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Water-Quality, Bed-Sediment, and Biological Data (October 2013 through September 2014) and Statistical Summaries of Data for Streams in the Clark Fork Basin, Montana

Open-File Report 2015–1223

U.S. Department of the Interior
U.S. Geological Survey

Cover photograph. Blackfoot River near Bonner (12340000). Photograph by Kent A. Dodge, U.S. Geological Survey.

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By Kent A. Dodge and Michelle I. Hornberger

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SALLY JEWELL, Secretary

U.S. Geological Survey
Suzette M. Kimball, Acting Director

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Contents

Abstract....1
Introduction....1
Sampling Locations and Types of Data....2
Water-Quality Data....2
Methods....2
Results....8
Quality Assurance....8
Bed-Sediment Data....11
Methods....11
Results....11
Quality Assurance....11
Biological Data....12
Methods....12
Results....13
Quality Assurance....13
Statistical Summaries of Data....13
References Cited....14
Data....19

Figures

1. Map showing location of study area in the Clark Fork Basin, Montana....3

Tables

1. Type and period of data collection at sampling sites in the Clark Fork Basin, Montana..4
2. Properties and constituents measured onsite or analyzed in water, bed-sediment, and biota samples from the Clark Fork Basin, Montana 6
3. Data-quality objectives for analyses of water samples collected in the Clark Fork Basin, Montana 7
4. Water-quality data for the Clark Fork Basin, Montana, October 2013 through September 2014....20
5. Daily mean streamflow and suspended-sediment data for Clark Fork at Deer Lodge, Montana, October 2013 through September 2014....40
6. Daily mean streamflow and suspended-sediment data for Clark Fork at Turah Bridge, near Bonner, Montana, October 2013 through September 2014....44
7. Daily mean streamflow and suspended-sediment data for Blackfoot River near Bonner, Montana, October 2013 through September 2014....48
8. Daily mean streamflow and suspended-sediment data for Clark Fork above Missoula, Montana, October 2013 through September 2014 52
9. Seasonal daily maximum, minimum, and mean turbidity, with monthly summary statistics at Mill Creek at Opportunity, Montana, April through September 2014 56
10. Seasonal daily maximum, minimum, and mean turbidity, with monthly summary statistics at Willow Creek at Opportunity, Montana, April through September 2014 58
11. Seasonal daily maximum, minimum, and mean turbidity, with monthly summary statistics at Warm Springs Creek at Warm Springs, Montana, April through September 2014....60
12. Seasonal daily maximum, minimum, and mean turbidity, with monthly summary statistics at Lost Creek near Anacona, Montana, April through September 2014....62
13. Analyses of field replicates for water samples, Clark Fork Basin, Montana 64
14. Precision of analyses of field replicates for water samples, Clark Fork Basin, Montana 68
15. Precision of analyses of laboratory replicates for water samples, Clark Fork Basin, Montana....69
16. Recovery efficiency for analyses of laboratory-spiked deionized-water blank samples 70
17. Recovery efficiency for analyses of laboratory-spiked stream samples, Clark Fork Basin, Montana....70
18. Analyses of field blanks for water samples 71
19. Bed-sediment data for the Clark Fork Basin, Montana, August 2014....72
20. Recovery efficiency for analyses of standard reference materials for bed-sediment samples....73
21. Analyses of procedural blanks for bed-sediment samples....74
22. Biological data for the Clark Fork Basin, Montana, August 2014 75
23. Recovery efficiency for analyses of certified reference material for biota samples 76
24. Analyses of procedural blanks for biota samples....77
25. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2014 78
26. Statistical summary of long-term bed-sediment data for the Clark Fork Basin, Montana, August 1986 through August 2014....98

27. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2014.....103

Conversion Factors

Inch/Pound to International System of Units

Multiply	By	To obtain
	Length	
inch (in.)	25.4	millimeter (mm)
inch (in.)	25,400	micrometer (µm)
mile (mi)	1.609	kilometer (km)
	Area	
square mile (mi^2)	2.590	square kilometer (km^2)
	Volume	
gallon (gal)	3.785	liter (L)
gallon (gal)	3,785	milliliter (mL)
acre-foot (acre-ft)	1,233	cubic meter (m^3)
	Flow rate	
cubic foot per second (ft^3/s)	0.02832	cubic meter per second (m^3/s)
	Mass	
ounce (oz)	28.35	gram (g)
parts per million	1	microgram per gram (µg/g)
ton	907.2	kilogram (kg)
ton per day (ton/d)	907.2	kilogram per day

Temperature in degrees Celsius (°C) may be converted to degrees Fahrenheit (°F) as follows:
°F=(1.8×°C)+32

Datum

Horizontal coordinate information is referenced to the North American Datum of 1927 (NAD 27).

Supplemental Information

Concentrations of chemical constituents in water are given either in milligrams per liter (mg/L) or micrograms per liter (µg/L).

Water year is the 12-month period from October 1 through September 30 of the following calendar year. The water year is designated by the calendar year in which it ends. For example, water year 2014 is the period from October 1, 2013, through September 30, 2014.

Abbreviations

CRM	certified reference material
FNU	formazin nephelometric units
ICP–AES	inductively coupled plasma-atomic emission spectrometry
ICP–MS	inductively coupled plasma-mass spectrometry
ICP–OES	inductively coupled plasma-optical emission spectrometry
LRL	laboratory reporting level
LT–MDL	long-term method detection level
MRL	minimum reporting level
NIST	National Institute of Standards and Technology
NRP	National Research Program
NTRU	nephelometric turbidity ratio unit
NWQL	National Water Quality Laboratory
PTFE	polytetrafluoroethylene
RSD	relative standard deviation
spp.	species
SRM	standard reference material
USGS	U.S. Geological Survey
YSI	Yellow Springs Instruments Company

Water-Quality, Bed-Sediment, and Biological Data (October 2013 through September 2014) and Statistical Summaries of Data for Streams in the Clark Fork Basin, Montana

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Abstract

Water, bed sediment, and biota were sampled in streams from Butte to near Missoula, Montana, as part of a monitoring program in the upper Clark Fork Basin of western Montana. The sampling program was led by the U.S. Geological Survey, in cooperation with the U.S. Environmental Protection Agency, to characterize aquatic resources in the Clark Fork Basin, with emphasis on trace elements associated with historic mining and smelting activities. Sampling sites were located on the Clark Fork and selected tributaries. Water samples were collected periodically at 20 sites from October 2013 through September 2014. Bed-sediment and biota samples were collected once at 14 sites during August 2014.

This report presents the analytical results and quality-assurance data for water-quality, bed-sediment, and biota samples collected at sites from October 2013 through September 2014. Water-quality data include concentrations of selected major ions, trace elements, and suspended sediment. At 12 sites, dissolved organic carbon and turbidity samples were collected. In addition, nitrogen (nitrate plus nitrite) samples were collected at two sites. Daily values of mean suspended-sediment concentration and suspended-sediment discharge were determined for four sites. Seasonal daily values of turbidity were determined for four sites. Bed-sediment data include trace-element concentrations in the fine-grained fraction. Biological data include trace-element concentrations in whole-body tissue of aquatic benthic insects. Statistical summaries of water-quality, bed-sediment, and biological data for sites in the upper Clark Fork Basin are provided for the period of record.

Introduction

The Clark Fork originates near the town of Warm Springs in western Montana at the confluence of Silver Bow and Warm Springs Creeks (fig. 1). Along the 148-mile (mi) reach of stream from Silver Bow Creek in Butte to the Clark Fork near Missoula, six major tributaries enter: Blacktail Creek, Warm Springs Creek, Little Blackfoot River, Flint Creek, Rock Creek, and Blackfoot River. Principal surface-water uses in the 6,000-square-mile (mi^2) upper Clark Fork Basin above Missoula include irrigation, stock watering, small-scale industry (Cannon and Johnson, 2004), and habitat for trout fisheries. Primary current (2015) land uses are cattle production, logging, mining, residential development, and recreation. Large-scale mining and smelting were prevalent land uses in the upper basin for more than 100 years, but are now either discontinued or substantially reduced in scale.

Deposits of copper, gold, silver, and lead ores were extensively mined, milled, and smelted in the drainages of Silver Bow and Warm Springs Creeks from about the 1860s to the 1980s (U.S. Environmental Protection Agency, 2004). Moderate- and small-scale mining also took place in the basins of most of the major tributaries to the upper Clark Fork. Tailings produced during past mineral processing commonly contain large quantities of trace elements such as arsenic, cadmium, copper, lead, and zinc. Eroded tailings mix with stream sediment and get deposited farther downstream in stream channels, on flood plains, in the Warm Springs Ponds, and at the location of the former Milltown Reservoir whose dam (Milltown Dam) was breached on March 28, 2008 (Andrews, 1987). The occurrence of elevated trace-element concentrations in water and bed sediment can pose a potential risk to aquatic biota and human health (U.S. Environmental Protection Agency, 2004).

Concern about the potential toxicity of trace elements to aquatic biota and human health has resulted in a comprehensive effort by State, Federal, Tribal, and private entities to characterize the aquatic resources in the upper Clark Fork Basin to guide and monitor remedial cleanup activities. A long-term database was considered necessary to detect trends over time to evaluate the effectiveness of remediation. Water-quality data have been collected by the U.S. Geological Survey (USGS) at selected sites in the upper Clark Fork Basin since 1985 (Lambing, 1987 through 1991; Lambing and others, 1994, 1995; Dodge and others, 1996 through 2010, 2012 through 2013, 2014a, 2014b). Trace-element data for bed sediment and biota (aquatic benthic insects) have been collected

intermittently at selected sites since 1986 as part of studies on the contamination of bed-sediment quality and bioaccumulation of metals lead by the USGS National Research Program (NRP) (Axtmann and Luoma, 1991; Cain and others, 1992, 1995; Axtmann and others, 1997; Hornberger and others, 1997). In March 1993, an expanded monitoring program for water, bed sediment, and biota in the upper basin was implemented by the USGS, in cooperation with the U.S. Environmental Protection Agency, to systematically quantify the seasonal and annual variability in selected constituents.

The purpose of this report is to present water-quality data from samples collected at 20 sites and bed-sediment and biological data from samples collected at 14 sites in the Clark Fork Basin from October 2013 through September 2014 (fig. 1). Quality-assurance data are presented for water-quality, bed-sediment, and biota samples collected during the same time period. Statistical summaries also are provided for water-quality, bed-sediment, and biological data collected at the sites for the period of record.

Sampling Locations and Types of Data

Sampling sites for the monitoring program in the upper Clark Fork Basin from Butte to near Missoula (fig. 1) are located on the Clark Fork main stem (including Silver Bow Creek), three major tributaries (Blacktail Creek, Warm Springs Creek, and Blackfoot River), and three smaller tributaries (Mill Creek, Willow Creek, and Lost Creek). The sites, types of data collected, and period of record for each type of data are listed in table 1. Main-stem sampling sites were selected to divide the upper Clark Fork into reaches of approximate uniform length, with each reach encompassing either a major tributary or depositional environment (Warm Springs Ponds and the former Milltown Reservoir). Major tributaries were sampled to describe water-quality, bed-sediment, and biological characteristics of important hydrologic sources in the upper Clark Fork Basin and to provide reference comparisons to the main stem. The three smaller tributaries were sampled to gain better spatial resolution on sources of metals entering the Clark Fork in an area of historical metal-processing activities near Anaconda, Montana. Water-quality samples were collected periodically at 20 sites. Daily suspended-sediment samples were collected at four sites, and daily turbidity data were measured by continuous turbidity monitors recording every 15 minutes at four sites. Bed-sediment and biological samples were collected annually at 13 sites, with one additional site (Warm Springs Creek at Warm Springs) sampled every third year. Continuous streamflow data were collected at 19 sites.

Properties measured onsite and constituents for which water, bed-sediment, and biota samples were analyzed are listed in table 2. Data-quality objectives for analyses of water samples are listed in table 3. Results of onsite measurements of stream properties; laboratory analyses of water-quality, bed-sediment, and biota samples; and quality-assurance data for water year 2014 are listed in tables 4 through 24 at the back of the report. Statistical summaries of long-term water-quality, bed-sediment, and biological data collected between March 1985 and September 2014 are listed in tables 25 through 27 at the back of the report.

Quality assurance of data was maintained through the use of documented procedures described in the following sections, which were designed to provide environmentally representative data. Acceptable results of the procedures were verified with quality-control samples that were collected systematically to provide a measure of the accuracy, precision, and bias of the environmental data, and to identify problems associated with sampling, processing, or analysis.

Water-Quality Data

Water-quality data consist of onsite measurements of selected stream properties and laboratory determination of concentrations of chemical and physical constituents in periodically collected stream samples. Water samples were collected at 20 sites in the upper Clark Fork Basin 6–8 times per year on a schedule designed to describe seasonal and hydrologic variability. At the four daily suspended-sediment sites, suspended-sediment samples were collected by a contract observer 2–10 times per week, depending on season and flow conditions. Continuous turbidity monitors were operated seasonally (April to September 2014) at four sites near Warm Springs and Anaconda; turbidity data (recorded every 15 minutes) were used to compute daily mean turbidity values (table 1).

Methods

Water samples were collected and composited from vertical transits throughout the entire stream depth at multiple locations across the stream by using depth- and width-integration methods described by Ward and Harr (1990), Edwards and Glysson (1999), and the U.S. Geological Survey (variously dated). These methods provide a vertically and laterally discharge-weighted composite sample that is intended to be representative of the entire flow passing through the cross section of a stream. Samplers consisted of isokinetic depth-integrating water-quality samplers (Davis, 2005) that were constructed of plastic or coated with a nonmetallic rubber-coating paint and equipped with polytetrafluoroethylene (PTFE) nozzles.

Instantaneous streamflow was determined at the time of water sampling either by direct measurement or from stage-discharge rating tables (Rantz and others, 1982). Daily mean streamflow values during ice periods were estimated because backwater affected the stage-discharge relation. Onsite measurements of pH, specific conductance, and water temperature were made during collection of periodic water samples. Onsite sample processing, including filtration and preservation, was completed according to procedures described by Ward and

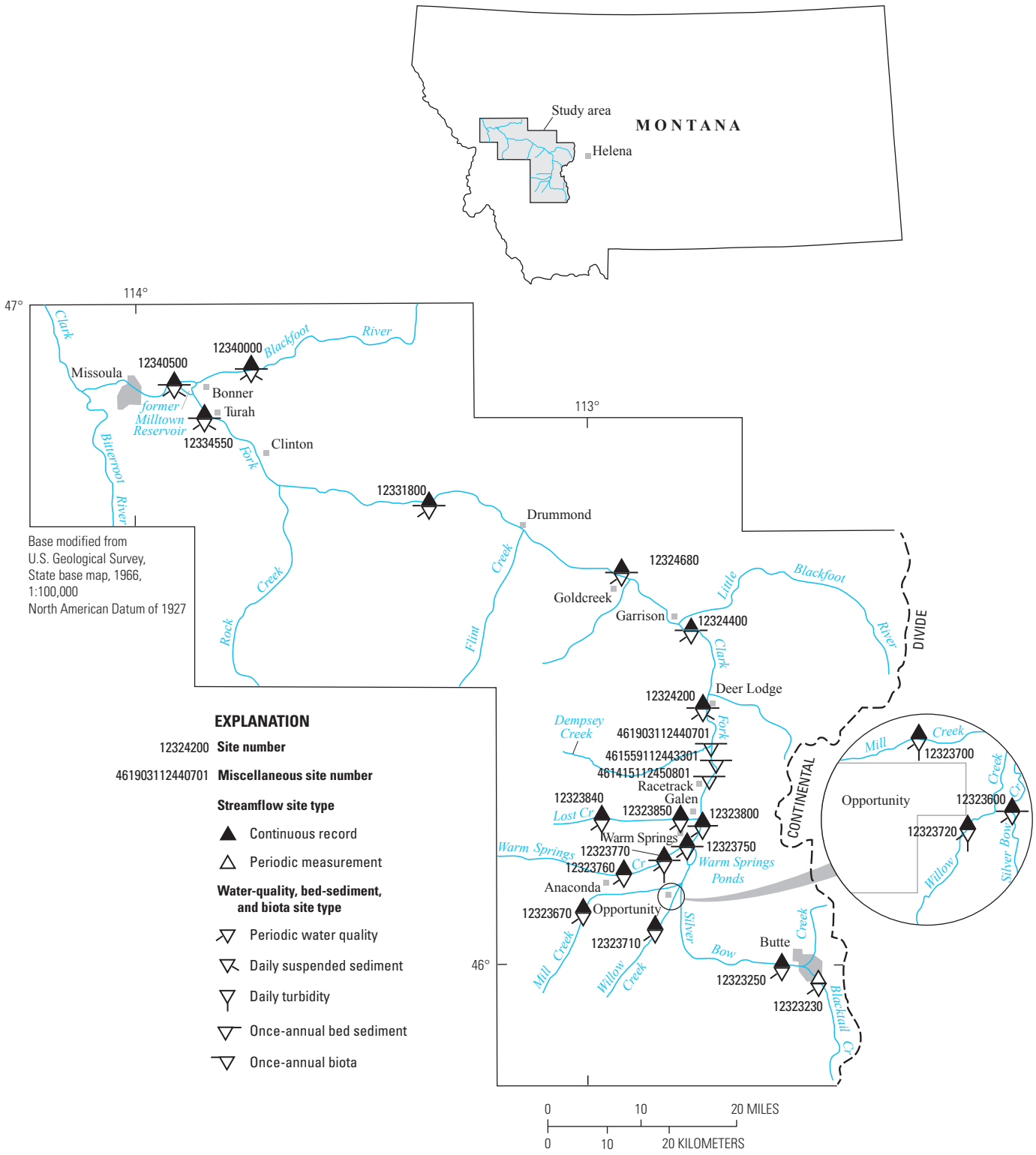

Figure 1. Location of study area in the Clark Fork Basin, Montana.

Table 1. Type and period of data collection at sampling sites in the Clark Fork Basin, Montana.

[--, no data; P, present; D, discontinued]

Station number (fig. 1)	Station name	Continuous-record streamflow	Periodic water quality[1]	Daily suspended sediment	Daily turbidity (seasonal)	Fine-grained bed sediment[2]	Biota[2]
12323230	Blacktail Creek at Harrison Avenue, at Butte	--	03/1993–08/1995, 12/1996–08/2003, 12/2004–P	--	--	--	--
12323250	Silver Bow Creek below Blacktail Creek, at Butte	10/1983–P	03/1993–08/1995, 12/1996–P	--	--	--	--
12323600	Silver Bow Creek at Opportunity	07/1988–P	03/1993–08/1995, 12/1996–P	03/1993–09/1995, D	--	07/1992–P	07/1992, 08/1994–08/1995, 08/1997–P
12323670	Mill Creek near Anaconda	10/2004–P	12/2004–P	--	06/2006–09/2012, D	--	--
12323700	Mill Creek at Opportunity	04/2003–P	03/2003–P	--	04/2013–P	--	--
12323710	Willow Creek near Anaconda	03/2005–P	12/2004–P	--	06/2006–09/2012, D	--	--
12323720	Willow Creek at Opportunity	04/2003–P	03/2003–P	--	04/2013–P	--	--
12323750	Silver Bow Creek at Warm Springs	03/1972–09/1979, 04/1993–P	03/1993–P	04/1993–09/1995, D	--	07/1992–P	07/1992–P
12323760	Warm Springs Creek near Anaconda	10/1997–P	10/2005–P	--	05/2006–09/2012, D	--	--
12323770	Warm Springs Creek at Warm Springs	10/1983–P	03/1993–P	--	04/2013–P	08/1995, 08/1997, 08/1999, 08/2002, 08/2005, 08/2008, 08/2011, 08/2014	08/1995, 08/1997, 08/1999, 08/2002, 08/2005, 08/2008, 08/2011, 08/2014
12323800	Clark Fork near Galen	07/1988–P	07/1988–P	--	--	08/1987, 08/1991–P	08/1987, 08/1991–P
12323840	Lost Creek near Anaconda	10/2004–P	12/2004–P	--	05/2006–P	--	--
12323850	Lost Creek near Galen	04/2003–P	03/2003–P	--	--	--	--
461415112450801	Clark Fork below Lost Creek, near Galen	--	--	--	--	08/1996–P	08/1996–P
461559112443301	Clark Fork at county bridge, near Racetrack	--	--	--	--	08/1996–P	08/1996–P
461903112440701	Clark Fork at Dempsey Creek diversion, near Racetrack	--	--	--	--	08/1996–P	08/1996–P

Table 1. Type and period of data collection at sampling sites in the Clark Fork Basin, Montana.—Continued

[--, no data; P, present; D, discontinued]

Station number (fig. 1)	Station name	Continuous-record streamflow	Periodic water quality[1]	Daily suspended sediment	Daily turbidity (seasonal)	Fine-grained bed sediment[2]	Biota[2]
12324200	Clark Fork at Deer Lodge	10/1978–P	03/1985–P	03/1985–08/1986, 04/1987–03/2003, 08/2003–P	--	08/1986–08/1987, 08/1990–P	08/1986–08/1987, 08/1990–P
12324400	Clark Fork above Little Blackfoot River, near Garrison	02/2009–P	03/2009–P	--	--	08/2009–P	08/2009–P
12324680	Clark Fork at Goldcreek	10/1977–P	03/1993–P	--	--	07/1992–P	07/1992–P
12331800	Clark Fork near Drummond	04/1993–P	03/1993–P	--	--	08/1986, 08/1987, 08/1991–P	08/1986, 08/1991–P
12334550	Clark Fork at Turah Bridge, near Bonner	03/1985–P	03/1985–P	03/1985–03/2003, 08/2003–P	--	08/1986, 08/1991–P	08/1986, 08/1991–P
12340000	Blackfoot River near Bonner	10/1939–P	03/1985–P	07/1986–04/1987, 06/1988–09/1995, 10/2005–P	--	08/1986–08/1987, 08/1991, 08/1993–08/1996, 08/1998–08/2001, 09/2003, 08/2006–P	08/1986–08/1987, 08/1991, 08/1993, 08/1996, 08/1998, 09/2000, 09/2003, 08/2006–P
12340500	Clark Fork above Missoula	03/1929–P	07/1986–P[3]	07/1986–04/1987, 06/1988–01/1996, 03/1996–03/2003, 08/2003–P	04/2007–09/2007	08/1997–P	08/1997–P

[1]Onsite measurements of physical properties and laboratory analyses for selected major ions, trace elements, and suspended sediment. Before March 1993, laboratory analyses included only trace elements and suspended sediment. In 2012, dissolved organic carbon and turbidity analyses were included at select sites. In 2013, nutrient sample analyses were included for two sites near Butte, Montana.

[2]Laboratory analyses of aquatic benthic insects for trace elements.

[3]Before October 1989, water-quality data for Clark Fork above Missoula included only suspended-sediment data.

Table 2. Properties and constituents measured onsite or analyzed in water, bed-sediment, and biota samples from the Clark Fork Basin, Montana.

Water		Bed sediment	Biota
Property	**Constituent**	**Constituent**	**Constituent**
Streamflow	Hardness (calculated)	Arsenic	Arsenic
pH	Calcium	Cadmium	Cadmium
Specific conductance	Magnesium	Chromium	Chromium
Temperature	Potassium	Copper	Copper
Turbidity	Sodium	Iron	Iron
	Alkalinity	Lead	Lead
	Chloride	Manganese	Manganese
	Fluoride	Nickel	Nickel
	Silica	Zinc	Zinc
	Sulfate		
	Nitrate plus nitrite		
	Cadmium		
	Copper		
	Iron		
	Lead		
	Manganese		
	Zinc		
	Arsenic		
	Dissolved organic carbon		
	Suspended sediment		

Harr (1990), Horowitz and others (1994), and the U.S. Geological Survey (variously dated).

Composite water samples were analyzed for the constituents listed in table 2. Filtered (0.45-micrometer [µm] pore size) and unfiltered recoverable concentrations of trace elements (arsenic, cadmium, copper, iron, lead, manganese, and zinc); filtered concentrations of calcium, magnesium, potassium, sodium, chloride, fluoride, silica, sulfate, nitrogen (nitrate plus nitrite), and organic carbon; and unfiltered turbidity (selected sites) were measured by the USGS National Water Quality Laboratory (NWQL) in Denver, Colorado. Concentrations of calcium and magnesium were used for the calculation of water hardness.

Filtered concentrations of arsenic, cadmium, copper, lead, manganese, and zinc were measured using inductively coupled plasma-mass spectrometry (ICP–MS) (Faires, 1993; Garbarino and others, 2006). At select sites in the upper basin, filtered concentrations of potassium, sodium, alkalinity, chloride, fluoride, silica, sulfate, and dissolved organic carbon were measured by ICP–MS (Fishman, 1993; Fishman and Friedman, 1989; American Public Health Association, 1998), whereas nitrogen (nitrate plus nitrite) was measured using the enzymatic reduction, colorimetric reduction method (Patton and Kryskalla, 2011). Filtered concentrations of calcium, magnesium, and iron were measured using inductively coupled plasma-atomic emission spectrometry (ICP–AES) (Fishman, 1993). Unfiltered recoverable concentrations of trace elements were measured in unfiltered samples that were first digested with dilute hydrochloric acid (Hoffman and others, 1996). For cadmium, iron, lead, and manganese, the digested samples were analyzed by ICP–MS as described by Garbarino and Struzeski (1998). For arsenic, copper, and zinc, the digested samples were analyzed by ICP–MS as described by Garbarino and others (2006). Selected unfiltered samples were measured for turbidity by the NWQL using Standard Method 2130 (American Public Health Association and others, 1998).

Water samples for analysis of suspended sediment also were collected from multiple vertical transits when periodic water samples were collected. These samples were analyzed for suspended-sediment concentration and the percentage of suspended-sediment mass finer than 0.062-millimeter (mm) diameter (silt size and smaller) by the USGS Wyoming-Montana Water Science Center Sediment Laboratory (hereinafter referred to as the "Wyoming-Montana Sediment Laboratory") in Helena, Mont., according to methods described by Guy (1969) and Dodge and Lambing (2006).

Suspended-sediment samples for the four daily suspended-sediment sites (table 1) were collected by local contract observers using the depth-integration method at a single vertical transit near midstream. The samples were analyzed

Table 3. Data-quality objectives for analyses of water samples collected in the Clark Fork Basin, Montana.

[lab, laboratory; NTRU, nephelometric turbidity ratio unit; --, not determined; mg/L, milligram per liter; µg/L, microgram per liter; mm, millimeter]

Constituent	Data-quality objectives		
	Detectability	Precision	Bias
	Laboratory reporting level	Maximum relative standard deviation of replicate analyses (percent)	Maximum deviation of spike recovery (percent)
Turbidity, unfiltered, lab, NTRU	2.0 units	20	--
Calcium, filtered	0.022 mg/L	20	--
Magnesium, filtered	0.011 mg/L	20	--
Potassium, filtered	0.03 mg/L	20	--
Sodium, filtered	0.06 mg/L	20	--
Alkalinity, filtered, lab	4.6 mg/L	20	--
Chloride, filtered	0.02 mg/L	20	--
Fluoride, filtered	0.01 mg/L	20	--
Silica, filtered	0.018 mg/L	20	--
Sulfate, filtered	0.02 mg/L	20	--
Nitrate plus nitrite, filtered	0.01 mg/L	20	--
Cadmium, filtered	0.030 µg/L	20	25
Cadmium, unfiltered recoverable	0.030 µg/L	20	25
Copper, filtered	0.80 µg/L	20	25
Copper, unfiltered recoverable	0.80 µg/L	20	25
Iron, filtered	4.0 µg/L	20	25
Iron, unfiltered recoverable	4.6 µg/L	20	25
Lead, filtered	0.040 µg/L	20	25
Lead, unfiltered recoverable	0.04 µg/L	20	25
Manganese, filtered	0.40 µg/L	20	25
Manganese, unfiltered recoverable	0.4 µg/L	20	25
Zinc, filtered	2.0 µg/L	20	25
Zinc, unfiltered recoverable	2.0 µg/L	20	25
Arsenic, filtered	0.01 µg/L	20	25
Arsenic, unfiltered recoverable	0.28 µg/L	20	25
Organic carbon, filtered	0.23 mg/L	20	--
Sediment, suspended, percent finer than 0.062 mm	1 percent	20	--
Sediment, suspended	1 mg/L	20	--

for suspended-sediment concentration and used to calculate daily mean suspended-sediment concentrations according to methods described by Porterfield (1972).

Suspended-sediment discharge is determined according to the following equation (Porterfield, 1972):

$$Q_s = Q_w \times C_s \times k\,, \qquad (1)$$

where

Q_s is suspended-sediment discharge, in tons per day;

Q_w is streamflow, in cubic feet per second;

C_s is suspended-sediment concentration, in milligrams per liter; and

k is a units-conversion constant (0.0027) to convert instantaneous suspended-sediment discharge to an equivalent daily suspended-sediment discharge.

Turbidity data were measured using continuous turbidity monitors (Yellow Springs Instruments Company [YSI] 6136 turbidity sensor) at four tributary sites in the upper Clark Fork Basin near Anaconda (table 1). The turbidity sites are operated seasonally, generally from early spring (after ice breakup) to early fall (before stream freeze-up). Turbidity values are recorded at 15-minute intervals and can be viewed in real-time

at http://waterdata.usgs.gov/mt/nwis/current?type=quality. These values differ from the turbidity values resulting from laboratory analyses of the discrete water-quality samples because of differences in instrumentation and sampling procedures. Continuous recordings enable determination of the minimum and maximum value for each day as well as a daily mean turbidity, which is based on the average of all values in a 24-hour period. Procedures for the operation of continuous turbidity monitors and for daily record computations are described by Wagner and others (2006).

Results

Water-quality data from samples collected periodically during water year 2014 (October 1, 2013 through September 30, 2014) are listed in table 4. Daily mean streamflow, daily mean suspended-sediment concentration, and daily suspended-sediment discharge for water year 2014 at the four daily suspended-sediment sites are listed in tables 5 through 8 along with monthly summary statistics and annual totals for streamflow and suspended-sediment discharge. Daily maximum, minimum, and mean turbidity at four sites are listed in tables 9 through 12 along with monthly summary statistics.

Quality Assurance

Quality-assurance procedures used for the collection and field processing of water samples are described by Ward and Harr (1990), Horowitz and others (1994), Edwards and Glysson (1999), Lambing (2006), and the U.S. Geological Survey (variously dated). Standard procedures used by the NWQL for internal sample handling and quality assurance are described by Friedman and Erdmann (1982), Jones (1987), and Pritt and Raese (1995). Quality-assurance procedures used by the Wyoming-Montana Sediment Laboratory are described by Dodge and Lambing (2006). Standard procedures used for the calibration, measurement, and quality assurance of turbidity monitors are described by Anderson (2005).

The quality of analytical results reported for water samples was evaluated using quality-control samples that were submitted from the field and analyzed concurrently in the laboratory with routine samples. These quality-control samples consisted of replicates, spikes, and blanks that provided quantitative information on the precision and bias of the overall field and laboratory process. Each type of quality-control sample was submitted at a proportion equivalent to about 5 percent of the total number of water samples; therefore, the total number of quality-control samples represented about 15 percent of the total number of water samples.

In addition to the use of quality-control samples submitted from the field, internal quality-assurance practices are performed systematically by the NWQL to provide quality control of analytical procedures (D.L. Stevenson, U.S. Geological Survey, written commun., 2012). These internal practices include analyses of quality-control samples such as calibration standard samples, standard reference water samples, replicate samples, deionized-water blank samples, or spiked samples at a proportion equivalent to at least 10 percent of the sample load. The NWQL participates in a blind-sample program in which standard reference water samples prepared by the USGS Branch of Quality Systems are routinely inserted into the sample line for each analytical method at a frequency proportional to the sample load (http://bqs.usgs.gov). The laboratory also participates in external evaluation studies and audits with the National Environmental Laboratory Accreditation Program, the U.S. Environmental Protection Agency, Environment Canada, and the USGS Branch of Quality Systems to assess analytical performance.

Replicate data can be collected in different ways to provide an assessment of precision (reproducibility) of analytical results. Replicate samples are two or more samples considered to be essentially identical in composition. Replicate samples can be collected in the field (field replicate) either by repeating the collection process to obtain two or more independent composite samples or by splitting a single composite sample into two or more subsamples. The individual replicate samples are then analyzed separately. Likewise, a single sample can be analyzed two or more times in the laboratory to obtain a measure of analytical precision (laboratory replicate).

Precision of analytical results for field replicates can be affected by numerous sources of variability within the field and laboratory environments, including sample collection, processing, and analysis. To provide data on overall precision for samples exposed to field and laboratory sources of variability, replicate stream samples for chemical analysis were obtained in the field by splitting a composite stream sample. Replicate stream samples for suspended-sediment analysis were obtained in the field by collecting two independent cross-sectional samples. Analyses of field replicate samples indicate the reproducibility of environmental data that are affected by the combined potential variability introduced by field and laboratory processes.

Precision of analytical results for laboratory replicates, which exclude field sources of variability, was determined using two independent chemical analyses of aliquots from a single sample selected from the group of samples constituting each analytical run. A separate analysis of the sample was made at the beginning and end of each analytical run to provide information on the reproducibility of laboratory analytical results independent of possible variability caused by field sample collection and processing. Laboratory replicates are not obtainable for suspended-sediment samples because the samples are consumed during the analysis.

Spiked samples are used to evaluate bias, which measures the ability of an analytical method to accurately quantify a known amount of analyte added to a sample. Because some constituents in stream water potentially can interfere with the analysis of a sample for a targeted analyte, it is important to determine whether such effects are causing biased (consistently high or low) results. Deionized-water blank samples and aliquots of stream samples were spiked in the laboratory

with known amounts of the same trace elements for which water samples were being analyzed. Analyses of spiked blanks indicate if the spiking procedure and analytical method are within control for a water matrix that is presumably free of chemical interference. Analyses of spiked aliquots of stream samples indicate if the chemical matrix of the stream water interferes with the analytical measurement and whether these interferences could contribute substantial bias to reported trace-element concentrations for stream samples.

Deionized-water blank samples were submitted for every field trip and analyzed to identify the presence and magnitude of contamination that could potentially bias analytical results. The type of blank sample routinely tested was a field blank. Field blanks are aliquots of deionized water that are certified as constituent-free and are processed in the field through the sampling equipment used to collect stream samples. These blanks then are subjected to the same processing (sample splitting, filtration, preservation, transportation, and laboratory handling) as stream samples. Blank samples are analyzed for the same constituents as stream samples to identify whether any detectable concentrations exist.

All water samples were handled in accordance with chain-of-custody procedures that provide documentation of sample identity, shipment, receipt, and laboratory handling (Driscoll and Hatcher, 2010). All environmental and quality-control samples submitted from a sampling episode were stored in a secure area of the NWQL and analyzed as a discrete sample group, independent of other samples submitted to the NWQL; therefore, the quality-control data apply solely to the analytical results for stream samples reported herein and provide a direct measure of data quality for this monitoring program.

Data-quality objectives (table 3) were established for water-quality data as part of the study plan for the expanded long-term monitoring program initiated in 1993. The objectives identify the analytical requirements of detectability and serve as a guide for identifying questionable data by establishing acceptable limits for precision and bias of laboratory results. Comparisons of quality-control data to data-quality objectives were used to evaluate whether sampling and analytical procedures produced environmentally representative data in a consistent manner. Data that did not meet the objectives were evaluated for acceptability; if necessary, additional quality-control samples were submitted and corrective action was taken.

The NWQL uses a statistically based convention for establishing minimum laboratory reporting levels (LRLs) for analytical results and for reporting low-concentration data (Childress and others, 1999). Quality-control data are collected by the NWQL on a continuing basis to determine long-term method detection levels (LT–MDLs) and LRLs. These values are reevaluated each year and, consequently, can change from year to year. The methods used to determine the LRLs are designed to limit the likelihood of a possible occurrence of a false positive or false negative error to 1 percent or less. Accordingly, concentrations are reported as less than the LRL for samples in which the analyte was not detected. The LRL for organics is twice the LT-MDL. A thorough description of these laboratory definitions can be found at the USGS National Water Quality Laboratory Web site (http://wwwnwql.cr.usgs.gov/qas/Reporting_Limits/Website/Abbreviations_Definitions.pdf). Estimated values are noted with a remark code of "E" for describing streamflow (for ice affected periods) and turbidity (for periods that exceed the manufacturers' threshold for the sonde).

The precision of analytical results for a constituent can be determined by estimating a standard deviation of the differences in concentrations between replicate analyses for several sets of samples. These replicate analyses may consist either of individual analyses of a pair of samples considered to be essentially identical (field replicates) or of multiple analyses of an individual sample (laboratory replicates). The differences in concentration between replicate analyses can be used to estimate a standard deviation according to the following equation (Taylor, 1987):

$$S = \sqrt{\frac{\sum d^2}{2k}}\ , \qquad (2)$$

where

S is the standard deviation of the difference in concentration between replicate analyses,
d is the difference in concentration between each pair of replicate analyses, and
k is the number of pairs of replicate analyses.

Precision also can be expressed as a relative standard deviation (RSD), in percent, which is computed from the standard deviation and the mean concentration for all the replicate analyses. Expressing precision relative to a mean concentration standardizes the comparison of precision among individual constituents. The RSD is calculated according to the following equation (Taylor, 1987):

$$RSD = \frac{S}{\bar{x}} \times 100\,, \qquad (3)$$

where

RSD is the relative standard deviation,
S is the standard deviation, and
$\bar{x}$ is the mean concentration for all replicate analyses.

Paired analyses of field replicates are listed in table 13. The overall precision for each constituent estimated from analyses of field replicates, which include field and laboratory sources of variability, is listed in table 14. The data-quality objective used to indicate acceptable precision of results for field replicates was a maximum RSD of 20 percent (table 3). Precision estimates for the analytical results of field replicates within the 20-percent RSD limit for all constituents (table 14) except turbidity. This one exceedance of the data-quality objective resulted from a statistical artifact of calculating the difference between one

replicate sample pair for which one value exceeds the LRL, and one that does not.

The precision for each constituent estimated from laboratory replicate analyses, which include only laboratory sources of variability, is listed in table 15. Statistics for the precision of analytical results for laboratory replicates are calculated by using unrounded values stored in laboratory data files. The data-quality objective used to indicate acceptable precision of results for laboratory replicates was a maximum RSD of 20 percent (table 3). Precision estimates for the laboratory replicates were within the 20-percent RSD limit for all constituents (table 15). No adjustments were made to analytical data on the basis of replicate analyses precision.

Recovery efficiency for analyses of constituents is determined by comparison of a sample and a spiked aliquot of the same sample. The data-quality objective for acceptable spike recovery of trace elements in water samples determined by NWQL was a maximum deviation of 25 percent from a theoretical 100-percent recovery of added constituent (table 3). At the laboratory, a spiked deionized-water blank sample and a spiked aliquot of a stream sample were prepared and analyzed along with the original unspiked sample. The differences between the spiked and unspiked sample concentrations were determined and used to compute recovery, in percent, according to equation 4:

$$R = \frac{D}{C} \times 100 , \qquad (4)$$

where

R is the spike recovery, in percent;
D is the difference between the spiked and unspiked sample concentrations; and
C is the concentration of material used to spike the sample.

If the spike recovery of a trace element was outside a range of 75 to 125 percent, the instrument was recalibrated and the entire sample set and all spiked samples were reanalyzed for that particular trace element until recoveries were improved to the extent possible. Recovery efficiency for individual trace elements in laboratory-spiked deionized-water blank samples and in laboratory-spiked stream samples is listed in tables 16 and 17, respectively. The mean spike recovery for deionized-water blank samples spiked with trace elements (table 16) ranged from 94.7 to 110 percent with the smallest individual constituent recovery being arsenic, filtered, at 87.6 percent and the largest being zinc, filtered, at 117 percent. The 95-percent confidence intervals (Taylor, 1987) for the mean spike recovery for each constituent for which deionized-water blank samples were analyzed (table 16) did not exceed a 25-percent deviation from an expected 100-percent recovery. The mean spike recovery for spiked stream samples (table 17) ranged from 88.9 to 103 percent with the smallest individual constituent recovery being arsenic, filtered, at 82.7 percent and the largest being cadmium, filtered, at 110 percent. The 95-percent confidence intervals for the mean spike recovery for each constituent for which stream water samples were analyzed (table 17) did not exceed a 25-percent deviation from an expected 100-percent recovery. No adjustments were made to analytical data on the basis of the mean spike recovery.

High or low bias is indicated if the 95-percent confidence interval does not include 100-percent recovery, thereby indicating a consistent deviation or bias, either high or low. Confidence intervals for percent recovery include 100 percent for all laboratory-spiked deionized-water blank samples (table 16) except for filtered zinc (103–117 percent). Confidence intervals for percent recovery include 100 percent for all laboratory-spiked stream samples (table 17) except for unfiltered cadmium (92.0–99.0 percent), unfiltered copper (89.8–97.8 percent), and unfiltered zinc (83.1–94.6 percent). Because the mean spike recoveries for all constituents of laboratory-spiked stream samples met data-quality objectives (less than a 25-percent deviation from 100-percent recovery), no adjustments were made to analytical results for stream samples on the basis of spike recoveries.

Analytical results for field blanks are listed in table 18. A field blank with constituent concentrations less than or equal to the LRL for the analytical method indicates that the entire process of sample collection, field processing, and laboratory analysis is presumably free of contamination. If detectable concentrations of trace elements in field blanks were greater than or equal to twice the LRL, the concentrations were noted during data review. Analytical results from the field blank collected as part of the subsequent sample set were evaluated for evidence of a consistent trend that could indicate systematic contamination. Sporadic, infrequent, nonconsecutive exceedances of twice the LRL most likely represented random contamination or instrument calibration error that was not persistent in the process and was not likely to cause positive bias in a long-term record of analytical results; however, if concentrations for a particular constituent exceeded twice the LRL in field blanks from two consecutive field trips, additional blank samples were collected from individual components of the processing sequence and were submitted for analysis to identify the source of contamination.

Constituent concentrations in field blanks (table 18) were almost always less than the LRL. Two sample concentrations of filtered silica (0.069 and 0.023 milligrams per liter [mg/L]) exceeded the LRL of 0.018 mg/L. One sample concentration of unfiltered copper (1.5 micrograms per liter [µg/L]) exceeded the LRL of 0.80 µg/L. One sample concentration of unfiltered lead (0.06 µg/L) exceeded the LRL of 0.04 µg/L. Three sample concentrations of filtered manganese (all three were 0.41 µg/L) exceeded the LRL of 0.40 µg/L. The systematic presence of filtered manganese has been documented and is currently (2015) being reviewed by the USGS Office of Water Quality. No adjustments were made to water-quality sample data pending the results of this review.

Bed-Sediment Data

Bed-sediment data for the long-term monitoring program in the Clark Fork Basin consist of trace-element concentrations in the fine-grained (less than 0.063 mm) fraction of bed-sediment samples. Bed-sediment samples are collected once annually at 13 sites (fig. 1 and table 1) during low, stable flow conditions at about the same time of year as previous samples (typically August), to facilitate data comparisons among years. Warm Springs Creek at Warm Springs is sampled once every 3 years rather than once annually and was sampled during water year 2014.

Methods

Fine-grained bed-sediment samples were collected in August 2014 using protocols described by Axtmann and Luoma (1991). Samples were collected from the surfaces of streambed deposits in areas near the edge of the stream using an acid-washed polypropylene scoop. Whenever possible, samples were collected from both sides of the stream.

Individual samples of bed sediment were collected by scooping material from the surfaces of three to five randomly selected deposits along pools or low-velocity areas. The three to five individual samples were combined to form a single composite sample. This collection process was repeated three times to obtain three composite samples. Each composite sample was wet-sieved onsite through a 0.063-mm polyester-mesh sieve using ambient stream water. The fraction of bed sediment in each composite sample that was finer than 0.063 mm was collected in an acid-washed 500-milliliter (mL) polyethylene bottle and transported to the laboratory on ice.

Bed-sediment samples were processed and analyzed at the USGS National Research Program Ecology and Contaminants Project Laboratory in Menlo Park, California. Bed-sediment samples were oven-dried at 60 degrees Celsius (°C) and ground into smaller particle sizes using an acid-washed, ceramic mortar and pestle. Single aliquots of approximately 0.5–0.6 grams (g) of sediment from each of the three composite bed-sediment samples were digested using a hot, concentrated, nitric acid reflux according to methods described by Luoma and Bryan (1981). Laboratory replicates were analyzed by taking an aliquot from one of the three sieved replicate samples at each station. After a 2-week digestion period, the aliquots were evaporated to dryness on a hot plate. The dry residue was reconstituted in 10 mL of 0.6N (normal) hydrochloric acid. The reconstituted aliquots were then filtered through a 0.45-µm pore-size filter by using a syringe and an in-line disposable filter cartridge. The filtrate was diluted to a 1:10 ratio with 0.6N hydrochloric acid. These final solutions were analyzed for arsenic, cadmium, chromium, copper, iron, lead, manganese, nickel, and zinc by using inductively coupled plasma-optical emission spectrometry *(ICP–OES)*. The smallest concentration of a constituent that can be reliably reported for analyses of bed sediment is termed the minimum reporting level (MRL).

