Water Resources Data
Montana
Water Year 2003

Volume 2. Yellowstone and Upper Columbia River Basins and Ground-Water Levels

By Wayne R. Berkas, Melvin K. White, Patricia B. Ladd, Fred A. Bailey, and Kent A. Dodge

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3162 Bozeman Avenue
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PREFACE

In the act that established the U.S. Geological Survey more than a century ago, the agency was charged by Congress with the responsibility for "...classification of the public lands, and examination of the geologic structure, mineral resources, and products of the national domain." This charge was simple recognition of the principle that factual information is essential to sound development and management decisions involving natural resources. In keeping with this principle, the Water Resources Division of the Survey publishes annually, by district, hydrologic records for water resources thought to be of particular usefulness to the public and to the scientific community.

This report is the culmination of a concerted effort by dedicated personnel of the U.S. Geological Survey, who collected, compiled, analyzed, verified, and organized the data, and who typed, edited, and assembled the report. In addition to the authors, who had primary responsibility for assuring that the information contained herein is accurate, complete, and adheres to Geological Survey policy and established guidelines, the following individuals contributed significantly to the collection, processing, and tabulation of the data:

Donald A. Bischoff, Hydrologic Technician
Bruce M. Bochy, Hydrologic Technician
Craig L. Bowers, Hydrologic Technician
Tyrel F. Brandt, Hydrologic Technician
Rodney R. Caldwell, Hydrologist
Thomas E. Cleasby, Hydrologist
DeAnn M. Dutton, Hydrologic Technician
James R. Finley, Hydrologic Technician
Kari L. Finley, Hydrologic Technician
James L. Fisher, Hydrologic Technician
John J. French, Supervisory Hydrologic Technician
Cynthia J. Harksen, Technical Editor
Terry L. Heinert, Hydrologic Technician
Kurt C. Jenewein, Scientific Illustrator
Arthur W. Johnson, Hydrologic Technician
Philip L. Karper, Hydrologic Technician
Stacy M. Kinsey, Hydrologic Technician
John H. Lambing, Hydrologist
Robert G. Legare, Hydrologic Technician
Stephen V. Lynn, Supervisory Hydrologic Technician
Norman A. Midtlyng, Hydrologic Technician
Evonne S. Mitton, Computer Assistant
Timothy J. Morgan, Hydrologic Technician
Steven W. Nichols, Hydrologic Technician
Virginia L. Redstone, Hydrologic Technician
Kevin L. Sattler, Hydrologic Technician
Todd C. Schmitt, Hydrologic Technician
Ronald R. Shields, Scientist Emeritus
Andrew A. Skerda, Hydrologic Technician
William G. Stotts, Hydrologic Technician
LaVerne G. Sultz, Hydrologic Technician
Wayne A. Tice
Greg R. Trunkle, Hydrologic Technician
Peter R. Wright, Hydrologist

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Water resources data for Montana for the 2003 water year, volumes 1 and 2, consist of records of stage, discharge, and water quality of streams; stage, contents, and water quality of lakes and reservoirs; and water levels in wells. This volume contains discharge records for 114 streamflow-gaging stations; stage or content records for 4 lakes and large reservoirs and content for 26 smaller reservoirs; water-quality records for 76 streamflow stations (11 ungaged), and 3 lakes; water-level records for 53 observation wells; and precipitation and water-quality records for 2 atmospheric-deposition stations. Additional water year 2003 data collected at crest-stage gage and miscellaneous-measurement sites were collected but are not published in this report. These data are stored within the District office files in Helena and are available on request. These data represent part of the National Water Data System operated by the U.S. Geological Survey and cooperating State and Federal agencies in Montana.

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INTRODUCTION

The U.S. Geological Survey (USGS), in cooperation with other Federal, State, and local agencies and Tribal governments, collects a large amount of data pertaining to the water resources of Montana each water year. These data, accumulated over many years, constitute a valuable data base for developing an improved understanding of the water resources of the State. To make these data readily available to interested parties outside the USGS, the data are published annually, by water year, in this report series entitled, "Water Resources Data, Montana."

This report, volumes 1 and 2, includes records on both surface and ground water from stations within the State and selected stations near the Montana border in adjacent states and Canada. Specifically, it contains (1) discharge records for 246 streamflow-gaging stations; (2) stage or content records for 9 lakes and large reservoirs and content records for 31 smaller reservoirs; (3) water-quality records for 143 stream sites (45 ungaged), 7 ground-water wells, and 3 lake sites; (4) water-level records for 53 observation wells; and (5) precipitation and water-quality records for 2 atmospheric-deposition stations

Volume 1 contains discharge records for 132 streamflow-gaging stations; stage or content records for 5 lakes and large reservoirs and content records for 5 smaller reservoirs; and water-quality records for 66 stream sites (34 ungaged) and 7 wells.

Volume 2 contains discharge records for 114 streamflow-gaging stations; stage or content records for 4 lakes and large reservoirs and content records for 26 smaller reservoirs; water-quality records for 77 stream sites (11 ungaged) and 3 lake sites; water-level records for 53 observation wells; and precipitation and water-quality records for 2 atmospheric-deposition stations.

Additional data for water year 2003 were collected at crest-stage gage and miscellaneous-measurement sites but are not published in this report. These data are stored within files in the USGS office in Helena and are available on request. The locations of streamflow-gaging stations are shown later in the report in figure 6, locations of water-quality stations are shown in figure 7, and locations of observation wells are shown in figure 8.

Records of discharge or stage of streams and contents or stage of lakes and reservoirs were first published in a series of USGS Water-Supply Papers entitled "Surface Water Supply of the United States." These Water-Supply Papers were published in an annual series for water years 1899-1960 and then in a 5-year series for water years 1961-65 and 1966-70. Records of chemical quality, water temperatures, and suspended sediment were published from 1941 to 1970 in an annual series of Water-Supply Papers entitled "Quality of Surface Waters of the United States." Records of ground-water levels were published from 1935 to 1974 in a series of Water-Supply Papers entitled "Ground-Water Levels in the United States." Water-Supply Papers may be reviewed in the libraries of the principal cities of the United States or may be purchased from USGS, Branch of Information Services, Box 25286, Denver, Colorado 80225. For water years 1961 through 1970, streamflow data were published by the USGS in annual reports for each State. Water-quality records for water years 1964 through 1970 were similarly published either in separate reports or in conjunction with streamflow records. Beginning with the 1971 water year, data for streamflow, water quality, and ground water are published as a single or multi-volume USGS annual water-data report for each State. These reports carry an identification number consisting of the two-letter State abbreviation, the last two digits of the water year, and the volume number. For example, this volume is identified as "U.S. Geological Survey Water-Data Report MT-03-1." These water-data reports are for sale, in paper copy or on microfiche, by the National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22161, telephone 1-800-553-6847.

Water-resources information for Montana and the rest of the Nation are available through the World Wide Web as part of the USGS National Water-Information System (NWIS) at:

http://waterdata.usgs.gov/nwis

For Montana, this information includes surface-water, water-quality, and ground-water data. Surface-water information available from the USGS includes provisional real-time streamflow data for stations with satellite telemetry, provisional daily data for the previous 18 months, and daily data for the period of record at each site. Daily, monthly, and annual streamflow statistics also are available as well as annual peak streamflow data. In addition, flood-frequency and basin-characteristics information for selected sites in Montana is available at:

http://mt.water.usgs.gov/freq

Water-quality information available from the USGS includes provisional real-time specific-conductance and water-temperature data for selected sites with satellite telemetry and historical water-quality data for many surface- and ground-water sites in Montana. Ground-water information available from the USGS includes descriptive information for wells, springs, and test holes such as location (latitude and longitude), well depth, site use, water levels, and aquifer.

Additional information, including current prices, for ordering specific reports may be obtained from the District Chief at the address given on the back of the title page or by telephone at (406) 457-5900 or 1-888-ASK-USGS.

COOPERATION

The USGS has had cooperative agreements with other agencies and organizations for the systematic collection of streamflow records since 1906, for water-quality records since 1946, and for ground-water levels since 1964. In water year 2003, agencies and organizations that supported data collection through cooperative agreements with the USGS are:

Federal Agencies
- Bonneville Power Administration
- Bureau of Indian Affairs
- Bureau of Land Management
- Bureau of Reclamation
- Department of State, International Joint Commission
- National Park Service
- U.S. Army Corps of Engineers
- U.S.D.A. Forest Service
- U.S. Environmental Protection Agency
- U.S. Fish and Wildlife Service
- U.S. Geological Survey

Tribal Governments
- Blackfeet Nation
- Chippewa Cree Tribe of the Rocky Boy's Reservation
- Confederated Salish and Kootenai Tribes of the Flathead Reservation
- Crow Tribe
- Fort Peck Tribes
- Northern Cheyenne Tribe

State Agencies
- Montana Bureau of Mines and Geology
- Montana Department of Environmental Quality
- Montana Department of Fish, Wildlife and Parks
- Montana Department of Natural Resources and Conservation
- Montana Department of Transportation
- Montana School of Technology of the University of Montana
- Wyoming Department of Environmental Quality
- Wyoming State Engineer

Federal Energy Regulatory Commission Licensees
- Avista Corporation
- Pacific Power and Light

Local Agencies
- Cascade County Conservation District
- City of Bozeman
- East Bench Irrigation District
- Lewis and Clark County Water Quality Protection District
- Lower Musselshell Conservation District
- Lower Yellowstone Irrigation Project
- North Powell Conservation District
- Teton County Conservation District

GENERAL HYDROLOGIC SETTING

Montana, with an area of about 147,200 square miles (mi^2), is the fourth largest State in the Union (fig. 1). The major drainage basins in the State are the Hudson Bay basin (465 mi^2) and the upper Missouri River basin (120,700 mi^2) east of the Continental Divide, and the upper Columbia River basin (26,000 mi^2) west of the divide. The Hudson Bay and upper Missouri River basins drain about 82 percent of the State and provide slightly less than 50 percent of the total streamflow. The upper Columbia River basin drains about 18 percent of the State and provides about 50 percent of the total streamflow.

The western and southwestern parts of the State are in the Northern and Middle Rocky Mountains physiographic provinces. The central and eastern parts are in the Great Plains physiographic province. The Northern and Middle Rocky Mountains are characterized by rugged mountains and intermontane valleys, whereas the Great Plains consists of rolling to dissected plains and small mountain ranges. Altitude in Montana ranges from more than 12,000 feet in the mountains northeast of Yellowstone National Park to about 1,850 feet where the Kootenai River flows from the northwestern part of the State.

Climate and hydrologic conditions differ substantially across the State. Annual precipitation varies considerably throughout the basins, from about 100-120 inches along the Continental Divide in Glacier National Park to about 6-12 inches in parts of eastern and south-central Montana and in some of the western intermontane valleys. The diverse precipitation patterns in Montana result from the effects of geographic and topographic features on warm, moist air from either the Gulf of Mexico or the Pacific Ocean. In mountainous areas, much of the annual precipitation falls as snow during the winter. Although much of the annual precipitation on the Great Plains also falls as snow during the winter, intense rainstorms during the summer can add substantial quantities of precipitation to the annual totals in a short time. In areas east of the mountains, generally one-half of the annual precipitation falls from May through July.

Peak runoff from the basins can result from spring snowmelt, snowmelt mixed with rain, or intense rainfall. In addition, backwater from ice jams commonly creates flooding in many rivers throughout the State. The record flood of April 1952 in northeastern Montana is an example of spring snowmelt flooding. The flood in May 1981 in west-central Montana is an example of flooding caused by snowmelt mixed with rain. The floods of June 1964, June 1975, and May 1978 are examples of flooding predominantly caused by intense rainfall. Flash floods, although restricted in areal extent, are at times numerous in the north-central and eastern parts of the State. In many areas, peak runoff is stored in reservoirs to decrease flooding. The stored water is used for irrigation (the predominant consumptive use of water statewide), power generation, and recreation.

Figure 1. General geographic features of Montana.

Surface water throughout the State generally is suitable for most uses except in parts of eastern Montana where, because of large concentrations of dissolved solids and some individual constituents, recommended standards or criteria for domestic and agricultural uses may be exceeded. The ionic composition of surface water is largely influenced by geology and can vary markedly between the western mountains and the eastern plains. In the western mountains, where the rocks generally are older and resistant to weathering, the streamflow characteristically is a calcium bicarbonate type. The dissolved-solids concentrations in mountain streams seldom exceed 500 milligrams per liter (mg/L), even during base-flow conditions. In the eastern plains, where sedimentary rocks are less resistant to weathering, streamflow commonly is a sodium sulfate type, with dissolved-solids concentrations ranging from about 100 to 8,000 mg/L. In the northeastern part of the State, streamflow typically is a sodium bicarbonate type. Snowmelt and intense rainstorms sometimes produce large quantities of runoff that can dilute concentrations of dissolved solids, modify chemical compositions, and increase concentrations of suspended sediment.

The availability and quality of ground water in Montana are largely controlled by the hydraulic and geochemical properties of diverse rocks and sediments. In western Montana, ground water is available from alluvium along streams and rivers, from basin fill in intermontane valleys, from glacial deposits, and from fractured consolidated rocks. In eastern Montana, ground water is available from alluvial deposits along larger rivers and streams and from sedimentary rocks. Outside of the alluvial valleys, ground-water availability in sedimentary rock is variable. Throughout Montana, alluvial deposits along streams generally are the most productive aquifers, and yields to wells along the major streams may be several hundred gallons per minute. Alluvium can be readily recharged by precipitation, by streams during periods of high flow, and by applied irrigation water. The particle size distribution and sorting of glacial deposits largely determines their potential for yielding water to wells. Where coarse, well-sorted outwash gravels are present, the potential for developing large-yield wells is good, whereas yields from wells completed in poorly sorted glacial till generally are limited to a few gallons per minute. Many fractured consolidated-rock formations yield water but, because of the complexity of the geology, fractured rocks might not yield water in all areas. Wells completed in consolidated rocks generally yield only a few gallons per minute. However, several hundred gallons per minute can be obtained from highly fractured or cavernous formations in some areas. The well depth required to reach a given aquifer varies with location.

HYDROLOGIC-MONITORING ACTIVITY

Nine streamflow-gaging stations were established or reestablished during water year 2003 to aid in the assessment of the State's water resources. The stations are:

06036905 Firehole River near West Yellowstone
06037100 Gibbon River at Madison Junction, Yellowstone National Park
06119600 Musselshell River near Martinsdale
06190540 Boiling River at Mammoth, Yellowstone National Park
06327500 Yellowstone River at Glendive
12323700 Mill Creek at Opportunity
12323720 Willow Creek at Opportunity
12323850 Lost Creek near Galen
12351200 Bitterroot River near Florence

Three water-quality stations were reestablished in the Tongue River and Rosebud Creek basins near the end of water year 2003 to supplement information in an area of potential coal-bed methane development. These stations are:

06295113 Rosebud Creek at reservation boundary, near Kirby
06307600 Hanging Woman Creek near Birney
06307740 Otter Creek at Ashland

Nine miscellaneous surface-water-quality stations were established during water year 2003 to obtain data to characterize the baseline water-quality in an area with the potential for development of coal-bed methane resources. These stations are:

445729106573501 Ash Creek above mouth, near Acme, Wyo.
445832106551401 Youngs Creek above mouth, near Decker
450047106514201 Squirrel Creek above mouth, at Decker
450137106595101 Youngs Creek near reservation boundary, near Decker
450124106585101 Tanner Creek near mouth, near Decker
451302106583201 Rosebud Creek near Battlefield, near Kirby
451618106590001 Indian Creek at mouth, near Kirby
452800107001101 Thompson Creek near Busby
453021107000001 Davis Creek near Busby

Water-quality sampling continued at surface-water sites and ground-water wells that were established in 2002 in the headwaters of Tenmile Creek and Basin Creek near a repository (Luttrell Repository) where mine wastes and mill tailings from nearby abandoned-mine sites are being placed for long-term storage. The sampling of streams and ground water in the area surrounding the repository is intended to detect potential migration of contaminants from the disposal area. Ten surface-water stations and seven ground-water wells were sampled for this study during water year 2003. Seven new surface-water stations were established for the study in 2003:

462442112174601 Grub Creek above confluence with unnamed tributary, near Rimini
462442112174602 Unnamed Tributary to Grub Creek at mouth, SS No. 6, near Rimini
462458112173201 Unnamed Tributary to Grub Creek, SS No. 5, near Rimini
462542112173101 Monitor Creek, SS No. 12 (below SS No. 1), near Rimini
462544112162001 Ruby Creek, RC2A, above Scott Reservoir, near Rimini
462720112165101 Tenmile Creek above confluence with Monitor Creek, near Rimini
462721112164801 Monitor Creek at mouth, near Rimini

Three new water-quality stations were established in the Clark Fork basin to gain additional information on metal sources. These stations are:

12323700 Mill Creek at Opportunity
12323720 Willow Creek at Opportunity
12323850 Lost Creek near Galen

Water-quality sampling was reestablished at station 12335500, Nevada Creek above Reservoir, near Helmville, to supplement data collected at several other sites in the Blackfoot River basin for the purpose of watershed characterization.

Five streamflow-gaging stations were discontinued during or at the end of water year 2003:

06139800 West Fork Beaver Creek near Rocky Boy
06139850 Beaver Creek above Elk Creek, near Rocky Boy
06212500 Red Lodge Creek below Cooney Reservoir, near Boyd
12323248 Silver Bow Creek above Wastewater Plant outflow, at Butte
12346500 Skalkaho Creek near Hamilton

Twenty-one water-quality stations were discontinued:

06032300 High Ore Creek near Basin
06038800 Madison River at Kirby Ranch, near Cameron
06043500 Gallatin River near Gallatin Gateway
06048700 East Gallatin River below Bridge Creek, near Bozeman
06071300 Little Prickly Pear Creek at Wolf Creek
06154410 Little Peoples Creek near Hays
06191500 Yellowstone River at Corwin Springs
462508112173601 Unnamed Tributary of Grub Creek, SS No. 3, near Rimini
462505112173601 Unnamed Tributary of Grub Creek, SS No. 2, near Rimini
462503112173001 Unnamed Tributary of Grub Creek, SS No. 4A, near Rimini
462442112174901 Grub Creek near Rimini
462520112165601 Ruby Creek No. 1A above Scott Reservoir, near Rimini
462527112175201 Tenmile Creek at headwaters, near Rimini
462529112173301 Monitor Creek, SS No. 8, near Rimini
462531112172901 Monitor Creek, SS MS, near Rimini
462535112173601 Monitor Creek, SS No. 11, near Rimini
462537112173301 Monitor Creek, SS No. 10, near Rimini
462538112163301 Ruby Creek No. 2 above Scott Reservoir, near Rimini
462541112172001 Monitor Creek Adit near Rimini
462542112173301 Monitor Creek, 5-MC, near Rimini
462549112161401 Ruby Creek No. 3 above Scott Reservoir, near Rimini

SUMMARY OF HYDROLOGIC CONDITIONS

Temperature and Precipitation

For most of Montana, temperatures from October through January were warmer than normal. During the end of February, below-average temperatures moved across Montana, but during March, temperatures generally rose to above normal. The above-normal temperatures in March caused valley and prairie snow to melt in some areas resulting in high flows in some of the streams. Early in May, record low temperatures were recorded in southwest Montana, but by the end of the month, record high temperatures were noted across the State. Temperatures generally remained above average across the State for the rest of the water year.

Precipitation, departure from normal precipitation, and percentage of normal precipitation for seven climatological divisions of the State are listed in table 1. The precipitation data listed in table 1 are averages of the total monthly precipitation for the National Weather Service (NWS) reporting stations within each of the climatological divisions. No attempt was made to area-weight the division totals. As shown in table 1, for October 2002 through March 2003, precipitation ranged from 69 percent of normal in the southwestern division to 109 percent of normal in the southeastern division. For April 2003 through September 2003, precipitation ranged from 71 percent of normal in the western and southwestern divisions to 86 percent of normal in the northeastern division. Total precipitation for water year 2003 varied across the State from 70 percent of normal in southwestern Montana to 89 percent of normal in southeastern Montana. Overall, all climatological divisions received less-than-normal precipitation through water year 2003. Total average precipitation amounts for climatological division for water year 2003 ranged from 10.45 inches for the north-central division to 15.45 inches for the western division.

Most NWS stations in Montana measure precipitation in valley or non-mountainous locations. Data for precipitation falling as snow in the mountainous parts of the State during the winter are published by the U.S. Department of Agriculture, Natural Resources Conservation Service, in the report "Montana Water Supply Outlook." Percentages of normal water content of snowpack, by drainage basin, are listed in table 2.

By March 1, 2003, the percentage-of-normal water content of mountain snowpack ranged from 54 to 94 percent. By April 1, the percentage-of-normal water content increased in most basins from the previous month and ranged from 34 to 115 percent. By May 1, the percentage-of-normal water content ranged from 0 to 99 percent. Overall, the percentage-of-normal water content in snowpack on May 1, 2003, was below normal in the Sun-Teton-Marias (62 percent), Milk (0 percent) and Powder (69 percent) River basins, and near normal (± 20 percent of average) in the remaining basins.

Table 1. Precipitation and departure from normal, in inches, and percentage of normal, Montana, water year 2003[1]

Climatological division (number of stations)	October 2002 through March 2003			April through September 2003			Water year 2003		
	Total monthly precipitation	Departure from normal, 1971-2000	Percentage of normal	Total monthly precipitation	Departure from normal, 1971-2000	Percentage of normal	Total average precipitation	Departure from normal, 1971-2000	Percentage of normal
Western (45)	8.59	-1.74	83	6.86	-2.77	71	15.45	-4.51	77
Southwestern (22)	3.75	-1.71	69	7.40	-3.10	71	11.15	-4.81	70
North Central (42)	2.56	-0.75	77	7.89	-2.13	79	10.45	-2.88	78
Central (35)	3.72	-0.52	88	8.60	-2.20	80	12.32	-2.72	82
South Central (26)	5.41	-0.02	100	7.78	-3.24	70	13.19	-3.26	79
Northeastern (27)	2.29	-0.35	87	8.77	-1.52	86	11.06	-1.87	86
Southeastern (22)	3.87	0.32	109	8.57	-1.89	82	12.44	-1.57	89

[1]Data from U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service, 2003, Climatological Data, Montana, v. 105, no. 10 through v. 106, no. 8; Gina Loss, National Oceanic and Atmospheric Administration, written commun., 2003. Normals of precipitation are determined from the base period 1971-2000.

Table 2. Percentage-of-normal water content of mountain snowpack in Montana, 2003[1]

Drainage basin	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1
Hudson Bay					
St. Mary	70	73	71	88	82
Missouri					
Upper Missouri	62	74	86	93	95
Sun-Teton-Marias	46	52	54	82	62
Smith-Judith-Musselshell	68	74	94	98	94
Milk	9	17	66	34	0
Upper Yellowstone	69	85	92	103	96
Bighorn	70	77	87	103	86
Tongue	77	79	94	115	94
Powder	67	66	82	104	69
Upper Columbia					
Kootenai	73	71	69	86	86
Clark Fork	60	72	79	100	99
Flathead	59	69	69	86	81

[1]Data from J. L. Ward, U.S. Department of Agriculture, Natural Resources Conservation Service, written commun., 2003. Normals for snowpack are determined from the base period 1971-2000.

SURFACE WATER

Streamflow

Streamflow data for water year 2003 can be compared to long-term data for water years 1971-2000 and maximum and minimum monthly mean discharge for the period of record at seven streamflow-gaging stations (fig. 2). Compared to the mean annual discharge (average of the annual mean discharges) for water years 1971-2000, the annual mean discharge shown in figure 2 during water year 2003 was 78 percent of average at Middle Fork Flathead River near West Glacier (station 12358500); 90 percent of average at Clark Fork at St. Regis (station 12354500); 66 percent of average at Missouri River at Toston (station 06054500); 86 percent of average at Yellowstone River at Corwin Springs (station 06191500); 75 percent of average at Yellowstone River at Billings (station 06214500); 64 percent of average at Rock Creek below Horse Creek, near international boundary (station 06169500); and 71 percent of average at Marias River near Shelby (station 06099500).

The annual departure from mean annual discharge at two streamflow-gaging stations on unregulated streams is shown in figure 3. At both Yellowstone River at Corwin Springs and Middle Fork Flathead River near West Glacier, the annual mean discharge during water year 2003 was less than the long-term average for the period of record.

Extraordinary flooding did not occur in any major river basins in Montana during water year 2003. However, flash flooding did occur in March in several small, ungaged drainages during a rapid snowmelt period across the northern and eastern plains and in west-central intermontane valleys in Montana. A comparison of peak discharges at 25 selected streamflow-gaging stations for water year 2003 to peak discharges for the period of record is presented in table 3. Record peak discharges were not recorded for any of these stations, although peak discharge could not be determined at three of the stations in water year 2003. The recurrence intervals for peaks during water year 2003 were less than 2 years at 10 stations, 2-5 years at 10 stations, 5-10 years at 1 station, and 20-50 years at 1 station.

A comparison of minimum daily mean discharge for 24 selected long-term streamflow-gaging stations for water year 2003 to minimum daily mean discharge for the period of record is presented in table 4. Record minimum daily mean discharges were not recorded during water year 2003, although below-normal streamflow conditions prevailed through the year in Montana. Minimum daily discharges had recurrence intervals of less than 2 years at 10 sites, recurrence intervals of 2-5 years at 8 sites, recurrence intervals of 5-10 years at 5 sites, and recurrence intervals of 20-50 years at 1 site.

The percentage-of-normal storage (based on water years 1971-2000), by month, for major reservoirs is listed in table 5. At the end of water year 2003, storage was normal or within 20 percent of normal in five of the six major reservoirs used to supply water primarily for hydroelectric-power generation, but storage was well below normal in all four reservoirs used to supply water primarily for irrigation.

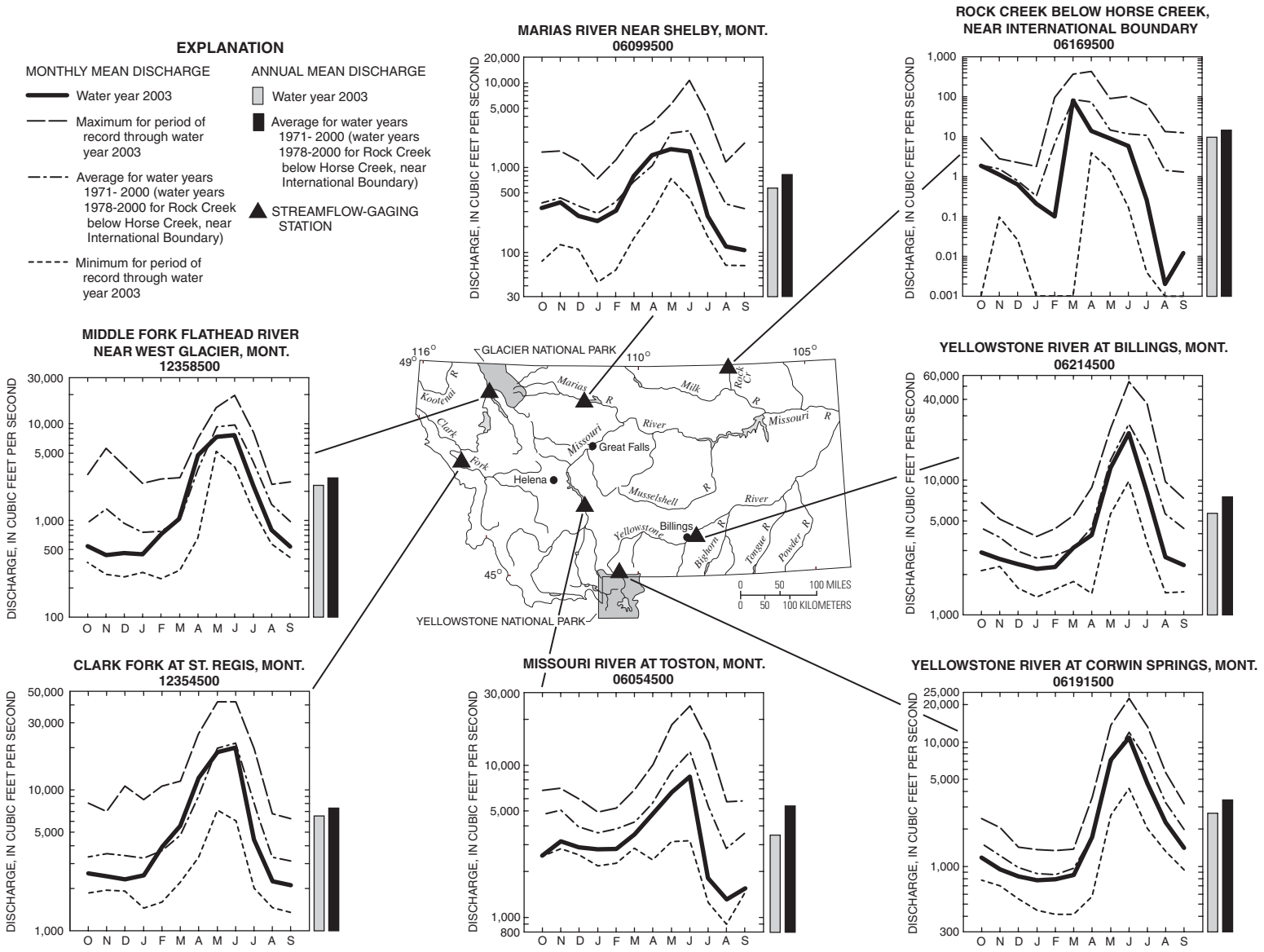

Figure 2. Streamflow data for water year 2003 compared to long-term data at selected streamflow-gaging stations, Montana.

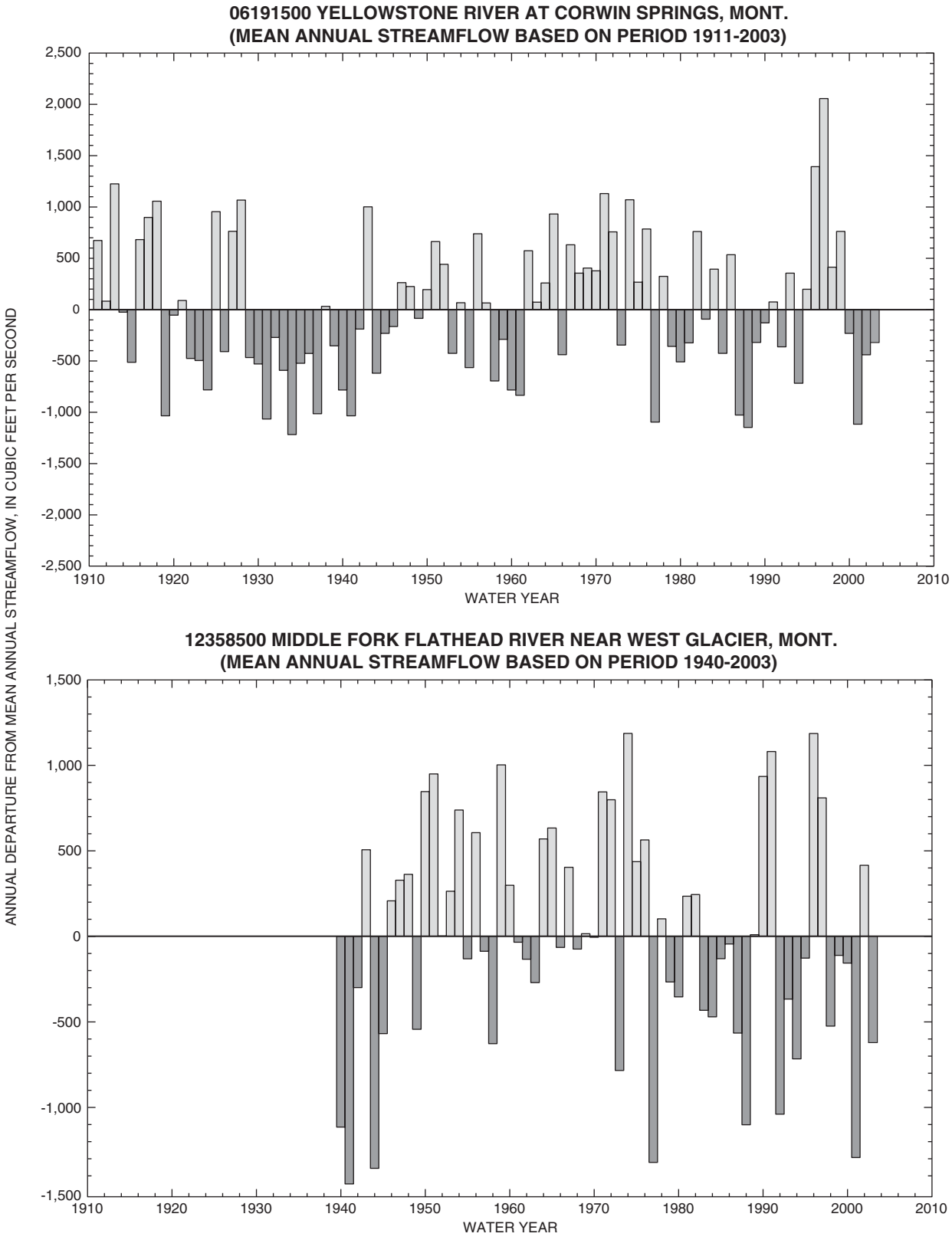

Figure 3. Annual departure from mean annual discharge at two streamflow-gaging stations on unregulated streams in Montana.

Table 3. Comparisons of instantaneous peak discharge for water year 2003 with instantaneous peak discharge for period of record at selected stations in Montana

[Symbols: <, less than; --, not determined; *, outside period of record]

Station number	Station name	Drainage area (square miles)	Peak discharge, water year 2003			Peak discharge, period of record through water year 2002	
			Date	Cubic feet per second	Recurrence interval (years)	Date	Cubic feet per second
05014500	Swiftcurrent Creek at Many Glacier	30.9	05/27	1,180	2-5	06/08/64	6,700
05017500	St. Mary River near Babb	276	05/31	2,960	<2	06/09/64	16,500
06025500	Big Hole River near Melrose	2,476	05/31	9,520	2-5	06/10/72	14,300
06054500	Missouri River at Toston	14,669	06/02	20,200	2-5	06/12/97	34,000
06089000	Sun River near Vaughn	1,854	05/27	3,620	<2	06/09/64	53,500
06099500	Marias River near Shelby	3,242	03/15	4,180	<2	06/09/64	241,000
06115200	Missouri River near Landusky	40,987	03/16	unknown	--	06/03/53	137,000
06120500	Musselshell River at Harlowton	1,125	04/27	411	<2	06/20/75	7,270
06154400	Peoples Creek near Hays	220	03/14	391	2-5	06/08/72	8,460
06174500	Milk River at Nashua	22,332	03/25	4,760	<2	04/18/52	45,300
06181000	Poplar River near Poplar	3,174	unknown	unknown	--	04/06/54	37,400
06191500	Yellowstone River at Corwin Springs	2,623	06/01	23,800	5-10	06/10/96	32,200
						06/06/97	32,200
06200000	Boulder River at Big Timber	523	05/30	5,290	2-5	06/05/97	9,940
06214500	Yellowstone River at Billings	11,795	06/02	46,500	2-5	06/12/97	82,000
06289000	Little Bighorn River at State Line, near Wyola	193	05/31	1,460	2-5	06/03/44	2,730
06308500	Tongue River at Miles City	5,397	03/15	4,000	2-5	06/15/62	13,300
06329500	Yellowstone River near Sidney	69,103	06/05	49,100	<2	06/21/21	159,000
12301300	Tobacco River near Eureka	440	05/30	908	<2	05/13/91	3,180
12304500	Yaak River near Troy	766	05/26	3,440	<2	05/17/97	12,600
						* 05/54	*13,400
12332000	Middle Fork Rock Creek near Philipsburg	123	05/31	1,670	20-50	06/16/74	1,680
12335500	Nevada Creek above Reservoir, near Helmville	116	unknown	unknown	--	06/02/53	1,800
12340000	Blackfoot River near Bonner	2,290	05/30	8,100	<2	06/10/64	19,200
12354500	Clark Fork at St. Regis	10,709	06/02	44,300	2-5	05/24/48	68,900
						05/18/97	68,900
12358500	Middle Fork Flathead River near West Glacier	1,128	05/26	19,800	<2	06/09/64	140,000
12370000	Swan River near Bigfork	671	06/02	5,290	2-5	06/20/74	8,890

Table 4. Comparisons of minimum daily mean discharge for water year 2003 to minimum daily mean discharge for period of record at selected stations in Montana

[Symbol: <, less than]

Station number	Station name	Drainage area (square miles)	Minimum daily mean discharge, water year 2003			Minimum daily mean discharge, period of record through water year 2002	
			Date	Cubic feet per second	Recurrence interval (years)	Date	Cubic feet per second
05014500	Swiftcurrent Creek at Many Glacier	30.9	01/19	17	<2	11/14,16/76	0
05017500	St. Mary River near Babb	276	12/25	59	<2	01/03/53	27
06025500	Big Hole River near Melrose	2,476	09/06	177	2-5	08/17/31	49
06054500	Missouri River at Toston	14,669	08/24	1,180	2-5	01/12/63	700
06089000	Sun River near Vaughn	1,854	09/07	173	<2	05/26/41	23
06099500	Marias River near Shelby	3,242	09/04	70	2-5	08/20/19	10
06115200	Missouri River near Landusky	40,987	09/09	3,650	2-5	12/13/36	1,220
06120500	Musselshell River at Harlowton	1,125	09/08	1.9	5-10	([1])	0
06174500	Milk River at Nashua	22,332	07/05	44	<2	([1])	0
06181000	Poplar River near Poplar	3,174	08/28	2.8	<2	([1])	0
06191500	Yellowstone River at Corwin Springs	2,623	12/24	656	<2	02/05/89	380
06200000	Boulder River at Big Timber	523	02/24	55	2-5	08/26/61	12
06214500	Yellowstone River at Billings	11,795	02/24	1,500	<2	12/12/32	450
06289000	Little Bighorn River at State line, near Wyola	193	02/24	20	20-50	02/02/89	18
06308500	Tongue River at Miles City	5,397	10/01	35	<2	07/09/40	0
06329500	Yellowstone River near Sidney	69,103	08/30	1,720	5-10	05/17/61	570
12301300	Tobacco River near Eureka	440	12/28	35	5-10	01/11/63	20
12304500	Yaak River near Troy	766	09/07	33	5-10	09/19/01	49
12332000	Middle Fork Rock Creek near Philipsburg	123	02/24	25	<2	02/09/53	5.3
12335500	Nevada Creek above Reservoir, near Helmville	116	08/03	3.6	2-5	01/11/44	2.0
12340000	Blackfoot River near Bonner	2,290	01/10	300	2-5	01/04/50	200
12354500	Clark Fork at St. Regis	10,709	01/12	1,800	<2	02/03/89	800
12358500	Middle Fork Flathead River near West Glacier	1,128	01/11	299	2-5	11/27/52	189
12370000	Swan River near Bigfork	671	09/08	287	5-10	01/26-29/30	193

[1]At various dates.

Table 5. Percentage-of-normal storage, by month, during water year 2003 for selected major reservoirs in Montana

Reservoir	Usable capacity (acre-feet)	Percentage-of-normal storage based on 1971-2000 period of record											
		2002			2003								
		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Hydroelectric-power generation													
Canyon Ferry Lake	2,043,000	97	96	98	102	105	108	112	106	101	96	95	92
Fort Peck Lake	18,910,000	72	73	72	70	70	73	71	68	67	65	64	64
Bighorn Lake	1,356,000	64	68	70	72	72	75	77	78	81	77	81	80
Lake Koocanusa	5,748,000	109	122	119	149	178	167	160	145	120	103	92	92
Hungry Horse Reservoir	3,451,000	103	103	105	110	115	125	136	115	108	100	97	100
Flathead Lake	1,791,000	109	111	100	125	143	155	129	103	100	99	99	100
Irrigation													
Lima Reservoir	84,050	20	25	31	34	39	43	49	49	9	9	12	16
Clark Canyon Reservoir	255,600	19	25	31	36	39	43	44	40	25	11	9	13
Gibson Reservoir	99,050	93	92	89	87	86	91	132	107	92	31	13	21
Fresno Reservoir	103,000	88	94	98	98	93	101	96	101	63	61	41	53

Water Quality

The USGS operates a network of water-quality stations throughout Montana in cooperation with numerous Federal, State, and local agencies and Tribal governments. The network changes from year to year as objectives are achieved or modified, or funding levels change. Some stations are operated for only a few years and commonly are part of a short-term investigation to examine water quality related to a specific condition. Other stations have been in operation for many years and provide a basis for description of long-term water-quality conditions or trends that represent a wide range of hydrologic or land-use variability. Long-term stations typically are located on major streams that represent an important water resource in the area and require data on an ongoing basis for various management concerns. A statewide network of 37 water-quality stations established in 1999 continued in operation through 2003. The network supplements the long-term record of water quality across the State and provides a reference for trends over time. Water-quality sampling that was started in 2001 at four sites in southeastern Montana (Tongue and Powder River basins) continued in 2003 and was subsequently expanded to seven sites (including the Rosebud Creek basin) to assist the States of Montana and Wyoming with assessing the potential effects of coal-bed methane development on water resources in these basins.

Various water-quality measurements are made, either onsite or by laboratory analysis of samples, depending on the objective of the investigation. Several types of water-quality data that describe physical and chemical characteristics are routinely obtained in many sampling programs. Examples of commonly measured water-quality characteristics are dissolved solids, dissolved oxygen, dissolved nitrite plus nitrate, total phosphorus, and suspended sediment. Guideline concentrations established by the State of Montana[1] serve to illustrate the general range of values protective of human health and aquatic organisms.

The concentration of dissolved solids, which represents the mass (milligrams) of all constituents dissolved in a unit volume (liter) of water, can be determined either from the weight of dry residue that remains after evaporation of a known volume of water that has been filtered to remove particulate material, or estimated from the sum of the individual dissolved major-ion concentrations. An excessive concentration of dissolved solids can render the water unsuitable for certain uses such as human consumption, irrigation of crops, or livestock watering. Water-quality criteria established by the State of Montana[2] indicate that water might not be suitable when dissolved-solids concentrations exceed 500 mg/L if used for human consumption, 1,200 mg/L if used for crop irrigation, and 10,000 mg/L if used for livestock watering.

Dissolved oxygen in surface water is essential for most aquatic organisms and is an indicator of the biochemical condition of the stream or lake. The solubility of oxygen in water is a function of water temperature and barometric pressure; therefore, the oxygen content in surface water is subject to considerable daily and seasonal change. Biological activities such as photosynthesis and decomposition also can cause rapid and large changes in dissolved-oxygen concentration. Dissolved-oxygen concentrations less than 5.0

[1]Montana Department of Health and Environmental Sciences, 1986, Montana water quality, 1986: Helena, Montana Department of Health and Environmental Sciences, 1986 Montana 305(b) Report, 198 p.

[2]Montana Department of Environmental Quality, 2002, Montana numeric water quality standards: Helena, Mont., Water Quality Division, Circular WBQ-7, 37 p.

mg/L for warm-water fish or 8.0 mg/L for cold-water fish may be detrimental if sustained for extended periods of time.[2]

Nitrogen (N) is an essential plant nutrient that occurs in several forms in surface water. Common sources of nitrogen are atmospheric deposition, soils, plant fertilizers, animal waste, and sewage or septic effluent. Nitrite and nitrate are forms of nitrogen that can occur in surface water, although nitrite is seldom present in large amounts in oxygenated water. Dissolved nitrate is a major nutrient for plants; consequently, large concentrations of nitrate in streams and lakes can cause rapid growth of aquatic plants. Nitrate concentrations in excess of 0.3 mg/L as N have the potential to cause nuisance growths of algae and other aquatic plants (Ivalou O'Dell, U.S. Geological Survey, written communication, 1994). In addition, human health can be adversely affected if the nitrate concentration exceeds 10 mg/L as N in drinking water.[3]

Phosphorus (P) is an essential plant nutrient that can stimulate excessive growth of aquatic plants. Total phosphorus includes the inorganic and organic forms of dissolved and suspended phosphorus and is commonly analyzed as an indicator of eutrophication potential. Although phosphorus can originate naturally from igneous and sedimentary rock formations, more common sources include sewage, detergents, fertilizer, and livestock waste. Total phosphorus in streams should not exceed 0.1 mg/L as P to prevent nuisance plant growth according to water-quality criteria established by the State of Montana.[2] Water-quality criteria established by the EPA[4] also indicate that total phosphorus should not exceed 0.05 mg/L as P in streams discharging directly to lakes or 0.025 mg/L as P within lakes.

Suspended sediment is particulate material eroded from the land surface by either wind or water and maintained in suspension in streams by hydraulic energy. The quantity of suspended sediment in streams typically increases during periods of increased runoff, when large amounts of rainfall or snowmelt can rapidly erode soil and the increased streamflow can scour channel sediments. Although large suspended-sediment concentrations can occur naturally in areas underlain by easily erodible geologic materials, land use that disturbs soils also can contribute substantial quantities of sediment to streams and lakes. The quantity of sediment in suspension has important physical and chemical implications for aquatic life. Sediment in suspension during high flow may be deposited in stream channels or lakes where water velocities decrease. In areas of sediment deposition, aquatic insects or fish eggs can be smothered, thereby rendering the bottom habitat unsuitable for their survival. Many chemical constituents such as some metals, phosphorus, and some pesticides tend to sorb strongly to sediment. As a result, chemicals may be readily transported from land sources into river systems where aquatic organisms could be exposed to toxic concentrations.

Statistical summaries of selected water-quality measurements made at eight long-term water-quality stations in Montana are presented in table 6. The range of values for each type of measurement is described by the minimum and maximum values. To compare current and long-term water-quality conditions, the range of values are summarized for both water year 2003 and the period of record through water year 2002. In addition, the central tendency of data collected over the period of record is described by the median (50th percentile).

GROUND WATER

Ground-Water Levels

Water levels were measured in 53 observation wells during water year 2003. Water levels in most of these wells primarily reflect the response of the ground-water system in the area to natural climatic conditions. However, several wells are within the zone of influence of human activities, and water levels in these wells can be affected by pumping or infiltration of applied irrigation water. Seventeen of the observation wells are equipped with continuous water-level recorders and have varying lengths of record. One of the continuous recorders was converted to near real-time data delivery, with water-level data collected hourly and transmitted every 4 hours via satellite for display as part of the USGS National Water Information System program web site:

http://waterdata.usgs.gov/nwis

Individual data values from the continuous recorders are not presented in this report but are available at the Montana District Office in Helena. Hydrographs are included for the 17 wells equipped with recorders, and periodic water-level data for all 53 wells are presented in this report. Water levels commonly fluctuate throughout the year and from year to year as a result of changes in climatic conditions or human activities. Some of the hydrographs show the effects of the below-normal precipitation in many climatological divisions across Montana during water year 2003.

[3]U.S. Environmental Protection Agency, 1991, Maximum Contaminant Levels (section 141.62 of subpart G of part 141, National Revised Primary Drinking Water Regulations): U.S. Code of Federal Regulations Title 40, Parts 100 to 149, revised as of July 1, 1991, p. 673.

[4]U.S. Environmental Protection Agency, 1986, Quality criteria for water, 1986: Washington, D.C., Office of Water Regulations and Standards, EPA 440/5-86-001, unpaged.

Table 6. Statistical summaries of selected water-quality measurements for long-term water-quality stations in Montana for water year 2003 and the period of record through water year 2002

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

Station number	Station name	Water year 2003			Period of record through water year 2002			
		Number of samples	Minimum	Maximum	Number of samples	Minimum	Maximum	Median
Dissolved solids, in milligrams per liter								
06054500	Missouri River near Toston	2	176	197	167	123	299	238
06178500	East Poplar River at International Boundary	4	896	991	263	97	1,480	940
06185500	Missouri River near Culbertson	8	330	429	231	221	579	403
06192500	Yellowstone River near Livingston	2	96	109	260	55	251	154
06326500	Powder River near Locate	12	591	2,230	206	408	3,450	1,460
06329500	Yellowstone River near Sidney	2	158	465	295	142	863	469
12301933	Kootenai River below Libby Dam, near Libby	2	122	143	240	55	211	139
12388700	Flathead River at Perma	2	95	102	69	89	106	96
Dissolved oxygen, in milligrams per liter								
06054500	Missouri River near Toston	0	--	--	321	6.2	13.8	9.6
06178500	East Poplar River at International Boundary	4	6.1	8.7	259	.9	17.2	9.2
06185500	Missouri River near Culbertson	8	7.8	12.8	277	6.0	14.2	9.3
06192500	Yellowstone River near Livingston	0	--	--	198	7.0	14.6	9.5
06326500	Powder River near Locate	9	6.7	11.7	311	2.7	15.7	8.6
06329500	Yellowstone River near Sidney	11	6.3	14.0	490	4.4	15.0	8.7
12301933	Kootenai River below Libby Dam, near Libby	8	9.3	11.4	440	6.9	18.3	10.8
12388700	Flathead River at Perma	0	--	--	99	7.4	18.1	10.5
Dissolved nitrite plus nitrate, in milligrams per liter as nitrogen								
06054500	Missouri River near Toston	4	.015	.172	97	<.05	.38	.08
06178500	East Poplar River at International Boundary	4	<.022	.149	61	<.01	.29	.07
06185500	Missouri River near Culbertson	8	<.022	.099	157	<.005	.38	.007
06192500	Yellowstone River near Livingston	4	.017	.238	239	<.05	1.2	.10
06326500	Powder River near Locate	12	<.022	.814	144	<.01	1.8	.27
06329500	Yellowstone River near Sidney	11	<.060	.660	235	<.005	.73	.20
12301933	Kootenai River below Libby Dam, near Libby	8	.036	.121	302	<.05	.79	.10
12388700	Flathead River at Perma	4	<.022	.020	36	<.005	.21	.02
Total phosphorus, in milligrams per liter as phosphorus								
06054500	Missouri River near Toston	4	.04	.20	177	<.01	.44	.04
06178500	East Poplar River at International Boundary	4	.05	.12	265	<.01	.40	.03
06185500	Missouri River near Culbertson	8	.08	.35	217	.01	.93	.08
06192500	Yellowstone River near Livingston	4	.02	.23	117	<.01	1.2	.03
06326500	Powder River near Locate	12	.01	6.0	207	.008	26	.17
06329500	Yellowstone River near Sidney	11	.02	1.4	366	<.01	2.7	.09
12301933	Kootenai River below Libby Dam, near Libby	8	<.004	.012	515	<.001	.26	.008
12388700	Flathead River at Perma	4	.002	.047	83	<.008	.24	.005
Suspended sediment, in milligrams per liter								
06054500	Missouri River near Toston	4	13	146	231	4	491	18
06178500	East Poplar River at International Boundary	4	75	121	229	4	322	54
06185500	Missouri River near Culbertson	8	156	477	178	19	2,370	238
06192500	Yellowstone River near Livingston	4	8	290	160	2	1,090	10
06326500	Powder River near Locate	11	32	16,000	279	8	41,400	745
06329500	Yellowstone River near Sidney	17	30	3,220	398	10	15,500	312
12301933	Kootenai River below Libby Dam, near Libby	6	1	2	17	1	3	2
12388700	Flathead River at Perma	4	2	70	72	1	65	4

EXPLANATION OF THE RECORDS

The surface-water and ground-water records published in this report are for water year 2003 that began October 1, 2002, and ended September 30, 2003. A calendar of the water year is provided on the inside of the front cover. The records contain streamflow data, stage and content data for lakes and reservoirs, water-quality data for surface and ground water, and ground-water-level data. The locations of the stations and wells where the data were collected are shown in figures 6 through 8. The following sections of the introductory text are presented to provide users with a more detailed explanation of how the hydrologic data published in this report were collected, analyzed, computed, and arranged for presentation.

DOWNSTREAM ORDER AND STATION NUMBER

Since October 1, 1950, hydrologic-station records in USGS reports have been listed in order of downstream direction along the main stream. All stations on a tributary entering upstream from a main-stream station are listed before that station. A station on a tributary entering between two main-stream stations is listed between those stations. A similar order is followed in listing stations on first rank, second rank, and other ranks of tributaries. The rank of any tributary on which a station is located with respect to the stream to which it is immediately tributary is indicated by an indention in that list of stations in the front of this report. Each indentation represents one rank. This downstream order and system of indentation indicates which stations are on tributaries between any two stations and the rank of the tributary on which each station is located.

