	na	na	na	na	na	na	na	0.002
CYANIDE TOTAL	CYN	MG/L AS CN	0	na	na	na	na	na	na	na	na	na	na	na	0.005
SUSP SED	SSED	MG/L	17	na	744	467	502	700	182	1730	98.0	2660	na	na	na
SUSP-SIEVE	SIEV	%	13	na	52.4	61.1	49.6	16.0	29.7	67.3	25.4	69.1	na	na	na

Table A5. Univariate statistics for water-quality data collected for station 4905, October 1987 through September 1992

Note: DETECTIONS refers to analyses with results greater than detection limits; CENSOREDS refers to analyses with results less than method reporting limits; Abrv, abbreviations used on figures; Samples, number of samples collected; % < MRL, percent of samples collected less than method reporting limit; G mean, geometric mean, Stddev, standard deviation; 15.0% 15th percentile; 85.0%, 85th percentile; Min, minimum, Max, maximum; na, not applicable; CFS, cubic feet per second, CONDF, specific conductance measured in field; CONDL, specific conductance measured in lab; US/CM, microsiemens per centimeter, MICROSIEGENS/C, microsiemens per centimeter; WH, whole water; MG/L, milligram per liter; COLS, colonies; ML, milliliter; DISS, dissolved; D, Dissolved, TOT, total; T, total; AMM, ammonia; HEX, hexavalent; Standard, Colorado Department of Public Health and Environment chronic in-stream standard (standard listed for NO23 is for nitrate)

Variable	Abrv	Units	Samples	% < MRL		DETECTIONS							CENSOREDS		
				Mean	Median	G mean	Stddev	15.0%	85.0%	Min	Max	Mean	Median	Standard	
DISCHARGE	CFS	CFS	61	na	32.8	24.0	25.3	34.4	15.3	45.7	5.90	222	na	na	na
SPECIFIC COND.	COND US/CM @ 25C		59	na	588	602	567	148	391	737	233	949	na	na	na
SPECIFIC COND.	COND MICROSIEMENS/C		60	na	588	605	569	140	422	717	242	925	na	na	na
PH, WH, FIELD	PH STANDARD UNITS		59	na	8.29	8.40	8.29	0.25	8.10	8.50	7.20	8.60	na	na	na
WATER TEMP.	TEMP DEGREES		60	na	14.3	16.0	na	9.80	0.50	24.0	0	31.0	na	na	na
OXYGEN DISS.	DO MG/L		59	na	8.46	8.20	8.24	2.01	6.20	11.2	5.70	13.4	na	na	6.00
OXYGEN DIS. %	%DO % OF SATURATION		58	na	99.0	98.0	98.9	5.06	95.0	104	82.0	114	na	na	na
BOD 5-DAY	BOD5 MG/L		58	na	2.77	1.50	1.72	3.24	0.80	5.01	0.20	15.0	na	na	na
COLIFORM FECAL	FCOL COLS./100 ML		57	5.26	3450	320	416	10600	40.0	4430	5.00	70000	240	100	200
FECAL STRPT	FSTRP COLS./100 ML		57	1.75	3320	820	855	7600	158	7900	47.0	50000	80.0	80.0	na
CALCIUM DISS.	CA MG/L AS CA		44	na	67.4	69.5	65.2	16.4	47.5	86.3	26.0	98.0	na	na	na
MAGNESIUM DISS	MG MG/L AS MG		44	na	11.6	12.0	11.1	3.25	7.80	15.0	3.90	19.0	na	na	na
ALKALINITY	ALK MG/L AS CACO3		61	na	133	134	129	27.2	101	165	63.0	183	na	na	na
SULFATE DISS.	SO4 MG/L AS SO4		61	na	119	120	113	36.5	77.9	160	38.0	210	na	na	250
CHLORIDE DISS.	CL MG/L AS CL		58	na	21.9	20.0	19.8	13.7	12.9	25.2	8.00	110	na	na	250
FLUORIDE DISS.	F MG/L AS F		26	na	1.43	1.35	1.39	0.33	1.10	1.80	0.80	2.00	na	na	2.00
HARDNESS TOTAL	HARD MG/L AS CAO3		44	na	216	220	209	54.0	150	280	81.0	310	na	na	na
RESIDUE TOTAL	RES MG/L		61	na	273	153	168	354	70.9	510	11.0	2490	na	na	na
NITROGEN AMM	TNH3 MG/L AS N		0	na	na	na	na	na	na	na	na	na	na	na	na
UN-IONIZED AMM NH3-	-MG/L AS NH3		0	na	na	na	na	na	na	na	na	na	na	na	0.10
NO2 + NO3 DISS	NO23 MG/L AS N		0	na	na	na	na	na	na	na	na	na	na	na	10
NITROGEN, NO2	NIT MG/L AS N		0	na	na	na	na	na	na	na	na	na	na	na	0.50
NITROGEN AMM+	TNIT MG/L AS N		60	na	0.70	0.60	0.60	0.38	0.30	1.00	0.20	1.90	na	na	na
PHOSPHORUS O	OPO4 MG/L AS P		0	na	na	na	na	na	na	na	na	na	na	na	na
ARSENIC DISS.	AS D UG/L AS AS		0	na	na	na	na	na	na	na	na	na	na	na	50.0
ARSENIC TOTAL	AS T UG/L AS AS		0	na	na	na	na	na	na	na	na	na	na	na	50.0
BARIUM DISS.	BA D UG/L AS BA		0	na	na	na	na	na	na	na	na	na	na	na	na
BARIUM TOTAL	BA T UG/L AS BA		0	na	na	na	na	na	na	na	na	na	na	na	na
BORON DISS.	B D UG/L AS B		0	na	na	na	na	na	na	na	na	na	na	na	750
BORON TOTAL	B T UG/L AS B		0	na	na	na	na	na	na	na	na	na	na	na	na
CADMIUM DISS.	CD D UG/L AS CD		37	83.8	1.17	1.00	1.12	0.41	1.00	1.95	1.00	2.00	1.00	1.00	5.00
CADMIUM TOTAL	CD T UG/L AS CD		60	91.7	1.20	1.00	1.15	0.45	na	na	1.00	2.00	1.00	1.00	na
CHROMIUM DISS.	CR D UG/L AS CR		60	80.0	1.42	1.00	1.30	0.67	1.00	2.05	1.00	3.00	1.25	1.00	50.0
CHROMIUM HEX.	CR6 UG/L AS CR		37	83.8	1.83	1.00	1.47	1.60	1.00	4.85	1.00	5.00	1.00	1.00	11.0
CHROMIUM TOTAL	CR T UG/L AS CR		36	19.4	6.52	5.00	4.74	6.01	2.00	11.5	1.00	28.0	1.00	1.00	na
COPPER DISS.	CU D UG/L AS CU		37	13.5	1.50	1.00	1.39	0.62	1.00	2.00	1.00	3.00	1.00	1.00	29.4
COPPER TOTAL	CU T UG/L AS CU		61	na	9.69	8.00	7.93	6.95	4.00	14.0	2.00	39.0	na	na	na
IRON TOTAL	FE T UG/L AS FE		61	1.64	7220	3800	4180	8900	1620	12900	160	50000	10	10	1000
IRON DISS.	FE D UG/L AS FE		60	15.0	17.3	10	12.5	19.9	6.00	21.8	4.00	120	7.67	10	300
LEAD DISS.	PB D UG/L AS PB		37	86.5	2.80	1.00	1.58	4.02	na	na	1.00	10	1.00	1.00	17.6
LEAD TOTAL	PB T UG/L AS PB		60	10	13.0	8.00	8.53	14.0	3.00	19.5	1.00	64.0	5.00	5.00	na
MANGANESE DISS	MN D UG/L AS MN		60	26.7	5.00	3.00	3.35	5.62	1.00	8.50	1.00	30.0	7.75	10	71.0
MANGANESE TOT	MN T UG/L AS MN		61	na	199	110	123	216	50.0	391	10	980	na	na	na
MERCURY DISS.	HG D UG/L AS HG		0	na	na	na	na	na	na	na	na	na	na	na	0.10
MERCURY, TOT	HG T UG/L AS HG		0	na	na	na	na	na	na	na	na	na	na	na	0.01
MOLYBDENUM DIS	MO D UG/L AS MO		0	na	na	na	na	na	na	na	na	na	na	na	na
MOLYBDENUM TOT	MO T UG/L AS MO		0	na	na	na	na	na	na	na	na	na	na	na	na
NICKEL DISS.	NI D UG/L AS NI		37	27.0	1.63	1.00	1.47	0.88	1.00	2.00	1.00	5.00	1.00	1.00	100
NICKEL TOTAL	NI T UG/L AS NI		37	na	7.11	5.00	5.12	6.55	2.00	12.9	1.00	34.0	na	na	na
SILVER DISS.	AG D UG/L AS AG		0	na	na	na	na	na	na	na	na	na	na	na	0.47
SILVER TOTAL	AG T UG/L AS AG		0	na	na	na	na	na	na	na	na	na	na	na	na
SELENIUM DISS.	SE D UG/L AS SE		0	na	na	na	na	na	na	na	na	na	na	na	5.00
SELENIUM TOTAL	SE T UG/L AS SE		0	na	na	na	na	na	na	na	na	na	na	na	na
ZINC DISS.	ZN D UG/L AS ZN		37	24.3	7.36	6.00	6.55	4.41	4.00	11.3	4.00	25.0	3.00	3.00	261
ZINC TOTAL	ZN T UG/L AS ZN		61	6.56	66.8	40.0	44.1	70.9	20.0	129	10	360	10	10	na
SULFIDE TOTAL	H2S MG/L AS S		0	na	na	na	na	na	na	na	na	na	na	na	0.002
CYANIDE TOTAL	CYN MG/L AS CN		0	na	na	na	na	na	na	na	na	na	na	na	0.005
SUSP SED	SSED MG/L		15	na	878	409	476	1440	148	1480	105	5820	na	na	na
SUSP-SIEVE	SIEV %		13	na	60.8	65.9	58.0	18.2	35.5	78.9	33.9	83.8	na	na	na

Table A6. Univariate statistics for water-quality data collected for station 5500, October 1987 through September 1992

Note: DETECTIONS refers to analyses with results greater than detection limits; CENSOREDS refers to analyses with results less than method reporting limits; Abrv, abbreviations used on figures; Samples, number of samples collected; % < MRL, percent of samples collected less than method reporting limit; G mean, geometric mean, Stddev, standard deviation; 15.0% 15th percentile; 85.0%, 85th percentile; Min, minimum, Max, maximum; na, not applicable; CFS, cubic feet per second, CONDF, specific conductance measured in field; CONDL, specific conductance measured in lab; US/CM, microsiemens per centimeter, MICROSIEMENS/C, microsiemens per centimeter; WH, whole water; MG/L, milligram per liter; COLS, colonies; ML, milliliter; DISS, dissolved; D, Dissolved, TOT, total; T, total; AMM, ammonia; HEX, hexavalent; Standard, Colorado Department of Public Health and Environment chronic in-stream standard (standard listed for NO23 is for nitrate)

Variable	Abrv	Units	Samples		DETECTIONS							CENSOREDS			
				% < MRL	Mean	Median	G mean	Stddev	15.0%	85.0%	Min	Max	Mean	Median	Standard
DISCHARGE	CFS	CFS	193	na	92.6	35.5	44.4	232	18.8	97.9	8.63	2170	na	na	na
SPECIFIC COND.	COND	US/CM @ 25C	157	na	605	610	575	186	401	781	218	1300	na	na	na
SPECIFIC COND.	COND	MICROSIEMENS/C	63	na	613	645	580	201	385	764	244	1330	na	na	na
PH, WH, FIELD	PH	STANDARD UNITS	64	na	8.16	8.20	8.16	0.23	8.00	8.30	7.09	8.40	na	na	na
WATER TEMP.	TEMP	DEGREES	163	na	12.9	13.5	na	7.96	2.50	21.7	0	28.0	na	na	na
OXYGEN DISS.	DO	MG/L	64	na	8.85	8.75	8.71	1.56	6.90	10.8	6.20	11.7	na	na	5.00
OXYGEN DIS. %	%DO	% OF SATURATION	57	na	101	99.0	101	6.40	95.0	107	90.0	130	na	na	na
BOD 5-DAY	BOD5	MG/L	57	1.75	2.05	1.40	1.35	3.21	0.71	2.60	0.20	22.0	0.50	0.50	na
CALIFORN FECAL	FCOL	COLS./100 ML	57	na	3590	530	531	9580	35.7	5830	12.0	64000	na	na	2000
FECAL STRPT	FSTRP	COLS./100 ML	57	na	3240	660	809	9550	197	3920	50.0	66000	na	na	na
CALCIUM DISS.	CA	MG/L AS CA	49	na	63.0	65.0	60.2	18.6	41.5	81.5	26.0	110	na	na	na
MAGNESIUM DISS	MG	MG/L AS MG	49	na	13.8	14.0	12.9	4.89	8.35	19.0	4.60	25.0	na	na	na
ALKALINITY	ALK	MG/L AS CACO3	65	na	133	138	129	32.2	94.7	164	65.0	210	na	na	na
SULFATE DISS.	SO4	MG/L AS SO4	65	na	133	140	120	52.0	70.8	180	14.0	250	na	na	330
CHLORIDE DISS.	CL	MG/L AS CL	62	na	25.6	21.0	20.8	32.2	12.0	29.6	8.70	260	na	na	250
FLUORIDE DISS.	F	MG/L AS F	30	na	2.03	1.95	1.97	0.49	1.50	2.54	1.30	3.10	na	na	2.00
HARDNESS TOTAL	HARD	MG/L AS CAO3	49	na	215	220	204	65.9	140	285	84.0	380	na	na	na
RESIDUE TOTAL	RES	MG/L	60	na	157	92.5	103	161	37.1	299	14.0	821	na	na	na
NITROGEN AMM	TNH3	MG/L AS N	4	na	0.13	0.03	0.04	0.20	na	na	0.01	0.43	na	na	na
UN-IONIZED AMM	NH3-	MG/L AS NH3	4	na	0.002	0.002	na	0.003	na	na	0	0.006	na	na	0.10
NO2 + NO3 DISS	NO23	MG/L AS N	4	na	2.00	2.05	1.97	0.39	na	na	1.50	2.40	na	na	10
NITROGEN, NO2	NIT	MG/L AS N	0	na	na	na	na	na	na	na	na	na	na	na	1.00
NITROGEN AMM+	TNIT	MG/L AS N	60	8.33	0.63	0.50	0.53	0.42	0.30	0.96	0.20	2.30	0.20	0.20	na
PHOSPHORUS O	OPO4	MG/L AS P	0	na	na	na	na	na	na	na	na	na	na	na	na
ARSENIC DISS.	AS D	UG/L AS AS	10	40.0	2.00	1.50	1.70	1.26	1.00	3.95	1.00	4.00	1.00	1.00	50.0
ARSENIC TOTAL	AS T	UG/L AS AS	6	33.3	1.00	1.00	1.00	0	na	na	1.00	1.00	1.00	1.00	50.0
BARIUM DISS.	BA D	UG/L AS BA	4	na	47.3	47.5	47.0	5.68	na	na	41.0	53.0	na	na	na
BARIUM TOTAL	BA T	UG/L AS BA	0	na	na	na	na	na	na	na	na	na	na	na	na
BORON DISS.	B D	UG/L AS B	9	na	70.0	60.0	67.1	22.4	50.0	105	50.0	110	na	na	750
BORON TOTAL	B T	UG/L AS B	5	na	66.0	60.0	62.6	24.1	na	na	40.0	100	na	na	na
CADMIUM DISS.	CD D	UG/L AS CD	41	87.8	2.00	2.00	1.89	0.71	na	na	1.00	3.00	1.00	1.00	5.00
CADMIUM TOTAL	CD T	UG/L AS CD	60	86.7	1.00	1.00	1.00	0	1.00	1.00	1.00	1.00	1.00	1.00	na
CHROMIUM DISS.	CR D	UG/L AS CR	65	83.1	1.27	1.00	1.21	0.47	1.00	2.00	1.00	2.00	1.54	1.00	50.0
CHROMIUM HEX.	CR6	UG/L AS CR	37	83.8	1.50	1.00	1.35	0.84	1.00	2.95	1.00	3.00	1.00	1.00	11.0
CHROMIUM TOTAL	CR T	UG/L AS CR	36	25.0	3.93	3.00	2.91	4.36	1.20	4.80	1.00	22.0	1.00	1.00	na
COPPER DISS.	CU D	UG/L AS CU	41	24.4	1.81	2.00	1.65	0.79	1.00	3.00	1.00	4.00	4.60	1.00	27.6
COPPER TOTAL	CU T	UG/L AS CU	61	4.92	6.62	6.00	5.76	3.90	3.00	11.2	2.00	23.0	1.00	1.00	na
IRON TOTAL	FE T	UG/L AS FE	61	na	4920	2800	3120	6350	1300	8580	410	38000	na	na	8000
IRON DISS.	FE D	UG/L AS FE	65	13.8	71.4	10.5	14.8	242	5.00	34.5	3.00	1400	6.89	10	300
LEAD DISS.	PB D	UG/L AS PB	41	78.0	1.33	1.00	1.26	0.50	1.00	2.00	1.00	2.00	2.13	1.00	15.9
LEAD TOTAL	PB T	UG/L AS PB	60	11.7	11.4	7.00	7.57	13.5	3.00	21.0	2.00	75.0	5.00	5.00	na
MANGANESE DISS	MN D	UG/L AS MN	65	1.54	31.0	21.0	22.3	26.1	9.00	60.3	4.00	130	10	10	50.0
MANGANESE TOT	MN T	UG/L AS MN	61	na	171	120	136	148	80.0	264	30.0	850	na	na	na
MERCURY DISS.	HG D	UG/L AS HG	4	75.0	0.50	0.50	0.50	na	na	0.50	0.50	0.10	0.10	0.10	0.01
MERCURY, TOT	HG T	UG/L AS HG	0	na	na	na	na	na	na	na	na	na	na	na	na
MOLYBDENUM DIS	MO D	UG/L AS MO	4	75.0	10	10	10	na	na	na	10	10	10	10	na
MOLYBDENUM TOT	MO T	UG/L AS MO	0	na	na	na	na	na	na	na	na	na	na	na	na
NICKEL DISS.	NI D	UG/L AS NI	40	47.5	1.57	2.00	1.49	0.51	1.00	2.00	1.00	2.00	2.89	1.00	100
NICKEL TOTAL	NI T	UG/L AS NI	37	2.70	4.14	3.00	3.32	3.06	1.55	6.00	1.00	17.0	1.00	1.00	na
SILVER DISS.	AG D	UG/L AS AG	4	100	na	na	na	na	na	na	na	1.00	1.00	1.00	0.41
SILVER TOTAL	AG T	UG/L AS AG	0	na	na	na	na	na	na	na	na	na	na	na	na
SELENIUM DISS.	SE D	UG/L AS SE	4	5.00	4.50	4.86	1.41	na	na	4.00	7.00	na	na	6.00	na
SELENIUM TOTAL	SE T	UG/L AS SE	0	na	na	na	na	na	na	na	na	na	na	na	na
ZINC DISS.	ZN D	UG/L AS ZN	41	17.1	13.6	7.00	8.79	23.5	4.25	15.8	3.00	140	3.00	3.00	246
ZINC TOTAL	ZN T	UG/L AS ZN	61	3.28	51.7	30.0	39.1	49.1	20.0	80.0	10	240	10	10	na
SULFIDE TOTAL	H2S	MG/L AS S	6	100	na	na	na	na	na	na	na	na	0.50	0.50	0.002
CYANIDE TOTAL	CYN	MG/L AS CN	6	100	na	na	na	na	na	na	na	na	0.01	0.01	0.005
SUSP SED	SSED	MG/L	81	na	1230	257	368	2500	101	2060	36.0	11500	na	na	na
SUSP-SIEVE	SIEV	%	47	na	69.0	71.0	66.7	16.6	49.7	83.8	33.0	98.0	na	na	na