Results

Concentrations of trace elements measured in samples of fine-grained bed sediment collected during August 2014 are listed in table 19. Liquid-phase concentrations, measured in microgram per milliliter, were analyzed in the reconstituted aliquots of digested bed sediment. Solid-phase concentrations, measured in microgram per gram, were calculated using the following equation:

$$\mu g/g = \frac{(\mu g/mL)(\text{volume of digested sample, in mL})}{(\text{dry weight of sample, in grams})(\text{dilution ratio})}. \quad (5)$$

where

µg/g is micrograms per gram,
µg/mL is microgram per liter, and
mL is millimeter.

The reported solid-phase concentrations (table 19) are the means of all analyses for replicate aliquots from each composite bed-sediment sample collected at the site. Because the conversion from liquid-phase to solid-phase concentration is dependent on the dilution ratio and the dry weight of the sample, MRLs for some trace elements might differ among stations and among years.

Quality Assurance

The USGS protocols for field collection and processing of bed-sediment samples are designed to prevent contamination from metal sources. Nonmetallic sampling and processing equipment (white plastic scoop, funnel-frame apparatus, and 500-mL sample bottles) were acid-washed and rinsed with deionized water before the collection of the first sample. Polyester-mesh sieves were washed in laboratory-grade detergent and rinsed with deionized water. All equipment received a final rinse onsite with stream water. Sampling equipment used at more than one site was rinsed thoroughly between sites with stream water. Separate sieves were used at each site and, therefore, did not require between-site cleaning. Bed-sediment samples were collected sequentially at sites along a general increasing concentration gradient (downstream to upstream sites) to minimize effects from potential site-to-site carryover contamination.

Quality assurance of analytical results for bed-sediment samples included laboratory instrument calibration with standard solutions and analysis of quality-control samples designed to identify the presence and magnitude of bias (Ellen V. Axtmann, U.S. Geological Survey, written commun., 1994). Quality-control samples consisted of standard reference materials (SRMs), issued by the National Institute of Standards and Technology (NIST), and procedural blanks. Ten low-concentration SRMs, 10 high-concentration SRMs, and 14 procedural blanks were analyzed.

Standard reference materials are commercially prepared materials that have certified concentrations of trace elements. Analyses of SRMs are used to indicate the ability of the

method to accurately measure a known quantity of a constituent. Multiple analyses of SRMs are made to derive a mean and 95-percent confidence interval for recovery. Recovery efficiency for trace-element analyses of SRMs for bed sediment is listed in table 20. Two SRMs, consisting of agricultural soils and representing low and high concentrations of trace elements, were analyzed to test recovery efficiency for a range of concentrations similar to those discovered in the bed sediment in streams in the upper Clark Fork Basin.

The digestion process used to analyze bed-sediment samples is not a "total" digestion (does not liberate elements associated with crystalline lattices); therefore, 100-percent recovery may not be achieved for elements strongly bound to the sediment. The percent recovery of trace elements for SRM analyses that use less than a total digestion is useful to indicate which trace elements display strong sediment-binding characteristics in the SRM and whether analytical recovery is consistent between multiple sets of analyses.

Although data-quality objectives have not been established for bed sediment, percent recoveries for individual trace elements (table 20) illustrate analytical performance. Metal recoveries of sediment digests were evaluated with NIST 2709a San Joaquin soils and NIST 2711a Montana soil II. Mean recoveries in SRM 2709a ranged from 38.7 to 90.9 percent of the certified concentrations (table 20). The mean recoveries were within 30 percent of the 95-percent confidence interval for arsenic, copper, manganese, nickel, and zinc. Elements with relatively low certified concentrations (cadmium, 0.371 micrograms per gram [µg/g]) or with a strong association with crystalline lattices (chromium, lead) had lower percent recoveries (between 40 and 65 percent). Mean recoveries in SRM 2711a ranged from 49.9 to 98.6 percent (table 20). The percent recoveries were within 20 percent of the 95-percent confidence interval for arsenic, cadmium, copper, iron, lead, manganese, nickel, and zinc. Chromium had the lowest mean recovery (49.9 percent) due to the strong binding nature of the crystalline lattice. No adjustments were made to trace-element concentrations in bed-sediment samples on the basis of recovery efficiencies.

Procedural blanks for bed-sediment samples consisted of the same reagents used for sample digestion and reconstitution. Concentrated nitric acid used for sample digestion was heated and evaporated to dryness. After evaporation, 0.6N hydrochloric acid was added to reconstitute the dry residue. Procedural blanks, therefore, represent the same chemical matrix and exposure to analytical materials and handling as the reagents used to digest and reconstitute bed-sediment samples. Analytical results of procedural blanks for bed sediment (table 21) are reported as a liquid-phase concentration, in microgram per milliliter. A procedural blank was prepared and analyzed concurrently with bed-sediment samples for each site. Concentrations of trace elements in all procedural blanks were less than the MRL for all elements. No adjustments were made to analytical data on the basis of procedural blanks.

Biological Data

Biological data for the long-term monitoring program in the Clark Fork Basin consist of analyses of trace-element concentrations in the whole-body tissue of aquatic benthic insects. Insect samples are collected once annually at the same 13 sites and on the same dates as bed-sediment samples (fig. 1 and table 1), allowing for a direct comparison of biological data with bed-sediment data through the years. Warm Springs Creek at Warm Springs is sampled once every 3 years, rather than annually, and was sampled during water year 2014.

Methods

Insect samples were collected using protocols described in Hornberger and others (1997). Benthic insects at immature stages were collected with a large nylon-mesh kick net. A single riffle at each site was sampled repeatedly until an adequate number of individual insects were collected to provide sufficient mass for analysis. Targeted taxa for collection were the order Trichoptera (caddisflies) and the order Plecoptera (stoneflies).

Two caddisfly species of the genus *Hydropsyche* (*Hydropsyche cockerelli* and *Hydropsyche occidentalis)* were targeted for collection in this study because of their occurrence at most sites. *Hydropsyche* species (spp.) that could not be positively identified were categorized as *Hydropsyche* spp. or *Hydropsyche morosa* group. On the few occasions when *Hydropsyche* were not present, other caddisflies, including *Brachycentrus* spp. and *Rhyacophila* spp., were collected. The caddisfly *Arctopsyche grandis* and the stoneflies *Claassenia sabulosa* and *Hesperoperla* spp. were collected where available to represent additional insect taxa that are commonly distributed in the Clark Fork Basin.

Samples of each taxon were sorted by genus in the field and placed in acid-washed plastic containers. Samples were frozen in a small amount of ambient stream water on dry ice within 30 minutes of collection. Between 1986 and 1998, macroinvertebrate containers were kept on ice to allow the insects to evacuate their gut contents (depurate) for 6 to 8 hours. Excess water was drained and insects were frozen for transport to the laboratory. Since 1999, samples were immediately frozen on dry ice in the field to reduce the possibility of metal loss through intracellular breakdown during depuration. A comparison of immediately frozen to depurated samples indicated that although no substantial difference occurred for most metals, concentrations of copper were about 20 percent lower in the depurated samples than in the samples that were immediately frozen. The data were not adjusted for this difference.

Insect samples were processed and analyzed at the USGS National Research Program Ecology and Contaminants Project Laboratory in Menlo Park, Calif. Insects were thawed and rinsed with ultrapure deionized water to remove particulate matter and then sorted to their lowest possible taxonomic level. If large numbers of specimens were collected at a site,

similar-sized individuals were composited into replicate subsamples. Subsamples were placed in tared scintillation vials and oven-dried at 70 °C. Subsamples were weighed to obtain a final dry weight and digested by reflux using concentrated nitric acid (Cain and others, 1992). After digestion, insect samples were evaporated to dryness on a hot plate. The dry residue was reconstituted in 0.6N hydrochloric acid, filtered through a 0.45-µm pore-size filter, and analyzed undiluted by ICP–OES for arsenic, cadmium, chromium, copper, iron, lead, manganese, nickel, and zinc. The smallest concentration of a constituent that can be reliably reported for analyses of biota is termed the MRL.

Results

Concentrations of trace elements in whole-body tissue of aquatic insects collected during August 2014 are listed in table 22. The variability in the number of composite samples among species and among sites reflects differences in insect abundance, with the number of composite samples increasing with the relative abundance of insects. Liquid-phase concentrations, in microgram per milliliter, analyzed in the reconstituted samples were converted to solid-phase concentrations, in microgram per gram, by using equation 5 (used earlier in this report to calculate solid-phase concentrations of trace elements in bed sediment). All tissue samples were analyzed undiluted (dilution ratio 1:1). As with MRLs for trace elements in bed sediment, MRLs for trace elements in insects may differ among sites as a result of varied sample weights. In general, the smaller the biological-sample weight (primarily a function of insect abundance), the higher the MRL; therefore, higher MRLs do not necessarily imply a higher trace-element concentration in tissue.

Quality Assurance

The USGS protocols for field collection and processing of biota samples are designed to prevent contamination from metal sources. Nonmetallic nets, sampling equipment, and processing equipment were used in all sample collection. Equipment was acid-washed and rinsed in ultrapure deionized water before the first sample collection. Nets and equipment were thoroughly rinsed in stream water at each main-stem site. New nets were used at each tributary site. Biota samples were collected sequentially at sites along an increasing concentration gradient, which was from downstream sites to upstream sites, to minimize effects from potential site-to-site carryover contamination (Hornberger and others, 1997).

Quality assurance of analytical results for biota samples included laboratory-instrument calibration with standard solutions and analyses of quality-control samples designed to quantify precision and to identify the presence and magnitude of bias. Quality-control samples consisted of 10 replicates of the certified reference material (CRM) TORT-2 (lobster hepatopancreas), 7 replicates of the CRM TORT-3 (also lobster hepatopancreas), and 14 procedural blanks (1 at each site). Both CRMs were purchased from the National Research Council Canada. TORT-3 is the replacement for the preceding version of the CRM standard. Quality-control samples were analyzed in a proportion equivalent to about 20 percent of the total number of biota samples.

Recovery efficiencies for trace-element analyses of the CRM samples TORT-2 and TORT-3 are listed in table 23. Data-quality objectives have not been established for analytical recovery in biota, but percent recoveries indicate analytical performance. Mean CRM recoveries for TORT-2 ranged from 76.4 to 139 percent for all constituents. The mean recoveries for arsenic, cadmium, copper, iron, lead, manganese, and zinc were within 20 percent of the certified value (based on the 95-percent confidence interval). Chromium had a higher percent recovery (139 percent), whereas nickel had a slightly low recovery (76.4 percent), due in part to the relatively low certified concentrations in the standard (0.77 µg/g and 2.5 µg/g, respectively). Mean CRM recoveries for TORT-3 ranged from 78.8 to 179 percent for all constituents. The mean recoveries were within 14 percent for arsenic, cadmium, chromium, copper, iron, manganese, nickel, and zinc. Mean recovery was high for lead (179 percent), likely due to the relatively low certified value in the standard (0.225 µg/g). No adjustments were made to trace-element concentrations in biota samples on the basis of recovery efficiencies.

Procedural blanks for biota consisted of undiluted aliquots of the same reagents used to digest and reconstitute tissue of aquatic insects. Analytical results of procedural blanks for biota (table 24) are reported as a liquid-phase concentration, in micrograms per milliliter. A procedural blank was prepared and analyzed concurrently with biota samples for each site. Concentrations of trace elements in all procedural blanks were less than the MRL; therefore, no adjustments to the data were necessary.

Statistical Summaries of Data

Statistical summaries of long-term water-quality, bed-sediment, and biological data for the Clark Fork Basin are listed in tables 25 through 27 for the period of record at each site. The summaries include the period of record; number of samples; and maximum, minimum, mean, and median concentrations.

Statistical summaries of water-quality data (table 25) are based on results of cross-section samples collected periodically by the USGS for the long-term monitoring program in the Clark Fork Basin during the period of record for each site. The summaries do not include data for supplemental samples collected at selected sites that targeted high-flow conditions or maintenance drawdowns of Milltown Reservoir, which might disproportionately skew the long-term statistics relative to the other sites in the network. Statistical summaries of bed-sediment (table 26) and biological data (table 27) are based on

results of samples collected once during the indicated years. Because not all sites were sampled for bed sediment and biota every year, the data for some sites do not represent a consecutive annual record. Statistical summaries are not presented for discontinued sites.

Statistics for bed-sediment data (table 26) are based on the mean trace-element concentrations determined for each year from the mean of the analyses of composite samples; therefore, the number of samples for bed sediment represents the number of years that the constituent was analyzed. The number of samples for arsenic for bed sediment is smaller than the number for other trace elements because sampling for arsenic began in September 2003. In addition, the number of samples analyzed for silver in bed sediment is smaller because analysis for this constituent was discontinued in 2004.

In contrast, statistics for biological data (table 27) are based on individual analyses for each composite sample collected rather than on a single mean concentration for each year. Differences in the number of composited biota samples among species reflect differences in species abundance, both within and between sites and among years. As a result, the statistics for biota describe a wider range of variation in trace-element concentrations than would be evident if results from individual composite samples were averaged. Also, the number of samples for arsenic in biota samples is smaller than the number for other trace elements because sampling for arsenic began in September 2003. The abundance of aquatic insects at a particular site in a given year limits the biomass of the sample, which in turn may result in varied MRLs. When MRLs vary among years, differences in concentration with time are difficult to determine, especially when a large percentage of the samples have concentrations less than MRLs.

The presence or absence of insect species at a given site can vary among years and may result in different taxa being analyzed in the long-term period of record. Because *Hydropsyche* insects were not sorted to the species level during 1986–89, statistics for stations sampled during those years are based on the results of all *Hydropsyche* species combined. At some sites, statistics for the *Hydropsyche morosa* group are based on the combined results for two or more species because these samples could not be clearly identified to the species level, but the individual insects had *morosa* characteristics.

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Data

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2013 through September 2014.

[hh, hour; mm, minute; ft^3/s, cubic foot per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; --, no data; <, less than laboratory reporting level; E, estimated; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day]

12323230—Blacktail Creek at Harrison Avenue, at Butte									
Date	Time (hhmm)	Streamflow, instantaneous (ft^3/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Water temperature, onsite (°C)	Turbidity, unfiltered, lab (NTRU)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/04/2013	0940	6.7	7.6	308	4.0	--	125	35.9	8.67
03/24/2014	1015	6.5	7.7	312	2.5	<2.0	120	34.2	8.51
04/21/2014	0920	21	7.5	216	4.0	E3.0	78.6	22.7	5.30
05/12/2014	1120	32	7.5	199	3.0	E6.5	71.9	20.8	4.84
05/27/2014	0900	35	7.6	190	11.5	E3.4	74.0	21.2	5.10
06/09/2014	0900	15	7.6	217	10.0	E5.6	87.4	24.8	6.17
07/14/2014	0850	6	7.6	303	12.0	E2.0	121	34.6	8.53
08/11/2014	0850	4	7.6	338	10.0	<2.0	143	40.7	10.1

Date	Potassium, filtered (mg/L)	Sodium, filtered (mg/L)	Alkalinity, filtered, lab (mg/L)	Chloride, filtered (mg/L)	Fluoride, filtered (mg/L)	Silica, filtered (mg/L)	Sulfate, filtered (mg/L)	Nitrate plus nitrite, filtered (mg/L)	Cadmium, filtered (µg/L)
11/04/2013	2.57	12.5	84.7	14.2	0.22	25.9	40.2	--	<0.030
03/24/2014	3.59	12.5	96.5	14.8	0.21	24.6	32.8	1.18	<0.030
04/21/2014	2.98	9.86	60.9	11.9	0.19	19.7	23.7	0.29	0.034
05/12/2014	2.35	10.2	54.5	9.76	0.18	22.1	25.0	0.20	0.042
05/27/2014	2.48	8.05	63.4	6.16	0.19	23.2	19.0	0.16	0.031
06/09/2014	2.20	8.08	75.1	7.77	0.20	22.9	18.9	0.35	0.035
07/14/2014	2.66	11.6	101	12.3	0.27	27.0	27.3	1.08	<0.030
08/11/2014	2.81	13.5	113	13.7	0.25	24.9	31.7	1.22	<0.030

Date	Cadmium, unfiltered recoverable (µg/L)	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)	Lead, filtered (µg/L)	Lead, unfiltered recoverable (µg/L)	Manganese, filtered (µg/L)	Manganese, unfiltered recoverable (µg/L)
11/04/2013	<0.030	1.3	2.2	80.5	258	0.055	0.27	41.7	48.0
03/24/2014	<0.030	1.7	3.1	159	410	0.070	0.42	78.3	87.8
04/21/2014	0.034	4.8	9.0	409	738	0.349	0.74	37.5	46.1
05/12/2014	<0.030	6.2	11.3	279	813	0.232	1.08	29.5	43.7
05/27/2014	0.037	6.0	7.8	270	609	0.180	0.64	36.2	49.9
06/09/2014	0.040	3.4	5.9	398	1,080	0.191	0.83	50.4	94.0
07/14/2014	<0.030	1.6	2.5	168	416	0.076	0.29	50.1	57.8
08/11/2014	<0.030	1.2	1.6	52.1	178	<0.040	0.13	40.9	43.9

Date	Zinc, filtered (µg/L)	Zinc, unfiltered recoverable (µg/L)	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Organic carbon, filtered (mg/L)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/04/2013	3.2	3.6	1.5	1.9	2.37	87	3	0.05
03/24/2014	3.0	4.5	2.1	2.6	3.39	85	3	0.05
04/21/2014	2.9	3.7	4.6	4.7	7.58	84	6	0.34
05/12/2014	2.8	6.5	3.5	4.5	8.18	93	10	0.86
05/27/2014	2.4	4.3	5.6	7.5	9.52	88	5	0.47
06/09/2014	2.1	4.3	4.8	7.3	7.64	93	9	0.36
07/14/2014	<2.0	2.3	4.1	4.9	3.27	96	2	0.03
08/11/2014	<2.0	2.1	2.1	2.5	1.80	93	1	0.01

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2013 through September 2014.—Continued

[hh, hour; mm, minute; ft^3/s, cubic foot per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; --, no data; <, less than laboratory reporting level; E, estimated; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day]

12323250—Silver Bow Creek below Blacktail Creek, at Butte									
Date	Time (hhmm)	Streamflow, instantaneous (ft^3/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Water temperature, onsite (°C)	Turbidity, unfiltered, lab (NTRU)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/04/2013	1135	19	7.8	515	11.0	--	172	48.2	12.5
03/24/2014	1145	19	7.6	522	5.0	E2.6	160	43.6	12.4
04/21/2014	1045	38	7.6	395	6.0	E4.4	132	35.0	10.7
05/12/2014	1310	51	7.8	333	7.0	E5.0	112	32.2	7.59
05/27/2014	1040	50	7.7	321	12.5	E5.3	105	30.1	7.21
06/09/2014	1025	31	8.0	400	12.0	E3.6	130	36.9	9.09
07/14/2014	1025	19	7.7	525	16.0	<2.0	162	45.6	11.6
08/11/2014	1040	17	7.6	533	16.0	E2.4	171	48.2	12.4

Date	Potassium, filtered (mg/L)	Sodium, filtered (mg/L)	Alkalinity, filtered, lab (mg/L)	Chloride, filtered (mg/L)	Fluoride, filtered (mg/L)	Silica, filtered (mg/L)	Sulfate, filtered (µg/L)	Nitrate plus nitrite, filtered (mg/L)	Cadmium, filtered (µg/L)
11/04/2013	5.70	28.7	104	30.3	0.34	21.8	86.6	--	0.069
03/24/2014	6.69	26.9	119	33.8	0.35	21.3	79.2	0.97	0.086
04/21/2014	4.70	19.1	88.6	25.9	0.28	19.6	58.0	0.52	0.058
05/12/2014	3.64	17.6	75.3	18.7	0.27	20.9	53.7	0.44	0.064
05/27/2014	3.96	16.6	82.9	15.7	0.26	21.8	46.0	0.34	0.048
06/09/2014	4.56	19.5	96.1	21.3	0.29	19.1	59.1	0.53	0.054
07/14/2014	6.07	27.6	80.5	31.3	0.40	20.8	85.2	1.03	0.065
08/11/2014	7.62	32.0	78.0	33.9	0.36	19.5	90.4	4.40	0.065

Date	Cadmium, unfiltered recoverable (µg/L)	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)	Lead, filtered (µg/L)	Lead, unfiltered recoverable µg/L)	Manganese, filtered (µg/L)	Manganese, unfiltered recoverable (µg/L)
11/04/2013	0.092	3.3	9.3	34.4	162	0.202	1.18	77.6	90.5
03/24/2014	0.121	5.4	12.3	102	270	0.283	1.36	130	139
04/21/2014	0.105	5.4	11.6	264	605	0.375	2.04	66.9	84.8
05/12/2014	0.103	6.7	14.2	197	624	0.285	2.07	60.1	78.2
05/27/2014	0.126	6.5	21.1	201	701	0.409	3.52	56.4	94.7
06/09/2014	0.106	4.6	12.7	207	679	0.292	2.10	67.2	90.7
07/14/2014	0.094	4.4	11.0	44.2	154	0.197	1.14	30.9	43.2
08/11/2014	0.099	4.2	12.2	36.6	100	0.277	0.96	33.2	38.3

Date	Zinc, filtered (µg/L)	Zinc, unfiltered recoverable (µg/L)	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Organic carbon, filtered (mg/L)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/04/2013	32.7	36.5	2.7	3.2	5.73	88	5	0.26
03/24/2014	40.3	44.9	3.3	3.6	7.49	80	4	0.21
04/21/2014	20.6	30.3	4.6	5.3	8.12	57	10	1.0
05/12/2014	15.1	24.9	4.2	5.1	8.35	66	11	1.5
05/27/2014	15.5	29.6	5.5	8.1	9.97	76	12	1.6
06/09/2014	17.5	27.7	4.5	6.6	8.91	83	8	0.67
07/14/2014	31.8	37.4	4.3	5.0	6.89	73	2	0.10
08/11/2014	42.3	47.5	3.9	4.3	7.66	74	3	0.14

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2013 through September 2014.—Continued

[hh, hour; mm, minute; ft^3/s, cubic foot per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; --, no data; <, less than laboratory reporting level; E, estimated; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day]

12323600—Silver Bow Creek at Opportunity									
Date	Time (hhmm)	Streamflow, instantaneous (ft^3/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Water temperature, onsite (°C)	Turbidity, unfiltered, lab (NTRU)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/05/2013	1135	31	8.2	545	-0.5	--	194	57.2	12.4
03/24/2014	1325	49	8.0	526	5.0	E4.0	223	67.2	13.4
04/21/2014	1220	70	8.3	354	7.0	E5.7	124	37.4	7.48
05/12/2014	1445	130	8.3	308	8.5	E6.8	110	33.6	6.41
05/27/2014	1220	179	8.5	248	9.5	E7.5	99.8	31.0	5.45
06/09/2014	1215	99	8.6	296	12.0	E3.2	118	35.9	6.96
07/14/2014	1205	37	8.6	439	17.5	E2.5	165	49.0	10.3
08/11/2014	1230	22	9.0	499	19.0	E5.4	185	54.2	12.0

Date	Potassium, filtered (mg/L)	Sodium, filtered (mg/L)	Alkalinity, filtered, lab (mg/L)	Chloride, filtered (mg/L)	Fluoride, filtered (mg/L)	Silica, filtered (mg/L)	Sulfate, filtered (µg/L)	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)
11/05/2013	--	--	--	--	--	--	--	0.218	0.304
03/24/2014	1.79	5.06	104	38.2	0.61	10.7	92.9	0.404	0.531
04/21/2014	3.70	17.9	79.1	19.3	0.37	18.4	59.4	0.174	0.325
05/12/2014	3.14	16.6	74.1	14.1	0.27	21.0	50.9	0.135	0.244
05/27/2014	2.26	9.67	71.6	7.65	0.16	17.7	37.0	0.086	0.278
06/09/2014	2.53	12.3	83.3	11.6	0.21	17.6	43.1	0.082	0.177
07/14/2014	4.29	22.6	101	27.2	0.40	23.4	73.1	0.187	0.230
08/11/2014	5.46	30.2	105	35.1	0.45	13.5	89.8	0.224	0.321

Date	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)	Lead, filtered (µg/L)	Lead, unfiltered recoverable (µg/L)	Manganese, filtered (µg/L)	Manganese, unfiltered recoverable (µg/L)
11/05/2013	6.6	16.5	15.4	285	0.133	2.47	109	140
03/24/2014	15.5	29.8	14.7	384	0.231	2.86	226	249
04/21/2014	12.8	27.6	102	728	0.421	4.36	95.0	150
05/12/2014	10.2	21.3	100	618	0.341	3.52	71.3	117
05/27/2014	10.8	27.0	88.8	842	0.332	5.75	57.5	120
06/09/2014	7.4	14.9	53.6	385	0.247	3.26	66.4	103
07/14/2014	10.7	16.1	31.3	176	0.234	1.48	47.8	73.8
08/11/2014	11.9	18.8	20.1	199	0.191	1.67	27.5	88.4

Date	Zinc, filtered (µg/L)	Zinc, unfiltered recoverable (µg/L)	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Organic carbon, filtered (mg/L)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/05/2013	61.9	81.7	4.4	5.5	--	86	9	0.75
03/24/2014	116	131	6.7	7.1	4.45	71	11	1.5
04/21/2014	43.5	76.5	7.1	7.6	6.33	53	25	4.7
05/12/2014	30.9	57.9	7.0	8.2	8.18	64	22	7.7
05/27/2014	19.0	53.5	6.6	9.2	8.35	40	53	26
06/09/2014	16.1	36.8	5.5	7.3	6.67	68	13	3.5
07/14/2014	20.9	32.7	9.8	10.0	4.20	88	5	0.50
08/11/2014	16.6	42.3	9.4	9.9	4.33	85	8	0.48

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2013 through September 2014.—Continued

[hh, hour; mm, minute; ft^3/s, cubic foot per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; --, no data; <, less than laboratory reporting level; E, estimated; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day]

12323670—Mill Creek near Anaconda

Date	Time (hhmm)	Streamflow, instantaneous (ft^3/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Water temperature, onsite (°C)	Turbidity, unfiltered, lab (NTRU)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/04/2013	1530	17	8.1	146	1.5	--	65.7	18.0	5.04
03/25/2014	0800	11	7.8	192	1.0	<2.0	84.3	22.6	6.74
04/21/2014	1545	45	8.0	127	9.5	E2.6	51.1	14.3	3.74
05/12/2014	1820	73	7.8	113	9.5	E2.5	44.3	12.6	3.10
05/27/2014	1550	251	7.7	69	9.0	E4.8	27.1	7.90	1.79
06/09/2014	1550	157	7.7	74	11.0	<2.0	31.9	9.31	2.09
07/14/2014	1520	60	7.9	97	13.0	<2.0	45.6	13.1	3.15
08/11/2014	1540	24	8.1	145	17.0	<2.0	69.1	19.3	5.10

Date	Potassium, filtered (mg/L)	Sodium, filtered (mg/L)	Alkalinity, filtered, lab (mg/L)	Chloride, filtered (mg/L)	Fluoride, filtered (mg/L)	Silica, filtered (mg/L)	Sulfate, filtered (µg/L)	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)
11/04/2013	--	--	--	--	--	--	--	0.043	0.058
03/25/2014	0.82	6.04	85.1	0.54	0.34	13.2	13.9	0.065	0.095
04/21/2014	0.74	5.50	54.4	0.46	0.34	14.6	8.89	0.052	0.080
05/12/2014	0.73	5.66	48.9	0.41	0.28	15.5	7.07	0.052	0.072
05/27/2014	0.55	2.62	30.8	0.27	0.29	11.3	3.38	0.037	0.157
06/09/2014	0.47	2.14	34.1	0.18	0.30	9.83	3.12	0.032	0.056
07/14/2014	0.48	2.18	45.4	0.17	0.35	9.27	3.67	0.033	0.051
08/11/2014	0.65	3.07	68.7	0.24	0.33	11.0	5.37	0.035	0.049

Date	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)	Lead, filtered (µg/L)	Lead, unfiltered recoverable (µg/L)	Manganese, filtered (µg/L)	Manganese, unfiltered recoverable (µg/L)
11/04/2013	1.1	1.3	34.0	64.9	0.048	0.15	4.34	6.2
03/25/2014	1.6	2.8	40.3	120	0.074	0.41	8.40	12.9
04/21/2014	3.4	5.2	52.6	206	0.135	0.64	4.69	12.2
05/12/2014	3.6	5.3	43.1	201	0.135	0.75	4.43	10.5
05/27/2014	3.4	7.6	42.9	730	0.133	2.19	6.64	35.0
06/09/2014	2.1	3.5	30.0	164	0.081	0.54	4.12	10.9
07/14/2014	1.6	2.8	46.3	132	0.086	0.47	7.02	12.3
08/11/2014	1.5	2.1	71.3	143	0.095	0.36	6.90	14.7

Date	Zinc, filtered (µg/L)	Zinc, unfiltered recoverable (µg/L)	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Organic carbon, filtered (mg/L)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/04/2013	2.0	<2.0	9.9	11.2	--	14	6	0.28
03/25/2014	2.9	3.4	25.0	26.5	1.65	42	3	0.09
04/21/2014	<2.0	3.3	26.7	25.5	3.48	77	5	0.61
05/12/2014	2.4	3.6	26.7	26.9	3.46	43	6	1.2
05/27/2014	<2.0	8.2	10.1	14.5	3.45	31	42	28
06/09/2014	<2.0	2.4	8.1	10.5	2.56	52	8	3.4
07/14/2014	<2.0	2.7	9.3	10.3	1.53	45	4	0.65
08/11/2014	<2.0	<2.0	12.3	13.6	1.35	60	3	0.19

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2013 through September 2014.—Continued

[hh, hour; mm, minute; ft^3/s, cubic foot per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; --, no data; <, less than laboratory reporting level; E, estimated; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day]

12323700—Mill Creek at Opportunity									
Date	Time (hhmm)	Streamflow, instantaneous (ft^3/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Water temperature, onsite (°C)	Turbidity, unfiltered, lab (NTRU)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/05/2013	0910	9.2	7.8	178	0.0	<2.0	81.3	22.6	6.05
03/25/2014	0900	9.8	8.0	226	1.0	<2.0	95.4	26.2	7.31
04/21/2014	1650	20	8.0	142	10.0	E2.6	57.5	16.3	4.07
05/12/2014	1920	35	7.9	122	10.0	E2.9	47.9	13.7	3.30
05/27/2014	1700	136	7.7	74	10.5	E7.2	29.3	8.49	1.97
06/09/2014	1705	81	7.8	80	12.0	<2.0	33.8	9.82	2.24
07/14/2014	1620	41	7.9	106	14.5	<2.0	48.2	13.8	3.33
08/11/2014	1630	9.2	8.1	161	18.0	<2.0	75.2	21.1	5.48

Date	Potassium, filtered (mg/L)	Sodium, filtered (mg/L)	Alkalinity, filtered, lab (mg/L)	Chloride, filtered (mg/L)	Fluoride, filtered (mg/L)	Silica, filtered (mg/L)	Sulfate, filtered (µg/L)	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)
11/05/2013	0.78	5.08	72.4	0.56	0.36	13.0	16.7	0.067	0.080
03/25/2014	1.02	8.15	88.2	0.82	0.36	12.8	27.7	0.054	0.072
04/21/2014	0.79	5.70	57.2	0.55	0.35	14.3	13.0	0.056	0.083
05/12/2014	0.71	5.90	50.4	0.45	0.29	14.9	9.68	0.062	0.101
05/27/2014	0.58	2.95	31.9	0.24	0.30	11.6	4.41	0.049	0.249
06/09/2014	0.51	2.33	35.8	0.21	0.30	10.2	4.19	0.048	0.097
07/14/2014	0.57	2.58	47.2	0.21	0.33	9.59	5.66	0.042	0.078
08/11/2014	0.80	4.19	71.2	0.34	0.34	11.7	10.2	0.056	0.063

Date	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)	Lead, filtered (µg/L)	Lead, unfiltered recoverable (µg/L)	Manganese, filtered (µg/L)	Manganese, unfiltered recoverable (µg/L)
11/05/2013	1.2	1.6	53.2	84.1	0.048	0.14	9.73	9.7
03/25/2014	1.8	3.4	31.4	105	0.066	0.26	3.58	5.3
04/21/2014	3.6	5.3	40.4	207	0.121	0.68	3.33	10.7
05/12/2014	3.3	6.0	36.6	247	0.117	1.03	4.09	16.3
05/27/2014	3.9	12.3	46.8	924	0.210	3.80	6.22	40.5
06/09/2014	2.6	4.8	30.5	256	0.108	1.00	4.32	14.7
07/14/2014	2.0	3.7	57.8	184	0.124	0.68	6.33	16.6
08/11/2014	2.3	3.0	88.3	159	0.144	0.44	5.82	12.7

Date	Zinc, filtered (µg/L)	Zinc, unfiltered recoverable (µg/L)	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Organic carbon, filtered (mg/L)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/05/2013	4.8	5.0	11.3	12.2	2.10	90	1	0.02
03/25/2014	2.6	3.6	22.9	23.2	1.73	67	1	0.03
04/21/2014	2.6	3.9	25.5	24.8	2.98	76	6	0.32
05/12/2014	<2.0	4.7	25.8	26.5	3.31	56	9	0.85
05/27/2014	2.3	12.4	13.5	21.0	4.10	47	48	18
06/09/2014	2.0	4.2	11.9	15.3	2.51	67	10	2.2
07/14/2014	<2.0	3.2	17.7	19.4	1.58	65	4	0.44
08/11/2014	<2.0	2.6	24.4	25.6	1.85	79	4	0.10

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2013 through September 2014.—Continued

[hh, hour; mm, minute; ft^3/s, cubic foot per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; --, no data; <, less than laboratory reporting level; E, estimated; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day]

12323710—Willow Creek near Anaconda

Date	Time (hhmm)	Streamflow, instantaneous (ft^3/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Water temperature, onsite (°C)	Turbidity, unfiltered, lab (NTRU)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/04/2013	1350	1.2	7.6	119	1.0	--	32.1	10.6	1.38
03/24/2014	1540	2.6	7.6	139	1.5	<2.0	51.0	16.6	2.33
04/21/2014	1420	12	7.7	104	6.0	E9.3	37.4	12.4	1.53
05/12/2014	1700	26	7.6	86	8.0	E6.1	30.1	10.1	1.21
05/27/2014	1430	47	7.6	65	8.5	E6.0	21.5	7.22	0.84
06/09/2014	1425	16	7.7	84	10.0	E2.4	31.0	10.5	1.17
07/14/2014	1410	4.7	7.7	104	12.0	<2.0	39.2	13.2	1.54
08/11/2014	1425	2.6	7.8	108	16.0	<2.0	40.4	13.6	1.58

Date	Potassium, filtered (mg/L)	Sodium, filtered (mg/L)	Alkalinity, filtered, lab (mg/L)	Chloride, filtered (mg/L)	Fluoride, filtered (mg/L)	Silica, filtered (mg/L)	Sulfate, filtered (µg/L)	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)
11/04/2013	--	--	--	--	--	--	--	<0.030	0.031
03/24/2014	1.06	7.94	53.5	0.83	0.07	22.9	15.7	<0.030	0.032
04/21/2014	0.92	6.10	38.6	0.69	0.07	24.9	10.7	<0.030	0.046
05/12/2014	0.94	5.99	32.3	0.55	0.07	24.9	8.36	0.034	0.052
05/27/2014	0.70	4.58	26.3	0.34	0.06	21.7	5.10	0.037	0.068
06/09/2014	0.73	4.39	35.3	0.34	0.06	20.9	6.00	<0.030	0.047
07/14/2014	0.91	5.39	45.7	0.30	0.07	23.7	6.18	0.034	0.056
08/11/2014	1.08	6.47	47.8	0.33	0.07	24.7	5.89	0.033	0.059

Date	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)	Lead, filtered (µg/L)	Lead, unfiltered recoverable (µg/L)	Manganese, filtered (µg/L)	Manganese, unfiltered recoverable (µg/L)
11/04/2013	1.0	1.6	57.2	150	0.072	0.19	11.2	17.6
03/24/2014	1.3	1.8	72.0	176	0.064	0.23	16.2	22.6
04/21/2014	2.9	4.1	134	541	0.276	0.76	13.6	27.0
05/12/2014	3.4	4.7	152	372	0.242	0.64	7.69	15.8
05/27/2014	2.8	5.1	70.2	334	0.207	1.01	6.94	19.0
06/09/2014	2.5	2.8	59.7	174	0.165	0.56	10.7	17.0
07/14/2014	1.9	2.9	89.1	182	0.189	0.47	12.1	23.9
08/11/2014	3.0	2.7	133	218	0.278	0.54	8.61	17.0

Date	Zinc, filtered (µg/L)	Zinc, unfiltered recoverable (µg/L)	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Organic carbon, filtered (mg/L)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/04/2013	2.1	<2.0	7.7	12.6	--	90	1	<0.01
03/24/2014	<2.0	<2.0	13.2	14.2	3.57	77	1	0.01
04/21/2014	<2.0	3.9	18.6	19.4	6.77	89	9	0.29
05/12/2014	<2.0	3.3	17.6	17.0	7.03	86	5	0.35
05/27/2014	<2.0	4.7	11.9	14.5	5.23	70	15	1.9
06/09/2014	3.0	2.1	12.0	14.2	4.79	97	3	0.13
07/14/2014	<2.0	<2.0	18.7	20.6	4.38	90	4	0.05
08/11/2014	<2.0	2.1	22.7	24.5	4.25	76	3	0.02

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2013 through September 2014.—Continued

[hh, hour; mm, minute; ft^3/s, cubic foot per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; --, no data; <, less than laboratory reporting level; E, estimated; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day]

12323720—Willow Creek at Opportunity									
Date	Time (hhmm)	Streamflow, instantaneous (ft^3/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Water temperature, onsite (°C)	Turbidity, unfiltered, lab (NTRU)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/05/2013	1020	5.1	8.1	286	2.5	E5.8	129	37.4	8.75
03/24/2014	1420	7.7	8.2	317	8.0	<2.0	134	38.6	9.21
04/21/2014	1300	15	8.0	186	8.0	E4.7	72.4	22.2	4.11
05/12/2014	1530	30	7.9	143	11.0	E5.2	54.9	17.1	2.99
05/27/2014	1310	45	7.8	131	11.0	E3.8	54.2	16.5	3.15
06/09/2014	1310	30	8.0	197	14.0	E2.4	87.8	26.1	5.53
07/14/2014	1250	9.9	8.0	241	14.0	<2.0	109	31.6	7.22
08/11/2014	1310	7.1	8.3	270	16.0	<2.0	122	35.2	8.23

Date	Potassium, filtered (mg/L)	Sodium, filtered (mg/L)	Alkalinity, filtered, lab (mg/L)	Chloride, filtered (mg/L)	Fluoride, filtered (mg/L)	Silica, filtered (mg/L)	Sulfate, filtered (µg/L)	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)
11/05/2013	1.40	10.7	117	2.05	0.43	22.1	25.5	<0.030	0.074
03/24/2014	1.74	12.0	124	3.28	0.42	20.9	36.5	<0.030	0.060
04/21/2014	1.26	8.65	68.8	1.54	0.19	23.4	21.8	0.040	0.101
05/12/2014	1.07	7.56	53.3	1.12	0.15	23.5	15.0	0.036	0.091
05/27/2014	0.94	6.12	54.9	0.79	0.18	23.5	9.21	0.047	--
06/09/2014	1.20	6.76	89.9	0.99	0.34	22.5	10.5	0.038	0.069
07/14/2014	1.24	8.19	106	1.63	0.41	22.0	16.1	0.036	0.053
08/11/2014	1.30	9.09	117	2.14	0.46	20.2	20.0	0.033	0.036

Date	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)	Lead, filtered (µg/L)	Lead, unfiltered recoverable (µg/L)	Manganese, filtered (µg/L)	Manganese, unfiltered recoverable (µg/L)
11/05/2013	0.87	7.1	10.8	346	0.075	2.58	47.6	63.0
03/24/2014	2.4	6.1	24.5	142	0.150	1.32	53.7	60.1
04/21/2014	5.7	11.1	63.1	368	0.266	1.93	29.4	46.8
05/12/2014	6.5	13.5	77.4	348	0.306	2.03	18.5	29.5
05/27/2014	8.5	--	80.8	--	0.296	--	15.9	--
06/09/2014	5.3	8.2	53.1	193	0.197	1.13	19.4	27.6
07/14/2014	3.0	4.9	38.5	151	0.186	0.84	18.2	23.7
08/11/2014	2.9	3.1	79.7	111	0.442	0.62	7.98	9.9

Date	Zinc, filtered (µg/L)	Zinc, unfiltered recoverable (µg/L)	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Organic carbon, filtered (mg/L)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/05/2013	2.8	11.0	9.3	11.6	1.75	99	13	0.18
03/24/2014	4.4	8.0	17.7	19.1	2.46	97	3	0.06
04/21/2014	5.2	11.9	22.6	22.9	5.97	91	12	0.49
05/12/2014	5.1	11.2	23.2	24.3	6.85	90	11	0.89
05/27/2014	7.8	--	31.7	35.0	6.83	81	11	1.3
06/09/2014	5.3	8.8	44.5	51.7	6.46	90	5	0.41
07/14/2014	3.1	5.0	25.3	27.5	3.80	95	3	0.08
08/11/2014	2.5	3.2	17.1	17.2	2.41	95	6	0.12

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2013 through September 2014.—Continued

[hh, hour; mm, minute; ft^3/s, cubic foot per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; --, no data; <, less than laboratory reporting level; E, estimated; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day]

12323750—Silver Bow Creek at Warm Springs									
Date	Time (hhmm)	Streamflow, instantaneous (ft^3/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Water temperature, onsite (°C)	Turbidity, unfiltered, lab (NTRU)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/05/2013	1350	67	8.6	524	2.0	--	196	54.0	15.0
03/25/2014	1045	72	8.8	496	3.5	E5.1	206	59.9	13.7
04/22/2014	1035	153	8.3	441	9.0	E11	173	50.7	11.3
05/13/2014	1200	210	8.5	388	9.0	E2.1	150	45.4	8.84
05/28/2014	1030	307	8.8	267	10.0	E3.8	103	30.7	6.49
06/10/2014	1030	186	8.9	241	10.5	E2.4	101	29.8	6.40
07/15/2014	1020	93	9.1	289	15.5	E3.3	125	36.2	8.42
08/12/2014	1110	50	9.4	376	17.0	E2.9	169	48.5	11.6

Date	Potassium, filtered (mg/L)	Sodium, filtered (mg/L)	Alkalinity, filtered, lab (mg/L)	Chloride, filtered (mg/L)	Fluoride, filtered (mg/L)	Silica, filtered (mg/L)	Sulfate, filtered (µg/L)	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)
11/05/2013	--	--	--	--	--	--	--	0.045	0.102
03/25/2014	4.73	19.4	104	21.6	0.70	11.1	115	0.055	0.123
04/22/2014	4.45	20.0	97.1	19.6	0.66	10.5	93.7	0.033	0.567
05/13/2014	3.70	17.9	92.4	15.9	0.49	12.4	74.1	0.054	0.082
05/28/2014	2.41	11.9	69.2	8.75	0.42	11.4	47.5	0.050	0.119
06/10/2014	1.77	8.61	69.8	6.05	0.41	10.1	39.2	0.046	0.087
07/15/2014	1.72	9.30	78.9	5.98	0.50	12.7	57.2	<0.030	0.073
08/12/2014	2.31	14.4	95.7	9.88	0.64	15.8	83.0	<0.030	0.036

Date	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)	Lead, filtered (µg/L)	Lead, unfiltered recoverable (µg/L)	Manganese, filtered (µg/L)	Manganese, unfiltered recoverable (µg/L)
11/05/2013	2.0	5.0	16.5	168	0.088	0.96	63.1	107
03/25/2014	6.4	15.0	37.6	372	0.360	4.58	122	153
04/22/2014	2.3	32.8	14.5	839	0.098	6.39	135	332
05/13/2014	4.1	7.7	27.5	187	0.167	1.06	65.4	83.5
05/28/2014	6.9	11.1	45.1	296	0.184	1.50	52.4	93.8
06/10/2014	5.2	8.0	34.0	216	0.128	1.05	43.9	66.9
07/15/2014	3.5	6.5	48.3	222	0.159	1.05	66.5	111
08/12/2014	2.1	2.8	27.7	88.0	0.110	0.37	42.8	68.3

Date	Zinc, filtered (µg/L)	Zinc, unfiltered recoverable (µg/L)	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Organic carbon, filtered (mg/L)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/05/2013	2.9	7.3	13.5	16.9	--	98	15	2.7
03/25/2014	5.8	21.7	13.0	15.0	5.91	97	7	1.4
04/22/2014	2.8	69.8	12.2	16.9	4.89	95	21	8.7
05/13/2014	4.2	12.7	15.1	16.9	4.86	83	3	1.7
05/28/2014	3.3	12.6	18.2	22.3	5.56	90	8	6.6
06/10/2014	<2.0	7.4	18.9	24.4	4.69	85	5	2.5
07/15/2014	<2.0	5.4	23.8	26.8	4.54	87	6	1.5
08/12/2014	<2.0	2.3	32.7	33.9	5.33	83	1	0.14

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2013 through September 2014.—Continued

