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Water-Quality, Bed-Sediment, and Biological Data (October 2006 through September 2007) and Statistical Summaries of Long-Term Data for Streams in the Clark Fork Basin, Montana


Loading excavated bottom sediment into railcars.


Building the bypass channel in preparation for removal of Milltown Dam.


Unloading excavated bottom sediment from railcars.

Open-File Report 2008–1318

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

Cover photographs:

Left: Building the bypass channel for the Clark Fork at the Milltown Reservoir Superfund site near Bonner, Montana. Photograph by Diana Hammer, U.S. Environmental Protection Agency, taken October 2, 2007.

Top right: Loading excavated bottom sediment into railcars at the Milltown Reservoir Superfund site near Bonner, Montana, for transport to the repository near Opportunity, Montana. Photograph by Diana Hammer, U.S. Environmental Protection Agency, taken October 2, 2007.

Bottom right: Unloading excavated bottom sediment from railcars at the Milltown Reservoir Superfund site near Opportunity, Montana. Photograph by Kent A. Dodge, U.S. Geological Survey, taken April 18, 2008.

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By Kent A. Dodge, Michelle I. Hornberger, and Jessica L. Dyke

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Contents

Figures

Tables

Conversion Factors, Datum, Abbreviated Water-Quality Units, and Acronyms

Multiply	By	To obtain
acre-foot (acre-ft)	1,233	cubic meter (m^3)
cubic foot per second (ft^3/s)	0.02832	cubic meter per second (m^3/s)
gallon (gal)	3.785	liter (L)
gallon (gal)	3,785	milliliter (mL)
inch (in.)	25.4	millimeter (mm)
inch (in.)	25,400	micrometer (µm)
mile (mi)	1.609	kilometer (km)
ounce (oz)	28.35	gram (g)
part per million (ppm)	1	microgram per gram (µg/g)
square mile (mi^2)	2.59	square kilometer (km^2)
ton	907.2	kilogram
ton per day (ton/d)	907.2	kilogram per day (kg/d)

Temperature in degrees Celsius (°C) may be converted to degrees Fahrenheit (°F) as follows:

$$°F = (1.8 \times °C) + 32$$

Vertical coordinate information is referenced to the National Geodetic Vertical Datum of 1929 (NGVD 29). Horizontal coordinate information is referenced to the North American Datum of 1927 (NAD 27).

Water-year definition:

Water year is the 12-month period from October 1 through September 30 of the following calendar year. The water year is designated by the calendar year in which it ends. For example, water year 2007 is the period from October 1, 2006, through September 30, 2007.

Abbreviated water-quality units used in this report:

µg/g	microgram per gram
µg/L	microgram per liter
µg/mL	microgram per milliliter
µm	micrometer
µS/cm	microsiemens per centimeter at 25 degrees Celsius
mg/L	milligrams per liter
nm	nanometer
ppm	part per million

Acronyms used in the report:

FNU	formazin nephelometric units
ICAPES	inductively coupled argon plasma-emission spectroscopy
LRL	laboratory reporting level
LT–MDL	long-term method detection level
NTRU	nephelometric turbidity ratio unit
NWQL	USGS National Water Quality Laboratory, Denver, Colo.
RSD	relative standard deviation
spp.	species
SRM	standard reference material
TFE	tetraflouroethylene
USGS	U.S. Geological Survey
YSI	Yellow Springs Instrument

Water-Quality, Bed-Sediment, and Biological Data (October 2006 through September 2007) and Statistical Summaries of Long-Term Data for Streams in the Clark Fork Basin, Montana

By Kent A. Dodge, Michelle I. Hornberger, and Jessica L. Dyke

Abstract

Water, bed sediment, and biota were sampled in streams from Butte to below Milltown Reservoir as part of a long-term monitoring program in the upper Clark Fork basin; additional water-quality samples were collected in the Clark Fork basin from sites near Milltown Reservoir downstream to near the confluence of the Clark Fork and Flathead River as part of a supplemental sampling program. The sampling programs were conducted in cooperation with the U.S. Environmental Protection Agency to characterize aquatic resources in the Clark Fork basin of western Montana, with emphasis on trace elements associated with historic mining and smelting activities. Sampling sites were located on the Clark Fork and selected tributaries. Water-quality samples were collected periodically at 22 sites from October 2006 through September 2007. Bed-sediment and biological samples were collected once at 12 sites during August 2007.

This report presents the analytical results and quality-assurance data for water-quality, bed-sediment, and biota samples collected at all long-term and supplemental monitoring sites from October 2006 through September 2007. Water-quality data include concentrations of selected major ions, trace elements, and suspended sediment. Turbidity was analyzed for samples collected at sites where seasonal daily values of turbidity were being determined. Nutrients also were analyzed in the supplemental water-quality samples. Daily values of suspended-sediment concentration and suspended-sediment discharge were determined for four sites, and seasonal daily values of turbidity were determined for five 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 long-term water-quality, bed-sediment, and biological data for sites in the upper Clark Fork basin are provided for the period of record since 1985.

Introduction

The Clark Fork originates near Warm Springs in western Montana at the confluence of Silver Bow and Warm Springs Creeks (fig. 1). Along the 148-mi reach of stream from Silver Bow Creek in Butte to the Clark Fork at Milltown Reservoir, 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-mi^2 upper Clark Fork basin above Missoula include irrigation, stock watering, light industry, hydroelectric power generation, and habitat for trout fisheries. Current land uses primarily 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 smaller 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 occurred in the basins of most of the major tributaries to the upper Clark Fork. Tailings derived from past mineral processing commonly contain large quantities of trace elements such as arsenic, cadmium, copper, lead, and zinc. Tailings have been eroded, mixed with stream sediment, transported downstream, and deposited in stream channels, on flood plains, and in the Warm Springs Ponds and Milltown Reservoir (Andrews, 1987). The widely dispersed tailings continue to be reeroded, transported, and redeposited along the stream channel and flood plain, especially during high flows. The occurrence of elevated trace-element concentrations in water and bed sediment can pose a potential risk to aquatic biota and human health (U.S. Environmental Protection Agency, 2004).

Concern about the potential toxicity of trace elements to aquatic biota and human health has resulted in a comprehensive effort by State, Federal, and private entities to characterize the aquatic resources in the upper Clark Fork basin to guide and monitor remedial cleanup activities. A long-term database was considered necessary to detect trends over time in order to evaluate the effectiveness of remediation. Water-quality data have been collected by the U.S. Geological Survey (USGS) at selected sites in the upper Clark Fork basin since 1985 (Lambing, 1987 through 1991; Lambing and others, 1994, 1995; Dodge and others, 1996 through 2007). 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 contamination of bed sediment and bioaccumulation of metals conducted by the USGS National Research Program (Axtmann and Luoma, 1991; Cain and others, 1992, 1995; Axtmann and others, 1997; Hornberger and others, 1997).

In March 1993, an expanded long-term monitoring program for water quality, 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. In April 2006, a supplemental water-quality sampling program was initiated at six sites for the part of the Clark Fork basin from near Milltown Reservoir to near the confluence of the Clark Fork and Flathead River (fig. 1; table 1). Of the sites that bracket Milltown Reservoir, three also are part of the long-term monitoring network. The supplemental monitoring provides additional spatial coverage of constituent concentrations prior to the planned removal of Milltown Dam.

The purpose of this report is to present water-quality data for 22 sites and trace-element data for 12 bed-sediment and biological sites in the Clark Fork basin collected from October 2006 through September 2007. Quality-assurance data are presented for water-quality, bed-sediment, and biota samples. Statistical summaries also are provided for long-term water-quality, bed-sediment, and biological data collected since 1985.

Sampling Locations and Types of Data

Sampling sites for the long-term monitoring program in the upper Clark Fork basin from Butte to below Milltown Reservoir (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 relatively uniform length, with each reach encompassing either a major tributary or depositional environment (Warm Springs Ponds and Milltown Reservoir). Major tributaries were sampled to describe water-quality, bed-sediment, and biological characteristics of important hydrologic sources in the upper 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. In the long-term monitoring program, water-quality data were obtained periodically at 19 sites; daily suspended-sediment data were obtained at 4 sites and daily turbidity data were obtained by continuous turbidity monitors at 5 sites. Trace-element data for 12 bed-sediment and 12 biological sites were obtained once annually. Continuous streamflow data were collected at 18 sites in the long-term monitoring network.

Supplemental water-quality samples were collected at six sites from near Milltown Reservoir to near the confluence of the Clark Fork and Flathead River (fig. 1). Of those sites, three (Clark Fork at Turah Bridge, near Bonner, Blackfoot River near Bonner, and Clark Fork above Missoula) bracket Milltown Reservoir and also are part of the long-term monitoring network; three additional sites (Bitterroot River near Missoula, Clark Fork at St. Regis, and Flathead River at Perma) are farther downstream in the basin. The types of data collected and period of record for each type of data for the three additional sites that are not part of the long-term network also are listed in table 1 and shown in figure 1. Supplemental water-quality samples were collected during periods of either high flow or reservoir drawdown to characterize conditions when the potential for scour of bottom sediments from Milltown Reservoir was greatest. The sites were sampled in a downstream progression during 2–day periods to generally coincide with traveltime along the Clark Fork main stem. The water-quality and streamflow data for each sampling episode can be used to calculate instantaneous constituent loads to identify the relative contributions of load from different source areas. Supplemental samples from the 6 sites were collected 11 times. One sample was collected in October 2006 during a drawdown of Milltown Reservoir, and 10 were collected from April to June 2007 during the rising limb and peak of the annual hydrograph.

Properties measured onsite and constituents for which water-quality, bed-sediment, and biota samples were analyzed are listed in table 2. Data-quality objectives for analyses of water-quality samples are listed in table 3. Results of onsite measurements of properties; laboratory analyses of water-quality, bed-sediment, and biota samples; and quality-assurance data for water year 2007 are listed in tables 4 through 25 at the back of the report. Statistical summaries of long-term water-quality, bed-sediment, and biological data collected between March 1985 and September 2007 are listed in tables 26 through 28 at the back of the report.

Quality assurance of data was maintained through the use of documented procedures designed to provide environmentally representative data. Acceptable performance of the procedures was 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.

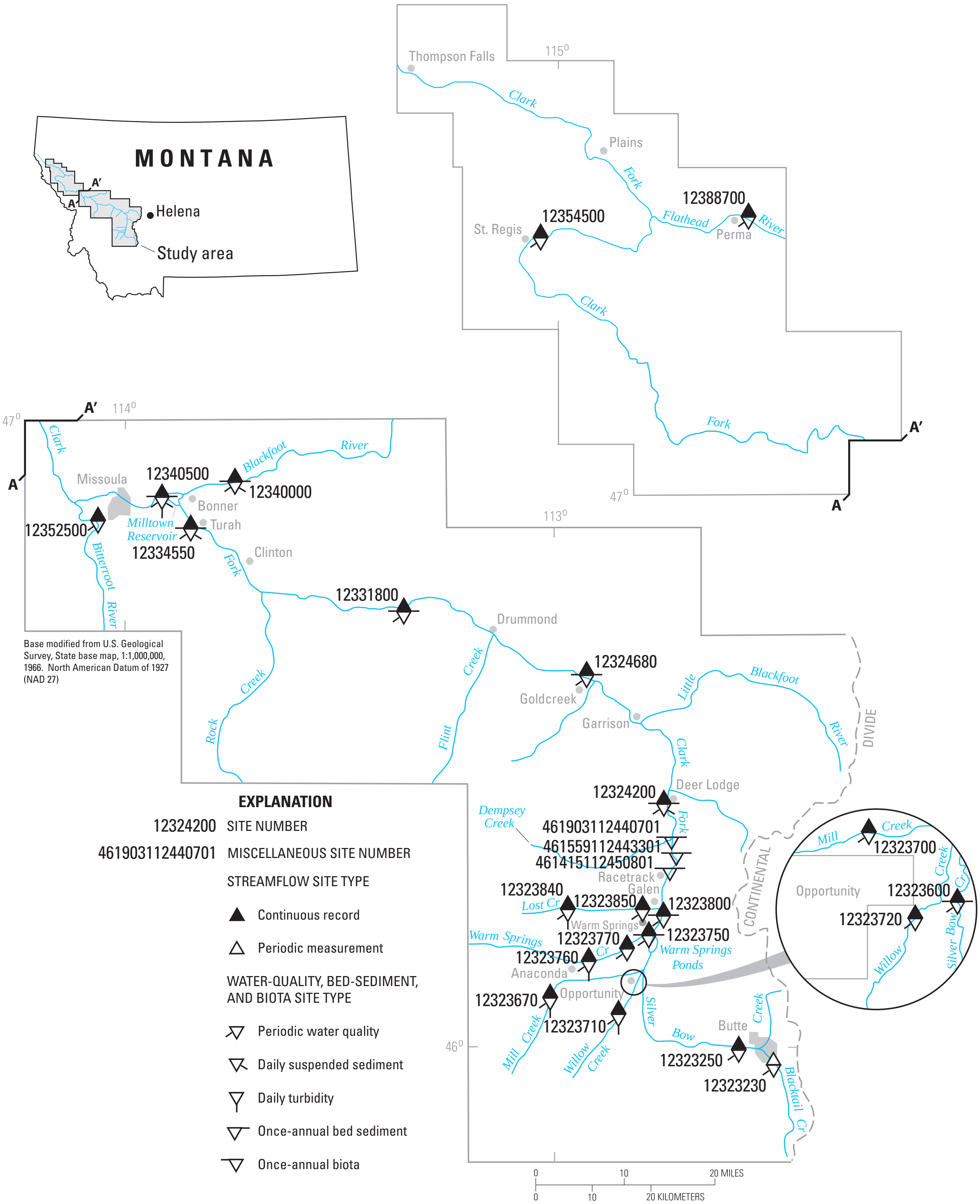

Figure 1. Location of study area in the Clark Fork basin, Montana.

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

[Abbreviations: LT, site is part of long-term monitoring network; S, site is part of supplemental monitoring network; P, present; D, discontinued. Symbol: --, no data]

Station number (fig. 1)	Station name	Network	Continuous-record streamflow	Periodic water-quality[1]	Daily suspended sediment	Daily turbidity (seasonal)	Fine-grained bed sediment[2]	Bulk bed sediment[2,3]	Biota[2]
12323230	Blacktail Creek at Harrison Avenue, at Butte	LT	--	03/93–08/95, 12/96–08/03, 12/04–P	--	--	--	--	--
12323250	Silver Bow Creek below Blacktail Creek, at Butte	LT	10/83–P	03/93–08/95, 12/96–P	--	--	--	--	--
12323600	Silver Bow Creek at Opportunity	LT	07/88–P	03/93–08/95, 12/96–P	03/93–09/95, D	--	07/92–P	08/93–08/95, 08/97–08/04, D	07/92, 08/94–08/95, 08/97–P
12323670	Mill Creek near Anaconda	LT	10/04–P	12/04–P	--	06/06–P	--	--	--
12323700	Mill Creek at Opportunity	LT	04/03–P	03/03–P	--	--	--	--	--
12323710	Willow Creek near Anaconda	LT	03/05–P	12/04–P	--	06/06–P	--	--	--
12323720	Willow Creek at Opportunity	LT	04/03–P	03/03–P	--	--	--	--	--
12323750	Silver Bow Creek at Warm Springs	LT	03/72–09/79, 04/93–P	03/93–P	04/93–09/95, D	--	07/92–P	08/93, 08/95–08/04, D	07/92–P
12323760	Warm Springs Creek near Anaconda	LT	10/97–P	10/05–P	--	05/06–P	--	--	--
12323770	Warm Springs Creek at Warm Springs	LT	10/83–P	03/93–P	--	--	08/95, 08/97, 08/99, 08/02, 08/05	08/95, 08/97, 08/99, 08/02, D	08/95, 08/97, 08/99, 08/02, 08/05
12323800	Clark Fork near Galen	LT	07/88–P	07/88–P	--	--	08/87, 08/91–P	08/93–08/04, D	08/87, 08/91–P
12323840	Lost Creek near Anaconda	LT	10/04–P	12/04–P	--	05/06–P	--	--	--
12323850	Lost Creek near Galen	LT	04/03–P	03/03–P	--	--	--	--	--
461415112450801	Clark Fork below Lost Creek, near Galen	LT	--	--	--	--	08/96–P	08/96–08/04, D	08/96–P
461559112443301	Clark Fork at county bridge, near Racetrack	LT	--	--	--	--	08/96–P	08/96–08/04, D	08/96–P
461903112440701	Clark Fork at Dempsey Creek diversion, near Racetrack	LT	--	--	--	--	08/96–P	08/96–08/04, D	08/96–P

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

[Abbreviations: LT, site is part of long-term monitoring network; S, site is part of supplemental monitoring network; P, present; D, discontinued. Symbol: --, no data]

Station number (fig. 1)	Station name	Network	Continuous-record streamflow	Periodic water-quality[1]	Daily suspended sediment	Daily turbidity (seasonal)	Fine-grained bed sediment[2]	Bulk bed sediment[2,3]	Biota[2]
12324200	Clark Fork at Deer Lodge	LT	10/78–P	03/85–P	03/85–08/86, 04/87–03/03, 08/03–P	--	08/86–08/87, 08/90–P	08/93–08/04, D	08/86–08/87, 08/90–P
12324680	Clark Fork at Goldcreek	LT	10/77-P	03/93–P	--	--	07/92–P	08/93–08/04, D	07/92–P
12331800	Clark Fork near Drummond	LT	04/93–P	03/93–P	--	--	08/86, 08/87, 08/91–P	08/93–08/04, D	08/86, 08/91–P
12334550	Clark Fork at Turah Bridge, near Bonner	LT, S	03/85–P	03/85–P	03/85–03/03, 08/03–P	--	08/86, 08/91–P	08/93–08/04, D	08/86, 08/91–P
12340000	Blackfoot River near Bonner	LT, S	10/39–P	03/85–P	07/86–04/87, 06/88–09/95, 10/05–P	--	08/86–08/87, 08/91, 08/93–96, 08/98–01, 09/03, 08/06, 08/07	08/93, 08/94, 08/99–01, 09/03, D	08/86–08/87, 08/91, 08/93, 08/96, 08/98, 09/00, 09/03, 08/06, 08/07
12340500	Clark Fork above Missoula	LT, S	03/29–P	07/86–P[4]	07/86–04/87, 06/88–01/96, 03/96–03/03, 08/03–P	04/07–P	08/97–P	08/97–08/04, D	08/97–P
12352500	Bitterroot River near Missoula	S	07/1898–11/1901, 05/1903–12/1904, 07/89–P	05/97–P	--	--	--	--	--
12354500	Clark Fork at St. Regis	S	10/10–P	04/06–P	--	--	--	--	--
12388700	Flathead River at Perma	S	10/83–P	10/70–09/73, 10/96–09/03, 04/06–P	--	--	--	--	--

[1]Onsite measurements of physical properties and laboratory analyses for selected major ions, trace elements, and suspended sediment. Prior to March 1993, laboratory analyses included only trace elements and suspended sediment.

[2]Laboratory analyses for trace elements.

[3]Bulk bed-sediment sampling was discontinued in 2005.

[4]Prior to 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 samples of water, bed sediment, and biota from the Clark Fork basin, Montana.

Water quality		Bed sediment	Biota
Property	**Constituent**	**Constituent**	**Constituent**
Streamflow	Hardness (calculated)	Arsenic	Arsenic
pH	Calcium	Cadmium	Cadmium
Specific conductance	Magnesium	Chromium	Chromium
Temperature	Nitrogen	Copper	Copper
Turbidity	Phosphorous	Iron	Iron
	Arsenic	Lead	Lead
	Cadmium	Manganese	Manganese
	Copper	Nickel	Nickel
	Iron	Zinc	Zinc
	Lead		
	Manganese		
	Zinc		
	Suspended sediment		

Water-Quality Data

Water-quality data consist of onsite measurements of selected stream properties and concentrations of chemical and physical constituents analyzed in periodically collected stream samples. Routine water-quality samples for the long-term monitoring program were collected at 19 sites in the upper Clark Fork basin 6–8 times per year on a schedule designed to describe seasonal and hydrologic variability. Supplemental water-quality samples were collected 11 times at the 3 sites bracketing Milltown Reservoir and at the 3 additional sites downstream from Missoula. At the 4 daily suspended-sediment sites, suspended-sediment samples were collected by an observer 2–14 times per week, depending on season and flow conditions. Continuous turbidity monitors were operated seasonally (October–November/December 2006 and March/April–September 2007) at four sites near Anaconda and at Clark Fork above Missoula to determine daily values (table 1).

Methods

Water samples were collected 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 USGS National Field Manual for the Collection of Water-Quality Data (variously dated). These methods provide a vertically and laterally discharge-weighted composite sample that is intended to be representative of the entire flow passing through the cross section of a stream. Sampling equipment consisted of depth-integrating suspended-sediment and water-quality samplers (Davis, 2005), which were constructed of plastic or coated with a nonmetallic epoxy paint and equipped with nylon or tetraflouroethylene (TFE) nozzles.

Instantaneous streamflow at the time of water sampling was determined at all sites, either by direct measurement or from stage-discharge rating tables (Rantz and others, 1982). Daily mean streamflow was estimated during ice periods because backwater affected the stage-discharge relation. On July 1–3 at Clark Fork at Turah Bridge daily mean streamflow was estimated because of damage to the orifice line. Onsite measurements of pH, specific conductance, and water temperature were made during collection of periodic water-quality samples. Onsite sample processing, including filtration and preservation, was performed according to procedures described by Ward and Harr (1990), Horowitz and others (1994), and the USGS National Field Manual for the Collection of Water Quality Data (variously dated).

Water-quality samples were analyzed for the constituents listed in table 2. The terms "filtered" and "unfiltered recoverable" replace the terms "dissolved" and "total recoverable," respectively, which were used in past reports from this project. Filtered (0.45-µm pore size) and unfiltered recoverable concentrations of the trace elements (arsenic, cadmium, copper, iron, lead, manganese, and zinc) were determined by the USGS National Water Quality Laboratory (NWQL) in Denver, Colo. Filtered concentrations of calcium and magnesium also were determined to enable calculation of hardness. Concentrations of the nutrients total nitrogen and total phosphorous were determined for the supplemental water-quality samples.

Filtered concentrations of arsenic, cadmium, copper, lead, manganese, and zinc were determined by inductively coupled plasma-mass spectrometry (Faires, 1993; Garbarino, 1999). Filtered concentrations of calcium, magnesium, and iron were

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

[Abbreviations: µg/L, micrograms per liter; mg/L, milligrams per liter; mm, millimeter. Symbol: --, not determined]

Constituent	Data-quality objectives		
	Detectability	Precision	Bias
	Laboratory reporting level	Maximum relative standard deviation of replicate analyses, in percent	Maximum deviation of spike recovery, in percent
Calcium, filtered	0.02 mg/L	20	--
Magnesium, filtered	.014 mg/L	20	--
Nitrogen, unfiltered recoverable	.06 mg/L	20	25
Phosphorus, unfiltered recoverable	.008 mg/L	20	25
Arsenic, filtered	.12 µg/L	20	25
Arsenic, unfiltered recoverable	.20 µg/L	20	25
Cadmium, filtered	.04 µg/L	20	25
Cadmium, unfiltered recoverable	.02 µg/L	20	25
Copper, filtered	.4 µg/L	20	25
Copper, unfiltered recoverable	1.2 µg/L	20	25
Iron, filtered	6 µg/L	20	25
Iron, unfiltered recoverable	6 µg/L	20	25
Lead, filtered	.12 µg/L	20	25
Lead, unfiltered recoverable	.06 µg/L	20	25
Manganese, filtered	.2 µg/L	20	25
Manganese, unfiltered recoverable	.6 µg/L	20	25
Zinc, filtered	.60 µg/L	20	25
Zinc, unfiltered recoverable	2 µg/L	20	25
Sediment, suspended, percent finer than 0.062 mm	1 percent	20	--
Sediment, suspended	1 mg/L	20	--

determined by inductively coupled plasma-atomic emission spectrometry (Fishman, 1993). Unfiltered recoverable concentrations of trace elements were determined from unfiltered samples that were first digested with dilute hydrochloric acid (Hoffman and others, 1996) and then analyzed by inductively coupled plasma-mass spectrometry (Garbarino and Struzeski, 1998). Unfiltered recoverable concentrations of nitrogen and phosphorous were determined from unfiltered samples that were digested with alkaline persulfate and then analyzed by colorimetry (Patton and Kryskalla, 2003).

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

Suspended-sediment samples for the four daily suspended-sediment sites (table 1) were collected by local contract observers using the depth-integration method at a single vertical transit near midstream. The samples were analyzed for suspended-sediment concentration and were used to determine daily mean suspended-sediment concentrations according to methods described by Porterfield (1972). Suspended-sediment discharge is determined according to the following equation (Porterfield, 1972):

$$Q_s = Q_w \times C_s \times k, \tag{1}$$

where

- Q_s is suspended-sediment discharge, in tons per day;
- Q_w is streamflow, in cubic feet per second;
- C_s is suspended-sediment concentration, in milligrams per liter; and
- k is a units-conversion constant (0.0027) to convert instantaneous suspended-sediment discharge to an equivalent daily suspended-sediment discharge.

Turbidity data were obtained by continuous turbidity monitors [Yellow Springs Instrument (YSI, 6136 turbidity sensor)] at four tributary sites in the upper Clark Fork basin near Anaconda and at Clark Fork above Missoula (table 1). The monitors near Anaconda were installed in May–June 2006 to provide supporting information on runoff conditions in an area where remediation activities are being conducted. The monitor at Clark Fork above Missoula was installed in April 2007 to provide real-time turbidity information in an area where remediation activities related to the removal of Milltown Dam are being conducted. The monitors are operated seasonally, generally from early spring (after ice breakup) to early winter (before stream freeze-up). Turbidity values are recorded at 15-minute intervals and can be viewed in real-time on the USGS Web page at *http://waterdata.usgs.gov/mt/nwis*. Continuous recordings provide the minimum and maximum values for each day as well as a daily mean turbidity value 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 for samples collected periodically during water year 2007 are listed in table 4. Daily mean streamflow, daily mean suspended-sediment concentration, and daily suspended-sediment discharge for water year 2007 at the four daily suspended-sediment sites are listed in tables 5 through 8 along with monthly summary statistics and annual totals for streamflow and suspended-sediment discharge. Daily maximum, minimum, and mean turbidity at five sites are listed in tables 9 through 13 along with monthly summary statistics.

Quality Assurance

Quality-assurance procedures used for the collection and field processing of water-quality 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 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 (2004).

The quality of analytical results reported for water-quality samples was evaluated by the use of 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-quality samples. Therefore, the total number of quality-control samples represented about 15 percent of the total number of water-quality 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 (Pritt and Raese, 1995; Maloney, 2005). These internal practices include analyses of quality-control samples such as calibration standard samples, standard reference water samples, replicate samples, deionized-water blank samples, or spiked samples at a proportion equivalent to at least 10 percent of the sample load. The NWQL participates in a blind-sample program in which standard reference water samples prepared by the USGS Branch of Quality Systems are routinely inserted into the sample line for each analytical method at a frequency proportional to the sample load (*http://bqs.usgs.gov*). The laboratory also participates in external evaluation studies and audits with the National Environmental Laboratory Accreditation Program, the U.S. Environmental Protection Agency, Environment Canada, and the USGS Branch of Quality Systems to assess analytical performance.

Replicate data can be obtained 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 obtained in the field (field replicate) by either 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 is affected by numerous sources of variability within the field and laboratory environments, including sample collection, sample processing, and sample analysis. To provide data on overall precision for samples exposed to all 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 concurrently collecting two independent cross-sectional samples. Analyses of these field replicates indicate the reproducibility of environmental data that are affected by the combined variability potentially introduced by field and laboratory processes.

Precision of analytical results for laboratory replicates, which exclude field sources of variability, was determined by 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 can potentially 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-quality samples were analyzed. Analyses of these 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 potentially could bias analytical results. The particular type of blank sample routinely tested was a field blank. Field blanks are aliquots of deionized water that are certified as trace-element free and are processed 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. All routine 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 that was initiated in 1993. The objectives identify 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 were producing 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 LT–MDL values are designed to limit the possible occurrence of a false positive or false negative error to 1 percent or less. Accordingly, concentrations are reported as less than the LRL for samples in which the analyte was either not detected or did not pass identification criteria. Analytes that are detected at concentrations between the LT–MDL and LRL and that pass identification criteria are reported as estimated concentrations. Estimated concentrations are noted with a remark code of “E.” These data need to be used with the understanding that their uncertainty is greater than that of data reported without the “E” remark code.

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):

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

where

S is the standard deviation of the difference in concentration between replicate analyses,

d is the difference in concentration between each pair of replicate analyses, and

k is the number of pairs of replicate analyses.

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

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

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 14. The overall precision estimated for each constituent on the basis of analyses of field replicates, which include both field and laboratory sources of variability, is listed in table 15. 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 (table 15).

The precision estimated for each constituent on the basis of laboratory replicate analyses, which include only laboratory sources of variability, is listed in table 16. 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 16), except filtered cadmium. The *RSD* for this constituent was 27 percent and is primarily a statistical artifact of comparing the results of one sample that was estimated (E0.02 µg/L) with one that was 0.06 µg/L. When analyzing metals near detection, a 100–percent variation can be expected (Gary Cottrell, U.S. Geological Survey, written commun., 2008). Because the reporting level for filtered cadmium is 0.04 µg/L, a +/- 0.04 µg/L difference can be expected; therefore, the spread of 0.02–0.06 µg/L is within expected laboratory analytical variation. When this replicate pair was excluded, the other seven replicate pairs had a *RSD* for filtered cadmium of 7.1 percent; therefore, data quality objectives were met for precision on the basis of the laboratory replicate results for all constituents.

Recovery efficiency for analyses of constituents is determined by analyses of an unspiked sample and a spiked aliquot of the same sample. The data-quality objective for acceptable spike recovery of trace elements in water samples 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 3:

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

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 17 and 18, respectively. The mean spike recovery for deionized-water blank samples spiked with trace elements (table 17) ranged from 98.4 to 107 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 17) did not exceed a 25-percent deviation from an expected 100-percent recovery. The mean spike recovery for spiked stream samples (table 18) ranged from 96.3 to 109 percent. The 95-percent confidence intervals for mean spike recoveries (table 18) did not exceed a 25-percent deviation from an expected 100-percent recovery. No adjustments were made to analytical data on the basis of the mean spike recovery.

High or low bias is indicated if the 95-percent confidence interval does not include 100-percent recovery, thereby indicating a consistent deviation in one direction. All laboratory-spiked deionized-water blank samples (table 17) had confidence intervals for percent recovery that included 100 percent except for filtered cadmium (103–112 percent) and filtered zinc (102–113). All laboratory-spiked stream samples (table 18) also had confidence intervals for percent recovery that included 100 percent except for filtered cadmium (102–114 percent), filtered iron (103–111 percent), filtered lead (103–115 percent), and unfiltered recoverable lead (102–107 percent). Both the 95-percent confidence interval and mean spike recovery for these constituents indicate a persistent but minor, high bias. Because the mean spike recoveries for all constituents met data-quality objectives (less than a 25-percent deviation from 100-percent recovery), no adjustments were made to analytical results for stream samples on the basis of spike recoveries.

Analytical results for field blanks are listed in table 19. A field blank with constituent concentrations equal to or less than the LRL for the analytical method indicates the entire process of sample collection, field processing, and laboratory analysis is presumably free of contamination. If detectable concentrations in field blanks were equal to or greater than twice the LRL, the concentrations were noted during data review. Analytical results from the field blank for the next sample set were evaluated for a consistent trend that could indicate systematic contamination. Sporadic, infrequent exceedances of twice the LRL probably 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, blank samples were collected from individual components of the processing sequence and were submitted for analysis to identify the source of contamination.

Trace-element concentrations in field blanks (table 19) were almost always less than the LRL. Four detections exceeded twice the LRL in two separate samples. Three occurred on May 3, 2007, for filtered copper (3.6 µg/L), which was greater than the LRL of 0.4 µg/L; filtered lead (0.39 µg/L), which was greater than the LRL of 0.12 µg/L;

and filtered zinc (6.7 µg/L), which was greater than the LRL of 0.60. The fourth detection of more than twice the LRL occurred on June 27, 2007, for filtered zinc (2.8 µg/L). No adjustments were made to water-quality sample results on the basis of these four detections because no trends were indicated in blank samples for subsequent sampling trips.

Although random in occurrence, the relatively large magnitude of detectable concentrations (about 3–10 times the LRL) in blank samples was notable. Anomalous high concentrations for several filtered trace elements relative to the unfiltered concentrations, previous results for the site, and ambient flow conditions at the time of sampling were observed throughout the June–August 2007 period. Analytical reruns were requested for trace elements with questionable concentrations. The reruns produced more reasonable values in many cases, but were unable to resolve discrepancies in some samples. Where trace-element concentrations could not be considered reliable, they were deleted from the database and are indicated in table 4 by dashes (--). Almost all of the deleted trace-element concentrations are for filtered analyses and include 1 value for filtered arsenic, 8 values for filtered cadmium, 2 values for filtered copper, 1 value for filtered lead, and 2 values for filtered zinc; 1 value also was deleted for unfiltered recoverable iron.

Bed-Sediment Data

Bed-sediment data for the long-term monitoring program in the upper Clark Fork basin consist of analyses of trace-element concentrations in the fine-grained (<0.064 mm) fraction of bed-sediment samples. Collection of bulk bed sediment (fine-grained plus coarse-grained fractions) was discontinued in 2005; therefore, no bulk bed sediment analytical results or statistical summaries are presented in this report. Bed-sediment samples were collected once annually at 12 sites (fig. 1 and table 1) during low, stable flow conditions at about the same time of year (typically August) as previous samples to facilitate data comparisons among years. One site, Warm Springs Creek at Warm Springs, is sampled once every 3 years rather than once annually.

Methods

Fine-grained bed-sediment samples were collected in August 2007 using protocols described by E.V. Axtmann (U.S. Geological Survey, written commun., 1994). Samples were collected from the surfaces of streambed deposits in low-velocity 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 pool 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 0.064-mm nylon-mesh sieve using ambient stream water. The fraction of bed sediment in each composite sample that was finer than 0.064 mm was transferred to an acid-washed 500-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, Calif. Bed-sediment samples were oven-dried at 60°C and ground into smaller particle sizes using an acid-washed ceramic mortar and pestle. Single aliquots of approximately 0.6 g of sediment from each of the three composite bed-sediment samples were digested by using a hot, concentrated, nitric acid reflux according to methods described by Luoma and Bryan (1981). An additional aliquot was analyzed from one of the sieved replicate samples at each station. After a digestion period of as much as 2 weeks, 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 then were filtered through a 0.45-µm filter using a syringe and 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 argon plasma-emission spectroscopy (ICAPES). The smallest concentration of a constituent that can be reliably reported for analyses of bed sediment is termed the minimum reporting level.

Results

Concentrations of trace elements measured in samples of fine-grained bed sediment collected during August 2007 are listed in table 20. Liquid-phase concentrations, in µg/mL (which is equivalent to parts per million; ppm), that were analyzed in the reconstituted aliquots of digested bed sediment were converted to solid-phase concentrations, in µg/g, by using the following equation:

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

The reported solid-phase concentrations listed in table 20 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 both the dilution ratio and the dry weight of the sample, minimum reporting levels for some trace elements might differ among stations and among years.

Quality Assurance

The protocols for field collection and processing of bed-sediment samples are designed to prevent contamination from metal sources. Nonmetallic sampling and processing equipment was acid-washed and rinsed with deionized water prior to the first sample collection. Nylon-mesh sieves were washed in a 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 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 an increasing concentration gradient 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 (E.V. Axtmann, U.S. Geological Survey, written commun., 1994). Quality-control samples consisted of standard reference materials (SRMs) and procedural blanks. Each type of quality-control sample was analyzed in a proportion equivalent to about 10 percent of the total number of bed-sediment samples.

SRMs 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 the 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 21. Two SRMs consisting of agricultural soils representing low and high concentrations of trace elements were analyzed to test recovery efficiency for a range of concentrations generally similar to those occurring in the bed sediment of 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 21) illustrate analytical performance. For copper, iron, manganese, nickel, and zinc, mean SRM recoveries for the low-concentration standard (SRM 2709) ranged from 85.1 to 100.5 percent of the certified concentrations. Mean recoveries were lower for arsenic and chromium (72.7 and 74.5 percent, respectively) and higher for lead (119.4 percent). Cadmium concentrations were near the minimum reporting level in SRM 2709 and were not reported. The lack of measurable recoveries for cadmium in the SRM likely is the result of analyzing concentrations very close to the liquid-phase detection limit (0.0005 µg/mL) coupled with signal enhancement resulting from matrix interference. The generally small range of variation (less than 5 percent for most constituents) for the 95-percent confidence interval indicates good reproducibility of multiple analyses of SRM 2709. Mean SRM recoveries for arsenic, cadmium, copper, iron, lead, manganese, nickel, and zinc for the high-concentration standard (SRM 2711) ranged from 80.7 to 95.7 percent of the certified concentrations. Chromium had a lower recovery (63.9 percent) for the high-concentration standard, possibly because of the strong binding nature of this element to sediment. The generally small range of variation (less than 10 percent for all constituents) for the 95-percent confidence interval indicates good reproducibility of multiple analyses of SRM 2711. No adjustments were made to trace-element concentrations in bed-sediment samples on the basis of recovery efficiencies.

Procedural blanks for bed-sediment samples consisted of the same reagents used for sample digestion and reconstitution. Concentrated nitric acid used for sample digestion was heated and evaporated to dryness. After evaporation, 0.6N hydrochloric acid was added to reconstitute the dry residue. Procedural blanks, therefore, represent the same chemical matrix and exposure to analytical materials and handling as the reagents used to digest and reconstitute bed-sediment samples. Analytical results of procedural blanks for bed sediment (table 22) are reported as a liquid-phase concentration, in micrograms per milliliter, which is equivalent to parts per million. 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 minimum reporting level; thus, no contamination bias was indicated and no adjustments to the data were necessary.

Biological Data

Biological data for the long-term monitoring program in the upper Clark Fork basin consist of analyses of trace-element concentrations in the whole-body tissue of aquatic benthic insects. Insect samples were collected once annually at the same 12 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 among the years. One site, Warm Springs Creek at Warm Springs, is sampled once every 3 years rather than once annually.

Methods

Insect samples were collected using protocols described in Hornberger and others (1997). Immature stages of benthic insects were collected with a large nylon-mesh kick net. A single riffle at each station was sampled repeatedly until an adequate number of individual insects was 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 tana* were collected in a few instances. *Hydropsyche* species (spp.) that could not be positively identified were considered to belong to the *morosa* group and are categorized as *Hydropsyche* spp. or *Hydropsyche morosa* group (in previous reports). The caddisfly *Arctopsyche grandis* and the stonefly *Claasenia sabulosa* were collected where available to represent additional insect taxa that are commonly distributed in the upper Clark Fork basin. In addition, the caddisfly group *Brachycentrus* spp. was sometimes collected when targeted taxa were not available.

Samples of each taxon were sorted by genus in the field and placed in acid-washed plastic containers. Samples were frozen on dry ice within 30 minutes of collection in a small amount of ambient stream water. Between 1986 and 1998, macroinvertebrate containers were kept on ice to allow the insects to evacuate their gut contents for a period of 6 to 8 hours. Excess water was drained and insects were frozen for transport to the laboratory. During 1999–2007, 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 showed that although no substantial difference occurred for most metals, concentrations of copper were about 20 percent lower in the depurated macroinvertebrate 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 ultra-pure 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 filter, and analyzed undiluted by ICAPES 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 minimum reporting level.

Results

Concentrations of trace elements in whole-body tissue of aquatic insects collected during August 2007 are listed in table 23. 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 4. As with minimum reporting levels for trace elements in bed sediment, minimum reporting levels for trace elements in insects may differ among sites as a result of varied sample weights. In general, the smaller the biological-sample weight (a function of insect abundance), the higher the minimum reporting level. Therefore, higher minimum reporting levels do not necessarily imply a higher trace-element concentration in tissue.