Table A7. Univariate statistics for water-quality data collected for station 5530, October 1987 through September 1992

Note: DETECTIONS refers to analyses with results greater than detection limits; CENSOREDS refers to analyses with results less than method reporting limits; Abrv, abbreviations used on figures; Samples, number of samples collected; % < MRL, percent of samples collected less than method reporting limit; G mean, geometric mean, Stddev, standard deviation; 15.0% 15th percentile; 85.0%, 85th percentile; Min, minimum, Max, maximum; na, not applicable; CFS, cubic feet per second, CONDF, specific conductance measured in field; CONDL, specific conductance measured in lab; US/CM, microsiemens per centimeter, MICROSIEGENS/C, microsiemens per centimeter; WH, whole water; MG/L, milligram per liter; COLS, colonies; ML, milliliter; DISS, dissolved; D, Dissolved, TOT, total; T, total; AMM, ammonia; HEX, hexavalent; Standard, Colorado Department of Public Health and Environment chronic in-stream standard (standard listed for NO23 is for nitrate)

Variable	Abrv	Units	Samples		% < MRL		DETECTIONS						CENSOREDS		
			Mean	Median	G mean	Stddev	15.0%	85.0%	Min	Max	Mean	Median	Standard		
DISCHARGE	CFS	CFS	72	na	93.7	90.0	88.2	33.8	56.0	127	44.0	217	na	na	na
SPECIFIC COND.	COND US/CM @ 25C		79	na	794	836	779	146	619	897	335	1340	na	na	na
SPECIFIC COND.	COND MICROSIEMENS/C		62	na	759	794	744	145	589	859	335	1360	na	na	na
PH, WH, FIELD	PH STANDARD UNITS		65	na	7.77	7.80	7.77	0.15	7.64	7.90	7.30	8.00	na	na	na
WATER TEMP.	TEMP DEGREES		78	na	14.5	13.5	13.2	5.36	9.00	20.6	0.50	24.0	na	na	na
OXYGEN DISS.	DO MG/L		65	na	7.68	7.80	7.58	1.23	6.39	8.80	3.90	11.3	na	na	5.00
OXYGEN DIS. %	%DO % OF SATURATION		60	na	94.0	93.0	93.8	7.25	87.2	101	75.0	118	na	na	na
BOD 5-DAY	BOD5 MG/L		58	na	15.4	15.0	14.2	6.09	9.38	21.0	5.20	32.0	na	na	na
COLIFORM FECAL	FCOL COLS./100 ML		58	6.90	2320	600	654	6510	143	2600	26.0	45000	39.5	36.5	2000
FECAL STRPT	FSTRP COLS./100 ML		59	na	1970	510	741	4020	240	3100	60.0	23000	na	na	na
CALCIUM DISS.	CA MG/L AS CA		47	na	50.0	52.0	49.6	6.34	43.0	55.0	29.0	62.0	na	na	na
MAGNESIUM DISS	MG MG/L AS MG		47	na	15.3	15.0	14.9	3.26	12.0	18.8	6.30	23.0	na	na	na
ALKALINITY	ALK MG/L AS CACO3		40	na	102	100	100	18.7	83.3	122	64.0	152	na	na	na
SULFATE DISS.	SO4 MG/L AS SO4		40	na	159	165	154	36.8	112	190	58.0	230	na	na	330
CHLORIDE DISS.	CL MG/L AS CL		37	na	43.5	40.0	38.3	33.5	25.0	51.0	15.0	230	na	na	250
FLUORIDE DISS.	F MG/L AS F		29	na	1.80	1.70	1.77	0.32	1.50	2.25	1.30	2.60	na	na	2.00
HARDNESS TOTAL	HARD MG/L AS CAO3		47	na	188	190	186	28.4	152	220	98.0	240	na	na	na
RESIDUE TOTAL	RES MG/L		60	na	98.7	57.5	62.8	136	29.8	139	5.00	920	na	na	na
NITROGEN AMM	TNH3 MG/L AS N		5	na	8.72	9.80	8.44	2.17	na	na	4.90	10	na	na	na
UN-IONIZED AMM NH3-	MG/L AS NH3		4	na	0.14	0.14	0.13	0.05	na	na	0.08	0.19	na	na	0.10
NO2 + NO3 DISS	NO23 MG/L AS N		5	na	2.01	2.20	1.85	0.82	na	na	0.93	2.80	na	na	10
NITROGEN, NO2	NIT MG/L AS N		1	na	0.02	0.02	0.02	na	na	na	0.02	0.02	na	na	1.00
NITROGEN AMM+	TNIT MG/L AS N		59	na	11.3	11.0	10.4	4.85	6.50	14.0	3.20	37.0	na	na	na
PHOSPHORUS O	OPO4 MG/L AS P		1	na	2.90	2.90	2.90	na	na	na	2.90	2.90	na	na	na
ARSENIC DISS.	AS D UG/L AS AS		10	30.0	1.43	1.00	1.35	0.54	1.00	2.00	1.00	2.00	1.00	1.00	50.0
ARSENIC TOTAL	AS T UG/L AS AS		6	33.3	1.25	1.00	1.19	0.50	na	na	1.00	2.00	1.00	1.00	50.0
BARIUM DISS.	BA D UG/L AS BA		4	na	44.5	37.5	42.1	18.2	na	na	32.0	71.0	na	na	na
BARIUM TOTAL	BA T UG/L AS BA		0	na	na	na	na	na	na	na	na	na	na	na	na
BORON DISS.	B D UG/L AS B		8	na	154	140	150	35.8	114	207	100	210	na	na	750
BORON TOTAL	B T UG/L AS B		5	na	158	150	154	40.9	na	na	110	220	na	na	na
CADMIUM DISS.	CD D UG/L AS CD		61	80.3	1.25	1.00	1.19	0.45	1.00	2.00	1.00	2.00	1.00	1.00	5.00
CADMIUM TOTAL	CD T UG/L AS CD		56	91.1	1.00	1.00	1.00	0	na	na	1.00	1.00	1.00	1.00	na
CHROMIUM DISS.	CR D UG/L AS CR		61	32.8	2.95	2.00	2.10	3.83	1.00	3.70	1.00	24.0	1.60	1.00	50.0
CHROMIUM HEX.	CR6 UG/L AS CR		57	86.0	1.63	1.00	1.33	1.41	1.00	3.95	1.00	5.00	1.00	1.00	11.0
CHROMIUM TOTAL	CR T UG/L AS CR		56	16.1	5.15	4.00	3.77	5.02	2.00	8.80	1.00	29.0	1.00	1.00	na
COPPER DISS.	CU D UG/L AS CU		61	8.20	5.43	5.00	5.00	2.24	3.00	7.00	2.00	11.0	8.20	10	23.2
COPPER TOTAL	CU T UG/L AS CU		57	1.75	10.8	10	9.93	4.56	7.00	15.5	3.00	29.0	1.00	1.00	na
IRON TOTAL	FE T UG/L AS FE		57	na	2480	1500	1770	2500	859	3900	360	12000	na	na	8000
IRON DISS.	FE D UG/L AS FE		41	na	46.4	45.0	43.6	16.9	28.6	64.9	20.0	100	na	na	300
LEAD DISS.	PB D UG/L AS PB		61	68.9	1.63	1.00	1.42	1.01	1.00	3.00	1.00	4.00	3.38	1.00	11.9
LEAD TOTAL	PB T UG/L AS PB		56	8.93	9.80	6.00	7.01	9.00	3.00	20.2	2.00	39.0	5.00	5.00	na
MANGANESE DISS	MN D UG/L AS MN		40	na	68.1	69.5	62.4	24.4	45.2	93.9	11.0	120	na	na	50.0
MANGANESE TOT	MD T UG/L AS MN		36	na	146	125	136	64.0	100	205	70.0	360	na	na	na
MERCURY DISS.	HG D UG/L AS HG		4	50.0	0.25	0.25	0.25	0.07	na	na	0.20	0.30	0.10	0.10	0.10
MERCURY, TOT	HG T UG/L AS HG		0	na	na	na	na	na	na	na	na	na	na	na	0.01
MOLYBDENUM DIS	MO D UG/L AS MO		4	75.0	20.0	20.0	20.0	na	na	na	20.0	20.0	10	10	na
MOLYBDENUM TOT	MO T UG/L AS MO		0	na	na	na	na	na	na	na	na	na	na	na	na
NICKEL DISS.	NI D UG/L AS NI		60	10	4.20	4.00	3.52	3.03	2.00	6.00	1.00	20.0	5.50	5.50	100
NICKEL TOTAL	NI T UG/L AS NI		57	na	7.04	6.00	6.14	3.92	4.00	12.0	2.00	17.0	na	na	na
SILVER DISS.	AG D UG/L AS AG		4	100	na	na	na	na	na	na	na	na	1.00	1.00	0.29
SILVER TOTAL	AG T UG/L AS AG		0	na	na	na	na	na	na	na	na	na	na	na	na
SELENIUM DISS.	SE D UG/L AS SE		25	na	5.36	5.00	5.15	1.55	4.00	7.10	3.00	9.00	na	na	6.00
SELENIUM TOTAL	SE T UG/L AS SE		18	na	5.00	5.00	4.84	1.28	3.85	6.15	3.00	7.00	na	na	na
ZINC DISS.	ZN D UG/L AS ZN		61	na	47.5	35.0	38.7	34.4	21.0	80.0	5.20	160	na	na	207
ZINC TOTAL	ZN T UG/L AS ZN		57	na	77.4	60.0	66.9	48.7	40.0	110	30.0	280	na	na	na
SULFIDE TOTAL	H2S MG/L AS S		5	80.0	1.00	1.00	1.00	na	na	1.00	1.00	0.50	0.50	0.50	0.002
CYANIDE TOTAL	CYN MG/L AS CN		6	83.3	0.01	0.01	0.01	na	na	0.01	0.01	0.01	0.01	0.01	0.005
SUSP SED	SSED MG/L		1	na	805	805	805	na	na	805	805	na	na	na	na
SUSP-SIEVE	SIEV %		1	na	83.0	83.0	83.0	na	na	83.0	83.0	na	na	na	na

Table A8. Univariate statistics for water-quality data collected for station 5533, October 1987 through September 1992

Note: DETECTIONS refers to analyses with results greater than detection limits; CENSOREDS refers to analyses with results less than method reporting limits; Abrv, abbreviations used on figures; Samples, number of samples collected; % < MRL, percent of samples collected less than method reporting limit; G mean, geometric mean, Stddev, standard deviation; 15.0% 15th percentile; 85.0%, 85th percentile; Min, minimum, Max, maximum; na, not applicable; CFS, cubic feet per second, CONDF, specific conductance measured in field; CONDL, specific conductance measured in lab; US/CM, microsiemens per centimeter, MICROSIEMENS/C, microsiemens per centimeter; WH, whole water; MG/L, milligram per liter; COLS, colonies; ML, milliliter; DISS, dissolved; D, Dissolved, TOT, total; T, total; AMM, ammonia; HEX, hexavalent; Standard, Colorado Department of Public Health and Environment chronic in-stream standard (standard listed for NO23 is for nitrate)