[hh, hour; mm, minute; ft^3/s, cubic foot per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; --, no data; <, less than laboratory reporting level; E, estimated; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day]

12323760—Warm Springs Creek near Anaconda									
Date	Time (hhmm)	Streamflow, instantaneous (ft^3/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Water temperature, onsite (°C)	Turbidity, unfiltered, lab (NTRU)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/05/2013	0755	59	8.2	268	0.5	--	132	38.8	8.66
04/22/2014	0855	60	8.4	272	6.0	<2.0	131	39.1	8.14
05/13/2014	0930	90	8.4	254	4.5	<2.0	127	38.4	7.53
05/28/2014	0900	382	7.9	136	4.5	E5.6	62.9	19.8	3.25
07/15/2014	0830	172	8.2	183	10.5	<2.0	92.1	28.0	5.42
08/12/2014	0830	93	8.3	238	10.0	<2.0	120	35.9	7.38

Date	Potassium, filtered (mg/L)	Sodium, filtered (mg/L)	Alkalinity, filtered, lab (mg/L)	Chloride, filtered (mg/L)	Fluoride, filtered (mg/L)	Silica, filtered (mg/L)	Sulfate, filtered (µg/L)	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)
11/05/2013	--	--	--	--	--	--	--	<0.030	<0.030
04/22/2014	1.34	3.44	126	1.53	0.39	9.70	15.9	<0.030	<0.030
05/13/2014	1.25	3.25	118	1.26	0.37	9.92	13.5	<0.030	<0.030
05/28/2014	0.80	1.54	60.3	0.49	0.30	8.25	7.98	<0.030	0.073
07/15/2014	0.94	1.93	83.2	0.75	0.39	9.59	10.0	<0.030	<0.030
08/12/2014	1.17	2.83	111	1.06	0.39	10.7	11.9	0.030	<0.030

Date	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)	Lead, filtered (µg/L)	Lead, unfiltered recoverable (µg/L)	Manganese, filtered (µg/L)	Manganese, unfiltered recoverable (µg/L)
11/05/2013	<0.80	<0.80	<4.0	19.1	<0.040	0.08	0.77	0.9
04/22/2014	<0.80	2.4	5.1	93.4	<0.040	0.32	0.75	4.2
05/13/2014	0.83	4.4	7.1	77.0	<0.040	0.26	0.83	3.6
05/28/2014	1.4	8.8	15.2	525	<0.040	1.58	2.38	20.5
07/15/2014	0.88	2.9	7.0	92.3	<0.040	0.33	1.31	5.8
08/12/2014	1.6	2.0	8.8	72.7	<0.040	0.24	0.80	4.1

Date	Zinc, filtered (µg/L)	Zinc, unfiltered recoverable (µg/L)	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Organic carbon, filtered (mg/L)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/05/2013	<2.0	<2.0	1.7	1.8	--	64	1	0.16
04/22/2014	<2.0	2.8	2.7	2.7	1.31	80	6	0.97
05/13/2014	<2.0	3.3	2.3	2.6	1.77	68	3	0.73
05/28/2014	<2.0	9.6	1.3	2.7	2.92	55	32	33
07/15/2014	<2.0	3.7	1.8	2.1	1.28	63	5	2.3
08/12/2014	<2.0	2.4	2.1	2.3	0.83	59	3	0.75

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2013 through September 2014.—Continued

[hh, hour; mm, minute; ft^3/s, cubic foot per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; --, no data; <, less than laboratory reporting level; E, estimated; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day]

12323770—Warm Springs Creek at Warm Springs									
Date	Time (hhmm)	Streamflow, instantaneous (ft^3/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Water temperature, onsite (°C)	Turbidity, unfiltered, lab (NTRU)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/05/2013	1250	32	8.3	379	1.0	<2.0	193	58.1	11.5
03/25/2014	1005	24	8.1	443	2.0	<2.0	203	59.2	13.5
04/22/2014	1120	33	8.3	405	8.0	<2.0	203	61.4	12.0
05/13/2014	1040	56	8.3	356	6.0	<2.0	177	53.3	10.7
05/28/2014	1115	239	7.9	180	7.0	E11	85.5	27.0	4.36
06/10/2014	0910	207	8.0	167	7.0	E2.4	82.3	25.8	4.36
07/15/2014	0935	109	8.0	228	12.5	E4.3	112	34.2	6.40
08/12/2014	0940	50	8.2	304	12.0	<2.0	154	46.9	8.92

Date	Potassium, filtered (mg/L)	Sodium, filtered (mg/L)	Alkalinity, filtered, lab (mg/L)	Chloride, filtered (mg/L)	Fluoride, filtered (mg/L)	Silica, filtered (mg/L)	Sulfate, filtered (µg/L)	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)
11/05/2013	1.50	4.31	139	1.57	0.48	11.9	55.1	0.050	0.052
03/25/2014	4.66	19.2	149	2.11	0.50	11.1	84.4	0.055	0.069
04/22/2014	1.56	4.64	145	2.21	0.48	10.6	64.9	0.054	0.062
05/13/2014	1.56	4.33	132	1.74	0.45	9.86	51.0	0.061	0.057
05/28/2014	0.93	1.84	69.5	0.64	0.34	8.91	19.5	0.034	0.204
06/10/2014	0.83	1.78	66.8	0.60	0.34	9.05	16.3	0.041	0.082
07/15/2014	1.25	2.39	91.7	1.07	0.41	10.0	22.7	0.043	0.088
08/12/2014	1.35	3.30	124	1.37	0.42	10.8	32.7	0.031	0.038

Date	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)	Lead, filtered (µg/L)	Lead, unfiltered recoverable (µg/L)	Manganese, filtered (µg/L)	Manganese, unfiltered recoverable (µg/L)
11/05/2013	1.4	3.9	15.0	52.8	<0.040	0.20	163	182
03/25/2014	2.4	5.1	33.8	58.2	<0.040	0.21	218	233
04/22/2014	2.9	7.2	10.9	93.4	<0.040	0.37	123	175
05/13/2014	3.4	6.9	11.4	88.0	<0.040	0.41	88.3	131
05/28/2014	4.5	50.3	21.1	1,280	0.083	5.96	44.5	233
06/10/2014	3.2	14.2	15.6	308	0.045	1.57	37.6	78.6
07/15/2014	3.6	15.6	19.8	312	0.087	1.87	35.7	71.7
08/12/2014	2.3	5.7	18.3	76.5	0.049	0.37	28.9	46.6

Date	Zinc, filtered (µg/L)	Zinc, unfiltered recoverable (µg/L)	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Organic carbon, filtered (mg/L)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/05/2013	2.1	2.5	3.7	4.2	0.89	63	2	0.17
03/25/2014	2.1	2.9	6.9	7.1	1.45	82	1	0.06
04/22/2014	<2.0	3.1	7.1	7.0	1.53	67	4	0.36
05/13/2014	<2.0	2.9	5.3	5.9	1.84	64	3	0.45
05/28/2014	<2.0	23.7	5.2	11.8	3.27	60	65	42
06/10/2014	2.2	7.4	3.9	5.9	2.29	68	14	7.8
07/15/2014	<2.0	8.2	6.9	8.5	2.14	79	13	3.8
08/12/2014	<2.0	3.0	6.1	7.0	1.25	84	2	0.27

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2013 through September 2014.—Continued

[hh, hour; mm, minute; ft^3/s, cubic foot per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; --, no data; <, less than laboratory reporting level; E, estimated; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day]

12323800—Clark Fork near Galen								
Date	Time (hhmm)	Streamflow, instantaneous (ft^3/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Water temperature, onsite (°C)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/05/2013	1530	111	8.8	481	2.0	194	55.1	13.7
03/25/2014	1230	85	8.6	494	4.0	208	61.3	13.5
04/22/2014	1245	181	8.6	432	10.0	178	52.5	11.4
05/13/2014	1340	265	8.8	374	10.0	155	47.1	9.04
05/28/2014	1330	535	8.5	227	11.5	93.2	28.4	5.43
06/10/2014	1230	390	8.5	206	12.0	91.3	27.7	5.37
07/15/2014	1220	197	8.7	262	16.0	119	35.4	7.36
08/12/2014	1235	87	8.9	346	17.0	164	48.5	10.5

Date	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)	Lead, filtered (µg/L)	Lead, unfiltered recoverable (µg/L)
11/05/2013	0.044	0.103	2.8	10.3	7.5	199	0.052	1.16
03/25/2014	0.060	0.120	5.3	14.3	26.0	299	0.229	3.35
04/22/2014	0.037	0.223	3.3	17.5	8.7	447	0.075	2.97
05/13/2014	0.065	0.096	4.8	11.1	21.7	231	0.143	1.50
05/28/2014	0.045	0.195	6.3	42.2	27.7	855	0.157	5.13
06/10/2014	0.040	0.097	4.6	14.6	19.9	291	0.086	1.54
07/15/2014	0.037	0.071	4.3	11.6	26.5	223	0.113	1.29
08/12/2014	0.035	0.044	3.9	6.2	43.0	97.3	0.225	0.59

Date	Manganese, filtered (µg/L)	Manganese, unfiltered recoverable (µg/L)	Zinc, filtered (µg/L)	Zinc, unfiltered recoverable (µg/L)	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/05/2013	64.8	96.4	2.7	8.2	10.4	12.7	94	5	1.5
03/25/2014	126	162	5.2	17.0	11.6	13.6	90	6	1.4
04/22/2014	93.6	220	2.9	30.6	11.8	13.9	88	11	5.4
05/13/2014	56.3	93.7	4.0	13.3	14.3	15.4	79	5	3.6
05/28/2014	41.5	163	2.3	24.9	12.6	20.8	68	42	61
06/10/2014	34.4	76.7	<2.0	9.9	11.6	15.6	68	11	12
07/15/2014	42.0	85.0	<2.0	7.1	14.6	15.7	87	7	3.7
08/12/2014	38.0	60.1	2.2	3.9	18.0	19.1	47	6	1.4

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2013 through September 2014.—Continued

[hh, hour; mm, minute; ft^3/s, cubic foot per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; --, no data; <, less than laboratory reporting level; E, estimated; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day]

12323840—Lost Creek near Anaconda									
Date	Time (hhmm)	Streamflow, instantaneous (ft^3/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Water temperature, onsite (°C)	Turbidity, unfiltered, lab (NTRU)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/04/2013	1630	5.7	8.2	237	2.5	<2.0	119	35.2	7.47
03/24/2014	1710	5.5	8.2	237	4.0	<2.0	112	33.0	7.21
04/22/2014	0745	8.3	8.1	223	6.0	<2.0	110	32.2	7.14
05/13/2014	0840	5.8	7.8	202	4.0	<2.0	96.2	29.4	5.52
05/28/2014	0740	35	7.8	130	5.0	E9.4	61.0	18.9	3.35
06/10/2014	0740	31	7.8	149	6.0	E2.0	71.7	22.2	3.93
07/15/2014	0740	13	8.0	206	10.0	<2.0	103	31.6	5.92
08/12/2014	0735	15	8.0	223	10.0	<2.0	112	34.1	6.54

Date	Potassium, filtered (mg/L)	Sodium, filtered (mg/L)	Alkalinity, filtered, lab (mg/L)	Chloride, filtered (mg/L)	Fluoride, filtered (mg/L)	Silica, filtered (mg/L)	Sulfate, filtered (µg/L)	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)
11/04/2013	1.37	3.62	110	0.92	0.47	12.3	13.3	0.037	0.037
03/24/2014	1.46	3.63	110	1.05	0.49	11.3	13.8	<0.030	0.040
04/22/2014	1.30	3.01	102	0.96	0.45	10.9	11.9	<0.030	0.049
05/13/2014	1.25	2.86	92.8	0.83	0.39	10.9	10.2	0.031	0.047
05/28/2014	0.95	1.87	59.5	0.51	0.28	9.69	5.93	<0.030	0.123
06/10/2014	0.88	1.91	69.8	0.54	0.29	9.65	5.89	<0.030	0.044
07/15/2014	1.25	2.77	99.3	0.71	0.38	11.1	6.99	<0.030	0.031
08/12/2014	1.30	2.77	108	0.70	0.39	11.5	8.04	<0.030	0.039

Date	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)	Lead, filtered (µg/L)	Lead, unfiltered recoverable (µg/L)	Manganese, filtered (µg/L)	Manganese, unfiltered recoverable (µg/L)
11/04/2013	1.5	2.7	5.8	42.6	<0.040	0.18	1.83	2.1
03/24/2014	1.3	5.2	6.6	115	<0.040	0.55	0.82	4.1
04/22/2014	1.6	6.3	7.1	218	<0.040	0.81	1.04	6.7
05/13/2014	1.4	6.8	5.7	146	<0.040	0.56	0.90	5.1
05/28/2014	2.6	20.7	24.1	994	0.064	3.51	2.22	25.3
06/10/2014	2.0	8.9	14.0	284	<0.040	1.06	1.38	8.0
07/15/2014	1.7	3.6	14.5	109	<0.040	0.35	2.24	6.1
08/12/2014	2.6	4.4	12.1	160	<0.040	0.64	1.43	7.7

Date	Zinc, filtered (µg/L)	Zinc, unfiltered recoverable (µg/L)	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Organic carbon, filtered (mg/L)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/04/2013	2.0	<2.0	3.0	3.4	1.05	88	1	0.02
03/24/2014	<2.0	2.5	3.4	3.9	0.90	76	4	0.06
04/22/2014	<2.0	3.5	3.0	3.8	1.43	68	13	0.29
05/13/2014	<2.0	3.3	2.7	3.1	2.09	63	6	0.09
05/28/2014	<2.0	11.5	3.1	6.1	3.84	41	65	6.1
06/10/2014	<2.0	3.5	3.3	4.6	2.79	31	16	1.3
07/15/2014	<2.0	2.1	5.2	5.5	1.81	51	4	0.14
08/12/2014	<2.0	2.4	3.6	3.9	1.18	62	8	0.32

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2013 through September 2014.—Continued

[hh, hour; mm, minute; ft^3/s, cubic foot per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; --, no data; <, less than laboratory reporting level; E, estimated; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day]

12323850—Lost Creek near Galen									
Date	Time (hhmm)	Streamflow, instantaneous (ft^3/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Water temperature, onsite (°C)	Turbidity, unfiltered, lab (NTRU)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/05/2013	1450	39	8.3	605	1.5	--	285	83.8	18.5
03/25/2014	1145	46	8.2	625	4.0	E5.4	317	92.0	21.1
04/22/2014	1210	44	8.3	604	10.0	<2.0	302	88.1	19.8
05/13/2014	1300	E46	8.4	597	10.0	E2.3	305	89.6	19.8
05/28/2014	1225	32	8.5	568	13.0	<2.0	294	85.1	19.8
06/10/2014	1130	16	8.3	596	13.0	<2.0	299	85.4	20.9
07/15/2014	1125	5.3	8.2	624	17.0	<2.0	292	81.0	21.8
08/12/2014	1205	1.9	8.0	637	17.0	<2.0	282	74.3	23.4

Date	Potassium, filtered (mg/L)	Sodium, filtered (mg/L)	Alkalinity, filtered, lab (mg/L)	Chloride, filtered (mg/L)	Fluoride, filtered (mg/L)	Silica, filtered (mg/L)	Sulfate, filtered (µg/L)	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)
11/05/2013	--	--	--	--	--	--	--	<0.030	<0.030
03/25/2014	2.43	12.8	188	4.82	0.48	16.2	146	<0.030	0.072
04/22/2014	2.09	11.6	182	4.83	0.48	14.0	140	<0.030	0.039
05/13/2014	2.07	11.5	178	4.70	0.44	11.7	135	0.032	0.051
05/28/2014	2.05	10.1	166	3.90	0.49	14.0	138	<0.030	0.031
06/10/2014	2.30	11.1	176	3.94	0.54	14.2	142	<0.030	<0.090
07/15/2014	3.04	21.4	196	5.62	0.67	17.6	134	<0.030	<0.030
08/12/2014	3.68	31.5	213	5.61	0.77	19.6	122	0.031	<0.030

Date	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)	Lead, filtered (µg/L)	Lead, unfiltered recoverable (µg/L)	Manganese, filtered (µg/L)	Manganese, unfiltered recoverable (µg/L)
11/05/2013	<0.80	1.5	4.0	26.2	<0.040	0.16	2.34	2.7
03/25/2014	0.92	9.4	11.6	290	0.057	1.50	28.8	41.9
04/22/2014	1.3	3.5	11.0	88.0	<0.040	0.37	15.6	19.9
05/13/2014	1.4	5.2	11.0	141	<0.040	0.63	17.3	24.7
05/28/2014	3.0	5.0	16.5	94.8	0.042	0.32	15.3	20.5
06/10/2014	1.9	3.5	14.2	59.1	<0.040	0.21	10.8	14.0
07/15/2014	1.4	3.0	13.9	62.0	<0.040	0.19	15.2	20.3
08/12/2014	1.8	3.4	29.6	87.9	0.075	0.27	36.9	43.1

Date	Zinc, filtered (µg/L)	Zinc, unfiltered recoverable (µg/L)	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Organic carbon, filtered (mg/L)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/05/2013	<2.0	<2.0	7.4	8.7	--	79	12	1.3
03/25/2014	<2.0	6.4	12.4	13.6	1.48	94	14	1.7
04/22/2014	<2.0	3.0	12.6	12.3	1.62	46	15	1.8
05/13/2014	<2.0	3.4	10.3	11.5	1.71	54	15	1.9
05/28/2014	<2.0	<2.0	16.4	19.2	3.09	70	5	0.43
06/10/2014	<2.0	<6.0	15.3	18.1	2.82	79	15	0.65
07/15/2014	<2.0	<2.0	15.1	15.1	2.25	61	14	0.20
08/12/2014	<2.0	2.0	13.0	13.6	3.25	70	10	0.05

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2013 through September 2014.—Continued

[hh, hour; mm, minute; ft^3/s, cubic foot per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; --, no data; <, less than laboratory reporting level; E, estimated; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day]

12324200—Clark Fork at Deer Lodge								
Date	Time (hhmm)	Streamflow, instantaneous (ft^3/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Water temperature, onsite (°C)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/06/2013	0810	212	8.1	511	1.0	225	65.5	15.0
03/25/2014	1355	250	8.2	521	6.0	228	66.5	14.9
04/22/2014	1425	282	8.4	487	10.5	206	60.5	13.4
05/13/2014	1520	353	8.8	417	12.0	185	54.7	11.7
05/28/2014	1535	691	8.1	256	14.0	107	32.2	6.38
06/10/2014	1435	419	8.3	275	15.0	122	36.5	7.49
07/15/2014	1405	208	8.7	342	20.0	154	46.1	9.52
08/12/2014	1405	112	8.6	430	19.5	195	58.3	12.1

Date	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)	Lead, filtered (µg/L)	Lead, unfiltered recoverable (µg/L)
11/06/2013	0.041	0.097	4.7	13.6	6.2	230	<0.040	1.62
03/25/2014	0.064	0.377	6.1	50.2	18.3	790	0.169	6.90
04/22/2014	0.063	0.216	6.2	37.1	8.3	588	0.083	4.95
05/13/2014	0.056	0.152	7.6	27.8	14.4	444	0.126	3.39
05/28/2014	0.067	0.507	12.5	201	33.4	2,640	0.363	20.7
06/10/2014	0.065	0.215	8.9	62.6	20.2	787	0.195	6.58
07/15/2014	0.059	0.074	7.4	15.1	22.2	140	0.199	1.24
08/12/2014	0.048	0.060	7.0	11.8	13.6	82.6	0.121	0.78

Date	Manganese, filtered (µg/L)	Manganese, unfiltered recoverable (µg/L)	Zinc, filtered (µg/L)	Zinc, unfiltered recoverable (µg/L)	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/06/2013	29.9	54.2	8.2	16.4	7.7	9.9	90	8	4.6
03/25/2014	66.1	131	8.1	40.1	11.7	16.9	82	30	20
04/22/2014	33.1	124	4.2	34.9	12.5	16.6	79	24	18
05/13/2014	24.0	76.1	3.4	24.4	13.8	16.6	73	18	17
05/28/2014	23.8	232	6.6	108	12.9	33.7	47	137	256
06/10/2014	19.7	101	4.4	37.1	14.4	22.5	66	34	38
07/15/2014	33.4	47.1	3.5	8.6	17.7	19.8	87	4	2.2
08/12/2014	14.6	34.8	2.7	6.5	16.8	17.7	90	2	0.60

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2013 through September 2014.—Continued

[hh, hour; mm, minute; ft^3/s, cubic foot per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; --, no data; <, less than laboratory reporting level; E, estimated; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day]

12324400—Clark Fork above Little Blackfoot River, near Garrison

Date	Time (hhmm)	Streamflow, instantaneous (ft^3/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Water temperature, onsite (°C)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/06/2013	0955	233	8.2	520	1.5	225	65.5	14.9
03/25/2014	1525	233	8.2	527	6.5	228	66.3	15.0
04/22/2014	1550	306	8.5	482	10.0	209	61.1	13.7
05/13/2014	1700	374	8.9	420	13.0	185	54.4	12.1
05/28/2014	1710	826	8.0	270	15.0	113	33.7	6.92
06/10/2014	1615	461	8.4	324	17.0	144	42.2	9.29
07/15/2014	1620	228	8.8	380	21.0	172	50.5	11.3
08/12/2014	1520	115	8.5	451	21.0	201	58.4	13.3

Date	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)	Lead, filtered (µg/L)	Lead, unfiltered recoverable (µg/L)
11/06/2013	0.032	0.120	2.8	17.7	5.5	278	<0.040	2.14
03/25/2014	0.062	0.283	6.2	58.9	15.1	919	0.172	7.94
04/22/2014	0.052	0.230	6.2	46.4	5.8	738	0.104	5.96
05/13/2014	0.053	0.155	7.4	34.6	11.2	541	0.110	4.17
05/28/2014	0.071	0.644	14.1	167	36.0	2,750	0.478	23.2
06/10/2014	0.069	0.248	10.1	54.7	19.1	797	0.216	6.82
07/15/2014	0.066	0.076	8.9	16.6	20.9	127	0.208	1.21
08/12/2014	0.042	0.047	7.2	11.1	9.5	58.4	0.076	0.55

Date	Manganese, filtered (µg/L)	Manganese, unfiltered recoverable (µg/L)	Zinc, filtered (µg/L)	Zinc, unfiltered recoverable (µg/L)	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/06/2013	34.8	78.1	6.1	19.5	7.8	10.5	82	16	10
03/25/2014	65.1	149	9.2	51.7	12.2	17.9	81	37	23
04/22/2014	35.8	136	3.2	42.3	13.2	16.7	71	36	30
05/13/2014	21.0	82.4	2.6	28.7	15.2	18.6	76	21	21
05/28/2014	22.3	252	7.8	130	14.3	35.1	70	125	279
06/10/2014	20.3	102	5.0	40.9	15.2	22.2	72	32	40
07/15/2014	31.0	45.7	3.2	8.8	19.6	19.8	88	3	1.8
08/12/2014	14.8	29.6	2.3	5.4	17.3	17.8	92	1	0.31

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2013 through September 2014.—Continued

[hh, hour; mm, minute; ft^3/s, cubic foot per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; --, no data; <, less than laboratory reporting level; E, estimated; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day]

12324680—Clark Fork at Goldcreek								
Date	Time (hhmm)	Streamflow, instantaneous (ft^3/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Water temperature, onsite (°C)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/06/2013	1105	345	8.3	449	3.0	190	55.6	12.4
03/25/2014	1645	446	8.3	456	7.0	196	57.4	12.9
04/23/2014	0800	1,100	8.0	306	5.0	128	38.3	7.87
05/14/2014	0805	992	8.1	302	8.0	130	39.2	7.85
05/29/2014	0820	1,840	8.0	216	10.0	98.5	29.6	5.96
06/11/2014	0840	908	8.2	293	12.0	133	39.8	8.23
07/15/2014	1525	457	8.4	357	20.0	164	48.5	10.3
08/12/2014	1620	204	8.5	395	19.5	175	51.3	11.5

Date	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)	Lead, filtered (µg/L)	Lead, unfiltered recoverable (µg/L)
11/06/2013	0.036	0.081	2.1	12.1	4.5	206	<0.040	1.47
03/25/2014	0.050	0.190	4.5	38.4	11.4	607	0.115	5.01
04/23/2014	0.034	0.379	4.3	74.9	57.7	2,670	0.183	15.6
05/14/2014	0.039	0.108	4.7	18.6	26.4	569	0.113	2.62
05/29/2014	0.040	0.280	9.5	69.2	46.2	1,460	0.309	9.63
06/11/2014	0.047	0.137	6.5	31.1	20.6	518	0.138	3.59
07/15/2014	0.049	0.062	5.6	10.9	15.3	168	0.109	0.89
08/12/2014	0.041	0.042	5.3	7.2	26.6	67.8	0.156	0.40

Date	Manganese, filtered (µg/L)	Manganese, unfiltered recoverable (µg/L)	Zinc, filtered (µg/L)	Zinc, unfiltered recoverable (µg/L)	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/06/2013	18.0	57.5	5.8	13.0	5.9	7.5	87	9	8.4
03/25/2014	41.1	96.2	6.1	32.7	9.2	12.6	86	22	26
04/23/2014	14.7	253	4.1	81.5	7.1	16.6	70	128	380
05/14/2014	13.3	55.8	3.4	18.5	8.3	9.8	74	23	62
05/29/2014	11.1	133	6.5	55.0	8.5	17.4	66	73	363
06/11/2014	12.8	66.3	6.1	23.9	10.0	14.3	83	18	44
07/15/2014	19.9	40.3	2.6	7.7	12.5	12.6	85	6	7.4
08/12/2014	15.8	28.8	3.4	4.2	11.5	11.6	65	2	1.1

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2013 through September 2014.—Continued

[hh, hour; mm, minute; ft^3/s, cubic foot per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; --, no data; <, less than laboratory reporting level; E, estimated; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day]

12331800—Clark Fork near Drummond

Date	Time (hhmm)	Streamflow, instantaneous (ft^3/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Water temperature, onsite (°C)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/06/2013	1315	514	8.3	469	5.0	213	60.9	14.9
03/26/2014	0830	695	8.1	468	6.0	210	60.3	14.5
04/23/2014	0945	1,280	8.1	331	6.5	146	41.6	10.2
05/14/2014	1000	1,250	8.2	327	9.5	142	42.1	9.04
05/29/2014	0955	2,130	8.0	243	12.0	109	32.6	6.75
06/11/2014	1040	1,110	8.2	342	14.0	156	45.2	10.4
07/16/2014	0755	637	8.2	420	17.5	197	57.0	13.3
08/13/2014	0815	324	8.1	516	17.0	244	69.0	17.4

Date	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)	Lead, filtered (µg/L)	Lead, unfiltered recoverable (µg/L)
11/06/2013	<0.030	0.067	1.9	8.0	<4.0	176	<0.040	1.31
03/26/2014	0.054	0.163	3.9	29.7	12.0	567	0.121	4.43
04/23/2014	0.040	0.252	4.0	41.8	26.9	1,480	0.141	8.14
05/14/2014	0.046	0.145	7.8	26.9	20.2	697	0.137	3.80
05/29/2014	0.050	0.370	9.7	79.1	48.4	1,960	0.364	12.8
06/11/2014	0.058	0.145	6.7	27.3	15.6	461	0.130	3.20
07/16/2014	0.046	0.061	5.2	9.8	11.8	181	0.113	1.04
08/13/2014	0.035	0.049	3.5	5.7	6.6	62.3	0.048	0.43

Date	Manganese, filtered (µg/L)	Manganese, unfiltered recoverable (µg/L)	Zinc, filtered (µg/L)	Zinc, unfiltered recoverable (µg/L)	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/06/2013	13.0	42.4	4.0	11.7	6.4	7.7	78	11	15
03/26/2014	33.0	89.7	7.5	30.6	8.9	11.8	80	25	47
04/23/2014	12.5	160	4.4	58.3	7.7	12.5	64	80	276
05/14/2014	15.3	78.7	4.2	29.8	8.5	11.5	68	33	111
05/29/2014	10.2	192	6.7	86.8	9.0	19.1	58	117	673
06/11/2014	14.6	64.9	5.0	22.8	10.0	13.8	69	21	63
07/16/2014	15.6	41.9	3.8	9.2	12.8	13.3	87	7	12
08/13/2014	11.9	32.0	3.4	5.7	11.5	11.9	87	2	1.7

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2013 through September 2014.—Continued

[hh, hour; mm, minute; ft^3/s, cubic foot per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; --, no data; <, less than laboratory reporting level; E, estimated; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day]

12334550—Clark Fork at Turah Bridge, near Bonner								
Date	Time (hhmm)	Streamflow, instantaneous (ft^3/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Water temperature, onsite (°C)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/07/2013	1110	796	8.3	385	4.5	169	47.6	12.2
03/26/2014	1040	1,150	8.2	378	6.0	169	47.2	12.3
04/23/2014	1140	2,580	8.1	232	7.0	97.4	27.8	6.77
05/14/2014	1200	2,970	8.1	214	9.0	83.6	22.9	6.42
05/29/2014	1140	6,030	7.9	140	10.0	60.1	17.3	4.11
06/11/2014	1230	3,250	8.1	181	13.0	81.2	23.0	5.77
07/16/2014	0945	1,400	8.2	285	16.0	131	37.2	9.27
08/13/2014	0950	665	8.3	324	16.0	154	43.0	11.4

Date	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)	Lead, filtered (µg/L)	Lead, unfiltered recoverable (µg/L)
11/07/2013	<0.030	0.047	1.3	6.0	<4.0	134	<0.040	0.87
03/26/2014	0.037	0.104	2.7	16.0	11.7	356	0.078	2.54
04/23/2014	<0.030	0.139	2.9	23.1	37.6	973	0.108	4.24
05/14/2014	0.032	0.093	3.2	13.5	37.3	448	0.114	2.09
05/29/2014	0.036	0.214	5.5	37.3	47.1	1,290	0.189	5.86
06/11/2014	0.033	0.071	3.2	11.0	23.2	396	0.083	1.67
07/16/2014	0.031	0.040	3.0	8.2	14.3	107	<0.040	0.52
08/13/2014	<0.030	0.045	2.0	4.1	6.6	70.9	<0.040	0.42

Date	Manganese, filtered (µg/L)	Manganese, unfiltered recoverable (µg/L)	Zinc, filtered (µg/L)	Zinc, unfiltered recoverable (µg/L)	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/07/2013	4.09	25.0	3.7	9.6	4.5	5.8	85	7	15
03/26/2014	15.9	53.3	5.2	21.0	6.1	7.4	79	16	50
04/23/2014	7.03	87.3	3.0	38.3	4.5	6.8	60	56	390
05/14/2014	7.04	42.3	3.3	17.7	4.5	5.8	68	23	184
05/29/2014	9.64	107	5.2	52.5	4.2	8.7	47	106	1,730
06/11/2014	9.24	37.1	2.9	14.2	4.0	5.9	57	25	219
07/16/2014	6.41	19.4	2.3	5.2	6.6	6.7	64	6	23
08/13/2014	5.79	20.8	<2.0	5.2	5.6	5.8	88	3	5.4

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2013 through September 2014.—Continued

[hh, hour; mm, minute; ft^3/s, cubic foot per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; --, no data; <, less than laboratory reporting level; E, estimated; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day]

12340000—Blackfoot River near Bonner								
Date	Time (hhmm)	Streamflow, instantaneous (ft^3/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Water temperature, onsite (°C)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/07/2013	0940	515	8.2	269	3.0	130	32.9	11.6
04/23/2014	1420	3,650	8.2	158	6.0	73.3	19.4	6.02
05/14/2014	1430	4,760	8.2	171	9.0	76.2	19.2	6.83
05/29/2014	1410	10,000	8.1	151	11.0	74.1	20.0	5.87
07/16/2014	1200	1,810	8.4	214	17.5	108	27.8	9.45
08/13/2014	1155	815	8.5	256	17.5	135	33.7	12.3

Date	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)	Lead, filtered (µg/L)	Lead, unfiltered recoverable (µg/L)
11/07/2013	<0.030	<0.030	<0.80	<0.80	<4.0	30.6	<0.040	<0.04
04/23/2014	<0.030	<0.030	<0.80	1.7	44.1	543	<0.040	0.50
05/14/2014	<0.030	<0.030	<0.80	2.3	23.4	262	<0.040	0.33
05/29/2014	<0.030	<0.030	0.88	2.9	30.2	823	<0.040	0.94
07/16/2014	<0.030	<0.030	<0.80	<0.80	9.1	80.9	<0.040	0.09
08/13/2014	<0.030	<0.030	1.2	<0.80	4.9	38.6	<0.040	0.05

Date	Manganese, filtered (µg/L)	Manganese, unfiltered recoverable (µg/L)	Zinc, filtered (µg/L)	Zinc, unfiltered recoverable (µg/L)	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/07/2013	1.52	2.6	<2.0	<2.0	0.90	1.1	75	2	2.8
04/23/2014	3.65	43.6	<2.0	2.6	0.80	1.1	84	33	325
05/14/2014	2.54	17.7	<2.0	2.2	0.78	1.1	86	17	218
05/29/2014	3.53	44.8	<2.0	4.6	0.79	1.7	76	73	1,970
07/16/2014	1.45	7.4	<2.0	<2.0	1.1	1.2	89	5	24
08/13/2014	1.60	5.4	<2.0	<2.0	1.2	1.2	90	2	4.4

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2013 through September 2014.—Continued

[hh, hour; mm, minute; ft^3/s, cubic foot per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; --, no data; <, less than laboratory reporting level; E, estimated; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day]

12340500—Clark Fork above Missoula								
Date	Time (hhmm)	Streamflow, instantaneous (ft^3/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Water temperature, onsite (°C)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/07/2013	0750	1,280	8.3	341	3.5	154	42.0	12.0
03/26/2014	1330	1,880	8.4	322	6.0	147	39.8	11.5
04/23/2014	1620	6,310	8.1	189	7.0	83.4	23.0	6.31
05/14/2014	1610	7,650	8.2	188	10.0	85.9	23.6	6.54
05/29/2014	1550	16,600	8.0	148	11.0	70.7	19.6	5.30
06/11/2014	1430	9,340	8.2	168	13.0	81.5	21.9	6.54
07/16/2014	1345	3,290	8.4	244	18.0	117	31.5	9.30
08/13/2014	1345	1,500	8.5	282	18.0	141	37.3	11.7

Date	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)	Lead, filtered (µg/L)	Lead, unfiltered recoverable (µg/L)
11/07/2013	<0.030	0.035	1.0	3.7	4.5	172	<0.040	0.55
03/26/2014	<0.030	0.066	1.8	8.8	13.0	259	0.057	1.60
04/23/2014	<0.030	0.067	1.8	11.6	49.0	770	0.088	2.36
05/14/2014	<0.030	0.040	1.9	9.7	27.5	333	0.060	1.00
05/29/2014	<0.030	0.096	2.9	14.8	38.5	1,010	0.105	2.79
06/11/2014	<0.030	0.046	1.7	4.8	20.7	290	0.041	0.71
07/16/2014	<0.030	<0.030	1.5	2.8	9.9	76.7	<0.040	0.23
08/13/2014	<0.030	<0.030	1.5	2.0	5.2	40.9	<0.040	0.16

Date	Manganese, filtered (µg/L)	Manganese, unfiltered recoverable (µg/L)	Zinc, filtered (µg/L)	Zinc, unfiltered recoverable (µg/L)	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/07/2013	5.68	19.5	2.8	6.2	3.0	3.8	95	4	14
03/26/2014	13.5	36.4	2.9	11.8	4.1	5.1	84	11	56
04/23/2014	6.72	65.4	<2.0	18.0	2.5	3.7	67	50	852
05/14/2014	5.88	28.1	<2.0	8.9	2.5	3.0	79	18	372
05/29/2014	8.01	68.2	2.3	21.9	2.1	4.2	66	85	3,810
06/11/2014	6.54	24.3	<2.0	6.2	2.1	2.9	76	19	479
07/16/2014	5.41	14.6	<2.0	2.5	3.6	4.0	82	4	36
08/13/2014	5.59	14.0	<2.0	2.3	3.1	3.4	82	2	8.1

Table 5. Daily mean streamflow and suspended-sediment data for Clark Fork at Deer Lodge, Montana (12324200), October 2013 through September 2014.

[ft^3/s, cubic foot per second; mg/L, milligram per liter; ton/d, ton per day; e, estimated; --, no data or value not computed; max, maximum; min, minimum]

Day	Mean streamflow (ft^3/s)	Suspended sediment		Mean streamflow (ft^3/s)	Suspended sediment		Mean streamflow (ft^3/s)	Suspended sediment	
		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)
	October			November			December		
1	181	10	4.9	218	19	11	227	39	24
2	191	10	5.1	223	20	12	233	40	25
3	196	10	5.1	225	17	10	187	41	21
4	202	10	5.2	216	13	7.8	145	42	16
5	202	9	5.2	209	10	5.8	e120	40	13
6	201	9	5.1	216	13	7.6	e120	37	12
7	202	9	5.0	227	22	13	e110	34	10
8	201	9	4.9	235	21	14	e110	32	9.4
9	202	9	4.9	228	19	12	e120	33	11
10	208	9	5.0	222	20	12	e130	36	13
11	209	9	4.9	227	20	12	e150	39	16
12	213	9	5.0	223	19	12	187	40	20
13	220	9	5.1	226	19	11	164	27	12
14	219	8	5.0	222	18	11	164	21	9.4
15	218	8	4.9	225	19	12	171	24	11
16	213	8	4.7	225	21	13	184	27	14
17	223	8	4.8	218	22	13	e170	28	13
18	218	8	4.9	215	24	14	e170	28	13
19	214	9	5.1	214	26	15	e170	28	13
20	208	9	5.3	223	28	17	e170	28	13
21	205	10	5.5	201	30	16	190	29	15
22	204	10	5.6	197	32	17	191	30	15
23	204	10	5.8	203	35	19	196	31	16
24	201	11	5.8	208	38	21	207	32	18
25	201	11	6.0	197	41	22	e180	31	15
26	206	12	6.9	205	43	24	192	31	16
27	212	14	8.1	211	43	24	203	30	16
28	205	16	8.8	217	41	24	198	29	16
29	200	18	9.5	215	40	23	204	29	16
30	208	18	10	222	38	23	195	28	15
31	216	19	11	--	--	--	198	28	15
Total[1]	**6,403**	**--**	**183.1**	**6,513**	**--**	**448.2**	**5,356**	**--**	**461.8**
Mean	**207**	**11**	**5.9**	**217**	**26**	**15**	**173**	**32**	**15**
Max	**223**	**19**	**11**	**235**	**43**	**24**	**233**	**42**	**25**
Min	**181**	**8**	**4.7**	**197**	**10**	**5.8**	**110**	**21**	**9.4**

Table 5. Daily mean streamflow and suspended-sediment data for Clark Fork at Deer Lodge, Montana (12324200), October 2013 through September 2014.—Continued

[ft³/s, cubic foot per second; mg/L, milligram per liter; ton/d, ton per day; e, estimated; --, no data or value not computed; max, maximum; min, minimum]

Day	Mean streamflow (ft³/s)	Suspended sediment		Mean streamflow (ft³/s)	Suspended sediment		Mean streamflow (ft³/s)	Suspended sediment	
		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)
	January			February			March		
1	195	27	14	e160	20	8.7	e90	131	32
2	192	27	14	e150	22	9.0	e130	131	46
3	198	27	15	e130	24	8.6	207	131	73
4	197	28	15	e120	26	8.6	254	128	88
5	184	28	14	e105	28	8.0	244	107	70
6	168	28	13	e100	30	8.0	581	536	841
7	190	28	14	e150	42	17	490	284	376
8	195	27	14	e180	51	25	405	141	154
9	204	27	15	e180	42	21	409	260	287
10	199	28	15	e180	30	15	551	263	391
11	197	29	15	e160	25	11	591	136	218
12	201	29	16	e150	33	13	513	76	105
13	196	30	16	177	52	25	419	55	63
14	196	28	15	186	63	32	368	47	47
15	198	25	13	184	71	35	345	43	40
16	197	22	12	198	74	40	333	48	43
17	193	20	10	209	75	43	338	48	44
18	192	19	10	199	71	38	320	45	39
19	192	19	10	191	66	34	314	42	36
20	187	20	10	196	60	32	306	39	32
21	183	20	9.8	185	55	28	287	32	25
22	188	20	9.9	190	58	30	271	33	24
23	183	19	9.4	182	71	35	263	32	23
24	182	19	9.1	164	100	44	254	34	23
25	186	18	9.1	e160	125	54	246	31	21
26	182	17	8.5	e150	133	54	252	29	20
27	176	17	7.9	e150	132	54	255	30	21
28	166	16	7.1	e140	132	50	253	32	22
29	186	15	7.7	--	--	--	264	31	22
30	e180	16	8.0	--	--	--	275	34	25
31	e170	18	8.4	--	--	--	271	28	20
Total[1]	**5,853**	**--**	**364.9**	**4,626**	**--**	**780.9**	**10,099**	**--**	**3,271**
Mean	**189**	**23**	**12**	**165**	**61**	**28**	**326**	**98**	**106**
Max	**204**	**30**	**16**	**209**	**133**	**54**	**591**	**536**	**841**
Min	**166**	**15**	**7.1**	**100**	**20**	**8.0**	**90**	**28**	**20**

Table 5. Daily mean streamflow and suspended-sediment data for Clark Fork at Deer Lodge, Montana (12324200), October 2013 through September 2014.—Continued

[ft^3/s, cubic foot per second; mg/L, milligram per liter; ton/d, ton per day; e, estimated; --, no data or value not computed; max, maximum; min, minimum]

Day	Mean streamflow (ft^3/s)	Suspended sediment		Mean streamflow (ft^3/s)	Suspended sediment		Mean streamflow (ft^3/s)	Suspended sediment	
		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)
		April			May			June	
1	274	21	16	334	32	29	585	67	107
2	269	18	13	337	38	35	538	70	101
3	263	18	13	361	42	41	509	60	82
4	262	17	12	399	54	58	507	53	73
5	259	18	13	420	56	63	510	41	57
6	260	24	17	423	58	67	501	33	44
7	264	61	43	401	38	41	475	35	44
8	269	74	54	394	32	34	438	34	40
9	327	58	51	384	30	31	416	27	30
10	367	66	66	380	27	27	408	26	28
11	361	43	42	391	21	22	399	26	28
12	346	32	30	370	18	18	348	23	22
13	327	35	31	348	17	16	354	42	40
14	313	30	25	365	16	15	398	34	36
15	295	25	20	354	17	16	388	22	24
16	258	18	13	360	34	33	382	33	34
17	250	15	10	419	74	84	450	71	86
18	259	16	11	458	123	152	469	23	30
19	263	16	11	530	70	100	443	64	77
20	269	20	14	536	57	82	439	53	63
21	270	21	15	525	86	122	495	113	151
22	288	34	26	541	152	223	515	63	88
23	339	29	27	582	187	294	519	46	64
24	324	22	19	621	175	294	494	34	45
25	310	70	58	669	180	324	524	33	47
26	406	61	67	668	154	278	626	28	48
27	396	48	52	682	140	258	725	21	41
28	353	31	30	698	137	258	741	19	38
29	325	25	22	668	98	177	683	19	34
30	329	29	25	665	101	182	602	15	24
31	--	--	--	616	76	127	--	--	--
Total[1]	**9,095**	**--**	**846**	**14,899**	**--**	**3,501**	**14,881**	**--**	**1,626**
Mean	**303**	**33**	**28**	**481**	**75**	**113**	**496**	**41**	**54**
Max	**406**	**74**	**67**	**698**	**187**	**324**	**741**	**113**	**151**
Min	**250**	**15**	**10**	**334**	**16**	**15**	**348**	**15**	**22**

Table 5. Daily mean streamflow and suspended-sediment data for Clark Fork at Deer Lodge, Montana (12324200), October 2013 through September 2014.—Continued

[ft³/s, cubic foot per second; mg/L, milligram per liter; ton/d, ton per day; e, estimated; --, no data or value not computed; max, maximum; min, minimum]

Day	Mean streamflow (ft³/s)	Suspended sediment		Mean streamflow (ft³/s)	Suspended sediment		Mean streamflow (ft³/s)	Suspended sediment	
		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)
		July			August			September	
1	532	13	18	120	3	0.97	262	6	4.4
2	473	16	20	120	3	1.0	252	6	4.1
3	426	22	25	124	3	1.2	236	6	3.8
4	456	20	24	121	4	1.2	222	6	3.6
5	449	9	11	118	4	1.3	225	6	3.6
6	417	7	7.4	123	5	1.5	223	6	3.6
7	376	4	4.1	130	5	1.9	219	6	3.5
8	344	4	3.9	124	7	2.2	214	6	3.5
9	316	7	6.0	126	10	3.3	198	6	3.2
10	281	5	3.9	122	9	2.8	221	6	3.3
11	255	4	2.5	115	4	1.3	246	5	3.4
12	229	4	2.3	113	4	1.2	258	5	3.2
13	214	3	1.6	130	85	30	252	4	2.8
14	196	2	1.1	160	82	35	249	5	3.1
15	207	3	1.6	176	34	16	241	7	4.3
16	257	3	2.4	217	14	8.2	257	9	6.0
17	234	3	1.6	190	8	3.9	242	11	6.9
18	204	2	1.1	173	9	4.0	239	10	6.7
19	193	2	1.0	158	9	3.9	213	10	5.6
20	176	1	0.63	152	11	4.5	200	9	4.8
21	169	2	0.80	162	24	11	196	8	4.3
22	166	3	1.3	182	61	30	194	8	4.0
23	172	9	4.1	284	114	88	194	7	3.7
24	170	5	2.3	441	28	33	190	7	3.4
25	160	3	1.4	413	13	15	186	6	3.1
26	154	2	0.95	378	12	12	190	6	3.1
27	154	2	0.84	348	11	9.9	212	6	3.4
28	143	3	1.0	319	9	8.2	225	6	3.7
29	138	3	1.1	289	8	6.5	227	7	4.0
30	128	3	1.0	272	7	5.3	237	7	4.4
31	123	3	1.0	267	7	5.0	--	--	--
Total[1]	**7,912**	**--**	**154.92**	**6,167**	**--**	**349.27**	**6,720**	**--**	**120.5**
Mean	**255**	**6**	**5.0**	**199**	**20**	**11**	**224**	**7**	**4.0**
Max	**532**	**22**	**25**	**441**	**114**	**88**	**262**	**11**	**6.9**
Min	**123**	**1**	**0.63**	**113**	**3**	**0.97**	**186**	**4**	**2.8**

[1]Total for water year 2014 (unrounded sum of daily values): streamflow=98,524 ft³/s (annual runoff=195,400 acre-feet); suspended-sediment discharge=12,107.59 tons.