As an added means of identification, each hydrologic station and partial-record station has been assigned a station number. These station numbers are in the same downstream order used in this report. In assigning a station number, no distinction is made between partial-record stations and other stations; therefore, the station number for a partial-record station indicates downstream-order position in a list composed of both types of stations. Gaps are consecutive. The complete 8-digit (or 10-digit) number for each station such as 06090300, which appears just to the left of the station name, includes a 2-digit part number "06" plus the 6-digit (or 8-digit) downstream order number "090300." In areas of high station density, an additional two digits may be added to the station identification number to yield a 10-digit number. The stations are numbered in downstream order as described above between stations of consecutive 8-digit numbers.

NUMBERING SYSTEM FOR WELLS AND MISCELLANEOUS SITES

The USGS well and miscellaneous site-numbering system is based on the grid system of latitude and longitude. The system provides the geographic location of the well or miscellaneous site and a unique number for each site. The number consists of 15 digits. The first 6 digits denote the degrees, minutes, and seconds of latitude, and the next 7 digits denote degrees, minutes, and seconds of longitude; the last 2 digits are a sequential number for wells within a 1-second grid. In the event that the latitude-longitude coordinates for a well and miscellaneous site are the same, a sequential number such as "01," "02," and so forth, would be assigned as one would for wells (see fig. 4). The 8-digit, downstream order station numbers are not assigned to wells and miscellaneous sites where only random water-quality samples or discharge measurements are taken.

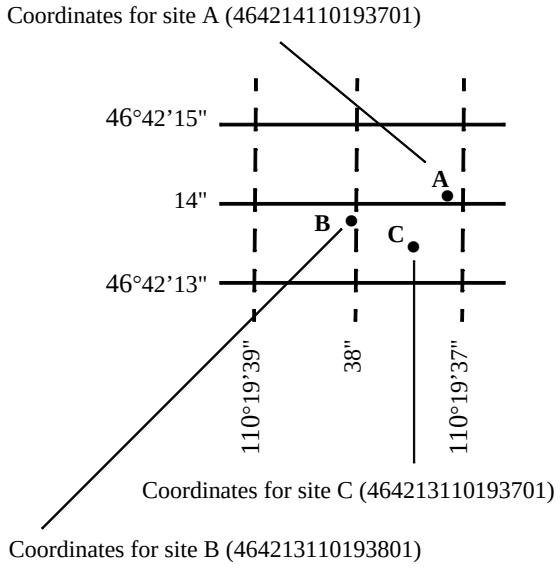

Figure 4. System for numbering wells and miscellaneous sites (latitude and longitude).

In addition to the well number that is based on latitude and longitude given for each well, another well number is given that is based on the Bureau of Land Management's system of land subdivision. This well number is familiar to the water users of Montana and shows the location of the well by quadrant, township, range section, and position within the section (see fig. 5). The capital letter at the beginning of the location number indicates the quadrant in which the well is located. Four quadrants are formed by the intersection of the base line and the principal meridian—A indicates the northeast quadrant, B the northwest, C the southwest, and D the southeast. The first numeral indicates the township, the second the range, and the third the section in which the well is located. Letters following the section number locate the well within the section. The first letter denotes the quarter section, the second the quarter-quarter section, and the third the quarter-quarter-quarter section. The letters are assigned within the section in a counter-clockwise direction beginning with (a) in the northeast quarter of the section. Letters are assigned within each quarter section and quarter-quarter section in the same manner. Where two or more wells are located within the

smallest subdivision, consecutive numbers beginning with 01 are added to the letters in the order in which the wells are inventoried. For example, 30N33W05ABAB01 is the first well inventoried in $NW^1/_4NE^1/_4NW^1/_4NE^1/_4$ sec. 5, T.30N.,R.33W (northwest quarter of the northeast quarter of the northwest quarter of the northeast quarter of section 5, in township 30 north, range 33 west).

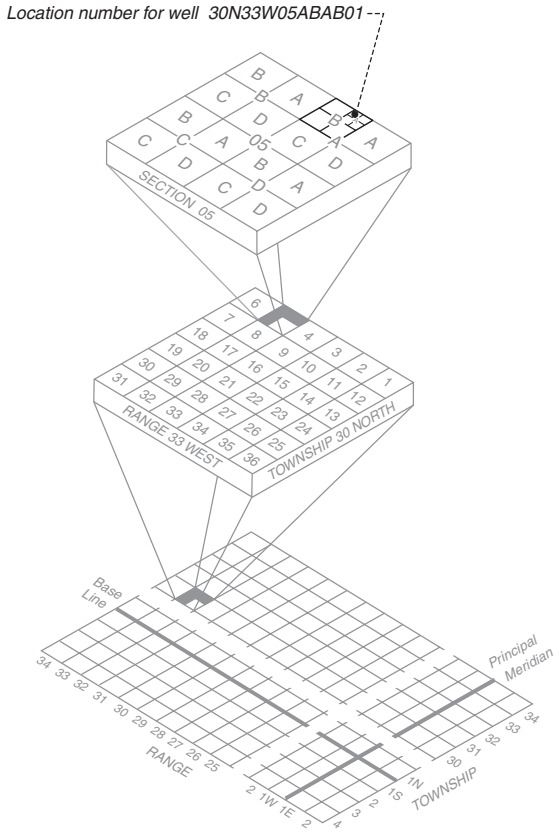

Figure 5. System for numbering wells and miscellaneous sites (township and range).

SPECIAL NETWORKS AND PROGRAMS

Hydrologic Benchmark Network is a network of 61 sites in small drainage basins in 39 States that was established in 1963 to provide consistent streamflow data representative of undeveloped watersheds nationwide, and from which data could be analyzed on a continuing basis for use in comparison and contrast with conditions observed in basins more obviously affected by human activities. At selected sites, water-quality information is being gathered on major ions and nutrients, primarily to assess the effects of acid deposition on stream chemistry. Additional information on the Hydrologic Benchmark Program may be accessed from:

http://water.usgs.gov/hbn/

National Stream-Quality Accounting Network (NASQAN) is a network of sites used to monitor the water quality of large rivers within the Nation's largest river basins. From 1995 through 1999, a network of approximately 40 stations was operated in the Mississippi, Columbia, Colorado, and Rio Grande River basins. For the period 2000 through 2004, sampling was reduced to a few index stations on the Colorado and Columbia Rivers so that a network of 5 stations could be implemented on the Yukon River. Samples are collected with sufficient frequency that the flux of a wide range of constituents can be estimated. The objective of NASQAN is to characterize the water quality of these large rivers by measuring concentration and mass transport of a wide range of dissolved and suspended constituents, including nutrients, major ions, dissolved and sediment-bound heavy metals, common pesticides, and inorganic and organic forms of carbon. This information will be used (1) to describe the long-term trends and changes in concentration and transport of these constituents; (2) to test findings of the National Water-Quality Assessment (NAWQA) Program; (3) to characterize processes unique to large-river systems such as storage and re-mobilization of sediments and associated contaminants; and (4) to refine existing estimates of off-continent transport of water, sediment, and chemicals for assessing human effects on the world's oceans and for determining global cycles of carbon, nutrients, and other chemicals. Additional information about the NASQAN Program may be accessed from:

http://water.usgs.gov/nasqan/

The National Atmospheric Deposition Program/ National Trends Network (NADP/NTN) is a network of monitoring sites that provide continuous measurement and assessment of the chemical constituents in precipitation throughout the United States. As the lead Federal agency, the USGS works together with over 100 organizations to provide a long-term, spatial and temporal record of atmospheric deposition generated from this network of 250 precipitation-chemistry monitoring sites. The USGS supports 74 of these 250 sites. This long-term, nationally consistent monitoring program, coupled with ecosystem research, provides critical information toward a national scorecard to evaluate the effectiveness of ongoing and future regulations intended to reduce atmospheric emissions and subsequent impacts to the Nation's land and water resources. Reports and other information on the NADP/NTN Program, as well as data from the individual sites, may be accessed from:

http://bqs.usgs.gov/acidrain/

The USGS National Water-Quality Assessment (NAWQA) Program is a long-term program with goals to describe the status and trends of water-quality conditions for a large, representative part of the Nation's ground- and surface-water resources; to provide an improved understanding of the primary natural and human factors affecting these observed conditions and trends; and to provide information that supports development and evaluation of management, regulatory, and monitoring decisions by other agencies.

Assessment activities are being conducted in 42 study units (major watersheds and aquifer systems) that represent a wide range of environmental settings nationwide and that account for a large percentage of the Nation's water use. A wide array of chemical constituents is measured in ground water, surface water, streambed sediments, and fish tissues. The coordinated application of comparative hydrologic studies at a wide range of spatial and temporal scales will provide information for water-resources managers to use in making decisions and a foundation for aggregation and comparison of findings to address water-quality issues of regional and national interest.

Communication and coordination between USGS personnel and other local, State, and Federal interests are critical components of the NAWQA Program. Each study unit has a local liaison committee consisting of representatives from key Federal, State, and local water-resources agencies, Indian nations, and universities in the study unit. Liaison committees typically meet semiannually to discuss their information needs, monitoring plans and progress, desired information products, and opportunities to collaborate efforts among the agencies. Additional information about the NAWQA Program may be accessed from:

http://water.usgs.gov/nawqa/

The USGS National Streamflow Information Program (NSIP) is a long-term program with goals to provide framework streamflow data across the Nation. Included in the program are creation of a permanent Federally funded streamflow network, research on the nature of streamflow, regional assessments of streamflow data and databases, and upgrades in the streamflow information delivery systems. Additional information about NSIP may be accessed from:

http://water.usgs.gov/nsip/

EXPLANATION OF STAGE- AND WATER-DISCHARGE RECORDS

Data Collection and Computation

The base data collected at gaging stations (fig. 6) consist of records of stage and measurements of discharge of streams or canals, and stage, surface area, and volume of lakes or reservoirs. In addition, observations of factors affecting the stage-discharge relation or the stage-capacity relation, weather records, and other information are used to supplement base data in determining the daily flow or volume of water in storage. Records of stage are obtained from a water-stage recorder that is either downloaded electronically in the field to a laptop computer or similar device or is transmitted using telemetry such as GOES satellite, land-line or cellular-phone modems, or by radio transmission. Measurements of discharge are made with a current meter or acoustic Doppler current profiler, using the general methods adopted by the USGS. These methods are described in standard textbooks, USGS Water-Supply Paper 2175, and the Techniques of Water-Resources Investigations of the United States Geological Survey (TWRIs), Book 3, Chapters A1 through A19 and Book 8, Chapters A2 and B2. The methods are consistent with the American Society for Testing and Materials (ASTM) standards and generally follow the standards of the International Organization for Standards (ISO).

For stream-gaging stations, discharge-rating tables for any stage are prepared from stage-discharge curves. If extensions to the rating curves are necessary to express discharge greater than measured, the extensions are made on the basis of indirect measurements of peak discharge (such as slope-area or contracted-opening measurements, or computation of flow over dams and weirs), step-backwater techniques, velocity-area studies, and logarithmic plotting. The daily mean discharge is computed from gage heights and rating tables, then the monthly and yearly mean discharges are computed from the daily values. If the stage-discharge relation is subject to change because of frequent or continual change in the physical features of the stream channel, the daily mean discharge is computed by the shifting-control method in which correction factors based on individual discharge measurements and notes by engineers and observers are used when applying the gage heights to the rating tables. If the stage-discharge relation for a station is temporarily changed by the presence of aquatic growth or debris on the controlling section, the daily mean discharge is computed by the shifting-control method.

At some stations, stage-discharge relation is affected by changing stage. At these stations, the rate of change in stage is used as a factor in computing discharge.

At some stream-gaging stations in the northern United States, the stage-discharge relation is affected by ice in the winter; therefore, computation of the discharge in the usual manner is impossible. Discharge for periods of ice effect is computed on the basis of gage-height record and occasional winter-discharge measurements. Consideration is given to the available information on temperature and precipitation, notes by gage observers and hydrologists, and comparable records of discharge from other stations in the same or nearby basins.

For a lake or reservoir station, capacity tables giving the volume or contents for any stage are prepared from stage-area relation curves defined by surveys. The application of the stage to the capacity table gives the contents, from which the daily, monthly, or yearly changes are computed.

If the stage-capacity curve is subject to changes because of deposition of sediment in the reservoir, periodic resurveys of the reservoir are necessary to define new stage-capacity curves. During the period between reservoir surveys, the computed contents may be increasingly in error due to the gradual accumulation of sediment.

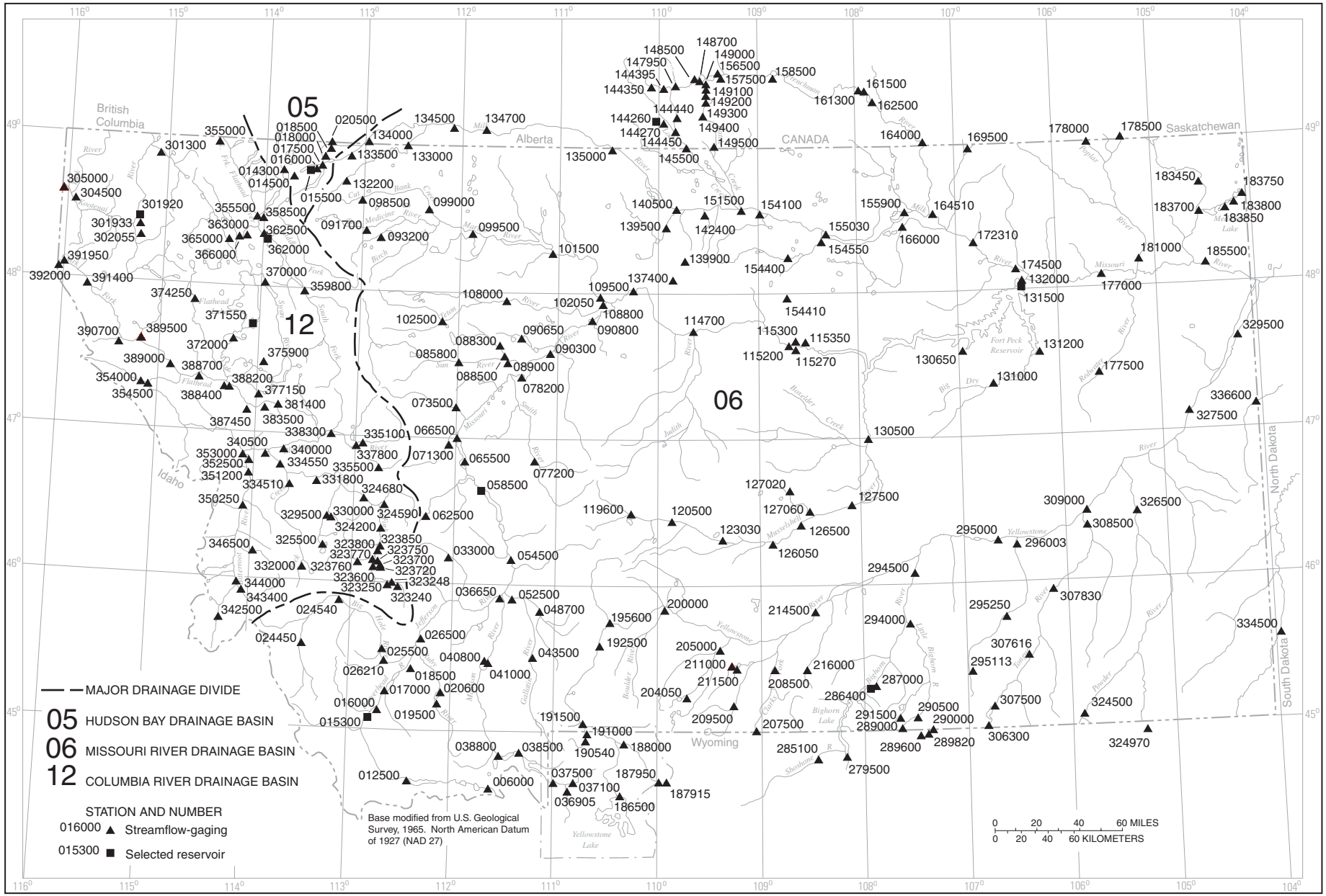

Figure 6. Location of streamflow-gaging and selected reservoir stations in Montana and adjacent areas, water year 2003.

For some stream-gaging stations, periods of time occur when no gage-height record is obtained or the recorded gage height is faulty and cannot be used to compute daily discharge or contents. Such a situation can happen when the recorder stops or otherwise fails to operate properly, the intakes are plugged, the float is frozen in the well, or for various other reasons. For such periods, the daily discharges are estimated on the basis of recorded range in stage, prior and subsequent records, discharge measurements, weather records, and comparison with records from other stations in the same or nearby basins. Likewise, lake or reservoir volumes may be estimated on the basis of operator's log, prior and subsequent records, inflow-outflow studies, and other information.

Data Presentation

The records published for each continuous-record surface-water discharge station (stream-gaging station) consist of four parts: (1) the station manuscript or description; (2) the data table of daily mean values of discharge for the current water year with summary data; (3) a tabular statistical summary of monthly mean flow data for a designated period, by water year; and (4) a summary statistics table that includes statistical data of annual, daily, and instantaneous flows as well as data pertaining to annual runoff, 7-day low-flow minimums, and flow duration.

Station Manuscript

The manuscript provides, under various headings, descriptive information, such as station location; period of record; historical extremes outside the period of record; record accuracy; and other remarks pertinent to station operation and regulation. The following information, as appropriate, is provided with each continuous record of discharge or lake content. Comments follow that clarify information presented under the various headings of the station description.

LOCATION.—Location information is obtained from the most accurate maps available. The location of the gaging station with respect to the cultural and physical features in the vicinity and with respect to the reference place mentioned in the station name is given. River mileages, given for most stations, were determined by methods given in Montana Department of Natural Resources and Conservation River Mile Index[5,6,7].

DRAINAGE AREA.—Drainage areas are measured using the most accurate maps available. Because the type of maps available varies from one drainage basin to another, the accuracy of drainage areas likewise varies. Drainage areas are updated as better maps become available.

PERIOD OF RECORD.—This term indicates the time period for which records have been published for the station or for an equivalent station. An equivalent station is one that was in operation at a time that the present station was not and whose location was such that its flow reasonably can be considered equivalent to flow at the present station.

REVISED RECORDS.—If a critical error in published records is discovered, a revision is included in the first report published following discovery of the error.

GAGE.—The type of gage in current use, the elevation of the current gage referred to a standard datum, and a condensed history of the types, locations, and elevations of previous gages are given under this heading.

REMARKS.—All periods of estimated daily discharge are flagged in the daily discharge table. (See section titled Identifying Estimated Daily Discharge.) Information is presented relative to the accuracy of the records, to special methods of computation, and to conditions that affect natural flow at the station. In addition, information may be presented pertaining to average discharge data for the period of record; to extremes data for the period of record and the current year; and, possibly, to other pertinent items. For reservoir stations, information is given on the dam forming the reservoir, the capacity, the outlet works and spillway, and the purpose and use of the reservoir.

COOPERATION.—Records provided by a cooperating organization or obtained for the USGS by a cooperating organization are identified here.

EXTREMES OUTSIDE PERIOD OF RECORD.—Information here documents major floods or unusually low flows that occurred outside the stated period of record. The information may or may not have been obtained by the USGS.

REVISIONS.—Records are revised if errors in published records are discovered. Appropriate updates are made in the USGS distributed data system, NWIS, and subsequently to its Web-based National data system, NWISWeb:

http://water.usgs.gov/nwis/nwis

Users are encouraged to obtain all required data from NWIS or NWISWeb to ensure that they have the most recent data updates. Updates to NWISWeb are made on an annual basis.

Although rare, occasionally the records of a discontinued gaging station may need revision. Because no current or, possibly, future station manuscript would be published for these stations to document the revision in a REVISED RECORDS entry, users of data for these stations who obtained the record from previously published data reports may wish to contact the District Office (address given on the back of the title page of this report) to determine if the published records were revised after the station was discontinued. If, however, the data for a discontinued station were obtained by computer

[5]Montana Department of Natural Resources and Conservation, 1976, River mile index of the Yellowstone River: Helena, Mont., 61 p.
[6]Montana Department of Natural Resources and Conservation, 1979, River mile index of the Missouri River: Helena, Mont., 142 p.
[7]Montana Department of Natural Resources and Conservation, 1984, River mile index of the Columbia River basin: Helena, Mont., p. 1-76.

retrieval, the data would be current. Any published revision of data is always accompanied by revision of the corresponding data in computer storage.

Manuscript information for lake or reservoir stations differs from that for stream stations in the nature of the REMARKS and in the inclusion of a stage-capacity table when daily volumes are given.

Data Table of Daily Mean Values

The daily table of discharge records for stream-gaging stations gives mean discharge for each day of the water year. In the monthly summary for the table, the line headed TOTAL gives the sum of the daily figures for each month; the line headed MEAN gives the arithmetic average flow in cubic feet per second for the month; and the lines headed MAX and MIN give the maximum and minimum daily mean discharges, respectively, for each month. Discharge for the month is expressed in cubic feet per second per square mile (line headed CFSM); or in inches (line headed IN); or in acre-feet (line headed AC-FT). Values for cubic feet per second per square mile and runoff in inches or in acre-feet may be omitted if extensive regulation or diversion is in effect or if the drainage area includes large noncontributing areas. At some stations, monthly and (or) yearly observed discharges are adjusted for reservoir storage or diversion, or diversion data or reservoir volumes are given. These values are identified by a symbol and a corresponding footnote.

Statistics of Monthly Mean Data

A tabular summary of the mean (line headed MEAN), maximum (MAX), and minimum (MIN) of monthly mean flows for each month for a designated period is provided below the mean values table. The water years of the first occurrence of the maximum and minimum monthly flows are provided immediately below those values. The designated period will be expressed as FOR WATER YEARS __-__, BY WATER YEAR (WY), and will list the first and last water years of the range of years selected from the PERIOD OF RECORD paragraph in the station manuscript. The designated period will consist of all of the station record within the specified water years, including complete months of record for partial water years, and may coincide with the period of record for the station. The water years for which the statistics are computed are consecutive, unless a break in the station record is indicated in the manuscript.

Summary Statistics

A table titled SUMMARY STATISTICS follows the statistics of monthly mean data tabulation. This table consists of four columns with the first column containing the line headings of the statistics being reported. The table provides a statistical summary of yearly, daily, and instantaneous flows, not only for the current water year but also for the previous calendar year and for a designated period, as appropriate. The designated period selected, WATER YEARS __-__, will consist of all of the station records within the specified water years, including complete months of record for partial water years, and may coincide with the period of record for the station. The water years for which the statistics are computed are consecutive, unless a break in the station record is indicated in the manuscript. All of the calculations for the statistical characteristics designated ANNUAL (see line headings below), except for the ANNUAL 7-DAY MINIMUM statistic, are calculated for the designated period using complete water years. The other statistical characteristics may be calculated using partial water years.

The date or water year, as appropriate, of the first occurrence of each statistic reporting extreme values of discharge is provided adjacent to the statistic. Repeated occurrences may be noted in the REMARKS paragraph of the manuscript or in footnotes. Because the designated period may not be the same as the station period of record published in the manuscript, occasionally the dates of occurrence listed for the daily and instantaneous extremes in the designated-period column may not be within the selected water years listed in the heading. When the dates of occurrence do not fall within the selected water years listed in the heading, it will be noted in the REMARKS paragraph or in footnotes. Selected streamflow duration-curve statistics and runoff data also are given. Runoff data may be omitted if extensive regulation or diversion of flow is in effect in the drainage basin.

The following summary statistics data are provided with each continuous record of discharge. Comments that follow clarify information presented under the various line headings of the SUMMARY STATISTICS table.

ANNUAL TOTAL.—The sum of the daily mean values of discharge for the year.

ANNUAL MEAN.—The arithmetic mean for the individual daily mean discharges for the year noted or for the designated period.

HIGHEST ANNUAL MEAN.—The maximum annual mean discharge occurring for the designated period.

LOWEST ANNUAL MEAN.—The minimum annual mean discharge occurring for the designated period.

HIGHEST DAILY MEAN.—The maximum daily mean discharge for the year or for the designated period.

LOWEST DAILY MEAN.—The minimum daily mean discharge for the year or for the designated period.

ANNUAL 7-DAY MINIMUM.—The lowest mean discharge for 7 consecutive days for a calendar year or a water year. Note that most low-flow frequency analyses of annual 7-day minimum flows use a climatic year (April 1-March 31). The date shown in the summary statistics table is the initial date of the 7-day period. This value should not be confused with the 7-day 10-year low-flow statistic.

MAXIMUM PEAK FLOW.—The maximum instantaneous peak discharge occurring for the water year or designated period. Occasionally the maximum flow for a year may occur at midnight at the beginning or end of the year, on a recession from or rise toward a higher peak in the adjoining year. In this case, the maximum peak flow is given in the table and the maximum flow may be reported in a footnote or in the REMARKS paragraph in the manuscript.

MAXIMUM PEAK STAGE.—The maximum instantaneous peak stage occurring for the water year or designated period. Occasionally the maximum stage for a year may occur at midnight at the beginning or end of the year, on a recession from or rise toward a higher peak in the adjoining year. In this case, the maximum peak stage is given in the table and the maximum stage may be reported in the REMARKS paragraph in the manuscript or in a footnote. If the dates of occurrence of the maximum peak stage and maximum peak flow are different, the REMARKS paragraph in the manuscript or a footnote may be used to provide further information.

INSTANTANEOUS LOW FLOW.—The minimum instantaneous discharge occurring for the water year or for the designated period.

ANNUAL RUNOFF.—Indicates the total quantity of water in runoff for a drainage area for the year. Data reports may use any of the following units of measurement in presenting annual runoff data:

Acre-foot (AC-FT) is the quantity of water required to cover 1 acre to a depth of 1 foot and is equivalent to 43,560 cubic feet or about 326,000 gallons or 1,233 cubic meters.

Cubic feet per square mile (CFSM) is the average number of cubic feet of water flowing per second from each square mile of area drained, assuming the runoff is distributed uniformly in time and area.

Inches (INCHES) indicate the depth to which the drainage area would be covered if all of the runoff for a given time period were uniformly distributed on it.

10 PERCENT EXCEEDS.—The discharge that has been exceeded 10 percent of the time for the designated period.

50 PERCENT EXCEEDS.—The discharge that has been exceeded 50 percent of the time for the designated period.

90 PERCENT EXCEEDS.—The discharge that has been exceeded 90 percent of the time for the designated period.

Identifying Estimated Daily Discharge

Estimated daily-discharge values published in the water-discharge tables of annual State data reports are identified. This identification is shown either by flagging individual daily values with the letter "e" and noting in a table footnote, "e–Estimated," or by listing the dates of the estimated record in the REMARKS paragraph of the station description.

Accuracy of Field Data and Computed Results

The accuracy of streamflow data depends primarily on (1) the stability of the stage-discharge relation or, if the control is unstable, the frequency of discharge measurements, and (2) the accuracy of observations of stage, measurements of discharge, and interpretations of records.

The degree of accuracy of the records is stated in the REMARKS in the station description. "Excellent" indicates that about 95 percent of the daily discharges are within 5 percent of the true value; "good" within 10 percent; and "fair," within 15 percent. "Poor" indicates that daily discharges have less than "fair" accuracy. Different accuracies may be attributed to different parts of a given record.

Values of daily mean discharge in this report are shown to the nearest hundredth of a cubic foot per second for discharges of less than 1 ft^3/s; to the nearest tenths between 1.0 and 10 ft^3/s; to whole numbers between 10 and 1,000 ft^3/s; and to 3 significant figures above 1,000 ft^3/s. The number of significant figures used is based solely on the magnitude of the discharge value. The same rounding rules apply to discharge values listed for partial-record stations.

Discharge at many stations, as indicated by the monthly mean, may not reflect natural runoff due to the effects of diversion, consumption, regulation by storage, increase or decrease in evaporation due to artificial causes, or to other factors. For such stations, values of cubic feet per second per square mile and of runoff in inches are not published unless satisfactory adjustments can be made for diversions, for changes in contents of reservoirs, or for other changes incident to use and control. Evaporation from a reservoir is not included in the adjustments for changes in reservoir contents, unless it is so stated. Even at those stations where adjustments are made, large errors in computed runoff may occur if adjustments or losses are large in comparison with the observed discharge.

Other Data Records Available

Information of a more detailed nature than that published for most of the stream-gaging stations such as discharge measurements, gage-height records, and rating tables is available from the District office. Also, most stream-gaging station records are available in computer-usable form and many statistical analyses have been made.

Information on the availability of unpublished data or statistical analyses may be obtained from the District office (see address on the back of the title page of this report).

Publications

The annual series of Water-Supply Papers that give information on quantity of surface waters in Montana are given in table 7. Data for the Hudson Bay basin is given in Part 5, for the Missouri River basin in Part 6, and for the Columbia River basin in Part 12.

Table 7. Water-Supply Paper numbers and parts for surface-water stations, 1899-1970

Year	Part 5	Part 6	Part 12	Year	Part 5	Part 6	Part 12
1899		36,37	38				
1900	49	49	51,52				
1901	66,75	66,75	66,75	1936	805	806	812
1902	83,85	84	85	1937	825	826	832
1903	98,99,100	99	100	1938	855	856	862
1904	130	130	135	1939	875	876	882
1905	171	172	178	1940	895	896	902
1906	207	208	214	1941	925	926	932
1907	245	246	252	1942	955	956	962
1908	245	246	252	1943	975	976	982
1909	265	266	272	1944	1005	1006	1012
1910	285	286	292	1945	1035	1036	1042
1911	305	306	312	1946	1055	1056	1062
1912	325	326	332A	1947	1085	1086	1092
1913	355	356	362A	1948	1115	1116	1122
1914	385	386	392	1949	1145	1146	1152
1915	405	406	412	1950	1175	1176	1182
1916	435	436	442	1951	1208	1209	1216
1917	455	456	462	1952	1238	1239	1246
1918	475	476	482	1953	1278	1279	1286
1919	505	506	512	1954	1338	1339	1346
1920	505	506	512	1955	1388	1389	1396
1921	525	526	532	1956	1438	1439	1446
1922	545	546	552	1957	1508	1509	1516
1923	565	566	572	1958	1558	1559	1566
1924	585	586	592	1959	1628	1629	1636
1925	605	606	612	1960	1708	1709	1716
1926	625	626	632	1961-65	1913	1916	1933
1927	645	646	652	1966-70	2113	2116	2133
1928	665	666	672				
1929	685	686	692	1950	1308	1309	1316
1930	700	701	707	Compilation			
1931	715	716	722	1960	1728	1729	1736
1932	730	731	737	Compilation			
1933	745	746	752				
1934	760	761	767				
1935	785	786	792				

EXPLANATION OF PRECIPITATION RECORDS

Data Collection and Computation

Rainfall data generally are collected using electronic data loggers that measure the rainfall in 0.01-inch increments every 15 minutes using either a tipping-bucket rain gage or a collection well gage. Twenty-four hour rainfall totals are tabulated and presented. A 24-hour period extends from just past midnight of the previous day to midnight of the current day. Snowfall-affected data can result during cold weather when snow fills the rain-gage funnel and then melts as temperatures rise. Snowfall-affected data are subject to errors. Missing values are indicated by this symbol "---" in the table.

Data Presentation

Precipitation records collected at surface-water gaging stations are identified with the same station number and name as the stream-gaging station. Where a surface-water daily-record station is not available, the precipitation record is published with its own name and latitude-longitude identification number.

Information pertinent to the history of a precipitation station is provided in descriptive headings preceding the tabular data. These descriptive headings give details regarding location, period of record, and general remarks.

The following information is provided with each precipitation station. Comments that follow clarify information presented under the various headings of the station description.

LOCATION.—See Data Presentation in the EXPLANATION OF STAGE- AND WATER-DISCHARGE RECORDS section of this report (same comments apply).

PERIOD OF RECORD.—See Data Presentation in the EXPLANATION OF STAGE- AND WATER-DISCHARGE RECORDS section of this report (same comments apply).

INSTRUMENTATION.—Information on the type of rainfall collection system is given.

REMARKS.—Remarks provide added information pertinent to the collection, analysis, or computation of records.

EXPLANATION OF WATER-QUALITY RECORDS

Collection and Examination of Data

Surface-water samples for analysis usually are collected at or near stream-gaging stations. The quality-of-water records are given immediately following the discharge records at these stations.

The descriptive heading for water-quality records gives the period of record for all water-quality data; the period of daily record for parameters that are measured on a daily basis (specific conductance, water temperature, sediment discharge, and so forth); extremes for the current year; and general remarks.

For ground-water records, no descriptive statements are given; however, the well number, depth of well, sampling date, or other pertinent data are given in the table containing the chemical analyses of the ground water.

Water Analysis

Most of the methods used for collecting and analyzing water samples are described in the TWRIs. A list of TWRIs is provided in this report.

One sample can define adequately the water quality at a given time if the mixture of solutes throughout the stream cross-section is homogeneous. However, the concentration of solutes at different locations in the cross section may vary widely with different rates of water discharge, depending on the source of material and the turbulence and mixing of the stream. Some streams must be sampled at several verticals to obtain a representative sample needed for an accurate mean concentration and for use in calculating load.

Chemical-quality data published in this report are considered to be the most representative values available for the stations listed. The values reported represent water-quality conditions at the time of sampling as much as possible, consistent with available sampling techniques and methods of analysis. In the rare case where an apparent inconsistency exists between a reported pH value and the relative abundance of carbon dioxide species (carbonate and bicarbonate), the inconsistency is the result of a slight uptake of carbon dioxide from the air by the sample between measurement of pH in the field and determination of carbonate and bicarbonate in the laboratory.

For chemical-quality stations equipped with digital monitors, the records consist of daily maximum and minimum values (and sometimes mean or median values) for each constituent measured, and are based on 15-minute or 1-hour intervals of recorded data beginning at 0000 hours and ending at 2400 hours for the day of record.

SURFACE-WATER-QUALITY RECORDS

Records of surface-water quality ordinarily are obtained at or near stream-gaging stations because discharge data is useful in the interpretation of surface-water quality. Records of surface-water quality in this report involve a variety of types of data and measurement frequencies.

Classification of Records

Water-quality data for surface-water sites are grouped into one of three classifications. A *continuous-record station* is a site where data are collected on a regularly scheduled basis. Frequency may be one or more times daily, weekly, monthly, or quarterly. A *partial-record station* is a site where limited water-quality data are collected systematically over a period of years. Frequency of sampling is usually less than quarterly. A *miscellaneous sampling site* is a location other than a continuous- or partial-record station, where samples are collected to give better areal coverage to define water-quality conditions in the river basin.

A careful distinction needs to be made between *continuous records* as used in this report and *continuous recordings* that refer to a continuous graph or a series of discrete values recorded at short intervals. Some records of water quality, such as temperature and specific conductance, may be obtained through continuous recordings; however, because of costs, most data are obtained only monthly or less frequently. Locations of stations for which records on the quality of surface water appear in this report are shown in figure 7.

Accuracy of the Records

One of four accuracy classifications is applied for measured physical properties at continuous-record stations on a scale ranging from poor to excellent. The accuracy rating is based on data values recorded before any shifts or corrections are made. Additional consideration also is given to the amount of publishable record and to the amount of data that have been corrected or shifted.

Rating classifications for continuous water-quality records

[≤, less than or equal to; ±, plus or minus value shown; °C, degree Celsius; >, greater than; %, percent; mg/L, milligram per liter; pH unit, standard pH unit]

Measured physical property	Rating			
	Excellent	Good	Fair	Poor
Water temperature	≤ ±0.2 °C	> ±0.2 to 0.5 °C	> ±0.5 to 0.8 °C	> ±0.8 °C
Specific conductance	≤ ±3%	> ±3 to 10%	> ±10 to 15%	> ±15%
Dissolved oxygen	≤ ±0.3 mg/L	> ±0.3 to 0.5 mg/L	> ±0.5 to 0.8 mg/L	> ±0.8 mg/L
pH	≤ ±0.2 unit	> ±0.2 to 0.5 unit	> ±0.5 to 0.8 unit	> ±0.8 unit
Turbidity	≤ ±5%	> ±5 to 10%	> ±10 to 15%	> ±15%

Arrangement of Records

Water-quality records collected at a surface-water daily record station are published immediately following that record, regardless of the frequency of sample collection. Station number and name are the same for both records. Where a surface-water daily record station is not available or where the water quality differs significantly from that at the nearby surface-water station, the continuing water-quality record is published with its own station number and name in the regular downstream-order sequence. Water-quality data for partial-record stations and for miscellaneous sampling sites appear in separate tables following the table of discharge measurements at miscellaneous sites.

On-Site Measurements and Sample Collection

In obtaining water-quality data, a major concern is assuring that the data obtained represent the naturally occurring quality of the water. To ensure this, certain measurements, such as water temperature, pH, and dissolved oxygen, must be made on site when the samples are taken. To assure that measurements made in the laboratory also represent the naturally occurring water, carefully prescribed procedures must be followed in collecting the samples, in treating the samples to prevent changes in quality pending analysis, and in shipping the samples to the laboratory. Procedures for on-site measurements and for collecting, treating, and shipping samples are given in TWRIs Book 1, Chapter D2; Book 3, Chapters A1, A3, and A4; and Book 9, Chapters A1-A9. These TWRIs are listed in this report. Also, detailed information on collecting, treating, and shipping samples can be obtained from the USGS District office (see address that is shown on the back of title page in this report).

Water Temperature

Water temperatures are measured at most of the water-quality stations. In addition, water temperatures are taken at the time of discharge measurements for water-discharge stations. For stations where water temperatures are taken manually once or twice daily, the water temperatures are taken at about the same time each day. Large streams have a small diurnal temperature change; shallow streams may have a daily range of several degrees and may follow closely the changes in air temperature. Some streams may be affected by waste-heat discharges.

At stations where recording instruments are used, either mean temperatures or maximum and minimum temperatures for each day are published. Water temperatures measured at the time of water-discharge measurements are on file in the District office.

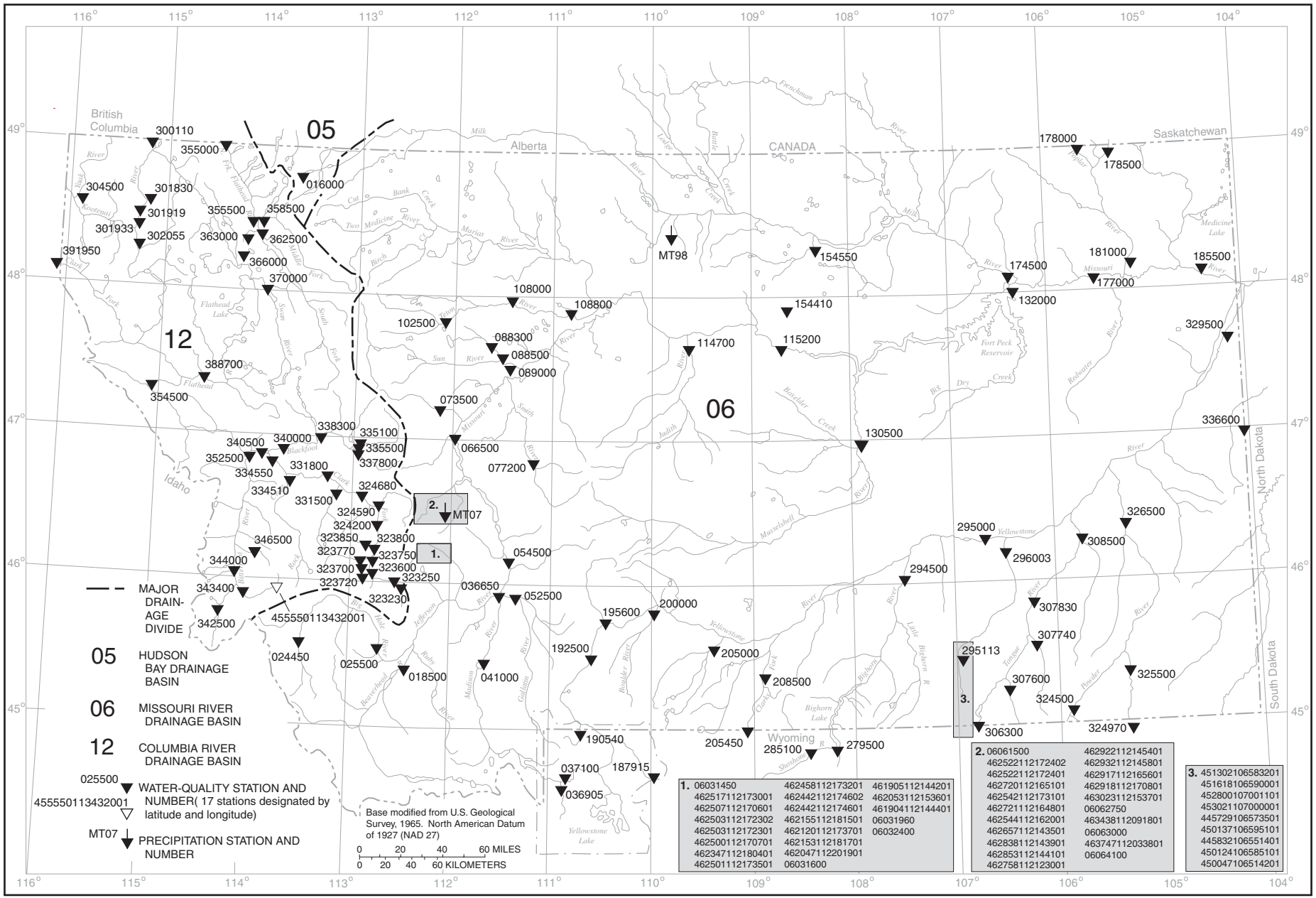

Figure 7. Location of surface-water-quality stations in Montana and adjacent areas, water year 2003.

Sediment

Suspended-sediment concentrations are determined from samples collected by using depth-integrating samplers. Samples usually are obtained at several verticals in the cross section, or a single sample may be obtained at a fixed point and a coefficient applied to determine the mean concentration in the cross section.

During periods of rapidly changing flow or rapidly changing concentration, samples may be collected more frequently (twice daily or, in some instances, hourly). The published sediment discharges for days of rapidly changing flow or concentration were computed by the subdivided-day method (time-discharge weighted average). Therefore, for those days when the published sediment discharge value differs from the value computed as the product of discharge times mean concentration times 0.0027, the reader can assume that the sediment discharge for that day was computed by the subdivided-day method. For periods when no samples were collected, daily discharges of suspended sediment were estimated on the basis of water discharge, sediment concentrations observed immediately before and after the periods, and suspended-sediment loads for other periods of similar discharge.

At other stations, suspended-sediment samples are collected periodically at many verticals in the stream cross section. Although data collected periodically may represent conditions only at the time of observation, such data are useful in establishing seasonal relations between quality and streamflow and in predicting long-term sediment-discharge characteristics of the stream.

In addition to the records of suspended-sediment discharge, records of the periodic measurements of the particle-size distribution of the suspended sediment and bed material are included for some stations.

Laboratory Measurements

Samples for biochemical oxygen demand (BOD) and indicator bacteria are analyzed locally. All other samples are analyzed in the USGS laboratory in Lakewood, Colorado, unless otherwise noted. Methods used in analyzing sediment samples and computing sediment records are given in TWRI, Book 5, Chapter C1. Methods used by the USGS laboratories are given in the TWRIs, Book 1, Chapter D2; Book 3, Chapter C2; and Book 5, Chapters A1, A3, and A4. These methods are consistent with ASTM standards and generally follow ISO standards.

Data Presentation

For continuing-record stations, information pertinent to the history of station operation is provided in descriptive headings preceding the tabular data. These descriptive headings give details regarding location, drainage area, period of record, type of data available, instrumentation, general remarks, cooperation, and extremes for parameters currently measured daily. Tables of chemical, physical, biological, radiochemical data, and so forth, obtained at a frequency less than daily are presented first. Tables of "daily values" of specific conductance, pH, water temperature, dissolved oxygen, and suspended sediment then follow in sequence.

In the descriptive headings, if the location is identical to that of the discharge gaging station, neither the LOCATION nor the DRAINAGE AREA statements are repeated. The following information is provided with each continuous-record station. Comments that follow clarify information presented under the various headings of the station description.

LOCATION.—See Data Presentation information in the EXPLANATION OF STAGE- AND WATER-DISCHARGE RECORDS section of this report (same comments apply).

DRAINAGE AREA.—See Data Presentation information in the EXPLANATION OF STAGE- AND WATER-DISCHARGE RECORDS section of this report (same comments apply).

PERIOD OF RECORD.—This indicates the time periods for which published water-quality records for the station are available. The periods are shown separately for records of parameters measured daily or continuously and those measured less than daily. For those measured daily or continuously, periods of record are given for the parameters individually.

INSTRUMENTATION.—Information on instrumentation is given only if a water-quality monitor temperature record, sediment pumping sampler, or other sampling device is in operation at a station.

REMARKS.—Remarks provide added information pertinent to the collection, analysis, or computation of the records.

COOPERATION.—Records provided by a cooperating organization or obtained for the USGS by a cooperating organization are identified here.

EXTREMES.—Maximums and minimums are given only for parameters measured daily or more frequently. For parameters measured weekly or less frequently, true maximums or minimums may not have been obtained. Extremes, when given, are provided for both the period of record and for the current water year.

REVISIONS.—Records are revised if errors in published water-quality records are discovered. Appropriate updates are made in the USGS distributed data system, NWIS, and subsequently to its Web-based National data system, NWISWeb:

http://waterdata.usgs.gov/nwis

Users of USGS water-quality data are encouraged to obtain all required data from NWIS or NWISWeb to ensure that they

have the most recent updates. Updates to the NWISWeb are made on an annual basis.

The surface-water-quality records for partial-record stations and miscellaneous sampling sites are published in separate tables following the table of discharge measurements at miscellaneous sites. No descriptive statements are given for these records. Each station is published with its own station number and name in the regular downstream-order sequence.

Remark Codes

The following remark codes may appear with the water-quality data in this section:

Printed Output	Remark
E	Estimated value.
>	Actual value is known to be greater than the value shown.
<	Actual value is known to be less than the value shown.
K	Results based on colony count outside the acceptance range (non-ideal colony count).
L	Biological organism count less than 0.5 percent (organism may be observed rather than counted).
D	Biological organism count equal to or greater than 15 percent (dominant).
S	Most probable value.
V	Analyte was detected in both the environmental sample and the associated blanks.
&	Biological organism estimated as dominant.

Water-Quality Control Data

The USGS National Water Quality Laboratory collects quality-control data on a continuing basis to evaluate selected analytical methods to determine long-term method detection levels (LT-MDLs) and laboratory reporting levels (LRLs). These values are re-evaluated each year on the basis of the most recent quality-control data and, consequently, may change from year to year.

This reporting procedure limits the occurrence of false positive error. Falsely reporting a concentration greater than the LT-MDL for a sample in which the analyte is not present is 1 percent or less. Application of the LRL limits the occurrence of false negative error. The chance of falsely reporting a non-detection for a sample in which the analyte is present at a concentration equal to or greater than the LRL is 1 percent or less.

Accordingly, concentrations are reported as less than LRL for samples in which the analyte was either not detected or did not pass identification. Analytes detected at concentrations between the LT-MDL and the LRL and that pass identification criteria are estimated. Estimated concentrations will be noted with a remark code of "E." These data should be used with the understanding that their uncertainty is greater than that of data reported without the E remark code.

Data generated from quality-control (QC) samples are a requisite for evaluating the quality of the sampling and processing techniques as well as data from the actual samples themselves. Without QC data, environmental sample data cannot be adequately interpreted because the errors associated with the sample data are unknown. The various types of QC samples collected by this District office are described in the following section. Procedures have been established for the storage of water-quality-control data within the USGS. These procedures allow for storage of all derived QC data and are identified so that they can be related to corresponding environmental samples. These data are not presented in this report but are available from the District office.

Blank Samples

Blank samples are collected and analyzed to ensure that environmental samples have not been contaminated in the overall data-collection process. The blank solution used to develop specific types of blank samples is a solution that is free of the analytes of interest. Any measured value signal in a blank sample for an analyte (a specific component measured in a chemical analysis) that was absent in the blank solution is believed to be due to contamination. Many types of blank samples are possible; each is designed to segregate a different part of the overall data-collection process. The types of blank samples collected in this district are:

Field blank—A blank solution that is subjected to all aspects of sample collection, field processing preservation, transportation, and laboratory handling as an environmental sample.

Trip blank—A blank solution that is put in the same type of bottle used for an environmental sample and kept with the set of sample bottles before and after sample collection.

Equipment blank—A blank solution that is processed through all equipment used for collecting and processing an environmental sample (similar to a field blank but normally done in the more controlled conditions of the office).

Sampler blank—A blank solution that is poured or pumped through the same field sampler used for collecting an environmental sample.

Filter blank—A blank solution that is filtered in the same manner and through the same filter apparatus used for an environmental sample.

Splitter blank—A blank solution that is mixed and separated using a field splitter in the same manner and through the same apparatus used for an environmental sample.

Preservation blank—A blank solution that is treated with the sampler preservatives used for an environmental sample.

Reference Samples

Reference material is a solution or material prepared by a laboratory. The reference material composition is certified for one or more properties so that it can be used to assess a measurement method. Samples of reference material are submitted for analysis to ensure that an analytical method is accurate for the known properties of the reference material. Generally, the selected reference material properties are similar to the environmental sample properties.

Replicate Samples

Replicate samples are a set of environmental samples collected in a manner such that the samples are thought to be essentially identical in composition. Replicate is the general case for which a duplicate is the special case consisting of two samples. Replicate samples are collected and analyzed to establish the amount of variability in the data contributed by some part of the collection and analytical process. Many types of replicate samples are possible, each of which may yield slightly different results in a dynamic hydrologic setting, such as a flowing stream. The types of replicate samples collected in this district are:

Concurrent samples—A type of replicate sample in which the samples are collected simultaneously with two or more samplers or by using one sampler and alternating the collection of samples into two or more compositing containers.

Sequential samples—A type of replicate sample in which the samples are collected one after the other, typically over a short time.

Split sample—A type of replicate sample in which a sample is split into subsamples, each subsample contemporaneous in time and space.

Spike Samples

Spike samples are samples to which known quantities of a solution with one or more well-established analyte concentrations have been added. These samples are analyzed to determine the extent of matrix interference or degradation on the analyte concentration during sample processing and analysis.

Publications

The annual series of Water-Supply Papers that give information on quality of surface waters in Montana are shown in the following table. Data for Hudson Bay and Missouri River basins are given in parts 5-6 and data for Upper Columbia River basin are given in part 12.

Table 8. Water-Supply Paper numbers and parts for water-quality stations, 1947-70

Year	Parts 5-6	Part 12	Year	Parts 5-6	Part 12
1946	1050	---	1961	1883	1885
1947	1102	---	1962	1943	1945
1948	1132	---	1963	1949	1951
1949	1162	1163	1964	1956	1959
1950	1187	1189	1965	1963	1966
1951	1198	1200	1966	1993	1996
1952	1251	1253	1967	2013	2016
1953	1291	1293	1968	2094, 2095	2100
1954	1351	1353	1969	2145	2150
1955	1401	1403	1970	2155	2160
1956	1451	1453			
1957	1521	1523			
1958	1572	1574			
1959	1643	1645			
1960	1743	1745			

EXPLANATION OF GROUND-WATER-LEVEL RECORDS

Generally, only ground-water-level data from selected wells with continuous recorders from a basic network of observation wells are published in this report (volume 2). This basic network contains observation wells located so that the most significant data are obtained from the fewest wells in the most important aquifers.

Site Identification Numbers

Each well is identified by means of (1) a 15-digit number that is based on latitude and longitude and (2) a local number that is produced for local needs.

Data Collection and Computation

Measurements are made in many types of wells, under varying conditions of access and at different temperatures; hence, neither the method of measurement nor the equipment can be standardized. At each observation well, however, the equipment and techniques used are those that will ensure that measurements at each well are consistent.

Most methods for collecting and analyzing water samples are described in the TWRIs referred to in the On-site Measurements and Sample Collection and the Laboratory Measurements sections in this report. In addition, TWRI Book 1, Chapter D2, describes guidelines for the collection and field analysis of ground-water samples for selected unstable constituents. Procedures for on-site measurements and for collecting, treating, and shipping samples are given in TWRIs

Book 1, Chapter D2; Book 3, Chapters A1, A3, and A4; and Book 9, Chapters A1 through A9. The values in this report represent water-quality conditions at the time of sampling, as much as possible, and that are consistent with available sampling techniques and methods of analysis. These methods are consistent with ASTM standards and generally follow ISO standards. Trained personnel collected all samples. The wells sampled were pumped long enough to ensure that the water collected came directly from the aquifer and had not stood for a long time in the well casing where it would have been exposed to the atmosphere and to the material, possibly metal, comprising the casings.

