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Water-Quality, Bed-Sediment, and Biological Data (October 2014 through September 2015) and Statistical Summaries of Data for Streams in the Clark Fork Basin, Montana

Open-File Report 2016–1201

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

Cover. Photograph of the Clark Fork River near Missoula, Montana, by Michael Williams taken on September 1, 2016. Michael Williams Photography, Missoula, Montana. Used with permission.

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SALLY JEWELL, Secretary

U.S. Geological Survey
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Conversion Factors

U.S. customary units 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	micrograms per gram (µg/g)
parts per million	1	micrograms per milliliter (µg/mL)
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:

$$°F=(1.8\times°C)+32$$

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 and is designated by the calendar year in which it ends. For example, water year 2015 is the period from October 1, 2014, through September 30, 2015.

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

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Abstract

Water, bed sediment, and biota were sampled in selected 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 2014 through September 2015. Bed-sediment and biota samples were collected once at 13 sites during August 2015.

This report presents the analytical results and quality-assurance data for water-quality, bed-sediment, and biota samples collected at sites from October 2014 through September 2015. Water-quality data include concentrations of selected major ions, trace elements, and suspended sediment. At 12 sites, samples for analysis of dissolved organic carbon and turbidity were collected. In addition, samples for analysis of nitrogen (nitrate plus nitrite) were collected at two sites. Daily values of mean suspended-sediment concentration and suspended-sediment discharge were determined for three 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 (2016) 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 are deposited farther downstream in stream channels, on flood plains, in the Warm Springs Ponds, and at the location of the former Milltown Reservoir (fig.1) whose dam (Milltown Dam) was breached on March 28, 2008 (Andrews, 1987). The presence 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. The development of 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

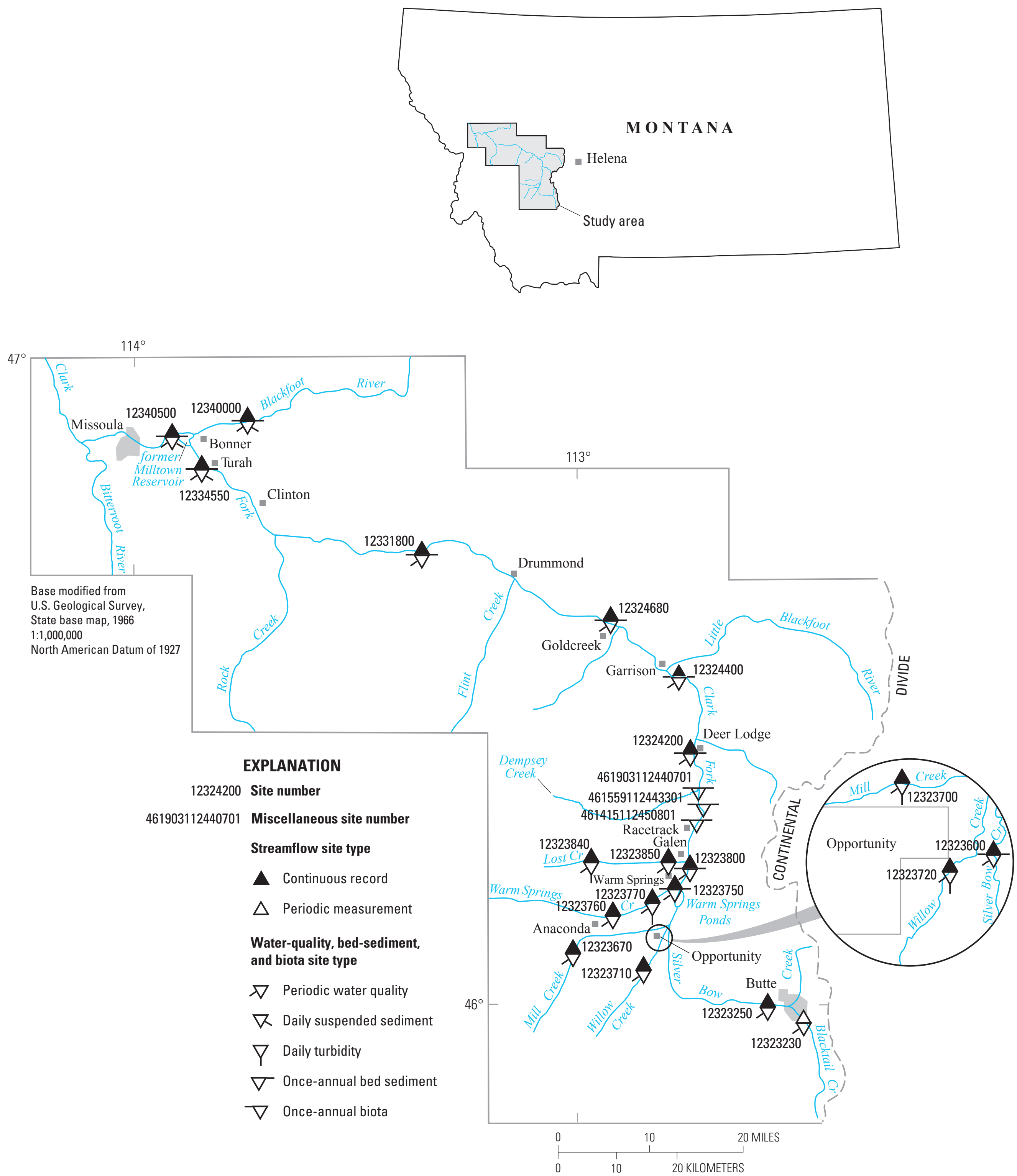

Figure 1. Location of study area in the Clark Fork Basin, Montana.

1991; Lambing and others, 1994, 1995; Dodge and others, 1996 through 2010, 2012, 2013, 2014a, 2014b; Dodge and Hornberger, 2015). 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 13 sites in the Clark Fork Basin from October 2014 through September 2015 (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 three sites, and daily turbidity values were computed using data 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 [12323770]) 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 2015 (October 1, 2014 through September 30, 2015) are listed in tables 4 through 23 at the back of the report. Statistical summaries of long-term water-quality, bed-sediment, and biological data collected between March 1985 and September 2015 are listed in tables 24 through 26 at the back of the report.

Quality assurance of data was maintained through the use of documented procedures described in the following sections. These quality-assurance data 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 three daily suspended-sediment sites, suspended-sediment samples were collected by a contract observer 2–7 times per week, depending on season and flow conditions. Continuous turbidity monitors were operated seasonally (March to September 2015) 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). The use of these methods provides 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.

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

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

Site number (fig. 1)	Site 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
12324200	Clark Fork at Deer Lodge	10/1978–P	03/1985–P	03/1985–08/1986, 04/1987–03/2003, 08/2003–2014	--	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

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

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

Site number (fig. 1)	Site name	Continuous-record streamflow	Periodic water quality[1]	Daily suspended sediment	Daily turbidity (seasonal)	Fine-grained bed sediment[2]	Biota[2]
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 (12323230 and 12323250) near Butte, Montana.

[2]Laboratory analyses of fine-grained bed sediment and 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		

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

Composited 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 to calculate water hardness.

Concentrations of arsenic, cadmium, copper, lead, manganese, and zinc in filtered samples were measured using inductively coupled plasma-mass spectrometry (ICP–MS) (Faires, 1993; Garbarino and others, 2006). Concentrations of calcium, magnesium, and iron in filtered samples were measured using inductively coupled plasma-atomic emission spectrometry (ICP–AES) (Fishman, 1993). Concentrations of potassium, sodium, alkalinity, chloride, fluoride, silica, sulfate, nitrogen (nitrate plus nitrite), and dissolved organic carbon were measured in filtered samples collected at select sites in the upper Clark Fork Basin. Potassium was measured by Standard Method 3120 (American Public Health Association, 1998); sodium and silica were analyzed by ICP–AES (Fishman, 1993); alkalinity was measured by electrometric titration (Fishman, 1993); chloride, fluoride, and sulfate were measured by ion chromatography (Fishman and Friedman, 1989); nitrogen (nitrate plus nitrite) was measured by colorimetric enzymatic reduction (Patton and Kryskalla, 2011); and dissolved organic carbon was measured by persulfate oxidation and infrared spectrometry (Brenton and Arnett, 1993). Recoverable concentrations of trace elements were measured in unfiltered samples that were first digested with dilute

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	0.20 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	--

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). Turbidity was measured by the NWQL using Standard Method 2130 (American Public Health Association, 1998) in selected unfiltered samples.

Water samples for analysis of suspended sediment also were collected from multiple vertical transits when periodic water samples were collected. Water 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 three daily suspended-sediment sites (table 1) were collected by local contract observers using the depth-integration method at a single vertical transit near midstream as described by Guy (1969). The samples were analyzed for suspended-sediment concentration, which was used to calculate daily mean suspended-sediment concentrations according to methods described by Porterfield (1972).

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

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

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 was measured using 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 reported 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 turbidity values 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 2015 (October 1, 2014 through September 30, 2015) are listed in table 4. In water year 2015, there were two water-quality samples with missing constituents because the constituents did not pass review and could not be resolved by reruns. Daily mean streamflow, daily mean suspended-sediment concentration, and daily suspended-sediment discharge for water year 2015 at the three daily suspended-sediment sites are listed in tables 5 through 7 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 8 through 11 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. 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 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 NWQL 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 of 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 12. The overall precision for each constituent estimated from analyses of field replicates, which include field and laboratory sources of variability, is listed in table 13. 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 were within the 20-percent RSD limit for all constituents except turbidity (table 13). This one exceedance of the data-quality objective resulted from a statistical artifact of calculating the difference between one estimated replicate sample pair and one replicate sample pair that is less than the LRL.

The precision for each constituent estimated from laboratory replicate analyses, which include only laboratory sources of variability, is listed in table 14. 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 14). 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 15 and 16, respectively. The mean spike recovery for deionized-water blank samples spiked with trace elements (table 15) ranged from 91.9 to 115 percent with the smallest individual constituent recovery being manganese, filtered, at 64.7 percent and the largest being zinc, unfiltered recoverable, at 129 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 15) did not exceed a 25-percent deviation from an expected 100-percent recovery except for copper, unfiltered recoverable (126 percent); manganese, filtered (64.7 percent); and zinc, unfiltered recoverable (129 percent). The mean spike recovery for spiked stream samples (table 16) ranged from 94.2 to 110 percent with the smallest individual constituent recovery being iron, filtered, at 80.7 percent and the largest being iron, unfiltered recoverable, at 127 percent. The 95-percent confidence intervals for the mean spike recovery for each constituent for which stream water samples were analyzed (table 16) did not exceed a 25-percent deviation from an expected 100-percent recovery except for iron, unfiltered recoverable (127 percent). 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 15) except for zinc, unfiltered recoverable (101–129 percent). Confidence intervals for percent recovery include 100 percent for all laboratory-spiked stream samples (table 16) except for lead, filtered (102–106 percent) and manganese, filtered (101–105 percent). 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 17. 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 17) almost always were less than the LRL. Two sample concentrations of filtered silica (0.072 and 0.042 milligrams per liter [mg/L]) exceeded the LRL of 0.018 mg/L. One sample concentration of iron, unfiltered recoverable (7.5 micrograms per liter [µg/L]) exceeded the LRL of 4.6 µg/L. Two blank samples (05/12/2015 and 08/11/2015) inadvertently were not analyzed for major constituents. 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 were 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 not sampled during water year 2015.

Methods

Fine-grained bed-sediment samples were collected in August 2015 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 site. 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 2015 are listed in table 18. Liquid-phase concentrations, measured in micrograms per milliliter, were analyzed in the reconstituted aliquots of digested bed sediment. Solid-phase concentrations, measured in micrograms per gram, were calculated using the following equation:

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

where

µg/g	is micrograms per gram,
µg/mL	is micrograms per milliliter, and
mL	is milliliters.

The reported solid-phase concentrations (table 18) 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 sites 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 (that is, downstream sites have lower metal concentrations in bed sediments compared 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 13 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 19. 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 19) 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 46.7 to 88.0 percent of the certified concentrations (table 19). The mean recoveries were within 18 percent of the SRM (based on the 95-percent confidence interval) for copper, iron, manganese, nickel, and zinc. The lowest percent recoveries (between 46.7 and 65.9 percent) were observed in trace elements with the lowest certified concentrations (cadmium, 0.371 micrograms per gram [µg/g]) or with a strong association with crystalline lattices (arsenic, chromium, and lead). Mean recoveries in SRM 2711a ranged from 56.9 to 97.4 percent (table 19). The percent recoveries were within 14 percent of the SRM (based on the 95-percent confidence interval) for arsenic, cadmium, copper, iron, lead, nickel, zinc, and 20 percent for manganese. The lowest mean recovery (56.9 percent) was observed in chromium analysis 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 analysis 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. Analytical results of procedural blanks for bed sediment (table 20) are reported as a liquid-phase concentration, in micrograms 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 except for one nickel value (0.003 micrograms per milliliter [µg/mL]) in the procedural blank analyzed with the sample collected from the Clark Fork at Goldcreek site. 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 once annually and was not sampled during water year 2015.

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 2015 are listed in table 21. 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 micrograms per milliliter, analyzed in the reconstituted samples were converted to solid-phase concentrations, in micrograms 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 12 replicates of the certified reference material (CRM) TORT-3 (lobster hepatopancreas) purchased from the National Research Council Canada. TORT-3 is the replacement for the preceding version of the CRM standard TORT-2 (also lobster hepatopancreas) reported in an earlier report (Dodge and Hornberger, 2015). 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 TORT-3 CRM are listed in table 22. Data-quality objectives have not been established for analytical recovery in biota, but percent recoveries indicate analytical performance. Mean CRM recoveries for TORT-3 ranged from 79.6 to 170 percent for all constituents. The mean recoveries were within 20 percent (based on the 95-percent confidence interval) for arsenic, cadmium, chromium, copper, iron, manganese, nickel, and zinc. Mean recovery was the highest for lead analysis (170 percent), likely because of the low certified concentration 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 23) 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 24 through 26 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 24) 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 25) and biological data (table 26) are based on results of samples collected once each year 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 25) 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 26) 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 among 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 sites 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 clearly be 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 2014 through September 2015.

[hh, hour; mm, minute; ft³/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; <, less than laboratory reporting level; E, estimated; µg/L, microgram per liter; mm, millimeters; ton/d, ton per day; --, no data]

12323230—Blacktail Creek at Harrison Avenue, at Butte

Date	Time (hhmm)	Streamflow, instantaneous (ft³/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)
10/14/2014	0845	13	7.5	234	6.0	<2.0	92.7	25.8	6.85
03/23/2015	0925	15	7.5	231	3.0	E3.5	90.4	25.8	6.31
04/20/2015	0900	12	7.6	245	4.0	E2.7	102	29.7	6.78
05/11/2015	0905	13	7.7	234	6.0	E3.7	96.5	27.9	6.53
05/26/2015	0915	25	7.7	195	11.0	E6.5	81.0	23.2	5.59
06/08/2015	0915	20	7.7	213	13.0	E7.5	88.3	25.2	6.16
07/13/2015	1015	5.7	7.7	295	12.0	E2.6	126	36.0	8.76
08/10/2015	0845	4.6	7.6	317	10.0	<2.0	129	36.9	8.84

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)
10/14/2014	2.74	9.60	78.4	8.25	0.19	21.6	24.2	0.53	<0.030
03/23/2015	2.55	9.45	74.1	10.6	0.18	21.1	22.3	0.52	0.033
04/20/2015	2.39	10.8	78.0	11.9	0.19	23.9	23.4	0.61	<0.030
05/11/2015	2.34	9.81	77.5	10.8	0.18	22.6	21.3	0.50	0.045
05/26/2015	2.66	8.99	66.7	7.43	0.21	24.9	16.2	0.23	<0.030
06/08/2015	2.53	8.84	76.7	6.87	0.19	26.1	14.7	0.28	0.037
07/13/2015	2.73	11.9	101	11.9	0.23	24.4	25.6	1.05	0.049
08/10/2015	2.62	12.2	105	13.1	0.23	26.2	30.4	1.24	<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)
10/14/2014	<0.030	1.8	2.6	165	387	0.092	0.30	28.0	33.2
03/23/2015	<0.030	2.9	4.2	356	781	0.232	0.64	45.1	57.3
04/20/2015	<0.030	2.6	3.6	224	512	0.136	0.38	43.1	52.0
05/11/2015	<0.030	3.2	4.1	233	652	0.167	0.55	43.2	53.0
05/26/2015	<0.030	5.5	8.2	348	866	0.297	0.99	36.4	57.4
06/08/2015	0.037	4.8	7.2	739	1,370	0.531	1.32	60.6	91.7
07/13/2015	<0.030	1.9	2.2	122	420	0.139	0.56	49.1	54.8
08/10/2015	<0.030	1.2	2.3	51.9	372	0.050	0.38	44.4	54.8

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)
10/14/2014	2.1	2.4	2.5	3.1	3.43	95	2	0.07
03/23/2015	2.1	3.4	2.7	3.6	5.22	86	4	0.16
04/20/2015	<2.0	2.9	2.3	2.7	4.29	92	3	0.10
05/11/2015	<2.0	2.3	2.9	3.6	4.88	93	4	0.14
05/26/2015	<2.0	3.8	5.2	6.6	8.13	74	9	0.61
06/08/2015	2.3	4.9	7.7	9.8	7.71	93	12	0.65
07/13/2015	<2.0	2.1	3.8	4.6	3.37	91	4	0.06
08/10/2015	<2.0	3.6	2.7	3.4	2.14	85	4	0.05

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2014 through September 2015.—Continued

[hh, hour; mm, minute; ft³/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; <, less than laboratory reporting level; E, estimated; µg/L, microgram per liter; mm, millimeters; ton/d, ton per day; --, no data]

12323250—Silver Bow Creek below Blacktail Creek, at Butte

Date	Time (hhmm)	Streamflow, instantaneous (ft³/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)
10/14/2014	1035	29	7.7	445	8.0	E2.4	148	41.1	11.1
03/23/2015	1120	30	7.8	406	4.5	E3.0	141	39.8	10.2
04/20/2015	1020	27	7.7	441	6.5	E2.0	148	41.7	10.5
05/11/2015	1040	27	7.8	401	8.0	E4.5	132	38.0	8.91
05/26/2015	1105	44	7.8	348	13.0	E6.4	116	33.2	7.99
06/08/2015	1050	37	7.9	389	15.0	E8.6	126	36.3	8.62
07/13/2015	1140	19	7.8	514	16.0	E3.0	165	46.7	11.8
08/10/2015	1015	18	7.7	562	14.0	<2.0	169	47.7	12.2

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)
10/14/2014	5.50	26.2	101	25.7	0.31	20.5	72.7	1.61	0.057
03/23/2015	4.26	19.8	92.6	24.1	0.28	20.5	65.0	0.82	0.082
04/20/2015	4.98	23.4	77.3	26.6	0.29	22.6	65.2	0.80	0.062
05/11/2015	4.50	20.8	98.7	24.5	0.28	20.8	57.0	0.61	0.052
05/26/2015	4.48	18.2	89.9	18.5	0.29	22.9	45.0	0.44	0.043
06/08/2015	4.74	20.1	69.7	19.7	0.28	23.2	48.6	0.39	0.045
07/13/2015	6.25	28.5	80.4	31.5	0.33	19.7	77.0	0.65	0.049
08/10/2015	6.64	31.6	99.9	34.4	0.35	21.7	82.0	0.71	0.070

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)
10/14/2014	0.084	2.6	8.9	63.4	335	0.142	1.80	43.5	66.4
03/23/2015	0.073	7.4	8.0	392	484	0.720	1.11	67.8	76.2
04/20/2015	0.063	5.0	8.5	127	322	0.256	0.81	61.9	74.3
05/11/2015	0.081	4.0	10.2	154	535	0.240	1.67	61.0	77.2
05/26/2015	0.113	6.9	18.6	217	896	0.580	5.87	49.1	86.2
06/08/2015	0.091	6.0	12.5	353	959	0.806	2.90	65.8	89.7
07/13/2015	0.072	3.3	8.2	60.2	157	0.206	0.88	50.7	62.9
08/10/2015	0.078	3.8	11.0	41.1	123	0.196	0.75	51.9	62.3

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)
10/14/2014	31.0	41.1	2.8	3.6	4.93	82	7	0.55
03/23/2015	28.1	30.5	3.4	3.7	5.94	79	4	0.32
04/20/2015	30.8	37.4	2.9	3.1	6.09	87	6	0.44
05/11/2015	24.9	36.4	3.2	4.2	6.06	81	7	0.51
05/26/2015	18.8	42.7	4.9	7.1	8.66	85	19	2.3
06/08/2015	15.1	30.3	6.6	8.2	8.58	90	15	1.5
07/13/2015	13.1	26.1	4.1	4.4	7.21	80	4	0.21
08/10/2015	33.6	43.3	3.7	3.9	7.68	81	3	0.15

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2014 through September 2015.—Continued

[hh, hour; mm, minute; ft³/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; <, less than laboratory reporting level; E, estimated; µg/L, microgram per liter; mm, millimeters; ton/d, ton per day; --, no data]

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)
10/14/2014	1215	43	8.4	452	8.5	E3.3	162	46.9	10.9
03/23/2015	1315	69	8.5	384	5.0	E4.4	148	44.5	8.83
04/20/2015	1200	70	8.8	397	8.0	E3.4	146	44.1	8.83
05/11/2015	1230	78	9.2	372	9.0	E3.7	142	43.0	8.42
05/27/2015	1340	143	8.3	274	12.0	E12	111	33.9	6.37
06/08/2015	1220	88	8.6	332	16.0	E5.7	131	39.9	7.67
07/13/2015	1310	25	9.2	497	20.0	E2.5	193	57.2	12.2
08/10/2015	1140	21	8.7	535	17.0	E3.6	191	56.2	12.3

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)
10/14/2014	4.82	25.9	100	26.9	0.47	21.5	78.4	0.255	0.276
03/23/2015	3.92	20.1	87.1	23.0	0.31	20.3	61.0	0.204	0.276
04/20/2015	3.74	20.9	89.3	25.8	0.34	18.6	62.4	0.157	0.249
05/11/2015	3.35	17.2	91.5	20.7	0.31	14.0	60.4	0.130	0.238
05/27/2015	3.17	12.6	75.8	10.7	0.25	20.2	37.2	0.192	0.313
06/08/2015	3.08	15.9	90.0	14.7	0.25	21.3	44.1	0.106	0.239
07/13/2015	5.47	29.0	105	39.0	0.43	12.2	83.6	0.165	0.228
08/10/2015	5.06	27.9	109	41.4	0.47	20.7	88.0	0.162	0.271

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)
10/14/2014	12.4	18.7	154	289	0.975	1.92	60.9	91.4
03/23/2015	9.5	17.0	48.7	427	0.190	1.76	106	139
04/20/2015	9.9	16.8	39.5	323	0.168	1.31	123	174
05/11/2015	8.4	13.6	36.0	275	0.129	1.30	110	137
05/27/2015	18.5	28.5	397	841	4.22	6.79	82.3	139
06/08/2015	9.4	18.7	65.0	458	0.284	2.48	58.8	102
07/13/2015	11.8	15.9	20.9	114	0.132	0.67	35.0	62.8
08/10/2015	9.5	16.2	13.7	257	0.138	1.67	36.2	130

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)
10/14/2014	61.6	69.9	5.1	5.7	3.06	92	8	0.93
03/23/2015	46.3	69.6	4.9	6.0	5.55	77	11	2.0
04/20/2015	29.8	63.6	5.2	5.8	4.70	86	12	2.3
05/11/2015	18.1	44.6	4.8	5.5	5.33	85	8	1.7
05/27/2015	42.9	72.0	8.1	9.0	7.69	44	48	19
06/08/2015	14.8	42.8	7.3	8.4	6.40	87	12	2.9
07/13/2015	11.7	26.8	8.2	8.8	5.10	86	5	0.34
08/10/2015	17.3	44.9	8.2	8.8	3.89	90	8	0.45

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2014 through September 2015.—Continued

[hh, hour; mm, minute; ft³/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; <, less than laboratory reporting level; E, estimated; µg/L, microgram per liter; mm, millimeters; ton/d, ton per day; --, no data]

12323670—Mill Creek near Anaconda

Date	Time (hhmm)	Streamflow, instantaneous (ft³/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)
10/14/2014	1620	19	8.0	158	9.0	<2.0	71.4	19.5	5.49
03/23/2015	1635	41	7.8	128	5.0	E3.1	53.3	14.8	3.98
04/20/2015	1505	35	7.9	140	10.0	E2.0	62.8	17.7	4.50
05/11/2015	1605	64	7.9	104	9.5	E2.1	44.2	12.6	3.09
05/26/2015	1705	125	7.9	86	11.0	E3.5	36.4	10.5	2.45
06/08/2015	1535	147	7.8	75	14.0	E2.6	32.7	9.72	2.04
07/13/2015	1455	39	8.1	125	15.0	<2.0	58.1	16.4	4.16
08/10/2015	1430	22	8.2	159	15.0	<2.0	74.8	20.7	5.63

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)
10/14/2014	0.73	4.26	73.6	0.41	0.36	12.1	7.47	0.046	0.044
03/23/2015	0.73	5.47	56.3	0.40	0.32	14.7	8.12	0.050	0.052
04/20/2015	0.75	5.52	62.2	0.36	0.29	15.3	7.79	0.041	0.047
05/11/2015	0.57	3.64	46.5	0.26	0.29	13.6	5.17	0.035	0.058
05/26/2015	0.57	3.45	38.0	0.21	0.30	12.5	4.29	0.052	0.087
06/08/2015	0.51	2.57	33.0	0.16	0.29	9.88	3.20	0.040	0.061
07/13/2015	0.60	3.32	58.6	0.21	0.31	10.3	4.99	<0.030	0.048
08/10/2015	0.65	3.87	75.3	0.26	0.34	12.1	6.48	0.031	0.043

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)
10/14/2014	1.8	1.8	60.9	107	0.065	0.20	6.43	9.8
03/23/2015	3.7	4.0	94.4	218	0.193	0.52	4.23	9.6
04/20/2015	2.4	3.1	40.6	144	0.091	0.41	4.85	10.2
05/11/2015	2.2	3.2	42.1	157	0.095	0.59	3.95	10.4
05/26/2015	3.5	4.9	117	306	0.364	1.12	8.29	16.3
06/08/2015	2.2	3.4	41.5	174	0.112	0.60	3.98	10.1
07/13/2015	2.4	2.5	69.4	167	0.125	0.45	7.22	13.3
08/10/2015	1.4	2.0	77.6	138	0.122	0.31	6.92	11.5

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)
10/14/2014	<2.0	<2.0	11.5	12.8	1.29	78	1	0.05
03/23/2015	2.3	3.1	16.0	17.9	2.80	96	2	0.22
04/20/2015	<2.0	2.5	16.4	16.9	2.16	85	3	0.28
05/11/2015	<2.0	4.0	13.9	14.4	2.35	66	3	0.52
05/26/2015	2.3	3.8	15.3	16.9	2.58	52	11	3.7
06/08/2015	<2.0	3.1	10.9	12.1	2.27	61	8	3.2
07/13/2015	<2.0	<2.0	16.4	18.3	2.03	65	3	0.32
08/10/2015	<2.0	<2.0	18.8	19.4	1.39	75	1	0.06

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2014 through September 2015.—Continued

[hh, hour; mm, minute; ft³/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; <, less than laboratory reporting level; E, estimated; µg/L, microgram per liter; mm, millimeters; ton/d, ton per day; --, no data]

12323700—Mill Creek at Opportunity

Date	Time (hhmm)	Streamflow, instantaneous (ft³/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)
10/14/2014	1715	11	8.0	181	9.5	<2.0	80.1	22.2	6.01
03/23/2015	1745	34	8.0	142	5.0	E2.9	58.8	16.4	4.33
04/20/2015	1600	24	8.2	157	11.0	E2.1	67.9	19.0	4.99
05/11/2015	1705	38	8.0	114	9.0	E2.6	47.8	13.7	3.33
05/27/2015	0750	69	7.8	89	8.0	E5.0	39.0	11.2	2.64
06/08/2015	1630	85	7.9	80	15.0	E3.4	35.1	10.4	2.21
07/13/2015	1640	15	8.2	136	17.0	<2.0	63.8	18.0	4.56
08/10/2015	1535	3.6	8.1	176	17.0	<2.0	78.8	22.1	5.73

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)
10/14/2014	0.90	5.42	77.0	0.55	0.37	12.5	14.3	0.064	0.070
03/23/2015	0.72	5.89	59.5	0.50	0.32	14.2	12.0	0.054	0.078
04/20/2015	0.80	6.33	65.7	0.46	0.31	15.5	12.2	0.052	0.066
05/11/2015	0.60	4.06	49.1	0.31	0.29	13.8	7.55	0.067	0.082
05/27/2015	0.56	3.57	38.4	0.24	0.30	11.9	5.45	0.043	0.177
06/08/2015	0.57	2.75	34.5	0.18	0.30	10.2	4.11	0.047	0.103
07/13/2015	0.76	3.99	60.4	0.29	0.31	10.3	8.00	0.048	0.076
08/10/2015	0.78	4.98	77.4	0.41	0.36	12.1	11.8	0.057	0.052

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)
10/14/2014	1.4	2.1	83.0	145	0.109	0.26	5.58	8.3
03/23/2015	3.0	4.5	77.9	238	0.164	0.69	3.05	10.5
04/20/2015	2.5	3.5	41.0	163	0.102	0.53	4.48	11.3
05/11/2015	2.4	3.8	46.7	195	0.151	0.79	4.25	13.8
05/27/2015	3.2	8.5	108	606	0.153	2.41	4.30	31.8
06/08/2015	3.1	5.5	66.2	300	0.274	1.29	4.93	17.5
07/13/2015	2.7	3.6	66.9	172	0.178	0.59	5.03	11.8
08/10/2015	2.2	2.8	68.0	115	0.142	0.29	6.40	8.6