Table 6. Daily mean streamflow and suspended-sediment data for Clark Fork at Turah Bridge, near Bonner, Montana (12334550), October 2013 through September 2014.

[ft^3/s, cubic foot per second; mg/L, milligram per liter; ton/d, ton per day; e, estimated; --, no data or value not computed; max, maximum; min, minimum]

Day	Mean streamflow (ft^3/s)	Suspended sediment		Mean streamflow (ft^3/s)	Suspended sediment		Mean streamflow (ft^3/s)	Suspended sediment	
		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)
	October			November			December		
1	910	27	65	806	10	21	780	8	17
2	875	26	61	810	9	21	839	8	19
3	846	25	57	823	9	20	792	9	18
4	849	24	55	818	9	20	681	9	16
5	846	23	53	794	9	18	e390	9	9.5
6	841	22	51	781	8	17	e280	9	7.0
7	841	22	49	806	8	18	e250	10	6.5
8	836	21	47	837	8	18	e255	10	6.8
9	844	20	45	848	8	19	e270	10	7.5
10	845	19	43	826	8	19	e310	11	9.1
11	845	18	41	813	9	19	e380	11	12
12	849	17	39	811	9	19	e440	13	15
13	849	16	37	805	9	19	e520	15	21
14	849	15	35	806	9	19	e590	19	30
15	851	15	34	799	9	19	e620	23	39
16	850	14	33	805	8	18	e640	28	49
17	840	14	31	802	8	17	e660	31	55
18	843	13	30	778	7	16	e690	28	52
19	841	13	29	770	7	15	700	22	41
20	834	12	28	778	7	14	e650	14	24
21	820	12	27	760	6	13	649	8	14
22	807	12	26	668	6	11	651	10	17
23	802	12	25	678	6	11	683	12	22
24	795	11	24	675	6	12	699	11	20
25	793	11	24	676	7	12	673	9	17
26	787	11	23	680	7	13	645	9	15
27	783	11	23	691	7	13	661	8	15
28	783	11	22	699	7	14	679	9	16
29	780	10	22	673	8	14	677	9	17
30	745	10	21	744	8	16	658	10	18
31	792	10	21	--	--	--	686	11	20
Total[1]	**25,671**	**--**	**1,121**	**23,060**	**--**	**495**	**18,098**	**--**	**645.4**
Mean	**828**	**16**	**36**	**769**	**8**	**16**	**584**	**13**	**21**
Max	**910**	**27**	**65**	**848**	**10**	**21**	**839**	**31**	**55**
Min	**745**	**10**	**21**	**668**	**6**	**11**	**250**	**8**	**6.5**

Table 6. Daily mean streamflow and suspended-sediment data for Clark Fork at Turah Bridge, near Bonner, Montana (12334550), October 2013 through September 2014.—Continued

[ft³/s, cubic foot per second; mg/L, milligram per liter; ton/d, ton per day; e, estimated; --, no data or value not computed; max, maximum; min, minimum]

Day	Mean streamflow (ft³/s)	Suspended sediment		Mean streamflow (ft³/s)	Suspended sediment		Mean streamflow (ft³/s)	Suspended sediment	
		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)
		January			February			March	
1	696	10	19	e470	5	6.4	e480	4	5.8
2	679	10	18	e480	4	5.8	e400	5	4.9
3	703	10	19	e460	4	4.9	e400	6	6.3
4	699	10	18	e470	3	4.4	e500	8	11
5	e580	9	13	e440	3	3.9	768	13	27
6	e460	7	9.0	e320	4	3.2	991	69	185
7	e500	7	9.0	e300	4	3.6	2,120	269	1,540
8	540	7	11	e390	7	7.3	2,310	333	2,080
9	672	9	16	e420	13	14	2,040	164	902
10	687	10	18	e460	20	25	3,190	553	4,770
11	682	10	18	e480	29	37	3,820	354	3,650
12	708	9	18	e510	38	53	2,770	180	1,350
13	697	9	17	e560	49	74	2,140	90	520
14	733	10	20	e590	56	89	1,930	61	320
15	733	11	22	e600	47	76	1,750	47	222
16	707	12	22	e630	25	43	1,690	44	202
17	668	11	20	e650	13	23	1,840	60	299
18	657	10	18	672	12	22	1,720	53	244
19	638	9	16	687	12	22	1,490	29	117
20	655	9	16	670	10	18	1,410	25	96
21	624	9	15	648	8	14	1,330	23	82
22	621	9	15	630	6	11	1,240	20	68
23	650	9	15	620	7	12	1,190	18	59
24	624	8	14	e600	9	14	1,160	18	56
25	604	8	13	e540	9	14	1,140	18	54
26	611	8	13	e490	8	11	1,170	17	53
27	596	7	12	e480	7	8.9	1,240	21	71
28	e540	7	10	e480	5	7.0	1,220	18	60
29	e520	7	9.4	--	--	--	1,280	18	62
30	e620	6	11	--	--	--	1,460	26	103
31	e540	6	8.5	--	--	--	1,400	23	87
Total[1]	**19,644**	**--**	**472.9**	**14,747**	**--**	**627.4**	**47,589**	**--**	**17,307**
Mean	**634**	**9**	**15**	**527**	**15**	**22**	**1,535**	**83**	**558**
Max	**733**	**12**	**22**	**687**	**56**	**89**	**3,820**	**553**	**4,770**
Min	**460**	**6**	**8.5**	**300**	**3**	**3.2**	**400**	**4**	**4.9**

Table 6. Daily mean streamflow and suspended-sediment data for Clark Fork at Turah Bridge, near Bonner, Montana (12334550), October 2013 through September 2014.—Continued

[ft^3/s, cubic foot per second; mg/L, milligram per liter; ton/d, ton per day; e, estimated; --, no data or value not computed; max, maximum; min, minimum]

Day	Mean streamflow (ft^3/s)	Suspended sediment		Mean streamflow (ft^3/s)	Suspended sediment		Mean streamflow (ft^3/s)	Suspended sediment	
		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)
		April			May			June	
1	1,330	16	59	2,380	37	235	5,070	67	916
2	1,310	15	53	2,680	64	466	4,840	64	832
3	1,300	14	49	3,370	136	1,240	4,670	63	798
4	1,300	14	51	4,320	185	2,160	4,520	58	707
5	1,340	15	56	4,830	199	2,600	4,390	51	605
6	1,340	15	53	4,690	135	1,700	4,260	54	623
7	1,390	17	65	4,380	96	1,130	4,030	43	473
8	1,630	36	158	3,970	67	723	3,720	41	407
9	2,150	112	651	3,750	56	570	3,490	33	310
10	2,520	149	1,010	3,690	49	484	3,410	34	314
11	2,380	84	541	3,630	41	401	3,280	28	251
12	2,390	68	437	3,380	34	306	3,090	26	220
13	2,310	58	360	3,140	31	261	3,000	25	206
14	2,060	37	207	2,960	25	203	2,980	23	185
15	1,960	32	169	3,000	27	222	2,870	22	169
16	1,900	26	136	3,330	37	331	2,730	20	148
17	1,800	20	99	3,880	61	643	2,890	26	201
18	1,840	23	114	4,680	117	1,470	3,060	30	245
19	1,950	25	131	5,230	137	1,930	3,000	24	191
20	1,960	28	146	4,980	99	1,340	2,880	21	166
21	2,070	28	157	4,780	72	924	2,720	19	139
22	2,260	45	272	4,870	69	907	2,750	18	134
23	2,580	67	467	5,240	111	1,560	2,750	18	134
24	2,670	79	568	5,800	194	3,040	2,680	18	127
25	2,550	51	353	6,140	206	3,410	2,670	18	129
26	2,650	59	423	6,090	167	2,750	3,000	44	353
27	2,880	97	752	6,180	137	2,290	3,490	69	647
28	2,670	61	439	6,210	127	2,120	3,500	52	487
29	2,490	43	291	6,110	110	1,810	3,370	42	383
30	2,360	37	238	5,810	95	1,490	3,000	30	241
31	--	--	--	5,280	77	1,090	--	--	--
Total[1]	**61,340**	**--**	**8,505**	**138,780**	**--**	**39,806**	**102,110**	**--**	**10,741**
Mean	**2,045**	**46**	**284**	**4,477**	**97**	**1,280**	**3,404**	**36**	**358**
Max	**2,880**	**149**	**1,010**	**6,210**	**206**	**3,410**	**5,070**	**69**	**916**
Min	**1,300**	**14**	**49**	**2,380**	**25**	**203**	**2,670**	**18**	**127**

Table 6. Daily mean streamflow and suspended-sediment data for Clark Fork at Turah Bridge, near Bonner, Montana (12334550), October 2013 through September 2014.—Continued

[ft³/s, cubic foot per second; mg/L, milligram per liter; ton/d, ton per day; e, estimated; --, no data or value not computed; max, maximum; min, minimum]

Day	Mean streamflow (ft³/s)	Suspended sediment		Mean streamflow (ft³/s)	Suspended sediment		Mean streamflow (ft³/s)	Suspended sediment	
		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)
		July			August			September	
1	2,670	22	156	831	4	9.0	1,030	10	28
2	2,440	19	124	813	4	8.8	1,000	9	25
3	2,270	14	89	797	4	8.6	972	8	22
4	2,180	12	72	786	4	8.5	948	8	20
5	2,140	12	69	797	4	8.7	920	7	18
6	2,060	11	59	782	4	9.1	909	7	17
7	1,930	11	59	718	5	8.8	892	7	17
8	1,790	9	45	696	5	9.0	884	7	17
9	1,680	8	35	710	5	9.6	877	7	16
10	1,600	6	28	694	5	9.4	860	7	16
11	1,510	6	25	667	5	9.0	881	6	15
12	1,420	6	25	659	5	8.4	913	6	15
13	1,360	7	26	664	4	7.5	942	6	16
14	1,310	7	25	712	5	9.1	947	7	17
15	1,330	7	25	819	6	13	931	7	18
16	1,380	7	27	856	8	17	909	8	19
17	1,390	8	29	846	8	18	895	8	19
18	1,310	7	24	823	7	16	880	7	18
19	1,240	6	20	777	6	12	860	7	16
20	1,180	6	19	749	5	11	848	6	15
21	1,120	6	18	770	9	19	822	6	13
22	1,090	6	18	879	19	46	802	6	13
23	1,110	6	17	1,000	45	122	786	6	13
24	1,110	5	14	1,360	47	173	769	6	12
25	1,080	4	12	1,420	40	155	748	6	12
26	1,040	4	11	1,320	33	117	734	6	12
27	985	4	11	1,230	26	87	744	7	14
28	949	4	10	1,190	20	65	788	7	16
29	921	4	9.9	1,140	16	49	820	8	18
30	891	4	9.6	1,110	14	41	858	9	20
31	856	4	9.2	1,080	12	34	--	--	--
Total[1]	**45,342**	**--**	**1,120.7**	**27,695**	**--**	**1,118.5**	**26,169**	**--**	**507**
Mean	**1,463**	**8**	**36**	**893**	**12**	**36**	**872**	**7**	**17**
Max	**2,670**	**22**	**156**	**1,420**	**47**	**173**	**1,030**	**10**	**28**
Min	**856**	**4**	**9.2**	**659**	**4**	**7.5**	**734**	**6**	**12**

[1]Total for water year 2014 (unrounded sum of daily values): streamflow=550,245 ft³/s (annual runoff=1,091,000 acre-feet); suspended-sediment discharge=82,466.9 tons.

Table 7. Daily mean streamflow and suspended-sediment data for Blackfoot River near Bonner, Montana (12340000), October 2013 through September 2014.

[ft^3/s, cubic foot per second; mg/L, milligram per liter; ton/d, ton per day; e, estimated; --, no data or value not computed; max, maximum; min, minimum]

Day	Mean streamflow (ft^3/s)	Suspended sediment		Mean streamflow (ft^3/s)	Suspended sediment		Mean streamflow (ft^3/s)	Suspended sediment	
		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)
		October			November			December	
1	592	3	4.8	511	2	2.8	569	6	9.2
2	592	3	4.8	508	2	2.7	593	6	9.6
3	581	3	4.7	516	2	2.8	563	5	7.6
4	569	3	4.6	512	2	2.8	e350	3	2.8
5	565	3	4.6	512	2	2.8	e310	2	1.7
6	561	3	4.5	515	2	2.8	e280	1	0.76
7	570	3	4.6	519	2	2.8	e260	1	0.70
8	584	3	4.7	535	2	2.9	e250	1	0.68
9	595	3	4.8	536	2	2.9	e240	1	0.65
10	597	3	4.8	544	2	2.9	e250	1	0.68
11	597	3	4.8	552	2	3.0	e300	1	0.81
12	592	3	4.8	549	2	3.0	e440	2	2.4
13	589	3	4.8	544	2	2.9	e510	4	5.5
14	587	3	4.8	536	2	2.9	e480	4	5.2
15	582	3	4.7	532	2	2.9	e480	4	5.2
16	576	3	4.7	542	2	2.9	e480	5	6.5
17	570	3	4.6	540	2	2.9	e480	5	6.5
18	557	2	3.0	535	2	2.9	e490	5	6.6
19	547	2	3.0	539	2	2.9	e500	5	6.8
20	538	2	2.9	553	2	3.0	e440	4	4.8
21	530	2	2.9	514	2	2.8	e440	3	3.6
22	527	2	2.8	e460	2	2.5	e450	2	2.4
23	526	2	2.8	e350	2	1.9	e500	2	2.7
24	525	2	2.8	e420	2	2.3	e500	2	2.7
25	524	2	2.8	e500	3	4.0	e470	1	1.3
26	526	2	2.8	e520	4	5.6	e480	4	5.2
27	524	2	2.8	e510	4	5.5	e470	6	7.6
28	521	2	2.8	e520	4	5.6	e460	6	7.5
29	513	2	2.8	e500	4	5.4	e460	4	5.0
30	507	2	2.7	e570	5	7.7	e460	3	3.7
31	514	2	2.8	--	--	--	e500	2	2.7
Total[1]	**17,278**	**--**	**119.8**	**15,494**	**--**	**100.8**	**13,455**	**--**	**129.08**
Mean	**557**	**3**	**3.9**	**516**	**2**	**3.4**	**434**	**3**	**4.2**
Max	**597**	**3**	**4.8**	**570**	**5**	**7.7**	**593**	**6**	**9.6**
Min	**507**	**2**	**2.7**	**350**	**2**	**1.9**	**240**	**1**	**0.65**

Table 7. Daily mean streamflow and suspended-sediment data for Blackfoot River near Bonner, Montana (12340000), October 2013 through September 2014.—Continued

[ft³/s, cubic foot per second; mg/L, milligram per liter; ton/d, ton per day; e, estimated; --, no data or value not computed; max, maximum; min, minimum]

Day	Mean streamflow (ft³/s)	Suspended sediment		Mean streamflow (ft³/s)	Suspended sediment		Mean streamflow (ft³/s)	Suspended sediment	
		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)
	January			February			March		
1	e510	2	2.8	e400	2	2.2	e450	2	2.4
2	492	2	2.7	e380	2	2.1	e500	2	2.7
3	506	2	2.7	e350	2	1.9	e650	2	3.5
4	488	2	2.6	e300	2	1.6	666	2	3.6
5	e400	1	1.1	e240	2	1.3	669	2	3.6
6	e300	1	0.81	e230	2	1.2	657	4	7.1
7	e380	1	1.0	e240	2	1.3	712	6	12
8	e460	1	1.2	e260	2	1.4	722	6	12
9	e480	2	2.6	e320	2	1.7	776	9	19
10	e500	3	4.0	e370	2	2.0	1,070	19	55
11	483	3	3.9	e420	2	2.3	1,490	29	117
12	480	2	2.6	e450	2	2.4	1,590	26	112
13	479	2	2.6	e510	2	2.8	1,410	21	80
14	569	2	3.1	e540	1	1.5	1,250	25	84
15	546	2	2.9	e560	1	1.5	1,130	32	98
16	493	2	2.7	e580	2	3.1	1,080	28	82
17	e500	3	4.0	e600	2	3.2	1,170	24	76
18	e460	3	3.7	e600	1	1.6	1,160	26	81
19	e440	4	4.8	e610	1	1.6	981	27	72
20	e440	3	3.6	e480	1	1.3	897	19	46
21	e430	1	1.2	e480	1	1.3	829	13	29
22	e440	1	1.2	e460	1	1.2	768	10	21
23	e450	1	1.2	e440	3	3.6	747	7	14
24	e450	2	2.4	e410	6	6.6	743	6	12
25	e420	2	2.3	e370	7	7.0	738	6	12
26	e400	2	2.2	e400	6	6.5	745	9	18
27	e400	1	1.1	e460	4	5.0	794	14	30
28	e370	1	1.0	e460	3	3.7	798	13	28
29	e420	1	1.1	--	--	--	932	15	38
30	e420	2	2.3	--	--	--	1,090	17	50
31	e410	2	2.2	--	--	--	1,080	16	47
Total[1]	**14,016**	**--**	**73.61**	**11,920**	**--**	**72.9**	**28,294**	**--**	**1,267.9**
Mean	**452**	**2**	**2.4**	**426**	**2**	**2.6**	**913**	**14**	**41**
Max	**569**	**4**	**4.8**	**610**	**7**	**7.0**	**1,590**	**32**	**117**
Min	**300**	**1**	**0.81**	**230**	**1**	**1.2**	**450**	**2**	**2.4**

Table 7. Daily mean streamflow and suspended-sediment data for Blackfoot River near Bonner, Montana (12340000), October 2013 through September 2014.—Continued

[ft^3/s, cubic foot per second; mg/L, milligram per liter; ton/d, ton per day; e, estimated; --, no data or value not computed; max, maximum; min, minimum]

Day	Mean streamflow (ft^3/s)	Suspended sediment		Mean streamflow (ft^3/s)	Suspended sediment		Mean streamflow (ft^3/s)	Suspended sediment	
		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)
		April			May			June	
1	1,040	16	45	3,890	20	210	7,930	40	856
2	1,040	16	45	4,600	33	410	7,710	35	729
3	1,040	16	45	6,060	85	1,390	7,550	35	713
4	1,090	14	41	7,310	94	1,860	7,490	32	647
5	1,120	13	39	8,060	93	2,020	7,350	29	576
6	1,180	14	45	7,740	64	1,340	7,170	30	581
7	1,330	19	68	7,170	49	949	6,750	29	529
8	1,530	25	103	6,580	41	728	6,290	26	442
9	1,930	36	188	6,150	33	548	6,010	24	389
10	2,290	37	229	5,830	28	441	5,950	21	337
11	2,420	30	196	5,540	24	359	5,820	20	314
12	2,580	25	174	5,160	20	279	5,470	22	325
13	2,620	18	127	4,830	17	222	5,360	19	275
14	2,540	16	110	4,720	16	204	5,370	17	246
15	2,460	16	106	4,870	15	197	5,050	15	205
16	2,390	14	90	5,670	22	337	4,670	15	189
17	2,320	12	75	6,740	42	764	4,640	13	163
18	2,360	12	76	7,830	68	1,440	4,600	12	149
19	2,450	12	79	8,060	61	1,330	4,660	13	164
20	2,560	12	83	7,950	55	1,180	4,600	12	149
21	2,730	15	111	7,900	50	1,070	4,360	11	129
22	3,090	23	192	8,220	51	1,130	4,260	10	115
23	3,590	36	349	8,930	62	1,490	4,330	16	187
24	3,890	44	462	10,000	102	2,750	4,290	14	162
25	3,870	41	428	10,400	110	3,090	4,260	19	219
26	4,000	35	378	10,500	103	2,920	4,360	14	165
27	4,180	37	418	10,600	102	2,920	4,520	16	195
28	4,120	37	412	10,200	75	2,070	4,400	15	178
29	3,910	27	285	9,900	66	1,760	4,180	12	135
30	3,760	22	223	9,250	56	1,400	3,900	10	105
31	--	--	--	8,410	46	1,040	--	--	--
Total[1]	**75,430**	**--**	**5,222**	**229,070**	**--**	**37,848**	**163,300**	**--**	**9,568**
Mean	**2,514**	**23**	**174**	**7,389**	**55**	**1,220**	**5,443**	**20**	**319**
Max	**4,180**	**44**	**462**	**10,600**	**110**	**3,090**	**7,930**	**40**	**856**
Min	**1,040**	**12**	**39**	**3,890**	**15**	**197**	**3,900**	**10**	**105**

Table 7. Daily mean streamflow and suspended-sediment data for Blackfoot River near Bonner, Montana (12340000), October 2013 through September 2014.—Continued

[ft³/s, cubic foot per second; mg/L, milligram per liter; ton/d, ton per day; e, estimated; --, no data or value not computed; max, maximum; min, minimum]

Day	Mean streamflow (ft³/s)	Suspended sediment		Mean streamflow (ft³/s)	Suspended sediment		Mean streamflow (ft³/s)	Suspended sediment	
		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)
		July			August			September	
1	3,610	10	97	975	2	5.3	738	1	2.0
2	3,350	9	81	984	3	8.0	741	1	2.0
3	3,200	9	78	985	4	11	721	2	3.9
4	3,130	8	68	961	5	13	706	2	3.8
5	2,990	8	65	976	6	16	693	2	3.7
6	2,810	7	53	993	6	16	686	2	3.7
7	2,630	6	43	950	6	15	682	2	3.7
8	2,480	6	40	905	6	15	671	2	3.6
9	2,330	6	38	905	5	12	659	2	3.6
10	2,200	5	30	889	4	9.6	656	2	3.5
11	2,090	4	23	855	3	6.9	665	2	3.6
12	1,990	4	21	831	2	4.5	669	2	3.6
13	1,880	4	20	815	2	4.4	672	2	3.6
14	1,780	4	19	823	2	4.4	677	2	3.7
15	1,740	4	19	850	2	4.6	670	3	5.4
16	1,810	4	20	848	2	4.6	665	3	5.4
17	1,730	3	14	831	2	4.5	659	3	5.3
18	1,600	2	8.6	807	2	4.4	644	3	5.2
19	1,520	2	8.2	777	2	4.2	625	2	3.4
20	1,440	2	7.8	764	2	4.1	617	2	3.3
21	1,380	2	7.5	765	2	4.1	613	2	3.3
22	1,330	2	7.2	782	2	4.2	605	2	3.3
23	1,290	4	14	829	2	4.5	591	2	3.2
24	1,290	3	10	871	2	4.7	588	3	4.8
25	1,240	2	6.7	886	2	4.8	591	3	4.8
26	1,200	2	6.5	857	2	4.6	589	3	4.8
27	1,140	2	6.2	821	2	4.4	582	3	4.7
28	1,090	2	5.9	790	2	4.3	586	4	6.3
29	1,060	2	5.7	764	2	4.1	590	4	6.4
30	1,030	2	5.6	749	2	4.0	604	4	6.5
31	999	2	5.4	744	1	2.0	--	--	--
Total[1]	**59,359**	**--**	**834.3**	**26,582**	**--**	**213.2**	**19,455**	**--**	**124.1**
Mean	**1,915**	**4**	**27**	**857**	**3**	**6.9**	**648**	**2**	**4.1**
Max	**3,610**	**10**	**97**	**993**	**6**	**16**	**741**	**4**	**6.5**
Min	**999**	**2**	**5.4**	**744**	**1**	**2.0**	**582**	**1**	**2.0**

[1]Total for water year 2014 (unrounded sum of daily values): streamflow=673,653 ft³/s (annual runoff=1,336,00 acre-feet); suspended-sediment discharge=55,573.69 tons.

Table 8. Daily mean streamflow and suspended-sediment data for Clark Fork above Missoula, Montana (12340500), October 2013 through September 2014.

[ft^3/s, cubic foot per second; mg/L, milligram per liter; ton/d, ton per day; e, estimated; --, no data or value not computed; max, maximum; min, minimum]

Day	Mean streamflow (ft^3/s)	Suspended sediment		Mean streamflow (ft^3/s)	Suspended sediment		Mean streamflow (ft^3/s)	Suspended sediment	
		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)
	October			November			December		
1	1,460	13	51	1,280	4	14	1,360	21	77
2	1,440	13	51	1,280	4	14	1,460	26	102
3	1,390	12	45	1,300	4	14	1,350	22	80
4	1,380	11	41	1,300	4	14	e1,050	17	48
5	1,370	10	37	1,270	5	17	e750	13	26
6	1,360	10	37	1,260	5	17	e550	10	15
7	1,370	10	37	1,290	5	17	e530	8	11
8	1,380	10	37	1,330	5	18	e500	7	9.4
9	1,400	10	38	1,350	5	18	e510	6	8.3
10	1,400	11	42	1,340	5	18	e550	7	10
11	1,410	11	42	1,330	5	18	e680	10	18
12	1,400	11	42	1,320	5	18	e980	13	34
13	1,400	11	42	1,310	5	18	e1,030	16	44
14	1,400	12	45	1,310	5	18	e1,070	20	58
15	1,400	12	45	1,330	5	18	e1,100	23	68
16	1,390	11	41	1,370	6	22	e1,120	26	79
17	1,370	10	37	1,370	6	22	e1,140	29	89
18	1,360	10	37	1,340	7	25	e1,170	29	92
19	1,350	9	33	1,330	7	25	e1,200	26	84
20	1,330	8	29	1,360	8	29	e1,080	19	55
21	1,310	7	25	1,320	8	29	e1,100	10	30
22	1,290	6	21	1,120	9	27	e1,100	7	21
23	1,280	6	21	1,020	10	28	1,180	6	19
24	1,280	6	21	1,090	11	32	1,200	5	16
25	1,280	5	17	1,170	12	38	1,140	4	12
26	1,270	5	17	1,200	12	39	1,110	5	15
27	1,270	5	17	1,200	13	42	1,120	6	18
28	1,260	4	14	1,190	14	45	1,140	5	15
29	1,260	4	14	1,170	15	47	1,140	4	12
30	1,210	4	13	1,310	17	60	1,110	4	12
31	1,260	4	14	--	--	--	1,170	5	16
Total[1]	**41,730**	**--**	**1,003**	**38,160**	**--**	**761**	**31,690**	**--**	**1,193.7**
Mean	**1,346**	**9**	**32**	**1,272**	**8**	**25**	**1,022**	**13**	**39**
Max	**1,460**	**13**	**51**	**1,370**	**17**	**60**	**1,460**	**29**	**102**
Min	**1,210**	**4**	**13**	**1,020**	**4**	**14**	**500**	**4**	**8.3**

Table 8. Daily mean streamflow and suspended-sediment data for Clark Fork above Missoula, Montana (12340500), October 2013 through September 2014.—Continued

[ft³/s, cubic foot per second; mg/L, milligram per liter; ton/d, ton per day; e, estimated; --, no data or value not computed; max, maximum; min, minimum]

Day	Mean streamflow (ft³/s)	Suspended sediment		Mean streamflow (ft³/s)	Suspended sediment		Mean streamflow (ft³/s)	Suspended sediment	
		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)
	January			February			March		
1	1,190	6	19	938	4	10	e910	3	7.4
2	1,160	6	19	864	4	9.3	e924	3	7.5
3	1,210	6	20	e1,030	5	14	e1,050	3	8.5
4	1,200	6	19	e891	8	19	e1,170	7	22
5	1,070	5	14	e741	10	20	e1,380	17	63
6	e760	3	6.2	e672	6	11	e1,560	31	131
7	e880	3	7.1	e695	3	5.6	2,660	156	1,120
8	e1,000	3	8.1	e780	2	4.2	3,030	200	1,640
9	e1,100	5	15	e886	2	4.8	2,850	115	885
10	1,180	6	19	e986	3	8.0	4,210	250	2,840
11	1,170	6	19	e1,080	4	12	5,610	221	3,350
12	1,200	5	16	e1,170	5	16	4,660	114	1,430
13	1,190	5	16	e1,290	6	21	3,740	57	576
14	1,320	7	25	e1,410	9	34	3,330	43	387
15	1,310	7	25	e1,470	12	48	3,000	38	308
16	1,220	6	20	e1,510	18	73	2,870	33	256
17	1,150	5	16	e1,540	19	79	3,080	37	308
18	1,120	5	15	1,390	14	53	3,000	31	251
19	1,080	4	12	1,170	10	32	2,560	27	187
20	1,090	4	12	1,130	8	24	2,360	22	140
21	1,050	4	11	1,100	6	18	2,210	18	107
22	1,060	4	11	1,070	4	12	2,040	15	83
23	1,100	4	12	1,050	5	14	1,960	12	64
24	1,070	4	12	996	6	16	1,910	12	62
25	1,030	4	11	923	7	17	1,880	12	61
26	1,010	4	11	895	6	14	1,900	11	56
27	986	4	11	948	5	13	2,040	15	83
28	905	4	9.8	e940	4	10	2,030	13	71
29	938	4	10	--	--	--	2,210	14	84
30	1,060	7	20	--	--	--	2,600	17	119
31	954	6	15	--	--	--	2,580	18	125
Total[1]	**33,763**	**--**	**456.2**	**29,565**	**--**	**611.9**	**77,314**	**--**	**14,832.4**
Mean	**1,089**	**5**	**15**	**1,056**	**7**	**22**	**2,494**	**50**	**478**
Max	**1,320**	**7**	**25**	**1,540**	**19**	**79**	**5,610**	**250**	**3,350**
Min	**760**	**3**	**6.2**	**672**	**2**	**4.2**	**910**	**3**	**7.4**

Table 8. Daily mean streamflow and suspended-sediment data for Clark Fork above Missoula, Montana (12340500), October 2013 through September 2014.—Continued

[ft^3/s, cubic foot per second; mg/L, milligram per liter; ton/d, ton per day; e, estimated; --, no data or value not computed; max, maximum; min, minimum]

Day	Mean streamflow (ft^3/s)	Suspended sediment		Mean streamflow (ft^3/s)	Suspended sediment		Mean streamflow (ft^3/s)	Suspended sediment	
		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)
		April			May			June	
1	2,440	16	105	6,250	23	388	13,400	48	1,740
2	2,400	14	91	7,200	41	797	12,900	44	1,530
3	2,400	12	78	9,370	106	2,680	12,500	42	1,420
4	2,440	12	79	11,400	142	4,370	12,300	40	1,330
5	2,500	12	81	12,800	143	4,940	12,100	38	1,240
6	2,570	13	90	12,500	93	3,140	11,800	36	1,150
7	2,740	17	126	11,600	68	2,130	11,100	31	929
8	3,180	26	223	10,600	51	1,460	10,300	27	751
9	4,110	62	688	9,890	41	1,090	9,770	27	712
10	4,980	83	1,120	9,490	34	871	9,600	24	622
11	5,010	57	771	9,190	30	744	9,350	20	505
12	5,110	47	648	8,570	24	555	8,810	19	452
13	5,140	37	513	7,970	22	473	8,550	18	416
14	4,760	24	308	7,640	19	392	8,560	18	416
15	4,550	21	258	7,780	19	399	8,150	16	352
16	4,440	18	216	8,870	28	671	7,590	15	307
17	4,250	14	161	10,500	52	1,470	7,670	15	311
18	4,260	14	161	12,400	92	3,080	7,870	16	340
19	4,470	16	193	13,300	102	3,660	7,880	16	340
20	4,580	16	198	13,000	83	2,910	7,720	16	334
21	4,850	19	249	12,800	61	2,110	7,270	14	275
22	5,360	27	391	13,200	60	2,140	7,180	14	271
23	6,180	44	734	14,300	80	3,090	7,250	14	274
24	6,690	53	957	16,100	134	5,820	7,150	13	251
25	6,560	44	779	17,000	139	6,380	7,070	12	229
26	6,610	43	767	17,000	121	5,550	7,510	18	365
27	7,100	57	1,090	17,100	103	4,760	8,200	30	664
28	7,000	46	869	16,800	89	4,040	8,140	26	571
29	6,570	32	568	16,500	82	3,650	7,810	23	485
30	6,240	26	438	15,700	70	2,970	7,140	18	347
31	--	--	--	14,200	55	2,110	--	--	--
Total[1]	**139,490**	**--**	**12,950**	**371,020**	**--**	**78,840**	**272,640**	**--**	**18,929**
Mean	**4,650**	**31**	**432**	**11,970**	**71**	**2,540**	**9,088**	**24**	**631**
Max	**7,100**	**83**	**1,120**	**17,100**	**143**	**6,380**	**13,400**	**48**	**1,740**
Min	**2,400**	**12**	**78**	**6,250**	**19**	**388**	**7,070**	**12**	**229**

Table 8. Daily mean streamflow and suspended-sediment data for Clark Fork above Missoula, Montana (12340500), October 2013 through September 2014.—Continued

[ft³/s, cubic foot per second; mg/L, milligram per liter; ton/d, ton per day; e, estimated; --, no data or value not computed; max, maximum; min, minimum]

Day	Mean streamflow (ft³/s)	Suspended sediment		Mean streamflow (ft³/s)	Suspended sediment		Mean streamflow (ft³/s)	Suspended sediment	
		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)
		July			August			September	
1	6,500	14	246	1,850	2	10	1,770	5	24
2	5,980	12	194	1,830	2	9.9	1,730	4	19
3	5,630	10	152	1,820	2	9.8	1,690	4	18
4	5,450	10	147	1,790	2	9.7	1,640	3	13
5	5,300	9	129	1,800	2	9.7	1,610	3	13
6	5,020	8	108	1,810	2	9.8	1,580	3	13
7	4,720	8	102	1,720	2	9.3	1,560	4	17
8	4,410	7	83	1,640	2	8.9	1,540	4	17
9	4,150	6	67	1,640	2	8.9	1,520	4	16
10	3,940	5	53	1,610	2	8.7	1,500	4	16
11	3,730	4	40	1,560	2	8.4	1,520	4	16
12	3,530	4	38	1,520	2	8.2	1,560	4	17
13	3,360	4	36	1,500	2	8.1	1,590	4	17
14	3,190	4	34	1,550	2	8.4	1,610	4	17
15	3,160	4	34	1,680	3	14	1,590	4	17
16	3,270	4	35	1,710	3	14	1,560	4	17
17	3,230	4	35	1,700	3	14	1,530	4	17
18	3,020	3	24	1,650	3	13	1,510	4	16
19	2,860	3	23	1,570	2	8.5	1,460	4	16
20	2,720	3	22	1,510	2	8.2	1,440	4	16
21	2,590	3	21	1,530	2	8.3	1,410	4	15
22	2,510	2	14	1,640	16	71	1,380	4	15
23	2,480	2	13	1,800	22	107	1,350	4	15
24	2,480	2	13	2,190	19	112	1,320	3	11
25	2,400	2	13	2,320	18	113	1,310	3	11
26	2,310	2	12	2,200	14	83	1,290	3	10
27	2,200	2	12	2,070	11	61	1,280	3	10
28	2,110	2	11	2,000	7	38	1,330	3	11
29	2,040	3	17	1,910	6	31	1,360	4	15
30	1,980	2	11	1,850	6	30	1,420	5	19
31	1,910	2	10	1,820	5	25	--	--	--
Total[1]	**108,180**	**--**	**1,749**	**54,790**	**--**	**878.8**	**44,960**	**--**	**464**
Mean	**3,490**	**5**	**56**	**1,767**	**5**	**28**	**1,499**	**4**	**15**
Max	**6,500**	**14**	**246**	**2,320**	**22**	**113**	**1,770**	**5**	**24**
Min	**1,910**	**2**	**10**	**1,500**	**2**	**8.1**	**1,280**	**3**	**10**

[1]Total for water year 2014 (unrounded sum of daily values): streamflow=1,243,302 ft³/s (annual runoff=2,466,000 acre-feet); suspended-sediment discharge=132,669.0 tons.

Table 9. Seasonal daily maximum, minimum, and mean turbidity, with monthly summary statistics at Mill Creek at Opportunity, Montana (12323700), April through September 2014.

[Turbidity values are based on near-infrared monochrome light emitted at wavelengths of 780 to 900 nanometers with a detection angle of 90 ± 2.5 degrees to incident beam, reported in formazin nephelometric units (FNU). --, no data]

Day	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Maximum	Minimum	Mean
	April			May			June		
1	--	--	--	9.5	5.5	6.5	11	6.0	7.5
2	--	--	--	18	7.5	10	9.0	5.5	7.0
3	3.5	2.5	3.0	27	15	21	10	6.0	7.5
4	3.5	2.5	3.0	30	16	21	12	8.0	9.5
5	4.0	3.0	3.0	30	17	22	12	5.5	7.0
6	4.0	3.0	3.5	24	11	15	12	5.5	8.0
7	7.0	3.0	4.0	14	9.5	11	12	7.5	8.5
8	11	4.5	6.5	14	9.0	11	9.0	7.0	8.0
9	15	7.0	9.5	13	7.0	8.5	9.0	7.0	8.0
10	14	7.5	10	10	7.5	8.5	10	7.5	8.5
11	10	6.0	8.0	10	7.0	8.0	8.5	7.0	7.5
12	10	6.0	8.0	9.0	7.0	7.5	9.0	7.0	7.5
13	7.5	5.5	6.5	9.0	6.0	7.0	9.5	7.5	8.0
14	7.5	5.0	6.0	8.5	6.0	7.0	9.0	7.0	7.5
15	7.0	4.5	5.5	10	6.5	7.5	8.0	6.5	7.0
16	6.5	4.5	5.0	12	8.0	9.5	8.0	6.0	6.5
17	6.5	3.5	4.5	23	12	14	8.5	6.0	7.0
18	6.0	4.0	5.0	43	17	24	7.5	5.5	6.5
19	6.5	4.0	5.0	22	13	16	7.5	5.0	6.0
20	6.0	4.0	5.0	15	9.0	12	9.5	6.5	7.5
21	7.5	4.5	6.0	13	8.0	10	11	7.0	8.5
22	21	5.5	9.0	30	11	15	8.5	6.5	7.5
23	25	7.0	12	64	21	32	8.0	6.0	6.5
24	9.0	6.0	7.5	--	--	--	8.0	6.5	7.0
25	17	6.0	8.5	--	--	--	16	7.5	10
26	24	6.5	10	--	--	--	9.5	6.5	8.0
27	8.5	6.0	7.0	--	--	--	8.0	5.0	6.0
28	7.5	5.5	6.5	--	--	--	5.5	4.0	5.0
29	8.0	5.0	6.0	--	--	--	5.5	4.0	4.5
30	7.5	5.0	6.0	--	--	--	5.5	4.0	4.5
31	--	--	--	10	6.5	8.0	--	--	--
Month[1]	**25**	**2.5**	**6.4**	**64**	**5.5**	**13**	**16**	**4.0**	**7.3**

Table 9. Seasonal daily maximum, minimum, and mean turbidity, with monthly summary statistics at Mill Creek at Opportunity, Montana (12323700), April through September 2014.—Continued

[Turbidity values are based on near-infrared monochrome light emitted at wavelengths of 780 to 900 nanometers with a detection angle of 90 ± 2.5 degrees to incident beam, reported in formazin nephelometric units (FNU). --, no data]

Day	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Maximum	Minimum	Mean
	July			August			September		
1	5.5	4.0	4.5	5.0	3.5	4.0	5.0	3.5	4.0
2	6.5	3.0	4.5	5.0	3.0	4.0	5.0	3.5	4.0
3	6.0	3.5	4.5	5.0	3.0	4.0	4.5	3.0	3.5
4	5.5	4.0	4.5	4.5	3.0	4.0	4.5	3.5	4.0
5	6.0	4.0	5.0	6.0	4.0	4.5	4.5	3.0	3.5
6	6.5	4.0	5.0	5.0	3.5	4.5	4.5	2.5	3.5
7	6.0	4.0	5.0	5.0	3.5	4.0	4.0	3.0	3.5
8	6.5	4.5	5.0	4.5	3.5	4.0	4.0	3.0	3.5
9	6.0	4.0	5.0	4.5	3.0	4.0	4.0	3.5	3.5
10	9.0	4.0	5.5	4.5	3.0	3.5	4.5	3.0	3.5
11	--	--	--	4.5	3.0	3.5	4.0	3.0	3.5
12	--	--	--	4.5	3.0	3.5	4.5	3.0	3.5
13	--	--	--	11	3.0	4.5	4.0	3.0	3.5
14	--	--	--	12	4.0	7.0	4.5	3.0	3.5
15	--	--	--	19	3.0	5.0	3.5	2.5	3.0
16	--	--	--	5.0	3.0	4.0	3.5	2.5	3.0
17	--	--	--	4.5	3.0	3.5	3.5	2.0	3.0
18	6.5	5.0	5.5	4.5	2.0	3.5	3.5	2.0	2.5
19	6.5	3.0	4.5	20	3.0	4.0	3.0	2.0	2.5
20	5.5	3.5	4.5	5.0	3.0	4.0	3.0	2.0	2.5
21	5.5	3.0	4.5	5.5	4.0	4.5	3.0	2.0	2.5
22	5.5	3.5	4.5	10	4.5	5.5	3.0	2.0	2.5
23	5.5	3.5	4.5	32	10	20	2.5	2.0	2.0
24	6.0	4.0	4.5	17	6.5	9.0	2.5	1.5	2.0
25	5.5	3.5	4.5	8.5	5.0	6.5	3.5	2.0	2.5
26	5.0	3.0	4.0	7.0	4.5	5.5	2.5	2.0	2.0
27	4.5	2.5	3.5	6.0	4.0	5.0	4.5	2.0	2.5
28	5.0	3.0	4.0	6.0	4.0	5.0	4.0	3.0	3.5
29	5.5	3.5	4.5	5.5	4.0	4.5	3.5	2.5	3.0
30	4.5	3.0	4.0	5.5	4.0	4.5	4.0	2.5	3.5
31	5.0	3.5	4.0	5.0	3.5	4.0	--	--	--
Month[1]	**9.0**	**2.5**	**4.6**	**32**	**2.0**	**5.1**	**5.0**	**1.5**	**3.1**

[1]For months with missing daily values, the means are calculated using available values.

Table 10. Seasonal daily maximum, minimum, and mean turbidity, with monthly summary statistics at Willow Creek at Opportunity, Montana (12323720), April through September 2014.