Water-level measurements in this report are given in feet with reference to land-surface datum (lsd). Land-surface datum is a datum plane that is approximately at land surface at each well. If known, the elevation of the land-surface datum above sea level is given in the well description. The height of the measuring point (MP) above or below land-surface datum is given in each well description. Water levels in wells equipped with recording gages are reported for every fifth day and the end of each month (EOM).

Water levels are reported to as many significant figures as can be justified by the local conditions. For example, in a measurement of a depth of water of several hundred feet, the error in determining the absolute value of the total depth to water may be a few tenths of a foot, whereas the error in determining the net change of water level between successive measurements may be only a hundredth or a few hundredths of a foot. For lesser depths to water the accuracy is greater. Accordingly, most measurements are reported to a hundredth of a foot, but some are given only to a tenth of a foot or a larger unit.

Data Presentation

Water-level data are presented in alphabetical order by county. The primary identification number for a given well is the 15-digit site identification number that appears in the upper left corner of the table. The secondary identification number is the local or county well number. Well locations are shown in figure 8*;* each well is identified on the map by its local well or county well number.

Each well record consists of three parts: the well description, the data table of water levels observed during the water year, and, for most wells, a hydrograph following the data table. Well descriptions are presented in the headings preceding the tabular data.

The following comments clarify information presented in these various headings.

LOCATION.—This paragraph follows the well-identification number and reports the hydrologic-unit number and a geographic point of reference. Latitudes and longitudes used in this report are reported as North American Datum of 1927 unless otherwise specified.

HYDROGEOLOGIC UNIT.—This entry designates by name and geologic age the aquifer that the well taps.

WELL CHARACTERISTICS.—This entry describes the well in terms of depth, casing diameter and depth or screened interval, method of construction, use, and changes since construction.

INSTRUMENTATION.—This paragraph provides information on both the frequency of measurement and the collection method used, allowing the user to better evaluate the reported water-level extremes by knowing whether they are based on continuous, monthly, or some other frequency of measurement.

DATUM.—This entry describes both the measuring point and the land-surface elevation at the well. The altitude of the land-surface datum is described in feet above the altitude datum; it is reported with a precision depending on the method of determination. The measuring point is described physically (such as top of casing, top of instrument shelf, and so forth), and in relation to land surface (such as 1.3 ft above land-surface datum). The elevation of the land-surface datum is described in feet above National Geodetic Vertical Datum of 1929 (NGVD 29); it is reported with a precision depending on the method of determination.

REMARKS.—This entry describes factors that may influence the water level in a well or the measurement of the water level, when various methods of measurement were begun, and the network (climatic, terrain, local, or areal effects) or the special project to which the well belongs.

PERIOD OF RECORD.—This entry indicates the time period for which records are published for the well, the month and year at the start of publication of water-level records by the USGS, and the words “to current year” if the records are to be continued into the following year. Time periods for which water-level records are available, but are not published by the USGS, may be noted.

EXTREMES FOR PERIOD OF RECORD.—This entry contains the highest and lowest instantaneously recorded or measured water levels of the period of published record, with respect to land-surface datum or sea level, and the dates of occurrence.

Water-Level Tables

A table of water levels follows the well description for each well. Water-level measurements in this report are given in feet with reference to either sea level or land-surface datum (lsd). Missing records are indicated by dashes in place of the water-level value.

For wells not equipped with recorders, water-level measurements were obtained periodically by steel or electric tape. Tables of periodic water-level measurements in these wells show the date of measurement and the measured water-level value.

Hydrographs

Hydrographs are a graphic display of water-level fluctuations over a period of time. In this report, current water year and, when appropriate, period-of-record hydrographs are shown. Hydrographs that display periodic water-level measurements show points that may be connected with a dashed line from one measurement to the next. Hydrographs that display recorder data show a solid line representing the mean water level recorded for each day. Missing data are indicated by a blank space or break in a hydrograph. Missing data may occur as a result of recorder malfunctions, battery failures, or mechanical problems related to the response of the recorder's float mechanism to water-level fluctuations in a well.

GROUND-WATER-QUALITY DATA

Data Collection and Computation

The ground-water-quality data in this report were obtained as a part of special studies in specific areas. Consequently, a number of chemical analyses are presented for some wells within a county but not for others. As a result, the records for this year, by themselves, do not provide a balanced view of ground-water quality Statewide.

Most methods for collecting and analyzing water samples are described in the TWRIs. Procedures for on-site measurements and for collecting, treating, and shipping samples are given in TWRI, Book 1, Chapter D2; Book 3, Chapter C2; and Book 5, Chapters A1, A3, and A4. Also, detailed information on collecting, treating, and shipping samples may be obtained from the USGS District office (see address shown on back of title page in this report).

Laboratory Measurements

Analysis for sulfide and measurement of alkalinity, pH, water temperature, specific conductance, and dissolved oxygen are performed on site. All other sample analyses areperformed at the USGS laboratory in Lakewood, Colorado, unless otherwise noted. Methods used by the USGS laboratory are given in TWRI, Book 1, Chapter D2; Book 3, Chapter C2; and Book 5, Chapters A1, A3, and A4.

Publications

Publication of ground-water level data for the United States in Water-Supply Papers was begun by the USGS in 1935. From 1935 through 1939, a single Water-Supply Paper for each year covering the entire nation was issued (Water-Supply Papers 777, 817, 840, 845, and 886). From 1940 through 1974, separate Water-Supply Papers were issued for 6 sections of the United States. Water-level data for Montana are in the Water-Supply Papers listed in the following table, each report containing one or more calendar years (January-December) of data. Data in this report are for the 12-month water year ending September 30. Information about reports and other data on ground water in Montana may be obtained from the District office, at the address given on the back of the title page.

Table 9. Water-Supply Paper numbers and parts for ground-water stations, 1940-74

Year	WSP No. Pt. 5	Year	WSP No. Pt. 5	Year	WSP No. Pt.5
1940	910	1947	1100	1954	1325
1941	940	1948	1130	1955	1408
1942	948	1949	1160	1956-60	1760
1943	990	1950	1169	1961-65	1845
1944	1020	1951	1195	1966-70	1980
1945	1027	1952	1225	1971-74	2161
1946	1075	1953	1269		

ACCESS TO USGS WATER DATA

The USGS provides near real-time stage and discharge data for many of the gaging stations equipped with the necessary telemetry and historic daily-mean and peak-flow discharge data for most current or discontinued gaging stations through the World Wide Web (WWW). These data may be accessed from:

http://water.usgs.gov

Water-quality data and ground-water data also are available through the WWW. In addition, data can be provided in various machine-readable formats on various media. Information about the availability of specific types of data or products, and user charges, can be obtained locally from each Water Discipline District Office (See address that is shown on the back of the title page of this report.)

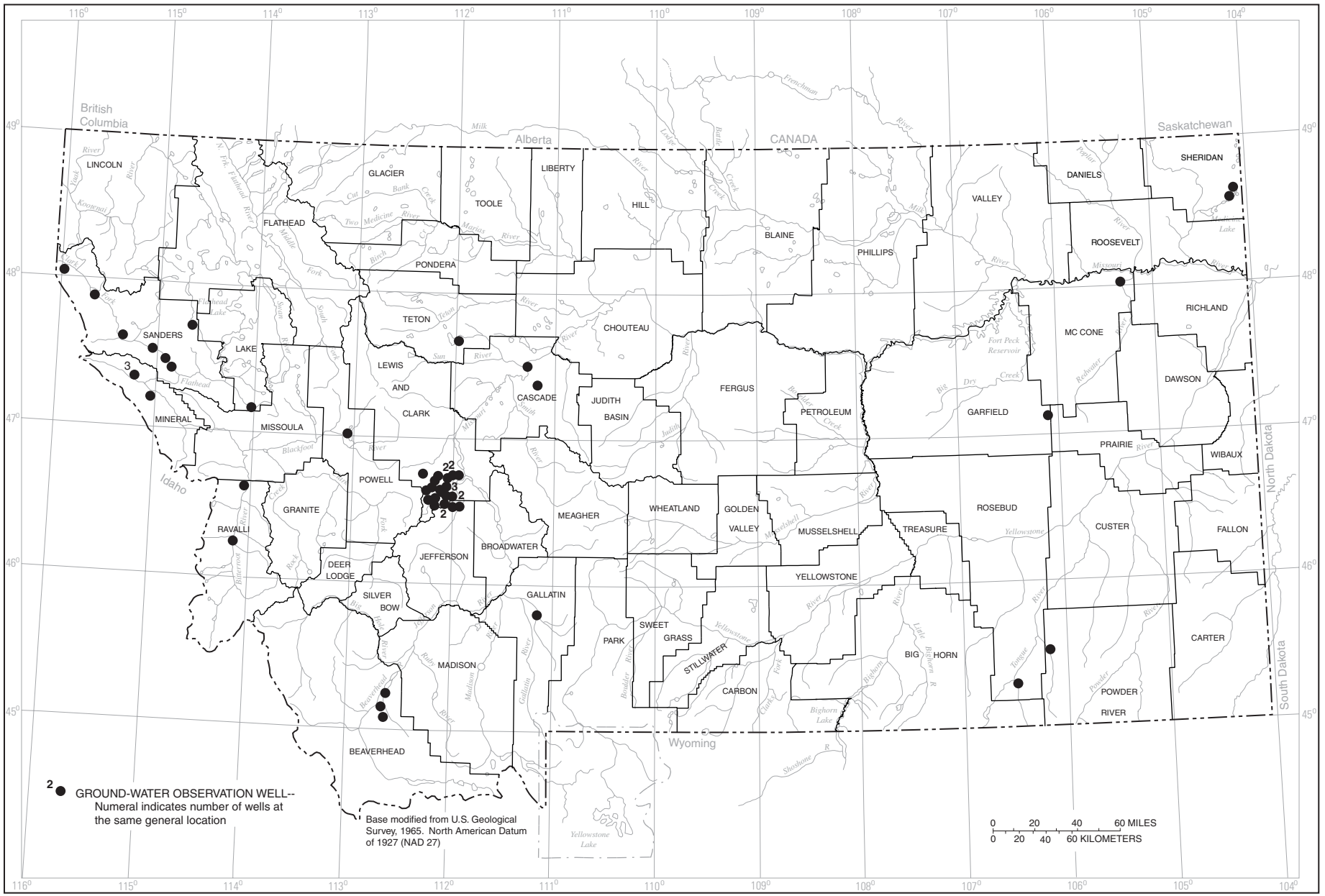

Figure 8. Location of ground-water observation wells in Montana, water year 2003.

DEFINITION OF TERMS

Specialized technical terms related to streamflow, water-quality, and other hydrologic data, as used in this report, are defined below. Terms such as algae, water level, and precipitation are used in their common everyday meanings, definitions of which are given in standard dictionaries. Not all terms defined in this alphabetical list apply to every State. See also table for converting English units to International System (SI) Units. Other glossaries that also define water-related terms are accessible from:

http://water.usgs.gov/glossaries.html

Acid neutralizing capacity (ANC) is the equivalent sum of all bases or base-producing materials, solutes plus particulates, in an aqueous system that can be titrated with acid to an equivalence point. This term designates titration of an "unfiltered" sample (formerly reported as alkalinity).

Acre-foot (AC-FT, acre-ft) is a unit of volume, commonly used to measure quantities of water used or stored, equivalent to the volume of water required to cover 1 acre to a depth of 1 foot and equivalent to 43,560 cubic feet, 325,851 gallons, or 1,233 cubic meters. (See also "Annual runoff")

Adenosine triphosphate (ATP) is an organic, phosphate-rich compound important in the transfer of energy in organisms. Its central role in living cells makes ATP an excellent indicator of the presence of living material in water. A measurement of ATP therefore provides a sensitive and rapid estimate of biomass. ATP is reported in micrograms per liter.

Adjusted discharge is discharge data that have been mathematically adjusted (for example, to remove the effects of a daily tide cycle or reservoir storage).

Algal growth potential (AGP) is the maximum algal dry weight biomass that can be produced in a natural water sample under standardized laboratory conditions. The growth potential is the algal biomass present at stationary phase and is expressed as milligrams dry weight of algae produced per liter of sample. (See also "Biomass" and "Dry weight")

Alkalinity is the capacity of solutes in an aqueous system to neutralize acid. This term designates titration of a "filtered" sample.

Annual runoff is the total quantity of water that is discharged ("runs off") from a drainage basin in a year. Data reports may present annual runoff data as volumes in acre-feet, as discharges per unit of drainage area in cubic feet per second per square mile, or as depths of water on the drainage basin in inches.

Annual 7-day minimum is the lowest mean value for any 7-consecutive-day period in a year. Annual 7-day minimum values are reported herein for the calendar year and the water year (October 1 through September 30). Most low-flow frequency analyses use a climatic year (April 1-March 31), which tends to prevent the low-flow period from being artificially split between adjacent years. The date shown in the summary statistics table is the initial date of the 7-day period. (This value should not be confused with the 7-day, 10-year low-flow statistic.)

Aroclor is the registered trademark for a group of poly-chlorinated biphenyls that were manufactured by the Monsanto Company prior to 1976. Aroclors are assigned specific 4-digit reference numbers dependent upon molecular type and degree of substitution of the biphenyl ring hydrogen atoms by chlorine atoms. The first two digits of a numbered aroclor represent the molecular type, and the last two digits represent the percentage weight of the hydrogen-substituted chlorine.

Artificial substrate is a device that is purposely placed in a stream or lake for colonization of organisms. The artificial substrate simplifies the community structure by standardizing the substrate from which each sample is collected. Examples of artificial substrates are basket samplers (made of wire cages filled with clean streamside rocks) and multiplate samplers (made of hardboard) for benthic organism collection, and plexiglass strips for periphyton collection. (See also "Substrate")

Ash mass is the mass or amount of residue present after the residue from the dry mass determination has been ashed in a muffle furnace at a temperature of 500°C for 1 hour. Ash mass of zooplankton and phytoplankton is expressed in grams per cubic meter (g/m^3), and periphyton and benthic organisms in grams per square meter (g/m^2). (See also "Biomass" and "Dry mass")

Aspect is the direction toward which a slope faces with respect to the compass.

Bacteria are microscopic unicellular organisms, typically spherical, rodlike, or spiral and threadlike in shape, often clumped into colonies. Some bacteria cause disease, whereas others perform an essential role in nature in the recycling of materials; for example, by decomposing organic matter into a form available for reuse by plants.

Bankfull stage, as used in this report, is the stage at which a stream first overflows its natural banks formed by floods with 1- to 3-year recurrence intervals.

Base discharge (for peak discharge) is a discharge value, determined for selected stations, above which peak discharge data are published. The base discharge at each station is selected so that an average of about three peak flows per year will be published. (See also "Peak flow")

Base flow is sustained flow of a stream in the absence of direct runoff. It includes natural and human-induced streamflows. Natural base flow is sustained largely by ground-water discharge.

Bed material is the sediment mixture of which a streambed, lake, pond, reservoir, or estuary bottom is composed. (See also "Bedload" and "Sediment")

Bedload is material in transport that is supported primarily by the streambed. In this report, bedload is considered to consist of particles in transit from the bed to an elevation equal to the top of the bedload sampler nozzle (ranging from 0.25 to 0.5 foot) that are retained in the bedload sampler. A sample collected with a pressure-differential bedload sampler also may contain a component of the suspended load.

Bedload discharge (tons per day) is the rate of sediment moving as bedload, reported as dry weight, that passes through a cross section in a given time. NOTE: Bedload discharge values in this report may include a component of the suspended-sediment discharge. A correction may be necessary when computing the total sediment discharge by summing the bedload discharge and the suspended-sediment discharge. (See also "Bedload," "Dry weight," "Sediment," and "Suspended-sediment discharge")

Benthic organisms are the group of organisms inhabiting the bottom of an aquatic environment. They include a number of types of organisms, such as bacteria, fungi, insect larvae and nymphs, snails, clams, and crayfish. They are useful as indicators of water quality.

Biochemical oxygen demand (BOD) is a measure of the quantity of dissolved oxygen, in milligrams per liter, necessary for the decomposition of organic matter by microorganisms, such as bacteria.

Biomass is the amount of living matter present at any given time, expressed as mass per unit area or volume of habitat.

Biomass pigment ratio is an indicator of the total proportion of periphyton that are autotrophic (plants). This is also called the Autotrophic Index.

Blue-green algae *(Cyanophyta)* are a group of phytoplankton and periphyton organisms with a blue pigment in addition to a green pigment called chlorophyll. Blue-green algae can cause nuisance water-quality conditions in lakes and slow-flowing rivers; however, they are found commonly in streams throughout the year. The abundance of blue-green algae in phytoplankton samples is expressed as the number of cells per milliliter (cells/mL) or biovolume in cubic micrometers per milliliter (mm3/mL). The abundance of blue-green algae in periphyton samples is given in cells per square centimeter (cells/cm2) or biovolume per square centimeter (mm3/cm2). (See also "Phytoplankton" and "Periphyton")

Bottom material (See "Bed material")

Bulk electrical conductivity is the combined electrical conductivity of all material within a doughnut-shaped volume surrounding an induction probe. Bulk conductivity is affected by different physical and chemical properties of the material including the dissolved solids content of the pore water and lithology and porosity of the rock.

Canadian Geodetic Vertical Datum 1928 is a geodetic datum derived from a general adjustment of Canada's first order level network in 1928.

Cell volume (biovolume) determination is one of several common methods used to estimate biomass of algae in aquatic systems. Cell members of algae are frequently used in aquatic surveys as an indicator of algal production. However, cell numbers alone cannot represent true biomass because of considerable cell-size variation among the algal species. Cell volume (μm^3) is determined by obtaining critical cell measurements or cell dimensions (for example, length, width, height, or radius) for 20 to 50 cells of each important species to obtain an average biovolume per cell. Cells are categorized according to the correspondence of their cellular shape to the nearest geometric solid or combinations of simple solids (for example, spheres, cones, or cylinders). Representative formulae used to compute biovolume are as follows:

$$\text{sphere } 4/3\ \pi r^3 \quad \text{cone } 1/3\ \pi r^2 h \quad \text{cylinder } \pi r^2 h.$$

pi (π) is the ratio of the circumference to the diameter of a circle; pi = 3.14159….

From cell volume, total algal biomass expressed as biovolume (μm^3/mL) is thus determined by multiplying the number of cells of a given species by its average cell volume and then summing these volumes for all species.

Cells/volume refers to the number of cells of any organism that is counted by using a microscope and grid or counting cell. Many planktonic organisms are multicelled and are counted according to the number of contained cells per sample volume, and generally are reported as cells or units per milliliter (mL) or liter (L).

Cfs-day (See "Cubic foot per second-day")

Channel bars, as used in this report, are the lowest prominent geomorphic features higher than the channel bed.

Chemical oxygen demand (COD) is a measure of the chemically oxidizable material in the water and furnishes an approximation of the amount of organic and reducing material present. The determined value may correlate with BOD or with carbonaceous organic pollution from sewage or industrial wastes. [See also "Biochemical oxygen demand (BOD)"]

Clostridium perfringens *(C. perfringens)* is a spore-forming bacterium that is common in the feces of human and other warmblooded animals. Clostridial spores are being used experimentally as an indicator of past fecal contamination and presence of microorganisms that are resistant to disinfection and environmental stresses. (See also "Bacteria")

Coliphages are viruses that infect and replicate in coliform bacteria. They are indicative of sewage contamination of water and of the survival and transport of viruses in the environment.

Color unit is produced by 1 milligram per liter of platinum in the form of the chloroplatinate ion. Color is expressed in units of the platinum-cobalt scale.

Confined aquifer is a term used to describe an aquifer containing water between two relatively impermeable boundaries. The water level in a well tapping a confined aquifer stands above the top of the confined aquifer and can be higher or lower than the water table that may be present in the material above it. In some cases, the water level can rise above the ground surface, yielding a flowing well.

Contents is the volume of water in a reservoir or lake. Unless otherwise indicated, volume is computed on the basis of a level pool and does not include bank storage.

Continuous-record station is a site where data are collected with sufficient frequency to define daily mean values and variations within a day.

Control designates a feature in the channel that physically affects the water-surface elevation and thereby determines the stage-discharge relation at the gage. This feature may be a constriction of the channel, a bedrock outcrop, a gravel bar, an artificial structure, or a uniform cross section over a long reach of the channel.

Control structure, as used in this report, is a structure on a stream or canal that is used to regulate the flow or stage of the stream or to prevent the intrusion of saltwater.

Cubic foot per second (CFS, ft^3/s) is the rate of discharge representing a volume of 1 cubic foot passing a given point in 1 second. It is equivalent to approximately 7.48 gallons per second or approximately 449 gallons per minute, or 0.02832 cubic meters per second. The term "second-foot" sometimes is used synonymously with "cubic foot per second" but is now obsolete.

Cubic foot per second-day (CFS-DAY, Cfs-day, [$(ft^3/s)/d$]) is the volume of water represented by a flow of 1 cubic foot per second for 24 hours. It is equivalent to 86,400 cubic feet, 1.98347 acre-feet, 646,317 gallons, or 2,446.6 cubic meters. The daily mean discharges reported in the daily value data tables are numerically equal to the daily volumes in cfs-days, and the totals also represent volumes in cfs-days.

Cubic foot per second per square mile [CFSM, $(ft^3/s)/mi^2$] is the average number of cubic feet of water flowing per second from each square mile of area drained, assuming the runoff is distributed uniformly in time and area. (See also "Annual runoff")

Daily mean suspended-sediment concentration is the time-weighted concentration of suspended sediment passing a stream cross section during a 24-hour day. (See also "Sediment" and "Suspended-sediment concentration")

Daily record station is a site where data are collected with sufficient frequency to develop a record of one or more data values per day. The frequency of data collection can range from continuous recording to periodic sample or data collection on a daily or near-daily basis.

Data collection platform (DCP) is an electronic instrument that collects, processes, and stores data from various sensors, and transmits the data by satellite data relay, line-of-sight radio, and/or landline telemetry.

Data logger is a microprocessor-based data acquisition system designed specifically to acquire, process, and store data. Data are usually downloaded from onsite data loggers for entry into office data systems.

Datum is a surface or point relative to which measurements of height and/or horizontal position are reported. A vertical datum is a horizontal surface used as the zero point for measurements of gage height, stage, or elevation; a horizontal datum is a reference for positions given in terms of latitude-longitude, State Plane coordinates, or UTM coordinates. (See also "Gage datum," "Land-surface datum," "National Geodetic Vertical Datum of 1929," and "North American Vertical Datum of 1988")

Diatoms are the unicellular or colonial algae having a siliceous shell. Their concentrations are expressed as number of cells per milliliter (cells/mL) of sample. (See also "Phytoplankton")

Diel is of or pertaining to a 24-hour period of time; a regular daily cycle.

Discharge, or **flow**, is the rate that matter passes through a cross section of a stream channel or other water body per unit of time. The term commonly refers to the volume of water (including, unless otherwise stated, any sediment or other constituents suspended or dissolved in the water) that passes a cross section in a stream channel, canal, pipeline, etc., within a given period of time (cubic feet per second). Discharge also can apply to the rate at which constituents, such as suspended sediment, bedload, and dissolved or suspended chemicals, pass through a cross section, in which cases the quantity is expressed as the mass of constituent that passes the cross section in a given period of time (tons per day).

Dissolved refers to that material in a representative water sample that passes through a 0.45-micrometer membrane filter. This is a convenient operational definition used by Federal and State agencies that collect water-quality data. Determinations of "dissolved" constituent concentrations are made on sample water that has been filtered.

Dissolved oxygen (DO) is the molecular oxygen (oxygen gas) dissolved in water. The concentration in water is a function of atmospheric pressure, temperature, and dissolved-solids

concentration of the water. The ability of water to retain oxygen decreases with increasing temperature or dissolved-solids concentration. Photosynthesis and respiration by plants commonly cause diurnal variations in dissolved-oxygen concentration in water from some streams.

Dissolved solids concentration in water is the quantity of dissolved material in a sample of water. It is determined either analytically by the "residue-on-evaporation" method, or mathematically by totaling the concentrations of individual constituents reported in a comprehensive chemical analysis. During the analytical determination, the bicarbonate (generally a major dissolved component of water) is converted to carbonate. In the mathematical calculation, the bicarbonate value, in milligrams per liter, is multiplied by 0.4926 to convert it to carbonate. Alternatively, alkalinity concentration (as mg/L $CaCO_3$) can be converted to carbonate concentration by multiplying by 0.60.

Diversity index (H) (Shannon index) is a numerical expression of evenness of distribution of aquatic organisms. The formula for diversity index is:

$$\bar{d} = -\sum_{i \approx 1}^{s} \frac{n_i}{n} \log_2 \frac{n_i}{n} \quad ,$$

where n_i is the number of individuals per taxon, n is the total number of individuals, and s is the total number of taxa in the sample of the community. Index values range from zero, when all the organisms in the sample are the same, to some positive number, when some or all of the organisms in the sample are different.

Drainage area of a stream at a specific location is that area upstream from the location, measured in a horizontal plane, that has a common outlet at the site for its surface runoff from precipitation that normally drains by gravity into a stream. Drainage areas given herein include all closed basins, or noncontributing areas, within the area unless otherwise specified.

Drainage basin is a part of the Earth's surface that contains a drainage system with a common outlet for its surface runoff. (See "Drainage area")

Dry mass refers to the mass of residue present after drying in an oven at 105°C, until the mass remains unchanged. This mass represents the total organic matter, ash and sediment, in the sample. Dry-mass values are expressed in the same units as ash mass. (See also "Ash mass," "Biomass," and "Wet mass")

Dry weight refers to the weight of animal tissue after it has been dried in an oven at 65°C until a constant weight is achieved. Dry weight represents total organic and inorganic matter in the tissue. (See also "Wet weight")

Embeddedness is the degree to which gravel-sized and larger particles are surrounded or enclosed by finer-sized particles. (See also "Substrate embeddedness class")

Enterococcus bacteria are commonly found in the feces of humans and other warmblooded animals. Although some strains are ubiquitous and not related to fecal pollution, the presence of enterococci in water is an indication of fecal pollution and the possible presence of enteric pathogens. Enterococcus bacteria are those bacteria that produce pink to red colonies with black or reddish-brown precipitate after incubation at 41°C on mE agar (nutrient medium for bacterial growth) and subsequent transfer to EIA medium. Enterococci include S*treptococcus feacalis, Streptococcus feacium, Streptococcus avium,* and their variants. (See also "Bacteria")

EPT Index is the total number of distinct taxa within the insect orders Ephemeroptera, Plecoptera, and Trichoptera. This index summarizes the taxa richness within the aquatic insects that are generally considered pollution sensitive; the index usually decreases with pollution.

Escherichia coli *(E. coli)* are bacteria present in the intestine and feces of warmblooded animals. *E. coli* are a member species of the fecal coliform group of indicator bacteria. In the laboratory, they are defined as those bacteria that produce yellow or yellow-brown colonies on a filter pad saturated with urea substrate broth after primary culturing for 22 to 24 hours at 44.5°C on mTEC medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample. (See also "Bacteria")

Estimated (E) value of a concentration is reported when an analyte is detected and all criteria for a positive result are met. If the concentration is less than the method detection limit (MDL), an E code will be reported with the value. If the analyte is identified qualitatively as present, but the quantitative determination is substantially more uncertain, the National Water Quality Laboratory will identify the result with an E code even though the measured value is greater than the MDL. A value reported with an E code should be used with caution. When no analyte is detected in a sample, the default reporting value is the MDL preceded by a less than sign (<). For bacteriological data, concentrations are reported as estimated when results are based on non-ideal colony counts.

Euglenoids *(Euglenophyta)* are a group of algae that are usually free-swimming and rarely creeping. They have the ability to grow either photosynthetically in the light or heterotrophically in the dark. (See also "Phytoplankton")

Extractable organic halides (EOX) are organic compounds that contain halogen atoms such as chlorine. These organic compounds are semivolatile and extractable by ethyl acetate from air-dried streambed sediment. The ethyl acetate extract is combusted, and the concentration is determined by microcoulometric determination of the halides formed. The

concentration is reported as micrograms of chlorine per gram of the dry weight of the streambed sediment.

Fecal coliform bacteria are present in the intestines or feces of warmblooded animals. They often are used as indicators of the sanitary quality of the water. In the laboratory, they are defined as all organisms that produce blue colonies within 24 hours when incubated at 44.5°C plus or minus 0.2°C on M-FC medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample. (See also "Bacteria")

Fecal streptococcal bacteria are present in the intestines of warmblooded animals and are ubiquitous in the environment. They are characterized as gram-positive, cocci bacteria that are capable of growth in brain-heart infusion broth. In the laboratory, they are defined as all the organisms that produce red or pink colonies within 48 hours at 35°C plus or minus 1.0°C on KF-streptococcus medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample. (See also "Bacteria")

Fire algae *(Pyrrhophyta)* are free-swimming unicells characterized by a red pigment spot. (See also "Phytoplankton")

Flow-duration percentiles are values on a scale of 100 that indicate the percentage of time for which a flow is not exceeded. For example, the 90th percentile of river flow is greater than or equal to 90 percent of all recorded flow rates.

Gage datum is a horizontal surface used as a zero point for measurement of stage or gage height. This surface usually is located slightly below the lowest point of the stream bottom such that the gage height is usually slightly greater than the maximum depth of water. Because the gage datum itself is not an actual physical object, the datum usually is defined by specifying the elevations of permanent reference marks such as bridge abutments and survey monuments, and the gage is set to agree with the reference marks. Gage datum is a local datum that is maintained independently of any national geodetic datum. However, if the elevation of the gage datum relative to the national datum (North American Vertical Datum of 1988 or National Geodetic Vertical Datum of 1929) has been determined, then the gage readings can be converted to elevations above the national datum by adding the elevation of the gage datum to the gage reading.

Gage height (G.H.) is the water-surface elevation, in feet above the gage datum. If the water surface is below the gage datum, the gage height is negative. Gage height often is used interchangeably with the more general term "stage," although gage height is more appropriate when used in reference to a reading on a gage.

Gage values are values that are recorded, transmitted, and/or computed from a gaging station. Gage values typically are collected at 5-, 15-, or 30-minute intervals.

Gaging station is a site on a stream, canal, lake, or reservoir where systematic observations of stage, discharge, or other hydrologic data are obtained.

Gas chromatography/flame ionization detector (GC/FID) is a laboratory analytical method used as a screening technique for semivolatile organic compounds that are extractable from water in methylene chloride.

Geomorphic channel units, as used in this report, are fluvial geomorphic descriptors of channel shape and stream velocity. Pools, riffles, and runs are types of geomorphic channel units considered for National Water-Quality Assessment (NAWQA) Program habitat sampling.

Green algae *(Chlorophyta)* are unicellular or colonial algae with chlorophyll pigments similar to those in terrestrial green plants. Some forms of green algae produce mats or floating "moss" in lakes. The abundance of green algae in phytoplankton samples is expressed as the number of cells per milliliter (cells/mL) or biovolume in cubic micrometers per milliliter (mm^3/mL). The abundance of green algae in periphyton samples is given in cells per square centimeter (cells/cm^2) or biovolume per square centimeter (mm^3/cm^2). (See also "Phytoplankton" and "Periphyton")

Habitat, as used in this report, includes all nonliving (physical) aspects of the aquatic ecosystem, although living components like aquatic macrophytes and riparian vegetation also are usually included. Measurements of habitat are typically made over a wider geographic scale than are measurements of species distribution.

Habitat quality index is the qualitative description (level 1) of instream habitat and riparian conditions surrounding the reach sampled. Scores range from 0 to 100 percent with higher scores indicative of desirable habitat conditions for aquatic life. Index only applicable to wadable streams.

Hardness of water is a physical-chemical characteristic that commonly is recognized by the increased quantity of soap required to produce lather. It is computed as the sum of equivalents of polyvalent cations (primarily calcium and magnesium) and is expressed as the equivalent concentration of calcium carbonate ($CaCO_3$).

High tide is the maximum height reached by each rising tide. The high-high and low-high tides are the higher and lower of the two high tides, respectively, of each tidal day. See NOAA web site:

http://www.co-ops.nos.noaa.gov/tideglos.html

Hilsenhoff's Biotic Index (HBI) is an indicator of organic pollution that uses tolerance values to weight taxa abundances; usually increases with pollution. It is calculated as follows:

$$HBI = sum\frac{(n)(a)}{N} \quad ,$$

where *n* is the number of individuals of each taxon, *a* is the tolerance value of each taxon, and *N* is the total number of organisms in the sample.

Horizontal datum (See "Datum")

Hydrologic index stations referred to in this report are continuous-record gaging stations that have been selected as representative of streamflow patterns for their respective regions. Station locations are shown on index maps.

Hydrologic unit is a geographic area representing part or all of a surface drainage basin or distinct hydrologic feature as defined by the former Office of Water Data Coordination and delineated on the State Hydrologic Unit Maps by the USGS. Each hydrologic unit is identified by an 8-digit number.

Inch (IN., in.), as used in this report, refers to the depth to which the drainage area would be covered with water if all of the runoff for a given time period were uniformly distributed on it. (See also "Annual runoff")

Instantaneous discharge is the discharge at a particular instant of time. (See also "Discharge")

International Boundary Commission Survey Datum refers to a geodetic datum established at numerous monuments along the United States-Canada boundary by the International Boundary Commission.

Island, as used in this report, is a mid-channel bar that has permanent woody vegetation, is flooded once a year on average, and remains stable except during large flood events.

Laboratory reporting level (LRL) generally is equal to twice the yearly determined long-term method detection level (LT-MDL). The LRL controls false negative error. The probability of falsely reporting a nondetection for a sample that contained an analyte at a concentration equal to or greater than the LRL is predicted to be less than or equal to 1 percent. The value of the LRL will be reported with a "less than" (<) remark code for samples in which the analyte was not detected. The National Water Quality Laboratory (NWQL) collects quality-control data from selected analytical methods on a continuing basis to determine LT-MDLs and to establish LRLs. These values are reevaluated annually on the basis of the most current quality-control data and, therefore, may change. The LRL replaces the term 'non-detection value' (NDV).

Land-surface datum (lsd) is a datum plane that is approximately at land surface at each ground-water observation well.

Latent heat flux (often used interchangeably with latent heat-flux density) is the amount of heat energy that converts water from liquid to vapor (evaporation) or from vapor to liquid (condensation) across a specified cross-sectional area per unit time. Usually expressed in watts per square meter.

Light-attenuation coefficient, also known as the extinction coefficient, is a measure of water clarity. Light is attenuated according to the Lambert-Beer equation:

$$I = I_o e^{-\lambda L},$$

where I_o is the source light intensity, I is the light intensity at length L (in meters) from the source, λ is the light-attenuation coefficient, and e is the base of the natural logarithm. The light-attenuation coefficient is defined as

$$\lambda = -\frac{1}{L}\log_e \frac{I}{I_o}.$$

Lipid is any one of a family of compounds that are insoluble in water and that make up one of the principal components of living cells. Lipids include fats, oils, waxes, and steroids. Many environmental contaminants such as organochlorine pesticides are lipophilic.

Long-term method detection level (LT-MDL) is a detection level derived by determining the standard deviation of a minimum of 24 method detection limit (MDL) spike sample measurements over an extended period of time. LT-MDL data are collected on a continuous basis to assess year-to-year variations in the LT-MDL. The LT-MDL controls false positive error. The chance of falsely reporting a concentration at or greater than the LT-MDL for a sample that did not contain the analyte is predicted to be less than or equal to 1 percent.

Low tide is the minimum height reached by each falling tide. The high-low and low-low tides are the higher and lower of the two low tides, respectively, of each tidal day. See NOAA web site:

http://www.co-ops.nos.noaa.gov/tideglos.html.

Macrophytes are the macroscopic plants in the aquatic environment. The most common macrophytes are the rooted vascular plants that usually are arranged in zones in aquatic ecosystems and restricted in the area by the extent of illumination through the water and sediment deposition along the shoreline.

Mean concentration of suspended sediment (Daily mean suspended-sediment concentration) is the time-weighted concentration of suspended sediment passing a stream cross section during a given time period. (See also "Daily mean suspended-sediment concentration" and "Suspended-sediment concentration")

Mean discharge (MEAN) is the arithmetic mean of individual daily mean discharges during a specific period. (See also "Discharge")

Mean high or **low tide** is the average of all high or low tides, respectively, over a specific period.

Mean sea level is a local tidal datum. It is the arithmetic mean of hourly heights observed over the National Tidal Datum Epoch. Shorter series are specified in the name; for

example, monthly mean sea level and yearly mean sea level. In order that they may be recovered when needed, such datums are referenced to fixed points known as benchmarks. (See also "Datum")

Measuring point (MP) is an arbitrary permanent reference point from which the distance to water surface in a well is measured to obtain water level.

Megahertz is a unit of frequency. One megahertz equals one million cycles per second.

Membrane filter is a thin microporous material of specific pore size used to filter bacteria, algae, and other very small particles from water.

Metamorphic stage refers to the stage of development that an organism exhibits during its transformation from an immature form to an adult form. This developmental process exists for most insects, and the degree of difference from the immature stage to the adult form varies from relatively slight to pronounced, with many intermediates. Examples of metamorphic stages of insects are egg-larva-adult or egg-nymph-adult.

Method detection limit (MDL) is the minimum concentration of a substance that can be measured and reported with 99-percent confidence that the analyte concentration is greater than zero. It is determined from the analysis of a sample in a given matrix containing the analyte. At the MDL concentration, the risk of a false positive is predicted to be less than or equal to 1 percent.

Method of Cubatures is a method of computing discharge in tidal estuaries based on the conservation of mass equation.

Methylene blue active substances (MBAS) are apparent detergents. The determination depends on the formation of a blue color when methylene blue dye reacts with synthetic anionic detergent compounds.

Micrograms per gram (UG/G, µg/g) is a unit expressing the concentration of a chemical constituent as the mass (micrograms) of the element per unit mass (gram) of material analyzed.

Micrograms per kilogram (UG/KG, µg/kg) is a unit expressing the concentration of a chemical constituent as the mass (micrograms) of the constituent per unit mass (kilogram) of the material analyzed. One microgram per kilogram is equivalent to 1 part per billion.

Micrograms per liter (UG/L, µg/L) is a unit expressing the concentration of chemical constituents in water as mass (micrograms) of constituent per unit volume (liter) of water. One thousand micrograms per liter is equivalent to 1 milligram per liter. One microgram per liter is equivalent to 1 part per billion.

Microsiemens per centimeter (US/CM, µS/cm) is a unit expressing the amount of electrical conductivity of a solution as measured between opposite faces of a centimeter cube of solution at a specified temperature. Siemens is the International System of Units nomenclature. It is synonymous with mhos and is the reciprocal of resistance in ohms.

Milligrams per liter (MG/L, mg/L) is a unit for expressing the concentration of chemical constituents in water as the mass (milligrams) of constituent per unit volume (liter) of water. Concentration of suspended sediment also is expressed in milligrams per liter and is based on the mass of dry sediment per liter of water-sediment mixture.

Minimum reporting level (MRL) is the smallest measured concentration of a constituent that may be reliably reported by using a given analytical method.

Miscellaneous site, miscellaneous station, or miscellaneous sampling site is a site where streamflow, sediment, and/or water-quality data or water-quality or sediment samples are collected once, or more often on a random or discontinuous basis to provide better areal coverage for defining hydrologic and water-quality conditions over a broad area in a river basin.

Most probable number (MPN) is an index of the number of coliform bacteria that, more probably than any other number, would give the results shown by the laboratory examination; it is not an actual enumeration. MPN is determined from the distribution of gas-positive cultures among multiple inoculated tubes.

Multiple-plate samplers are artificial substrates of known surface area used for obtaining benthic invertebrate samples. They consist of a series of spaced, hardboard plates on an eyebolt.

Nanograms per liter (NG/L, ng/L) is a unit expressing the concentration of chemical constituents in solution as mass (nanograms) of solute per unit volume (liter) of water. One million nanograms per liter is equivalent to 1 milligram per liter.

National Geodetic Vertical Datum of 1929 (NGVD 29) is a fixed reference adopted as a standard geodetic datum for elevations determined by leveling. It was formerly called "Sea Level Datum of 1929" or "mean sea level." Although the datum was derived from the mean sea level at 26 tide stations, it does not necessarily represent local mean sea level at any particular place. See NOAA web site:

http://www.ngs.noaa.gov/faq.shtml#WhatVD29VD88.

(See "North American Vertical Datum of 1988")

Natural substrate refers to any naturally occurring immersed or submersed solid surface, such as a rock or tree, upon which an organism lives. (See also "Substrate")

Nekton are the consumers in the aquatic environment and consist of large free-swimming organisms that are capable of sustained, directed mobility.

Nephelometric turbidity unit (NTU) is the measurement for reporting turbidity that is based on use of a standard suspension of formazin. Turbidity measured in NTU uses nephelometric methods that depend on passing specific light of a specific wavelength through the sample.

North American Datum of 1927 (NAD 27) is the horizontal control datum for the United States that was defined by a location and azimuth on the Clarke spheroid of 1866.

North American Datum of 1983 (NAD 83) is the horizontal control datum for the United States, Canada, Mexico, and Central America that is based on the adjustment of 250,000 points including 600 satellite Doppler stations that constrain the system to a geocentric origin. NAD 83 has been officially adopted as the legal horizontal datum for the United States by the Federal government.

North American Vertical Datum of 1988 (NAVD 88) is a fixed reference adopted as the official civilian vertical datum for elevations determined by Federal surveying and mapping activities in the United States. This datum was established in 1991 by minimum-constraint adjustment of the Canadian**,** Mexican, and United States first-order terrestrial leveling networks.

Open or **screened interval** is the length of unscreened opening or of well screen through which water enters a well, in feet below land surface.

Organic carbon (OC) is a measure of organic matter present in aqueous solution, suspension, or bottom sediment. May be reported as dissolved organic carbon (DOC), particulate organic carbon (POC), or total organic carbon (TOC).

Organic mass or **volatile mass** of a living substance is the difference between the dry mass and ash mass and represents the actual mass of the living matter. Organic mass is expressed in the same units as for ash mass and dry mass. (See also “Ash mass,” “Biomass,” and “Dry mass”)

Organism count/area refers to the number of organisms collected and enumerated in a sample and adjusted to the number per area habitat, usually square meter (m^2), acre, or hectare. Periphyton, benthic organisms, and macrophytes are expressed in these terms.

Organism count/volume refers to the number of organisms collected and enumerated in a sample and adjusted to the number per sample volume, usually milliliter (mL) or liter (L). Numbers of planktonic organisms can be expressed in these terms.

Organochlorine compounds are any chemicals that contain carbon and chlorine. Organochlorine compounds that are important in investigations of water, sediment, and biological quality include certain pesticides and industrial compounds.

Parameter code is a 5-digit number used in the USGS computerized data system, National Water Information System (NWIS), to uniquely identify a specific constituent or property.

Partial-record station is a site where discrete measurements of one or more hydrologic parameters are obtained over a period of time without continuous data being recorded or computed. A common example is a crest-stage gage partial-record station at which only peak stages and flows are recorded.

Particle size is the diameter, in millimeters (mm), of a particle determined by sieve or sedimentation methods. The sedimentation method utilizes the principle of Stokes law to calculate sediment particle sizes. Sedimentation methods (pipet, bottom-withdrawal tube, visual-accumulation tube, sedigraph) determine fall diameter of particles in either distilled water (chemically dispersed) or in native water (the river water at the time and point of sampling).

Particle-size classification, as used in this report, agrees with the recommendation made by the American Geophysical Union Subcommittee on Sediment Terminology. The classification is as follows:

Classification	Size (mm)	Method of analysis
Clay	>0.00024 - 0.004	Sedimentation
Silt	>0.004 - 0.062	Sedimentation
Sand	>0.062 - 2.0	Sedimentation/sieve
Gravel	>2.0 - 64.0	Sieve
Cobble	>64 - 256	Manual measurement
Boulder	>256	Manual measurement

The particle-size distributions given in this report are not necessarily representative of all particles in transport in the stream. For the sedimentation method, most of the organic matter is removed, and the sample is subjected to mechanical and chemical dispersion before analysis in distilled water. Chemical dispersion is not used for native water analysis.

Peak flow (peak stage) is an instantaneous local maximum value in the continuous time series of streamflows or stages, preceded by a period of increasing values and followed by a period of decreasing values. Several peak values ordinarily occur in a year. The maximum peak value in a year is called the annual peak; peaks lower than the annual peak are called secondary peaks. Occasionally, the annual peak may not be the maximum value for the year; in such cases, the maximum value occurs at midnight at the beginning or end of the year, on the recession from or rise toward a higher peak in the adjoining year. If values are recorded at a discrete series of times, the peak recorded value may be taken as an approximation of the true peak, which may occur between the recording instants. If the values are recorded with finite precision, a sequence of equal recorded values may occur at the peak; in this case, the first value is taken as the peak.

Percent composition or **percent of total** is a unit for expressing the ratio of a particular part of a sample or population to the total sample or population, in terms of types, numbers, weight, mass, or volume.

Percent shading is a measure of the amount of sunlight potentially reaching the stream. A clinometer is used to measure left and right bank canopy angles. These values are added together, divided by 180, and multiplied by 100 to compute percentage of shade.

Periodic-record station is a site where stage, discharge, sediment, chemical, physical, or other hydrologic measurements are made one or more times during a year but at a frequency insufficient to develop a daily record.

Periphyton is the assemblage of microorganisms attached to and living upon submerged solid surfaces. Although primarily consisting of algae, they also include bacteria, fungi, protozoa, rotifers, and other small organisms. Periphyton are useful indicators of water quality.

Pesticides are chemical compounds used to control undesirable organisms. Major categories of pesticides include insecticides, miticides, fungicides, herbicides, and rodenticides.

pH of water is the negative logarithm of the hydrogen-ion activity. Solutions with pH less than 7.0 standard units are termed "acidic," and solutions with a pH greater than 7.0 are termed "basic." Solutions with a pH of 7.0 are neutral. The presence and concentration of many dissolved chemical constituents found in water are affected, in part, by the hydrogen-ion activity of water. Biological processes including growth, distribution of organisms, and toxicity of the water to organisms also are affected, in part, by the hydrogen-ion activity of water.

Phytoplankton is the plant part of the plankton. They are usually microscopic, and their movement is subject to the water currents. Phytoplankton growth is dependent upon solar radiation and nutrient substances. Because they are able to incorporate as well as release materials to the surrounding water, the phytoplankton have a profound effect upon the quality of the water. They are the primary food producers in the aquatic environment and commonly are known as algae. (See also "Plankton")

Picocurie (PC, pCi) is one trillionth (1×10^{-12}) of the amount of radioactive nuclide represented by a curie (Ci). A curie is the quantity of radioactive nuclide that yields 3.7×10^{10} radioactive disintegrations per second (dps). A picocurie yields 0.037 dps, or 2.22 dpm (disintegrations per minute).

Plankton is the community of suspended, floating, or weakly swimming organisms that live in the open water of lakes and rivers. Concentrations are expressed as a number of cells per milliliter (cells/mL) of sample.

Polychlorinated biphenyls (PCBs) are industrial chemicals that are mixtures of chlorinated biphenyl compounds having various percentages of chlorine. They are similar in structure to organochlorine insecticides.

Polychlorinated naphthalenes (PCNs) are industrial chemicals that are mixtures of chlorinated naphthalene compounds. They have properties and applications similar to polychlorinated biphenyls (PCBs) and have been identified in commercial PCB preparations.

Pool, as used in this report, is a small part of a stream reach with little velocity, commonly with water deeper than surrounding areas.

Primary productivity is a measure of the rate at which new organic matter is formed and accumulated through photosynthetic and chemosynthetic activity of producer organisms (chiefly, green plants). The rate of primary production is estimated by measuring the amount of oxygen released (oxygen method) or the amount of carbon assimilated (carbon method) by the plants.

Primary productivity (carbon method) is expressed as milligrams of carbon per area per unit time [mg C/(m^2/time)] for periphyton and macrophytes or per volume [mg C/(m^3/time)] for phytoplankton. The carbon method defines the amount of carbon dioxide consumed as measured by radioactive carbon (carbon-14). The carbon-14 method is of greater sensitivity than the oxygen light and dark bottle method and is preferred for use with unenriched water samples. Unit time may be either the hour or day, depending on the incubation period. (See also "Primary productivity")

Primary productivity (oxygen method) is expressed as milligrams of oxygen per area per unit time [mg O/(m^2/time)] for periphyton and macrophytes or per volume [mg O/(m^3/time)] for phytoplankton. The oxygen method defines production and respiration rates as estimated from changes in the measured dissolved-oxygen concentration. The oxygen light and dark bottle method is preferred if the rate of primary production is sufficient for accurate measurements to be made within 24 hours. Unit time may be either the hour or day, depending on the incubation period. (See also "Primary productivity")

Radioisotopes are isotopic forms of elements that exhibit radioactivity. Isotopes are varieties of a chemical element that differ in atomic weight but are very nearly alike in chemical properties. The difference arises because the atoms of the isotopic forms of an element differ in the number of neutrons in the nucleus; for example, ordinary chlorine is a mixture of isotopes having atomic weights of 35 and 37, and the natural mixture has an atomic weight of about 35.453. Many of the elements similarly exist as mixtures of isotopes, and a great many new isotopes have been produced in the operation of nuclear devices such as the cyclotron. There are 275 isotopes of the 81 stable elements, in addition to more than 800 radioactive isotopes.

Reach, as used in this report, is a length of stream that is chosen to represent a uniform set of physical, chemical, and

biological conditions within a segment. It is the principal sampling unit for collecting physical, chemical, and biological data.

Recoverable from bed (bottom) material is the amount of a given constituent that is in solution after a representative sample of bottom material has been digested by a method (usually using an acid or mixture of acids) that results in dissolution of readily soluble substances. Complete dissolution of all bottom material is not achieved by the digestion treatment and thus the determination represents less than the total amount (that is, less than 95 percent) of the constituent in the sample. To achieve comparability of analytical data, equivalent digestion procedures would be required of all laboratories performing such analyses because different digestion procedures are likely to produce different analytical results. (See also "Bed material")

Recurrence interval, also referred to as return period, is the average time, usually expressed in years, between occurrences of hydrologic events of a specified type (such as exceedances of a specified high flow or nonexceedance of a specified low flow). The terms "return period" and "recurrence interval" do not imply regular cyclic occurrence. The actual times between occurrences vary randomly, with most of the times being less than the average and a few being substantially greater than the average. For example, the 100-year flood is the flow rate that is exceeded by the annual maximum peak flow at intervals whose average length is 100 years (that is, once in 100 years, on average); almost two-thirds of all exceedances of the 100-year flood occur less than 100 years after the previous exceedance, half occur less than 70 years after the previous exceedance, and about one-eighth occur more than 200 years after the previous exceedance. Similarly, the 7-day, 10-year low flow ($7Q_{10}$) is the flow rate below which the annual minimum 7-day-mean flow dips at intervals whose average length is 10 years (that is, once in 10 years, on average); almost two-thirds of the nonexceedances of the $7Q_{10}$ occur less than 10 years after the previous nonexceedance, half occur less than 7 years after, and about one-eighth occur more than 20 years after the previous nonexceedance. The recurrence interval for annual events is the reciprocal of the annual probability of occurrence. Thus, the 100-year flood has a 1-percent chance of being exceeded by the maximum peak flow in any year, and there is a 10-percent chance in any year that the annual minimum 7-day-mean flow will be less than the $7Q_{10}$.

Replicate samples are a group of samples collected in a manner such that the samples are thought to be essentially identical in composition.

Return period (See "Recurrence interval")

Riffle, as used in this report, is a shallow part of the stream where water flows swiftly over completely or partially submerged obstructions to produce surface agitation.

River mileage is the curvilinear distance, in miles, measured upstream from the mouth along the meandering path of a stream channel in accordance with Bulletin No. 14 (October 1968) of the Water Resources Council and typically is used to denote location along a river.

Run, as used in this report, is a relatively shallow part of a stream with moderate velocity and little or no surface turbulence.

Runoff is the quantity of water that is discharged ("runs off") from a drainage basin during a given time period. Runoff data may be presented as volumes in acre-feet, as mean discharges per unit of drainage area in cubic feet per second per square mile, or as depths of water on the drainage basin in inches. (See also "Annual runoff")

Sea level, as used in this report, refers to one of the two commonly used national vertical datums (NGVD 1929 or NAVD 1988). See separate entries for definitions of these datums.