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)
10/14/2014	2.7	3.1	18.6	21.3	1.76	64	1	0.03
03/23/2015	2.6	5.0	16.8	19.5	2.89	79	4	0.37
04/20/2015	<2.0	3.6	18.7	18.5	2.13	84	4	0.26
05/11/2015	<2.0	3.7	16.8	17.9	2.25	71	5	0.51
05/27/2015	2.2	8.5	15.1	19.8	2.79	61	19	3.5
06/08/2015	<2.0	5.5	14.0	16.1	2.30	56	14	3.2
07/13/2015	<2.0	2.9	23.7	25.9	2.45	86	2	0.08
08/10/2015	<2.0	<2.0	29.7	30.2	1.70	83	1	0.01

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2014 through September 2015.—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; <, less than laboratory reporting level; E, estimated; µg/L, microgram per liter; mm, millimeters; ton/d, ton per day; --, no data]

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)
10/14/2014	1415	2.1	7.8	124	8.0	<2.0	46.0	15.2	1.97
03/23/2015	1520	11	7.6	95	4.0	E12	38.0	12.7	1.54
04/20/2015	1335	10	7.7	98	6.0	E5.9	38.4	12.8	1.54
05/11/2015	1440	20	7.7	81	7.0	E4.9	30.1	10.1	1.21
05/26/2015	1445	26	7.7	86	10.5	E6.6	32.3	10.8	1.29
06/08/2015	1420	14	7.9	100	13.0	E5.5	38.9	13.1	1.47
07/14/2015	0750	3.8	7.7	113	11.0	E2.4	45.4	15.2	1.81
08/10/2015	1330	1.9	7.9	115	15.0	<2.0	42.9	14.4	1.68

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)
10/14/2014	1.13	7.48	53.3	0.72	0.07	24.8	8.44	0.035	0.043
03/23/2015	0.95	6.22	37.1	0.57	0.06	26.9	8.83	<0.030	0.047
04/20/2015	0.84	6.25	38.9	0.48	0.07	24.9	8.21	<0.030	<0.030
05/11/2015	0.84	5.08	33.4	0.38	0.06	26.0	5.98	<0.030	0.048
05/26/2015	0.87	5.03	34.7	0.37	E0.06	24.0	6.29	<0.030	0.052
06/08/2015	0.95	5.68	41.4	0.33	0.06	24.4	6.45	<0.030	0.047
07/14/2015	1.05	6.61	50.5	0.33	0.07	24.8	6.36	<0.030	0.037
08/10/2015	1.05	6.71	50.3	0.38	0.08	26.1	6.54	<0.030	0.045

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)
10/14/2014	1.6	2.0	117	174	0.152	0.26	9.28	13.3
03/23/2015	3.2	3.9	226	759	0.390	0.94	9.82	24.1
04/20/2015	2.5	2.5	101	336	0.193	0.46	9.28	18.7
05/11/2015	2.2	2.9	121	282	0.200	0.67	7.58	17.6
05/26/2015	3.0	3.7	129	416	0.266	0.78	7.86	17.6
06/08/2015	2.2	2.7	84.2	253	0.220	0.58	10.8	14.7
07/14/2015	1.9	2.5	95.4	204	0.236	0.51	7.96	15.0
08/10/2015	2.2	2.8	106	231	0.215	0.49	7.79	13.6

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)
10/14/2014	<2.0	<2.0	15.8	17.4	3.63	92	1	0.01
03/23/2015	2.2	4.1	16.7	17.9	7.07	96	4	0.12
04/20/2015	<2.0	2.7	15.0	14.4	4.44	96	4	0.11
05/11/2015	<2.0	2.1	12.5	12.9	4.20	85	6	0.32
05/26/2015	<2.0	2.5	13.4	14.4	5.02	81	10	0.70
06/08/2015	<2.0	2.4	14.5	15.2	4.69	79	6	0.23
07/14/2015	<2.0	<2.0	19.5	20.6	4.24	94	3	0.03
08/10/2015	<2.0	<2.0	22.2	23.1	3.44	95	2	0.01

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2014 through September 2015.—Continued

[hh, hour; mm, minute; ft³/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; <, less than laboratory reporting level; E, estimated; µg/L, microgram per liter; mm, millimeters; ton/d, ton per day; --, no data]

12323720—Willow Creek at Opportunity

Date	Time (hhmm)	Streamflow, instantaneous (ft³/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)
10/14/2014	1255	6.5	8.2	275	10.0	<2.0	117	33.8	7.97
03/23/2015	1405	14	8.1	191	5.0	E7.2	79.8	24.1	4.79
04/20/2015	1240	11	8.0	200	9.0	E3.8	83.8	25.2	5.07
05/11/2015	1320	21	7.9	181	10.0	E3.1	75.6	22.7	4.62
05/26/2015	1315	34	7.9	191	13.5	E5.2	84.7	25.9	4.86
06/08/2015	1305	32	8.1	248	17.5	E4.2	115	34.1	7.26
07/13/2015	1350	7.7	8.6	278	17.0	<2.0	130	37.7	8.69
08/10/2015	1225	5.4	8.2	298	14.0	<2.0	134	38.7	9.06

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)
10/14/2014	1.48	10.9	117	2.40	0.44	21.5	23.3	<0.030	0.032
03/23/2015	1.34	8.98	75.2	1.65	0.20	24.4	18.0	0.034	0.076
04/20/2015	1.25	9.29	79.3	1.64	0.21	24.8	18.1	<0.030	0.050
05/11/2015	1.15	8.00	76.4	1.29	0.22	24.6	13.4	0.046	0.064
05/26/2015	1.50	9.00	81.5	1.29	0.25	25.8	12.4	0.053	0.137
06/08/2015	2.28	8.80	111	1.45	0.43	27.8	11.6	0.074	0.117
07/13/2015	1.45	9.53	124	2.01	0.44	19.8	18.7	<0.030	0.031
08/10/2015	1.39	9.22	131	2.35	0.49	20.4	21.7	<0.030	0.032

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)
10/14/2014	1.4	3.4	25.3	139	0.172	0.97	13.8	18.7
03/23/2015	3.7	7.8	113	472	0.324	1.93	31.4	50.3
04/20/2015	4.0	7.2	59.0	264	0.238	1.34	30.6	45.0
05/11/2015	6.5	9.5	69.9	244	0.268	1.49	20.5	28.1
05/26/2015	8.7	15.3	100	381	0.378	2.44	22.9	41.8
06/08/2015	9.4	13.4	130	283	0.588	1.83	28.9	40.2
07/13/2015	2.3	2.8	28.7	105	0.166	0.55	4.15	7.2
08/10/2015	2.4	3.3	14.7	77.7	0.108	0.62	10.6	14.6

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)
10/14/2014	<2.0	4.0	12.1	14.3	2.30	89	2	0.04
03/23/2015	3.2	9.0	16.6	20.3	5.53	97	9	0.34
04/20/2015	2.7	8.0	19.4	20.3	4.02	96	6	0.18
05/11/2015	5.6	10.2	34.1	35.6	5.77	80	6	0.34
05/26/2015	6.5	15.0	48.4	53.1	7.67	86	12	1.1
06/08/2015	5.3	11.1	105	107	9.75	87	8	0.69
07/13/2015	<2.0	<2.0	23.9	26.3	3.04	92	2	0.04
08/10/2015	2.5	4.4	15.8	16.9	2.15	83	1	0.01

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2014 through September 2015.—Continued

[hh, hour; mm, minute; ft³/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; <, less than laboratory reporting level; E, estimated; µg/L, microgram per liter; mm, millimeters; ton/d, ton per day; --, no data]

12323750—Silver Bow Creek at Warm Springs

Date	Time (hhmm)	Streamflow, instantaneous (ft³/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)
10/15/2014	1030	67	8.7	477	8.5	<2.0	188	51.3	14.6
03/24/2015	0945	107	8.4	425	3.0	E4.7	182	53.0	12.0
04/21/2015	1025	99	8.4	447	8.0	E2.6	185	54.3	12.1
05/12/2015	1130	95	8.6	345	10.0	E3.0	136	39.5	9.12
05/27/2015	0955	219	8.7	354	11.5	E2.4	147	43.6	9.22
06/09/2015	0845	169	8.4	299	14.0	E3.5	122	36.0	7.82
07/14/2015	1050	48	9.3	380	16.0	E2.0	171	48.3	12.2
08/11/2015	1020	35	9.3	464	15.5	<2.0	205	58.6	14.3

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)
10/15/2014	4.36	20.4	100	18.6	0.75	9.44	110	0.040	0.053
03/24/2015	3.69	18.5	94.6	17.9	0.64	12.1	89.6	0.039	0.105
04/21/2015	3.81	19.1	98.9	18.9	0.59	11.1	94.1	0.033	0.062
05/12/2015	2.54	13.1	82.1	11.9	0.53	11.9	68.8	0.036	0.081
05/27/2015	3.41	16.9	86.3	15.1	0.52	10.8	65.0	0.053	0.114
06/09/2015	2.46	11.8	81.4	9.15	0.45	13.5	48.1	0.051	0.089
07/14/2015	2.34	14.3	93.3	10.8	0.63	13.7	84.5	<0.030	0.032
08/11/2015	2.73	16.6	103	13.9	0.77	15.6	114	<0.030	0.074

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)
10/15/2014	2.0	4.1	26.0	105	0.122	0.61	36.7	66.8
03/24/2015	2.6	8.0	30.0	314	0.154	1.76	144	199
04/21/2015	2.3	6.6	29.9	252	0.185	1.42	128	158
05/12/2015	3.5	6.7	38.0	274	0.189	1.49	63.7	88.2
05/27/2015	5.7	9.5	40.5	275	0.196	1.45	60.4	87.6
06/09/2015	5.7	8.4	63.0	226	0.250	1.01	76.9	93.3
07/14/2015	2.4	2.8	25.7	99.8	0.087	0.38	48.7	88.2
08/11/2015	3.3	3.7	16.7	61.1	0.077	0.37	41.3	60.1

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)
10/15/2014	<2.0	5.5	16.1	18.7	3.96	91	2	0.36
03/24/2015	3.9	14.1	9.7	12.8	4.24	96	7	2.0
04/21/2015	3.3	13.3	10.5	12.7	3.80	96	6	1.6
05/12/2015	2.8	9.8	16.4	18.1	3.98	91	6	1.5
05/27/2015	3.7	13.2	17.9	21.1	5.00	80	6	3.5
06/09/2015	3.1	8.1	28.5	30.9	5.09	84	5	2.3
07/14/2015	<2.0	2.6	28.5	30.1	4.31	77	1	0.13
08/11/2015	<2.0	<2.0	29.7	30.7	4.36	88	1	0.09

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2014 through September 2015.—Continued

[hh, hour; mm, minute; ft³/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; <, less than laboratory reporting level; E, estimated; µg/L, microgram per liter; mm, millimeters; ton/d, ton per day; --, no data]

12323760—Warm Springs Creek near Anaconda

Date	Time (hhmm)	Streamflow, instantaneous (ft³/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)
10/15/2014	0840	86	8.4	260	6.0	<2.0	131	38.8	8.34
04/21/2015	0845	78	8.4	254	5.0	<2.0	135	40.7	8.14
05/12/2015	0910	135	8.2	199	5.0	<2.0	98.2	29.8	5.78
05/27/2015	1520	238	8.2	148	8.0	E2.6	76.8	24.0	4.11
07/14/2015	0900	96	8.3	235	9.0	<2.0	123	36.5	7.70
08/11/2015	0820	68	8.4	258	9.5	<2.0	130	38.6	8.17

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)
10/15/2014	1.33	3.27	121	1.33	0.42	10.9	14.0	0.030	<0.030
04/21/2015	1.27	3.07	120	1.15	0.36	10.4	13.0	<0.030	<0.030
05/12/2015	0.94	2.08	91.6	0.75	0.31	9.29	10.4	<0.030	<0.030
05/27/2015	0.85	1.90	65.6	0.57	0.31	9.17	8.75	<0.030	0.033
07/14/2015	1.15	2.77	110	0.98	0.37	9.70	12.0	<0.030	<0.030
08/11/2015	1.23	3.09	120	1.19	0.41	10.9	13.9	<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)
10/15/2014	<0.80	1.1	<4.0	41.4	<0.040	0.12	0.58	2.1
04/21/2015	0.83	1.5	5.5	59.2	<0.040	0.19	0.55	2.7
05/12/2015	0.93	1.6	7.8	69.8	<0.040	0.23	0.70	3.4
05/27/2015	1.7	3.5	37	188	0.099	0.71	2.70	8.6
07/14/2015	0.95	1.9	9.1	73.7	<0.040	0.25	0.82	4.0
08/11/2015	<0.80	1.8	4.3	49.2	<0.040	0.19	0.50	2.7

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)
10/15/2014	<2.0	<2.0	1.9	2.1	0.84	68	2	0.46
04/21/2015	<2.0	6.2	1.7	1.8	1.18	71	3	0.63
05/12/2015	<2.0	3.0	1.4	1.5	1.40	72	4	1.5
05/27/2015	<2.0	6.2	1.5	1.9	2.06	62	9	5.8
07/14/2015	<2.0	2.6	2.8	3.0	1.07	84	3	0.78
08/11/2015	<2.0	<2.0	2.1	2.1	0.85	70	2	0.37

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2014 through September 2015.—Continued

[hh, hour; mm, minute; ft³/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; <, less than laboratory reporting level; E, estimated; µg/L, microgram per liter; mm, millimeters; ton/d, ton per day; --, no data]

12323770—Warm Springs Creek at Warm Springs

Date	Time (hhmm)	Streamflow, instantaneous (ft³/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)
10/15/2014	0950	37	8.2	385	7.0	<2.0	190	56.8	11.6
03/24/2015	0910	42	8.1	353	2.5	<2.0	187	56.3	11.2
04/21/2015	0945	49	8.2	338	6.0	<2.0	173	51.7	10.6
05/12/2015	1020	89	8.2	247	7.0	E2.3	121	36.9	7.01
05/27/2015	0900	156	8.0	190	9.0	E3.6	95.3	29.6	5.22
06/09/2015	0945	151	8.0	177	10.5	E4.7	87.2	27.0	4.79
07/14/2015	1010	26	8.3	316	12.0	<2.0	163	49.5	9.62
08/11/2015	0935	19	8.2	331	11.5	<2.0	167	50.0	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 (µg/L)	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)
10/15/2014	1.67	4.56	144	1.91	0.47	11.5	55.8	0.048	0.042
03/24/2015	1.42	4.15	138	1.70	0.40	11.4	44.7	0.054	0.043
04/21/2015	1.39	3.92	134	1.53	0.40	10.9	40.1	0.041	0.038
05/12/2015	1.07	2.56	103	0.98	0.34	9.70	23.2	0.036	0.048
05/27/2015	0.97	2.29	77.3	0.74	0.33	9.26	17.7	0.032	0.089
06/09/2015	0.91	2.09	71.4	0.61	0.36	9.52	15.3	0.063	0.071
07/14/2015	1.46	3.93	127	1.52	0.40	10.0	35.4	0.031	<0.030
08/11/2015	1.43	3.81	135	1.54	0.43	11.0	35.9	0.044	0.050

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)
10/15/2014	3.4	5.3	36.8	65.5	0.113	0.29	46.6	59.1
03/24/2015	2.0	6.6	5.0	93.6	<0.040	0.40	48.6	84.2
04/21/2015	2.5	7.0	10.7	90.6	<0.040	0.42	41.5	77.4
05/12/2015	2.4	9.5	11.8	161	0.042	0.89	24.7	53.8
05/27/2015	2.8	22.2	7.3	391	0.042	2.16	22.6	73.9
06/09/2015	3.8	15.0	23.9	252	0.127	1.50	24.6	56.8
07/14/2015	2.8	5.3	19.2	67.1	0.069	0.34	33.0	40.4
08/11/2015	2.9	5.4	19.3	64.5	0.082	0.28	25.5	40.4

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)
10/15/2014	2.1	2.6	6.3	7.4	1.22	89	2	0.20
03/24/2015	<2.0	3.1	4.0	4.6	1.23	95	2	0.23
04/21/2015	<2.0	3.8	4.7	5.3	1.49	72	4	0.53
05/12/2015	<2.0	5.3	4.1	5.2	1.50	70	7	1.7
05/27/2015	<2.0	8.9	4.3	6.9	1.92	57	20	8.4
06/09/2015	<2.0	7.5	5.1	6.6	1.99	53	15	6.1
07/14/2015	<2.0	<2.0	7.7	8.5	1.36	90	2	0.14
08/11/2015	<2.0	<2.0	7.1	8.0	1.16	89	2	0.10

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2014 through September 2015.—Continued

[hh, hour; mm, minute; ft³/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; <, less than laboratory reporting level; E, estimated; µg/L, microgram per liter; mm, millimeters; ton/d, ton per day; --, no data]

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)
10/15/2014	1210	111	8.7	445	8.5	189	53.2	13.7
03/24/2015	1135	157	8.3	398	4.0	164	48.0	10.6
04/21/2015	1155	152	8.3	414	10.0	177	51.9	11.6
05/12/2015	1320	192	8.5	299	11.0	125	37.3	7.85
05/27/2015	1215	416	8.5	286	12.0	127	38.5	7.43
06/09/2015	1110	373	8.4	246	15.0	108	32.4	6.55
07/14/2015	1230	99	8.9	359	17.0	165	47.7	11.1
08/11/2015	1205	51	8.8	424	18.0	189	54.6	12.9

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)
10/15/2014	0.044	0.037	2.9	4.8	12.4	75.9	0.069	0.44
03/24/2015	0.045	0.111	2.7	12.9	21.5	355	0.099	2.04
04/21/2015	0.035	0.091	3.1	10.4	18.3	265	0.123	1.80
05/12/2015	0.043	0.082	4.1	11.9	27.9	265	0.133	1.57
05/27/2015	0.048	0.126	5.4	20.9	33.1	414	0.170	2.69
06/09/2015	0.040	0.098	5.1	16.0	31.8	271	0.126	1.38
07/14/2015	<0.030	0.034	3.8	6.2	16.9	76.0	0.082	0.45
08/11/2015	<0.030	0.041	3.8	6.5	13.3	80.6	0.069	0.51

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)
10/15/2014	23.7	40.9	2.2	3.6	12.6	13.8	87	2	0.60
03/24/2015	88.8	158	3.4	19.4	8.4	11.5	84	12	5.1
04/21/2015	76.5	125	3.1	10.6	9.1	11.0	87	7	2.9
05/12/2015	40.1	85.0	3.3	10.1	10.9	12.5	70	9	4.7
05/27/2015	37.2	90.5	3.2	16.2	13.1	16.5	65	16	18
06/09/2015	39.5	71.3	<2.0	10.7	18.9	21.8	76	9	9.1
07/14/2015	31.5	50.9	<2.0	2.8	20.5	21.9	76	2	0.53
08/11/2015	36.4	57.5	<2.0	4.0	21.4	22.4	75	2	0.28

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2014 through September 2015.—Continued

[hh, hour; mm, minute; ft³/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; <, less than laboratory reporting level; E, estimated; µg/L, microgram per liter; mm, millimeters; ton/d, ton per day; --, no data]

12323840—Lost Creek near Anaconda

Date	Time (hhmm)	Streamflow, instantaneous (ft³/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)
10/15/2014	0750	9.4	8.2	239	6.5	<2.0	115	34.5	7.04
03/24/2015	0800	8.1	8.1	217	2.0	<2.0	110	33.0	6.82
04/21/2015	0745	10	7.9	203	5.0	E2.4	103	31.2	5.96
05/12/2015	0745	11	7.8	170	5.5	E4.8	83.4	25.2	4.96
05/26/2015	1605	12	7.9	176	12.0	E3.1	85.6	26.7	4.60
06/09/2015	0745	20	8.0	172	8.5	E2.9	85.6	26.7	4.62
07/13/2015	1540	4.4	8.2	234	12.5	<2.0	117	35.6	6.69
08/11/2015	0735	9.4	8.1	227	10.0	<2.0	115	34.8	6.74

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)
10/15/2014	1.46	3.47	114	0.95	0.45	12.0	10.1	<0.030	<0.030
03/24/2015	1.32	3.10	101	0.93	0.41	12.2	11.0	--	--
04/21/2015	1.20	2.81	94.2	0.75	0.40	11.6	9.44	<0.030	<0.030
05/12/2015	1.01	2.30	79.3	0.60	0.32	10.9	7.22	<0.030	0.065
05/26/2015	1.16	2.78	77.2	2.13	0.31	10.9	7.43	<0.030	0.067
06/09/2015	1.04	2.68	80.5	0.52	0.31	11.2	6.48	<0.030	0.040
07/13/2015	1.39	3.68	118	0.82	0.39	11.3	7.93	0.034	0.040
08/11/2015	1.30	3.06	111	0.73	0.40	12.2	8.48	<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)
10/15/2014	1.7	4.3	11.5	110	<0.040	0.44	1.38	5.7
03/24/2015	--	--	--	--	--	--	--	--
04/21/2015	1.4	5.5	10.1	192	<0.040	0.69	0.99	7.1
05/12/2015	1.9	14.0	13.0	344	0.066	1.84	2.07	11.8
05/26/2015	3.0	13.8	8.1	485	0.044	2.23	1.40	50.1
06/09/2015	2.0	5.7	25.6	204	0.043	0.72	2.12	6.8
07/13/2015	2.0	2.6	9.3	40.4	<0.040	0.21	1.52	3.3
08/11/2015	1.4	5.5	15.7	165	<0.040	0.68	1.98	8.5

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)
10/15/2014	<2.0	2.1	3.2	3.9	1.25	54	5	0.13
03/24/2015	--	--	--	--	1.44	64	4	0.09
04/21/2015	<2.0	3.2	2.5	3.2	1.53	63	11	0.30
05/12/2015	<2.0	5.8	2.8	4.0	2.06	72	18	0.53
05/26/2015	2.3	15.2	4.8	4.5	2.46	51	24	0.78
06/09/2015	<2.0	4.4	5.0	5.6	2.20	34	17	0.92
07/13/2015	<2.0	<2.0	6.8	6.4	1.78	59	1	0.01
08/11/2015	<2.0	2.6	5.0	5.9	1.34	68	6	0.15

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2014 through September 2015.—Continued

[hh, hour; mm, minute; ft³/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; <, less than laboratory reporting level; E, estimated; µg/L, microgram per liter; mm, millimeters; ton/d, ton per day; --, no data]

12323850—Lost Creek near Galen

Date	Time (hhmm)	Streamflow, instantaneous (ft³/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)
10/15/2014	1130	45	8.2	580	8.0	<2.0	281	80.4	19.6
03/24/2015	1045	53	8.2	579	3.0	E4.4	271	78.8	18.1
04/21/2015	1120	46	8.2	581	9.5	E3.1	295	85.4	19.8
05/12/2015	1235	16	8.4	604	11.5	E2.1	301	85.5	21.2
05/27/2015	1105	16	8.3	774	13.0	<2.0	401	114	28.0
06/09/2015	1025	13	8.2	674	16.5	<2.0	347	100	23.4
07/14/2015	1210	8.8	8.2	669	15.0	<2.0	343	97.6	24.2
08/11/2015	1130	2.3	8.0	610	15.0	<2.0	248	63.5	21.8

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)
10/15/2014	2.40	11.5	186	4.71	0.50	15.2	117	<0.030	<0.030
03/24/2015	2.09	11.2	181	4.57	0.47	14.3	121	0.041	0.070
04/21/2015	2.25	12.9	182	4.31	0.45	15.7	117	<0.030	0.044
05/12/2015	2.17	12.9	185	4.34	0.47	15.1	123	<0.030	0.030
05/27/2015	3.57	18.5	218	5.33	0.67	19.9	200	<0.030	<0.030
06/09/2015	2.55	15.7	194	4.42	0.56	16.8	161	<0.030	<0.030
07/14/2015	2.63	19.6	193	4.93	0.54	17.6	165	<0.030	<0.030
08/11/2015	3.18	29.2	224	5.09	0.78	19.2	95.3	<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)
10/15/2014	1.1	3.0	13.7	83.9	<0.040	0.29	8.08	11.0
03/24/2015	2.7	7.8	84.5	253	0.320	1.11	21.6	31.6
04/21/2015	1.7	6.8	16.1	200	0.079	0.83	17.0	24.4
05/12/2015	1.9	4.1	21.2	137	0.090	0.59	20.5	26.8
05/27/2015	2.5	4.3	27.8	97.5	0.066	0.32	26.7	30.8
06/09/2015	2.0	3.7	26.2	79.7	0.059	0.21	25.3	25.8
07/14/2015	1.6	2.8	26.1	84.5	0.045	0.22	14.9	17.2
08/11/2015	2.8	3.6	35.3	91.3	0.053	0.15	26.2	27.3

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)
10/15/2014	<2.0	2.4	10.7	12.3	1.69	77	13	1.6
03/24/2015	2.6	6.4	9.6	11.4	1.73	87	12	1.7
04/21/2015	<2.0	4.9	10.2	11.5	1.52	39	25	3.1
05/12/2015	<2.0	3.3	12.2	12.8	1.81	53	26	1.1
05/27/2015	<2.0	<2.0	28.3	30.1	4.33	52	26	1.1
06/09/2015	<2.0	<2.0	20.8	21.9	2.78	78	28	0.98
07/14/2015	<2.0	<2.0	14.0	15.4	2.16	69	29	0.69
08/11/2015	<2.0	<2.0	11.0	12.1	2.61	72	12	0.07

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2014 through September 2015.—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; <, less than laboratory reporting level; E, estimated; µg/L, microgram per liter; mm, millimeters; ton/d, ton per day; --, no data]

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)
10/15/2014	1330	228	8.6	493	9.0	220	62.7	15.5
03/24/2015	1305	286	8.3	438	4.0	203	59.1	13.3
04/21/2015	1325	245	8.3	465	11.5	212	62.2	13.7
05/12/2015	1500	212	8.6	379	13.0	171	49.8	11.2
05/27/2015	1505	483	8.2	341	14.5	154	46.1	9.57
06/09/2015	1255	414	8.2	290	18.5	130	39.0	7.94
07/14/2015	1425	93	8.6	427	19.0	200	59.1	12.7
08/11/2015	1340	61	8.5	492	20.0	211	62.5	13.4

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)
10/15/2014	0.062	0.086	5.6	14.8	19.9	205	0.164	1.59
03/24/2015	0.068	0.184	5.4	38.2	14.2	634	0.126	5.15
04/21/2015	0.076	0.141	6.5	28.5	17.3	449	0.152	3.12
05/12/2015	0.064	0.112	7.0	21.2	21.9	305	0.143	2.36
05/27/2015	0.071	0.356	10.6	98.6	28.2	1,640	0.304	13.4
06/09/2015	0.069	0.239	10.9	57.9	25.1	824	0.243	7.08
07/14/2015	0.046	0.053	6.9	12.4	8.1	96.6	0.103	0.88
08/11/2015	0.047	0.048	7.3	10.2	13.7	63.0	0.114	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)
10/15/2014	24.4	47.9	3.4	11.8	12.3	13.8	86	7	4.3
03/24/2015	31.7	106	6.7	33.2	8.7	14.0	76	25	19
04/21/2015	30.9	89.5	5.9	24.0	10.8	13.8	83	16	11
05/12/2015	28.4	60.3	3.6	16.7	12.7	15.3	83	9	5.2
05/27/2015	19.4	142	5.4	74.4	14.9	27.1	61	68	89
06/09/2015	18.6	83.1	5.1	42.2	17.3	24.1	64	35	39
07/14/2015	17.4	28.1	2.7	7.4	15.7	16.8	92	2	0.50
08/11/2015	11.7	22.9	3.1	5.0	14.1	14.6	82	4	0.66

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2014 through September 2015.—Continued

[hh, hour; mm, minute; ft³/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; <, less than laboratory reporting level; E, estimated; µg/L, microgram per liter; mm, millimeters; ton/d, ton per day; --, no data]

12324400—Clark Fork above Little Blackfoot River, near Garrison

Date	Time (hhmm)	Streamflow, instantaneous (ft³/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)
10/15/2014	1500	260	8.5	502	10.0	222	63.6	15.5
03/24/2015	1435	306	8.5	443	5.0	202	58.8	13.3
04/21/2015	1450	274	8.4	473	13.0	209	61.0	13.8
05/12/2015	1645	213	8.6	392	15.0	171	49.3	11.6
05/28/2015	1320	564	8.1	357	14.0	163	48.2	10.3
06/09/2015	1435	473	8.2	321	20.0	143	42.5	8.93
07/14/2015	1610	122	8.7	430	22.0	189	54.1	13.1
08/11/2015	1510	69	8.5	483	21.5	206	58.8	14.4

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)
10/15/2014	0.051	0.096	4.7	19.4	5.6	249	0.100	2.21
03/24/2015	0.066	0.195	6.8	46.5	36.3	809	0.326	5.71
04/21/2015	0.072	0.162	8.2	36.1	13.3	541	0.171	4.00
05/12/2015	0.064	0.131	7.9	28.4	21.7	407	0.188	3.16
05/28/2015	0.072	0.472	11.6	127	27.2	2,150	0.351	17.0
06/09/2015	0.084	0.340	14.4	89.2	64.4	1,260	0.715	9.97
07/14/2015	0.050	0.040	8.1	10.8	60.2	--	0.086	0.43
08/11/2015	<0.030	0.035	9.2	11.3	7.0	40.7	0.057	0.33

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)
10/15/2014	24.0	79.8	3.5	15.9	12.2	15.1	86	9	6.3
03/24/2015	30.8	112	6.2	38.7	9.5	15.4	76	31	26
04/21/2015	22.4	92.2	4.2	29.3	11.8	15.2	83	21	16
05/12/2015	28.8	71.3	3.3	22.1	13.8	16.3	86	18	10
05/28/2015	15.7	190	6.5	104	15.8	30.5	59	97	148
06/09/2015	23.3	126	6.7	67.2	18.7	29.0	61	51	65
07/14/2015	8.56	13.4	<2.0	4.9	17.2	18.5	89	3	0.99
08/11/2015	12.0	24.3	<2.0	3.2	16.1	16.4	73	5	0.93