[Turbidity values are based on near-infrared monochrome light emitted at wavelengths of 780 to 900 nanometers with a detection angle of 90 ± 2.5 degrees to incident beam, reported in formazin nephelometric units (FNU). --, no data]

Day	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Maximum	Minimum	Mean
	April			May			June		
1	--	--	--	--	--	--	9.0	4.5	5.5
2	--	--	--	--	--	--	8.0	4.5	5.5
3	5.5	3.5	4.5	25	17	21	6.0	4.0	4.5
4	5.0	4.0	4.5	--	--	--	6.0	4.0	4.5
5	5.0	4.0	4.0	--	--	--	7.5	4.0	5.0
6	5.0	4.0	4.0	--	--	--	5.5	4.0	4.5
7	8.5	4.0	6.5	--	--	--	5.0	3.5	4.0
8	8.0	6.0	6.5	--	--	--	5.0	3.5	4.0
9	10	6.5	8.5	--	--	--	6.0	3.0	4.5
10	14	8.5	11	--	--	--	7.0	3.5	5.0
11	--	--	--	--	--	--	6.5	4.0	5.0
12	--	--	--	--	--	--	6.0	3.5	4.5
13	24	13	16	12	7.5	7.5	6.5	3.5	4.0
14	--	--	--	8.0	7.5	7.5	5.0	3.0	3.5
15	--	--	--	--	--	--	6.0	2.5	3.5
16	--	--	--	12	7.5	9.0	5.0	2.5	3.0
17	--	--	--	13	7.5	11	14	3.0	6.5
18	--	--	--	15	8.5	10	4.5	2.5	3.0
19	--	--	--	14	9.0	11	4.0	2.0	2.5
20	--	--	--	12	8.0	9.0	--	--	--
21	--	--	--	9.0	7.5	8.0	--	--	--
22	--	--	--	11	7.5	8.5	--	--	--
23	--	--	--	10	8.0	9.0	--	--	--
24	--	--	--	10	8.5	9.5	--	--	--
25	--	--	--	10	8.0	9.0	--	--	--
26	--	--	--	8.5	7.0	7.5	--	--	--
27	--	--	--	8.0	6.5	7.0	--	--	--
28	--	--	--	7.5	5.5	6.5	--	--	--
29	--	--	--	8.5	5.5	6.5	--	--	--
30	--	--	--	9.5	5.0	6.5	--	--	--
31	--	--	--	6.5	4.5	5.5	--	--	--
Month[1]	**24**	**3.5**	**7.3**	**25**	**4.5**	**8.9**	**14**	**2.0**	**4.3**

Table 10. Seasonal daily maximum, minimum, and mean turbidity, with monthly summary statistics at Willow Creek at Opportunity, Montana (12323720), April through September 2014.—Continued

[Turbidity values are based on near-infrared monochrome light emitted at wavelengths of 780 to 900 nanometers with a detection angle of 90 ± 2.5 degrees to incident beam, reported in formazin nephelometric units (FNU). --, no data]

Day	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Maximum	Minimum	Mean
	July			August			September		
1	--	--	--	6.5	3.0	4.5	4.0	2.5	3.0
2	--	--	--	4.5	2.5	3.5	5.0	2.5	3.5
3	5.0	2.5	3.5	5.0	3.0	4.0	4.5	2.5	3.0
4	4.0	2.0	3.0	5.0	3.0	4.0	4.0	2.5	3.0
5	4.0	1.5	3.0	5.0	3.0	3.5	3.5	2.5	3.0
6	5.0	2.0	3.0	4.5	2.5	3.5	4.0	2.5	3.0
7	5.0	2.0	3.5	4.0	2.5	3.5	4.0	2.5	3.0
8	6.5	2.5	3.5	4.5	2.5	3.5	4.5	2.5	3.5
9	8.0	2.5	5.0	4.0	2.5	3.0	4.0	2.5	3.0
10	7.5	3.0	4.5	3.5	2.0	3.0	3.5	2.5	3.0
11	7.0	2.5	4.5	4.0	2.0	2.5	4.0	2.5	3.0
12	6.0	3.0	4.0	3.5	2.0	3.0	3.5	2.0	3.0
13	10	3.5	5.0	4.0	2.5	3.0	3.5	2.5	3.0
14	10	3.5	6.0	5.0	3.5	4.0	3.5	2.5	3.0
15	8.0	4.5	6.0	16	3.0	6.5	3.5	2.5	3.0
16	7.5	3.5	5.0	13	3.0	6.0	3.5	2.5	2.5
17	7.0	3.0	4.5	5.0	2.5	3.5	3.5	2.0	2.5
18	6.0	2.5	4.0	4.0	2.5	3.0	3.5	2.0	2.5
19	5.0	2.0	3.5	4.0	2.5	3.0	4.0	2.5	3.0
20	4.5	2.0	3.0	4.0	2.5	3.0	3.5	2.5	3.0
21	6.5	2.5	3.5	4.0	2.5	3.0	3.5	2.5	3.0
22	4.5	2.0	3.5	5.0	2.5	3.5	4.0	2.5	3.0
23	7.5	3.0	4.5	9.5	4.0	7.0	3.5	2.5	3.0
24	5.5	3.0	4.0	11	4.0	6.5	4.5	2.5	3.0
25	4.5	2.5	3.5	5.5	2.5	3.5	4.5	2.5	3.0
26	4.5	2.0	3.5	5.5	2.5	4.0	4.0	2.5	3.5
27	5.0	2.5	3.5	5.0	2.5	3.5	4.5	3.0	3.5
28	5.0	3.0	3.5	4.5	2.5	3.5	4.5	3.0	3.5
29	4.5	2.5	3.5	4.5	2.5	3.5	4.5	2.5	3.5
30	6.0	3.0	4.0	4.5	3.0	3.5	5.0	3.0	4.0
31	5.0	3.0	4.0	4.5	3.0	3.5	--	--	--
Month[1]	**10**	**1.5**	**4.0**	**16**	**2.0**	**3.8**	**5.0**	**2.0**	**3.1**

[1]For months with missing daily values, the means are calculated using available values.

Table 11. Seasonal daily maximum, minimum, and mean turbidity, with monthly summary statistics at Warm Springs Creek at Warm Springs, Montana (12323770), April through September 2014.

[Turbidity values are based on near-infrared monochrome light emitted at wavelengths of 780 to 900 nanometers with a detection angle of 90 ± 2.5 degrees to incident beam, reported in formazin nephelometric units (FNU). --, no data]

Day	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Maximum	Minimum	Mean
	April			May			June		
1	--	--	--	3.0	1.5	2.0	7.5	5.5	6.5
2	2.0	1.0	1.5	3.5	1.5	2.5	7.5	4.5	5.5
3	2.0	1.0	1.5	5.5	2.5	4.0	6.5	4.5	5.5
4	2.0	1.0	1.0	6.0	3.5	4.5	8.0	5.0	6.5
5	2.0	1.0	1.0	6.5	3.0	4.5	7.0	4.5	5.5
6	1.5	1.0	1.0	4.5	2.5	3.0	7.0	5.0	6.0
7	2.5	1.0	1.5	3.5	2.0	2.5	6.5	4.0	5.0
8	2.5	1.0	1.5	3.5	1.5	2.5	5.0	3.5	4.0
9	3.0	1.5	2.5	3.5	2.0	2.5	5.0	3.5	4.0
10	3.5	1.5	2.5	4.5	2.0	3.0	6.5	4.0	5.0
11	2.5	1.0	2.0	4.5	2.0	3.0	7.0	3.5	5.0
12	2.5	1.0	2.0	3.0	1.5	2.5	4.5	3.0	3.5
13	2.5	1.5	2.0	3.0	1.5	2.0	8.5	3.5	4.5
14	2.5	1.0	1.5	2.5	1.0	2.0	5.0	3.0	4.0
15	2.0	1.0	1.5	3.0	1.5	2.0	6.5	3.5	4.5
16	2.5	1.0	1.5	6.0	2.0	4.5	8.0	5.5	7.0
17	2.5	1.0	1.5	13	5.0	9.5	9.0	6.0	7.5
18	2.5	1.5	1.5	27	10	20	8.0	6.0	7.0
19	2.5	1.0	1.5	20	7.5	11	8.5	6.5	7.5
20	2.5	1.0	1.5	8.5	5.5	6.5	10	7.0	7.5
21	2.0	1.0	1.5	18	6.0	7.5	8.5	5.0	6.0
22	4.0	1.5	2.5	18	7.5	12	7.5	5.5	6.5
23	4.5	2.0	3.0	33	11	22	8.5	6.5	7.5
24	3.0	1.0	2.0	42	15	28	9.5	6.5	7.5
25	5.0	1.0	2.0	24	12	19	10	6.0	7.5
26	10	2.5	5.0	25	12	18	10	4.0	5.5
27	3.5	1.5	2.5	32	14	23	10	4.5	6.0
28	3.0	1.5	2.0	23	16	19	--	--	--
29	3.0	1.5	2.0	24	13	19	--	--	--
30	3.0	1.5	2.0	15	9.0	12	--	--	--
31	--	--	--	12	7.0	8.5	--	--	--
Month[1]	**10**	**1.0**	**1.9**	**42**	**1.0**	**9.1**	**10**	**3.0**	**5.9**

Table 11. Seasonal daily maximum, minimum, and mean turbidity, with monthly summary statistics at Warm Springs Creek at Warm Springs, Montana (12323770), April through September 2014.—Continued

[Turbidity values are based on near-infrared monochrome light emitted at wavelengths of 780 to 900 nanometers with a detection angle of 90 ± 2.5 degrees to incident beam, reported in formazin nephelometric units (FNU). --, no data]

Day	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Maximum	Minimum	Mean
	July			August			September		
1	--	--	--	2.5	0.5	1.5	--	--	--
2	--	--	--	--	--	--	3.0	1.5	2.0
3	7.5	3.0	4.0	--	--	--	4.0	1.5	2.5
4	4.5	2.0	3.0	--	--	--	4.0	1.5	2.0
5	4.0	2.5	3.5	--	--	--	--	--	--
6	4.0	2.0	3.0	--	--	--	--	--	--
7	3.5	2.0	2.5	--	--	--	--	--	--
8	3.5	1.5	2.5	--	--	--	--	--	--
9	4.0	2.0	2.5	--	--	--	--	--	--
10	3.5	1.5	2.5	--	--	--	--	--	--
11	4.5	2.0	3.0	--	--	--	3.5	2.0	2.5
12	3.0	1.5	2.5	--	--	--	4.5	1.0	2.0
13	3.5	1.0	2.0	3.5	1.5	2.0	4.0	2.0	2.5
14	3.0	1.5	2.5	5.0	2.0	3.0	4.0	2.0	2.5
15	--	--	--	3.5	1.5	2.5	--	--	--
16	4.0	2.0	3.0	4.5	1.5	2.5	3.5	2.0	2.5
17	3.0	1.0	2.0	3.0	2.0	2.5	--	--	--
18	3.0	1.5	2.0	--	--	--	1.5	1.0	1.5
19	3.0	1.0	2.0	--	--	--	--	--	--
20	3.0	1.0	2.0	--	--	--	--	--	--
21	2.5	1.0	1.5	16	4.5	11	--	--	--
22	3.0	1.0	2.0	18	10	13	--	--	--
23	9.0	1.5	3.0	--	--	--	--	--	--
24	3.0	1.0	2.0	--	--	--	--	--	--
25	3.5	0.5	2.0	--	--	--	--	--	--
26	3.0	0.5	1.5	--	--	--	--	--	--
27	2.5	0.5	1.5	--	--	--	--	--	--
28	3.0	0.5	1.5	--	--	--	--	--	--
29	2.5	1.0	1.5	3.5	1.5	2.5	--	--	--
30	2.5	0.5	1.5	--	--	--	--	--	--
31	2.0	0.5	1.0	4.5	2.0	2.5	--	--	--
Month[1]	**9.0**	**0.5**	**2.3**	**18**	**0.5**	**4.3**	**4.5**	**1.0**	**2.2**

[1]For months with missing daily values, the means are calculated using available values.

Table 12. Seasonal daily maximum, minimum, and mean turbidity, with monthly summary statistics at Lost Creek near Anacona, Montana (12323840), April through September 2014.

[Turbidity values are based on near-infrared monochrome light emitted at wavelengths of 780 to 900 nanometers with a detection angle of 90 ± 2.5 degrees to incident beam, reported in formazin nephelometric units (FNU). --, no data]

Day	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Maximum	Minimum	Mean
	April			May			June		
1	--	--	--	--	--	--	10	6.0	7.0
2	--	--	--	14	5.0	6.5	8.5	5.5	7.0
3	3.5	2.0	2.5	18	8.5	12	10	6.0	7.5
4	3.5	2.0	2.5	23	9.0	14	12	6.5	8.5
5	3.5	2.0	2.5	--	--	--	13	6.5	8.5
6	5.5	2.5	3.5	12	6.0	9.0	13	7.0	9.0
7	13	2.5	5.0	9.0	5.0	6.0	10	5.5	7.0
8	36	3.0	9.0	--	--	--	9.5	4.5	6.0
9	34	5.5	13	7.0	4.0	5.0	7.0	4.5	5.5
10	20	4.5	8.0	7.0	4.0	5.0	--	--	--
11	--	--	--	7.0	4.0	4.5	--	--	--
12	16	4.5	7.5	6.0	3.5	4.5	--	--	--
13	--	--	--	8.0	3.5	5.0	8.5	5.5	7.0
14	18	3.0	5.5	8.0	4.0	5.0	11	3.5	5.5
15	6.0	3.5	4.5	14	4.5	6.0	5.0	3.0	4.0
16	5.0	2.5	3.5	13	7.0	9.5	5.0	3.5	4.0
17	11	3.0	5.5	34	10	18	7.5	3.5	5.0
18	9.0	3.5	5.0	61	19	33	6.0	3.0	4.0
19	6.0	3.0	4.5	26	11	15	6.5	3.5	5.0
20	6.5	3.0	4.5	15	8.0	10	24	3.0	6.0
21	18	3.5	6.0	18	8.0	10	7.0	3.5	4.5
22	13	4.5	7.5	26	10	15	9.0	3.5	5.0
23	36	4.0	8.0	50	13	20	7.5	3.5	5.0
24	18	6.0	8.5	77	24	42	6.0	3.5	4.5
25	53	4.5	9.5	--	--	--	6.5	3.5	4.5
26	62	7.0	17	33	15	21	7.0	3.5	4.5
27	24	5.0	7.5	49	15	23	5.0	3.0	4.0
28	8.5	4.0	5.5	22	12	16	5.0	3.0	4.0
29	9.5	4.0	7.0	25	11	16	4.5	3.0	3.5
30	22	4.5	9.5	15	9.0	11	4.0	3.0	3.5
31	--	--	--	11	7.0	8.5	--	--	--
Month[1]	**62**	**2.0**	**6.6**	**77**	**3.5**	**13**	**24**	**3.0**	**5.5**

Table 12. Seasonal daily maximum, minimum, and mean turbidity, with monthly summary statistics at Lost Creek near Anacona, Montana (12323840), April through September 2014.—Continued

[Turbidity values are based on near-infrared monochrome light emitted at wavelengths of 780 to 900 nanometers with a detection angle of 90 ± 2.5 degrees to incident beam, reported in formazin nephelometric units (FNU). --, no data]

Day	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Maximum	Minimum	Mean
	July			August			September		
1	5.0	3.0	3.5	2.0	1.5	1.5	4.0	2.0	3.0
2	7.0	2.5	3.5	4.5	1.5	2.0	5.0	2.5	3.0
3	7.0	2.5	3.5	2.5	1.5	2.0	5.5	2.5	3.0
4	4.0	2.5	3.0	72	1.5	6.5	4.5	2.0	3.0
5	5.5	2.5	3.5	10	3.5	5.5	4.5	2.0	3.0
6	4.5	2.5	3.5	6.0	3.0	4.0	4.5	2.0	3.0
7	4.5	2.5	3.0	5.5	3.0	4.0	5.0	2.5	3.5
8	4.0	2.5	3.0	7.0	3.0	4.0	5.0	2.0	3.5
9	4.0	2.5	3.0	4.5	2.5	3.5	4.5	2.0	3.0
10	6.0	2.0	3.0	4.5	2.5	3.5	5.0	2.5	3.5
11	3.5	2.0	2.5	4.0	2.5	3.5	3.5	1.5	2.5
12	6.0	2.0	2.5	4.5	2.5	3.5	3.5	2.0	2.5
13	4.5	2.0	2.5	24	2.5	4.5	3.5	2.0	2.5
14	4.5	2.0	3.0	27	3.0	6.0	3.5	2.0	3.0
15	5.0	2.0	3.0	5.0	2.5	3.5	4.0	2.0	3.0
16	3.5	2.0	2.5	6.0	2.5	3.5	4.5	2.0	3.0
17	--	--	--	4.5	2.5	3.0	3.0	1.5	2.5
18	--	--	--	4.0	2.5	3.5	3.5	1.5	2.0
19	--	--	--	4.5	2.5	3.5	3.0	1.5	2.0
20	--	--	--	4.5	2.5	3.5	2.5	1.5	2.0
21	--	--	--	7.0	3.0	4.0	3.0	1.5	2.0
22	--	--	--	14	3.0	5.0	3.0	1.5	2.0
23	--	--	--	32	8.5	16	2.5	1.5	2.0
24	--	--	--	11	3.5	5.5	2.5	1.5	1.5
25	--	--	--	5.5	3.0	4.0	2.0	1.0	1.5
26	--	--	--	5.0	2.5	3.5	9.5	1.0	2.0
27	--	--	--	4.5	2.5	3.5	3.5	1.5	2.5
28	--	--	--	4.5	2.5	3.5	3.5	1.0	2.0
29	2.5	1.5	2.0	4.5	2.5	3.5	2.5	1.0	2.0
30	3.0	1.5	2.0	6.5	2.5	3.5	4.5	1.5	2.0
31	2.5	1.5	2.0	4.5	2.5	3.0	--	--	--
Month[1]	**7.0**	**1.5**	**2.9**	**72**	**1.5**	**4.2**	**9.5**	**1.0**	**2.5**

[1]For months with missing daily values, the means are calculated using available values.

Table 13. Analyses of field replicates for water samples, Clark Fork Basin, Montana.

[hh, hour; mm, minute; lab, laboratory; NTRU, nephelometric turbidity ratio unit; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; µg/L, microgram per liter; mm, millimeter; <, less than laboratory reporting level; --, no data; E, estimated]

Site number (fig. 1)	Site name	Date	Time (hhmm)	Turbidity, unfiltered, lab (NTRU)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium filtered (mg/L)	Potassium, filtered (mg/L)	Sodium, filtered (mg/L)	Alkalinity, filtered, lab (mg/L)
12323700	Mill Creek at Opportunity	8/11/2014	1630	<2.0	75.2	21.1	5.48	0.80	4.19	71.2
		8/11/2014	1635	<2.0	74.4	20.9	5.42	0.78	4.12	71.2
12323750	Silver Bow Creek at Warm Springs	7/15/2014	1020	E3.3	125	36.2	8.42	1.72	9.30	78.9
		7/15/2014	1025	E2.8	127	36.6	8.53	1.67	9.09	78.8
12323840	Lost Creek near Anaconda	4/22/2014	0745	<2.0	110	32.2	7.14	1.30	3.01	102
		4/22/2014	0750	E2.3	110	32.6	7.02	1.35	3.01	102
12324200	Clark Fork at Deer Lodge	5/13/2014	1520	--	185	54.7	11.7	--	--	--
		5/13/2014	1525	--	184	54.3	11.7	--	--	--
12324400	Clark Fork above Little Blackfoot, near Garrison	3/25/2014	1525	--	228	66.3	15.0	--	--	--
		3/25/2014	1530	--	232	68.0	15.2	--	--	--
12324680	Clark Fork at Goldcreek	11/6/2013	1105	--	190	55.6	12.4	--	--	--
		11/6/2013	1110	--	200	58.3	13.1	--	--	--
12334550	Clark Fork at Turah Bridge, near Bonner	5/29/2014	1140	--	60.1	17.3	4.11	--	--	--
		5/29/2014	1145	--	60.3	17.4	4.11	--	--	--
12340500	Clark Fork above Missoula	6/11/2014	1430	--	81.5	21.9	6.54	--	--	--
		6/11/2014	1435	--	80.0	21.6	6.31	--	--	--

Table 13. Analyses of field replicates for water samples, Clark Fork Basin, Montana.—Continued

[hh, hour; mm, minute; lab, laboratory; NTRU, nephelometric turbidity ratio unit; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; µg/L, microgram per liter; mm, millimeter; <, less than laboratory reporting level; --, no data; E, estimated]

Site number (fig. 1)	Site name	Date	Time (hhmm)	Chloride, filtered (mg/L)	Flouride, filtered (mg/L)	Silica, filtered (mg/l)	Sulfate, filtered (mg/L)	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)
12323700	Mill Creek at Opportunity	8/11/2014	1630	0.34	0.34	11.7	10.2	0.056	0.063	2.3	3.0
		8/11/2014	1635	0.34	0.34	11.8	10.2	0.065	0.072	2.2	3.1
12323750	Silver Bow Creek at Warm Springs	7/15/2014	1020	5.98	0.50	12.7	57.2	<0.030	0.073	3.5	6.5
		7/15/2014	1025	5.98	0.50	12.7	57.2	0.031	0.075	3.5	6.2
12323840	Lost Creek near Anaconda	4/22/2014	0745	0.96	0.45	10.9	11.9	<0.030	0.049	1.6	6.3
		4/22/2014	0750	0.96	0.45	10.9	11.9	--	--	1.6	--
12324200	Clark Fork at Deer Lodge	5/13/2014	1520	--	--	--	--	0.056	0.152	7.6	27.8
		5/13/2014	1525	--	--	--	--	0.067	0.150	6.7	26.8
12324400	Clark Fork above Little Blackfoot, near Garrison	3/25/2014	1525	--	--	--	--	0.062	0.283	6.2	58.9
		3/25/2014	1530	--	--	--	--	0.067	0.284	5.9	61.1
12324680	Clark Fork at Goldcreek	11/6/2013	1105	--	--	--	--	0.036	0.081	2.1	12.1
		11/6/2013	1110	--	--	--	--	0.033	0.093	2.1	12.0
12334550	Clark Fork at Turah Bridge, near Bonner	5/29/2014	1140	--	--	--	--	0.036	0.214	5.5	37.3
		5/29/2014	1145	--	--	--	--	0.031	0.197	5.5	34.9
12340500	Clark Fork above Missoula	6/11/2014	1430	--	--	--	--	<0.030	0.046	1.7	4.8
		6/11/2014	1435	--	--	--	--	<0.030	0.043	1.5	5.4

Table 13. Analyses of field replicates for water samples, Clark Fork Basin, Montana.—Continued

[hh, hour; mm, minute; lab, laboratory; NTRU, nephelometric turbidity ratio unit; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; µg/L, microgram per liter; mm, millimeter; <, less than laboratory reporting level; --, no data; E, estimated]

Site number (fig. 1)	Site name	Date	Time (hhmm)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)	Lead, filtered (µg/L)	Lead, unfiltered recoverable (µg/L)	Manganese, filtered (µg/L)	Manganese, unfiltered recoverable (µg/L)	Zinc, filtered (µg/L)	Zinc, unfiltered recoverable (µg/L)
12323700	Mill Creek at Opportunity	8/11/2014	1630	88.3	159	0.144	0.44	5.82	12.7	<2.0	2.6
		8/11/2014	1635	89.0	158	0.167	0.43	5.97	13.3	--	2.6
12323750	Silver Bow Creek at Warm Springs	7/15/2014	1020	48.3	222	0.159	1.05	66.5	111	<2.0	5.4
		7/15/2014	1025	48.8	223	0.169	1.05	66.9	110	<2.0	5.4
12323840	Lost Creek near Anaconda	4/22/2014	0745	7.1	218	<0.040	0.81	1.04	6.7	<2.0	3.5
		4/22/2014	0750	7.1	--	<0.040	--	1.03	--	<2.0	--
12324200	Clark Fork at Deer Lodge	5/13/2014	1520	14.4	444	0.126	3.39	24.0	76.1	3.4	24.4
		5/13/2014	1525	13.7	460	0.125	3.48	23.8	75.1	2.7	24.0
12324400	Clark Fork above Little Blackfoot, near Garrison	3/25/2014	1525	15.1	919	0.172	7.94	65.1	149	9.2	51.7
		3/25/2014	1530	16.0	931	0.169	8.29	65.0	149	9.0	53.2
12324680	Clark Fork at Goldcreek	11/6/2013	1105	4.5	206	<0.040	1.47	18.0	57.5	5.8	13.0
		11/6/2013	1110	5.0	218	<0.040	1.49	19.2	57.6	4.0	13.1
12334550	Clark Fork at Turah Bridge, near Bonner	5/29/2014	1140	47.1	1,290	0.189	5.86	9.64	107	5.2	52.5
		5/29/2014	1145	48.4	1,270	0.188	5.89	9.54	102	5.1	46.6
12340500	Clark Fork above Missoula	6/11/2014	1430	20.7	290	0.041	0.71	6.54	24.3	<2.0	6.2
		6/11/2014	1435	16.3	318	<0.040	0.80	6.41	25.7	<2.0	7.8

Table 13. Analyses of field replicates for water samples, Clark Fork Basin, Montana.—Continued

[hh, hour; mm, minute; lab, laboratory; NTRU, nephelometric turbidity ratio unit; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; µg/L, microgram per liter; mm, millimeter; <, less than laboratory reporting level; --, no data; E, estimated]

Site number (fig. 1)	Site name	Date	Time (hhmm)	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Organic carbon, filtered (mg/L)	Sediment suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)
12323700	Mill Creek at Opportunity	8/11/2014	1630	24.4	25.6	1.85	79	4
		8/11/2014	1635	24.7	26.1	1.59	80	5
12323750	Silver Bow Creek at Warm Springs	7/15/2014	1020	23.8	26.8	4.54	87	6
		7/15/2014	1025	24.0	25.7	4.12	86	6
12323840	Lost Creek near Anaconda	4/22/2014	0745	3.0	3.8	1.43	68	13
		4/22/2014	0750	--	--	1.49	67	13
12324200	Clark Fork at Deer Lodge	5/13/2014	1520	13.8	16.6	--	73	18
		5/13/2014	1525	13.7	16.6	--	76	18
12324400	Clark Fork above Little Blackfoot, near Garrison	3/25/2014	1525	12.2	17.9	--	81	37
		3/25/2014	1530	12.1	18.4	--	82	37
12324680	Clark Fork at Goldcreek	11/6/2013	1105	5.9	7.5	--	87	9
		11/6/2013	1110	6.2	7.4	--	76	10
12334550	Clark Fork at Turah Bridge, near Bonner	5/29/2014	1140	4.2	8.7	--	47	106
		5/29/2014	1145	4.2	8.4	--	49	104
12340500	Clark Fork above Missoula	6/11/2014	1430	2.1	2.9	--	76	19
		6/11/2014	1435	2.1	3.1	--	75	20

Table 14. Precision of analyses of field replicates for water samples, Clark Fork Basin, Montana.

[lab, laboratory; NTRU, nephelometric turbidity ratio unit; mg/L, milligram per liter; µg/L, microgram per liter; mm, millimeter]

Constituent and reporting unit	Number of replicate pairs	Standard deviation[1] (listed units)	Relative standard deviation (percent)	Within limits[2] of data-quality objective
Turbidity, unfiltered, lab, NTRU	3	0.57	30	Yes[3]
Calcium, filtered, mg/L	8	0.82	2.1	Yes
Magnesium, filtered, mg/L	8	0.20	2.2	Yes
Potassium, filtered, mg/L	3	0.03	2.4	Yes
Sodium, filtered, mg/L	3	0.09	1.7	Yes
Alkalinity, filtered, lab, mg/L	3	0.04	0.05	Yes
Chloride, filtered, mg/L	3	0.00	0.00	Yes
Fluoride, filtered, mg/L	3	0.00	0.00	Yes
Silica, filtered, mg/L	3	0.04	0.35	Yes
Sulfate, filtered, mg/L	3	0.00	0.00	Yes
Cadmium, filtered, µg/L	7	0.01	15	Yes
Cadmium, unfiltered recoverable, µg/L	7	0.01	4.7	Yes
Copper, filtered, µg/L	8	0.24	6.6	Yes
Copper, unfiltered recoverable, µg/L	7	0.93	4.3	Yes
Iron, filtered, µg/L	8	1.2	3.9	Yes
Iron, unfiltered recoverable, µg/L	7	11	2.2	Yes
Lead, filtered, µg/L	8	0.01	7.5	Yes
Lead, unfiltered recoverable, µg/L	7	0.10	3.3	Yes
Manganese, filtered, µg/L	8	0.33	1.3	Yes
Manganese, unfiltered recoverable, µg/L	7	1.4	1.9	Yes
Zinc, filtered, µg/L	7	0.5	14	Yes
Zinc, unfiltered recoverable, µg/L	7	1.7	7.7	Yes
Arsenic, filtered, µg/L	7	0.13	1.1	Yes
Arsenic, unfiltered recoverable, µg/L	7	0.36	2.4	Yes
Organic carbon, filtered, mg/L	3	0.20	8.1	Yes
Sediment, suspended, percent finer than 0.062 mm	8	3	4.0	Yes
Sediment, suspended, mg/L	8	0.66	2.5	Yes

[1]Standard deviation is calculated using one-half of the laboratory reporting level for censored values (less than the laboratory reporting level).

[2]The data-quality objective for an acceptable level of precision is a maximum relative standard deviation of 20 percent for field replicate analyses (table 3).

[3]Exceedence of data-quality objective resulted from a statistical artifact of calculating the difference between one replicate sample pair for which one value exceeds the laboratory reporting level, and one does not. Because analytical variation, in percent, can be large at very low concentrations, the precision estimated may not be representative of analytical performance at detectable concentrations.

Table 15. Precision of analyses of laboratory replicates for water samples, Clark Fork Basin, Montana.

[mg/L, milligram per liter; µg/L, microgram per liter]

Constituent and reporting unit	Number of replicate pairs	Standard deviation (listed units)	Relative standard deviation (percent)	Within limits[1] of data-quality objective
Calcium, filtered, mg/L	7	0.45	1.1	Yes
Magnesium, filtered, mg/L	7	0.05	0.49	Yes
Cadmium, filtered, µg/L	7	0.00	6.3	Yes
Cadmium, unfiltered recoverable, µg/L	7	0.00	1.8	Yes
Copper, filtered, µg/L	7	0.18	4.3	Yes
Copper, unfiltered recoverable, µg/L	7	1.1	5.4	Yes
Iron, filtered, µg/L	7	3.6	9.9	Yes
Iron, unfiltered recoverable, µg/L	7	9.9	1.9	Yes
Lead, filtered, µg/L	7	0.00	0.75	Yes
Lead, unfiltered recoverable, µg/L	7	0.05	1.7	Yes
Manganese, filtered, µg/L	7	0.15	0.56	Yes
Manganese, unfiltered recoverable, µg/L	7	1.4	1.9	Yes
Zinc, filtered, µg/L	7	0.21	1.4	Yes
Zinc, unfiltered recoverable, µg/L	7	1.1	3.7	Yes
Arsenic, filtered, µg/L	7	0.08	0.65	Yes
Arsenic, unfiltered recoverable, µg/L	7	0.48	3.1	Yes

[1]The data-quality objective for an acceptable level of precision is a maximum relative standard deviation of 20 percent for laboratory replicate analyses (table 3).

Table 16. Recovery efficiency for analyses of laboratory-spiked deionized-water blank samples.

[µg/L, microgram per liter]

Constituent and reporting unit	Number of samples	95-percent confidence interval for spike recovery (percent)	Mean spike recovery (percent)	Within limits[1] of data-quality objective
Cadmium, filtered, µg/L	5	95.1–104	99.4	Yes
Cadmium, unfiltered recoverable, µg/L	5	99.0–104	101	Yes
Copper, filtered, µg/L	5	91.0–105	98.1	Yes
Copper, unfiltered recoverable, µg/L	5	98.8–102	100	Yes
Iron, filtered, µg/L	5	95.8–111	103	Yes
Iron, unfiltered recoverable, µg/L	5	99.7–106	103	Yes
Lead, filtered, µg/L	5	100–104	102	Yes
Lead, unfiltered recoverable, µg/L	5	100–107	103	Yes
Manganese, filtered, µg/L	5	91.6–107	99.2	Yes
Manganese, unfiltered recoverable, µg/L	5	97.7–103	100	Yes
Zinc, filtered, µg/L	5	103–117	110	Yes
Zinc, unfiltered recoverable, µg/L	5	97.1–104	101	Yes
Arsenic, filtered, µg/L	5	87.6–102	94.7	Yes
Arsenic, unfiltered recoverable, µg/L	5	99.0–105	102	Yes

[1]The data-quality objective for acceptable bias is a maximum deviation of 25 percent from a theoretical 100-percent recovery (table 3).

Table 17. Recovery efficiency for analyses of laboratory-spiked stream samples, Clark Fork Basin, Montana.

[µg/L, microgram per liter]

Constituent and reporting unit	Number of samples	95-percent confidence interval for spike recovery (percent)	Mean spike recovery (percent)	Within limits[1] of data-quality objective
Cadmium, filtered, µg/L	5	95.6–110	103	Yes
Cadmium, unfiltered recoverable, µg/L	5	92.0–99.0	95.5	Yes
Copper, filtered, µg/L	5	90.1–103	96.6	Yes
Copper, unfiltered recoverable, µg/L	5	89.8–97.8	93.8	Yes
Iron, filtered, µg/L	5	92.7–103	97.6	Yes
Iron, unfiltered recoverable, µg/L	5	92.7–109	101	Yes
Lead, filtered, µg/L	5	96.7–103	100	Yes
Lead, unfiltered recoverable, µg/L	5	94.9–104	99.7	Yes
Manganese, filtered, µg/L	5	90.4–104	97.1	Yes
Manganese, unfiltered recoverable, µg/L	5	89.3–100	94.8	Yes
Zinc, filtered, µg/L	5	94.2–108	101	Yes
Zinc, unfiltered recoverable, µg/L	5	83.1–94.6	88.9	Yes
Arsenic, filtered, µg/L	5	82.7–102	92.4	Yes
Arsenic, unfiltered recoverable, µg/L	5	93.5–102	97.7	Yes

[1]The data-quality objective for acceptable bias is a maximum deviation of 25 percent from a theoretical 100-percent recovery (table 3).

Table 18. Analyses of field blanks for water samples.

[hh, hour; mm, minute; µS/cm, microsiemen per centimeter at 25 degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; mg/L, milligram per liter; --, no data; <, less than laboratory reporting level; µg/L, microgram per liter]

Date	Time (hhmm)	pH, onsite (standard units)	Specific conduc-tance, onsite (µS/cm)	Turbidity, unfiltered, lab (NTRU)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)	Potassium, filtered (mg/L)	Sodium, filtered (mg/L)	Alkalinity, filtered, lab (mg/L)	Chloride, filtered (mg/L)
11/4/2013	1345	5.5	2	--	<0.022	<0.011	--	--	--	--
[1]3/19/2014	0800	5.5	2	<2.0	<0.022	<0.011	<0.03	<0.06	<4.6	<0.02
4/23/2014	1615	5.5	2	--	<0.022	<0.011	--	--	--	--
5/13/2014	0835	5.4	2	<2.0	<0.022	<0.011	<0.03	<0.06	<4.6	<0.02
5/28/2014	1530	5.2	2	--	<0.022	<0.011	--	--	--	--
6/11/2014	1035	5.6	2	--	<0.022	<0.011	--	--	--	--
7/15/2014	1215	5.4	2	--	<0.022	<0.011	--	--	--	--
8/12/2014	1105	5.5	2	<2.0	<0.022	<0.011	<0.03	<0.06	<4.6	<0.02

Date	Fluoride, filtered (mg/L)	Silica, filtered (mg/L)	Sulfate, filtered (mg/L)	Nitrate plus nitrite, filtered (mg/L)	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)
11/4/2013	--	--	--	--	<0.030	<0.030	<0.80	<0.80	<4.0	<4.6
[1]3/19/2014	<0.01	0.069	<0.02	<0.01	<0.030	<0.030	<0.80	<0.80	<4.0	<4.6
4/23/2014	--	--	--	--	<0.030	<0.030	<0.80	<0.80	<4.0	<4.6
5/13/2014	<0.01	0.023	<0.02	--	<0.030	<0.030	<0.80	1.5	<4.0	<4.6
5/28/2014	--	--	--	--	<0.030	<0.030	<0.80	<0.80	<4.0	<4.6
6/11/2014	--	--	--	--	<0.030	<0.030	<0.80	<0.80	<4.0	<4.6
7/15/2014	--	--	--	--	<0.030	<0.030	<0.80	<0.80	<4.0	<4.6
8/12/2014	<0.01	<0.018	<0.02	--	<0.030	<0.030	<0.80	<0.80	<4.0	<4.6

Date	Lead, filtered (µg/L)	Lead, unfiltered recoverable (µg/L)	Manganese, filtered (µg/L)	Manganese, unfiltered recoverable (µg/L)	Zinc, filtered (µg/L)	Zinc, unfiltered recoverable (µg/L)	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Organic carbon, filtered (mg/L)
11/4/2013	<0.040	<0.04	0.41	<0.4	<2.0	<2.0	<0.10	<0.28	--
[1]3/19/2014	<0.040	<0.04	<0.40	<0.4	<2.0	<2.0	<0.10	<0.28	<0.23
4/23/2014	<0.040	<0.04	<0.40	<0.4	<2.0	<2.0	<0.10	<0.28	--
5/13/2014	<0.040	<0.04	0.41	<0.4	<2.0	<2.0	<0.10	<0.28	<0.23
5/28/2014	<0.040	<0.04	0.41	<0.4	<2.0	<2.0	<0.10	<0.28	--
6/11/2014	<0.040	0.06	<0.40	<0.4	<2.0	<2.0	<0.10	<0.28	--
7/15/2014	<0.040	<0.04	<0.40	<0.4	<2.0	<2.0	<0.10	<0.28	--
8/12/2014	<0.040	<0.04	<0.40	<0.4	<2.0	<2.0	<0.10	<0.28	<0.23

[1]Annual office equipment blank collected before any equipment was used in the field.

Table 19. Bed-sediment data for the Clark Fork Basin, Montana, August 2014.

[Trace-element concentrations in bed sediment were determined for the fine-grained fraction (material less than 0.063 millimeter in diameter). Reported concentrations are the mean of all replicate aliquot analyses from each composite sample. µg/g, microgram per gram of dry sample weight; <, less than laboratory reporting level]

Site number (fig. 1)	Site name	Number of composite samples	Concentration (µg/g)								
			Arsenic	Cadmium	Chromium	Copper	Iron	Lead	Manganese	Nickel	Zinc
12323600	Silver Bow Creek at Opportunity	3	37.8	10.0	19.6	699	28,200	113	3,470	13.7	1,670
12323750	Silver Bow Creek at Warm Springs	3	132	7.0	23.5	333	27,600	91.5	7,320	17.3	619
12323770	Warm Springs Creek at Warm Springs	3	64.5	2.8	24.1	767	22,100	75.8	4,690	20.8	367
12323800	Clark Fork near Galen	3	143	5.0	21.5	1,060	28,600	126	5,490	19.0	867
461415112450801	Clark Fork below Lost Creek, near Galen	3	163	5.5	19.4	1,470	28,800	161	4,880	16.1	1,080
461559112443301	Clark Fork at county bridge, near Racetrack	3	121	5.3	19.2	1,350	28,800	134	3,480	14.1	1,030
461903112440701	Clark Fork at Dempsey Creek diversion, near Racetrack	3	109	5.2	19.0	1,200	31,400	151	3,820	13.5	1,090
12324200	Clark Fork at Deer Lodge	3	98.9	5.0	23.1	1,210	30,000	145	2,060	15.8	1,010
12324400	Clark Fork above Little Blackfoot River, near Garrison	3	86.4	5.0	22.5	1,200	26,500	132	3,410	14.1	1,110
12324680	Clark Fork at Goldcreek	3	51.5	3.2	23.6	687	24,100	94.8	1,450	13.3	764
12331800	Clark Fork near Drummond	3	51.1	3.9	20.1	638	44,000	102	1,810	15.5	998
12334550	Clark Fork at Turah Bridge, near Bonner	3	26.0	2.1	19.2	322	20,800	58.3	1,060	13.3	615
12340000	Blackfoot River near Bonner	3	4.7	<0.11	15.3	21.9	18,400	11.7	387	11.1	57.5
12340500	Clark Fork above Missoula	3	18.4	1.0	17.2	167	19,300	34.4	653	11.7	358

Table 20. Recovery efficiency for analyses of standard reference materials for bed-sediment samples.

[Dilution ratio is the proportion of initial volume of concentrated nitric acid used as a digesting reagent to final volume of solution after addition of 0.6N (normal) hydrochloric acid used for reconstituting dried residue. µg/g, microgram per gram of dry sample weight; SRM, standard reference material (agricultural soils)]

Constituent	Number of analyses	Dilution ratio	Certified concentration (µg/g)	Mean SRM recovery (percent)	95-percent confidence interval for SRM recovery (percent)
SRM sample 2709a					
Arsenic	10	1:10	10.5	69.8	69.0–70.7
Cadmium	10	1:10	0.371	38.7	35.7–41.6
Chromium	10	1:10	130	63.9	62.3–65.6
Copper	10	1:10	33.9	79.9	77.5–82.4
Iron	10	1:10	33,600	90.9	89.0–92.8
Lead	10	1:10	17.3	56.6	55.5–57.7
Manganese	10	1:10	529	89.4	87.8–91.1
Nickel	10	1:10	85	83.5	82.7–84.2
Zinc	10	1:10	103	84.8	84.0–85.7
SRM sample 2711a					
Arsenic	10	1:10	107	87.1	86.1–88.2
Cadmium	10	1:10	54.1	98.6	97.6–99.7
Chromium	10	1:10	52.3	49.9	48.0–51.7
Copper	10	1:10	140	98.0	95.5–100
Iron	10	1:10	28,200	85.7	83.8–87.7
Lead	10	1:10	1,400	91.0	89.9–92.1
Manganese	10	1:10	675	81.1	79.4–82.8
Nickel	10	1:10	21.7	82.9	81.7–84.0
Zinc	10	1:10	414	88.3	87.1–89.4

Table 21. Analyses of procedural blanks for bed-sediment samples.

[Dilution ratio is the proportion of initial volume of concentrated nitric acid used as a digesting reagent to final volume of solution after addition of 0.6N (normal) hydrochloric acid used for reconstituting dried residue. µg/mL, microgram per milliliter; <, less than minimum reporting level for liquid-phase concentration, in µg/mL]

Site number (fig. 1)	Site name	Dilution ratio	Concentration (µg/mL)								
			Arsenic	Cadmium	Chromium	Copper	Iron	Lead	Manganese	Nickel	Zinc
12323600	Silver Bow Creek at Opportunity	1:10	<0.002	<0.001	<0.003	<0.002	<0.10	<0.004	<0.003	<0.001	<0.001
12323750	Silver Bow Creek at Warm Springs	1:10	<0.002	<0.001	<0.003	<0.002	<0.10	<0.004	<0.003	<0.001	<0.001
12323770	Warm Springs Creek at Warm Springs	1:10	<0.002	<0.001	<0.003	<0.002	<0.10	<0.004	<0.003	<0.001	<0.001
12323800	Clark Fork near Galen	1:10	<0.002	<0.001	<0.003	<0.002	<0.10	<0.004	<0.003	<0.001	<0.001
461415112450801	Clark Fork below Lost Creek, near Galen	1:10	<0.002	<0.001	<0.003	<0.002	<0.10	<0.004	<0.003	<0.001	<0.001
461559112443301	Clark Fork at county bridge, near Racetrack	1:10	<0.002	<0.001	<0.003	<0.002	<0.10	<0.004	<0.003	<0.001	<0.001
461903112440701	Clark Fork at Dempsey Creek diversion, near Racetrack	1:10	<0.002	<0.001	<0.003	<0.002	<0.10	<0.004	<0.003	<0.001	<0.001
12324200	Clark Fork at Deer Lodge	1:10	<0.002	<0.001	<0.003	<0.002	<0.10	<0.004	<0.003	<0.001	<0.001
12324400	Clark Fork above Little Blackfoot River, near Garrison	1:10	<0.002	<0.001	<0.003	<0.002	<0.10	<0.004	<0.003	<0.001	<0.001
12324680	Clark Fork at Goldcreek	1:10	<0.002	<0.001	<0.003	<0.002	<0.10	<0.004	<0.003	<0.001	<0.001
12331800	Clark Fork near Drummond	1:10	<0.002	<0.001	<0.003	<0.002	<0.10	<0.004	<0.003	<0.001	<0.001
12334550	Clark Fork at Turah Bridge, near Bonner	1:10	<0.002	<0.001	<0.003	<0.002	<0.10	<0.004	<0.003	<0.001	<0.001
12340000	Blackfoot River near Bonner	1:10	<0.002	<0.001	<0.003	<0.002	<0.10	<0.004	<0.003	<0.001	<0.001
12340500	Clark Fork above Missoula	1:10	<0.002	<0.001	<0.003	<0.002	<0.10	<0.004	<0.003	<0.001	<0.001

Table 22. Biological data for the Clark Fork Basin, Montana, August 2014.