Variable	Abrv	Units	Samples		% < MRL		DETECTIONS						CENSOREDS		
					Mean	Median	G mean	Stddev	15.0%	85.0%	Min	Max	Mean	Median	Standard
DISCHARGE	CFS	CFS	36	na	96.0	86.5	85.7	47.3	55.1	125	9.80	300	na	na	na
SPECIFIC COND.	COND	US/CM @ 25C	35	na	807	824	797	124	670	884	441	1200	na	na	na
SPECIFIC COND.	COND	MICROSIEMENS/C	36	na	775	803	765	125	642	846	444	1210	na	na	na
PH, WH, FIELD	PH	STANDARD UNITS	34	na	7.92	7.90	7.92	0.10	7.80	8.00	7.70	8.20	na	na	na
WATER TEMP.	TEMP	DEGREES	36	na	15.4	14.8	14.4	5.48	9.55	22.5	5.00	25.0	na	na	na
OXYGEN DISS.	DO	MG/L	36	na	7.49	7.65	7.43	0.99	6.20	8.50	5.80	9.30	na	na	5.00
OXYGEN DIS. %	%DO	% OF SATURATION	35	na	92.4	92.0	92.3	3.70	87.4	96.6	85.0	100	na	na	na
BOD 5-DAY	BOD5	MG/L	35	na	16.3	16.0	14.5	7.20	8.96	23.6	2.40	36.0	na	na	na
COLIFORM FECAL	FCOL	COLS./100 ML	34	na	1140	445	429	2270	100	1580	27.0	10000	na	na	2000
FECAL STRPT	FSTRP	COLS./100 ML	35	na	1860	420	622	4240	220	3100	80.0	22000	na	na	na
CALCIUM DISS.	CA	MG/L AS CA	36	na	52.8	54.0	52.4	5.92	46.7	57.5	32.0	64.0	na	na	na
MAGNESIUM DISS.	MG	MG/L AS MG	36	na	16.2	17.0	15.9	2.59	13.0	18.0	8.40	22.0	na	na	na
ALKALINITY	ALK	MG/L AS CACO3	36	na	99.3	97.5	98.3	14.7	84.6	111	68.0	135	na	na	na
SULFATE DISS.	SO4	MG/L AS SO4	36	na	166	170	164	29.8	130	200	83.0	230	na	na	330
CHLORIDE DISS.	CL	MG/L AS CL	33	na	44.3	40.0	39.6	31.5	28.1	50.7	17.0	210	na	na	250
FLUORIDE DISS.	F	MG/L AS F	25	na	1.76	1.70	1.74	0.27	1.50	2.11	1.10	2.30	na	na	2.00
HARDNESS TOTAL	HARD	MG/L AS CAO3	36	na	198	200	196	25.1	176	220	110	240	na	na	na
RESIDUE TOTAL	RES	MG/L	36	na	95.0	65.5	72.2	109	43.1	119	29.0	646	na	na	na
NITROGEN AMM.	TNH3	MG/L AS N	0	na	na	na	na	na	na	na	na	na	na	na	na
UN-IONIZED AMM	-NH3-	MG/L AS NH3	0	na	na	na	na	na	na	na	na	na	na	na	0.10
NO2 + NO3 DISS	NO23	MG/L AS N	0	na	na	na	na	na	na	na	na	na	na	na	10
NITROGEN, NO2	NIT	MG/L AS N	0	na	na	na	na	na	na	na	na	na	na	na	1.00
NITROGEN AMM+	TNT	MG/L AS N	36	na	9.95	9.75	9.01	3.88	6.07	14.0	0.90	20.0	na	na	na
PHOSPHORUS O	OPO4	MG/L AS P	0	na	na	na	na	na	na	na	na	na	na	na	na
ARSENIC DISS.	AS D	UG/L AS AS	0	na	na	na	na	na	na	na	na	na	na	na	50.0
ARSENIC TOTAL	AS T	UG/L AS AS	0	na	na	na	na	na	na	na	na	na	na	na	50.0
BARIUM DISS.	BA D	UG/L AS BA	0	na	na	na	na	na	na	na	na	na	na	na	na
BARIUM TOTAL	BA T	UG/L AS BA	0	na	na	na	na	na	na	na	na	na	na	na	na
BORON DISS.	B D	UG/L AS B	0	na	na	na	na	na	na	na	na	na	na	na	750
BORON TOTAL	B T	UG/L AS B	0	na	na	na	na	na	na	na	na	na	na	na	na
CADMIUM DISS.	CD D	UG/L AS CD	36	88.9	1.00	1.00	1.00	0	na	na	1.00	1.00	1.00	1.00	5.00
CADMIUM TOTAL	CD T	UG/L AS CD	36	94.4	1.00	1.00	1.00	0	na	na	1.00	1.00	1.00	1.00	na
CHROMIUM DISS.	CR D	UG/L AS CR	36	61.1	1.71	1.50	1.54	0.82	1.00	3.00	1.00	3.00	1.00	1.36	50.0
CHROMIUM HEX.	CR6	UG/L AS CR	36	88.9	1.75	1.50	1.57	0.96	na	na	1.00	3.00	1.00	1.00	11.0
CHROMIUM TOTAL	CR T	UG/L AS CR	35	17.1	3.90	3.00	3.02	4.19	2.00	5.50	1.00	24.0	1.00	1.00	na
COPPER DISS.	CU D	UG/L AS CU	36	na	4.67	4.00	4.37	1.72	3.00	6.45	2.00	10	na	na	23.2
COPPER TOTAL	CU T	UG/L AS CU	36	5.56	9.62	8.50	8.95	4.55	7.00	12.0	5.00	31.0	1.00	1.00	na
IRON TOTAL	FE T	UG/L AS FE	36	na	2520	1650	1830	2930	862	3680	610	17000	na	na	8000
IRON DISS.	FE D	UG/L AS FE	36	na	38.1	33.0	35.7	14.3	24.0	53.5	18.0	80.0	na	na	300
LEAD DISS.	PB D	UG/L AS PB	36	61.1	4.64	1.00	1.53	12.8	1.00	2.00	1.00	49.0	1.00	1.00	11.9
LEAD TOTAL	PB T	UG/L AS PB	35	2.86	7.53	4.50	5.22	12.3	3.00	9.75	2.00	75.0	1.00	1.00	na
MANGANESE DISS.	MN D	UG/L AS MN	36	na	64.8	62.5	59.2	25.2	34.7	93.5	19.0	120	na	na	50.0
MANGANESE TOT	MD T	UG/L AS MN	36	na	138	120	130	63.3	95.5	185	80.0	440	na	na	na
MERCURY DISS.	HG D	UG/L AS HG	0	na	na	na	na	na	na	na	na	na	na	na	0.10
MERCURY, TOT	HG T	UG/L AS HG	0	na	na	na	na	na	na	na	na	na	na	na	0.01
MOLYBDENUM DISS	MO D	UG/L AS MO	0	na	na	na	na	na	na	na	na	na	na	na	na
MOLYBDENUM TOT	MO T	UG/L AS MO	0	na	na	na	na	na	na	na	na	na	na	na	na
NICKEL DISS.	NID	UG/L AS NI	36	na	3.31	3.00	3.07	1.39	2.00	5.00	2.00	8.00	na	na	100
NICKEL TOTAL	NIT	UG/L AS NI	36	2.78	5.66	5.00	5.02	3.01	3.00	7.60	1.00	16.0	1.00	1.00	na
SILVER DISS.	AG D	UG/L AS AG	0	na	na	na	na	na	na	na	na	na	na	na	0.29
SILVER TOTAL	AG T	UG/L AS AG	0	na	na	na	na	na	na	na	na	na	na	na	na
SELENIUM DISS.	SE D	UG/L AS SE	0	na	na	na	na	na	na	na	na	na	na	na	6.00
SELENIUM TOTAL	SE T	UG/L AS SE	0	na	na	na	na	na	na	na	na	na	na	na	na
ZINC DISS.	ZND	UG/L AS ZN	36	na	28.6	27.0	27.0	9.76	20.0	39.5	13.0	53.0	na	na	207
ZINC TOTAL	ZNT	UG/L AS ZN	36	na	52.8	50.0	48.1	29.6	30.0	70.0	20.0	200	na	na	na
SULFIDE TOTAL	H2S	MG/L AS S	0	na	na	na	na	na	na	na	na	na	na	na	0.002
CYANIDE TOTAL	CYN	MG/L AS CN	0	na	na	na	na	na	na	na	na	na	na	na	0.005
SUSP SED	SSED	MG/L	0	na	na	na	na	na	na	na	na	na	na	na	na
SUSP-SIEVE	SIEV	%	0	na	na	na	na	na	na	na	na	na	na	na	na

Table A9. Univariate statistics for water-quality data collected for station 5905, October 1987 through September 1992

Note: DETECTIONS refers to analyses with results greater than detection limits; CENSOREDS refers to analyses with results less than method reporting limits; Abrv, abbreviations used on figures; Samples, number of samples collected; % < MRL, percent of samples collected less than method reporting limit; G mean, geometric mean; Stddev, standard deviation; 15.0% 15th percentile; 85.0%, 85th percentile; Min, minimum, Max, maximum; na, not applicable; CFS, cubic feet per second; CONDF, specific conductance measured in field; CONDL, specific conductance measured in lab; US/CM, microsiemens per centimeter, MICROSIEMENS/C, microsiemens per centimeter; WH, whole water; MG/L, milligram per liter; COLS, colonies; ML, milliliter; DISS, dissolved; D, Dissolved, TOT, total; T, total; AMM, ammonia; HEX, hexavalent; Standard, Colorado Department of Public Health and Environment chronic in-stream standard (standard listed for NO23 is for nitrate)

Table A10. Univariate statistics for water-quality data collected for station 6300, October 1987 through September 1992

Note: DETECTIONS refers to analyses with results greater than detection limits; CENSOREDS refers to analyses with results less than method reporting limits; Abrv, abbreviations used on figures; Samples, number of samples collected; % < MRL, percent of samples collected less than method reporting limit; G mean, geometric mean, Stddev, standard deviation; 15.0% 15th percentile; 85.0%, 85th percentile; Min, minimum, Max, maximum; na, not applicable; CFS, cubic feet per second, CONDF, specific conductance measured in field; CONDL, specific conductance measured in lab; US/CM, microsiemens per centimeter, MICROSIEMENS/C, microsiemens per centimeter; WH, whole water; MG/L, milligram per liter; COLS, colonies; ML, milliliter; DISS, dissolved; D, Dissolved, TOT, total; T, total; AMM, ammonia; HEX, hexavalent; Standard, Colorado Department of Public Health and Environment chronic in-stream standard (standard listed for NO23 is for nitrate)

Variable	Abrv	Units	Samples		% < MRL		DETECTIONS						CENSOREDS		
					Mean	Median	G mean	Stddev	15.0%	85.0%	Min	Max	Mean	Median	Standard
DISCHARGE	CFS	CFS	155	na	111	74.5	67.0	129	24.9	184	0.72	1020	na	na	na
SPECIFIC COND.	COND	US/CM @ 25C	129	na	1070	1100	1040	208	863	1260	480	1570	na	na	na
SPECIFIC COND.	COND	MICROSIEMENS/C	9	na	1060	1070	1050	114	891	1180	885	1180	na	na	na
PH, WH, FIELD	PH	STANDARD UNITS	12	na	8.22	8.26	8.22	0.19	8.17	8.40	7.65	8.40	na	na	na
WATER TEMP.	TEMP	DEGREES	134	na	16.1	18.0	na	8.43	6.00	25.0	0	32.5	na	na	na
OXYGEN DISS.	DO	MG/L	12	na	7.57	7.35	7.39	1.73	5.40	9.85	5.30	10.7	na	na	5.00
OXYGEN DIS. %	%DO	% OF SATURATION	8	na	95.4	96.0	95.4	0.92	94.0	96.0	94.0	96.0	na	na	na
BOD 5-DAY	BOD5	MG/L	7	na	8.16	5.20	5.42	9.13	1.92	24.2	1.90	28.0	na	na	na
COLIFORM FECAL	FCOL	COLS./100 ML	8	na	478	225	234	610	40.0	1510	40.0	1800	na	na	2000
FECAL STRPT	FSTRP	COLS./100 ML	8	na	492	215	260	777	90.1	1690	47.0	2400	na	na	na
CALCIUM DISS.	CA	MG/L AS CA	12	na	86.1	82.0	85.1	13.4	69.9	101	68.0	110	na	na	na
MAGNESIUM DISS	MG	MG/L AS MG	12	na	26.5	25.0	26.2	4.01	22.9	31.2	21.0	34.0	na	na	na
ALKALINITY	ALK	MG/L AS CACO3	12	na	172	161	170	26.6	141	208	140	214	na	na	na
SULFATE DISS.	SO4	MG/L AS SO4	12	na	302	290	299	45.1	250	361	240	380	na	na	330
CHLORIDE DISS.	CL	MG/L AS CL	12	na	50.6	49.5	48.7	16.1	35.8	59.9	31.0	96.0	na	na	250
FLUORIDE DISS.	F	MG/L AS F	12	na	1.91	1.85	1.89	0.26	1.69	2.21	1.50	2.40	na	na	2.00
HARDNESS TOTAL	HARD	MG/L AS CAO3	12	na	326	305	322	50.4	270	382	260	420	na	na	na
RESIDUE TOTAL	RES	MG/L	8	na	217	185	174	148	74.6	433	70.0	445	na	na	na
NITROGEN AMM.	TNH3	MG/L AS N	4	25.0	1.19	0.03	0.15	2.00	na	na	0.03	3.50	0.01	0.01	na
UN-IONIZED AMM.	NH3-	MG/L AS NH3	3	na	0.02	0.004	0.007	0.03	na	na	0.002	0.05	na	na	0.10
NO2 + NO3 DISS	NO23	MG/L AS N	4	na	2.65	2.70	2.34	1.39	na	na	1.10	4.10	na	na	10
NITROGEN, NO2	NIT	MG/L AS N	0	na	na	na	na	na	na	na	na	na	na	na	1.00
NITROGEN AMM+	TNIT	MG/L AS N	8	na	1.45	1.10	1.19	1.04	0.54	3.18	0.40	3.70	na	na	na
PHOSPHORUS O	OPO4	MG/L AS P	0	na	na	na	na	na	na	na	na	na	na	na	na
ARSENIC DISS.	AS D	UG/L AS AS	4	25.0	4.00	4.00	4.00	0	na	na	4.00	4.00	1.00	1.00	50.0
ARSENIC TOTAL	AS T	UG/L AS AS	0	na	na	na	na	na	na	na	na	na	na	na	50.0
BARIUM DISS.	BA D	UG/L AS BA	4	na	43.3	43.5	42.5	8.96	na	na	33.0	53.0	na	na	na
BARIUM TOTAL	BA T	UG/L AS BA	0	na	na	na	na	na	na	na	na	na	na	na	na
BORON DISS.	B D	UG/L AS B	3	na	190	180	188	36.1	na	na	160	230	na	na	750
BORON TOTAL	B T	UG/L AS B	0	na	na	na	na	na	na	na	na	na	na	na	na
CADMIUM DISS.	CD D	UG/L AS CD	12	91.7	2.00	2.00	2.00	na	na	na	2.00	2.00	1.00	1.00	5.00
CADMIUM TOTAL	CD T	UG/L AS CD	8	100	na	na	na	na	na	na	na	1.00	1.00	na	na
CHROMIUM DISS.	CR D	UG/L AS CR	12	100	na	na	na	na	na	na	na	2.33	1.00	50.0	na
CHROMIUM HEX.	CR6	UG/L AS CR	8	100	na	na	na	na	na	na	na	1.00	1.00	11.0	na
CHROMIUM TOTAL	CR T	UG/L AS CR	8	na	4.53	3.00	3.57	3.21	1.35	9.43	1.00	10.2	na	na	na
COPPER DISS.	CU D	UG/L AS CU	12	33.3	2.50	2.50	2.45	0.54	2.00	3.00	2.00	3.00	10	10	36.0
COPPER TOTAL	CU T	UG/L AS CU	8	na	10	9.50	9.06	4.34	4.35	15.0	4.00	15.0	na	na	na
IRON TOTAL	FE T	UG/L AS FE	8	na	6410	5550	5210	4220	2070	12700	2000	13000	na	na	8000
IRON DISS.	FE D	UG/L AS FE	12	8.33	16.8	14.0	14.5	10.3	7.80	32.6	7.00	39.0	3.00	3.00	300
LEAD DISS.	PB D	UG/L AS PB	12	100	na	na	na	na	na	na	na	4.00	1.00	24.7	na
LEAD TOTAL	PB T	UG/L AS PB	8	na	15.0	12.0	12.8	9.93	7.00	31.5	7.00	36.0	na	na	na
MANGANESE DISS.	MN D	UG/L AS MN	12	na	19.8	13.5	14.7	17.0	4.95	50.4	4.00	57.0	na	na	50.0
MANGANESE TOT	MN T	UG/L AS MN	8	na	225	205	195	124	90.0	405	90.0	440	na	na	na
MERCURY DISS.	HG D	UG/L AS HG	4	75.0	0.20	0.20	0.20	na	na	0.20	0.20	0.10	0.10	0.10	0.01
MERCURY, TOT	HG T	UG/L AS HG	0	na	na	na	na	na	na	na	na	na	na	na	na
MOLYBDENUM DIS	MO D	UG/L AS MO	4	75.0	10	10	10	na	na	na	10	10	10	10	na
MOLYBDENUM TOT	MO T	UG/L AS MO	0	na	na	na	na	na	na	na	na	na	na	na	na
NICKEL DISS.	NI D	UG/L AS NI	12	33.3	3.13	3.00	3.02	0.83	2.00	4.00	2.00	4.00	10	10	100
NICKEL TOTAL	NI T	UG/L AS NI	8	na	7.75	6.50	7.34	2.76	5.00	11.0	5.00	11.0	na	na	na
SILVER DISS.	AG D	UG/L AS AG	4	100	na	na	na	na	na	na	na	1.00	1.00	0.71	na
SILVER TOTAL	AG T	UG/L AS AG	0	na	na	na	na	na	na	na	na	na	na	na	na
SELENIUM DISS.	SE D	UG/L AS SE	4	5.00	5.00	5.00	0	na	na	5.00	5.00	na	na	6.0	na
SELENIUM TOTAL	SE T	UG/L AS SE	0	na	na	na	na	na	na	na	na	na	na	na	na
ZINC DISS.	ZN D	UG/L AS ZN	12	8.33	12.5	14.0	11.4	4.87	5.80	18.2	5.00	19.0	3.00	3.00	320
ZINC TOTAL	ZN T	UG/L AS ZN	8	na	55.0	55.0	48.2	28.8	23.5	96.5	20.0	100	na	na	na
SULFIDE TOTAL	H2S	MG/L AS S	0	na	na	na	na	na	na	na	na	na	na	na	0.002
CYANIDE TOTAL	CYN	MG/L AS CN	0	na	na	na	na	na	na	na	na	na	na	na	0.005
SUSP SED	SSED	MG/L	0	na	na	na	na	na	na	na	na	na	na	na	na
SUSP-SIEVE	SIEV	%	0	na	na	na	na	na	na	na	na	na	na	na	na