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2014 through September 2015.—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; <, less than laboratory reporting level; E, estimated; µg/L, microgram per liter; mm, millimeters; ton/d, ton per day; --, no data]

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)
10/15/2014	1600	396	8.6	447	10.0	200	57.6	13.6
03/25/2015	0820	650	8.1	346	3.5	151	44.6	9.53
04/21/2015	1550	507	8.7	369	12.0	165	47.9	11.1
05/13/2015	0820	431	8.2	326	9.5	140	41.5	8.79
05/28/2015	1200	822	8.2	317	13.0	145	43.4	8.89
06/10/2015	1125	868	8.2	288	17.0	129	38.4	7.94
07/14/2015	1705	337	9.1	362	22.0	171	49.5	11.5
08/11/2015	1610	129	8.7	401	22.0	180	52.1	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)
10/15/2014	0.047	0.067	4.0	12.7	11.7	185	0.111	1.37
03/25/2015	0.044	0.138	3.7	25.9	39.7	632	0.139	3.55
04/21/2015	0.038	0.084	5.6	20.3	15.2	358	0.123	2.19
05/13/2015	0.041	0.096	5.2	18.5	17.4	376	0.104	2.43
05/28/2015	0.050	0.353	11.0	93.4	74.8	1,350	0.677	11.1
06/10/2015	0.053	0.198	9.8	50.1	42.8	799	0.377	5.90
07/14/2015	<0.030	0.031	5.7	7.2	6.0	46.2	0.041	0.27
08/11/2015	<0.030	0.048	5.0	8.3	59.3	79.6	<0.040	0.51

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)
10/15/2014	13.4	63.2	2.5	10.9	9.4	10.7	89	7	7.5
03/25/2015	12.8	71.4	5.0	24.7	5.6	9.2	80	23	40
04/21/2015	11.2	55.6	2.1	16.2	8.2	9.9	82	15	21
05/13/2015	16.5	56.6	3.9	17.5	8.7	10.3	87	14	16
05/28/2015	14.4	132	6.3	65.7	12.2	21.0	71	56	124
06/10/2015	12.1	83.8	4.4	38.9	13.0	17.6	68	35	82
07/14/2015	5.58	14.3	<2.0	2.9	11.5	11.6	94	4	3.6
08/11/2015	11.6	46.1	<2.0	4.9	10.7	11.0	90	5	1.7

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2014 through September 2015.—Continued

[hh, hour; mm, minute; ft³/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; <, less than laboratory reporting level; E, estimated; µg/L, microgram per liter; mm, millimeters; ton/d, ton per day; --, no data]

12331800—Clark Fork near Drummond

Date	Time (hhmm)	Streamflow, instantaneous (ft³/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)
10/16/2014	0750	582	8.1	474	8.5	215	60.4	15.5
03/25/2015	0930	864	8.2	373	5.0	170	47.9	12.2
04/22/2015	0800	641	8.2	400	10.5	177	50.2	12.6
05/13/2015	0930	514	8.2	398	12.0	178	50.8	12.4
05/28/2015	1030	1,170	8.1	371	14.0	172	50.4	11.2
06/10/2015	1010	938	8.1	353	17.0	158	46.1	10.5
07/15/2015	0720	378	7.9	460	17.5	215	59.8	15.9
08/12/2015	0750	222	8.0	560	18.0	258	72.0	18.9

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)
10/16/2014	0.042	0.069	3.0	9.6	12.8	195	0.118	1.43
03/25/2015	0.042	0.127	3.9	21.4	27.9	614	0.145	3.48
04/22/2015	0.032	0.128	4.8	23.2	14.3	494	0.159	3.27
05/13/2015	0.039	0.078	5.4	12.0	17.1	188	0.126	1.36
05/28/2015	0.045	0.385	9.2	83.3	33.2	1,750	0.307	11.5
06/10/2015	0.053	0.247	8.3	51.8	18.2	1,100	0.235	6.83
07/15/2015	<0.030	<0.030	5.3	7.3	5.2	39.8	<0.040	0.25
08/12/2015	0.044	0.050	3.4	6.3	7.9	61.8	0.074	0.50

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)
10/16/2014	13.0	65.3	3.8	12.1	8.3	10.1	87	9	14
03/25/2015	13.0	70.6	4.5	24.8	6.3	9.5	71	27	63
04/22/2015	17.1	81.2	4.1	26.9	8.5	11.0	91	22	38
05/13/2015	23.2	45.9	4.4	12.6	9.8	10.7	92	6	8.3
05/28/2015	24.9	188	5.5	81.6	12.7	20.1	84	76	240
06/10/2015	11.7	116	4.5	51.2	13.3	18.1	58	56	142
07/15/2015	6.14	14.8	2.5	4.6	10.4	10.7	82	4	4.1
08/12/2015	22.4	56.1	2.7	5.7	11.0	11.1	42	18	11

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2014 through September 2015.—Continued

[hh, hour; mm, minute; ft³/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; <, less than laboratory reporting level; E, estimated; µg/L, microgram per liter; mm, millimeters; ton/d, ton per day; --, no data]

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)
10/16/2014	1000	973	8.2	374	8.5	172	47.4	12.9
03/25/2015	1110	1,730	8.2	256	4.5	110	31.1	7.85
04/22/2015	0950	1,610	8.1	247	9.0	111	31.1	8.01
05/13/2015	1120	1,750	8.3	196	10.0	85.1	23.8	6.25
05/28/2015	0840	2,470	8.0	213	12.0	100	29.1	6.73
06/10/2015	0800	1,910	8.1	244	16.0	110	31.7	7.53
07/15/2015	0905	812	8.1	290	16.0	133	35.5	10.8
08/12/2015	0905	468	8.1	341	16.0	155	42.1	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)
10/16/2014	<0.030	0.043	2.2	6.4	6.8	146	<0.040	0.87
03/25/2015	0.034	0.077	2.6	12.0	41.2	405	0.107	1.85
04/22/2015	<0.030	0.054	3.0	9.3	22.0	295	0.088	1.26
05/13/2015	<0.030	<0.030	2.0	4.1	22.1	162	0.056	0.45
05/28/2015	0.083	0.200	17.9	37.8	359	1,020	2.79	6.16
06/10/2015	<0.030	0.150	4.3	27.9	22.8	619	0.171	3.94
07/15/2015	<0.030	<0.030	2.7	5.0	6.0	86.8	<0.040	0.39
08/12/2015	<0.030	0.041	2.0	5.2	5.3	127	0.042	0.56

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)
10/16/2014	3.90	35.3	3.3	9.3	5.5	6.3	86	7	18
03/25/2015	4.74	44.7	3.3	16.8	3.6	5.2	67	19	89
04/22/2015	5.66	32.2	2.3	12.7	4.1	5.4	77	14	61
05/13/2015	4.41	14.6	<2.0	4.9	3.5	3.9	79	7	33
05/28/2015	48.6	102	17.4	44.6	7.3	9.9	77	41	273
06/10/2015	10.3	74.2	5.1	30.7	7.4	9.6	74	32	165
07/15/2015	3.05	15.3	<2.0	4.9	4.8	5.5	85	5	11
08/12/2015	5.43	27.5	<2.0	8.2	5.2	6.0	84	9	11

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2014 through September 2015.—Continued

[hh, hour; mm, minute; ft³/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; <, less than laboratory reporting level; E, estimated; µg/L, microgram per liter; mm, millimeters; ton/d, ton per day; --, no data]

12340000—Blackfoot River near Bonner

Date	Time (hhmm)	Streamflow, instantaneous (ft³/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)
10/16/2014	1235	579	8.4	277	9.0	142	35.4	13.1
04/22/2015	1205	2,440	8.3	184	10.0	93.2	24.4	7.84
05/13/2015	1340	2,500	8.2	186	10.0	89.9	23.2	7.75
05/28/2015	1605	3,350	8.3	179	12.0	95.9	25.4	7.86
07/15/2015	1050	711	8.4	250	16.0	132	32.9	12.2
08/12/2015	1045	472	8.4	256	17.0	133	32.2	12.7

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)
10/16/2014	<0.030	<0.030	<0.80	<0.80	4.3	33.6	<0.040	<0.04
04/22/2015	<0.030	<0.030	<0.80	0.90	13.0	144	<0.040	0.15
05/13/2015	<0.030	<0.030	<0.80	<0.80	12.2	95.4	<0.040	0.11
05/28/2015	<0.030	<0.030	0.96	1.3	104	286	0.167	0.39
07/15/2015	<0.030	<0.030	<0.80	<0.80	10.0	38.6	<0.040	0.05
08/12/2015	<0.030	<0.030	<0.80	<0.80	4.4	30.6	<0.040	0.06

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)
10/16/2014	1.41	4.6	<2.0	<2.0	1.0	1.1	84	2	3.1
04/22/2015	2.00	12.4	<2.0	<2.0	0.80	0.89	86	7	46
05/13/2015	1.86	9.3	<2.0	<2.0	0.79	0.82	78	6	40
05/28/2015	9.82	22.5	<2.0	<2.0	0.96	1.1	87	20	181
07/15/2015	1.34	5.6	<2.0	<2.0	1.2	1.3	80	2	3.8
08/12/2015	1.86	6.4	<2.0	<2.0	1.2	1.4	89	2	2.5

Table 4. Water-quality data for the Clark Fork Basin, Montana, October 2014 through September 2015.—Continued

[hh, hour; mm, minute; ft³/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; <, less than laboratory reporting level; E, estimated; µg/L, microgram per liter; mm, millimeters; ton/d, ton per day; --, no data]

12340500—Clark Fork above Missoula

Date	Time (hhmm)	Streamflow, instan-tane-ous (ft³/s)	pH, onsite (standard units)	Specific conduct-ance, onsite (µS/cm)	Water temperature, onsite (°C)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
10/16/2014	1420	1,520	8.5	330	9.0	157	41.7	12.9
03/25/2015	1345	5,140	8.2	202	5.0	96.5	25.7	7.85
04/22/2015	1350	4,120	8.4	210	10.5	99.8	27.0	7.87
05/13/2015	1520	4,260	8.4	189	11.0	89.6	23.9	7.27
05/28/2015	1740	6,080	8.3	193	13.0	95.2	26.1	7.27
06/10/2015	1400	4,690	8.4	213	18.0	105	28.7	8.02
07/15/2015	1310	1,530	8.6	265	17.5	129	33.2	11.2
08/12/2015	1240	965	8.4	292	18.5	143	36.8	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)
10/16/2014	<0.030	<0.030	1.4	3.6	4.9	85.3	<0.040	0.44
03/25/2015	<0.030	0.032	1.3	4.7	36.3	303	0.066	0.77
04/22/2015	<0.030	<0.030	1.7	4.2	11.7	195	0.042	0.59
05/13/2015	<0.030	<0.030	1.6	2.4	57.5	122	0.139	0.30
05/28/2015	<0.030	0.058	3.0	8.6	32.0	266	0.194	1.11
06/10/2015	<0.030	0.100	2.2	10.8	10.2	330	0.071	1.51
07/15/2015	<0.030	<0.030	1.9	2.8	4.8	45.5	<0.040	0.17
08/12/2015	<0.030	<0.030	1.6	2.8	6.1	73.6	<0.040	0.30

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)
10/16/2014	5.63	22.9	2.3	5.1	3.9	4.7	89	4	16
03/25/2015	4.28	25.9	<2.0	7.7	1.9	2.5	77	13	180
04/22/2015	4.56	21.9	<2.0	6.5	2.2	2.6	71	11	122
05/13/2015	7.56	13.5	<2.0	3.1	2.0	1.9	82	7	81
05/28/2015	6.58	8.8	2.1	3.9	3.3	5.8	82	27	443
06/10/2015	5.37	39.4	<2.0	13.1	3.7	4.8	82	19	241
07/15/2015	3.48	11.1	<2.0	3.5	3.1	3.3	88	2	8.3
08/12/2015	7.04	21.6	<2.0	4.3	3.3	3.6	89	5	13

Table 5. Daily mean streamflow and suspended-sediment data for Clark Fork at Turah Bridge, near Bonner, Montana (12334550), October 2014 through September 2015.

[ft^3/s, cubic feet 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	926	9	23	1,050	8	23	e1,020	14	39
2	956	8	21	1,100	11	33	e1,000	7	19
3	951	8	21	1,120	11	33	e1,030	10	28
4	940	8	20	1,080	10	29	e1,060	16	46
5	948	8	20	1,070	9	26	e1,090	20	59
6	932	8	20	1,080	9	26	1,100	19	56
7	920	8	20	1,100	9	27	1,070	16	46
8	914	8	20	1,110	8	24	1,050	14	40
9	916	8	20	1,120	8	24	1,030	12	33
10	912	8	20	e1,120	11	33	1,020	12	33
11	926	8	20	e1,080	10	29	1,030	13	36
12	985	8	21	e950	8	21	1,050	13	37
13	1,000	8	22	e710	6	12	1,070	14	40
14	990	8	21	e650	3	5.3	1,090	15	44
15	969	8	21	e670	2	3.6	1,060	14	40
16	961	8	21	e670	2	3.6	936	11	28
17	937	6	15	e680	2	3.7	947	10	26
18	933	6	15	e690	3	5.6	1,000	10	27
19	932	6	15	e710	5	9.6	1,010	10	27
20	922	7	17	e760	8	16	1,020	10	28
21	943	8	20	e860	10	23	1,030	11	31
22	1,040	11	31	e950	13	33	1,070	11	32
23	1,090	13	38	e1,010	16	44	1,030	11	31
24	1,080	12	35	1,030	18	50	1,010	10	27
25	1,120	13	39	1,030	21	58	1,050	9	26
26	1,110	11	33	1,070	25	72	1,010	9	25
27	1,090	10	29	1,050	28	79	e950	8	21
28	1,060	8	23	e1,150	45	140	931	6	15
29	1,070	8	23	e1,100	59	175	e905	5	12
30	1,080	8	23	e1,050	38	108	e635	3	5.1
31	1,050	8	23	--	--	--	e410	2	2.2
Total[1]	**30,603**	**--**	**710**	**28,820**	**--**	**1,169.4**	**30,714**	**--**	**959.3**
Mean	**987**	**9**	**23**	**961**	**14**	**39**	**991**	**11**	**31**
Max	**1,120**	**13**	**39**	**1,150**	**59**	**175**	**1,100**	**20**	**59**
Min	**912**	**6**	**15**	**650**	**2**	**3.6**	**410**	**2**	**2.2**

Table 5. Daily mean streamflow and suspended-sediment data for Clark Fork at Turah Bridge, near Bonner, Montana (12334550), October 2014 through September 2015.—Continued

[ft^3/s, cubic feet 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)
	January			February			March		
1	e510	3	4.1	1,120	17	51	1,050	10	28
2	e690	7	13	1,110	17	51	1,030	10	28
3	e815	12	26	1,120	16	48	1,040	10	28
4	e890	18	43	1,100	16	48	966	10	26
5	e910	23	57	1,080	16	47	1,010	10	27
6	e980	23	61	1,080	17	50	1,040	10	28
7	e950	17	44	1,310	23	81	1,050	10	28
8	e900	10	24	2,000	94	508	1,050	10	28
9	e900	6	15	1,970	99	527	1,060	8	23
10	e950	7	18	2,180	107	630	1,060	9	26
11	994	12	32	2,040	71	391	1,060	10	29
12	1,060	18	52	1,840	51	253	1,060	9	26
13	1,050	18	51	1,740	36	169	1,080	9	26
14	951	15	39	1,680	26	118	1,100	10	30
15	894	13	31	1,640	21	93	1,190	17	55
16	860	11	26	1,590	20	86	1,510	40	163
17	979	11	29	1,510	20	82	1,740	50	235
18	996	14	38	1,420	19	73	1,810	46	225
19	1,100	27	80	1,410	17	65	1,850	46	230
20	1,140	38	117	1,390	15	56	1,780	36	173
21	1,020	21	58	1,370	15	55	1,760	32	152
22	907	16	39	1,220	14	46	1,760	30	143
23	945	21	54	1,020	13	36	1,750	27	128
24	1,030	36	100	1,070	15	43	1,750	22	104
25	1,440	111	432	1,210	18	59	1,720	20	93
26	1,600	89	384	1,210	15	49	1,680	22	100
27	1,550	71	297	1,140	12	37	1,640	23	102
28	1,450	56	219	1,100	10	30	1,700	23	106
29	1,330	44	158	--	--	--	1,790	27	130
30	1,240	32	107	--	--	--	1,770	25	119
31	1,170	23	73	--	--	--	1,820	31	152
Total[1]	**32,201**	**--**	**2,721.1**	**39,670**	**--**	**3,782**	**43,676**	**--**	**2,791**
Mean	**1,039**	**27**	**88**	**1,417**	**30**	**135**	**1,409**	**21**	**90**
Max	**1,600**	**111**	**432**	**2,180**	**107**	**630**	**1,850**	**50**	**235**
Min	**510**	**3**	**4.1**	**1,020**	**10**	**30**	**966**	**8**	**23**

Table 5. Daily mean streamflow and suspended-sediment data for Clark Fork at Turah Bridge, near Bonner, Montana (12334550), October 2014 through September 2015.—Continued

[ft^3/s, cubic feet 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	1,950	40	211	1,900	18	92	2,610	51	359
2	1,980	34	182	1,870	15	76	2,700	59	430
3	1,920	26	135	1,900	15	77	2,830	72	550
4	1,870	26	131	1,930	15	78	2,740	65	481
5	1,830	23	114	1,970	16	85	2,560	56	387
6	1,790	20	97	2,020	17	93	2,410	43	280
7	1,740	17	80	2,000	17	92	2,240	37	224
8	1,680	17	77	1,890	11	56	2,080	36	202
9	1,640	16	71	1,790	8	39	1,970	34	181
10	1,600	17	73	1,730	8	37	1,940	33	173
11	1,590	16	69	1,690	8	37	1,900	34	174
12	1,570	14	59	1,670	7	32	1,760	27	128
13	1,530	14	58	1,750	8	38	1,630	22	97
14	1,500	15	61	1,800	9	44	1,510	16	65
15	1,510	15	61	1,810	9	44	1,390	13	49
16	1,470	16	64	2,050	15	83	1,300	12	42
17	1,410	16	61	2,390	36	232	1,230	10	33
18	1,410	17	65	2,570	44	305	1,200	8	26
19	1,460	20	79	2,400	36	233	1,160	8	25
20	1,500	14	57	2,280	25	154	1,120	7	21
21	1,550	14	59	2,190	21	124	1,080	5	15
22	1,630	17	75	2,160	18	105	1,050	5	14
23	1,760	23	109	2,180	18	106	1,010	4	11
24	1,880	25	127	2,200	20	119	973	3	7.9
25	1,900	24	123	2,230	20	120	915	3	7.4
26	1,890	24	122	2,240	21	127	871	3	7.1
27	1,830	20	99	2,280	25	154	831	3	6.7
28	1,770	17	81	2,490	43	289	799	2	4.3
29	1,770	16	76	2,620	52	368	773	2	4.2
30	1,850	18	90	2,590	49	343	799	3	6.5
31	--	--	--	2,590	47	329	--	--	--
Total[1]	**50,780**	**--**	**2,766**	**65,180**	**--**	**4,111**	**47,381**	**--**	**4,011**
Mean	**1,693**	**20**	**92**	**2,103**	**22**	**133**	**1,579**	**23**	**134**
Max	**1,980**	**40**	**211**	**2,620**	**52**	**368**	**2,830**	**72**	**550**
Min	**1,410**	**14**	**57**	**1,670**	**7**	**32**	**773**	**2**	**4.2**

Table 5. Daily mean streamflow and suspended-sediment data for Clark Fork at Turah Bridge, near Bonner, Montana (12334550), October 2014 through September 2015.—Continued

[ft³/s, cubic feet 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	800	2	4.3	605	16	26	378	10	10
2	765	2	4.1	577	13	20	378	10	10
3	747	2	4.0	554	11	16	389	10	11
4	730	2	3.9	534	10	14	401	11	12
5	711	2	3.8	531	9	13	467	14	18
6	723	3	5.9	531	9	13	586	29	46
7	716	3	5.8	512	9	12	609	29	48
8	715	4	7.7	497	10	13	594	22	35
9	705	4	7.6	490	10	13	583	18	28
10	699	4	7.5	489	10	13	570	17	26
11	762	5	10	476	10	13	559	15	23
12	817	7	15	457	11	14	534	15	22
13	821	7	16	449	12	15	504	14	19
14	810	7	15	433	12	14	499	13	18
15	795	7	15	440	12	14	523	13	18
16	760	7	14	430	12	14	562	12	18
17	722	8	16	436	12	14	610	12	20
18	701	8	15	434	11	13	642	14	24
19	687	8	15	427	10	12	659	24	43
20	657	8	14	414	9	10	677	22	40
21	619	8	13	392	9	9.5	661	18	32
22	583	8	13	387	9	9.4	636	17	29
23	580	8	13	387	9	9.4	609	15	25
24	625	10	17	387	10	10	606	14	23
25	617	10	17	390	10	11	602	13	21
26	609	11	18	384	10	10	583	12	19
27	631	12	20	382	11	11	572	11	17
28	746	19	38	376	12	12	570	9	14
29	756	18	37	373	12	12	581	9	14
30	707	15	29	385	11	11	607	9	15
31	651	14	25	389	10	11	--	--	--
Total[1]	**21,967**	**--**	**439.6**	**13,948**	**--**	**402.3**	**16,751**	**--**	**698**
Mean	**709**	**8**	**14**	**450**	**11**	**13**	**558**	**15**	**23**
Max	**821**	**19**	**38**	**605**	**16**	**26**	**677**	**29**	**48**
Min	**580**	**2**	**3.8**	**373**	**9**	**9.4**	**378**	**9**	**10**

[1]Total for water year 2015 (unrounded sum of daily values): streamflow=421,691 ft³/s (annual runoff=836,400 acre-feet); suspended-sediment discharge=24,560.8 tons.

Table 6. Daily mean streamflow and suspended-sediment data for Blackfoot River near Bonner, Montana (12340000), October 2014 through September 2015.

[ft^3/s, cubic feet 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	612	3	5.0	593	2	3.2	585	8	13
2	606	2	3.3	621	2	3.4	619	6	10
3	599	2	3.2	645	2	3.5	632	4	6.8
4	597	2	3.2	648	3	5.2	679	4	7.3
5	591	2	3.2	653	3	5.3	734	3	5.9
6	586	2	3.2	655	2	3.5	725	3	5.9
7	580	2	3.1	668	2	3.6	705	3	5.7
8	571	2	3.1	664	2	3.6	665	2	3.6
9	563	2	3.0	685	2	3.7	656	2	3.5
10	562	2	3.0	e700	2	3.8	662	2	3.6
11	566	2	3.1	e640	3	5.2	657	2	3.5
12	595	4	6.4	e500	3	4.0	654	2	3.5
13	592	2	3.2	e420	3	3.4	662	2	3.6
14	585	2	3.2	e400	3	3.2	669	2	3.6
15	575	2	3.1	e410	2	2.2	656	2	3.5
16	579	2	3.1	e430	2	2.3	594	2	3.2
17	573	2	3.1	e470	2	2.5	638	2	3.4
18	573	2	3.1	e500	2	2.7	643	2	3.5
19	570	2	3.1	e560	3	4.5	639	2	3.5
20	565	2	3.1	e600	3	4.9	627	2	3.4
21	576	2	3.1	e650	4	7.0	647	1	1.7
22	605	2	3.3	e700	4	7.6	646	1	1.7
23	611	2	3.3	e680	4	7.3	632	1	1.7
24	607	2	3.3	e670	4	7.2	632	1	1.7
25	597	2	3.2	e670	4	7.2	648	1	1.7
26	596	2	3.2	e680	4	7.3	630	1	1.7
27	589	2	3.2	691	4	7.5	e603	1	1.6
28	585	2	3.2	712	5	9.6	e580	1	1.6
29	590	2	3.2	e743	6	12	e500	2	2.7
30	592	2	3.2	e672	7	13	e350	2	1.9
31	592	2	3.2	--	--	--	e340	2	1.8
Total[1]	**18,180**	**--**	**103.2**	**18,330**	**--**	**159.4**	**19,309**	**--**	**119.8**
Mean	**586**	**2**	**3.3**	**611**	**3**	**5.3**	**623**	**2**	**3.9**
Max	**612**	**4**	**6.4**	**743**	**7**	**13**	**734**	**8**	**13**
Min	**562**	**2**	**3.0**	**400**	**2**	**2.2**	**340**	**1**	**1.6**

Table 6. Daily mean streamflow and suspended-sediment data for Blackfoot River near Bonner, Montana (12340000), October 2014 through September 2015.—Continued

[ft³/s, cubic feet 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	e380	1	1.0	763	4	8.2	990	4	11
2	e450	1	1.2	763	4	8.2	994	4	11
3	e500	1	1.4	774	4	8.4	945	3	7.7
4	e550	2	3.0	771	4	8.3	906	3	7.3
5	e600	2	3.2	759	5	10	935	3	7.6
6	e700	2	3.8	746	5	10	926	4	10
7	e700	2	3.8	795	6	13	938	4	10
8	e670	1	1.8	1,170	16	51	944	6	15
9	e680	1	1.8	1,520	34	140	969	6	16
10	e700	1	1.9	1,640	37	164	990	7	19
11	e740	2	4.0	1,650	31	138	1,010	8	22
12	761	2	4.1	1,560	23	97	1,020	9	25
13	e700	2	3.8	1,540	18	75	1,110	9	27
14	e620	2	3.3	1,570	15	64	1,190	11	35
15	e600	1	1.6	1,620	13	57	1,580	24	102
16	e660	1	1.8	1,600	12	52	2,900	71	556
17	e680	1	1.8	1,530	10	41	3,480	49	460
18	695	2	3.8	1,480	9	36	3,580	30	290
19	704	3	5.7	1,450	9	35	3,580	25	242
20	688	4	7.4	1,430	8	31	3,500	21	198
21	e650	4	7.0	1,410	8	30	3,450	18	168
22	e600	4	6.5	1,260	7	24	3,430	16	148
23	e640	3	5.2	1,150	7	22	3,420	14	129
24	682	4	7.4	1,190	6	19	3,340	13	117
25	747	5	10	1,210	6	20	3,190	12	103
26	862	4	9.3	1,160	5	16	3,030	11	90
27	986	6	16	1,100	5	15	2,940	11	87
28	895	5	12	1,050	4	11	3,030	13	106
29	843	6	14	--	--	--	3,210	14	121
30	804	5	11	--	--	--	3,280	14	124
31	780	4	8.4	--	--	--	3,400	14	129
Total[1]	**21,267**	**--**	**167.0**	**34,661**	**--**	**1,204.1**	**68,207**	**--**	**3,393.6**
Mean	**686**	**3**	**5.4**	**1,238**	**11**	**43**	**2,200**	**15**	**109**
Max	**986**	**6**	**16**	**1,650**	**37**	**164**	**3,580**	**71**	**556**
Min	**380**	**1**	**1.0**	**746**	**4**	**8.2**	**906**	**3**	**7.3**

Table 6. Daily mean streamflow and suspended-sediment data for Blackfoot River near Bonner, Montana (12340000), October 2014 through September 2015.—Continued

[ft³/s, cubic feet 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)
		April			May			June	
1	3,560	16	154	2,840	8	61	3,460	32	299
2	3,560	15	144	2,900	9	70	3,740	37	374
3	3,410	13	120	3,000	10	81	3,910	46	486
4	3,230	13	113	3,060	11	91	3,610	40	390
5	3,050	11	91	3,150	13	111	3,290	30	266
6	2,880	9	70	3,320	14	125	3,050	22	181
7	2,720	9	66	3,320	15	134	2,900	18	141
8	2,540	8	55	3,150	12	102	2,780	17	128
9	2,320	8	50	2,950	10	80	2,670	15	108
10	2,190	8	47	2,780	8	60	2,640	15	107
11	2,160	8	47	2,660	7	50	2,520	15	102
12	2,150	6	35	2,570	6	42	2,290	14	87
13	2,110	7	40	2,510	6	41	2,100	12	68
14	2,070	6	34	2,480	6	40	1,950	9	47
15	2,040	5	28	2,490	6	40	1,820	8	39
16	1,990	5	27	2,560	6	41	1,700	8	37
17	1,990	6	32	2,650	6	43	1,590	7	30
18	2,050	8	44	2,680	6	43	1,500	6	24
19	2,130	7	40	2,640	7	50	1,420	6	23
20	2,180	8	47	2,520	6	41	1,350	4	15
21	2,260	8	49	2,450	6	40	1,310	4	14
22	2,430	8	52	2,490	6	40	1,260	4	14
23	2,660	10	72	2,620	8	57	1,210	4	13
24	2,820	12	91	2,840	11	84	1,160	4	13
25	2,830	10	76	3,020	13	106	1,120	3	9.1
26	2,780	10	75	3,070	15	124	1,090	3	8.8
27	2,700	8	58	3,180	18	155	1,040	2	5.6
28	2,580	6	42	3,300	21	187	1,010	4	11
29	2,570	6	42	3,310	24	214	979	3	7.9
30	2,720	7	51	3,290	27	240	963	3	7.8
31	--	--	--	3,390	29	265	--	--	--
Total[1]	**76,680**	**--**	**1,892**	**89,190**	**--**	**2,858**	**61,432**	**--**	**3,056.2**
Mean	**2,556**	**9**	**63**	**2,877**	**11**	**92**	**2,048**	**13**	**102**
Max	**3,560**	**16**	**154**	**3,390**	**29**	**265**	**3,910**	**46**	**486**
Min	**1,990**	**5**	**27**	**2,450**	**6**	**40**	**963**	**2**	**5.6**

Table 6. Daily mean streamflow and suspended-sediment data for Blackfoot River near Bonner, Montana (12340000), October 2014 through September 2015.—Continued

[ft^3/s, cubic feet 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)
	July			August			September		
1	925	4	10	582	2	3.1	423	2	2.3
2	898	3	7.3	566	2	3.1	409	2	2.2
3	875	3	7.1	549	2	3.0	407	2	2.2
4	849	4	9.2	537	3	4.3	424	3	3.4
5	825	4	8.9	527	3	4.3	464	4	5.0
6	816	3	6.6	532	4	5.7	544	3	4.4
7	817	2	4.4	524	5	7.1	552	4	6.0
8	795	2	4.3	511	6	8.3	517	3	4.2
9	769	2	4.2	498	6	8.1	492	3	4.0
10	744	2	4.0	490	5	6.6	474	3	3.8
11	730	2	3.9	484	3	3.9	456	4	4.9
12	764	7	14	472	2	2.5	446	4	4.8
13	754	6	12	471	3	3.8	437	4	4.7
14	734	3	5.9	456	3	3.7	431	3	3.5
15	711	2	3.8	467	4	5.0	442	3	3.6
16	699	2	3.8	463	5	6.3	448	2	2.4
17	684	2	3.7	456	6	7.4	451	2	2.4
18	670	3	5.4	452	4	4.9	454	3	3.7
19	656	3	5.3	446	2	2.4	446	3	3.6
20	647	3	5.2	448	2	2.4	440	4	4.8
21	631	3	5.1	433	2	2.3	429	4	4.6
22	611	3	4.9	435	2	2.3	425	4	4.6
23	598	3	4.8	428	2	2.3	419	3	3.4
24	596	3	4.8	437	2	2.4	411	3	3.3
25	590	2	3.2	434	2	2.3	409	3	3.3
26	587	2	3.2	424	2	2.3	405	3	3.3
27	605	2	3.3	419	2	2.3	401	3	3.2
28	651	5	8.8	411	2	2.2	407	3	3.3
29	672	3	5.4	416	2	2.2	410	3	3.3
30	644	4	7.0	421	2	2.3	410	3	3.3
31	606	3	4.9	424	2	2.3	--	--	--
Total[1]	**22,153**	**--**	**184.4**	**14,613**	**--**	**121.1**	**13,283**	**--**	**111.5**
Mean	**715**	**3**	**5.9**	**471**	**3**	**3.9**	**443**	**3**	**3.7**
Max	**925**	**7**	**14**	**582**	**6**	**8.3**	**552**	**4**	**6.0**
Min	**587**	**2**	**3.2**	**411**	**2**	**2.2**	**401**	**2**	**2.2**

[1]Total for water year 2015 (unrounded sum of daily values): streamflow=457,305 ft^3/s (annual runoff=907,100 acre-feet); suspended-sediment discharge=13,370.3 tons.