Sediment is solid material that originates mostly from disintegrated rocks; when transported by, suspended in, or deposited from water, it is referred to as "fluvial sediment." Sediment includes chemical and biochemical precipitates and decomposed organic material, such as humus. The quantity, characteristics, and cause of the occurrence of sediment in streams are affected by environmental and land-use factors. Some major factors are topography, soil characteristics, land cover, and depth and intensity of precipitation.

Sensible heat flux (often used interchangeably with latent sensible heat-flux density) is the amount of heat energy that moves by turbulent transport through the air across a specified cross-sectional area per unit time and goes to heating (cooling) the air. Usually expressed in watts per square meter.

Seven-day, 10-year low flow ($7Q_{10}$) is the discharge below which the annual 7-day minimum flow falls in 1 year out of 10 on the long-term average. The recurrence interval of the $7Q_{10}$ is 10 years; the chance that the annual 7-day minimum flow will be less than the $7Q_{10}$ is 10 percent in any given year. (See also "Annual 7-day minimum" and "Recurrence interval")

Shelves, as used in this report, are streambank features extending nearly horizontally from the flood plain to the lower limit of persistent woody vegetation.

Sodium adsorption ratio (SAR) is the expression of relative activity of sodium ions in exchange reactions within soil and is an index of sodium or alkali hazard to the soil. Sodium hazard in water is an index that can be used to evaluate the suitability of water for irrigating crops.

Soil heat flux (often used interchangeably with soil heat-flux density) is the amount of heat energy that moves by conduction across a specified cross-sectional area of soil per

unit time and goes to heating (or cooling) the soil. Usually expressed in watts per square meter.

Soil-water content is the water lost from the soil upon drying to constant mass at 105°C; expressed either as mass of water per unit mass of dry soil or as the volume of water per unit bulk volume of soil.

Specific electrical conductance (conductivity) is a measure of the capacity of water (or other media) to conduct an electrical current. It is expressed in microsiemens per centimeter at 25°C. Specific electrical conductance is a function of the types and quantity of dissolved substances in water and can be used for approximating the dissolved-solids content of the water. Commonly, the concentration of dissolved solids (in milligrams per liter) is from 55 to 75 percent of the specific conductance (in microsiemens). This relation is not constant from stream to stream, and it may vary in the same source with changes in the composition of the water.

Stable isotope ratio (per MIL) is a unit expressing the ratio of the abundance of two radioactive isotopes. Isotope ratios are used in hydrologic studies to determine the age or source of specific water, to evaluate mixing of different water, as an aid in determining reaction rates, and other chemical or hydrologic processes.

Stage (See "Gage height")

Stage-discharge relation is the relation between the water-surface elevation, termed stage (gage height), and the volume of water flowing in a channel per unit time.

Streamflow is the discharge that occurs in a natural channel. Although the term "discharge" can be applied to the flow of a canal, the word "streamflow" uniquely describes the discharge in a surface stream course. The term "streamflow" is more general than "runoff" as streamflow may be applied to discharge whether or not it is affected by diversion or regulation.

Substrate is the physical surface upon which an organism lives.

Substrate embeddedness class is a visual estimate of riffle streambed substrate larger than gravel that is surrounded or covered by fine sediment (<2mm, sand or finer). Below are the class categories expressed as the percentage covered by fine sediment:

0	no gravel or larger substrate	3	26-50 percent
1	> 75 percent	4	5-25 percent
2	51-75 percent	5	< 5 percent

Surface area of a lake is that area (acres) encompassed by the boundary of the lake as shown on USGS topographic maps, or other available maps or photographs. Because surface area changes with lake stage, surface areas listed in this report represent those determined for the stage at the time the maps or photographs were obtained.

Surficial bed material is the upper surface (0.1 to 0.2 foot) of the bed material that is sampled using U.S. Series Bed-Material Samplers.

Surrogate is an analyte that behaves similarly to a target analyte, but that is highly unlikely to occur in a sample. A surrogate is added to a sample in known amounts before extraction and is measured with the same laboratory procedures used to measure the target analyte. Its purpose is to monitor method performance for an individual sample.

Suspended (as used in tables of chemical analyses) refers to the amount (concentration) of undissolved material in a water-sediment mixture. It is defined operationally as the material retained on a 0.45-micrometer filter.

Suspended, recoverable is the amount of a given constituent that is in solution after the part of a representative suspended water-sediment sample that is retained on a 0.45-micrometer membrane filter has been digested by a method (usually using a dilute acid solution) that results in dissolution of only readily soluble substances. Complete dissolution of all the particulate matter is not achieved by the digestion treatment, and thus the determination represents something less than the "total" amount (that is, less than 95 percent) of the constituent present in the sample. To achieve comparability of analytical data, equivalent digestion procedures are required of all laboratories performing such analyses because different digestion procedures are likely to produce different analytical results. Determinations of "suspended, recoverable" constituents are made either by directly analyzing the suspended material collected on the filter or, more commonly, by difference, on the basis of determinations of (1) dissolved and (2) total recoverable concentrations of the constituent. (See also "Suspended")

Suspended sediment is the sediment maintained in suspension by the upward components of turbulent currents or that exists in suspension as a colloid. (See also "Sediment")

Suspended-sediment concentration is the velocity-weighted concentration of suspended sediment in the sampled zone (from the water surface to a point approximately 0.3 foot above the bed) expressed as milligrams of dry sediment per liter of water-sediment mixture (mg/L). The analytical technique uses the mass of all of the sediment and the net weight of the water-sediment mixture in a sample to compute the suspended-sediment concentration. (See also "Sediment" and "Suspended sediment")

Suspended-sediment discharge (tons/d) is the rate of sediment transport, as measured by dry mass or volume, that passes a cross section in a given time. It is calculated in units of tons per day as follows: concentration (mg/L) x discharge (ft^3/s) x 0.0027. (See also "Sediment," "Suspended sediment," and "Suspended-sediment concentration")

Suspended-sediment load is a general term that refers to a given characteristic of the material in suspension that passes a point during a specified period of time. The term needs to be qualified, such as "annual suspended-sediment load" or "sand-size suspended-sediment load," and so on. It is not synonymous with either suspended-sediment discharge or concentration. (See also "Sediment")

Suspended solids, total residue at 105°C concentration is the concentration of inorganic and organic material retained on a filter, expressed as milligrams of dry material per liter of water (mg/L). An aliquot of the sample is used for this analysis.

Suspended, total is the total amount of a given constituent in the part of a water-sediment sample that is retained on a 0.45-micrometer membrane filter. This term is used only when the analytical procedure assures measurement of at least 95 percent of the constituent determined. Knowledge of the expected form of the constituent in the sample, as well as the analytical methodology used, is required to determine when the results should be reported as "suspended, total." Determinations of "suspended, total" constituents are made either by directly analyzing portions of the suspended material collected on the filter or, more commonly, by difference, on the basis of determinations of (1) dissolved and (2) total concentrations of the constituent. (See also "Suspended")

Synoptic studies are short-term investigations of specific water-quality conditions during selected seasonal or hydrologic periods to provide improved spatial resolution for critical water-quality conditions. For the period and conditions sampled, they assess the spatial distribution of selected water-quality conditions in relation to causative factors, such as land use and contaminant sources.

Taxa (Species) richness is the number of species (taxa) present in a defined area or sampling unit.

Taxonomy is the division of biology concerned with the classification and naming of organisms. The classification of organisms is based upon a hierarchial scheme beginning with Kingdom and ending with Species at the base. The higher the classification level, the fewer features the organisms have in common. For example, the taxonomy of a particular mayfly, *Hexagenia limbata,* is the following:

Kingdom:	Animal
Phylum:	Arthropoda
Class:	Insecta
Order:	Ephemeroptera
Family:	Ephemeridae
Genus:	*Hexagenia*
Species:	*Hexagenia limbata*

Thalweg is the line formed by connecting points of minimum streambed elevation (deepest part of the channel).

Thermograph is an instrument that continuously records variations of temperature on a chart. The more general term "temperature recorder" is used in the table descriptions and refers to any instrument that records temperature whether on a chart, a tape, or any other medium.

Time-weighted average is computed by multiplying the number of days in the sampling period by the concentrations of individual constituents for the corresponding period and dividing the sum of the products by the total number of days. A time-weighted average represents the composition of water resulting from the mixing of flow proportionally to the duration of the concentration.

Tons per acre-foot (T/acre-ft) is the dry mass (tons) of a constituent per unit volume (acre-foot) of water. It is computed by multiplying the concentration of the constituent, in milligrams per liter, by 0.00136.

Tons per day (T/DAY, tons/d) is a common chemical or sediment discharge unit. It is the quantity of a substance in solution, in suspension, or as bedload that passes a stream section during a 24-hour period. It is equivalent to 2,000 pounds per day, or 0.9072 metric tons per day.

Total is the amount of a given constituent in a representative whole-water (unfiltered) sample, regardless of the constituent's physical or chemical form. This term is used only when the analytical procedure assures measurement of at least 95 percent of the constituent present in both the dissolved and suspended phases of the sample. A knowledge of the expected form of the constituent in the sample, as well as the analytical methodology used, is required to judge when the results should be reported as "total." (Note that the word "total" does double duty here, indicating both that the sample consists of a water-suspended sediment mixture and that the analytical method determined at least 95 percent of the constituent in the sample.)

Total coliform bacteria are a particular group of bacteria that are used as indicators of possible sewage pollution. This group includes coliforms that inhabit the intestine of warmblooded animals and those that inhabit soils. They are characterized as aerobic or facultative anaerobic, gram-negative, nonspore-forming, rod-shaped bacteria that ferment lactose with gas formation within 48 hours at 35°C. In the laboratory, these bacteria are defined as all the organisms that produce colonies with a golden-green metallic sheen within 24 hours when incubated at 35°C plus or minus 1.0°C on M-Endo medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 milliliters of sample. (See also "Bacteria")

Total discharge is the quantity of a given constituent, measured as dry mass or volume, that passes a stream cross section per unit of time. When referring to constituents other than water, this term needs to be qualified, such as "total sediment discharge," "total chloride discharge," and so on.

Total in bottom material is the amount of a given constituent in a representative sample of bottom material. This term is used only when the analytical procedure assures measurement of at least 95 percent of the constituent determined. A knowledge of the expected form of the constituent in the sample, as well as the analytical methodology used, is required to judge when the results should be reported as "total in bottom material."

Total length (fish) is the straight-line distance from the anterior point of a fish specimen's snout, with the mouth closed, to the posterior end of the caudal (tail) fin, with the lobes of the caudal fin squeezed together.

Total load refers to all of a constituent in transport. When referring to sediment, it includes suspended load plus bed load.

Total organism count is the number of organisms collected and enumerated in any particular sample. (See also "Organism count/volume")

Total recoverable is the amount of a given constituent in a whole-water sample after a sample has been digested by a method (usually using a dilute acid solution) that results in dissolution of only readily soluble substances. Complete dissolution of all particulate matter is not achieved by the digestion treatment, and thus the determination represents something less than the "total" amount (that is, less than 95 percent) of the constituent present in the dissolved and suspended phases of the sample. To achieve comparability of analytical data for whole-water samples, equivalent digestion procedures are required of all laboratories performing such analyses because different digestion procedures may produce different analytical results.

Total sediment discharge is the mass of suspended-sediment plus bed-load transport, measured as dry weight, that passes a cross section in a given time. It is a rate and is reported as tons per day. (See also "Bedload," "Bedload discharge," "Sediment," "Suspended sediment," and "Suspended-sediment concentration")

Total sediment load or **Total load** is the sediment in transport as bedload and suspended-sediment load. The term may be qualified, such as "annual suspended-sediment load" or "sand-size suspended-sediment load," and so on. It differs from total sediment discharge in that load refers to the material, whereas discharge refers to the quantity of material, expressed in units of mass per unit time. (See also "Sediment," "Suspended-sediment load," and "Total load")

Transect, as used in this report, is a line across a stream perpendicular to the flow and along which measurements are taken, so that morphological and flow characteristics along the line are described from bank to bank. Unlike a cross section, no attempt is made to determine known elevation points along the line.

Turbidity is the reduction in the transparency of a solution due to the presence of suspended and some dissolved substances. The measurement technique records the collective optical properties of the solution that cause light to be scattered and attenuated rather than transmitted in straight lines; the higher the intensity of scattered or attenuated light, the higher the value of the turbidity. Turbidity is expressed in nephelometric turbidity units (NTU). Depending on the method used, the turbidity units as NTU can be defined as the intensity of light of a specified wavelength scattered or attenuated by suspended particles or absorbed at a method specified angle, usually 90 degrees, from the path of the incident light. Currently approved methods for the measurement of turbidity in the USGS include those that conform to U.S. EPA Method 180.1, ASTM D1889-00, and ISO 7027. Measurements of turbidity by these different methods and different instruments are unlikely to yield equivalent values.

Ultraviolet (UV) absorbance (absorption) at 254 or 280 nanometers is a measure of the aggregate concentration of the mixture of UV absorbing organic materials dissolved in the analyzed water, such as lignin, tannin, humic substances, and various aromatic compounds. UV absorbance (absorption) at 254 or 280 nanometers is measured in UV absorption units per centimeter of pathlength of UV light through a sample.

Unconfined aquifer is an aquifer whose upper surface is a water table free to fluctuate under atmospheric pressure. (See "Water-table aquifer")

Vertical datum (See "Datum")

Volatile organic compounds (VOCs) are organic compounds that can be isolated from the water phase of a sample by purging the water sample with inert gas, such as helium, and subsequently analyzed by gas chromatography. Many VOCs are human-made chemicals that are used and produced in the manufacture of paints, adhesives, petroleum products, pharmaceuticals, and refrigerants. They are often components of fuels, solvents, hydraulic fluids, paint thinners, and dry cleaning agents commonly used in urban settings. VOC contamination of drinking-water supplies is a human health concern because many are toxic and are known or suspected human carcinogens.

Water table is that surface in a ground-water body at which the water pressure is equal to the atmospheric pressure.

Water-table aquifer is an unconfined aquifer within which the water table is found.

Water year in USGS reports dealing with surface-water supply is the 12-month period October 1 through September 30. The water year is designated by the calendar year in which it ends and which includes 9 of the 12 months. Thus, the year ending September 30, 2003, is called the "2003 water year."

WDR is used as an abbreviation for "Water-Data Report" in the REVISED RECORDS paragraph to refer to State annual hydrologic-data reports. (WRD was used as an abbreviation

for "Water-Resources Data" in reports published prior to 1976.)

Weighted average is used in this report to indicate discharge-weighted average. It is computed by multiplying the discharge for a sampling period by the concentrations of individual constituents for the corresponding period and dividing the sum of the products by the sum of the discharges. A discharge-weighted average approximates the composition of water that would be found in a reservoir containing all the water passing a given location during the water year after thorough mixing in the reservoir.

Wet mass is the mass of living matter plus contained water. (See also "Biomass" and "Dry mass")

Wet weight refers to the weight of animal tissue or other substance including its contained water. (See also "Dry weight")

WSP is used as an acronym for "Water-Supply Paper" in reference to previously published reports.

Zooplankton is the animal part of the plankton. Zooplankton are capable of extensive movements within the water column and often are large enough to be seen with the unaided eye. Zooplankton are secondary consumers feeding upon bacteria, phytoplankton, and detritus. Because they are the grazers in the aquatic environment, the zooplankton are a vital part of the aquatic food web. The zooplankton community is dominated by small crustaceans and rotifers. (See also "Plankton")

TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS OF THE U.S. GEOLOGICAL SURVEY

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Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)

[P, present;--, no data]

Station number	Station name	Drainage area (square miles)	Period of record (by water year)								
			Discharge or contents		Water quality						
					Daily			Periodic			
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
			Part 5--Hudson Bay Basin								
05010000	Belly River at international boundary	74.8	1947-64	1948-64	--	--	--	--	--	--
05010500	North Fork Belly River at international boundary	10.1	1947-55	1948-55	--	--	--	--	--	--
05010700	Mountain View Irrigation District Canal near Mtn. View, Alberta	--	1935-78	--	--	--	--	--	--	--
05011000	Belly River near Mountain View, Alberta	121	1912-78	1912-78	--	--	--	--	--	--
05011500	Waterton River near international boundary	61.0	1947-64	1948-64	--	--	--	--	--	--
05012000	Street Creek at international boundary	6.0	1948-55	1948-55, 1964	--	--	--	--	--	--
05012500	Boundary Creek at international boundary	21.0	1948-64	1948-64	--	--	--	--	--	--
05013000	Waterton River near Waterton Park, Alberta	238	1908-33, 1948-78	1908-30, 1933, 1948-78	--	--	--	--	--	--
05013500	St. Mary Lake near St. Mary	130	1929-61	--	--	--	--	--	--	--
05013600	St. Mary River near St. Mary	130	1961-62	--	--	--	--	--	--	--
05013700	St. Mary River above Swiftcurrent Creek, near Babb	173	1902-15	1902-15	--	--	--	--	--	--
05013900	Grinnell Creek at Grinnell Glacier, near Many Glacier	1.1	1959-71	1960-63, 1965-66, 1968-71	--	--	--	--	--	--
05014000	Grinnell Creek near Many Glacier	3.32	1949-78	1950-78	--	--	--	--	--	--
05014300	**Swiftcurrent Creek above Swiftcurrent Lake, nr Many Glacier**		**2003**	**2003**						
05014500	**Swiftcurrent Creek at Many Glacier**	30.9	**1912-P**	**1913-P**	--	1966-69	--	--	1966	--
05015000	Canyon Creek near Many Glacier	7.1	1918-37	1919, 1921-27, 1929-31, 1934,1936	--	--	--	--	--	--
05015500	**Lake Sherburne at Sherburne**	64.1	**1915-P**	--	--	--	--	--	--	--
05016000	**Swiftcurrent Creek at Sherburne**	64.6	**1912-81, 1984-P**	**1913-P**	--	--	--	1990-92	**1996-P**	--
05016400	Swiftcurrent Creek at mouth, near Babb	--	--	--	--	--	--	--	1996	--
05016500	Swiftcurrent Creek near Babb	98.6	1902-10	1902, 1904-07, 1909	--	--	--	--	--	--
05017000	Lower St. Mary Lake near Babb	276	1929-55	--	--	--	--	--	--	--
05017500	**St. Mary River near Babb**	276	**1901-02, 1910-25, 1950-P**	**1902, 1911-25, 1951-P**	--	--	--	1965	--	--
05018000	**St. Mary Canal at intake, near Babb**	--	**1918-50, 1997-P**	--	--	--	--	--	--	--
05018500	**St. Mary Canal at St. Mary Crossing, near Babb**	--	**1918-P**	--	--	--	--	--	--	--

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)							
			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
			Part 5--Hudson Bay Basin--Continued							
05019000	St. Mary Canal at Hudson Bay Divide, near Browning	--	1917-66	--	--	--	--	1965, 1981-83	--	--
05019500	St. Mary River below St. Mary Canal, near Babb	286	1929-50	1929-33, 1935-50	--	--	--	--	--	--
05020000	Kennedy Creek near Babb	60.8	1905	1964,1975	--	--	--	--	--	--
05020500	**St. Mary River at international boundary**	465	**1902-P**	**1903-P**	1978-81	1978-79	--	1978-93	1978-93	1978-93
			Part 6--Missouri River Basin							
06006000	**Red Rock Creek above Lakes, near Lakeview**	39.2	**1997-P**	**1997-P**	--	--	--	--	--	--
06007000	Tom Creek near Lakeview	6.43	1989	1989	--	--	--	--	--	--
06008000	Odell Creek above Taft Ranch, near Lakeview	17.7	1993-98	1994-98	--	--	--	--	--	--
06010000	Red Rock River near Lakeview	237	1933-37	--	--	--	--	--	--	--
06010500	Red Rock River at Metzel Fork, near Monida	264	1925-29	--	--	--	--	--	--	--
06010600	Red Rock River at Brundage Bridge, near Lakeview	277	1988-89	1989	--	--	--	--	--	--
06011000	Red Rock River at Kennedy Ranch, near Lakeview	323	1936-67	1937-42, 1945-54, 1956-67, 1984	--	--	--	--	--	--
06011400	Long Creek near Lakeview	36	--	1960-67, 1969,1984	--	--	--	--	--	--
06011500	Red Rock River above Lima Reservoir, near Monida	431	1911, 1914-18, 1925,1930	--	--	--	--	--	--	--
06011900	Red Rock River tributary near Monida	0.37	--	1960-67, 1984	--	--	--	--	--	--
06012000	**Lima Reservoir near Monida**	570	**1940-P**	--	--	--	--	--	--	--
06012500	**Red Rock River below Lima Reservoir, near Monida**	570	**1911-19, 1925-69, 1974-82, 1985-P**	**1912-18, 1926-69, 1974-82, 1985-P**	--	--	--	--	--	--
06013000	Red Rock River at Lima	602	1907-11	--	--	--	--	--	--	--
06013200	Traux Creek near Lima	4.06	--	1960-74, 1984	--	--	--	--	--	--
06013400	Muddy Creek near Dell	63.4	--	1960-74, 1984	--	--	--	--	--	--
06013500	Big Sheep Creek below Muddy Creek, near Dell	278	1936, 1946-53, 1977-79	1946-53, 1960-91	--	1977-79	1977-79	--	1977-79	--
06013900	Sage Creek tributary near Dell	0.34	--	1959-67	--	--	--	--	--	--
06014000	Red Rock River near Dell	1,421	1942-67	1943-67	--	--	--	--	--	--

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)							
			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
			Part 6--Missouri River Basin--Continued							
06014500	Red Rock River at Red Rock	1,548	1890, 1951-52, 1974-83	1974-83	--	--	--	--	--	--
06015000	Horse Prairie Creek near Grant	325	1946-53	1946-53	--	--	--	--	--	--
06015300	**Clark Canyon Reservoir near Grant**	2,321	**1964-P**	--	--	--	--	--	--	--
06015400	Beaverhead River near Grant	2,322	1962-83	1963-83	--	--	--	--	--	--
06015430	**Clark Canyon near Dillon**	18.0	--	**1969, 1974-P**	--	--	--	--	--	--
06015500	Grasshopper Creek near Dillon	348	1921-33, 1946-54, 1955-58, 1960-61	1921-32, 1946-53, 1955-58, 1960-73, 1975	--	--	--	1986	--	--
06016000	**Beaverhead River at Barretts**	2,737	**1907-P**	**1908-P**	1965-78	1965-78	--	1965-78, 1986		--
06016500	Rattlesnake Creek near Dillon	23.9	1946-49	--	--	--	--	--	--	--
06016900	Beaverhead River tributary near Dillon	0.93	--	1960-74	--	--	--	--	--	--
06017000	**Beaverhead River at Dillon**	2,895	**1950-52, 1963-71 2002-P**	**1951-52, 1964-71 2002-P**	--	--	--	--	--	--
06017500	Blacktail Deer Creek near Dillon	312	1946-54, 1955-66	1946-53, 1955-66, 1984	--	--	--	--	--	--
06017600	Blacktail Deer Creek at Dillon	--	--	--	--	--	--	1986	--	--
06018000	Beaverhead River near Dillon	3,484	1951-52, 1963-83	1951-52, 1964-83	--	--	--	--	--	--
06018200	Beaverhead River tributary No. 2 near Dillon	0.88	--	1958-65	--	--	--	--	--	--
06018500	**Beaverhead River near Twin Bridges**	3,619	**1935-P**	**1936-44, 1946-P**	--	**2001-P**	1962-74	**1950-51, 1962-81, 1986, 1999-P**	**1999-P**	--
06019000	Ruby River above Warm Springs Creek, near Alder	145	1948-53	1948-53	--	--	--	--	--	--
06019400	Sweetwater Creek near Alder	81.5	--	1974-91	--	--	--	--	--	--
06019500	**Ruby River above Reservoir, near Alder**	534	**1938-P**	**1939-P**	--	--	--	--	1994	--
06019800	Idaho Creek near Alder	11.0	--	1960-85	--	--	--	--	--	--
06020000	Ruby River at damsite, near Alder	592	1911-14, 1935-37	--	--	--	--	--	--	--
06020600	**Ruby River below Reservoir, near Alder**	596	**1962-P**	**1963-P**	--	--	--	--	1994	--
06021000	Ruby River near Alder	614	1929-39, 1946-61	1929-39, 1947-60	--	--	--	--	--	--
06021500	Ruby River at Laurin	650	1946-61	1947-60	--	--	--	--	--	--
06022000	Ruby River below Ramshorn Creek, near Sheridan	843	1946-53	1947-53	--	--	--	--	--	--

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)							
			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
			Part 6--Missouri River Basin--Continued							
06022500	Ruby River near Sheridan	863	1946-51	--	--	--	--	--	--	--
06023000	Ruby River near Twin Bridges	935	1940-43, 1946-65, 1979-81	1942-73, 1947-65, 1980-81	--	1979-81	--	1986	1965	--
06023500	Big Hole River near Jackson	44.0	1948-54	1948-53	--	--	--	--	--	--
06024000	Miner Creek near Jackson	17.6	1948-54	1948-53	--	--	--	--	--	--
06024450	**Big Hole River below Big Lake Creek, at Wisdom**	575	**1988-P**	**1988-P**	--	**1988-P**	--	--	--	--
06024470	Swamp Creek near Wisdom	66.1	1995-96	1995-96	--	--	--	--	--	--
06024500	Trail Creek near Wisdom	71.4	1948-54, 1966-72	1948-53, 1967-72	--	--	--	--	--	--
06024510	West Fork Ruby Creek near Wisdom	13.4	1995-96	1995-96	--	--	--	--	--	--
06024540	**Big Hole River below Mudd Creek, near Wisdom**	1,267	**1997-P**	**1998-P**	--	--	--	--	--	--
06024580	Big Hole River near Wise River	1,611	1979-81	1980-81	--	--	--	--	--	--
06024590	Wise River near Wise River	214	1973-85	1973-85	--	--	--	--	--	--
06025000	Big Hole River near Dewey	1,990	1910-13	--	--	--	--	--	--	--
06025100	**Quartz Hill Gulch near Wise River**	14.3	--	**1974-P**	--	--	--	--	--	--
06025250	Big Hole River at Maiden Rock, near Divide	2,199	1997-2002	1998-2002	--	--	--	--	--	--
06025270	Moose Creek above McClean Creek, near Divide	31.9	1998-99	1998-99	--	--	--	--	--	--
06025300	Moose Creek near Divide	42.3	--	1960-74	--	--	--	--	--	--
06025480	Rock Creek below Browns Lake, near Glen	23.0	1998-99	1998-99	--	--	--	--	--	--
06025500	**Big Hole River near Melrose**	2,476	**1923-P**	**1924-40, 1942-P**	--	**1960-64, 1977-P**	1960-64	1957, 1961, 1961-64	--	--
06025700	Willow Creek diversions to Birch Creek, near Glen	--	1946-53, 1955-66	--	--	--	--	--	--	--
06025800	Willow Creek near Glen	35.6	1962-66, 1997-99	1998-99	--	--	--	1963-65	1964-65	--
06026000	Birch Creek near Glen	36.0	1946-53, 1955-76	1946-53, 1955-76	--	--	--	1959-62	1960-61	--
06026210	**Big Hole River near Glen**	2,655	**1997-P**	**1998-P**	--	--	--	--	--	--
06026400	Big Hole River near Twin Bridges	2,762	1979-81	1980-81	--	--	--	1986	--	--
06026500	**Jefferson River near Twin Bridges**	7,632	**1940-43, 1958-72, 1994-P**	**1942-43, 1958-72, 1994-P**	--	1994-2002	1960-62, 1965-72	1958-62, 1965-72	1971-72	--
06027000	Jefferson River near Silver Star	7,683	1910-16, 1920-39	1911-16, 1921-39, 1966	--	--	--	--	--	--
06027200	Jefferson River at Silver Star	7,683	1972-74	1973-74	--	--	--	1973-74	1974	--
06027500	Bell Creek near Waterloo	5.63	1941-42	--	--	--	--	--	--	--
06027700	Fish Creek near Silver Star	38.9	1959-91	1959-91	--	--	--	--	--	--

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)							
			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
		Part 6--Missouri River Basin--Continued								
06028000	Big Pipestone Creek near Whitehall	108	1910-11	--	--	--	--	--	--	--
06028500	Little Pipestone Creek near Whitehall	30.7	1935-40	1935-40	--	--	--	--	--	--
06028700	Big Pipestone Creek at Whitehall	--	--	--	--	--	--	1986	--	--
06029000	Whitetail Creek near Whitehall	30.8	1949-68	1950-53, 1955-68, 1981	--	--	--	--	--	--
06029500	Little Whitetail Creek near Whitetail	91.0	1911	--	--	--	--	--	--	--
06030000	Whitetail Creek at Whitehall	179	1911	--	--	--	--	--	--	--
06030200	Jefferson River tributary near Whitehall	1.85	--	1960-75	--	--	--	--	--	--
06030300	**Jefferson River tributary No. 2 near Whitehall**	4.50	--	**1958-P**	--	--	--	--	--	--
06030500	Boulder River above Rock Creek, near Basin	19.4	1936, 1946-53, 1955-57	1947-53, 1955-57, 1975,1981	--	--	--	--	--	--
06031000	Rock Creek at CCC Camp, near Bernice	9.87	1936	--	--	--	--	--	--	--
06031450	**Boulder River above Kleinsmith Gulch, near Basin**	--	--	--	--	--	--	**1997-P**	**1997-P**	--
06031500	Boulder River at Basin	219	1921-23	--	--	--	--	1997-99	1997-99	--
06031600	**Basin Creek at Basin**	--	--	--	--	--	--	**1997-P**	**1997-P**	--
06031950	**Cataract Creek near Basin**	30.6	--	**1973-P**	--	--	--	1997-99	1997-99	--
06031960	**Cataract Creek at Basin**	--	--	--	--	--	--	**1997-P**	**1997-P**	--
06032000	Boulder River near Basin	292	1919-20	--	--	--	--	1997-99	1997-99	--
06032300	High Ore Creek near Basin	8.86	1997	1997	--	--	1997	1997-2002	1997-2002	--
06032400	**Boulder River below Little Galena Gulch near Boulder**	318	1997	1997	--	--	1997	**1997-P**	**1997-P**	--
06032500	Muskrat Creek near Boulder	6.09	1912-14	--	--	--	--	--	--	--
06033000	**Boulder River near Boulder**	381	**1929-72, 1985-P**	**1929-72, 1975,1981, 1985-P**	--	--	--	1997-99	1997-99	--
06033500	North Fork Little Boulder River near Boulder	18.8	1926-27	--	--	--	--	--	--	--
06033900	Boulder River near Cardwell	756	--	--	--	--		1986	1997	--
06034000	South Boulder River near Jefferson Island	27.5	1926-33	1926-33	--	--	--	--	--	--
06034300	South Boulder River near Cardwell	--	--	--	--	--	--	1986	--	--
06034500	Jefferson River at Sappington	9,277	1895-1905, 1938-69	1895-1905, 1939-69, 1975	--	--	--	--	--	--
06034700	Sand Creek at Sappington	9.41	--	1960-74	--	--	--	--	--	--
06034800	Jefferson River tributary No. 3 near Sappington	1.14	--	1960-74	--	--	--	--	--	--
06035000	Willow Creek near Harrison	83.8	1938-2002	1938-2002	--	2002	--	--	--	--
06035500	Norwegian Creek near Harrison	22.4	1938-43, 1946-51	1938-43, 1947-51	--	--	--	--	--	--

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)							
			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
			Part 6--Missouri River Basin--Continued							
06036500	Willow Creek near Willow Creek	165	1919-33, 1946-53, 1955-57	1920-29, 1931-32, 1947-53, 1955-56	--	--	--	1986	--	--
06036600	Jefferson River tributary No. 4 near Three Forks	0.53	--	1960-74, 1982-83	--	--	--	--	--	--
06036650	**Jefferson River near Three Forks**	9,532	**1978-P**	**1979-P**	--	**1980-81 2000-P**	--	**1986-87, 1999-P**	**1999-P**	--
06036700	Jefferson River tributary No. 5 near Three Forks	3.69	--	1960-73, 1980, 1982-83	--	--	--	--	--	--
06036800	Firehole River near Old Faithful, Yellowstone National Park	--	--	--	--	--	--	1958	--	--
06036905	**Firehole River near West Yellowstone**	282	**1984-96 2003**	**1984-96 2003**	1983-88	**1983-93 2003**	--	1987,1989	--	--
06037000	Gibbon River near West Yellowstone	118	1913-16, 1984-96	1984-96	1983-88	1983-93	--	1987, 1989	--	--
06037100	**Gibbon River at Madison Junction, Yellowstone Nat'l Park**	126	**2003**	**2003**	--	**2003**	--	--	--	--
06037500	**Madison River near West Yellowstone**	420	**1913-73, 1983-86, 1989-P**	**1914-17, 1919-73, 1984-86, 1989-P**	1983-86	1983-86	--	1959, 1986-95	1989-90 1992-95	--
06037600	Madison River above Hebgen Lake, near West Yellowstone	--	--	--	--	--	--	1993-94	1993-94	--
06037700	South Fork Madison River above Denny Creek, near West Yellowstone	--	--	--	--	--	--	1987-88	--	--
06038000	**Hebgen Lake near Grayling**	904	**1936-P**	--	--	--	--	--	--	--
06038500	**Madison River below Hebgen Lake, near Grayling**	905	**1909-P**	**1940-P**	--	--	--	1986-95	1992-95	--
06038550	Cabin Creek near West Yellowstone	30.3	--	**1974-P**	--	--	--	--	--	--
06038800	**Madison River at Kirby Ranch, near Cameron**	1,065	**1959-63, 1978-P**	**1960-61, 1963, 1985-P**	--	1995-2002	1960	1959	1959-60	--
06039000	West Fork Madison River near Lakeview	11.9	1936	--	--	--	--	--	--	--
06039200	West Fork Madison River near Cameron	220	1965-67	1966-67	--	--	--	1986-88	--	--
06039500	Madison River at Lyon	1,346	1928-32	--	--	--	--	1959	--	--
06040000	Madison River near Cameron	1,669	1952-63, 1968-70	1952-58, 1960-63, 1968-70	--	--	--	1988, 1993-95	1993-95	--
06040010	Blaine Spring Creek near Cameron	3.42	1971-72	--	--	--	--	--	--	--
06040300	Jack Creek near Ennis	51.5	1973-86, 1992	1974-86, 1991-92	--	--	--	1980	--	--
06040400	Meadow Creek near McAllister	--	--	--	--	--	--	1986	--	--
06040500	**Ennis Lake near McAllister**	2,181	**1936-P**	--	--	--	--	--	--	--

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)							
			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
			Part 6--Missouri River Basin--Continued							
06040800	**Madison River above Powerplant, near McAllister**	4,690	**2002-P**	**2002-P**	--	--	--	--	--	--
06041000	**Madison River below Ennis Lake, near McAllister**	2,186	**1901-P**	**1943-P**	--	**1977-P**	--	1972-73, 1986-87, 1991-95	1991-95	1972-73
06041300	Hot Springs Creek near Norris	72.5	--	--	--	--	--	1986-87, 1993-94	1993-94	--
06041500	Madison River near Norris	2,288	1890-93, 1910	--	--	--	--	1993-95	1993-95	--
06041700	Cherry Creek near Norris	--	--	--	--	--	--	1986-87, 1993-94	1993-94	--
06042000	Madison River below Cherry Creek, near Norris	2,387	1897-1905	1898-1905	--	--	--	--	--	--
06042500	Madison River near Three Forks	2,511	1893-97, 1928-32, 1941-50	1894-96 1929-32, 1942-50	--	--	--	--	--	--
06042600	Madison River at Three Forks	2,531	--	--	--	--	--	1986-87 1990, 1993-95	1990, 1993-95	--
06043000	Taylor Creek near Grayling	98.0	1946-54, 1955-57, 1966-67	1947-53, 1955-57, 1967	--	--	--	--	--	--
06043200	Squaw Creek near Gallatin Gateway	40.4	--	1959-75	--	--	--	--	--	--
06043300	**Logger Creek near Gallatin Gateway**	2.48	--	**1959-P**	--	--	--	--	--	--
06043500	**Gallatin River near Gallatin Gateway**	825	**1889-94, 1930-69, 1971-81, 1985-P**	**1890-94, 1931-81, 1985-P**	--	2001-2002	--	1949-51, 1986-87, 1998	--	1998
06044000	Gallatin River near Salesville	833	1895-1905, 1910-13, 1921-23	1896-1905, 1912-13, 1921-23	--	--	--	--	--	--
06044100	Wilson Creek near Gallatin Gateway	5.33	1952-53	--	--	--	--	--	--	--
06044200	West Fork Wilson Creek near Gallatin Gateway	3.81	1952-53	--	--	--	--	--	--	--
06044300	Big Bear Creek near Gallatin Gateway	13.2	1952-53	--	--	--	--	--	--	--
06044400	Little Bear Creek near Gallatin Gateway	3.87	1952-53	--	--	--	--	--	--	--
06044500	South Cottonwood Creek near Gallatin Gateway	21.9	1951-53	--	--	--	--	--	--	--
06045000	Gallatin River at Axtell Bridge, near Gallatin Gateway	927	1950-54	--	--	--	--	--	--	--
06045200	Fish Creek near Gallatin Gateway	--	1952-53	--	--	--	--	--	--	--
06045300	Yellow Dog Creek near Belgrade	6.85	1952-53	--	--	--	--	--	--	--
06045350	Godfrey Creek near Belgrade	6.32	1952-53	--	--	--	--	--	--	--
06045400	Baker Creek near Manhattan	--	1952-53	--	--	--	--	--	--	--
06045500	Gallatin River near Belgrade	965	1950-54	--	--	--	--	1949	--	--
06046000	Gallatin River near Manhattan	970	1950-54	--	--	--	--	1949	--	--

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)							
			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
			Part 6--Missouri River Basin--Continued							
06046100	Ridgley Creek near Manhattan	--	1952-53	--	--	--	--	--	--	--
06046200	Gallatin River above Camp Creek, near Manhattan	--	--	--	--	--	--	1949	--	--
06046300	Camp Creek near Belgrade	34.5	1952-53	--	--	--	--	--	--	--
06046400	Randall Creek near Manhattan	--	1952-53	--	--	--	--	--	--	--
06046500	Rocky Creek near Bozeman	50.5	1951-53	1952-53, 1959-91	--	--	--	1949	--	--
06046520	Unnamed Creek near Bozeman	2.63	--	1997	--	--	--	--	--	--
06046700	Pitcher Creek near Bozeman	2.33	--	1960-75, 1981	--	--	--	--	--	--
06047000	Bear Canyon near Bozeman	17.0	1951-53	1952-53, 1959-73, 1975,1981	--	--	--	--	--	--
06047500	Sourdough Creek near Bozeman	28.2	1951-53	--	--	--	--	--	--	--
06048000	East Gallatin River at Bozeman	148	1939-61	1940-61, 1981	--	--	--	1949,1951	--	--
06048500	Bridger Creek near Bozeman	62.5	1946-69, 1971-72, 1987	1946-69, 1971-72, 1981,1987	--	--	--	1949	--	--
06048600	Lyman Creek near Bozeman	1.75	1952-53	--	--	--	--	1949	--	--
06048700	**East Gallatin River below Bridger Creek, near Bozeman**	226	**2002-P**	**2002-P**	--	2002	--	--	--	--
06048800	Deer Creek near Bozeman	--	1953	--	--	--	--	--	--	--
06048900	East Gallatin River near Belgrade	--	1952-53	--	--	--	--	--	--	--
06049000	Middle Cottonwood Creek near Bozeman	4.25	1951-53	--	--	--	--	--	--	--
06050000	Hyalite Creek at Hyalite Ranger Station, near Bozeman	48.2	1895-96, 1898-1900, 1902,1904, 1935-95	1898-1899, 1902, 1935-95	--	--	--	1949	--	--
06050100	Hyalite Creek near Belgrade	--	1952	--	--	--	--	--	--	--
06050200	Bostwick Creek near Belgrade	5.04	1952-53	--	--	--	--	1949	--	--
06050400	Thompson Creek near Belgrade	--	1952-53	--	--	--	--	--	--	--
06050450	Ben Hart Creek near Belgrade	--	1952-53	--	--	--	--	--	--	--
06050500	Ross Creek near Belgrade	1.25	1951-53	--	--	--	--	1949,1951	--	--
06050700	Truman Creek near Belgrade	2.94	1952-53	--	--	--	--	--	--	--
06051000	Reese Creek near Belgrade	21.5	1951-53	--	--	--	--	--	--	--
06051200	Bear Creek near Belgrade	4.30	1952-53	--	--	--	--	--	--	--
06051300	Foster Creek near Belgrade	--	1953	--	--	--	--	--	--	--
06051500	Dry Creek at Andrus Ranch, near Manhattan	96.2	1952-53	--	--	--	--	--	--	--
06051700	Reynolds (Quagle) Creek near Manhattan	--	1953	--	--	--	--	--	--	--
06052000	Dry Creek at Brownell Ranch, near Manhattan	104	1951	--	--	--	--	--	--	--
06052050	Story Creek near Manhattan	--	1952-53	--	--	--	--	--	--	--

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)							
			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
			Part 6--Missouri River Basin--Continued							
06052100	Cowan Creek near Manhattan	--	1952-53	--	--	--	--	--	--	--
06052200	Gibson Creek near Manhattan	--	1952-53	--	--	--	--	1949,1951	--	--
06052300	Bull Run Creek near Manhattan	--	1952-53	--	--	--	--	--	--	--
06052500	**Gallatin River at Logan**	1,795	**1893-1905, 1928-P**	**1895-1900, 1902-1905, 1929-33, 1935-P**	--	**1979-85, 2001-P**	--	**1949,1951, 1957,1986, 1999-P**	**1965, 1999-P**	--
06053000	Sixteenmile Creek at Ringling	79.0	1950-55	1951-55	--	--	--	--	--	--
06053050	**Lost Creek near Ringling**	9.59	--	**1974-P**	--	--	--	--	--	--
06053400	Sixteenmile Creek near Toston	--	--	--	--	--	--	1986	--	--
06053500	Broadwater East Canal near Toston	--	1941-49	--	--	--	--	--	--	--
06054000	Broadwater West Canal near Toston	--	1941-49	--	--	--	--	--	--	--
06054500	**Missouri River at Toston**	14,669	**1890-91, 1910-16, 1941-P**	**1890, 1910-16, 1941-P**	1973-81	**1949-53 1973-P**	1949-53	**1949-51, 1972-95, 1999-P**	**1965, 1973-95, 1999-P**	1972-94
06055000	Crow Creek near Townsend	48.6	1912-13	--	--	--	--	1950,1986, 1988-91	1989-90	--
06055500	Crow Creek near Radersburg	76.6	1901, 1919-29, 1966-72, 1989-90	1901, 1920-29, 1966-72, 1975,1981, 1989-90	--	--	--	--	--	--
06056200	Castle Creek tributary near Ringling	2.51	--	1960-74, 1981, 1989-90	--	--	--	--	--	--
06056300	**Cabin Creek near Townsend**	11.8	--	**1960-P**	--	--	--	--	--	--
06056500	Deep Creek near Townsend	65.4	1910-15	--	--	--	--	--	--	--
06056600	Deep Creek below North Fork Deep Creek, near Townsend	87.7	--	1959-73, 1975,1981, 1989-90	--	--	--	--	--	--
06057000	Missouri River near Townsend	15,343	1891-1904	1892-1903, 1964	--	--	--	--	--	--
06057400	Beaver Creek above Weasel Creek, near Winston	21.5	--	--	--	--	--	1950, 1988-91	1989-90	--
06057500	Lake Sewell near Helena	15,894	1936-53	--	--	--	--	--	--	--
06058000	Missouri River at Canyon Ferry	15,894	1889	--	--	--	--	--	--	--
06058500	**Canyon Ferry Lake near Helena**	15,904	**1953-P**	--	--	--	--	--	--	--
06058502	Missouri River below Canyon Ferry Dam, near Helena	15,904	--	--	1968-87	--	--	1968-87	--	--
06058700	Mitchell Gulch near East Helena	8.09	--	1959-2002	--	--	--	--	--	--
06058900	Prickly Pear Creek below Anderson Gulch, near Jefferson City	14.0	--	1989-90	--	--	--	1988-90	1989-90	--
06059000	Dutchman Creek near Alhambra	9.78	1921-24	--	--	--	--	--	--	--

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)							
			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
			Part 6--Missouri River Basin--Continued							
06059500	Warm Springs Creek at Alhambra	20.6	1921-24	--	--	--	--	--	--	--
06060000	Clancy Creek at Clancy	33.1	1921-23	--	--	--	--	--	--	--
06060500	Lump Gulch at Foley's Ranch, near Clancy	33.0	1921-24	--	--	--	--	--	--	--
06061000	Lump Gulch at Zastrow's Ranch, near Clancy	43.4	1908-13	1909-13, 1981	--	--	--	--	--	--
06061500	**Prickly Pear Creek near Clancy**	192	1908-16, 1921-33, 1945-69, 1978-2002	1911-16, 1923-33, 1946-53, 1955-69, 1975, 1979-2002	--	--	--	**1950, 1999-P**	**1999-P**	--
06061700	Jackson Creek near East Helena	3.44	--	1961-75, 1981, 1989-90	--	--	--	--	--	--
06061800	Crystal Creek near East Helena	3.77	--	1961-75, 1981, 1989-90	--	--	--	--	--	--
06061900	McClellan Creek near East Helena	33.2	--	1961-75, 1981, 1989-90	--	--	--	1988-90	1989-90	--
06062000	Prickly Pear Creek at East Helena	251	1908-13	--	--	--	--	1995	--	--
06062010	Prickly Pear Creek below East Helena	--	--	--	--	--	--	1971	--	--
06062500	**Tenmile Creek near Rimini**	30.9	**1914-94, 1997-P**	**1915-94, 1997-P**	--	--	--	1981, 1997-99	1997-99	--
06062700	Little Porcupine Creek tributary near Helena	0.39	--	1959-73, 1981,1989	--	--	--	--	--	--
06062750	**Tenmile Creek at Tenmile Water Treatment Plant, near Rimini**	51.1	**1997-P**	**1997-P**	--	--	--	**1999-P**	**1999-P**	--
06063000	**Tenmile Creek near Helena**	96.5	1908-54, 1997-98	1909-54, 1975,1981, 1997-98	--	--	--	**1950-51, 1997-98 2002-P**	**1997-98 2002-P**	--
06063500	Sevenmile Creek at Birdseye	31.9	1908-13	--	--	--	--	--	--	--
06064000	Sevenmile Creek near Helena	--	1908	--	--	--	--	--	--	--
06064100	**Tenmile Creek at Green Meadow Drive, at Helena**	161	1997-98	1997-98	--	--	--	**2002-P**	**2002-P**	--
06064150	Tenmile Creek above Prickly Pear Creek, near Helena	188	1997-98	1997-98	--	--	--	--	--	--
06064500	**Lake Helena near Helena**	610	**1945-P**	--	--	--	--	--	--	--
06065000	**Hauser Lake near Helena**	16,876	**1936-P**	--	--	--	--	--	--	--
06065500	**Missouri River below Hauser Dam, near Helena**	16,876	**1923-42 1995-P**	**1923-42, 1995-P**	--	--	--	--	--	--
06066000	**Holter Lake near Wolf Creek**	17,149	**1936-P**	--	--	--	--	--	--	--
06066500	**Missouri River below Holter Dam, near Wolf Creek**	17,149	**1945-P**	**1946-P**	--	**2000-P**	--	--	--	--
06067000	Little Prickly Pear Creek above Deadman Creek, near Marysville	20.1	1909-11	--	--	--	--	--	--	--

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)							
			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
		Part 6--Missouri River Basin--Continued								
06067500	Deadman Creek near Marysville	9.52	1909-11	--	--	--	--	--	--	--
06068000	Lost Horse Creek near Marysville	13.1	1909-11	--	--	--	--	--	--	--
06068500	Little Prickly Pear Creek near Marysville	44.4	1913-33	1913-32	--	--	--	--	--	--
06069000	Marsh Creek near Marysville	6.07	1909-12	--	--	--	--	--	--	--
06070000	Canyon Creek near Canyon Creek	73.8	1921-23	--	--	--	--	--	--	--
06070500	Cottonwood Creek near Canyon Creek	16.5	1921-22	--	--	--	--	--	--	--
06071000	Little Prickly Pear Creek near Canyon Creek	183	1909-11, 1913-24	1909-11, 1913-24	--	--	--	--	--	--
06071080	Sieben Ranch ditch below Clark Creek, near Wolf Creek	--	--	--	--	--	--	--	1964-67	--
06071100	Little Prickly Pear Creek at Sieben Ranch, near Wolf Creek	270	1962-67	1962-67	--	--	1962-67	1964	1966	--
06071130	Little Prickly Pear Creek above Medicine Rock Creek, near Wolf Creek	--	--	--	--	--	--	--	1964-67	--
06071180	Medicine Rock Creek near Wolf Creek	--	--	--	--	--	--	--	1964-67	--
06071200	Lyons Creek near Wolf Creek	29.9	--	1959-73, 1975	--	--	--	--	1964-67	--
06071220	Little Prickly Pear Creek below Lyons Creek, near Wolf Creek	--	--	--	--	--	--	--	1965-67	--
06071230	Little Prickly Pear Creek above Sheep Creek, near Wolf Creek	--	--	--	--	--	--	--	1964	--
06071240	Sheep Creek near Wolf Creek	--	--	--	--	--	--	--	1964-67	--
06071290	Wolf Creek at Wolf Creek	--	--	--	--	--	--	--	1964-64	--
06071300	**Little Prickly Pear Creek at Wolf Creek**	381	**1962-67, 1992-P**	**1962-65, 1967,1975, 1992-P**	--	2001-2002	1962-67	1964	1964-67	--
06071400	Dog Creek near Craig	15.7	--	1960-75	--	--	--	--	--	--
06071500	Missouri River at Craig	17,739	1890-92	--	--	--	--	--	--	--
06071600	Wegner Creek at Craig	35.7	--	1960-91	--	--	--	--	--	--
06072000	Dearborn River above Falls Creek, near Clemons	69.6	1908-12	--	--	--	--	--	--	--
06072500	Falls Creek near Clemons	37.6	1908-12	--	--	--	--	--	--	--
06073000	Dearborn River near Clemons	123	1921-23, 1929-53	1921-23 1929-53, 1964,1975	--	--	--	--	--	--
06073500	**Dearborn River near Craig**	325	**1946-69, 1994-P**	**1946-69, 1975, 1994-P**	--	**1993-P**	--	**1991, 1999-P**	**1999-P**	--
06073600	**Black Rock Creek near Augusta**	5.54	--	**1974-P**	--	--	--	--	--	--
06074000	Missouri River at Cascade	18,493	1902-15, 1953	1903-15	--	--	--	--	--	--
06074500	Smith River near White Sulphur Springs	30.7	1923-31, 1934-36	1923-31, 1934-36	--	--	--	--	--	--
06075500	Smith River above Fivemile Creek, near White Sulphur Springs	73.2	1934-43	1934-43	--	--	--	--	--	--
06075600	Fivemile Creek near White Sulphur Springs	6.42	--	1960-74	--	--	--	--	--	--