Table A11. Univariate statistics for water-quality data collected for station 6500, October 1987 through September 1992

Note: DETECTIONS refers to analyses with results greater than detection limits; CENSOREDS refers to analyses with results less than method reporting limits; Abrv, abbreviations used on figures; Samples, number of samples collected; % < MRL, percent of samples collected less than method reporting limit; G mean, geometric mean, Stddev, standard deviation; 15.0% 15th percentile; 85.0%, 85th percentile; Min, minimum, Max, maximum; na, not applicable; CFS, cubic feet per second, CONDF, specific conductance measured in field; CONDL, specific conductance measured in lab; US/CM, microsiemens per centimeter, MICROSIEGENS/C, microsiemens per centimeter; WH, whole water; MG/L, milligram per liter; COLS, colonies; ML, milliliter; DISS, dissolved; D, Dissolved, TOT, total; T, total; AMM, ammonia; HEX, hexavalent; Standard, Colorado Department of Public Health and Environment chronic in-stream standard (standard listed for NO23 is for nitrate)

Variable	Abrv	Units	Samples		% < MRL		DETECTIONS							CENSOREDS		
					Mean	Median	G mean	Stddev	15.0%	85.0%	Min	Max	Mean	Median	Standard	
DISCHARGE	CFS	CFS	82	na	90.3	79.5	70.4	60.9	28.2	140	8.50	325	na	na	na	
SPECIFIC COND.	COND	US/CM @ 25C	82	na	1320	1320	1300	200	1120	1510	756	1780	na	na	na	
SPECIFIC COND.	COND	MICROSIEMENS/C	83	na	1300	1300	1290	195	1110	1520	751	1710	na	na	na	
PH, WH, FIELD	PH	STANDARD UNITS	80	na	8.32	8.30	8.32	0.16	8.20	8.50	7.80	8.70	na	na	na	
WATER TEMP.	TEMP	DEGREES	81	na	15.8	16.0	na	9.45	4.00	26.7	0	32.0	na	na	na	
OXYGEN DISS.	DO	MG/L	81	na	8.46	8.10	8.25	1.97	6.40	10.8	5.50	13.7	na	na	5.00	
OXYGEN DIS. %	%DO	% OF SATURATION	80	na	98.6	97.0	98.4	7.42	93.0	105	79.0	132	na	na	na	
BOD 5-DAY	BOD5	MG/L	58	1.72	6.45	3.90	3.98	6.88	1.30	13.6	0.50	34.0	0.50	0.50	na	
COLIFORM FECAL	FCOL	COLS./100 ML	78	3.85	637	160	152	1720	31.2	932	3.00	13000	9.67	5.00	2000	
FECAL STRPT	FSTRP	COLS./100 ML	77	1.30	1430	395	466	2880	140	2060	17.0	15000	44.0	44.0	na	
CALCIUM DISS.	CA	MG/L AS CA	23	na	96.7	96.0	95.9	12.8	83.2	110	73.0	120	na	na	na	
MAGNESIUM DISS	MG	MG/L AS MG	23	na	35.6	33.0	34.7	8.22	28.6	46.4	22.0	54.0	na	na	na	
ALKALINITY	ALK	MG/L AS CACO3	23	na	185	192	184	24.0	156	212	146	223	na	na	na	
SULFATE DISS.	SO4	MG/L AS SO4	23	na	383	380	376	77.2	310	478	270	550	na	na	490	
CHLORIDE DISS.	CL	MG/L AS CL	23	na	50.4	52.0	49.8	7.88	40.6	59.0	34.0	62.0	na	na	250	
FLUORIDE DISS.	F	MG/L AS F	9	na	1.89	1.90	1.88	0.14	1.70	2.05	1.60	2.10	na	na	2.00	
HARDNESS TOTAL	HARD	MG/L AS CAO3	23	na	389	380	384	61.9	326	454	270	510	na	na	na	
RESIDUE TOTAL	RES	MG/L	59	na	519	168	155	1370	29.0	690	7.00	8950	na	na	na	
NITROGEN AMM	TNH3	MG/L AS N	0	na	na	na	na	na	na	na	na	na	na	na	na	
UN-IONIZED AMM NH3-	MG/L AS NH3	0	na	na	na	na	na	na	na	na	na	na	na	na	0.10	
NO2 + NO3 DISS	NO23	MG/L AS N	1	na	4.70	4.70	4.70	na	na	na	4.70	4.70	na	na	10	
NITROGEN, NO2	NIT	MG/L AS N	0	na	na	na	na	na	na	na	na	na	na	na	5.00	
NITROGEN AMM+	TNIT	MG/L AS N	60	1.67	1.36	1.10	1.06	0.96	0.50	2.40	0.20	3.90	2.10	2.10	na	
PHOSPHORUS O	OPO4	MG/L AS P	0	na	na	na	na	na	na	na	na	na	na	na	na	
ARSENIC DISS.	AS D	UG/L AS AS	1	na	4.00	4.00	4.00	na	na	na	4.00	4.00	na	na	50.0	
ARSENIC TOTAL	AS T	UG/L AS AS	0	na	na	na	na	na	na	na	na	na	na	na	50.0	
BARIUM DISS.	BA D	UG/L AS BA	0	na	na	na	na	na	na	na	na	na	na	na	na	
BARIUM TOTAL	BA T	UG/L AS BA	0	na	na	na	na	na	na	na	na	na	na	na	na	
BORON DISS.	B D	UG/L AS B	1	na	220	220	220	na	na	na	220	220	na	na	750	
BORON TOTAL	B T	UG/L AS B	0	na	na	na	na	na	na	na	na	na	na	na	na	
CADMIUM DISS.	CD D	UG/L AS CD	23	60.9	0.24	0.20	0.20	0.16	0.10	0.50	0.10	0.50	0.16	0.10	5.00	
CADMIUM TOTAL	CD T	UG/L AS CD	21	81.0	1.50	1.00	1.32	1.00	na	na	1.00	3.00	1.00	1.00	na	
CHROMIUM DISS.	CR D	UG/L AS CR	23	87.0	1.33	1.00	1.26	0.58	na	na	1.00	2.00	1.00	1.00	50.0	
CHROMIUM HEX.	CR6	UG/L AS CR	0	na	na	na	na	na	na	na	na	na	na	na	11.0	
CHROMIUM TOTAL	CR T	UG/L AS CR	21	14.3	8.39	6.50	6.83	5.14	3.85	16.3	1.00	18.0	1.00	1.00	na	
COPPER DISS.	CU D	UG/L AS CU	23	na	2.35	2.00	2.19	0.94	2.00	3.40	1.00	5.00	na	na	44.0	
COPPER TOTAL	CU T	UG/L AS CU	20	na	15.6	10.5	10.5	20.9	4.15	23.3	3.00	100	na	na	na	
IRON TOTAL	FE T	UG/L AS FE	20	na	8980	8950	5550	6540	964	18000	230	20000	na	na	5100	
IRON DISS.	FE D	UG/L AS FE	22	13.6	11.7	8.00	8.99	10.3	4.00	19.0	4.00	39.0	3.00	3.00	300	
LEAD DISS.	PB D	UG/L AS PB	23	78.3	0.66	0.70	0.65	0.11	na	0.50	0.80	0.75	0.50	0.50	34.4	
LEAD TOTAL	PB T	UG/L AS PB	20	na	20.0	14.0	10.8	31.2	2.30	19.0	2.00	140	na	na	na	
MANGANESE DISS	MN D	UG/L AS MN	22	4.55	6.24	3.00	4.15	9.84	2.00	8.10	2.00	48.0	1.00	1.00	50.0	
MANGANESE TOT	MN T	UG/L AS MN	21	na	355	310	246	402	62.0	460	40.0	2000	na	na	na	
MERCURY DISS.	HG D	UG/L AS HG	1	na	0.50	0.50	0.50	na	na	na	0.50	0.50	na	na	0.10	
MERCURY, TOT	HG T	UG/L AS HG	0	na	na	na	na	na	na	na	na	na	na	na	0.01	
MOLYBDENUM DIS	MO D	UG/L AS MO	1	na	8.00	8.00	8.00	na	na	na	8.00	8.00	na	na	na	
MOLYBDENUM TOT	MO T	UG/L AS MO	0	na	na	na	na	na	na	na	na	na	na	na	na	
NICKEL DISS.	NI D	UG/L AS NI	22	na	3.23	3.00	3.13	0.81	2.00	4.00	2.00	5.00	na	na	100	
NICKEL TOTAL	NI T	UG/L AS NI	18	na	14.3	11.5	10.3	16.7	4.00	19.3	3.00	78.0	na	na	na	
SILVER DISS.	AG D	UG/L AS AG	21	95.2	1.00	1.00	1.00	na	na	na	1.00	1.00	1.00	1.00	1.06	
SILVER TOTAL	AG T	UG/L AS AG	22	90.9	1.00	1.00	1.00	0	na	na	1.00	1.00	1.00	1.00	na	
SELENIUM DISS.	SE D	UG/L AS SE	19	na	21.3	19.0	17.9	12.8	10	33.0	5.00	53.0	na	na	20.0	
SELENIUM TOTAL	SE T	UG/L AS SE	13	na	25.5	22.0	23.2	12.2	16.0	41.0	11.0	56.0	na	na	na	
ZINC DISS.	ZN D	UG/L AS ZN	23	na	8.00	8.00	6.82	4.68	3.00	12.8	3.00	22.0	na	na	390	
ZINC TOTAL	ZN T	UG/L AS ZN	21	4.76	85.5	75.0	66.5	84.4	31.5	109	20.0	420	10	10	na	
SULFIDE TOTAL	H2S	MG/L AS S	0	na	na	na	na	na	na	na	na	na	na	na	na	
CYANIDE TOTAL	CYN	MG/L AS CN	0	na	na	na	na	na	na	na	na	na	na	na	0.005	
SUSP SED	SSED	MG/L	22	na	632	545	393	793	108	925	45.0	3930	na	na	na	
SUSP-SIEVE	SIEV	%	22	na	64.5	62.5	62.4	15.8	49.1	84.1	27.5	90.0	na	na	na	

Table A12. Univariate statistics for water-quality data collected for station 3700, October 1992 through September 1997

Note: DETECTIONS refers to analyses with results greater than detection limits; CENSOREDS refers to analyses with results less than method reporting limits; Abrv, abbreviations used on figures; Samples, number of samples collected; % < MRL, percent of samples collected less than method reporting limit; G mean, geometric mean, Stddev, standard deviation; 15.0% 15th percentile; 85.0%, 85th percentile; Min, minimum, Max, maximum; na, not applicable; CFS, cubic feet per second, CONDF, specific conductance measured in field; CONDL, specific conductance measured in lab; US/CM, microsiemens per centimeter, MICROSIEMENS/C, microsiemens per centimeter; WH, whole water; MG/L, milligram per liter; COLS, colonies; ML, milliliter; DISS, dissolved; D, Dissolved, TOT, total; T, total; AMM, ammonia; HEX, hexavalent; Standard, Colorado Department of Public Health and Environment chronic in-stream standard (standard listed for NO23 is for nitrate)

Variable	Abrv	Units	Samples		DETECTIONS							CENSOREDS			
				% < MRL	Mean	Median	G mean	Stddev	15.0%	85.0%	Min	Max	Mean	Median	Standard
DISCHARGE	CFS	CFS	142	na	39.6	15.0	18.5	74.6	7.21	64.8	2.00	518	na	na	na
SPECIFIC COND.	COND US/CM @ 25C	118	na	298	293	280	99.4	179	407	129	565	na	na	na	
SPECIFIC COND.	COND MICROSIEMENS/C	59	na	306	301	291	92.4	187	417	138	458	na	na	na	
PH, WH, FIELD	PH STANDARD UNITS	58	na	8.14	8.20	8.13	0.24	7.80	8.40	7.60	8.50	na	na	na	
WATER TEMP.	TEMP DEGREES	122	na	7.20	7.25	na	4.80	1.50	13.0	0	17.5	na	na	20.0	
OXYGEN DISS.	DO	MG/L	58	na	9.74	9.85	9.65	1.27	8.10	11.2	7.70	12.2	na	na	7.00
OXYGEN DIS. %	%DO OF SATURATION	57	na	97.8	97.0	97.7	3.38	95.0	101	91.0	109	na	na	na	
BOD 5-DAY	BOD5	MG/L	58	3.45	0.61	0.55	0.53	0.38	0.30	0.90	0.20	2.30	0.30	0.30	na
CALIFORN FECAL	FCOL	COLS./100 ML	54	na	350	135	161	556	50.0	668	8.00	3500	na	na	200
FECAL STRPT	FSTRP	COLS./100 ML	56	na	415	180	214	682	55.8	735	26.0	4700	na	na	na
CALCIUM DISS.	CA	MG/L AS CA	59	na	31.8	31.0	30.2	9.93	19.0	43.0	15.0	50.0	na	na	na
MAGNESIUM DISS	MG	MG/L AS MG	59	na	6.35	6.20	5.95	2.15	3.69	8.70	2.70	10	na	na	na
ALKALINITY	ALK	MG/L AS CACO3	59	na	104	105	96.7	37.0	56.2	149	39.0	166	na	na	na
SULFATE DISS.	SO4	MG/L AS SO4	58	na	14.5	14.6	14.1	3.32	11.0	18.0	7.20	20.0	na	na	250
CHLORIDE DISS.	CL	MG/L AS CL	58	na	16.6	16.0	15.3	6.32	9.25	24.0	6.30	33.7	na	na	250
FLUORIDE DISS.	F	MG/L AS F	58	na	2.66	2.70	2.64	0.25	2.50	2.90	1.60	3.10	na	na	2.00
HARDNESS TOTAL	HARD	MG/L AS CAO3	59	na	106	100	99.9	33.8	64.0	140	49.0	170	na	na	na
RESIDUE TOTAL	RES	MG/L	59	3.39	27.1	12.0	10.7	43.2	2.00	42.2	1.00	212	1.00	1.00	na
NITROGEN AMM	TNH3	MG/L AS N	55	60.0	0.02	0.02	0.02	0.008	0.02	0.03	0.01	0.04	0.01	0.01	na
UN-IONIZED AMM	NH3-	MG/L AS NH3	22	na	0.0006	0.001	na	0.0006	0	0.001	0	0.002	na	na	0.02
NO2 + NO3 DISS	NO23	MG/L AS N	55	na	0.83	0.86	0.77	0.27	0.50	1.10	0.12	1.30	na	na	10
NITROGEN, NO2	NIT	MG/L AS N	55	81.8	0.01	0.01	0.01	0.005	0.01	0.02	0.01	0.02	0.01	0.01	0.05
NITROGEN AMM+	TNIT	MG/L AS N	59	76.3	0.31	0.21	0.28	0.15	0.20	0.45	0.20	0.70	0.20	0.20	na
PHOSPHORUS O	OPO4	MG/L AS P	55	80.0	0.01	0.01	0.01	0.005	0.01	0.02	0.01	0.02	0.01	0.01	na
ARSENIC DISS.	AS D	UG/L AS AS	0	na	na	na	na	na	na	na	na	na	na	na	50.0
ARSENIC TOTAL	AS T	UG/L AS AS	0	na	na	na	na	na	na	na	na	na	na	na	50.0
BARIUM DISS.	BA D	UG/L AS BA	1	na	85.7	85.7	85.7	na	na	85.7	85.7	na	na	na	na
BARIUM TOTAL	BA T	UG/L AS BA	0	na	na	na	na	na	na	na	na	na	na	na	na
BORON DISS.	B D	UG/L AS B	1	na	45.8	45.8	45.8	na	na	45.8	45.8	na	na	na	750
BORON TOTAL	B T	UG/L AS B	0	na	na	na	na	na	na	na	na	na	na	na	na
CADMIUM DISS.	CD D	UG/L AS CD	59	100	na	na	na	na	na	na	na	0.99	1.00	5.00	
CADMIUM TOTAL	CD T	UG/L AS CD	59	100	na	na	na	na	na	na	na	1.00	1.00	na	
CHROMIUM DISS.	CR D	UG/L AS CR	59	98.3	3.00	3.00	3.00	na	na	3.00	3.00	1.00	1.00	50.0	
CHROMIUM HEX.	CR6	UG/L AS CR	59	96.6	1.00	1.00	1.00	0	na	1.00	1.00	1.00	1.00	11.0	
CHROMIUM TOTAL	CR T	UG/L AS CR	59	86.4	1.43	1.20	1.36	0.46	1.00	2.07	1.00	2.10	1.00	1.00	na
COPPER DISS.	CU D	UG/L AS CU	59	79.7	1.18	1.00	1.13	0.44	1.00	1.46	0.89	2.50	1.00	1.00	15.8
COPPER TOTAL	CU T	UG/L AS CU	59	42.4	1.81	1.95	1.63	0.89	1.00	2.95	1.00	4.00	1.00	1.00	na
IRON TOTAL	FE T	UG/L AS FE	59	na	925	440	541	1180	180	1500	130	5900	na	na	1000
IRON DISS.	FE D	UG/L AS FE	59	5.08	40.9	37.5	31.7	30.9	12.5	60.0	6.52	189	10	10	300
LEAD DISS.	PB D	UG/L AS PB	59	96.6	1.45	1.45	1.33	0.79	na	0.89	2.00	1.00	1.00	1.00	6.27
LEAD TOTAL	PB T	UG/L AS PB	59	50.8	3.72	2.00	2.81	3.17	1.10	8.00	1.00	12.0	1.00	1.00	na
MANGANESE DISS	MN D	UG/L AS MN	59	1.69	30.2	29.1	28.2	10.6	17.0	41.5	9.00	53.0	10	10	50.0
MANGANESE TOT	MN T	UG/L AS MN	59	na	86.2	60.0	70.4	68.3	40.0	120	30.0	350	na	na	na
MERCURY DISS.	HG D	UG/L AS HG	0	na	na	na	na	na	na	na	na	na	na	na	0.10
MERCURY, TOT	HG T	UG/L AS HG	0	na	na	na	na	na	na	na	na	na	na	na	0.01
MOLYBDENUM DIS	MO D	UG/L AS MO	1	na	2.48	2.48	2.48	na	na	2.48	2.48	na	na	na	na
MOLYBDENUM TOT	MO T	UG/L AS MO	0	na	na	na	na	na	na	na	na	na	na	na	na
NICKEL DISS.	NI D	UG/L AS NI	59	93.2	1.32	1.15	1.27	0.47	na	1.00	2.00	1.00	1.00	100	100
NICKEL TOTAL	NI T	UG/L AS NI	59	64.4	1.68	1.00	1.40	1.39	1.00	2.70	1.00	7.00	1.00	1.00	na
SILVER DISS.	AG D	UG/L AS AG	1	100	na	na	na	na	na	na	na	0.20	0.20	0.13	
SILVER TOTAL	AG T	UG/L AS AG	0	na	na	na	na	na	na	na	na	na	na	na	na
SELENIUM DISS.	SE D	UG/L AS SE	0	na	na	na	na	na	na	na	na	na	na	5.00	
SELENIUM TOTAL	SE T	UG/L AS SE	0	na	na	na	na	na	na	na	na	na	na	na	na
ZINC DISS.	ZN D	UG/L AS ZN	59	52.5	4.79	5.00	4.64	1.20	3.15	6.00	3.00	7.00	4.35	3.00	141
ZINC TOTAL	ZN T	UG/L AS ZN	59	61.0	21.3	20.0	19.0	10.6	10	30.0	10	50.0	10	10	na
SULFIDE TOTAL	H2S	MG/L AS S	0	na	na	na	na	na	na	na	na	na	na	na	0.002
CYANIDE TOTAL	CYN	MG/L AS CN	0	na	na	na	na	na	na	na	na	na	na	na	0.005
SUSP SED	SSED	MG/L	51	na	383	31.0	45.1	1400	9.96	315	2.90	8020	na	na	na
SUSP-SIEVE	SIEV	%	1	na	60.0	60.0	60.0	na	na	60.0	60.0	na	na	na	na