Table 7. Daily mean streamflow and suspended-sediment data for Clark Fork above Missoula, Montana (12340500), October 2014 through September 2015.

[ft^3/s, cubic feet 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	1,480	4	16	1,610	5	22	e1,600	19	82
2	1,520	4	16	1,700	5	23	e1,550	13	54
3	1,510	4	16	1,740	6	28	e1,600	13	56
4	1,500	4	16	1,710	6	28	e1,700	12	55
5	1,500	4	16	1,710	6	28	e1,800	13	63
6	1,480	4	16	1,720	5	23	1,810	14	68
7	1,460	4	16	1,740	5	23	1,760	9	43
8	1,450	4	16	1,750	5	24	1,700	6	28
9	1,450	4	16	1,790	5	24	1,660	6	27
10	1,440	4	16	e1,800	5	24	1,650	6	27
11	1,460	4	16	e1,700	6	28	1,650	6	27
12	1,550	4	17	e1,400	7	26	1,670	6	27
13	1,570	4	17	e1,100	9	27	1,700	6	28
14	1,550	4	17	e1,000	12	32	1,740	6	28
15	1,520	4	16	e1,000	15	40	1,700	6	28
16	1,510	4	16	e1,050	18	51	1,520	5	21
17	1,480	3	12	e1,100	21	62	1,530	4	17
18	1,470	3	12	e1,150	22	68	1,610	4	17
19	1,470	3	12	e1,200	17	55	1,620	4	17
20	1,460	3	12	e1,300	11	39	1,620	4	17
21	1,490	4	16	e1,450	6	23	1,650	5	22
22	1,600	6	26	e1,600	5	22	1,690	5	23
23	1,670	7	32	e1,650	6	27	1,640	5	22
24	1,660	8	36	e1,700	8	37	1,610	5	22
25	1,680	8	36	1,690	9	41	1,680	5	23
26	1,680	7	32	1,740	10	47	1,620	5	22
27	1,660	7	31	1,710	10	46	1,550	5	21
28	1,620	6	26	1,890	23	117	1,530	4	17
29	1,630	6	26	e1,850	40	200	e1,300	3	11
30	1,640	6	27	e1,750	30	142	e900	3	7.3
31	1,620	5	22	--	--	--	e800	13	28
Total[1]	**47,780**	**--**	**617**	**46,300**	**--**	**1,377**	**49,160**	**--**	**948.3**
Mean	**1,541**	**5**	**20**	**1,543**	**11**	**46**	**1,586**	**7**	**31**
Max	**1,680**	**8**	**36**	**1,890**	**40**	**200**	**1,810**	**19**	**82**
Min	**1,440**	**3**	**12**	**1,000**	**5**	**22**	**800**	**3**	**7.3**

Table 7. Daily mean streamflow and suspended-sediment data for Clark Fork above Missoula, Montana (12340500), October 2014 through September 2015.—Continued

[ft³/s, cubic feet 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	e900	45	109	1,890	9	46	2,110	6	34
2	e1,100	91	270	1,870	9	45	2,060	6	33
3	e1,250	138	466	1,890	9	46	2,040	5	28
4	e1,400	185	699	1,870	8	40	1,900	5	26
5	e1,600	233	1,010	1,830	8	40	1,970	4	21
6	e1,500	245	992	1,820	9	44	2,010	5	27
7	e1,400	189	714	2,050	12	66	2,020	6	33
8	e1,400	98	370	3,210	38	329	2,040	6	33
9	e1,500	30	122	3,690	53	528	2,060	6	33
10	e1,600	8	35	4,040	56	611	2,090	6	34
11	e1,700	9	41	3,990	44	474	2,110	6	34
12	e1,800	11	53	3,650	30	296	2,130	7	40
13	e1,750	11	52	3,510	24	227	2,220	8	48
14	1,660	10	45	3,450	19	177	2,330	9	57
15	1,500	9	36	3,460	19	177	2,780	16	120
16	1,520	7	29	3,390	16	146	4,410	56	667
17	1,580	5	21	3,220	13	113	5,400	51	744
18	1,620	6	26	3,060	12	99	5,600	37	559
19	1,720	7	33	3,000	11	89	5,660	32	489
20	1,790	9	43	2,960	10	80	5,530	27	403
21	1,650	10	45	2,910	10	79	5,430	22	323
22	1,490	10	40	2,620	9	64	5,410	19	278
23	1,540	10	42	2,230	9	54	5,400	18	262
24	1,670	12	54	2,290	8	49	5,320	16	230
25	2,150	40	232	2,500	8	54	5,150	14	195
26	2,480	50	335	2,460	7	46	4,930	14	186
27	2,600	48	337	2,330	7	44	4,790	14	181
28	2,440	31	204	2,220	6	36	4,910	16	212
29	2,230	23	138	--	--	--	5,210	17	239
30	2,060	17	95	--	--	--	5,270	17	242
31	1,960	12	64	--	--	--	5,410	18	263
Total[1]	**52,560**	**--**	**6,752**	**77,410**	**--**	**4,099**	**115,700**	**--**	**6,074**
Mean	**1,695**	**52**	**218**	**2,765**	**17**	**146**	**3,732**	**16**	**196**
Max	**2,600**	**245**	**1,010**	**4,040**	**56**	**611**	**5,660**	**56**	**744**
Min	**900**	**5**	**21**	**1,820**	**6**	**36**	**1,900**	**4**	**21**

Table 7. Daily mean streamflow and suspended-sediment data for Clark Fork above Missoula, Montana (12340500), October 2014 through September 2015.—Continued

[ft³/s, cubic feet 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)
		April			May			June	
1	5,720	20	309	4,800	12	156	6,310	32	545
2	5,800	19	298	4,840	11	144	6,670	37	666
3	5,610	15	227	4,950	11	147	7,010	50	946
4	5,370	14	203	5,050	12	164	6,620	44	786
5	5,160	12	167	5,160	12	167	6,090	34	559
6	4,930	12	160	5,380	15	218	5,630	26	395
7	4,720	10	127	5,390	16	233	5,290	22	314
8	4,470	10	121	5,120	12	166	5,000	22	297
9	4,200	10	113	4,800	10	130	4,750	20	256
10	3,980	10	107	4,550	8	98	4,670	18	227
11	3,920	10	106	4,380	8	95	4,530	18	220
12	3,900	8	84	4,260	7	81	4,160	16	180
13	3,790	9	92	4,260	7	81	3,820	13	134
14	3,710	9	90	4,280	8	92	3,530	10	95
15	3,680	8	79	4,290	8	93	3,260	9	79
16	3,580	8	77	4,590	10	124	3,050	8	66
17	3,510	8	76	5,050	17	232	2,850	7	54
18	3,540	8	76	5,330	23	331	2,720	6	44
19	3,650	8	79	5,110	19	262	2,600	6	42
20	3,760	8	81	4,880	13	171	2,480	4	27
21	3,880	10	105	4,700	10	127	2,390	5	32
22	4,120	10	111	4,720	10	127	2,310	4	25
23	4,490	14	170	4,880	12	158	2,210	3	18
24	4,790	16	207	5,130	12	166	2,140	3	17
25	4,840	14	183	5,370	13	188	2,040	3	17
26	4,780	13	168	5,450	15	221	1,960	2	11
27	4,630	12	150	5,590	17	257	1,880	2	10
28	4,430	9	108	5,990	28	453	1,810	3	15
29	4,400	10	119	6,160	30	499	1,740	2	9.4
30	4,610	11	137	6,130	29	480	1,740	2	9.4
31	--	--	--	6,240	30	505	--	--	--
Total[1]	**131,970**	**--**	**4,130**	**156,830**	**--**	**6,366**	**111,260**	**--**	**6,095.8**
Mean	**4,399**	**11**	**138**	**5,059**	**14**	**205**	**3,709**	**14**	**203**
Max	**5,800**	**20**	**309**	**6,240**	**30**	**505**	**7,010**	**50**	**946**
Min	**3,510**	**8**	**76**	**4,260**	**7**	**81**	**1,740**	**2**	**9.4**

Table 7. Daily mean streamflow and suspended-sediment data for Clark Fork above Missoula, Montana (12340500), October 2014 through September 2015.—Continued

[ft³/s, cubic feet 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	1,720	2	9.3	1,230	5	17	830	3	6.7
2	1,670	2	9.0	1,180	4	13	814	3	6.6
3	1,620	2	8.7	1,140	4	12	815	3	6.6
4	1,590	2	8.6	1,110	4	12	842	3	6.8
5	1,540	2	8.3	1,090	4	12	935	4	10
6	1,530	2	8.3	1,100	4	12	1,140	8	25
7	1,540	2	8.3	1,070	4	12	1,190	10	32
8	1,520	3	12	1,040	5	14	1,140	9	28
9	1,490	3	12	1,020	5	14	1,110	7	21
10	1,440	4	16	1,010	5	14	1,080	6	17
11	1,500	5	20	993	4	11	1,050	6	17
12	1,580	3	13	962	4	10	1,010	6	16
13	1,580	2	8.5	950	4	10	972	6	16
14	1,560	2	8.4	920	4	9.9	954	6	15
15	1,520	2	8.2	932	4	10	990	6	16
16	1,470	1	4.0	923	4	10	1,030	6	17
17	1,420	1	3.8	922	4	10	1,080	6	17
18	1,390	1	3.8	915	3	7.4	1,120	8	24
19	1,360	2	7.3	905	3	7.3	1,130	10	31
20	1,330	3	11	892	2	4.8	1,140	10	31
21	1,280	3	10	856	2	4.6	1,120	10	30
22	1,220	3	9.9	847	2	4.6	1,090	9	26
23	1,200	3	9.7	840	3	6.8	1,060	8	23
24	1,240	4	13	845	3	6.8	1,040	7	20
25	1,240	4	13	848	3	6.9	1,030	6	17
26	1,220	5	16	834	3	6.8	1,010	5	14
27	1,260	5	17	823	3	6.7	994	5	13
28	1,420	7	27	809	3	6.6	999	4	11
29	1,480	8	32	811	3	6.6	1,010	4	11
30	1,410	7	27	825	3	6.7	1,040	4	11
31	1,310	6	21	837	3	6.8	--	--	--
Total[1]	**44,650**	**--**	**384.1**	**29,479**	**--**	**292.3**	**30,765**	**--**	**535.7**
Mean	**1,440**	**3**	**12**	**951**	**4**	**9.4**	**1,026**	**6**	**18**
Max	**1,720**	**8**	**32**	**1,230**	**5**	**17**	**1,190**	**10**	**32**
Min	**1,200**	**1**	**3.8**	**809**	**2**	**4.6**	**814**	**3**	**6.6**

[1]Total for water year 2015 (unrounded sum of daily values): streamflow=893,864 ft³/s (annual runoff=1,773,000 acre-feet); suspended-sediment discharge=37,671.2 tons.

Table 8. Seasonal daily maximum, minimum, and mean turbidity, with monthly summary statistics at Mill Creek at Opportunity, Montana (12323700), March through September 2015.

[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	Maximum	Minimum	Mean
	March			April			May			June		
1	--	--	--	7.0	5.0	5.5	7.0	4.0	5.5	23	9.5	15
2	--	--	--	6.0	4.5	5.0	6.0	4.0	5.0	14	7.5	10
3	--	--	--	6.0	4.5	5.0	7.5	4.0	5.5	9.5	6.0	7.5
4	--	--	--	5.5	4.0	4.5	8.0	5.0	6.0	8.5	6.0	7.0
5	--	--	--	5.0	4.0	4.5	14	5.5	8.5	9.0	5.0	6.5
6	--	--	--	5.0	3.5	4.0	16	6.5	9.5	9.5	4.5	6.0
7	--	--	--	5.5	4.0	4.5	8.5	4.5	6.5	--	--	--
8	--	--	--	5.0	3.5	4.0	80	5.0	12	--	--	--
9	--	--	--	5.0	3.5	4.0	9.5	4.0	6.5	--	--	--
10	--	--	--	5.5	3.5	4.0	8.0	3.5	5.0	--	--	--
11	--	--	--	4.5	3.5	3.5	7.0	3.5	4.5	5.5	4.0	4.5
12	--	--	--	4.5	3.0	3.5	7.5	3.0	4.5	5.5	3.5	4.0
13	--	--	--	4.5	3.0	3.5	11	4.0	7.0	5.0	3.0	3.5
14	--	--	--	4.5	3.0	3.5	7.0	4.0	5.5	4.5	2.5	3.5
15	--	--	--	4.0	3.0	3.5	14	4.0	6.0	4.5	2.5	3.5
16	--	--	--	4.0	2.0	3.0	43	11	23	4.5	2.5	3.5
17	--	--	--	4.5	2.0	3.5	35	11	18	4.5	2.5	3.0
18	--	--	--	4.0	3.0	3.5	14	8.5	10	4.0	2.0	3.0
19	--	--	--	4.5	2.0	3.5	11	7.5	9.0	5.0	2.0	3.0
20	--	--	--	4.5	2.0	3.5	10	6.5	8.0	4.0	2.0	2.5
21	--	--	--	5.0	2.5	3.5	9.5	5.5	7.0	12	2.0	3.0
22	--	--	--	6.5	3.5	4.5	8.5	5.5	6.5	12	3.5	5.5
23	--	--	--	6.5	4.0	5.0	9.5	5.5	7.0	5.5	3.0	4.0
24	--	--	--	9.5	5.0	6.0	8.5	6.0	7.0	5.0	2.5	3.5
25	--	--	--	8.0	4.0	5.5	8.5	5.5	6.5	5.0	2.5	3.5
26	--	--	--	5.0	3.5	4.5	11	6.5	8.0	5.0	2.0	3.0
27	--	--	--	5.5	3.0	4.0	12	6.5	8.5	7.5	2.5	3.5
28	--	--	--	5.5	3.0	4.5	21	7.5	11	5.0	2.0	3.0
29	--	--	--	6.5	3.5	4.5	25	8.0	13	6.5	1.5	3.0
30	--	--	--	6.5	4.0	5.0	13	7.5	10	6.5	2.0	3.5
31	6.5	4.5	5.5	--	--	--	12	6.5	9.0	--	--	--
Month[1]	**6.5**	**4.5**	**5.5**	**9.5**	**2.0**	**4.2**	**80**	**3.0**	**8.4**	**23**	**1.5**	**4.7**

Table 8. Seasonal daily maximum, minimum, and mean turbidity, with monthly summary statistics at Mill Creek at Opportunity, Montana (12323700), March through September 2015.—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	4.5	2.0	2.5	2.5	1.5	2.0	2.0	1.0	1.5
2	4.0	1.5	2.5	2.5	1.5	2.0	1.5	1.0	1.0
3	3.5	1.0	2.0	4.0	1.5	2.0	1.5	1.0	1.0
4	3.5	1.0	2.0	2.0	1.5	1.5	3.0	1.5	1.5
5	4.0	1.0	2.0	2.5	1.5	1.5	5.5	2.0	3.0
6	3.0	1.5	2.0	2.0	1.5	1.5	2.0	1.0	1.5
7	3.0	1.0	2.0	3.5	1.5	1.5	2.0	1.0	1.5
8	3.5	1.0	2.0	2.5	1.5	1.5	2.0	1.0	1.5
9	3.0	1.5	2.0	2.0	1.0	1.5	1.5	1.5	1.5
10	3.5	2.0	2.5	6.0	1.5	2.0	2.0	1.5	1.5
11	--	--	--	2.5	1.5	2.0	2.5	1.5	1.5
12	--	--	--	2.0	1.5	1.5	2.5	1.5	1.5
13	3.0	1.5	2.5	2.0	1.5	1.5	2.0	1.5	1.5
14	3.0	1.5	2.0	2.0	1.5	1.5	2.5	1.5	1.5
15	3.0	1.0	1.5	--	--	--	3.5	2.0	2.5
16	2.5	1.0	1.5	--	--	--	--	--	--
17	2.0	1.0	1.5	--	--	--	3.5	2.0	2.5
18	2.5	1.0	1.5	--	--	--	3.5	2.0	2.5
19	2.0	1.0	1.5	--	--	--	--	--	--
20	2.0	1.0	1.5	--	--	--	--	--	--
21	2.0	1.0	1.5	2.0	1.5	2.0	2.5	1.5	2.0
22	3.0	1.0	1.5	2.0	1.5	1.5	--	--	--
23	3.5	1.5	2.0	2.0	1.5	1.5	--	--	--
24	2.5	1.5	2.0	2.0	1.0	1.5	2.0	1.5	2.0
25	3.0	1.5	2.0	2.0	1.0	1.5	2.5	2.0	2.0
26	5.0	1.5	2.0	3.5	1.0	1.5	--	--	--
27	4.0	2.0	3.0	2.5	1.0	1.5	--	--	--
28	4.0	2.0	3.0	2.0	1.0	1.5	--	--	--
29	3.5	2.0	2.5	2.0	1.0	1.5	--	--	--
30	3.0	2.0	2.5	2.0	1.0	1.5	--	--	--
31	3.0	2.0	2.5	1.5	1.0	1.5	--	--	--
Month[1]	**5.0**	**1.0**	**2.1**	**6.0**	**1.0**	**1.6**	**5.5**	**1.0**	**1.8**

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

Table 9. Seasonal daily maximum, minimum, and mean turbidity, with monthly summary statistics at Willow Creek at Opportunity, Montana (12323720), March through September 2015.

[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	Maximum	Minimum	Mean
	March			April			May			June		
1	--	--	--	12	9.5	11	9.0	6.0	7.0	7.5	5.0	6.5
2	--	--	--	13	9.5	11	8.5	6.5	7.0	8.0	5.0	6.0
3	--	--	--	15	9.0	11	8.0	6.0	7.0	7.0	4.5	5.5
4	--	--	--	12	9.0	10	9.0	7.0	8.0	7.5	5.0	5.5
5	--	--	--	10	7.5	9.0	9.5	6.0	7.5	7.0	4.5	6.0
6	--	--	--	10	7.0	8.0	--	--	--	7.5	5.0	6.0
7	--	--	--	10	6.0	7.5	--	--	--	7.5	4.5	6.0
8	--	--	--	7.5	6.0	6.5	--	--	--	8.5	4.5	5.5
9	--	--	--	7.0	5.5	6.5	9.0	5.5	7.0	8.0	4.5	6.0
10	--	--	--	7.0	5.5	6.0	7.5	5.0	6.5	7.5	4.5	5.0
11	--	--	--	7.0	5.0	6.0	8.5	6.0	7.0	--	--	--
12	--	--	--	7.0	5.0	6.0	9.5	4.5	6.0	7.0	4.0	5.0
13	--	--	--	6.5	5.0	5.5	11	6.5	8.0	6.5	3.5	5.0
14	--	--	--	7.0	5.0	6.0	9.0	4.5	6.5	6.5	3.5	4.5
15	--	--	--	6.5	5.0	5.5	11	5.5	7.5	6.0	3.5	4.5
16	--	--	--	8.0	4.5	6.0	22	7.5	14	7.5	3.0	5.0
17	--	--	--	8.0	6.0	6.5	22	12	15	7.0	3.0	4.5
18	--	--	--	7.5	5.5	6.0	17	14	15	6.0	3.0	4.0
19	--	--	--	7.5	4.5	6.0	17	12	14	5.5	3.0	4.0
20	--	--	--	7.5	5.0	6.0	13	11	11	4.5	2.5	3.5
21	--	--	--	6.5	4.5	5.5	12	9.5	10	4.5	2.5	3.0
22	--	--	--	9.5	5.0	6.0	13	8.5	10	4.0	2.0	3.0
23	--	--	--	11	5.0	7.0	11	8.5	9.5	4.0	2.0	3.0
24	--	--	--	9.5	4.5	6.5	11	7.5	9.0	4.5	2.5	3.0
25	--	--	--	10	5.5	7.0	10	7.5	8.5	4.0	2.5	3.0
26	--	--	--	11	6.0	7.5	9.0	7.0	8.0	4.5	2.5	3.0
27	--	--	--	9.5	6.0	7.5	8.5	6.5	7.5	4.5	2.0	3.0
28	--	--	--	9.0	7.0	7.5	9.0	6.5	7.0	4.0	2.0	2.5
29	--	--	--	8.5	6.5	7.5	8.5	5.5	7.0	3.5	2.0	3.0
30	--	--	--	11	6.5	8.0	8.5	5.0	6.0	3.5	2.0	2.5
31	13	9.5	11	--	--	--	8.0	5.5	6.5	--	--	--
Month[1]	**13**	**9.5**	**11**	**15**	**4.5**	**7.2**	**22**	**4.5**	**8.7**	**8.5**	**2.0**	**4.4**

Table 9. Seasonal daily maximum, minimum, and mean turbidity, with monthly summary statistics at Willow Creek at Opportunity, Montana (12323720), March through September 2015.—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	3.0	1.5	2.0	--	--	--	3.5	2.5	3.0
2	2.5	1.5	2.0	--	--	--	--	--	--
3	3.0	1.5	2.0	--	--	--	--	--	--
4	3.5	1.5	2.0	--	--	--	3.0	2.0	2.0
5	2.5	1.5	2.0	--	--	--	4.5	2.5	3.0
6	2.5	1.5	2.0	--	--	--	5.0	2.5	3.5
7	3.0	2.0	2.0	--	--	--	3.5	2.0	2.5
8	3.5	1.5	2.5	--	--	--	3.0	2.0	2.5
9	4.5	2.0	3.0	--	--	--	3.5	2.0	2.5
10	3.0	2.0	2.5	--	--	--	4.0	2.0	2.5
11	3.0	1.5	2.5	--	--	--	3.5	2.0	2.5
12	3.5	2.0	2.5	--	--	--	3.5	2.0	2.5
13	3.0	2.0	2.5	--	--	--	3.0	2.0	2.5
14	3.0	2.0	2.5	--	--	--	3.5	2.5	2.5
15	3.0	2.0	2.5	--	--	--	3.5	2.0	2.5
16	3.0	2.0	2.5	--	--	--	4.5	3.0	3.5
17	3.0	1.5	2.5	--	--	--	4.5	2.5	3.5
18	2.5	1.5	2.0	--	--	--	4.0	2.5	3.5
19	2.5	1.5	2.0	--	--	--	3.5	2.5	3.0
20	2.5	1.5	2.0	--	--	--	3.5	2.0	2.5
21	2.5	2.0	2.0	4.0	2.5	3.0	3.5	2.0	2.5
22	3.0	2.0	2.5	3.5	2.5	2.5	3.0	2.0	2.5
23	3.0	2.0	2.5	4.0	2.5	2.5	2.5	2.0	2.0
24	3.5	2.5	2.5	4.0	2.5	2.5	3.5	1.5	2.0
25	3.5	2.0	2.5	4.0	2.5	3.0	3.5	2.0	2.0
26	3.0	1.5	2.0	4.0	2.5	3.0	3.5	2.0	2.0
27	3.5	2.0	2.5	3.5	2.5	2.5	3.5	2.0	2.5
28	6.0	2.5	3.5	3.0	2.0	2.5	3.0	2.0	2.5
29	4.0	2.0	3.0	3.0	2.5	2.5	3.0	2.0	2.5
30	4.0	2.0	3.0	3.5	2.5	3.0	3.5	2.0	2.5
31	--	--	--	3.5	2.5	3.0	--	--	--
Month[1]	**6.0**	**1.5**	**2.4**	**4.0**	**2.0**	**2.7**	**5.0**	**1.5**	**2.6**

[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 Warm Springs Creek at Warm Springs, Montana (12323770), March through September 2015.

[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	Maximum	Minimum	Mean
	March			April			May			June		
1	--	--	--	4.5	3.0	3.5	8.0	3.5	4.5	12	7.5	9.5
2	--	--	--	4.0	2.0	3.0	9.0	6.0	7.5	--	--	--
3	--	--	--	4.0	2.0	3.0	9.0	6.0	7.5	--	--	--
4	--	--	--	3.5	2.0	3.0	10	6.5	8.0	--	--	--
5	--	--	--	3.5	2.0	2.5	15	6.5	11	--	--	--
6	--	--	--	4.0	2.0	2.5	15	8.5	12	--	--	--
7	--	--	--	4.5	2.0	2.5	9.5	5.5	7.5	--	--	--
8	--	--	--	4.5	2.0	2.5	8.0	4.5	5.5	--	--	--
9	--	--	--	4.5	2.0	2.5	6.5	3.5	4.5	--	--	--
10	--	--	--	3.5	1.5	2.5	6.0	3.5	4.5	--	--	--
11	--	--	--	3.5	2.0	2.5	6.0	3.5	4.5	--	--	--
12	--	--	--	3.5	1.5	2.5	5.5	3.0	4.0	13	4.0	5.0
13	--	--	--	3.0	2.0	2.0	7.5	4.5	5.5	6.5	3.5	4.5
14	--	--	--	3.0	2.0	2.5	8.0	5.0	6.0	5.0	3.0	4.0
15	--	--	--	2.5	1.5	2.0	9.0	6.5	8.0	5.0	3.0	4.0
16	--	--	--	2.5	2.0	2.0	17	9.0	13	5.5	3.5	4.0
17	--	--	--	5.5	2.0	3.0	16	7.5	11	5.0	3.0	4.0
18	--	--	--	3.5	2.0	2.5	8.5	5.0	6.5	4.5	3.0	3.5
19	--	--	--	3.0	2.0	2.5	7.0	4.5	5.5	4.5	3.0	3.5
20	--	--	--	3.5	2.0	2.5	6.0	4.0	5.0	5.5	3.0	4.0
21	--	--	--	3.5	2.0	2.5	6.5	4.0	5.0	4.5	2.5	3.5
22	--	--	--	4.0	2.5	3.0	8.5	5.5	6.5	4.5	2.5	3.5
23	--	--	--	5.0	3.0	3.5	8.0	5.5	6.5	4.0	2.5	3.0
24	--	--	--	6.5	3.5	4.5	9.5	6.0	7.5	4.0	2.0	3.0
25	--	--	--	6.0	3.0	4.5	8.0	5.5	6.5	6.0	2.0	3.0
26	--	--	--	4.5	3.0	3.5	9.5	6.5	8.0	5.0	2.0	3.0
27	--	--	--	5.0	2.5	3.0	8.5	6.0	7.5	--	--	--
28	--	--	--	4.0	2.5	3.0	23	7.0	11	5.5	1.5	2.5
29	--	--	--	4.5	2.5	3.0	11	6.0	8.0	190	1.5	6.5
30	--	--	--	5.5	3.0	3.5	11	6.0	7.0	240	3.0	21
31	4.5	2.0	3.0	--	--	--	8.5	6.0	7.0	--	--	--
Month[1]	**4.5**	**2.0**	**3.0**	**6.5**	**1.5**	**2.8**	**23**	**3.0**	**7.2**	**240**	**1.5**	**5.0**

Table 10. Seasonal daily maximum, minimum, and mean turbidity, with monthly summary statistics at Warm Springs Creek at Warm Springs, Montana (12323770), March through September 2015.—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	4.5	2	3	2.0	0.5	1.0	3.0	0.5	1.0
2	--	--	--	2.0	0.5	1.0	2.0	0.5	1.0
3	4.0	1.5	2.5	4.0	0.5	1.5	2.0	0.5	1.0
4	3.5	1.0	2.0	1.5	0.5	1.0	9.0	1.0	2.5
5	3.5	1.0	2.0	1.0	0.5	0.5	15	3.0	6.5
6	2.5	1.0	1.5	1.5	0.5	1.0	4.5	1.0	2.0
7	3.0	1.0	1.5	1.5	0.5	1.0	2.5	0.5	1.0
8	--	--	--	1.5	0.5	1.0	3.0	1.0	1.0
9	1.5	0.5	1.0	2.0	0.5	1.0	2.0	0.5	1.0
10	1.5	0.5	1.0	1.5	0.5	1.0	1.5	0.5	1.0
11	2.0	1.0	1.5	1.5	0.5	1.0	2.5	0.5	1.0
12	2.0	0.5	1.0	2.5	0.5	1.0	1.5	0.5	1.0
13	2.0	0.5	1.0	1.5	0.5	1.0	1.5	0.5	1.0
14	2.5	0.5	1.0	1.5	0.5	1.0	2.5	1.0	1.0
15	2.0	0.5	1.0	2.0	0.5	1.0	4.5	1.5	2.5
16	1.5	0.5	1.0	2.5	0.5	1.0	2.5	1.0	1.5
17	2.0	0.5	1.0	3.0	0.5	1.0	2.0	1.0	1.5
18	2.0	0.5	1.0	2.0	0.5	1.0	2.0	1.0	1.0
19	1.5	0.5	1.0	1.5	0.5	1.0	2.0	0.5	1.0
20	1.5	0.5	1.0	1.5	0.5	1.0	2.0	0.5	1.0
21	1.0	0.5	0.5	2.0	0.5	1.0	2.0	0.5	1.0
22	3.0	0.5	1.0	1.5	0.5	1.0	2.0	0.5	1.0
23	4.5	1.0	2.0	1.5	0.5	1.0	2.5	1.0	1.5
24	6.0	1.0	2.5	1.5	0.5	1.0	3.5	1.0	2.0
25	8.5	0.5	4.0	1.5	0.5	1.0	3.5	1.0	2.0
26	11	1.0	4.0	1.5	0.5	1.0	3.5	1.0	2.0
27	--	--	--	1.5	0.5	1.0	3.5	1.0	2.0
28	--	--	--	2.5	0.5	1.0	3.5	1.0	2.0
29	--	--	--	1.5	0.5	1.0	2.5	1.0	1.5
30	1.5	0.5	0.5	1.5	0.5	1.0	--	--	--
31	2.0	0.5	1.0	2.0	0.5	1.0	--	--	--
Month[1]	**11**	**0.5**	**1.6**	**4.0**	**0.5**	**1.0**	**15**	**0.5**	**1.6**

[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 Lost Creek near Anaconda, Montana (12323840), March through September 2015.