[Analyses are for the whole-body tissue of aquatic insects. Composite samples were made by combining similar-sized insects of the same species into a sample of sufficient mass for analysis. Concentrations for biota samples composed of two or more composite samples are the means of all analyses. All tissues were analyzed undiluted (dilution ratio 1:1). µg/g, microgram per gram of dry sample weight]

Taxon	Number of composite samples	Concentration (µg/g)								
		Arsenic	Cadmium	Chromium	Copper	Iron	Lead	Manganese	Nickel	Zinc
12323600—Silver Bow Creek at Opportunity										
Hydropsyche cockerelli	2	4.7	3.8	4.1	87.7	2,420	12.5	827	2.1	445
12323750—Silver Bow Creek at Warm Springs										
Hydropsyche cockerelli	2	9.0	0.5	1.4	28.7	826	3.0	719	0.8	171
12323770—Warm Springs Creek at Warm Springs										
Arctopsyche grandis	1	7.6	2.5	5.0	102	1,490	7.7	1,550	4.0	216
Hesperoperla pacifica	1	2.9	2.6	0.9	55.9	375	1.4	270	1.1	427
Hydropsyche occidentalis	1	9.8	1.4	3.1	116	1,520	7.0	1,440	3.5	171
12323800—Clark Fork near Galen										
Hydropsyche cockerelli	2	13.5	2.3	4.2	120	2,390	11.1	1,720	2.7	229
461415112450801—Clark Fork below Lost Creek, near Galen										
Hydropsyche cockerelli	3	15.4	2.4	2.4	167	2,000	15.0	1,540	2.8	263
461559112443301—Clark Fork at county bridge, near Racetrack										
Arctopsyche grandis	1	5.2	2.4	3.3	81.0	889	9.1	1,430	1.9	243
Hydropsyche cockerelli	2	14.3	2.7	2.5	124	1,660	11.8	1,640	1.9	247
461903112440701—Clark Fork at Dempsey Creek diversion, near Racetrack										
Arctopsyche grandis	2	6.4	3.8	0.9	69.1	542	6.8	1,280	1.1	283
Claassenia sabulosa	1	2.6	0.9	0.5	59.0	216	1.4	98.4	0.7	255
Hydropsyche cockerelli	2	13.6	1.7	3.1	100	2,150	12.0	1,420	2.1	247
Hydropsyche occidentalis	1	16.1	1.4	3.8	107	1,880	16.2	1,410	2.0	280
12324200—Clark Fork at Deer Lodge										
Arctopsyche grandis	1	6.3	3.3	2.0	78.5	1,320	12.5	1,580	1.7	265
Hydropsyche cockerelli	2	9.2	3.5	2.1	98.0	1,260	13.2	1,570	1.2	218
Hydropsyche occidentalis	1	9.0	1.9	2.0	87.7	1,160	12.4	1,760	1.5	232
12324400—Clark Fork above Little Blackfoot River, near Garrison										
Arctopsyche grandis	2	4.8	3.6	1.2	59.5	552	5.4	1,110	1.0	232
Claassenia sabulosa	2	2.7	1.1	0.6	71.3	282	2.1	210	1.0	264
Hydropsyche cockerelli	1	9.5	3.4	2.5	129	1,380	14.3	1,880	1.5	242
12324680—Clark Fork at Goldcreek										
Arctopsyche grandis	3	4.5	2.5	1.0	40.2	526	3.9	1,240	0.9	198
Claassenia sabulosa	2	1.7	0.8	0.7	59.3	290	1.5	144	0.7	235
12331800—Clark Fork near Drummond										
Arctopsyche grandis	3	2.6	1.5	0.9	24.8	460	4.3	914	0.7	191
Claassenia sabulosa	2	1.7	0.8	0.6	49.0	251	1.3	121	0.8	305
Hydropsyche cockerelli	1	5.0	2.1	2.7	61.8	1,320	10.3	1,380	1.5	226
Hydropsyche occidentalis	1	4.5	2.9	3.0	65.0	1,320	10.4	1,670	1.5	267

Table 22. Biological data for the Clark Fork Basin, Montana, August 2014.—Continued

[Analyses are for the whole-body tissue of aquatic insects. Composite samples were made by combining similar-sized insects of the same species into a sample of sufficient mass for analysis. Concentrations for biota samples composed of two or more composite samples are the means of all analyses. All tissues were analyzed undiluted (dilution ratio 1:1). µg/g, microgram per gram of dry sample weight]

Taxon	Number of composite samples	Concentration (µg/g)								
		Arsenic	Cadmium	Chromium	Copper	Iron	Lead	Manganese	Nickel	Zinc
12334550—Clark Fork at Turah Bridge, near Bonner										
Arctopsyche grandis	2	4.1	1.7	2.0	39.0	1,060	5.8	966	1.4	246
Claassenia sabulosa	2	2.5	2.0	0.6	72.8	176	0.7	99.4	0.4	386
Hydropsyche cockerelli	2	5.0	1.5	2.3	60.1	1,440	6.9	927	1.9	224
Hydropsyche occidentalis	1	4.2	1.1	2.7	50.7	1,410	7.1	1,070	1.6	227
12340000—Blackfoot River near Bonner										
Arctopsyche grandis	2	2.8	0.4	2.3	17.0	1,010	1.2	407	2.0	151
Hydropsyche cockerelli	1	2.9	0.3	5.7	17.5	2,140	2.6	409	2.6	132
Hydropsyche occidentalis	1	2.2	0.4	3.2	16.7	1,600	1.8	457	1.7	162
12340500—Clark Fork above Missoula										
Arctopsyche grandis	2	2.2	1.5	1.2	20.0	576	1.9	697	0.8	196
Claassenia sabulosa	2	1.0	1.2	0.6	45.2	216	0.5	108	0.6	279
Hydropsyche cockerelli	2	3.0	1.0	2.5	38.4	1,310	3.9	874	1.4	190

Table 23. Recovery efficiency for analyses of certified reference material for biota samples.

[CRM, certified reference material (lobster hepatopancreas); µg/g, microgram per gram of dry sample weight]

Constituent	Number of analyses	Certified concentration (µg/g)	Mean CRM recovery (percent)	95-percent confidence interval for CRM recovery (percent)
CRM sample TORT-2				
Arsenic	10	21.6	97.6	96.9–98.3
Cadmium	10	26.7	90.7	89.6–91.8
Chromium	10	0.77	139	80.7–197
Copper	10	106	81.6	80.6–82.7
Iron	10	105	106	98.8–113
Lead	10	0.35	114	96.8–130
Manganese	10	13.6	88.3	86.8–89.9
Nickel	10	2.5	76.4	74.3–78.5
Zinc	10	180	89.6	87.0–92.3
CRM sample TORT-3				
Arsenic	7	59.5	109	107–110
Cadmium	7	42.3	86.1	84.0–88.1
Chromium	7	1.95	87.3	82.8–91.9
Copper	7	497	86.1	84.9–87.2
Iron	7	179	89.4	86.3–92.5
Lead	7	0.225	179	165–193
Manganese	7	15.6	84.8	82.8–86.8
Nickel	7	5.3	78.8	76.9–80.8
Zinc	7	136	89.1	86.7–91.5

Table 24. Analyses of procedural blanks for biota samples.

[Procedural blanks were not diluted prior to analyses. µg/mL, microgram per milliliter; <, less than minimum reporting level for liquid-phase concentration, in µg/mL]

Site number (fig. 1)	Site name	Dilution ratio	Concentration (µg/mL)								
			Arsenic	Cadmium	Chromium	Copper	Iron	Lead	Manganese	Nickel	Zinc
12323600	Silver Bow Creek at Opportunity	1:1	<0.003	<0.001	<0.005	<0.003	<0.4	<0.009	<0.005	<0.001	<0.001
12323750	Silver Bow Creek at Warm Springs	1:1	<0.003	<0.001	<0.005	<0.003	<0.4	<0.009	<0.005	<0.001	<0.001
12323770	Warm Springs Creek at Warm Springs	1:1	<0.003	<0.001	<0.005	<0.003	<0.4	<0.009	<0.005	<0.001	<0.001
12323800	Clark Fork near Galen	1:1	<0.003	<0.001	<0.005	<0.003	<0.4	<0.009	<0.005	<0.001	<0.001
461415112450801	Clark Fork below Lost Creek, near Galen	1:1	<0.003	<0.001	<0.005	<0.003	<0.4	<0.009	<0.005	<0.001	<0.001
461559112443301	Clark Fork at county bridge, near Racetrack	1:1	<0.003	<0.001	<0.005	<0.003	<0.4	<0.009	<0.005	<0.001	<0.001
461903112440701	Clark Fork at Dempsey Creek diversion, near Racetrack	1:1	<0.003	<0.001	<0.005	<0.003	<0.4	<0.009	<0.005	<0.001	<0.001
12324200	Clark Fork at Deer Lodge	1:1	<0.003	<0.001	<0.005	<0.003	<0.4	<0.009	<0.005	<0.001	<0.001
12324400	Clark Fork above Little Blackfoot River, near Garrison	1:1	<0.003	<0.001	<0.005	<0.003	<0.4	<0.009	<0.005	<0.001	<0.001
12324680	Clark Fork at Goldcreek	1:1	<0.003	<0.001	<0.005	<0.003	<0.4	<0.009	<0.005	<0.001	<0.001
12331800	Clark Fork near Drummond	1:1	<0.003	<0.001	<0.005	<0.003	<0.4	<0.009	<0.005	<0.001	<0.001
12334550	Clark Fork at Turah Bridge, near Bonner	1:1	<0.003	<0.001	<0.005	<0.003	<0.4	<0.009	<0.005	<0.001	<0.001
12340000	Blackfoot River near Bonner	1:1	<0.003	<0.001	<0.005	<0.003	<0.4	<0.009	<0.005	<0.001	<0.001
12340500	Clark Fork above Missoula	1:1	<0.003	<0.001	<0.005	<0.003	<0.4	<0.009	<0.005	<0.001	<0.001

Table 25. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2014.

[ft^3/s, cubic foot per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; <, less than laboratory reporting level[1]; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day; --, no data]

Property or constituent and reporting unit	Number of samples	Maximum	Minimum	Mean	Median
12323230—Blacktail Creek at Harrison Avenue, at Butte Period of record for water-quality data: March 1993–August 1995, December 1996–August 2003, December 2004–September 2014					
Streamflow, instantaneous (ft^3/s)	163	156	1.9	16	9.2
pH, onsite (standard units)	163	8.4	7.3	7.7	7.7
Specific conductance, onsite (µS/cm)	163	412	116	263	264
Temperature, water (°C)	163	17.5	1.0	7.9	8.0
Turbidity, unfiltered, lab (NTRU)	7	6.5	<2.0	[2]3.2	3.0
Hardness, filtered (mg/L as $CaCO_3$)	163	153	37.7	104	106
Calcium, filtered (mg/L)	163	42.9	10.6	29.7	30.0
Magnesium, filtered (mg/L)	163	11.1	2.71	7.23	7.29
Potassium, filtered (mg/L)	41	6.40	2.00	2.78	2.57
Sodium, filtered (mg/L)	41	18.0	6.40	10.6	10.7
Alkalinity, filtered, lab (mg/L)	13	124	54.5	87.6	84.7
Chloride, filtered (mg/L)	41	18.0	2.80	8.22	7.50
Fluoride, filtered (mg/L)	41	0.60	0.18	0.30	0.30
Silica, filtered (mg/L)	41	32.0	14.0	24.4	24.6
Sulfate, filtered (mg/L)	41	40.2	15.0	26.9	27.3
Nitrate plus nitrite, filtered (mg/L)	7	1.2	0.16	0.64	0.35
Cadmium, filtered (µg/L)	161	0.50	<0.03	[2]0.04	0.02
Cadmium, unfiltered recoverable (µg/L)	163	0.11	<0.01	[2]0.04	<1
Copper, filtered (µg/L)	162	10.0	<1.0	[2]3.5	3.0
Copper, unfiltered recoverable (µg/L)	163	52.0	0.91	6.3	5.0
Iron, filtered (µg/L)	163	640	15.2	192	174
Iron, unfiltered recoverable (µg/L)	163	4,220	123	659	590
Lead, filtered (µg/L)	163	2.80	<0.02	[2]0.18	0.05
Lead, unfiltered recoverable (µg/L)	163	47.0	<1.00	[2]1.60	0.64
Manganese, filtered (µg/L)	163	144	14.2	44.4	39.0
Manganese, unfiltered recoverable (µg/L)	163	240	23.5	61.6	52.7
Zinc, filtered (µg/L)	161	11	<1.0	[2]3.3	2.6
Zinc, unfiltered recoverable (µg/L)	163	130	<3.0	[2]7.7	4.0
Arsenic, filtered (µg/L)	162	13.0	1.0	4.0	3.4
Arsenic, unfiltered recoverable (µg/L)	163	18.0	1.0	[2]5.4	4.5
Organic carbon, filtered (mg/L)	13	9.52	1.40	4.62	3.85
Sediment, suspended (percent finer than 0.062 mm)	163	97	50	82	84
Sediment, suspended concentration (mg/L)	163	139	1	11	7
Sediment, suspended discharge (ton/d)	163	59	0.01	0.96	0.17

Table 25. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2014.—Continued

[ft^3/s, cubic foot per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; <, less than laboratory reporting level[1]; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day; --, no data]

Property or constituent and reporting unit	Number of samples	Maximum	Minimum	Mean	Median
12323250—Silver Bow Creek below Blacktail Creek, at Butte Period of record for water-quality data: March 1993–August 1995, December 1996–September 2014					
Streamflow, instantaneous (ft^3/s)	171	202	13	31	25
pH, onsite (standard units)	171	8.2	7.2	7.6	7.6
Specific conductance, onsite (µS/cm)	171	691	209	459	468
Temperature, water (°C)	171	20.0	1.0	10.2	10.0
Turbidity, unflitered, lab (NTRU)	7	5.3	<2.0	[2]3.6	3.6
Hardness, filtered (mg/L as $CaCO_3$)	171	217	66.0	147	150
Calcium, filtered (mg/L)	171	62.7	19.0	41.8	42.4
Magnesium, filtered (mg/L)	171	16.1	4.51	10.4	10.7
Potassium, filtered (mg/L)	41	35.0	3.64	7.95	5.80
Sodium, filtered (mg/L)	41	66.0	12.0	25.2	25.0
Alkalinity, filtered, lab (mg/L)	13	119	66.9	87.2	82.9
Chloride, filtered (mg/L)	40	88.0	6.70	23.4	21.0
Fluoride, filtered (mg/L)	40	0.80	0.26	0.43	0.40
Silica, filtered (mg/L)	40	28.0	17.0	22.2	22.0
Sulfate, filtered (mg/L)	40	96.0	35.0	72.4	75.5
Nitrate plus nitrite, filtered (mg/L)	7	4.40	0.34	1.18	0.53
Cadmium, filtered (µg/L)	171	6.2	0.04	0.83	0.20
Cadmium, unfiltered recoverable (µg/L)	171	6.0	0.06	1.12	0.30
Copper, filtered (µg/L)	171	303	2.9	28.4	12.1
Copper, unfiltered recoverable (µg/L)	171	550	8.4	65.6	22.6
Iron, filtered (µg/L)	171	292	9.6	97.3	78.5
Iron, unfiltered recoverable (µg/L)	171	7,400	85.4	777	546
Lead, filtered (µg/L)	171	2.4	<0.5	[2]0.42	0.24
Lead, unfiltered recoverable (µg/L)	171	250	0.61	10.1	2.41
Manganese, filtered (µg/L)	171	1,700	20.7	283	145
Manganese, unfiltered recoverable (µg/L)	171	1,600	25.9	322	165
Zinc, filtered (µg/L)	171	2,200	5.3	271	81.5
Zinc, unfiltered recoverable (µg/L)	171	2,200	20.5	329	106
Arsenic, filtered (µg/L)	171	13.4	2.3	6.0	5.6
Arsenic, unfiltered recoverable (µg/L)	171	45.0	3.0	9.5	8.0
Organic carbon, filtered (mg/L)	13	9.97	5.73	7.32	7.49
Sediment, suspended (percent finer than 0.062 mm)	170	98	42	83	85
Sediment, suspended concentration (mg/L)	170	405	2	19	9
Sediment, suspended discharge (ton/d)	170	70	0.08	2.2	0.62

Table 25. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2014.—Continued

[ft^3/s, cubic foot per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; <, less than laboratory reporting level[1]; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day; --, no data]

Property or constituent and reporting unit	Number of samples	Maximum	Minimum	Mean	Median
12323600—Silver Bow Creek at Opportunity Period of record for water-quality data: March 1993–August 1995, December 1996–September 2014					
Streamflow, instantaneous (ft^3/s)	171	648	13	79	52
pH, onsite (standard units)	173	9.5	7.2	8.4	8.3
Specific conductance, onsite (µS/cm)	173	633	202	414	407
Temperature, water (°C)	173	24.0	-1.0	9.4	9.5
Turbidity, unfiltered, lab (NTRU)	7	7.5	2.5	5.0	5.4
Hardness, filtered (mg/L as $CaCO_3$)	173	240	60.2	149	148
Calcium, filtered (mg/L)	173	71.6	18.5	44.1	44.0
Magnesium, filtered (mg/L)	173	15.0	3.42	9.44	9.34
Potassium, filtered (mg/L)	44	16.0	1.79	4.69	4.20
Sodium, filtered (mg/L)	44	33.5	5.06	17.5	16.8
Alkalinity, filtered, lab (mg/L)	15	110	71.6	91.8	93.6
Chloride, filtered (mg/L)	43	38.2	3.20	14.2	12.0
Fluoride, filtered (mg/L)	43	0.80	0.16	0.40	0.40
Silica, filtered (mg/L)	43	28.0	9.56	20.2	21.0
Sulfate, filtered (mg/L)	43	190	32.0	65.8	62.0
Cadmium, filtered (µg/L)	172	41.0	<0.1	[2]0.94	0.50
Cadmium, unfiltered recoverable (µg/L)	173	49.0	0.18	[2]1.70	1.00
Copper, filtered (µg/L)	171	450	6.5	38.6	30.0
Copper, unfiltered recoverable (µg/L)	173	3,900	14.9	167	92.0
Iron, filtered (µg/L)	173	307	<3	[2]48.7	28.1
Iron, unfiltered recoverable (µg/L)	172	24,100	176	1,430	748
Lead, filtered (µg/L)	173	5.1	<0.5	[2]0.64	0.32
Lead, unfiltered recoverable (µg/L)	173	650	1.48	31.3	13.8
Manganese, filtered (µg/L)	173	9,300	27.5	354	264
Manganese, unfiltered recoverable (µg/L)	173	10,000	69.8	466	342
Zinc, filtered (µg/L)	172	13,000	11.2	241	116
Zinc, unfiltered recoverable (µg/L)	173	15,000	32.7	425	249
Arsenic, filtered (µg/L)	173	34.0	1.0	10.5	10.0
Arsenic, unfiltered recoverable (µg/L)	173	235	5.5	22.5	16.0
Organic carbon, filtered (mg/L)	12	8.35	3.70	5.62	5.16
Sediment, suspended (percent finer than 0.062 mm)	174	95	37	78	82
Sediment, suspended concentration (mg/L)	174	801	5	47	19
Sediment, suspended discharge (ton/d)	171	781	0.18	21	2.7

Table 25. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2014.—Continued

[ft^3/s, cubic foot per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; <, less than laboratory reporting level[1]; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day; --, no data]

Property or constituent and reporting unit	Number of samples	Maximum	Minimum	Mean	Median
12323670—Mill Creek near Anaconda Period of record for water-quality data: December 2004–September 2014					
Streamflow, instantaneous (ft^3/s)	79	309	7.4	64	33
pH, onsite (standard units)	80	8.6	7.5	8.0	8.0
Specific conductance, onsite (µS/cm)	80	213	56	131	129
Temperature, water (°C)	80	17.0	0.0	8.3	8.2
Turbidity, unfiltered, lab, (NTRU)	73	21	<2.0	[2]2.4	<2.0
Hardness, filtered (mg/L as $CaCO_3$)	80	98.0	23.7	57.1	54.2
Calcium, filtered (mg/L)	80	26.7	7.00	15.8	15.0
Magnesium, filtered (mg/L)	80	8.01	1.45	4.27	3.96
Potassium, filtered (mg/L)	7	0.82	0.47	0.63	0.65
Sodium, filtered (mg/L)	7	6.04	2.14	3.89	3.07
Alkalinity, filtered, lab (mg/L)	7	85.1	30.8	52.5	48.9
Chloride, filtered (mg/L)	7	0.54	0.17	0.32	0.27
Fluoride, filtered (mg/L)	7	0.35	0.28	0.32	0.33
Silica, filtered (mg/L)	7	15.5	9.27	12.1	11.3
Sulfate, filtered (mg/L)	7	13.9	3.12	6.49	5.37
Cadmium, filtered (µg/L)	79	0.11	0.02	[2]0.05	0.04
Cadmium, unfiltered recoverable (µg/L)	80	0.19	0.03	0.08	0.07
Copper, filtered (µg/L)	80	5.1	0.72	2.2	2.0
Copper, unfiltered recoverable (µg/L)	80	10.6	1.3	3.7	3.1
Iron, filtered (µg/L)	80	125	21.2	45.5	40.8
Iron, unfiltered recoverable (µg/L)	80	730	64.9	191	148
Lead, filtered (µg/L)	80	0.24	0.02	[2]0.12	0.10
Lead, unfiltered recoverable (µg/L)	80	3.12	0.15	0.72	0.54
Manganese, filtered (µg/L)	80	12.0	3.1	5.8	5.6
Manganese, unfiltered recoverable (µg/L)	80	36.6	6.2	13.3	11.5
Zinc, filtered (µg/L)	80	4.3	<1.4	[2]1.7	1.5
Zinc, unfiltered recoverable (µg/L)	80	9.2	<2.0	[2]3.0	2.6
Arsenic, filtered (µg/L)	80	32.9	7.3	16.2	14.6
Arsenic, unfiltered recoverable (µg/L)	80	34.8	7.8	17.4	15.4
Organic carbon, filtered (mg/L)	7	3.48	1.35	2.50	2.56
Sediment, suspended (percent finer than 0.062 mm)	80	86	14	61	64
Sediment, suspended concentration (mg/L)	80	42	1	6	4
Sediment, suspended discharge (ton/d)	79	28	0.02	2.1	0.36

Table 25. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2014.—Continued

[ft^3/s, cubic foot per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; <, less than laboratory reporting level[1]; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day; --, no data]

Property or constituent and reporting unit	Number of samples	Maximum	Minimum	Mean	Median
12323700—Mill Creek at Opportunity Period of record for water-quality data: March 2003–September 2014					
Streamflow, instantaneous (ft^3/s)	94	261	0.43	38	12
pH, onsite (standard units)	96	8.3	7.5	7.9	8.0
Specific conductance, onsite (µS/cm)	96	242	59	147	148
Temperature, water (°C)	96	20.0	-1.0	9.1	9.2
Turbidity, unfiltered, lab (NTRU)	14	7.2	<2.0	[2]1.8	<2.0
Hardness, filtered (mg/L as $CaCO_3$)	96	112	24.0	63.1	62.5
Calcium, filtered (mg/L)	96	31.0	7.01	17.7	17.4
Magnesium, filtered (mg/L)	96	8.44	1.56	4.59	4.54
Potassium, filtered (mg/L)	14	1.02	0.48	0.69	0.68
Sodium, filtered (mg/L)	14	8.15	2.29	4.29	3.80
Alkalinity, filtered, lab (mg/L)	14	88.2	31.9	56.0	53.8
Chloride, filtered (mg/L)	14	0.82	0.21	0.40	0.32
Fluoride, filtered (mg/L)	14	0.40	0.29	0.34	0.36
Silica, filtered (mg/L)	14	14.9	9.47	11.9	11.6
Sulfate, filtered (mg/L)	14	27.7	4.19	10.9	9.40
Cadmium, filtered (µg/L)	96	0.13	0.02	0.06	0.06
Cadmium, unfiltered recoverable (µg/L)	96	0.86	0.03	0.13	0.09
Copper, filtered (µg/L)	96	6.1	1.0	2.8	2.4
Copper, unfiltered recoverable (µg/L)	96	38.8	1.5	6.1	3.9
Iron, filtered (µg/L)	96	93.8	15.9	45.7	41.2
Iron, unfiltered recoverable (µg/L)	96	1,960	44.3	284	150
Lead, filtered (µg/L)	96	0.35	<0.08	[2]0.13	0.12
Lead, unfiltered recoverable (µg/L)	96	12.7	0.07	1.34	0.47
Manganese, filtered (µg/L)	96	32.8	2.1	6.8	5.1
Manganese, unfiltered recoverable (µg/L)	96	113	2.9	17.5	12.0
Zinc, filtered (µg/L)	95	7.7	<1.4	[2]2.8	2.6
Zinc, unfiltered recoverable (µg/L)	96	41	<2.4	[2]6.0	4.1
Arsenic, filtered (µg/L)	96	55.1	9.0	21.0	19.2
Arsenic, unfiltered recoverable (µg/L)	96	53.5	10.0	23.6	22.0
Organic carbon, filtered (mg/L)	14	4.10	1.33	2.31	2.08
Sediment, suspended (percent finer than 0.062 mm)	96	91	26	69	71
Sediment, suspended concentration (mg/L)	96	107	1	12	4
Sediment, suspended discharge (ton/d)	94	55	<0.01	[2]3.3	0.10

Table 25. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2014.—Continued

[ft^3/s, cubic foot per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; <, less than laboratory reporting level[1]; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day; --, no data]

Property or constituent and reporting unit	Number of samples	Maximum	Minimum	Mean	Median
12323710—Willow Creek near Anaconda Period of record for water-quality data: December 2004–September 2014					
Streamflow, instantaneous (ft^3/s)	71	114	1.0	15	7.6
pH, onsite (standard units)	73	8.2	7.5	7.7	7.7
Specific conductance, onsite (µS/cm)	73	151	65	103	108
Temperature, water (°C)	73	16.0	0.0	7.2	7.5
Turbidity, unfiltered, lab (NTRU)	66	39	<2.0	[2]5.2	2.8
Hardness, filtered (mg/L as $CaCO_3$)	73	56.3	22.5	37.4	38.5
Calcium, filtered (mg/L)	73	18.3	7.22	12.5	13.0
Magnesium, filtered (mg/L)	73	2.60	0.78	1.50	1.47
Potassium, filtered (mg/L)	7	1.08	0.70	0.91	0.92
Sodium, filtered (mg/L)	7	7.94	4.39	5.84	5.99
Alkalinity, filtered, lab (mg/L)	7	53.5	26.3	39.9	38.6
Chloride, filtered (mg/L)	7	0.83	0.30	0.48	0.34
Fluoride, filtered (mg/L)	7	0.07	0.06	0.07	0.07
Silica, filtered (mg/L)	7	24.9	20.9	23.4	23.7
Sulfate, filtered (mg/L)	7	15.7	5.10	8.3	6.18
Cadmium, filtered (µg/L)	71	0.05	<0.02	[2]0.03	0.03
Cadmium, unfiltered recoverable (µg/L)	73	0.33	<0.04	[2]0.06	0.05
Copper, filtered (µg/L)	73	4.2	0.82	2.1	2.1
Copper, unfiltered recoverable (µg/L)	73	16.8	1.0	3.7	3.0
Iron, filtered (µg/L)	73	277	28	85.9	72.0
Iron, unfiltered recoverable (µg/L)	73	2,380	85.7	349	218
Lead, filtered (µg/L)	73	0.37	0.03	[2]0.16	0.15
Lead, unfiltered recoverable (µg/L)	73	7.96	0.10	0.85	0.49
Manganese, filtered (µg/L)	73	34.5	6.0	14.1	12.6
Manganese, unfiltered recoverable (µg/L)	73	99.9	12.8	25.8	22.6
Zinc, filtered (µg/L)	73	3.3	0.65	[2]1.7	1.5
Zinc, unfiltered recoverable (µg/L)	73	17.8	<2.0	[2]3.1	2.0
Arsenic, filtered (µg/L)	73	25.7	7.7	15.9	14.9
Arsenic, unfiltered recoverable (µg/L)	73	27.0	9.8	16.9	15.4
Organic carbon, filtered (mg/L)	7	7.03	3.57	5.15	4.79
Sediment, suspended (percent finer than 0.062 mm)	73	97	25	76	80
Sediment, suspended concentration (mg/L)	73	195	1	15	4
Sediment, suspended discharge (ton/d)	71	50	<0.01	[2]2.1	0.09

Table 25. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2014.—Continued

[ft^3/s, cubic foot per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; <, less than laboratory reporting level[1]; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day; --, no data]

Property or constituent and reporting unit	Number of samples	Maximum	Minimum	Mean	Median
12323720—Willow Creek at Opportunity Period of record for water-quality data: March 2003–September 2014					
Streamflow, instantaneous (ft^3/s)	96	116	4.5	17	8.9
pH, onsite (standard units)	96	9.0	7.6	8.1	8.1
Specific conductance, onsite (µS/cm)	96	371	116	265	285
Temperature, water (°C)	96	24.0	0.0	11.0	11.0
Turbidity, unfiltered, lab (NTRU)	14	5.8	<2.0	[2]3.6	3.4
Hardness, filtered (mg/L as $CaCO_3$)	96	169	54.2	115	124
Calcium, filtered (mg/L)	96	47.4	16.5	33.5	36.1
Magnesium, filtered (mg/L)	96	12.3	2.99	7.60	8.13
Potassium, filtered (mg/L)	14	1.74	0.94	1.32	1.34
Sodium, filtered (mg/L)	14	12.2	6.12	9.08	9.00
Alkalinity, filtered, lab (mg/L)	14	127	53.3	99.3	108
Chloride, filtered (mg/L)	14	3.28	0.79	1.79	1.82
Fluoride, filtered (mg/L)	14	0.56	0.15	0.36	0.38
Silica, filtered (mg/L)	14	23.5	18.4	21.9	22.4
Sulfate, filtered (mg/L)	14	36.5	9.21	20.6	21.4
Cadmium, filtered (µg/L)	96	0.12	<0.03	[2]0.04	0.04
Cadmium, unfiltered recoverable (µg/L)	95	0.52	0.02	0.10	0.07
Copper, filtered (µg/L)	96	21.4	0.87	5.1	3.5
Copper, unfiltered recoverable (µg/L)	95	48.8	2.6	10.7	7.7
Iron, filtered (µg/L)	96	274	6.1	50.5	44.5
Iron, unfiltered recoverable (µg/L)	95	1,670	27	285	218
Lead, filtered (µg/L)	96	0.89	0.04	[2]0.23	0.20
Lead, unfiltered recoverable (µg/L)	95	14.4	0.27	2.20	1.43
Manganese, filtered (µg/L)	96	200	3.3	33.2	25.4
Manganese, unfiltered recoverable (µg/L)	95	228	4.7	46.5	37.1
Zinc, filtered (µg/L)	96	19.8	<1.4	[2]5.0	4.0
Zinc, unfiltered recoverable (µg/L)	95	68	1.2	11.9	9.0
Arsenic, filtered (µg/L)	96	164	9.3	36.9	26.2
Arsenic, unfiltered recoverable (µg/L)	96	164	11.4	39.3	27.4
Organic carbon, filtered (mg/L)	14	6.85	1.60	4.07	4.00
Sediment, suspended (percent finer than 0.062 mm)	96	99	54	86	90
Sediment, suspended concentration (mg/L)	96	87	1	11	6
Sediment, suspended discharge (ton/d)	96	11	0.02	0.90	0.16

Table 25. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2014.—Continued

[ft^3/s, cubic foot per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; <, less than laboratory reporting level[1]; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day; --, no data]

Property or constituent and reporting unit	Number of samples	Maximum	Minimum	Mean	Median
12323750—Silver Bow Creek at Warm Springs Period of record for water-quality data: March 1993–September 2014					
Streamflow, instantaneous (ft^3/s)	180	1,030	16	140	88
pH, onsite (standard units)	178	9.6	8.0	8.8	8.8
Specific conductance, onsite (µS/cm)	178	783	182	458	470
Temperature, water (°C)	179	25.0	0.0	10.4	10.0
Turbidity, unfiltered, lab (NTRU)	7	11	2.1	4.4	3.3
Hardness, filtered (mg/L as $CaCO_3$)	178	314	74.9	190	194
Calcium, filtered (mg/L)	178	90.4	22.5	55.2	56.6
Magnesium, filtered (mg/L)	178	21.4	4.52	12.6	13.0
Potassium, filtered (mg/L)	38	8.30	1.72	4.18	4.20
Sodium, filtered (mg/L)	38	23.0	8.20	15.8	16.5
Alkalinity, filtered, lab (mg/L)	10	104	69.2	86.2	85.6
Chloride, filtered (mg/L)	38	21.6	1.30	8.94	8.60
Fluoride, filtered (mg/L)	38	1.20	0.41	0.69	0.70
Silica, filtered (mg/L)	38	20.0	6.30	12.4	12.0
Sulfate, filtered (mg/L)	38	210	39.2	109	110
Cadmium, filtered (µg/L)	178	0.31	<0.03	[2]0.06	0.03
Cadmium, unfiltered recoverable (µg/L)	178	0.57	<0.1	[2]0.12	0.07
Copper, filtered (µg/L)	178	40.0	1.6	7.3	5.2
Copper, unfiltered recoverable (µg/L)	178	96.8	2.4	14.9	10.6
Iron, filtered (µg/L)	178	93	<5	[2]19.9	16.2
Iron, unfiltered recoverable (µg/L)	178	3,000	35.8	314	235
Lead, filtered (µg/L)	178	1.0	<0.08	[2]0.13	0.04
Lead, unfiltered recoverable (µg/L)	178	41.8	<1.00	[2]2.25	1.23
Manganese, filtered (µg/L)	178	875	11.8	112	75.5
Manganese, unfiltered recoverable (µg/L)	178	899	24.0	171	130
Zinc, filtered (µg/L)	178	73	<1.0	[2]6.7	3.5
Zinc, unfiltered recoverable (µg/L)	178	180	2.0	[2]28.0	15.2
Arsenic, filtered (µg/L)	178	60.0	6.8	22.7	22.6
Arsenic, unfiltered recoverable (µg/L)	178	94.0	10.0	26.2	25.0
Organic carbon, filtered (mg/L)	7	5.91	4.54	5.11	4.89
Sediment, suspended (percent finer than 0.062 mm)	179	98	43	83	85
Sediment, suspended concentration (mg/L)	180	229	1	9	6
Sediment, suspended discharge (ton/d)	180	279	0.05	5.9	1.4

Table 25. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2014.—Continued

[ft^3/s, cubic foot per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; <, less than laboratory reporting level[1]; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day; --, no data]

Property or constituent and reporting unit	Number of samples	Maximum	Minimum	Mean	Median
12323760—Warm Springs Creek near Anaconda Period of record for water-quality data: October 2005–September 2014					
Streamflow, instantaneous (ft^3/s)	54	573	41	140	92
pH, onsite (standard units)	54	8.8	7.8	8.4	8.4
Specific conductance, onsite (µS/cm)	54	278	125	221	234
Temperature, water (°C)	54	16.0	0.5	8.6	8.8
Turbidity, unfiltered, lab (NTRU)	48	18	<2.0	[2]2.1	<2.0
Hardness, filtered (mg/L as $CaCO_3$)	54	145	58.5	108	112
Calcium, filtered (mg/L)	54	42.8	18.5	32.2	33.8
Magnesium, filtered (mg/L)	54	9.34	2.96	6.59	6.90
Potassium, filtered (mg/L)	5	1.34	0.80	1.10	1.17
Sodium, filtered (mg/L)	5	3.44	1.54	2.60	2.83
Alkalinity, filtered, lab (mg/L)	5	126	60.3	99.7	111
Chloride, filtered (mg/L)	5	1.53	0.49	1.02	1.06
Fluoride, filtered (mg/L)	5	0.39	0.30	0.37	0.39
Silica, filtered (mg/L)	5	10.7	8.25	9.63	9.70
Sulfate, filtered (mg/L)	5	15.9	7.98	11.9	11.9
Cadmium, filtered (µg/L)	54	0.04	<0.02	[2]0.02	0.02
Cadmium, unfiltered recoverable (µg/L)	54	0.14	<0.02	[2]0.03	0.02
Copper, filtered (µg/L)	53	6.4	<0.80	[2]1.1	0.88
Copper, unfiltered recoverable (µg/L)	54	28.0	<0.80	[2]3.4	2.1
Iron, filtered (µg/L)	54	22.4	<4	[2]7.4	6.1
Iron, unfiltered recoverable (µg/L)	54	1,000	19.1	126	75.8
Lead, filtered (µg/L)	54	0.11	<0.02	[2]0.03	<0.08
Lead, unfiltered recoverable (µg/L)	54	3.51	0.07	0.43	0.26
Manganese, filtered (µg/L)	54	2.8	0.13	[2]1.2	1.1
Manganese, unfiltered recoverable (µg/L)	54	45.2	0.90	6.0	4.1
Zinc, filtered (µg/L)	54	5.6	<1.4	[2]1.0	<2.0
Zinc, unfiltered recoverable (µg/L)	54	20.1	<2.0	[2]3.2	1.6
Arsenic, filtered (µg/L)	54	3.9	1.3	2.2	2.2
Arsenic, unfiltered recoverable (µg/L)	54	5.6	1.7	2.7	2.5
Organic carbon, filtered (mg/L)	5	2.92	0.83	1.62	1.31
Sediment, suspended (percent finer than 0.062 mm)	54	83	32	65	66
Sediment, suspended concentration (mg/L)	54	65	1	8	4
Sediment, suspended discharge (ton/d)	54	68	0.13	4.7	0.98

Table 25. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2014.—Continued

[ft^3/s, cubic foot per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; <, less than laboratory reporting level[1]; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day; --, no data]

Property or constituent and reporting unit	Number of samples	Maximum	Minimum	Mean	Median
12323770—Warm Springs Creek at Warm Springs Period of record for water-quality data: March 1993–September 2014					
Streamflow, instantaneous (ft^3/s)	136	420	2.8	97	57
pH, onsite (standard units)	135	8.7	7.4	8.2	8.2
Specific conductance, onsite (µS/cm)	135	795	139	292	296
Temperature, water (°C)	136	20.0	0.0	8.4	8.0
Turbidity, unfiltered, lab (NTRU)	14	11	<2.0	[2]2.1	<2.0
Hardness, filtered (mg/L as $CaCO_3$)	135	415	39.8	142	145
Calcium, filtered (mg/L)	135	130	10.5	43.3	43.8
Magnesium, filtered (mg/L)	135	22.0	3.29	8.23	8.10
Potassium, filtered (mg/L)	33	4.70	0.83	1.56	1.35
Sodium, filtered (mg/L)	33	19.2	1.78	3.93	3.30
Alkalinity, filtered, lab (mg/L)	16	149	66.8	115	118
Chloride, filtered (mg/L)	33	3.60	0.50	1.28	1.03
Fluoride, filtered (mg/L)	33	0.60	0.30	0.42	0.40
Silica, filtered (mg/L)	33	13.0	8.40	10.3	10.0
Sulfate, filtered (mg/L)	33	270	16.3	53.8	36.1
Cadmium, filtered (µg/L)	134	0.10	<0.04	[2]0.04	0.02
Cadmium, unfiltered recoverable (µg/L)	134	0.41	<0.05	[2]0.08	0.04
Copper, filtered (µg/L)	134	16.0	1.0	3.2	2.7
Copper, unfiltered recoverable (µg/L)	134	147	2.3	18.8	8.8
Iron, filtered (µg/L)	135	33.8	<5.0	[2]11.9	10.5
Iron, unfiltered recoverable (µg/L)	135	2,110	17.2	302	120
Lead, filtered (µg/L)	134	1.8	<0.025	[2]0.07	<0.60
Lead, unfiltered recoverable (µg/L)	134	14.0	<1.00	[2]1.85	0.66
Manganese, filtered (µg/L)	134	570	18.8	110	82.9
Manganese, unfiltered recoverable (µg/L)	134	1,400	37.1	191	150
Zinc, filtered (µg/L)	134	10	<1.0	[2]2.0	1.2
Zinc, unfiltered recoverable (µg/L)	135	60	<2.4	[2]8.7	3.0
Arsenic, filtered (µg/L)	134	14.0	2.0	5.0	4.4
Arsenic, unfiltered recoverable (µg/L)	134	27.0	3.0	7.2	5.9
Organic carbon, filtered (mg/L)	14	3.27	0.89	1.65	1.60
Sediment, suspended (percent finer than 0.062 mm)	136	90	43	71	70
Sediment, suspended concentration (mg/L)	136	127	1	17	8
Sediment, suspended discharge (ton/d)	136	87	0.03	8.2	1.0

Table 25. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2014.—Continued

[ft^3/s, cubic foot per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; <, less than laboratory reporting level[1]; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day; --, no data]

Property or constituent and reporting unit	Number of samples	Maximum	Minimum	Mean	Median
12323800—Clark Fork near Galen Period of record for water-quality data: July 1988–September 2014					
Streamflow, instantaneous (ft^3/s)	220	1,380	14	223	140
pH, onsite (standard units)	208	9.2	7.5	8.5	8.6
Specific conductance, onsite (µS/cm)	209	720	182	408	417
Temperature, water (°C)	220	23.5	0.0	9.8	10.0
Hardness, filtered (mg/L as $CaCO_3$)	207	365	76.4	178	184
Calcium, filtered (mg/L)	207	110	23.2	52.7	54.2
Magnesium, filtered (mg/L)	207	22.0	4.44	11.3	11.7
Potassium, filtered (mg/L)	32	5.90	2.00	3.51	3.30
Sodium, filtered (mg/L)	32	19.0	3.60	12.0	12.5
Alkalinity, filtered, lab (mg/L)	3	117	84.4	96.3	87.4
Chloride, filtered (mg/L)	32	11.0	2.00	6.50	6.22
Fluoride, filtered (mg/L)	32	1.10	0.40	0.60	0.60
Silica, filtered (mg/L)	32	17.0	8.10	11.7	11.8
Sulfate, filtered (mg/L)	32	220	34.0	97.2	98.5
Cadmium, filtered (µg/L)	207	1.0	<0.04	[2]0.06	0.03
Cadmium, unfiltered recoverable (µg/L)	207	3.0	<0.1	[2]0.18	0.06
Copper, filtered (µg/L)	207	50.0	1.4	7.4	5.4
Copper, unfiltered recoverable (µg/L)	206	240	4.1	25.9	14.7
Iron, filtered (µg/L)	207	110	<3.0	[2]16.2	12.1
Iron, unfiltered recoverable (µg/L)	207	9,200	56.2	456	260
Lead, filtered (µg/L)	207	3.00	<0.08	[2]0.14	<1.00
Lead, unfiltered recoverable (µg/L)	207	31.0	<1.00	[2]3.30	1.75
Manganese, filtered (µg/L)	207	460	13.1	99.9	72.6
Manganese, unfiltered recoverable (µg/L)	207	1,400	47.3	209	162
Zinc, filtered (µg/L)	207	110	<1.0	[2]8.2	3.7
Zinc, unfiltered recoverable (µg/L)	207	360	2.7	[2]34.3	20.0
Arsenic, filtered (µg/L)	207	53.0	4.0	15.0	14.0
Arsenic, unfiltered recoverable (µg/L)	207	78.0	3.0	18.9	16.9
Sediment, suspended (percent finer than 0.062 mm)	220	97	32	76	78
Sediment, suspended concentration (mg/L)	221	338	1	17	8
Sediment, suspended discharge (ton/d)	220	459	0.12	20	2.8

Table 25. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2014.—Continued

[ft^3/s, cubic foot per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; <, less than laboratory reporting level[1]; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day; --, no data]

Property or constituent and reporting unit	Number of samples	Maximum	Minimum	Mean	Median
12323840—Lost Creek near Anaconda Period of record for water-quality data: December 2004–September 2014					
Streamflow, instantaneous (ft^3/s)	79	73	0.37	12	8.7
pH, onsite (standard units)	79	8.6	7.4	8.1	8.2
Specific conductance, onsite (µS/cm)	79	253	121	198	211
Temperature, water (°C)	79	17.0	0.0	7.8	8.0
Turbidity, unfiltered, lab (NTRU)	79	24,200	<2.0	[2]309	<2.0
Hardness, filtered (mg/L as $CaCO_3$)	79	122	50.4	94.9	101
Calcium, filtered (mg/L)	79	37.1	15.7	28.8	30.3
Magnesium, filtered (mg/L)	79	7.47	2.71	5.61	5.92
Potassium, filtered (mg/L)	14	1.46	0.88	1.23	1.26
Sodium, filtered (mg/L)	14	3.63	1.87	2.79	2.77
Alkalinity, filtered, lab (mg/L)	14	110	59.5	95.2	101.0
Chloride, filtered (mg/L)	14	1.05	0.51	0.72	0.70
Fluoride, filtered (mg/L)	14	0.49	0.28	0.41	0.41
Silica, filtered (mg/L)	14	12.3	9.65	11.0	11.2
Sulfate, filtered (mg/L)	14	13.8	5.89	9.08	8.26
Cadmium, filtered (µg/L)	78	0.90	<0.02	[2]0.04	0.02
Cadmium, unfiltered recoverable (µg/L)	79	147	<0.02	[2]1.9	0.04
Copper, filtered (µg/L)	79	90.5	0.80	3.0	1.6
Copper, unfiltered recoverable (µg/L)	79	29,100	1.3	375	4.4
Iron, filtered (µg/L)	79	26.5	<6.0	[2]9.8	8.7
Iron, unfiltered recoverable (µg/L)	79	99,700	22.3	1,450	110
Lead, filtered (µg/L)	79	0.18	<0.02	[2]0.04	<0.12
Lead, unfiltered recoverable (µg/L)	79	1,290	0.08	17.1	0.46
Manganese, filtered (µg/L)	79	42.4	<0.2	[2]1.9	1.4
Manganese, unfiltered recoverable (µg/L)	79	8,830	1.2	118	4.6
Zinc, filtered (µg/L)	78	30.0	<1.4	[2]1.6	<2.8
Zinc, unfiltered recoverable (µg/L)	78	7,780	<2	[2]103	2.2
Arsenic, filtered (µg/L)	79	156	1.8	6.0	3.3
Arsenic, unfiltered recoverable (µg/L)	79	3,860	2.0	53.5	3.9
Organic carbon, filtered (mg/L)	14	3.84	0.90	1.79	1.62
Sediment, suspended (percent finer than 0.062 mm)	79	97	22	57	58
Sediment, suspended concentration (mg/L)	79	58,900	1	758	6
Sediment, suspended discharge (ton/d)	79	1,320	<0.01	[2]18	0.13

Table 25. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2014.—Continued

[ft^3/s, cubic foot per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; <, less than laboratory reporting level[1]; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day; --, no data]