Table A13. Univariate statistics for water-quality data collected for station 3747, October 1992 through September 1997

Note: DETECTIONS refers to analyses with results greater than detection limits; CENSOREDS refers to analyses with results less than method reporting limits; Abrv, abbreviations used on figures; Samples, number of samples collected; % < MRL, percent of samples collected less than method reporting limit; G mean, geometric mean, Stddev, standard deviation; 15.0% 15th percentile; 85.0%, 85th percentile; Min, minimum, Max, maximum; na, not applicable; CFS, cubic feet per second, CONDF, specific conductance measured in field; CONDL, specific conductance measured in lab; US/CM, microsiemens per centimeter, MICROSIEMENS/C, microsiemens per centimeter; WH, whole water; MG/L, milligram per liter; COLS, colonies; ML, milliliter; DISS, dissolved; D, Dissolved, TOT, total; T, total; AMM, ammonia; HEX, hexavalent; Standard, Colorado Department of Public Health and Environment chronic in-stream standard (standard listed for NO₃ is for nitrate)

Table A14. Univariate statistics for water-quality data collected for station 3780, October 1992 through September 1997

Note: DETECTIONS refers to analyses with results greater than detection limits; CENSOREDS refers to analyses with results less than method reporting limits; Abrv, abbreviations used on figures; Samples, number of samples collected; % < MRL, percent of samples collected less than method reporting limit; G mean, geometric mean, Stddev, standard deviation; 15.0% 15th percentile; 85.0%, 85th percentile; Min, minimum, Max, maximum; na, not applicable; CFS, cubic feet per second, CONDF, specific conductance measured in field; CONDL, specific conductance measured in lab; US/CM, microsiemens per centimeter, MICROSIEMENS/C, microsiemens per centimeter; WH, whole water; MG/L, milligram per liter; COLS, colonies; ML, milliliter; DISS, dissolved; D, Dissolved, TOT, total; T, total; AMM, ammonia; HEX, hexavalent; Standard, Colorado Department of Public Health and Environment chronic in-stream standard (standard listed for NO23 is for nitrate)

Variable	Abrv	Units	Samples		% < MRL		DETECTIONS						CENSOREDS		
					Mean	Median	G mean	Stddev	15.0%	85.0%	Min	Max	Mean	Median	Standard
DISCHARGE	CFS	CFS	118	na	14.4	5.75	7.87	20.9	2.70	29.0	1.40	158	na	na	na
SPECIFIC COND.	COND	US/CM @ 25C	115	na	279	302	267	76.1	182	353	112	405	na	na	na
SPECIFIC COND.	COND	MICROSIEMENS/C	59	na	287	305	275	77.6	177	357	133	415	na	na	na
PH, WH, FIELD	PH	STANDARD UNITS	58	na	8.21	8.20	8.20	0.31	7.89	8.50	7.50	9.00	na	na	na
WATER TEMP.	TEMP	DEGREES	117	na	10.7	10.5	na	7.11	2.00	19.2	0	26.0	na	na	na
OXYGEN DISS.	DO	MG/L	56	na	9.09	8.85	8.99	1.39	7.66	10.8	6.70	11.8	na	na	6.00
OXYGEN DIS. %	DO	% OF SATURATION	56	na	102	100	102	7.41	95.6	111	92.0	125	na	na	na
BOD 5-DAY	BOD5	MG/L	59	1.69	1.31	1.20	1.21	0.54	0.88	1.80	0.20	3.60	1.20	1.20	na
COLIFORM FECAL	FCOL	COLS./100 ML	56	na	43.7	32.5	22.0	54.9	5.00	80.9	1.00	340	na	na	200
FECAL STRPT	FSTRP	COLS./100 ML	59	1.69	44.1	28.0	26.1	53.1	8.85	84.3	3.00	350	1.00	1.00	na
CALCIUM DISS.	CA	MG/L AS CA	59	na	25.7	27.0	25.2	4.92	19.1	30.0	14.4	34.0	na	na	na
MAGNESIUM DISS.	MG	MG/L AS MG	59	na	4.23	4.50	4.11	0.94	2.94	5.20	2.15	5.80	na	na	na
ALKALINITY	ALK	MG/L AS CACO3	59	na	78.5	82.0	76.2	17.5	56.0	97.0	35.0	108	na	na	na
SULFATE DISS.	SO4	MG/L AS SO4	59	na	22.2	24.0	20.7	7.71	12.0	30.0	9.57	37.0	na	na	250
CHLORIDE DISS.	CL	MG/L AS CL	59	na	20.3	21.4	18.3	8.01	9.34	29.0	5.42	34.0	na	na	250
FLUORIDE DISS.	F	MG/L AS F	59	na	1.44	1.40	1.43	0.15	1.30	1.60	1.10	1.70	na	na	2.00
HARDNESS TOTAL	HARD	MG/L AS CAO3	59	na	81.8	86.0	80.0	16.2	60.0	96.0	45.0	110	na	na	na
RESIDUE TOTAL	RES	MG/L	59	5.08	28.8	11.0	12.9	43.9	5.00	65.2	1.00	187	1.00	1.00	na
NITROGEN AMM.	TNH3	MG/L AS N	56	26.8	0.15	0.04	0.07	0.26	0.02	0.28	0.02	1.20	0.01	0.01	na
UN-IONIZED AMM	NH3-	MG/L AS NH3	40	na	0.005	0.002	na	0.02	0.001	0.005	0	0.10	na	na	0.10
NO2 + NO3 DISS	NO23	MG/L AS N	56	10.7	0.69	0.44	0.42	0.66	0.10	1.34	0.06	3.20	0.05	0.05	10
NITROGEN, NO2	NIT	MG/L AS N	56	46.4	0.03	0.02	0.02	0.02	0.01	0.04	0.01	0.13	0.01	0.01	0.50
NITROGEN AMM+	TNIT	MG/L AS N	59	na	0.58	0.50	0.51	0.34	0.34	0.80	0.20	1.70	na	na	na
PHOSPHORUS O	OPO4	MG/L AS P	56	na	0.73	0.70	0.56	0.44	0.23	1.20	0.04	2.10	na	na	na
ARSENIC DISS.	AS D	UG/L AS AS	0	na	na	na	na	na	na	na	na	na	na	na	50.0
ARSENIC TOTAL	AS T	UG/L AS AS	0	na	na	na	na	na	na	na	na	na	na	na	50.0
BARIUM DISS.	BA D	UG/L AS BA	0	na	na	na	na	na	na	na	na	na	na	na	na
BARIUM TOTAL	BA T	UG/L AS BA	0	na	na	na	na	na	na	na	na	na	na	na	na
BORON DISS.	B D	UG/L AS B	0	na	na	na	na	na	na	na	na	na	na	na	750
BORON TOTAL	B T	UG/L AS B	0	na	na	na	na	na	na	na	na	na	na	na	na
CADMIUM DISS.	CD D	UG/L AS CD	59	100	na	na	na	na	na	na	na	1.00	1.00	1.00	3.75
CADMIUM TOTAL	CD T	UG/L AS CD	59	100	na	na	na	na	na	na	na	1.00	1.00	1.00	na
CHROMIUM DISS.	CR D	UG/L AS CR	59	96.6	3.30	3.30	3.22	0.99	na	2.60	4.00	1.00	1.00	50.0	50.0
CHROMIUM HEX.	CR6	UG/L AS CR	59	94.9	1.33	1.00	1.26	0.58	na	1.00	2.00	1.00	1.00	11.0	11.0
CHROMIUM TOTAL	CR T	UG/L AS CR	58	94.8	1.83	2.00	1.82	0.29	na	1.50	2.00	1.00	1.00	na	na
COPPER DISS.	CU D	UG/L AS CU	59	18.6	1.91	2.00	1.71	0.93	1.00	3.00	1.00	5.00	1.00	1.00	11.4
COPPER TOTAL	CU T	UG/L AS CU	59	6.78	2.49	2.00	2.12	2.08	1.00	3.84	1.00	16.0	1.00	1.00	na
IRON TOTAL	FE T	UG/L AS FE	59	na	783	530	613	722	330	1300	259	3700	na	na	1000
IRON DISS.	FE D	UG/L AS FE	55	na	90.7	94.0	80.3	40.9	40.0	126	13.0	220	na	na	300
LEAD DISS.	PB D	UG/L AS PB	59	96.6	3.00	3.00	2.24	2.83	na	1.00	5.00	1.00	1.00	1.00	3.67
LEAD TOTAL	PB T	UG/L AS PB	59	69.5	2.09	1.80	1.74	1.41	1.00	4.15	1.00	5.00	1.00	1.00	na
MANGANESE DISS	MN D	UG/L AS MN	59	na	43.7	42.0	41.7	13.2	30.0	56.0	23.0	76.0	na	na	71.0
MANGANESE TOT	MN T	UG/L AS MN	59	na	86.2	80.0	76.8	46.7	50.0	120	20.0	300	na	na	na
MERCURY DISS.	HG D	UG/L AS HG	0	na	na	na	na	na	na	na	na	na	na	na	0.10
MERCURY, TOT	HG T	UG/L AS HG	0	na	na	na	na	na	na	na	na	na	na	na	0.01
MOLYBDENUM DIS	MO D	UG/L AS MO	0	na	na	na	na	na	na	na	na	na	na	na	na
MOLYBDENUM TOT	MO T	UG/L AS MO	0	na	na	na	na	na	na	na	na	na	na	na	na
NICKEL DISS.	NI D	UG/L AS NI	59	39.0	1.72	2.00	1.60	0.65	1.00	2.00	1.00	3.20	1.00	1.00	92.7
NICKEL TOTAL	NI T	UG/L AS NI	59	16.9	2.08	2.00	1.94	0.72	1.00	3.00	1.00	3.00	1.00	1.00	na
SILVER DISS.	AG D	UG/L AS AG	0	na	na	na	na	na	na	na	na	na	na	na	0.07
SILVER TOTAL	AG T	UG/L AS AG	0	na	na	na	na	na	na	na	na	na	na	na	na
SELENIUM DISS.	SE D	UG/L AS SE	0	na	na	na	na	na	na	na	na	na	na	na	5.00
SELENIUM TOTAL	SE T	UG/L AS SE	0	na	na	na	na	na	na	na	na	na	na	na	na
ZINC DISS.	ZN D	UG/L AS ZN	59	39.0	10.2	10	9.50	3.77	6.44	13.5	4.00	20.0	4.52	3.00	102
ZINC TOTAL	ZN T	UG/L AS ZN	59	52.5	16.3	17.5	15.1	6.69	10	20.0	10	30.0	10	10	na
SULFIDE TOTAL	H2S	MG/L AS S	0	na	na	na	na	na	na	na	na	na	na	na	0.002
CYANIDE TOTAL	CYN	MG/L AS CN	0	na	na	na	na	na	na	na	na	na	na	na	0.005
SUSP SED	SSED	MG/L	0	na	na	na	na	na	na	na	na	na	na	na	na
SUSP-SIEVE	SIEV	%	0	na	na	na	na	na	na	na	na	na	na	na	na

Table A15. Univariate statistics for water-quality data collected for station 4000, October 1992 through September 1997

Note: DETECTIONS refers to analyses with results greater than detection limits; CENSOREDS refers to analyses with results less than method reporting limits; Abrv, abbreviations used on figures; Samples, number of samples collected; % < MRL, percent of samples collected less than method reporting limit; G mean, geometric mean; Stddev, standard deviation; 15.0% 15th percentile; 85.0%, 85th percentile; Min, minimum, Max, maximum; na, not applicable; CFS, cubic feet per second; CONDF, specific conductance measured in field; CONDL, specific conductance measured in lab; US/CM, microsiemens per centimeter, MICROSIEMENS/C, microsiemens per centimeter; WH, whole water; MG/L, milligram per liter; COLS, colonies; ML, milliliter; DISS, dissolved; D, Dissolved, TOT, total; T, total; AMM, ammonia; HEX, hexavalent; Standard, Colorado Department of Public Health and Environment chronic in-stream standard (standard listed for NO23 is for nitrate)

Table A16. Univariate statistics for water-quality data collected for station 4905, October 1992 through September 1997

Note: DETECTIONS refers to analyses with results greater than detection limits; CENSOREDS refers to analyses with results less than method reporting limits; Abrv, abbreviations used on figures; Samples, number of samples collected; % < MRL, percent of samples collected less than method reporting limit; G mean, geometric mean, Stddev, standard deviation; 15.0% 15th percentile; 85.0%, 85th percentile; Min, minimum, Max, maximum; na, not applicable; CFS, cubic feet per second, CONDF, specific conductance measured in field; CONDL, specific conductance measured in lab; US/CM, microsiemens per centimeter, MICROSIEGENS/C, microsiemens per centimeter; WH, whole water; MG/L, milligram per liter; COLS, colonies; ML, milliliter; DISS, dissolved; D, Dissolved, TOT, total; T, total; AMM, ammonia; HEX, hexavalent; Standard, Colorado Department of Public Health and Environment chronic in-stream standard (standard listed for NO23 is for nitrate)