Quality Assurance

The 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 employed in all sample collection. Equipment was acid-washed and rinsed in ultra-pure deionized water prior to the first sample collection. Nets and equipment were thoroughly rinsed in ambient stream water at each new main-stem site. New nets were used for all tributary sites. Biota samples were collected sequentially at sites along an increasing concentration gradient to minimize effects from potential site-to-site carryover contamination.

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 tissue SRM (lobster hepatopancreas) and 12 procedural blanks (one at each station). Quality-control samples were analyzed in a proportion equivalent to about 20 percent of the total number of biota samples.

Recovery efficiency for trace-element analyses of the SRM for biota is listed in table 24. Data-quality objectives have not been established for analytical recovery in biota, but percent recoveries are shown to illustrate analytical performance. Mean SRM recoveries ranged from 93.8 to 106 percent for arsenic, cadmium, copper, iron, manganese, nickel and zinc. A lower mean recovery was measured for lead (91.0 percent), with 3 of the 12 analyses having concentrations less than or very near the minimum reporting level. A high mean recovery was measured for chromium

(140 percent). With the exception of chromium and lead, both of which had low certified concentrations in the SRM (0.77 µg/g and 0.35 µg/g, respectively), the range of variation of the 95-percent confidence interval was within 10 percent, indicating reasonable recoveries in the SRM. No adjustments were made to the biota samples on the basis of trace element recovery efficiencies.

Procedural blanks for biota consisted of the same reagents used to digest and reconstitute tissue of aquatic insects and were analyzed undiluted. Analytical results of procedural blanks for biota (table 25) are reported as a liquid-phase concentration, in micrograms per milliliter, which is equivalent to parts per million. 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 minimum reporting level; 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 upper Clark Fork basin are listed in tables 26 through 28 for the period of record at each site since 1985. The summaries include the period of record, number of samples, and maximum, minimum, mean, and median concentrations.

Statistical summaries of long-term water-quality data (table 26) are based on results of cross-section samples collected periodically by the USGS for the long-term monitoring program in the upper Clark Fork basin during the period of record for each site. The summaries do not include data for supplemental samples collected at selected sites. Inclusion of results for supplemental samples that targeted high-flow conditions or maintenance drawdowns of Milltown Reservoir would disproportionately skew the long-term statistics relative to the other sites in the network. Statistical summaries of fine-grained bed-sediment (table 27) and biological data (table 28) are based on results of samples collected once annually 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. Sampling of bulk bed sediment has been discontinued; therefore, a statistical summary is not presented. Statistical summaries are not presented for discontinued sites.

Statistics for bed-sediment data (table 27) 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. In contrast, statistics for biological data (table 28) are based on individual analyses for each composite sample collected rather than on a single mean concentration for each year. Also, the number of samples for arsenic for both bed sediment and biota is smaller than the number for other trace elements because sampling for arsenic began in September 2003.

Differences in the number of composited biota samples among species reflect differences in species abundance, both within and between sites and among years. As a result, the statistics for biota describe a wider range of variation in trace-element concentrations than would be evident if results from individual composite samples were averaged. 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 minimum reporting levels. Where minimum reporting levels vary among years, differences in concentration with time are difficult to determine, especially when a large percentage of the samples have concentrations less than minimum reporting levels.

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

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Data

Table 4. Water-quality data for the Clark Fork basin, Montana, October 2006 through September 2007.

[Abbreviations: ft³/s, cubic feet per second; °C, degrees Celsius; E, estimated; lab, laboratory; µg/L, micrograms per liter; µS/cm, microsiemens per centimeter at 25°C; mg/L, milligrams per liter; mm, millimeters; NTRU, nephelometric turbidity ratio unit; ton/d, tons per day. Symbols: <, less than laboratory reporting level; --, no data]

12323230--Blacktail Creek at Harrison Avenue, at Butte

Date	Time	Stream-flow, instan-taneous (ft³/s)	pH, onsite (standard units)	Specific conduct-ance, onsite (µS/cm)	Temper-ature, water (°C)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Mag-nesium, filtered (mg/L)
11/13/2006	0900	6.2	7.7	288	4.0	120	34.4	7.95
02/26/2007	0900	4.9	7.7	317	2.5	120	34.1	9.07
03/26/2007	0945	12	7.7	227	3.5	90	25.9	6.24
05/10/2007	0725	11	7.7	240	10.0	93	27.1	6.29
06/05/2007	0840	18	7.7	216	13.5	83	24.3	5.53
06/19/2007	0655	20	7.6	208	10.0	84	23.9	5.82
07/24/2007	0705	4.3	7.5	341	12.0	140	38.6	9.57
08/27/2007	1540	3.4	8.0	331	14.5	130	37.4	9.07

Date	Arsenic, filtered (µg/L)	Arsenic, unfiltered recover-able (µg/L)	Cadmium, filtered (µg/L)	Cadmium, unfiltered recover-able (µg/L)	Copper, filtered (µg/L)	Copper, unfiltered recover-able (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recover-able (µg/L)
11/13/2006	1.9	2.4	E0.03	0.03	1.5	3.1	137	388
02/26/2007	1.7	2.4	.04	.04	1.4	4.7	122	565
03/26/2007	3.7	4.7	.05	.03	2.9	4.8	378	675
05/10/2007	4.9	5.6	E.02	.03	3.6	4.9	214	481
06/05/2007	7.3	8.8	--	.03	4.4	6.0	297	673
06/19/2007	7.2	8.6	E.03	.04	4.2	6.0	289	631
07/24/2007	--	4.4	--	.03	--	2.2	82	235
08/27/2007	2.9	3.1	E.03	.03	1.2	1.8	25	220

Date	Lead, filtered (µg/L)	Lead, unfiltered recover-able (µg/L)	Man-ganese, filtered (µg/L)	Man-ganese, unfiltered recover-able (µg/L)	Zinc, filtered (µg/L)	Zinc, unfiltered recover-able (µg/L)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/13/2006	E0.06	0.32	44.6	47.6	3.4	6	80	5	0.08
02/26/2007	E.06	.75	44.4	60.3	3.2	6	89	9	.12
03/26/2007	.30	.78	54.5	61.2	2.4	4	81	5	.16
05/10/2007	.14	.44	37.4	47.4	1.8	2.6	86	3	.09
06/05/2007	.17	.52	30.2	42.6	2.0	3.2	82	6	.29
06/19/2007	.19	.51	31.5	42.3	1.8	3.0	83	5	.27
07/24/2007	<.12	.17	54.5	59.6	--	2.1	93	1	.01
08/27/2007	<.12	.57	27.8	32.5	.82	2.9	76	4	.04

Table 4. Water-quality data for the Clark Fork basin, Montana, October 2006 through September 2007.—Continued

[Abbreviations: ft^3/s, cubic feet per second; °C, degrees Celsius; E, estimated; lab, laboratory; µg/L, micrograms per liter; µS/cm, microsiemens per centimeter at 25°C; mg/L, milligrams per liter; mm, millimeters; NTRU, nephelometric turbidity ratio unit; ton/d, tons per day. Symbols: <, less than laboratory reporting level; --, no data]

12323250--Silver Bow Creek below Blacktail Creek, at Butte

Date	Time	Streamflow, instantaneous (ft^3/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Temperature, water (°C)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/13/2006	1045	19	7.4	513	4.5	180	50.3	12.2
02/26/2007	1030	19	7.6	542	5.0	160	44.4	12.4
03/26/2007	1110	28	7.7	433	5.5	140	38.7	9.42
05/10/2007	0850	25	7.7	423	11.0	130	37.8	9.03
06/05/2007	0925	33	7.6	373	14.0	120	35.4	8.19
06/19/2007	0825	33	7.7	366	10.5	120	34.6	8.37
07/24/2007	0815	15	7.5	564	17.0	160	47.2	11.4
08/27/2007	1505	15	7.7	575	17.5	170	49.5	11.8

Date	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)
11/13/2006	3.6	4.5	0.12	0.22	8.9	18.7	35	347
02/26/2007	3.0	4.1	.16	.26	13.0	24.5	35	337
03/26/2007	3.7	4.9	.11	.14	12.2	19.3	148	453
05/10/2007	5.1	6.3	.12	.20	12.4	22.1	110	528
06/05/2007	6.8	8.3	.20	.21	12.7	19.7	161	600
06/19/2007	6.6	8.2	.08	.14	11.3	16.7	169	543
07/24/2007	4.8	5.5	.15	.15	9.5	13.3	29	120
08/27/2007	4.8	5.4	.07	.12	8.5	10.5	17	89

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)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/13/2006	0.15	1.99	145	160	46.3	58	83	7	0.36
02/26/2007	.27	2.30	122	139	60.7	75	83	9	.46
03/26/2007	.26	1.52	109	118	36.0	47	89	6	.45
05/10/2007	.33	3.47	108	139	41.8	59.3	94	10	.68
06/05/2007	.35	2.53	86.3	114	36.0	45.5	88	8	.71
06/19/2007	.27	1.73	79.6	97.1	30.9	41.5	90	7	.62
07/24/2007	.24	.66	58.9	70.9	50.4	51.6	87	2	.08
08/27/2007	.18	.71	32.9	49.8	36.4	38.3	76	3	.12

Table 4. Water-quality data for the Clark Fork basin, Montana, October 2006 through September 2007.—Continued

[Abbreviations: ft³/s, cubic feet per second; °C, degrees Celsius; E, estimated; lab, laboratory; µg/L, micrograms per liter; µS/cm, microsiemens per centimeter at 25°C; mg/L, milligrams per liter; mm, millimeters; NTRU, nephelometric turbidity ratio unit; ton/d, tons per day. Symbols: <, less than laboratory reporting level; --, no data]

12323600--Silver Bow Creek at Opportunity

Date	Time	Stream-flow, instan-taneous (ft^3/s)	pH, onsite (standard units)	Specific conduct-ance, onsite (µS/cm)	Temper-ature, water (°C)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Mag-nesium, filtered (mg/L)
11/14/2006	0800	34	8.3	499	0.5	180	54.7	11.5
02/26/2007	1505	32	8.3	522	1.5	170	49.1	12.1
03/27/2007	1120	59	8.3	414	5.0	140	42.3	9.04
05/09/2007	1105	59	8.5	391	11.0	150	44.1	8.65
06/05/2007	1425	80	8.3	361	14.5	130	39.4	7.70
06/19/2007	0935	81	8.3	352	11.0	130	37.9	7.99
07/24/2007	0935	25	8.5	528	19.5	190	55.3	11.8
08/28/2007	0720	15	8.1	619	10.0	220	63.4	14.1

Date	Arsenic, filtered (µg/L)	Arsenic, unfiltered recover-able (µg/L)	Cadmium, filtered (µg/L)	Cadmium, unfiltered recover-able (µg/L)	Copper, filtered (µg/L)	Copper, unfiltered recover-able (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recover-able (µg/L)
11/14/2006	8.0	10.6	0.55	0.96	18.9	65.4	20	552
02/26/2007	8.0	10.1	.77	.94	25.5	61.4	16	420
03/27/2007	9.1	13.8	.56	1.49	24.2	63.7	38	650
05/09/2007	9.5	12.4	.24	.60	18.6	59.5	39	618
06/05/2007	10.8	14.6	.22	.69	17.3	72.5	44	827
06/19/2007	11.3	15.2	.24	.65	21.8	68.7	71	757
07/24/2007	18.5	19.5	.27	.70	18.9	65.7	22	456
08/28/2007	13.1	12.2	--	.57	--	31.1	14	--

Date	Lead, filtered (µg/L)	Lead, unfiltered recover-able (µg/L)	Man-ganese, filtered (µg/L)	Man-ganese, unfiltered recover-able (µg/L)	Zinc, filtered (µg/L)	Zinc, unfiltered recover-able (µg/L)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/14/2006	0.25	10.7	216	268	214	274	92	16	1.5
02/26/2007	.27	8.60	264	334	194	251	74	13	1.1
03/27/2007	.37	14.2	260	284	142	217	79	17	2.7
05/09/2007	.33	13.1	126	223	49.4	136	86	20	3.2
06/05/2007	.58	16.9	115	223	47.5	139	84	23	5.0
06/19/2007	.70	14.9	104	169	67.2	142	85	21	4.6
07/24/2007	.51	12.9	87.4	182	35.8	120	81	16	1.1
08/28/2007	.36	5.66	121	165	--	110	84	6	.24

Table 4. Water-quality data for the Clark Fork basin, Montana, October 2006 through September 2007.—Continued

[Abbreviations: ft³/s, cubic feet per second; °C, degrees Celsius; E, estimated; lab, laboratory; µg/L, micrograms per liter; µS/cm, microsiemens per centimeter at 25°C; mg/L, milligrams per liter; mm, millimeters; NTRU, nephelometric turbidity ratio unit; ton/d, tons per day. Symbols: <, less than laboratory reporting level; --, no data]

12323670--Mill Creek near Anaconda

Date	Time	Streamflow, instantaneous (ft^3/s)	Turbidity, unfiltered, lab (NTRU)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Temperature, water (°C)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/13/2006	1400	19	<2.0	8.3	144	2.5	68	18.9	5.03
02/26/2007	1200	9.1	2.6	8.3	191	1.0	85	22.5	6.99
03/26/2007	1350	21	<2.0	8.1	140	5.5	62	17.1	4.71
05/09/2007	1505	70	<2.0	8.0	97	12.0	38	11.0	2.65
06/04/2007	1650	122	<2.0	7.9	77	14.5	29	8.69	1.88
06/18/2007	1345	75	<2.0	7.8	91	10.0	37	10.7	2.50
07/23/2007	1320	21	<2.0	8.0	150	17.0	68	18.8	5.21
08/27/2007	1125	12	<2.0	8.3	186	11.5	83	22.4	6.62

Date	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)
11/13/2006	11.7	12.6	<0.04	0.05	1.3	2.0	67	126
02/26/2007	9.5	10.2	E.03	.04	.79	1.4	36	89
03/26/2007	15.0	16.6	.05	.05	2.2	3.5	46	163
05/09/2007	17.8	19.1	E.03	.07	3.0	4.7	36	166
06/04/2007	17.0	18.5	--	.09	2.3	5.2	29	204
06/18/2007	17.2	18.8	.04	.07	1.8	3.4	35	124
07/23/2007	30.3	29.8	.07	.08	2.1	5.3	125	203
08/27/2007	23.6	23.6	E.03	.06	1.3	2.0	77	149

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)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/13/2006	E0.08	0.23	7.5	10.3	1.2	E2	64	2	0.10
02/26/2007	<.12	.19	6.9	8.8	1.0	E1	70	1	.02
03/26/2007	E.11	.56	5.5	10.8	.91	2	75	3	.17
05/09/2007	.16	.78	3.6	11.5	1.9	3.2	60	5	.95
06/04/2007	E.11	1.05	3.6	11.0	1.3	3.4	49	7	2.3
06/18/2007	E.07	.59	4.3	9.4	.97	2.4	64	4	.81
07/23/2007	.22	.72	7.1	15.6	.95	2.2	76	3	.17
08/27/2007	.14	.45	7.8	13.6	1.7	2.6	71	2	.06

Table 4. Water-quality data for the Clark Fork basin, Montana, October 2006 through September 2007.—Continued

[Abbreviations: ft³/s, cubic feet per second; °C, degrees Celsius; E, estimated; lab, laboratory; µg/L, micrograms per liter; µS/cm, microsiemens per centimeter at 25°C; mg/L, milligrams per liter; mm, millimeters; NTRU, nephelometric turbidity ratio unit; ton/d, tons per day. Symbols: <, less than laboratory reporting level; --, no data]

12323700--Mill Creek at Opportunity

Date	Time	Streamflow, instantaneous (ft³/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Temperature, water (°C)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/13/2006	1630	12	8.1	164	2.5	73	20.6	5.36
02/26/2007	1340	E5.0	8.2	217	0.5	94	25.4	7.42
03/26/2007	1620	5.5	8.1	161	7.5	69	19.0	5.11
05/09/2007	1035	35	8.0	107	9.0	42	11.9	2.93
06/05/2007	1140	103	7.8	75	10.5	30	8.65	1.93
06/18/2007	1530	40	8.0	99	11.5	41	11.7	2.75
07/23/2007	1530	6.3	8.1	168	20.0	71	19.6	5.37
08/27/2007	1340	.83	8.0	199	15.0	84	23.4	6.29

Date	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)
11/13/2006	20.6	21.0	0.06	0.11	1.9	2.8	74	129
02/26/2007	14.0	14.6	.05	.07	1.1	1.7	28	68
03/26/2007	17.9	19.8	E.02	.07	2.5	3.3	30	95
05/09/2007	22.9	25.0	.06	.12	4.0	6.6	34	212
06/05/2007	20.3	29.5	.13	.32	3.9	17.4	36	959
06/18/2007	23.1	25.2	.07	.12	2.6	6.3	42	233
07/23/2007	55.1	53.5	.07	.09	2.6	3.5	94	155
08/27/2007	26.4	27.8	.05	.07	1.6	2.2	42	115

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)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/13/2006	0.12	0.26	5.6	8.0	4.2	5	71	2	0.06
02/26/2007	<.12	.13	2.2	3.5	2.4	2	86	1	E.01
03/26/2007	E.07	.26	4.1	5.8	2.2	3	67	2	.03
05/09/2007	.16	1.14	3.1	14.0	2.8	5.7	67	6	.57
06/05/2007	.12	4.54	5.1	49.2	3.4	15.9	47	49	14
06/18/2007	.16	1.12	4.8	13.6	2.1	5.1	60	8	.86
07/23/2007	.20	.42	5.7	9.3	1.3	E1.9	82	1	.02
08/27/2007	<.12	.30	9.3	12.5	1.6	2.2	75	2	<.01

Table 4. Water-quality data for the Clark Fork basin, Montana, October 2006 through September 2007.—Continued

[Abbreviations: ft³/s, cubic feet per second; °C, degrees Celsius; E, estimated; lab, laboratory; µg/L, micrograms per liter; µS/cm, microsiemens per centimeter at 25°C; mg/L, milligrams per liter; mm, millimeters; NTRU, nephelometric turbidity ratio unit; ton/d, tons per day. Symbols: <, less than laboratory reporting level; --, no data]

12323710--Willow Creek near Anaconda

Date	Time	Streamflow, instantaneous (ft³/s)	Turbidity, unfiltered, lab (NTRU)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Temperature, water (°C)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/13/2006	1230	2.2	<2.0	7.6	110	0.5	41	14.0	1.55
03/26/2007	1245	5.5	5.7	7.6	99	2.0	37	12.4	1.38
05/09/2007	1605	15	7.6	7.7	81	12.0	27	9.29	1.03
06/04/2007	1520	19	5.1	7.8	88	13.0	31	10.7	1.12
06/18/2007	1250	11	2.7	7.8	100	9.5	35	11.9	1.32
07/23/2007	1230	3.3	<2.0	7.8	109	15.5	39	13.3	1.44
08/27/2007	1045	1.9	<2.0	7.8	111	9.0	38	12.8	1.41

Date	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)
11/13/2006	11.8	11.8	<0.04	0.04	1.3	1.9	82	136
03/26/2007	13.6	14.7	E.03	.04	2.3	3.2	86	302
05/09/2007	14.0	14.6	E.03	.08	2.2	4.3	64	573
06/04/2007	14.2	14.6	E.03	.06	1.9	3.5	63	344
06/18/2007	12.3	13.3	E.03	.04	1.3	2.4	69	206
07/23/2007	16.9	16.2	--	.04	1.2	1.5	54	111
08/27/2007	15.5	15.3	E.02	.02	.96	E1.0	51	106

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)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/13/2006	E0.07	0.16	25.1	27.1	1.2	E1	88	2	0.01
03/26/2007	.16	.57	14.9	22.8	1.8	2	80	6	.09
05/09/2007	.17	1.36	11.2	31.6	1.2	4.5	49	31	1.3
06/04/2007	.13	.83	10.6	20.0	.96	2.7	56	13	.67
06/18/2007	E.07	.38	14.7	21.4	.81	E1.7	80	5	.15
07/23/2007	E.07	.22	11.9	19.1	.75	E1.1	94	1	.01
08/27/2007	E.07	.21	13.2	18.1	.65	E1.3	74	2	.01

Table 4. Water-quality data for the Clark Fork basin, Montana, October 2006 through September 2007.—Continued

[Abbreviations: ft³/s, cubic feet per second; °C, degrees Celsius; E, estimated; lab, laboratory; µg/L, micrograms per liter; µS/cm, microsiemens per centimeter at 25°C; mg/L, milligrams per liter; mm, millimeters; NTRU, nephelometric turbidity ratio unit; ton/d, tons per day. Symbols: <, less than laboratory reporting level; --, no data]

12323720--Willow Creek at Opportunity

Date	Time	Stream-flow, instan-taneous (ft³/s)	pH, onsite (standard units)	Specific conduct-ance, onsite (µS/cm)	Temper-ature, water (°C)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/13/2006	1700	6.2	8.1	311	5.0	140	39.8	9.28
02/26/2007	1415	4.7	8.2	322	3.0	130	37.0	9.42
03/26/2007	1650	6.8	8.4	266	10.0	110	32.6	7.28
05/09/2007	1145	17	8.0	222	12.5	91	27.3	5.51
06/05/2007	1220	25	7.9	214	14.5	90	27.1	5.37
06/18/2007	1600	22	8.0	259	14.5	110	33.1	7.44
07/23/2007	1600	7.4	8.4	306	20.5	140	39.6	9.12
08/27/2007	1405	5.9	8.5	310	16.0	130	38.7	9.31

Date	Arsenic, filtered (µg/L)	Arsenic, unfiltered recover-able (µg/L)	Cadmium, filtered (µg/L)	Cadmium, unfiltered recover-able (µg/L)	Copper, filtered (µg/L)	Copper, unfiltered recover-able (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)
11/13/2006	17.4	20.9	<0.04	0.15	1.3	13.5	18	482
02/26/2007	11.6	13.5	E.02	.07	1.1	6.0	29	231
03/26/2007	24.1	27.4	E.02	.07	3.0	6.6	43	242
05/09/2007	54.2	56.8	E.03	.13	9.1	19.4	70	400
06/05/2007	62.4	64.8	.07	.15	8.8	17.3	96	394
06/18/2007	46.6	48.0	.04	.09	5.0	9.0	49	204
07/23/2007	44.1	45.3	.04	.05	3.0	4.9	23	156
08/27/2007	22.0	21.5	E.02	.03	2.2	3.1	8	71

Date	Lead, filtered (µg/L)	Lead, unfiltered recover-able (µg/L)	Man-ganese, filtered (µg/L)	Man-ganese, unfiltered recover-able (µg/L)	Zinc, filtered (µg/L)	Zinc, unfiltered recover-able (µg/L)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/13/2006	0.16	5.10	60.4	73.9	3.0	19	92	19	0.32
02/26/2007	.15	1.94	63.9	72.2	3.7	10	92	5	.06
03/26/2007	.23	1.63	48.9	56.0	2.7	7	86	7	.13
05/09/2007	.37	3.38	34.3	53.3	6.5	18.3	77	19	.87
06/05/2007	.40	2.72	27.5	44.3	6.0	15.5	77	13	.88
06/18/2007	.20	1.55	16.5	25.3	3.5	10.2	65	7	.42
07/23/2007	.12	1.12	10.7	23.5	.98	3.9	90	4	.08
08/27/2007	E.06	.64	6.4	11.7	.84	2.6	79	3	.05

Table 4. Water-quality data for the Clark Fork basin, Montana, October 2006 through September 2007.—Continued

[Abbreviations: ft^3/s, cubic feet per second; °C, degrees Celsius; E, estimated; lab, laboratory; µg/L, micrograms per liter; µS/cm, microsiemens per centimeter at 25°C; mg/L, milligrams per liter; mm, millimeters; NTRU, nephelometric turbidity ratio unit; ton/d, tons per day. Symbols: <, less than laboratory reporting level; --, no data]

12323750--Silver Bow Creek at Warm Springs

Date	Time	Streamflow, instantaneous (ft^3/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Temperature, water (°C)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/14/2006	0920	64	8.4	530	1.0	230	66.3	15.2
02/26/2007	1550	54	8.6	605	3.0	240	69.1	16.6
03/27/2007	1220	50	8.5	557	7.0	240	69.5	15.2
05/09/2007	0930	150	8.3	451	13.5	180	51.5	11.9
06/05/2007	1535	249	9.2	333	13.5	130	38.0	8.54
06/19/2007	1010	155	9.2	460	13.0	190	56.0	11.9
07/24/2007	1030	33	9.0	503	20.0	210	61.5	13.7
08/28/2007	0815	25	8.6	598	12.5	250	73.0	16.5

Date	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)
11/14/2006	12.4	16.8	0.04	0.27	1.7	14.6	12	427
02/26/2007	12.6	14.6	.11	.17	4.1	8.7	9	218
03/27/2007	10.1	13.0	E.03	.08	2.1	6.2	8	230
05/09/2007	20.7	23.4	E.03	.10	3.1	6.9	20	263
06/05/2007	26.7	30.1	.05	.16	5.2	12.6	24	449
06/19/2007	29.4	30.5	.04	.10	5.3	8.6	17	144
07/24/2007	36.4	37.1	.04	.06	3.0	4.5	8	101
08/28/2007	33.6	34.8	E.02	.03	2.0	2.4	E6	56

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)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/14/2006	E0.09	3.24	96.1	147	3.6	29	96	7	1.2
02/26/2007	<.12	1.11	205	242	7.5	17	85	5	.73
03/27/2007	<.12	1.48	176	239	3.6	11	90	5	.68
05/09/2007	.13	1.33	180	224	3.6	10.9	87	7	2.8
06/05/2007	.12	2.23	37.0	94.4	1.2	12.2	86	13	8.7
06/19/2007	E.11	.75	98.4	127	3.0	6.3	86	4	1.7
07/24/2007	<.12	.55	28.4	85.6	.98	3.1	76	3	.27
08/28/2007	<.12	.28	32.5	55.5	1.1	2.1	67	2	.14

Table 4. Water-quality data for the Clark Fork basin, Montana, October 2006 through September 2007.—Continued

[Abbreviations: ft³/s, cubic feet per second; °C, degrees Celsius; E, estimated; lab, laboratory; µg/L, micrograms per liter; µS/cm, microsiemens per centimeter at 25°C; mg/L, milligrams per liter; mm, millimeters; NTRU, nephelometric turbidity ratio unit; ton/d, tons per day. Symbols: <, less than laboratory reporting level; --, no data]

12323760--Warm Springs near Anaconda

Date	Time	Streamflow, instantaneous (ft³/s)	Turbidity, unfiltered, lab (NTRU)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Temperature, water (°C)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/13/2006	1545	65	<2.0	8.7	247	4.5	120	37.0	7.79
03/26/2007	1515	41	<2.0	8.7	264	8.0	130	38.6	8.47
05/09/2007	1310	145	<2.0	8.4	182	8.5	84	25.6	4.83
06/12/2007	1020	391	2.3	8.1	140	7.0	66	20.5	3.64
07/23/2007	1400	85	2.3	8.5	230	14.0	110	32.3	6.83
08/27/2007	1240	62	<2.0	8.5	255	10.5	120	36.3	7.84

Date	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)
11/13/2006	1.9	2.0	<0.04	0.03	0.57	1.3	E6	45
03/26/2007	2.4	2.7	E.02	.02	.86	2.1	<6	75
05/09/2007	2.0	2.3	<.04	.04	1.1	3.3	7	125
06/12/2007	2.7	3.2	<.04	.05	1.4	4.7	13	237
07/23/2007	2.8	3.0	E.02	.07	.87	2.1	13	79
08/27/2007	2.6	2.6	E.02	.03	.62	E1.1	E5	67

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)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/13/2006	<0.12	0.12	0.5	1.8	0.84	E1	67	2	0.35
03/26/2007	<.12	.26	.8	3.3	E.54	E2	71	4	.44
05/09/2007	<.12	.47	.9	5.1	1.2	2.7	57	6	2.3
06/12/2007	<.12	.62	2.1	11.3	1.3	5.5	51	17	18
07/23/2007	<.12	.28	1.1	4.1	1.4	2.7	61	4	.92
08/27/2007	<.12	.23	.8	4.3	E.48	E1.6	67	3	.50

Table 4. Water-quality data for the Clark Fork basin, Montana, October 2006 through September 2007.—Continued

[Abbreviations: ft³/s, cubic feet per second; °C, degrees Celsius; E, estimated; lab, laboratory; µg/L, micrograms per liter; µS/cm, microsiemens per centimeter at 25°C; mg/L, milligrams per liter; mm, millimeters; NTRU, nephelometric turbidity ratio unit; ton/d, tons per day. Symbols: <, less than laboratory reporting level; --, no data]

12323770--Warm Springs Creek at Warm Springs

Date	Time	Streamflow, instantaneous (ft^3/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Temperature, water (°C)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/14/2006	0900	46	8.4	321	2.0	160	49.6	9.22
03/27/2007	1200	34	8.5	358	5.5	180	54.7	10.2
05/09/2007	0905	99	8.2	243	8.5	110	35.1	6.45
06/12/2007	1130	250	8.0	166	9.0	77	23.9	4.20
07/24/2007	1010	52	8.2	291	14.5	140	41.6	8.01
08/28/2007	0755	39	8.1	329	9.5	150	46.8	9.13

Date	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)
11/14/2006	3.3	3.7	<0.04	0.06	1.6	5.9	12	76
03/27/2007	4.2	4.5	<.04	.05	2.0	5.9	9	75
05/09/2007	4.1	6.1	E.03	.10	2.7	23.0	10	357
06/12/2007	5.1	7.2	E.02	.09	3.7	21.3	15	381
07/24/2007	5.6	5.7	.05	.05	1.8	4.7	11	63
08/28/2007	4.4	4.9	E.03	.05	1.8	6.2	11	80

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)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/14/2006	<0.12	0.34	158	194	3.0	3	61	4	0.50
03/27/2007	<.12	.37	150	174	.90	3	68	4	.37
05/09/2007	<.12	2.09	72.9	201	1.2	8.9	65	20	5.3
06/12/2007	<.12	1.88	44.9	113	5.1	9.1	68	20	14
07/24/2007	<.12	.31	78.7	108	.73	E1.7	71	3	.42
08/28/2007	<.12	.43	100	155	1.0	2.3	59	3	.32

Table 4. Water-quality data for the Clark Fork basin, Montana, October 2006 through September 2007.—Continued

[Abbreviations: ft³/s, cubic feet per second; °C, degrees Celsius; E, estimated; lab, laboratory; µg/L, micrograms per liter; µS/cm, microsiemens per centimeter at 25°C; mg/L, milligrams per liter; mm, millimeters; NTRU, nephelometric turbidity ratio unit; ton/d, tons per day. Symbols: <, less than laboratory reporting level; --, no data]

12323800--Clark Fork near Galen

Date	Time	Streamflow, instantaneous (ft^3/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Temperature, water (°C)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/14/2006	1045	101	8.6	447	2.0	200	60.0	13.1
02/27/2007	1120	81	8.5	514	1.0	210	62.0	14.1
03/27/2007	1340	87	8.4	480	6.0	210	63.1	13.2
05/08/2007	1315	225	8.4	377	12.0	150	46.1	9.56
06/05/2007	1720	492	8.8	243	13.0	99	29.8	6.07
06/19/2007	1125	341	8.9	338	12.0	140	41.9	8.59
07/24/2007	1155	79	8.6	383	18.0	170	50.1	10.3
08/28/2007	0935	60	8.4	435	11.0	200	58.2	12.2

Date	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)
11/14/2006	8.2	11.2	E0.02	0.17	1.7	10.9	9	256
02/27/2007	8.7	10.8	.07	.17	3.3	19.2	E6	327
03/27/2007	7.5	9.7	E.02	.08	2.7	9.3	10	199
05/08/2007	14.4	16.8	E.03	.08	3.7	14.6	15	290
06/05/2007	17.1	23.6	E.02	.23	5.7	56.4	21	968
06/19/2007	17.4	18.8	E.03	.10	4.1	13.4	16	229
07/24/2007	16.2	17.0	.04	.05	3.1	5.8	7	64
08/28/2007	16.5	16.9	E.03	.06	2.7	10.3	7	300

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)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/14/2006	<0.12	1.86	109	149	2.9	16	90	4	1.1
02/27/2007	<.12	2.07	178	273	5.3	21	72	12	2.6
03/27/2007	<.12	1.25	151	207	3.7	10	83	5	1.2
05/08/2007	E.07	1.83	95.9	174	3.0	13.0	74	11	6.7
06/05/2007	E.10	6.79	52.9	258	1.2	29.2	68	48	64
06/19/2007	E.07	1.30	66.5	113	1.2	8.5	75	8	7.4
07/24/2007	<.12	.41	34.4	67.8	1.4	2.7	77	2	.43
08/28/2007	<.12	1.13	37.6	110	1.3	9.9	78	2	.32

Table 4. Water-quality data for the Clark Fork basin, Montana, October 2006 through September 2007.—Continued

[Abbreviations: ft³/s, cubic feet per second; °C, degrees Celsius; E, estimated; lab, laboratory; µg/L, micrograms per liter; µS/cm, microsiemens per centimeter at 25°C; mg/L, milligrams per liter; mm, millimeters; NTRU, nephelometric turbidity ratio unit; ton/d, tons per day. Symbols: <, less than laboratory reporting level; --, no data]

12323840--Lost Creek near Anaconda

Date	Time	Streamflow, instantaneous (ft³/s)	Turbidity, unfiltered, lab (NTRU)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Temperature, water (°C)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/13/2006	1500	5.7	<2.0	8.4	222	3.0	110	32.5	6.45
02/26/2007	1240	3.2	<2.0	8.4	218	1.5	100	30.0	6.54
03/26/2007	1420	4.1	<2.0	8.4	213	6.0	100	31.3	6.44
05/09/2007	1410	5.2	4.3	8.3	200	11.5	92	28.0	5.43
06/04/2007	1720	12	<2.0	8.2	187	15.0	86	26.8	4.72
06/18/2007	1425	9.6	<2.0	8.2	197	11.5	91	27.8	5.18
07/23/2007	1455	.37	<2.0	8.2	244	17.0	110	34.6	6.44
08/27/2007	1155	6.8	<2.0	8.3	232	10.5	110	32.8	6.69

Date	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)
11/13/2006	3.5	3.7	<0.04	0.04	1.4	4.1	10	87
02/26/2007	2.8	2.6	E.03	.03	1.2	2.1	E4	30
03/26/2007	2.9	3.2	.05	.03	1.6	3.2	E6	60
05/09/2007	5.1	5.7	E.03	.07	2.6	7.6	14	199
06/04/2007	10.8	10.8	--	.06	3.3	8.3	11	192
06/18/2007	10.2	10.7	E.02	.05	2.6	6.0	8	116
07/23/2007	12.1	11.7	.06	.07	3.1	6.0	6	109
08/27/2007	4.1	4.4	<.04	.04	1.1	2.2	11	62

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)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/13/2006	<0.12	0.37	1.0	3.1	2.2	3	65	3	0.05
02/26/2007	<.12	.13	.4	1.3	1.0	E1	62	1	.01
03/26/2007	<.12	.26	.9	2.6	1.3	E2	64	4	.04
05/09/2007	<.12	1.55	1.1	6.5	1.1	3.7	58	9	.13
06/04/2007	<.12	.75	1.3	5.8	1.3	3.9	51	12	.39
06/18/2007	<.12	.59	1.2	4.6	1.1	3.0	36	9	.23
07/23/2007	<.12	.54	1.5	7.0	1.2	3.0	54	1	<.01
08/27/2007	<.12	.28	.7	3.6	.62	E1.8	56	4	.07

Table 4. Water-quality data for the Clark Fork basin, Montana, October 2006 through September 2007.—Continued

[Abbreviations: ft³/s, cubic feet per second; °C, degrees Celsius; E, estimated; lab, laboratory; µg/L, micrograms per liter; µS/cm, microsiemens per centimeter at 25°C; mg/L, milligrams per liter; mm, millimeters; NTRU, nephelometric turbidity ratio unit; ton/d, tons per day. Symbols: <, less than laboratory reporting level; --, no data]

12323850--Lost Creek near Galen

Date	Time	Streamflow, instantaneous (ft³/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Temperature, water (°C)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/14/2006	1015	42	8.4	628	2.0	310	91.8	20.7
02/27/2007	1050	40	8.3	615	0.0	290	84.6	19.1
03/27/2007	1315	42	8.3	641	6.0	320	94.8	20.8
05/08/2007	1245	32	8.5	608	13.5	290	82.5	19.3
06/05/2007	1640	2.4	8.2	673	16.5	260	69.9	21.8
06/19/2007	1055	9.4	8.4	700	12.5	320	93.1	21.8
07/24/2007	1135	1.7	8.3	604	19.5	220	56.0	19.1
08/28/2007	0910	2.0	8.2	629	10.0	240	61.7	20.7

Date	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)
11/14/2006	11.5	12.1	E0.02	0.05	1.4	4.0	7	71
02/27/2007	8.1	9.6	E.03	.09	.99	9.5	E5	293
03/27/2007	13.0	14.2	E.02	.06	2.2	6.3	14	126
05/08/2007	15.3	15.9	E.03	.04	2.3	5.5	10	114
06/05/2007	18.8	21.3	--	.04	2.5	4.8	36	167
06/19/2007	11.3	11.5	<.04	.03	1.3	3.4	12	68
07/24/2007	9.5	10.0	.04	.04	1.7	2.9	8	47
08/28/2007	6.0	6.1	E.03	.03	1.3	1.6	8	23

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)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/14/2006	<0.12	0.23	5.5	8.3	2.1	4	51	37	4.2
02/27/2007	<.12	1.06	13.5	29.0	2.8	8	67	30	3.2
03/27/2007	<.12	.44	21.7	26.1	2.2	5	70	6	.68
05/08/2007	<.12	.38	13.0	19.1	1.1	2.6	59	21	1.8
06/05/2007	--	.18	39.4	42.8	.87	E1.5	56	29	.19
06/19/2007	<.12	.19	9.7	13.6	E.59	E1.4	38	12	.30
07/24/2007	<.12	.13	7.3	11.6	.71	<2.0	71	3	.01
08/28/2007	<.12	E.06	6.1	6.8	E.58	<2.0	67	5	.03

Table 4. Water-quality data for the Clark Fork basin, Montana, October 2006 through September 2007.—Continued

[Abbreviations: ft³/s, cubic feet per second; °C, degrees Celsius; E, estimated; lab, laboratory; µg/L, micrograms per liter; µS/cm, microsiemens per centimeter at 25°C; mg/L, milligrams per liter; mm, millimeters; NTRU, nephelometric turbidity ratio unit; ton/d, tons per day. Symbols: <, less than laboratory reporting level; --, no data]

12324200--Clark Fork at Deer Lodge

Date	Time	Streamflow, instantaneous (ft³/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Temperature, water (°C)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/14/2006	1200	224	8.5	503	2.5	230	68.8	15.3
02/27/2007	1240	208	8.4	504	0.0	220	63.5	14.1
03/27/2007	1450	204	8.3	505	6.5	220	67.1	13.9
05/08/2007	1130	286	8.2	442	12.5	190	56.0	12.2
06/04/2007	1030	414	8.2	307	15.5	130	37.9	7.54
06/18/2007	1105	459	8.3	350	13.0	140	42.2	8.62
07/23/2007	1100	61	8.4	462	19.5	190	56.9	11.8
08/27/2007	0845	73	8.1	500	12.0	210	63.9	13.2

Date	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)
11/14/2006	9.8	12.0	0.04	0.15	4.0	16.7	8	270
02/27/2007	8.1	10.5	.06	.17	3.8	24.7	E6	420
03/27/2007	9.8	13.5	.07	.15	5.2	29.9	11	459
05/08/2007	15.1	21.0	.05	.27	6.8	53.7	16	814
06/04/2007	16.8	21.0	.07	.18	7.7	41.9	16	628
06/18/2007	16.1	20.6	.10	.20	8.1	39.5	16	553
07/23/2007	17.5	17.2	--	.06	7.7	11.6	6	50
08/27/2007	13.5	13.9	.04	.05	6.3	10.7	7	57