Property or constituent and reporting unit	Number of samples	Maximum	Minimum	Mean	Median
12323850—Lost Creek near Galen Period of record for water-quality data: March 2003–September 2014					
Streamflow, instantaneous (ft^3/s)	94	71	1.3	24	18
pH, onsite (standard units)	96	8.7	7.9	8.3	8.3
Specific conductance, onsite (µS/cm)	96	934	540	640	628
Temperature, water (°C)	96	26.5	0.0	10.2	10.0
Turbidity, unfiltered, lab (NTRU)	7	5.4	<2.0	[2]1.8	<2.0
Hardness, filtered (mg/L as $CaCO_3$)	96	451	203	303	300
Calcium, filtered (mg/L)	96	122	48.5	85.9	86.6
Magnesium, filtered (mg/L)	96	35.7	17.3	21.5	20.9
Potassium, filtered (mg/L)	7	3.68	2.05	2.52	2.30
Sodium, filtered (mg/L)	7	31.5	10.1	15.7	11.6
Alkalinity, filtered, lab (mg/L)	7	213	166	186	182
Chloride, filtered (mg/L)	7	5.62	3.90	4.77	4.82
Fluoride, filtered (mg/L)	7	0.77	0.44	0.55	0.49
Silica, filtered (mg/L)	7	19.6	11.7	15.3	14.2
Sulfate, filtered (mg/L)	7	146	122	137	138
Cadmium, filtered (µg/L)	95	0.05	<0.02	[2]0.03	0.02
Cadmium, unfiltered recoverable (µg/L)	96	0.12	<0.02	[2]0.04	0.04
Copper, filtered (µg/L)	96	6.7	0.80	2.2	1.8
Copper, unfiltered recoverable (µg/L)	96	22.5	1.5	5.2	4.2
Iron, filtered (µg/L)	96	61.1	4.0	[2]13.3	11.2
Iron, unfiltered recoverable (µg/L)	96	392	14	104	80.0
Lead, filtered (µg/L)	95	0.33	<0.025	[2]0.05	0.02
Lead, unfiltered recoverable (µg/L)	96	1.90	0.04	0.39	0.28
Manganese, filtered (µg/L)	96	54.0	1.91	15.6	14.3
Manganese, unfiltered recoverable (µg/L)	96	56.5	2.20	20.7	19.2
Zinc, filtered (µg/L)	95	3.8	<1.0	[2]1.5	1.2
Zinc, unfiltered recoverable (µg/L)	96	10.3	<2.0	[2]2.9	2.0
Arsenic, filtered (µg/L)	96	41.8	6.0	14.1	12.6
Arsenic, unfiltered recoverable (µg/L)	96	43.0	6.0	14.9	13.6
Organic carbon, filtered (mg/L)	7	3.25	1.48	2.32	2.25
Sediment, suspended (percent finer than 0.062 mm)	96	94	18	61	64
Sediment, suspended concentration (mg/L)	96	79	2	16	14
Sediment, suspended discharge (ton/d)	94	4.2	0.01	1.0	0.67

Table 25. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2014.—Continued

[ft^3/s, cubic foot per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; <, less than laboratory reporting level[1]; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day; --, no data]

Property or constituent and reporting unit	Number of samples	Maximum	Minimum	Mean	Median
12324200—Clark Fork at Deer Lodge Period of record for water-quality data: March 1985–September 2014					
Streamflow, instantaneous (ft^3/s)	273	2,000	23	307	229
pH, onsite (standard units)	221	8.9	7.4	8.3	8.3
Specific conductance, onsite (µS/cm)	256	642	228	467	491
Temperature, water (°C)	272	23.0	0.0	10.0	10.0
Hardness, filtered (mg/L as $CaCO_3$)	213	282	94.9	198	207
Calcium, filtered (mg/L)	213	82.0	28.2	58.4	60.9
Magnesium, filtered (mg/L)	213	18.7	5.53	12.6	13.2
Potassium, filtered (mg/L)	31	6.30	2.40	3.62	3.60
Sodium, filtered (mg/L)	31	25.0	8.60	14.9	14.0
Alkalinity, filtered, lab (mg/L)	3	142	105	119	109
Chloride, filtered (mg/L)	31	12.0	1.20	7.00	7.10
Fluoride, filtered (mg/L)	31	0.70	0.10	0.61	0.60
Silica, filtered (mg/L)	31	34.0	11.0	16.6	16.0
Sulfate, filtered (mg/L)	31	140	44.0	96.2	98.0
Cadmium, filtered (µg/L)	222	2.0	<0.10	[2]0.08	0.03
Cadmium, unfiltered recoverable (µg/L)	222	5.0	<0.10	[2]0.38	0.10
Copper, filtered (µg/L)	223	120	3.2	10.4	8.0
Copper, unfiltered recoverable (µg/L)	221	1,500	8.2	76.0	35.0
Iron, filtered (µg/L)	223	190	<3	[2]15.2	9.6
Iron, unfiltered recoverable (µg/L)	223	29,000	27.2	1,360	499
Lead, filtered (µg/L)	223	6.00	<0.04	[2]0.29	<5.00
Lead, unfiltered recoverable (µg/L)	223	200	0.33	[2]10.0	4.36
Manganese, filtered (µg/L)	223	400	1.0	40.7	33.0
Manganese, unfiltered recoverable (µg/L)	223	4,600	11.9	217	129
Zinc, filtered (µg/L)	223	230	<10.0	[2]11.0	7.4
Zinc, unfiltered recoverable (µg/L)	221	1,700	4.0	78.4	37.1
Arsenic, filtered (µg/L)	223	39.0	6.0	14.4	13.4
Arsenic, unfiltered recoverable (µg/L)	222	215	4.8	23.3	17.2
Sediment, suspended (percent finer than 0.062 mm)	264	99	31	72	73
Sediment, suspended concentration (mg/L)	273	2,250	1	65	22
Sediment, suspended discharge (ton/d)	273	8,690	0.18	136	12

Table 25. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2014.—Continued

[ft^3/s, cubic foot per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; <, less than laboratory reporting level[1]; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day; --, no data]

Property or constituent and reporting unit	Number of samples	Maximum	Minimum	Mean	Median
12324400—Clark Fork above Little Blackfoot River, near Garrison Period of record for water-quality data: March 2009–September 2014					
Streamflow, instantaneous (ft^3/s)	46	2,310	71	472	318
pH, onsite (standard units)	46	8.9	7.9	8.4	8.4
Specific conductance, onsite (µS/cm)	46	527	249	412	447
Temperature, water (°C)	46	21.0	1.0	11.4	12.2
Hardness, filtered (mg/L as $CaCO_3$)	46	228	104	181	196
Calcium, filtered (mg/L)	46	66.5	31.8	529	56.8
Magnesium, filtered (mg/L)	46	15.2	5.93	11.8	12.9
Cadmium, filtered (µg/L)	46	0.23	0.02	0.07	0.07
Cadmium, unfiltered recoverable (µg/L)	46	0.84	0.03	0.27	0.22
Copper, filtered (µg/L)	46	40.6	2.8	9.5	7.8
Copper, unfiltered recoverable (µg/L)	46	222	10.0	60.0	33.7
Iron, filtered (µg/L)	46	43.2	4.5	16.3	13.8
Iron, unfiltered recoverable (µg/L)	46	3,860	46.1	901	552
Lead, filtered (µg/L)	46	0.48	0.04	0.16	0.12
Lead, unfiltered recoverable (µg/L)	46	32.3	0.39	7.8	4.16
Manganese, filtered (µg/L)	46	65.1	12.3	29.9	27.6
Manganese, unfiltered recoverable (µg/L)	46	344	19.7	123	103
Zinc, filtered (µg/L)	46	37.1	1.9	6.2	5.2
Zinc, unfiltered recoverable (µg/L)	46	181	3.0	49.0	28.8
Arsenic, filtered (µg/L)	46	36.7	7.8	15.3	15.6
Arsenic, unfiltered recoverable (µg/L)	46	46.0	10.5	21.5	18.2
Sediment, suspended (percent finer than 0.062 mm)	46	92	42	72	75
Sediment, suspended concentration (mg/L)	46	205	1	45	26
Sediment, suspended discharge (ton/d)	46	550	0.31	90	24

Table 25. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2014.—Continued

[ft^3/s, cubic foot per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; <, less than laboratory reporting level[1]; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day; --, no data]

Property or constituent and reporting unit	Number of samples	Maximum	Minimum	Mean	Median
12324680—Clark Fork at Goldcreek Period of record for water-quality data: March 1993–September 2014					
Streamflow, instantaneous (ft^3/s)	179	4,450	87	777	513
pH, onsite (standard units)	178	8.9	7.9	8.4	8.3
Specific conductance, onsite (µS/cm)	178	510	206	366	378
Temperature, water (°C)	179	23.0	0.0	10.2	10.5
Hardness, filtered (mg/L as $CaCO_3$)	178	232	85.8	161	169
Calcium, filtered (mg/L)	178	68.0	25.9	47.6	49.8
Magnesium, filtered (mg/L)	178	15.0	5.15	10.3	10.7
Potassium, filtered (mg/L)	28	6.90	2.00	3.11	3.00
Sodium, filtered (mg/L)	28	19.0	6.90	11.5	12.0
Chloride, filtered (mg/L)	28	7.20	2.50	4.73	4.40
Fluoride, filtered (mg/L)	28	0.60	0.10	0.43	0.40
Silica, filtered (mg/L)	28	25.0	14.0	18.3	18.0
Sulfate, filtered (mg/L)	28	88.0	31.0	59.5	55.5
Cadmium, filtered (µg/L)	178	0.2	<0.02	[2]0.04	0.02
Cadmium, unfiltered recoverable (µg/L)	178	2.0	<0.10	[2]0.17	0.08
Copper, filtered (µg/L)	177	36.0	2.1	6.5	5.3
Copper, unfiltered recoverable (µg/L)	177	440	5.2	38.5	22.9
Iron, filtered (µg/L)	178	100	<3	[2]19.3	12.7
Iron, unfiltered recoverable (µg/L)	178	12,000	27.3	832	420
Lead, filtered (µg/L)	176	0.6	<0.04	[2]0.11	<1.00
Lead, unfiltered recoverable (µg/L)	177	73.0	0.14	[2]5.40	2.79
Manganese, filtered (µg/L)	178	57.3	4.0	18.9	17.0
Manganese, unfiltered recoverable (µg/L)	178	1,100	9.3	115	81.7
Zinc, filtered (µg/L)	178	26	<1.0	[2]5.3	3.7
Zinc, unfiltered recoverable (µg/L)	178	510	2	41.1	27.6
Arsenic, filtered (µg/L)	178	22.5	5.8	10.0	9.8
Arsenic, unfiltered recoverable (µg/L)	178	75.0	7.0	14.5	12.0
Sediment, suspended (percent finer than 0.062 mm)	179	94	43	75	78
Sediment, suspended concentration (mg/L)	179	752	1	47	20
Sediment, suspended discharge (ton/d)	179	7,960	0.55	198	27

Table 25. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2014.—Continued

[ft^3/s, cubic foot per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; <, less than laboratory reporting level[1]; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day; --, no data]

Property or constituent and reporting unit	Number of samples	Maximum	Minimum	Mean	Median
12331800—Clark Fork near Drummond Period of record for water-quality data: March 1993–September 2014					
Streamflow, instantaneous (ft^3/s)	179	5,540	149	1,060	771
pH, onsite (standard units)	178	8.7	7.8	8.3	8.3
Specific conductance, onsite (µS/cm)	178	630	189	406	419
Temperature, water (°C)	179	22.5	0.5	11.0	11.0
Hardness, filtered (mg/L as $CaCO_3$)	178	298	73.9	183	190
Calcium, filtered (mg/L)	178	83.0	21.0	52.5	54.6
Magnesium, filtered (mg/L)	178	22.0	5.2	12.6	13.0
Potassium, filtered (mg/L)	28	10.0	2.10	3.67	3.40
Sodium, filtered (mg/L)	28	20.0	5.60	11.5	12.0
Chloride, filtered (mg/L)	28	7.80	2.70	4.83	4.65
Fluoride, filtered (mg/L)	28	0.50	0.20	0.39	0.40
Silica, filtered (mg/L)	28	24.0	10.0	18.7	18.5
Sulfate, filtered (mg/L)	28	130	25.0	64.8	64.5
Cadmium, filtered (µg/L)	177	0.30	<0.03	[2]0.05	0.03
Cadmium, unfiltered recoverable (µg/L)	178	2.0	<0.10	[2]0.22	0.08
Copper, filtered (µg/L)	175	21.0	1.0	6.3	4.9
Copper, unfiltered recoverable (µg/L)	176	360	4.6	40.7	22.0
Iron, filtered (µg/L)	178	150	<3	[2]18.7	9.7
Iron, unfiltered recoverable (µg/L)	177	8,800	19.7	954	461
Lead, filtered (µg/L)	174	1.2	<0.04	[2]0.16	0.04
Lead, unfiltered recoverable (µg/L)	174	56.0	<1.00	[2]7.22	3.45
Manganese, filtered (µg/L)	177	60.7	3.3	16.6	14.9
Manganese, unfiltered recoverable (µg/L)	178	880	8.0	138	89.8
Zinc, filtered (µg/L)	178	21.0	<1.4	[2]5.7	4.3
Zinc, unfiltered recoverable (µg/L)	178	490	2.9	55.6	30.0
Arsenic, filtered (µg/L)	178	23.9	3.2	10.5	10.0
Arsenic, unfiltered recoverable (µg/L)	178	62	7.7	15.7	13.0
Sediment, suspended (percent finer than 0.062 mm)	179	93	38	74	75
Sediment, suspended concentration (mg/L)	179	530	2	60	25
Sediment, suspended discharge (ton/d)	179	4,720	1.7	303	48

Table 25. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2014.—Continued

[ft^3/s, cubic foot per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; <, less than laboratory reporting level[1]; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day; --, no data]

Property or constituent and reporting unit	Number of samples	Maximum	Minimum	Mean	Median
12334550—Clark Fork at Turah Bridge, near Bonner Period of record for water-quality data: March 1985–September 2014					
Streamflow, instantaneous (ft^3/s)	276	10,600	296	1,970	1,170
pH, onsite (standard units)	222	8.8	7.4	8.2	8.2
Specific conductance, onsite (µS/cm)	251	483	139	298	311
Temperature, water (°C)	275	22.0	0.0	9.6	10.0
Hardness, filtered (mg/L as $CaCO_3$)	212	205	53.6	130	133
Calcium, filtered (mg/L)	212	59.0	14.9	36.8	37.2
Magnesium, filtered (mg/L)	212	14.0	3.95	9.39	9.48
Potassium, filtered (mg/L)	32	5.70	1.51	2.45	2.45
Sodium, filtered (mg/L)	32	12.0	3.34	7.95	8.45
Alkalinity, filtered, lab (mg/L)	4	155	52.5	108	111
Chloride, filtered (mg/L)	32	5.60	1.50	3.13	2.95
Fluoride, filtered (mg/L)	32	0.40	0.17	0.29	0.30
Silica, filtered (mg/L)	32	19.0	12.0	14.9	15.0
Sulfate, filtered (mg/L)	32	68.0	12.6	41.8	41.0
Nitrate plus nitrite, filtered (mg/L)	8	0.069	<0.013	[2]0.027	0.012
Phosphorus, unfiltered (mg/L)	10	0.240	0.014	0.080	0.068
Total nitrogen, unfiltered (mg/L)	2	0.49	0.38	0.44	--
Cadmium, filtered (µg/L)	220	0.10	<0.02	[2]0.03	<1
Cadmium, unfiltered recoverable (µg/L)	221	4.00	<0.01	[2]0.23	0.03
Copper, filtered (µg/L)	220	25.0	1.1	4.6	3.6
Copper, unfiltered recoverable (µg/L)	219	500	2.7	31.5	14.6
Iron, filtered (µg/L)	221	190	<3	[2]23.5	14.0
Iron, unfiltered recoverable (µg/L)	221	19,000	32.6	936	360
Lead, filtered (µg/L)	217	7.00	<0.02	[2]0.26	<1.00
Lead, unfiltered recoverable (µg/L)	217	100	<1.00	[2]6.34	2.40
Manganese, filtered (µg/L)	221	37.4	<1.0	[2]8.4	7.0
Manganese, unfiltered recoverable (µg/L)	221	2,000	8.9	112	57.9
Zinc, filtered (µg/L)	219	39	<2.0	[2]5.6	3.9
Zinc, unfiltered recoverable (µg/L)	221	1,100	2.9	[2]53.4	26.2
Arsenic, filtered (µg/L)	221	17.0	2.7	6.0	5.6
Arsenic, unfiltered recoverable (µg/L)	221	110	3.0	9.4	7.0
Sediment, suspended (percent finer than 0.062 mm)	265	98	27	74	75
Sediment, suspended concentration (mg/L)	276	1,370	2	53	18
Sediment, suspended discharge (ton/d)	276	34,700	3.0	602	60

Table 25. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2014.—Continued

[ft^3/s, cubic foot per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; <, less than laboratory reporting level[1]; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day; --, no data]

Property or constituent and reporting unit	Number of samples	Maximum	Minimum	Mean	Median
12340000—Blackfoot River near Bonner Period of record for water-quality data: March 1985–September 2014					
Streamflow, instantaneous (ft^3/s)	202	13,400	344	2,810	1,380
pH, onsite (standard units)	162	8.7	7.5	8.3	8.3
Specific conductance, onsite (µS/cm)	179	294	131	208	204
Temperature, water (°C)	202	22.5	0.0	9.6	9.5
Turbidity, unfiltered, lab (NTRU)	7	30	<2.0	[2]7.2	2.0
Hardness, filtered (mg/L as $CaCO_3$)	154	146	55.1	104	98.6
Calcium, filtered (mg/L)	154	37.7	14.0	26.5	25.4
Magnesium, filtered (mg/L)	154	13.2	4.90	9.13	8.66
Potassium, filtered (mg/L)	26	2.80	0.48	0.87	0.80
Sodium, filtered (mg/L)	26	3.41	1.17	2.46	2.50
Alkalinity, filtered, lab (mg/L)	9	148	71.5	117	131
Chloride, filtered (mg/L)	26	1.60	0.23	0.64	0.58
Fluoride, filtered (mg/L)	26	0.10	<0.10	[2]0.10	<0.10
Silica, filtered (mg/L)	26	12.0	6.80	8.64	8.10
Sulfate, filtered (mg/L)	26	6.60	1.10	4.58	4.80
Nitrate plus nitrite, filtered (mg/L)	30	0.040	<0.005	[2]0.010	0.005
Phosphorus, unfiltered (mg/L)	31	0.167	0.003	0.027	0.015
Total nitrogen, unfiltered (mg/L)	14	0.33	0.08	0.15	0.14
Cadmium, filtered (µg/L)	160	1.00	<0.02	[2]0.02	<0.10
Cadmium, unfiltered recoverable (µg/L)	162	2.00	<0.01	[2]0.09	<1.00
Copper, filtered (µg/L)	158	7.0	<0.80	[2]1.3	0.70
Copper, unfiltered recoverable (µg/L)	159	34.0	<0.70	[2]4.2	1.9
Iron, filtered (µg/L)	161	100	<3	[2]17.5	10.2
Iron, unfiltered recoverable (µg/L)	162	3,600	13.9	400	185
Lead, filtered (µg/L)	156	8.00	<0.02	[2]0.27	<0.50
Lead, unfiltered recoverable (µg/L)	157	25.0	<0.04	[2]2.00	0.09
Manganese, filtered (µg/L)	161	11.0	<1.0	[2]2.4	2.0
Manganese, unfiltered recoverable (µg/L)	162	180	<10.0	[2]27.5	16.0
Zinc, filtered (µg/L)	160	15.0	<0.60	[2]1.9	<3.0
Zinc, unfiltered recoverable (µg/L)	162	60.0	<1.0	[2]4.9	<10.0
Arsenic, filtered (µg/L)	161	2.0	<1.0	[2]0.96	0.95
Arsenic, unfiltered recoverable (µg/L)	162	4.0	<1.0	[2]1.3	1.0
Sediment, suspended (percent finer than 0.062 mm)	200	98	42	80	82
Sediment, suspended concentration (mg/L)	202	271	1	28	8
Sediment, suspended discharge (ton/d)	202	7,670	1.1	512	31

Table 25. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2014.—Continued

[ft^3/s, cubic foot per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; <, less than laboratory reporting level[1]; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day; --, no data]

Property or constituent and reporting unit	Number of samples	Maximum	Minimum	Mean	Median
12340500—Clark Fork above Missoula Period of record for water-quality data: July 1986–September 2014					
Streamflow, instantaneous (ft^3/s)	241	22,900	720	4,660	2,480
pH, onsite (standard units)	199	8.8	7.9	8.3	8.3
Specific conductance, onsite (µS/cm)	219	399	142	251	260
Temperature, water (°C)	239	22.0	0.0	9.7	9.5
Turbidity, unfiltered, lab (NTRU)	40	100	<2.0	[2]13	4.9
Hardness, filtered (mg/L as $CaCO_3$)	199	168	60.5	116	117
Calcium, filtered (mg/L)	199	46.0	14.0	31.3	31.5
Magnesium, filtered (mg/L)	199	13.4	5.28	9.19	9.20
Potassium, filtered (mg/L)	28	4.50	0.90	1.72	1.50
Sodium, filtered (mg/L)	28	7.80	2.40	5.29	5.35
Chloride, filtered (mg/L)	28	4.20	0.90	1.92	1.80
Fluoride, filtered (mg/L)	28	0.30	<0.10	[2]0.19	0.20
Silica, filtered (mg/L)	28	16.0	9.40	11.8	11.0
Sulfate, filtered (mg/L)	28	43.0	9.30	23.3	23.0
Phosphorus, unfiltered (mg/L)	2	0.102	0.066	0.084	--
Total nitrogen, unfiltered (mg/L)	2	0.470	0.320	0.395	--
Cadmium, filtered (µg/L)	198	0.20	<0.02	[2]0.03	<0.10
Cadmium, unfiltered recoverable (µg/L)	199	5.0	<0.01	[2]0.14	<1.0
Copper, filtered (µg/L)	198	12.6	0.7	2.7	2.0
Copper, unfiltered recoverable (µg/L)	197	400	1.9	18.3	8.1
Iron, filtered (µg/L)	199	200	<3	[2]21.5	15.0
Iron, unfiltered recoverable (µg/L)	199	13,000	40.9	604	250
Lead, filtered (µg/L)	192	1.20	<0.02	[2]0.13	<1.00
Lead, unfiltered recoverable (µg/L)	194	78.0	<1.00	[2]3.24	1.50
Manganese, filtered (µg/L)	199	230	4.5	15.1	13.0
Manganese, unfiltered recoverable (µg/L)	199	1,100	10.0	62.6	40.0
Zinc, filtered (µg/L)	198	16.0	<1.0	[2]3.4	2.3
Zinc, unfiltered recoverable (µg/L)	199	1,100	<3.0	[2]32.2	13.0
Arsenic, filtered (µg/L)	199	9.0	1.0	3.4	3.2
Arsenic, unfiltered recoverable (µg/L)	199	69.0	1.0	5.3	4.0
Sediment, suspended (percent finer than 0.062 mm)	237	99	14	82	87
Sediment, suspended concentration (mg/L)	242	950	2	42	12
Sediment, suspended discharge (ton/d)	241	21,900	5.8	1,080	85

[1]Differing less-than (<) values for an individual constituent are the result of changes in the laboratory reporting level during the period of record.

[2]Value for the mean is estimated by using a log-probability regression to predict the values of data less than the laboratory reporting level (Helsel and Cohn, 1988). Minimum values that are not censored when the mean indicates that a censored value was used in the mean calculation, are a result of changes in the laboratory reporting level during the period of record.

Table 26. Statistical summary of long-term bed-sediment data for the Clark Fork Basin, Montana, August 1986 through August 2014.

[Reported concentrations are in microgram per gram dry weight (µg/g). Number of samples represents the number of years that the constituent was analyzed, with each year represented by a single mean concentration of composite samples. Arsenic was not analyzed until 2003; therefore, the number of samples is smaller than that for the other trace elements. <, less than the minimum reporting level; --, indicates insufficient data (less than three samples) to compute statistic]

Constituent	Number of samples	Maximum	Minimum	Mean	Median
12323600—Silver Bow Creek at Opportunity Period of record for bed-sediment data: 1992–2014					
Arsenic	12	186	34	100	96
Cadmium	23	43.9	5.9	26.1	26.5
Chromium	21	50.7	16.8	29.9	25.9
Copper	23	9,020	522	3,590	3,700
Iron	23	45,300	28,200	35,000	34,100
Lead	23	1,030	121	553	538
Manganese	23	9,220	1,160	3,140	2,590
Nickel	22	21.4	12.0	14.9	14.6
Silver	12	20.0	8.3	15.5	15.8
Zinc	23	13,400	1,490	6,310	6,850
12323750—Silver Bow Creek at Warm Springs Period of record for bed-sediment data: 1992–2014					
Arsenic	12	177	67	114	106
Cadmium	23	12.2	4.2	7.0	6.5
Chromium	21	46.8	<15.7	[1]24.3	[1]23.5
Copper	23	769	169	342	296
Iron	23	32,500	15,400	23,900	23,800
Lead	23	100	49	71	70
Manganese	23	17,700	1,470	7,460	7,230
Nickel	22	20.0	9.2	14.9	14.7
Silver	12	4.4	0.3	[1]1.9	[1]1.8
Zinc	23	2,220	554	891	688
12323770—Warm Springs Creek at Warm Springs Period of record for bed-sediment data: 1995, 1997, 1999, 2002, 2005, 2008, 2011, 2014					
Arsenic	4	66	34	54	58
Cadmium	8	5.8	1.2	3.2	3.3
Chromium	8	39.3	24.1	31.0	31.5
Copper	8	1,060	496	839	864
Iron	8	26,600	16,800	21,500	21,900
Lead	8	86	42	75	81
Manganese	8	12,100	555	6,620	6,900
Nickel	8	25.5	14.5	19.4	19.2
Silver	4	5.1	3.1	3.8	3.5
Zinc	8	453	237	379	385

Table 26. Statistical summary of long-term bed-sediment data for the Clark Fork Basin, Montana, August 1986 through August 2014.—Continued

[Reported concentrations are in microgram per gram dry weight (µg/g). Number of samples represents the number of years that the constituent was analyzed, with each year represented by a single mean concentration of composite samples. Arsenic was not analyzed until 2003; therefore, the number of samples is smaller than that for the other trace elements. <, less than the minimum reporting level; --, indicates insufficient data (less than three samples) to compute statistic]

Constituent	Number of samples	Maximum	Minimum	Mean	Median
12323800—Clark Fork near Galen Period of record for bed-sediment data: 1987, 1991–2014					
Arsenic	12	156	73	107	103
Cadmium	25	20.1	3.8	8.0	6.0
Chromium	21	44.6	19.1	29.8	27.0
Copper	25	2,300	838	1,190	1,110
Iron	25	39,800	22,600	27,900	27,400
Lead	25	235	92	129	126
Manganese	25	17,300	1,530	8,590	8,470
Nickel	22	23.2	13.9	18.6	18.3
Silver	14	7.3	<3.2	[1]4.4	[1]4.5
Zinc	25	3,560	721	1,350	1,120
461415112450801—Clark Fork below Lost Creek, near Galen Period of record for bed-sediment data: 1996–2014					
Arsenic	12	204	90	119	109
Cadmium	19	10.5	4.8	6.8	6.4
Chromium	19	42.4	19.4	30.8	30.0
Copper	19	2,050	1,150	1,490	1,450
Iron	19	32,800	24,400	29,100	29,600
Lead	19	218	123	162	161
Manganese	19	9,820	1,430	5,230	5,000
Nickel	19	19.9	11.7	15.9	16.3
Silver	8	7.8	4.2	6.5	6.7
Zinc	19	1,680	930	1,250	1,220
461559112443301—Clark Fork at county bridge, near Racetrack Period of record for bed-sediment data: 1996–2014					
Arsenic	12	132	56	92	90
Cadmium	19	8.7	4.6	6.4	6.0
Chromium	19	45.2	19.0	29.1	28.4
Copper	19	1,810	933	1,280	1,310
Iron	19	31,700	21,200	27,400	28,100
Lead	19	186	103	142	143
Manganese	19	6,310	1,600	3,210	3,060
Nickel	19	18.4	10.3	14.4	14.7
Silver	8	6.1	<3.3	[1]5.0	[1]5.4
Zinc	19	1,550	911	1,160	1,130

Table 26. Statistical summary of long-term bed-sediment data for the Clark Fork Basin, Montana, August 1986 through August 2014.—Continued

[Reported concentrations are in microgram per gram dry weight (µg/g). Number of samples represents the number of years that the constituent was analyzed, with each year represented by a single mean concentration of composite samples. Arsenic was not analyzed until 2003; therefore, the number of samples is smaller than that for the other trace elements. <, less than the minimum reporting level; --, indicates insufficient data (less than three samples) to compute statistic]

Constituent	Number of samples	Maximum	Minimum	Mean	Median
461903112440701—Clark Fork at Dempsey Creek diversion, near Racetrack Period of record for bed-sediment data: 1996–2014					
Arsenic	12	109	58	83	83
Cadmium	19	10.3	4.1	6.2	5.7
Chromium	19	39.9	16.0	27.4	26.0
Copper	19	1,580	721	1,120	1,100
Iron	19	33,700	20,600	27,200	27,100
Lead	19	155	92	129	132
Manganese	19	8,370	1,200	3,790	3,210
Nickel	19	16.9	8.7	12.9	12.7
Silver	8	6.2	2.7	4.9	5.0
Zinc	19	1,570	900	1,120	1,080
12324200—Clark Fork at Deer Lodge Period of record for bed-sediment data: 1986–87, 1990–2014					
Arsenic	12	102	49	75	71
Cadmium	27	10.0	3.5	5.9	5.0
Chromium	21	50.7	19.5	32.5	28.4
Copper	27	4,180	683	1,240	1,070
Iron	27	35,300	21,100	27,400	26,500
Lead	27	242	103	143	142
Manganese	27	6,020	1,070	2,570	2,410
Nickel	22	21.1	11.5	14.9	14.5
Silver	16	7.9	2.4	4.7	4.5
Zinc	27	1,730	844	1,160	1,050
12324400—Clark Fork above Little Blackfoot River, near Garrison Period of record for bed-sediment data: 2009-2014					
Arsenic	6	91	50	75	82
Cadmium	6	5.5	4.1	4.7	4.6
Chromium	6	52.8	19.9	37.7	42.3
Copper	6	1,290	773	1,110	1,230
Iron	6	32,400	20,400	26,500	26,900
Lead	6	145	92	126	136
Manganese	6	3,560	1,150	2,550	2,800
Nickel	6	17.2	10.6	13.8	14.0
Silver	0	--	--	--	--
Zinc	6	1,240	850	1,060	1,100

Table 26. Statistical summary of long-term bed-sediment data for the Clark Fork Basin, Montana, August 1986 through August 2014.—Continued

[Reported concentrations are in microgram per gram dry weight (µg/g). Number of samples represents the number of years that the constituent was analyzed, with each year represented by a single mean concentration of composite samples. Arsenic was not analyzed until 2003; therefore, the number of samples is smaller than that for the other trace elements. <, less than the minimum reporting level; --, indicates insufficient data (less than three samples) to compute statistic]

Constituent	Number of samples	Maximum	Minimum	Mean	Median
12324680—Clark Fork at Goldcreek Period of record for bed-sediment data: 1992–2014					
Arsenic	12	62	23	41	37
Cadmium	23	8.1	2.5	4.4	4.0
Chromium	21	55.3	20.2	32.6	31.6
Copper	23	1,080	338	674	687
Iron	23	32,100	15,500	23,400	24,000
Lead	23	152	52	93	94
Manganese	23	2,610	977	1,780	1,770
Nickel	22	18.6	9.0	13.8	14.1
Silver	12	4.8	2.3	3.2	3.2
Zinc	23	1,320	531	888	880
12331800—Clark Fork near Drummond Period of record for bed-sediment data: 1986–87, 1991–2014					
Arsenic	12	66	17	38	33
Cadmium	26	7.7	1.7	4.1	4.1
Chromium	21	41.9	9.2	27.7	30.1
Copper	26	747	183	465	464
Iron	26	44,000	14,800	24,900	23,200
Lead	26	135	27	84	84
Manganese	26	4,820	832	2,010	1,840
Nickel	22	16.8	4.8	12.8	13.6
Silver	15	4.7	<3.2	[1]3.0	[1]2.9
Zinc	26	1,230	380	908	947
12334550—Clark Fork at Turah Bridge, near Bonner Period of record for bed-sediment data: 1986, 1991–2014					
Arsenic	12	43	17	27	25
Cadmium	25	7.3	1.2	3.3	3.4
Chromium	21	42.5	15.3	26.7	27.7
Copper	25	635	211	344	322
Iron	25	25,900	12,600	19,300	17,300
Lead	25	115	37	66	63
Manganese	25	2,340	591	1,250	1,230
Nickel	22	19.1	6.9	12.3	11.6
Silver	14	3.9	<1.9	[1]2.1	[1]1.9
Zinc	25	1,160	448	773	775

Table 26. Statistical summary of long-term bed-sediment data for the Clark Fork Basin, Montana, August 1986 through August 2014.—Continued

[Reported concentrations are in microgram per gram dry weight (µg/g). Number of samples represents the number of years that the constituent was analyzed, with each year represented by a single mean concentration of composite samples. Arsenic was not analyzed until 2003; therefore, the number of samples is smaller than that for the other trace elements. <, less than the minimum reporting level; --, indicates insufficient data (less than three samples) to compute statistic]

Constituent	Number of samples	Maximum	Minimum	Mean	Median
12340000—Blackfoot River near Bonner Period of record for bed-sediment data: 1986–87, 1991, 1993–96, 1998–2001, 2003, 2006–14					
Arsenic	10	6	<0.2	[1]3	[1]4
Cadmium	21	2.0	0.04	[1]0.5	[1]0.3
Chromium	17	35.2	14.5	22.2	23.6
Copper	21	27	11	20	21
Iron	21	23,000	12,400	17,600	18,100
Lead	21	20	<13	[1]13	[1]12
Manganese	21	746	298	536	544
Nickel	18	14.3	6.0	11.2	11.4
Silver	12	<1.9	<0.3	[1]0.5	[1]<0.6
Zinc	21	82	35	60	61
12340500—Clark Fork above Missoula Period of record for bed-sediment data: 1997–2014					
Arsenic	12	54	12	29	29
Cadmium	18	5.8	1.0	2.8	2.7
Chromium	17	40.7	13.2	26.4	28.5
Copper	18	551	129	332	304
Iron	18	27,000	14,700	20,500	20,400
Lead	18	78	25	52	52
Manganese	18	2,250	477	1,070	996
Nickel	18	15.8	7.6	12.5	12.5
Silver	7	2.9	0.8	[1]2.0	[1]2.1
Zinc	18	1,090	346	676	664

[1]Value determined by substituting one-half of the minimum reporting level for censored (<) values when both uncensored and censored values were used to determine the mean and median.

Table 27. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2014.

[Concentrations are in microgram per gram dry weight (µg/g). Number of composite samples represents the total of all individual composite samples collected for every year that the constituent was analyzed. Values for a single sample are arbitrarily listed in the "Mean" column. Because *Hydropsyche* insects were not sorted to the species level during 1986–89, *Hydropsyche* species statistics for stations sampled during those years are based on the results of all *Hydropsyche* species combined. At some sites, statistics of *Hydropsyche morosa* group are based on the combined results of two or more species. Insects collected during 1986–98 were depurated prior to analysis; depuration was discontinued in 1999. Arsenic was not analyzed until 2003; therefore, the number of samples may be small or zero for some taxa. spp., one or more similar species; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed; <, less than minimum reporting level]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
12323600—Silver Bow Creek at Opportunity Period of record for biological data: 1992, 1994–95, 1997–2014					
Brachycentrus spp.					
Arsenic	0	--	--	--	--
Cadmium	5	12.5	5.8	10.1	11.6
Chromium	5	5.9	0.7	2.1	0.9
Copper	5	846	235	587	592
Iron	5	1,190	335	617	469
Lead	5	21.5	7.4	13.7	13.8
Manganese	5	817	231	515	503
Nickel	5	2.1	<0.1	[1]1.3	[1]1.6
Zinc	5	995	629	803	815
Hydropsyche cockerelli					
Arsenic	22	33.3	4.3	12.2	11.0
Cadmium	28	9.7	3.0	5.2	4.7
Chromium	28	25.5	1.0	4.3	3.7
Copper	28	1,090	78.6	337	342
Iron	28	6,150	689	2,720	2,420
Lead	28	74.3	11.9	34.0	25.0
Manganese	28	3,030	180	1,030	997
Nickel	28	4.3	0.7	2.6	2.5
Zinc	28	1,590	432	819	768
Hydropsyche spp.					
Arsenic	14	23.1	6.1	12.1	10.7
Cadmium	19	11.0	2.0	5.4	5.0
Chromium	19	4.7	0.6	2.6	3.0
Copper	19	930	80.7	428	352
Iron	19	3,630	1,050	2,260	2,210
Lead	19	237	19.3	45.5	36.5
Manganese	19	1,790	612	1,040	1,040
Nickel	19	4.1	0.7	2.2	2.3
Zinc	19	1,290	388	875	876
Hydropsyche tana					
Arsenic	0	--	--	--	--
Cadmium	6	9.2	4.8	6.8	6.9
Chromium	6	11.5	0.9	4.5	1.8
Copper	6	456	10.5	236	298
Iron	6	1,520	875	1,100	1,050
Lead	6	21.0	15.6	18.6	18.3
Manganese	6	969	307	634	675
Nickel	6	1.8	0.7	1.4	1.6
Zinc	6	1,070	760	961	1,020

Table 27. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2014.—Continued

[Concentrations are in microgram per gram dry weight (µg/g). Number of composite samples represents the total of all individual composite samples collected for every year that the constituent was analyzed. Values for a single sample are arbitrarily listed in the "Mean" column. Because *Hydropsyche* insects were not sorted to the species level during 1986–89, *Hydropsyche* species statistics for stations sampled during those years are based on the results of all *Hydropsyche* species combined. At some sites, statistics of *Hydropsyche morosa* group are based on the combined results of two or more species. Insects collected during 1986–98 were depurated prior to analysis; depuration was discontinued in 1999. Arsenic was not analyzed until 2003; therefore, the number of samples may be small or zero for some taxa. spp., one or more similar species; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed; <, less than minimum reporting level]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
12323750—Silver Bow Creek at Warm Springs Period of record for biological data: 1992–2014					
Claassenia sabulosa					
Arsenic	2	5.0	1.8	3.4	--
Cadmium	2	1.1	0.5	0.8	--
Chromium	2	2.8	0.6	1.7	--
Copper	2	66.4	47.6	57.0	--
Iron	2	300	151	226	--
Lead	2	1.5	0.6	1.0	--
Manganese	2	922	98	510	--
Nickel	2	0.6	0.5	0.6	--
Zinc	2	400	340	370	--
Hydropsyche cockerelli					
Arsenic	20	23.6	7.9	12.5	10.6
Cadmium	46	2.1	0.2	0.6	0.5
Chromium	46	4.3	0.4	1.1	0.9
Copper	46	97.0	16.7	36.5	30.5
Iron	46	1,650	351	837	780
Lead	46	6.0	0.3	3.2	3.0
Manganese	46	3,890	491	1,230	954
Nickel	46	1.8	0.3	0.9	0.8
Zinc	46	276	115	176	169
Hydropsyche occidentalis					
Arsenic	9	31.0	10.5	18.6	15.6
Cadmium	24	1.6	0.2	0.6	0.4
Chromium	24	6.8	0.3	1.7	1.0
Copper	24	48.9	11.0	33.2	32.0
Iron	24	2,960	372	1,240	1,000
Lead	24	8.2	<1.7	[1]4.2	[1]3.8
Manganese	24	6,940	996	2,380	1,890
Nickel	24	2.7	0.7	1.5	1.5
Zinc	24	220	140	181	182
Hydropsyche spp.					
Arsenic	1	--	--	14.0	--
Cadmium	5	2.3	0.4	1.0	0.6
Chromium	5	2.5	0.5	1.4	1.3
Copper	5	47.6	34.9	39.9	40.4
Iron	5	1,100	561	763	767
Lead	5	5.1	1.9	4.0	4.5
Manganese	5	1,190	443	817	804
Nickel	5	1.9	<0.4	[1]1.0	[1]0.8
Zinc	5	284	141	188	162

Table 27. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2014.—Continued

[Concentrations are in microgram per gram dry weight (µg/g). Number of composite samples represents the total of all individual composite samples collected for every year that the constituent was analyzed. Values for a single sample are arbitrarily listed in the "Mean" column. Because *Hydropsyche* insects were not sorted to the species level during 1986–89, *Hydropsyche* species statistics for stations sampled during those years are based on the results of all *Hydropsyche* species combined. At some sites, statistics of *Hydropsyche morosa* group are based on the combined results of two or more species. Insects collected during 1986–98 were depurated prior to analysis; depuration was discontinued in 1999. Arsenic was not analyzed until 2003; therefore, the number of samples may be small or zero for some taxa. spp., one or more similar species; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed; <, less than minimum reporting level]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
12323770—Warm Springs Creek at Warm Springs					
Period of record for biological data: 1995, 1997, 1999, 2002, 2005, 2008, 2011, 2014					
Arctopsyche grandis					
Arsenic	5	9.8	7.6	8.9	9.5
Cadmium	9	3.6	0.4	2.5	2.5
Chromium	9	5.0	0.8	2.7	2.8
Copper	9	132	53.2	102	102
Iron	9	1,490	684	1,030	1,040
Lead	9	7.7	3.0	[1]5.6	[1]5.3
Manganese	9	3,560	738	2,230	2,280
Nickel	9	4.0	1.1	[1]2.5	[1]2.3
Zinc	9	267	181	206	197
Hesperoperla spp.					
Arsenic	2	2.9	1.2	2.0	--
Cadmium	2	2.6	1.0	1.8	--
Chromium	2	2.0	0.9	1.4	--
Copper	2	64.9	55.9	60.4	--
Iron	2	456	375	416	--
Lead	2	1.9	1.4	1.6	--
Manganese	2	270	202	236	--
Nickel	2	1.1	0.6	0.8	--
Zinc	2	573	427	500	--
Hydropsyche occidentalis					
Arsenic	4	13.6	9.8	12.4	13.0
Cadmium	6	1.4	0.7	1.1	1.2
Chromium	6	8.6	0.3	3.7	3.2
Copper	6	183	116	151	150
Iron	6	2,360	1,520	1,870	1,840
Lead	6	12.6	6.7	8.2	7.4
Manganese	6	3,190	1,440	2,580	2,680
Nickel	6	4.5	2.0	3.1	3.2
Zinc	6	204	148	169	168
Hydropsyche spp.					
Arsenic	0	--	--	--	--
Cadmium	2	1.1	0.6	0.8	--
Chromium	2	1.6	1.4	1.5	--
Copper	2	95.9	94.8	95.4	--
Iron	2	1,220	1,150	1,180	--
Lead	2	5.9	5.2	5.6	--
Manganese	2	3,390	956	2,170	--
Nickel	2	2.0	1.8	1.9	--
Zinc	2	129	125	127	--

Table 27. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2014.—Continued

[Concentrations are in microgram per gram dry weight (µg/g). Number of composite samples represents the total of all individual composite samples collected for every year that the constituent was analyzed. Values for a single sample are arbitrarily listed in the "Mean" column. Because *Hydropsyche* insects were not sorted to the species level during 1986–89, *Hydropsyche* species statistics for stations sampled during those years are based on the results of all *Hydropsyche* species combined. At some sites, statistics of *Hydropsyche morosa* group are based on the combined results of two or more species. Insects collected during 1986–98 were depurated prior to analysis; depuration was discontinued in 1999. Arsenic was not analyzed until 2003; therefore, the number of samples may be small or zero for some taxa. spp., one or more similar species; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed; <, less than minimum reporting level]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
12323800—Clark Fork near Galen Period of record for biological data: 1987, 1991–2014					
Claassenia sabulosa					
Arsenic	1	--	--	2.0	--
Cadmium	1	--	--	0.2	--
Chromium	1	--	--	1.5	--
Copper	1	--	--	54.7	--
Iron	1	--	--	242	--
Lead	1	--	--	1.0	--
Manganese	1	--	--	323	--
Nickel	1	--	--	0.5	--
Zinc	1	--	--	237	--
Hydropsyche cockerelli					
Arsenic	13	20.5	13.2	15.1	14.0
Cadmium	38	2.7	0.7	1.5	1.5
Chromium	38	9.6	0.8	2.3	1.9
Copper	38	181	48.7	108	116
Iron	38	2,660	816	1,560	1,510
Lead	38	17.1	1.2	8.8	8.5
Manganese	38	3,620	1,070	2,260	2,250
Nickel	38	6.5	0.9	1.9	1.7
Zinc	38	363	136	218	213
Hydropsyche morosa group					
Arsenic	0	--	--	--	--
Cadmium	5	3.2	2.4	2.5	2.4
Chromium	5	4.6	1.8	2.6	2.2
Copper	5	185	156	173	175
Iron	5	1,890	1,360	1,510	1,430
Lead	5	12.4	7.1	8.5	7.9
Manganese	5	3,960	2,360	3,500	3,860
Nickel	5	3.6	1.9	2.3	2.1
Zinc	5	349	292	309	303
Hydropsyche occidentalis					
Arsenic	20	17.7	9.1	14.3	14.6
Cadmium	52	1.6	0.6	1.1	1.2
Chromium	52	6.6	0.4	2.1	1.9
Copper	52	151	49.2	94.6	91.6
Iron	52	2,590	642	1,510	1,420
Lead	52	13.5	1.6	8.2	8.1
Manganese	52	6,170	653	2,480	2,080
Nickel	52	3.5	0.8	1.8	1.7
Zinc	52	286	168	206	200