Variable	Abrv	Units	Samples		% < MRL		DETECTIONS						CENSOREDS		
					Mean	Median	G mean	Stddev	15.0%	85.0%	Min	Max	Mean	Median	Standard
DISCHARGE	CFS	CFS	59	na	34.9	22.0	25.1	44.8	14.0	47.0	6.10	305	na	na	na
SPECIFIC COND.	COND	US/CM @ 25C	58	na	643	679	626	138	449	766	254	901	na	na	na
SPECIFIC COND.	COND	MICROSIEMENS/C	59	na	649	683	632	138	457	776	257	931	na	na	na
PH, WH, FIELD	PH	STANDARD UNITS	58	na	8.37	8.40	8.36	0.23	8.20	8.60	7.50	8.60	na	na	na
WATER TEMP.	TEMP	DEGREES	59	na	14.0	15.0	na	9.46	1.00	25.0	0	30.0	na	na	na
OXYGEN DISS.	DO	MG/L	57	na	8.45	7.80	8.25	1.88	6.57	11.3	5.80	12.6	na	na	6.00
OXYGEN DIS. %	%DO	% OF SATURATION	57	na	99.4	98.0	99.3	5.03	96.0	103	89.0	125	na	na	na
BOD 5-DAY	BOD5	MG/L	59	1.69	1.06	0.80	0.77	0.98	0.40	1.63	0.10	5.50	1.10	1.10	na
COLIFORM FECAL	FCOL	COLS./100 ML	55	na	220	140	123	275	34.0	300	8.00	1350	na	na	200
FECAL STRPT	FSTRP	COLS./100 ML	58	na	264	195	178	313	95.5	400	17.0	1800	na	na	na
CALCIUM DISS.	CA	MG/L AS CA	59	na	74.7	80.0	72.1	17.8	48.1	90.0	27.0	110	na	na	na
MAGNESIUM DISS	MG	MG/L AS MG	59	na	13.5	14.0	12.9	3.72	8.10	17.0	4.60	23.0	na	na	na
ALKALINITY	ALK	MG/L AS CACO3	59	na	140	149	136	28.7	99.0	161	56.0	197	na	na	na
SULFATE DISS.	SO4	MG/L AS SO4	59	na	141	150	133	43.0	83.0	180	38.0	240	na	na	250
CHLORIDE DISS.	CL	MG/L AS CL	59	na	25.9	26.0	24.8	7.52	18.0	30.0	11.0	54.0	na	na	250
FLUORIDE DISS.	F	MG/L AS F	59	na	1.29	1.30	1.28	0.18	1.20	1.50	0.50	1.62	na	na	2.00
HARDNESS TOTAL	HARD	MG/L AS CAO3	59	na	241	260	232	60.0	150	290	86.0	370	na	na	na
RESIDUE TOTAL	RES	MG/L	58	1.72	190	128	130	190	42.1	334	15.0	1070	1.00	1.00	na
NITROGEN AMM	TNH3	MG/L AS N	56	41.1	0.07	0.02	0.03	0.15	0.02	0.08	0.01	0.83	0.01	0.01	na
UN-IONIZED AMM	NH3-	MG/L AS NH3	32	na	0.003	0.002	na	0.007	0	0.004	0	0.04	na	na	0.10
NO2 + NO3 DISS	NO23	MG/L AS N	56	na	3.15	3.30	2.94	1.02	1.67	4.10	0.72	4.80	na	na	10
NITROGEN, NO2	NIT	MG/L AS N	56	30.4	0.02	0.02	0.02	0.01	0.01	0.02	0.01	0.07	0.01	0.01	0.50
NITROGEN AMM+	TNIT	MG/L AS N	59	8.47	0.51	0.40	0.44	0.29	0.30	0.79	0.20	1.50	0.20	0.20	na
PHOSPHORUS O	OPO4	MG/L AS P	56	1.79	0.08	0.08	0.07	0.04	0.04	0.11	0.02	0.31	0.01	0.01	na
ARSENIC DISS.	AS D	UG/L AS AS	0	na	na	na	na	na	na	na	na	na	na	na	50.0
ARSENIC TOTAL	AS T	UG/L AS AS	0	na	na	na	na	na	na	na	na	na	na	na	50.0
BARIUM DISS.	BA D	UG/L AS BA	0	na	na	na	na	na	na	na	na	na	na	na	na
BARIUM TOTAL	BA T	UG/L AS BA	0	na	na	na	na	na	na	na	na	na	na	na	na
BORON DISS.	B D	UG/L AS B	0	na	na	na	na	na	na	na	na	na	na	na	750
BORON TOTAL	B T	UG/L AS B	0	na	na	na	na	na	na	na	na	na	na	na	na
CADMIUM DISS.	CD D	UG/L AS CD	59	98.3	2.00	2.00	2.00	na	na	na	2.00	2.00	1.00	1.00	5.00
CADMIUM TOTAL	CD T	UG/L AS CD	59	100	na	na	na	na	na	na	na	1.00	1.00	1.00	na
CHROMIUM DISS.	CR D	UG/L AS CR	59	93.2	1.63	1.25	1.47	0.93	na	na	1.00	3.00	1.00	1.00	50.0
CHROMIUM HEX.	CR6	UG/L AS CR	58	94.8	1.33	1.00	1.26	0.58	na	na	1.00	2.00	1.00	1.00	11.0
CHROMIUM TOTAL	CR T	UG/L AS CR	58	25.9	2.92	2.10	2.41	2.25	1.40	5.16	1.00	12.0	1.00	1.00	na
COPPER DISS.	CU D	UG/L AS CU	59	25.4	1.39	1.00	1.25	0.96	1.00	2.00	1.00	6.80	1.00	1.00	29.4
COPPER TOTAL	CU T	UG/L AS CU	59	na	5.46	4.00	4.47	4.47	2.80	8.00	2.00	25.0	na	na	na
IRON TOTAL	FE T	UG/L AS FE	59	na	4030	2700	2790	4120	1300	6080	470	20000	na	na	1000
IRON DISS.	FE D	UG/L AS FE	58	58.6	8.27	5.00	6.69	6.35	4.00	16.0	3.00	28.0	4.85	3.00	300
LEAD DISS.	PB D	UG/L AS PB	59	98.3	3.00	3.00	3.00	na	na	3.00	3.00	1.00	1.00	1.00	17.6
LEAD TOTAL	PB T	UG/L AS PB	59	5.08	6.05	4.00	4.20	7.08	2.00	9.45	1.00	42.0	1.00	1.00	na
MANGANESE DISS	MN D	UG/L AS MN	59	16.9	3.57	3.00	2.93	2.36	1.13	6.00	1.00	10	7.30	10	71.0
MANGANESE TOT	MD T	UG/L AS MN	59	1.69	117	90.0	85.3	107	30.0	176	10	590	10	10	na
MERCURY DISS.	HG D	UG/L AS HG	0	na	na	na	na	na	na	na	na	na	na	na	0.10
MERCURY, TOT	HG T	UG/L AS HG	0	na	na	na	na	na	na	na	na	na	na	na	0.01
MOLYBDENUM DIS	MO D	UG/L AS MO	0	na	na	na	na	na	na	na	na	na	na	na	na
MOLYBDENUM TOT	MO T	UG/L AS MO	0	na	na	na	na	na	na	na	na	na	na	na	na
NICKEL DISS.	NI D	UG/L AS NI	59	39.0	1.49	1.20	1.40	0.55	1.00	2.00	1.00	3.00	1.00	1.00	100
NICKEL TOTAL	NI T	UG/L AS NI	58	na	4.12	3.00	3.40	3.20	2.00	6.06	1.00	18.0	na	na	na
SILVER DISS.	AG D	UG/L AS AG	0	na	na	na	na	na	na	na	na	na	na	na	0.47
SILVER TOTAL	AG T	UG/L AS AG	0	na	na	na	na	na	na	na	na	na	na	na	na
SELENIUM DISS.	SE D	UG/L AS SE	0	na	na	na	na	na	na	na	na	na	na	na	5.00
SELENIUM TOTAL	SE T	UG/L AS SE	0	na	na	na	na	na	na	na	na	na	na	na	na
ZINC DISS.	ZN D	UG/L AS ZN	59	69.5	5.56	5.00	5.07	2.74	3.00	7.72	3.00	14.0	4.02	3.00	261
ZINC TOTAL	ZN T	UG/L AS ZN	59	16.9	31.4	20.0	24.3	29.2	10	50.0	10	160	10	10	na
SULFIDE TOTAL	H2S	MG/L AS S	0	na	na	na	na	na	na	na	na	na	na	na	0.002
CYANIDE TOTAL	CYN	MG/L AS CN	0	na	na	na	na	na	na	na	na	na	na	na	0.005
SUSP SED	SSED	MG/L	0	na	na	na	na	na	na	na	na	na	na	na	na
SUSP-SIEVE	SIEV	%	0	na	na	na	na	na	na	na	na	na	na	na	na

Table A17. Univariate statistics for water-quality data collected for station 5500, October 1992 through September 1997

Note: DETECTIONS refers to analyses with results greater than detection limits; CENSOREDS refers to analyses with results less than method reporting limits; Abrv, abbreviations used on figures; Samples, number of samples collected; % < MRL, percent of samples collected less than method reporting limit; G mean, geometric mean, Stddev, standard deviation; 15.0% 15th percentile; 85.0%, 85th percentile; Min, minimum, Max, maximum; na, not applicable; CFS, cubic feet per second, CONDF, specific conductance measured in field; CONDL, specific conductance measured in lab; US/CM, microsiemens per centimeter, MICROSIEGENS/C, microsiemens per centimeter; WH, whole water; MG/L, milligram per liter; COLS, colonies; ML, milliliter; DISS, dissolved; D, Dissolved, TOT, total; T, total; AMM, ammonia; HEX, hexavalent; Standard, Colorado Department of Public Health and Environment chronic in-stream standard (standard listed for NO23 is for nitrate)

Variable	Abrv	Units	Samples	% < MRL		DETECTIONS							CENSOREDS			
				Mean	Median	G mean	Stddev	15.0%	85.0%	Min	Max		Mean	Median	Standard	
DISCHARGE	CFS	CFS	193	na	101	43.0	52.5	185	23.0	163	4.00	1800	na	na	na	
SPECIFIC COND.	COND	US/CM @ 25C	163	na	592	600	562	176	374	756	222	1010	na	na	na	
SPECIFIC COND.	COND	MICROSIEMENS/C	59	na	587	607	559	168	372	751	237	974	na	na	na	
PH, WH, FIELD	PH	STANDARD UNITS	59	na	8.18	8.20	8.18	0.19	8.00	8.40	7.60	8.40	na	na	na	
WATER TEMP.	TEMP	DEGREES	170	na	11.8	12.0	na	7.42	2.50	20.5	0	28.5	na	na	na	
OXYGEN DISS.	DO	MG/L	59	na	9.32	9.30	9.20	1.49	7.50	11.2	6.40	11.9	na	na	5.00	
OXYGEN DIS. %	%DO	% OF SATURATION	59	na	99.8	99.0	99.7	5.28	95.0	104	91.0	125	na	na	na	
BOD 5-DAY	BOD5	MG/L	58	na	0.99	0.80	0.80	0.74	0.40	1.43	0.10	4.00	na	na	na	
COLIFORM FECAL	FCOL	COLS./100 ML	53	na	286	150	150	290	36.1	599	11.0	1100	na	na	2000	
FECAL STRPT	FSTRP	COLS./100 ML	57	na	462	280	267	551	77.0	819	35.0	3300	na	na	na	
CALCIUM DISS.	CA	MG/L AS CA	59	na	61.6	64.0	58.5	18.1	38.3	81.0	24.0	100	na	na	na	
MAGNESIUM DISS	MG	MG/L AS MG	59	na	13.8	15.0	12.9	4.80	7.78	18.0	4.00	25.0	na	na	na	
ALKALINITY	ALK	MG/L AS CACO3	59	na	125	134	120	33.2	77.1	157	55.0	191	na	na	na	
SULFATE DISS.	SO4	MG/L AS SO4	59	na	128	130	116	49.7	61.5	180	32.0	271	na	na	330	
CHLORIDE DISS.	CL	MG/L AS CL	59	na	22.4	24.0	21.2	6.53	14.0	28.0	8.40	35.0	na	na	250	
FLUORIDE DISS.	F	MG/L AS F	59	na	2.01	2.00	1.98	0.35	1.70	2.37	1.20	3.10	na	na	2.00	
HARDNESS TOTAL	HARD	MG/L AS CAO3	59	na	211	220	200	63.9	130	270	76.0	350	na	na	na	
RESIDUE TOTAL	RES	MG/L	59	na	117	84.0	86.8	110	38.0	171	22.0	640	na	na	na	
NITROGEN AMM	TNH3	MG/L AS N	55	30.9	0.04	0.03	0.03	0.03	0.02	0.09	0.01	0.14	0.01	0.01	na	
UN-IONIZED AMM	NH3-	MG/L AS NH3	38	na	0.001	0.001	na	0.001	0	0.002	0	0.006	na	na	0.10	
NO2 + NO3 DISS	NO23	MG/L AS N	55	na	2.20	2.45	2.02	0.82	1.17	3.00	0.59	3.70	na	na	10	
NITROGEN, NO2	NIT	MG/L AS N	55	38.2	0.02	0.02	0.02	0.01	0.01	0.03	0.01	0.06	0.01	0.01	1.00	
NITROGEN AMM+	TNIT	MG/L AS N	59	22.0	0.37	0.30	0.33	0.22	0.20	0.50	0.20	1.20	0.20	0.20	na	
PHOSPHORUS O	OPO4	MG/L AS P	55	3.64	0.05	0.05	0.04	0.02	0.03	0.07	0.02	0.08	0.01	0.01	na	
ARSENIC DISS.	AS	D	UG/L AS AS	10	80.0	1.00	1.00	0	na	na	1.00	1.00	1.00	1.00	50.0	
ARSENIC TOTAL	AS	T	UG/L AS AS	9	22.2	2.14	2.00	2.03	0.69	1.20	3.00	1.00	3.00	1.00	1.00	50.0
BARIUM DISS.	BA	D	UG/L AS BA	0	na	na	na	na	na	na	na	na	na	na	na	
BARIUM TOTAL	BA	T	UG/L AS BA	0	na	na	na	na	na	na	na	na	na	na	na	
BORON DISS.	B	D	UG/L AS B	10	na	57.1	65.0	52.0	22.0	26.5	80.0	20.0	80.0	na	750	
BORON TOTAL	B	T	UG/L AS B	10	na	63.5	70.0	60.6	19.2	38.3	83.5	35.0	90.0	na	na	
CADMIUM DISS.	CD	D	UG/L AS CD	59	100	na	na	na	na	na	na	na	1.00	1.00	5.00	
CADMIUM TOTAL	CD	T	UG/L AS CD	59	100	na	na	na	na	na	na	na	1.00	1.00	na	
CHROMIUM DISS.	CR	D	UG/L AS CR	59	98.3	1.00	1.00	1.00	na	na	1.00	1.00	1.00	1.00	50.0	
CHROMIUM HEX.	CR6	UG/L AS CR	59	96.6	2.00	2.00	2.00	0	na	na	2.00	2.00	1.00	1.00	11.0	
CHROMIUM TOTAL	CR	T	UG/L AS CR	58	39.7	2.12	1.80	1.84	1.29	1.04	3.76	1.00	6.10	1.00	1.00	na
COPPER DISS.	CU	D	UG/L AS CU	59	47.5	1.25	1.00	1.19	0.43	1.00	2.00	1.00	2.10	1.00	1.00	27.6
COPPER TOTAL	CU	T	UG/L AS CU	59	3.39	3.66	3.00	3.19	2.14	2.00	5.58	1.00	11.0	1.00	1.00	na
IRON TOTAL	FE	T	UG/L AS FE	59	2640	2000	2010	2300	940	4600	510	12000	na	na	8000	
IRON DISS.	FE	D	UG/L AS FE	59	28.8	16.2	7.00	8.83	32.3	5.00	17.8	3.00	160	5.47	3.00	300
LEAD DISS.	PB	D	UG/L AS PB	59	100	na	na	na	na	na	na	na	1.00	1.00	15.9	
LEAD TOTAL	PB	T	UG/L AS PB	59	na	5.93	3.60	3.94	7.39	2.00	11.0	1.00	48.0	na	na	
MANGANESE DISS	MN	D	UG/L AS MN	59	3.39	22.6	21.0	19.3	12.9	9.70	33.3	6.00	70.0	10	50.0	
MANGANESE TOT	MN	T	UG/L AS MN	59	na	108	90.0	94.2	65.7	60.0	170	30.0	410	na	na	
MERCURY DISS.	HG	D	UG/L AS HG	0	na	na	na	na	na	na	na	na	na	na	0.10	
MERCURY, TOT	HG	T	UG/L AS HG	0	na	na	na	na	na	na	na	na	na	na	0.01	
MOLYBDENUM DIS	MO	D	UG/L AS MO	0	na	na	na	na	na	na	na	na	na	na	na	
MOLYBDENUM TOT	MO	T	UG/L AS MO	0	na	na	na	na	na	na	na	na	na	na	na	
NICKEL DISS.	NI	D	UG/L AS NI	59	50.8	1.12	1.00	1.09	0.31	1.00	1.20	1.00	2.00	1.00	1.00	100
NICKEL TOTAL	NI	T	UG/L AS NI	59	5.08	2.89	3.00	2.59	1.47	2.00	4.00	1.00	9.00	1.00	1.00	na
SILVER DISS.	AG	D	UG/L AS AG	0	na	na	na	na	na	na	na	na	na	na	0.41	
SILVER TOTAL	AG	T	UG/L AS AG	0	na	na	na	na	na	na	na	na	na	na	na	
SELENIUM DISS.	SE	D	UG/L AS SE	28	na	4.28	4.12	3.76	1.96	1.98	6.72	1.00	7.00	na	6.00	
SELENIUM TOTAL	SE	T	UG/L AS SE	0	na	na	na	na	na	na	na	na	na	na	na	
ZINC DISS.	ZN	D	UG/L AS ZN	59	50.8	5.88	5.00	5.43	2.46	3.37	9.52	3.00	12.0	4.40	3.00	246
ZINC TOTAL	ZN	T	UG/L AS ZN	59	10.2	24.9	20.0	21.2	15.8	10	39.7	10	90.0	10	10	na
SULFIDE TOTAL	H2S	MG/L AS S	10	90.0	0.80	0.80	0.80	na	na	na	0.80	0.80	0.50	0.50	0.002	
CYANIDE TOTAL	CYN	MG/L AS CN	10	100	na	na	na	na	na	na	na	0.01	0.01	0.005	na	
SUSP SED	SSED	MG/L	49	na	663	149	199	1760	63.5	630	44.0	10200	na	na	na	
SUSP-SIEVE	SIEV	%	1	na	46.0	46.0	46.0	na	na	na	46.0	46.0	na	na	na	