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)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/14/2006	<0.12	1.82	45.1	70.7	7.0	20	86	8	4.8
02/27/2007	<.12	2.80	72.0	117	7.2	29	76	19	11
03/27/2007	E.10	3.68	74.8	143	7.0	30	83	18	9.9
05/08/2007	E.11	6.83	29.0	183	6.1	45.0	76	34	26
06/04/2007	E.08	4.97	22.8	130	4.6	31.4	81	23	26
06/18/2007	E.10	4.69	32.6	119	5.0	28.9	71	23	29
07/23/2007	<.12	.47	16.9	31.7	3.5	6.4	75	2	.33
08/27/2007	<.12	.53	11.6	29.1	5.9	8.4	73	3	.59

Table 4. Water-quality data for the Clark Fork basin, Montana, October 2006 through September 2007.—Continued

[Abbreviations: ft³/s, cubic feet per second; °C, degrees Celsius; E, estimated; lab, laboratory; µg/L, micrograms per liter; µS/cm, microsiemens per centimeter at 25°C; mg/L, milligrams per liter; mm, millimeters; NTRU, nephelometric turbidity ratio unit; ton/d, tons per day. Symbols: <, less than laboratory reporting level; --, no data]

12324680--Clark Fork at Goldcreek

Date	Time	Streamflow, instantaneous (ft^3/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Temperature, water (°C)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/14/2006	1400	390	8.9	433	3.0	200	60.4	13.0
02/27/2007	1415	317	8.8	460	0.0	200	57.7	13.1
03/27/2007	1600	501	8.6	374	5.5	170	51.0	10.5
05/08/2007	0930	725	8.3	347	10.0	150	43.2	9.36
06/06/2007	0720	1,730	8.1	268	12.0	110	32.5	7.01
06/19/2007	1305	944	8.5	327	14.5	140	40.6	8.53
07/24/2007	1325	202	8.6	384	20.0	160	49.1	10.3
08/28/2007	1055	140	8.5	436	14.5	190	54.5	12.1

Date	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)
11/14/2006	9.1	9.9	0.04	0.09	3.6	12.5	E6	170
02/27/2007	7.5	8.7	.05	.11	3.5	16.5	E5	254
03/27/2007	7.2	9.1	<.04	.11	3.9	19.0	10	384
05/08/2007	9.8	13.8	E.03	.20	4.9	38.3	25	726
06/06/2007	11.9	20.8	.04	.32	10.0	79.4	30	1,580
06/19/2007	11.2	13.8	E.03	.12	6.0	24.5	14	404
07/24/2007	10.7	10.9	.04	.04	3.9	5.4	E3	34
08/28/2007	10.9	10.9	E.03	.04	4.2	5.9	E4	42

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)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/14/2006	<0.12	1.20	15.3	46.8	2.2	12	89	7	7.4
02/27/2007	<.12	1.70	37.6	72.7	4.2	19	79	12	10
03/27/2007	E.06	2.73	24.7	73.9	2.7	19	85	16	22
05/08/2007	E.09	5.09	10.8	135	4.1	35.9	74	37	72
06/06/2007	.14	10.8	12.9	177	5.2	62.1	64	92	430
06/19/2007	E.06	2.76	17.9	71.5	2.7	20.0	78	16	41
07/24/2007	<.12	.16	5.8	17.6	1.1	2.3	70	1	.55
08/28/2007	<.12	.26	8.1	34.4	1.7	3.6	66	2	.76

Table 4. Water-quality data for the Clark Fork basin, Montana, October 2006 through September 2007.—Continued

[Abbreviations: ft³/s, cubic feet per second; °C, degrees Celsius; E, estimated; lab, laboratory; µg/L, micrograms per liter; µS/cm, microsiemens per centimeter at 25°C; mg/L, milligrams per liter; mm, millimeters; NTRU, nephelometric turbidity ratio unit; ton/d, tons per day. Symbols: <, less than laboratory reporting level; --, no data]

12331800--Clark Fork near Drummond

Date	Time	Streamflow, instantaneous (ft³/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Temperature, water (°C)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
11/14/2006	1500	573	8.7	459	5.0	220	62.7	14.8
02/27/2007	1525	460	8.4	478	3.0	210	59.4	14.5
03/28/2007	0850	720	8.3	401	5.5	180	53.5	12.1
05/08/2007	0815	1,030	8.2	356	11.5	150	44.0	10.8
06/07/2007	1140	3,160	8.2	293	9.0	120	34.8	8.26
06/19/2007	1425	1,410	8.3	352	15.5	150	44.7	10.1
07/24/2007	1440	298	8.6	463	21.0	210	57.5	15.2
08/28/2007	1215	232	8.4	573	16.5	250	71.4	18.0

Date	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)
11/14/2006	8.4	9.2	E0.02	0.08	2.9	9.7	E4	188
02/27/2007	7.4	8.5	.06	.12	3.3	14.3	E4	276
03/28/2007	6.9	10.0	E.03	.14	3.5	20.0	10	532
05/08/2007	9.7	14.6	.04	.22	4.8	38.2	11	913
06/07/2007	18.0	41.3	.07	1.02	16.0	170	54	4,450
06/19/2007	12.6	16.3	.05	.20	6.1	26.2	39	657
07/24/2007	11.5	11.6	E.03	.05	3.9	5.5	<6	26
08/28/2007	11.1	11.3	E.03	.07	3.1	5.9	<6	81

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)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
11/14/2006	<0.12	1.32	11.0	44.4	2.6	12	79	12	19
02/27/2007	E.06	1.84	27.6	64.4	5.6	20	80	13	16
03/28/2007	E.07	3.80	18.0	91.3	4.0	30	74	27	52
05/08/2007	E.11	7.15	7.8	156	4.0	47.6	72	54	150
06/07/2007	.58	31.0	30.9	507	9.5	200	59	315	2,690
06/19/2007	.13	5.24	27.5	111	4.2	32.8	67	37	141
07/24/2007	<.12	.18	3.3	13.5	.95	2.9	71	7	5.6
08/28/2007	<.12	.67	11.7	53.6	2.1	7.4	82	9	5.6

Table 4. Water-quality data for the Clark Fork basin, Montana, October 2006 through September 2007.—Continued

[Abbreviations: ft^3/s, cubic feet per second; °C, degrees Celsius; E, estimated; lab, laboratory; µg/L, micrograms per liter; µS/cm, microsiemens per centimeter at 25°C; mg/L, milligrams per liter; mm, millimeters; NTRU, nephelometric turbidity ratio unit; ton/d, tons per day. Symbols: <, less than laboratory reporting level; --, no data]

12334550--Clark Fork at Turah Bridge, near Bonner

Date	Time	Stream-flow, instanta-neous (ft^3/s)	pH, onsite (standard units)	Specific conduct-ance, onsite (µS/cm)	Temper-ature, water (°C)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Mag-nesium, filtered (mg/L)	Total nitrogen, unfiltered, (mg/L)
*10/17/2006	1100	840	8.5	401	7.0	190	54.0	13.2	0.32
11/14/2006	1630	944	8.7	355	4.0	170	46.8	11.8	--
02/27/2007	1640	697	8.8	396	3.0	170	49.2	12.6	--
03/28/2007	1100	1,240	8.4	291	5.5	130	36.4	9.19	--
*04/09/2007	1130	1,080	8.1	322	8.0	140	40.2	10.3	.37
*04/23/2007	1030	1,240	8.3	331	9.5	150	42.6	11.1	.45
*05/03/2007	1100	2,700	8.1	168	8.0	76	21.4	5.46	.68
05/07/2007	1445	2,530	8.3	218	11.0	94	26.5	6.78	--
*05/14/2007	1100	3,340	8.1	166	10.0	72	20.4	5.11	.37
*05/22/2007	1100	3,360	8.0	174	7.0	75	21.4	5.33	.29
*05/31/2007	1230	3,360	8.2	222	13.0	98	27.6	6.92	.36
*06/06/2007	1100	3,670	8.2	197	11.5	85	24.4	5.95	.42
06/07/2007	1455	4,980	8.2	214	10.0	92	26.0	6.61	--
*06/12/2007	1030	5,390	8.0	219	12.5	96	27.2	6.87	.41
*06/19/2007	1230	3,390	8.3	249	13.0	110	31.1	7.70	.26
06/20/2007	0900	3,080	8.2	257	14.0	110	31.6	7.84	--
*06/26/2007	1030	2,180	8.4	278	12.0	130	36.0	9.34	.19
07/24/2007	1605	690	8.8	285	21.5	120	32.8	9.88	--
08/28/2007	1330	451	8.6	367	15.5	160	43.9	12.2	--

Date	Total phos-phorous, unfiltered, (mg/L)	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Cadmium, filtered (µg/L)	Cadmium, unfiltered recover-able (µg/L)	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)
*10/17/2006	0.041	6.7	7.9	<0.04	0.14	2.0	13.6	E5	296
11/14/2006	--	5.6	6.0	E.02	.05	2.3	5.8	E5	114
02/27/2007	--	5.6	6.2	.04	.08	2.6	9.0	11	145
03/28/2007	--	4.4	5.8	.04	.09	2.9	12.3	13	327
*04/09/2007	.043	5.5	6.4	E.02	.08	3.3	12.6	10	287
*04/23/2007	.059	6.6	8.1	E.02	.12	7.8	18.4	13	472
*05/03/2007	.129	4.4	8.1	E.02	.24	3.6	30.7	26	1,340
05/07/2007	--	5.2	7.3	E.03	.13	3.7	21.5	29	563
*05/14/2007	.059	4.7	6.8	E.02	.11	3.2	18.3	20	585
*05/22/2007	.051	4.2	5.9	E.02	.11	2.8	16.7	19	505
*05/31/2007	.066	7.4	10.3	E.02	.15	4.7	25.3	15	696
*06/06/2007	.076	6.8	10.5	E.02	.19	3.8	26.6	21	832
06/07/2007	--	10.3	19.6	.04	.52	12.7	78.5	48	2,460
*06/12/2007	.092	9.5	13.2	E.02	.20	6.2	34.8	19	1,110
*06/19/2007	.046	7.7	9.0	E.02	.10	3.9	15.6	13	381
06/20/2007	--	7.4	9.2	E.03	.10	3.5	15.5	40	399
*06/26/2007	.026	7.2	7.1	<.04	.05	3.2	6.9	12	142
07/24/2007	--	5.6	5.7	E.02	.03	2.2	3.4	E4	44
08/28/2007	--	6.0	6.2	<.04	.06	2.0	2.7	E3	42

Table 4. Water-quality data for the Clark Fork basin, Montana, October 2006 through September 2007.—Continued

[Abbreviations: ft^3/s, cubic feet per second; °C, degrees Celsius; E, estimated; lab, laboratory; µg/L, micrograms per liter; µS/cm, microsiemens per centimeter at 25°C; mg/L, milligrams per liter; mm, millimeters; NTRU, nephelometric turbidity ratio unit; ton/d, tons per day. Symbols: <, less than laboratory reporting level; --, no data]

12334550--Clark Fork at Turah Bridge, near Bonner–Continued

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)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
*10/17/2006	<0.12	2.31	2.9	84.1	2.6	26	89	18	41
11/14/2006	E.07	.74	3.4	23.3	2.3	8	86	6	15
02/27/2007	<.12	1.03	6.3	30.3	1.9	11	85	7	13
03/28/2007	E.06	1.92	6.9	50.0	4.5	18	75	18	60
*04/09/2007	E.08	2.03	6.2	55.2	3.1	18.6	81	17	50
*04/23/2007	E.08	3.28	5.9	75.5	2.8	24.8	83	22	74
*05/03/2007	.18	6.50	11.0	151	4.0	52.5	62	92	671
05/07/2007	.12	3.74	7.2	79.1	2.9	27.8	69	35	239
*05/14/2007	E.07	3.57	6.3	74.6	3.1	26.0	59	45	406
*05/22/2007	E.06	2.74	5.5	70.0	3.0	21.3	63	32	290
*05/31/2007	<.12	4.38	7.4	90.3	3.3	32.4	73	41	372
*06/06/2007	<.12	5.38	6.2	118	3.5	48.5	64	55	545
06/07/2007	.37	14.9	17.7	283	6.8	113	65	157	2,110
*06/12/2007	E.07	6.08	9.5	130	4.8	47.5	61	74	1,080
*06/19/2007	<.12	2.38	12.4	60.1	3.9	21.2	71	21	192
06/20/2007	E.11	2.60	11.8	57.9	2.8	20.1	73	21	175
*06/26/2007	<.12	.77	9.3	20.1	2.7	8.9	73	5	29
07/24/2007	<.12	.19	3.6	13.0	1.4	3.3	73	4	7.5
08/28/2007	<.12	.30	4.3	16.5	.94	3.6	79	4	4.9

*Sample collected as part of a supplemental sampling program.

Table 4. Water-quality data for the Clark Fork basin, Montana, October 2006 through September 2007.—Continued

[Abbreviations: ft³/s, cubic feet per second; °C, degrees Celsius; E, estimated; lab, laboratory; µg/L, micrograms per liter; µS/cm, microsiemens per centimeter at 25°C; mg/L, milligrams per liter; mm, millimeters; NTRU, nephelometric turbidity ratio unit; ton/d, tons per day. Symbols: <, less than laboratory reporting level; --, no data]

12340000--Blackfoot River near Bonner

Date	Time	Streamflow, instantaneous (ft^3/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Temperature, water (°C)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)	Total nitrogen, unfiltered, (mg/L)
*10/17/2006	1230	517	8.5	266	7.0	140	35.4	12.3	0.17
11/15/2006	0830	1,260	8.4	202	3.0	100	27.2	8.71	--
03/28/2007	1310	2,550	8.4	177	5.0	88	22.9	7.52	--
*04/09/2007	1300	1,710	8.3	194	7.5	96	24.6	8.33	.19
*04/23/2007	1230	1,880	8.3	201	9.0	100	26.3	8.76	.20
*05/03/2007	1300	5,340	8.2	149	8.5	77	20.2	6.55	.43
05/07/2007	1330	4,140	8.3	180	9.5	88	22.8	7.45	--
*05/14/2007	1330	5,320	8.2	158	9.5	78	20.4	6.61	.20
*05/22/2007	1300	4,380	8.4	165	8.5	84	21.9	7.09	.17
*05/31/2007	1430	3,310	8.5	190	13.0	94	24.5	8.06	.16
*060/6/2007	1300	3,650	8.4	175	11.5	87	22.7	7.41	.15
*06/12/2007	1230	2,960	8.3	202	13.5	100	25.5	8.82	.13
06/12/2007	1450	2,950	8.5	204	15.0	99	25.5	8.69	--
*06/19/2007	1400	2,240	8.4	214	13.5	110	27.4	9.43	.13
*06/26/2007	1200	1,640	8.6	222	14.0	120	29.4	10.1	.13
07/25/2007	0725	680	8.3	256	18.5	120	29.4	11.2	--
08/28/2007	1445	461	8.6	265	16.0	130	31.9	12.3	--

Date	Total phosphorous, unfiltered, (mg/L)	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/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)
*10/17/2006	<0.008	1.1	1.3	<0.04	<0.02	0.50	1.2	7	30
11/15/2006	--	.79	.93	<.04	<.02	.46	E1.1	9	58
03/28/2007	--	.78	.93	<.04	E.01	.77	1.6	25	203
*04/09/2007	.019	.84	.90	<.04	<.02	.72	E.77	12	93
*04/23/2007	.022	.91	1.0	<.04	<.02	.77	E.79	12	141
*05/03/2007	.083	.74	1.4	<.04	.02	2.0	3.0	15	953
05/07/2007	--	.87	1.1	E.02	E.01	.71	2.0	14	407
*05/14/2007	.036	.89	1.2	<.04	<.02	.89	2.8	9	417
*05/22/2007	.023	.78	.98	<.04	E.01	.50	E1.1	8	293
*05/31/2007	.019	.84	1.0	<.04	<.02	E.37	1.4	7	196
*060/6/2007	.020	.82	1.0	<.04	E.01	<.40	E1.1	9	241
*06/12/2007	.019	1.0	1.1	<.04	E.01	<.40	E1.1	7	200
06/12/2007	--	.98	1.2	<.04	E.01	E.26	1.4	8	270
*06/19/2007	.015	.96	.99	<.04	E.01	<.40	1.3	9	137
*06/26/2007	.010	1.1	1.2	<.04	<.02	E.27	E.64	10	78
07/25/2007	--	1.4	1.5	E.02	<.02	E.34	<1.2	<6	40
08/28/2007	--	1.4	1.3	<.04	<.02	E.23	<1.2	E3	16

Table 4. Water-quality data for the Clark Fork basin, Montana, October 2006 through September 2007.—Continued

[Abbreviations: ft^3/s, cubic feet per second; °C, degrees Celsius; E, estimated; lab, laboratory; µg/L, micrograms per liter; µS/cm, microsiemens per centimeter at 25°C; mg/L, milligrams per liter; mm, millimeters; NTRU, nephelometric turbidity ratio unit; ton/d, tons per day. Symbols: <, less than laboratory reporting level; --, no data]

12340000--Blackfoot River near Bonner–Continued									
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)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
*10/17/2006	<0.12	<0.06	1.0	3.4	E0.42	<2	87	1	1.4
11/15/2006	<.12	E.06	1.0	5.0	.88	E1	87	4	14
03/28/2007	<.12	.23	2.6	18.2	.73	E2	81	12	83
*04/09/2007	<.12	.11	2.3	10.3	.76	<2.0	83	5	23
*04/23/2007	<.12	.16	2.6	16.2	1.2	E1.1	84	7	36
*05/03/2007	.17	1.30	3.0	70.2	2.5	5.1	83	84	1,210
05/07/2007	<.12	.59	2.5	31.3	.61	3.0	88	32	358
*05/14/2007	<.12	.61	2.2	29.9	2.0	2.8	83	40	575
*05/22/2007	<.12	.35	1.8	18.9	.92	E1.9	85	18	213
*05/31/2007	<.12	.26	2.0	15.1	E.39	E1.9	87	15	134
*060/6/2007	<.12	.35	1.3	18.6	<.60	2.1	86	19	187
*06/12/2007	<.12	.28	2.0	14.8	<.60	E2.0	91	13	104
06/12/2007	<.12	.32	2.5	16.0	<.60	2.1	91	14	112
*06/19/2007	<.12	.19	2.0	11.3	.65	E1.4	88	7	42
*06/26/2007	<.12	.11	2.0	7.7	.87	E1.0	84	5	22
07/25/2007	<.12	.07	1.1	7.0	E.44	<2.0	76	3	5.5
08/28/2007	<.12	<.06	1.6	3.4	<.60	<2.0	69	2	2.5

*Sample collected as part of a supplemental sampling program.

Table 4. Water-quality data for the Clark Fork basin, Montana, October 2006 through September 2007.—Continued

[Abbreviations: ft³/s, cubic feet per second; °C, degrees Celsius; E, estimated; lab, laboratory; µg/L, micrograms per liter; µS/cm, microsiemens per centimeter at 25°C; mg/L, milligrams per liter; mm, millimeters; NTRU, nephelometric turbidity ratio unit; ton/d, tons per day. Symbols: <, less than laboratory reporting level; --, no data]

12340500--Clark Fork above Missoula

Date	Time	Streamflow, instantaneous (ft^3/s)	Turbidity, unfiltered, lab (NTRU)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Temperature, water (°C)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)
*10/17/2006	1400	1,350	--	8.4	349	7.5	170	45.9	12.7
11/15/2006	1000	2,130	3.1	8.3	270	2.0	130	35.3	10.2
02/28/2007	0845	1,230	3.2	8.4	320	0.5	140	38.2	11.3
03/28/2007	1500	3,760	7.0	8.4	217	5.5	100	27.1	7.97
*04/09/2007	1500	2,800	--	8.2	247	8.5	110	31.0	9.00
*04/23/2007	1430	3,010	--	8.3	256	10.0	120	32.6	9.45
*05/03/2007	1530	8,560	38	8.1	158	9.0	78	21.0	6.20
05/07/2007	1130	6,540	17	8.2	198	9.5	89	23.9	7.07
*05/14/2007	1500	8,890	20	7.9	162	11.5	77	20.9	6.08
*05/22/2007	1430	7,580	12	8.3	170	9.0	81	22.0	6.38
*05/31/2007	1630	6,390	--	8.3	206	15.0	98	26.6	7.60
*06/06/2007	1430	7,200	--	8.1	188	12.0	88	24.1	6.71
06/08/2007	0815	8,370	21	8.2	215	10.0	98	26.6	7.56
*06/12/2007	1500	7,620	--	8.2	216	14.5	99	26.9	7.74
*06/19/2007	1530	5,390	--	8.2	234	14.5	110	29.4	8.41
06/20/2007	0720	4,440	4.9	8.2	240	13.5	110	29.7	8.48
*06/26/2007	1300	4,070	--	8.4	247	15.0	120	32.4	9.78
07/25/2007	0840	1,320	2.4	8.3	272	20.0	120	31.2	10.5
08/29/2007	0745	873	2.3	8.4	318	15.0	150	38.5	12.2

Date	Total nitrogen, unfiltered, (mg/L)	Total phosphorous, unfiltered, (mg/L)	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)	Cadmium, filtered (µg/L)	Cadmium, unfiltered recoverable (µg/L)	Copper, filtered (µg/L)	Copper, unfiltered recoverable (µg/L)
*10/17/2006	0.33	0.056	4.8	7.4	<0.04	0.27	3.0	27.9
11/15/2006	--	--	3.2	3.6	<.04	.07	1.2	7.9
02/28/2007	--	--	3.8	4.4	E.03	.13	1.8	12.8
03/28/2007	--	--	2.3	3.3	E.02	.08	1.6	9.6
*04/09/2007	.27	.035	2.9	3.6	<.04	.06	1.7	8.4
*04/23/2007	.43	.062	3.6	6.1	<.04	.29	2.2	25.4
*05/03/2007	.60	.195	2.4	8.1	<.04	.25	2.0	30.4
05/07/2007	--	--	2.7	4.8	.05	.13	2.3	20.0
*05/14/2007	.31	.063	2.6	4.9	<.04	.21	2.1	22.9
*05/22/2007	.23	.050	2.4	4.0	<.04	.09	1.8	15.4
*05/31/2007	.28	.059	4.5	7.0	<.04	.15	2.7	26.5
*06/06/2007	.31	.072	4.1	7.2	<.04	.20	2.3	29.5
06/08/2007	--	--	8.1	16.7	E.03	.57	7.4	86.0
*06/12/2007	.38	.112	6.7	12.1	<.04	.46	4.3	58.9
*06/19/2007	.23	.043	5.2	7.0	<.04	.15	2.5	20.7
06/20/2007	--	--	5.1	7.1	E.02	.21	2.6	23.2
*06/26/2007	.18	.031	4.5	5.4	<.04	.11	1.8	13.5
07/25/2007	--	--	3.6	4.0	E.02	.09	1.9	13.9
08/29/2007	--	--	4.1	4.6	<.04	.10	1.9	11.7

Table 4. Water-quality data for the Clark Fork basin, Montana, October 2006 through September 2007.—Continued

[Abbreviations: ft^3/s, cubic feet per second; °C, degrees Celsius; E, estimated; lab, laboratory; µg/L, micrograms per liter; µS/cm, microsiemens per centimeter at 25°C; mg/L, milligrams per liter; mm, millimeters; NTRU, nephelometric turbidity ratio unit; ton/d, tons per day. Symbols: <, less than laboratory reporting level; --, no data]

12340500--Clark Fork above Missoula–Continued

Date	Iron, filtered (µg/L)	Iron, unfiltered recoverable (µg/L)	Lead, filtered (µg/L)	Lead, unfiltered recoverable (µg/L)	Manganese, filtered (µg/L)	Manganese, unfiltered recoverable (µg/L)	Zinc, filtered (µg/L)	Zinc, unfiltered recoverable (µg/L)
*10/17/2006	7	674	0.12	5.18	15.2	80.7	4.0	60
11/15/2006	14	223	<.12	1.09	10.7	24.4	3.0	15
02/28/2007	14	182	E.07	1.71	14.7	30.6	3.6	18
03/28/2007	22	618	<.12	1.98	8.1	44.7	1.7	22
*04/09/2007	14	294	<.12	1.91	9.8	37.7	1.9	15.0
*04/23/2007	15	788	E.07	4.39	14.8	69.8	2.2	54.4
*05/03/2007	32	2,050	E.07	6.53	11.1	143	2.9	52.8
05/07/2007	20	798	E.10	3.60	7.2	72.0	2.4	37.8
*05/14/2007	15	793	<.12	3.99	8.1	117	2.5	47.0
*05/22/2007	13	538	<.12	2.47	6.2	53.3	2.4	25.3
*05/31/2007	11	747	<.12	4.05	9.4	71.6	2.4	45.0
*06/06/2007	17	994	<.12	5.05	10.4	101	3.2	56.5
06/08/2007	39	2,550	.33	14.1	17.2	233	6.0	140
*06/12/2007	14	1,710	E.08	9.06	17.7	152	3.5	104
*06/19/2007	14	609	<.12	3.14	15.8	64.7	3.3	40.8
06/20/2007	17	682	E.07	6.07	17.6	80.9	2.9	45.5
*06/26/2007	16	361	E.06	1.69	15.4	39.0	2.6	23.1
07/25/2007	E5	182	E.08	1.73	9.5	33.0	2.0	16.9
08/29/2007	7	244	E.10	1.85	20.7	52.3	2.7	19.8

Date	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
*10/17/2006	70	47	171
11/15/2006	37	18	104
02/28/2007	65	10	33
03/28/2007	14	100	1,020
*04/09/2007	38	32	242
*04/23/2007	42	68	553
*05/03/2007	28	281	6,490
05/07/2007	56	70	1,240
*05/14/2007	34	126	3,020
*05/22/2007	47	51	1,040
*05/31/2007	49	62	1,070
*06/06/2007	39	93	1,810
06/08/2007	44	200	4,520
*06/12/2007	39	160	3,290
*06/19/2007	29	62	902
06/20/2007	43	50	599
*06/26/2007	29	40	440
07/25/2007	81	12	43
08/29/2007	76	14	33

*Sample collected as part of a supplemental sampling program.

Table 4. Water-quality data for the Clark Fork basin, Montana, October 2006 through September 2007.—Continued

[Abbreviations: ft³/s, cubic feet per second; °C, degrees Celsius; E, estimated; lab, laboratory; µg/L, micrograms per liter; µS/cm, microsiemens per centimeter at 25°C; mg/L, milligrams per liter; mm, millimeters; NTRU, nephelometric turbidity ratio unit; ton/d, tons per day. Symbols: <, less than laboratory reporting level; --, no data]

12352500--Bitterroot River near Missoula

Date	Time	Streamflow, instantaneous (ft^3/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Temperature, water (°C)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)	Total nitrogen, unfiltered, (mg/L)
10/18/2006	1530	657	8.2	178	8.5	78	22.9	5.08	0.18
04/10/2007	0830	2,860	7.7	68	7.0	28	8.41	1.81	.27
04/24/2007	0830	2,150	7.6	84	9.5	35	10.2	2.21	.21
05/04/2007	0730	7,800	7.6	44	6.5	18	5.45	1.15	.36
05/15/2007	0730	7,760	7.5	48	10.0	19	5.78	1.16	.21
05/23/2007	0700	6,600	7.5	59	8.0	25	7.29	1.53	.20
06/01/2007	0630	5,130	7.6	61	13.5	24	7.26	1.51	.17
06/07/2007	0700	6,990	7.5	56	9.5	23	6.68	1.44	.21
06/13/2007	0630	5,580	7.8	67	14.0	27	7.97	1.72	.15
06/20/2007	0700	3,480	7.6	81	15.0	33	9.69	2.12	.15
06/27/2007	0700	2,150	7.8	91	15.0	37	10.8	2.47	.18

Date	Total phosphorous, unfiltered (mg/L)	Arsenic, filtered (µg/L)	Arsenic, unfiltered, recoverable (µg/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)
10/18/2006	E0.008	0.49	0.58	<0.04	<0.02	0.66	E1.0	23	63
04/10/2007	.025	.24	.31	<.04	E.01	.50	E.93	29	359
04/24/2007	.020	.27	.31	<.04	E.01	.61	E.83	30	196
05/04/2007	.050	.27	.39	<.04	E.01	.87	1.6	32	785
05/15/2007	.034	.27	.32	<.04	E.01	.66	1.3	28	442
05/23/2007	.024	.31	.34	<.04	<.02	.62	E.92	36	304
06/01/2007	.018	.26	.32	<.04	<.02	<.40	E.67	26	214
06/07/2007	.025	.28	.34	<.04	E.01	E.24	E.83	43	362
06/13/2007	.020	.33	.42	<.04	<.02	<.40	E.79	32	290
06/20/2007	.016	.35	.37	<.04	E.01	.47	E1.0	40	191
06/27/2007	.014	.36	.44	E.02	<.02	E.34	E.62	31	121

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)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
10/18/2006	<0.12	<0.06	2.5	8.5	0.91	<2	80	1	1.8
04/10/2007	<.12	.30	4.5	20.4	.90	E1.6	52	21	162
04/24/2007	<.12	.16	5.1	14.0	.76	E1.1	73	9	52
05/04/2007	<.12	.70	3.8	33.5	1.3	3.3	36	96	2,020
05/15/2007	<.12	.42	4.4	17.8	1.6	2.9	32	68	1,420
05/23/2007	<.12	.25	6.9	15.6	.97	2.0	32	36	642
06/01/2007	<.12	.16	3.9	10.3	E.41	E1.2	48	16	222
06/07/2007	<.12	.28	5.2	15.8	.83	2.2	39	32	604
06/13/2007	<.12	.22	3.9	12.3	E.31	E1.4	39	20	301
06/20/2007	<.12	.15	4.3	11.2	.74	2.1	68	7	66
06/27/2007	<.12	.08	3.4	8.4	.98	E1.1	80	4	23

Table 4. Water-quality data for the Clark Fork basin, Montana, October 2006 through September 2007.—Continued

[Abbreviations: ft³/s, cubic feet per second; °C, degrees Celsius; E, estimated; lab, laboratory; µg/L, micrograms per liter; µS/cm, microsiemens per centimeter at 25°C; mg/L, milligrams per liter; mm, millimeters; NTRU, nephelometric turbidity ratio unit; ton/d, tons per day. Symbols: <, less than laboratory reporting level; --, no data]

12354500--Clark Fork at St. Regis

Date	Time	Streamflow, instantaneous (ft^3/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Temperature, water (°C)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)	Total nitrogen, unfiltered (mg/L)
10/18/2006	1245	2,620	8.3	284	8.0	130	35.5	9.87	0.24
04/10/2007	1430	8,510	8.2	173	4.5	75	20.5	5.72	.28
04/24/2007	1545	8,080	8.3	187	7.0	83	22.9	6.34	.24
05/04/2007	1300	21,800	8.2	110	5.5	52	14.4	3.86	.63
05/15/2007	1430	21,800	7.9	116	9.0	52	14.3	3.85	.30
05/23/2007	1300	18,500	8.1	122	8.0	55	15.2	4.19	.21
06/01/2007	1300	14,800	8.1	150	11.5	65	18.0	4.95	.22
06/07/2007	1330	18,000	8.1	129	9.5	58	16.2	4.31	.25
06/13/2007	1330	15,800	7.9	156	12.5	68	18.8	5.16	.32
06/20/2007	1330	10,600	8.1	183	13.5	79	21.6	6.07	.19
06/27/2007	1300	7,210	8.4	188	14.0	86	23.3	6.70	.17

Date	Total phosphorous, unfiltered (mg/L)	Arsenic, filtered (µg/L)	Arsenic, unfiltered, recoverable (µg/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)
10/18/2006	E0.008	2.8	2.8	<0.04	0.03	3.0	3.9	7	88
04/10/2007	.022	1.5	1.7	E.02	.03	1.5	4.5	13	179
04/24/2007	.029	2.0	2.1	E.02	.04	1.7	5.0	12	200
05/04/2007	.122	1.5	3.6	<.04	.19	1.7	25.8	21	1,720
05/15/2007	.078	1.4	2.6	E.02	.09	1.8	13.0	16	881
05/23/2007	.034	1.3	1.8	E.02	.05	1.5	6.3	17	392
06/01/2007	.030	2.4	3.2	<.04	.06	2.1	9.7	15	345
06/07/2007	.039	2.1	3.2	<.04	.10	2.0	12.6	18	585
06/13/2007	.048	3.7	5.3	<.04	.13	3.6	21.4	14	676
06/20/2007	.023	3.1	3.5	<.04	.07	2.0	8.1	14	262
06/27/2007	.013	2.9	2.9	<.04	.02	2.0	4.5	16	119

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)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
10/18/2006	0.16	0.46	1.6	17.1	3.5	6	91	4	28
04/10/2007	E.07	.72	2.9	24.0	2.5	7.6	77	12	276
04/24/2007	E.08	.86	2.4	26.9	2.4	8.1	77	11	240
05/04/2007	E.07	5.27	2.6	126	2.3	50.8	60	151	8,890
05/15/2007	<.12	2.62	2.9	54.5	2.4	23.9	57	78	4,590
05/23/2007	<.12	1.10	3.4	30.5	2.6	10.6	62	34	1,700
06/01/2007	<.12	1.62	2.5	31.2	3.6	15.3	71	23	919
06/07/2007	<.12	2.23	1.8	49.5	2.0	21.0	58	49	2,380
06/13/2007	0.13	3.19	2.6	56.7	5.9	31.1	71	41	1,750
06/20/2007	E.06	1.17	4.2	26.3	3.6	13.7	80	14	401
06/27/2007	<.12	.46	2.6	13.2	1.6	5.0	83	5	97

Table 4. Water-quality data for the Clark Fork basin, Montana, October 2006 through September 2007.—Continued

[Abbreviations: ft³/s, cubic feet per second; °C, degrees Celsius; E, estimated; lab, laboratory; µg/L, micrograms per liter; µS/cm, microsiemens per centimeter at 25°C; mg/L, milligrams per liter; mm, millimeters; NTRU, nephelometric turbidity ratio unit; ton/d, tons per day. Symbols: <, less than laboratory reporting level; --, no data]

12388700--Flathead River at Perma

Date	Time	Streamflow, instantaneous (ft³/s)	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Temperature, water (°C)	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)	Total nitrogen, unfiltered, (mg/L)
10/18/2006	1000	5,640	8.4	179	11.5	90	25.5	6.49	0.15
04/10/2007	1230	14,700	8.0	172	6.5	89	25.3	6.28	.14
04/24/2007	1130	14,000	7.9	174	9.5	91	26.1	6.40	.13
05/04/2007	1100	16,300	8.4	173	9.0	91	25.8	6.39	.14
05/15/2007	1130	18,400	8.3	173	13.0	87	24.7	6.08	.14
05/23/2007	1030	25,400	8.4	173	13.0	88	25.1	6.16	.12
06/01/2007	1030	14,800	8.3	173	16.5	86	24.6	6.07	.12
06/07/2007	1100	32,600	8.2	171	16.0	87	25.0	6.03	.14
06/13/2007	1130	22,000	8.2	173	14.0	87	24.8	6.19	.11
06/20/2007	1100	19,200	8.3	172	16.5	87	24.5	6.27	.11
06/27/2007	1030	14,400	8.3	170	18.0	85	23.8	6.21	.11

Date	Total phosphorous, unfiltered (mg/L)	Arsenic, filtered (µg/L)	Arsenic, unfiltered, recoverable (µg/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)
10/18/2006	<0.008	0.43	0.50	<0.04	<0.02	0.97	<1.2	<6	42
04/10/2007	E.005	.36	.39	<.04	<.02	.69	<1.2	<6	63
04/24/2007	E.007	.42	.44	<.04	<.02	.66	<1.2	E3	45
05/04/2007	E.008	.38	.38	<.04	<.02	.95	<1.2	E5	85
05/15/2007	.008	.46	.37	<.04	<.02	.46	<1.2	<6	72
05/23/2007	E.007	.38	.40	<.04	<.02	.69	E.62	<6	82
06/01/2007	E.005	.37	.43	<.04	<.02	<.40	<1.2	<6	50
06/07/2007	.011	.40	.47	<.04	E.01	<.40	<1.2	E3	186
06/13/2007	E.005	.38	.43	<.04	<.02	<.40	<1.2	E3	54
06/20/2007	E.005	.39	.43	<.04	E.01	E.22	<1.2	E4	70
06/27/2007	E.005	.42	.45	<.04	<.02	<.40	<1.2	<6	41

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)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)	Sediment discharge, suspended (ton/d)
10/18/2006	<.12	E0.03	0.5	3.8	0.64	<2	88	2	30
04/10/2007	<.12	.10	.9	4.6	.87	<2.0	84	5	198
04/24/2007	<.12	.07	.9	3.9	E.47	<2.0	82	3	113
05/04/2007	<.12	.13	.8	6.2	.89	<2.0	86	6	264
05/15/2007	<.12	.10	.9	5.6	.71	<2.0	75	7	348
05/23/2007	<.12	.09	.9	6.0	1.0	<2.0	76	7	480
06/01/2007	<.12	.07	.8	4.5	.67	<2.0	79	4	160
06/07/2007	<.12	.25	.6	10.9	E.36	E1.1	81	15	1,320
06/13/2007	<.12	.10	.8	4.2	<.60	<2.0	77	3	178
06/20/2007	<.12	.11	.7	4.8	.77	<2.0	83	4	207
06/27/2007	<.12	.06	.8	3.7	E.52	<2.0	84	3	117

Table 5. Daily mean streamflow and suspended-sediment data for Clark Fork at Deer Lodge, Montana, October 2006 through September 2007.