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)							
			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
			Part 6--Missouri River Basin--Continued							
06075700	North Fork Smith River near mouth, near White Sulphur Springs	185	--	--	--	--	--	1993-95	1993-95	1993-95
06075800	South Fork Smith River at mouth, near White Sulphur Springs	174	--	--	--	--	--	1993-95	1993-95	1993-95
06075900	Big Birch Creek at mouth, near White Sulphur Springs	49.6	--	--	--	--	--	1993-95	1993-95	1993-95
06076000	Newlan Creek near White Sulphur Springs	7.27	1946-54	1946-53, 1960-73	--	--	--	--	--	--
06076500	Newlan Creek near damsite, near White Sulphur Springs	44.8	1950-57	1951-57	--	--	--	--	--	--
06076550	Newlan Creek at mouth, near White Sulphur Springs	--	--	--	--	--	--	1993-95	1993-95	1993-95
06076600	Camas Creek at mouth, near White Sulphur Springs	--	--	--	--	--	--	1993-95	1993-95	1992-95
06076650	Benton Gulch at mouth, near White Sulphur Springs	57.6	--	--	--	--	--	1993-95	1993-95	1993-95
06076690	Smith River near Fort Logan	846	1978-96	1978-96	--	--	--	1993-95	1993-95	1993-95
06076700	Sheep Creek near Neihart	5.22	--	1960-91	--	--	--	--	--	--
06076800	Nugget Creek near Neihart	1.50	--	1959-73	--	--	--	--	--	--
06077000	Sheep Creek near White Sulphur Springs	42.8	1941-72	1942-72, 1975,1981	--	--	--	1956,1980	1980	--
06077090	Sheep Creek near mouth, near White Sulphur Springs	192	--	--	--	--	--	1993-95	1993-95	1991, 1993-95
06077200	**Smith River below Eagle Creek, near Fort Logan**	1,088	**1996-P**	**1997-P**	--	**1997-P**	--	--	--	--
06077300	Trout Creek near Eden	13.2	--	1974-84	--	--	--	--	--	--
06077500	Smith River near Eden	1,594	1951-69	1951-69, 1975,1981	--	--	--	--	--	--
06077700	Smith River tributary near Eden	1.44	--	1960-73, 1975	--	--	--	--	--	--
06077800	Goodman Coulee near Eden	22.1	--	1959-82	--	--	--	--	--	--
06078000	Smith River at Truly	2,006	1905-07, 1929-32	1905-07, 1929-32, 1953	--	--	--	1991	--	--
06078200	**Missouri River near Ulm**	20,941	**1957-P**	**1948,1953, 1958-P**	--	--	--	--	--	--
06078230	Sand Coulee Creek above Cottonwood Creek, at Centerville	78.8	1995-96	1995-96	--	--	--	1994-96	--	--
06078250	Cottonwood Creek near Stockett	--	1995-96	1995-96	--	--	--	1994-96	--	--
06078260	Number Five Coulee below Giffen Spring, near Stockett	16.7	1995-96	1995-96	--	--	--	1994-96	--	--
06078270	Sand Coulee at Sand Coulee	6.36	1995-96	1995-96	--	--	--	1994-96	--	--
06078500	North Fork Sun River near Augusta	258	1911-12, 1946-68, 1989-93	1911-12, 1946-68, 1989-93	--	--	--	--	1989-93	--
06079000	South Fork Sun River near Augusta	252	1911-12	--	--	--	--	--	--	--
06079500	**Gibson Reservoir near Augusta**	575	**1930-P**	--	--	--	--	1951	--	--
06079600	Beaver Creek at Gibson Dam, near Augusta	20.8	--	1959-73	--	--	--	--	--	--

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)							
			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
			Part 6--Missouri River Basin--Continued							
06080000	Sun River near Augusta	609	1889-91, 1904-40	1890, 1905-29, 1964	--	--	--	--	--	--
06080500	Pishkun Reservoir near Augusta	--	1936-95	--	--	--	--	1951	--	--
06080700	Spring Valley Canal below Spring Valley drop, near Fairfield	--	1967-68	--	--	--	--	--	--	--
06080800	Spring Valley Canal above Upper Turnbull drop, near Fairfield	--	1967-68	--	--	--	--	--	--	--
06080900	Sun River below diversion dam, near Augusta	609	1967-80	1964, 1968-80	1968-79	--	--	1968-79	--	--
06081000	Floweree Big Canal near Augusta	--	1912	--	--	--	--	--	--	--
06081500	Willow Creek near Augusta	96.1	1905-25	1905-1910, 1912-25	--	--	--	--	--	--
06082000	Willow Creek Reservoir near Augusta	--	1936-95	--	--	--	--	--	--	--
06082200	Sun River below Willow Creek, near Augusta	827	1967-74	1964, 1968-75	--	--	--	--	--	--
06082500	Smith Creek near Augusta	25.0	1906-13	1906-12	--	--	--	--	--	--
06083000	Nilan Reservoir near Augusta	--	1951-95	--	--	--	--	--	--	--
06083500	Ford Creek near Augusta	19.4	1906-13	1906-12, 1964	--	--	--	--	--	--
06084000	Smith Creek below Ford Creek, near Augusta	74.0	1946-52	1946-52, 1964,1975	--	--	--	1951	--	--
06084500	Elk Creek at Augusta	157	1905-25	1905-24, 1964,1975	--	--	--	--	--	--
06085000	Crown Butte Canal at Riebling	--	1912	--	--	--	--	--	--	--
06085500	Crown Butte Canal near Simms	--	1912	--	--	--	--	--	--	--
06085800	**Sun River at Simms**	1,320	**1953, 1966-79. 1997-P**	**1964, 1966-79, 1997-P**	--	--	--	1996-98	1996-98	--
06086000	Sun River at Fort Shaw	1,417	1912-28	1913-28	--	--	--	--	--	--
06086500	Sun River Canal at Sun River	--	1912	--	--	--	--	--	--	--
06087000	Sun River Canal at Vaughn	--	1912	--	--	--	--	--	--	--
06087500	Sun River at Sun River	1,454	1905-12	1906-12	--	--	--	--	--	--
06087900	Muddy Creek tributary near Power	3.15	--	1963-78, 1986	--	--	--	--	--	--
06088000	Muddy Creek near Power	137	1935-40, 1982-83	1982-83	--	--	--	1992	--	--
06088100	Spring Coulee near Power	30.4	1982-83	1982	--	--	--	1992	--	--
06088200	Tank Coulee near Power	31.0	1982-83	1982	--	--	--	1992	--	--
06088300	**Muddy Creek near Vaughn**	282	**1968-87, 1996-P**	**1968-87, 1996-P**	1968-82	1968-79	1968-82	**1968-82, 1992-P**	**1971-82, 1996-P**	--

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)							
			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
			Part 6--Missouri River Basin--Continued							
06088500	**Muddy Creek at Vaughn**	314	**1925-26. 1934-68, 1971-P**	**1925, 1934-37, 1939-68, 1971-P**	1968, 1972-82	1968, 1971-79	1971-82	**1968, 1972-82, 1992-P**	**1968, 1971-81, 1993-P**	--
06089000	**Sun River near Vaughn**	1,849	**1897, 1934-P**	**1934-P**	**1969-P**	**1969-79 1999-P**	--	**1969-P**	**1987-94 1996-P**	1987-94
06089300	Sun River tributary near Great Falls	21.0	--	1956-73, 1975, 1979-80	--	--	--	--	--	--
06090100	Missouri River at Black Eagle Dam, at Great Falls	--	--	--	--	--	--	1951	--	--
06090130	Missouri River below Rainbow Dam, near Great Falls	--	--	--	--	--	--	1971	--	--
06090300	**Missouri River near Great Falls**	23,292	**1953, 1956-P**	**1952-P**	--	--	--	1994-95	1994-95	--
06090500	Belt Creek near Monarch	368	1951-82	1952-82	--	1977-81	--	--	--	--
06090550	**Little Otter Creek near Raynesford**	39.5	--	**1974-P**	--	--	--	--	--	--
06090570	Big Otter Creek near Belt	197	1994-98	1994-98	--	--	--	--	--	--
06090590	Anaconda Drain at Belt	0.05	1995-96	1995-96	--	--	--	94-96	--	--
06090600	Belt Creek near Belt	700	1905-07	--	--	--	--	--	--	--
06090610	Belt Creek near Portage	799	1980-83	1981-83	--	1981-83	--	1981-83	1981-83	--
06090650	**Lake Creek near Power**	83.8	**1990-P**	**1990-P**	1992-96	1992-95	1992-95	1990-96	--	--
06090700	Highwood Creek near Highwood	57.8	1905-06	--	--	--	--	--	--	--
06090720	Highwood Creek near Portage	122	1980-83	1981-83	--	1981-83	--	1981-83	1981-83	1981
06090800	**Missouri River at Fort Benton**	24,749	**1890-P**	**1891-1899, 1901-P**	--	1981-82	1980	1969-73 1981-86	1965, 1980-86	1969-73 1981-86
06090810	Ninemile Coulee near Fort Benton	16.9	--	1972-73, 1975-90	--	--	--	--	--	--
06091000	Two Medicine River near East Glacier	51.1	1912-13, 1918-24, 1962-64	1912, 1918-21, 1923-24, 1963-64	--	--	--	--	--	--
06091500	Two Medicine River at Midvale	--	1902-03	--	--	--	--	--	--	--
06091700	**Two Medicine River below South Fork, near Browning**	250	**1977-P**	**1977-P**	--	--	--	1988-89	--	--
06091850	Two Medicine Canal wasteway to Mission Lake, near Blackfoot	--	--	--	--	--	--	1971	--	--
06091852	Mission Lake near Blackfoot	--	--	--	--	--	--	1971-75	--	--
06091853	Spring Creek at Mission Lake outlet, near Cut Bank	--	--	--	--	--	--	1971	--	--
06091900	Two Medicine Canal near Cut Bank	--	--	--	--	--	--	1956	--	--
06092000	Two Medicine River near Browning	317	1907-25, 1951-77	1907, 1909-12, 1914-24, 1951-77	--	--	--	1956	--	--
06092500	Badger Creek near Browning	133	1951-73	1951-73	--	--	--	--	--	--

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)							
			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
			Part 6--Missouri River Basin--Continued							
06093200	**Badger Creek below Four Horns Canal, near Browning**	152	**1973-P**	**1974-P**	--	--	--	1988-89	--	--
06093300	Badger Canal near Dupuyer	--	--	--	--	--	--	1956	--	--
06093500	Badger Creek near Family	239	1907-25	1910-13, 1915-24	--	--	--	--	--	--
06093600	Two Medicine River near Cut Bank	--	--	--	--	--	--	1982-84	--	--
06094000	Swift Reservoir near Dupuyer	75.3	1916, 1936-64, 1967-95	--	--	--	--	--	--	--
06094500	Birch Creek at Swift Dam, near Dupuyer	75.3	1913-29	1913-26, 1929	--	--	--	--	--	--
06095000	Birch Creek near Dupuyer	105	1907-37	1909-37, 1964	--	--	--	--	--	--
06095500	Lake Frances near Valier	--	1936-95	--	--	--	--	--	--	--
06096000	Birch Creek at Nelson's Ranch, near Dupuyer	111	1914-26	1914-15, 1917-21, 1923-26	--	--	--	--	--	--
06096500	Birch Creek at Hall's Ranch, near Dupuyer	122	1913-20	1913-15, 1917-20	--	--	--	--	--	--
06097000	Birch Creek at Robare	128	1914-26	1915, 1917-23, 1925-26	--	--	--	--	--	--
06097100	Blacktail Creek near Heart Butte	16.4	--	1975-91	--	--	--	--	--	--
06097200	Blacktail Creek near Dupuyer	--	--	--	--	--	--	1982-84	--	--
06097500	Dupuyer Creek at Dupuyer	65.7	1908-13	--	--	--	--	--	--	--
06098000	Dupuyer Creek near Valier	137	1912-37	1913-29, 1932-37, 1948,1964	--	--	--	--	--	--
06098100	Birch Creek near Valier	471	1978-83	1978-83	--	--	--	1955, 1978-83	--	--
06098500	**Cut Bank Creek near Browning**	123	**1918-25, 1991-P**	**1918, 1920-24, 1991-P**	--	--	--	1991-92	--	--
06098700	**Powell Coulee near Browning**	12.7	--	**1974-P**	--	--	--	--	--	--
06098900	Big Rock Coulee near Santa Rita	185	--	--	--	--	--	1982-84, 1991-92	--	--
06099000	**Cut Bank Creek at Cut Bank**	1,041	**1905-20, 1922-24, 1951-73, 1982-P**	**1906-12, 1914-17, 1919-20, 1922-24, 1951-73, 1975, 1982-P**	--	--	--	1951, 1982-89, 1991-92	--	--

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)							
			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
			Part 6--Missouri River Basin--Continued							
06099100	Spring Creek near Cut Bank	91	--	--	--	--	--	1982-84, 1991-92	--	--
06099300	Cut Bank Creek at mouth, near Cut Bank	1,213	--	--	--	--	--	1991-92	--	--
06099500	**Marias River near Shelby**	3,242	**1902-08, 1911-P**	**1902-04, 1906-07, 1911-46, 1948-P**	--	1950-51	1950-51	--	--	--
06099700	Middle Fork Dry Fork Marias River near Dupuyer	20.2	--	1960-74, 1986	--	--	--	--	--	--
06100000	Dry Fork Marias River near Valier	131	1911-15	--	--	--	--	--	1980	--
06100200	Heines Coulee tributary near Valier	0.60	--	1960-75, 1986	--	--	--	--	--	--
06100300	**Lone Man Coulee near Valier**	14.1	--	**1960-P**	--	--	--	--	--	--
06100500	Dry Fork Marias River at Fowler	314	1921-31	1920-31	--	--	--	--	--	--
06101000	Willow Creek near Devon	310	1921-25	--	--	--	--	--	--	--
06101200	Willow Creek near Galata	839	1977-82	1978-82	--	--	--	--	--	--
06101300	Lake Elwell near Chester	4,923	1956-95	--	--	--	--	--	--	--
06101500	**Marias River near Chester**	4,927	**1921, 1945-47, 1955-P**	**1921,1946, 1956-P**	--	**1994-P**	--	1964-72, 1978-86, 1991	1978-86	1978-86
06101520	**Favot Coulee tributary near Ledger**	0.86	--	**1974-P**	--	--	--	--	--	--
06101560	Pondera Coulee near Chester	598	1976-85	1964, 1976-85	--	--	--	--	--	--
06101600	Marias River tributary No. 3 near Chester	0.26	--	1962-76, 1978	--	--	--	--	--	--
06101700	Fey Coulee tributary near Chester	2.47	--	1963-91	--	--	--	--	--	--
06101800	Sixmile Coulee near Chester	30.3	--	1963-77, 1979,1986	--	--	--	--	--	--
06101900	Dead Indian Coulee near Fort Benton	2.73	--	1963-77, 1986	--	--	--	--	--	--
06102000	Marias River near Brinkman	6,425	1922-56	1908, 1922-56	--	--	--	--	--	--
06102050	**Marias River near Loma**	7,137	**1960-72 2001-P**	1960-72	--	--	--	--	1965	--
06102100	Dry Fork Coulee tributary near Loma	0.84	--	1959-73	--	--	--	--	--	--
06102200	Marias River tributary at Loma	1.62	--	1956-60, 1962-73	--	--	--	--	--	--
06102300	Maris River tributary No. 2 at Loma	0.25	--	1956-60, 1962-73	--	--	--	--	--	--
06102500	**Teton River below South Fork, near Choteau**	105	**1947-55 1998-P**	**1948-54, 1964, 1998-P**	--	--	--	**1998-P**	**1998-P**	--

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)							
			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
			Part 6--Missouri River Basin--Continued							
06103000	Teton River at Strabane	128	1904-06, 1908-25	1908-25	--	--	--	--	--	--
06103500	McDonald Creek near Strabane	5.17	1913-14, 1917-20	--	--	--	--	--	--	--
06104000	McDonald Creek near Choteau	10.4	1917-20	--	--	--	--	--	--	--
06104500	Teton River near Choteau	221	1906, 1913-19	--	--	--	--	--	--	--
06105000	Deep Creek at Frazer's Ranch, near Choteau	37.7	1912	--	--	--	--	--	--	--
06105500	Willow Creek near Choteau	88.2	1912-17	--	--	--	--	--	--	--
06105800	Bruce Coulee tributary near Choteau	1.70	--	1963-2002	--	--	--	--	--	--
06106000	Deep Creek near Choteau	223	1911-25	1911-24, 1964	--	--	--	--	--	--
06106500	Muddy Creek near Bynum	71.1	1912-25	1913-18, 1920, 1922-24	--	--	--	--	--	--
06107000	North Fork Muddy Creek near Bynum	61.3	1912-24	1913-17, 1919-24	--	--	--	--	--	--
06107500	Muddy Creek near Agawam	274	1917	--	--	--	--	--	--	--
06108000	**Teton River near Dutton**	1,307	**1954-P**	**1955-P**	--	--	--	**1998-P**	**1998-P**	--
06108200	Kinley Coulee near Dutton	9.67	--	1963-78	--	--	--	--	--	--
06108300	Kinley Coulee tributary near Dutton	2.65	--	1963-78	--	--	--	--	--	--
06108500	Teton River near Fort Benton	1,989	1929-32	--	--	--	--	1991	--	--
06108800	**Teton River at Loma**	2,010	**1998-P**	**1999-P**	--	**2000-P**	--	**1998-P**	**1965, 1998-P**	--
06109000	Missouri River at Loma	34,221	1935-53	--	--	--	--	--	--	--
06109500	**Missouri River at Virgelle**	34,379	**1935-P**	**1935-P**	--	--	--	1975-85 1991	1975-85, 1991	1975-85
06109530	Little Sandy Creek tributary near Virgelle	0.80	--	1972, 1974-2002	--	--	--	--	--	--
06109560	**Alkali Coulee tributary near Virgelle**	0.96	--	**1974-P**	--	--	--	--	--	--
06109750	Middle Fork Judith River below Lost Fork, near Utica	108	1972-75	1972-75	--	--	--	--	--	--
06109775	Middle Fork Judith River at Ranger Station, near Utica	--	--	--	--	--	--	1964	--	--
06109780	Middle Fork Judith River near Utica	160	1972-79	1972-79	--	--	--	--	--	--
06109800	South Fork Judith River near Utica	58.7	1958-79	1959-79	--	--	--	--	--	--
06109900	Judith River tributary near Utica	7.15	--	1960-74	--	--	--	--	--	--
06109950	Judith River tributary No. 2, near Utica	6.97		1959-67	--	--	--	--	--	--
06110000	Judith River near Utica	328	1920-75	1920-32, 1934-75	--	--	--	--	--	--
06110500	Ackley Lake near Hobson	--	1938-95	--	--	--	--	--	--	--

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)								
			Discharge or contents		Water quality						
					Daily			Periodic			
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
			Part 6--Missouri River Basin--Continued								
06111000	Ross Fork Creek near Hobson	337	1946-54, 1955-62	1947-53, 1955-62, 1975	--	--	--	--	--	--
06111500	Big Spring Creek near Lewistown	20.9	1932-57	1932-40	--	--	--	--	--	--
06111700	Mill Creek near Lewistown	3.14	--	1960-91	--	--	--	--	--	--
06112000	Cottonwood Creek near Lewistown	45.6	1946-51	--	--	--	--	--	--	--
06112100	Cottonwood Creek near Moore	47.9	1957-63	1958-73, 1975,1978	--	--	--	--	--	--
06112500	Sage Creek at Windham	58.6	1920-22	--	--	--	--	--	--	--
06112800	**Bull Creek tributary near Hilger**	0.99	--	**1974-P**	--	--	--	--	--	--
06113000	Judith River near Lewistown	1,939	1910-11	--	--	--	--	--	--	--
06113500	Judith River near Winifred	2,160	1929-32	--	--	--	--	1991	--	--
06114000	Wolf Creek at Neubert Ranch, near Stanford	79.2	1920-26	1920-26	--	--	--	--	--	--
06114500	Wolf Creek near Stanford	112	1950-53, 1955-62	1950-53, 1955-58, 1960-62, 1975,1978	--	--	--	--	--	--
06114550	**Wolf Creek tributary near Coffee Creek**	1.73	--	**1974-P**	--	--	--	--	--	--
06114700	**Judith River near mouth, near Winifred**	2,731	**2001-P**	**2001-P**	--	**2001-P**	--	**2001-P**	**2001-P**	--
06114900	Taffy Creek tributary near Winifred	2.95	--	1974-2002	--	--	--	--	--	--
06115000	Missouri River at Power Plant Ferry, near Zortman	40,763	1934-68	1934-67	--	--	--	--	--	--
06115200	**Missouri River near Landusky**	40,987	**1934-P**	**1934-P**	--	--	**1972-P**	1976-94	**1972-P**	1979-94
06115270	**Armells Creek near Landusky**		**2000-P**	**2000-P**	--	--	--	--	--	--
06115300	**Duval Creek near Landusky**	3.31	**2000-P**	**1963-P**	--	--	--	--	--	--
06115350	**Rock Creek near Landusky**		**2000-P**	**2000-P**						
06115500	North Fork Musselshell River near Delpine	31.4	1940-79	1941-79	--	--	--	--	--	--
06116000	North Fork Musselshell River at Delpine	48.6	1909-12, 1922-32	1909-11, 1922-32	--	--	--	--	--	--
06116500	Bair Reservoir near Delpine	48.6	1939-95	--	--	--	--	--	--	--
06116900	Checkerboard Creek near Delpine	21.1	1909-15	--	--	--	--	--	--	--
06117000	Checkerboard Creek at Delpine	23.9	1922-32	1922-30, 1932	--	--	--	--	--	--
06117500	Spring Creek near Martinsdale	32.5	1922-24	--	--	--	--	--	--	--
06117800	Big Coulee near Martinsdale	2.86	--	1972, 1974-2002	--	--	--	--	--	--
06118000	North Fork Musselshell River near Martinsdale	233	1907-14	1908-14	--	--	--	--	--	--
06118500	South Fork Musselshell River above Martinsdale	287	1942-79	1942-79	--	--	--	--	--	--
06119000	Martinsdale Reservoir near Martinsdale	--	1939-95	--	--	--	--	--	--	--
06119500	South Fork Musselshell River near Martinsdale	300	1907-15, 1930-32	1908-14, 1930,1932	--	--	--	--	--	--

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)							
			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
			Part 6--Missouri River Basin--Continued							
06119600	**Musselshell River at Martinsdale**	538	**2003**	2003	--	--	--	--	--	--
06120000	Big Elk Creek at Twodot	89.1	1953-56	--	--	--	--	--	--	--
06120500	**Musselshell River at Harlowton**	1,125	**1907-P**	**1909-P**	--	2001-2002	--	1988-91	1988-91	--
06120600	Antelope Creek tributary near Harlowton	0.47	--	1956-73	--	--	--	--	--	--
06120700	Antelope Creek tributary near mouth, near Harlowton	1.92	--	1956-73	--	--	--	--	--	--
06120800	Alkali Creek near Harlowton	21.2	--	1956-91	--	--	--	--	--	--
06120900	Antelope Creek at Harlowton	88.7	--	1950, 1954-73, 1976, 1978-80	--	--	--	--	--	--
06121000	American Fork near Harlowton	94.6	1907-14, 1924-32	1908-11, 1913, 1924-30, 1932	--	--	--	--	--	--
06121500	Lebo Creek near Harlowton	59.1	1907-14, 1924-32	1910,1913, 1924-32	--	--	--	--	--	--
06122000	American Fork below Lebo Creek, near Harlowton	166	1946-67	1947-67, 1975	--	--	--	--	--	--
06122500	Deadmans Basin Reservoir near Shawmut	--	1941-95	--	--	--	--	--	--	--
06122800	Musselshell River near Shawmut	1,479	1986-98	1986-97	--	--	--	--	--	--
06123000	Musselshell River at Shawmut	1,496	1902-07	--	--	--	--	--	--	--
06123030	**Musselshell River above Mud Creek, near Shawmut**	--	**1998-P**	**1998-P**	--	--	--	--	--	--
06123200	**Sadie Creek near Harlowton**	2.10	--	**1971, 1973-P**	--	--	--	--	--	--
06123500	Musselshell River near Ryegate	1,979	1946-79	1947-79	--	--	--	--	--	--
06124000	Careless Creek near Living Springs	21.2	1920-23	--	--	--	--	--	--	--
06124500	West Careless Creek near Living Springs	23.5	1920-21	--	--	--	--	--	--	--
06124600	**East Fork Roberts Creek tributary near Judith Gap**	0.74	--	**1974-P**	--	--	--	--	--	--
06125000	Roberts Creek at Hedgesville	322	1920-23	--	--	--	--	--	--	--
06125500	Careless Creek at Wallum	471	1934-42	1934-37, 1939-42	--	--	--	--	--	--
06125520	**Swimming Woman Creek tributary near Living Springs**	1.27	--	**1974-P**	--	--	--	--	--	--
06125680	**Big Coulee Creek tributary near Cushman**	1.23	--	**1974-P**	--	--	--	--	--	--
06125700	Big Coulee Creek near Lavina	232	1957-72	1958-72	--	--	--	--	--	--
06126000	Musselshell River at Lavina	2,928	1906	--	--	--	--	--	--	--
06126050	**Musselshell River near Lavina**	2,970	**1992-P**	**1992-P**	--	--	--	--	--	--
06126300	Currant Creek near Roundup	220	--	1958-59, 1961-73	--	--	--	--	--	--
06126470	Halfbreed Creek near Klein	53.2	1978-91	1978-91	--	--	--	1978-81, 1984	1978-81, 1984	--

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)							
			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
			Part 6--Missouri River Basin--Continued							
06126500	**Musselshell River near Roundup**	4,023	**1946-P**	**1946-48, 1950-P**	--	--	--	1978-81	1978-81	--
06127000	**South Willow Creek near Roundup**	--	1922-23	--	--	--	--	--	--	--
06127020	**Willow Creek above LMGA Reservoir, near Roundup**	124	**1995-P**	**1996-P**	--	--	--	--	--	--
06127060	**Willow Creek at U.S. Canal, near Roundup**	141	**1995-P**	**1996-P**	--	--	--	--	--	--
06127100	South Willow Creek tributary near Roundup	1.38	--	1962-76	--	--	--	--	--	--
06127150	East Parrot Creek near Roundup	20.2	--	--	--	--	--	1979-80	1979-80	--
06127160	West Parrot Creek near Roundup	20.5	--	--	--	--	--	1978-81	1978-81	--
06127200	Musselshell River tributary near Musselshell	10.8	--	1963-77, 1991	--	--	--	--	--	--
06127300	Fattig Creek near Delphia	22.9	--	--	--	--	--	1978-81	1978-81	--
06127500	**Musselshell River at Musselshell**	4,568	**1928-32, 1945-79, 1983-P**	**1929-30, 1932, 1946-79, 1983-P**	--	--	--	1988-91	1988-91	--
06127505	**Fishel Creek near Musselshell**	16.5	--	**1974-P**	--	--	--	--	--	--
06127520	**Home Creek near Sumatra**	1.98	--	**1973-P**	--	--	--	--	--	--
06127570	**Butts Coulee near Melstone**	6.71	--	**1963-P**	--	--	--	--	--	--
06127585	**Little Wall Creek tributary near Flatwillow**	9.77	--	**1974-P**	--	--	--	--	--	--
06127600	Musselshell River near Mosby	5,941	1963-66	--	--	--	1963-66	1963-66	1964-66	--
06127900	Flatwillow Creek near Flatwillow	188	1911-32, 1934-56	1911-32, 1934-36, 1938-56	--	--	--	--	--	--
06128200	Flatwillow Creek near Winnett	642	1921-32, 1948-51	1923-29, 1931-32, 1948-51	--	--	--	--	--	--
06128400	South Fork Bear Creek near Roy	39.6	--	1962-76	--	--	--	--	--	--
06128500	**South Fork Bear Creek tributary near Roy**	5.40	--	**1962-P**	--	--	--	--	--	--
06128900	Box Elder Creek tributary near Winnett	16.2	--	1955-73	--	--	--	--	--	--
06129000	Box Elder Creek near Winnett	684	1930-33, 1934-38, 1958-72	1931-32, 1934-38, 1959-71, 1978	--	--	--	--	--	--
06129100	North Fork McDonald Creek tributary near Heath	2.24	--	1960-75	--	--	--	--	--	--
06129200	Alkali Creek near Heath	3.76	--	1960-74	--	--	--	--	--	--
06129400	South Fork McDonald Creek tributary near Grassrange	0.51	--	1963-77	--	--	--	--	--	--
06129500	McDonald Creek at Winnett	421	1930-32, 1934-45, 1953-56	1931-32, 1934-45, 1953-73, 1975	--	--	--	--	--	--

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)							
			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
		Part 6--Missouri River Basin--Continued								
06129700	**Gorman Coulee near Cat Creek**	2.32	--	**1955-59, 1962-73, 1977,1980, 1991-P**	--	--	--	--	--	--
06129800	Gorman Coulee tributary near Cat Creek	0.81	--	1955-2002	--	--	--	--	--	--
06130000	Flatwillow Creek near Mosby	1,855	1964-66	--	--	--	1964-66	1964-66	1964-66	--
06130500	**Musselshell River at Mosby**	7,846	**1929-35, 1934-P**	**1929, 1931-32, 1934-P**	--	**2000-P**	1983-95	**1975-95, 1999-P**	**1975-1997, 1999-P**	1975-95
06130600	Cat Creek near Cat Creek	36.5	--	1958-73, 1977,1980	--	--	--	--	--	--
06130610	**Bair Coulee near Mosby**	1.79	--	**1974-P**	--	--	--	--	--	--
06130620	**Blood Creek tributary near Valentine**	1.97	--	**1974-P**	--	--	--	--	--	--
06130650	**Hell Creek near Jordan**	70.6	**2000-P**	**2000-P**	--	--	--	--	--	--
06130680	Big Dry Creek at Jordan	521	--	--	--	--	--	1976-77	1976-77	--
06130700	Sand Creek near Jordan	317	1957-67	1958-67, 1986	--	--	--	--	--	--
06130800	Second Creek tributary near Jordan	0.52	--	1954, 1958-73	--	--	--	--	--	--
06130850	Second Creek tributary No. 2 near Jordan	2.08	--	1958-90	--	--	--	--	--	--
06130900	Second Creek tributary No. 3 near Jordan	0.72	--	1958-72	--	--	--	--	--	--
06130915	**Russian Coulee near Jordan**	3.45	--	**1974-P**	--	--	--	--	--	--
06130925	Thompson Creek tributary near Cohagen	1.23	--	1974-95	--	--	--	--	--	--
06130935	Crow Rock Creek near Cohagen	213	--	--	--	--	--	1978-80	1978-80	1978-80
06130940	**Spring Creek tributary near Van Norman**	1.39	--	**1974-P**	--	--	--	--	--	--
06130950	Little Dry Creek near Van Norman	1,224	1980	1958-75, 1986,1995	--	--	--	1976-77	1976-77	--
06131000	**Big Dry Creek near Van Norman**	2,554	**1939-P**	**1940-P**	--	--	--	1978,1981	1978	--
06131100	**Terry Coulee near Van Norman**	0.48	--	**1974-P**	--	--	--	--	--	--
06131120	Timber Creek near Van Norman	287	1982-85, 1988	1982-85, 1988	--	--	--	1976-79	1976-80	--
06131200	**Nelson Creek near Van Norman**	100	**1976-85, 2000-P**	**1976-85, 1991, 2000-P**	--	--	--	1976-79	1976-79	--
06131300	**McGuire Creek tributary near Van Norman**	0.79	--	**1974-P**	--	--	--	--	--	--
06131500	**Fort Peck Lake at Fort Peck**	57,500	**1938-P**	--	--	--	--	--	--	--
06132000	**Missouri River below Fork Peck Dam, at Fort Peck**	57,556	**1936-P**	**1934-P**	--	**2002-P**	--	**1964, 1975-87, 2002-P**	**1975-87, 2002-P**	1975-86
06132200	**South Fork Milk River near Babb**	70.4	**1961-P**	**1961-P**	--	--	--	1990-92	--	--
06132250	Livermore Creek near Babb	25.0	--	1962-67	--	--	--	--	--	--

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)							
			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
			Part 6--Missouri River Basin--Continued							
06132400	Dry Fork Milk River near Babb	17.9	--	1962-91	--	--	--	--	--	--
06132500	South Fork Milk River near international boundary, near Browning	287	1905-31	--	--	--	--	1964	--	--
06132700	Milk River near Del Bonita	325	1962-65	1906-08, 1911, 1913-17, 1919, 1923-24, 1927, 1929-30, 1962-67	--	--	--	--	--	--
06133000	**Milk River at western crossing of international boundary**	401	**1931-P**	**1931-38, 1940-P**	--	--	--	1960,1973, 1984-86, 1993	--	--
06133500	**North Fork Milk River above St. Mary Canal, near Browning**	60.2	**1911-12, 1919-P**	**1911-12, 1924, 1926-27, 1937, 1941-42, 1944-45, 1948, 1950-51, 1953-P**	--	--	--	1960,1965, 1973-74, 1982-83, 1990-92	--	--
06134000	**North Milk River near international boundary**	91.8	**1909-P**	**1911, 1913-P**	--	--	--	1960,1965, 1973-74, 1981, 1984-86, 1993	--	--
06134500	**Milk River at Milk River, Alberta**	1,050	**1909-P**	**1909, 1913-P**	--	--	--	1960,1965	--	--
06134600	Red River at international boundary	138	--	--	--	--	--	1995	--	--
06134700	**Verdigris Coulee near the mouth, near Milk River, Alberta**	137	**1985-P**	**1985-P**	--	--	--	--	--	--
06134800	Van Cleeve Coulee tributary near Sunburst	10.8	--	1963-91	--	--	--	--	--	--
06134850	Milk River near Writing-on-Stone Provincial Park, Alberta	1,690	1978-83	1978-82	--	--	--	--	--	--
06134890	Miners Coulee near international boundary	--	1966-94	--	--	--	--	--	--	--
06134930	Bear Creek near international boundary	--	1966-94	--	--	--	--	--	--	--
06134950	Milk River near Pendant D'Oreille	2,330	1978-83	1978-82	--	--	--	--	--	--
06135000	**Milk River at eastern crossing of international boundary**	2,525	**1910-P**	**1910-11, 1913-15, 1917, 1919-P**	--	--	--	1960,1965, 1974, 1984-86, 1993-94	--	--
06135500	Sage Creek at Q Ranch, near Wild Horse, Alberta	175	1935-83	1936-41, 1943, 1946-83	--	--	--	1965	--	--

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)							
			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
		Part 6--Missouri River Basin--Continued								
06136000	Sage Creek at international boundary	220	1946-84	1946-83	--	--	--	1965	--	--
06136400	Spring Coulee tributary near Simpson	2.49	--	1972, 1974-2002	--	--	--	--	--	--
06136500	**Fresno Reservoir near Havre**	3,766	**1940-P**	--	--	--	--	--	--	--
06136700	Milk River below Fresno Dam, near Havre	3,400	1952-53	--	--	--	--	1950-53	--	--
06137000	Milk River above Havre	3,826	1928-33	--	--	--	--	--	--	--
06137400	**Big Sandy Creek at reservation boundary, near Rocky Boy**	24.7	**1982-P**	**1982-P**	--	--	--	1982-84, 1987-89	--	--
06137500	Big Sandy Creek near Big Sandy	83.3	1946-51	--	--	--	--	--	--	--
06137540	Duck Creek near Box Elder	--	--	--	--	--	--	1982-84	--	--
06137550	Camp Creek near Box Elder	7.2	--	--	--	--	--	1983-84	--	--
06137570	Boxelder Creek near Rocky Boy	48.2	1975-97	1976-97	--	--	--	1977-81 1983-84, 1993	1977-81, 1993	1977-81
06137575	Boxelder Creek at Box Elder	67.1	--	--	--	--	--	1983	--	--
06137580	Sage Creek near Whitlash	7.26	1976-82, 1985-90	1977-82, 1985-90	--	--	--	--	--	--
06137600	**Sage Creek tributary No. 2 near Joplin**	2.21	--	**1974-P**	--	--	--	--	--	--
06137900	England Coulee at Hingham	0.93	--	1960-74	--	--	--	--	--	--
06138000	Sage Creek near Kremlin	914	1946-51	1946-48, 1950-52	--	--	--	--	--	--
06138500	Big Sandy Creek near Box Elder	1,629	1927-39	1927-32, 1934-36, 1938	--	--	--	--	--	--
06138570	Big Sandy Creek above Gravel Coulee, near Laredo	1,639	--	--	--	--	--	1982-84	--	--
06138700	**South Fork Spring Coulee near Havre**	6.47	--	**1960-P**	--	--	--	--	--	--
06138800	Spring Coulee near Havre	17.8	--	1959-73	--	--	--	--	--	--
06139000	Big Sandy Creek near Laredo	1,752	1918-20	--	--	--	--	--	--	--
06139500	**Big Sandy Creek near Havre**	1,805	**1946-53, 1984-P**	**1946-53, 1955-67, 1969,1978, 1984-P**	--	--	--	1986-90	1986-90	--
06139800	West Fork Beaver Creek near Rocky Boy	2.92	2001-2002	--	--	--	--	--	--	--
06139850	Beaver Creek above Elk Creek, near Rocky Boy	7.63	2001-2002	--	--	--	--	--	--	--
06139900	**Beaver Creek at reservation boundary, near Rocky Boy**	16.1	**2001-P**	--	--	--	--	1982-84	--	--
06140000	Beaver Creek near Havre	87.4	1918-21	1919-21, 1966-86	--	--	--	--	--	--
06140400	Bullhook Creek near Havre	39.6	--	1960-71, 1973-75, 1986	--	--	--	--	--	--

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)							
			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
			Part 6--Missouri River Basin--Continued							
06140500	**Milk River at Havre**	5,785	**1898-1923, 1954-P**	**1899-1922, 1952-53, 1955-P**	--	--	--	1964-72	--	--
06141000	Boxelder Creek near Havre	23.7	1919-22	--	--	--	--	--	--	--
06141500	Boxelder Creek at P.X. Ranch, near Havre	33.3	1918	--	--	--	--	--	--	--
06141600	Little Boxelder Creek at mouth, near Havre	95.9	1986-92, 1994-96	1986-92, 1994-96	--	--	--	--	--	--
06141900	Milk River tributary near Lohman	0.11	--	1960-74	--	--	--	--	--	--
06142000	Clear Creek near Bearpaw	69.6	1918-22	--	--	--	--	--	--	--
06142400	**Clear Creek near Chinook**	135	**1984-P**	**1984-P**	--	--	--	--	--	--
06142500	Fort Belknap Canal near Chinook	--	1903-21	--	--	--	--	--	--	--
06143000	Milk River at Lohman	6,166	1918-26, 1934-51	1919,1923, 1925, 1934-48, 1950-52	--	--	--	--	--	--
06144000	Paradise Valley Canal near headgate, near Chinook	--	1906-08, 1920-21	--	--	--	--	--	--	--
06144100	Walburger Coulee below diversion, near Govenlock, Sask.	32.6	1963-79	1963-78	--	--	--	--	--	--
06144250	Lodge Creek at Alberta boundary	342	1951, 1963-67	--	--	--	--	1960	--	--
06144260	**Altawan Reservoir near Govenlock, Saskatchewan**	373	**1966-P**	--	--	--	--	--	--	--
06144270	**Spangler Ditch near Govenlock, Saskatchewan**	--	**1966-P**	--	--	--	--	--	--	--
06144300	Lodge Creek below Spangler Project, near Govenlock, Sask.	--	1963-66	--	--	--	--	--	--	--
06144350	**Middle Creek near Saskatchewan boundary**	118	**1963-P**	**1952, 1963-P**	--	--	--	--	--	--
06144360	Middle Creek Reservoir near Govenlock	130	1966-95	--	--	--	--	--	--	--
06144395	**Middle Creek below Middle Creek Reservoir, near Govenlock, Saskatchewan**	149	**1972-P**	1974-78, 1983, 1986-87	--	--	--	--	--	--
06144400	Middle Creek near Battle Creek, Saskatchewan	177	1963-72	1963-71, 1994	--	--	--	--	--	--
06144440	**Middle Creek near Govenlock, Saskatchewan**	253	**1986-P**	**1986-P**	--	--	--	--	--	--
06144450	**Middle Creek above Lodge Creek, near Govenlock, Sask.**	276	**1962-66, 1986-P**	**1986-P**	--	--	--	--	--	--
06144500	Lodge Creek at international boundary	753	1910-52	1911-15, 1917-52	--	--	--	--	--	--
06145000	McRae Creek at international boundary	59.0	1927-52	1927-28, 1930-33, 1935-47, 1950-52	--	--	--	--	--	--

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)							
			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
			Part 6--Missouri River Basin--Continued							
06145500	**Lodge Creek below McRae Creek, at international boundary**	825	**1951-P**	**1952-P**	--	--	--	1960,1964, 1973, 1977-80, 1987-89	--	--
06146000	North Chinook Canal near Havre	--	1921-24, 1928-68	--	--	--	--	--	--	--
06146500	Reser Ditch near Chinook	--	1905-06	--	--	--	--	--	--	--
06147000	West Fork Ditch near Chinook	--	1905-07	--	--	--	--	--	--	--
06147500	Lodge Creek at Chinook	1,175	1906-08	--	--	--	--	--	--	--
06147950	**Gaff Ditch near Merryflat, Saskatchewan**	--	**1972-P**	--	--	--	--	--	--	--
06148000	Battle Creek above Cypress Lake west inflow canal, near West Plains, Saskatchewan	270	1939-66	1939-66	--	--	--	1960	--	--
06148500	**Cypress Lake west inflow canal near West Plains, Sask.**	--	**1939-P**	--	--	--	--	--	--	--
06148700	**Cypress Lake west inflow canal drain near Oxarat, Sask.**	--	**1963-P**	--	--	--	--	--	--	--
06149000	**Cypress Lake west outflow near West Plains, Sask.**	--	**1940-P**	--	--	--	--	1960	--	--
06149100	**Vidora Ditch near Consul, Saskatchewan**	--	**1963-P**	--	--	--	--	--	--	--
06149200	**Richardson Ditch near Consul, Saskatchewan**	--	**1963-P**	--	---	--	--	--	--	--
06149300	**McKinnon Ditch near Consul Saskatchewan**	--	**1963-P**	--	--	--	--	--	--	--
06149400	**Nashlyn Canal near Consul, Saskatchewan**	--	**1963-P**	--	--	--	--	--	--	--
06149500	**Battle Creek at international boundary**	997	**1917-P**	**1917-P**	--	--	--	1960,1964, 1972-74, 1987-89	--	1972
06150000	Woodpile Coulee near international boundary	60.2	1927-77	1927-30, 1932-47, 1950-63, 1965-76, 1986	--	--	--	--	--	--
06150500	East Fork Battle Creek near international boundary	89.5	1927-76	1927-33, 1935-63, 1965-67, 1969, 1971-76, 1986	--	--	--	--	--	--
06151000	Lyons Creek at international boundary	66.7	1927-94	1927-30, 1932, 1934-47, 1950-52, 1954-63, 1965-94	--	--	--	--	--	--
06151500	**Battle Creek near Chinook**	1,623	**1905-21, 1984-P**	**1905-14, 1917-21, 1952, 1984-P**	--	--	--	--	--	--

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)							
			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
			Part 6--Missouri River Basin--Continued							
06152000	Cook Canal near Chinook	--	1905-19	--	--	--	--	--	--	--
06152500	Matheson Canal near Chinook	--	1905-21, 1928-49, 1951-56	--	--	--	--	--	--	--
06153000	Paradise Valley Canal near Chinook	--	1903-19	--	--	--	--	--	--	--
06153400	**Fifteenmile Creek tributary near Zurich**	1.60	--	**1974-P**	--	--	--	--	--	--
06153500	Harlem Canal near Zurich	--	1904-21	--	--	--	--	--	--	--
06154000	Milk River Canal A near Harlem	--	1905, 1910-20, 1986-87	--	--	--	--	--	--	--
06154100	**Milk River near Harlem**	9,822	**1959-69, 1983-P**	**1952, 1960-69, 1978, 1983-P**	--	--	--	1959-69 1994	--	--
06154140	Fifteenmile Creek tributary near Harlem	2.31	1983-92	1983-92	--	--	--	--	--	--
06154150	White Bear Creek below Fifteenmile Creek, near Dodson	--	--	--	--	--	--	1982-84	--	--
06154350	**Peoples Creek tributary near Lloyd**	2.51	--	**1974-P**	--	--	--	--	--	--
06154390	Peoples Creek near Cleveland	--	--	--	--	--	--	1982-84	--	--
06154400	**Peoples Creek near Hays**	220	**1966-P**	**1967-P**	--	--	--	1960-61, 1963,1994	--	--
06154410	**Little Peoples Creek near Hays**	13	**1973-P**	**1973-P**	--	--	--	1977-2002	1977-85 1988-2002	1977-85
06154430	Lodge Pole Creek at Lodge Pole	19.5	1987-2000	1987-2000	--	--	--	1982-84, 1988-92, 1994	1988-92	--
06154490	Willow Creek near Dodson	5.16	1983-92	1983-92	--	--	--	--	--	--
06154500	Peoples Creek near Dodson	670	1918-22, 1951-73, 1982-88	1952-66, 1968-73, 1982-88	--	--	--	1982-88	--	--
06154510	**Kuhr Coulee tributary near Dodson**	1.25	1983-92	**1983-P**	--	--	--	--	--	--
06154550	**Peoples Creek below Kuhr Coulee, near Dodson**	675	**1918-21, 1951-73, 1982-P**	**1989-P**	--	--	--	**1989-92, 1994, 1999-P**	--	--
06155000	**Nelson Reservoir near Saco**	--	**1928-95**	--	--	--	--	--	--	--
06155005	Dodson North Canal near Dodson	--	--	--	--	1973	--	--	--	--
06155030	**Milk River near Dodson**	11,192	**1983-P**	**1983-P**	--	--	--	1994	--	--
06155100	Black Coulee near Malta	6.64	--	1956-67, 1986	--	--	--	--	--	--
06155200	Alkali Creek near Malta	162	--	1956-59, 1961-73, 1986	--	--	--	--	--	--
06155300	Disjardin Coulee near Malta	4.84	--	1956-2002	--	--	--	--	--	--

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)							
			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
			Part 6--Missouri River Basin--Continued							
06155400	South Fork Taylor Coulee near Malta	5.08	--	1956-73, 1986	--	--	--	--	--	--
06155500	Milk River at Malta	11,762	1902-22, 1952	1903-09, 1911-13, 1915-22, 1952	--	--	--	--	--	--
06155600	**Murphy Coulee tributary near Hogeland**	2.62	--	**1974-P**	--	--	--	--	--	--
06155900	**Milk River at Cree Crossing, near Saco**	13,118	**2000-P**	**2000-P**	--	--	--	--	--	--
06156000	Whitewater Creek near international boundary	458	1927-80	1927-33, 1935-79	--	--	--	1965, 1977-80	--	--
06156100	**Lush Coulee near Whitewater**	9.58	--	**1972, 1974-P**	--	--	--	--	--	--
06156500	**Belanger Creek diversion canal near Vidora, Saskatchewan**	--	**1946-P**	--	--	--	--	--	--	--
06157000	**Cypress Lake near Vidora, Saskatchewan**	107	**1939-P**	--	--	--	--	--	--	--
06157500	**Cypress Lake east outflow canal near Vidora, Saskatchewan**	--	**1940, 1943-P**	--	--	--	--	--	--	--
06158000	Frenchman River above Eastend Reservoir, near Ravenscrag, Saskatchewan	601	1912-18, 1937-67	1913-15, 1917, 1937-66	--	--	--	1960	--	--
06158500	**Eastend Canal at Eastend, Saskatchewan**	--	**1937-P**	--	--	--	--	--	--	--
06159000	**Eastend Reservoir at Eastend, Saskatchewan**	619	**1937-P**	--	--	--	--	--	--	--
06159500	Frenchman River below Eastend Reservoir, near Eastend, Saskatchewan	619	1909-16, 1918-31, 1935-36, 1939-91	1909, 1911-15, 1918-31, 1940-91	--	--	--	--	--	--
06160500	Frenchman River at Morrison's, near Eastend, Saskatchewan	800	1937-55	1939-52	--	--	--	1960	--	--
06160600	Frenchman River below Eastern Irrigation Project, near Eastend, Saskatchewan	835	1937-55, 1962-75	1939-52, 1962-75	--	--	--	--	--	--
06161000	Frenchman River at 50-mile, near Bracken, Saskatchewan	1,248	1914-31, 1935-55	1914-17, 1919-31, 1936-52	--	--	--	--	--	--
06161300	**Huff Lake pumping canal near Val Marie, Saskatchewan**	--	**1963-P**	--	--	--	--	--	--	--
06161500	**Huff Lake gravity canal near Val Marie, Saskatchewan**	--	**1946-P**	--	--	--	--	--	--	--
06162000	**Huff Lake near Val Marie, Saskatchewan**	1,274	**1940-P**	--	--	--	--	--	--	--
06162500	**Newton Lake main canal near Val Marie, Saskatchewan**	--	**1937-P**	--	--	--	--	--	--	--
06163000	**Newton Lake near Val Marie, Saskatchewan**	1,349	**1937-P**	--	--	--	--	--	--	--
06163050	Frenchman River below Newton Lake, near Val Marie, Sask.	1,349	1976-94	--	--	--	--	--	--	--
06163400	Denniel Creek near Val Marie, Saskatchewan	251	1963-77	1963-76	--	--	--	--	--	--
06163500	Frenchman River below Val Marie, Saskatchewan	1,725	1937-53, 1963-76	1937-52, 1962-67, 1969-75	--	--	--	1960	--	--

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)							
			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
			Part 6--Missouri River Basin--Continued							
06164000	**Frenchman River at international boundary**	2,120	**1917-P**	**1917-P**	--	--	--	1960,1964 1973, 1987-89	--	--
06164500	Frenchman Canal near Saco	--	1921, 1928-68	--	--	--	--	--	--	--
06164510	**Milk River at Juneburg Bridge, near Saco**	17,670	**1978-P**	**1978-P**	--	--	--	1978-96	--	--
06164590	Beaver Creek near Zortman	10.1	1983-92	1984-92	--	--	--	1984,1994	--	--
06164600	**Beaver Creek tributary near Zortman**	3.89	--	**1974-P**	--	--	--	--	--	--
06164615	Little Warm Creek at reservation boundary, near Zortman	6.31	1983-92	1983-92	--	--	--	1983-90	--	--
06164620	Little Warm Creek near Lodge Pole	--	--	--	--	--	--	1982-83	--	--
06164623	**Little Warm Creek tributary near Lodge Pole**	2.42	1983-92	**1983-P**	--	--	--	1994	--	--
06164630	Big Warm Creek near Zortman	8.58	1983-87	1983-87	--	--	--	1983-84	--	--
06164640	Big Warm Creek near Lodge Pole	--	--	--	--	--	--	1982-83	--	--
06164800	Beaver Creek above Dix Creek, near Malta	929	1967-69, 1976-82	1967-69, 1974, 1976-82, 1986	--	--	--	--	--	--
06165000	Beaver Creek near Malta	1,010	1917-21	--	--	--	--	--	--	--
06165200	**Guston Coulee near Malta**	2.06	--	**1974-P**	--	--	--	--	--	--
06165500	Beaver Creek overflow near Bowdoin	--	1903-13	1903-06, 1909, 1912	--	--	--	--	--	--
06166000	**Beaver Creek below Guston Coulee, near Saco (Beaver Creek near Bowdoin)**	1,208	**1920-21, 1981-P**	**1982-93, 1995-P**	--	--	--	1980-85	--	--
06166500	Beaver Creek near Saco	1,224	1903-06, 1908-13	--	--	--	--	--	--	--
06167000	Beaver Creek near Brady's Ranch, at Ashfield	1,327	1918	--	--	--	--	--	--	--
06167100	Beaver Creek above dam, near Saco	1,338	--	--	--	--	--	1982-83, 1985	--	--
06167500	Beaver Creek near Hinsdale	1,785	1918-21, 1952	--	--	--	--	--	--	--
06168000	Bowray Ditch near Barnard	--	1914	--	--	--	--	--	--	--
06168500	Rock Creek at international boundary	241	1914-16, 1927-62	1927-61	--	--	--	--	--	--
06169000	Horse Creek at international boundary	73.5	1914-62	1915-33, 1935-61	--	--	--	--	--	--
06169500	**Rock Creek below Horse Creek, near international boundary**	328	**1916-26, 1956-P**	**1917, 1919-26, 1952, 1957-P**	--	--	--	1964,1965, 1977-96	1979-96	1979-96
06169600	South Creek tributary near Opheim	2.15	1983-87	1983-87	--	--	--	--	--	--