[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	Maximum	Minimum	Mean
	March			April			May			June		
1	--	--	--	8.5	6.0	7.0	--	--	--	18	10	13
2	--	--	--	7.5	5.0	6.0	--	--	--	25	12	17
3	--	--	--	7.0	4.5	5.5	--	--	--	14	9.0	11
4	--	--	--	6.0	4.5	5.0	--	--	--	12	8.0	9.5
5	--	--	--	8.0	4.5	5.0	--	--	--	10	7.0	8.5
6	--	--	--	6.0	4.5	5.0	--	--	--	10	7.0	8.0
7	--	--	--	7.0	4.5	5.0	--	--	--	9.5	6.5	7.5
8	--	--	--	5.0	4.5	4.5	--	--	--	9.0	6.0	7.0
9	--	--	--	18	4.5	6.0	8.5	6.0	7.0	8.5	6.0	7.0
10	--	--	--	7.0	5.0	5.5	8.0	5.5	6.5	9.5	6.0	7.0
11	--	--	--	7.0	4.5	5.5	7.5	5.0	6.0	7.5	5.5	6.0
12	--	--	--	6.0	4.5	5.5	9.0	5.0	6.0	6.5	5.0	5.5
13	--	--	--	6.5	4.5	5.5	12	5.5	7.0	6.0	4.5	5.0
14	--	--	--	6.5	5.0	5.5	8.5	5.0	6.5	7.0	4.5	5.5
15	--	--	--	9.5	5.0	6.0	10	5.5	7.0	6.5	4.5	5.5
16	--	--	--	8.0	4.5	5.5	20	8.0	13	7.0	4.5	5.5
17	--	--	--	6.5	5.0	5.5	21	6.5	10	6.0	4.5	5.0
18	--	--	--	6.5	5.0	5.5	8.0	5.5	6.5	6.0	4.5	5.0
19	--	--	--	7.0	5.0	5.5	19	5.5	7.0	5.5	4.0	5.0
20	--	--	--	7.0	5.0	5.5	11	6.0	7.5	6.5	4.0	5.0
21	--	--	--	8.0	5.5	7.0	9.5	5.5	7.5	6.0	3.5	4.5
22	--	--	--	--	--	--	11	5.0	7.0	5.5	3.5	4.0
23	--	--	--	--	--	--	10	6.0	7.0	5.5	3.5	4.0
24	--	--	--	--	--	--	11	7.0	8.5	6.5	4.0	5.0
25	--	--	--	--	--	--	30	7.0	9.5	6.0	4.0	5.0
26	--	--	--	--	--	--	29	8.5	12	7.0	4.0	5.0
27	--	--	--	--	--	--	18	9.0	11	7.0	3.5	5.0
28	--	--	--	--	--	--	18	10	13	6.0	3.5	4.5
29	--	--	--	--	--	--	16	9.0	12	12	4.0	6.5
30	--	--	--	--	--	--	21	11	14	6.5	4.5	5.5
31	7.5	5.0	6.0	--	--	--	31	10	15	--	--	--
Month[1]	**7.5**	**5.0**	**6.0**	**18**	**4.5**	**5.6**	**31**	**5.0**	**9.0**	**25**	**3.5**	**6.6**

Table 11. Seasonal daily maximum, minimum, and mean turbidity, with monthly summary statistics at Lost Creek near Anaconda, Montana (12323840), March through September 2015.—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	7.5	5.0	6.0	3.5	2.0	3.0
2	5.0	4.0	4.5	8.0	5.0	6.0	3.5	2.5	3.0
3	--	--	--	8.0	5.0	6.0	3.0	2.5	3.0
4	7.0	4.5	5.5	8.0	5.0	6.0	5.5	2.5	3.5
5	6.5	4.0	4.5	7.5	5.0	6.0	9.0	3.5	5.5
6	5.5	4.0	4.5	8.0	5.0	6.0	3.5	2.5	3.0
7	5.5	4.0	4.5	7.5	5.0	6.0	16	2.5	4.0
8	7.0	4.0	5.0	6.5	4.5	5.5	5.0	3.0	4.0
9	5.0	4.0	4.5	6.5	4.5	5.5	3.5	3.0	3.0
10	5.5	4.0	4.0	9.5	5.0	6.5	3.5	2.5	3.0
11	7.5	4.0	4.5	7.5	4.5	6.0	3.5	2.5	3.0
12	5.0	3.5	4.0	8.5	4.5	6.0	3.5	2.5	3.0
13	6.0	3.5	4.0	7.5	4.5	5.5	3.0	2.5	2.5
14	7.5	4.0	4.5	7.5	5.0	6.0	3.5	2.5	3.0
15	4.5	4.0	4.0	7.5	4.5	5.5	10	2.5	3.5
16	4.5	4.0	4.0	7.5	3.5	5.0	10	2.5	3.5
17	4.5	4.0	4.0	4.5	3.5	4.0	3.0	2.5	3.0
18	5.0	4.0	4.5	5.5	3.5	4.0	3.5	2.5	2.5
19	5.0	3.5	4.0	4.5	3.0	3.5	2.5	2.0	2.5
20	4.5	3.5	4.0	4.0	3.0	3.5	3.5	2.0	2.5
21	8.0	2.5	4.0	4.0	3.0	3.5	2.5	2.0	2.5
22	5.0	2.5	3.0	4.0	3.0	3.5	3.0	2.0	2.5
23	4.5	2.5	3.0	4.0	3.0	3.5	3.0	2.0	2.0
24	4.5	2.5	3.5	4.0	2.5	3.0	2.5	2.0	2.0
25	4.0	2.0	2.5	3.5	3.0	3.0	2.5	2.0	2.0
26	3.0	2.0	2.0	3.5	2.5	3.0	3.0	2.0	2.0
27	5.0	2.0	4.0	3.5	2.5	2.5	2.5	2.0	2.0
28	4.5	1.5	3.0	2.5	2.0	2.5	2.5	2.0	2.5
29	26	1.5	6.0	4.0	2.0	2.5	2.5	2.0	2.5
30	26	5.5	9.0	3.0	2.5	2.5	3.0	2.5	2.5
31	9.5	5.5	7.0	3.0	2.0	2.5	--	--	--
Month[1]	**26**	**1.5**	**4.3**	**9.5**	**2.0**	**4.5**	**16**	**2.0**	**2.9**

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

Table 12. Analyses of field replicates for water samples, Clark Fork Basin, Montana.

[hh, hours; mm, minutes; lab, laboratory; NTRU, nephelometric turbidity ratio unit; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; µg/L, microgram per liter; mm, millimeter; --, no data; <, less than laboratory reporting level; 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)	Chloride, filtered (mg/L)	Fluoride, filtered (mg/L)	Silica, filtered (mg/l)
12324680	Clark Fork at Goldcreek	10/15/2014	1600	--	200	57.6	13.6	--	--	--	--	--	--
		10/15/2014	1605	--	205	59.8	13.6	--	--	--	--	--	--
12323250	Silver Bow Creek below Blacktail Creek, at Butte	03/23/2015	1120	E3.0	141	39.8	10.2	4.26	19.8	92.6	24.1	0.28	20.5
		03/23/2015	1125	E2.5	140	39.7	10.0	4.26	19.8	92.5	24.1	0.29	20.4
12324400	Clark Fork above Little Blackfoot River, near Garrison	03/24/2015	1435	--	202	58.8	13.3	--	--	--	--	--	--
		03/24/2015	1440	--	202	59.1	13.2	--	--	--	--	--	--
12323840	Lost Creek near Anaconda	04/21/2015	0745	E2.4	103	31.2	5.96	1.20	2.81	94.2	0.75	0.40	11.6
		04/21/2015	0750	E2.5	103	31.4	5.99	1.20	2.83	94.3	0.75	0.39	11.6
12324200	Clark Fork at Deer Lodge	05/12/2015	1500	--	171	49.8	11.2	--	--	--	--	--	--
		05/12/2015	1505	--	170	49.4	11.3	--	--	--	--	--	--
12334550	Clark Fork at Turah Bridge, near Bonner	05/28/2015	0840	--	100	29.1	6.73	--	--	--	--	--	--
		05/28/2015	0845	--	94.1	27.1	6.39	--	--	--	--	--	--
12340500	Clark Fork above Missoula	06/10/2015	1400	--	105	28.7	8.02	--	--	--	--	--	--
		06/10/2015	1405	--	108	30.0	7.94	--	--	--	--	--	--
12323750	Silver Bow Creek at Warm Springs	07/14/2015	1050	E2.0	171	48.3	12.2	2.34	14.3	93.3	10.8	0.63	13.7
		07/14/2015	1055	<2.0	173	49.4	12.1	2.37	14.6	93.2	10.8	0.63	13.5
12323700	Mill Creek at Opportunity	08/10/2015	1535	<2.0	78.8	22.1	5.73	0.78	4.98	77.4	0.41	0.36	12.1
		08/10/2015	1540	<2.0	78.6	22.2	5.66	0.74	4.70	77.3	0.41	0.36	11.9

Table 12. Analyses of field replicates for water samples, Clark Fork Basin, Montana.—Continued

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

Site number (fig. 1)	Site name	Date	Time (hhmm)	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)	Lead, filtered (µg/L)	Lead, unfiltered recoverable (µg/L)
12324680	Clark Fork at Goldcreek	10/15/2014	1600	--	--	0.047	0.067	4.0	12.7	11.7	185	0.111	1.37
		10/15/2014	1605	--	--	0.050	0.074	3.9	13.2	12.3	181	0.111	1.39
12323250	Silver Bow Creek below Blacktail Creek, at Butte	03/23/2015	1120	65.0	0.82	0.082	0.073	7.4	8.0	392	484	0.720	1.11
		03/23/2015	1125	65.0	0.82	0.073	0.076	6.5	9.7	389	476	0.719	1.14
12324400	Clark Fork above Little Blackfoot River, near Garrison	03/24/2015	1435	--	--	0.066	0.195	6.8	46.5	36.3	809	0.326	5.71
		03/24/2015	1440	--	--	0.070	0.199	6.9	43.1	37.8	791	0.350	5.61
12323840	Lost Creek near Anaconda	04/21/2015	0745	9.44	--	<0.030	<0.030	1.4	5.5	10.1	192	<0.040	0.69
		04/21/2015	0750	9.45	--	<0.030	<0.030	1.4	5.6	9.5	186	<0.040	0.73
12324200	Clark Fork at Deer Lodge	05/12/2015	1500	--	--	0.064	0.112	7.0	21.2	21.9	305	0.143	2.36
		05/12/2015	1505	--	--	0.062	0.104	6.7	22.2	23.5	305	0.145	2.52
12334550	Clark Fork at Turah Bridge, near Bonner	05/28/2015	0840	--	--	0.083	0.200	17.9	37.8	359	1,020	2.79	6.16
		05/28/2015	0845	--	--	0.094	0.182	17.5	36.3	339	905	2.74	5.56
12340500	Clark Fork above Missoula	06/10/2015	1400	--	--	<0.030	0.100	2.2	10.8	10.2	330	0.071	1.51
		06/10/2015	1405	--	--	<0.030	0.058	2.1	11.0	12.0	342	0.069	1.55
12323750	Silver Bow Creek at Warm Springs	07/14/2015	1050	84.5	--	<0.030	0.032	2.4	2.8	25.7	99.8	0.087	0.38
		07/14/2015	1055	84.6	--	<0.030	0.031	2.4	3.3	25.0	98.1	0.085	0.39
12323700	Mill Creek at Opportunity	08/10/2015	1535	11.8	--	0.057	0.052	2.2	2.8	68.0	115	0.142	0.29
		08/10/2015	1540	11.8	--	0.049	0.070	2.4	3.1	65.1	114	0.162	0.31

Table 12. Analyses of field replicates for water samples, Clark Fork Basin, Montana.—Continued

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

Site number (fig. 1)	Site name	Date	Time (hhmm)	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)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)
12324680	Clark Fork at Goldcreek	10/15/2014	1600	13.4	63.2	2.5	10.9	9.4	10.7	--	89	7
		10/15/2014	1605	13.9	62.0	2.5	10.6	9.4	11.3	--	87	6
12323250	Silver Bow Creek below Blacktail Creek, at Butte	03/23/2015	1120	67.8	76.2	28.1	30.5	3.4	3.7	5.94	79	4
		03/23/2015	1125	67.5	73.8	28.6	30.2	3.3	3.5	5.92	81	4
12324400	Clark Fork above Little Blackfoot River, near Garrison	03/24/2015	1435	30.8	112	6.2	38.7	9.5	15.4	--	76	31
		03/24/2015	1440	31.4	111	5.9	36.9	9.6	14.8	--	72	33
12323840	Lost Creek near Anaconda	04/21/2015	0745	0.99	7.1	<2.0	3.2	2.5	3.2	1.53	63	11
		04/21/2015	0750	0.99	7.0	<2.0	5.0	2.6	3.0	1.51	62	11
12324200	Clark Fork at Deer Lodge	05/12/2015	1500	28.4	60.3	3.6	16.7	12.7	15.3	--	83	9
		05/12/2015	1505	27.9	57.7	3.0	18.4	13.1	14.8	--	82	9
12334550	Clark Fork at Turah Bridge, near Bonner	05/28/2015	0840	48.6	102	17.4	44.6	7.3	9.9	--	77	41
		05/28/2015	0845	46.9	99.1	16.9	39.6	7.4	9.2	--	76	42
12340500	Clark Fork above Missoula	06/10/2015	1400	5.37	39.4	<2.0	13.1	3.7	4.8	--	82	19
		06/10/2015	1405	5.45	39.7	<2.0	12.2	3.7	4.9	--	82	19
12323750	Silver Bow Creek at Warm Springs	07/14/2015	1050	48.7	88.2	<2.0	2.6	28.5	30.1	4.31	77	1
		07/14/2015	1055	49.3	90.8	<2.0	2.2	29.1	31.1	4.30	83	1
12323700	Mill Creek at Opportunity	08/10/2015	1535	6.40	8.6	<2.0	<2.0	29.7	30.2	1.70	83	1
		08/10/2015	1540	6.17	8.4	<2.0	2.0	28.8	30.6	1.81	91	1

Table 13. 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	4	0.40	21	Yes[3]
Calcium, filtered, mg/L	9	0.82	2.0	Yes
Magnesium, filtered, mg/L	9	0.10	1.1	Yes
Potassium, filtered, mg/L	4	0.02	0.82	Yes
Sodium, filtered, mg/L	4	0.15	1.4	Yes
Alkalinity, filtered, lab, mg/L	4	0.07	0.08	Yes
Chloride, filtered, mg/L	4	0.00	0.00	Yes
Fluoride, filtered, mg/L	4	0.00	1.2	Yes
Silica, filtered, mg/L	4	0.11	0.74	Yes
Sulfate, filtered, mg/L	4	0.04	0.08	Yes
Cadmium, filtered, µg/L	9	0.00	8.2	Yes
Cadmium, unfiltered recoverable, µg/L	9	0.01	13	Yes
Copper, filtered, µg/L	9	0.25	4.5	Yes
Copper, unfiltered recoverable, µg/L	9	1.0	6.1	Yes
Iron, filtered, µg/L	9	4.9	4.7	Yes
Iron, unfiltered recoverable, µg/L	9	28	7.2	Yes
Lead, filtered, µg/L	9	0.01	2.8	Yes
Lead, unfiltered recoverable, µg/L	9	0.15	6.9	Yes
Manganese, filtered, µg/L	9	0.49	1.8	Yes
Manganese, unfiltered recoverable, µg/L	9	1.3	2.1	Yes
Zinc, filtered, µg/L	9	0.23	3.4	Yes
Zinc, unfiltered recoverable, µg/L	9	1.4	8.1	Yes
Arsenic, filtered, µg/L	9	0.28	2.3	Yes
Arsenic, unfiltered recoverable, µg/L	9	0.39	2.8	Yes
Organic carbon, filtered, mg/L	4	0.04	1.2	Yes
Sediment, suspended, percent finer than 0.062 mm	9	2.7	3.4	Yes
Sediment, suspended, mg/L	9	0.58	4.2	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 is estimated and one is less than the laboratory reporting level. 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 14. 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, in listed units	Relative standard deviation (percent)	Within limits[1] of data-quality objective
Calcium, filtered, mg/L	7	2.4	6.1	Yes
Magnesium, filtered, mg/L	7	0.56	3.9	Yes
Cadmium, filtered, µg/L	7	0.00	5.4	Yes
Cadmium, unfiltered recoverable, µg/L	7	0.00	4.4	Yes
Copper, filtered, µg/L	7	0.09	1.5	Yes
Copper, unfiltered recoverable, µg/L	7	0.20	1.1	Yes
Iron, filtered, µg/L	7	2.5	3.4	Yes
Iron, unfiltered recoverable, µg/L	7	1.0	0.27	Yes
Lead, filtered, µg/L	7	0.01	2.0	Yes
Lead, unfiltered recoverable, µg/L	7	0.02	0.69	Yes
Manganese, filtered, µg/L	7	0.13	0.53	Yes
Manganese, unfiltered recoverable, µg/L	7	0.52	0.88	Yes
Zinc, filtered, µg/L	7	0.08	1.7	Yes
Zinc, unfiltered recoverable, µg/L	7	0.23	1.4	Yes
Arsenic, filtered, µg/L	7	0.24	1.8	Yes
Arsenic, unfiltered recoverable, µg/L	7	0.31	2.0	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 15. 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	96.1–102	99.0	Yes
Cadmium, unfiltered recoverable, µg/L	5	99.9–109	104	Yes
Copper, filtered, µg/L	5	94.2–107	100	Yes
Copper, unfiltered recoverable, µg/L	5	95.7–126	111	No[2]
Iron, filtered, µg/L	5	96.1–104	100	Yes
Iron, unfiltered recoverable, µg/L	5	83.3–113	98.2	Yes
Lead, filtered, µg/L	5	96.1–104	100	Yes
Lead, unfiltered recoverable, µg/L	5	88.0–111	99.6	Yes
Manganese, filtered, µg/L	5	64.7–119	91.9	No[3]
Manganese, unfiltered recoverable, µg/L	5	96.1–121	108	Yes
Zinc, filtered, µg/L	5	97.0–109	103	Yes
Zinc, unfiltered recoverable, µg/L	5	101–129	115	No[4]
Arsenic, filtered, µg/L	5	98.2–103	100	Yes
Arsenic, unfiltered recoverable, µg/L	5	91.8–108	99.9	Yes

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

[2]Exceedance of data-quality objective resulted from two samples having a recovery of 123 percent.

[3]Exceedance of data-quality objective resulted from one sample having a recovery of 52.9 percent. When data from this one spiked-sample set are removed from the 95-percent confidence interval calculation, filtered manganese meets the data-quality objective limit (97.9–105 percent).

[4]Exceedance of data-quality objective resulted from two samples having a recovery of 127 percent.

Table 16. 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	98.5–104	101	Yes
Cadmium, unfiltered recoverable, µg/L	5	95.4–116	106	Yes
Copper, filtered, µg/L	5	93.1–100	96.7	Yes
Copper, unfiltered recoverable, µg/L	5	92.6–103	97.7	Yes
Iron, filtered, µg/L	5	80.7–120	100	Yes
Iron, unfiltered recoverable, µg/L	5	93.1–127	110	No[2]
Lead, filtered, µg/L	5	102–106	104	Yes
Lead, unfiltered recoverable, µg/L	5	96.4–115	106	Yes
Manganese, filtered, µg/L	5	101–105	103	Yes
Manganese, unfiltered recoverable, µg/L	5	94.0–105	99.7	Yes
Zinc, filtered, µg/L	5	87.0–101	94.2	Yes
Zinc, unfiltered recoverable, µg/L	5	90.2–107	98.6	Yes
Arsenic, filtered, µg/L	5	97.6–104	101	Yes
Arsenic, unfiltered recoverable, µg/L	5	86.7–121	104	Yes

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

[2]Exceedance of data-quality objective resulted from one sample having a recovery of 135 percent. When data from this one spiked-sample set are removed from the 95-percent confidence interval calculation, unfiltered recoverable iron meets the data-quality objective limit (101–107 percent).

Table 17. Analyses of field blanks for water samples.

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

Date	Time (hhmm)	pH, onsite (standard units)	Specific conductance, 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)
10/14/2014	1410	5.5	2	<2.0	<0.022	<0.011	<0.03	<0.06	<4.6	<0.02
[1]03/19/2015	1200	5.6	2	<2.0	<0.022	<0.011	<0.03	<0.06	<4.6	<0.02
04/22/2015	1345	5.4	2	--	<0.022	<0.011	--	--	--	--
05/12/2015	0740	5.3	2	<2.0	<0.022	<0.011	--[2]	--[2]	--[2]	--[2]
05/27/2015	1500	5.4	2	--	<0.022	<0.011	--	--	--	--
06/10/2015	1005	5.5	2	--	<0.022	<0.011	--	--	--	--
07/14/2015	1225	5.5	2	--	<0.022	<0.011	--	--	--	--
08/11/2015	1015	5.4	2	<2.0	<0.022	<0.011	--[2]	--[2]	--[2]	--[2]

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)
10/14/2014	<0.01	0.072	<0.02	--	<0.030	<0.030	<0.80	<0.80	<4.0	<4.6
[1]03/19/2015	<0.01	0.042	<0.02	<0.01	<0.030	<0.030	<0.80	<0.80	<4.0	<4.6
04/22/2015	--	--	--	--	<0.030	<0.030	<0.80	<0.80	<4.0	<4.6
05/12/2015	--[2]	--[2]	--[2]	--	<0.030	<0.030	<0.80	<0.80	<4.0	7.5
05/27/2015	--	--	--	--	<0.030	<0.030	<0.80	<0.80	<4.0	<4.6
06/10/2015	--	--	--	--	<0.030	<0.030	<0.80	<0.80	<4.0	<4.6
07/14/2015	--	--	--	--	<0.030	<0.030	<0.80	<0.80	<4.0	<4.6
08/11/2015	--[2]	--[2]	--[2]	--	<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)
10/14/2014	<0.040	<0.04	<0.40	<0.4	<2.0	<2.0	<0.10	<0.20	<0.23
[1]03/19/2015	<0.040	<0.04	<0.40	<0.4	<2.0	<2.0	<0.10	<0.20	<0.23
04/22/2015	<0.040	<0.04	<0.40	<0.4	<2.0	<2.0	<0.10	<0.20	--
05/12/2015	<0.040	<0.04	<0.40	<0.4	<2.0	<2.0	<0.10	<0.20	<0.23
05/27/2015	<0.040	<0.04	<0.40	<0.4	<2.0	<2.0	<0.10	<0.20	--
06/10/2015	<0.040	<0.04	<0.40	<0.4	<2.0	<2.0	<0.10	<0.20	--
07/14/2015	<0.040	<0.04	<0.40	<0.4	<2.0	<2.0	<0.10	<0.20	--
08/11/2015	<0.040	<0.04	<0.40	<0.4	<2.0	<2.0	<0.10	<0.20	<0.23

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

[2]Laboratory analysis for this constituent inadvertently not requested.

Table 18. Bed-sediment data for the Clark Fork Basin, Montana, August 2015.

[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]

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	27.3	12.0	21.3	574	28,400	112	3,760	14.8	1,740
12323750	Silver Bow Creek at Warm Springs	3	98.3	5.5	15.1	264	21,300	76.4	7,610	13.5	674
12323800	Clark Fork near Galen	3	129	5.0	20.6	1,060	26,600	136	6,180	16.9	930
461415112450801	Clark Fork below Lost Creek, near Galen	3	143	5.4	17.2	1,490	25,900	175	4,340	12.8	1,160
461559112443301	Clark Fork at county bridge, near Racetrack	3	104	5.2	14.4	1,060	23,800	137	3,540	11.4	990
461903112440701	Clark Fork at Dempsey Creek diversion, near Racetrack	3	79.0	4.2	15.7	996	24,400	135	1,590	10.3	951
12324200	Clark Fork at Deer Lodge	3	72.6	4.1	22.2	1,000	23,800	131	1,430	12.0	987
12324400	Clark Fork above Little Blackfoot River, near Garrison	3	49.4	4.3	15.0	666	16,800	93.6	2,670	9.2	780
12324680	Clark Fork at Goldcreek	3	28.6	2.0	9.9	281	11,500	45.4	2,730	7.6	427
12331800	Clark Fork near Drummond	3	32.2	2.9	14.3	437	16,000	66.9	1,490	9.5	638
12334550	Clark Fork at Turah Bridge, near Bonner	3	18.0	1.4	13.6	229	13,400	41.9	383	9.1	451
12340000	Blackfoot River near Bonner	3	5.3	0.05	13.3	17.3	15,000	11.1	345	10.4	59.3
12340500	Clark Fork above Missoula	3	15.7	1.3	12.8	163	13,800	31.6	903	9.8	394

Table 19. 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	58.5	57.6–59.3
Cadmium	10	1:10	0.371	46.7	44.9–48.6
Chromium	10	1:10	130	65.9	64.6–67.2
Copper	10	1:10	33.9	85.2	84.7–85.6
Iron	10	1:10	33,600	88.0	87.5–88.4
Lead	10	1:10	17.3	56.3	55.4–57.3
Manganese	10	1:10	529	83.5	83.0–84.0
Nickel	10	1:10	85	81.3	80.8–81.8
Zinc	10	1:10	103	85.3	84.9–85.8
SRM sample 2711a					
Arsenic	10	1:10	107	89.0	87.6–90.3
Cadmium	10	1:10	54.1	97.4	96.7–98.0
Chromium	10	1:10	52.3	56.9	54.9–58.9
Copper	10	1:10	140	94.1	93.0–95.3
Iron	10	1:10	28,200	85.1	84.4–85.8
Lead	10	1:10	1,400	93.2	92.2–94.2
Manganese	10	1:10	675	79.4	78.5–80.4
Nickel	10	1:10	21.7	85.5	84.4–86.6
Zinc	10	1:10	414	92.3	91.2–93.3

Table 20. 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	<0.02	<0.005	<0.06	<0.004	<0.007	<0.001	<0.01
12323750	Silver Bow Creek at Warm Springs	1:10	<0.002	<0.001	<0.02	<0.005	<0.06	<0.004	<0.007	<0.001	<0.01
12323800	Clark Fork near Galen	1:10	<0.002	<0.001	<0.02	<0.005	<0.06	<0.004	<0.007	<0.001	<0.01
461415112450801	Clark Fork below Lost Creek, near Galen	1:10	<0.002	<0.001	<0.02	<0.005	<0.06	<0.004	<0.007	<0.001	<0.01
461559112443301	Clark Fork at county bridge, near Racetrack	1:10	<0.002	<0.001	<0.02	<0.005	<0.06	<0.004	<0.007	<0.001	<0.01
461903112440701	Clark Fork at Dempsey Creek diversion, near Racetrack	1:10	<0.002	<0.001	<0.02	<0.005	<0.06	<0.004	<0.007	<0.001	<0.01
12324200	Clark Fork at Deer Lodge	1:10	<0.002	<0.001	<0.02	<0.005	<0.06	<0.004	<0.007	<0.001	<0.01
12324400	Clark Fork above Little Blackfoot River, near Garrison	1:10	<0.002	<0.001	<0.02	<0.005	<0.06	<0.004	<0.007	<0.001	<0.01
12324680	Clark Fork at Goldcreek	1:10	<0.002	<0.001	<0.02	<0.005	<0.06	<0.004	<0.007	0.003	<0.01
12331800	Clark Fork near Drummond	1:10	<0.002	<0.001	<0.02	<0.005	<0.06	<0.004	<0.007	<0.001	<0.01
12334550	Clark Fork at Turah Bridge, near Bonner	1:10	<0.002	<0.001	<0.02	<0.005	<0.06	<0.004	<0.007	<0.001	<0.01
12340000	Blackfoot River near Bonner	1:10	<0.002	<0.001	<0.02	<0.005	<0.06	<0.004	<0.007	<0.001	<0.01
12340500	Clark Fork above Missoula	1:10	<0.002	<0.001	<0.02	<0.005	<0.06	<0.004	<0.007	<0.001	<0.01

Table 21. Biological data for the Clark Fork Basin, Montana, August 2015.