[Abbreviations: acre-ft, acre-feet; ft^3/s, cubic feet per second; e, estimated; max, maximum; mg/L, milligrams per liter; min, minimum; ton/d, tons per day. Symbol: --, no data or value not computed]

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	146	14	5.5	e180	19	9.2	e170	26	12
2	145	15	5.9	e190	17	8.7	e160	29	13
3	145	16	6.3	208	13	7.3	e160	27	12
4	140	17	6.4	227	11	6.7	e180	24	12
5	147	17	6.7	217	11	6.4	199	22	12
6	150	14	5.7	216	9	5.2	e200	19	10
7	158	10	4.3	228	7	4.3	e200	18	9.7
8	164	9	4.0	250	9	6.1	e210	21	12
9	165	9	4.0	263	13	9.2	e210	24	14
10	170	10	4.6	247	13	8.7	e210	25	14
11	173	10	4.7	250	12	8.1	231	25	16
12	176	10	4.8	242	10	6.5	232	25	16
13	178	11	5.3	239	9	5.8	237	24	15
14	186	11	5.5	226	8	4.9	249	24	16
15	187	10	5.0	218	11	6.5	261	24	17
16	200	10	5.4	217	19	11	e200	24	13
17	220	9	5.3	210	20	11	e160	24	10
18	212	8	4.6	200	20	11	e160	24	10
19	206	8	4.4	201	20	11	e170	22	10
20	230	7	4.3	209	20	11	e180	21	10
21	254	6	4.1	211	20	11	e180	19	9.2
22	236	6	3.8	220	23	14	e180	18	8.7
23	227	6	3.7	221	28	17	e180	17	8.3
24	223	7	4.2	203	30	16	e190	16	8.2
25	223	9	5.4	e190	28	14	203	16	8.8
26	216	10	5.8	e170	25	11	216	16	9.3
27	211	12	6.8	e180	22	11	223	15	9.0
28	205	14	7.7	e150	19	7.7	209	15	8.5
29	203	16	8.8	e160	18	7.8	e180	20	9.7
30	201	18	9.8	e160	21	9.1	e160	25	11
31	e170	19	8.7	--	--	--	e160	25	11
TOTAL	**5,867**	**--**	**171.5**	**6,303**	**--**	**277.2**	**6,060**	**--**	**355.4**
MEAN	**189**	**11**	**5.5**	**210**	**17**	**9.2**	**195**	**22**	**11**
MAX	**254**	**19**	**9.8**	**263**	**30**	**17**	**261**	**29**	**17**
MIN	**140**	**6**	**3.7**	**150**	**7**	**4.3**	**160**	**15**	**8.2**

Table 5. Daily mean streamflow and suspended-sediment data for Clark Fork at Deer Lodge, Montana, October 2006 through September 2007.—Continued

[Abbreviations: acre-ft, acre-feet; ft^3/s, cubic feet per second; e, estimated; max, maximum; mg/L, milligrams per liter; min, minimum; ton/d, tons per day. Symbol: --, no data or value not computed]

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	e180	24	12	e140	24	9.1	204	26	14
2	198	24	13	e150	24	9.7	190	27	14
3	223	23	14	e170	24	11	194	24	13
4	210	22	12	184	24	12	207	25	14
5	196	24	13	209	29	16	213	25	14
6	e170	26	12	227	50	31	228	32	20
7	e170	27	12	215	65	38	242	19	12
8	209	24	14	215	64	37	241	26	17
9	208	21	12	215	58	34	214	36	21
10	205	18	10	214	52	30	209	38	21
11	e130	15	5.3	209	46	26	215	22	13
12	e80	14	3.0	215	40	23	243	15	9.8
13	e100	16	4.3	210	36	20	270	13	9.5
14	e110	17	5.0	215	35	20	235	17	11
15	e110	17	5.0	214	35	20	208	18	10
16	e120	19	6.2	215	34	20	200	18	9.7
17	e130	20	7.0	212	32	18	200	18	9.7
18	e140	22	8.3	215	30	17	200	16	8.6
19	e150	24	9.7	210	28	16	200	19	10
20	154	25	10	207	26	15	201	17	9.2
21	e140	26	9.8	206	24	13	196	16	8.5
22	159	26	11	206	23	13	187	16	8.1
23	173	27	13	213	22	13	186	16	8.0
24	185	26	13	202	21	11	181	17	8.3
25	e200	24	13	205	21	12	183	20	9.9
26	e200	24	13	204	20	11	189	20	10
27	e160	24	10	198	20	11	200	19	10
28	e160	24	10	198	23	12	210	24	14
29	e160	24	10	--	--	--	207	27	15
30	e160	24	10	--	--	--	203	27	15
31	e160	24	10	--	--	--	204	24	13
TOTAL	**5,050**	**--**	**310.6**	**5,693**	**--**	**518.8**	**6,460**	**--**	**380.3**
MEAN	**163**	**22**	**10**	**203**	**33**	**19**	**208**	**22**	**12**
MAX	**223**	**27**	**14**	**227**	**65**	**38**	**270**	**38**	**21**
MIN	**80**	**14**	**3.0**	**140**	**20**	**9.1**	**181**	**13**	**8.0**

Table 5. Daily mean streamflow and suspended-sediment data for Clark Fork at Deer Lodge, Montana, October 2006 through September 2007.—Continued

[Abbreviations: acre-ft, acre-feet; ft³/s, cubic feet per second; e, estimated; max, maximum; mg/L, milligrams per liter; min, minimum; ton/d, tons per day. Symbol: --, no data or value not computed]

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	203	22	12	250	34	23	405	20	22
2	208	25	14	273	43	32	390	21	22
3	214	28	16	441	217	258	394	50	53
4	204	23	13	495	153	204	417	31	35
5	205	21	12	403	63	69	528	125	178
6	205	23	13	352	43	41	798	200	431
7	226	25	15	312	38	32	974	142	373
8	221	21	13	293	36	28	747	48	97
9	216	22	13	303	40	33	651	98	172
10	209	26	15	309	45	38	623	98	165
11	209	28	16	349	46	43	791	68	145
12	223	28	17	382	55	57	800	60	130
13	226	25	15	400	49	53	649	41	72
14	216	21	12	406	42	46	590	36	57
15	209	17	9.6	367	31	31	546	31	46
16	206	17	9.5	314	26	22	477	28	36
17	199	17	9.1	317	28	24	471	26	33
18	271	64	47	311	25	21	454	20	25
19	341	110	101	312	27	23	408	15	17
20	314	57	48	324	24	21	348	12	11
21	247	28	19	389	44	46	349	12	11
22	226	21	13	540	84	122	336	8	7.3
23	221	22	13	562	84	127	319	6	5.2
24	211	19	11	430	32	37	293	16	13
25	205	17	9.4	410	28	31	270	18	13
26	213	18	10	373	22	22	233	13	8.2
27	209	17	9.6	341	19	17	223	6	3.6
28	202	15	8.2	464	42	53	209	6	3.4
29	202	17	9.3	570	49	75	195	2	1.1
30	222	22	13	482	34	44	196	2	1.1
31	--	--	--	436	25	29	--	--	--
TOTAL	**6,683**	**--**	**535.7**	**11,910**	**--**	**1,702**	**14,084**	**--**	**2,186.9**
MEAN	**223**	**27**	**18**	**384**	**49**	**55**	**469**	**42**	**73**
MAX	**341**	**110**	**101**	**570**	**217**	**258**	**974**	**200**	**431**
MIN	**199**	**15**	**8.2**	**250**	**19**	**17**	**195**	**2**	**1.1**

Table 5. Daily mean streamflow and suspended-sediment data for Clark Fork at Deer Lodge, Montana, October 2006 through September 2007.—Continued

[Abbreviations: acre-ft, acre-feet; ft³/s, cubic feet per second; e, estimated; max, maximum; mg/L, milligrams per liter; min, minimum; ton/d, tons per day. Symbol: --, no data or value not computed]

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	193	1	0.52	53	3	0.43	69	5	0.93
2	189	1	.51	51	3	.41	75	7	1.4
3	181	2	.98	54	3	.44	67	8	1.4
4	146	2	.79	56	3	.45	69	8	1.5
5	131	3	1.1	59	3	.48	84	9	2.0
6	120	4	1.3	63	3	.51	92	10	2.5
7	110	4	1.2	66	4	.71	84	10	2.3
8	113	5	1.5	65	6	1.1	77	10	2.1
9	105	5	1.4	63	7	1.2	79	10	2.1
10	94	6	1.5	64	6	1.0	81	9	2.0
11	91	7	1.7	67	5	.90	84	9	2.0
12	82	8	1.8	85	4	.92	82	8	1.8
13	71	8	1.5	76	3	.62	79	8	1.7
14	64	8	1.4	50	3	.41	85	8	1.8
15	63	7	1.2	57	4	.62	84	8	1.8
16	64	6	1.0	57	5	.77	83	9	2.0
17	67	6	1.1	62	6	1.0	81	9	2.0
18	83	5	1.1	71	6	1.2	86	10	2.3
19	87	5	1.2	76	7	1.4	86	8	1.9
20	69	4	.75	83	7	1.6	97	5	1.3
21	64	4	.69	87	8	1.9	108	4	1.2
22	64	3	.52	80	8	1.7	111	6	1.8
23	60	2	.32	73	9	1.8	141	6	2.3
24	58	1	.16	70	10	1.9	181	7	3.4
25	66	2	.36	75	10	2.0	189	8	4.1
26	81	6	1.3	73	6	1.2	181	8	3.9
27	76	6	1.2	72	3	.58	176	8	3.8
28	75	5	1.0	69	5	.93	173	7	3.3
29	71	5	.96	65	12	2.1	175	7	3.3
30	62	4	.67	61	9	1.5	180	6	2.9
31	60	4	.65	61	5	.82	--	--	--
TOTAL	**2,860**	**--**	**31.38**	**2,064**	**--**	**32.6**	**3,239**	**--**	**66.83**
MEAN	**92.3**	**4**	**1.0**	**66.6**	**6**	**1.1**	**108**	**8**	**2.2**
MAX	**193**	**8**	**1.8**	**87**	**12**	**2.1**	**189**	**10**	**4.1**
MIN	**58**	**1**	**.16**	**50**	**3**	**.41**	**67**	**4**	**.93**

Total for water year 2007 (unrounded sum of daily values): streamflow–76,273 ft³/s (annual runoff–151,300 acre-ft); suspended-sediment discharge–6,569.21 tons.

Table 6. Daily mean streamflow and suspended-sediment data for Clark Fork at Turah Bridge, near Bonner, Montana, October 2006 through September 2007.

[Abbreviations: acre-ft, acre-feet; ft^3/s, cubic feet per second; e, estimated; max, maximum; mg/L, milligrams per liter; min, minimum; ton/d, tons per day. Symbol: --, no data or value not computed]

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	621	15	25	692	5	9.3	e750	7	14
2	624	15	25	700	5	9.5	e769	6	12
3	634	14	24	794	5	11	729	7	14
4	642	15	26	820	7	15	714	8	15
5	653	16	28	862	10	23	767	8	17
6	674	16	29	871	11	26	761	7	14
7	703	16	30	903	12	29	762	7	14
8	687	15	28	1,140	19	58	775	6	13
9	701	14	26	1,290	26	91	e780	6	13
10	720	14	27	1,110	12	36	e800	6	13
11	734	13	26	1,030	10	28	843	7	16
12	735	13	26	990	9	24	843	9	20
13	730	12	24	949	8	20	849	10	23
14	730	11	22	940	7	18	858	10	23
15	747	11	22	901	6	15	888	8	19
16	773	15	31	895	6	14	e860	5	12
17	838	18	41	906	6	15	e720	4	7.8
18	832	18	40	865	6	14	e620	4	6.7
19	824	23	51	852	6	14	e600	3	4.9
20	902	28	68	850	6	14	e640	2	3.5
21	993	30	80	871	6	14	e660	2	3.6
22	985	26	69	900	6	15	e740	2	4.0
23	925	19	47	905	6	15	e720	2	3.9
24	887	14	34	880	6	14	e760	2	4.1
25	869	10	23	866	5	12	798	6	13
26	855	9	21	837	5	11	837	13	29
27	835	8	18	814	5	11	853	14	32
28	825	7	16	815	6	13	857	14	32
29	817	7	15	766	7	14	e740	5	10
30	812	6	13	e730	8	16	e640	3	5.2
31	772	6	13	--	--	--	e620	3	5.0
TOTAL	**24,079**	**--**	**968**	**26,744**	**--**	**618.8**	**23,553**	**--**	**416.7**
MEAN	**777**	**15**	**31**	**891**	**8**	**21**	**760**	**6**	**13**
MAX	**993**	**30**	**80**	**1,290**	**26**	**91**	**888**	**14**	**32**
MIN	**621**	**6**	**13**	**692**	**5**	**9.3**	**600**	**2**	**3.5**

Table 6. Daily mean streamflow and suspended-sediment data for Clark Fork at Turah Bridge, near Bonner, Montana, October 2006 through September 2007.—Continued

[Abbreviations: acre-ft, acre-feet; ft^3/s, cubic feet per second; e, estimated; max, maximum; mg/L, milligrams per liter; min, minimum; ton/d, tons per day. Symbol: --, no data or value not computed]

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	e600	3	4.9	e600	4	6.5	669	9	16
2	e700	12	23	e540	5	7.3	658	8	14
3	883	20	48	e520	6	8.4	640	7	12
4	897	14	34	590	7	11	677	10	18
5	828	10	22	664	8	14	762	13	27
6	735	8	16	747	14	28	867	29	68
7	672	8	15	848	24	55	1,060	68	195
8	731	13	26	833	21	47	1,150	97	301
9	768	12	25	880	16	38	1,140	84	259
10	e740	6	12	982	20	53	1,030	53	147
11	e560	3	4.5	951	18	46	1,030	48	133
12	e250	3	2.0	911	16	39	1,300	170	597
13	e177	2	.96	832	17	38	1,910	395	2,040
14	e211	2	1.1	781	17	36	1,610	130	565
15	e250	3	2.0	781	17	36	1,280	50	173
16	e280	3	2.3	861	41	95	1,120	33	100
17	e320	2	1.7	910	58	143	1,090	28	82
18	e410	2	2.2	886	46	110	1,130	30	92
19	e500	2	2.7	842	35	80	1,200	33	107
20	e620	4	6.7	793	24	51	1,190	29	93
21	e660	7	12	791	21	45	1,170	25	79
22	689	8	15	765	21	43	1,100	19	56
23	704	8	15	766	21	43	1,070	19	55
24	692	8	15	745	20	40	1,050	19	54
25	676	8	15	713	17	33	1,070	19	55
26	659	7	12	726	11	22	1,130	18	55
27	e620	6	10	701	8	15	1,180	20	64
28	e560	5	7.6	666	8	14	1,220	18	59
29	e540	3	4.4	--	--	--	1,170	15	47
30	e540	3	4.4	--	--	--	1,100	13	39
31	e580	3	4.7	--	--	--	1,090	14	41
TOTAL	**18,052**	**--**	**367.16**	**21,625**	**--**	**1,197.2**	**33,863**	**--**	**5,643**
MEAN	**582**	**6**	**12**	**772**	**19**	**43**	**1,092**	**49**	**182**
MAX	**897**	**20**	**48**	**982**	**58**	**143**	**1,910**	**395**	**2,040**
MIN	**177**	**2**	**.96**	**520**	**4**	**6.5**	**640**	**7**	**12**

Table 6. Daily mean streamflow and suspended-sediment data for Clark Fork at Turah Bridge, near Bonner, Montana, October 2006 through September 2007.—Continued

[Abbreviations: acre-ft, acre-feet; ft³/s, cubic feet per second; e, estimated; max, maximum; mg/L, milligrams per liter; min, minimum; ton/d, tons per day. Symbol: --, no data or value not computed]

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	1,100	14	42	2,110	59	336	3,190	31	267
2	1,070	14	40	2,280	63	388	3,070	27	224
3	1,060	12	34	2,780	110	826	3,020	28	228
4	1,030	12	33	3,300	124	1,100	3,060	26	215
5	1,030	14	39	3,030	71	581	3,210	30	260
6	1,030	14	39	2,740	46	340	3,750	63	638
7	1,040	15	42	2,520	34	231	4,780	146	1,880
8	1,060	17	49	2,410	32	208	5,070	116	1,590
9	1,100	20	59	2,450	29	192	4,710	76	966
10	1,130	17	52	2,620	31	219	4,440	58	695
11	1,100	12	36	2,940	41	325	4,880	75	988
12	1,080	12	35	3,120	41	345	5,260	76	1,080
13	1,060	12	34	3,270	43	380	5,040	51	694
14	1,040	14	39	3,390	46	421	4,560	40	492
15	1,040	16	45	3,300	34	303	4,220	35	399
16	1,060	15	43	3,100	25	209	3,930	36	382
17	1,070	17	49	2,990	21	170	3,800	31	318
18	1,180	21	67	2,940	20	159	3,680	29	288
19	1,350	33	120	2,930	17	134	3,430	24	222
20	1,340	31	112	2,920	18	142	3,110	22	185
21	1,300	28	98	3,050	20	165	2,830	18	138
22	1,270	26	89	3,350	32	289	2,650	13	93
23	1,270	25	86	3,440	41	381	2,500	12	81
24	1,310	23	81	3,410	40	368	2,370	8	51
25	1,340	25	90	3,340	34	307	2,280	6	37
26	1,420	27	104	3,240	30	262	2,160	5	29
27	1,480	27	108	3,040	24	197	2,000	4	22
28	1,480	24	96	3,230	29	253	1,890	4	20
29	1,620	31	136	3,620	60	586	1,800	4	19
30	1,870	46	232	3,570	52	501	1,620	3	13
31	--	--	--	3,380	42	383	--	--	--
TOTAL	**36,330**	**--**	**2,129**	**93,810**	**--**	**10,701**	**102,310**	**--**	**12,514**
MEAN	**1,211**	**20**	**71**	**3,026**	**42**	**345**	**3,410**	**37**	**417**
MAX	**1,870**	**46**	**232**	**3,620**	**124**	**1,100**	**5,260**	**146**	**1,880**
MIN	**1,030**	**12**	**33**	**2,110**	**17**	**134**	**1,620**	**3**	**13**

Table 6. Daily mean streamflow and suspended-sediment data for Clark Fork at Turah Bridge, near Bonner, Montana, October 2006 through September 2007.—Continued

[Abbreviations: acre-ft, acre-feet; ft^3/s, cubic feet per second; e, estimated; max, maximum; mg/L, milligrams per liter; min, minimum; ton/d, tons per day. Symbol: --, no data or value not computed]

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	e1,470	3	12	608	6	9.8	453	7	8.6
2	e1,320	3	11	592	6	9.6	442	7	8.4
3	e1,170	3	9.5	579	6	9.4	443	7	8.4
4	1,110	3	9.0	560	5	7.6	443	6	7.2
5	1,060	3	8.6	548	5	7.4	461	7	8.7
6	1,010	3	8.2	538	5	7.3	510	8	11
7	986	3	8.0	540	5	7.3	501	8	11
8	952	3	7.7	526	5	7.1	491	7	9.3
9	913	3	7.4	510	5	6.9	492	6	8.0
10	902	3	7.3	495	6	8.0	489	6	7.9
11	878	3	7.1	480	6	7.8	487	6	7.9
12	858	3	6.9	469	6	7.6	484	6	7.8
13	835	2	4.5	467	6	7.6	477	6	7.7
14	811	3	6.6	473	6	7.7	475	6	7.7
15	797	3	6.5	456	6	7.4	478	6	7.7
16	791	3	6.4	444	6	7.2	474	6	7.7
17	805	3	6.5	449	6	7.3	479	6	7.8
18	840	5	11	457	6	7.4	495	6	8.0
19	821	4	8.9	460	6	7.5	526	6	8.5
20	781	5	11	471	6	7.6	566	6	9.2
21	751	5	10	499	6	8.1	580	7	11
22	724	4	7.8	509	5	6.9	574	9	14
23	701	4	7.6	500	5	6.8	677	12	22
24	687	4	7.4	483	5	6.5	869	35	82
25	693	9	17	472	5	6.4	880	27	64
26	733	8	16	465	5	6.3	847	15	34
27	708	6	11	457	5	6.2	825	13	29
28	694	6	11	448	5	6.0	808	11	24
29	675	6	11	439	4	4.7	805	8	17
30	645	6	10	427	4	4.6	798	8	17
31	622	6	10	434	4	4.7	--	--	--
TOTAL	**26,743**	**--**	**282.9**	**15,255**	**--**	**222.7**	**17,329**	**--**	**482.5**
MEAN	**863**	**4**	**9.1**	**492**	**5**	**7.2**	**578**	**9**	**16**
MAX	**1,470**	**9**	**17**	**608**	**6**	**9.8**	**880**	**35**	**82**
MIN	**622**	**2**	**4.5**	**427**	**4**	**4.6**	**442**	**6**	**7.2**

Total for water year 2007 (unrounded sum of daily values): streamflow–439,693 ft^3/s (annual runoff–872,100 acre-ft); suspended-sediment discharge–35,542.96 tons.

Table 7. Daily mean streamflow and suspended-sediment data for Blackfoot River near Bonner, Montana, October 2006 through September 2007.

[Abbreviations: acre-ft, acre-feet; ft³/s, cubic feet per second; e, estimated; max, maximum; mg/L, milligrams per liter; min, minimum; ton/d, tons per day. Symbol: --, no data or value not computed]

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)
	OCTOBER			NOVEMBER			DECEMBER		
1	472	2	2.5	e420	1	1.1	e700	3	5.7
2	472	1	1.3	e440	1	1.2	e730	3	5.9
3	472	1	1.3	e480	2	2.6	e740	3	6.0
4	472	1	1.3	534	2	2.9	e730	3	5.9
5	472	1	1.3	562	2	3.0	e730	3	5.9
6	472	1	1.3	600	4	6.5	e760	3	6.2
7	472	2	2.5	762	16	33	e710	3	5.8
8	472	2	2.5	2,480	50	335	e690	2	3.7
9	472	2	2.5	2,530	42	287	e680	2	3.7
10	472	2	2.5	2,130	14	81	e680	2	3.7
11	472	2	2.5	1,860	8	40	e720	2	3.9
12	472	2	2.5	1,640	8	35	756	3	6.1
13	467	1	1.3	1,470	5	20	755	4	8.2
14	467	2	2.5	1,390	4	15	762	3	6.2
15	468	2	2.5	1,250	4	14	773	3	6.3
16	493	2	2.7	1,190	3	9.6	762	3	6.2
17	520	2	2.8	1,140	3	9.2	e630	3	5.1
18	509	3	4.1	1,060	3	8.6	e450	3	3.6
19	512	4	5.5	1,010	3	8.2	e350	2	1.9
20	562	4	6.1	988	3	8.0	e360	2	1.9
21	567	4	6.1	1,020	3	8.3	e370	1	1.0
22	565	3	4.6	1,070	3	8.7	e400	1	1.1
23	555	3	4.5	1,050	3	8.5	e530	1	1.4
24	540	2	2.9	1,020	2	5.5	e580	2	3.1
25	529	2	2.9	1,010	2	5.5	e600	2	3.2
26	519	1	1.4	947	2	5.1	e670	1	1.8
27	510	2	2.8	921	2	5.0	686	1	1.9
28	504	2	2.7	e800	3	6.5	674	1	1.8
29	498	3	4.0	e600	3	4.9	e650	1	1.8
30	e490	2	2.6	e530	3	4.3	e560	1	1.5
31	e460	2	2.5	--	--	--	e430	1	1.2
TOTAL	**15,399**	**--**	**88.5**	**32,904**	**--**	**983.2**	**19,618**	**--**	**121.7**
MEAN	**497**	**2**	**2.9**	**1,097**	**7**	**33**	**633**	**2**	**3.9**
MAX	**567**	**4**	**6.1**	**2,530**	**50**	**335**	**773**	**4**	**8.2**
MIN	**460**	**1**	**1.3**	**420**	**1**	**1.1**	**350**	**1**	**1.0**

Table 7. Daily mean streamflow and suspended-sediment data for Blackfoot River near Bonner, Montana, October 2006 through September 2007.—Continued

[Abbreviations: acre-ft, acre-feet; ft³/s, cubic feet per second; e, estimated; max, maximum; mg/L, milligrams per liter; min, minimum; ton/d, tons per day. Symbol: --, no data or value not computed]

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	e400	1	1.1	e500	2	2.7	549	3	4.4
2	e500	2	2.7	e480	2	2.6	527	3	4.3
3	e660	2	3.6	e430	3	3.5	526	3	4.3
4	e670	2	3.6	e410	3	3.3	548	3	4.4
5	665	2	3.6	e480	3	3.9	563	6	9.1
6	663	1	1.8	e520	3	4.2	602	11	18
7	659	1	1.8	e520	2	2.8	794	18	39
8	651	1	1.8	e550	3	4.5	1,060	22	63
9	646	1	1.7	e570	4	6.2	1,130	26	79
10	646	1	1.7	e580	4	6.3	1,030	23	64
11	e550	1	1.5	e620	4	6.7	1,040	23	65
12	e400	2	2.2	e600	4	6.5	1,240	33	110
13	e300	2	1.6	e560	4	6.0	1,710	45	208
14	e380	2	2.1	e540	4	5.8	1,690	32	146
15	e450	2	2.4	e550	6	8.9	1,480	16	64
16	e470	2	2.5	e600	7	11	1,430	14	54
17	e480	1	1.3	614	8	13	1,480	12	48
18	e500	2	2.7	625	7	12	1,670	13	59
19	e520	2	2.8	607	6	9.8	1,880	15	76
20	e570	2	3.1	612	6	9.9	2,010	15	81
21	e600	2	3.2	616	5	8.3	2,060	13	72
22	e660	2	3.6	592	5	8.0	2,030	10	55
23	e630	2	3.4	603	4	6.5	1,990	9	48
24	e600	2	3.2	592	4	6.4	1,980	10	53
25	e580	2	3.1	584	4	6.3	2,100	10	57
26	e540	2	2.9	580	3	4.7	2,350	12	76
27	e500	2	2.7	567	3	4.6	2,500	16	108
28	e480	2	2.6	558	3	4.5	2,550	15	103
29	e460	2	2.5	--	--	--	2,440	11	72
30	e500	2	2.7	--	--	--	2,310	9	56
31	e470	2	2.5	--	--	--	2,200	8	48
TOTAL	**16,800**	**--**	**78.0**	**15,660**	**--**	**178.9**	**47,469**	**--**	**1,948.5**
MEAN	**542**	**2**	**2.5**	**559**	**4**	**6.4**	**1,531**	**15**	**63**
MAX	**670**	**2**	**3.6**	**625**	**8**	**13**	**2,550**	**45**	**208**
MIN	**300**	**1**	**1.1**	**410**	**2**	**2.6**	**526**	**3**	**4.3**

Table 7. Daily mean streamflow and suspended-sediment data for Blackfoot River near Bonner, Montana, October 2006 through September 2007.—Continued

[Abbreviations: acre-ft, acre-feet; ft^3/s, cubic feet per second; e, estimated; max, maximum; mg/L, milligrams per liter; min, minimum; ton/d, tons per day. Symbol: --, no data or value not computed]

Day	Mean streamflow (ft^3/s)	Suspended sediment		Mean streamflow (ft^3/s)	Suspended sediment		Mean streamflow (ft^3/s)	Suspended sediment	
		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)		Mean concentration (mg/L)	Discharge (ton/d)
	APRIL			MAY			JUNE		
1	2,120	8	46	3,980	63	677	3,290	14	124
2	2,060	7	39	4,340	68	797	3,350	16	145
3	2,000	5	27	5,190	86	1,210	3,440	19	176
4	1,910	5	26	5,610	93	1,410	3,460	19	177
5	1,850	5	25	5,140	71	985	3,520	19	181
6	1,770	6	29	4,570	47	580	3,640	20	197
7	1,700	6	28	4,160	34	382	3,730	22	222
8	1,670	6	27	3,990	34	366	3,590	22	213
9	1,710	6	28	4,140	34	380	3,340	22	198
10	1,800	7	34	4,580	40	495	3,160	19	162
11	1,810	6	29	4,990	44	593	3,110	18	151
12	1,770	6	29	5,220	47	662	2,960	17	136
13	1,720	6	28	5,400	49	714	2,770	15	112
14	1,680	7	32	5,320	42	603	2,630	13	92
15	1,700	8	37	4,890	35	462	2,480	11	74
16	1,760	8	38	4,530	31	379	2,330	10	63
17	1,800	12	58	4,430	27	323	2,310	10	62
18	1,960	13	69	4,550	26	319	2,370	9	58
19	2,110	15	85	4,750	28	359	2,240	8	48
20	2,060	12	67	4,750	29	372	2,080	8	45
21	1,990	12	64	4,600	25	310	1,980	8	43
22	1,930	10	52	4,390	21	249	1,900	7	36
23	1,890	10	51	4,080	22	242	1,830	8	40
24	1,950	10	53	3,770	18	183	1,760	7	33
25	2,100	13	74	3,630	17	167	1,700	5	23
26	2,290	16	99	3,490	17	160	1,630	5	22
27	2,440	18	119	3,310	17	152	1,550	8	33
28	2,600	22	154	3,360	15	136	1,480	5	20
29	3,030	32	262	3,450	16	149	1,390	5	19
30	3,590	48	465	3,400	16	147	1,340	5	18
31	--	--	--	3,310	16	143	--	--	--
TOTAL	**60,770**	**--**	**2,174**	**135,320**	**--**	**14,106**	**76,360**	**--**	**2,923**
MEAN	**2,026**	**12**	**72**	**4,365**	**36**	**455**	**2,545**	**12**	**97**
MAX	**3,590**	**48**	**465**	**5,610**	**93**	**1,410**	**3,730**	**22**	**222**
MIN	**1,670**	**5**	**25**	**3,310**	**15**	**136**	**1,340**	**5**	**18**

Table 7. Daily mean streamflow and suspended-sediment data for Blackfoot River near Bonner, Montana, October 2006 through September 2007.—Continued

[Abbreviations: acre-ft, acre-feet; ft^3/s, cubic feet per second; e, estimated; max, maximum; mg/L, milligrams per liter; min, minimum; ton/d, tons per day. Symbol: --, no data or value not computed]

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	1,300	5	18	e615	3	5.0	457	2	2.5
2	1,230	5	17	e600	3	4.9	452	2	2.4
3	1,210	6	20	e580	2	3.1	448	2	2.4
4	1,160	6	19	e570	2	3.1	443	2	2.4
5	1,110	6	18	e560	2	3.0	443	2	2.4
6	1,070	5	14	e550	2	3.0	449	2	2.4
7	1,040	5	14	e540	1	1.5	444	2	2.4
8	1,000	4	11	e530	1	1.4	439	2	2.4
9	974	3	7.9	e515	1	1.4	441	2	2.4
10	939	3	7.6	525	1	1.4	447	2	2.4
11	911	3	7.4	528	2	2.9	452	2	2.4
12	888	3	7.2	523	2	2.8	442	2	2.4
13	853	3	6.9	516	2	2.8	430	1	1.2
14	830	3	6.7	505	2	2.7	429	1	1.2
15	827	3	6.7	490	2	2.6	429	2	2.3
16	803	3	6.5	486	2	2.6	432	2	2.3
17	805	3	6.5	489	2	2.6	432	2	2.3
18	815	2	4.4	493	2	2.7	439	1	1.2
19	790	2	4.3	498	2	2.7	454	1	1.2
20	757	2	4.1	508	1	1.4	460	1	1.2
21	732	2	4.0	519	1	1.4	468	2	2.5
22	711	2	3.8	521	1	1.4	463	2	2.5
23	692	2	3.7	504	1	1.4	516	3	4.2
24	683	2	3.7	493	1	1.3	556	3	4.5
25	677	2	3.7	480	1	1.3	542	2	2.9
26	662	3	5.4	459	1	1.2	510	2	2.8
27	664	3	5.4	450	1	1.2	492	2	2.7
28	661	3	5.4	456	2	2.5	481	2	2.6
29	644	2	3.5	454	2	2.5	487	2	2.6
30	632	2	3.4	443	2	2.4	478	2	2.6
31	626	2	3.4	441	2	2.4	--	--	--
TOTAL	**26,696**	--	**252.6**	**15,841**	--	**72.6**	**13,855**	--	**71.7**
MEAN	**861**	**3**	**8.1**	**511**	**2**	**2.3**	**462**	**2**	**2.4**
MAX	**1,300**	**6**	**20**	**615**	**3**	**5.0**	**556**	**3**	**4.5**
MIN	**626**	**2**	**3.4**	**441**	**1**	**1.2**	**429**	**1**	**1.2**

Total for water year 2007 (unrounded sum of daily values): streamflow–476,692 ft^3/s (annual runoff–945,500 acre-ft); suspended-sediment discharge–22,998.7 tons.

Table 8. Daily mean streamflow and suspended-sediment data for Clark Fork above Missoula, Montana, October 2006 through September 2007.

[Abbreviations: acre-ft, acre-feet; ft^3/s, cubic feet per second; e, estimated; max, maximum; mg/L, milligrams per liter; min, minimum; ton/d, tons per day. Symbol: --, no data or value not computed]

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	1,080	50	146	1,130	18	55	1,450	35	137
2	1,080	48	140	1,150	18	56	e1,500	23	93
3	1,090	47	138	1,280	22	76	e1,470	19	75
4	1,090	48	141	1,300	28	98	e1,450	15	59
5	1,110	58	174	1,360	36	132	e1,500	13	53
6	1,120	80	242	1,410	45	171	1,530	13	54
7	1,150	95	295	1,570	54	229	1,470	13	52
8	1,130	79	241	3,190	140	1,210	1,460	14	55
9	1,140	70	215	3,830	226	2,340	1,460	17	67
10	1,160	64	200	3,230	150	1,310	1,480	62	248
11	1,170	55	174	2,840	125	958	1,560	63	265
12	1,180	48	153	2,590	85	594	1,560	60	253
13	1,170	42	133	2,370	65	416	1,570	47	199
14	1,170	41	130	2,280	43	265	1,600	38	164
15	1,180	41	131	2,120	19	109	1,650	31	138
16	1,220	39	128	2,030	18	99	1,640	19	84
17	1,320	46	164	2,020	18	98	e1,400	8	30
18	1,320	59	210	1,890	17	87	e1,100	8	24
19	1,310	64	226	1,830	17	84	e950	13	33
20	1,430	71	274	1,790	17	82	e1,000	18	49
21	1,530	75	310	1,840	18	89	e1,030	26	72
22	1,540	73	304	1,900	17	87	e1,150	35	109
23	1,460	62	244	1,900	14	72	e1,270	44	151
24	1,400	53	200	1,860	11	55	e1,350	54	197
25	1,370	47	174	1,830	10	49	e1,400	72	272
26	1,340	44	159	1,760	10	48	e1,530	488	2,020
27	1,320	40	143	1,690	12	55	e1,600	552	2,380
28	1,290	36	125	1,620	14	61	e1,600	350	1,510
29	1,270	32	110	1,340	44	159	e1,450	378	1,480
30	1,270	28	96	1,260	228	776	e1,200	318	1,030
31	1,230	22	73	--	--	--	e1,050	240	680
TOTAL	**38,640**	**--**	**5,593**	**58,210**	**--**	**9,920**	**43,430**	**--**	**12,033**
MEAN	**1,246**	**53**	**180**	**1,940**	**51**	**331**	**1,401**	**100**	**388**
MAX	**1,540**	**95**	**310**	**3,830**	**228**	**2,340**	**1,650**	**552**	**2,380**
MIN	**1,080**	**22**	**73**	**1,130**	**10**	**48**	**950**	**8**	**24**

Table 8. Daily mean streamflow and suspended-sediment data for Clark Fork above Missoula, Montana, October 2006 through September 2007.—Continued

[Abbreviations: acre-ft, acre-feet; ft³/s, cubic feet per second; e, estimated; max, maximum; mg/L, milligrams per liter; min, minimum; ton/d, tons per day. Symbol: --, no data or value not computed]

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	e1,000	169	456	e1,100	7	21	1,180	13	41
2	e1,200	95	308	e1,030	7	19	1,160	13	41
3	e1,600	115	497	e950	7	18	1,130	13	40
4	e1,650	161	717	e1,000	11	30	1,180	13	41
5	1,590	147	631	e1,150	84	261	1,270	18	62
6	1,430	114	440	1,340	99	358	1,400	34	129
7	1,360	83	305	1,370	78	289	1,790	96	464
8	1,390	60	225	1,390	55	206	2,170	158	926
9	1,380	50	186	1,440	52	202	2,330	184	1,160
10	1,380	65	242	1,560	44	185	2,100	116	658
11	e1,100	104	309	1,560	32	135	2,060	80	445
12	e650	151	265	1,510	28	114	2,490	133	894
13	e450	198	241	1,390	28	105	3,860	515	5,370
14	e600	177	287	1,330	28	101	3,600	243	2,360
15	e700	103	195	1,340	28	101	2,940	102	810
16	e750	36	73	1,440	30	117	2,620	70	495
17	e800	5	11	1,540	57	237	2,600	65	456
18	e900	4	9.7	1,510	42	171	2,780	55	413
19	e1,030	4	11	1,460	41	162	3,110	76	638
20	e1,200	6	19	1,400	36	136	3,230	107	933
21	e1,270	9	31	1,390	26	98	3,290	99	879
22	e1,370	11	41	1,350	23	84	3,170	68	582
23	e1,350	17	62	1,350	22	80	3,080	55	457
24	e1,300	22	77	1,330	20	72	3,030	51	417
25	e1,270	24	82	1,280	16	55	3,130	61	516
26	e1,200	19	62	1,280	12	41	3,450	76	708
27	e1,130	14	43	1,260	9	31	3,650	106	1,040
28	e1,050	9	26	1,210	11	36	3,750	106	1,070
29	e1,000	7	19	--	--	--	3,610	75	731
30	e1,030	7	19	--	--	--	3,400	38	349
31	e1,050	7	20	--	--	--	3,270	40	353
TOTAL	**35,180**	**--**	**5,909.7**	**37,260**	**--**	**3465**	**81,830**	**--**	**23,478**
MEAN	**1,135**	**64**	**191**	**1,331**	**33**	**124**	**2,640**	**93**	**757**
MAX	**1,650**	**198**	**717**	**1,560**	**99**	**358**	**3,860**	**515**	**5,370**
MIN	**450**	**4**	**9.7**	**950**	**7**	**18**	**1,130**	**13**	**40**

Table 8. Daily mean streamflow and suspended-sediment data for Clark Fork above Missoula, Montana, October 2006 through September 2007.—Continued

[Abbreviations: acre-ft, acre-feet; ft³/s, cubic feet per second; e, estimated; max, maximum; mg/L, milligrams per liter; min, minimum; ton/d, tons per day. Symbol: --, no data or value not computed]

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	3,210	64	555	6,100	294	4,840	6,220	60	1,010
2	3,120	36	303	6,720	240	4,350	6,150	62	1,030
3	3,040	44	361	8,060	266	5,790	6,190	55	919
4	2,910	37	291	9,130	300	7,400	6,230	53	892
5	2,840	47	360	8,330	158	3,550	6,450	55	958
6	2,790	42	316	7,380	95	1,890	7,150	97	1,870
7	2,710	33	241	6,690	75	1,350	8,220	208	4,620
8	2,700	37	270	6,360	65	1,120	8,250	181	4,030
9	2,760	38	283	6,490	65	1,140	7,520	124	2,520
10	2,900	69	540	7,100	70	1,340	7,070	112	2,140
11	2,880	61	474	7,870	89	1,890	7,260	142	2,780
12	2,810	48	364	8,320	104	2,340	7,430	179	3,590
13	2,740	48	355	8,700	98	2,300	6,860	140	2,590
14	2,680	57	412	8,730	109	2,570	6,330	108	1,850
15	2,700	42	306	8,100	84	1,840	5,910	87	1,390
16	2,780	62	465	7,450	58	1,170	5,520	84	1,250
17	2,820	58	442	7,170	51	987	5,330	79	1,140
18	3,080	100	832	7,240	51	997	5,290	61	871
19	3,470	114	1,070	7,420	51	1,020	4,970	50	671
20	3,420	94	868	7,420	49	982	4,550	51	627
21	3,300	120	1,070	7,380	42	837	4,210	43	489
22	3,190	100	861	7,500	53	1,070	3,990	36	388
23	3,140	62	526	7,320	61	1,210	3,780	38	388
24	3,250	62	544	7,000	67	1,270	3,600	28	272
25	3,430	90	833	6,760	62	1,130	3,450	34	317
26	3,710	133	1,330	6,500	61	1,070	3,250	38	333
27	3,910	112	1,180	6,140	52	862	3,080	28	233
28	4,030	134	1,460	6,320	50	853	2,880	19	148
29	4,550	185	2,270	6,850	94	1,740	2,720	18	132
30	5,370	258	3,740	6,750	88	1,600	2,590	17	119
31	--	--	--	6,430	71	1,230	--	--	--
TOTAL	**96,240**	**--**	**22,922**	**225,730**	**--**	**61,738**	**162,450**	**--**	**39,567**
MEAN	**3,208**	**80**	**764**	**7,282**	**99**	**1,990**	**5,415**	**76**	**1,320**
MAX	**5,370**	**258**	**3,740**	**9,130**	**300**	**7,400**	**8,250**	**208**	**4,620**
MIN	**2,680**	**33**	**241**	**6,100**	**42**	**837**	**2,590**	**17**	**119**

Table 8. Daily mean streamflow and suspended-sediment data for Clark Fork above Missoula, Montana, October 2006 through September 2007.—Continued

[Abbreviations: acre-ft, acre-feet; ft³/s, cubic feet per second; e, estimated; max, maximum; mg/L, milligrams per liter; min, minimum; ton/d, tons per day. Symbol: --, no data or value not computed]

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	2,490	16	108	1,170	12	38	881	15	36
2	2,350	14	89	1,140	12	37	870	15	35
3	2,310	12	75	1,130	12	37	859	14	32
4	2,230	10	60	1,100	12	36	858	14	32
5	2,150	8	46	1,070	12	35	865	13	30
6	2,070	8	45	1,070	12	35	915	12	30
7	2,010	8	43	1,060	12	34	912	10	25
8	1,950	8	42	1,040	12	34	895	9	22
9	1,900	8	41	1,020	12	33	897	9	22
10	1,860	8	40	993	12	32	900	10	24
11	1,810	8	39	979	13	34	902	10	24
12	1,770	10	48	972	13	34	894	11	27
13	1,700	10	46	959	14	36	876	12	28
14	1,640	10	44	957	14	36	873	11	26
15	1,610	10	43	932	14	35	873	10	24
16	1,580	11	47	911	14	34	869	10	23
17	1,590	11	47	916	14	35	876	9	21
18	1,620	11	48	927	14	35	892	9	22
19	1,590	11	47	934	14	35	932	9	23
20	1,510	11	45	962	14	36	974	11	29
21	1,450	11	43	992	15	40	1,010	12	33
22	1,400	11	42	1,010	15	41	996	13	35
23	1,370	11	41	986	15	40	1,140	19	58
24	1,340	12	43	955	14	36	1,370	38	141
25	1,330	12	43	930	14	35	1,410	33	126
26	1,360	14	51	903	15	37	1,350	21	77
27	1,330	16	57	881	15	36	1,290	18	63
28	1,310	18	64	876	15	35	1,270	16	55
29	1,270	19	65	870	15	35	1,270	14	48
30	1,220	16	53	852	15	35	1,250	14	47
31	1,190	13	42	851	15	34	--	--	--
TOTAL	**52,310**	**--**	**1,587**	**30,348**	**--**	**1,105**	**30,169**	**--**	**1,218**
MEAN	**1,687**	**11**	**51**	**979**	**14**	**36**	**1,006**	**14**	**41**
MAX	**2,490**	**19**	**108**	**1,170**	**15**	**41**	**1,410**	**38**	**141**
MIN	**1,190**	**8**	**39**	**851**	**12**	**32**	**858**	**9**	**21**

Total for water year 2007 (unrounded sum of daily values): streamflow–891,797 ft3/s (annual runoff–1,769,000 acre-ft); suspended-sediment discharge–188,535.7 tons.