Table A18. Univariate statistics for water-quality data collected for station 5530, October 1992 through September 1997

Note: DETECTIONS refers to analyses with results greater than detection limits; CENSOREDS refers to analyses with results less than method reporting limits; Abrv, abbreviations used on figures; Samples, number of samples collected; % < MRL, percent of samples collected less than method reporting limit; G mean, geometric mean; Stddev, standard deviation; 15.0% 15th percentile; 85.0%, 85th percentile; Min, minimum; Max, maximum; na, not applicable; CFS, cubic feet per second; CONDF, specific conductance measured in field; CONDL, specific conductance measured in lab; US/CM, microsiemens per centimeter, MICROSIEMENS/C, microsiemens per centimeter; WH, whole water; MG/L, milligram per liter; COLS, colonies; ML, milliliter; DISS, dissolved; D, Dissolved, TOT, total; T, total; AMM, ammonia; HEX, hexavalent; Standard, Colorado Department of Public Health and Environment chronic in-stream standard (standard listed for NO23 is for nitrate)

Variable	Abrv	Units	Samples		% < MRL		DETECTIONS						CENSOREDS		
					Mean	Median	G mean	Stddev	15.0%	85.0%	Min	Max	Mean	Median	Standard
DISCHARGE	CFS	CFS	59	na	135	97.0	112	135	75.0	190	54.0	1000	na	na	na
SPECIFIC COND.	COND	US/CM @ 25C	58	na	719	767	703	136	562	824	301	893	na	na	na
SPECIFIC COND.	COND	MICROSIEMENS/C	58	na	716	755	702	127	555	831	341	897	na	na	na
PH, WH, FIELD	PH	STANDARD UNITS	59	na	7.91	7.90	7.91	0.15	7.80	8.00	7.50	8.20	na	na	na
WATER TEMP.	TEMP	DEGREES	59	na	14.9	14.5	14.2	4.61	9.50	21.0	7.50	23.5	na	na	na
OXYGEN DISS.	DO	MG/L	58	na	7.71	7.80	7.67	0.83	6.50	8.60	6.10	9.20	na	na	5.00
OXYGEN DIS. %	%DO	% OF SATURATION	57	na	94.2	94.0	94.0	5.13	89.0	99.0	84.0	114	na	na	na
BOD 5-DAY	BOD5	MG/L	56	na	10.7	11.0	9.01	5.65	4.43	17.0	1.50	29.0	na	na	na
COLIFORM FECAL	FCOL	COLS./100 ML	56	na	451	190	198	695	48.1	868	13.0	3300	na	na	2000
FECAL STRPT	FSTRP	COLS./100 ML	56	na	395	265	251	519	92.4	613	48.0	3300	na	na	na
CALCIUM DISS.	CA	MG/L AS CA	59	na	49.9	50.9	49.2	8.29	41.4	59.0	27.0	67.0	na	na	na
MAGNESIUM DISS	MG	MG/L AS MG	59	na	15.1	16.0	14.8	3.01	12.0	18.0	6.30	20.4	na	na	na
ALKALINITY	ALK	MG/L AS CACO3	59	na	98.1	96.0	96.7	15.8	82.0	115	56.0	130	na	na	na
SULFATE DISS.	SO4	MG/L AS SO4	59	na	152	160	148	32.4	118	180	54.0	200	na	na	330
CHLORIDE DISS.	CL	MG/L AS CL	59	na	36.2	38.0	34.6	9.33	25.0	44.0	12.0	53.0	na	na	250
FLUORIDE DISS.	F	MG/L AS F	59	na	1.80	1.80	1.78	0.27	1.50	2.10	1.30	2.42	na	na	2.00
HARDNESS TOTAL	HARD	MG/L AS CAO3	59	na	187	190	183	32.9	160	220	93.0	240	na	na	na
RESIDUE TOTAL	RBS	MG/L	59	na	65.4	46.0	49.4	67.2	24.0	100	15.0	446	na	na	na
NITROGEN AMM	TNH3	MG/L AS N	56	1.79	4.93	5.30	2.90	3.60	0.72	9.66	0.02	11.0	0.01	0.01	na
UN-IONIZED AMM	NH3-	MG/L AS NH3	55	na	0.11	0.08	0.06	0.10	0.01	0.21	0.001	0.43	na	na	0.10
NO2 + NO3 DISS	NO23	MG/L AS N	56	na	2.63	2.50	2.43	0.98	1.67	3.90	0.71	4.60	na	na	10
NITROGEN, NO2	NIT	MG/L AS N	56	1.79	0.18	0.15	0.14	0.21	0.08	0.22	0.02	1.60	0.01	0.01	1.00
NITROGEN AMM+	TNIT	MG/L AS N	59	na	6.79	7.00	5.00	4.39	1.68	12.0	0.50	16.0	na	na	na
PHOSPHORUS O	OPO4	MG/L AS P	56	na	1.07	0.83	0.53	0.94	0.07	2.29	0.03	2.80	na	na	na
ARSENIC DISS.	AS D	UG/L AS AS	10	60.0	1.00	1.00	1.00	0	na	na	1.00	1.00	1.00	1.00	50.0
ARSENIC TOTAL	AS T	UG/L AS AS	9	22.2	2.00	2.00	1.85	0.81	1.00	3.00	1.00	3.00	1.00	1.00	50.0
BARIUM DISS.	BA D	UG/L AS BA	0	na	na	na	na	na	na	na	na	na	na	na	na
BARIUM TOTAL	BA T	UG/L AS BA	0	na	na	na	na	na	na	na	na	na	na	na	na
BORON DISS.	B D	UG/L AS B	10	na	124	145	109	52.2	43.0	167	30.0	180	na	na	750
BORON TOTAL	B T	UG/L AS B	10	na	122	135	111	48.1	53.0	170	40.0	170	na	na	na
CADMIUM DISS.	CD D	UG/L AS CD	59	98.3	2.00	2.00	2.00	na	na	na	2.00	2.00	1.00	1.00	5.00
CADMIUM TOTAL	CD T	UG/L AS CD	59	100	na	na	na	na	na	na	na	1.00	1.00	1.00	na
CHROMIUM DISS.	CR D	UG/L AS CR	59	79.7	1.50	1.20	1.40	0.66	1.10	2.62	1.00	3.00	1.00	1.00	50.0
CHROMIUM HEX.	CR6	UG/L AS CR	59	91.5	1.80	2.00	1.64	0.84	na	1.00	3.00	1.00	1.00	1.00	11.0
CHROMIUM TOTAL	CR T	UG/L AS CR	59	39.0	2.10	2.00	1.95	0.82	1.20	3.00	1.00	4.70	1.00	1.00	na
COPPER DISS.	CU D	UG/L AS CU	59	8.47	3.23	3.00	2.81	1.66	1.78	5.00	1.00	8.00	1.00	1.00	23.2
COPPER TOTAL	CU T	UG/L AS CU	59	na	6.20	6.00	5.57	2.88	3.00	9.00	2.00	14.0	na	na	na
IRON TOTAL	FE T	UG/L AS FE	59	na	1460	860	1050	1550	533	2200	280	9000	na	na	8000
IRON DISS.	FE D	UG/L AS FE	59	na	52.9	37.0	36.7	97.6	20.0	65.0	7.97	770	na	na	300
LEAD DISS.	PB D	UG/L AS PB	59	91.5	1.40	1.00	1.25	0.89	na	na	1.00	3.00	1.00	1.00	11.9
LEAD TOTAL	PB T	UG/L AS PB	59	3.39	4.76	3.00	3.32	5.63	2.00	7.15	1.00	33.0	1.00	1.00	na
MANGANESE DISS	MN D	UG/L AS MN	59	na	57.5	60.0	52.9	20.4	32.0	74.0	13.0	110	na	na	50.0
MANGANESE TOT	MD T	UG/L AS MN	59	na	109	100	103	46.7	80.0	140	40.0	350	na	na	na
MERCURY DISS.	HG D	UG/L AS HG	0	na	na	na	na	na	na	na	na	na	na	na	0.10
MERCURY, TOT	HG T	UG/L AS HG	0	na	na	na	na	na	na	na	na	na	na	na	0.01
MOLYBDENUM DIS	MO D	UG/L AS MO	0	na	na	na	na	na	na	na	na	na	na	na	na
MOLYBDENUM TOT	MO T	UG/L AS MO	0	na	na	na	na	na	na	na	na	na	na	na	na
NICKEL DISS.	NI D	UG/L AS NI	59	8.47	2.65	2.40	2.37	1.37	1.40	3.00	1.00	9.00	1.00	1.00	100
NICKEL TOTAL	NI T	UG/L AS NI	59	na	3.77	4.00	3.51	1.54	2.70	5.00	1.30	10	na	na	na
SILVER DISS.	AG D	UG/L AS AG	0	na	na	na	na	na	na	na	na	na	na	na	0.29
SILVER TOTAL	AG T	UG/L AS AG	0	na	na	na	na	na	na	na	na	na	na	na	na
SELENIUM DISS.	SE D	UG/L AS SE	28	na	3.54	3.55	3.33	1.22	2.46	4.46	1.00	7.00	na	na	6.00
SELENIUM TOTAL	SE T	UG/L AS SE	0	na	na	na	na	na	na	na	na	na	na	na	na
ZINC DISS.	ZN D	UG/L AS ZN	59	3.39	24.6	23.0	22.5	9.46	14.4	34.6	5.36	50.0	3.00	3.00	207
ZINC TOTAL	ZN T	UG/L AS ZN	59	na	37.8	35.0	35.0	14.2	25.0	50.0	10	80.0	na	na	na
SULFIDE TOTAL	H2S	MG/L AS S	10	100	na	na	na	na	na	na	na	na	0.95	0.50	0.002
CYANIDE TOTAL	CYN	MG/L AS CN	10	100	na	na	na	na	na	na	na	na	0.01	0.01	0.005
SUSP SED	SSED	MG/L	0	na	na	na	na	na	na	na	na	na	na	na	na
SUSP-SIEVE	SIEV	%	0	na	na	na	na	na	na	na	na	na	na	na	na

Table A19. Univariate statistics for water-quality data collected for station 5533, October 1992 through September 1997

Note: DETECTIONS refers to analyses with results greater than detection limits; CENSOREDS refers to analyses with results less than method reporting limits; Abrv, abbreviations used on figures; Samples, number of samples collected; % < MRL, percent of samples collected less than method reporting limit; G mean, geometric mean, Stddev, standard deviation; 15.0% 15th percentile; 85.0%, 85th percentile; Min, minimum, Max, maximum; na, not applicable; CFS, cubic feet per second, CONDF, specific conductance measured in field; CONDL, specific conductance measured in lab; US/CM, microsiemens per centimeter, MICROSIEMENS/C, microsiemens per centimeter; WH, whole water; MG/L, milligram per liter; COLS, colonies; ML, milliliter; DISS, dissolved; D, Dissolved, TOT, total; T, total; AMM, ammonia; HEX, hexavalent; Standard, Colorado Department of Public Health and Environment chronic in-stream standard (standard listed for NO23 is for nitrate)

Table A20. Univariate statistics for water-quality data collected for station 5905, October 1992 through September 1997

Note: DETECTIONS refers to analyses with results greater than detection limits; CENSOREDS refers to analyses with results less than method reporting limits; Abrv, abbreviations used on figures; Samples, number of samples collected; % < MRL, percent of samples collected less than method reporting limit; G mean, geometric mean, Stddev, standard deviation; 15.0% 15th percentile; 85.0%, 85th percentile; Min, minimum, Max, maximum; na, not applicable; CFS, cubic feet per second, CONDF, specific conductance measured in field; CONDL, specific conductance measured in lab; US/CM, microsiemens per centimeter, MICROSIEMENS/C, microsiemens per centimeter; WH, whole water; MG/L, milligram per liter; COLS, colonies; ML, milliliter; DISS, dissolved; D, Dissolved, TOT, total; T, total; AMM, ammonia; HEX, hexavalent; Standard, Colorado Department of Public Health and Environment chronic in-stream standard (standard listed for NO23 is for nitrate)