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)							
			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
		Part 6--Missouri River Basin--Continued								
06169700	South Creek tributary No. 2 near Opheim	1.62	1983-87	1983-87	--	--	--	--	--	--
06169800	South Creek tributary No. 3 near international boundary	.32	1983-87	1983-87	--	--	--	--	--	--
06170000	McEachern Creek at international boundary	182	1924-77	1924-76	--	--	--	1965, 1978-80	--	--
06170050	Rock Creek below McEachern Creek, near international boundary	650	1983-87	1983-87	--	--	--	--	--	--
06170080	Starbuck Coulee near international boundary	4.16	1983-87	1983-87	--	--	--	--	--	--
06170200	Willow Creek near Hinsdale	283	1965-73	1965-73, 1979	--	--	--	--	--	--
06170500	Rock Creek Canal near Hinsdale	--	1918-20	--	--	--	--	--	--	--
06171000	Rock Creek near Hinsdale	1,313	1906-07, 1912-20	1906-07, 1912, 1914-20, 1952	--	--	--	--	--	--
06171500	Milk River at Hinsdale	20,897	1908-14, 1952	--	--	--	--	--	--	--
06172000	Milk River near Vandalia	20,926	1915-25, 1928-39, 1952	1915, 1917-25, 1929-39, 1952	--	--	--	1970-73	--	--
06172000	Milk River at Vandalia	20,944	1970-73, 1983-86	1970-73, 1983-87	--	--	--	--	--	--
06172200	Buggy Creek near Tampico	105	1958-67	1958-67, 1972, 1982	--	--	--	--	--	--
06172300	**Unger Coulee near Vandalia**	11.1	--	**1958-P**	--	--	--	--	--	--
06172310	**Milk River at Tampico**	21,078	**1973-77, 1987-P**	**1974-77, 1988-P**	--	--	--	1974-77	--	--
06172350	Mooney Coulee near Tampico	14.3	--	1961-75, 1982	--	--	--	--	--	--
06172400	Milk River tributary No. 2 near Glasgow	1.79	--	1958-60	--	--	--	--	--	--
06172500	Sheepshed Reservoir	11.3	1955-67	--	--	--	--	--	--	--
06173000	Halfway Reservoir	16.2	1955-62	--	--	--	--	--	--	--
06173300	Willow Creek tributary near Fort Peck	0.86	--	1972, 1974-91	--	--	--	--	--	--
06173500	Burnett Northwest Reservoir	5.0	1954-59, 1960-67	--	--	--	--	--	--	--
06174000	Willow Creek near Glasgow	538	1954-87	1954-87, 1993	--	--	--	--	1960-64	--
06174200	Milk River near Glasgow	21,965	1952	--	--	--	--	1969-73	--	1969-73
06174300	**Milk River tributary No. 3 near Glasgow**	1.82	--	**1974-P**	--	--	--	--	--	--

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)							
			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
			Part 6--Missouri River Basin--Continued							
06174500	**Milk River at Nashua**	22,332	**1939-P**	**1940-P**	--	**2000-P**	--	**1950-53, 1959-94, 1999-P**	**1974-94, 1999-P**	1974-94
06174550	Middle Fork Porcupine Creek near Baylor	--	--	--	--	--	--	1982-83	--	--
06174600	**Snow Coulee at Opheim**	3.11	--	**1972, 1974-P**	--	--	--	--	--	--
06174700	West Fork Porcupine Creek near Baylor	--	--	--	--	--	--	1982-83	--	--
06175000	Porcupine Creek at Nashua	725	1908-24, 1982-92	1909, 1912-21, 1923-24, 1939, 1982-93	--	--	--	1982-89	--	--
06175400	Frazer Reservoir outlet near Frazer	--	--	--	--	--	--	1960-63 1966-97, 1969-72	--	--
06175500	Little Porcupine Creek at Frazer	280	1909-16, 1918-19	--	--	--	--	--	--	--
06175505	Little Porcupine Creek below diversion, at Frazer	--	--	--	--	--	--	1982-83	--	--
06175540	Prairie Elk Creek near Oswego	352	1975-85	1976-85	--	--	--	1976-79	1976-79	--
06175550	East Fork Sand Creek near Vida	8.51	--	1963-77	--	--	--	--	--	--
06175580	Sand Creek near Wolf Point	201	--	--	--	--	--	1976-77	1976-77	--
06175600	West Fork Wolf Creek near Lustre	6.57	--	1956-67	--	--	--	--	--	--
06175700	East Fork Wolf Creek near Lustre	9.61	--	1956-2002	--	--	--	--	--	--
06175800	Wolf Creek tributary near Wolf Point	2.46	--	1955-67	--	--	--	--	--	--
06175900	Wolf Creek tributary No. 2 near Wolf Point	6.10	--	1955-84	--	--	--	--	--	--
06176000	Wolf Point ditch at Wolf Point	--	1909-10	--	--	--	--	--	--	--
06176500	Wolf Creek near Wolf Point	251	1908-14, 1950-53, 1982-92	1910-12, 1950-54, 1956-70, 1972-73, 1982-93	--	--	--	1982-84	--	--
06176950	Missouri River tributary No. 6 near Wolf Point	0.53	--	1973-91	--	--	--	--	--	--
06177000	**Missouri River near Wolf Point**	82,290	**1928-P**	**1929-P**	--	**1979-85 2002-P**	--	**1949-51, 1961-62, 1965-68, 1970-73 2002-P**	**2002-P**	--
06177020	**Tule Creek tributary near Wolf Point**	1.91	--	**1974-P**	--	--	--	--	--	--
06177025	Tule Creek near Poplar	--	--	--	--	--	--	1982	--	--
06177050	East Fork Duck Creek near Brockway	12.4	--	1955-2002	--	--	--	--	--	--
06177100	Duck Creek near Brockway	54.0	--	1957-73	--	--	--	--	--	--

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)							
			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
		Part 6--Missouri River Basin--Continued								
06177150	Redwater River at Brockway	216	--	1957-73, 1986	--	--	--	1980-83	--	--
06177200	Tusler Creek near Brockway	90.2	--	1957-72	--	--	--	--	--	--
06177250	Tusler Creek tributary near Brockway	3.17	--	1957-73, 1986	--	--	--	--	--	--
06177300	Redwater River tributary near Brockway	0.29	--	1954,1957, 1959-73	--	--	--	--	--	--
06177350	South Fork Dry Ash Creek near Circle	5.74	--	1955-60, 1962-72, 1986	--	--	--	--	--	--
06177400	McCune Creek near Circle	29.9	1982-85	1955-58, 1960-73, 1982-86	--	--	--	--	--	--
06177500	**Redwater River at Circle**	547	**1929-72, 1974-P**	**1929-30, 1932-72, 1975-P**	--	--	--	1975-85	1975-85	--
06177520	Horse Creek near Circle	101	--	--	--	--	--	1977-79, 1982	1977-79	--
06177650	Redwater River near Richey	1,071	1982-86	1983-85	1982-85	--	--	1982-85	1982-84	--
06177700	**Cow Creek tributary near Vida**	1.71	1982-85	**1963-P**	--	--	--	--	--	--
06177720	West Fork Sullivan Creek near Richey	14.8	--	1972, 1974-92	--	--	--	--	--	--
06177800	Gady Coulee near Vida	0.91	--	1962-91	--	--	--	--	--	--
06177820	**Horse Creek tributary near Richey**	0.63	--	**1974-P**	--	--	--	--	--	--
06177825	Redwater River near Vida	1,974	1975-85	1976-85	--	--	--	1976-85	1976-85	--
06178000	**Poplar River at international boundary**	358	**1931-P**	**1931, 1933-P**	--	--	--	**1964-65, 1976-P**	**1977-P**	1977-78
06178150	Poplar River near Scobey	572	--	--	--	--	--	1975-80	1977-79	1977-78
06178500	**East Poplar River at international boundary**	541	**1931-P**	**1931-32, 1935-43, 1945-P**	**1982-P**	--	--	**1964-65, 1975-P**	**1975-P**	1977-81
06179000	East Fork Poplar River near Scobey	722	1935-40, 1975-79	1975-79	--	--	--	1975-95	1977-95	1977-78
06179100	**Butte Creek tributary near Four Buttes**	1.60	--	**1972, 1974-P**	--	--	--	--	--	--
06179200	Poplar River above West Fork, near Bredette	1,745	--	--	--	--	--	1976-81, 1985-93	1977-81	1977-78
06179500	West Fork Poplar River at international boundary	139	1931-53	1931-33, 1935-37, 1939-52	--	--	--	1976-83	1977-79	1977-78
06180000	West Fork Poplar River near Richland	428	1935-49	1935-49, 1990,1994	--	--	--	--	--	--

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)							
			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
			Part 6--Missouri River Basin--Continued							
06180200	West Fork Poplar River near Four Buttes	732	--	--	--	--	--	1975-76	--	--
06180400	West Fork Poplar River near Bredette	1,010	--	--	--	--	--	1976-93	1977-84	1977-78
06180500	Poplar River near Bredette	2,940	1934-47	1934-47	--	--	--	--	--	--
06180600	Poplar River above Slims Coulee, near Poplar	--	--	--	--	--	--	1991-93	--	--
06181000	**Poplar River near Poplar**	3,174	**1908-24, 1947-69, 1975-79, 1982-P**	**1909,1915, 1921,1923, 1946, 1948-63, 1965-69, 1975-79, 1982-P**	--	**2000-P**	--	**1975-81, 1987-94, 1999-P**	**1975-81, 1987-94, 1999-P**	1975-78, 1987-94
06181200	Missouri River tributary No. 2 near Brockton	1.60	--	1962-76	--	--	--	--	--	--
06181500	Big Muddy Creek at international boundary	29.0	1949-52	--	--	--	--	--	--	--
06181995	Beaver Creek at international boundary	149	1977-94	1978-94	--	--	--	1977-91	1977-91	1977-78
06182000	Beaver Creek near international boundary	224	1949-53	--	--	--	--	--	--	--
06182500	Big Muddy Creek at Daleview	279	1947-72	1948-72, 1975	--	--	--	--	--	--
06182700	Middle Fork Big Muddy Creek near Flaxville	3.12	--	1972, 1974-83	--	--	--	--	--	--
06183000	Big Muddy Creek at Plentywood	850	1948-53	1948-53, 1955-67	--	--	--	--	--	--
06183100	Box Elder Creek near Plentywood	9.40	--	1956-73, 1976	--	--	--	--	--	--
06183200	Box Elder Creek at dam site, near Plentywood	19.9	--	1953,1955, 1957-63	--	--	--	--	--	--
06183300	Marron Creek tributary near Plentywood	6.08	--	1955-2002	--	--	--	--	--	--
06183400	Spring Creek at Highway 16, near Plentywood	16.9	--	1956-73, 1976	--	--	--	--	--	--
06183450	**Big Muddy Creek near Antelope**	967	**1979-P**	**1979-P**	--	--	--	1979-93	1979-87	--
06183500	Big Muddy Creek at Reserve	1,044	1920-25, 1950-53	1920-21, 1923-24, 1950-53	--	--	--	--	--	--
06183700	**Big Muddy Creek diversion canal near Medicine Lake**	--	**1985-P**	--	--	--	--	--	--	--
06183750	**Lake Creek near Dagmar**	101	**1985-89, 1995-P**	**1986-89, 1996-P**	--	--	--	--	--	--
06183800	**Cottonwood Creek near Dagmar**	126	**1985-89, 1995-P**	**1986-89, 1996-P**	--	--	--	--	--	--
06183850	**Sand Creek near Dagmar**	122	**1985-89, 1995-P**	**1986-89, 1995-P**	--	--	--	--	--	--
06183900	Wolf Creek near Reserve	--	--	--	--	--	--	1982-84	--	--
06184000	Wolf Creek near Medicine Lake	165	1918-19	--	--	--	--	--	--	--

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)							
			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
			Part 6--Missouri River Basin--Continued							
06184200	**Lost Creek tributary near Homestead**	1.90	--	**1972, 1974-P**	--	--	--	--	--	--
06184400	Smoke Creek near Flaxville	--	--	--	--	--	--	1982	--	--
06184500	Smoke Creek near Poplar	283	1918	--	--	--	--	--	--	--
06185000	Big Muddy Creek near Culbertson	2,447	1908-21	1909-14, 1916-21	--	--	--	--	--	--
06185100	Big Muddy Creek tributary near Culbertson	7.38	--	1963-77	--	--	--	--	--	--
06185110	Big Muddy Creek near mouth, near Culbertson	2,684	1982-92	1982-92	--	--	--	1982-89	--	--
06185150	Hardscrabble Creek near Culbertson	121	--	--	--	--	--	1981-83	1981-83	--
06185200	Missouri River tributary No. 3 near Culbertson	1.23	--	1963-77	--	--	--	--	--	--
06185300	Missouri River tributary No. 4 near Bainville	11.6	--	1963-77	--	--	--	--	--	--
06185400	**Missouri River tributary No. 5 at Culbertson**	3.67	--	**1963-P**	--	--	--	--	--	--
06185500	**Missouri River near Culbertson**	91,557	**1941-51, 1958-P**	**1942-51, 1959-P**	--	**2002-P**	1972-76	**1965-86, 1992-94, 1997-P**	**1972-86, 1997-P**	**1969-86, 2003**
			Part 6--Yellowstone River Basin							
06186000	Yellowstone Lake at Bridge Bay, Yellowstone National Park	1,006	1921-86	--	--	--	--	--	--	--
06186500	**Yellowstone River at Yellowstone Lake outlet, Yellowstone National Park**	991	**1922-82, 1984-86, 1989-P**	**1923-86, 1989-P**	1984-85	1984-85	--	--	--	--
06187000	Yellowstone River near Canyon Hotel, Yellowstone National Park	1,157	1913-51	1913-18, 1821-51	--	--	--	--	--	--
06187500	Tower Creek at Tower Falls, Yellowstone National Park	50.4	1922-43	1923-43	--	--	--	--	--	--
06187550	Yellowstone River at Tower Junction, Yellowstone National Park	1,342	1984-86	1984-86	1984-85	1984-85	--	--	--	--
06187915	**Soda Butte Creek at park boundary, at Silver Gate**	31.2	**1999-P**	**1999-P**	--	--	--	1999-2001	1999-2001	2000-2001
06187950	**Soda Butte Creek near Lamar Ranger Station,Yellowstone National Park**	99	**1989-P**	**1989-P**	--	--	--	1989	--	--
06188000	**Lamar River near Tower Falls Ranger Station, Yellowstone National Park**	660	**1922-69, 1985-86, 1988-P**	**1923-69, 1985-86, 1989-P**	--	--	1985-86, 1989-92	1989	1985-86, 1988-92,	--
06188500	East Fork Blacktail Deer Creek near Mammoth, Yellowstone National Park	10.3	1938-41	--	--	--	--	--	--	--
06189000	Blacktail Deer Creek near Mammoth, Yellowstone National Park	15	1938-45, 1989-93	1938-45, 1989-93	--	--	--	1989	--	--
06189500	Bear Creek at Jardine	40.8	1946-49	--	--	--	--	--	--	--
06190000	Lupine Creek near Mammoth, Yellowstone National Park	4.67	1938-41	--	--	--	--	--	--	--
06190370	Gardner River above Mammoth Springs Outflow, near Mammoth, Yellowstone National Park	--	--	--	--	--	--	1988-93	--	--

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)							
			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
			Part 6--Yellowstone River Basin--Continued							
06190415	Mammoth Springs Outflow at Mammoth, Yellowstone National Park	--	--	--	--	--	--	1988-94	--	--
06190500	Gardner River at Mammoth, Yellowstone National Park	200	1922-39	1923-38	--	--	--	--	--	--
06190525	Gardner River Sinkhole Diversion at Mammoth, Yellowstone National Park	--	--	--	--	--	--	1989-92	--	--
06190530	Clematis Creek at Mammoth, Yellowstone National Park	2.71	--	--	--	--	--	1990-92	--	--
06190540	**Boiling River at Mammoth, Yellowstone National Park**	--	**1989-94 2003**	**1989-95 2003**	1989-90	**1989-90 2003**	--	1967, 1988-94	--	--
06191000	**Gardner River near Mammoth, Yellowstone National Park**	202	**1938-72, 1984-P**	**1939-72, 1984-P**	1985	1985	--	1988-93	1989	--
06191400	LaDuke Hot Springs near Corwin Springs	--	--	--	--	--	--	1988-94	--	--
06191500	**Yellowstone River at Corwin Springs**	2,619	**1889-93, 1910-P**	**1890-93, 1911-P**	1984-85	1977-81, 1984-85 2002	1985-92	1956-57, 1969-74, 1988-90 1999-2001	1965, 1985-92 1999-2001	1969-74 2000-2001
06191800	Big Creek near Emigrant	60.9	1973-79, 1983-85	1974-79, 1983-85	--	--	--	--	--	--
06192000	Mill Creek near Pray	148	1951-56	1951-56	--	--	--	--	--	--
06192500	**Yellowstone River near Livingston**	3,551	**1897-1905, 1928-32, 1937-P**	**1897-1905, 1929-32, 1938-P**	--	**2000-P**	1985-86	**1970-94, 1999-P**	**1965, 1979-94, 1999-P**	1979-94
06193000	Shields River near Wilsall	87.8	1935-57	1936-57	--	--	--	--	--	--
06193500	Shields River at Clyde Park	543	1921-23, 1929-32, 1934-67	1921-23, 1929-32, 1934-67	--	--	--	--	1965	--
06194000	Brackett Creek near Clyde Park	57.9	1921-23, 1934-57	1921-23, 1934-57	--	--	--	--	--	--
06194500	Canyon Creek near Chadbourn	21.5	1923	--	--	--	--	--	--	--
06195000	Bangtail Creek at Chadbourn	13.3	1923	--	--	--	--	--	--	--
06195500	Willow Creek near Chadbourn	29.7	1923	--	--	--	--	--	--	--
06195600	**Shields River near Livingston**	852	**1979-P**	**1979-P**	--	**2000-P**	--	**1999-P**	**1999-P**	--
06196000	North Fork Big Timber Creek near Big Timber	36.6	1907-12	--	--	--	--	--	--	--
06196500	South Fork Big Timber Creek near Big Timber	28.1	1907-11	--	--	--	--	--	--	--
06197000	Big Timber Creek near Big Timber	74.9	1912-24	1912-16, 1918-24, 1971	--	--	--	--	--	--
06197020	Big Timber Creek near mouth, near Big Timber	--	--	--	--	--	--	--	1965	--

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)							
			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
			Part 6--Yellowstone River Basin--Continued							
06197500	Boulder River near Contact	226	1910-16, 1929, 1950-69, 1970-74, 1981-83	1910-16, 1929, 1951-69, 1971-75, 1982-83	--	--	1972	1971-73	1971-73 1981-83	--
06197800	East Boulder River below Dry Fork Creek, near McLeod	--	--	--	--	--	--	--	1981-83	--
06198000	East Fork Boulder River near McLeod	85.6	1907-10, 1981-83	1908-09, 1982-83	--	--	--	--	1981-83	1982-83
06198450	West Fork Boulder River at West Boulder Reservoir near McLeod	--	--	--	--	--	--	--	1981-83	--
06198500	West Fork Boulder River near Bruffeys	91.6	1904-10	1904-1908, 1910	--	--	--	--	--	--
06199000	West Boulder River at McLeod	135	1907-14	1907-14	--	--	--	--	1981-83	--
06199500	Boulder River near McLeod	476	1912-14	--	--	--	--	--	--	--
06200000	**Boulder River at Big Timber**	523	**1947-53, 1955-P**	**1947-53, 1955-P**	--	**2000-P**	--	**1965, 1999-P**	**1965, 1981-83, 1999-P**	--
06200400	Sweet Grass Creek near Melville	46.3	1907-12	--	--	--	--	--	--	--
06200500	Sweet Grass Creek above Melville	63.8	1913-25, 1937-69	1914-24, 1937-69, 1971,1975	--	--	--	--	--	--
06201000	Sweet Grass Creek below Melville	143	1907-24, 1937-43, 1946-52	1907-16, 1918-24, 1937-42, 1946-52	--	--	--	--	--	--
06201500	Sweet Grass Creek near Greycliff	368	1941-42	--	--	--	--	--	--	--
06201550	Yellowstone River tributary near Greycliff	2.72	--	1960-74	--	--	--	--	--	--
06201600	Bridger Creek near Greycliff	61.5	--	1960-75	--	--	--	--	--	--
06201650	Work Creek near Reed Point	32.5	--	1959-73, 1978	--	--	--	--	--	--
06201700	**Hump Creek near Reed Point**	7.61	--	**1960-P**	--	--	--	--	--	--
06201750	Berry Creek near Columbus	23.5	--	1958-73, 1978	--	--	--	--	--	--
06201800	Stillwater River above Woodbine Creek, near Nye	160	1924-27	--	--	--	--	--	--	--
06202000	Woodbine Creek near Nye	19.4	1924-27	--	--	--	--	--	--	--
06202500	Stillwater River near Nye	180	1929-32	--	--	--	--	--	--	--
06202510	Stillwater River above Nye Creek, near Nye	193	1980-91	1980-91	--	--	--	--	1981-83	1982-83
06202530	Stillwater River above West Fork, at Nye	193	--	--	--	--	--	--	1971-73	--
06202590	West Fork Stillwater River above Cathedral Creek, near Nye	--	--	--	--	--	--	--	1981-83	--
06202597	Castle Creek near Nye	--	--	--	--	--	--	--	1973	--
06202598	West Fork Stillwater River below Castle Creek, near Nye	122	--	--	--	--	--	--	1971-73 1981-83	--

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)							
			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
			Part 6--Yellowstone River Basin--Continued							
06202600	Stillwater River at Nye	337	1969-77	1970-76	--	--	--	--	--	--
06202610	Stillwater River at Beehive	371	--	--	--	--	1972-73	1971-73, 1982-83	1973, 1982-83	1982-83
06203000	East Rosebud Creek near Roscoe	105	1920-21	--	--	--	--	--	--	--
06203500	East Rosebud Creek at Roscoe	125	1921-24	--	--	--	--	--	--	--
06204000	**Mystic Lake near Roscoe**	46.9	**1936-P**	--	--	--	--	--	--	--
06204050	**West Rosebud Creek near Roscoe**	52.1	**1965-P**	**1966-P**	--	--	--	--	--	--
06204150	Fishtail Creek near Dean	--	--	--	--	--	--	--	1981-83	--
06204220	Butcher Creek near Luther	9.69	--	--	--	--	--	1960	1960-61	--
06204240	Butcher Creek near Roscoe	--	--	--	--	--	--	--	1960-61	--
06204260	Butcher Creek near Fishtail	--	--	--	--	--	--	--	1960-61	--
06204300	Butcher Creek near Absarokee	39.6	1960-62	--	--	--	--	1960	--	--
06204500	Rosebud Creek near Absarokee	394	1935-69	1935-69	--	--	--	--	--	--
06204700	Rosebud Creek at Absarokee	401	1910-14	--	--	--	--	--	--	--
06205000	**Stillwater River near Absarokee**	975	**1910-14, 1935-P**	**1911-14, 1935-P**	--	2001-2002	--	**1999-P**	**1965,1981, 1999-P**	--
06205050	Stillwater River near Columbus	--	--	--	--	--	--	--	1982-83	--
06205100	Allen Creek near Park City	7.17	--	1961-2002	--	--	--	--	--	--
06205200	Yellowstone River at Laurel	8,189	--	--	--	--	--	1951-52, 1974-79	1975-78	1974-79
06207500	**Clarks Fork Yellowstone River near Belfry**	1,154	**1921-P**	**1922-P**	--	--	1984	1966-88	1965,1971 1984	--
06207510	Big Sand Coulee at Wyoming-Montana State line	134	1973-81	1973-80	--	--	1973-81	--	--	--
06207520	Silver Tip Creek below Amoco dam, near Belfry	--	--	--	--	--	--	1972	--	--
06207523	Silver Tip Creek below Sinclair oil field, near Belfry	--	--	--	--	--	--	1972	--	--
06207530	Silver Tip Creek above Gobblers Draw, near Belfry	--	--	--	--	--	--	1971	--	--
06207540	Silver Tip Creek near Belfry	88.0	1968-75	1968-75	--	--	1969-72, 1974	1969-75	1970-75	--
06207600	Jack Creek tributary near Belfry	0.85	--	1975-91	--	--	--	--	--	--
06207700	North Fork Bluewater Creek near Bridger	8.1	--	--	--	--	--	--	1960-61, 1964-68	--
06207800	Bluewater Creek near Bridger	28.1	1960-70	1960-70, 1978	--	--	1962-70	1960	1964-65	--
06207850	Bluewater Creek at Sanford Ranch	43.9	--	--	--	--	1964-70	--	1960-61 1964-70	--
06207870	Bluewater Creek near Fromberg	46.6	--	--	--	--	1964-70	1960	1960-61, 1964-68	--
06207900	Bluewater Creek at Fromberg	53.2	1961-64	--	--	--	1962-64	1960,1980	1960-761, 1964-68, 1970,1980	--

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)							
			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
		Part 6--Yellowstone River Basin--Continued								
06208000	Clarks Fork Yellowstone River at Fromberg	1,940	1905-14	1905-13	--	--	--	--	--	--
06208400	Elbow Creek near Joliet	48.6	1984	1984	--	--	--	1984	1984	--
06208500	**Clarks Fork Yellowstone River at Edgar**	2,022	**1921-69, 1987-P**	**1922-32, 1934-69, 1987-P**	--	**2000-P**	1972-73	**1964-65, 1999-P**	**1965,1973, 1999-P**	**2000-P**
06208800	Clarks Fork Yellowstone River near Silesia	2,093	1970-87	1970-86	--	--	1984	1984	1984	--
06209000	Glacier Lake near Red Lodge	3.77	1939-47, 1960-64	--	--	--	--	--	--	--
06209010	Rock Creek below Glacier Lake, near Red Lodge	3.89	1960-64	--	--	--	--	--	--	--
06209500	**Rock Creek near Red Lodge**	105	**1932-82, 1985-86, 2000-P**	**1932, 1934-82, 1985-86, 2000-P**	--	2001-2002	--	--	--	--
06210000	West Fork Rock Creek below Basin Creek, near Red Lodge	63.1	1937-57	1938-56	--	--	--	--	--	--
06210500	West Fork Rock Creek near Red Lodge	66.9	1932-44	1932, 1934-44	--	--	--	--	--	--
06211000	**Red Lodge Creek above Cooney Reservoir, near Boyd**	143	**1937-P**	**1937-P**	--	--	--	--	--	--
06211500	**Willow Creek near Boyd**	53.3	**1937-P**	**1937-P**	--	--	--	--	--	--
06212000	Cooney Reservoir near Boyd	206	1937-95	--	--	--	--	--	--	--
06212500	**Red Lodge Creek below Cooney Reservoir, near Boyd**	210	**1937-P**	**1938-P**	--	--	--	--	--	--
06213000	Red Lodge Creek near Boyd	234	1932-37	--	--	--	--	--	--	--
06213500	Rock Creek at Joliet	539	1946-53	1946-53	--	--	--	--	--	--
06214000	Rock Creek at Rockvale	569	1920-22, 1952-40, 1984-90	1921-22, 1932,1934, 1935-40, 1985-90	--	--	--	--	--	--
06214050	Clarks Fork Yellowstone River near Laurel	2,783	--	--	--	--	--	1969-73	--	1969-73
06214100	Yellowstone River near Laurel	11,036	--	--	--	--	--	1969-72	--	1969-72
06214150	Mills Creek at Rapelje	3.32	--	1974-2002	--	--	--	--	--	--
06214500	**Yellowstone River at Billings**	11,805	**1904-05, 1928-P**	**1904-05, 1918, 1929-P**	--	2001-2002	1977-81	**1963-93 1999-P**	**1965, 1975-93 1999-P**	**1975-93 2000-P**
06215000	Pryor Creek above Pryor	39.6	1921-24, 1967-74	1921-24, 1967-74	--	--	--	1987-90	--	--
06215500	Lost Creek near Pryor	9.72	1921-24	1922-24	--	--	--	--	--	--
06216000	**Pryor Creek at Pryor**	117	**1921-24, 1966-P**	**1922-24, 1967-P**	--	--	--	--	--	--
06216200	**West Wets Creek near Billings**	8.80	--	**1955-P**	--	--	--	--	--	--
06216300	West Buckeye Creek near Billings	2.64	--	1955-73, 1978	--	--	--	--	--	--

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)							
			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
			Part 6--Yellowstone River Basin--Continued							
06216500	Pryor Creek near Billings	440	1911-24, 1938-54	1912-24, 1938-53, 1955-73, 1978	--	--	--	--	--	--
06216900	Pryor Creek near Huntley	582	1979-99	1978-99	--	--	--	--	--	--
06217000	Pryor Creek at Huntley	606	1904-17	1905-06, 1908, 1910-15, 1978	--	--	--	--	--	--
06217300	**Twelvemile Creek near Shepherd**	9.05	--	**1973-P**	--	--	--	--	--	--
06217500	Yellowstone River at Huntley	12,840	1908-16	1908-16	--	--	--	1951-52, 1971-81	1975-81	1972-81
06217700	**North Fork Crooked Creek tributary near Shepherd**	6.85	--	**1962-P**	--	--	--	--	--	--
06217750	Fly Creek at Pompeys Pillar	285	1969-81	1969-81	--	--	--	1969-81	--	--
06217800	Yellowstone River tributary No. 2 near Pompeys Pillar	0.70	--	1962-73	--	--	--	--	--	--
06217950	Buffalo Creek near Custer	221	1980-83	1980-83	--	--	--	--	--	--
06218000	Yellowstone River at Junction (at Custer)	14,427	1906-08	--	--	--	--	1969-70	--	1969-70
06286258	Big Coulee near Lovell, Wyoming	30.1	1970-78	--	--	--	--	--	--	--
06286270	Porcupine Creek near Lovell, Wyoming	135	1964-67	--	--	--	--	--	--	--
06286340	Dry Head Creek near Pryor	58.0	1965-66	--	--	--	--	--	--	--
06286350	Dry Head Creek above Hoodoo Creek, near Pryor	80.0	1966-68	1966-67	--	--	--	--	--	--
06286370	Big Bull Elk Creek near St. Xavier	35.0	1965-68	--	--	--	--	--	--	--
06286390	Black Canyon Creek near St. Xavier	52.0	1965-66	1965-66	--	--	--	--	--	--
06286395	Black Canyon Creek below Three Springs Creek, near St. Xavier	75.0	1966-68	1966-67	--	--	--	--	--	--
06286400	**Bighorn Lake near St. Xavier**	19,626	**1965-P**	--	---	--	--	--	--	--
06286490	**Bighorn Canal near St. Xavier**	--	**1966-P**	--	--	--	--	--	--	--
06286500	Bighorn Canal below wasteway, near St. Xavier	--	1947-52	--	--	--	--	--	--	--
06287000	**Bighorn River near St. Xavier**	19,667	**1934-P**	**1935-P**	--	1970-79	--	1967-81		1969-70
06287500	Soap Creek near St. Xavier	98.3	1911-14, 1939-53, 1963, 1968-72	1939-53, 1963, 1968-72, 1978	--	--	--	--	--	--
06287700	Soap Creek near mouth, near St. Xavier	111	1914-24	1914-18, 1920-24	--	--	--	--	--	--
06288000	Rotten Grass Creek near St. Xavier	147	1911-22, 1968-73	1914-17, 1968-72, 1978	--	--	--	--	--	--
06288200	Beauvais Creek near St. Xavier	100	1967-77	1968-78	--	--	--	1967-78	1968-78	1969-78
06288500	Bighorn River near Hardin	20,722	1904-25, 1928-33	1904-24, 1929-33	--	1968-74	--	1951, 1969-73, 1987-89	--	1970-73

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)							
			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
			Part 6--Yellowstone River Basin--Continued							
06288960	Little Bighorn River near Parkman, Wyoming	137	1970-72	1972	--	--	--	--	--	--
06288990	West Fork Little Bighorn River near Parkman, Wyoming	38.2	1970-72, 1983-87	--	--	--	--	--	--	--
06289000	**Little Bighorn River at State line, near Wyola**	182	**1939-P**	**1939-P**	--	--	--	1993-2001	1993-2001	1993-2001
06289500	Little Bighorn River near Wyola	251	1912-24	1912-24	--	--	--	1993-2001	1993-2001	1993-2001
06290000	**Pass Creek near Wyola**	111	**1935-56, 1983-P**	**1935-56, 1978, 1983-P**	--	--	--	--	--	--
06290200	Little Bighorn River tributary near Wyola	4.43	--	1973-86	--	--	--	--	--	--
06290500	**Little Bighorn River below Pass Creek, near Wyola**	428	**1939-75, 1977-P**	**1939-P**	--	--	1970-73	1970-75, 1977	1970-73	--
06291000	Owl Creek near Lodge Grass	163	1939-45, 1980-92	1939-42, 1944-45, 1980-92	--	--	--	--	--	--
06291200	Lodge Grass Creek at State Line, near Wyola	16.7	1983-84	1983-89	--	--	--	--	--	--
06291500	**Lodge Grass Creek above Willow Creek Diversion, near Wyola**	80.7	**1939-74, 1983-P**	**1939-74, 1978, 1983-P**	--	--	--	--	--	--
06292000	Lodge Grass Creek near Wyola	88.9	1921-24	--	--	--	--	--	--	--
06292500	Lodge Grass Creek near Lodge Grass	143	1912-16, 1921-24	1912-15, 1921-24	--	--	--	--	--	--
06293000	Lodge Grass Creek at Lodge Grass	170	1916-20	--	--	--	--	--	--	--
06293300	**Long Otter Creek near Lodge Grass**	11.7	--	**1973-P**	--	--	--	--	--	--
06293500	Little Bighorn River near Crow Agency	1,181	1912-24, 1928-33, 1938-60	1912, 1914-24, 1929-32, 1938-60	--	--	--	--	--	--
06293900	Little Bighorn River at Crow Agency	1,190	1905-06	--	--	--	--	--	--	--
06294000	**Little Bighorn River near Hardin**	1,294	**1953-P**	**1953-P**	--	--	1970-77	1970-79, 1987-89, 1993-2001	1971-75, 1977, 1993-2001	1993-2001
06294400	**Andresen Coulee near Custer**	2.35	--	**1963-P**	--	--	--	--	--	--
06294500	**Bighorn River above Tullock Creek, near Bighorn**	22,414	**1982-P**	**1982-P**	--	**2000-P**	--	**1999-P**	**1999-P**	--
06294600	**East Cabin Creek tributary near Hardin**	8.63	1982-85	**1973-P**	--	--	--	--	--	--
06294690	Tullock Creek near Bighorn	446	1975-82	1975-82	--	--	--	--	--	--
06294700	Bighorn River at Bighorn	22,885	1945-81	1945-81	--	--	1960-72	1960-92	1960-72, 1975-92	1975-92
06294800	Unknown Creek near Bighorn	14.6	--	1962-76, 1979,1991	--	--	--	--	--	--
06294840	Yellowstone River at Myers	37,674	--	--	--	--	--	1974-77	--	1975-77

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)							
			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
		Part 6--Yellowstone River Basin--Continued								
06294850	Buckingham Coulee near Myers	2.63	--	1962-76, 1979,1991	--	--	--	--	--	--
06294900	Middle Fork Froze to Death Creek tributary near Ingomar	1.36	--	1962-76	--	--	--	--	--	--
06294920	East Fork Sarpy Creek near Colstrip	79.2	--	--	--	--	--	1981-83	1981-83	--
06294930	**Sarpy Creek tributary near Colstrip**	4.44	--	**1972-P**	--	--	--	--	--	--
06294940	Sarpy Creek near Hysham	453	1973-84	1974-84	--	--	--	1975-84	1975-84	--
06294950	Starved to Death Creek near Sanders	36.9	1980-85	1980-85	--	--	--	--	--	--
06294960	Anderson Creek at Vananda	5.71	--	1973-84, 1991	--	--	--	--	--	--
06294980	East Fork Armells Creek near Colstrip	97.3	--	--	--	--	--	1975-85	1975-85	--
06294985	**East Fork Armells Creek tributary near Colstrip**	1.87	--	**1973-P**	--	--	--	--	--	--
06294991	West Fork Armells Creek near Forsyth	148	--	--	--	--	--	1975-77	1975-77	--
06294995	Armells Creek near Forsyth	370	1974-84, 1988-95	1975-84, 1988-95	--	--	--	1975-86, 1988-95	1975-86, 1988-95	--
06295000	**Yellowstone River at Forsyth**	40,146	**1921-23, 1977-P**	**1921-23, 1978-P**	--	--	1978-81	1974-82 1999-2001	1975-82 1999-2001	1975,1978, 1979, 2000-2001
06295020	**Short Creek near Forsyth**	3.23	--	**1962-P**	--	--	--	--	--	--
06295050	Little Porcupine Creek near Forsyth	614	--	1958-73, 1975,1978, 1986,1993	--	--	--	--	--	--
06295100	Rosebud Creek near Kirby	35.5	1982-85, 1988	1960-74, 1982-2002	--	--	--	--	--	--
06295110	Rosebud Creek at Kirby	--	--	--	--	--	--	1978-79	1978-79	--
06295113	**Rosebud Creek at reservation boundary, near Kirby**	123	**1980-P**	**1980-P**	--	--	--	**1980-84 2003**	**1980-84 2003**	**2003**
06295130	Rosebud Creek tributary near Busby	1.14	--	1963-77	--	--	--	--	--	--
06295200	Whitedirt Creek near Lame Deer	1.58	--	1959-73	--	--	--	--	--	--
06295250	**Rosebud Creek near Colstrip**	799	**1974-P**	**1975-P**	--	--	--	1975-85	1975-84	--
06295350	Greenleaf Creek near Colstrip	30.5	--	--	--	--	--	1975	1975	--
06295380	Cow Creek near Colstrip	27.2	--	--	--	--	--	1980-85	1980-85	--
06295400	Rosebud Creek above Pony Creek, near Colstrip	961	--	--	--	--	--	1975-78	1975-77	--
06295420	Snider Creek near Brandenberg	11.9	--	--	--	--	--	1978	1978	--
06295500	Rosebud Creek near Rosebud	1,193	1938-43	1938-43	--	--	--	1975-77	1975-77	--
06296000	Rosebud Creek near Forsyth	1,279	1947-54	1948-53, 1655-57, 1959, 1961-67, 1969,1978	--	--	--	--	--	--

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)							
			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
		Part 6--Yellowstone River Basin--Continued								
06296003	**Rosebud Creek at mouth, near Rosebud**	1,302	**1974-P**	**1975-P**	--	--	--	**1975-86, 1988-93, 1999-P**	**1975-86, 1988-93, 1999-P**	--
06296100	**Snell Creek near Hathaway**	10.5	1982-85	**1963-77, 1979, 1982-P**	--	--	--	--	--	--
06296115	**Reservation Creek near Miles City**	6.29	--	**1973-P**	--	--	--	--	--	--
06296120	Yellowstone River near Miles City	42,847	--	--	1969-84	--	--	1969-84	1975-84	1974-81
06306000	Tongue River near Acme, Wyoming	894	1939-57	--	--	--	--	--	--	--
06306100	Squirrel Creek near Decker	33.6	1975-85	1976-85	--	--	--	1976-85	1976-85	--
06306250	Prairie Dog Creek near Acme, Wyoming	358	1971-79	--	--	--	--	--	--	--
06306300	**Tongue River at State line, near Decker**	1,453	**1960-P**	**1961-P**	**1983-87 2001-P**	**1966-76 2001-P**	--	**1966-P**	--	1986-88
06306500	Tongue River near Decker	1,585	1928-38	1928-38	--	--	--	--	--	--
06306800	Deer Creek near Decker	47.7	--	--	--	--	--	1975-77	1975-76	--
06306900	Spring Creek near Decker	34.7	--	1958-86	--	--	--	1978,1980	1978,1980	--
06306950	South Fork Leaf Rock Creek near Kirby (Leaf Rock Creek near Kirby)	4.53	1982-85	1958, 1960-96	--	--	--	--	--	--
06307000	**Tongue River Reservoir near Decker**	1,770	**1938-P**	--	--	--	--	--	--	--
06307500	**Tongue River at Tongue River Dam, near Decker**	1,770	**1939-P**	**1939-P**	1981-87	--	--	1951, 1976-95	1976-96	--
06307510	Fourmile Creek near Birney	22.3	--	--	--	--	--	1975	1975	--
06307520	Canyon Creek near Birney	50.2	--	1972-91	--	--	--	--	--	--
06307525	Prairie Dog Creek above Jack Creek, near Birney	6.57	1979-83	1979-83	--	--	--	1978-81, 1983	1978-83	--
06307528	Prairie Dog Creek near Birney	19.6	1979-84	1979-84	--	--	--	1978-80, 1983	1978-83	--
06307530	Bull Creek near Birney	45.8	--	--	--	--	--	1975	1975	--
06307540	Hanging Woman Creek at State line, near Otter	90.2	--	--	--	--	--	1980, 1982-83	1980, 1982-83	--
06307560	East Trail Creek near Otter	31.3	1976-81	1977-81	--	--	--	1977-80	1977-78, 1980	--
06307563	Corral Creek near Otter	26.5	--	--	--	--	--	1980-83	1980-83	--
06307567	Horse Creek near Birney	16.0	--	--	--	--	--	1983	1983	--
06307570	Hanging Woman Creek below Horse Creek, near Birney	321	--	--	--	--	--	1978-83, 1986-87	1978-83, 1986-87	--
06307600	**Hanging Woman Creek near Birney**	470	**1974-84, 1986-95 2003**	**1974-84, 1986-95 2003**	1981-83, 1986-87	--	--	**1975-95 2003**	**1975-95 2003**	**2003**
06307610	Tongue River below Hanging Woman Creek, near Birney	2,533	--	--	--	--	--	1974-79	1975-79	1975-79
06307615	Cook Creek near Birney	62.6	--	--	--	--	--	1975-77	1975-77	--

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)							
			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
		Part 6--Yellowstone River Basin--Continued								
06307616	**Tongue River at Birney Day School, near Birney**	2,621	**1980-P**	**1980-P**	--	--	--	1980-93	1980-86	--
06307620	Tie Creek near Birney	18.7	--	1973-84, 1991	--	--	--	--	--	--
06307640	Spring Creek near Ashland	1.56	--	1962-76	--	--	--	--	--	--
06307660	Walking Horse Creek near Ashland	3.33	--	1963-78	--	--	--	--	--	--
06307665	Otter Creek near Otter	40.9	--	--	--	--	--	1978-84	1978-84	--
06307670	Bear Creek at Otter	90.4	--	--	--	--	--	1975-76	1975-76	--
06307700	**Cow Creek near Fort Howes Ranger Station, near Otter**	8.37	--	**1972-P**	--	--	--	--	--	--
06307717	Otter Creek below Fifteenmile Creek, near Otter	453	1982-86	1982-85	1983-85	--	--	1982-85	1982-85	--
06307720	**Brian Creek near Ashland**	8.03	--	**1973-P**	--	--	--	--	--	--
06307725	Otter Creek above Tenmile Creek, near Ashland	466	--	--	--	--	--	1978-81	1978-81	--
06307730	Threemile Creek near Ashland	51.5	--	--	--	--	--	1975	1975	--
06307735	Home Creek near Ashland	58.7	--	--	--	--	--	1977-84	1977-84	--
06307740	**Otter Creek at Ashland**	707	**1973-85, 1988-95 2003**	**1973-85, 1988-95 2003**	1981-85	--	--	**1975-85, 1988-95 2003**	**1975-85, 1988-95 2003**	**2003**
06307760	Stebbins Creek near Ashland	5.41	--	1963-77	--	--	--	--	--	--
06307780	Stebbins Creek at mouth, near Ashland	20.8	--	1963-91	--	--	--	--	--	--
06307800	Tongue River near Ashland	3,830	1956-73	1967-72	--	--	--	--	--	--
06307810	Beaver Creek near Ashland	92.3	--	--	--	--	--	1975-76	1975-76	--
06307830	**Tongue River below Brandenberg Bridge, near Ashland**	3,948	**1973-84, 2000-P**	**1974-84, 2000-P**	**2001-P**	**2001-P**	1975-81	**1974-81, 2000-P**	**1975, 1978-81, 2000-P**	**2003**
06307840	Liscom Creek near Ashland	47.6	--	--	--	--	--	1975,1977	1975,1977	--
06307890	Foster Creek near Volborg	116	--	--	--	--	--	1975-77	1975-77	--
06307930	Jack Creek near Volborg	5.47	--	1973-2002	--	--	--	--	--	--
06308000	Tongue River near Miles City	4,539	1929-33	--	--	--	--	--	--	--
06308100	Sixmile Creek tributary near Epsie	0.80	--	1972-91	--	--	--	--	--	--
06308160	Pumpkin Creek near Loesch	102	--	--	--	--	--	1976-79	1976-79	--
06308170	Little Pumpkin Creek near Volborg	101	--	--	--	--	--	1976-77	1976-77	--
06308190	Pumpkin Creek near Volborg	386	--	--	--	--	--	1976-77	1976-77	--
06308200	**Basin Creek tributary near Volborg**	0.14	--	**1955-P**	--	--	--	--	--	--
06308300	Basin Creek near Volborg	11.1	--	1955-73	--	--	--	--	--	--
06308330	**Deer Creek tributary near Volberg**	1.65	--	**1973-P**	--	--	--	--	--	--
06308340	**LaGrange Creek near Volberg**	3.66	--	**1973-P**	--	--	--	--	--	--
06308400	Pumpkin Creek near Miles City	697	1972-85	1973-85	--	--	--	1976-85	1976-85	--
06308500	**Tongue River at Miles City**	5,379	**1938-42, 1946-P**	**1938-41, 1946-P**	--	**2000-P**	1978-86	**1949-94, 1999-P**	**1975-94, 1999-P**	1975-94

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)							
			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
		Part 6--Yellowstone River Basin--Continued								
06309000	**Yellowstone River at Miles City**	48,253	**1922-23, 1928-P**	**1923, 1929-P**	--	--	--	1948-52, 1965	1965	--
06309020	Rock Springs Creek tributary at Rock Springs	0.96	--	1963-78, 1987	--	--	--	--	--	--
06309040	Dry House Creek near Angela	38.6	--	1963-77, 1987	--	--	--	--	--	--
06309060	North Fork Sunday Creek tributary No. 2 near Angela	0.22	--	1962-91	--	--	--	--	--	--
06309075	Sunday Creek near Miles City	714	1975-84	1975-84	--	--	--	--	--	--
06309078	Tree Coulee near Kinsey	4.13	--	1972, 1974-2002	--	--	--	--	--	--
06309079	Muster Creek near Kinsey	28.5	--	--	--	--	--	1978-80	1978-80	1978-80
06309080	**Deep Creek near Kinsey**	11.5	--	**1962-P**	--	--	--	--	--	--
06309090	Ash Creek near Locate	6.23	--	1962-76	--	--	--	--	--	--
06309145	Custer Creek near Kinsey	151	--	--	--	--	--	1978-80	1978-80	1978-80
06324500	**Powder River at Moorhead**	8,086	**1929-72, 1974-P**	**1923, 1929-72, 1975-P**	**1986-89 2001-P**	--	1975-96	**1949, 1951-53, 1956-57, 1969-72, 1975-92 2001-P**	**1975-1997 2001-P**	1969-72
06324700	Sand Creek near Broadus	10.2	--	1955-84	--	--	--	--	--	--
06324710	Powder River at Broadus	8,748	1975-92	1976-92	--	--	1976-92	1979, 1988-90	1976-92, 1995	--
06324995	**Badger Creek at Biddle**	6.06	--	**1972-P**	--	--	--	--	--	--
06325000	Little Powder River at Biddle	1,541	1938-43	--	--	--	--	--	--	--
06325400	East Fork Little Powder River tributary near Hammond	3.45	--	1974-84	--	--	--	--	--	--
06325500	**Little Powder River near Broadus**	1,974	1947-53, 1957-72	1947-53, 1956-72, 1978	--	--	--	**2002-P**	**2002-P**	--
06325550	Little Powder River at mouth, near Broadus	--	--	--	--	--	--	1978-79, 1988-90 2001-2002	1988-89 2001-2002	--
06325650	Powder River near Powderville	--	--	--	--	--	--	1978-90	1988	--
06325700	**Deep Creek tributary near Powderville**	3.00	--	**1973-P**	--	--	--	--	--	--
06325950	**Cut Coulee near Mizpah**	2.23	--	**1973-P**	--	--	--	--	--	--
06326000	Powder River near Mizpah	12,132	1928-33	--	--	--	--	1989	--	--
06326050	Mizpah Creek at Olive	129	--	--	--	--	--	1976-79	1976-79	--
06326200	Mizpah Creek near Volberg	510	--	--	--	--	--	1976-79	1976-77	--
06326300	Mizpah Creek near Mizpah	797	1975-86	1975-86	--	--	--	1976-84, 1989-90	1976-84	--

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)							
			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
			Part 6--Yellowstone River Basin--Continued							
06326400	Meyers Creek near Locate	9.42	--	1962-76, 1982	--	--	--	--	--	--
06326500	**Powder River near Locate**	13,068	**1938-P**	**1938-P**	1951-62, 1975-81, 1988-90	--	1975-84	**1948-63, 1975-94, 1999-P**	**1965, 1974-94 1999-P**	1975-94
06326507	Locate Creek near Ismay	--	--	--	--	--	--	1982-83	1982-83	--
06326510	Locate Creek tributary near Locate	0.91	--	1973-91	--	--	--	--	--	--
06326520	Powder River at mouth, near Terry	13,512	--	--	--	--	--	1978,1989	--	--
06326530	Yellowstone River near Terry	63,447	--	--	--	--	--	1974-83	1975-83	1975-80
06326550	Cherry Creek tributary near Terry	2.52	--	1973-91	--	--	--	--	--	--
06326555	Cherry Creek near Terry	358	1980-81, 1990-94	1980-81, 1990-94	1990-94	--	1990-94	1978-81	1978-81, 1990-94	--
06326580	**Lame Jones Creek tributary near Willard**	0.51	--	**1974-P**	--	--	--	--	--	--
06326600	O'Fallon Creek near Ismay	669	1978-92	1962-92	--	--	--	1978-84	1978-84	1978-80
06326650	O'Fallon Creek tributary near Ismay	0.16	--	1962-76	--	--	--	--	--	--
06326700	Deep Creek near Baker	3.79	--	1962-76, 1978	--	--	--	--	--	--
06326800	Pennel Creek tributary near Baker	0.86	--	1962-91	--	--	--	--	--	--
06326850	O'Fallon Creek at Mildred	1,396	1975-78	1976-78	--	--	--	--	--	--
06326900	Yellowstone River tributary No. 4 near Fallon	0.67	--	1962-76	--	--	--	--	--	--
06326940	**Spring Creek tributary near Fallon**	3.10	--	**1972-P**	--	--	--	--	--	--
06326950	**Yellowstone River tributary No. 5 near Marsh**	0.87	--	**1962-P**	--	--	--	--	--	--
06326952	Clear Creek near Lindsay	101	1982-85, 1988	1982-86	--	--	--	--	--	--
06326953	Clear Creek near Hoyt	138	--	1980	--	--	--	1978-80	1978-80	1978-80
06326960	**Timber Fork Upper Sevenmile Creek tributary near Lindsay**	1.13	--	**1974-P**	--	--	--	--	--	--
06326995	Upper Sevenmile Creek near Lindsay	137	--	--	--	--	--	1978-80	1978-80	1978-80
06327000	Upper Sevenmile Creek near Glendive	--	1921-22	--	--	--	--	--	--	--
06327450	**Cains Coulee at Glendive**	3.72	--	**1991-P**	--	--	--	--	--	--
06327500	**Yellowstone River at Glendive**	66,788	**1898-1911, 1932-34 2003**	**1903-10, 1932-34 2003**	--	--	--	1950	--	--
06327550	**South Fork Horse Creek tributary near Wibaux**	1.34	--	**1973-P**	--	--	--	--	--	--
06327700	Griffith Creek near Glendive	15.5	--	1955-63, 1965-67	--	--	--	--	--	--
06327720	**Griffith Creek tributary near Glendive**	3.48	--	**1965, 1974-P**	--	--	--	--	--	--
06327790	**Krug Creek tributary No. 2 near Wibaux**	0.44	--	**1974-P**	--	--	--	--	--	--
06327800	Krug Creek tributary near Wibaux	1.74	--	1955-61	--	--	--	--	--	--
06327850	Glendive Creek near Glendive	300	--	--	--	--	--	1978-81	1978-81	--