Table 9. Seasonal daily maximum, minimum, and mean turbidity at Mill Creek near Anaconda, Montana, October through November, 2006 and March through September, 2007.

[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). Symbol: --, no data]

Day	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Maximum	Minimum	Mean
	OCTOBER			NOVEMBER			MARCH		
1	2.0	0.5	1.0	3.0	1.0	1.5	--	--	--
2	1.5	.5	1.0	3.0	1.0	1.5	--	--	--
3	1.5	.5	1.0	2.5	1.0	1.5	--	--	--
4	2.0	1.0	1.0	3.0	1.0	1.5	--	--	--
5	2.0	1.0	1.5	2.5	1.0	1.5	--	--	--
6	2.0	1.0	1.5	3.0	1.0	1.5	--	--	--
7	3.0	1.5	2.0	12	1.5	4.5	--	--	--
8	3.0	1.0	1.5	12	2.0	4.0	--	--	--
9	2.0	1.0	1.0	3.5	1.5	2.0	--	--	--
10	2.0	1.0	1.0	4.0	1.5	2.5	--	--	--
11	3.5	1.0	1.0	4.5	1.5	2.5	--	--	--
12	2.5	.5	1.0	3.5	2.0	3.0	--	--	--
13	1.5	1.0	1.0	5.0	3.0	4.0	--	--	--
14	1.5	1.0	1.0	7.0	4.0	5.0	--	--	2.5
15	2.0	1.0	1.5	6.0	2.5	4.5	4.0	1.5	3.0
16	3.0	1.5	2.0	5.0	3.0	4.0	5.0	2.0	2.5
17	4.5	1.0	2.0	5.5	3.0	4.0	5.5	2.0	3.0
18	3.5	1.0	1.0	6.0	3.5	4.0	6.0	2.5	4.0
19	2.0	1.0	1.0	7.0	3.5	5.0	6.5	2.0	3.5
20	5.5	1.0	2.5	9.0	3.0	5.0	6.0	2.0	3.5
21	2.0	1.0	1.5	--	--	--	4.5	2.0	3.5
22	1.5	1.0	1.0	--	--	--	5.0	2.0	3.0
23	1.5	1.0	1.0	--	--	--	8.0	1.5	3.0
24	1.5	.5	1.0	--	--	--	8.5	1.5	3.0
25	1.5	.5	1.0	--	--	--	9.0	1.5	3.5
26	1.5	.5	1.0	--	--	--	4.5	2.0	2.5
27	1.0	.5	.5	--	--	--	6.0	2.0	3.0
28	1.5	.5	1.0	--	--	--	5.5	1.5	2.0
29	3.5	.5	1.0	--	--	--	6.5	1.5	2.5
30	3.5	1.0	1.5	--	--	--	7.5	1.0	2.0
31	3.5	1.0	2.0	--	--	--	6.5	1.5	2.5
MONTH[1]	**5.5**	**.5**	**1.3**	**12**	**1.0**	**3.2**	**9.0**	**1.0**	**2.9**

Table 9. Seasonal daily maximum, minimum, and mean turbidity at Mill Creek near Anaconda, Montana, October through November, 2006 and March through September, 2007.—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). Symbol: --, no data]

Day	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Maximum	Minimum	Mean
	APRIL			MAY			JUNE		
1	5.5	1.5	2.0	18	7.5	11	--	--	2.0
2	7.5	1.5	2.5	14	7.0	9.5	--	--	2.5
3	6.0	1.5	3.0	24	5.5	11	--	--	3.0
4	6.5	1.5	3.0	8.5	3.5	5.5	--	--	3.0
5	7.0	1.5	3.0	7.5	3.0	4.5	8.0	2.5	5.0
6	6.0	1.5	3.5	7.0	3.0	4.0	5.5	2.5	4.0
7	7.0	2.0	3.5	6.0	3.0	4.0	4.5	1.5	3.5
8	--	--	--	5.5	2.0	4.0	4.5	1.5	3.5
9	--	--	2.5	6.0	2.5	4.0	6.5	1.5	4.5
10	4.0	2.0	3.0	8.0	3.5	4.5	10	3.5	5.5
11	8.0	1.5	4.0	8.0	4.0	5.5	14	4.0	7.5
12	8.5	2.0	5.5	10	4.0	6.5	8.0	2.5	4.5
13	4.5	1.5	2.5	9.5	4.0	6.0	--	--	--
14	--	--	--	6.0	3.5	4.0	10	1.0	4.5
15	--	--	--	4.5	3.0	3.5	--	--	--
16	--	--	--	4.0	1.0	2.5	--	--	--
17	8.5	3.5	6.0	2.5	.5	1.5	12	1.0	5.0
18	9.5	4.5	7.0	--	--	2.0	--	--	--
19	10	3.5	7.0	--	--	1.5	7.0	1.5	2.5
20	10	3.0	6.5	4.0	1.0	2.0	3.5	1.5	2.5
21	9.5	4.0	6.0	4.0	1.0	2.0	3.5	2.0	2.5
22	10	4.0	6.5	2.0	1.0	1.5	3.0	2.0	2.5
23	10	4.5	7.5	--	--	1.5	--	--	2.5
24	10	5.0	8.0	2.5	1.0	1.5	--	--	2.0
25	11	5.0	8.5	3.0	1.0	1.5	--	--	2.0
26	10	5.5	8.0	--	--	1.5	--	--	2.0
27	10	5.0	8.0	--	--	1.5	3.0	1.5	2.0
28	17	7.0	9.5	--	--	2.0	3.5	2.0	2.5
29	20	8.5	13	2.5	1.5	2.0	3.0	1.5	2.0
30	18	7.0	11	--	--	2.0	--	--	2.0
31	--	--	--	--	--	2.0	--	--	--
MONTH[1]	**20**	**1.5**	**5.8**	**24**	**.5**	**3.7**	**14**	**1.0**	**3.3**

Table 9. Seasonal daily maximum, minimum, and mean turbidity at Mill Creek near Anaconda, Montana, October through November, 2006 and March through September, 2007.—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). Symbol: --, no data]

Day	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Maximum	Minimum	Mean
	JULY			AUGUST			SEPTEMBER		
1	3.0	1.5	2.0	--	--	2.0	7.0	2.0	4.5
2	2.5	1.5	2.0	3.5	1.0	2.0	--	--	--
3	--	--	2.0	3.5	1.0	2.0	--	--	--
4	2.5	1.5	2.0	4.0	1.0	2.0	--	--	--
5	3.0	1.0	2.0	3.0	1.0	2.0	--	--	--
6	3.0	1.0	2.0	3.0	1.0	2.0	--	--	--
7	3.0	1.0	2.0	3.0	1.0	2.0	--	--	2.5
8	--	--	2.0	--	--	2.0	3.5	2.5	2.5
9	2.5	1.0	1.5	3.5	1.5	2.5	3.0	2.0	2.5
10	2.5	1.0	1.5	4.0	2.5	3.0	2.5	1.5	2.0
11	--	--	1.5	4.0	2.5	3.0	2.5	1.5	2.0
12	2.5	1.0	1.5	3.5	2.0	2.5	2.5	1.5	2.0
13	2.5	1.0	1.5	3.5	2.5	3.0	3.0	2.0	2.0
14	3.5	1.0	2.0	3.5	2.5	3.0	4.0	2.0	2.5
15	--	--	2.0	3.0	2.0	2.5	4.0	2.0	2.5
16	4.0	1.0	1.5	3.0	2.0	2.5	5.5	2.0	3.0
17	6.0	1.0	2.0	3.0	2.0	2.0	4.0	2.0	2.5
18	9.5	1.5	3.5	2.5	1.5	2.0	3.0	2.0	2.5
19	3.0	1.0	1.5	3.0	2.0	2.0	3.5	2.5	3.0
20	2.5	1.0	1.5	2.5	1.5	2.0	3.5	3.0	3.0
21	3.5	1.0	1.5	3.0	1.5	2.0	4.5	3.0	3.5
22	3.5	1.0	1.5	3.5	1.5	2.0	6.5	3.5	4.0
23	3.5	1.0	1.5	2.5	1.5	2.0	8.0	4.5	6.0
24	3.5	1.0	2.0	2.5	1.5	2.0	5.5	1.5	3.0
25	4.0	1.5	2.5	2.5	1.5	1.5	3.0	1.5	2.0
26	3.5	.5	1.5	2.0	1.5	1.5	2.0	1.5	1.5
27	2.0	1.0	1.5	2.5	1.5	2.0	2.5	1.5	1.5
28	3.0	1.0	1.5	3.0	1.5	2.0	2.0	1.5	1.5
29	3.5	1.0	1.5	4.0	1.5	2.5	2.5	1.5	2.0
30	3.5	1.0	2.0	--	--	2.5	2.5	1.5	2.0
31	4.0	1.0	2.0	--	--	2.0	--	--	--
MONTH[1]	**9.5**	**.5**	**1.8**	**4.0**	**1.0**	**2.2**	**8.0**	**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 at Willow Creek near Anaconda, Montana, October through November, 2006 and March through September, 2007.

[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). Symbols: <, less than; --, no data]

Day	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Maximum	Minimum	Mean
	OCTOBER			NOVEMBER			MARCH		
1	2.5	1.5	1.5	7.0	1.5	4.0	--	--	--
2	2.5	1.0	1.5	6.0	2.0	3.5	--	--	--
3	3.0	1.0	1.5	6.0	1.5	3.5	--	--	--
4	3.5	1.5	2.0	7.0	1.5	3.5	--	--	--
5	3.0	1.0	1.5	6.5	2.0	3.5	--	--	--
6	8.5	1.5	3.0	5.5	2.0	2.5	--	--	--
7	3.5	1.5	2.0	--	--	4.5	--	--	--
8	2.5	1.5	2.0	--	--	--	--	--	--
9	3.5	1.5	2.0	--	--	--	--	--	--
10	3.0	1.5	2.0	--	--	--	--	--	--
11	2.5	2.0	2.0	--	--	--	--	--	--
12	3.0	1.5	2.0	--	--	--	--	--	--
13	2.5	1.5	2.0	--	--	--	--	--	--
14	3.0	1.5	2.0	2.0	1.0	1.5	--	--	4.5
15	3.0	1.5	2.0	2.5	1.0	1.5	10	4.0	5.5
16	5.0	2.0	2.5	3.0	1.0	2.0	5.0	3.5	4.0
17	5.0	1.5	3.0	3.5	1.0	1.5	13	3.5	5.0
18	5.0	1.5	2.5	4.0	1.0	2.0	9.5	5.0	6.0
19	5.5	1.5	2.5	4.0	1.0	1.5	--	--	--
20	--	--	--	3.5	1.0	1.5	--	--	--
21	--	--	--	--	--	--	--	--	--
22	--	--	--	--	--	--	--	--	--
23	--	--	--	--	--	--	--	--	--
24	--	--	2.0	--	--	--	--	--	--
25	3.5	1.0	1.5	--	--	--	--	--	--
26	3.5	1.0	1.5	--	--	--	--	--	--
27	5.0	1.5	2.0	--	--	--	--	--	--
28	4.0	1.5	2.0	--	--	--	--	--	--
29	5.0	1.5	3.0	--	--	--	--	--	--
30	5.5	1.5	3.0	--	--	--	--	--	--
31	5.5	1.5	3.0	--	--	--	--	--	--
MONTH[1]	**8.5**	**1.0**	**2.1**	**7.0**	**1.0**	**2.6**	**13**	**3.5**	**5.0**

Table 10. Seasonal daily maximum, minimum, and mean turbidity at Willow Creek near Anaconda, Montana, October through November, 2006 and March through September, 2007.—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). Symbols: <, less than; --, no data]

Day	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Maximum	Minimum	Mean
	APRIL			MAY			JUNE		
1	--	--	--	--	--	--	11	6.5	8.5
2	--	--	--	--	--	--	12	6.0	8.0
3	--	--	--	--	--	--	13	6.0	7.5
4	7.5	3.0	4.0	--	--	--	11	6.0	7.0
5	4.5	3.0	3.0	17	12	14	10	5.0	6.5
6	4.0	2.5	3.0	17	12	13	10	4.5	6.0
7	6.5	3.0	3.0	18	12	13	10	4.5	5.5
8	7.0	2.5	3.5	14	12	12	10	4.5	6.0
9	6.5	3.0	4.0	24	12	15	7.0	4.0	5.0
10	7.0	3.5	4.0	--	--	--	8.5	3.5	5.5
11	8.5	3.5	5.5	--	--	--	9.0	3.5	5.0
12	10	3.5	6.0	--	--	--	7.5	3.5	4.5
13	--	--	--	--	--	--	7.0	3.5	4.5
14	--	--	--	--	--	--	7.0	3.5	4.5
15	11	4.5	7.0	--	--	--	5.5	3.5	4.5
16	17	3.5	6.0	--	--	--	6.5	3.5	4.5
17	18	6.5	10	7.5	3.5	4.5	7.0	3.5	4.5
18	11	6.5	10	7.5	3.5	4.5	6.5	3.5	4.0
19	11	4.5	7.0	5.5	3.5	4.0	6.0	3.0	4.0
20	11	4.5	6.5	7.5	3.5	4.5	8.0	3.0	4.5
21	14	4.5	6.5	8.0	4.0	5.5	7.5	3.0	4.0
22	19	6.0	11	6.0	4.0	4.5	7.0	3.0	4.0
23	19	7.0	12	8.5	3.5	4.5	5.5	2.5	3.5
24	38	1.5	17	11	5.0	6.5	5.5	2.5	3.5
25	--	--	--	16	8.0	9.5	8.5	2.5	3.5
26	--	--	--	12	8.5	9.5	5.0	2.5	3.0
27	--	--	--	18	8.5	10	5.0	2.0	3.0
28	--	--	--	40	10	17	4.5	2.0	3.0
29	--	--	--	--	--	--	6.0	2.0	3.0
30	--	--	--	--	--	--	5.0	2.0	3.0
31	--	--	--	--	--	--	--	--	--
MONTH[1]	**38**	**1.5**	**6.8**	**40**	**3.5**	**8.9**	**13**	**2.0**	**4.8**

Table 10. Seasonal daily maximum, minimum, and mean turbidity at Willow Creek near Anaconda, Montana, October through November, 2006 and March through September, 2007.—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). Symbols: <, less than; --, no data]

Day	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Maximum	Minimum	Mean
	JULY			AUGUST			SEPTEMBER		
1	4.0	2.0	2.5	2.5	<0.5	0.5	3.0	1.0	1.5
2	5.0	2.0	3.0	1.5	<.5	.5	2.0	1.0	1.5
3	4.5	2.5	3.0	2.0	<.5	.5	2.0	1.0	1.5
4	4.0	2.0	3.0	1.0	<.5	.5	2.0	1.5	1.5
5	4.0	2.0	2.5	2.0	<.5	.5	2.5	1.5	1.5
6	4.0	2.0	2.5	2.0	<.5	.5	3.0	1.5	2.0
7	4.0	2.0	2.5	3.0	<.5	.5	3.5	.5	1.5
8	4.5	1.5	2.0	3.0	<.5	.5	3.0	1.0	1.5
9	5.5	1.5	2.0	3.0	.5	1.5	4.5	1.0	2.5
10	3.0	1.0	2.0	7.0	2.0	3.5	8.5	1.5	4.5
11	3.0	1.0	1.5	6.0	2.0	3.5	9.0	1.0	4.5
12	2.5	1.0	1.5	5.5	1.5	3.0	7.5	.5	3.0
13	2.0	1.0	1.5	3.0	1.5	2.0	2.0	.5	1.0
14	3.5	1.0	1.5	4.0	1.5	2.0	2.0	.5	1.0
15	2.5	1.0	1.5	3.5	1.5	2.0	2.0	.5	1.0
16	3.5	1.0	1.5	4.5	1.5	2.5	2.0	.5	1.0
17	5.0	1.0	1.5	4.0	1.5	2.5	1.5	.5	1.0
18	27	1.0	5.0	4.0	1.5	2.0	1.5	1.0	1.0
19	3.0	.5	1.0	4.5	1.5	2.5	3.0	1.0	1.5
20	3.0	.5	1.0	20	2.0	4.0	2.0	1.0	1.0
21	2.5	<.5	1.0	4.5	1.5	2.5	2.0	.5	1.0
22	2.0	<.5	1.0	3.0	1.5	2.0	11	1.0	1.5
23	2.0	.5	1.0	3.5	1.5	2.0	100	2.0	10
24	2.0	.5	1.0	4.0	1.5	2.0	9.0	2.0	4.5
25	2.0	<.5	1.0	3.0	1.5	2.0	4.5	1.5	2.5
26	1.5	<.5	.5	3.5	1.5	2.0	3.5	1.5	2.0
27	2.0	<.5	.5	3.5	1.5	2.0	4.5	1.5	2.0
28	2.0	<.5	.5	3.0	1.5	2.0	4.0	1.5	2.0
29	1.5	<.5	.5	4.0	1.5	2.0	4.0	1.5	2.0
30	1.0	<.5	.5	3.5	1.5	2.0	4.0	1.0	2.0
31	1.5	<.5	.5	3.5	1.5	1.5	--	--	--
MONTH[1]	**27**	**<.5**	**1.6**	**20**	**<.5**	**1.8**	**100**	**.5**	**2.2**

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

Table 11. Seasonal daily maximum, minimum, and mean turbidity at Warm Springs Creek near Anaconda, Montana, October through December, 2006 and April through September, 2007.

[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). Symbols: <, less than; --, no data]

Day	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Maximum	Minimum	Mean
	OCTOBER			NOVEMBER			DECEMBER		
1	3.0	2.0	2.0	4.0	2.0	3.0	5.0	3.0	3.0
2	3.0	2.0	2.0	3.0	2.0	2.5	4.0	3.0	3.0
3	2.0	2.0	2.0	43	2.0	5.5	3.0	2.0	2.5
4	5.5	2.0	2.0	3.0	2.0	2.5	4.0	3.0	3.0
5	3.0	2.0	2.0	6.0	2.0	2.5	4.0	3.0	3.0
6	6.5	2.0	2.0	4.0	2.0	2.5	4.0	3.0	3.0
7	3.5	2.0	2.0	5.0	2.0	3.0	5.0	3.0	3.0
8	2.5	1.5	2.0	8.0	3.0	5.0	3.0	3.0	3.0
9	2.5	1.5	2.0	4.0	2.0	3.0	4.0	3.0	3.0
10	2.5	1.5	2.0	3.0	2.0	3.0	4.0	3.0	3.0
11	3.5	1.5	1.5	5.0	2.0	2.5	4.0	3.0	3.0
12	2.5	1.5	2.0	3.0	2.0	2.5	--	--	3.0
13	2.5	1.5	1.5	5.0	2.0	2.5	--	--	--
14	2.5	1.5	1.5	4.0	2.0	3.0	--	--	--
15	1.5	1.5	1.5	4.0	2.0	3.0	--	--	--
16	4.0	1.5	2.0	3.0	2.0	2.5	--	--	--
17	3.0	1.5	2.0	3.0	2.0	2.0	--	--	--
18	2.5	1.5	1.5	3.0	2.0	2.0	--	--	--
19	2.5	1.5	1.5	3.0	2.0	2.0	--	--	--
20	39	1.5	6.0	3.0	2.0	2.0	--	--	--
21	3.5	1.5	2.0	7.0	2.0	2.5	--	--	--
22	2.0	1.5	2.0	5.0	2.0	3.0	--	--	--
23	2.0	1.5	2.0	3.0	2.0	3.0	--	--	--
24	2.5	2.0	2.0	3.0	2.0	3.0	--	--	--
25	3.0	2.0	2.0	3.0	2.0	3.0	--	--	--
26	3.0	2.0	2.0	3.0	3.0	3.0	--	--	--
27	3.0	2.0	2.0	4.0	3.0	3.0	--	--	--
28	2.0	2.0	2.0	5.0	2.0	2.5	--	--	--
29	3.0	2.0	2.0	4.0	2.0	2.5	--	--	--
30	3.0	2.0	2.0	11	2.0	3.0	--	--	--
31	5.0	2.0	3.0	--	--	--	--	--	--
MONTH[1]	**39**	**1.5**	**2.1**	**43**	**2.0**	**2.8**	**5.0**	**2.0**	**3.0**

Table 11. Seasonal daily maximum, minimum, and mean turbidity at Warm Springs Creek near Anaconda, Montana, October through December, 2006 and April through September, 2007.—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). Symbols: <, less than; --, no data]

Day	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Maximum	Minimum	Mean
	APRIL			MAY			JUNE		
1	--	--	--	21	6.0	10	6.5	3.0	3.5
2	--	--	--	16	7.0	10	4.5	3.0	3.5
3	--	--	--	55	7.0	16	5.5	3.0	4.0
4	4.0	3.0	3.0	12	4.0	5.5	22	2.5	5.0
5	4.0	2.0	3.0	6.0	3.0	4.0	29	7.0	14
6	4.0	3.0	3.0	4.0	3.0	3.5	14	6.0	8.5
7	4.0	3.0	3.0	5.0	3.0	3.0	7.0	4.0	5.0
8	4.0	3.0	3.0	4.0	3.0	3.0	6.0	3.0	3.5
9	4.0	3.0	3.5	5.0	3.0	3.5	5.0	3.0	3.5
10	4.0	3.0	3.0	7.5	3.0	4.5	10	3.0	5.0
11	4.0	3.0	3.0	10	5.0	7.0	24	8.5	13
12	4.0	2.0	3.0	10	5.0	7.5	39	4.0	7.5
13	4.0	3.0	3.0	15	5.0	9.0	9.5	3.0	4.5
14	4.0	3.0	3.0	7.5	4.0	5.5	8.5	3.0	4.0
15	4.0	3.0	3.0	6.5	3.0	4.0	4.5	3.0	3.5
16	4.0	3.0	3.0	5.0	3.0	3.5	5.5	3.0	3.5
17	14	2.0	3.5	5.0	3.0	4.0	7.5	3.5	5.0
18	16	4.0	7.5	5.0	3.0	4.0	14	4.5	8.5
19	5.0	3.0	3.5	11	4.0	5.5	43	7.5	20
20	7.0	3.0	4.0	10	4.0	5.5	33	5.5	11
21	28	3.0	7.0	18	5.0	7.0	47	6.5	12
22	9.0	3.0	3.5	7.0	3.0	4.0	25	7.0	14
23	5.0	2.0	3.5	11	3.0	3.5	33	2.5	7.5
24	7.0	3.0	3.5	7.5	3.0	3.5	4.5	2.5	2.5
25	5.0	3.0	3.5	7.5	2.0	3.5	12	2.5	3.0
26	5.0	3.0	3.5	4.0	2.0	2.5	3.5	2.5	2.5
27	5.0	3.0	3.5	8.5	2.0	3.5	2.5	2.5	2.5
28	5.0	3.0	4.0	8.5	3.0	5.0	4.5	2.5	2.5
29	9.0	4.0	6.0	4.0	2.0	3.0	3.5	1.0	2.5
30	23	7.0	13	5.5	2.0	2.5	3.5	1.0	2.0
31	--	--	--	3.0	2.0	2.5	--	--	--
MONTH[1]	**28**	**2.0**	**4.0**	**55**	**2.0**	**5.1**	**47**	**1.0**	**6.2**

Table 11. Seasonal daily maximum, minimum, and mean turbidity at Warm Springs Creek near Anaconda, Montana, October through December, 2006 and April through September, 2007.—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). Symbols: <, less than; --, no data]

Day	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Maximum	Minimum	Mean
	JULY			AUGUST			SEPTEMBER		
1	3.5	1.0	2.0	3.0	2.0	2.5	--	--	2.5
2	--	--	2.5	3.0	2.0	2.5	--	--	--
3	5.0	2.0	3.5	3.0	2.0	2.5	--	--	--
4	4.0	2.0	3.0	3.0	2.0	2.5	--	--	2.5
5	4.0	2.0	3.0	8.5	3.0	3.5	7.5	1.5	3.0
6	4.0	2.0	3.0	4.5	2.5	3.5	2.5	1.5	2.0
7	4.0	2.0	3.0	5.5	3.5	4.0	2.0	.5	1.0
8	5.0	2.0	3.0	6.5	4.5	5.5	.5	.5	.5
9	4.0	2.0	3.0	6.5	2.0	3.5	.5	.5	.5
10	4.0	2.0	3.0	2.5	2.0	2.0	.5	.5	.5
11	4.0	2.0	3.0	2.5	2.0	2.0	.5	.5	.5
12	4.0	2.0	3.0	2.5	2.0	2.0	.5	.5	.5
13	3.0	2.0	2.5	3.5	2.0	2.0	.5	.5	.5
14	4.0	2.0	2.5	2.5	2.0	2.0	1.5	<.5	.5
15	6.0	2.0	3.0	2.5	2.0	2.0	1.0	<.5	.5
16	4.0	2.0	2.5	7.0	2.0	2.0	1.5	<.5	.5
17	59	2.0	7.0	2.5	2.0	2.0	1.0	.5	.5
18	35	2.0	5.0	11	2.0	2.5	1.5	.5	.5
19	5.0	2.0	2.5	5.5	2.0	2.0	1.5	.5	1.0
20	5.0	2.0	2.5	2.5	2.0	2.0	1.0	<.5	.5
21	5.0	2.0	2.5	2.5	2.0	2.0	1.0	<.5	.5
22	4.0	2.0	2.5	2.5	2.0	2.0	1.0	.5	.5
23	4.0	2.0	2.5	3.5	1.5	2.0	37	1.0	5.0
24	4.5	2.0	2.5	2.5	1.5	2.0	2.0	.5	1.0
25	8.5	3.0	3.5	2.5	1.5	1.5	1.5	.5	1.0
26	4.0	2.0	2.5	2.5	1.5	1.5	1.5	.5	.5
27	4.0	2.0	3.0	2.5	1.5	1.5	2.5	.5	1.0
28	4.0	2.0	2.5	1.5	1.5	1.5	1.0	.5	1.0
29	4.5	2.0	2.5	1.5	1.5	1.5	1.5	.5	1.0
30	4.5	2.0	2.5	2.5	1.5	1.5	1.0	.5	1.0
31	3.0	2.0	2.5	--	--	3.0	--	--	--
MONTH[1]	**59**	**1.0**	**3.0**	**11**	**1.5**	**2.3**	**37**	**<.5**	**1.1**

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

Table 12. Seasonal daily maximum, minimum, and mean turbidity at Lost Creek near Anaconda, Montana, October through November, 2006 and March through September, 2007.

[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). Symbols: <, less than; --, no data]

Day	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Maximum	Minimum	Mean
		OCTOBER			NOVEMBER			MARCH	
1	2.0	0.5	1.0	2.5	1.0	1.5	--	--	--
2	2.5	.5	1.0	3.5	1.0	1.5	--	--	--
3	5.0	.5	1.0	3.0	1.5	2.0	--	--	--
4	1.0	.5	1.0	3.0	1.5	1.5	--	--	--
5	8.0	.5	1.5	3.0	1.0	1.5	--	--	--
6	5.0	1.0	1.5	3.0	1.0	1.5	--	--	--
7	1.5	.5	1.0	4.5	1.5	2.5	--	--	--
8	1.5	.5	1.0	15	2.0	6.0	--	--	--
9	2.5	1.0	1.0	3.0	1.5	2.0	--	--	--
10	12	1.0	2.0	3.5	1.5	1.5	--	--	--
11	3.5	1.0	2.0	3.0	1.5	1.5	--	--	--
12	3.0	1.0	1.5	3.5	1.5	1.5	--	--	--
13	2.5	1.0	1.0	3.0	1.5	1.5	--	--	--
14	3.0	1.0	1.0	3.5	1.5	2.0	--	--	--
15	3.5	1.0	1.0	5.5	1.5	2.5	--	--	--
16	9.0	1.0	2.0	4.5	1.5	2.0	--	--	--
17	3.0	1.0	1.0	4.0	1.5	2.0	--	--	--
18	3.0	1.0	1.0	3.5	1.5	2.0	--	--	--
19	19	1.0	2.5	4.0	1.5	2.0	--	--	--
20	19	1.5	4.0	4.5	1.5	2.0	--	--	--
21	8.0	1.0	2.0	--	--	--	--	--	--
22	2.5	1.0	1.0	--	--	--	2.5	1.0	1.5
23	--	--	--	--	--	--	2.0	1.0	1.5
24	--	--	--	--	--	--	3.0	1.0	1.5
25	5.5	1.0	1.5	--	--	--	2.5	1.0	1.5
26	5.0	1.0	1.5	--	--	--	2.5	1.0	2.0
27	4.0	1.0	1.5	--	--	--	4.5	1.5	2.5
28	3.0	1.0	1.5	--	--	--	3.0	1.0	2.0
29	4.0	1.0	1.5	--	--	--	7.0	1.5	2.5
30	2.5	1.0	1.5	--	--	--	4.5	1.5	2.0
31	2.5	1.0	1.5	--	--	--	3.5	1.0	1.5
MONTH[1]	**19**	**.5**	**1.5**	**15**	**1.0**	**2.0**	**7.0**	**1.0**	**1.9**

Table 12. Seasonal daily maximum, minimum, and mean turbidity at Lost Creek near Anaconda, Montana, October through November, 2006 and March through September, 2007.—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). Symbols: <, less than; --, no data

Day	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Maximum	Minimum	Mean
	APRIL			MAY			JUNE		
1	2.5	1.0	1.5	26	6.0	10	9.5	3.5	4.5
2	3.0	1.0	1.5	28	7.0	14	9.0	3.0	4.5
3	4.5	1.0	2.0	49	8.0	21	8.5	3.5	5.0
4	3.5	1.0	2.0	32	3.0	7.0	8.5	3.5	5.0
5	3.0	1.0	1.5	3.5	2.0	2.5	16	6.0	9.0
6	2.5	1.0	1.5	5.5	2.0	3.0	16	7.0	11
7	2.5	1.0	1.5	8.0	1.5	2.5	7.5	4.0	5.5
8	2.5	1.0	1.5	5.5	1.0	2.5	8.0	3.5	5.0
9	2.5	1.0	1.5	32	1.5	6.5	6.5	3.0	4.0
10	2.5	1.0	1.5	15	3.5	7.0	20	3.0	5.5
11	2.5	1.0	1.5	9.5	3.0	5.5	10	3.5	6.0
12	3.5	1.5	2.0	16	2.5	6.0	8.5	3.5	4.5
13	3.0	1.5	2.0	8.5	3.5	5.0	6.5	3.0	4.0
14	2.5	1.0	2.0	8.0	3.0	5.0	6.0	3.0	4.0
15	3.5	2.0	2.5	6.0	2.0	3.5	7.0	3.0	4.0
16	3.5	1.5	2.5	7.0	3.0	4.0	7.5	3.0	4.0
17	3.5	1.5	2.0	6.0	3.0	4.0	9.0	3.0	3.5
18	9.5	3.0	6.5	16	3.0	5.5	10	2.5	4.0
19	18	3.0	6.5	12	4.5	6.5	8.5	3.0	4.0
20	8.5	2.0	3.5	8.0	4.0	5.5	7.5	3.0	4.0
21	5.5	2.0	3.0	22	5.5	9.5	9.5	3.0	4.0
22	4.0	1.5	2.5	11	5.5	7.0	--	--	--
23	9.0	2.0	3.0	8.0	3.5	4.5	--	--	--
24	5.0	2.5	3.0	28	3.5	5.5	--	--	--
25	18	2.5	3.5	19	3.5	5.5	--	--	--
26	4.0	2.0	2.5	6.5	3.0	4.0	--	--	--
27	11	2.0	3.0	12	3.5	5.0	10	1.0	2.0
28	23	3.0	5.5	67	5.0	15	3.0	.5	1.5
29	24	4.0	7.5	7.0	4.0	5.0	3.0	.5	1.5
30	18	5.0	11	10	3.5	5.0	6.5	1.0	2.0
31	--	--	--	8.5	3.5	5.0	--	--	--
MONTH[1]	**24**	**1.0**	**3.0**	**67**	**1.0**	**6.4**	**20**	**.5**	**4.5**

Table 12. Seasonal daily maximum, minimum, and mean turbidity at Lost Creek near Anaconda, Montana, October through November, 2006 and March through September, 2007.—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). Symbols: <, less than; --, no data

Day	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Maximum	Minimum	Mean
	JULY			AUGUST			SEPTEMBER		
1	5.0	<0.5	1.5	2.5	0.5	1.0	4.0	2.5	3.0
2	5.0	.5	2.0	1.5	.5	1.0	4.0	2.0	3.0
3	8.5	.5	2.0	21	.5	2.0	11	2.0	3.0
4	3.5	1.0	2.0	3.0	1.0	1.5	5.0	2.0	2.5
5	2.5	.5	1.5	7.0	.5	1.5	5.5	2.5	3.0
6	2.5	.5	1.5	4.0	1.5	2.0	5.0	2.0	2.5
7	6.0	1.0	1.5	3.0	1.5	2.0	3.0	1.5	2.0
8	2.0	.5	1.5	2.0	1.0	1.5	3.5	1.5	2.0
9	2.0	.5	1.5	20	1.0	2.0	3.5	1.5	2.0
10	2.5	.5	1.5	4.5	2.0	3.0	--	--	2.0
11	5.5	.5	1.5	64	2.5	8.5	--	--	--
12	5.5	.5	1.5	7.0	3.5	5.0	--	--	--
13	4.5	.5	1.5	4.5	3.0	3.5	--	--	--
14	6.0	1.0	2.0	4.0	2.5	3.0	3.0	1.5	2.5
15	2.5	1.0	1.5	4.5	2.5	3.0	--	--	2.0
16	1.5	1.0	1.5	4.5	2.5	3.0	--	--	--
17	8.5	1.0	2.0	4.5	2.5	3.5	--	--	2.5
18	48	.5	4.5	4.5	2.5	3.5	--	--	2.5
19	2.5	1.0	1.5	4.0	2.5	3.0	--	--	2.0
20	2.5	.5	1.5	4.0	2.5	3.0	--	--	--
21	3.0	1.0	2.0	4.0	2.5	3.0	--	--	--
22	6.5	1.0	2.0	12	2.5	3.5	--	--	--
23	7.0	.5	1.5	4.0	2.5	3.0	--	--	6.0
24	7.0	1.0	2.5	7.5	2.5	3.0	3.0	2.0	2.5
25	4.0	.5	1.0	4.0	2.5	3.0	2.5	2.0	2.5
26	4.0	.5	1.5	4.5	2.5	3.0	--	--	2.0
27	2.0	.5	1.0	4.5	2.5	3.0	--	--	--
28	2.0	<.5	1.0	4.0	2.5	3.0	--	--	--
29	6.0	.5	1.0	4.0	2.5	3.0	3.0	2.5	2.5
30	2.0	.5	1.0	4.0	2.5	3.0	4.5	2.5	3.0
31	1.5	<.5	0.5	6.5	2.5	3.0	--	--	--
MONTH[1]	**48**	**<.5**	**1.6**	**64**	**.5**	**2.9**	**11**	**1.5**	**2.6**

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

Table 13. Seasonal daily maximum, minimum, and mean turbidity at Clark Fork above Missoula, Montana, April through September, 2007.

[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). Symbol: --, no data]

Day	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Maximum	Minimum	Mean
	APRIL			MAY			JUNE		
1	--	--	--	37	25	30	17	12	15
2	--	--	--	34	25	29	17	12	14
3	--	--	--	52	28	37	17	12	14
4	--	--	--	55	39	44	17	12	14
5	--	--	--	41	26	34	19	12	15
6	--	--	--	28	19	22	27	16	19
7	--	--	--	21	16	18	46	26	36
8	--	--	--	18	14	16	47	26	36
9	--	--	--	17	13	15	31	22	27
10	--	--	--	20	13	16	26	18	22
11	--	--	--	24	17	19	30	19	23
12	--	--	--	24	18	20	32	23	28
13	--	--	--	24	18	21	34	21	25
14	--	--	--	24	18	21	35	16	20
15	--	--	--	23	15	18	23	14	18
16	--	--	--	17	12	14	18	12	16
17	--	--	--	14	11	12	18	12	14
18	--	--	--	14	10	12	15	9.0	11
19	--	--	--	14	11	13	--	--	9.5
20	--	--	--	15	11	12	--	--	--
21	--	--	--	14	11	12	--	--	--
22	--	--	--	15	11	12	--	--	8.5
23	--	--	--	17	12	14	11	7.5	8.5
24	--	--	--	18	13	15	10	6.0	7.5
25	--	--	7.5	16	11	13	8.5	5.5	7.0
26	11	6.5	8.5	15	11	13	8.5	5.0	6.5
27	13	8.5	10	15	10	12	8.0	5.0	6.0
28	13	9.0	11	18	9.5	12	8.5	5.5	6.0
29	26	11	16	25	15	19	10	5.0	6.5
30	38	21	26	24	16	18	9.5	5.0	6.0
31	--	--	--	20	13	16	--	--	--
MONTH[1]	**38**	**6.5**	**13**	**55**	**9.5**	**19**	**47**	**5.0**	**16**

Table 13. Seasonal daily maximum, minimum, and mean turbidity at Clark Fork above Missoula, Montana, April through September, 2007.—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). Symbol: --, no data]

Day	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Maximum	Minimum	Mean
	JULY			AUGUST			SEPTEMBER		
1	9.5	4.5	6.0	--	--	--	--	--	--
2	10	4.0	6.5	--	--	--	--	--	--
3	--	--	5.5	7.5	3.0	4.5	--	--	--
4	9.0	3.5	4.5	7.5	3.0	4.5	--	--	2.5
5	8.5	4.0	5.5	7.5	3.0	4.5	6.0	2.0	3.0
6	--	--	--	--	--	--	5.5	2.5	3.5
7	--	--	--	--	--	--	9.5	2.5	4.5
8	--	--	--	--	--	--	--	--	6.0
9	--	--	--	7.0	3.5	5.0	8.5	2.5	4.0
10	--	--	--	7.0	3.5	5.0	12	1.5	5.0
11	--	--	--	7.0	3.0	4.5	--	--	--
12	--	--	--	8.5	3.0	5.0	--	--	3.5
13	--	--	--	9.0	3.0	5.0	8.0	2.5	4.0
14	--	--	3.0	7.5	2.5	4.0	5.5	2.5	3.5
15	4.0	2.0	3.0	7.0	3.5	5.0	9.0	3.0	4.5
16	5.0	1.5	2.5	7.0	3.0	4.5	9.0	2.5	4.0
17	5.0	2.0	2.5	7.0	3.5	5.0	7.0	2.5	4.0
18	6.5	1.5	3.5	7.0	3.5	5.5	7.0	3.0	4.0
19	8.5	1.5	3.5	7.0	4.0	5.5	9.0	3.0	6.0
20	3.0	1.5	2.0	7.0	3.5	5.0	--	--	5.5
21	3.0	1.0	2.0	8.5	3.5	5.0	6.5	3.5	4.5
22	7.0	1.0	2.0	12	4.0	7.0	10	3.0	5.5
23	3.0	1.0	2.0	8.0	4.0	5.5	11	4.5	6.5
24	7.0	1.0	2.0	--	--	8.0	16	7.0	9.0
25	4.0	1.5	2.5	--	--	--	17	5.5	9.5
26	5.5	2.5	3.5	--	--	--	12	4.5	6.5
27	8.0	3.0	4.5	--	--	--	8.5	3.5	5.5
28	6.0	2.5	4.0	--	--	--	7.5	3.0	4.5
29	6.5	2.5	4.0	--	--	--	7.0	3.0	4.5
30	6.5	2.5	4.0	--	--	--	5.0	2.5	3.5
31	--	--	--	--	--	--	--	--	--
MONTH[1]	**10**	**1.0**	**3.4**	**12**	**2.5**	**5.2**	**17**	**1.5**	**4.9**

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

Table 14. Analyses of field replicates for water samples, Clark Fork basin, Montana.