Table 27. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2014.—Continued

[Concentrations are in microgram per gram dry weight (µg/g). Number of composite samples represents the total of all individual composite samples collected for every year that the constituent was analyzed. Values for a single sample are arbitrarily listed in the "Mean" column. Because *Hydropsyche* insects were not sorted to the species level during 1986–89, *Hydropsyche* species statistics for stations sampled during those years are based on the results of all *Hydropsyche* species combined. At some sites, statistics of *Hydropsyche morosa* group are based on the combined results of two or more species. Insects collected during 1986–98 were depurated prior to analysis; depuration was discontinued in 1999. Arsenic was not analyzed until 2003; therefore, the number of samples may be small or zero for some taxa. spp., one or more similar species; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed; <, less than minimum reporting level]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
12323800—Clark Fork near Galen—Continued Period of record for biological data: 1987, 1991–2014					
Hydropsyche tana					
Arsenic	0	--	--	--	--
Cadmium	1	--	--	1.5	--
Chromium	1	--	--	1.4	--
Copper	1	--	--	92.9	--
Iron	1	--	--	1,340	--
Lead	1	--	--	9.0	--
Manganese	1	--	--	2,160	--
Nickel	1	--	--	2.1	--
Zinc	1	--	--	206	--
Hydropsyche spp.					
Arsenic	5	15.7	5.5	11.1	14.2
Cadmium	9	3.5	0.7	1.8	1.3
Chromium	5	2.4	1.1	1.8	1.9
Copper	9	154	55.3	110	126
Iron	9	2,110	914	1,350	1,300
Lead	9	13.5	3.8	9.0	10.5
Manganese	5	4,760	668	2,410	1,520
Nickel	5	2.7	0.9	1.6	1.5
Zinc	9	329	132	239	228

Table 27. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2014.—Continued

[Concentrations are in microgram per gram dry weight (µg/g). Number of composite samples represents the total of all individual composite samples collected for every year that the constituent was analyzed. Values for a single sample are arbitrarily listed in the "Mean" column. Because *Hydropsyche* insects were not sorted to the species level during 1986–89, *Hydropsyche* species statistics for stations sampled during those years are based on the results of all *Hydropsyche* species combined. At some sites, statistics of *Hydropsyche morosa* group are based on the combined results of two or more species. Insects collected during 1986–98 were depurated prior to analysis; depuration was discontinued in 1999. Arsenic was not analyzed until 2003; therefore, the number of samples may be small or zero for some taxa. spp., one or more similar species; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed; <, less than minimum reporting level]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
461415112450801—Clark Fork below Lost Creek, near Galen Period of record for biological data: 1996–2014					
Claassenia sabulosa					
Arsenic	1	--	--	1.5	--
Cadmium	2	0.4	0.3	0.4	--
Chromium	2	1.9	0.4	1.2	--
Copper	2	70.1	67.1	68.6	--
Iron	2	209	189	199	--
Lead	2	1.2	0.7	1.0	--
Manganese	2	238	90.4	164	--
Nickel	2	0.2	<0.2	[1]0.2	--
Zinc	2	245	208	226	--
Hydropsyche cockerelli					
Arsenic	19	27.8	8.8	16.3	15.6
Cadmium	30	2.8	1.1	1.9	1.8
Chromium	30	4.0	0.8	2.3	2.4
Copper	30	338	48.8	149	131
Iron	30	4,080	691	1,790	1,640
Lead	30	28.6	4.5	13.6	12.1
Manganese	30	3,160	1,230	1,820	1,720
Nickel	30	2.8	0.9	1.7	1.4
Zinc	30	339	151	241	237
Hydropsyche occidentalis					
Arsenic	9	20.9	12.7	15.8	15.0
Cadmium	23	1.9	0.9	1.4	1.4
Chromium	23	3.6	1.2	2.1	2.0
Copper	23	219	52.1	117	119
Iron	23	2,830	963	1,650	1,510
Lead	23	19.4	6.6	11.0	10.7
Manganese	23	4,150	1,220	2,540	2,190
Nickel	23	3.0	0.9	1.6	1.5
Zinc	23	308	174	243	245
Hydropsyche spp.					
Arsenic	4	14.5	7.0	10.2	9.7
Cadmium	8	1.8	1.0	1.3	1.3
Chromium	8	2.4	0.9	1.4	1.2
Copper	8	153	45.1	96.4	93.0
Iron	8	1,810	533	1,160	1,130
Lead	8	20.5	4.1	9.5	8.0
Manganese	8	1,980	775	1,270	1,230
Nickel	8	2.8	0.9	1.6	1.4
Zinc	8	228	143	182	173

Table 27. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2014.—Continued

[Concentrations are in microgram per gram dry weight (µg/g). Number of composite samples represents the total of all individual composite samples collected for every year that the constituent was analyzed. Values for a single sample are arbitrarily listed in the "Mean" column. Because *Hydropsyche* insects were not sorted to the species level during 1986–89, *Hydropsyche* species statistics for stations sampled during those years are based on the results of all *Hydropsyche* species combined. At some sites, statistics of *Hydropsyche morosa* group are based on the combined results of two or more species. Insects collected during 1986–98 were depurated prior to analysis; depuration was discontinued in 1999. Arsenic was not analyzed until 2003; therefore, the number of samples may be small or zero for some taxa. spp., one or more similar species; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed; <, less than minimum reporting level]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
461415112450801—Clark Fork below Lost Creek, near Galen Period of record for biological data: 1996–2014—Continued					
Rhyacophila spp.					
Arsenic	2	5.2	3.5	4.4	--
Cadmium	2	4.3	3.9	4.1	--
Chromium	2	1.1	1.0	1.0	--
Copper	2	93.1	73.7	83.4	--
Iron	2	346	324	335	--
Lead	2	5.9	4.8	5.4	--
Manganese	2	320	192	256	--
Nickel	2	0.3	0.3	0.3	--
Zinc	2	411	301	356	--

Table 27. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2014.—Continued

[Concentrations are in microgram per gram dry weight (µg/g). Number of composite samples represents the total of all individual composite samples collected for every year that the constituent was analyzed. Values for a single sample are arbitrarily listed in the "Mean" column. Because *Hydropsyche* insects were not sorted to the species level during 1986–89, *Hydropsyche* species statistics for stations sampled during those years are based on the results of all *Hydropsyche* species combined. At some sites, statistics of *Hydropsyche morosa* group are based on the combined results of two or more species. Insects collected during 1986–98 were depurated prior to analysis; depuration was discontinued in 1999. Arsenic was not analyzed until 2003; therefore, the number of samples may be small or zero for some taxa. spp., one or more similar species; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed; <, less than minimum reporting level]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
461559112443301—Clark Fork at county bridge, near Racetrack Period of record for biological data: 1996–2014					
Arctopsyche grandis					
Arsenic	2	13.0	5.2	9.1	--
Cadmium	2	2.4	1.2	1.8	--
Chromium	2	3.3	1.9	2.6	--
Copper	2	101	81.0	91.0	--
Iron	2	1,410	889	1,150	--
Lead	2	13.2	9.1	11.2	--
Manganese	2	2,480	1,430	1,960	--
Nickel	2	1.9	1.4	1.6	--
Zinc	2	260	243	252	--
Claassenia sabulosa					
Arsenic	0	--	--	--	--
Cadmium	1	--	--	0.4	--
Chromium	1	--	--	0.3	--
Copper	1	--	--	40.3	--
Iron	1	--	--	113	--
Lead	1	--	--	0.8	--
Manganese	1	--	--	172	--
Nickel	1	--	--	0.2	--
Zinc	1	--	--	213	--
Hydropsyche cockerelli					
Arsenic	16	20.2	11.1	14.4	14.0
Cadmium	27	2.7	0.8	1.6	1.5
Chromium	27	3.0	0.6	1.9	2.1
Copper	27	198	50.0	107	99.5
Iron	27	3,330	657	1,420	1,150
Lead	27	18.7	3.7	9.8	8.6
Manganese	27	2,360	646	1,670	1,830
Nickel	27	2.0	0.7	1.3	1.2
Zinc	27	302	139	207	192

Table 27. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2014.—Continued

[Concentrations are in microgram per gram dry weight (µg/g). Number of composite samples represents the total of all individual composite samples collected for every year that the constituent was analyzed. Values for a single sample are arbitrarily listed in the "Mean" column. Because *Hydropsyche* insects were not sorted to the species level during 1986–89, *Hydropsyche* species statistics for stations sampled during those years are based on the results of all *Hydropsyche* species combined. At some sites, statistics of *Hydropsyche morosa* group are based on the combined results of two or more species. Insects collected during 1986–98 were depurated prior to analysis; depuration was discontinued in 1999. Arsenic was not analyzed until 2003; therefore, the number of samples may be small or zero for some taxa. spp., one or more similar species; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed; <, less than minimum reporting level]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
461559112443301—Clark Fork at county bridge, near Racetrack—Continued Period of record for biological data: 1996–2014					
Hydropsyche occidentalis					
Arsenic	15	16.8	9.2	13.1	12.8
Cadmium	28	2.3	0.7	1.4	1.4
Chromium	28	3.7	1.1	2.2	2.0
Copper	28	164	59.5	116	122
Iron	28	3,690	1,030	1,670	1,580
Lead	28	15.7	4.3	10.9	10.9
Manganese	28	3,770	660	1,990	1,910
Nickel	28	2.3	1.1	1.5	1.3
Zinc	28	361	181	234	227
Hydropsyche spp.					
Arsenic	6	12.8	5.7	9.6	9.8
Cadmium	8	2.4	1.0	1.6	1.5
Chromium	8	3.9	0.7	1.6	1.0
Copper	8	144	68.1	97	84.0
Iron	8	1,880	787	1,220	1,170
Lead	8	15.0	5.7	8.8	7.1
Manganese	8	2,370	886	1,320	1,150
Nickel	8	2.0	0.7	1.3	1.2
Zinc	8	229	151	193	194

Table 27. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2014.—Continued

[Concentrations are in microgram per gram dry weight (µg/g). Number of composite samples represents the total of all individual composite samples collected for every year that the constituent was analyzed. Values for a single sample are arbitrarily listed in the "Mean" column. Because *Hydropsyche* insects were not sorted to the species level during 1986–89, *Hydropsyche* species statistics for stations sampled during those years are based on the results of all *Hydropsyche* species combined. At some sites, statistics of *Hydropsyche morosa* group are based on the combined results of two or more species. Insects collected during 1986–98 were depurated prior to analysis; depuration was discontinued in 1999. Arsenic was not analyzed until 2003; therefore, the number of samples may be small or zero for some taxa. spp., one or more similar species; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed; <, less than minimum reporting level]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
461903112440701—Clark Fork at Dempsey Creek diversion, near Racetrack Period of record for biological data: 1996–2014					
Arctopsyche grandis					
Arsenic	5	17.5	6.2	10.0	8.1
Cadmium	6	7.1	1.7	3.8	3.6
Chromium	6	12.9	0.9	[1]3.9	[1]1.4
Copper	6	196	30.8	98.1	75.3
Iron	6	2,800	340	1,090	693
Lead	6	17.6	5.7	[1]9.9	[1]7.9
Manganese	6	2,060	510	1,280	1,270
Nickel	6	2.5	1.0	1.5	1.1
Zinc	6	489	87	296	283
Claassenia sabulosa					
Arsenic	4	3.8	1.6	2.8	2.9
Cadmium	4	2.4	0.9	1.4	1.2
Chromium	4	1.7	0.2	0.9	0.8
Copper	4	87.2	58.6	69.6	66.2
Iron	4	485	173	293	257
Lead	4	3.4	0.9	1.9	1.6
Manganese	4	1,260	98	461	243
Nickel	4	1.0	0.2	0.6	0.6
Zinc	4	394	168	287	292
Hydropsyche cockerelli					
Arsenic	14	18.8	8.0	13.3	13.4
Cadmium	23	2.1	0.7	1.4	1.4
Chromium	23	4.6	0.5	1.8	1.5
Copper	23	247	60.7	114	95.1
Iron	23	3,010	552	1,350	1,130
Lead	23	21.9	3.5	9.4	8.9
Manganese	23	2,650	487	1,430	1,350
Nickel	23	2.5	0.5	1.3	1.0
Zinc	23	285	162	220	227

Table 27. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2014.—Continued

[Concentrations are in microgram per gram dry weight (µg/g). Number of composite samples represents the total of all individual composite samples collected for every year that the constituent was analyzed. Values for a single sample are arbitrarily listed in the "Mean" column. Because *Hydropsyche* insects were not sorted to the species level during 1986–89, *Hydropsyche* species statistics for stations sampled during those years are based on the results of all *Hydropsyche* species combined. At some sites, statistics of *Hydropsyche morosa* group are based on the combined results of two or more species. Insects collected during 1986–98 were depurated prior to analysis; depuration was discontinued in 1999. Arsenic was not analyzed until 2003; therefore, the number of samples may be small or zero for some taxa. spp., one or more similar species; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed; <, less than minimum reporting level]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
461903112440701—Clark Fork at Dempsey Creek diversion, near Racetrack—Continued Period of record for biological data: 1996–2014					
Hydropsyche occidentalis					
Arsenic	19	24.0	9.8	14.8	15.8
Cadmium	36	2.4	0.7	1.3	1.3
Chromium	36	6.2	0.8	2.2	1.9
Copper	36	345	74.9	128	108
Iron	36	3,390	940	1,750	1,550
Lead	36	21.8	6.1	12.6	11.6
Manganese	36	4,460	826	2,300	2,160
Nickel	36	2.4	1.0	1.6	1.5
Zinc	36	386	197	262	245
Hydropsyche spp.					
Arsenic	2	6.5	6.4	6.4	--
Cadmium	4	1.7	0.9	1.3	1.3
Chromium	4	2.1	0.8	1.4	1.2
Copper	4	140	65.5	94.1	85.4
Iron	4	1,610	875	1,120	987
Lead	4	13.2	7.3	9.7	9.1
Manganese	4	1,150	638	824	756
Nickel	4	1.6	0.6	1.1	1.1
Zinc	4	212	162	184	180

Table 27. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2014.—Continued

[Concentrations are in microgram per gram dry weight (µg/g). Number of composite samples represents the total of all individual composite samples collected for every year that the constituent was analyzed. Values for a single sample are arbitrarily listed in the "Mean" column. Because *Hydropsyche* insects were not sorted to the species level during 1986–89, *Hydropsyche* species statistics for stations sampled during those years are based on the results of all *Hydropsyche* species combined. At some sites, statistics of *Hydropsyche morosa* group are based on the combined results of two or more species. Insects collected during 1986–98 were depurated prior to analysis; depuration was discontinued in 1999. Arsenic was not analyzed until 2003; therefore, the number of samples may be small or zero for some taxa. spp., one or more similar species; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed; <, less than minimum reporting level]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
12324200—Clark Fork at Deer Lodge Period of record for biological data: 1986–87, 1990–2014					
Arctopsyche grandis					
Arsenic	7	13.3	5.8	8.8	8.3
Cadmium	9	4.7	2.6	[1]3.5	[1]3.4
Chromium	9	4.7	1.0	[1]2.3	[1]2.0
Copper	9	183	34.9	96.8	88.6
Iron	9	2,320	537	1,180	1,090
Lead	9	17.4	3.8	[1]10.7	[1]11.2
Manganese	9	1,620	380	1,150	1,320
Nickel	9	1.9	<1.3	[1]1.4	[1]1.3
Zinc	9	370	140	268	269
Hydropsyche cockerelli					
Arsenic	12	17.1	5.8	10.1	9.8
Cadmium	35	3.6	0.6	1.6	1.7
Chromium	35	4.3	0.4	1.8	1.9
Copper	35	241	54.7	106	102
Iron	35	3,340	490	1,260	1,110
Lead	35	24.9	3.8	10.7	10.6
Manganese	35	1,580	396	992	1,020
Nickel	35	2.4	0.3	1.3	1.1
Zinc	35	391	132	201	194
Hydropsyche occidentalis					
Arsenic	22	21.1	6.6	11.3	10.2
Cadmium	59	3.4	0.6	1.4	1.3
Chromium	59	3.7	0.6	2.0	1.9
Copper	59	222	49.4	123	121
Iron	59	3,240	558	1,520	1,490
Lead	59	20.1	3.5	12.0	11.8
Manganese	59	2,850	649	1,610	1,680
Nickel	59	12.9	1.0	1.7	1.4
Zinc	59	346	166	246	237
Hydropsyche spp.					
Arsenic	1	--	--	6.0	--
Cadmium	4	2.6	1.6	2.2	2.3
Chromium	1	--	--	0.8	--
Copper	4	222	91	166	176
Iron	4	2,220	1,070	1,770	1,900
Lead	4	16.7	9.0	14.4	15.9
Manganese	1	--	--	837	--
Nickel	1	--	--	0.9	--
Zinc	4	298	196	242	237

Table 27. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2014.—Continued

[Concentrations are in microgram per gram dry weight (µg/g). Number of composite samples represents the total of all individual composite samples collected for every year that the constituent was analyzed. Values for a single sample are arbitrarily listed in the "Mean" column. Because *Hydropsyche* insects were not sorted to the species level during 1986–89, *Hydropsyche* species statistics for stations sampled during those years are based on the results of all *Hydropsyche* species combined. At some sites, statistics of *Hydropsyche morosa* group are based on the combined results of two or more species. Insects collected during 1986–98 were depurated prior to analysis; depuration was discontinued in 1999. Arsenic was not analyzed until 2003; therefore, the number of samples may be small or zero for some taxa. spp., one or more similar species; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed; <, less than minimum reporting level]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
12324400—Clark Fork above Little Blackfoot River, near Garrison Period of record for biological data: 2009–14					
Arctopsyche grandis					
Arsenic	10	16.6	3.2	6.8	5.8
Cadmium	10	4.9	1.2	3.3	3.6
Chromium	10	4.6	0.9	[1]1.8	[1]1.5
Copper	10	209	42.0	96.3	74.7
Iron	10	2,580	410	986	760
Lead	10	18.0	4.2	8.4	7.4
Manganese	10	1,940	659	1,210	1,030
Nickel	10	2.2	0.7	1.2	1.0
Zinc	10	378	227	273	267
Claassenia sabulosa					
Arsenic	2	2.9	2.4	2.6	--
Cadmium	2	1.3	1.0	1.2	--
Chromium	2	0.6	0.6	0.6	--
Copper	2	73.1	69.4	71.2	--
Iron	2	284	281	282	--
Lead	2	2.1	2.1	2.1	--
Manganese	2	226	193	210	--
Nickel	2	0.8	0.6	0.7	--
Zinc	2	297	231	264	--
Hydropsyche cockerelli					
Arsenic	3	11.1	7.8	9.5	9.5
Cadmium	3	4.0	0.9	2.8	3.4
Chromium	3	3.4	2.0	2.6	2.5
Copper	3	158	81.5	123	129
Iron	3	2,150	1,050	1,520	1,380
Lead	3	18.8	10.1	14.4	14.3
Manganese	3	1,870	1,270	1,550	1,500
Nickel	3	1.7	1.4	1.5	1.5
Zinc	3	284	216	247	242

Table 27. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2014.—Continued

[Concentrations are in microgram per gram dry weight (µg/g). Number of composite samples represents the total of all individual composite samples collected for every year that the constituent was analyzed. Values for a single sample are arbitrarily listed in the "Mean" column. Because *Hydropsyche* insects were not sorted to the species level during 1986–89, *Hydropsyche* species statistics for stations sampled during those years are based on the results of all *Hydropsyche* species combined. At some sites, statistics of *Hydropsyche morosa* group are based on the combined results of two or more species. Insects collected during 1986–98 were depurated prior to analysis; depuration was discontinued in 1999. Arsenic was not analyzed until 2003; therefore, the number of samples may be small or zero for some taxa. spp., one or more similar species; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed; <, less than minimum reporting level]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
12324400—Clark Fork above Little Blackfoot River, near Garrison—Continued Period of record for biological data: 2009–14					
Hydropsyche occidentalis					
Arsenic	9	14.7	6.4	10.1	8.8
Cadmium	9	2.5	1.3	2.0	2.0
Chromium	9	3.6	0.7	2.1	2.0
Copper	9	182	85.7	132	142
Iron	9	2,390	1,190	1,650	1,300
Lead	9	17.9	8.8	13.4	11.5
Manganese	9	2,100	975	1,460	1,260
Nickel	9	1.9	1.0	1.5	1.5
Zinc	9	299	223	260	254
Hydropsyche spp.					
Arsenic	1	--	--	13.6	--
Cadmium	1	--	--	1.7	--
Chromium	1	--	--	4.3	--
Copper	1	--	--	187	--
Iron	1	--	--	2,570	--
Lead	1	--	--	18.5	--
Manganese	1	--	--	919	--
Nickel	1	--	--	1.8	--
Zinc	1	--	--	296	--

Table 27. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2014.—Continued

[Concentrations are in microgram per gram dry weight (µg/g). Number of composite samples represents the total of all individual composite samples collected for every year that the constituent was analyzed. Values for a single sample are arbitrarily listed in the "Mean" column. Because *Hydropsyche* insects were not sorted to the species level during 1986–89, *Hydropsyche* species statistics for stations sampled during those years are based on the results of all *Hydropsyche* species combined. At some sites, statistics of *Hydropsyche morosa* group are based on the combined results of two or more species. Insects collected during 1986–98 were depurated prior to analysis; depuration was discontinued in 1999. Arsenic was not analyzed until 2003; therefore, the number of samples may be small or zero for some taxa. spp., one or more similar species; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed; <, less than minimum reporting level]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
12324680—Clark Fork at Goldcreek Period of record for biological data: 1992–2014					
Arctopsyche grandis					
Arsenic	40	17.0	1.8	5.1	4.7
Cadmium	69	6.6	0.6	2.0	1.8
Chromium	69	5.3	0.1	1.4	1.1
Copper	69	232	19.9	52.0	39.3
Iron	69	3,070	195	778	570
Lead	69	16.9	1.0	4.1	3.5
Manganese	69	1,580	436	883	871
Nickel	69	3.1	0.2	0.8	0.7
Zinc	69	326	146	206	190
Claassenia sabulosa					
Arsenic	28	2.5	0.4	1.4	1.5
Cadmium	48	3.5	0.1	1.0	0.7
Chromium	48	1.6	0.2	0.6	0.5
Copper	48	84.9	33.0	59.4	58.8
Iron	48	640	63.0	203	170
Lead	48	2.8	0.4	1.0	0.8
Manganese	48	320	50.6	153	143
Nickel	48	0.7	0.1	0.3	0.3
Zinc	48	364	166	264	260
Hydropsyche cockerelli					
Arsenic	17	9.8	4.1	6.0	5.7
Cadmium	36	4.2	0.5	1.5	1.3
Chromium	36	4.7	0.5	2.0	1.9
Copper	36	188	17.1	73.6	58.5
Iron	36	3,250	522	1,160	942
Lead	36	17.6	2.4	6.7	5.3
Manganese	36	1,710	538	1,000	981
Nickel	36	3.5	0.3	1.2	1.1
Zinc	36	359	106	192	185

Table 27. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2014.—Continued

[Concentrations are in microgram per gram dry weight (µg/g). Number of composite samples represents the total of all individual composite samples collected for every year that the constituent was analyzed. Values for a single sample are arbitrarily listed in the "Mean" column. Because *Hydropsyche* insects were not sorted to the species level during 1986–89, *Hydropsyche* species statistics for stations sampled during those years are based on the results of all *Hydropsyche* species combined. At some sites, statistics of *Hydropsyche morosa* group are based on the combined results of two or more species. Insects collected during 1986–98 were depurated prior to analysis; depuration was discontinued in 1999. Arsenic was not analyzed until 2003; therefore, the number of samples may be small or zero for some taxa. spp., one or more similar species; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed; <, less than minimum reporting level]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
12324680—Clark Fork at Goldcreek—Continued Period of record for biological data: 1992–2014					
Hydropsyche morosa group					
Arsenic	0	--	--	--	--
Cadmium	4	1.7	1.1	1.4	1.4
Chromium	4	1.4	1.3	1.4	1.4
Copper	4	72.9	43.8	60.5	62.7
Iron	4	1,320	612	1,050	1,130
Lead	4	6.9	2.4	4.6	4.6
Manganese	4	1,030	538	804	822
Nickel	4	1.4	0.9	1.2	1.2
Zinc	4	190	137	167	170
Hydropsyche occidentalis					
Arsenic	15	11.5	4.4	6.8	6.0
Cadmium	30	2.3	0.4	1.3	1.3
Chromium	30	3.9	0.4	1.8	1.7
Copper	30	170	26.4	72.6	62.5
Iron	30	2,720	466	1,240	1,140
Lead	30	15.7	2.9	7.4	6.0
Manganese	30	2,900	530	1,250	1,140
Nickel	30	2.5	0.8	1.3	1.1
Zinc	30	328	97.0	205	203
Hydropsyche spp.					
Arsenic	2	5.9	5.7	5.8	--
Cadmium	2	1.8	1.7	1.8	--
Chromium	2	1.6	1.6	1.6	--
Copper	2	83.5	73.6	78.6	--
Iron	2	1,150	1,110	1,130	--
Lead	2	9.2	8.0	8.6	--
Manganese	2	1,180	1,130	1,160	--
Nickel	2	0.8	0.8	0.8	--
Zinc	2	210	196	203	--

Table 27. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2014.—Continued

[Concentrations are in microgram per gram dry weight (µg/g). Number of composite samples represents the total of all individual composite samples collected for every year that the constituent was analyzed. Values for a single sample are arbitrarily listed in the "Mean" column. Because *Hydropsyche* insects were not sorted to the species level during 1986–89, *Hydropsyche* species statistics for stations sampled during those years are based on the results of all *Hydropsyche* species combined. At some sites, statistics of *Hydropsyche morosa* group are based on the combined results of two or more species. Insects collected during 1986–98 were depurated prior to analysis; depuration was discontinued in 1999. Arsenic was not analyzed until 2003; therefore, the number of samples may be small or zero for some taxa. spp., one or more similar species; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed; <, less than minimum reporting level]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
12331800—Clark Fork near Drummond Period of record for biological data: 1986, 1991–2014					
Arctopsyche grandis					
Arsenic	31	8.2	1.8	4.0	3.8
Cadmium	63	3.8	0.4	1.5	1.3
Chromium	63	4.2	0.2	1.1	1.0
Copper	63	103	16.9	34.7	29.1
Iron	63	1,720	193	612	504
Lead	63	11.8	1.6	4.7	4.1
Manganese	63	2,010	456	837	754
Nickel	63	1.9	0.2	0.7	0.6
Zinc	63	314	140	203	194
Claassenia sabulosa					
Arsenic	25	1.9	0.6	1.3	1.2
Cadmium	61	2.8	0.1	1.0	0.9
Chromium	61	3.3	0.2	0.7	0.6
Copper	61	165	18.0	64.6	60.6
Iron	61	449	45.4	179	149
Lead	61	2.9	0.2	1.0	0.9
Manganese	61	748	33.1	182	144
Nickel	61	1.1	0.1	[1]0.3	[1]0.2
Zinc	61	567	103	280	269
Hydropsyche cockerelli					
Arsenic	17	7.2	3.9	5.5	5.3
Cadmium	46	4.5	0.3	1.2	0.9
Chromium	46	3.5	0.4	1.6	1.5
Copper	46	156	30.0	58.6	51.7
Iron	46	2,500	506	1,170	976
Lead	46	15.0	4.7	8.4	7.5
Manganese	46	1,680	549	1,010	934
Nickel	46	2.0	0.5	1.1	1.1
Zinc	46	322	134	197	190

Table 27. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2014.—Continued

[Concentrations are in microgram per gram dry weight (µg/g). Number of composite samples represents the total of all individual composite samples collected for every year that the constituent was analyzed. Values for a single sample are arbitrarily listed in the "Mean" column. Because *Hydropsyche* insects were not sorted to the species level during 1986–89, *Hydropsyche* species statistics for stations sampled during those years are based on the results of all *Hydropsyche* species combined. At some sites, statistics of *Hydropsyche morosa* group are based on the combined results of two or more species. Insects collected during 1986–98 were depurated prior to analysis; depuration was discontinued in 1999. Arsenic was not analyzed until 2003; therefore, the number of samples may be small or zero for some taxa. spp., one or more similar species; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed; <, less than minimum reporting level]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
12331800—Clark Fork near Drummond—Continued Period of record for biological data: 1986, 1991–2014					
Hydropsyche morosa group					
Arsenic	0	--	--	--	--
Cadmium	6	1.3	1.1	1.2	1.2
Chromium	6	2.8	1.9	2.3	2.2
Copper	6	57.4	50.2	55.2	55.8
Iron	6	1,730	1,370	1,570	1,600
Lead	6	10.8	7.0	8.9	9.0
Manganese	6	1,940	1,260	1,610	1,610
Nickel	6	1.7	1.3	1.5	1.5
Zinc	6	250	227	239	240
Hydropsyche occidentalis					
Arsenic	18	7.7	4.3	5.5	5.4
Cadmium	34	2.8	0.4	1.1	1.0
Chromium	34	8.1	0.4	2.2	2.1
Copper	34	118	13.3	58.2	56.0
Iron	34	2,060	424	1,240	1,230
Lead	34	14.0	3.0	8.6	9.1
Manganese	34	2,920	477	1,410	1,220
Nickel	34	2.4	0.5	1.3	1.2
Zinc	34	293	153	222	222
Hydropsyche spp.					
Arsenic	0	--	--	--	--
Cadmium	1	--	--	2.6	--
Chromium	0	--	--	--	--
Copper	1	--	--	85.0	--
Iron	1	--	--	913	--
Lead	1	--	--	9.1	--
Manganese	0	--	--	--	--
Nickel	0	--	--	--	--
Zinc	1	--	--	260	--

Table 27. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2014.—Continued

[Concentrations are in microgram per gram dry weight (µg/g). Number of composite samples represents the total of all individual composite samples collected for every year that the constituent was analyzed. Values for a single sample are arbitrarily listed in the "Mean" column. Because *Hydropsyche* insects were not sorted to the species level during 1986–89, *Hydropsyche* species statistics for stations sampled during those years are based on the results of all *Hydropsyche* species combined. At some sites, statistics of *Hydropsyche morosa* group are based on the combined results of two or more species. Insects collected during 1986–98 were depurated prior to analysis; depuration was discontinued in 1999. Arsenic was not analyzed until 2003; therefore, the number of samples may be small or zero for some taxa. spp., one or more similar species; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed; <, less than minimum reporting level]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
12334550—Clark Fork at Turah Bridge, near Bonner Period of record for biological data: 1986, 1991–2014					
Arctopsyche grandis					
Arsenic	33	7.2	3.1	4.4	4.3
Cadmium	75	2.7	0.4	1.2	1.1
Chromium	75	4.1	0.5	1.6	1.5
Copper	75	125	17.6	37.7	32.0
Iron	75	2,870	372	922	790
Lead	75	13.2	1.6	4.4	3.8
Manganese	75	1,050	324	660	668
Nickel	75	2.6	0.4	1.1	0.9
Zinc	75	282	111	204	203
Claassenia sabulosa					
Arsenic	23	3.1	0.2	1.2	1.1
Cadmium	49	2.5	0.05	1.1	0.9
Chromium	49	2.0	0.2	0.7	0.6
Copper	49	97.8	37.5	60.2	56.8
Iron	49	378	58.6	135	115
Lead	49	1.6	0.2	0.7	0.6
Manganese	49	229	37.2	103	90.2
Nickel	49	0.6	0.04	0.2	0.2
Zinc	49	429	144	236	243
Hydropsyche cockerelli					
Arsenic	25	9.8	3.7	4.9	4.8
Cadmium	53	2.2	0.3	0.9	0.7
Chromium	53	14.2	0.2	2.2	1.7
Copper	53	126	26.4	49.4	44.2
Iron	53	3,180	566	1,240	1,140
Lead	53	19.7	2.2	5.7	5.2
Manganese	53	957	426	658	665
Nickel	53	2.7	0.6	1.3	1.3
Zinc	53	332	119	192	195

Table 27. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2014.—Continued

[Concentrations are in microgram per gram dry weight (µg/g). Number of composite samples represents the total of all individual composite samples collected for every year that the constituent was analyzed. Values for a single sample are arbitrarily listed in the "Mean" column. Because *Hydropsyche* insects were not sorted to the species level during 1986–89, *Hydropsyche* species statistics for stations sampled during those years are based on the results of all *Hydropsyche* species combined. At some sites, statistics of *Hydropsyche morosa* group are based on the combined results of two or more species. Insects collected during 1986–98 were depurated prior to analysis; depuration was discontinued in 1999. Arsenic was not analyzed until 2003; therefore, the number of samples may be small or zero for some taxa. spp., one or more similar species; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed; <, less than minimum reporting level]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
12334550—Clark Fork at Turah Bridge, near Bonner—Continued Period of record for biological data: 1986, 1991–2014					
Hydropsyche morosa group					
Arsenic	0	--	--	--	--
Cadmium	2	1.3	1.1	1.2	--
Chromium	2	4.6	2.4	3.5	--
Copper	2	84.1	26.8	55.4	--
Iron	2	1,800	986	1,390	--
Lead	2	6.6	<7.8	[1]5.2	--
Manganese	2	1,320	537	928	--
Nickel	2	1.7	1.3	1.5	--
Zinc	2	231	171	201	--
Hydropsyche occidentalis					
Arsenic	20	7.3	2.9	4.7	4.2
Cadmium	40	1.8	0.3	1.0	0.9
Chromium	40	5.0	0.6	2.0	1.7
Copper	40	102	27.4	49.9	45.8
Iron	40	2,590	472	1,280	1,170
Lead	40	14.2	2.8	6.5	5.7
Manganese	40	1,600	454	862	821
Nickel	40	3.2	0.6	1.3	1.2
Zinc	40	416	145	217	222
Hydropsyche spp.					
Arsenic	0	--	--	--	--
Cadmium	1	--	--	1.3	--
Chromium	1	--	--	2.4	--
Copper	1	--	--	84.1	--
Iron	1	--	--	1,800	--
Lead	1	--	--	<7.8	--
Manganese	1	--	--	537	--
Nickel	1	--	--	1.3	--
Zinc	1	--	--	171	--

Table 27. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2014.—Continued

[Concentrations are in microgram per gram dry weight (µg/g). Number of composite samples represents the total of all individual composite samples collected for every year that the constituent was analyzed. Values for a single sample are arbitrarily listed in the "Mean" column. Because *Hydropsyche* insects were not sorted to the species level during 1986–89, *Hydropsyche* species statistics for stations sampled during those years are based on the results of all *Hydropsyche* species combined. At some sites, statistics of *Hydropsyche morosa* group are based on the combined results of two or more species. Insects collected during 1986–98 were depurated prior to analysis; depuration was discontinued in 1999. Arsenic was not analyzed until 2003; therefore, the number of samples may be small or zero for some taxa. spp., one or more similar species; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed; <, less than minimum reporting level]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
12340000—Blackfoot River near Bonner Period of record for biological data: 1986–87, 1991, 1993, 1996, 1998, 2000, 2003, 2006–14					
Arctopsyche grandis					
Arsenic	12	4.6	1.6	2.6	2.2
Cadmium	22	0.5	0.1	0.3	0.3
Chromium	17	6.9	0.5	2.1	1.5
Copper	22	19.3	9.9	13.8	13.0
Iron	22	1,880	108	758	769
Lead	22	2.3	0.5	1.1	0.9
Manganese	17	633	286	448	422
Nickel	17	3.7	0.7	1.4	1.2
Zinc	22	170	106	143	143
Claassenia sabulosa					
Arsenic	11	3.0	0.1	1.0	0.7
Cadmium	22	0.2	0.1	0.1	0.2
Chromium	17	5.2	0.3	1.0	0.7
Copper	22	88.5	19.0	43.8	44.0
Iron	22	317	46.2	147	140
Lead	22	0.8	0.1	0.3	0.2
Manganese	17	133	26.3	80.3	73.4
Nickel	17	1.1	0.1	0.3	0.3
Zinc	22	399	117	230	207
Hydropsyche cockerelli					
Arsenic	8	4.2	2.1	3.0	3.0
Cadmium	8	0.6	<0.1	[1]0.3	[1]0.3
Chromium	8	5.7	1.6	3.2	3.0
Copper	8	17.5	5.6	14.6	15.8
Iron	8	2,390	1,120	1,770	1,800
Lead	8	2.6	1.5	2.0	2.0
Manganese	8	814	409	563	541
Nickel	8	4.6	1.4	2.3	1.9
Zinc	8	165	132	149	145

Table 27. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2014.—Continued

[Concentrations are in microgram per gram dry weight (µg/g). Number of composite samples represents the total of all individual composite samples collected for every year that the constituent was analyzed. Values for a single sample are arbitrarily listed in the "Mean" column. Because *Hydropsyche* insects were not sorted to the species level during 1986–89, *Hydropsyche* species statistics for stations sampled during those years are based on the results of all *Hydropsyche* species combined. At some sites, statistics of *Hydropsyche morosa* group are based on the combined results of two or more species. Insects collected during 1986–98 were depurated prior to analysis; depuration was discontinued in 1999. Arsenic was not analyzed until 2003; therefore, the number of samples may be small or zero for some taxa. spp., one or more similar species; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed; <, less than minimum reporting level]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
12340000—Blackfoot River near Bonner—Continued Period of record for biological data: 1986–87, 1991, 1993, 1996, 1998, 2000, 2003, 2006–14					
Hydropsyche occidentalis					
Arsenic	15	3.8	1.2	2.2	2.1
Cadmium	27	0.5	0.1	0.2	0.2
Chromium	27	5.8	0.8	2.2	1.9
Copper	27	20.9	12.0	16.0	16.0
Iron	27	2,090	927	1,480	1,490
Lead	27	2.0	0.8	1.5	1.6
Manganese	27	798	412	516	457
Nickel	27	4.9	0.9	1.6	1.4
Zinc	27	202	116	144	145
Hydropsyche spp.					
Arsenic	0	--	--	--	--
Cadmium	1	--	--	0.6	--
Chromium	1	--	--	1.6	--
Copper	1	--	--	13.9	--
Iron	1	--	--	1,140	--
Lead	1	--	--	2.9	--
Manganese	1	--	--	525	--
Nickel	1	--	--	2.8	--
Zinc	1	--	--	132	--

Table 27. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2014.—Continued

[Concentrations are in microgram per gram dry weight (µg/g). Number of composite samples represents the total of all individual composite samples collected for every year that the constituent was analyzed. Values for a single sample are arbitrarily listed in the "Mean" column. Because *Hydropsyche* insects were not sorted to the species level during 1986–89, *Hydropsyche* species statistics for stations sampled during those years are based on the results of all *Hydropsyche* species combined. At some sites, statistics of *Hydropsyche morosa* group are based on the combined results of two or more species. Insects collected during 1986–98 were depurated prior to analysis; depuration was discontinued in 1999. Arsenic was not analyzed until 2003; therefore, the number of samples may be small or zero for some taxa. spp., one or more similar species; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed; <, less than minimum reporting level]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
12340500—Clark Fork above Missoula Period of record for biological data: 1997–2014					
Arctopsyche grandis					
Arsenic	31	7.2	1.2	3.7	3.6
Cadmium	50	2.3	0.1	1.0	0.8
Chromium	50	4.2	0.4	1.6	1.5
Copper	50	81.2	13.7	37.9	34.3
Iron	50	2,340	302	1,010	881
Lead	50	8.8	1.1	4.0	3.8
Manganese	50	1,410	476	900	868
Nickel	50	2.1	0.3	1.1	1.0
Zinc	50	272	133	200	200
Claassenia sabulosa					
Arsenic	22	1.9	0.1	1.2	1.2
Cadmium	31	2.0	0.2	0.8	0.7
Chromium	31	1.4	0.1	0.7	0.7
Copper	31	81.1	25.8	52.0	51.0
Iron	31	424	82.0	224	227
Lead	31	3.1	0.2	0.9	0.8
Manganese	31	683	57.8	189	142
Nickel	31	0.7	0.2	[1]0.4	[1]0.4
Zinc	31	379	191	274	271
Hydropsyche cockerelli					
Arsenic	22	8.9	2.4	5.7	5.9
Cadmium	31	2.0	0.4	0.9	1.0
Chromium	31	6.0	1.0	2.9	2.7
Copper	31	99.7	24.4	61.2	58.1
Iron	31	3,590	830	1,990	2,040
Lead	31	12.1	2.5	7.3	6.8
Manganese	31	1,910	764	1,200	1,170
Nickel	31	2.4	0.9	1.8	1.8
Zinc	31	266	156	219	220
Hydropsyche occidentalis					
Arsenic	12	7.4	2.2	5.1	5.6
Cadmium	18	1.5	0.4	0.8	0.7
Chromium	18	5.5	0.7	2.9	3.0
Copper	18	80.7	25.3	53.9	58.9
Iron	18	2,540	690	1,900	2,060
Lead	18	11.4	2.1	6.8	6.6
Manganese	18	2,470	717	1,510	1,560
Nickel	18	2.4	0.7	1.8	1.8
Zinc	18	278	183	229	230

[1]Values determined by substituting one-half of the minimum reporting level for censored (<) values when both uncensored and censored values were used in determining the mean and median.

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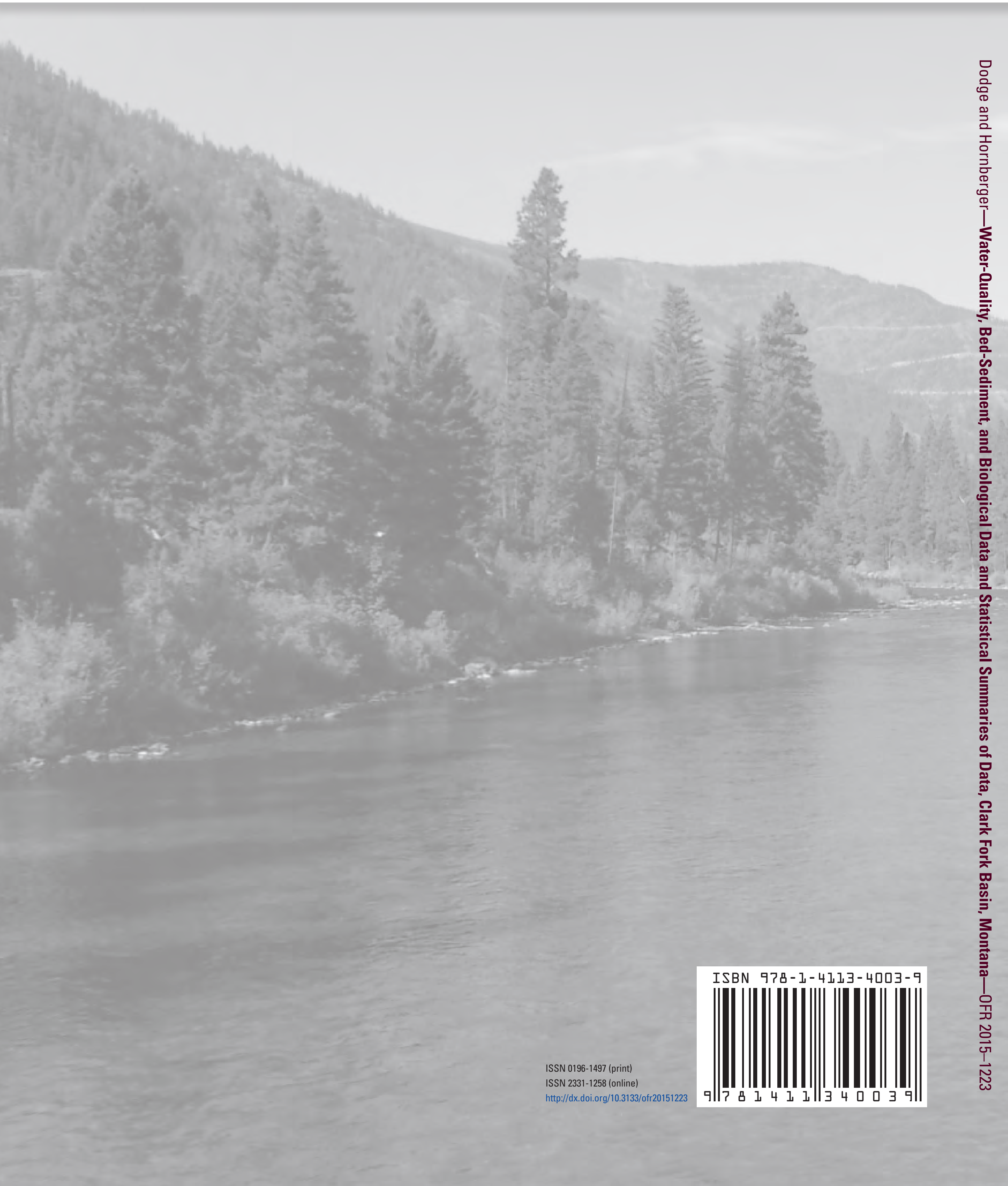

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