[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	Manga-nese	Nickel	Zinc
12323600—Silver Bow Creek at Opportunity										
Hydropsyche cockerelli	3	5.8	2.4	3.8	92.5	2,840	14.1	1,490	3.4	539
12323750—Silver Bow Creek at Warm Springs										
Hydropsyche cockerelli	3	11.8	0.3	1.1	30.6	821	2.9	1,260	1.4	165
12323800—Clark Fork near Galen										
Hydropsyche cockerelli	3	14.2	1.5	2.7	105	1,540	11.2	2,180	2.4	227
Hydropsyche occidentalis	1	13.7	1.3	3.3	104	1,460	10.9	2,560	2.7	251
461415112450801—Clark Fork below Lost Creek, near Galen										
Hydropsyche cockerelli	2	18.0	1.7	2.5	185	2,130	18.0	1,650	2.3	254
Hydropsyche occidentalis	1	16.9	1.6	6.5	186	1,980	20.4	1,750	3.2	330
461559112443301—Clark Fork at county bridge, near Racetrack										
Hydropsyche cockerelli	1	14.7	1.6	2.4	124	1,670	11.3	1,400	1.7	232
Hydropsyche occidentalis	1	12.2	1.2	1.8	104	1,510	10.6	1,560	1.7	233
461903112440701—Clark Fork at Dempsey Creek diversion, near Racetrack										
Arctopsyche grandis	3	5.1	1.0	0.9	35.3	387	2.2	758	0.6	160
Claassenia sabulosa	3	1.6	0.5	0.5	55.6	120	0.7	199	0.2	270
Hydropsyche cockerelli	1	8.1	1.5	1.1	71.3	873	4.7	1,190	0.9	172
Hydropsyche occidentalis	1	8.5	1.1	0.3	76.6	764	4.4	1,270	1.2	189
12324200—Clark Fork at Deer Lodge										
Hydropsyche cockerelli	3	10.6	3.2	3.4	144	2,090	15.2	1,530	2.5	251
Hydropsyche occidentalis	1	9.6	2.1	1.6	138	1,470	13.3	1,490	2.1	256
12324400—Clark Fork above Little Blackfoot River, near Garrison										
Arctopsyche grandis	2	3.9	1.0	1.2	44.2	265	2.9	585	0.5	193
Hydropsyche cockerelli	1	8.8	0.9	1.9	101	746	8.7	1,110	1.8	211
Hydropsyche occidentalis	2	8.7	1.0	2.2	108	920	10.3	1,390	1.6	228
12324680—Clark Fork at Goldcreek										
Arctopsyche grandis	3	4.1	1.2	1.1	37.3	323	2.3	672	0.6	164
Claassenia sabulosa	3	1.3	0.7	0.8	58.7	167	0.9	235	0.4	259
Hydropsyche cockerelli	1	7.6	1.1	2.3	79.6	1,050	6.8	927	1.9	201
Hydropsyche occidentalis	1	6.6	1.1	2.5	76.4	1,070	6.0	1,180	1.5	198

Table 21. Biological data for the Clark Fork Basin, Montana, August 2015.—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	Manga-nese	Nickel	Zinc
12331800—Clark Fork near Drummond										
Arctopsyche grandis	3	6.2	0.6	1.9	49.8	979	5.5	985	1.3	171
Claassenia sabulosa	3	1.6	0.4	0.6	56.5	130	0.6	171	0.4	271
Hydropsyche cockerelli	1	6.4	0.8	2.4	52.8	770	5.6	976	1.3	173
Hydropsyche occidentalis	1	6.4	0.8	2.7	60.9	1,160	7.2	1,310	1.6	208
12334550—Clark Fork at Turah Bridge, near Bonner										
Arctopsyche grandis	2	3.2	0.7	1.0	18.1	372	2.6	464	0.6	163
Claassenia sabulosa	2	0.6	0.6	1.2	49.0	96	0.5	71	0.4	247
Hydropsyche cockerelli	2	4.2	0.6	1.9	30.1	826	4.6	516	1.1	166
Hydropsyche occidentalis	1	4.4	0.7	2.2	34.4	1,070	5.1	598	1.4	189
12340000—Blackfoot River near Bonner										
Arctopsyche grandis	2	2.7	0.2	1.9	12.5	765	0.9	412	1.2	148
Claassenia sabulosa	2	0.6	0.1	0.8	38.2	111	0.1	70	0.3	211
Hydropsyche cockerelli	1	3.2	0.3	3.6	14.2	1,400	1.8	516	1.7	147
Hydropsyche occidentalis	1	3.0	0.2	2.5	15.1	1,350	1.6	616	1.5	163
12340500—Clark Fork above Missoula										
Arctopsyche grandis	4	3.5	0.7	1.3	27.7	544	2.3	794	1.1	170
Claassenia sabulosa	2	0.9	0.6	0.7	37.7	119	0.5	137	0.4	292
Hydropsyche cockerelli	3	4.3	0.6	1.9	34.9	1,020	4.1	783	1.5	186

Table 22. Recovery efficiency for analyses of standard reference material for biota samples.

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

Constituent	Number of analyses	Certified concentration (µg/g)	Mean CRM recovery (percent)	95-percent confidence interval for CRM recovery (percent)
CRM sample TORT-3				
Arsenic	12	59.5	108	108–109
Cadmium	12	42.3	79.6	78.7–80.4
Chromium	12	1.95	121	105–137
Copper	12	497	83.8	83.0–84.6
Iron	12	179	88.6	87.6–89.6
Lead	12	0.225	170	166–175
Manganese	12	15.6	84.7	83.6–85.8
Nickel	12	5.3	82.6	79.2–86.0
Zinc	12	136	89.4	88.8–90.0

Table 23. 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	Manga-nese	Nickel	Zinc
12323600	Silver Bow Creek at Opportunity	1:1	<0.003	<0.001	<0.01	<0.005	<0.02	<0.005	<0.001	<0.001	<0.01
12323750	Silver Bow Creek at Warm Springs	1:1	<0.003	<0.001	<0.01	<0.005	<0.02	<0.005	<0.001	<0.001	<0.01
12323800	Clark Fork near Galen	1:1	<0.003	<0.001	<0.01	<0.005	<0.02	<0.005	<0.001	<0.001	<0.01
461415112450801	Clark Fork below Lost Creek, near Galen	1:1	<0.003	<0.001	<0.01	<0.005	<0.02	<0.005	<0.001	<0.001	<0.01
461559112443301	Clark Fork at county bridge, near Racetrack	1:1	<0.003	<0.001	<0.01	<0.005	<0.02	<0.005	<0.001	<0.001	<0.01
461903112440701	Clark Fork at Dempsey Creek diversion, near Racetrack	1:1	<0.003	<0.001	<0.01	<0.005	<0.02	<0.005	<0.001	<0.001	<0.01
12324200	Clark Fork at Deer Lodge	1:1	<0.003	<0.001	<0.01	<0.005	<0.02	<0.005	<0.001	<0.001	<0.01
12324400	Clark Fork above Little Blackfoot River, near Garrison	1:1	<0.003	<0.001	<0.01	<0.005	<0.02	<0.005	<0.001	<0.001	<0.01
12324680	Clark Fork at Goldcreek	1:1	<0.003	<0.001	<0.01	<0.005	<0.02	<0.005	<0.001	<0.001	<0.01
12331800	Clark Fork near Drummond	1:1	<0.003	<0.001	<0.01	<0.005	<0.02	<0.005	<0.001	<0.001	<0.01
12334550	Clark Fork at Turah Bridge, near Bonner	1:1	<0.003	<0.001	<0.01	<0.005	<0.02	<0.005	<0.001	<0.001	<0.01
12340000	Blackfoot River near Bonner	1:1	<0.003	<0.001	<0.01	<0.005	<0.02	<0.005	<0.001	<0.001	<0.01
12340500	Clark Fork above Missoula	1:1	<0.003	<0.001	<0.01	<0.005	<0.02	<0.005	<0.001	<0.001	<0.01

Table 24. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2015.

[ft^3/s, cubic feet per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; <, less than laboratory reporting level1; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day; --, indicates either too few samples (less than three) or insufficient data to compute statistic]

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 2015					
Streamflow, instantaneous (ft^3/s)	171	156	1.9	16	9.3
pH, onsite (standard units)	171	8.4	7.3	7.7	7.7
Specific conductance, onsite (µS/cm)	171	412	116	262	262
Temperature, water (°C)	171	17.5	1.0	7.9	8.0
Turbidity, unfiltered, lab (NTRU)	15	7.5	<2.0	[2]3.5	3.0
Hardness, filtered (mg/L as $CaCO_3$)	171	153	37.7	104	105
Calcium, filtered (mg/L)	171	42.9	10.6	29.7	29.8
Magnesium, filtered (mg/L)	171	11.1	2.71	7.22	7.20
Potassium, filtered (mg/L)	49	6.40	2.00	2.75	2.57
Sodium, filtered (mg/L)	49	18.0	6.40	10.6	10.2
Alkalinity, filtered, lab (mg/L)	21	124	54.5	85.5	78.4
Chloride, filtered (mg/L)	49	18.0	2.80	8.53	8.00
Fluoride, filtered (mg/L)	49	0.60	0.18	0.28	0.30
Silica, filtered (mg/L)	49	32.0	14.0	24.3	24.4
Sulfate, filtered (mg/L)	49	40.2	14.7	26.2	26.0
Nitrate plus nitrite, filtered (mg/L)	15	1.2	0.16	0.63	0.52
Cadmium, filtered (µg/L)	169	0.50	<0.03	[2]0.04	0.02
Cadmium, unfiltered recoverable (µg/L)	171	0.11	<0.01	[2]0.04	<1
Copper, filtered (µg/L)	170	10.0	<1.0	[2]3.5	3.0
Copper, unfiltered recoverable (µg/L)	171	52.0	0.91	6.2	4.9
Iron, filtered (µg/L)	171	739	15.2	196	174
Iron, unfiltered recoverable (µg/L)	171	4,220	123	659	590
Lead, filtered (µg/L)	171	2.80	<0.02	[2]0.18	0.06
Lead, unfiltered recoverable (µg/L)	171	47.0	<1.00	[2]1.565	0.62
Manganese, filtered (µg/L)	171	144	14.2	44.4	39.5
Manganese, unfiltered recoverable (µg/L)	171	240	23.5	61.4	52.7
Zinc, filtered (µg/L)	169	11	<1.0	[2]3.2	2.4
Zinc, unfiltered recoverable (µg/L)	171	130	<3.0	[2]7.5	4.0
Arsenic, filtered (µg/L)	170	13.0	1.0	4.0	3.4
Arsenic, unfiltered recoverable (µg/L)	171	18.0	1.0	[2]5.3	4.5
Organic carbon, filtered (mg/L)	21	9.52	1.40	4.73	4.29
Sediment, suspended (percent finer than 0.062 mm)	171	97	50	83	85
Sediment, suspended concentration (mg/L)	171	139	1	11	7
Sediment, suspended discharge (ton/d)	171	59	0.01	0.92	0.17

Table 24. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2015.—Continued

[ft^3/s, cubic feet per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; <, less than laboratory reporting level1; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day; --, indicates either too few samples (less than three) or insufficient data to compute statistic]

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 2015					
Streamflow, instantaneous (ft^3/s)	179	202	13	31	25
pH, onsite (standard units)	179	8.2	7.2	7.6	7.6
Specific conductance, onsite (µS/cm)	179	691	209	458	465
Temperature, water (°C)	179	20.0	1.0	10.3	10.0
Turbidity, unflitered, lab (NTRU)	15	8.6	<2.0	[2]3.7	3.0
Hardness, filtered (mg/L as $CaCO_3$)	179	217	66.0	147	150
Calcium, filtered (mg/L)	179	62.7	19.0	41.8	42.2
Magnesium, filtered (mg/L)	179	16.1	4.51	10.4	10.7
Potassium, filtered (mg/L)	49	35.0	3.64	7.50	5.70
Sodium, filtered (mg/L)	49	66.0	12.0	24.9	24.7
Alkalinity, filtered, lab (mg/L)	21	119	66.9	87.7	88.6
Chloride, filtered (mg/L)	48	88.0	6.70	23.8	21.2
Fluoride, filtered (mg/L)	48	0.80	0.26	0.41	0.40
Silica, filtered (mg/L)	48	28.0	17.0	22.1	22.0
Sulfate, filtered (mg/L)	48	96.0	35.0	71.1	73.8
Nitrate plus nitrite, filtered (mg/L)	15	4.40	0.34	0.95	0.65
Cadmium, filtered (µg/L)	179	6.2	0.04	0.79	0.16
Cadmium, unfiltered recoverable (µg/L)	179	6.0	0.06	1.07	0.26
Copper, filtered (µg/L)	179	303	2.6	27.3	11.7
Copper, unfiltered recoverable (µg/L)	179	550	8.0	63.2	22.1
Iron, filtered (µg/L)	179	392	9.6	101	79.8
Iron, unfiltered recoverable (µg/L)	179	7,400	85.4	763	535
Lead, filtered (µg/L)	179	2.4	<0.5	[2]0.42	0.24
Lead, unfiltered recoverable (µg/L)	179	250	0.61	9.75	2.31
Manganese, filtered (µg/L)	179	1,700	20.7	273	132
Manganese, unfiltered recoverable (µg/L)	179	1,600	25.9	311	160
Zinc, filtered (µg/L)	179	2,200	5.3	260	65.6
Zinc, unfiltered recoverable (µg/L)	179	2,200	20.5	316	88.0
Arsenic, filtered (µg/L)	179	13.4	2.3	5.9	5.5
Arsenic, unfiltered recoverable (µg/L)	179	45.0	3.0	9.3	8.0
Organic carbon, filtered (mg/L)	21	9.97	4.93	7.16	7.21
Sediment, suspended (percent finer than 0.062 mm)	178	98	42	83	85
Sediment, suspended concentration (mg/L)	178	405	2	18	9
Sediment, suspended discharge (ton/d)	178	70	0.08	2.2	0.61

Table 24. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2015.—Continued

[ft^3/s, cubic feet per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; <, less than laboratory reporting level1; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day; --, indicates either too few samples (less than three) or insufficient data to compute statistic]

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 2015					
Streamflow, instantaneous (ft^3/s)	179	648	13	78	52
pH, onsite (standard units)	181	9.5	7.2	8.4	8.3
Specific conductance, onsite (µS/cm)	181	633	202	414	403
Temperature, water (°C)	181	24.0	-1.0	9.5	9.5
Turbidity, unfiltered, lab (NTRU)	15	12	2.5	4.9	4.0
Hardness, filtered (mg/L as $CaCO_3$)	181	240	60.2	149	148
Calcium, filtered (mg/L)	181	71.6	18.5	44.2	44.0
Magnesium, filtered (mg/L)	181	15.0	3.42	9.44	9.10
Potassium, filtered (mg/L)	52	16.0	1.79	4.60	4.10
Sodium, filtered (mg/L)	52	33.5	5.06	18.1	17.1
Alkalinity, filtered, lab (mg/L)	23	110	71.6	92.4	91.5
Chloride, filtered (mg/L)	51	41.4	3.20	15.9	12.0
Fluoride, filtered (mg/L)	51	0.80	0.16	0.40	0.40
Silica, filtered (mg/L)	51	28.0	9.56	19.9	21.0
Sulfate, filtered (mg/L)	51	190	32.0	65.6	62.0
Cadmium, filtered (µg/L)	180	41.0	<0.1	[2]0.90	0.47
Cadmium, unfiltered recoverable (µg/L)	181	49.0	0.18	[2]1.64	1.00
Copper, filtered (µg/L)	179	450	6.5	37.4	28.8
Copper, unfiltered recoverable (µg/L)	181	3,900	13.6	160	87.2
Iron, filtered (µg/L)	181	397	<3	[2]50.8	30.0
Iron, unfiltered recoverable (µg/L)	180	24,100	114	1,380	730
Lead, filtered (µg/L)	181	5.1	<0.5	[2]0.64	0.31
Lead, unfiltered recoverable (µg/L)	181	650	0.67	30.0	13.0
Manganese, filtered (µg/L)	181	9,300	27.5	342	259
Manganese, unfiltered recoverable (µg/L)	181	10,000	62.8	450	340
Zinc, filtered (µg/L)	180	13,000	11.2	231	110
Zinc, unfiltered recoverable (µg/L)	181	15,000	26.8	409	237
Arsenic, filtered (µg/L)	181	34.0	1.0	10.3	9.7
Arsenic, unfiltered recoverable (µg/L)	181	235	5.5	21.8	16.0
Organic carbon, filtered (mg/L)	20	8.35	3.06	5.46	5.16
Sediment, suspended (percent finer than 0.062 mm)	182	95	37	78	83
Sediment, suspended concentration (mg/L)	182	801	5	46	18
Sediment, suspended discharge (ton/d)	179	781	0.18	20	2.6

Table 24. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2015.—Continued

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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 2015					
Streamflow, instantaneous (ft^3/s)	87	309	7.4	64	38
pH, onsite (standard units)	88	8.6	7.5	8.0	8.0
Specific conductance, onsite (µS/cm)	88	213	56	130	129
Temperature, water (°C)	88	17.0	0.0	8.5	9.0
Turbidity, unfiltered, lab, (NTRU)	81	21	<2.0	[2]2.4	<2.0
Hardness, filtered (mg/L as $CaCO_3$)	88	98.0	23.7	56.8	54.6
Calcium, filtered (mg/L)	88	26.7	7.00	15.8	15.0
Magnesium, filtered (mg/L)	88	8.01	1.45	4.24	4.03
Potassium, filtered (mg/L)	15	0.82	0.47	0.64	0.65
Sodium, filtered (mg/L)	15	6.04	2.14	3.95	3.64
Alkalinity, filtered, lab (mg/L)	15	85.1	30.8	54.1	54.4
Chloride, filtered (mg/L)	15	0.54	0.16	0.30	0.26
Fluoride, filtered (mg/L)	15	0.36	0.28	0.32	0.31
Silica, filtered (mg/L)	15	15.5	9.27	12.3	12.1
Sulfate, filtered (mg/L)	15	13.9	3.12	6.19	5.37
Cadmium, filtered (µg/L)	87	0.11	0.02	[2]0.04	0.04
Cadmium, unfiltered recoverable (µg/L)	88	0.19	0.03	0.07	0.07
Copper, filtered (µg/L)	88	5.1	0.72	2.2	2.1
Copper, unfiltered recoverable (µg/L)	88	10.6	1.3	3.7	3.1
Iron, filtered (µg/L)	88	125	21.2	47.6	41.8
Iron, unfiltered recoverable (µg/L)	88	730	64.9	190	150
Lead, filtered (µg/L)	88	0.36	0.02	[2]0.12	0.11
Lead, unfiltered recoverable (µg/L)	88	3.12	0.15	0.70	0.54
Manganese, filtered (µg/L)	88	12.0	3.1	5.8	5.6
Manganese, unfiltered recoverable (µg/L)	88	36.6	6.2	13.2	11.4
Zinc, filtered (µg/L)	88	4.3	<1.4	[2]1.7	1.4
Zinc, unfiltered recoverable (µg/L)	88	9.2	<2.0	[2]3.0	2.6
Arsenic, filtered (µg/L)	88	32.9	7.3	16.1	14.9
Arsenic, unfiltered recoverable (µg/L)	88	34.8	7.8	17.3	15.6
Organic carbon, filtered (mg/L)	15	3.48	1.29	2.29	2.27
Sediment, suspended (percent finer than 0.062 mm)	88	96	14	62	66
Sediment, suspended concentration (mg/L)	88	42	1	6	3
Sediment, suspended discharge (ton/d)	87	28	0.02	2.0	0.32

Table 24. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2015.—Continued

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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 2015					
Streamflow, instantaneous (ft³/s)	102	261	0.43	38	14
pH, onsite (standard units)	104	8.3	7.5	8.0	8.0
Specific conductance, onsite (µS/cm)	104	242	59	146	146
Temperature, water (°C)	104	20.0	-1.0	9.3	9.5
Turbidity, unfiltered, lab (NTRU)	22	7.2	<2.0	[2]2.1	<2.0
Hardness, filtered (mg/L as $CaCO_3$)	104	112	24.0	62.8	62.2
Calcium, filtered (mg/L)	104	31.0	7.01	17.6	17.4
Magnesium, filtered (mg/L)	104	8.44	1.56	4.56	4.54
Potassium, filtered (mg/L)	22	1.02	0.48	0.70	0.72
Sodium, filtered (mg/L)	22	8.15	2.29	4.41	4.12
Alkalinity, filtered, lab (mg/L)	22	88.2	31.9	56.6	57.6
Chloride, filtered (mg/L)	22	0.82	0.18	0.39	0.32
Fluoride, filtered (mg/L)	22	0.40	0.29	0.34	0.34
Silica, filtered (mg/L)	22	15.5	9.47	12.1	12.0
Sulfate, filtered (mg/L)	22	27.7	4.11	10.4	9.40
Cadmium, filtered (µg/L)	104	0.13	0.02	0.06	0.06
Cadmium, unfiltered recoverable (µg/L)	104	0.86	0.03	0.13	0.09
Copper, filtered (µg/L)	104	6.1	1.0	2.8	2.4
Copper, unfiltered recoverable (µg/L)	104	38.8	1.5	6.0	3.8
Iron, filtered (µg/L)	104	108	15.9	47.6	42.2
Iron, unfiltered recoverable (µg/L)	104	1,960	44.3	280	157
Lead, filtered (µg/L)	104	0.35	<0.08	[2]0.13	0.12
Lead, unfiltered recoverable (µg/L)	104	12.7	0.07	1.30	0.52
Manganese, filtered (µg/L)	104	32.8	2.1	6.6	5.0
Manganese, unfiltered recoverable (µg/L)	104	113	2.9	17.2	12.0
Zinc, filtered (µg/L)	103	7.7	<1.4	[2]2.7	2.5
Zinc, unfiltered recoverable (µg/L)	104	41	<2.0	[2]5.9	4.0
Arsenic, filtered (µg/L)	104	55.1	9.0	20.8	18.6
Arsenic, unfiltered recoverable (µg/L)	104	53.5	10.0	23.5	21.5
Organic carbon, filtered (mg/L)	22	4.10	1.33	2.30	2.19
Sediment, suspended (percent finer than 0.062 mm)	104	91	26	69	71
Sediment, suspended concentration (mg/L)	104	107	1	11	4
Sediment, suspended discharge (ton/d)	102	55	<0.01	[2]3.1	0.12

Table 24. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2015.—Continued

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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 2015					
Streamflow, instantaneous (ft^3/s)	79	114	1.0	15	7.7
pH, onsite (standard units)	81	8.2	7.5	7.7	7.7
Specific conductance, onsite (µS/cm)	81	151	65	103	107
Temperature, water (°C)	81	16.0	0.0	7.4	7.5
Turbidity, unfiltered, lab (NTRU)	74	39	<2.0	[2]5.2	2.8
Hardness, filtered (mg/L as $CaCO_3$)	81	56.3	21.5	37.5	38.5
Calcium, filtered (mg/L)	81	18.3	7.22	12.5	13.0
Magnesium, filtered (mg/L)	81	2.60	0.78	1.51	1.48
Potassium, filtered (mg/L)	15	1.13	0.70	0.94	0.94
Sodium, filtered (mg/L)	15	7.94	4.39	6.00	6.10
Alkalinity, filtered, lab (mg/L)	15	53.5	26.3	41.3	38.9
Chloride, filtered (mg/L)	15	0.83	0.30	0.46	0.38
Fluoride, filtered (mg/L)	15	0.08	0.06	0.07	0.07
Silica, filtered (mg/L)	15	26.9	20.9	24.4	24.8
Sulfate, filtered (mg/L)	15	15.7	5.10	7.7	6.45
Cadmium, filtered (µg/L)	79	0.05	<0.02	[2]0.03	0.03
Cadmium, unfiltered recoverable (µg/L)	81	0.33	<0.03	[2]0.06	0.05
Copper, filtered (µg/L)	81	4.2	0.82	2.2	2.1
Copper, unfiltered recoverable (µg/L)	81	16.8	1.0	3.6	2.9
Iron, filtered (µg/L)	81	277	28	89.6	75.3
Iron, unfiltered recoverable (µg/L)	81	2,380	85.7	347	228
Lead, filtered (µg/L)	81	0.39	0.03	[2]0.16	0.16
Lead, unfiltered recoverable (µg/L)	81	7.96	0.10	0.83	0.50
Manganese, filtered (µg/L)	81	34.5	6.0	13.6	12.1
Manganese, unfiltered recoverable (µg/L)	81	99.9	12.8	24.9	21.7
Zinc, filtered (µg/L)	81	3.3	0.65	[2]1.7	1.5
Zinc, unfiltered recoverable (µg/L)	81	17.8	<2.0	[2]3.0	2.0
Arsenic, filtered (µg/L)	81	25.7	7.7	15.9	14.9
Arsenic, unfiltered recoverable (µg/L)	81	27.0	9.8	16.9	15.4
Organic carbon, filtered (mg/L)	15	7.07	3.44	4.85	4.44
Sediment, suspended (percent finer than 0.062 mm)	81	97	25	77	82
Sediment, suspended concentration (mg/L)	81	195	1	14	4
Sediment, suspended discharge (ton/d)	79	50	<0.01	[2]1.9	0.10

Table 24. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2015.—Continued

[ft^3/s, cubic feet per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; <, less than laboratory reporting level1; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day; --, indicates either too few samples (less than three) or insufficient data to compute statistic]

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 2015					
Streamflow, instantaneous (ft^3/s)	104	116	4.5	17	9.1
pH, onsite (standard units)	104	9.0	7.6	8.1	8.1
Specific conductance, onsite (µS/cm)	104	371	116	263	280
Temperature, water (°C)	104	24.0	0.0	11.1	11.0
Turbidity, unfiltered, lab (NTRU)	22	7.2	<2.0	[2]3.7	3.4
Hardness, filtered (mg/L as $CaCO_3$)	104	169	54.2	114	122
Calcium, filtered (mg/L)	104	47.4	16.5	33.3	35.8
Magnesium, filtered (mg/L)	104	12.3	2.99	7.52	8.00
Potassium, filtered (mg/L)	22	2.28	0.94	1.38	1.38
Sodium, filtered (mg/L)	22	12.2	6.12	9.13	9.04
Alkalinity, filtered, lab (mg/L)	22	127	53.3	99.3	108
Chloride, filtered (mg/L)	22	3.28	0.79	1.78	1.64
Fluoride, filtered (mg/L)	22	0.56	0.15	0.35	0.38
Silica, filtered (mg/L)	22	27.8	18.4	22.6	22.5
Sulfate, filtered (mg/L)	22	36.5	9.21	19.4	19.4
Cadmium, filtered (µg/L)	104	0.12	<0.03	[2]0.04	0.04
Cadmium, unfiltered recoverable (µg/L)	103	0.52	0.02	0.10	0.07
Copper, filtered (µg/L)	104	21.4	0.87	5.1	3.5
Copper, unfiltered recoverable (µg/L)	103	48.8	2.6	10.5	7.7
Iron, filtered (µg/L)	104	274	6.1	51.8	46.3
Iron, unfiltered recoverable (µg/L)	103	1,670	27.4	282	221
Lead, filtered (µg/L)	104	0.89	0.04	[2]0.23	0.20
Lead, unfiltered recoverable (µg/L)	103	14.4	0.27	2.14	1.43
Manganese, filtered (µg/L)	104	200	3.3	32.2	24.8
Manganese, unfiltered recoverable (µg/L)	103	228	4.7	45.2	37.1
Zinc, filtered (µg/L)	104	19.8	<1.4	[2]4.9	4.0
Zinc, unfiltered recoverable (µg/L)	103	68	1.2	11.6	9.0
Arsenic, filtered (µg/L)	104	164	9.3	36.7	25.7
Arsenic, unfiltered recoverable (µg/L)	104	164	11.4	39.1	27.2
Organic carbon, filtered (mg/L)	22	9.75	1.60	4.42	4.10
Sediment, suspended (percent finer than 0.062 mm)	104	99	54	86	90
Sediment, suspended concentration (mg/L)	104	87	1	10	6
Sediment, suspended discharge (ton/d)	104	11	0.01	0.85	0.16

Table 24. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2015.—Continued

[ft^3/s, cubic feet per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; <, less than laboratory reporting level1; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day; --, indicates either too few samples (less than three) or insufficient data to compute statistic]