[Abbreviations: E, estimated; µg/L, micrograms per liter; mg/L, milligrams per liter; mm, millimeter. Symbols: <, less than laboratory reporting level; --, no data]

Site number (fig. 1)	Site name	Date	Time	Hardness, filtered (mg/L as $CaCO_3$)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)	Total nitrogen, unfiltered (mg/L)	Total phosphorous, unfiltered (mg/L)	Arsenic, filtered (µg/L)	Arsenic, unfiltered recoverable (µg/L)
12323600	Silver Bow Creek at Opportunity	02/26/2007	1505	170	49.1	12.1	--	--	8.0	10.1
		02/26/2007	1510	170	49.1	12.2	--	--	8.1	10.0
12323670	Mill Creek near Anaconda	06/18/2007	1345	37	10.7	2.50	--	--	17.2	18.8
		06/18/2007	1350	38	10.8	2.55	--	--	18.0	18.1
12323700	Mill Creek at Opportunity	07/23/2007	1530	71	19.6	5.37	--	--	55.1	53.5
		07/23/2007	1535	69	19.4	5.05	--	--	52.2	54.3
12323750	Silver Bow Creek at Warm Springs	03/27/2007	1220	240	69.5	15.2	--	--	10.1	13.0
		03/27/2007	1225	240	70.0	15.4	--	--	10.1	13.2
12323760	Warm Springs Creek near Anaconda	08/27/2007	1240	120	36.3	7.84	--	--	2.6	2.6
		08/27/2007	1245	120	36.4	7.89	--	--	2.7	2.6
12324200	Clark Fork at Deer Lodge	05/08/2007	1130	190	56.0	12.2	--	--	15.1	21.0
		05/08/2007	1135	190	54.9	12.4	--	--	15.3	21.4
12334550	Clark Fork at Turah Bridge, near Bonner	06/07/2007	1455	92	26.0	6.61	--	--	10.3	19.6
		06/07/2007	1500	89	25.2	6.39	--	--	10.2	19.6
12340000	Blackfoot River near Bonner	05/31/2007	1430	94	24.5	8.06	0.16	0.019	.84	1.0
		05/31/2007	1435	93	24.2	7.94	.15	.017	.89	1.1
12340500	Clark Fork above Missoula	11/15/2006	1000	130	35.3	10.2	--	--	3.2	3.6
		11/15/2006	1005	130	36.4	10.4	--	--	3.4	3.8
		05/14/2007	1500	77	20.9	6.08	.31	.063	2.6	4.9
		05/14/2007	1505	77	20.9	6.07	.30	.064	2.7	5.0
12352500	Bitterroot River near Missoula	06/20/2007	0700	33	9.69	2.12	.15	.016	.35	.37
		06/20/2007	0705	33	9.66	2.10	.17	.016	.36	.42
12354500	Clark Fork at St. Regis	06/07/2007	1330	58	16.2	4.31	.25	.039	2.1	3.2
		06/07/2007	1340	57	15.9	4.15	.24	.042	2.1	3.2

Table 14. Analyses of field replicates for water samples, Clark Fork basin, Montana.—Continued

[Abbreviations: E, estimated; µg/L, micrograms per liter; mg/L, milligrams per liter; mm, millimeter. Symbols: <, less than laboratory reporting level; --, no data]

Site number (fig. 1)	Site name	Date	Time	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)
12323600	Silver Bow Creek at Opportunity	02/26/2007	1505	0.77	0.94	25.5	61.4	16	420	0.27
		02/26/2007	1510	.78	.93	25.7	59.2	17	422	.29
12323670	Mill Creek near Anaconda	06/18/2007	1345	.04	.07	1.8	3.4	35	124	E.07
		06/18/2007	1350	.04	.06	1.9	4.1	37	131	E.08
12323700	Mill Creek at Opportunity	07/23/2007	1530	.07	.09	2.6	3.5	94	155	.20
		07/23/2007	1535	.08	.08	2.5	3.7	89	156	.20
12323750	Silver Bow Creek at Warm Springs	03/27/2007	1220	E.03	.08	2.1	6.2	8	230	<.12
		03/27/2007	1225	E.02	.08	2.1	5.8	7	233	E.06
12323760	Warm Springs Creek near Anaconda	08/27/2007	1240	E.02	.03	.62	E1.1	E5	67	<.12
		08/27/2007	1245	<.04	.03	.69	1.2	E5	64	<.12
12324200	Clark Fork at Deer Lodge	05/08/2007	1130	.05	.27	6.8	53.7	16	814	E.11
		05/08/2007	1135	.06	.27	6.8	53.7	13	827	.12
12334550	Clark Fork at Turah Bridge, near Bonner	06/07/2007	1455	.04	.52	12.7	78.5	48	2,460	.37
		06/07/2007	1500	.05	.46	8.8	76.9	47	2,410	.35
12340000	Blackfoot River near Bonner	05/31/2007	1430	<.04	<.02	E.37	1.4	7	196	<.12
		05/31/2007	1435	<.04	<.02	E.35	1.3	6	198	<.12
12340500	Clark Fork above Missoula	11/15/2006	1000	<.04	.07	1.2	7.9	14	223	<.12
		11/15/2006	1005	<.04	.07	1.2	7.6	13	239	<.12
		05/14/2007	1500	<.04	.21	2.1	22.9	15	793	<.12
		05/14/2007	1505	E.02	.19	2.5	25.4	15	820	E.07
12352500	Bitterroot River near Missoula	06/20/2007	0700	<.04	E.01	.47	E1.0	40	191	<.12
		06/20/2007	0705	<.04	E.01	.45	E1.1	40	204	<.12
12354500	Clark Fork at St. Regis	06/07/2007	1330	<.04	.10	2.0	12.6	18	585	<.12
		06/07/2007	1340	<.04	.08	2.1	13.4	18	613	<.12

Table 14. Analyses of field replicates for water samples, Clark Fork basin, Montana.—Continued

[Abbreviations: E, estimated; µg/L, micrograms per liter; mg/L, milligrams per liter; mm, millimeter. Symbols: <, less than laboratory reporting level; --, no data]

Site number (fig. 1)	Site name	Date	Time	Lead, unfiltered recoverable (µg/L)	Manganese, filtered (µg/L)	Manganese, unfiltered recoverable (µg/L)	Zinc, filtered (µg/L)	Zinc, unfiltered recoverable (µg/L)	Sediment, suspended (percent finer than 0.062 mm)	Sediment, suspended (mg/L)
12323600	Silver Bow Creek at Opportunity	02/26/2007	1505	8.60	264	334	194	251	74	13
		02/26/2007	1510	8.61	268	322	195	244	71	11
12323670	Mill Creek near Anaconda	06/18/2007	1345	.59	4.3	9.4	.97	2	64	4
		06/18/2007	1350	.58	4.5	9.8	.91	2	62	3
12323700	Mill Creek at Opportunity	07/23/2007	1530	.42	5.7	9.3	1.3	E2	82	1
		07/23/2007	1535	.41	5.5	9.1	1.2	2	85	1
12323750	Silver Bow Creek at Warm Springs	03/27/2007	1220	1.48	176	239	3.6	11	90	5
		03/27/2007	1225	1.53	172	240	4.1	11	89	6
12323760	Warm Springs Creek near Anaconda	08/27/2007	1240	.23	.8	4.3	E.48	E2	67	3
		08/27/2007	1245	.25	.8	3.8	<.60	E2	69	3
12324200	Clark Fork at Deer Lodge	05/08/2007	1130	6.83	29.0	183	6.1	45	76	34
		05/08/2007	1135	7.23	28.9	178	6.3	45	76	34
12334550	Clark Fork at Turah Bridge, near Bonner	06/07/2007	1455	14.9	17.7	283	6.8	113	65	157
		06/07/2007	1500	14.7	17.0	274	6.7	104	66	154
12340000	Blackfoot River near Bonner	05/31/2007	1430	.26	2.0	15.1	E.39	E2	87	15
		05/31/2007	1435	.27	2.0	15.4	E.30	E2	87	15
12340500	Clark Fork above Missoula	11/15/2006	1000	1.09	10.7	24.4	3.0	15	37	18
		11/15/2006	1005	1.08	10.8	25.8	3.3	15	40	17
		05/14/2007	1500	3.99	8.1	117	2.5	47	34	126
		05/14/2007	1505	3.96	8.3	84.2	3.0	44	39	110
12352500	Bitterroot River near Missoula	06/20/2007	0700	.15	4.3	11.2	.74	2	68	7
		06/20/2007	0705	.15	4.4	11.3	E.32	E1	72	7
12354500	Clark Fork at St. Regis	06/07/2007	1330	2.23	1.8	49.5	2.0	21	58	49
		06/07/2007	1340	2.31	1.8	49.2	2.0	21	60	48

Table 15. Precision of analyses of field replicates for water samples, Clark Fork basin, Montana.

[Abbreviations: µg/L, micrograms per liter; mg/L, milligrams per liter; mm, millimeter]

Constituent and reporting unit	Number of replicate pairs	Standard deviation[1], in listed units	Relative standard deviation, in percent	Within limits[2] of data-quality objective
Calcium, filtered, mg/L	12	0.38	1.2	Yes
Magnesium, filtered, mg/L	12	.12	1.5	Yes
Total nitrogen, unfiltered, mg/L	4	.01	4.3	Yes
Total phosphorous, unfiltered, mg/L	4	.00	3.8	Yes
Arsenic, filtered, µg/L	12	.62	5.9	Yes
Arsenic, unfiltered recoverable, µg/L	12	.24	1.9	Yes
Cadmium, filtered, µg/L	12	.00	4.8	Yes
Cadmium, unfiltered recoverable, µg/L	12	.01	7.2	Yes
Copper, filtered, µg/L	12	.80	17	Yes
Copper, unfiltered recoverable, µg/L	12	.79	3.8	Yes
Iron, filtered, µg/L	12	1.3	5.2	Yes
Iron, unfiltered recoverable, µg/L	12	14	2.7	Yes
Lead, filtered, µg/L	12	.01	5.6	Yes
Lead, unfiltered recoverable, µg/L	12	.09	2.7	Yes
Manganese, filtered, µg/L	12	1.2	2.7	Yes
Manganese, unfiltered recoverable, µg/L	12	7.4	7.1	Yes
Zinc, filtered, µg/L	12	.28	1.5	Yes
Zinc, unfiltered recoverable, µg/L	12	2.4	5.8	Yes
Sediment, suspended, percent finer than 0.062 mm	12	1.8	2.7	Yes
Sediment, suspended, mg/L	12	3.4	9.6	Yes

[1]Standard deviation is calculated using one-half the laboratory reporting level for censored values.

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

Table 16. Precision of analyses of laboratory replicates for water samples, upper Clark Fork basin, Montana.

[Abbreviations: µg/L, micrograms per liter; mg/L, milligrams per liter]

Constituent and reporting unit	Number of replicate pairs	Standard deviation[1], in listed units	Relative standard deviation, in percent	Within limits[2] of data-quality objective
Calcium, filtered, mg/L	8	0.21	0.62	Yes
Magnesium, filtered, mg/L	8	.08	.89	Yes
Arsenic, filtered, µg/L	8	.44	3.3	Yes
Arsenic, unfiltered recoverable, µg/L	8	.32	2.1	Yes
Cadmium, filtered, µg/L	8	.01	27	Yes[3]
Cadmium, unfiltered recoverable, µg/L	8	.01	7.6	Yes
Copper, filtered, µg/L	8	.02	.84	Yes
Copper, unfiltered recoverable, µg/L	8	.49	4.4	Yes
Iron, filtered, µg/L	8	.90	4.0	Yes
Iron, unfiltered recoverable, µg/L	8	7.1	2.4	Yes
Lead, filtered, µg/L	8	.01	7.2	Yes
Lead, unfiltered recoverable, µg/L	8	.05	2.9	Yes
Manganese, filtered, µg/L	8	2.0	6.8	Yes
Manganese, unfiltered recoverable, µg/L	8	3.3	4.8	Yes
Zinc, filtered, µg/L	8	.14	6.1	Yes
Zinc, unfiltered recoverable, µg/L	8	.79	6.2	Yes

[1]Standard deviation is calculated using laboratory reporting level for censored values.

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

[3]Exceedance of data-quality objective resulted from a statistical artifact of calculating the difference between one replicate sample pair for which one value was estimated and one was near the laboratory reporting level. Because analytical variation, in percent, can be large at very low concentrations, the precision estimate may not be representative of analytical performance at detectable concentrations. When this one replicate pair was excluded, the other seven replicate pairs had an acceptable relative standard deviation for filtered cadmium of 7.1 percent.

Table 17. Recovery efficiency for analyses of laboratory-spiked deionized-water blank samples.

[Abbreviation: µg/L, micrograms per liter]

Constituent and reporting unit	Number of samples	95-percent confidence interval for spike recovery, in percent	Mean spike recovery, in percent	Within limits[1] of data-quality objective
Arsenic, filtered, µg/L	5	96.6–114	105	Yes
Arsenic, unfiltered recoverable, µg/L	5	95.2–109	102	Yes
Cadmium, filtered, µg/L	5	103–112	107	Yes
Cadmium, unfiltered recoverable, µg/L	5	94.4–111	103	Yes
Copper, filtered, µg/L	5	99.2–111	105	Yes
Copper, unfiltered recoverable, µg/L	5	86.9–110	98.4	Yes
Iron, filtered, µg/L	5	92.1–108	99.9	Yes
Iron, unfiltered recoverable, µg/L	5	98.5–110	104	Yes
Lead, filtered, µg/L	5	93.9–105	99.6	Yes
Lead, unfiltered recoverable, µg/L	5	100–106	103	Yes
Manganese, filtered, µg/L	5	99.9–114	107	Yes
Manganese, unfiltered recoverable, µg/L	5	97.0–116	107	Yes
Zinc, filtered, µg/L	5	102–113	107	Yes
Zinc, unfiltered recoverable, µg/L	5	96.5–110	103	Yes

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

Table 18. Recovery efficiency for analyses of laboratory-spiked stream samples, upper Clark Fork basin, Montana.

[Abbreviation: µg/L, micrograms per liter]

Constituent and reporting unit	Number of samples	95-percent confidence interval for spike recovery, in percent	Mean spike recovery, in percent	Within limits[1] of data-quality objective
Arsenic, filtered, µg/L	5	100–113	106	Yes
Arsenic, unfiltered recoverable, µg/L	5	98.2–106	102	Yes
Cadmium, filtered, µg/L	5	102–114	108	Yes
Cadmium, unfiltered recoverable, µg/L	5	92.2–104	98.0	Yes
Copper, filtered, µg/L	5	89.8–110	100	Yes
Copper, unfiltered recoverable, µg/L	5	91.8–101	96.3	Yes
Iron, filtered, µg/L	5	103–111	107	Yes
Iron, unfiltered recoverable, µg/L	5	94.7–112	103	Yes
Lead, filtered, µg/L	5	103–115	109	Yes
Lead, unfiltered recoverable, µg/L	5	102–107	104	Yes
Manganese, filtered, µg/L	5	100–113	106	Yes
Manganese, unfiltered recoverable, µg/L	5	96.1–106	101	Yes
Zinc, filtered, µg/L	5	95.7–113	104	Yes
Zinc, unfiltered recoverable, µg/L	5	89.2–107	98.0	Yes

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

Table 19. Analyses of field blanks for water samples.

[Abbreviations: µg/L, micrograms per liter; µS/cm, microsiemens per centimeter at 25°C; mg/L, milligrams per liter. Symbols: <, less than laboratory reporting level; --, no data]

Date	Time	pH, onsite (standard units)	Specific conductance, onsite (µS/cm)	Calcium, filtered (mg/L)	Magnesium, filtered (mg/L)	Total nitrogen, unfiltered (mg/L)	Total phosphorous, unfiltered (mg/L)	Arsenic, filtered (µg/L)	Arsenic, unfiltered, recoverable (µg/L)	Cadmium, filtered (µg/L)	Cadmium, unfiltered, recoverable (µg/L)
10/17/2006	1410	5.8	2	<0.02	<0.014	<0.06	<0.008	<0.12	<0.20	<0.04	<0.02
11/13/2006	1300	5.5	2	<.02	<.014	--	--	<.12	<.20	<.04	<.02
02/23/2007	1000	5.7	2	<.02	<.014	--	--	<.12	<.20	<.04	<.02
03/28/2007	1630	5.6	2	<.02	<.014	--	--	<.12	<.20	<.04	<.02
05/03/2007	1110	5.5	2	<.02	.014	<.06	<.008	<.12	<.20	<.04	<.02
05/09/2007	1300	5.6	2	<.02	<.014	--	--	<.12	<.20	<.04	<.02
06/01/2007	0640	6.0	2	<.02	<.014	<.06	<.008	<.12	<.20	<.04	<.02
06/04/2007	1330	5.7	2	<.02	<.014	--	--	<.12	<.20	<.04	<.02
06/13/2007	1140	5.8	--	<.02	<.014	<.06	<.008	<.12	<.20	<.04	<.02
06/19/2007	1700	5.5	2	<.02	<.014	--	--	<.12	<.20	<.04	<.02
06/27/2007	1240	6.1	2	<.02	<.014	<.06	<.008	<.12	<.20	<.04	<.02
07/24/2007	1800	5.4	2	<.02	<.014	--	--	<.12	<.20	<.04	<.02
08/28/2007	1700	5.7	2	<.02	<.014	--	--	<.12	<.20	<.04	<.02

Date	Time	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)	Zinc, filtered (µg/L)	Zinc, unfiltered, recoverable (ug/L)
10/17/2006	1410	<0.40	<1.2	<6	<6	<0.12	<0.06	<0.2	<0.6	<0.60	<2
11/13/2006	1300	<.40	<1.2	<6	<6	<.12	<.06	<.2	<.6	<.60	<2
02/23/2007	1000	<.40	<1.2	<6	<6	<.12	<.06	<.2	<.6	<.60	<2
03/28/2007	1630	<.40	<1.2	<6	<6	<.12	<.06	<.2	<.6	<.60	<2
05/03/2007	1110	3.6	<1.2	<6	<6	.39	<.06	<.2	<.6	6.7	<2
05/09/2007	1300	<.40	<1.2	<6	<6	<.12	<.06	<.2	<.6	<.60	<2
06/01/2007	0640	<.40	<1.2	<6	<6	<.12	<.06	<.2	<.6	<.60	<2
06/04/2007	1330	<.40	<1.2	<6	<6	<.12	<.06	<.2	<.6	<.60	<2
06/13/2007	1140	<.40	<1.2	<6	<6	<.12	<.06	<.2	<.6	<.60	<2
06/19/2007	1700	<.40	<1.2	<6	<6	<.12	<.06	<.2	<.6	<.60	<2
06/27/2007	1240	<.40	<1.2	<6	<6	<.12	<.06	<.2	<.6	2.8	<2
07/24/2007	1800	<.40	<1.2	<6	<6	<.12	<.06	<.2	<.6	<.60	<2
08/28/2007	1700	<.40	<1.2	<6	<6	<.12	<.06	<.2	<.6	<.60	<2

Table 20. Analyses of fine-grained bed sediment, upper Clark Fork basin, Montana, August 2007.

[Trace-element concentrations in bed sediment were determined for the fine-grained fraction (material less than 0.064 millimeter in diameter). Reported concentrations are the mean of all analyses for replicate aliquots from each composite sample. Abbreviation: µg/g, micrograms per gram of dry sample weight]

Site number (fig. 1)	Site name	Number of composite samples	Concentration, in µg/g								
			Arsenic	Cadmium	Chromium	Copper	Iron	Lead	Manganese	Nickel	Zinc
12323600	Silver Bow Creek at Opportunity	3	123	25.0	25.9	3,030	34,100	464	2,900	14.0	5,590
12323750	Silver Bow Creek at Warm Springs	3	108	5.4	24.6	294	25,100	75	7,190	15.6	672
12323800	Clark Fork near Galen	3	87	5.3	26.4	956	26,100	116	17,200	20.0	1,040
461415112450801	Clark Fork below Lost Creek, near Galen	3	109	6.2	27.1	1,540	31,100	170	7,900	15.1	1,430
461559112443301	Clark Fork at county bridge, near Racetrack	3	79	6.0	24.1	1,320	25,900	142	2,890	13.0	1,240
461903112440701	Clark Fork at Demspey Creek diversion, near Racetrack	3	87	5.2	24.0	1,120	27,100	132	7,570	12.7	1,160
12324200	Clark Fork at Deer Lodge	3	63	4.7	26.4	986	25,200	128	3,600	13.0	1,140
12324680	Clark Fork at Goldcreek	3	36	3.0	24.2	476	19,700	73	1,380	10.2	673
12331800	Clark Fork near Drummond	3	31	2.7	18.5	303	25,900	59	2,700	9.3	673
12334550	Clark Fork at Turah Bridge, near Bonner	3	25	2.1	17.9	248	15,900	50	1,600	10.6	626
12340000	Blackfoot River near Bonner	3	3	.2	21.1	22	19,500	19	545	11.7	72
12340500	Clark Fork above Missoula	3	40	3.9	26.2	501	21,700	67	1,120	13.0	992

Table 21. Recovery efficiency for analyses of standard reference materials for bed sediment.

[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. Abbreviations: µg/g, micrograms per gram of dry sample weight; SRM, standard reference material (agricultural soils). Symbol: --, recovery could not be determined because all analyses were less than the minimum reporting level]

Constituent	Number of analyses	Dilution ratio	Certified concentration (µg/g)	Mean SRM recovery, in percent	95-percent confidence interval for SRM recovery, in percent
SRM sample 2709					
Arsenic	10	2:8	17.7	72.7	70.6–74.7
Cadmium	10	2:8	.4	--	--
Chromium	10	2:8	130	74.5	73.1–76.0
Copper	10	2:8	35	100.5	97.5–104
Iron	10	2:8	35,000	92.0	90.9–93.2
Lead	10	2:8	19	119.4	118–121
Manganese	10	2:8	538	94.1	92.5–95.6
Nickel	10	2:8	88	85.1	84.3–86.0
Zinc	10	2:8	106	91.4	89.0–93.7
SRM sample 2711					
Arsenic	10	1:10	105	84.8	80.4–89.1
Cadmium	10	1:10	41.7	95.4	90.8–99.9
Chromium	10	1:10	47	63.9	59.2–68.7
Copper	10	1:10	114	94.1	89.8–98.4
Iron	10	1:10	28,900	87.3	84.0–90.7
Lead	10	1:10	1,160	95.7	91.1–100
Manganese	10	1:10	638	80.7	77.7–83.7
Nickel	10	1:10	20.6	84.3	80.1–88.6
Zinc	10	1:10	350	94.5	90.9–98.1

Table 22. Analyses of procedural blanks for bed sediment.

[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. Abbreviation: µg/mL, micrograms per milliliter. Symbol: <, less than minimum reporting level for liquid-phase concentration, in µg/mL]

Site number (fig. 1)	Site name	Dilution ratio	Trace-element concentration, in µg/mL								
			Arsenic	Cadmium	Chromium	Copper	Iron	Lead	Manganese	Nickel	Zinc
12323600	Silver Bow Creek at Opportunity	1:10	<0.005	<0.001	<0.007	<0.006	<0.1	<0.02	<0.01	<0.002	<0.01
12323750	Silver Bow Creek at Warm Springs	1:10	<.005	<.001	<.007	<.006	<.1	<.02	<.01	<.002	<.01
12323800	Clark Fork near Galen	1:10	<.005	<.001	<.007	<.006	<.1	<.02	<.01	<.002	<.01
461415112450801	Clark Fork below Lost Creek, near Galen	1:10	<.005	<.001	<.007	<.006	<.1	<.02	<.01	<.002	<.01
461559112443301	Clark Fork at county bridge, near Racetrack	1:10	<.005	<.001	<.007	<.006	<.1	<.02	<.01	<.002	<.01
461903112440701	Clark Fork at Dempsey Creek diversion, near Racetrack	1:10	<.005	<.001	<.007	<.006	<.1	<.02	<.01	<.002	<.01
12324200	Clark Fork at Deer Lodge	1:10	<.005	<.001	<.007	<.006	<.1	<.02	<.01	<.002	<.01
12324680	Clark Fork at Goldcreek	1:10	<.005	<.001	<.007	<.006	<.1	<.02	<.01	<.002	<.01
12331800	Clark Fork near Drummond	1:10	<.005	<.001	<.007	<.006	<.1	<.02	<.01	<.002	<.01
12334550	Clark Fork at Turah Bridge, near Bonner	1:10	<.005	<.001	<.007	<.006	<.1	<.02	<.01	<.002	<.01
12340000	Blackfoot River near Bonner	1:10	<.005	<.001	<.007	<.006	<.1	<.02	<.01	<.002	<.01
12340500	Clark Fork above Missoula	1:10	<.005	<.001	<.007	<.006	<.1	<.02	<.01	<.002	<.01

Table 23. Analyses of biota, upper Clark Fork basin, Montana, August 2007.

[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. Abbreviations: µg/g, micrograms per gram of dry sample weight; spp., species]

Taxon	Number of composite samples	Concentration, in µg/g								
		Arsenic	Cadmium	Chromium	Copper	Iron	Lead	Manganese	Nickel	Zinc
12323600 Silver Bow Creek at Opportunity										
Hydropsyche cockerelli	2	11.7	6.3	2.6	452	2,140	39.3	1,420	2.5	872
Hydropsyche spp.	1	10.7	5.9	3.7	480	2,220	43.5	1,200	2.7	876
12323750 Silver Bow Creek at Warm Springs										
Hydropsyche cockerelli	1	15.6	0.4	0.9	32.8	1,050	4.6	1,790	1.4	145
12323800 Clark Fork near Galen										
Claassenia sabulosa	1	2.0	0.2	1.5	54.7	242	1.0	323	0.5	237
Hydropsyche occidentalis	3	14.3	1.3	2.2	97.0	1,700	9.5	4,690	2.2	233
461415112450801 Clark Fork below Lost Creek, near Galen										
Hydropsyche cockerelli	1	10.0	1.5	1.3	108	1,030	8.2	1,790	1.3	216
Hydropsyche occidentalis	4	14.8	1.8	2.4	128	2,190	13.8	3,820	2.0	286
461559112443301 Clark Fork at county bridge, near Racetrack										
Hydropsyche occidentalis	2	14.4	1.8	2.8	127	2,650	12.8	2,930	1.9	287
461903112440701 Clark Fork at Dempsey Creek diversion, near Racetrack										
Hydropsyche occidentalis	3	16.0	1.9	2.8	144	2,050	13.4	4,320	1.9	377
12324200 Clark Fork at Deer Lodge										
Hydropsyche occidentalis	2	10.0	1.8	1.9	157	1,360	12.9	2,430	1.6	326
12324680 Clark Fork at Goldcreek										
Arctopsyche grandis	2	3.1	1.3	0.6	29.6	265	1.6	953	0.5	179
Claassenia sabulosa	2	1.8	.6	.3	60.8	144	.7	211	.4	286
Hydropsyche cockerelli	2	5.1	1.0	1.1	57.1	657	3.2	1,280	1.0	185
Hydropsyche occidentalis	1	5.1	1.0	1.1	53.9	733	3.8	1,620	1.0	214

Table 23. Analyses of biota, upper Clark Fork basin, Montana, August 2007.—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. Abbreviations: µg/g, micrograms per gram of dry sample weight; spp., species.]

Taxon	Number of composite samples	Concentration, in µg/g								
		Arsenic	Cadmium	Chromium	Copper	Iron	Lead	Manganese	Nickel	Zinc
12331800 Clark Fork near Drummond										
Arctopsyche grandis	1	4.2	0.6	0.9	34.2	464	3.7	952	0.8	179
Claassenia sabulosa	3	1.4	.3	.7	74.0	224	1.6	510	.4	306
Hydropsyche cockerelli	1	5.3	.6	1.8	53.7	854	5.4	1,060	1.2	175
Hydropsyche occidentalis	2	5.2	.6	1.4	58.1	1,050	6.3	1,210	1.2	197
12334550 Clark Fork at Turah Bridge, near Bonner										
Arctopsyche grandis	2	4.0	0.7	1.2	34.3	722	3.7	716	1.1	183
Claassenia sabulosa	2	1.1	.5	.8	82.7	190	1.1	212	.3	287
Hydropsyche cockerelli	2	4.7	.7	1.9	50.5	1,120	5.2	774	1.3	197
Hydropsyche occidentalis	1	4.0	.6	1.6	44.7	1,010	4.9	902	1.2	211
12340000 Blackfoot River near Bonner										
Arctopsyche grandis	1	4.6	0.2	6.9	16.2	808	2.0	607	3.7	150
Claassenia sabulosa	1	3.0	.2	5.2	32.7	211	.8	133	1.1	292
Hydropsyche cockerelli	1	3.1	.2	3.8	15.5	1,640	2.0	637	4.5	142
Hydropsyche occidentalis	1	3.8	.3	5.8	17.5	1,830	1.9	713	4.9	157
12340500 Clark Fork above Missoula										
Arctopsyche grandis	2	4.1	0.8	1.3	44.7	846	4.8	1,110	1.1	211
Claassenia sabulosa	2	1.7	.4	.9	58.5	266	1.5	216	.4	337
Hydropsyche cockerelli	2	6.0	1.1	1.9	78.3	1,940	10.5	1,510	1.5	253

Table 24. Recovery efficiency for analyses of standard reference material for biota.

[Abbreviations: µg/g, micrograms per gram of dry sample weight; µg/mL, micrograms per milliliter; SRM, standard reference material (lobster hepatopancreas)]

Constituent	Number of analyses	Certified concentration (µg/g)	Mean SRM recovery, in percent	95-percent confidence interval for SRM recovery, in percent
		SRM sample TORT-2		
Arsenic	12	21.6	97.0	96.1–97.8
Cadmium	12	26.7	96.2	93.8–98.6
Chromium	12	.77	140	129–151
Copper	12	106	102	101–103
Iron	12	105	104	103–104
Lead	[1]12	.35	91.0	87.9–94.0
Manganese	12	13.6	101	100–103
Nickel	12	2.5	93.8	90.7–97.0
Zinc	12	180	106	106–107

[1]Lead concentrations in three analyses were less than the liquid-phase minimum reporting level (0.003 µg/mL) and were not used to calculate SRM recovery.

Table 25. Analyses of procedural blanks for biota.

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

Site number (fig. 1)	Site name	Dilution ratio	Trace-element concentration, in µg/mL								
			Arsenic	Cadmium	Chromium	Copper	Iron	Lead	Manganese	Nickel	Zinc
12323600	Silver Bow Creek at Opportunity	1:1	<0.004	<0.001	<0.01	<0.001	<0.05	<0.003	<0.001	<0.001	<0.003
12323750	Silver Bow Creek at Warm Springs	1:1	<.004	<.001	<.01	<.001	<.05	<.003	<.001	<.001	<.003
12323800	Clark Fork near Galen	1:1	<.004	<.001	<.01	<.001	<.05	<.003	<.001	<.001	<.003
461415112450801	Clark Fork below Lost Creek, near Galen	1:1	<.004	<.001	<.01	<.001	<.05	<.003	<.001	<.001	<.003
461559112443301	Clark Fork at county bridge, near Racetrack	1:1	<.004	<.001	<.01	<.001	<.05	<.003	<.001	<.001	<.003
461903112440701	Clark Fork at Dempsey Creek diversion, near Racetrack	1:1	<.004	<.001	<.01	<.001	<.05	<.003	<.001	<.001	<.003
12324200	Clark Fork at Deer Lodge	1:1	<.004	<.001	<.01	<.001	<.05	<.003	<.001	<.001	<.003
12324680	Clark Fork at Goldcreek	1:1	<.004	<.001	<.01	<.001	<.05	<.003	<.001	<.001	<.003
12331800	Clark Fork near Drummond	1:1	<.004	<.001	<.01	<.001	<.05	<.003	<.001	<.001	<.003
12334550	Clark Fork at Turah Bridge, near Bonner	1:1	<.004	<.001	<.01	<.001	<.05	<.003	<.001	<.001	<.003
12340000	Blackfoot River near Bonner	1:1	<.004	<.001	<.01	<.001	<.05	<.003	<.001	<.001	<.003
12340500	Clark Fork above Missoula	1:1	<.004	<.001	<.01	<.001	<.05	<.003	<.001	<.001	<.003

Table 26. Statistical summary of long-term water-quality data for the upper Clark Fork basin, Montana, March 1985 through September 2007.

[Abbreviations: ft^3/s, cubic feet per second; °C, degrees Celsius; E, estimated; µg/L, micrograms per liter; µS/cm, microsiemens per centimeter at 25°C; mg/L, milligrams per liter; mm, millimeter; ton/d, tons per day. Symbols: <, less than laboratory reporting level[1]; --, indicates insufficient data greater than the laboratory reporting level 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 2007					
Streamflow, instantaneous (ft^3/s)	107	156	1.9	13	7.6
pH, onsite (standard units)	107	8.4	7.3	7.8	7.8
Specific conductance, onsite (µS/cm)	107	412	116	267	271
Temperature, water (°C)	107	17.5	1.5	8.3	8.0
Hardness, filtered (mg/L as $CaCO_3$)	107	150	38	106	110
Calcium, filtered (mg/L)	107	41.8	10.6	30.2	30.9
Magnesium, filtered (mg/L)	107	11.0	2.71	7.30	7.37
Arsenic, filtered (µg/L)	106	13	1	3.9	3.0
Arsenic, unfiltered (µg/L)	107	18	E1	[2]5.3	4
Cadmium, filtered (µg/L)	105	.5	<.04	[2].05	<.1
Cadmium, unfiltered (µg/L)	107	.11	<.04	[2].04	<1
Copper, filtered (µg/L)	106	10.0	<1.0	[2]3.7	3.2
Copper, unfiltered (µg/L)	107	52.0	1.5	6.9	5.6
Iron, filtered (µg/L)	107	640	15	166	150
Iron, unfiltered (µg/L)	107	4,220	139	667	550
Lead, filtered (µg/L)	107	2.80	<.08	[2].21	<.6
Lead, unfiltered (µg/L)	107	47.0	<1.00	[2]2.07	.72
Manganese, filtered (µg/L)	107	144	14.2	41.6	37.9
Manganese, unfiltered (µg/L)	107	240	23.5	58.1	50.6
Zinc, filtered (µg/L)	106	11	<1.0	[2]3.7	2.8
Zinc, unfiltered (µg/L)	107	130	<10	[2]9.4	4
Sediment, suspended (percent finer than 0.062 mm)	107	97	50	82	83
Sediment, suspended concentration (mg/L)	107	139	1	13	7
Sediment, suspended discharge (ton/d)	107	59	.01	1.2	.14

Table 26. Statistical summary of long-term water-quality data for the upper Clark Fork basin, Montana, March 1985 through September 2007.—Continued

[Abbreviations: ft^3/s, cubic feet per second; °C, degrees Celsius; E, estimated; µg/L, micrograms per liter; µS/cm, microsiemens per centimeter at 25°C; mg/L, milligrams per liter; mm, millimeter; ton/d, tons per day. Symbols: <, less than laboratory reporting level[1]; --, indicates insufficient data greater than the laboratory reporting level 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 2007					
Streamflow, instantaneous (ft^3/s)	115	134	13	28	23
pH, onsite (standard units)	115	8.1	7.2	7.6	7.6
Specific conductance, onsite (µS/cm)	115	691	226	475	482
Temperature, water (°C)	115	20.0	1.0	10.5	9.5
Hardness, filtered (mg/L as $CaCO_3$)	115	220	66	151	150
Calcium, filtered (mg/L)	115	62.7	19.0	42.9	44.0
Magnesium, filtered (mg/L)	115	14.6	4.51	10.6	11.0
Arsenic, filtered (µg/L)	115	13	2.3	6.5	6.3
Arsenic, unfiltered (µg/L)	115	45	3	11.2	10.0
Cadmium, filtered (µg/L)	115	6.2	.07	1.20	.90
Cadmium, unfiltered (µg/L)	115	6.0	.11	1.61	1.30
Copper, filtered (µg/L)	115	303	3.2	39.1	15.3
Copper, unfiltered (µg/L)	115	550	10.5	90.6	40.7
Iron, filtered (µg/L)	115	270	10	[2]84.2	61
Iron, unfiltered (µg/L)	115	7,400	85	918	600
Lead, filtered (µg/L)	115	2.4	<.5	[2].50	.22
Lead, unfiltered (µg/L)	115	250	.64	14.1	4.00
Manganese, filtered (µg/L)	115	1,700	21.4	385	348
Manganese, unfiltered (µg/L)	115	1,600	25.9	429	370
Zinc, filtered (µg/L)	115	2,200	26.7	390	277
Zinc, unfiltered (µg/L)	115	2,200	38	471	334
Sediment, suspended (percent finer than 0.062 mm)	114	98	42	84	86
Sediment, suspended concentration (mg/L)	114	405	2	24	11
Sediment, suspended discharge (ton/d)	114	70	.08	2.8	.68

Table 26. Statistical summary of long-term water-quality data for the upper Clark Fork basin, Montana, March 1985 through September 2007.—Continued

[Abbreviations: ft^3/s, cubic feet per second; °C, degrees Celsius; E, estimated; µg/L, micrograms per liter; µS/cm, microsiemens per centimeter at 25°C; mg/L, milligrams per liter; mm, millimeter; ton/d, tons per day. Symbols: <, less than laboratory reporting level[1]; --, indicates insufficient data greater than the laboratory reporting level 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 2007					
Streamflow, instantaneous (ft^3/s)	118	361	13	70	50
pH, onsite (standard units)	117	9.5	7.2	8.4	8.4
Specific conductance, onsite (µS/cm)	117	633	202	420	403
Temperature, water (°C)	117	22.5	0.0	9.3	9.5
Hardness, filtered (mg/L as $CaCO_3$)	117	240	60	151	150
Calcium, filtered (mg/L)	117	71.6	18.5	44.6	43.8
Magnesium, filtered (mg/L)	117	15.0	3.42	9.55	9.04
Arsenic, filtered (µg/L)	117	34	1	11.2	10.3
Arsenic, unfiltered (µg/L)	117	235	10.1	27.1	18.0
Cadmium, filtered (µg/L)	116	41.0	<.1	[2]1.24	.80
Cadmium, unfiltered (µg/L)	117	49.0	.52	[2]2.23	1.40
Copper, filtered (µg/L)	116	450	13.7	48.3	37.6
Copper, unfiltered (µg/L)	117	3,900	31.1	220	121
Iron, filtered (µg/L)	117	307	3	[2]45	24
Iron, unfiltered (µg/L)	116	24,100	255	1,580	780
Lead, filtered (µg/L)	117	5.1	<.5	[2].75	.31
Lead, unfiltered (µg/L)	117	650	5.38	40.2	15.1
Manganese, filtered (µg/L)	117	9,300	67.6	470	379
Manganese, unfiltered (µg/L)	117	10,000	117	591	467
Zinc, filtered (µg/L)	116	13,000	26.6	326	179
Zinc, unfiltered (µg/L)	117	15,000	97	566	360
Sediment, suspended (percent finer than 0.062 mm)	118	95	37	79	83
Sediment, suspended concentration (mg/L)	118	801	5	49	17
Sediment, suspended discharge (ton/d)	118	781	.18	20	2.4

Table 26. Statistical summary of long-term water-quality data for the upper Clark Fork basin, Montana, March 1985 through September 2007.—Continued