Variable	Abrv	Units	Samples		% < MRL		DETECTIONS						CENSOREDS		
					Mean	Median	G mean	Stddev	15.0%	85.0%	Min	Max	Mean	Median	Standard
DISCHARGE	CFS	CFS	58	na	138	102	103	142	46.3	211	24.0	845	na	na	na
SPECIFIC COND.	COND	US/CM @ 25C	59	na	941	990	922	171	69.1	1070	494	1230	na	na	na
SPECIFIC COND.	COND	MICROSIEMENS/C	59	na	926	971	909	165	694	1050	498	1230	na	na	na
PH, WH, FIELD	PH	STANDARD UNITS	58	na	7.96	8.00	7.96	0.12	7.89	8.10	7.60	8.20	na	na	na
WATER TEMP.	TEMP	DEGREES	59	na	10.9	10	na	6.31	4.00	17.0	0	23.5	na	na	na
OXYGEN DISS.	DO	MG/L	59	na	7.98	7.90	7.88	1.26	6.40	9.60	5.90	10.8	na	na	5.00
OXYGEN DIS. %	%DO	% OF SATURATION	59	na	87.0	86.0	86.6	7.80	79.0	96.0	73.0	105	na	na	na
BOD 5-DAY	BOD5	MG/L	58	na	11.6	6.65	8.34	9.76	3.93	25.0	1.00	34.0	na	na	na
COLIFORM FECAL	FCOL	COLS./100 ML	53	1.89	491	230	256	561	62.8	1010	9.00	2400	300	300	2000
FECAL STRPT	FSTRP	COLS./100 ML	55	na	431	240	231	542	72.2	866	18.0	2400	na	na	na
CALCIUM DISS.	CA	MG/L AS CA	59	na	70.4	72.0	68.9	13.6	53.3	83.0	37.0	100	na	na	na
MAGNESIUM DISS	MG	MG/L AS MG	59	na	22.8	23.0	22.2	4.66	17.6	27.0	11.0	33.0	na	na	na
ALKALINITY	ALK	MG/L AS CACO3	59	na	141	141	138	24.2	112	161	82.0	191	na	na	na
SULFATE DISS.	SO4	MG/L AS SO4	59	na	240	240	234	53.3	170	290	110	380	na	na	330
CHLORIDE DISS.	CL	MG/L AS CL	59	na	44.4	47.0	43.0	9.71	34.0	52.0	16.0	59.0	na	na	250
FLUORIDE DISS.	F	MG/L AS F	59	na	1.67	1.70	1.65	0.26	1.40	1.90	0.80	2.25	na	na	2.00
HARDNESS TOTAL	HARD	MG/L AS CAO3	59	na	270	280	264	52.3	210	320	140	380	na	na	na
RESIDUE TOTAL	RES	MG/L	59	150	79.0	82.3	224	29.0	236	14.0	1340	na	na	na	na
NITROGEN AMM	TNH3	MG/L AS N	56	3.57	1.55	0.55	0.52	1.85	0.08	3.90	0.02	6.00	0.01	0.01	na
UN-IONIZED AMM	NH3-	MG/L AS NH3	53	na	0.02	0.008	na	0.02	0.002	0.04	0	0.09	na	na	0.10
NO2 + NO3 DISS	NO23	MG/L AS N	56	1.79	4.65	4.80	4.38	1.44	2.77	6.16	1.30	7.50	0.05	0.05	10
NITROGEN, NO2	NIT	MG/L AS N	56	1.79	0.12	0.09	0.09	0.08	0.05	0.23	0.01	0.34	0.01	0.01	1.00
NITROGEN AMM+	TNT	MG/L AS N	59	1.69	2.49	1.25	1.74	2.12	0.72	5.42	0.40	8.00	0.20	0.20	na
PHOSPHORUS O	OPO4	MG/L AS P	56	1.79	0.87	0.71	0.66	0.60	0.27	1.56	0.08	2.30	0.01	0.01	na
ARSENIC DISS.	AS D	UG/L AS AS	10	20.0	1.50	1.41	0.54	1.00	2.00	1.00	2.00	1.00	1.00	1.00	50.0
ARSENIC TOTAL	AS T	UG/L AS AS	9	11.1	2.71	2.32	2.44	1.28	1.35	4.65	1.00	5.00	1.00	1.00	50.0
BARIUM DISS.	BA D	UG/L AS BA	0	na	na	na	na	na	na	na	na	na	na	na	na
BARIUM TOTAL	BA T	UG/L AS BA	0	na	na	na	na	na	na	na	na	na	na	na	na
BORON DISS.	B D	UG/L AS B	10	na	165	190	151	61.5	73.0	224	60.0	230	na	na	750
BORON TOTAL	B T	UG/L AS B	9	na	157	180	145	58.4	80.0	220	70.0	230	na	na	na
CADMIUM DISS.	CD D	UG/L AS CD	59	100	na	na	na	na	na	na	na	1.00	1.00	1.00	5.00
CADMIUM TOTAL	CD T	UG/L AS CD	59	100	na	na	na	na	na	na	na	1.00	1.00	1.00	na
CHROMIUM DISS.	CR D	UG/L AS CR	59	96.6	1.90	1.90	1.90	0.14	na	1.80	2.00	1.00	1.00	1.00	50.0
CHROMIUM HEX.	CR6	UG/L AS CR	58	96.6	3.50	3.50	3.46	0.71	na	3.00	4.00	1.00	1.00	1.00	11.0
CHROMIUM TOTAL	CR T	UG/L AS CR	58	24.1	2.68	1.95	2.13	2.52	1.17	4.93	1.00	15.0	1.00	1.00	na
COPPER DISS.	CU D	UG/L AS CU	59	1.69	2.56	2.00	2.36	1.45	2.00	3.00	1.00	12.1	1.00	1.00	31.9
COPPER TOTAL	CU T	UG/L AS CU	59	na	7.25	6.00	6.29	4.62	4.00	11.0	2.00	28.0	na	na	na
IRON TOTAL	FE T	UG/L AS FE	59	na	4060	1800	2170	7120	930	4860	530	45000	na	na	8000
IRON DISS.	FE D	UG/L AS FE	59	6.78	23.9	20.0	18.8	16.7	7.92	38.0	3.60	99.0	8.25	10	300
LEAD DISS.	PB D	UG/L AS PB	59	98.3	1.00	1.00	1.00	na	na	1.00	1.00	1.00	1.00	1.00	20.2
LEAD TOTAL	PB T	UG/L AS PB	59	na	6.97	4.00	4.43	8.76	2.00	12.0	1.00	50.0	na	na	na
MANGANESE DISS	MN D	UG/L AS MN	59	na	58.1	60.0	41.5	39.8	12.0	110	4.25	150	na	na	50.0
MANGANESE TOT	MD T	UG/L AS MN	59	na	174	150	148	123	90.0	220	46.0	809	na	na	na
MERCURY DISS.	HG D	UG/L AS HG	0	na	na	na	na	na	na	na	na	na	na	na	0.10
MERCURY, TOT	HG T	UG/L AS HG	0	na	na	na	na	na	na	na	na	na	na	na	0.01
MOLYBDENUM DIS	MO D	UG/L AS MO	0	na	na	na	na	na	na	na	na	na	na	na	na
MOLYBDENUM TOT	MO T	UG/L AS MO	0	na	na	na	na	na	na	na	na	na	na	na	na
NICKEL DISS.	NI D	UG/L AS NI	59	1.69	3.08	3.00	2.94	0.88	2.00	4.00	1.00	5.00	1.00	1.00	100
NICKEL TOTAL	NI T	UG/L AS NI	58	na	5.75	5.00	5.26	3.19	4.00	7.00	3.00	22.0	na	na	na
SILVER DISS.	AG D	UG/L AS AG	0	na	na	na	na	na	na	na	na	na	na	na	0.56
SILVER TOTAL	AG T	UG/L AS AG	0	na	na	na	na	na	na	na	na	na	na	na	na
SELENIUM DISS.	SE D	UG/L AS SE	29	3.45	4.50	4.19	4.37	1.13	3.10	5.65	3.00	8.00	1.00	1.00	6.00
SELENIUM TOTAL	SE T	UG/L AS SE	0	na	na	na	na	na	na	na	na	na	na	na	na
ZINC DISS.	ZN D	UG/L AS ZN	59	6.78	15.9	16.0	14.6	6.27	9.69	22.9	4.00	30.0	4.75	3.00	284
ZINC TOTAL	ZN T	UG/L AS ZN	59	na	41.5	33.0	35.8	28.8	20.0	50.0	10	200	na	na	na
SULFIDE TOTAL	H2S	MG/L AS S	10	90.0	0.80	0.80	0.80	na	na	0.80	0.80	0.50	0.50	0.002	na
CYANIDE TOTAL	CYN	MG/L AS CN	10	100	na	na	na	na	na	na	na	0.01	0.01	0.005	na
SUSP SED	SSED	MG/L	0	na	na	na	na	na	na	na	na	na	na	na	na
SUSP-SIEVE	SIEV	%	0	na	na	na	na	na	na	na	na	na	na	na	na

Table A21. Univariate statistics for water-quality data collected for station 6300, October 1992 through September 1997

Note: DETECTIONS refers to analyses with results greater than detection limits; CENSOREDS refers to analyses with results less than method reporting limits; Abrv, abbreviations used on figures; Samples, number of samples collected; % < MRL, percent of samples collected less than method reporting limit; G mean, geometric mean, Stddev, standard deviation; 15.0% 15th percentile; 85.0%, 85th percentile; Min, minimum, Max, maximum; na, not applicable; CFS, cubic feet per second, CONDF, specific conductance measured in field; CONDL, specific conductance measured in lab; US/CM, microsiemens per centimeter, MICROSIEMENS/C, microsiemens per centimeter; WH, whole water; MG/L, milligram per liter; COLS, colonies; ML, milliliter; DISS, dissolved; D, Dissolved, TOT, total; T, total; AMM, ammonia; HEX, hexavalent; Standard, Colorado Department of Public Health and Environment chronic in-stream standard (standard listed for NO₃ is for nitrate)

Table A22. Univariate statistics for water-quality data collected for station 6500, October 1992 through September 1997

Note: DETECTIONS refers to analyses with results greater than detection limits; CENSOREDS refers to analyses with results less than method reporting limits; Abrv, abbreviations used on figures; Samples, number of samples collected; % < MRL, percent of samples collected less than method reporting limit; G mean, geometric mean, Stddev, standard deviation; 15.0% 15th percentile; 85.0%, 85th percentile; Min, minimum, Max, maximum; na, not applicable; CFS, cubic feet per second, CONDF, specific conductance measured in field; CONDL, specific conductance measured in lab; US/CM, microsiemens per centimeter; MICROSIEMENS/C, microsiemens per centimeter; WH, whole water; MG/L, milligram per liter; COLS, colonies; ML, milliliter; DISS, dissolved; D, Dissolved, TOT, total; T, total; AMM, ammonia; HEX, hexavalent; Standard, Colorado Department of Public Health and Environment chronic in-stream standard (standard listed for NO23 is for nitrate)

Variable	Abrv	Units	Samples		% < MRL		DETECTIONS						CENSOREDS		
					Mean	Median	G mean	Stddev	15.0%	85.0%	Min	Max	Mean	Median	Standard
DISCHARGE	CFS	CFS	63	na	177	122	113	266	41.2	262	11.0	2040	na	na	na
SPECIFIC COND.	COND	US/CM @ 25C	63	na	1210	1220	1180	256	957	1470	591	2030	na	na	na
SPECIFIC COND.	COND	MICROSIEMENS/C	61	na	1220	1200	1190	253	960	1490	656	2040	na	na	na
PH, WH, FIELD	PH	STANDARD UNITS	61	na	8.31	8.40	8.31	0.13	8.20	8.40	7.90	8.50	na	na	na
WATER TEMP.	TEMP	DEGREES	63	na	14.4	14.5	na	8.23	4.80	24.4	0	30.5	na	na	na
OXYGEN DISS.	DO	MG/L	61	na	8.62	8.40	8.49	1.55	6.73	10.4	6.10	11.6	na	na	5.00
OXYGEN DIS. %	%DO	% OF SATURATION	61	na	98.7	98.0	98.6	4.11	95.0	103	90.0	115	na	na	na
BOD 5-DAY	BOD5	MG/L	59	na	3.85	2.40	na	4.27	0.80	7.10	0	22.0	na	na	na
COLIFORM FECAL	FCOL	COLS./100 ML	56	na	370	135	144	564	28.1	836	10	2800	na	na	2000
FECAL STRPT	FSTRP	COLS./100 ML	58	na	518	160	195	810	47.2	1240	10	3200	na	na	na
CALCIUM DISS.	CA	MG/L AS CA	3	na	100	100	95.0	na	na	91.0	110	na	na	na	na
MAGNESIUM DISS.	MG	MG/L AS MG	3	na	36.7	37.0	36.5	4.51	na	na	32.0	41.0	na	na	na
ALKALINITY	ALK	MG/L AS CACO3	4	na	196	196	195	21.2	na	na	173	220	na	na	na
SULFATE DISS.	SO4	MG/L AS SO4	3	na	380	370	377	55.7	na	na	330	440	na	na	490
CHLORIDE DISS.	CL	MG/L AS CL	3	na	58.0	56.0	57.9	4.36	na	na	55.0	63.0	na	na	250
FLUORIDE DISS.	F	MG/L AS F	0	na	na	na	na	na	na	na	na	na	na	na	2.00
HARDNESS TOTAL	HARD	MG/L AS CAO3	3	na	400	400	399	40.0	na	na	360	440	na	na	na
RESIDUE TOTAL	RES	MG/L	58	1.72	333	194	186	481	71.0	436	6.00	2410	1.00	1.00	na
NITROGEN AMM.	TNH3	MG/L AS N	57	26.3	0.15	0.03	0.05	0.31	0.02	0.24	0.02	1.50	0.01	0.01	na
UN-IONIZED AMM.	AMM-NH3-	MG/L AS NH3-	41	na	0.004	0.003	na	0.007	0.001	0.006	0	0.04	na	na	0.10
NO2 + NO3 DISS	NO23	MG/L AS N	58	na	5.10	5.20	4.82	1.58	3.01	7.02	2.00	7.50	na	na	10
NITROGEN, NO2	NIT	MG/L AS N	56	46.4	0.03	0.02	0.02	0.02	0.01	0.05	0.01	0.09	0.01	0.01	5.00
NITROGEN AMM+.	TNT	MG/L AS N	59	na	1.05	0.80	0.80	0.94	0.40	1.60	0.20	4.60	na	na	na
PHOSPHORUS O	OPO4	MG/L AS P	56	na	0.52	0.40	0.42	0.35	0.25	0.95	0.11	1.50	na	na	na
ARSENIC DISS.	AS D	UG/L AS AS	0	na	na	na	na	na	na	na	na	na	na	na	50.0
ARSENIC TOTAL	AS T	UG/L AS AS	0	na	na	na	na	na	na	na	na	na	na	na	50.0
BARIUM DISS.	BA D	UG/L AS BA	0	na	na	na	na	na	na	na	na	na	na	na	na
BARIUM TOTAL	BA T	UG/L AS BA	0	na	na	na	na	na	na	na	na	na	na	na	na
BORON DISS.	B D	UG/L AS B	0	na	na	na	na	na	na	na	na	na	na	na	750
BORON TOTAL	B T	UG/L AS B	0	na	na	na	na	na	na	na	na	na	na	na	na
CADMIUM DISS.	CD D	UG/L AS CD	3	66.7	0.10	0.10	0.10	na	na	na	0.10	0.10	0.10	0.10	5.00
CADMIUM TOTAL	CD T	UG/L AS CD	3	100	na	na	na	na	na	na	na	1.00	1.00	1.00	na
CHROMIUM DISS.	CR D	UG/L AS CR	3	66.7	2.00	2.00	2.00	na	na	na	2.00	2.00	1.00	1.00	50.0
CHROMIUM HEX.	CR6	UG/L AS CR	0	na	na	na	na	na	na	na	na	na	na	na	11.0
CHROMIUM TOTAL	CR T	UG/L AS CR	3	na	6.33	3.00	4.38	6.66	na	na	2.00	14.0	na	na	na
COPPER DISS.	CU D	UG/L AS CU	3	na	2.33	2.00	2.29	0.58	na	na	2.00	3.00	na	na	44.0
COPPER TOTAL	CU T	UG/L AS CU	3	na	8.33	8.00	8.32	0.58	na	na	8.00	9.00	na	na	na
IRON TOTAL	FE T	UG/L AS FE	3	na	4500	4700	4340	1410	na	na	3000	5800	na	na	5100
IRON DISS.	FE D	UG/L AS FE	3	na	11.3	13.0	10.8	3.79	na	na	7.00	14.0	na	na	300
LEAD DISS.	PB D	UG/L AS PB	3	66.7	0.80	0.80	0.80	na	na	na	0.80	0.80	0.50	0.50	34.4
LEAD TOTAL	PB T	UG/L AS PB	3	na	11.3	8.00	9.86	7.57	na	na	6.00	20.0	na	na	na
MANGANESE DISS.	MN D	UG/L AS MN	3	na	5.00	5.00	4.72	2.00	na	na	3.00	7.00	na	na	50.0
MANGANESE TOT	MD T	UG/L AS MN	3	na	200	200	197	40.0	na	na	160	240	na	na	na
MERCURY DISS.	HG D	UG/L AS HG	0	na	na	na	na	na	na	na	na	na	na	na	0.10
MERCURY, TOT	HG T	UG/L AS HG	0	na	na	na	na	na	na	na	na	na	na	na	0.01
MOLYBDENUM DISS	MO D	UG/L AS MO	0	na	na	na	na	na	na	na	na	na	na	na	na
MOLYBDENUM TOT	MO T	UG/L AS MO	0	na	na	na	na	na	na	na	na	na	na	na	na
NICKEL DISS.	NI D	UG/L AS NI	3	na	2.67	3.00	2.62	0.58	na	na	2.00	3.00	na	na	100
NICKEL TOTAL	NI T	UG/L AS NI	3	na	6.33	7.00	6.26	1.15	na	na	5.00	7.00	na	na	na
SILVER DISS.	AG D	UG/L AS AG	3	100	na	na	na	na	na	na	na	1.00	1.00	1.00	1.06
SILVER TOTAL	AG T	UG/L AS AG	3	100	na	na	na	na	na	na	na	1.00	1.00	1.00	na
SELENIUM DISS.	SE D	UG/L AS SE	31	3.23	16.5	14.5	15.0	7.64	8.94	26.0	6.00	38.0	1.00	1.00	20.0
SELENIUM TOTAL	SE T	UG/L AS SE	3	na	23.7	21.0	23.1	6.43	na	na	19.0	31.0	na	na	na
ZINC DISS.	ZN D	UG/L AS ZN	3	na	8.67	9.00	8.41	2.52	na	na	6.00	11.0	na	na	390
ZINC TOTAL	ZN T	UG/L AS ZN	3	na	30.0	40.0	25.2	17.3	na	na	10	40.0	na	na	na
SULFIDE TOTAL	H2S	MG/L AS S	0	na	na	na	na	na	na	na	na	na	na	na	na
CYANIDE TOTAL	CYN	MG/L AS CN	0	na	na	na	na	na	na	na	na	na	na	na	0.005
SUSP SED	SSED	MG/L	3	na	352	365	343	91.7	na	na	254	436	na	na	na
SUSP-SIEVE	SIEV	%	3	na	43.9	54.3	36.8	25.8	na	na	14.6	62.9	na	na	na