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)							
			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
			Part 6--Yellowstone River Basin--Continued							
06328000	Deer Creek near Glendive	198	1921-22	--	--	--	--	1978-80	1978-80	1978-80
06328100	**Yellowstone River tributary No. 6 near Glendive**	2.93	--	**1974-P**	--	--	--	--	--	--
06328200	Lower Sevenmile Creek near Bloomfield	25.2	1982-85	1983-87	--	--	--	--	--	--
06328400	Thirteenmile Creek tributary near Bloomfield	0.67	--	1972, 1974-91	--	--	--	--	--	--
06328700	Linden Creek at Intake	4.20	--	1958-73, 1980	--	--	--	--	--	--
06328800	Indian Creek at Intake	0.46	--	1958-73	--	--	--	--	--	--
06328900	War Dance Creek near Intake	3.69	--	1958-73, 1980	--	--	--	--	--	--
06329000	Cottonwood Creek near Intake	85.3	--	--	--	--	--	1978-81	1978-81	--
06329200	Burns Creek near Savage	233	1958-67, 1975-84, 1986	1958-67, 1975-84, 1986	--	--	--	1976-79, 1984,1986	1976-79, 1984,1986	--
06329350	**Alkali Creek near Sidney**	0.49	--	**1974-P**	--	--	--	--	--	--
06329500	**Yellowstone River near Sidney**	69,083	**1910-31, 1933-P**	**1911-31, 1934-P**	--	--	**1972-81, 1983-P**	**1948-P**	**1965, 1972-P**	1970-95
06329510	Fox Creek tributary near Lambert	5.01	--	1972, 1974-96	--	--	--	--	--	--
06329520	Fox Creek near Lambert	183	--	--	--	--	--	1981-83	1981-83	--
06329540	Lone Tree Creek near Sidney	39.4	--	--	--	--	--	1981-83	1981-83	--
06329570	**First Hay Creek near Sidney**	29.1	--	**1963-P**	--	--	--	--	--	--
06333500	Little Missouri River at Alzada	671	1904-07	--	--	--	--	1949-51	--	--
06333850	North Creek near Alzada	1.25	1951	1951-52, 1956-77	--	--	--	--	--	--
06333900	North Creek spreader diversion near Alzada	1.29	1952-56	--	--	--	--	--	--	--
06334000	Little Missouri River near Alzada	904	1911-25, 1928-32, 1935-69	1912-25, 1929-32, 1935-69	--	--	--	--	--	--
06334100	Wolf Creek near Hammond	10.1	--	1955-2002	--	--	--	--	--	--
06334200	Willow Creek near Alzada	122	--	1958-73	--	--	--	--	--	--
06334330	**Little Missouri River tributary near Albion**	1.49	--	**1972-P**	--	--	--	--	--	--
06334610	Hawks Nest Creek tributary near Albion	0.92	--	1973-2002	--	--	--	--	--	--
06334625	**Coal Creek tributary near Mill Iron**	0.64	--	**1974-P**	--	--	--	--	--	--
06334630	Boxelder Creek at Webster	1,092	1959-73	1960-73, 1975	--	--	--	1972-73	--	--
06334640	North Fork Coal Bank Creek near Mill Iron	15.6	--	1962-76	--	--	--	--	--	--
06334720	Soda Creek tributary near Webster	2.22	--	1962-91	--	--	--	--	--	--
06336447	Duck Creek near Wibaux	46.5	1978-85	1978-85	--	--	--	1979	1978-79	--
06336450	Spring Creek near Wibaux	4.00	1955-73	1956-73	--	--	--	--	--	--

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)							
			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
			Part 12--Kootenai River Basin							
06336500	Beaver Creek at Wibaux	351	1938-69, 1979-83	1872,1921, 1929, 1938-69, 1979-83	--	--	--	1979-84	1979-84	--
06336510	Upper Hay Creek tributary No. 2 near Wibaux	4.1	1978-82	1978-82	--	--	--	--	--	--
06336515	Hay Creek near Wibaux	11.4	1978-82	1978-82	--	--	--	--	--	--
06336545	Little Beaver Creek near Wibaux	96.2	1978-81	1978-81	--	--	--	1979-80	1979-80	--
06336550	Beaver Creek near Wibaux	--	1958-64	--	--	--	--	--	--	--
12300000	Kootenay River at Newgate, British Columbia	7,660	1931-72	1931-71	--	--	--	1949,1965	--	--
12300110	**Lake Koocanusa at international boundary**	--	--	--	--	--	--	**1972-P**	--	**1972-82, 2003**
12300200	Young Creek near Rexford	36.0	1973-75	1974-75	--	--	--	--	--	--
12300400	Cayuse Creek near Trego	5.29	--	1972-84	--	--	--	--	--	--
12300500	Fortine Creek near Trego	110	1947-53	1947-54, 1958, 1960-73	--	--	--	--	--	--
12300800	Deep Creek near Fortine	18.9	--	1954-91	--	--	--	--	--	--
12301000	Grave Creek near Fortine	54.9	1923-24	--	--	--	--	--	--	--
12301300	**Tobacco River near Eureka**	440	**1958-P**	**1948, 1959-P**	--	1971-85	--	1971-76	--	1974-76
12301500	Kootenai River near Rexford	8,420	1929-40, 1968-71	1929-40, 1948, 1968-71	--	--	1968-71	1967-72	1968-71	--
12301550	Pinkham Creek near Rexford	75.7	1973-81	1973-81	--	--	--	--	--	--
12301600	Lake Koocanusa below Pinkham Creek, near Rexford	--	--	--	--	--	--	1972-76	--	1972-76
12301700	Kootenai River tributary near Rexford	0.86	--	1959-70	--	--	--	--	--	--
12301800	Gold Creek near Rexford	6.12	--	1959-69	--	--	--	--	--	--
12301810	Big Creek near Rexford	137	1972-81	1973-82	--	--	--	--	--	--
12301830	**Lake Koocanusa at Tenmile Creek, near Libby**	--	--	--	--	--	--	**1972-P**	--	**1972-P**
12301850	Kootenai River at Worland Bridge, near Libby	8,892	1961-71	1961-71	--	--	--	--	--	--
12301900	Little Jackson Creek near Libby	2.60	--	1961-69	--	--	--	--	--	--
12301919	**Lake Koocanusa at Forebay, near Libby**	--	--	--	--	--	--	**1972-P**	--	**1972-82, 2003**
12301920	**Lake Koocanusa near Libby**	8,985	**1972-P**	--	--	--	--	--	--	--
12301921	Libby Dam near Libby	--	--	--	--	--	--	1964	--	--
12301933	**Kootenai River below Libby Dam, near Libby**	8,985	**1972-P**	**1972-P**	--	**2001-P**	1968-76	**1967-P**	1968-71	1973-82
12301990	Fisher River above Wolf Creek, near Libby	768	--	--	--	--	--	1967-70	1968-70	--
12301993	Wolf Creek tributary near Libby	2.76	--	1974-84	--	--	--	--	--	--
12301997	Richards Creek near Libby	9.50	--	1973-91	--	--	--	--	--	--
12301999	Wolf Creek near Libby	216	1967-77	1967-77	--	--	1968-70	1967-70	1969-70	--

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			Part 12--Kootenai River Basin--Continued							
12302000	Fisher River near Jennings	780	1951-69	1948, 1951-69, 1974	--	-	--	--	--	--
12302050	Peoples Creek near Libby	2.54	--	1961-67, 1976	--	--	--	--	--	--
12302055	**Fisher River near Libby**	838	**1967-P**	**1948, 1969-P**	--	1968-85	1968-76	**1967-76, 1999-P**	**1969-72, 1974-76, 1999-P**	1974-76
12302400	Shaughnessy Creek near Libby	1.16	--	1959-91	--	--	--	--	--	--
12302500	Granite Creek near Libby	23.6	1933-34, 1936-44, 1960-69	1933, 1937-44, 1948,1954, 1959-69, 1974	--	--	--	--	--	--
12303000	Kootenai River at Libby	10,240	1911-91	1911-91	--	--	--	1969-72, 1978	--	1969-73
12303100	Flower Creek near Libby	11.1	1960-92	1960-92	--	--	--	--	--	--
12303400	Ross Creek near Troy	23.8	--	1972-91	--	--	--	1971, 1976-78	1976-78	--
12303430	Stanley Creek near Troy	12.8	--	--	--	--	--	1976-78	1976-78	--
12303440	Camp Creek near Troy	11.3	--	1972-91	--	--	--	--	--	--
12303490	Lake Creek near Troy	179	--	--	--	--	--	1976-78	1976-78	--
12303500	Lake Creek at Troy	210	1945-57, 1983-95	1945-57, 1974, 1983-96	--	--	--	--	--	--
12304000	Callahan Creek at Troy	85.8	1911-12, 1914-16	--	--	--	--	--	--	--
12304040	Basin Creek near Yaak	27.4	1990-2000	1990-2000	--	--	--	--	--	--
12304060	Blacktail Creek near Yaak	8.66	--	1964, 1972-84	--	--	--	--	--	--
12304120	Zulu Creek near Yaak	5.27	--	1972-84	--	--	--	--	--	--
12304200	Yaak River near Yaak	493	1957-62	1956-62	--	--	--	--	--	--
12304250	Whitetail Creek near Yaak	2.48	--	1960-74	--	--	--	--	--	--
12304300	Cyclone Creek near Yaak	5.73	--	1960-91	--	--	--	--	--	--
12304400	Fourth of July Creek near Yaak	7.84	--	1960-74	--	--	--	--	--	--
12304500	**Yaak River near Troy**	766	**1910-16, 1956-P**	**1948,1954, 1956-P**	--	**1963-85 2000-P**	--	**1999-P**	**1999-P**	--
			Part 12--Pend Oreille River Basin							
12323170	Silver Bow Creek above Blacktail Creek, at Butte	--	1984-94	1984-94	--	--	--	--	--	--
12323200	Blacktail Creek near Butte	14.7	1984-88	1984-88	--	--	--	--	--	--

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			Part 12--Pend Oreille River Basin--Continued							
12323220	Basin Creek near Butte	37.6	1984-86	--	--	--	--	--	--	--
12323230	**Blacktail Creek at Harrison Avenue, at Butte**	--	--	--	--	--	--	**1993-95, 1997-P**	**1993-95, 1997-P**	--
12323240	**Blacktail Creek at Butte**	95.4	**1988-P**	**1989-P**	--	--	--	--	--	--
12323248	Silver Bow Creek above Wastewater Plant Outflow, at Butte	--	1999-2002	2000-2002	--	--	--	--	--	--
12323250	**Silver Bow Creek below Blacktail Creek, at Butte**	105	**1984-P**	**1984-P**	--	--	--	**1993-95, 1997-P**	**1993-95, 1997-P**	--
12323300	Smith Gulch near Silver Bow	4.36	--	1959-2002	--	--	--	--	--	--
12323500	German Gulch Creek near Ramsay	40.6	1955-69	1955-69, 1975	--	--	--	--	--	--
12323600	**Silver Bow Creek at Opportunity**	284	**1988-P**	**1989-P**	--	--	1993-95	**1993-95, 1997-P**	**1993-95, 1997-P**	--
12323700	**Mill Creek at Opportunity**	43.2	**2003**	**2003**	--	--	--	**2003**	**2003**	--
12323720	**Willow Creek at Opportunity**		**2003**	**2003**	--	--	--	**2003**	**2003**	--
12323750	**Silver Bow Creek at Warm Springs**	394	**1972-79, 1994-P**	**1972-79, 1989, 1993-P**	--	--	1993-95	**1971, 1993-P**	**1993-P**	--
12323760	**Warm Springs Creek near Anaconda**	157	**1998-P**	**1998-P**	--	--	--	--	--	--
12323770	**Warm Springs Creek at Warm Springs**	163	**1984-P**	**1984-P**	--	**2000-P**	--	**1993-P**	**1993-P**	--
12323800	**Clark Fork near Galen**	572	**1988-P**	**1989-P**	--	1991-2002	--	**1971-74 1988-P**	**1988-P**	1971-74
12323850	**Lost Creek near Galen**	60.5	**2003**	**2003**	--	--	--	**2003**	**2003**	--
12324000	Racetrack Creek near Anaconda	39.5	1911-13	--	--	--	--	--	--	--
12324100	Racetrack Creek below Granite Creek, near Anaconda	39.5	1914-17, 1957-73	1958-73, 1975	--	--	--	--	--	--
12324200	**Clark Fork at Deer Lodge**	916	**1979-P**	**1979-P**	--	1979-83, 1992-98, 2001-2002	**1985-P**	**1963, 1969-71, 1985-P**	**1985-P**	1969-71
12324250	Cottonwood Creek at Deer Lodge	45.4	--	1964, 1975-91	--	--	--	--	--	--
12324300	Clark Fork near Garrison	1,139	1961-62	--	--	--	--	--	--	--
12324590	**Little Blackfoot River near Garrison**	407	**1973-P**	**1973-P**	--	**2000-P**	--	**1963, 1985-P**	**1985-P**	--
12324600	Clark Fork at Garrison	1,550	--	--	--	--	--	1963, 1969-71	--	1970-71
12324660	Gold Creek at Goldcreek	64.1	1964-66	--	--	--	--	--	--	--
12324680	**Clark Fork at Goldcreek**	1,704	**1978-P**	**1978-P**	--	1992-98	--	**1992-P**	**1993-P**	--
12324700	Clark Fork tributary near Drummond	4.61	--	1958-95	--	--	--	--	--	--
12324800	Morris Creek near Drummond	12.6	--	1960-74, 1980	--	--	--	--	--	--
12325000	Georgetown Lake near Philipsburg	50.1	1939-97	--	--	--	--	--	--	--

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)							
			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
			Part 12--Pend Oreille River Basin--Continued							
12325500	**Flint Creek near Southern Cross**	52.6	**1940-98, 2000-P**	1941-98	--	--	--	--	--	--
12326000	Trout Creek above main canal, near Philipsburg	4.09	1946-49	--	--	--	--	--	--	--
12326500	Trout Creek near Southern Cross	36.1	1946-51	--	--	--	--	--	--	--
12327000	Trout Creek near Philipsburg	34.9	1939-43, 1945-46	--	--	--	--	--	--	--
12327090	Flint Creek above Fred Burr Creek, near Philipsburg	108	1994-98	1994-98	--	--	--	--	--	--
12327100	Fred Burr Creek near Philipsburg	15.7	1994-96	1994-96	--	--	--	--	--	--
12327500	Marshall Creek near Philipsburg	22.8	1942-43	--	--	--	--	--	--	--
12328000	Marshall Creek at mouth, near Philipsburg	23.2	1939-42	--	--	--	--	--	--	--
12328500	Flint Creek near Philipsburg	192	1939-41	--	--	--	--	1972-73	--	1972-73
12329000	Flint Creek above Maxville Siding, at Maxville	207	1939-41	--	--	--	--	--	--	--
12329500	**Flint Creek at Maxville**	208	**1941-P**	**1942-P**	--	--	--	--	--	--
12330000	**Boulder Creek at Maxville**	71.3	**1939-P**	**1940-P**	--	--	--	--	--	--
12330100	Flint Creek below Boulder Creek, near Maxville	--	--	--	--	--	--	1971	--	--
12330500	Flint Creek near Maxville	325	1946-49	--	--	--	--	--	--	--
12331000	Flint Creek near Hall	325	1939	--	--	--	--	--	--	--
12331100	Flint Creek below Douglas Creek, near Hall	339	1994-98	1995-98	--	--	--	--	--	--
12331500	**Flint Creek near Drummond**	490	**1990-P**	**1991-P**	--	--	--	**1972-73, 1985-P**	**1985-P**	1972-73
12331600	Clark Fork at Drummond	2,378	1967-68, 1973-83	1967, 1973-83	--	--	--	1971-74	--	1971-74
12331700	Edwards Gulch at Drummond	4.69	--	1960-62, 1974-91, 1996-2002	--	--	--	--	--	--
12331800	**Clark Fork near Drummond**	2,501	**1993-P**	**1993-P**	--	--	--	**1993-P**	**1993-P**	--
12331900	Clark Fork near Clinton	2,629	1979-90, 1992-94	1980-90, 1992-94	--	--	--	1963	--	--
12332000	**Middle Fork Rock Creek near Philipsburg**	123	**1937-P**	**1938-P**	--	--	--	--	--	--
12332500	East Fork Rock Creek Reservoir near Philipsburg	30.3	1939-95	--	--	--	--	--	--	--
12333000	East Fork Rock Creek near Philipsburg	30.3	1935-43	--	--	--	--	--	--	--
12333500	Rock Creek near Quigley	749	1922-27	1922	--	--	--	--	--	--
12334000	Ranch Creek near Quigley	42.7	1922-27	1922-27	--	--	--	--	--	--
12334500	Rock Creek below Ranch Creek, near Quigley	794	1911-12	--	--	--	--	--	--	--
12334510	**Rock Creek near Clinton**	885	**1972-P**	**1972-P**	--	1979-83, 1995-2002	--	**1985-P**	**1985-P**	--
12334550	**Clark Fork at Turah Bridge, near Bonner**	3,641	**1985-P**	**1986-P**	--	1992-98	**1985-P**	**1985-P**	**1985-P**	--
12334600	Blackfoot River near Lincoln	15.1	1969-70	1969-70, 1975	--	--	--	1969-70	--	--
12334620	Blackfoot River below First Gulch, near Lincoln	25.9	--	--	--	--	--	1995-97	1995-97	--

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)								
			Discharge or contents		Water quality						
					Daily			Periodic			
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
Part 12--Pend Oreille River Basin--Continued										
12334650	Blackfoot River below Alice Creek, near Lincoln	96.9	1971-75	1971-75	--	--	--	1971-74, 1995-97	1971-73, 1995-97	1973
12334680	Landers Fork near Lincoln	130	--	--	--	--	--	1995-97	1995-97	--
12334700	Blackfoot River below Seven-up Pete Creek, near Lincoln	255	--	--	--	--	--	1973, 1995-97	1995-97	1973, 1995-97
12334800	Blackfoot River at Dalton Mountain Road Bridge, near Lincoln	399	--	--	--	--	--	1973, 1995-97	1995-97	1973, 1995-97
12334900	Blackfoot River at Blackfoot Canyon Campground, near Lincoln	437	--	--	--	--	--	1973	--	1973 1995-97
12335000	Blackfoot River near Helmville	481	1940-54	1941-53, 1964, 1974-75	--	--	--	--	--	--
12335100	**Blackfoot River above Nevada Creek, near Helmville**	494	**2000-P**	--	--	2000-2002	--	**1995-97 2003**	**1995-97 2003**	--
12335500	**Nevada Creek above Reservoir, near Helmville**	116	**1939-P**	**1940-P**	--	--	--	**1980, 2003**	**1980,1994-2000,2003**	--
12336000	Nevada Creek near Finn	144	1934-39	--	--	--	--	--	--	--
12336500	Nevada Creek Reservoir near Finn	142	1939-95	--	--	-	--	--	--	--
12337000	Nevada Creek near Helmville	165	1946-49	--	--	--	--	--	--	--
12337500	Douglas Creek near Helmville	84.8	1946-47	--	--	--	--	--	--	--
12337800	**Nevada Creek at mouth, near Helmville**		**2002-P**		--	--	--	**2002-P**	**2002-P**	--
12338000	North Fork Blackfoot River near Ovando	228	1921-23	--	--	--	--	--	--	--
12338100	Rock Creek above Salmon Creek, near Ovando	7.60	1998	1998	--	--	--	--	--	--
12338300	**North Fork Blackfoot River above Dry Gulch, near Ovando**	314	**1998-P**	**1998-P**	--	2001-2002	--	1995-97	1995-97	--
12338500	Blackfoot River near Ovando	1,274	1940-63	1941-64, 1975	--	--	--	--	--	--
12338540	Monture Creek above Dunham Creek, near Ovando	64.7	--	1978-91	--	--	--	--	--	--
12338550	Dunham Creek at mouth, near Ovando	31.7	--	1978-91	--	--	--	--	--	--
12338600	Monture Creek at Forest Service boundary, near Ovando	105	--	1964, 1974-91	--	--	--	--	--	--
12338690	Monture Creek near Ovando	140	1973-83	1974-83	--	--	--	--	--	--
12338700	Blackfoot River at Scotty Brown Bridge, near Ovando	1,428	--	--	--	--	--	1995-97	1995-97	1995-97
12339000	Blackfoot River at Clearwater	1,550	1921-23	--	--	--	--	--	--	--
12339300	Deer Creek near Seeley Lake	19.8	--	1974-91	--	--	--	--	--	--
12339450	Clearwater River near Clearwater	345	1975-92	1975-92, 1997	--	--	--	1995-97	1995-97	--
12339500	Clearwater River at Clearwater	391	1921-23	--	--	--	--	--	--	--
12339800	Blackfoot River near Potomac	2,046	1957-65	1957-65	--	--	--	--	--	--
12339900	West Twin Creek near Bonner	7.33	--	1959-91	--	--	--	--	--	--

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)							
			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
			Part 12--Pend Oreille River Basin--Continued							
12340000	**Blackfoot River near Bonner**	2,290	**1898-99, 1901, 1903-05 1939-P**	**1899-1901, 1903-05, 1940-P**	--	**2000-P**	1986-95	**1963, 1985-P**	**1985-P**	--
12340200	Marshall Creek near Missoula	5.63	--	1959-73, 1980	--	--	--	--	--	--
12340500	**Clark Fork above Missoula**	5,999	**1929-P**	**1908, 1930-P**	--	1977-83	**1986-P**	**1969-71 1986-P**	**1986-P**	1969-71
12341000	Rattlesnake Creek at Missoula	79.7	1899-1901, 1958-67	1899,1948, 1958-59, 1961-64, 1966-67	--	--	--	--	--	--
12341500	Clark Fork at Missoula	6,084	1898-1907	1899-1907	--	--	--	1963	--	--
12342000	Painted Rocks Lake near Conner	317	1940-95	--	--	--	--	--	--	--
12342500	**West Fork Bitterroot River near Conner**	317	**1941-P**	**1941-P**	--	--	--	**2001-P**	**2001-P**	--
12342950	Trapper Creek near Conner	28.5	--	1974-91	--	--	--	--	--	--
12343000	West Fork Bitterroot River near Darby	552	1910-17	1911-17	--	--	--	--	--	--
12343400	**East Fork Bitterroot River near Conner**	381	**1956-72 2001-P**	**1956-72 2001-P**	--	--	--	**2001-P**	**2001-P**	--
12343500	East Fork Bitterroot River at Conner	405	1910-16, 1937-57	1937-57	--	--	--	--	--	--
12344000	**Bitterroot River near Darby**	1,049	**1937-P**	**1938-P**	--	**2001-P**	--	**1956, 1997-98 2001-P**	**1997-98 2001-P**	--
12344300	Burke Gulch near Darby	6.50	--	1958-82	--	--	--	--	--	--
12344500	Lake Como near Darby	54.6	1939-99	--	--	--	--	1956	--	--
12345000	Rock Creek near Darby	55.4	1946-53, 1957-59	1948-53, 1958-59	--	--	--	--	--	--
12345500	Rock Creek Canal near Darby	--	1946, 1948-53	--	--	--	--	--	--	--
12345800	Camas Creek near Hamilton	5.05	--	1958-73	--	--	--	--	--	--
12345850	Sleeping Child Creek near Hamilton	65.2	1973-77	1972-91	--	--	--	1956	--	--
12346000	Bitterroot River near Grantsdale	1,414	1902-07	--	--	--	--	--	--	--
12346500	**Skalkaho Creek near Hamilton**	87.8	**1949-53, 1957-79, 2001-P**	**1948-54, 1958-79, 2001-P**	--	--	--	**1956,1980, 2001-P**	**1980, 2001-P**	--
12347000	Skalkaho Creek at Brennan's ranch, near Hamilton	96.2	1920-24	1920-24, 1948	--	--	--	--	--	--
12347360	Bitterroot River at Hamilton	--	--	--	--	--	--	1997-98	1997-98	--
12347500	Blodgett Creek near Corvallis	25.9	1947-69	1947-69, 1972	--	--	--	1956	--	--
12348000	Blodgett Creek near Hamilton	28.3	1938-43	1938-43	--	--	--	--	--	--

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)							
			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
			Part 12--Pend Oreille River Basin--Continued							
12348200	Bitterroot River near Corvallis	1,711	1959-63	--	--	--	--	--	--	--
12348500	Willow Creek near Corvallis	21.9	1920-24, 1957-66	1920-22, 1958-73	--	--	--	1956	--	--
12349000	Willow Creek at Anfinson Ranch, near Corvallis	23.2	1938-43	1938-43	--	--	--	--	--	--
12349500	Fred Burr Creek near Victor	17.7	1947-51	--	--	--	--	--	--	--
12350000	Bear Creek near Victor	26.8	1938-55, 1957-59	1938-54, 1958-59	--	--	--	1956	--	--
12350200	Gash Creek near Victor	3.37	--	1958-73	--	--	--	--	--	--
12350250	**Bitterroot River at Bell Crossing, near Victor**	1,963	**1987-P**	**1987-P**	--	--	--	1997-98	1997-98	--
12350300	Big Creek near Victor	--	--	--	--	--	--	1956	--	--
12350500	Kootenai Creek near Stevensville	28.9	1949-53, 1957-63	1948-53, 1958-73	--	--	--	1956	--	--
12351000	Burnt Fork Bitterroot River near Stevensville	73.2	1920, 1922-24, 1938-62	1920, 1922-24, 1938-73	--	--	--	1956	1965	--
12351200	**Bitterroot River near Florence**	2,354	**1957-66 2003**	**1958-66, 1974,1982 2003**	--	--	--	1956, 1997-98	1997-98	--
12351400	Eightmile Creek near Florence	19.5	1957-63	1958-73	--	--	--	1956	--	--
12351500	Lolo Creek near Lolo	231	1911-15	--	--	--	--	--	--	--
12352000	Lolo Creek above Sleeman Creek, near Lolo	250	1951-60	1951-60, 1972,1974	--	--	--	--	--	--
12352200	Hays Creek near Missoula	4.16	--	1959-66, 1968-74, 1980	--	--	--	--	--	--
12352500	**Bitterroot River near Missoula**	2,814	**1898-1901, 1903-04, 1989-P**	**1899-1901, 1903-04, 1990-P**	--	**2000-P**	--	**1997-P**	**1997-P**	--
12352980	Bitterroot River at Maclay Bridge, near Missoula	2,850	--	--	--	--	--	1970-73	--	1970-73
12353000	**Clark Fork below Missoula**	9,003	**1929-P**	**1930-P**	--	1977-82	--	1979-95	1979-95	1979-95
12353250	Ninemile Creek near Alberton	50.2	--	1972, 1974-82	--	--	--	--	--	--
12353280	Ninemile Creek near Huson	170	1973-83	1974-83	--	--	--	--	--	--
12353300	Clark Fork near Alberton	9,272	1959-63	--	--	--	--	1969-71	--	1970-71
12353400	Negro Gulch near Alberton	8.02	--	1959-73, 1984-91	--	--	--	--	--	--
12353450	Fish Creek below West Fork, near Tarkio	242	--	--	--	1985-91	--	--	--	--
12353500	Clark Fork at Tarkio	9,882	1945-49	--	--	--	--	--	--	--
12353650	Clark Fork at Superior	10,210	--	--	--	1985-91	--	--	--	--
12353800	Thompson Creek near Superior	12.2	--	1961-79, 1982	--	--	--	--	--	--

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)							
			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
Part 12--Pend Oreille River Basin--Continued										
12353820	Dry Creek near Superior	46.3	1982-86	1982-91	--	--	--	--	--	--
12353850	East Fork Timber Creek near Haugan	2.72	--	1961-75, 1979	--	--	--	--	--	--
12353900	St. Regis River tributary near St. Regis	1.16	1959-61	--	--	--	--	--	--	--
12354000	**St. Regis River near St. Regis**	303	**1910-17, 1958-75, 2002-P**	**1911-17, 1934,1948, 1954, 1959-75, 2002-P**	--	1985-91	--	--	--	--
12354100	North Fork Little Joe Creek near St. Regis	14.7	--	1960-74	--	--	--	--	--	--
12354500	**Clark Fork at St. Regis**	10,709	**1910-P**	**1911-23, 1929-P**	--	2002	--	**1999-P**	--	--
12354700	Clark Fork near Paradise	10,794	--	--	--	1985-91	--	--	--	--
12355000	**Flathead River at Flathead, British Columbia**	427	**1929-95, 1999-P**	**1929-94, 2000-P**	--	1975-91	1975-79, 1985-91,	**1949-50, 1965,1970, 1975-93, 1999-P**	**1965,1970, 1975-93 1999-P**	1970, 1975-93
12355100	Starvation Creek near Flathead, British Columbia	16.4	1986-87	1986-87	--	--	--	--	--	--
12355150	Tuchuck Creek near Flathead, British Columbia	10.1	1986-88	1986-88	--	--	--	--	--	--
12355350	Big Creek at Big Creek Ranger Station, near Columbia Falls	82.1	--	1964, 1973-91	--	--	--	1980	1980	--
12355500	**North Fork Flathead River near Columbia Falls**	1,548	**1910-17, 1929-P**	**1911-17, 1929-P**	1976-79	**1976-P**	1976-79	**1950,1970, 1976-79 1999-P**	**1976-79, 1999-P**	1970, 1976-79
12355600	Middle Fork Flathead River at Schafer Ranger Station, near Essex	--	--	--	--	--	--	1970	--	1970
12355700	Middle Fork Flathead River near Essex	408	1957-61	1942-43, 1945-53, 1956-61, 1964	--	--	--	--	--	--
12355900	Middle Fork Flathead River above Bear Creek, near Essex	--	--	--	--	--	--	1970	--	1970
12356000	Skyland Creek near Essex	8.09	1946-52	1946-52, 1954, 1959-75	--	--	--	--	--	--
12356500	Bear Creek near Essex	20.4	1946-52	1946-52, 1964, 1975-91	--	--	--	--	--	--
12357000	Middle Fork Flathead River at Essex	510	1940-53, 1956-64	1940-54, 1956-64	--	--	--	--	--	--
12357300	Moccasin Creek near West Glacier	2.38	--	1959-75	--	--	--	--	--	--
12357400	Middle Fork Flathead River tributary at West Glacier	0.14	--	1960-74	--	--	--	--	--	--

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			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
			Part 12--Pend Oreille River Basin--Continued							
12357500	Middle Fork Flathead River at West Glacier	943	1911-23, 1929-33, 1943-48	1911-23, 1929-33, 1944-48	--	--	--	--	--	--
12358000	McDonald Creek at Apgar	175	1912-14	--	--	--	--	--	--	--
12358500	**Middle Fork Flathead River near West Glacier**	1,128	**1939-P**	**1940-P**	--	--	--	**1949-50, 1970, 1998-P**	**1999-P**	1970
12358900	South Fork Flathead River above Harrison Creek, near Swan Lake	--	--	--	--	--	--	1970	--	1970
12359000	South Fork Flathead River at Spotted Bear Ranger Station, near Hungry Horse	958	1948-57, 1959-67	1948-57, 1960-67	--	--	--	--	--	--
12359500	Spotted Bear River near Hungry Horse	184	1949-56	1948-56, 1964	--	--	--	--	--	--
12359800	**South Fork Flathead River above Twin Creek, near Hungry Horse**	1,160	**1964-82, 1985-P**	**1964-82, 1985-P**	--	--	--	1970	--	1970
12360000	Twin Creek near Hungry Horse	47.0	1948-56, 1965-67	1948-56, 1964-67	--	--	--	--	--	--
12360500	Lower Twin Creek near Hungry Horse	22.4	1948-56	1948-56	--	--	--	--	--	--
12360600	Soldier Creek near Hungry Horse	4.77	1965-67	1965-66	--	--	--	--	--	--
12361000	Sullivan Creek near Hungry Horse	71.3	1948-56, 1959-76	1948-56, 1960-76	--	--	--	--	--	--
12361500	Graves Creek near Hungry Horse	27.0	1948-56, 1965-67	1948-56, 1964-67	--	--	--	--	--	--
12361600	Canyon Creek near Hungry Horse	5.8	1965-67	1965-66	--	--	--	--	--	--
12361700	Goldie Creek near Hungry Horse	3.29	1965-67	1966	--	--	--	--	--	--
12361880	Wounded Buck Creek near Hungry Horse	13.6	1965-67	1965-66	--	--	--	--	--	--
12361950	Hungry Horse Creek near Hungry Horse	23.3	1969-72	1970	--	--	--	--	--	--
12361960	Emery Creek near Hungry Horse	26.4	1965-67	1965-66	--	--	--	--	--	--
12362000	**Hungry Horse Reservoir near Hungry Horse**	1,654	**1951-P**	--	--	--	--	--	--	--
12362500	**South Fork Flathead River near Columbia Falls**	1,663	**1910-16, 1923-P**	**1911-P**	--	**1964-68, 1979-P**	--	1949-50	--	--
12363000	**Flathead River at Columbia Falls**	4,464	**1922-23, 1928-P**	**1894, 1922-23, 1928-P**	1996-67, 1979-81	**1949-50, 1963-67, 1979-P**	1965-67	1949-50, 1963-67, 1970, 1979-94	1965,1967, 1979-94	1979-94
12363500	Flathead River near Kalispell	4,500	--	--	--	--	1968-69	--	1968	--
12363900	Rock Creek near Olney	3.61	--	1961-75	--	--	--	--	--	--
12363920	Stillwater River at Olney	146	1973-82	1973-82	--	--	--	--	--	--
12364000	Logan Creek at Tally Lake, near Whitefish	183	1931-34, 1936-42, 1945-47	1936-42, 1945-47	--	--	--	--	--	--
12364500	Logan Creek near Whitefish	199	1931	--	--	--	--	--	--	--

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Station number	Station name	Drainage area (square miles)	Period of record (by water year)							
			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
		Part 12--Pend Oreille River Basin--Continued								
12365000	**Stillwater River near Whitefish**	524	**1930-50, 1972-P**	**1931-50, 1964, 1973-P**	--	--	--	--	--	--
12365500	Stillwater River near Kalispell	338	1907,1922, 1928-31	--	--	--	--	--	--	--
12365800	Swift Creek near Whitefish	78.0	1973-81	1973-81	--	--	--	--	--	--
12366000	**Whitefish River near Kalispell**	170	**1928-50, 1972-P**	**1929-50, 1964, 1973-P**	--	--	--	**1999-P**	**1999-P**	--
12366100	**Trumbull Creek near Columbia Falls**	9.0	--	**1997-P**	--	--	--	--	--	--
12367000	Ashley Creek near Kila	44.2	1916	--	--	--	--	--	--	--
12367500	Ashley Creek near Kalispell	201	1931-50, 1972-74	1931-32, 1935-50, 1973-74	--	--	---	1969-70	--	1969-70
12367800	Ashley Creek below Kalispell	--	--	--	--	--	--	1969-70	--	1969-70
12368500	Flathead River at Therriault Ferry, near Kalispell	--	1934-45	--	--	--	--	--	--	--
12369000	Flathead River near Bigfork	6,300	1909-12, 1928-37, 1939-45	--	--	--	--	--	--	1969-71
12369200	Swan River near Condon	69.1	1973-92	1973-92	--	--	--	--	--	--
12369250	Holland Creek near Condon	22.3	--	1974-91	--	--	--	--	--	--
12369650	North Fork Lost Creek near Swan Lake	13.0	--	1982-91	--	--	--	--	--	--
12370000	**Swan River near Bigfork**	671	**1910-11, 1922-P**	**1922-P**	--	**2000-P**	--	**1999-P**	**1999-P**	--
12370500	Dayton Creek near Proctor	18.5	--	1959-91	--	--	--	--	--	--
12370900	Teepee Creek near Polson	2.18	1983-87	1960-74, 1980, 1983-87	--	--	--	1983-85	1983-85	--
12371000	**Turtle Lake near Polson**	--	**1939-P**	--	--	--	--	--	--	--
12371100	Hell Roaring Creek near Polson	6.22	1917-32	1917-32, 1948, 1959-67, 1980	--	--	--	--	--	--
12371500	Flathead Lake at Somers	7,086	1900, 1908-98	--	--	--	--	--	--	--
12371550	**Flathead Lake at Polson**	7,086	**1999-P**	--	--	--	--	1969-71	--	1969-71
12372000	**Flathead River near Polson**	7,096	**1907-P**	**1894, 1908-P**	--	1977-83	--	--	--	--
12372500	**Little Bitterroot Lake near Marion**	31.8	**1939-P**	--	--	--	--	--	--	--
12373000	Little Bitterroot River near Marion	31.8	1910-16	--	--	--	--	--	--	--
12373500	**Hubbart Reservoir near Niarada**	114	**1939-P**	--	--	--	--	--	--	--

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)							
			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
			Part 12--Pend Oreille River Basin--Continued							
12374000	Little Bitterroot River near Hubbart	134	1909-16	--	--	--	--	--	--	--
12374250	**Mill Creek above Bassoo Creek, near Niarada**	19.6	**1983-P**	**1983-P**	--	--	--	1983-85	1983-85	--
12374300	Mill Creek near Niarada	28.2	--	1959-73	--	--	--	--	--	--
12374500	Little Bitterroot River near Niarada	223	1908-10, 1916-17	--	--	--	--	--	--	--
12374800	Cromwell Creek near Niarada	14.3	1983-89	1983-89	--	--	--	1983-85	1983-85	--
12374900	Garden Creek near Hot Springs	3.57	--	1959-73	--	--	--	--	--	--
12375000	**Upper Dry Fork Reservoir near Lonepine**	8.53	**1940-P**	--	--	--	--	--	--	--
12375500	**Dry Fork Reservoir near Lonepine**	17.8	**1939-P**	--	--	--	--	--	--	--
12375800	Little Bitterroot River near Perma	--	--	--	--	--	--	1987-92	1987-92	--
12375900	**South Crow Creek near Ronan**	7.57	**1982-P**	**1983-P**	--	--	--	1983-85	1983-85	--
12376000	Crow Creek near Ronan	46.1	1906-17	1907-11, 1913-17	--	--	--	--	--	--
12376500	Mud Creek near Ronan	30.4	1908-11	--	--	--	--	--	--	--
12376700	**Lower Crow Reservoir near Charlo**	--	**1939-P**	--	--	--	--	--	--	--
12376900	Crow Creek at mouth, near Ronan	--	--	--	--	--	--	1987-92	1987-92	--
12377000	Crow Creek at Lozeaus ranch, near Ronan	139	1911-16	--	--	--	--	--	--	--
12377150	**Mission Creek above reservoir, near St. Ignatius**	12.4	**1982-P**	**1982-P**	--	--	--	1983-85	1983-86	--
12377200	**Mission Reservoir near St. Ignatius**	--	**1939-P**	--	--	--	--	--	--	--
12377300	**St. Mary's Lake near St. Ignatius**	--	**1939-P**	--	--	--	--	--	--	--
12377500	Dry Creek near St. Ignatius	24.7	1908-16	1909-16	--	--	--	--	--	--
12377900	**Pablo Reservoir near Polson**	--	**1939-P**	--	--	--	--	--	--	--
12378000	Mission Creek near St. Ignatius	74.8	1906-17	1907-17	--	--	--	--	--	--
12378200	**McDonald Reservoir near Charlo**	--	**1939-P**	--	--	--	--	--	--	--
12378300	**Kicking Horse Reservoir near Charlo**	--	**1939-P**	--	--	--	--	--	--	--
12378400	**Ninepipe Reservoir near Charlo**	--	**1939-P**	--	--	--	--	--	--	--
12378500	Post Creek at Fitzpatrick's ranch, near Ronan	28.4	1906-11	--	--	--	--	--	--	--
12379000	Post Creek at Deschamp's ranch, near Ronan	29.7	1911	--	--	--	--	--	--	--
12379500	Post Creek near St. Ignatius	47.6	1911-17	--	--	--	--	--	--	--
12379600	Mission Creek at National Bison Range, at Moiese	236	--	--	--	--	--	1987-92	1987-92	--
12380000	**Upper Jocko Lake near Arlee**	2.99	**1968-P**	--	--	--	--	--	--	--
12380500	**Lower Jocko Lake near Arlee**	7.39	**1939-P**	--	--	--	--	--	--	--
12381000	Jocko River above South Fork, near Jocko	14.9	1912-16	--	--	--	--	--	--	--
12381400	**South Fork Jocko River near Arlee**	56.0	**1982-P**	**1983-P**	--	--	--	1983-86	1983-86	
12381500	Jocko River below South Fork, near Jocko	72.3	1912-16	--	--	--	--	--	--	--
12382000	Middle Fork Jocko River near Jocko	19.5	1912-16	--	--	--	--	--	--	--
12382500	Falls Creek near Jocko	3.57	1912-16	--	--	--	--	--	--	--
12383000	Jocko River near Jocko	140	1918-19	--	--	--	--	--	--	--

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)							
			Discharge or contents		Water quality					
					Daily			Periodic		
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
			Part 12--Pend Oreille River Basin--Continued							
12383500	**Big Knife Creek near Arlee**	6.88	**1910-16, 1983-P**	**1982-P**	--	--	--	1983-85	1983-85	--
12384000	Big Knife Creek near Jocko	7.44	1909-11	--	--	--	--	--	--	--
12384500	Jocko River below Big Knife Creek, near Jocko	154	1909-16	--	--	--	--	--	--	--
12386000	East Finley Creek near Jocko	5.48	1909-16	--	--	--	--	--	-	--
12386500	Indian Ditch near Jocko	--	1909-16	--	--	--	--	--	--	--
12387000	Finley Creek near Jocko	36.7	1909-16	--	--	--	--	--	--	--
12387100	Agency Creek near Jocko	4.00	1909-16	--	--	--	--	--	--	--
12387200	Blodgett Creek near Jocko	5.48	1909	--	--	--	--	--	--	--
12387450	**Valley Creek near Arlee**	15.3	**1983-P**	**1983-P**	--	--	--	1983-85	1983-85	--
12387500	Valley Creek near Ravalli	64.1	1909-10	--	--	--	--	--	--	--
12388000	Jocko River at Ravalli	348	1907-11	--	--	--	--	--	--	--
12388200	**Jocko River at Dixon**	380	**1990-P**	**1990-P**	--	--		1987-92	1987-92	--
12388400	**Revais Creek below West Fork, near Dixon**	23.4	**1983-P**	**1983-P**	--	--	--	1983-85, 1991-92	1983-85 1991-92	--
12388500	Revais Creek near Dixon	26.3	1911-19	1911-16, 1918-19	--	--	--	--	--	--
12388650	Camas Creek near Hot Springs	4.46	1983-87	1983-87	--	--	--	1983-85	1983-85	--
12388700	**Flathead River at Perma**	8,795	**1984-P**	**1984-P**	--	**2000-P**	--	**1971-73, 1984-92 1997-P**	**1984-92, 1999-P**	1971-73
12389000	**Clark Fork near Plains**	19,958	**1910-P**	**1912-P**	--	--	--	1969-70	--	1969-70
12389150	McGregor Creek tributary near Marion	2.55	--	1972-82	--	--	--	--	--	--
12389200	Thompson River near Marion	104	--	--	--	--	--	1975-76	1975-76	1975-76
12389300	Thompson River ab Little Thompson River, near Thompson Falls	321	--	--	--	--	--	1975-76	1975-76	1975-76
12389400	Little Thompson River near Thompson Falls	129	--	--	--	--	--	1975-76	1975-76	1975-76
12389450	West Fork Thompson River near Thompson Falls	35.7	--	--	--	--	--	1975-76	1975-76	1975-76
12389500	**Thompson River near Thompson Falls**	642	**1911-16, 1956-P**	**1948, 1956-P**	--	--	--	1975-76	1975-76	1975-76
12390000	**Thompson Falls Reservoir at Thompson Falls**	20,968	**1939-P**	--	--	--	--	--	--	--
12390500	Prospect Creek near Thompson Falls	145	1911	--	--	--	--	--	--	--
12390700	**Prospect Creek at Thompson Falls**	182	**1956-P**	**1956-P**	--	--	--	--	--	--
12391000	Clark Fork at Thompson Falls	21,113	1952-59	1952-59	--	--	--	1963, 1969-73	--	1970-73
12391100	White Pine Creek near Trout Creek	8.75	--	1974-84	--	--	--	--	--	--
12391200	Canyon Creek near Trout Creek	8.64	--	1972, 1974-91	--	--	--	--	--	--
12391300	**Noxon Rapids Reservoir near Noxon**	21,833	**1959-P**	--	--	--	--	--	--	--
12391400	**Clark Fork below Noxon Rapids Dam, near Noxon**	21,833	**1960-P**	**1960-P**	--	--	--	--	--	--
12391420	Rock Creek near Noxon	32	--	--	--	--	--	1998	1998	--

Table 10. Montana active and discontinued streamflow-gaging, water-quality, and crest-stage gage stations (active stations in bold print)--Continued

Station number	Station name	Drainage area (square miles)	Period of record (by water year)								
			Discharge or contents		Water quality						
					Daily			Periodic			
			Daily or monthly	Annual peak	Specific conduct-ance	Water tempera-ture	Sediment	Chemistry	Sediment	Biology
			Part 12--Pend Oreille River Basin--Continued								
12391430	Skeleton Creek near Noxon	2.10	--	1973-84	--	--	--	--	--	--
12391500	Bull River near Heron	45.7	--	--	--	--	--	1971	--	--
12391525	Snake Creek near Noxon	3.11	--	1972-84	--	--	--	--	--	--
12391550	Bull River near Noxon	139	1973-82	1973-82	--	--	--	--	--	--

06186500 YELLOWSTONE RIVER AT YELLOWSTONE LAKE OUTLET, YELLOWSTONE NATIONAL PARK

LOCATION.--Lat 44°34'03", long 110°22'48" (NAD 27), Yellowstone National Park, Hydrologic Unit 10070001, on left bank 450 ft downstream from Fishing Bridge, 0.3 mi downstream from outlet of Yellowstone Lake, and at river mile 616.4.

DRAINAGE AREA (REVISED).--991 mi^2.

PERIOD OF RECORD.--December 1922 to September 1982, October 1983 to September 1986, October 1988 to current year. Prior to October 1926, gage heights only. Monthly discharge only for winter periods in water years 1927-30, 1932-33, 1935-38, 1940, 1942-46 published in WSP 1309; figures of daily discharge for these months published in WSP 646, 666, 686, 701, 731, 746, 786, 806, 826, 856, 896, 956, 976, 1006, 1036, and 1056, have been found to be unreliable and should not be used.

REVISED RECORDS.--WSP 1309: See PERIOD OF RECORD. WSP 1729: Drainage area. WDR MT-03-1: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 7,729.58 ft (NGVD 29). Prior to Oct. 2, 1928, nonrecording gage at site 450 ft upstream at elevation 1.07 ft higher.

REMARKS.--Records good except those for estimated daily discharges, which are poor. No artificial regulation. U. S. Geological Survey satellite telemeter at station. Several observations of water temperature and specific conductance were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	760	549	470	e380	e380	425	444	622	3380	4240	2190	1090
2	747	544	467	e380	e380	425	448	630	3690	4190	2130	1080
3	740	535	465	e380	e380	425	448	640	3900	4120	2080	1070
4	734	533	465	e380	e380	425	450	663	4030	4050	2040	1040
5	741	529	459	e380	e380	429	447	677	4140	3980	1980	1020
6	729	521	454	e370	e380	434	448	687	4200	3890	1940	1020
7	719	516	447	e370	e380	442	445	692	4240	3810	1890	1010
8	707	525	445	e370	e380	443	442	697	4260	3750	1840	999
9	698	515	444	e370	e380	443	439	700	4290	3670	1790	981
10	692	517	440	e370	e380	443	437	707	4350	3590	1750	955
11	683	514	436	e370	e380	442	436	715	4420	3530	1720	949
12	672	510	432	e370	e380	438	433	730	4480	3470	1670	925
13	660	506	430	e370	e390	432	433	752	4530	3400	1630	902
14	646	502	427	e370	e390	431	434	764	4570	3330	1610	897
15	639	496	425	e370	e400	427	452	792	4600	3260	1570	880
16	629	494	425	e370	e400	426	461	841	4680	3180	1530	865
17	622	486	418	e370	e410	418	461	890	4720	3110	1490	843
18	618	482	413	e370	e410	416	472	953	4780	3040	1450	834
19	610	481	411	e370	e420	418	477	1000	4840	2990	1420	822
20	602	474	404	e370	e420	418	479	1040	4890	2920	1390	803
21	600	469	401	e370	e420	420	482	1070	4900	2860	1360	788
22	591	466	399	e370	e420	420	487	1130	4870	2800	1340	779
23	595	e460	397	e370	e420	431	500	1200	4800	2720	1320	767
24	602	e460	398	e370	e420	436	507	1310	4710	2670	1280	752
25	594	e460	e380	e380	e420	435	515	1470	4630	2630	1240	743
26	590	e460	e380	e380	e420	444	534	1650	4530	2530	1210	733
27	589	e470	e380	e380	428	453	550	1850	4430	2480	1190	720
28	578	480	e380	e380	427	452	562	2080	4360	2430	1160	714
29	567	475	e380	e380	---	450	581	2350	4310	2360	1120	703
30	566	468	e380	e380	---	449	590	2690	4270	2290	1120	692
31	555	---	e380	e380	---	446	---	3040	---	2230	1120	---
TOTAL	20075	14897	13032	11590	11175	13436	14294	35032	132800	99520	48570	26376
MEAN	648	497	420	374	399	433	476	1130	4427	3210	1567	879
MAX	760	549	470	380	428	453	590	3040	4900	4240	2190	1090
MIN	555	460	380	370	380	416	433	622	3380	2230	1120	692
AC-FT	39820	29550	25850	22990	22170	26650	28350	69490	263400	197400	96340	52320
CFSM	0.64	0.49	0.42	0.37	0.40	0.43	0.47	1.12	4.40	3.19	1.56	0.87
IN.	0.74	0.55	0.48	0.43	0.41	0.50	0.53	1.30	4.91	3.68	1.80	0.98

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1927 - 2003, BY WATER YEAR (WY)*

MEAN	798	604	474	398	388	445	542	1161	3706	4034	2205	1207
MAX	1259	984	775	699	637	717	801	2214	8574	7160	4031	1954
(WY)	1973	1951	1951	1998	1998	1962	1952	1997	1997	1982	1982	1982
MIN	327	276	246	168	122	130	175	605	1707	1272	812	538
(WY)	1989	1989	1932	1989	1989	1935	1937	1953	1934	1934	1934	1934

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1927 - 2003*	
ANNUAL TOTAL	413239		440797			
ANNUAL MEAN	1132		1208		1335	
HIGHEST ANNUAL MEAN					2253	1997
LOWEST ANNUAL MEAN					682	1934
HIGHEST DAILY MEAN	4360	Jun 26	4900	Jun 21	9930	Jun 19 1997
LOWEST DAILY MEAN	230	Jan 23	370	Jan 6	100	Feb 18 1993
ANNUAL SEVEN-DAY MINIMUM	230	Jan 23	370	Jan 6	113	Feb 11 1989
MAXIMUM PEAK FLOW			4940	Jun 22	9950	Jun 18 1997
MAXIMUM PEAK STAGE			6.54	Jun 22	8.90	Jun 18 1997
ANNUAL RUNOFF (AC-FT)	819700		874300		967400	
ANNUAL RUNOFF (CFSM)	1.13		1.20		1.33	
ANNUAL RUNOFF (INCHES)	15.28		16.30		18.03	
10 PERCENT EXCEEDS	3430		3710		3490	
50 PERCENT EXCEEDS	544		578		676	
90 PERCENT EXCEEDS	260		380		336	

*--During periods of operation (October 1926 to September 1982, October 1983 to September 1986, October 1988 to current year).
e--Estimated.