[Abbreviations: ft^3/s, cubic feet per second; °C, degrees Celsius; E, estimated; µg/L, micrograms per liter; µS/cm, microsiemens per centimeter at 25°C; mg/L, milligrams per liter; mm, millimeter; ton/d, tons per day. Symbols: <, less than laboratory reporting level[1]; --, indicates insufficient data greater than the laboratory reporting level to compute statistic]

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 2007					
Streamflow, instantaneous (ft^3/s)	24	165	7.4	55	21
pH, onsite (standard units)	24	8.6	7.7	8.1	8.2
Specific conductance, onsite (µS/cm)	24	203	56	133	142
Temperature, water (°C)	24	17.0	1.0	8.6	8.0
Hardness, filtered (mg/L as $CaCO_3$)	24	98	24	59	64
Calcium, filtered (mg/L)	24	25.9	7.12	16.2	17.7
Magnesium, filtered (mg/L)	24	8.01	1.45	4.44	4.73
Arsenic, filtered (µg/L)	24	30.3	7.3	16.5	16.2
Arsenic, unfiltered (µg/L)	24	30.1	9	18.0	17.6
Cadmium, filtered (µg/L)	24	.11	<.04	[2].04	.04
Cadmium, unfiltered (µg/L)	24	.18	.04	.08	.07
Copper, filtered (µg/L)	24	4.7	.79	2.2	2.0
Copper, unfiltered (µg/L)	24	10.3	1.3	3.9	3.4
Iron, filtered (µg/L)	24	125	26	54	42
Iron, unfiltered (µg/L)	24	619	89	199	167
Lead, filtered (µg/L)	24	.24	<.08	[2].13	.11
Lead, unfiltered (µg/L)	24	3.12	.19	.78	.59
Manganese, filtered (µg/L)	24	8.9	3.4	5.9	6.2
Manganese, unfiltered (µg/L)	24	36.6	7.4	14.5	12.0
Zinc, filtered (µg/L)	24	2.4	.73	1.3	1.2
Zinc, unfiltered (µg/L)	24	8	1	2.8	2.3
Sediment, suspended (percent finer than 0.062 mm)	24	81	39	67	70
Sediment, suspended concentration (mg/L)	24	29	1	6	3
Sediment, suspended discharge (ton/d)	24	13	.02	1.7	.16

Table 26. Statistical summary of long-term water-quality data for the upper Clark Fork basin, Montana, March 1985 through September 2007.—Continued

[Abbreviations: ft^3/s, cubic feet per second; °C, degrees Celsius; E, estimated; µg/L, micrograms per liter; µS/cm, microsiemens per centimeter at 25°C; mg/L, milligrams per liter; mm, millimeter; ton/d, tons per day. Symbols: <, less than laboratory reporting level[1]; --, indicates insufficient data greater than the laboratory reporting level to compute statistic]

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 2007					
Streamflow, instantaneous (ft^3/s)	40	261	0.43	34	5.9
pH, onsite (standard units)	40	8.2	7.8	8.0	8.0
Specific conductance, onsite (µS/cm)	40	223	59	149	162
Temperature, water (°C)	40	20.0	.5	9.5	9.2
Hardness, filtered (mg/L as $CaCO_3$)	40	100	24	64	70
Calcium, filtered (mg/L)	40	28.0	7.01	17.9	19.3
Magnesium, filtered (mg/L)	40	7.83	1.56	4.64	5.11
Arsenic, filtered (µg/L)	40	55.1	9.0	23.8	23.0
Arsenic, unfiltered (µg/L)	40	53.5	10	27.4	26.6
Cadmium, filtered (µg/L)	40	.13	.02	.07	.07
Cadmium, unfiltered (µg/L)	40	.85	.06	.16	.10
Copper, filtered (µg/L)	40	6.1	1.1	3.1	2.8
Copper, unfiltered (µg/L)	40	38.8	1.7	7.2	4.2
Iron, filtered (µg/L)	40	94	17	51	44
Iron, unfiltered (µg/L)	40	1,960	67	314	138
Lead, filtered (µg/L)	40	.32	<.08	[2].14	.14
Lead, unfiltered (µg/L)	40	12.7	.07	1.58	.42
Manganese, filtered (µg/L)	40	32.8	2.2	8.5	6.7
Manganese, unfiltered (µg/L)	40	113	3.5	20.2	13.0
Zinc, filtered (µg/L)	40	7.7	1.3	3.3	3.1
Zinc, unfiltered (µg/L)	40	41	1.9	7.2	5
Sediment, suspended (percent finer than 0.062 mm)	40	90	26	72	78
Sediment, suspended concentration (mg/L)	40	107	1	13	2
Sediment, suspended discharge (ton/d)	40	55	<.01	[2]4.1	.02

Table 26. Statistical summary of long-term water-quality data for the upper Clark Fork basin, Montana, March 1985 through September 2007.—Continued

[Abbreviations: ft^3/s, cubic feet per second; °C, degrees Celsius; E, estimated; µg/L, micrograms per liter; µS/cm, microsiemens per centimeter at 25°C; mg/L, milligrams per liter; mm, millimeter; ton/d, tons per day. Symbols: <, less than laboratory reporting level[1]; --, indicates insufficient data greater than the laboratory reporting level to compute statistic]

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 2007					
Streamflow, instantaneous (ft^3/s)	22	39	1.0	9.9	4.4
pH, onsite (standard units)	22	8.2	7.5	7.7	7.7
Specific conductance, onsite (µS/cm)	22	115	66	98	101
Temperature, water (°C)	22	15.5	.5	7.6	7.8
Hardness, filtered (mg/L as $CaCO_3$)	22	42	22	35	38
Calcium, filtered (mg/L)	22	14.0	7.56	11.9	12.8
Magnesium, filtered (mg/L)	22	1.69	.78	1.31	1.40
Arsenic, filtered (µg/L)	22	24.9	9.9	15.7	14.2
Arsenic, unfiltered (µg/L)	22	27.0	10	16.7	14.6
Cadmium, filtered (µg/L)	22	.05	<.04	[2].03	.03
Cadmium, unfiltered (µg/L)	22	.19	.02	.06	.05
Copper, filtered (µg/L)	22	4.2	.96	2.0	1.9
Copper, unfiltered (µg/L)	22	16.8	1.0	3.8	3.0
Iron, filtered (µg/L)	22	154	36	72	67
Iron, unfiltered (µg/L)	22	1,260	93	283	198
Lead, filtered (µg/L)	22	.37	.05	.14	.12
Lead, unfiltered (µg/L)	22	4.08	.16	.70	.45
Manganese, filtered (µg/L)	22	34.5	8.1	15.6	14.0
Manganese, unfiltered (µg/L)	22	49.1	15.1	26.2	22.0
Zinc, filtered (µg/L)	22	3.3	.65	1.6	1.6
Zinc, unfiltered (µg/L)	22	10	1	2.6	2
Sediment, suspended (percent finer than 0.062 mm)	22	94	44	75	78
Sediment, suspended concentration (mg/L)	22	93	1	11	5
Sediment, suspended discharge (ton/d)	22	9.8	.01	.72	.07

Table 26. Statistical summary of long-term water-quality data for the upper Clark Fork basin, Montana, March 1985 through September 2007.—Continued

[Abbreviations: ft^3/s, cubic feet per second; °C, degrees Celsius; E, estimated; µg/L, micrograms per liter; µS/cm, microsiemens per centimeter at 25°C; mg/L, milligrams per liter; mm, millimeter; ton/d, tons per day. Symbols: <, less than laboratory reporting level[1]; --, indicates insufficient data greater than the laboratory reporting level 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 2007					
Streamflow, instantaneous (ft^3/s)	40	53	4.5	15	7.8
pH, onsite (standard units)	40	8.6	7.7	8.2	8.1
Specific conductance, onsite (µS/cm)	40	371	116	285	308
Temperature, water (°C)	40	20.5	1.5	11.2	11.8
Hardness, filtered (mg/L as $CaCO_3$)	40	170	67	126	130
Calcium, filtered (mg/L)	40	47.4	20.5	36.3	38.5
Magnesium, filtered (mg/L)	40	12.3	3.73	8.52	9.12
Arsenic, filtered (µg/L)	40	164	11.5	43.6	29.6
Arsenic, unfiltered (µg/L)	40	164	12	46.1	30.4
Cadmium, filtered (µg/L)	40	.11	<.04	[2].04	.04
Cadmium, unfiltered (µg/L)	40	.52	.03	.10	.07
Copper, filtered (µg/L)	40	21.4	1.1	5.7	3.3
Copper, unfiltered (µg/L)	40	48.8	2.8	11.6	7.8
Iron, filtered (µg/L)	40	111	7	39	29
Iron, unfiltered (µg/L)	40	1,420	27	246	190
Lead, filtered (µg/L)	40	.52	.04	[2].20	.17
Lead, unfiltered (µg/L)	40	14.4	.27	2.15	1.49
Manganese, filtered (µg/L)	40	63.9	4.1	27.2	22.0
Manganese, unfiltered (µg/L)	40	104	4.7	37.0	30.6
Zinc, filtered (µg/L)	40	19.8	.84	5.3	3.9
Zinc, unfiltered (µg/L)	40	68	2	12.2	9.5
Sediment, suspended (percent finer than 0.062 mm)	40	96	65	86	86
Sediment, suspended concentration (mg/L)	40	84	1	11	5
Sediment, suspended discharge (ton/d)	40	11	.02	.80	.13

Table 26. Statistical summary of long-term water-quality data for the upper Clark Fork basin, Montana, March 1985 through September 2007.—Continued

[Abbreviations: ft^3/s, cubic feet per second; °C, degrees Celsius; E, estimated; µg/L, micrograms per liter; µS/cm, microsiemens per centimeter at 25°C; mg/L, milligrams per liter; mm, millimeter; ton/d, tons per day. Symbols: <, less than laboratory reporting level[1]; --, indicates insufficient data greater than the laboratory reporting level 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 2007					
Streamflow, instantaneous (ft^3/s)	124	662	16	133	87
pH, onsite (standard units)	122	9.4	8.0	8.8	8.8
Specific conductance, onsite (µS/cm)	122	783	249	473	478
Temperature, water (°C)	123	25.0	.5	11.1	11.0
Hardness, filtered (mg/L as $CaCO_3$)	122	310	97	197	200
Calcium, filtered (mg/L)	122	90.4	27.9	57.1	58.8
Magnesium, filtered (mg/L)	122	21.4	5.94	13.1	13.2
Arsenic, filtered (µg/L)	122	60	6.8	22.4	22.6
Arsenic, unfiltered (µg/L)	122	94	10	26.6	26.3
Cadmium, filtered (µg/L)	122	.31	<.04	[2].06	.02
Cadmium, unfiltered (µg/L)	122	.56	<.1	[2].12	<1
Copper, filtered (µg/L)	122	40.0	1.7	8.5	6.6
Copper, unfiltered (µg/L)	122	96.8	2.4	17.3	12.2
Iron, filtered (µg/L)	122	93	<5	[2]17	14
Iron, unfiltered (µg/L)	122	3,000	36	341	262
Lead, filtered (µg/L)	122	1.0	<.08	[2].11	<.5
Lead, unfiltered (µg/L)	122	41.8	<1	[2]2.45	1.23
Manganese, filtered (µg/L)	122	875	11.8	129	96.3
Manganese, unfiltered (µg/L)	122	899	24.0	192	160
Zinc, filtered (µg/L)	122	73	<1.0	[2]8.5	4.4
Zinc, unfiltered (µg/L)	122	180	<10	[2]33.7	20
Sediment, suspended (percent finer than 0.062 mm)	123	97	43	82	85
Sediment, suspended concentration (mg/L)	124	229	1	11	6
Sediment, suspended discharge (ton/d)	124	279	.07	7.1	1.5

Table 26. Statistical summary of long-term water-quality data for the upper Clark Fork basin, Montana, March 1985 through September 2007.—Continued

[Abbreviations: ft^3/s, cubic feet per second; °C, degrees Celsius; E, estimated; µg/L, micrograms per liter; µS/cm, microsiemens per centimeter at 25°C; mg/L, milligrams per liter; mm, millimeter; ton/d, tons per day. Symbols: <, less than laboratory reporting level[1]; --, indicates insufficient data greater than the laboratory reporting level 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 2007					
Streamflow, instantaneous (ft^3/s)	12	391	41	115	70
pH, onsite (standard units)	12	8.8	8.1	8.5	8.6
Specific conductance, onsite (µS/cm)	12	264	126	222	242
Temperature, water (°C)	12	16.0	4.5	9.6	8.2
Hardness, filtered (mg/L as $CaCO_3$)	12	130	60	106	110
Calcium, filtered (mg/L)	12	38.6	18.6	32.1	34.2
Magnesium, filtered (mg/L)	12	8.47	3.25	6.60	6.99
Arsenic, filtered (µg/L)	12	2.8	1.8	2.3	2.3
Arsenic, unfiltered (µg/L)	12	3.2	2.0	2.5	2.4
Cadmium, filtered (µg/L)	12	.03	<.04	[2].02	<.04
Cadmium, unfiltered (µg/L)	12	.07	.02	.04	.03
Copper, filtered (µg/L)	12	1.4	.57	1.0	.98
Copper, unfiltered (µg/L)	12	4.7	1.1	2.4	2.2
Iron, filtered (µg/L)	12	13	<6	8	7
Iron, unfiltered (µg/L)	12	237	45	98	75
Lead, filtered (µg/L)	12	.05	<.08	--	<.12
Lead, unfiltered (µg/L)	12	.62	.12	.30	.24
Manganese, filtered (µg/L)	12	2.1	<.2	[2].9	.8
Manganese, unfiltered (µg/L)	12	11.3	1.8	4.6	3.9
Zinc, filtered (µg/L)	12	1.4	.30	.84	.77
Zinc, unfiltered (µg/L)	12	5.5	1	2.2	2
Sediment, suspended (percent finer than 0.062 mm)	12	80	51	66	67
Sediment, suspended concentration (mg/L)	12	17	2	6	4
Sediment, suspended discharge (ton/d)	12	18	.35	2.9	.64

Table 26. Statistical summary of long-term water-quality data for the upper Clark Fork basin, Montana, March 1985 through September 2007.—Continued

[Abbreviations: ft³/s, cubic feet per second; °C, degrees Celsius; E, estimated; µg/L, micrograms per liter; µS/cm, microsiemens per centimeter at 25°C; mg/L, milligrams per liter; mm, millimeter; ton/d, tons per day. Symbols: <, less than laboratory reporting level[1]; --, indicates insufficient data greater than the laboratory reporting level 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 2007					
Streamflow, instantaneous (ft^3/s)	91	420	2.8	91	50
pH, onsite (standard units)	90	8.7	7.4	8.3	8.3
Specific conductance, onsite (µS/cm)	90	795	139	301	312
Temperature, water (°C)	91	20.0	0.0	9.0	9.0
Hardness, filtered (mg/L as $CaCO_3$)	90	420	40	146	150
Calcium, filtered (mg/L)	90	130	10.5	44.5	46.1
Magnesium, filtered (mg/L)	90	22.0	3.29	8.38	8.46
Arsenic, filtered (µg/L)	90	14	2	5.2	4.8
Arsenic, unfiltered (µg/L)	90	27	3	7.6	6
Cadmium, filtered (µg/L)	90	.1	<.04	[2].04	<.1
Cadmium, unfiltered (µg/L)	90	.41	<.1	[2].08	<1.0
Copper, filtered (µg/L)	90	16.0	1.0	3.5	3.0
Copper, unfiltered (µg/L)	90	108	2.3	19.1	8.2
Iron, filtered (µg/L)	90	30	<5	[2]11	10
Iron, unfiltered (µg/L)	90	1,700	39	295	110
Lead, filtered (µg/L)	90	1.8	<.08	[2].09	<.5
Lead, unfiltered (µg/L)	90	14.0	<1.0	[2]1.89	.43
Manganese, filtered (µg/L)	90	570	22.6	132	105
Manganese, unfiltered (µg/L)	90	1,400	53.1	224	186
Zinc, filtered (µg/L)	90	10	<1.0	[2]2.2	1.1
Zinc, unfiltered (µg/L)	90	60	<10	[2]9.2	3
Sediment, suspended (percent finer than 0.062 mm)	91	88	55	72	72
Sediment, suspended concentration (mg/L)	91	106	2	17	7
Sediment, suspended discharge (ton/d)	91	87	.05	8.3	.92

Table 26. Statistical summary of long-term water-quality data for the upper Clark Fork basin, Montana, March 1985 through September 2007.—Continued

[Abbreviations: ft^3/s, cubic feet per second; °C, degrees Celsius; E, estimated; µg/L, micrograms per liter; µS/cm, microsiemens per centimeter at 25°C; mg/L, milligrams per liter; mm, millimeter; ton/d, tons per day. Symbols: <, less than laboratory reporting level[1]; --, indicates insufficient data greater than the laboratory reporting level 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 2007					
Streamflow, instantaneous (ft^3/s)	165	1,050	14	205	123
pH, onsite (standard units)	152	9.2	7.5	8.5	8.6
Specific conductance, onsite (µS/cm)	153	720	197	425	435
Temperature, water (°C)	164	23.5	0.0	10.1	10.0
Hardness, filtered (mg/L as $CaCO_3$)	151	370	81	186	190
Calcium, filtered (mg/L)	151	110	24.2	54.9	57.0
Magnesium, filtered (mg/L)	151	22.0	5.08	11.8	12.0
Arsenic, filtered (µg/L)	151	53	4	15.1	14.0
Arsenic, unfiltered (µg/L)	151	78	3	19.6	17.0
Cadmium, filtered (µg/L)	151	1.0	<.04	[2].06	<1
Cadmium, unfiltered (µg/L)	151	3	<.1	[2].20	<1
Copper, filtered (µg/L)	151	50	1.7	8.4	6.5
Copper, unfiltered (µg/L)	150	240	4.8	28.8	16.0
Iron, filtered (µg/L)	151	110	<3	[2]16	11
Iron, unfiltered (µg/L)	151	9,200	56	498	270
Lead, filtered (µg/L)	151	3	<.08	[2].16	<1
Lead, unfiltered (µg/L)	151	31.0	<1.0	[2]3.54	1.86
Manganese, filtered (µg/L)	151	460	25.2	115	88.9
Manganese, unfiltered (µg/L)	151	1,400	47.3	241	183
Zinc, filtered (µg/L)	151	110	<1.0	[2]10.2	5.3
Zinc, unfiltered (µg/L)	151	360	<10	[2]40.5	20.0
Sediment, suspended (percent finer than 0.062 mm)	164	97	41	78	78
Sediment, suspended concentration (mg/L)	165	338	2	18	7
Sediment, suspended discharge (ton/d)	165	459	.12	21	2.3

Table 26. Statistical summary of long-term water-quality data for the upper Clark Fork basin, Montana, March 1985 through September 2007.—Continued

[Abbreviations: ft^3/s, cubic feet per second; °C, degrees Celsius; E, estimated; µg/L, micrograms per liter; µS/cm, microsiemens per centimeter at 25°C; mg/L, milligrams per liter; mm, millimeter; ton/d, tons per day. Symbols: <, less than laboratory reporting level[1]; --, indicates insufficient data greater than the laboratory reporting level 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 2007					
Streamflow, instantaneous (ft^3/s)	23	17	0.37	6.6	5.2
pH, onsite (standard units)	23	8.6	7.4	8.3	8.3
Specific conductance, onsite (µS/cm)	23	253	136	205	213
Temperature, water (°C)	23	17.0	1.5	8.7	9.0
Hardness, filtered (mg/L as $CaCO_3$)	23	120	50	97	100
Calcium, filtered (mg/L)	23	37.1	15.7	29.5	30.3
Magnesium, filtered (mg/L)	23	7.11	2.71	5.71	6.14
Arsenic, filtered (µg/L)	23	156	2.4	12.3	5.1
Arsenic, unfiltered (µg/L)	23	3,860	2	174	5.8
Cadmium, filtered (µg/L)	23	.90	<.04	[2].07	.03
Cadmium, unfiltered (µg/L)	23	147	.02	6.4	.04
Copper, filtered (µg/L)	23	90.5	1.1	6.2	2.0
Copper, unfiltered (µg/L)	23	29,100	1.7	1,270	4.5
Iron, filtered (µg/L)	23	25	<6	[2]9	8
Iron, unfiltered (µg/L)	23	99,700	22	4,480	98
Lead, filtered (µg/L)	23	.18	<.08	[2].06	<.12
Lead, unfiltered (µg/L)	23	1,290	.10	56.8	.40
Manganese, filtered (µg/L)	23	42.4	.2	3.0	1.2
Manganese, unfiltered (µg/L)	23	8,830	1.2	389	3.6
Zinc, filtered (µg/L)	23	30.0	.62	2.5	1.2
Zinc, unfiltered (µg/L)	23	7,780	1.0	342	3.0
Sediment, suspended (percent finer than 0.062 mm)	23	97	30	61	63
Sediment, suspended concentration (mg/L)	23	58,900	1	2,570	6
Sediment, suspended discharge (ton/d)	23	1,320	<.1	[2]58	.08

Table 26. Statistical summary of long-term water-quality data for the upper Clark Fork basin, Montana, March 1985 through September 2007.—Continued

[Abbreviations: ft^3/s, cubic feet per second; °C, degrees Celsius; E, estimated; µg/L, micrograms per liter; µS/cm, microsiemens per centimeter at 25°C; mg/L, milligrams per liter; mm, millimeter; ton/d, tons per day. Symbols: <, less than laboratory reporting level[1]; --, indicates insufficient data greater than the laboratory reporting level 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 2007					
Streamflow, instantaneous (ft^3/s)	40	59	1.3	19	12
pH, onsite (standard units)	40	8.7	8.0	8.4	8.4
Specific conductance, onsite (µS/cm)	40	934	540	649	631
Temperature, water (°C)	40	26.5	0.0	12.1	11.8
Hardness, filtered (mg/L as $CaCO_3$)	40	450	200	300	300
Calcium, filtered (mg/L)	40	122	48.5	83.8	85.6
Magnesium, filtered (mg/L)	40	35.7	18.0	22.1	21.2
Arsenic, filtered (µg/L)	40	41.8	6	14.5	12.2
Arsenic, unfiltered (µg/L)	40	43	6	15.0	12.8
Cadmium, filtered (µg/L)	40	.05	<.04	[2].03	.03
Cadmium, unfiltered (µg/L)	40	.11	.02	.05	.04
Copper, filtered (µg/L)	40	6.7	.99	2.7	2.6
Copper, unfiltered (µg/L)	40	22.5	1.6	6.6	5.6
Iron, filtered (µg/L)	40	61	<6	[2]12	8
Iron, unfiltered (µg/L)	40	293	14	103	76.5
Lead, filtered (µg/L)	40	.33	<.08	[2].07	<.08
Lead, unfiltered (µg/L)	40	1.30	.04	.38	.27
Manganese, filtered (µg/L)	40	54.0	1.9	13.8	11.1
Manganese, unfiltered (µg/L)	40	56.5	2.2	18.0	13.8
Zinc, filtered (µg/L)	40	3.8	<1.0	[2]1.5	1.2
Zinc, unfiltered (µg/L)	40	9	<2	[2]3.2	2.0
Sediment, suspended (percent finer than 0.062 mm)	40	86	18	57	60
Sediment, suspended concentration (mg/L)	40	37	2	15	14
Sediment, suspended discharge (ton/d)	40	4.2	.01	.99	.32

Table 26. Statistical summary of long-term water-quality data for the upper Clark Fork basin, Montana, March 1985 through September 2007.—Continued

[Abbreviations: ft^3/s, cubic feet per second; °C, degrees Celsius; E, estimated; µg/L, micrograms per liter; µS/cm, microsiemens per centimeter at 25°C; mg/L, milligrams per liter; mm, millimeter; ton/d, tons per day. Symbols: <, less than laboratory reporting level[1]; --, indicates insufficient data greater than the laboratory reporting level 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 2007					
Streamflow, instantaneous (ft^3/s)	217	1,920	23	286	215
pH, onsite (standard units)	165	8.9	7.4	8.3	8.3
Specific conductance, onsite (µS/cm)	200	642	234	482	504
Temperature, water (°C)	216	23.0	0.0	10.0	10.0
Hardness, filtered (mg/L as $CaCO_3$)	157	280	95	204	220
Calcium, filtered (mg/L)	157	82.0	28.2	60.3	63.9
Magnesium, filtered (mg/L)	157	18.7	5.9	13.0	13.7
Arsenic, filtered (µg/L)	167	39	6.0	14.3	13.0
Arsenic, unfiltered (µg/L)	166	215	8	24.4	17.0
Cadmium, filtered (µg/L)	166	2	<.1	[2].08	<1
Cadmium, unfiltered (µg/L)	167	5	<.1	[2].43	<1
Copper, filtered (µg/L)	167	120	3.2	11.2	8.6
Copper, unfiltered (µg/L)	165	1,500	8.2	84.8	38.0
Iron, filtered (µg/L)	167	190	<3	[2]15	9
Iron, unfiltered (µg/L)	167	29,000	27	1,560	514
Lead, filtered (µg/L)	167	6	<.08	[2].34	<1
Lead, unfiltered (µg/L)	167	200	<1.00	[2]11.0	4.69
Manganese, filtered (µg/L)	167	400	1	43.0	33.9
Manganese, unfiltered (µg/L)	167	4,600	11.9	251	140
Zinc, filtered (µg/L)	167	230	<10	[2]12.4	8.9
Zinc, unfiltered (µg/L)	166	1,700	4	91.8	40
Sediment, suspended (percent finer than 0.062 mm)	208	99	37	72	73
Sediment, suspended concentration (mg/L)	217	2,250	1	72	22
Sediment, suspended discharge (ton/d)	217	8,690	.24	154	11

Table 26. Statistical summary of long-term water-quality data for the upper Clark Fork basin, Montana, March 1985 through September 2007.—Continued

[Abbreviations: ft^3/s, cubic feet per second; °C, degrees Celsius; E, estimated; µg/L, micrograms per liter; µS/cm, microsiemens per centimeter at 25°C; mg/L, milligrams per liter; mm, millimeter; ton/d, tons per day. Symbols: <, less than laboratory reporting level[1]; --, indicates insufficient data greater than the laboratory reporting level 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 2007					
Streamflow, instantaneous (ft^3/s)	123	3,920	87	724	505
pH, onsite (standard units)	122	8.9	7.9	8.4	8.3
Specific conductance, onsite (µS/cm)	122	510	206	374	392
Temperature, water (°C)	123	23.0	0.0	10.0	10.0
Hardness, filtered (mg/L as $CaCO_3$)	122	230	86	165	170
Calcium, filtered (mg/L)	122	68.0	25.9	48.5	51.0
Magnesium, filtered (mg/L)	122	15.0	5.15	10.5	11.0
Arsenic, filtered (µg/L)	122	20	5.8	10.0	10.0
Arsenic, unfiltered (µg/L)	122	75	7	14.9	12
Cadmium, filtered (µg/L)	122	.2	<.04	[2].04	<.1
Cadmium, unfiltered (µg/L)	122	2.0	<.1	[2].17	<1
Copper, filtered (µg/L)	121	36.0	2.1	6.7	5.4
Copper, unfiltered (µg/L)	121	440	5.2	40.7	23.0
Iron, filtered (µg/L)	122	100	<3	[2]18	11
Iron, unfiltered (µg/L)	122	12,000	27	867	423
Lead, filtered (µg/L)	121	.6	<.08	[2].10	<.5
Lead, unfiltered (µg/L)	121	73.0	<1.00	[2]5.66	2.80
Manganese, filtered (µg/L)	122	57.3	4.0	19.1	17.4
Manganese, unfiltered (µg/L)	122	1,100	10.5	125	85.2
Zinc, filtered (µg/L)	122	26	<1.0	[2]5.8	3.7
Zinc, unfiltered (µg/L)	122	510	2	45.6	30
Sediment, suspended (percent finer than 0.062 mm)	123	94	43	76	78
Sediment, suspended concentration (mg/L)	123	752	2	49	21
Sediment, suspended discharge (ton/d)	123	7,960	.62	215	27

Table 26. Statistical summary of long-term water-quality data for the upper Clark Fork basin, Montana, March 1985 through September 2007.—Continued

[Abbreviations: ft^3/s, cubic feet per second; °C, degrees Celsius; E, estimated; µg/L, micrograms per liter; µS/cm, microsiemens per centimeter at 25°C; mg/L, milligrams per liter; mm, millimeter; ton/d, tons per day. Symbols: <, less than laboratory reporting level[1]; --, indicates insufficient data greater than the laboratory reporting level 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 2007**					
Streamflow, instantaneous (ft^3/s)	123	3,860	149	1,010	749
pH, onsite (standard units)	122	8.7	7.8	8.3	8.3
Specific conductance, onsite (µS/cm)	122	630	189	414	433
Temperature, water (°C)	123	22.5	.5	11.0	11.0
Hardness, filtered (mg/L as $CaCO_3$)	122	300	74	187	195
Calcium, filtered (mg/L)	122	83.0	21.0	53.5	55.2
Magnesium, filtered (mg/L)	122	22.0	5.2	12.8	13.1
Arsenic, filtered (µg/L)	122	20	6.6	10.6	10.0
Arsenic, unfiltered (µg/L)	122	62	8	16.4	13.0
Cadmium, filtered (µg/L)	122	.30	<.04	[2].05	<.1
Cadmium, unfiltered (µg/L)	122	2.0	<.1	[2].23	<1
Copper, filtered (µg/L)	120	21.0	1.0	6.5	5.0
Copper, unfiltered (µg/L)	120	360	4.6	44.1	22.0
Iron, filtered (µg/L)	122	150	<3	[2]18	9
Iron, unfiltered (µg/L)	121	8,800	20	1,020	468
Lead, filtered (µg/L)	118	1.2	<.08	[2].16	<.60
Lead, unfiltered (µg/L)	118	56.0	<1.00	[2]7.88	3.50
Manganese, filtered (µg/L)	122	60.7	4.5	16.8	15.0
Manganese, unfiltered (µg/L)	122	880	8.0	149	96.0
Zinc, filtered (µg/L)	122	21	<3	[2]6.1	4.2
Zinc, unfiltered (µg/L)	122	490	2.9	63.0	31.9
Sediment, suspended (percent finer than 0.062 mm)	123	92	38	74	74
Sediment, suspended concentration (mg/L)	123	530	2	65	26
Sediment, suspended discharge (ton/d)	123	4,720	1.7	332	49

Table 26. Statistical summary of long-term water-quality data for the upper Clark Fork basin, Montana, March 1985 through September 2007.—Continued

[Abbreviations: ft^3/s, cubic feet per second; °C, degrees Celsius; E, estimated; µg/L, micrograms per liter; µS/cm, microsiemens per centimeter at 25°C; mg/L, milligrams per liter; mm, millimeter; ton/d, tons per day. Symbols: <, less than laboratory reporting level[1]; --, indicates insufficient data greater than the laboratory reporting level 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 2007					
Streamflow, instantaneous (ft^3/s)	220	9,560	296	1,850	1,110
pH, onsite (standard units)	166	8.8	7.4	8.3	8.3
Specific conductance, onsite (µS/cm)	195	483	139	303	315
Temperature, water (°C)	219	22.0	0.0	9.6	9.5
Hardness, filtered (mg/L as $CaCO_3$)	156	210	54	132	130
Calcium, filtered (mg/L)	156	59.0	14.9	37.2	37.8
Magnesium, filtered (mg/L)	156	14.0	3.94	9.51	9.50
Arsenic, filtered (µg/L)	165	17	2.7	6.0	5.2
Arsenic, unfiltered (µg/L)	165	110	3	9.9	7.0
Cadmium, filtered (µg/L)	165	.10	<.04	[2].03	<.1
Cadmium, unfiltered (µg/L)	165	4	<.1	[2].27	<1
Copper, filtered (µg/L)	164	25	E1.1	4.9	4.0
Copper, unfiltered (µg/L)	163	500	3.0	35.7	16.0
Iron, filtered (µg/L)	165	190	<3	[2]23	13
Iron, unfiltered (µg/L)	165	19,000	33	1,060	380
Lead, filtered (µg/L)	161	7	<.08	[2].31	<1
Lead, unfiltered (µg/L)	161	100	<1.00	[2]7.41	3.00
Manganese, filtered (µg/L)	165	37.4	1.0	8.1	6.8
Manganese, unfiltered (µg/L)	165	2,000	8.9	127	60
Zinc, filtered (µg/L)	164	39	<3	[2]6.1	4.0
Zinc, unfiltered (µg/L)	165	1,100	<10	[2]62	30
Sediment, suspended (percent finer than 0.062 mm)	209	98	27	73	75
Sediment, suspended concentration (mg/L)	220	1,370	2	58	18
Sediment, suspended discharge (ton/d)	220	34,700	3.0	632	60

Table 26. Statistical summary of long-term water-quality data for the upper Clark Fork basin, Montana, March 1985 through September 2007.—Continued

[Abbreviations: ft^3/s, cubic feet per second; °C, degrees Celsius; E, estimated; µg/L, micrograms per liter; µS/cm, microsiemens per centimeter at 25°C; mg/L, milligrams per liter; mm, millimeter; ton/d, tons per day. Symbols: <, less than laboratory reporting level[1]; --, indicates insufficient data greater than the laboratory reporting level 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 2007					
Streamflow, instantaneous (ft^3/s)	158	13,400	344	2,630	1,310
pH, onsite (standard units)	118	8.7	7.5	8.3	8.3
Specific conductance, onsite (µS/cm)	135	294	131	208	205
Temperature, water (°C)	158	22.5	0.0	9.4	9.5
Hardness, filtered (mg/L as $CaCO_3$)	111	140	55	103	99
Calcium, filtered (mg/L)	111	37.0	14.0	26.4	25.5
Magnesium, filtered (mg/L)	111	13.2	4.90	9.12	8.68
Arsenic, filtered (µg/L)	118	2	<1	[2].96	.98
Arsenic, unfiltered (µg/L)	118	4	<1	[2]1.2	1
Cadmium, filtered (µg/L)	118	1	<.04	[2].04	<.1
Cadmium, unfiltered (µg/L)	118	2	<.04	[2].12	<1
Copper, filtered (µg/L)	116	7.0	<1.0	[2]1.4	.8
Copper, unfiltered (µg/L)	115	34	<1.0	[2]5.2	2.2
Iron, filtered (µg/L)	118	100	<3	[2]17	10
Iron, unfiltered (µg/L)	118	3,600	10	435	195
Lead, filtered (µg/L)	114	8	<.08	[2].43	<.6
Lead, unfiltered (µg/L)	114	25.0	<.06	[2]2.59	.06
Manganese, filtered (µg/L)	118	11.0	<1	[2]2.4	2.0
Manganese, unfiltered (µg/L)	118	180	<10	[2]29.5	18.6
Zinc, filtered (µg/L)	118	15	<.60	[2]2.2	<20
Zinc, unfiltered (µg/L)	118	60	<1	[2]5.9	<10
Sediment, suspended (percent finer than 0.062 mm)	156	98	42	80	82
Sediment, suspended concentration (mg/L)	158	271	1	29	8
Sediment, suspended discharge (ton/d)	158	7,670	1.1	510	30

Table 26. Statistical summary of long-term water-quality data for the upper Clark Fork basin, Montana, March 1985 through September 2007.—Continued

[Abbreviations: ft^3/s, cubic feet per second; °C, degrees Celsius; E, estimated; µg/L, micrograms per liter; µS/cm, microsiemens per centimeter at 25°C; mg/L, milligrams per liter; mm, millimeter; ton/d, tons per day. Symbols: <, less than laboratory reporting level[1]; --, indicates insufficient data greater than the laboratory reporting level 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 2007					
Streamflow, instantaneous (ft^3/s)	186	21,600	720	4,350	2,380
pH, onsite (standard units)	143	8.7	7.9	8.3	8.3
Specific conductance, onsite (µS/cm)	163	399	142	254	261
Temperature, water (°C)	183	22.0	0.0	9.5	9.5
Hardness, filtered (mg/L as $CaCO_3$)	143	170	61	117	120
Calcium, filtered (mg/L)	143	46.0	14.0	31.6	32.0
Magnesium, filtered (mg/L)	143	13.4	5.28	9.29	9.20
Arsenic, filtered (µg/L)	143	9	1	3.4	3.0
Arsenic, unfiltered (µg/L)	143	69	E1	5.2	4
Cadmium, filtered (µg/L)	143	.2	<.04	[2].03	<.1
Cadmium, unfiltered (µg/L)	143	5.0	<.1	[2].15	<1
Copper, filtered (µg/L)	142	12.6	E.7	2.8	2.0
Copper, unfiltered (µg/L)	141	400	2.0	16.7	8.0
Iron, filtered (µg/L)	143	200	<3	[2]21	15
Iron, unfiltered (µg/L)	143	13,000	43	598	234
Lead, filtered (µg/L)	138	1.2	<.08	[2].16	<1
Lead, unfiltered (µg/L)	138	78.0	<1.00	[2]3.14	1.50
Manganese, filtered (µg/L)	143	230	6.2	17.2	14.2
Manganese, unfiltered (µg/L)	143	1,100	10	64.0	40
Zinc, filtered (µg/L)	143	16	<1.0	[2]3.7	2.1
Zinc, unfiltered (µg/L)	143	1,100	<10	[2]31.1	15
Sediment, suspended (percent finer than 0.062 mm)	181	99	14	85	89
Sediment, suspended concentration (mg/L)	186	824	2	38	12
Sediment, suspended discharge (ton/d)	186	21,900	5.8	930	81

[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).

Table 27. Statistical summary of long-term fine-grained bed-sediment data for the upper Clark Fork basin, Montana, August 1986 through August 2007.