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 2015					
Streamflow, instantaneous (ft^3/s)	188	1,030	16	138	89
pH, onsite (standard units)	186	9.6	8.0	8.8	8.8
Specific conductance, onsite (µS/cm)	186	783	182	455	465
Temperature, water (°C)	187	25.0	0.0	10.4	10.0
Turbidity, unfiltered, lab (NTRU)	15	11	<2.0	[2]3.4	2.9
Hardness, filtered (mg/L as $CaCO_3$)	186	314	74.9	189	192
Calcium, filtered (mg/L)	186	90.4	22.5	54.9	55.8
Magnesium, filtered (mg/L)	186	21.4	4.52	12.6	13.0
Potassium, filtered (mg/L)	46	8.30	1.72	4.00	3.90
Sodium, filtered (mg/L)	46	23.0	8.20	15.9	16.8
Alkalinity, filtered, lab (mg/L)	18	104	69.2	89.0	92.8
Chloride, filtered (mg/L)	46	21.6	1.30	9.91	9.54
Fluoride, filtered (mg/L)	46	1.20	0.41	0.68	0.68
Silica, filtered (mg/L)	46	20.0	6.30	12.4	12.0
Sulfate, filtered (mg/L)	46	210	39.2	105	97.0
Cadmium, filtered (µg/L)	186	0.31	<0.03	[2]0.06	0.03
Cadmium, unfiltered recoverable (µg/L)	186	0.57	<0.10	[2]0.12	0.07
Copper, filtered (µg/L)	186	40.0	1.6	7.1	5.1
Copper, unfiltered recoverable (µg/L)	186	96.8	2.4	14.6	10.2
Iron, filtered (µg/L)	186	93	<5	[2]20.5	16.8
Iron, unfiltered recoverable (µg/L)	186	3,000	35.8	309	235
Lead, filtered (µg/L)	186	1.0	<0.08	[2]0.13	0.05
Lead, unfiltered recoverable (µg/L)	186	41.8	<1.00	[2]2.20	1.23
Manganese, filtered (µg/L)	186	875	11.8	111	74.0
Manganese, unfiltered recoverable (µg/L)	186	899	24.0	168	130
Zinc, filtered (µg/L)	186	73	<1.0	[2]6.5	3.5
Zinc, unfiltered recoverable (µg/L)	186	180	2.0	[2]27.1	14.1
Arsenic, filtered (µg/L)	186	60.0	6.8	22.6	22.1
Arsenic, unfiltered recoverable (µg/L)	186	94.0	10.0	26.1	24.7
Organic carbon, filtered (mg/L)	15	5.91	3.80	4.70	4.69
Sediment, suspended (percent finer than 0.062 mm)	187	98	43	83	86
Sediment, suspended concentration (mg/L)	188	229	1	9	6
Sediment, suspended discharge (ton/d)	188	279	0.05	5.7	1.4

Table 24. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2015.—Continued

[ft^3/s, cubic feet 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; --, indicates either too few samples (less than three) or insufficient data to compute statistic]

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 2015					
Streamflow, instantaneous (ft^3/s)	60	573	41	138	92
pH, onsite (standard units)	60	8.8	7.8	8.4	8.4
Specific conductance, onsite (µS/cm)	60	278	125	221	236
Temperature, water (°C)	60	16.0	0.5	8.4	8.5
Turbidity, unfiltered, lab (NTRU)	54	18	<2.0	[2]2.0	<2.0
Hardness, filtered (mg/L as $CaCO_3$)	60	145	58.5	108	114
Calcium, filtered (mg/L)	60	42.8	18.5	32.5	34.2
Magnesium, filtered (mg/L)	60	9.34	2.96	6.63	6.99
Potassium, filtered (mg/L)	11	1.34	0.80	1.12	1.17
Sodium, filtered (mg/L)	11	3.44	1.54	2.65	2.83
Alkalinity, filtered, lab (mg/L)	11	126	60.3	102	111
Chloride, filtered (mg/L)	11	1.53	0.49	1.00	1.06
Fluoride, filtered (mg/L)	11	0.42	0.30	0.36	0.37
Silica, filtered (mg/L)	11	10.9	8.25	9.86	9.70
Sulfate, filtered (mg/L)	11	15.9	7.98	11.9	12.0
Cadmium, filtered (µg/L)	60	0.04	<0.02	[2]0.02	0.02
Cadmium, unfiltered recoverable (µg/L)	60	0.14	<0.02	[2]0.03	0.02
Copper, filtered (µg/L)	59	6.4	<0.80	[2]1.1	0.88
Copper, unfiltered recoverable (µg/L)	60	28.0	<0.80	[2]3.2	2.0
Iron, filtered (µg/L)	60	37.0	<4	[2]7.8	6.1
Iron, unfiltered recoverable (µg/L)	60	1,000	19.1	122	74.8
Lead, filtered (µg/L)	60	0.11	<0.02	[2]0.03	<0.08
Lead, unfiltered recoverable (µg/L)	60	3.51	0.07	0.42	0.24
Manganese, filtered (µg/L)	60	2.8	0.13	[2]1.2	1.1
Manganese, unfiltered recoverable (µg/L)	60	45.2	0.90	5.8	4.0
Zinc, filtered (µg/L)	60	5.6	<1.4	[2]1.0	<2.0
Zinc, unfiltered recoverable (µg/L)	60	20.1	<2.0	[2]3.2	1.7
Arsenic, filtered (µg/L)	60	3.9	1.3	2.2	2.1
Arsenic, unfiltered recoverable (µg/L)	60	5.6	1.5	2.6	2.5
Organic carbon, filtered (mg/L)	11	2.92	0.83	1.41	1.28
Sediment, suspended (percent finer than 0.062 mm)	60	84	32	66	66
Sediment, suspended concentration (mg/L)	60	65	1	7	4
Sediment, suspended discharge (ton/d)	60	68	0.13	4.4	0.94

Table 24. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2015.—Continued

[ft^3/s, cubic feet per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; <, less than laboratory reporting level1; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day; --, indicates either too few samples (less than three) or insufficient data to compute statistic]

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 2015					
Streamflow, instantaneous (ft^3/s)	144	420	2.8	96	57
pH, onsite (standard units)	143	8.7	7.4	8.2	8.2
Specific conductance, onsite (µS/cm)	143	795	139	292	299
Temperature, water (°C)	144	20.0	0.0	8.4	8.0
Turbidity, unfiltered, lab (NTRU)	22	11	<2.0	[2]2.1	<2.0
Hardness, filtered (mg/L as $CaCO_3$)	143	415	39.8	142	146
Calcium, filtered (mg/L)	143	130	10.5	43.4	44.1
Magnesium, filtered (mg/L)	143	22.0	3.29	8.26	8.38
Potassium, filtered (mg/L)	41	4.70	0.83	1.51	1.37
Sodium, filtered (mg/L)	41	19.2	1.78	3.83	3.31
Alkalinity, filtered, lab (mg/L)	24	149	66.8	116	126
Chloride, filtered (mg/L)	41	3.60	0.50	1.29	1.07
Fluoride, filtered (mg/L)	41	0.60	0.30	0.42	0.40
Silica, filtered (mg/L)	41	13.0	8.40	10.3	10.0
Sulfate, filtered (mg/L)	41	270	15.3	49.8	35.9
Cadmium, filtered (µg/L)	142	0.10	<0.04	[2]0.04	0.03
Cadmium, unfiltered recoverable (µg/L)	142	0.41	<0.03	[2]0.08	0.04
Copper, filtered (µg/L)	142	16.0	1.0	3.2	2.7
Copper, unfiltered recoverable (µg/L)	142	147	2.3	18.2	8.8
Iron, filtered (µg/L)	143	36.8	<5.0	[2]12.3	10.7
Iron, unfiltered recoverable (µg/L)	143	2,110	17.2	294	119
Lead, filtered (µg/L)	142	1.8	<0.025	[2]0.07	<1.0
Lead, unfiltered recoverable (µg/L)	142	14.0	<1.00	[2]1.79	0.56
Manganese, filtered (µg/L)	142	570	18.8	106	78.2
Manganese, unfiltered recoverable (µg/L)	142	1,400	37.1	184	139
Zinc, filtered (µg/L)	142	10	<1.0	[2]2.0	1.1
Zinc, unfiltered recoverable (µg/L)	143	60	<2.0	[2]8.5	3.1
Arsenic, filtered (µg/L)	142	14.0	2.0	5.0	4.4
Arsenic, unfiltered recoverable (µg/L)	142	27.0	3.0	7.2	6.0
Organic carbon, filtered (mg/L)	22	3.27	0.89	1.59	1.50
Sediment, suspended (percent finer than 0.062 mm)	144	95	43	71	71
Sediment, suspended concentration (mg/L)	144	127	1	17	7
Sediment, suspended discharge (ton/d)	144	87	0.03	7.9	1.0

Table 24. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2015.—Continued

[ft^3/s, cubic feet per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; <, less than laboratory reporting level1; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day; --, indicates either too few samples (less than three) or insufficient data to compute statistic]

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 2015					
Streamflow, instantaneous (ft^3/s)	228	1,380	14	222	143
pH, onsite (standard units)	216	9.2	7.5	8.5	8.6
Specific conductance, onsite (µS/cm)	217	720	182	406	414
Temperature, water (°C)	228	23.5	0.0	9.8	10.0
Hardness, filtered (mg/L as $CaCO_3$)	215	365	76.4	177	183
Calcium, filtered (mg/L)	215	110	23.2	52.4	54.0
Magnesium, filtered (mg/L)	215	22.0	4.44	11.3	11.6
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	6.47	6.22
Fluoride, filtered (mg/L)	32	1.10	0.40	0.62	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)	215	1.0	<0.03	[2]0.06	0.03
Cadmium, unfiltered recoverable (µg/L)	215	3.0	<0.1	[2]0.17	0.06
Copper, filtered (µg/L)	215	50.0	1.4	7.2	5.3
Copper, unfiltered recoverable (µg/L)	214	240	4.1	25.4	14.6
Iron, filtered (µg/L)	215	110	<3.0	[2]16.4	12.4
Iron, unfiltered recoverable (µg/L)	215	9,200	56.2	447	260
Lead, filtered (µg/L)	215	3.00	<0.08	[2]0.14	<1.00
Lead, unfiltered recoverable (µg/L)	215	31.0	<1.00	[2]3.18	1.72
Manganese, filtered (µg/L)	215	460	13.1	98.0	71.0
Manganese, unfiltered recoverable (µg/L)	215	1,400	40.9	204	156
Zinc, filtered (µg/L)	215	110	<1.0	[2]7.9	3.5
Zinc, unfiltered recoverable (µg/L)	215	360	2.7	[2]33.4	20.0
Arsenic, filtered (µg/L)	215	53.0	4.0	14.9	14.0
Arsenic, unfiltered recoverable (µg/L)	215	78.0	3.0	18.8	16.8
Sediment, suspended (percent finer than 0.062 mm)	228	97	32	76	77
Sediment, suspended concentration (mg/L)	229	338	1	17	8
Sediment, suspended discharge (ton/d)	228	459	0.12	19	2.9

Table 24. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2015.—Continued

[ft^3/s, cubic feet per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; <, less than laboratory reporting level1; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day; --, indicates either too few samples (less than three) or insufficient data to compute statistic]

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 2015					
Streamflow, instantaneous (ft^3/s)	87	73	0.37	12	9.2
pH, onsite (standard units)	87	8.6	7.4	8.1	8.2
Specific conductance, onsite (µS/cm)	87	253	121	199	211
Temperature, water (°C)	87	17.0	0.0	7.8	8.0
Turbidity, unfiltered, lab (NTRU)	87	24,200	<2.0	[2]280	<2.0
Hardness, filtered (mg/L as $CaCO_3$)	87	122	50.4	95.6	102
Calcium, filtered (mg/L)	87	37.1	15.7	29.0	30.3
Magnesium, filtered (mg/L)	87	7.47	2.71	5.64	5.92
Potassium, filtered (mg/L)	22	1.46	0.88	1.23	1.26
Sodium, filtered (mg/L)	22	3.68	1.87	2.86	2.80
Alkalinity, filtered, lab (mg/L)	22	118	59.5	95.8	100
Chloride, filtered (mg/L)	22	2.13	0.51	0.80	0.72
Fluoride, filtered (mg/L)	22	0.49	0.28	0.40	0.40
Silica, filtered (mg/L)	22	12.3	9.65	11.2	11.2
Sulfate, filtered (mg/L)	22	13.8	5.89	8.87	8.26
Cadmium, filtered (µg/L)	85	0.90	<0.02	[2]0.04	0.02
Cadmium, unfiltered recoverable (µg/L)	86	147	<0.02	[2]1.8	0.04
Copper, filtered (µg/L)	86	90.5	0.80	2.9	1.7
Copper, unfiltered recoverable (µg/L)	86	29,100	1.3	345	4.5
Iron, filtered (µg/L)	86	26.5	<6.0	[2]10.2	9.0
Iron, unfiltered recoverable (µg/L)	86	99,700	22.3	1,350	112
Lead, filtered (µg/L)	86	0.18	<0.02	[2]0.04	<0.12
Lead, unfiltered recoverable (µg/L)	86	1,290	0.08	15.8	0.48
Manganese, filtered (µg/L)	86	42.4	<0.2	[2]1.9	1.4
Manganese, unfiltered recoverable (µg/L)	86	8,830	1.2	110	4.8
Zinc, filtered (µg/L)	85	30.0	<1.4	[2]1.6	<2.8
Zinc, unfiltered recoverable (µg/L)	85	7,780	<2	[2]95.0	2.2
Arsenic, filtered (µg/L)	86	156	1.8	5.9	3.4
Arsenic, unfiltered recoverable (µg/L)	86	3,860	2.0	49.5	3.9
Organic carbon, filtered (mg/L)	22	3.84	0.90	1.78	1.66
Sediment, suspended (percent finer than 0.062 mm)	87	97	22	57	59
Sediment, suspended concentration (mg/L)	87	58,900	1	689	6
Sediment, suspended discharge (ton/d)	87	1,320	<0.01	[2]16	0.13

Table 24. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2015.—Continued

[ft³/s, cubic feet per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; <, less than laboratory reporting level1; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day; --, indicates either too few samples (less than three) or insufficient data to compute statistic]

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 2015					
Streamflow, instantaneous (ft³/s)	102	71	1.3	24	18
pH, onsite (standard units)	104	8.7	7.9	8.3	8.3
Specific conductance, onsite (µS/cm)	104	934	540	639	627
Temperature, water (°C)	104	26.5	0.0	10.3	10.0
Turbidity, unfiltered, lab (NTRU)	15	5.4	<2.0	[2]1.7	<2.0
Hardness, filtered (mg/L as $CaCO_3$)	104	451	203	304	300
Calcium, filtered (mg/L)	104	122	48.5	86.1	86.1
Magnesium, filtered (mg/L)	104	35.7	17.3	21.5	20.9
Potassium, filtered (mg/L)	15	3.68	2.05	2.57	2.40
Sodium, filtered (mg/L)	15	31.5	10.1	16.1	12.9
Alkalinity, filtered, lab (mg/L)	15	224	166	191	186
Chloride, filtered (mg/L)	15	5.62	3.90	4.74	4.71
Fluoride, filtered (mg/L)	15	0.78	0.44	0.55	0.50
Silica, filtered (mg/L)	15	19.9	11.7	16.1	15.7
Sulfate, filtered (mg/L)	15	200	95.3	137	135
Cadmium, filtered (µg/L)	103	0.05	<0.02	[2]0.03	0.02
Cadmium, unfiltered recoverable (µg/L)	104	0.12	<0.02	[2]0.04	0.03
Copper, filtered (µg/L)	104	6.7	0.80	2.1	1.9
Copper, unfiltered recoverable (µg/L)	104	22.5	1.5	5.2	4.1
Iron, filtered (µg/L)	104	84.5	4.0	[2]14.7	11.6
Iron, unfiltered recoverable (µg/L)	104	392	14.0	106	82.0
Lead, filtered (µg/L)	103	0.33	<0.025	[2]0.05	0.03
Lead, unfiltered recoverable (µg/L)	104	1.90	0.04	0.40	0.28
Manganese, filtered (µg/L)	104	54.0	1.91	16.0	14.9
Manganese, unfiltered recoverable (µg/L)	104	56.5	2.20	21.0	19.8
Zinc, filtered (µg/L)	103	3.8	<1.0	[2]1.5	1.1
Zinc, unfiltered recoverable (µg/L)	104	10.3	<2.0	[2]2.9	2.0
Arsenic, filtered (µg/L)	104	41.8	6.0	14.1	12.6
Arsenic, unfiltered recoverable (µg/L)	104	43.0	6.0	15.0	13.4
Organic carbon, filtered (mg/L)	15	4.33	1.48	2.32	2.16
Sediment, suspended (percent finer than 0.062 mm)	104	94	18	61	64
Sediment, suspended concentration (mg/L)	104	79	2	16	15
Sediment, suspended discharge (ton/d)	102	4.2	0.01	1.0	0.71

Table 24. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2015.—Continued

[ft^3/s, cubic feet per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; <, less than laboratory reporting level1; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day; --, indicates either too few samples (less than three) or insufficient data to compute statistic]

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 2015					
Streamflow, instantaneous (ft^3/s)	281	2,000	23	306	229
pH, onsite (standard units)	229	8.9	7.4	8.3	8.3
Specific conductance, onsite (µS/cm)	264	642	228	465	490
Temperature, water (°C)	280	23.0	0.0	10.1	10.5
Hardness, filtered (mg/L as $CaCO_3$)	221	282	94.9	197	206
Calcium, filtered (mg/L)	221	82.0	28.2	58.3	60.7
Magnesium, filtered (mg/L)	221	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)	230	2.0	<0.10	[2]0.08	0.04
Cadmium, unfiltered recoverable (µg/L)	230	5.0	<0.10	[2]0.36	0.10
Copper, filtered (µg/L)	231	120	3.2	10.3	7.8
Copper, unfiltered recoverable (µg/L)	229	1,500	8.2	74.7	34.0
Iron, filtered (µg/L)	231	190	<3	[2]15.3	10.0
Iron, unfiltered recoverable (µg/L)	231	29,000	27.2	1,340	494
Lead, filtered (µg/L)	231	6.00	<0.04	[2]0.29	<5.00
Lead, unfiltered recoverable (µg/L)	231	200	0.33	[2]9.84	4.08
Manganese, filtered (µg/L)	231	400	1.0	40.1	31.7
Manganese, unfiltered recoverable (µg/L)	231	4,600	11.9	212	124
Zinc, filtered (µg/L)	231	230	<10.0	[2]10.8	7.0
Zinc, unfiltered recoverable (µg/L)	229	1,700	4.0	76.6	35.8
Arsenic, filtered (µg/L)	231	39.0	6.0	14.4	13.4
Arsenic, unfiltered recoverable (µg/L)	230	215	4.8	23.1	17.0
Sediment, suspended (percent finer than 0.062 mm)	272	99	31	72	73
Sediment, suspended concentration (mg/L)	281	2,250	1	64	21
Sediment, suspended discharge (ton/d)	281	8,690	0.18	133	12

Table 24. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2015.—Continued

[ft³/s, cubic feet per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; <, less than laboratory reporting level1; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day; --, indicates either too few samples (less than three) or insufficient data to compute statistic]

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 2015					
Streamflow, instantaneous (ft^3/s)	54	2,310	69	444	306
pH, onsite (standard units)	54	8.9	7.9	8.4	8.4
Specific conductance, onsite (µS/cm)	54	527	249	414	444
Temperature, water (°C)	54	22.0	1.0	11.9	13.0
Hardness, filtered (mg/L as $CaCO_3$)	54	228	104	182	196
Calcium, filtered (mg/L)	54	66.5	31.8	53.2	56.8
Magnesium, filtered (mg/L)	54	15.5	5.93	12.0	13.2
Cadmium, filtered (µg/L)	54	0.23	0.02	0.07	0.07
Cadmium, unfiltered recoverable (µg/L)	54	0.84	0.03	0.26	0.18
Copper, filtered (µg/L)	54	40.6	2.8	9.4	7.9
Copper, unfiltered recoverable (µg/L)	54	222	10.0	57.9	33.8
Iron, filtered (µg/L)	54	64.4	4.5	18.2	14.6
Iron, unfiltered recoverable (µg/L)	53	3,860	40.7	885	541
Lead, filtered (µg/L)	54	0.72	0.04	0.17	0.13
Lead, unfiltered recoverable (µg/L)	54	32.3	0.33	7.5	4.08
Manganese, filtered (µg/L)	54	65.1	8.56	28.5	24.0
Manganese, unfiltered recoverable (µg/L)	54	344	13.4	117	100
Zinc, filtered (µg/L)	54	37.1	1.9	5.9	5.0
Zinc, unfiltered recoverable (µg/L)	54	181	3.0	47.0	28.8
Arsenic, filtered (µg/L)	54	36.7	7.8	15.1	15.5
Arsenic, unfiltered recoverable (µg/L)	54	46.0	10.5	21.2	17.9
Sediment, suspended (percent finer than 0.062 mm)	54	92	42	73	75
Sediment, suspended concentration (mg/L)	54	205	1	43	24
Sediment, suspended discharge (ton/d)	54	550	0.31	82	22

Table 24. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2015.—Continued

[ft^3/s, cubic feet per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; <, less than laboratory reporting level1; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day; --, indicates either too few samples (less than three) or insufficient data to compute statistic]

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 2015					
Streamflow, instantaneous (ft^3/s)	187	4,450	87	766	513
pH, onsite (standard units)	186	9.1	7.9	8.4	8.3
Specific conductance, onsite (µS/cm)	186	510	206	366	376
Temperature, water (°C)	187	23.0	0.0	10.3	10.5
Hardness, filtered (mg/L as $CaCO_3$)	186	232	85.8	161	169
Calcium, filtered (mg/L)	186	68.0	25.9	47.5	49.4
Magnesium, filtered (mg/L)	186	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)	186	0.2	<0.02	[2]0.04	0.02
Cadmium, unfiltered recoverable (µg/L)	186	2.0	<0.10	[2]0.17	0.08
Copper, filtered (µg/L)	185	36.0	2.1	6.5	5.3
Copper, unfiltered recoverable (µg/L)	185	440	5.2	38.2	21.5
Iron, filtered (µg/L)	186	100	<3	[2]19.9	12.9
Iron, unfiltered recoverable (µg/L)	186	12,000	27.3	817	416
Lead, filtered (µg/L)	184	0.68	<0.04	[2]0.12	<1.00
Lead, unfiltered recoverable (µg/L)	185	73.0	0.14	[2]5.29	2.76
Manganese, filtered (µg/L)	186	57.3	4.0	18.6	16.4
Manganese, unfiltered recoverable (µg/L)	186	1,100	9.3	113	80.8
Zinc, filtered (µg/L)	186	26	<1.0	[2]5.2	3.7
Zinc, unfiltered recoverable (µg/L)	186	510	2	40.3	26.7
Arsenic, filtered (µg/L)	186	22.5	5.6	10.0	9.8
Arsenic, unfiltered recoverable (µg/L)	186	75.0	7.0	14.5	12.0
Sediment, suspended (percent finer than 0.062 mm)	187	94	43	75	78
Sediment, suspended concentration (mg/L)	187	752	1	46	19
Sediment, suspended discharge (ton/d)	187	7,960	0.55	192	27

Table 24. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2015.—Continued

[ft^3/s, cubic feet per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; <, less than laboratory reporting level1; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day; --, indicates either too few samples (less than three) or insufficient data to compute statistic]

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 2015					
Streamflow, instantaneous (ft^3/s)	187	5,540	149	1,050	768
pH, onsite (standard units)	186	8.7	7.8	8.3	8.2
Specific conductance, onsite (µS/cm)	186	630	189	407	418
Temperature, water (°C)	187	22.5	0.5	11.0	11.0
Hardness, filtered (mg/L as $CaCO_3$)	186	298	73.9	183	190
Calcium, filtered (mg/L)	186	83.0	21.0	52.6	54.4
Magnesium, filtered (mg/L)	186	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)	185	0.30	<0.03	[2]0.05	0.03
Cadmium, unfiltered recoverable (µg/L)	186	2.0	<0.03	[2]0.22	0.08
Copper, filtered (µg/L)	183	21.0	1.0	6.3	4.9
Copper, unfiltered recoverable (µg/L)	184	360	4.6	40.1	21.8
Iron, filtered (µg/L)	186	150	<3	[2]18.7	10.0
Iron, unfiltered recoverable (µg/L)	185	8,800	19.7	937	461
Lead, filtered (µg/L)	182	1.2	<0.04	[2]0.16	0.05
Lead, unfiltered recoverable (µg/L)	182	56.0	0.17	[2]7.08	3.45
Manganese, filtered (µg/L)	185	60.7	3.3	16.6	14.9
Manganese, unfiltered recoverable (µg/L)	186	880	8.0	136	88.4
Zinc, filtered (µg/L)	186	21.0	<1.4	[2]5.6	4.3
Zinc, unfiltered recoverable (µg/L)	186	490	2.9	54.4	30.0
Arsenic, filtered (µg/L)	186	23.9	3.2	10.5	10.0
Arsenic, unfiltered recoverable (µg/L)	186	62	7.7	15.6	12.8
Sediment, suspended (percent finer than 0.062 mm)	187	93	38	74	75
Sediment, suspended concentration (mg/L)	187	530	2	58	25
Sediment, suspended discharge (ton/d)	187	4,720	1.7	293	47

Table 24. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2015.—Continued

[ft^3/s, cubic feet per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; <, less than laboratory reporting level1; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day; --, indicates either too few samples (less than three) or insufficient data to compute statistic]

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 2015					
Streamflow, instantaneous (ft^3/s)	284	10,600	296	1,960	1,190
pH, onsite (standard units)	230	8.8	7.4	8.2	8.2
Specific conductance, onsite (µS/cm)	259	483	139	297	310
Temperature, water (°C)	283	22.0	0.0	9.6	10.0
Hardness, filtered (mg/L as $CaCO_3$)	220	205	53.6	130	132
Calcium, filtered (mg/L)	220	59.0	14.9	36.7	37.0
Magnesium, filtered (mg/L)	220	14.0	3.95	9.38	9.40
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)	228	0.10	<0.02	[2]0.03	<1
Cadmium, unfiltered recoverable (µg/L)	229	4.00	<0.01	[2]0.22	0.03
Copper, filtered (µg/L)	228	25.0	1.1	4.6	3.4
Copper, unfiltered recoverable (µg/L)	227	500	2.7	30.9	14.0
Iron, filtered (µg/L)	229	359	<3	[2]24.8	14.3
Iron, unfiltered recoverable (µg/L)	229	19,000	32.6	915	356
Lead, filtered (µg/L)	225	7.00	<.02	[2]0.26	<1.00
Lead, unfiltered recoverable (µg/L)	225	100	<1.00	[2]6.18	2.33
Manganese, filtered (µg/L)	229	48.6	<1.0	[2]8.4	7.0
Manganese, unfiltered recoverable (µg/L)	229	2,000	8.9	110	57.3
Zinc, filtered (µg/L)	227	39	<2.0	[2]5.5	3.9
Zinc, unfiltered recoverable (µg/L)	229	1,100	2.9	[2]52.1	22.7
Arsenic, filtered (µg/L)	229	17.0	2.7	6.0	5.5
Arsenic, unfiltered recoverable (µg/L)	229	110	3.0	9.3	7.0
Sediment, suspended (percent finer than 0.062 mm)	273	98	27	74	76
Sediment, suspended concentration (mg/L)	284	1,370	2	52	18
Sediment, suspended discharge (ton/d)	284	34,700	3.0	587	60

Table 24. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2015.—Continued

[ft^3/s, cubic feet per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; <, less than laboratory reporting level1; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day; --, indicates either too few samples (less than three) or insufficient data to compute statistic]

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 2015					
Streamflow, instantaneous (ft^3/s)	208	13,400	344	2,780	1,380
pH, onsite (standard units)	168	8.7	7.5	8.3	8.3
Specific conductance, onsite (µS/cm)	185	294	131	209	204
Temperature, water (°C)	208	22.5	0.0	9.7	10.0
Turbidity, unfiltered, lab (NTRU)	7	30	<2.0	[2]7.2	2.0
Hardness, filtered (mg/L as $CaCO_3$)	160	146	55.1	104	98.6
Calcium, filtered (mg/L)	160	37.7	14.0	26.5	25.4
Magnesium, filtered (mg/L)	160	13.2	4.90	9.17	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)	166	1.00	<0.02	[2]0.02	<0.10
Cadmium, unfiltered recoverable (µg/L)	168	2.00	<0.01	[2]0.08	<1.00
Copper, filtered (µg/L)	164	7.0	<0.80	[2]1.2	0.70
Copper, unfiltered recoverable (µg/L)	165	34.0	<0.70	[2]4.1	1.7
Iron, filtered (µg/L)	167	104	<3	[2]17.8	10.2
Iron, unfiltered recoverable (µg/L)	168	3,600	13.9	389	172
Lead, filtered (µg/L)	162	8.00	<0.02	[2]0.26	<0.50
Lead, unfiltered recoverable (µg/L)	163	25.0	<0.04	[2]1.93	0.09
Manganese, filtered (µg/L)	167	11.0	<1.0	[2]2.4	2.0
Manganese, unfiltered recoverable (µg/L)	168	180	<10.0	[2]26.9	15.0
Zinc, filtered (µg/L)	166	15.0	<0.60	[2]1.8	<3.0
Zinc, unfiltered recoverable (µg/L)	168	60.0	<1.0	[2]4.7	<10.0
Arsenic, filtered (µg/L)	167	2.0	<1.0	[2]0.97	0.96
Arsenic, unfiltered recoverable (µg/L)	168	4.0	<1.0	[2]1.3	1.0
Sediment, suspended (percent finer than 0.062 mm)	206	98	42	80	82
Sediment, suspended concentration (mg/L)	208	271	1	28	8
Sediment, suspended discharge (ton/d)	208	7,670	1.1	499	31

Table 24. Statistical summary of long-term water-quality data for the Clark Fork Basin, Montana, March 1985 through September 2015.—Continued

[ft^3/s, cubic feet per second; µS/cm, microsiemen per centimeter at 25 °C; °C, degrees Celsius; lab, laboratory; NTRU, nephelometric turbidity ratio unit; <, less than laboratory reporting level1; mg/L, milligram per liter; $CaCO_3$, calcium carbonate; µg/L, microgram per liter; mm, millimeter; ton/d, ton per day; --, indicates either too few samples (less than three) or insufficient data to compute statistic]

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 2015					
Streamflow, instantaneous (ft^3/s)	249	22,900	720	4,630	2,520
pH, onsite (standard units)	207	8.8	7.9	8.3	8.3
Specific conductance, onsite (µS/cm)	227	399	142	251	259
Temperature, water (°C)	247	22.0	0.0	9.8	9.5
Turbidity, unfiltered, lab (NTRU)	40	100	<2.0	[2]13	4.9
Hardness, filtered (mg/L as $CaCO_3$)	207	168	60.5	116	117
Calcium, filtered (mg/L)	207	46.0	14.0	31.3	31.2
Magnesium, filtered (mg/L)	207	13.4	5.28	9.19	9.15
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)	206	0.20	<0.02	[2]0.03	<0.10
Cadmium, unfiltered recoverable (µg/L)	207	5.0	<0.01	[2]0.14	<1.0
Copper, filtered (µg/L)	206	12.6	0.7	2.7	2.0
Copper, unfiltered recoverable (µg/L)	205	400	1.9	17.8	8.0
Iron, filtered (µg/L)	207	200	<3	[2]21.5	14.9
Iron, unfiltered recoverable (µg/L)	207	13,000	40.9	588	247
Lead, filtered (µg/L)	200	1.20	<0.02	[2]0.12	<1.00
Lead, unfiltered recoverable (µg/L)	202	78.0	<1.00	[2]3.14	1.29
Manganese, filtered (µg/L)	207	230	3.5	14.8	12.9
Manganese, unfiltered recoverable (µg/L)	207	1,100	8.8	61.0	40.0
Zinc, filtered (µg/L)	206	16.0	<1.0	[2]3.3	2.3
Zinc, unfiltered recoverable (µg/L)	207	1,100	<3.0	[2]30.2	12.0
Arsenic, filtered (µg/L)	207	9.0	1.0	3.4	3.2
Arsenic, unfiltered recoverable (µg/L)	207	69.0	1.0	5.2	4.0
Sediment, suspended (percent finer than 0.062 mm)	245	99	14	82	87
Sediment, suspended concentration (mg/L)	250	950	2	41	12
Sediment, suspended discharge (ton/d)	249	21,900	5.8	1,050	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 25. Statistical summary of long-term bed-sediment data for the Clark Fork Basin, Montana, August 1986 through August 2015.

[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: 1992–2015					
Arsenic	13	186	27	95	73
Cadmium	24	43.9	5.9	25.5	26.3
Chromium	22	50.7	16.8	29.5	25.9
Copper	24	9,020	522	3,460	3,640
Iron	24	45,300	28,200	34,700	33,700
Lead	24	1,030	112	535	520
Manganese	24	9,220	1,160	3,170	2,680
Nickel	23	21.4	12.0	14.9	14.8
Silver	12	20.0	8.3	15.5	15.8
Zinc	24	13,400	1,490	6,120	6,760
12323750—Silver Bow Creek at Warm Springs Period of record for bed-sediment data: 1992–2015					
Arsenic	13	177	67	113	103
Cadmium	24	12.2	4.2	6.9	6.5
Chromium	22	46.8	<15.7	[1]23.9	[1]23.2
Copper	24	769	169	339	295
Iron	24	32,500	15,400	23,800	23,000
Lead	24	100	49	71	72
Manganese	24	17,700	1,470	7,460	7,280
Nickel	23	20.0	9.2	14.9	14.6
Silver	12	4.4	0.3	[1]1.9	[1]1.8
Zinc	24	2,220	554	883	687
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	3.1
Chromium	8	39.3	24.1	31.1	31.1
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	19.6	19.2
Silver	4	5.1	3.1	3.8	3.5
Zinc	8	453	237	379	385

Table 25. Statistical summary of long-term bed-sediment data for the Clark Fork Basin, Montana, August 1986 through August 2015.—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, 1991–2015					
Arsenic	13	156	73	109	107
Cadmium	26	20.1	3.8	7.7	6.4
Chromium	22	44.6	19.1	29.0	26.7
Copper	26	2,300	838	1,180	1,110
Iron	26	39,800	22,600	27,900	27,200
Lead	26	235	92	130	127
Manganese	26	17,300	1,530	8,500	7,400
Nickel	23	23.2	13.9	18.6	18.3
Silver	14	7.3	<3.2	[1]4.4	[1]4.5
Zinc	26	3,560	721	1,340	1,110
461415112450801—Clark Fork below Lost Creek, near Galen Period of record for bed-sediment data: 1996–2015					
Arsenic	13	204	90	121	109
Cadmium	20	10.5	4.8	6.6	6.2
Chromium	19	42.4	17.2	29.1	27.5
Copper	20	2,050	1,150	1,490	1,460
Iron	20	32,800	24,400	29,000	29,200
Lead	20	218	123	162	164
Manganese	20	9,820	1,430	5,190	4,940
Nickel	20	19.9	11.7	15.8	16.2
Silver	8	7.8	4.2	6.5	6.7
Zinc	20	1,680	930	1,250	1,190
461559112443301—Clark Fork at county bridge, near Racetrack Period of record for bed-sediment data: 1996–2015					
Arsenic	13	132	56	93	90
Cadmium	20	8.7	4.6	6.3	5.9
Chromium	19	45.2	14.4	28.3	27.6
Copper	20	1,810	933	1,270	1,290
Iron	20	31,700	21,200	27,300	28,100
Lead	20	186	103	141	139
Manganese	20	6,310	1,600	3,240	3,090
Nickel	20	18.4	10.3	14.2	14.5
Silver	8	6.1	<3.3	[1]5.0	[1]5.4
Zinc	20	1,550	911	1,160	1,130

Table 25. Statistical summary of long-term bed-sediment data for the Clark Fork Basin, Montana, August 1986 through August 2015.—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: 1996–2015					
Arsenic	13	109	58	82	80
Cadmium	20	10.3	4.1	6.1	5.5
Chromium	19	39.2	15.7	26.7	25.6
Copper	20	1,580	721	1,120	1,100
Iron	20	33,700	20,600	27,000	26,600
Lead	20	155	92	130	133
Manganese	20	8,370	1,200	3,680	3,200
Nickel	20	16.9	8.7	12.8	12.5
Silver	8	6.2	2.7	4.9	5.0
Zinc	20	1,570	900	1,110	1,080
12324200—Clark Fork at Deer Lodge Period of record for bed-sediment data: 1986–87, 1990–2015					
Arsenic	13	102	49	75	72
Cadmium	28	10.0	3.5	5.8	5.0
Chromium	22	50.7	19.5	32.0	28.3
Copper	28	4,180	683	1,230	1,070
Iron	28	35,300	21,100	27,300	26,300
Lead	28	242	103	142	140
Manganese	28	6,020	1,070	2,520	2,360
Nickel	23	21.1	11.5	14.7	14.3
Silver	16	7.9	2.4	4.7	4.5
Zinc	28	1,730	844	1,160	1,050
12324400—Clark Fork above Little Blackfoot River, near Garrison Period of record for bed-sediment data: 2009-2015					
Arsenic	7	91	49	71	81
Cadmium	7	5.5	4.1	4.6	4.5
Chromium	7	52.8	15.0	34.5	39.0
Copper	7	1,290	666	1,040	1,200
Iron	7	32,400	16,800	25,100	26,500
Lead	7	145	92	121	132
Manganese	7	3,560	1,150	2,570	2,670
Nickel	7	17.2	9.2	13.2	13.9
Silver	0	--	--	--	--
Zinc	7	1,240	780	1,020	1,100

Table 25. Statistical summary of long-term bed-sediment data for the Clark Fork Basin, Montana, August 1986 through August 2015.—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: 1992–2015					
Arsenic	13	62	23	40	36
Cadmium	24	8.1	2.0	4.3	3.9
Chromium	22	55.3	9.9	31.6	30.5
Copper	24	1,080	281	658	681
Iron	24	32,100	11,500	22,900	23,900
Lead	24	152	45	91	93
Manganese	24	2,730	977	1,820	1,810
Nickel	23	18.6	7.6	13.5	14.1
Silver	12	4.8	2.3	3.2	3.2
Zinc	24	1,320	427	870	874
12331800—Clark Fork near Drummond Period of record for bed-sediment data: 1986–87, 1991–2015					
Arsenic	13	66	17	37	33
Cadmium	27	7.7	1.7	4.1	4.1
Chromium	22	41.9	9.2	27.1	28.6
Copper	27	747	183	464	460
Iron	27	44,000	14,800	24,600	23,200
Lead	27	135	27	84	83
Manganese	27	4,820	832	1,980	1,810
Nickel	23	16.8	4.8	12.6	13.4
Silver	15	4.7	<3.2	[1]3.0	[1]2.9
Zinc	27	1,230	380	898	947
12334550—Clark Fork at Turah Bridge, near Bonner Period of record for bed-sediment data: 1986, 1991–2015					
Arsenic	13	43	17	26	25
Cadmium	26	7.3	1.2	3.2	3.2
Chromium	22	42.5	13.6	26.1	27.2
Copper	26	635	211	340	322
Iron	26	25,900	12,600	19,100	17,300
Lead	26	115	37	65	63
Manganese	26	2,340	383	1,220	1,180
Nickel	23	19.1	6.9	12.2	11.5
Silver	14	3.9	<1.9	[1]2.1	[1]1.9
Zinc	26	1,160	448	760	767

Table 25. Statistical summary of long-term bed-sediment data for the Clark Fork Basin, Montana, August 1986 through August 2015.—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, 2006–15					
Arsenic	11	6	<0.2	[1]4	[1]4
Cadmium	22	2.0	0.04	[1]0.4	[1]0.2
Chromium	18	35.2	13.3	21.7	22.8
Copper	22	27	11	20	21
Iron	22	23,000	12,400	17,500	17,900
Lead	22	20	<13	[1]13	[1]11
Manganese	22	746	298	527	543
Nickel	19	14.3	6.0	11.1	11.1
Silver	12	1.0	<0.3	[1]0.5	[1]0.3
Zinc	22	82	35	60	60
12340500—Clark Fork above Missoula Period of record for bed-sediment data: 1997–2015					
Arsenic	13	54	12	28	28
Cadmium	19	5.8	1.0	2.7	2.6
Chromium	18	40.7	12.8	25.6	27.3
Copper	19	551	129	323	282
Iron	19	27,000	13,800	20,100	20,400
Lead	19	78	25	50	50
Manganese	19	2,250	477	1,060	970
Nickel	19	15.8	7.6	12.3	12.4
Silver	7	2.9	0.8	[1]2.0	[1]2.1
Zinc	19	1,090	346	662	631

[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 26. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2015.

[Reported 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, 1997–2015					
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	25	33.3	4.3	11.4	10.5
Cadmium	31	9.7	2.4	4.9	4.4
Chromium	31	25.5	1.0	4.2	3.8
Copper	31	1,090	78.6	313	333
Iron	31	6,150	689	2,740	2,500
Lead	31	74.3	11.9	32.1	21.7
Manganese	31	3,030	180	1,070	1,140
Nickel	31	4.3	0.7	2.7	2.7
Zinc	31	1,590	432	792	762
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

Table 26. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2015.—Continued

[Reported 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—Continued Period of record for biological data: 1992, 1994–95, 1997–2015					
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
12323750—Silver Bow Creek at Warm Springs Period of record for biological data: 1992–2015					
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	23	23.6	7.9	12.4	11.7
Cadmium	49	2.1	0.2	0.6	0.5
Chromium	49	4.3	0.4	1.1	0.9
Copper	49	97.0	16.7	36.1	31.1
Iron	49	1,650	351	836	799
Lead	49	6.0	0.3	3.2	2.9
Manganese	49	3,890	491	1,230	1,010
Nickel	49	1.8	0.3	1.0	0.9
Zinc	49	276	115	175	168

Table 26. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2015.—Continued

[Reported 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—Continued Period of record for biological data: 1992–2015					
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
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

Table 26. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2015.—Continued

[Reported 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—Continued **Period of record for biological data: 1995, 1997, 1999, 2002, 2005, 2008, 2011, 2014**					
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 26. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2015.—Continued

[Reported 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, 1991–2015					
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	16	20.5	13.2	14.9	14.1
Cadmium	41	2.7	0.7	1.5	1.5
Chromium	41	9.6	0.8	2.3	2.1
Copper	41	181	48.7	108	107
Iron	41	2,660	816	1,560	1,510
Lead	41	17.1	1.2	9.0	8.8
Manganese	41	3,620	1,070	2,260	2,200
Nickel	41	6.5	0.9	2.0	1.8
Zinc	41	363	136	219	216
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

Table 26. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2015.—Continued

[Reported 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, 1991–2015					
Hydropsyche occidentalis					
Arsenic	21	17.7	9.1	14.2	14.6
Cadmium	53	1.6	0.6	1.1	1.2
Chromium	53	6.6	0.4	2.1	2.0
Copper	53	151	49.2	94.8	92.4
Iron	53	2,590	642	1,510	1,450
Lead	53	13.5	1.6	8.2	8.3
Manganese	53	6,170	653	2,480	2,110
Nickel	53	3.5	0.8	1.8	1.8
Zinc	53	286	168	207	201
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 26. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2015.—Continued

[Reported 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: 1996–2015					
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	21	27.8	8.8	16.4	16.6
Cadmium	32	2.8	1.1	1.9	1.7
Chromium	32	4.0	0.8	2.3	2.4
Copper	32	338	48.8	152	137
Iron	32	4,080	691	1,810	1,780
Lead	32	28.6	4.5	13.9	13.3
Manganese	32	3,160	1,230	1,810	1,700
Nickel	32	2.8	0.9	1.7	1.6
Zinc	32	339	151	242	243
Hydropsyche occidentalis					
Arsenic	10	20.9	12.7	15.9	15.3
Cadmium	24	1.9	0.9	1.4	1.4
Chromium	24	6.5	1.2	2.3	2.0
Copper	24	219	52.1	120	120
Iron	24	2,830	963	1,660	1,520
Lead	24	20.4	6.6	11.4	10.8
Manganese	24	4,150	1,220	2,500	2,180
Nickel	24	3.2	0.9	1.6	1.5
Zinc	24	330	174	247	247

Table 26. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2015.—Continued

[Reported 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—Continued Period of record for biological data: 1996–2015					
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
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	--
461559112443301—Clark Fork at county bridge, near Racetrack Period of record for biological data: 1996–2015					
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	--

Table 26. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2015.—Continued

[Reported 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: 1996–2015					
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	17	20.2	11.1	14.4	14.3
Cadmium	28	2.7	0.8	1.6	1.5
Chromium	28	3.0	0.6	1.9	2.1
Copper	28	198	50.0	108	100
Iron	28	3,330	657	1,420	1,160
Lead	28	18.7	3.7	9.8	8.7
Manganese	28	2,360	646	1,660	1,780
Nickel	28	2.0	0.7	1.3	1.3
Zinc	28	302	139	208	193
Hydropsyche occidentalis					
Arsenic	16	16.8	9.2	13.0	12.5
Cadmium	29	2.3	0.7	1.4	1.3
Chromium	29	3.7	1.1	2.1	2.0
Copper	29	164	59.5	115	122
Iron	29	3,690	1,030	1,670	1,580
Lead	29	15.7	4.3	10.9	10.9
Manganese	29	3,770	660	1,980	1,760
Nickel	29	2.3	1.1	1.5	1.4
Zinc	29	361	181	234	227

Table 26. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2015.—Continued

[Reported 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: 1996–2015					
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
461903112440701—Clark Fork at Dempsey Creek diversion, near Racetrack Period of record for biological data: 1996–2015					
Arctopsyche grandis					
Arsenic	8	17.5	4.4	8.2	6.4
Cadmium	9	7.1	0.9	2.9	2.5
Chromium	9	12.9	0.7	[1]2.8	[1]1.1
Copper	9	196	30.8	77.2	60.0
Iron	9	2,800	340	859	538
Lead	9	17.6	2.1	[1]7.0	[1]5.8
Manganese	9	2,060	510	1,110	1,160
Nickel	9	2.5	0.5	1.2	1.0
Zinc	9	489	87	251	256
Claassenia sabulosa					
Arsenic	7	3.8	1.2	2.3	2.1
Cadmium	7	2.4	0.4	1.0	0.9
Chromium	7	1.7	0.2	0.7	0.5
Copper	7	87.2	47.5	63.6	59.0
Iron	7	485	94	219	173
Lead	7	3.4	0.4	1.4	1.1
Manganese	7	1,260	98	349	228
Nickel	7	1.0	0.2	0.4	0.3
Zinc	7	394	168	280	255

Table 26. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2015.—Continued

[Reported 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: 1996–2015					
Hydropsyche cockerelli					
Arsenic	15	18.8	8.0	12.9	13.3
Cadmium	24	2.1	0.7	1.4	1.5
Chromium	24	4.6	0.5	1.8	1.5
Copper	24	247	60.7	112	93.5
Iron	24	3,010	552	1,330	1,060
Lead	24	21.9	3.5	9.2	8.7
Manganese	24	2,650	487	1,420	1,290
Nickel	24	2.5	0.5	1.3	1.0
Zinc	24	285	162	218	221
Hydropsyche occidentalis					
Arsenic	20	24.0	8.5	14.5	15.3
Cadmium	37	2.4	0.7	1.3	1.3
Chromium	37	6.2	0.3	2.1	1.9
Copper	37	345	74.9	126	107
Iron	37	3,390	764	1,730	1,550
Lead	37	21.8	4.4	12.4	11.5
Manganese	37	4,460	826	2,270	2,160
Nickel	37	2.4	1.0	1.6	1.5
Zinc	37	386	189	260	241
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 26. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2015.—Continued

[Reported 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, 1990–2015					
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	15	17.1	5.8	10.2	10.1
Cadmium	38	3.6	0.6	1.7	1.7
Chromium	38	4.3	0.4	1.9	2.0
Copper	38	241	54.7	109	104
Iron	38	3,340	490	1,330	1,220
Lead	38	24.9	3.8	11.1	11.4
Manganese	38	1,580	396	1,040	1,030
Nickel	38	3.3	0.3	1.4	1.1
Zinc	38	391	132	205	195
Hydropsyche occidentalis					
Arsenic	23	21.1	6.6	11.2	9.7
Cadmium	60	3.4	0.6	1.5	1.3
Chromium	60	3.7	0.6	2.0	1.9
Copper	60	222	49.4	124	121
Iron	60	3,240	558	1,520	1,490
Lead	60	20.1	3.5	12.0	11.9
Manganese	60	2,850	649	1,610	1,660
Nickel	60	12.9	1.0	1.7	1.4
Zinc	60	346	166	246	237

Table 26. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2015.—Continued

[Reported 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—Continued Period of record for biological data: 1986–87, 1990–2015					
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
12324400—Clark Fork above Little Blackfoot River, near Garrison Period of record for biological data: 2009–15					
Arctopsyche grandis					
Arsenic	12	16.6	3.2	6.3	5.4
Cadmium	12	4.9	0.9	2.9	3.3
Chromium	12	4.6	0.9	[1]1.7	[1]1.3
Copper	12	209	42.0	87.6	64.6
Iron	12	2,580	259	865	634
Lead	12	18.0	2.8	7.5	6.1
Manganese	12	1,940	578	1,110	981
Nickel	12	2.2	0.5	1.1	0.9
Zinc	12	378	185	260	246
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	--

Table 26. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2015.—Continued

[Reported 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: 2009–15					
Hydropsyche cockerelli					
Arsenic	4	11.1	7.8	9.3	9.2
Cadmium	4	4.0	0.9	2.3	2.2
Chromium	4	3.4	1.9	2.4	2.3
Copper	4	158	81.5	117	115
Iron	4	2,150	746	1,330	1,210
Lead	4	18.8	8.7	13.0	12.2
Manganese	4	1,870	1,110	1,440	1,380
Nickel	4	1.8	1.4	1.6	1.6
Zinc	4	284	212	238	229
Hydropsyche occidentalis					
Arsenic	11	14.7	6.4	9.8	8.8
Cadmium	11	2.5	1.0	1.8	1.9
Chromium	11	3.6	0.7	2.1	2.0
Copper	11	182	85.7	128	138
Iron	11	2,390	913	1,520	1,290
Lead	11	17.9	8.8	12.8	11.5
Manganese	11	2,100	975	1,450	1,320
Nickel	11	1.9	1.0	1.5	1.5
Zinc	11	299	223	254	252
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 26. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2015.—Continued

[Reported 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: 1992–2015					
Arctopsyche grandis					
Arsenic	43	17.0	1.8	5.0	4.1
Cadmium	72	6.6	0.6	1.9	1.8
Chromium	72	5.3	0.1	1.4	1.1
Copper	72	232	19.9	51.4	38.7
Iron	72	3,070	195	758	518
Lead	72	16.9	1.0	4.0	3.4
Manganese	72	1,580	436	874	870
Nickel	72	3.1	0.2	0.8	0.7
Zinc	72	326	146	204	189
Claassenia sabulosa					
Arsenic	31	2.5	0.4	1.4	1.4
Cadmium	51	3.5	0.1	1.0	0.7
Chromium	51	1.6	0.2	0.6	0.5
Copper	51	84.9	33.0	59.3	58.3
Iron	51	640	63.0	201	170
Lead	51	2.8	0.4	1.0	0.8
Manganese	51	320	50.6	157	149
Nickel	51	0.7	0.1	0.3	0.3
Zinc	51	364	166	264	258
Hydropsyche cockerelli					
Arsenic	18	9.8	4.1	6.0	5.8
Cadmium	37	4.2	0.5	1.4	1.3
Chromium	37	4.7	0.5	2.0	1.9
Copper	37	188	17.1	73.7	58.6
Iron	37	3,250	522	1,160	954
Lead	37	17.6	2.4	6.7	5.4
Manganese	37	1,710	538	1,000	963
Nickel	37	3.5	0.3	1.3	1.2
Zinc	37	359	106	193	186

Table 26. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2015.—Continued

[Reported 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: 1992–2015					
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	16	11.5	4.4	6.8	6.3
Cadmium	31	2.3	0.4	1.3	1.3
Chromium	31	3.9	0.4	1.8	1.7
Copper	31	170	26.4	72.7	62.6
Iron	31	2,720	466	1,230	1,120
Lead	31	15.7	2.9	7.4	6.0
Manganese	31	2,900	530	1,250	1,140
Nickel	31	2.5	0.8	1.3	1.1
Zinc	31	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 26. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2015.—Continued

[Reported 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, 1991–2015					
Arctopsyche grandis					
Arsenic	34	9.9	1.8	4.2	4.0
Cadmium	66	3.8	0.4	1.4	1.2
Chromium	66	4.2	0.2	1.1	1.0
Copper	66	103	16.9	35.4	28.7
Iron	66	2,400	193	629	498
Lead	66	12.4	1.6	4.7	4.0
Manganese	66	2,010	456	844	747
Nickel	66	2.6	0.2	0.7	0.6
Zinc	66	314	137	201	192
Claassenia sabulosa					
Arsenic	28	1.9	0.6	1.3	1.3
Cadmium	64	2.8	0.1	1.0	0.8
Chromium	64	3.3	0.2	0.7	0.6
Copper	64	165	18.0	64.2	60.3
Iron	64	449	45.4	177	147
Lead	64	2.9	0.2	1.0	0.9
Manganese	64	748	33.1	181	146
Nickel	64	1.1	0.1	[1]0.3	[1]0.3
Zinc	64	567	103	280	269
Hydropsyche cockerelli					
Arsenic	18	7.2	3.9	5.6	5.5
Cadmium	47	4.5	0.3	1.2	0.9
Chromium	47	3.5	0.4	1.6	1.6
Copper	47	156	30.0	58.5	52.3
Iron	47	2,500	506	1,160	969
Lead	47	15.0	4.7	8.3	7.4
Manganese	47	1,680	549	1,010	939
Nickel	47	2.0	0.5	1.2	1.1
Zinc	47	322	134	196	187

Table 26. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2015.—Continued

[Reported 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, 1991–2015					
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	19	7.7	4.3	5.6	5.4
Cadmium	35	2.8	0.4	1.1	1.0
Chromium	35	8.1	0.4	2.2	2.2
Copper	35	118	13.3	58.3	56.3
Iron	35	2,060	424	1,240	1,190
Lead	35	14.0	3.0	8.6	8.9
Manganese	35	2,920	477	1,410	1,230
Nickel	35	2.4	0.5	1.3	1.2
Zinc	35	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 26. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2015.—Continued

[Reported 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, 1991–2015					
Arctopsyche grandis					
Arsenic	35	7.2	2.8	4.4	4.3
Cadmium	77	2.7	0.4	1.2	1.2
Chromium	77	4.1	0.5	1.6	1.5
Copper	77	125	15.9	37.2	32.2
Iron	77	2,870	321	908	793
Lead	77	13.2	1.6	4.4	3.9
Manganese	77	1,050	324	655	676
Nickel	77	2.6	0.4	1.1	1.0
Zinc	77	282	111	203	204
Claassenia sabulosa					
Arsenic	25	3.1	0.2	1.1	1.0
Cadmium	51	2.5	0.05	1.1	0.8
Chromium	51	2.0	0.2	0.7	0.6
Copper	51	97.8	37.5	59.8	55.0
Iron	51	378	58.6	134	114
Lead	51	1.6	0.2	0.7	0.6
Manganese	51	229	37.2	102	90.2
Nickel	51	0.6	0.04	0.2	0.2
Zinc	51	429	144	237	243
Hydropsyche cockerelli					
Arsenic	27	9.8	3.7	4.8	4.7
Cadmium	55	2.2	0.3	0.9	0.7
Chromium	55	14.2	0.2	2.2	1.7
Copper	55	126	26.4	48.7	44.0
Iron	55	3,180	566	1,220	1,110
Lead	55	19.7	2.2	5.6	5.2
Manganese	55	957	426	653	661
Nickel	55	2.7	0.6	1.3	1.2
Zinc	55	332	119	191	194

Table 26. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2015.—Continued

[Reported 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, 1991–2015					
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	21	7.3	2.9	4.7	4.2
Cadmium	41	1.8	0.3	1.0	0.9
Chromium	41	5.0	0.6	2.0	1.8
Copper	41	102	27.4	49.6	45.3
Iron	41	2,590	472	1,270	1,160
Lead	41	14.2	2.8	6.5	5.7
Manganese	41	1,600	454	855	813
Nickel	41	3.2	0.6	1.3	1.2
Zinc	41	416	145	216	221
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 26. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2015.—Continued

[Reported 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, 2006–15					
Arctopsyche grandis					
Arsenic	14	4.6	1.6	2.7	2.4
Cadmium	24	0.5	0.1	0.3	0.3
Chromium	19	6.9	0.5	2.1	1.5
Copper	24	19.3	9.9	13.7	12.8
Iron	24	1,880	108	758	769
Lead	24	2.3	0.5	1.1	0.9
Manganese	19	633	286	444	422
Nickel	19	3.7	0.7	1.4	1.2
Zinc	24	170	106	143	144
Claassenia sabulosa					
Arsenic	13	3.0	0.1	1.0	0.7
Cadmium	24	0.2	0.1	0.1	0.2
Chromium	19	5.2	0.3	1.0	0.7
Copper	24	88.5	19.0	43.3	44.0
Iron	24	317	46.2	144	137
Lead	24	0.8	0.1	0.3	0.2
Manganese	19	133	26.3	79.3	73.4
Nickel	19	1.1	0.1	0.3	0.3
Zinc	24	399	117	229	207
Hydropsyche cockerelli					
Arsenic	9	4.2	2.1	3.0	3.0
Cadmium	9	0.6	<0.1	[1]0.3	[1]0.3
Chromium	9	5.7	1.6	3.2	3.6
Copper	9	17.5	5.6	14.6	15.5
Iron	9	2,390	1,120	1,730	1,640
Lead	9	2.6	1.5	2.0	2.0
Manganese	9	814	409	558	516
Nickel	9	4.6	1.4	2.2	1.9
Zinc	9	165	132	149	147

Table 26. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2015.—Continued

[Reported 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, 2006–15					
Hydropsyche occidentalis					
Arsenic	16	3.8	1.2	2.2	2.1
Cadmium	28	0.5	0.1	0.2	0.2
Chromium	28	5.8	0.8	2.2	1.9
Copper	28	20.9	12.0	15.9	15.8
Iron	28	2,090	927	1,470	1,480
Lead	28	2.0	0.8	1.5	1.6
Manganese	28	798	412	520	461
Nickel	28	4.9	0.9	1.6	1.4
Zinc	28	202	116	145	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	--
12340500—Clark Fork above Missoula Period of record for biological data: 1997–2015					
Arctopsyche grandis					
Arsenic	35	7.2	1.2	3.6	3.5
Cadmium	54	2.3	0.1	1.0	0.8
Chromium	54	4.2	0.4	1.6	1.4
Copper	54	81.2	13.7	37.2	31.1
Iron	54	2,340	302	972	839
Lead	54	8.8	1.1	3.9	3.6
Manganese	54	1,410	476	892	868
Nickel	54	2.1	0.3	1.1	1.1
Zinc	54	272	133	198	197

Table 26. Statistical summary of long-term biological data for the Clark Fork Basin, Montana, August 1986 through August 2015.—Continued

[Reported 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—Continued Period of record for biological data: 1997–2015					
Claassenia sabulosa					
Arsenic	24	1.9	0.1	1.2	1.2
Cadmium	33	2.0	0.2	0.8	0.7
Chromium	33	1.4	0.1	0.7	0.7
Copper	33	81.1	25.8	51.2	48.6
Iron	33	424	82.0	218	226
Lead	33	3.1	0.2	0.9	0.8
Manganese	33	683	57.8	186	142
Nickel	33	0.7	0.2	[1]0.4	[1]0.4
Zinc	33	379	191	275	271
Hydropsyche cockerelli					
Arsenic	25	8.9	2.4	5.5	5.4
Cadmium	34	2.0	0.4	0.9	0.9
Chromium	34	6.0	1.0	2.8	2.4
Copper	34	99.7	24.4	58.9	57.1
Iron	34	3,590	830	1,900	1,860
Lead	34	12.1	2.5	7.0	6.3
Manganese	34	1,910	764	1,160	1,170
Nickel	34	2.4	0.9	1.8	1.7
Zinc	34	266	156	216	218
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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