[Reported concentrations are in micrograms 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. Values for a single sample are arbitrarily listed in the "Mean" column. Values are reported using U.S. Geological Survey rounding standards. Symbols: <, less than the minimum reporting level; --, indicates insufficient data to compute statistic]

Constituent	Number of samples	Maximum	Minimum	Mean	Median
12323600--Silver Bow Creek at Opportunity Period of record for bed-sediment data: 1992–2007					
Arsenic	5	186	119	151	163
Cadmium	16	43.9	22.8	32.7	32.3
Chromium	14	32.4	16.8	24.9	25.1
Copper	16	9,020	2,480	4,660	4,560
Iron	16	41,200	28,200	35,300	34,500
Lead	16	1,030	381	694	770
Manganese	16	9,220	1,680	3,580	2,840
Nickel	15	21.4	12.0	15.1	14.9
Silver	12	20.0	8.3	15.5	15.8
Zinc	16	13,400	4,950	8,060	7,380
12323750--Silver Bow Creek at Warm Springs Period of record for bed-sediment data: 1992–2007					
Arsenic	5	177	97	126	108
Cadmium	16	12.2	4.2	7.4	6.7
Chromium	14	34.1	<15.7	[1]19.6	[1]18.7
Copper	16	769	169	346	282
Iron	16	31,700	15,400	22,300	21,300
Lead	16	100	49	71	71
Manganese	16	17,700	1,470	8,440	8,370
Nickel	15	19.1	9.2	14.7	14.6
Silver	12	4.4	.3	[1]1.9	11.8
Zinc	16	2,220	620	994	770
12323770--Warm Springs Creek at Warm Springs Period of record for bed-sediment data: 1995, 1997, 1999, 2002, 2005					
Arsenic	1	--	--	66	--
Cadmium	5	5.8	1.3	3.6	3.9
Chromium	5	33.4	27.5	30.4	30.8
Copper	5	991	779	878	881
Iron	5	22,400	16,800	20,700	21,900
Lead	5	86	67	81	85
Manganese	5	12,100	2,020	7,980	8,790
Nickel	5	21.9	17.6	19.2	19.2
Silver	4	5.1	3.1	3.8	3.5
Zinc	5	421	372	395	396

Table 27. Statistical summary of long-term fine-grained bed-sediment data for the upper Clark Fork basin, Montana, August 1986 through August 2007.—Continued

[Reported concentrations are in micrograms 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. Values for a single sample are arbitrarily listed in the "Mean" column. Values are reported using U.S. Geological Survey rounding standards. Symbols: <, less than the minimum reporting level; --, indicates insufficient data to compute statistic]

Constituent	Number of samples	Maximum	Minimum	Mean	Median
12323800--Clark Fork near Galen Period of record for bed-sediment data: 1987, 1991–2007					
Arsenic	5	119	87	104	107
Cadmium	18	20.1	4.0	9.0	7.7
Chromium	14	33.9	19.1	26.4	26.4
Copper	18	2,300	838	1,210	1,110
Iron	18	39,800	22,600	27,700	26,900
Lead	18	235	92	137	132
Manganese	18	17,300	2,780	10,100	11,400
Nickel	15	23.2	13.9	18.2	18.2
Silver	14	7.3	<3.2	[1]4.4	[1]4.5
Zinc	18	3,560	999	1,550	1,160
461415112450801--Clark Fork below Lost Creek, near Galen Period of record for bed-sediment data: 1996–2007					
Arsenic	5	204	92	125	109
Cadmium	12	10.5	5.2	7.5	7.0
Chromium	11	34.5	20.5	27.6	27.1
Copper	12	2,050	1,150	1,490	1,430
Iron	12	32,800	24,400	29,400	30,500
Lead	12	218	127	172	172
Manganese	12	9,820	3,540	6,190	5,820
Nickel	12	19.9	11.7	15.8	15.7
Silver	8	7.8	4.2	6.5	6.7
Zinc	12	1,680	1,120	1,360	1,360
461559112443301--Clark Fork at county bridge, near Racetrack Period of record for bed-sediment data: 1996–2007					
Arsenic	5	101	56	77	79
Cadmium	12	8.7	5.0	6.8	6.4
Chromium	11	33.3	19.0	25.2	24.9
Copper	12	1,610	933	1,200	1,180
Iron	12	31,700	21,200	26,400	27,000
Lead	12	186	103	142	138
Manganese	12	6,310	2,100	3,580	3,260
Nickel	12	18.4	10.3	14.0	13.9
Silver	8	6.1	<3.3	[1]5.0	[1]5.4
Zinc	12	1,550	999	1,200	1,150

Table 27. Statistical summary of long-term fine-grained bed-sediment data for the upper Clark Fork basin, Montana, August 1986 through August 2007.—Continued

[Reported concentrations are in micrograms 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. Values for a single sample are arbitrarily listed in the "Mean" column. Values are reported using U.S. Geological Survey rounding standards. Symbols: <, less than the minimum reporting level; --, indicates insufficient data 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: 1996–2007					
Arsenic	5	87	58	72	71
Cadmium	12	10.3	4.3	6.6	5.9
Chromium	11	34.1	16.0	24.4	24.0
Copper	12	1,550	721	1,030	1,010
Iron	12	33,700	20,600	26,100	25,200
Lead	12	155	92	127	126
Manganese	12	8,370	1,810	4,380	3,950
Nickel	12	16.9	8.7	12.8	12.5
Silver	8	6.2	2.7	4.9	5.0
Zinc	12	1,570	900	1,140	1,120
12324200--Clark Fork at Deer Lodge					
Period of record for bed-sediment data: 1986–87, 1990–2007					
Arsenic	5	77	49	64	63
Cadmium	20	10.0	3.8	6.4	5.8
Chromium	14	43.9	19.5	29.6	28.3
Copper	20	4,180	683	1,280	1,020
Iron	20	35,300	21,100	27,100	26,100
Lead	20	242	103	148	147
Manganese	20	6,020	1,110	2,790	2,450
Nickel	15	21.1	11.5	15.0	13.6
Silver	16	7.9	2.4	4.7	4.5
Zinc	20	1,730	846	1,230	1,240
12324680--Clark Fork at Goldcreek					
Period of record for bed-sediment data: 1992–2007					
Arsenic	5	39	23	31	32
Cadmium	16	8.1	2.6	4.8	5.1
Chromium	14	48.9	21.3	30.7	30.5
Copper	16	1,080	338	657	691
Iron	16	30,600	15,500	23,000	23,000
Lead	16	152	52	93	90
Manganese	16	2,610	1,160	1,860	1,810
Nickel	15	18.6	9.0	14.0	14.1
Silver	12	4.8	2.3	3.3	3.2
Zinc	16	1,320	584	934	1,080

Table 27. Statistical summary of long-term fine-grained bed-sediment data for the upper Clark Fork basin, Montana, August 1986 through August 2007.—Continued

[Reported concentrations are in micrograms 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. Values for a single sample are arbitrarily listed in the "Mean" column. Values are reported using U.S. Geological Survey rounding standards. Symbols: <, less than the minimum reporting level; --, indicates insufficient data to compute statistic]

Constituent	Number of samples	Maximum	Minimum	Mean	Median
12331800--Clark Fork near Drummond Period of record for bed-sediment data: 1986–87, 1991–2007					
Arsenic	5	34	31	32	31
Cadmium	19	7.7	2.6	4.6	4.3
Chromium	14	35.4	17.0	27.6	28.6
Copper	19	747	303	480	470
Iron	19	27,000	16,500	21,600	20,400
Lead	19	135	59	89	85
Manganese	19	3,520	1,150	2,020	1,890
Nickel	15	16.8	9.3	13.4	13.4
Silver	15	4.7	<3.2	[1]3.0	[1]2.9
Zinc	19	1,230	673	967	948
12334550--Clark Fork at Turah Bridge, near Bonner Period of record for bed-sediment data: 1986, 1991–2007					
Arsenic	5	30	19	23	22
Cadmium	18	7.3	1.9	3.8	3.7
Chromium	14	34.7	15.3	23.9	24.2
Copper	18	635	211	350	320
Iron	18	24,400	12,600	18,400	17,200
Lead	18	115	47	68	63
Manganese	18	2,270	671	1,250	1,250
Nickel	15	19.1	8.7	12.6	11.5
Silver	14	3.9	<1.9	[1]2.1	[1]1.9
Zinc	18	1,160	584	821	788
12340000--Blackfoot River near Bonner Period of record for bed-sediment data: 1986–87, 1991, 1993–96, 1998–2001, 2003, 2006, 2007					
Arsenic	3	4	2	3	3
Cadmium	14	2.0	<.2	[1].6	[1].4
Chromium	10	25.8	15.1	20.9	21.8
Copper	14	27	11	20	21
Iron	14	20,200	12,400	17,200	17,900
Lead	14	20	<13	[1]14	[1]13
Manganese	14	683	298	515	538
Nickel	11	14.3	9.4	11.9	11.8
Silver	12	<1.9	<.3	[1].5	[1]<.6
Zinc	14	73	35	59	62

Table 27. Statistical summary of long-term fine-grained bed-sediment data for the upper Clark Fork basin, Montana, August 1986 through August 2007.—Continued

[Reported concentrations are in micrograms 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. Values for a single sample are arbitrarily listed in the "Mean" column. Values are reported using U.S. Geological Survey rounding standards. Symbols: <, less than the minimum reporting level; --, indicates insufficient data to compute statistic]

Constituent	Number of samples	Maximum	Minimum	Mean	Median
12340500--Clark Fork above Missoula Period of record for bed-sediment data: 1997–2007					
Arsenic	5	52	17	32	29
Cadmium	11	5.8	1.5	3.5	3.5
Chromium	10	30.6	19.0	25.2	26.0
Copper	11	551	166	364	326
Iron	11	24,300	18,100	20,400	20,500
Lead	11	78	37	57	60
Manganese	11	1,420	477	994	1,020
Nickel	11	15.8	10.9	13.1	13.0
Silver	7	2.9	.8	[1]2.0	[1]2.1
Zinc	11	1,090	438	758	716

[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 (or) median.

Table 28. Statistical summary of long-term biological data for the upper Clark Fork basin, Montana, August 1986 through August 2007.

[Concentrations are in micrograms 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 arbitraily 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. Values are reported using U.S. Geological Survey rounding standards. Abbreviation: spp., one or more similar species. Symbols: <, less than minimum reporting level; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
12323600--Silver Bow Creek at Opportunity Period of record for biological data: 1992, 1994–95, 1997–2007					
Brachycentrus spp.					
Arsenic	0	--	--	--	--
Cadmium	5	12.5	5.8	10.1	11.6
Chromium	5	5.9	.7	2.1	.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	<.1	[1]1.3	[1]1.6
Zinc	5	995	629	803	815
Hydropsyche cockerelli					
Arsenic	8	20.4	9.6	12.7	11.7
Cadmium	14	9.7	3.1	5.5	5.1
Chromium	14	8.0	1.0	2.8	2.4
Copper	14	1,090	269	431	378
Iron	14	2,880	689	1,650	1,690
Lead	14	56.7	19.0	32.3	31.0
Manganese	14	3,030	180	1,010	818
Nickel	14	3.6	.7	2.0	2.0
Zinc	14	1,590	619	899	835
Hydropsyche spp.					
Arsenic	7	23.1	10.7	16.1	16.8
Cadmium	12	11.0	4.2	6.7	5.8
Chromium	12	4.6	.6	2.2	2.2
Copper	12	930	312	564	471
Iron	12	2,630	1,050	1,950	2,110
Lead	12	51.4	21.8	39.9	40.2
Manganese	12	1,340	712	1,090	1,060
Nickel	12	2.7	.7	2.2	2.4
Zinc	12	1,290	784	1,030	1,080

Table 28. Statistical summary of long-term biological data for the upper Clark Fork basin, Montana, August 1986 through August 2007.—Continued

[Concentrations are in micrograms 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 arbitraily 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. Values are reported using U.S. Geological Survey rounding standards. Abbreviation: spp., one or more similar species. Symbols: <, less than minimum reporting level; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed]

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, 1997–2007					
Hydropsyche tana					
Arsenic	0	--	--	--	--
Cadmium	6	9.2	4.8	6.8	6.9
Chromium	6	11.5	.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	.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: 1992–2007					
Hydropsyche cockerelli					
Arsenic	8	23.6	7.9	15.4	16.3
Cadmium	34	2.1	.2	.7	.5
Chromium	34	4.3	.4	1.0	.8
Copper	34	97.0	16.7	38.3	32.0
Iron	34	1,590	351	796	762
Lead	34	5.7	.3	3.0	2.7
Manganese	34	3,890	491	1,350	1,230
Nickel	34	1.8	.3	.9	.8
Zinc	34	276	115	175	167
Hydropsyche occidentalis					
Arsenic	5	31.0	10.5	21.0	25.6
Cadmium	20	1.6	.2	.6	.4
Chromium	20	6.8	.3	1.7	1.0
Copper	20	48.9	11.0	32.4	30.8
Iron	20	2,960	372	1,190	971
Lead	20	8.2	<1.7	[1]3.8	[1]3.5
Manganese	20	6,940	1,200	2,560	2,150
Nickel	20	2.7	.7	1.5	1.5
Zinc	20	220	140	178	179

Table 28. Statistical summary of long-term biological data for the upper Clark Fork basin, Montana, August 1986 through August 2007.—Continued

[Concentrations are in micrograms 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 arbitraily 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. Values are reported using U.S. Geological Survey rounding standards. Abbreviation: spp., one or more similar species. Symbols: <, less than minimum reporting level; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
12323750--Silver Bow Creek at Warm Springs—Continued Period of record for biological data: 1992–2007					
Hydropsyche spp.					
Arsenic	0	--	--	--	--
Cadmium	4	2.3	0.4	1.1	0.9
Chromium	4	1.4	.5	1.0	1.2
Copper	4	47.6	34.9	40.9	40.6
Iron	4	773	561	680	693
Lead	4	5.1	1.9	3.9	4.7
Manganese	4	1,100	443	725	678
Nickel	4	1.9	<.4	[1].8	[1].5
Zinc	4	285	141	195	177
12323770--Warm Springs Creek at Warm Springs Period of record for biological data: 1995, 1997, 1999, 2002, 2005					
Arctopsyche grandis					
Arsenic	2	9.8	9.5	9.6	--
Cadmium	6	3.6	1.9	2.7	2.7
Chromium	6	2.9	.8	1.7	1.6
Copper	6	133	78.3	106	100
Iron	6	1,100	684	918	957
Lead	6	5.6	3.0	[1]4.7	[1]5.2
Manganese	6	3,560	1,340	2,560	2,710
Nickel	6	2.8	1.8	[1]2.3	[1]2.3
Zinc	6	222	181	196	196
Hydropsyche occidentalis					
Arsenic	2	13.6	12.7	13.2	--
Cadmium	4	1.2	.7	1.0	1.0
Chromium	4	3.2	.3	2.2	3.2
Copper	4	183	125	156	158
Iron	4	2,070	1,590	1,840	1,840
Lead	4	8.2	6.7	7.4	7.4
Manganese	4	3,190	2,400	2,790	2,770
Nickel	4	3.3	2.0	2.6	2.6
Zinc	4	172	148	160	160

Table 28. Statistical summary of long-term biological data for the upper Clark Fork basin, Montana, August 1986 through August 2007.—Continued

[Concentrations are in micrograms 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 arbitraily 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. Values are reported using U.S. Geological Survey rounding standards. Abbreviation: spp., one or more similar species. Symbols: <, less than minimum reporting level; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed]

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					
Hydropsyche spp.					
Arsenic	0	--	--	--	--
Cadmium	2	1.1	0.6	0.9	--
Chromium	2	1.6	1.4	1.5	--
Copper	2	95.9	94.8	95.3	--
Iron	2	1,220	1,150	1,190	--
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	--
12323800--Clark Fork near Galen Period of record for biological data: 1987, 1991–2007					
Claassenia sabulosa					
Arsenic	1	--	--	2.0	--
Cadmium	1	--	--	.2	--
Chromium	1	--	--	1.5	--
Copper	1	--	--	54.7	--
Iron	1	--	--	242	--
Lead	1	--	--	1.0	--
Manganese	1	--	--	323	--
Nickel	1	--	--	.5	--
Zinc	1	--	--	237	--
Hydropsyche cockerelli					
Arsenic	6	15.8	13.2	14.2	13.8
Cadmium	31	2.7	.7	1.4	1.5
Chromium	31	4.4	.8	1.9	1.6
Copper	31	181	48.7	103	98.9
Iron	31	2,660	816	1,450	1,350
Lead	31	11.8	1.2	7.9	7.7
Manganese	31	3,620	1,070	2,270	2,290
Nickel	31	6.5	.9	1.8	1.6
Zinc	31	299	136	208	204

Table 28. Statistical summary of long-term biological data for the upper Clark Fork basin, Montana, August 1986 through August 2007.—Continued

[Concentrations are in micrograms 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 arbitraily 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. Values are reported using U.S. Geological Survey rounding standards. Abbreviation: spp., one or more similar species. Symbols: <, less than minimum reporting level; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
12323800--Clark Fork near Galen—Continued Period of record for biological data: 1987, 1991–2007					
Hydropsyche morosa group					
Arsenic	0	--	--	--	--
Cadmium	5	3.2	2.4	2.5	2.4
Chromium	5	4.6	1.8	2.6	2.2
Copper	5	185	156	173	175
Iron	5	1,890	1,360	1,510	1,430
Lead	5	12.4	7.1	8.5	7.9
Manganese	5	3,960	2,360	3,500	3,860
Nickel	5	3.6	1.9	2.3	2.1
Zinc	5	349	292	309	303
Hydropsyche occidentalis					
Arsenic	7	16.4	12.5	14.8	14.9
Cadmium	39	1.6	.6	1.1	1.1
Chromium	39	6.6	.4	2.0	1.6
Copper	39	121	49.2	83.4	83.3
Iron	39	1,920	642	1,300	1,250
Lead	39	13.5	1.6	7.2	6.7
Manganese	39	6,170	1,220	2,760	2,290
Nickel	39	3.5	.8	1.6	1.6
Zinc	39	286	168	202	197
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	--

Table 28. Statistical summary of long-term biological data for the upper Clark Fork basin, Montana, August 1986 through August 2007.—Continued

[Concentrations are in micrograms 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 arbitraily 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. Values are reported using U.S. Geological Survey rounding standards. Abbreviation: spp., one or more similar species. Symbols: <, less than minimum reporting level; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
12323800--Clark Fork near Galen—Continued Period of record for biological data: 1987, 1991–2007					
Hydropsyche spp.					
Arsenic	2	15.7	14.5	15.1	--
Cadmium	6	3.5	.8	2.3	2.8
Chromium	2	2.4	2.2	2.3	--
Copper	6	154	78.4	126	143
Iron	6	1,540	1,190	1,360	1,360
Lead	6	13.5	5.9	10.4	10.9
Manganese	2	4,760	4,400	4,580	--
Nickel	2	1.8	1.5	1.6	--
Zinc	6	329	218	280	291
461415112450801--Clark Fork below Lost Creek, near Galen Period of record for biological data: 1996–2007					
Claassenia sabulosa					
Arsenic	1	--	--	1.5	--
Cadmium	2	0.4	0.3	.4	--
Chromium	2	1.9	.4	1.2	--
Copper	2	70.1	67.1	68.6	--
Iron	2	209	189	199	--
Lead	2	1.2	.7	1.0	--
Manganese	2	238	90.4	164	--
Nickel	2	.2	<.2	[1].1	--
Zinc	2	245	208	226	--
Hydropsyche cockerelli					
Arsenic	10	27.8	8.8	14.0	11.5
Cadmium	21	2.8	1.1	1.8	1.6
Chromium	21	3.6	.8	1.9	2.0
Copper	21	338	48.8	129	108
Iron	21	4,080	691	1,510	1,170
Lead	21	28.6	4.5	11.3	9.0
Manganese	21	3,160	1,230	1,850	1,720
Nickel	21	2.8	.8	1.4	1.2
Zinc	21	339	151	225	221

Table 28. Statistical summary of long-term biological data for the upper Clark Fork basin, Montana, August 1986 through August 2007.—Continued

[Concentrations are in micrograms 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 arbitraily 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. Values are reported using U.S. Geological Survey rounding standards. Abbreviation: spp., one or more similar species. Symbols: <, less than minimum reporting level; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
461415112450801--Clark Fork below Lost Creek, near Galen—Continued Period of record for biological data: 1996–2007					
Hydropsyche occidentalis					
Arsenic	8	20.8	12.7	15.5	14.6
Cadmium	22	1.9	.9	1.4	1.4
Chromium	22	3.6	1.2	2.1	2.0
Copper	22	219	52.1	113	118
Iron	22	2,830	963	1,600	1,500
Lead	22	19.4	6.6	10.7	10.6
Manganese	22	4,150	1,220	2,570	2,240
Nickel	22	2.5	.9	1.5	1.5
Zinc	22	308	174	242	242
Hydropsyche spp.					
Arsenic	1	--	--	12.0	--
Cadmium	5	1.8	1.2	1.5	1.4
Chromium	5	2.4	.9	1.5	1.5
Copper	5	122	45.1	91.8	103
Iron	5	1,410	533	1,110	1,200
Lead	5	20.5	4.1	10.0	8.7
Manganese	5	1,980	799	1,440	1,230
Nickel	5	2.8	1.0	1.6	1.4
Zinc	5	225	143	179	179
461559112443301--Clark Fork at county bridge, near Racetrack Period of record for biological data: 1996–2007					
Claassenia sabulosa					
Arsenic	0	--	--	--	--
Cadmium	1	--	--	0.4	--
Chromium	1	--	--	.3	--
Copper	1	--	--	40.3	--
Iron	1	--	--	113	--
Lead	1	--	--	.8	--
Manganese	1	--	--	172	--
Nickel	1	--	--	.2	--
Zinc	1	--	--	213	--

Table 28. Statistical summary of long-term biological data for the upper Clark Fork basin, Montana, August 1986 through August 2007.—Continued

[Concentrations are in micrograms 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 arbitraily 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. Values are reported using U.S. Geological Survey rounding standards. Abbreviation: spp., one or more similar species. Symbols: <, less than minimum reporting level; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
461559112443301--Clark Fork at county bridge, near Racetrack—Continued Period of record for biological data: 1996–2007					
Hydropsyche cockerelli					
Arsenic	8	16.5	11.1	13.1	11.9
Cadmium	19	1.9	.8	1.4	1.5
Chromium	19	2.7	.6	1.6	1.2
Copper	19	198	50.0	96.5	91.4
Iron	19	2,720	657	1,140	981
Lead	19	17.2	3.7	7.9	7.2
Manganese	19	2,020	646	1,570	1,830
Nickel	19	2.0	.7	1.1	1.0
Zinc	19	240	139	182	179
Hydropsyche occidentalis					
Arsenic	6	16.8	11.6	14.4	14.6
Cadmium	19	2.3	.7	1.4	1.4
Chromium	19	3.6	1.1	2.2	2.0
Copper	19	160	59.5	112	124
Iron	19	3,690	1,030	1,700	1,600
Lead	19	14.7	4.3	10.5	10.3
Manganese	19	3,770	1,090	2,260	2,130
Nickel	19	2.3	1.1	1.4	1.3
Zinc	19	361	181	233	229
Hydropsyche spp.					
Arsenic	2	12.7	11.9	--	--
Cadmium	4	2.4	1.0	1.6	1.5
Chromium	4	2.5	.7	1.5	1.4
Copper	4	124	82.9	101	99.2
Iron	4	1,880	1,140	1,380	1,240
Lead	4	15.0	5.7	9.4	8.5
Manganese	4	2,370	910	1,500	1,360
Nickel	4	1.9	1.1	1.4	1.3
Zinc	4	220	151	190	194

Table 28. Statistical summary of long-term biological data for the upper Clark Fork basin, Montana, August 1986 through August 2007.—Continued

[Concentrations are in micrograms 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 arbitraily 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. Values are reported using U.S. Geological Survey rounding standards. Abbreviation: spp., one or more similar species. Symbols: <, less than minimum reporting level; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
461903112440701--Clark Fork at Dempsey Creek diversion, near Racetrack Period of record for biological data: 1996–2007					
Arctopsyche grandis					
Arsenic	0	--	--	--	--
Cadmium	1	--	--	1.7	--
Chromium	1	--	--	<2.4	--
Copper	1	--	--	30.8	--
Iron	1	--	--	340	--
Lead	1	--	--	<14.5	--
Manganese	1	--	--	510	--
Nickel	1	--	--	1.0	--
Zinc	1	--	--	87	--
Hydropsyche cockerelli					
Arsenic	6	18.8	8.0	13.0	12.8
Cadmium	15	1.7	.7	1.2	1.3
Chromium	15	4.0	.5	1.5	1.0
Copper	15	198	60.7	106	87.6
Iron	15	2,310	552	1,100	851
Lead	15	17.7	3.5	7.5	6.3
Manganese	15	2,650	487	1,380	1,230
Nickel	15	2.1	.5	1.1	.9
Zinc	15	275	162	201	182
Hydropsyche occidentalis					
Arsenic	7	24.0	10.2	15.2	15.8
Cadmium	24	1.9	.7	1.2	1.2
Chromium	24	6.2	.8	2.1	1.8
Copper	24	238	74.9	110	91.2
Iron	24	3,390	940	1,570	1,500
Lead	24	21.8	6.1	11.6	11.4
Manganese	24	4,460	826	2,730	2,370
Nickel	24	2.4	1.2	1.6	1.5
Zinc	24	386	211	265	239

Table 28. Statistical summary of long-term biological data for the upper Clark Fork basin, Montana, August 1986 through August 2007.—Continued

[Concentrations are in micrograms 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 arbitraily 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. Values are reported using U.S. Geological Survey rounding standards. Abbreviation: spp., one or more similar species. Symbols: <, less than minimum reporting level; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed]

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: 1996–2007					
Hydropsyche spp.					
Arsenic	0	--	--	--	--
Cadmium	2	1.7	1.6	1.6	--
Chromium	2	2.1	1.4	1.8	--
Copper	2	140	104	122	--
Iron	2	1,610	1,070	1,340	--
Lead	2	13.2	10.5	11.8	--
Manganese	2	1,150	638	892	--
Nickel	2	1.6	1.6	1.6	--
Zinc	2	212	191	202	--
12324200--Clark Fork at Deer Lodge Period of record for biological data: 1986–87, 1990–2007					
Arctopsyche grandis					
Arsenic	0	--	--	--	--
Cadmium	2	2.4	<4.2	[1]2.2	--
Chromium	2	1.0	<1.3	[1].8	--
Copper	2	69.1	34.9	52.0	--
Iron	2	676	537	606	--
Lead	2	<7.8	3.8	[1]3.8	--
Manganese	2	727	380	554	--
Nickel	2	<1.7	<1.3	[1]--	--
Zinc	2	178	140	159	--
Hydropsyche cockerelli					
Arsenic	5	11.4	5.8	8.1	7.3
Cadmium	28	2.3	.6	1.4	1.3
Chromium	28	3.2	.4	1.6	1.6
Copper	28	180	54.7	97.6	98.0
Iron	28	3,340	490	1,120	1,040
Lead	28	18.1	3.8	9.4	8.9
Manganese	28	1,570	396	873	772
Nickel	28	2.4	.3	1.1	1.0
Zinc	28	391	132	188	185

Table 28. Statistical summary of long-term biological data for the upper Clark Fork basin, Montana, August 1986 through August 2007.—Continued

[Concentrations are in micrograms 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 arbitraily 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. Values are reported using U.S. Geological Survey rounding standards. Abbreviation: spp., one or more similar species. Symbols: <, less than minimum reporting level; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
12324200--Clark Fork at Deer Lodge—Continued Period of record for biological data: 1986–87, 1990–2007					
Hydropsyche occidentalis					
Arsenic	8	12.4	6.6	10.1	10.0
Cadmium	45	2.7	.6	1.3	1.3
Chromium	45	3.6	.6	1.9	1.9
Copper	45	180	49.4	117	112
Iron	45	2,060	557	1,400	1,420
Lead	45	18.6	3.5	11.2	10.9
Manganese	45	2,850	649	1,750	1,740
Nickel	45	12.9	1.0	1.7	1.4
Zinc	45	346	166	245	237
Hydropsyche spp.					
Arsenic	0	--	--	--	--
Cadmium	3	2.6	2.0	2.4	2.5
Chromium	0	--	--	--	--
Copper	3	222	175	191	177
Iron	3	2,220	1,850	2,010	1,950
Lead	3	16.7	15.0	16.1	16.7
Manganese	0	--	--	--	--
Nickel	0	--	--	--	--
Zinc	3	298	197	257	276
12324680--Clark Fork at Goldcreek Period of record for biological data: 1992–2007					
Arctopsyche grandis					
Arsenic	19	6.4	1.8	3.7	2.7
Cadmium	48	6.6	.6	1.9	1.6
Chromium	48	3.3	.1	1.2	1.0
Copper	48	129	19.9	41.9	31.8
Iron	48	2,360	195	630	474
Lead	48	10.9	1.0	3.3	3.3
Manganese	48	1,580	436	848	831
Nickel	48	1.8	.2	.7	.6
Zinc	48	326	146	195	179

Table 28. Statistical summary of long-term biological data for the upper Clark Fork basin, Montana, August 1986 through August 2007.—Continued

[Concentrations are in micrograms 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 arbitraily 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. Values are reported using U.S. Geological Survey rounding standards. Abbreviation: spp., one or more similar species. Symbols: <, less than minimum reporting level; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
12324680--Clark Fork at Goldcreek—Continued Period of record for biological data: 1992–2007					
Claassenia sabulosa					
Arsenic	13	2.1	0.7	1.4	1.4
Cadmium	33	3.5	.1	1.0	.7
Chromium	33	1.6	.2	.6	.5
Copper	33	81.7	33.0	57.6	57.1
Iron	33	567	63.0	186	158
Lead	33	1.8	.4	.9	.8
Manganese	33	320	50.6	154	123
Nickel	33	.7	.1	.3	.3
Zinc	33	351	166	265	261
Hydropsyche cockerelli					
Arsenic	12	6.1	4.1	5.1	4.8
Cadmium	31	2.6	.5	1.3	1.2
Chromium	31	4.7	.5	2.0	1.9
Copper	31	188	17.1	67.6	56.6
Iron	31	3,250	522	1,080	810
Lead	31	16.2	2.4	6.1	5.1
Manganese	31	1,670	538	957	953
Nickel	31	2.3	.3	1.1	1.0
Zinc	31	249	106	183	184
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	.9	1.2	1.2
Zinc	4	190	137	167	170

Table 28. Statistical summary of long-term biological data for the upper Clark Fork basin, Montana, August 1986 through August 2007.—Continued

[Concentrations are in micrograms 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 arbitraily 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. Values are reported using U.S. Geological Survey rounding standards. Abbreviation: spp., one or more similar species. Symbols: <, less than minimum reporting level; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
12324680--Clark Fork at Goldcreek—Continued Period of record for biological data: 1992–2007					
Hydropsyche occidentalis					
Arsenic	5	5.8	4.7	5.2	5.1
Cadmium	20	1.8	.4	1.2	1.2
Chromium	20	3.9	.4	1.6	1.6
Copper	20	156	26.4	61.6	56.6
Iron	20	2,720	466	1,100	1,040
Lead	20	15.7	2.9	6.7	5.7
Manganese	20	2,210	530	1,250	1,210
Nickel	20	2.5	.8	1.2	1.0
Zinc	20	277	97	196	202
12331800--Clark Fork near Drummond Period of record for biological data: 1986, 1991–2007					
Arctopsyche grandis					
Arsenic	11	4.4	2.3	3.3	3.3
Cadmium	43	3.8	.4	1.3	1.1
Chromium	43	2.5	.2	1.0	1.0
Copper	43	89.2	16.9	32.1	27.4
Iron	43	1,660	193	557	482
Lead	43	11.8	1.6	4.3	3.9
Manganese	43	2,010	456	833	733
Nickel	43	1.9	.2	.6	.6
Zinc	43	308	140	187	183
Claassenia sabulosa					
Arsenic	11	1.8	0.7	1.2	1.2
Cadmium	47	2.8	.1	1.0	.8
Chromium	47	3.3	.2	.7	.6
Copper	47	165	18.0	64.7	60.0
Iron	47	387	45.4	162	141
Lead	47	2.9	.2	1.0	.8
Manganese	47	748	33.1	191	153
Nickel	47	1.1	.1	[1].3	[1].2
Zinc	47	567	103	275	261

Table 28. Statistical summary of long-term biological data for the upper Clark Fork basin, Montana, August 1986 through August 2007.—Continued

[Concentrations are in micrograms 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 arbitraily 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. Values are reported using U.S. Geological Survey rounding standards. Abbreviation: spp., one or more similar species. Symbols: <, less than minimum reporting level; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
12331800--Clark Fork near Drummond—Continued Period of record for biological data: 1986, 1991–2007					
Hydropsyche cockerelli					
Arsenic	8	5.7	3.9	4.6	4.5
Cadmium	37	2.3	.3	1.1	.8
Chromium	37	3.5	.4	1.6	1.6
Copper	37	156	30.0	58.0	50.7
Iron	37	2,500	506	1,130	912
Lead	37	15.0	4.8	8.0	6.7
Manganese	37	1,680	549	979	915
Nickel	37	2.0	.5	1.1	1.0
Zinc	37	248	134	191	184
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	9	6.9	4.3	5.1	5.1
Cadmium	25	2.0	.4	1.0	1.0
Chromium	25	8.1	.4	2.2	2.0
Copper	25	118	13.3	54.6	55.1
Iron	25	2,060	424	1,200	1,180
Lead	25	14.0	3.0	8.3	7.5
Manganese	25	2,920	619	1,480	1,220
Nickel	25	2.4	.5	1.3	1.2
Zinc	25	293	157	219	207

Table 28. Statistical summary of long-term biological data for the upper Clark Fork basin, Montana, August 1986 through August 2007.—Continued

[Concentrations are in micrograms 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 arbitraily 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. Values are reported using U.S. Geological Survey rounding standards. Abbreviation: spp., one or more similar species. Symbols: <, less than minimum reporting level; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
12331800--Clark Fork near Drummond—Continued Period of record for biological data: 1986, 1991–2007					
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	--
12334550--Clark Fork at Turah Bridge, near Bonner Period of record for biological data: 1986, 1991–2007					
Arctopsyche grandis					
Arsenic	16	5.0	3.1	4.3	4.4
Cadmium	58	2.7	.4	1.1	.8
Chromium	58	4.1	.5	1.6	1.4
Copper	58	125	20.1	37.2	30.4
Iron	58	2,870	372	908	789
Lead	58	13.2	1.6	4.2	3.4
Manganese	58	902	324	638	651
Nickel	58	2.6	.4	1.1	.9
Zinc	58	276	111	196	196
Claassenia sabulosa					
Arsenic	11	1.9	0.8	1.2	1.1
Cadmium	37	2.5	.1	.9	.8
Chromium	37	2.0	.2	.7	.6
Copper	37	95.1	37.5	58.9	54.4
Iron	37	340	58.6	121	107
Lead	37	1.6	.2	.6	.6
Manganese	37	229	37.2	95.4	79.4
Nickel	37	.6	.1	.2	.2
Zinc	37	342	144	231	235

Table 28. Statistical summary of long-term biological data for the upper Clark Fork basin, Montana, August 1986 through August 2007.—Continued

[Concentrations are in micrograms 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 arbitraily 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. Values are reported using U.S. Geological Survey rounding standards. Abbreviation: spp., one or more similar species. Symbols: <, less than minimum reporting level; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed]

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, 1991–2007					
Hydropsyche cockerelli					
Arsenic	12	5.1	3.7	4.5	4.7
Cadmium	40	1.8	.3	.8	.7
Chromium	40	8.0	.2	1.9	1.6
Copper	40	118	26.4	47.6	42.7
Iron	40	2,530	566	1,180	1,100
Lead	40	12.1	2.2	5.2	4.9
Manganese	40	805	426	629	651
Nickel	40	2.6	.6	1.2	1.2
Zinc	40	228	119	185	184
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	8	5.9	3.6	4.3	4.1
Cadmium	28	1.8	.3	.8	.8
Chromium	28	3.2	.6	1.7	1.6
Copper	28	102	27.4	47.4	42.8
Iron	28	2,310	472	1,180	1,130
Lead	28	14.2	3.0	6.2	5.4
Manganese	28	1,600	454	858	763
Nickel	28	3.2	.6	1.2	1.1
Zinc	28	416	145	211	220

Table 28. Statistical summary of long-term biological data for the upper Clark Fork basin, Montana, August 1986 through August 2007.—Continued

[Concentrations are in micrograms 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 arbitraily 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. Values are reported using U.S. Geological Survey rounding standards. Abbreviation: spp., one or more similar species. Symbols: <, less than minimum reporting level; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed]

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, 1991–2007					
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	--
12340000--Blackfoot River near Bonner Period of record for biological data: 1986–87, 1991, 1993, 1996, 1998, 2000, 2003, 2006, 2007					
Arctopsyche grandis					
Arsenic	3	4.6	2.2	3.2	2.8
Cadmium	13	.4	.1	.2	.2
Chromium	8	6.9	.8	2.1	1.3
Copper	13	16.2	9.9	12.5	12.0
Iron	13	1,230	108	648	697
Lead	13	2.3	.5	1.1	.9
Manganese	8	607	286	451	437
Nickel	8	3.7	.7	1.3	1.1
Zinc	13	150	123	137	137
Claassenia sabulosa					
Arsenic	3	3.0	1.4	2.0	1.7
Cadmium	14	.2	.1	.1	.1
Chromium	9	5.2	.3	1.1	.7
Copper	14	88.5	19.0	43.1	42.5
Iron	14	211	46.2	119	114
Lead	14	.8	.1	.4	.5
Manganese	9	133	26.3	71.4	60.0
Nickel	9	1.1	.1	.3	.3
Zinc	14	328	117	219	197

Table 28. Statistical summary of long-term biological data for the upper Clark Fork basin, Montana, August 1986 through August 2007.—Continued

[Concentrations are in micrograms 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 arbitraily 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. Values are reported using U.S. Geological Survey rounding standards. Abbreviation: spp., one or more similar species. Symbols: <, less than minimum reporting level; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed]

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, 2007					
Hydropsyche cockerelli					
Arsenic	2	3.1	3.0	3.1	--
Cadmium	2	.2	<.1	[1].2	--
Chromium	2	3.8	2.4	3.1	--
Copper	2	15.5	5.6	10.6	--
Iron	2	1,970	1,640	1,800	--
Lead	2	2.3	2.0	2.1	--
Manganese	2	716	637	677	--
Nickel	2	4.6	1.9	3.2	--
Zinc	2	142	140	141	--
Hydropsyche occidentalis					
Arsenic	3	3.8	2.4	3.2	3.2
Cadmium	15	.5	.1	.2	.2
Chromium	15	5.8	.8	2.2	1.9
Copper	15	20.6	12.0	14.8	14.5
Iron	15	1,930	1,060	1,440	1,470
Lead	15	1.9	.8	1.4	1.4
Manganese	15	762	414	514	474
Nickel	15	4.9	.9	1.6	1.4
Zinc	15	157	116	138	142
Hydropsyche spp.					
Arsenic	0	--	--	--	--
Cadmium	1	--	--	0.6	--
Chromium	1	--	--	1.6	--
Copper	1	--	--	13.9	--
Iron	1	--	--	1,140	--
Lead	1	--	--	2.9	--
Manganese	1	--	--	525	--
Nickel	1	--	--	2.8	--
Zinc	1	--	--	132	--

Table 28. Statistical summary of long-term biological data for the upper Clark Fork basin, Montana, August 1986 through August 2007.—Continued

[Concentrations are in micrograms 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 arbitraily 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. Values are reported using U.S. Geological Survey rounding standards. Abbreviation: spp., one or more similar species. Symbols: <, less than minimum reporting level; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
12340500--Clark Fork above Missoula Period of record for biological data: 1997–2007					
Arctopsyche grandis					
Arsenic	14	4.5	2.1	3.4	3.5
Cadmium	33	1.8	.1	.7	.6
Chromium	33	3.4	.6	1.6	1.4
Copper	33	77.6	19.5	34.8	33.8
Iron	33	2,340	476	949	869
Lead	33	6.8	1.2	3.9	3.8
Manganese	33	1,410	476	940	929
Nickel	33	2.0	.5	1.1	1.0
Zinc	33	260	133	188	185
Claassenia sabulosa					
Arsenic	8	1.9	0.7	1.5	1.6
Cadmium	17	2.0	.2	.6	.4
Chromium	17	1.4	.3	.8	.8
Copper	17	71.7	33.0	51.3	47.3
Iron	17	402	95.3	251	246
Lead	17	3.1	.5	1.2	1.1
Manganese	17	683	75.2	235	190
Nickel	17	.5	<.3	[1].4	[1].4
Zinc	17	363	191	279	271
Hydropsyche cockerelli					
Arsenic	11	8.0	3.6	6.1	6.4
Cadmium	20	1.3	.4	.8	.9
Chromium	20	6.0	1.8	3.1	3.2
Copper	20	97.9	29.9	63.8	58.9
Iron	20	3,590	1,400	2,100	2,050
Lead	20	11.8	4.2	7.8	7.4
Manganese	20	1,910	781	1,290	1,230
Nickel	20	2.4	1.4	1.8	1.7
Zinc	20	266	156	214	214

Table 28. Statistical summary of long-term biological data for the upper Clark Fork basin, Montana, August 1986 through August 2007.—Continued

[Concentrations are in micrograms 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 arbitraily 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. Values are reported using U.S. Geological Survey rounding standards. Abbreviation: spp., one or more similar species. Symbols: <, less than minimum reporting level; --, indicates either too few samples (less than three) or insufficient data to compute statistic, or element not analyzed]

Constituent	Number of composite samples	Maximum	Minimum	Mean	Median
12340500--Clark Fork above Missoula—Continued Period of record for biological data: 1997–2007					
Hydropsyche occidentalis					
Arsenic	4	6.2	3.9	5.6	6.2
Cadmium	10	1.2	.4	.7	.7
Chromium	10	5.5	2.1	3.3	3.0
Copper	10	76.5	30.3	53.9	57.3
Iron	10	2,400	1,450	2,010	2,110
Lead	10	11.1	4.0	7.3	7.2
Manganese	10	2,460	939	1,880	1,950
Nickel	10	2.4	1.6	2.0	2.0
Zinc	10	258	192	232	231

[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. When all data were less than the minimum reporting level, the median was determined by ranking the censored values in order of detection. No mean is reported when all values were below the minimum reporting level.

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