YELLOWSTONE RIVER BASIN

06187915 SODA BUTTE CREEK AT PARK BOUNDARY, AT SILVER GATE, MT

LOCATION.--Lat 45°00'11", long 110°00'04" (NAD 27), in $SW^1/_4NW^1/_4SW^1/_4$ sec.33, T.9 S., R.14 E., Park County, Hydrologic Unit 10070001, at Yellowstone National Park boundary, 0.25 mi downstream from Silver Creek, 0.75 mi southwest of Silver Gate, and at river mile 17.8.
DRAINAGE AREA.--31.2 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1998 to current year. October 1998 to September 2002 records collected by the National Park Service and U.S. Department of Agriculture, Forest Service, under the general supervision of the U.S. Geological Survey.
GAGE.--Water-stage recorder. Elevation of gage is 7,340 ft (NGVD 29).
REMARKS.--Water-discharge records good except for those discharges greater than 600 ft^3/s, which are fair, and estimated daily discharges, which are poor. No known regulation or diversion upstream from station. U.S. Geological Survey satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10	e3.5	e3.5	e3.0	e3.0	e1.5	e2.0	16	718	352	45	12
2	9.4	e4.0	e4.0	e3.5	e2.5	e1.2	e1.8	16	519	335	42	12
3	9.8	e4.0	e4.0	e3.5	e2.5	e1.0	e1.5	17	463	302	44	11
4	10	e4.5	e4.0	e3.0	e2.0	e1.0	e1.2	17	419	275	42	11
5	10	e4.5	e3.5	e3.0	e2.0	e0.90	e1.0	17	354	256	38	11
6	10	e5.0	e3.5	e2.5	e1.5	e1.0	e1.5	17	319	240	36	12
7	10	e5.0	e3.0	e2.5	e1.5	e1.2	e2.0	17	280	229	33	12
8	10	e5.0	e3.0	e2.0	e2.0	e1.2	2.3	16	311	199	32	12
9	9.7	e5.0	e3.0	e2.0	e2.0	e1.2	2.8	16	396	188	31	11
10	9.3	e4.5	e3.0	e2.0	e2.0	e1.2	4.1	17	457	180	29	11
11	9.7	e4.5	e3.0	e2.5	e2.0	e1.3	5.4	17	490	172	28	10
12	10	e4.5	e3.5	e2.5	e1.5	e1.5	7.3	18	479	166	27	14
13	10	e4.5	e4.0	e3.0	e2.0	e1.5	11	22	468	155	25	12
14	9.0	e4.5	e4.0	e3.0	e2.0	e1.3	12	27	475	142	24	10
15	8.9	e4.5	e4.0	e2.5	e2.0	e1.2	10	40	472	129	23	9.7
16	8.6	e4.5	e3.5	e2.0	e1.5	e1.0	9.7	55	511	122	22	9.8
17	8.4	e4.5	e3.5	e2.0	e1.5	e1.0	8.7	62	553	118	22	9.6
18	8.3	e4.5	e3.0	e2.0	e1.5	e1.0	7.6	62	638	116	21	9.2
19	8.6	e4.5	e3.0	e2.0	e1.5	e1.0	7.0	51	573	105	19	8.9
20	8.1	e4.5	e3.0	e2.5	e1.5	e1.0	7.5	51	555	101	18	8.7
21	8.3	e4.5	e3.5	e2.5	e2.0	e1.0	11	55	501	95	17	8.6
22	8.0	e4.5	e3.0	e2.5	e1.0	e1.2	15	82	376	88	18	8.3
23	e7.5	e4.0	e3.0	e2.5	e0.80	e1.0	20	134	277	83	18	8.2
24	7.8	e3.5	e3.0	e2.5	e0.80	e1.0	19	210	212	80	16	8.1
25	7.7	e3.5	e2.5	e3.0	e1.0	e1.0	22	338	176	80	15	7.8
26	e7.0	e3.5	e3.0	e3.5	e1.2	e1.0	25	412	162	72	15	7.5
27	e7.0	e4.0	e3.5	e3.0	e1.5	e1.0	21	523	185	75	15	7.6
28	7.4	e4.0	e3.5	e3.0	e1.5	e0.90	18	606	246	63	14	7.6
29	e7.0	e4.0	e3.5	e3.0	---	e1.0	17	639	301	57	14	7.5
30	e5.0	e3.5	e3.5	e3.0	---	e1.2	17	635	348	52	13	7.3
31	e3.0	---	e3.5	e3.0	---	e1.5	---	730	---	49	13	---
TOTAL	263.5	129.0	104.5	82.5	47.80	35.00	291.4	4935	12234	4676	769	295.4
MEAN	8.50	4.30	3.37	2.66	1.71	1.13	9.71	159	408	151	24.8	9.85
MAX	10	5.0	4.0	3.5	3.0	1.5	25	730	718	352	45	14
MIN	3.0	3.5	2.5	2.0	0.80	0.90	1.0	16	162	49	13	7.3
AC-FT	523	256	207	164	95	69	578	9790	24270	9270	1530	586
CFSM	0.27	0.14	0.11	0.09	0.05	0.04	0.31	5.10	13.1	4.83	0.80	0.32
IN.	0.31	0.15	0.12	0.10	0.06	0.04	0.35	5.88	14.59	5.58	0.92	0.35

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1999 - 2003, BY WATER YEAR (WY)

MEAN	8.94	5.40	3.54	2.46	1.97	1.59	8.32	140	328	130	27.3	13.5
MAX	11.9	6.84	4.70	3.36	2.31	1.90	14.3	167	408	212	45.0	22.4
(WY)	1999	1999	2002	2002	2002	2000	2000	2001	2003	1999	1999	1999
MIN	5.14	4.30	2.85	2.01	1.71	1.13	4.23	95.9	176	61.6	15.5	8.27
(WY)	2002	2003	2001	2000	2003	2003	1999	1999	2001	2001	2001	2001

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1999 - 2003	
ANNUAL TOTAL	20614.8		23863.10			
ANNUAL MEAN	56.5		65.4		56.0	
HIGHEST ANNUAL MEAN					65.4	2003
LOWEST ANNUAL MEAN					38.5	2001
HIGHEST DAILY MEAN	735	Jun 1	730	May 31	735	Jun 1 2002
LOWEST DAILY MEAN	1.4	Apr 2	0.80	Feb 23	0.80	Feb 23 2003
ANNUAL SEVEN-DAY MINIMUM	1.5	Mar 28	0.99	Mar 23	0.99	Mar 23 2003
MAXIMUM PEAK FLOW			896	Jun 1	912	Jun 1 2002
MAXIMUM PEAK STAGE			3.18	Jun 1	3.49	Jun 1 2002
ANNUAL RUNOFF (AC-FT)	40890		47330		40560	
ANNUAL RUNOFF (CFSM)	1.81		2.10		1.79	
ANNUAL RUNOFF (INCHES)	24.58		28.45		24.38	
10 PERCENT EXCEEDS	202		264		205	
50 PERCENT EXCEEDS	8.0		8.1		7.6	
90 PERCENT EXCEEDS	1.9		1.5		1.8	

e--Estimated.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--January 1999 to current year.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: April 2003 to September 2003.

INSTRUMENTATION.--Temperature recorder installed April 23, 2003.

REMARKS.--Daily water temperature record good. Unpublished records of instantaneous water temperature and specific conductance are available in files of the District office.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Maximum, 17.5°C, Aug. 15, 2003; minimum during period of collection, 0.0°C, Apr. 26, 27, and May 19, 20, 2003

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: Maximum, 17.5°C, Aug. 15; minimum during period of collection, 0.0°C, April 26, 27, and May 19, 20.

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1										5.0	1.0	2.5
2										5.5	0.5	2.5
3										4.5	1.5	2.5
4										5.5	1.5	3.0
5										5.5	1.0	3.0
6										6.0	0.5	3.0
7										7.0	1.0	3.5
8										6.0	1.0	3.0
9										8.5	1.0	4.0
10										6.5	1.5	3.5
11										6.0	0.5	3.0
12										6.0	1.5	3.5
13										8.0	1.0	4.0
14										10.5	0.5	4.5
15										7.5	1.0	3.5
16										7.0	1.0	3.0
17										7.5	0.5	3.0
18										3.0	0.5	2.0
19										6.5	0.0	2.5
20										9.0	0.0	3.5
21										7.0	1.0	3.5
22										8.5	1.5	3.5
23										6.5	1.0	3.0
24							5.0	1.5	2.5	6.5	1.0	3.0
25							5.5	0.5	2.5	6.0	1.0	2.5
26							2.5	0.0	1.5	4.5	1.0	2.5
27							5.5	0.0	2.0	6.5	1.0	3.0
28							3.5	0.5	1.5	6.5	1.5	3.0
29							5.5	0.5	2.5	6.0	1.5	3.0
30							5.5	1.0	3.0	5.0	1.5	3.0
31							---	---	---	4.0	2.0	3.0
MONTH							---	---	---	10.5	0.0	3.0

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003--Continued

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	5.0	2.0	3.0	9.5	3.0	5.5	16.0	6.5	11.0	14.5	6.0	10.0
2	5.5	1.5	3.0	10.5	3.0	6.0	16.0	7.0	11.0	14.0	6.5	10.0
3	6.5	1.5	3.5	10.5	3.0	6.0	13.0	8.5	10.5	14.5	6.5	10.0
4	6.0	2.0	3.0	10.5	3.0	6.0	13.5	8.5	10.5	14.0	6.5	10.5
5	5.5	2.0	3.0	11.0	3.5	6.5	15.0	7.0	10.5	12.0	7.5	10.0
6	6.0	1.5	3.0	11.0	3.5	6.5	15.5	7.5	11.0	11.0	8.0	9.5
7	7.5	1.5	4.0	11.0	4.0	7.0	16.0	7.0	11.0	13.5	7.5	10.0
8	7.5	1.5	4.0	8.5	4.0	6.0	12.5	6.5	9.5	9.5	6.5	8.0
9	7.0	2.5	4.5	12.0	3.5	7.0	12.0	7.0	9.0	10.5	4.0	7.0
10	7.0	2.5	4.0	12.5	4.0	7.5	15.0	6.5	10.5	8.0	6.0	7.0
11	7.0	2.5	4.0	12.5	5.0	8.0	15.0	7.5	11.0	7.5	5.5	6.5
12	7.0	2.0	4.0	12.5	5.0	8.0	15.0	8.0	11.0	6.5	4.5	6.0
13	6.5	2.5	4.0	13.0	4.5	8.0	15.0	7.5	11.0	7.5	3.5	5.0
14	7.0	2.0	4.0	13.0	4.5	8.0	15.5	8.0	11.5	10.0	1.5	5.5
15	7.5	2.5	4.0	11.5	4.5	8.0	17.5	8.5	12.5	9.5	3.0	6.5
16	6.5	2.5	4.5	11.0	5.0	8.0	14.5	8.5	11.5	7.5	4.5	6.0
17	8.5	2.5	4.5	13.0	5.5	9.0	11.0	7.5	9.0	5.5	3.0	4.0
18	8.5	2.5	4.5	12.5	6.0	9.5	14.5	5.5	10.0	7.5	2.5	4.5
19	7.0	3.0	4.5	12.5	5.5	9.0	15.5	7.0	11.0	8.0	1.5	4.5
20	7.0	3.0	4.5	14.5	6.0	10.0	16.0	7.5	11.5	8.0	2.5	5.5
21	6.0	2.5	4.0	14.5	6.5	10.0	14.5	8.0	11.0	9.0	2.0	5.5
22	4.0	2.0	3.0	15.0	6.0	10.0	12.5	9.0	10.5	9.5	2.5	6.0
23	5.5	1.5	3.5	15.0	6.5	10.5	16.0	8.5	11.5	9.5	3.0	6.5
24	6.5	2.5	4.0	15.0	7.5	11.0	13.5	7.0	10.5	10.0	3.5	6.5
25	6.5	2.0	4.0	12.5	8.5	10.0	16.0	7.0	11.0	10.5	4.0	7.0
26	7.5	3.0	5.0	12.5	8.0	10.0	15.5	7.0	11.0	11.5	5.5	8.5
27	10.0	2.5	5.5	15.5	8.0	11.0	11.5	8.0	9.5	10.5	4.0	7.0
28	8.5	4.0	5.5	16.0	7.5	11.0	13.0	7.5	10.0	10.0	4.0	7.0
29	10.0	3.0	5.5	15.5	6.5	10.5	10.5	7.0	9.0	8.5	3.5	6.0
30	9.5	3.5	5.5	16.0	6.5	10.5	12.0	7.0	9.5	9.0	3.0	5.5
31	---	---	---	12.5	7.0	10.0	14.0	5.5	9.5	---	---	---
MONTH	10.0	1.5	4.0	16.0	3.0	8.5	17.5	5.5	10.5	14.5	1.5	7.0

YELLOWSTONE RIVER BASIN

06187950 SODA BUTTE CREEK NEAR LAMAR RANGER STATION, YELLOWSTONE NATIONAL PARK

LOCATION.--Lat 44°52'06", long 110°09'53" (NAD 27), Yellowstone National Park, Hydrologic Unit 10070001, on left bank, 4 mi southeast of Lamar Ranger Station, and at river mile 1.5.

DRAINAGE AREA.--99.0 mi^2.

PERIOD OF RECORD.--October 1988 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 6,630 ft (NGVD 29).

REMARKS.--Records good except those for estimated daily discharges, which are poor. No regulation or diversion upstream from station. Several observations of water temperature and specific conductance were made during the year. U. S. Geological Survey satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	44	e20	21	26	29	e25	26	82	1340	537	90	51
2	43	e22	29	27	27	e20	28	78	950	509	85	49
3	42	e22	28	27	e25	e22	26	81	919	478	90	47
4	43	22	28	27	e25	e24	24	86	864	436	97	46
5	46	e22	28	27	e22	e20	e20	85	724	403	85	46
6	43	22	27	e24	e20	24	23	82	641	382	81	48
7	43	22	e25	e22	e20	e24	22	78	547	360	75	51
8	42	24	e24	e20	e23	e20	22	78	572	324	72	51
9	42	26	e23	e18	e24	21	26	72	683	294	75	49
10	41	27	e25	e16	22	22	29	72	821	289	72	48
11	44	27	e26	e20	e20	23	31	71	881	284	70	47
12	40	27	23	21	e18	22	34	74	889	279	67	48
13	38	27	24	23	e20	24	43	85	869	260	66	50
14	37	26	27	24	24	23	57	94	889	241	65	45
15	37	26	28	e24	24	24	65	139	899	225	60	43
16	36	23	28	e20	24	24	59	235	988	209	60	43
17	36	25	29	e20	e25	23	54	279	1030	198	60	44
18	36	26	e27	e20	e24	21	50	271	1120	197	63	42
19	35	27	e22	e20	e22	20	46	218	1050	186	61	41
20	35	26	e23	22	e20	18	46	201	998	171	59	40
21	35	25	20	23	25	20	53	206	887	162	61	40
22	36	25	23	e21	e24	20	71	285	697	151	57	39
23	35	e22	e20	23	e20	23	97	511	562	141	58	39
24	35	e20	e19	e22	e15	18	89	753	461	137	56	38
25	35	e17	e18	24	e15	20	94	1010	369	143	54	38
26	31	e17	e22	24	e16	22	107	1140	326	138	52	37
27	29	18	22	25	e20	23	93	1260	331	142	53	37
28	e26	22	24	24	23	e20	88	1350	407	121	59	37
29	e25	24	26	25	---	e22	84	1430	478	111	56	37
30	e22	26	26	25	---	22	82	1320	521	101	54	37
31	e20	---	27	25	---	23	---	1360	---	95	53	---
TOTAL	1132	705	762	709	616	677	1589	13086	22713	7704	2066	1308
MEAN	36.5	23.5	24.6	22.9	22.0	21.8	53.0	422	757	249	66.6	43.6
MAX	46	27	29	27	29	25	107	1430	1340	537	97	51
MIN	20	17	18	16	15	18	20	71	326	95	52	37
AC-FT	2250	1400	1510	1410	1220	1340	3150	25960	45050	15280	4100	2590

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1989 - 2003, BY WATER YEAR (WY)

MEAN	43.5	31.6	25.1	25.3	23.4	23.5	61.5	407	695	288	93.8	56.7
MAX	68.8	40.3	31.2	33.3	32.0	32.0	127	580	1251	447	162	92.0
(WY)	1998	1997	1996	1997	2000	1997	1990	1993	1996	1998	1997	1997
MIN	27.8	21.4	16.0	16.7	16.2	17.2	32.3	217	338	106	51.0	36.1
(WY)	1989	1995	1989	1989	2002	2002	1993	1995	2001	1994	2001	2001

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1989 - 2003	
ANNUAL TOTAL	45107		53067			
ANNUAL MEAN	124		145		148	
HIGHEST ANNUAL MEAN					204	1996
LOWEST ANNUAL MEAN					96.5	2001
HIGHEST DAILY MEAN	1050	May 31	1430	May 29	2070	Jun 9 1996
LOWEST DAILY MEAN	13	Feb 26	15	Feb 24	12	Feb 4 1989
ANNUAL SEVEN-DAY MINIMUM	14	Feb 24	19	Feb 22	13	Feb 2 1989
MAXIMUM PEAK FLOW			1790	May 28	a2450	Jun 8 1996
MAXIMUM PEAK STAGE			7.20	May 28	7.20	May 28 2003
ANNUAL RUNOFF (AC-FT)	89470		105300		107300	
10 PERCENT EXCEEDS	448		478		482	
50 PERCENT EXCEEDS	36		37		42	
90 PERCENT EXCEEDS	17		20		21	

a--Gage height, 5.61 ft.
e--Estimated.

06188000 LAMAR RIVER NEAR TOWER FALLS RANGER STATION, YELLOWSTONE NATIONAL PARK

LOCATION.--Lat 44°55'40", long 110°23'35" (NAD 27), Yellowstone National Park, Hydrologic Unit 10070001, on left bank 0.5 mi north of the Cooke City highway, 1.6 mi northeast of Tower Falls Ranger Station, 2.7 mi downstream from Slough Creek, and at river mile 0.5.

DRAINAGE AREA.--660 mi^2.

PERIOD OF RECORD.--September 1922, April 1923 to September 1969, May 1985 to September 1986 (seasonal records only), October 1988 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 6,000 ft (NGVD 29). Prior to Sept. 16, 1925, nonrecording gage and Sept. 16, 1925 to July 29, 1927, water-stage recorder at same site at elevation 1.00 ft higher. July 29, 1927 to Sept. 30, 1969, water-stage recorder at same site and elevation. May 1985 to September 1986, nonrecording gage at same site and elevation.

REMARKS.--Records good except those from May 31 to July 5, which are fair, and those for estimated daily discharges, which are poor. No regulation or diversion upstream from station. U.S. Geological Survey satellite telemeter at station. Several observations of water temperature and specific conductance were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	173	e110	e100	e100	e140	e75	e130	890	8710	1810	385	161
2	170	e120	e110	e100	e120	e80	e160	831	6390	1670	365	153
3	163	128	e110	e100	e110	e85	e140	864	5050	1560	354	148
4	169	126	e110	e100	e100	e85	e130	929	4610	1440	378	146
5	189	124	e110	e95	e90	e80	e120	989	4150	1320	407	142
6	190	125	e110	e90	e80	e80	e130	913	3810	1250	354	146
7	181	125	e100	e90	e80	e85	e150	851	3320	1170	330	171
8	187	134	e100	e85	e85	e90	156	876	3500	1120	315	179
9	184	140	e100	e85	e90	e95	187	814	3970	1020	331	185
10	174	139	e100	e90	e100	e100	283	798	4590	970	330	172
11	185	139	e110	e100	e100	e100	414	791	4600	919	313	181
12	187	135	e110	e110	e90	e110	574	837	4200	884	303	176
13	164	141	e120	e120	e95	e120	763	1000	3950	836	293	187
14	168	139	e130	e110	e100	e120	1040	1300	3930	787	286	174
15	168	137	e120	e100	e120	e120	1140	2050	3870	740	280	160
16	165	127	e110	e90	e110	e110	946	2870	3980	698	275	154
17	160	132	e100	e90	e110	e100	800	3360	3780	665	301	162
18	154	133	e90	e95	e110	e95	712	3280	3820	641	323	161
19	148	142	e90	e100	e110	e95	632	2230	3600	626	300	154
20	146	136	e90	e110	e110	e90	604	1910	3350	591	284	150
21	149	137	e100	e110	e120	e95	787	2120	3070	565	e260	147
22	155	134	e100	e110	e110	e100	1140	2820	2500	527	e250	143
23	151	132	e90	e110	e90	e95	1450	4440	2140	500	e240	140
24	152	108	e80	e120	e70	e90	1230	5840	1860	486	e220	137
25	150	e100	e90	e130	e75	e100	1350	7920	1640	494	e200	134
26	134	e110	e100	e140	e75	e95	1610	8320	1490	553	e180	132
27	126	e120	e110	e130	e80	e90	1210	8870	1490	529	e170	130
28	147	e110	e120	e120	e80	e85	1050	10200	1640	474	169	129
29	131	e110	e110	e120	---	e85	933	11600	1790	435	181	129
30	98	e110	e110	e120	---	e90	925	10800	1770	409	182	129
31	e100	---	e110	e130	---	e110	---	10100	---	390	172	---
TOTAL	4918	3803	3240	3300	2750	2950	20896	111413	106570	26079	8731	4612
MEAN	159	127	105	106	98.2	95.2	697	3594	3552	841	282	154
MAX	190	142	130	140	140	120	1610	11600	8710	1810	407	187
MIN	98	100	80	85	70	75	120	791	1490	390	169	129
AC-FT	9750	7540	6430	6550	5450	5850	41450	221000	211400	51730	17320	9150

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1923 - 2003, BY WATER YEAR (WY)*

MEAN	212	156	120	106	102	113	469	2866	4248	1346	351	228
MAX	485	330	202	200	171	204	1684	6885	9044	3256	886	518
(WY)	1942	1928	1951	1969	1969	1999	1990	1928	1996	1943	1968	1968
MIN	109	88.1	75.5	71.8	70.0	67.9	106	969	1408	344	173	115
(WY)	1989	1937	1953	1989	1942	1964	1945	1933	1934	1931	1940	1988

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1923 - 2003*	
ANNUAL TOTAL	311235		299262			
ANNUAL MEAN	853		820		866	
HIGHEST ANNUAL MEAN					1531	1997
LOWEST ANNUAL MEAN					525	1934
HIGHEST DAILY MEAN	10700	Jun 1	11600	May 29	15600	Jun 10 1996
LOWEST DAILY MEAN	70	Jan 15	70	Feb 24	45	Mar 23 1964
ANNUAL SEVEN-DAY MINIMUM	81	Jan 10	76	Feb 24	57	Mar 5 1964
MAXIMUM PEAK FLOW			14200	May 29	19500	Jun 10 1996
MAXIMUM PEAK STAGE			10.48	May 29	12.15	Jun 10 1996
INSTANTANEOUS LOW FLOW					a40	Mar 16 1945
ANNUAL RUNOFF (AC-FT)	617300		593600		627500	
10 PERCENT EXCEEDS	3170		2180		2930	
50 PERCENT EXCEEDS	168		151		181	
90 PERCENT EXCEEDS	85		90		90	

*--During periods of record {September 1922, April 1923 to September 1969, May 1985 to September 1986 (seasonal records only), October 1988 to current year}.
a--Observed, but may have been lower during periods of no gage-height record in winter.
e--Estimated.

YELLOWSTONE RIVER BASIN

06190540 BOILING RIVER AT MAMMOTH, YELLOWSTONE NATIONAL PARK

LOCATION.--Lat 44°59'07", long 110°41'18" (NAD 27), Yellowstone National Park, Hydrologic Unit 10070001, on left bank 50 ft downstream from outfall, 150 ft upstream of mouth, and 0.8 mi northeast of U.S. Post Office at Mammoth.

DRAINAGE AREA.-- Indeterminate.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1988 to September 1995, October 2002 to September 2003. Published as "Hot River" at Mammoth from 1989-94.

GAGE.--Water-stage recorder. Elevation of gage is 5,666.11 ft (NGVD 29) (levels by U.S. National Park Service).

REMARKS.--Water-discharge records good. No regulation or diversion upstream from station, however, flow is added from sinkholes upstream from spring. U.S. Geological Survey satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	30	28	28	28	30	30	31	31	33	28	25	21
2	30	29	29	28	30	30	31	31	33	28	24	21
3	30	29	29	29	29	30	31	31	33	27	24	21
4	30	29	29	29	28	30	31	31	33	27	24	21
5	30	29	29	30	29	30	31	32	32	27	24	21
6	30	29	29	30	30	31	31	32	32	26	25	22
7	30	30	29	29	29	30	31	32	31	26	25	22
8	30	30	26	29	30	31	31	32	31	26	25	22
9	30	30	27	31	30	30	31	32	31	26	26	22
10	30	30	28	31	30	31	31	32	31	25	26	22
11	30	30	29	32	30	31	31	32	31	25	e25	22
12	30	29	29	31	30	31	31	32	31	25	e24	22
13	30	29	29	31	30	31	32	32	31	24	e24	22
14	30	29	29	31	30	31	32	32	31	24	e24	22
15	30	29	29	30	30	31	32	32	31	24	e24	21
16	30	29	29	29	30	31	32	33	31	24	e24	21
17	30	29	29	28	30	31	32	33	31	24	e24	21
18	30	29	27	29	30	31	32	33	31	24	e25	21
19	30	29	28	30	30	31	32	33	31	23	e24	21
20	30	29	28	30	29	31	32	33	31	23	e24	21
21	30	29	28	30	30	31	32	33	31	23	e24	21
22	30	29	28	30	30	31	32	33	30	23	e24	21
23	30	29	28	30	30	31	32	33	30	24	e24	21
24	30	28	26	30	26	31	32	33	30	24	e24	21
25	30	28	28	30	28	31	32	33	30	25	e23	21
26	30	29	28	30	30	31	32	33	29	26	e23	21
27	29	29	29	30	30	31	32	33	29	25	22	21
28	30	29	28	30	30	31	32	33	29	25	22	21
29	30	29	28	30	---	31	31	33	29	25	22	21
30	28	29	28	30	---	31	31	33	28	25	22	21
31	27	---	28	30	---	31	---	33	---	24	21	---
TOTAL	924	872	876	925	828	954	946	1004	925	775	741	639
MEAN	29.8	29.1	28.3	29.8	29.6	30.8	31.5	32.4	30.8	25.0	23.9	21.3
MAX	30	30	29	32	30	31	32	33	33	28	26	22
MIN	27	28	26	28	26	30	31	31	28	23	21	21
AC-FT	1830	1730	1740	1830	1640	1890	1880	1990	1830	1540	1470	1270

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1989 - 2003, BY WATER YEAR (WY)*

MEAN	27.4	26.1	25.9	26.5	25.5	25.7	27.1	29.8	29.3	27.6	26.8	26.1
MAX	29.9	29.1	28.3	29.8	29.6	30.8	31.5	33.1	33.0	31.2	29.1	28.6
(WY)	1989	2003	2003	2003	2003	2003	2003	1995	1995	1995	1995	1995
MIN	23.9	22.7	22.9	24.1	22.0	23.8	25.0	27.3	27.2	25.0	23.9	21.3
(WY)	1990	1990	1994	1990	1994	1990	1991	1990	1990	2003	2003	2003

SUMMARY STATISTICS	FOR 2003 WATER YEAR		WATER YEARS 1989 - 2003*	
ANNUAL TOTAL	10409			
ANNUAL MEAN	28.5		27.0	
HIGHEST ANNUAL MEAN			28.5	2003
LOWEST ANNUAL MEAN			25.5	1990
HIGHEST DAILY MEAN	33	May 16	36	May 20 1995
LOWEST DAILY MEAN	21	Aug 31	19	Nov 23 1993
ANNUAL SEVEN-DAY MINIMUM	21	Sep 15	21	Nov 23 1993
MAXIMUM PEAK FLOW	34	May 18	b36	May 20 1995
MAXIMUM PEAK STAGE	1.47	May 18	1.50	May 17 1993
INSTANTANEOUS LOW FLOW	a21	Sep 4	c17	Jan 30 1994
ANNUAL RUNOFF (AC-FT)	20650		19550	
10 PERCENT EXCEEDS	32		30	
50 PERCENT EXCEEDS	30		27	
90 PERCENT EXCEEDS	23		24	

*--During periods of operation (October 1988 to September 1995, October 2002 to September 2003).
a--Gage height, 1.07 ft.
b--Gage height, 1.45 ft.
c--Gage height, 1.06 ft.
e--Estimated.

06190540 BOILING RIVER AT MAMMOTH, YELLOWSTONE NATIONAL PARK--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1988 to September 1994, October 2002 to September 2003.
PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1988 to September 1990.
WATER TEMPERATURE: October 1988 to September 1994, October 2002 to September 2003.
INSTRUMENTATION.--Temperature recorder installed Sept. 25, 2002.
REMARKS.--Daily water temperataure record good. Unpublished records of instantaneous water temperature and specific conductance are available in files of the District Office.
EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 2,410 microsiemens per centimeter (µS/cm) at 25.0°C, Jan. 29, 1990; minimum daily, 1,500 µS/cm at 25.0°C, July, 17, 22, 23, 1990.
WATER TEMPERATURE: Maximum, 57.0°C, July 22-24, 2003; minimum, 38.0°C, June 16, 27, 1989, Apr. 19, 1990.
EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: Maximum 57.0°C, July 22-24; minimum, 39.5°C, May 17.

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	44.5	44.0	44.5	48.0	45.0	46.5	52.0	44.0	45.5	44.0	43.5	44.0
2	45.0	43.5	44.0	45.5	45.0	45.5	45.0	44.0	44.5	44.0	43.5	44.0
3	44.5	43.5	44.0	45.5	45.0	45.0	44.5	44.0	44.5	44.0	44.0	44.0
4	45.0	44.0	44.5	45.0	45.0	45.0	45.0	44.0	44.5	44.0	44.0	44.0
5	45.0	44.5	45.0	45.5	45.0	45.0	44.5	44.5	44.5	44.5	44.0	44.0
6	45.5	44.5	45.0	45.0	44.5	45.0	44.5	44.0	44.5	47.0	43.5	44.0
7	45.5	44.5	45.0	45.0	44.5	45.0	49.5	44.0	44.5	51.0	44.0	47.0
8	45.5	44.5	45.0	45.0	45.0	45.0	51.5	45.5	48.5	51.5	43.5	48.0
9	45.5	44.5	45.0	45.5	45.0	45.5	50.5	44.5	47.0	46.5	43.5	45.0
10	45.0	44.5	45.0	45.5	45.0	45.0	49.0	43.5	45.5	49.5	44.5	46.5
11	45.0	44.0	44.5	45.5	45.0	45.0	47.0	43.5	44.5	44.5	43.0	43.5
12	44.5	43.5	44.0	45.5	45.0	45.5	46.5	44.0	44.5	43.5	43.0	43.5
13	45.0	43.5	44.0	46.0	45.0	45.5	44.5	44.0	44.0	44.0	43.5	43.5
14	45.0	43.5	44.5	45.0	45.0	45.0	44.5	44.0	44.0	44.5	44.0	44.0
15	45.0	43.5	44.5	45.0	44.5	45.0	44.5	44.0	44.0	45.0	43.5	44.0
16	45.0	44.0	44.5	45.0	44.5	44.5	44.0	44.0	44.0	52.0	44.0	46.0
17	45.0	44.0	44.5	45.0	44.5	45.0	44.0	43.5	44.0	51.5	44.0	47.0
18	45.0	44.0	44.5	45.0	44.5	44.5	50.0	43.5	46.5	50.5	44.0	46.0
19	45.0	43.5	44.5	45.0	44.5	45.0	45.5	44.5	45.0	44.0	43.5	44.0
20	45.0	44.0	44.5	45.5	45.0	45.0	46.0	43.5	45.0	44.5	44.0	44.0
21	45.0	44.5	44.5	45.5	45.0	45.5	44.0	43.5	43.5	44.5	44.0	44.0
22	45.0	44.0	44.5	45.5	45.0	45.5	45.5	43.5	44.0	44.5	44.0	44.0
23	44.5	43.5	44.0	45.5	44.5	44.5	48.0	44.0	45.0	44.5	44.0	44.5
24	44.5	44.0	44.0	50.0	44.5	47.0	50.0	45.5	48.0	44.5	44.0	44.0
25	44.5	44.0	44.0	48.5	44.5	45.5	45.5	43.5	44.5	44.5	44.0	44.5
26	45.5	43.5	44.0	46.5	44.0	45.0	43.5	43.0	43.5	44.5	44.0	44.5
27	47.0	43.5	44.5	44.0	44.0	44.0	43.0	42.5	43.0	44.5	44.5	44.5
28	45.0	44.0	44.5	44.5	44.0	44.0	43.5	43.0	43.0	44.5	44.0	44.0
29	44.5	43.5	44.0	45.0	44.5	44.5	44.0	43.5	43.5	44.5	44.0	44.0
30	51.0	44.5	47.0	44.5	44.5	44.5	44.0	43.5	43.5	45.0	44.0	44.5
31	53.0	46.0	48.5	---	---	---	44.0	43.5	44.0	45.0	44.0	44.5
MONTH	53.0	43.5	44.5	50.0	44.0	45.0	52.0	42.5	44.5	52.0	43.0	44.5

YELLOWSTONE RIVER BASIN

06190540 BOILING RIVER AT MAMMOTH, YELLOWSTONE NATIONAL PARK--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003--Continued

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	44.5	44.0	44.5	43.5	43.0	43.5	44.5	44.0	44.5	44.5	43.0	43.5
2	44.0	44.0	44.0	44.5	43.5	43.5	45.0	43.5	44.0	44.5	43.0	43.5
3	48.5	44.0	46.0	43.5	43.5	43.5	44.0	43.0	43.5	44.0	43.0	43.5
4	50.5	44.5	46.5	44.0	43.5	43.5	44.5	43.0	43.5	44.5	43.0	43.5
5	50.0	44.0	45.0	44.0	43.5	44.0	44.5	43.0	44.0	43.0	42.0	42.5
6	48.0	43.5	44.5	43.5	43.5	43.5	44.5	43.5	44.0	43.5	42.0	42.5
7	46.0	44.0	44.5	44.0	43.5	43.5	45.0	43.5	44.5	44.0	42.5	43.0
8	44.0	43.5	43.5	44.0	43.5	43.5	45.5	43.5	44.5	43.5	42.5	43.0
9	44.0	43.5	44.0	44.0	43.5	44.0	46.0	44.0	45.0	43.0	42.5	43.0
10	44.0	44.0	44.0	44.5	43.0	44.0	46.0	44.0	45.0	43.5	42.5	43.0
11	44.5	44.0	44.0	44.0	44.0	44.0	45.5	44.0	44.5	43.5	42.0	43.0
12	44.5	44.0	44.5	44.5	44.0	44.0	45.5	43.5	44.5	43.5	42.5	43.0
13	45.0	44.0	44.5	45.0	44.0	44.5	45.0	43.5	44.0	43.5	42.0	42.5
14	44.5	44.0	44.5	44.5	43.5	44.0	44.0	43.0	43.5	43.5	41.0	42.0
15	45.0	44.5	44.5	44.5	43.5	44.0	43.0	42.5	43.0	42.5	40.5	41.0
16	44.5	44.5	44.5	45.0	44.0	44.5	44.0	42.5	43.0	41.5	40.0	40.5
17	44.5	44.0	44.5	44.5	43.5	44.0	44.0	43.0	43.5	41.5	39.5	40.5
18	45.5	44.0	44.5	44.0	43.5	44.0	44.0	43.0	43.5	41.0	40.5	40.5
19	47.5	44.0	45.0	44.5	43.5	44.0	44.5	43.0	44.0	42.5	40.5	41.5
20	49.0	43.5	45.0	44.5	43.5	44.0	45.0	43.0	44.0	43.5	41.5	42.5
21	44.5	44.0	44.0	44.5	43.5	44.0	44.5	43.0	43.5	43.5	42.5	43.0
22	44.0	43.5	44.0	45.0	44.0	44.5	44.0	43.0	43.5	44.5	42.5	43.5
23	46.5	43.5	44.0	44.5	43.5	44.0	43.5	42.5	43.0	44.0	42.0	43.0
24	55.5	44.0	51.0	44.5	43.0	44.0	43.5	42.5	43.0	44.0	42.0	43.0
25	50.5	46.5	48.5	44.0	43.5	44.0	43.5	42.0	42.5	44.0	41.5	43.0
26	46.5	43.5	44.5	44.0	43.5	44.0	42.5	41.5	42.0	43.5	42.0	42.5
27	43.5	43.0	43.0	44.5	43.5	43.5	43.5	41.5	42.5	44.5	42.0	43.0
28	43.5	43.0	43.5	44.5	43.0	43.5	43.0	42.5	43.0	44.5	42.0	43.0
29	---	---	---	44.5	43.0	44.0	44.0	43.0	43.5	44.5	42.5	43.0
30	---	---	---	45.0	44.0	44.5	44.0	43.0	43.5	43.5	41.5	42.5
31	---	---	---	45.5	44.0	44.5	---	---	---	43.0	41.5	42.5
MONTH	55.5	43.0	45.0	45.5	43.0	44.0	46.0	41.5	43.5	44.5	39.5	42.5

		JUNE			JULY			AUGUST			SEPTEMBER	
1	43.0	41.0	42.0	50.0	47.5	49.0	55.5	54.5	55.0	56.5	55.5	56.0
2	44.0	42.0	43.0	50.5	48.0	49.5	55.5	54.5	55.0	56.5	56.0	56.0
3	44.0	42.5	43.0	51.0	49.0	50.0	55.5	55.0	55.5	56.5	56.0	56.0
4	44.0	42.5	43.5	52.0	49.5	50.5	55.5	55.0	55.0	56.5	56.0	56.0
5	44.5	43.0	43.5	52.5	50.5	51.5	55.5	54.5	55.0	56.5	56.0	56.0
6	44.0	43.0	43.5	52.5	51.0	52.0	55.5	55.0	55.0	56.0	55.5	55.5
7	44.5	43.0	44.0	53.0	51.5	52.5	56.0	55.0	55.5	56.0	55.0	55.5
8	45.0	43.0	44.0	53.0	52.0	52.5	55.5	55.0	55.5	56.0	55.0	55.0
9	45.0	43.5	44.5	54.0	52.0	53.0	55.0	54.5	55.0	55.5	55.0	55.5
10	45.0	43.5	44.5	54.5	53.0	53.5	55.5	55.0	55.0	55.5	55.0	55.0
11	45.0	43.5	44.5	54.5	53.5	54.0	56.0	55.5	55.5	55.5	55.0	55.0
12	45.0	43.5	44.5	55.0	53.5	54.5	56.0	55.5	55.5	55.5	55.0	55.5
13	45.5	43.5	44.5	55.5	54.0	54.5	56.0	55.5	56.0	55.5	55.0	55.5
14	45.5	43.5	44.5	55.5	54.5	55.0	56.0	55.5	56.0	56.0	55.0	55.5
15	45.0	44.0	44.5	55.5	54.5	55.0	56.0	55.5	56.0	56.0	55.5	56.0
16	45.5	44.0	45.0	56.0	55.0	55.5	56.0	55.0	55.5	56.0	55.5	55.5
17	46.0	44.0	45.0	56.0	55.5	55.5	56.0	55.0	55.5	55.5	55.0	55.5
18	45.5	44.0	45.0	56.5	55.5	56.0	55.5	54.5	55.0	55.5	55.5	55.5
19	45.5	44.0	45.0	56.5	55.5	56.0	56.0	55.0	55.5	56.0	55.5	55.5
20	45.5	44.5	45.0	56.5	56.0	56.0	56.0	55.5	56.0	56.0	55.5	56.0
21	45.5	44.0	44.5	56.5	56.0	56.5	56.0	55.5	56.0	56.0	55.5	56.0
22	45.0	43.5	44.0	57.0	56.0	56.5	56.0	55.5	56.0	56.0	55.5	56.0
23	44.5	43.5	44.0	57.0	56.5	56.5	56.0	55.5	56.0	56.5	56.0	56.0
24	45.0	44.0	44.5	57.0	55.0	56.5	56.5	55.5	56.0	56.0	56.0	56.0
25	46.0	44.0	45.0	55.0	52.5	54.0	56.5	56.0	56.0	56.5	56.0	56.0
26	47.5	45.5	46.5	53.5	51.5	52.5	56.5	56.0	56.0	56.5	56.0	56.0
27	48.5	46.5	47.5	54.0	52.5	53.5	56.5	56.0	56.0	56.0	56.0	56.0
28	48.5	47.0	47.5	54.5	53.5	54.0	56.0	55.5	56.0	56.0	55.5	56.0
29	49.0	46.5	48.0	55.0	54.0	54.5	56.0	55.5	55.5	56.0	55.5	56.0
30	50.0	47.5	48.5	55.0	54.5	54.5	56.0	55.5	55.5	56.0	55.5	56.0
31	---	---	---	55.0	54.5	55.0	56.0	55.5	56.0	---	---	---
MONTH	50.0	41.0	45.0	57.0	47.5	54.0	56.5	54.5	55.5	56.5	55.0	55.5

06191000 GARDNER RIVER NEAR MAMMOTH, YELLOWSTONE NATIONAL PARK

LOCATION.--Lat 44°59'33", long 110°41'26" (NAD 27), Yellowstone National Park, Hydrologic Unit 10070001, on left bank at Wyoming-Montana state line, 400 ft upstream from highway bridge, 0.5 mi downstream from Hot River (formerly Boiling River), 1.5 mi north of Mammoth, and at river mile 2.9.

DRAINAGE AREA.--202 mi^2.

PERIOD OF RECORD.--October 1938 to September 1972, April l984 to current year. Prior to October 1959, published as Gardiner River near Mammoth.

REVISED RECORDS.--WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 5,623.97 ft (NGVD 29) (levels by National Park Service).

REMARKS.--Records good. No regulation or diversion upstream from station. U.S. Geological Survey satellite telemeter at station. Several observations of water temperature and specific conductance were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	122	89	88	84	101	82	95	189	1520	254	133	105
2	121	95	90	84	92	77	97	183	1190	245	129	105
3	122	93	88	84	83	83	92	192	942	236	127	106
4	124	102	88	86	83	82	89	212	825	228	129	105
5	130	100	87	86	80	76	86	228	701	220	127	104
6	124	100	87	82	64	79	87	199	654	215	124	112
7	120	98	85	77	71	81	85	188	594	209	118	115
8	117	100	76	75	93	79	85	190	584	205	117	119
9	117	98	80	74	85	82	89	183	618	197	126	114
10	115	98	80	68	86	85	98	178	642	190	120	118
11	119	98	91	93	85	86	110	177	633	185	116	116
12	115	96	88	90	81	88	129	198	603	181	114	113
13	114	96	88	86	82	93	155	252	565	175	112	112
14	115	95	88	84	85	97	172	287	574	172	111	110
15	114	94	87	84	83	94	181	343	552	168	111	107
16	114	92	85	79	82	95	165	416	522	164	117	108
17	113	92	87	75	81	91	155	444	502	158	117	110
18	112	89	74	77	81	88	143	450	496	154	121	108
19	111	91	76	90	81	88	133	369	477	153	113	107
20	110	91	77	84	81	86	136	329	457	153	111	107
21	109	92	90	84	82	87	157	333	428	149	109	105
22	110	93	89	82	84	88	182	375	391	146	109	104
23	108	95	78	83	73	96	216	504	366	143	108	103
24	112	84	59	83	55	87	230	636	337	143	106	103
25	107	72	71	84	76	86	244	826	305	155	105	103
26	103	78	84	84	87	90	261	900	284	180	105	102
27	103	100	89	84	89	88	202	919	270	161	106	101
28	106	98	93	84	82	85	190	1010	268	147	109	102
29	101	93	88	84	---	84	183	1100	262	140	109	102
30	84	90	85	81	---	87	181	1200	257	136	109	101
31	88	---	85	89	---	91	---	1280	---	133	108	---
TOTAL	3480	2802	2601	2564	2288	2681	4428	14290	16819	5495	3576	3227
MEAN	112	93.4	83.9	82.7	81.7	86.5	148	461	561	177	115	108
MAX	130	102	93	93	101	97	261	1280	1520	254	133	119
MIN	84	72	59	68	55	76	85	177	257	133	105	101
AC-FT	6900	5560	5160	5090	4540	5320	8780	28340	33360	10900	7090	6400

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1939 - 2003, BY WATER YEAR (WY)*

MEAN	127	112	102	97.0	93.1	93.8	141	509	712	301	162	136
MAX	175	151	135	134	128	128	304	1067	1354	662	236	190
(WY)	1969	1998	1998	1998	1998	1998	1990	1997	1971	1943	1943	1968
MIN	94.9	85.5	79.3	77.6	75.0	75.4	84.1	283	212	133	103	93.4
(WY)	2002	1940	1941	1941	1940	1942	1945	1960	1987	1988	1988	1988

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1939 - 2003*	
ANNUAL TOTAL	66653		64251			
ANNUAL MEAN	183		176		216	
HIGHEST ANNUAL MEAN					324	1997
LOWEST ANNUAL MEAN					138	1988
HIGHEST DAILY MEAN	1240	Jun 2	1520	Jun 1	1830	May 29 1956
LOWEST DAILY MEAN	59	Dec 24	55	Feb 24	53	Dec 15 1988
ANNUAL SEVEN-DAY MINIMUM	77	Dec 19	76	Feb 19	61	Feb 1 1989
MAXIMUM PEAK FLOW			1730	Jun 1	b2080	Jun 4 1956
MAXIMUM PEAK STAGE			4.70	Jun 1	5.03	Jun 2 1997
INSTANTANEOUS LOW FLOW			a36	Feb 24	c35	Mar 28 1942
ANNUAL RUNOFF (AC-FT)	132200		127400		156400	
10 PERCENT EXCEEDS	453		367		510	
50 PERCENT EXCEEDS	115		106		121	
90 PERCENT EXCEEDS	83		82		87	

*--During periods of record {October 1938 to September 1972, April 1984 to present).
a--Gage height, 1.76 ft, result of freezeup.
b--Gage height, 4.46 ft.
c--Gage height, 1.08 ft.

YELLOWSTONE RIVER BASIN

06191500 YELLOWSTONE RIVER AT CORWIN SPRINGS, MT

LOCATION.--Lat 45°06'43", long 110°47'37" (NAD 27), in $NW^1/_4SE^1/_4NW^1/_4$ sec.30, T.8 S., R.8 E., Park County, Hydrologic Unit 10070002, on left bank 20 ft downstream from county road bridge at Corwin Springs, 1.3 mi upstream from Mol Heron Creek, 7 mi northwest of Gardiner, and at river mile 549.7.

DRAINAGE AREA (REVISED).--2,619 mi^2.

PERIOD OF RECORD.--August 1889 to November 1893 (published as "at Horr"), September 1910 to current year. Monthly discharge only for some periods, published in WSP 1309.

REVISED RECORDS.--WSP 1309: 1912. WSP 1509: 1889-94, 1911, 1913, 1916-18, 1920-21, 1925, 1927. WSP 1559: Drainage area. WDR MT-04-1: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 5,079.09 ft (NGVD 29). Aug. 12, 1889, to Nov. 4, 1893, nonrecording gages at site 2 mi upstream at different elevations. Sept. 2, 1910, to Apr. 19, 1935, nonrecording gages on bridge at present elevation.

REMARKS.--Records good. Natural storage in Yellowstone Lake. Diversions for irrigation of about 960 acres of which 40 acres lies downstream from station. U.S. Geological Survey satellite telemeter at station. Several observations of water temperature and specific conductance were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1350	942	894	804	910	799	942	2230	21200	7100	3040	1660
2	1300	965	902	792	923	763	1000	2160	17200	6830	2980	1620
3	1280	944	912	803	785	776	986	2170	14300	6570	2930	1600
4	1280	966	903	806	803	788	946	2340	13100	6320	2920	1580
5	1330	965	899	824	779	771	883	2480	11600	6090	2890	1550
6	1340	971	889	786	737	768	857	2380	11000	5960	2750	1560
7	1290	969	872	747	727	787	879	2270	10100	5810	2660	1590
8	1280	979	806	732	797	806	884	2270	10300	5660	2580	1590
9	1260	1010	778	728	795	824	914	2210	11200	5450	2550	1590
10	1240	992	793	706	805	843	1030	2150	12400	5240	2490	1550
11	1270	990	860	757	810	852	1210	2130	12500	5060	2430	1540
12	1260	976	837	791	794	872	1440	2220	11900	4940	2370	1530
13	1200	984	892	788	780	893	1730	2480	11500	4810	2300	1500
14	1200	974	872	788	814	956	2120	2980	11400	4690	2240	1460
15	1190	970	875	796	821	927	2350	4310	11400	4540	2210	1440
16	1170	940	858	748	809	936	2160	5770	11500	4390	2170	1420
17	1150	947	868	752	805	932	1900	7090	11300	4280	2150	1430
18	1140	923	785	725	810	873	1760	7140	11500	4170	2130	1370
19	1120	948	741	751	790	838	1630	5180	11100	4070	2080	1360
20	1120	936	822	770	788	860	1560	4440	10600	3970	2020	1340
21	1120	932	818	775	810	860	1750	4760	10100	3870	1970	1300
22	1120	930	830	777	822	857	2220	5520	9090	3760	1930	1280
23	1100	963	796	785	781	919	2760	8880	8490	3670	1920	1280
24	1120	864	656	769	699	856	2640	11300	7930	3590	1880	1260
25	1110	828	798	787	700	865	2710	14400	7480	3640	1830	1240
26	1070	837	772	786	754	894	3200	15500	7140	3680	1780	1220
27	1050	954	823	810	794	854	2670	16100	6980	3540	1760	1200
28	1090	968	820	823	804	835	2400	17900	7040	3390	1760	1180
29	1050	946	833	807	---	860	2250	20300	7210	3270	1740	1180
30	963	927	823	811	---	862	2210	20500	7100	3160	1720	1160
31	927	---	794	818	---	875	---	20400	---	3080	1690	---
TOTAL	36490	28440	25821	24142	22246	26401	51991	221960	325660	144600	69870	42580
MEAN	1177	948	833	779	794	852	1733	7160	10860	4665	2254	1419
MAX	1350	1010	912	824	923	956	3200	20500	21200	7100	3040	1660
MIN	927	828	656	706	699	763	857	2130	6980	3080	1690	1160
AC-FT	72380	56410	51220	47890	44120	52370	103100	440300	645900	286800	138600	84460

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1889 - 2003, BY WATER YEAR (WY)*

MEAN	1518	1187	963	850	838	919	1547	6105	11470	6782	3175	1946
MAX	2429	2058	1424	1361	1340	1376	3542	13590	22540	13260	5688	3207
(WY)	1973	1928	1984	1997	1997	1997	1990	1928	1997	1982	1982	1968
MIN	781	702	551	448	411	412	576	2575	4245	2025	1319	938
(WY)	1989	1989	1937	1937	1937	1937	1937	1975	1934	1919	1919	1988

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1889 - 2003*	
ANNUAL TOTAL	997550		1020201			
ANNUAL MEAN	2733		2795		3117	
HIGHEST ANNUAL MEAN					5158	1997
LOWEST ANNUAL MEAN					1903	1934
HIGHEST DAILY MEAN	18900	Jun 1	21200	Jun 1	32000	Jun 14 1918
LOWEST DAILY MEAN	599	Jan 2	656	Dec 24	380	Feb 5 1989
ANNUAL SEVEN-DAY MINIMUM	619	Jan 1	750	Jan 6	393	Feb 4 1937
MAXIMUM PEAK FLOW			23800	Jun 1	b32200	Jun 10 1996
MAXIMUM PEAK STAGE			9.39	Jun 1	11.50	Jun 14 1918
INSTANTANEOUS LOW FLOW			a600	Feb 25	c343	Feb 2 1989
ANNUAL RUNOFF (AC-FT)	1979000		2024000		2258000	
10 PERCENT EXCEEDS	8590		7140		8490	
50 PERCENT EXCEEDS	1200		1200		1400	
90 PERCENT EXCEEDS	646		788		760	

*--During periods of operation (August 1889 to November 1893, September 1910 to current year).
a--Gage height, 0.73 ft, result of freezeup.
b--Gage height, 10.92 ft.
c--Gage height, 0.12 ft, result of freezeup.

YELLOWSTONE RIVER BASIN

06192500 YELLOWSTONE RIVER NEAR LIVINGSTON, MT

LOCATION.--Lat 45°35'50", long 110°33'55" (NAD 27), in NE$^1/_4$NW$^1/_4$NW$^1/_4$ sec. 12, T.3 S., R.9 E., Park County, Hydrologic Unit 10070002, on right bank 50 ft downstream from bridge on Montana Secondary Highway 540, 2 mi downstream from Suce Creek, 4 mi south of Livingston, and at river mile 501.4.

DRAINAGE AREA.--3,551 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1897 to December 1905, August 1928 to September 1932, October 1937 to current year. Monthly discharge only for some periods, published in WSP 1309.

REVISED RECORDS.--WSP 1309: 1899. WSP 1509: 1902. WSP 1629: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 4,542.49 ft (NGVD 29). May 2, 1897, to Dec. 31, 1905, nonrecording gage on highway bridge at different elevation. Aug. 23, 1928, to Sept. 30, 1932, and Mar. 14, 1938, to Feb. 3, 1951, nonrecording gage on highway bridge at present elevation.

REMARKS.--Water-discharge records good except those for estimated daily discharges, which are fair. Diversions for irrigation of about 24,200 acres of which about 2,000 acres is downstream from station. U.S. Geological Survey satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1770	e1300	1310	1170	1180	e1200	1180	2780	24800	8260	3260	1840
2	1730	e1350	1290	1160	1250	e1150	1270	2760	22000	8000	3190	1810
3	1700	1330	1310	1160	1200	e1150	1250	2690	17900	7720	3130	1760
4	1700	1340	1300	1160	1130	e1200	1210	2820	16100	7370	3130	1740
5	1700	1350	1290	1170	1150	1160	1190	3000	14400	7070	3100	1720
6	1810	1340	1280	1170	e1100	1140	1180	3060	13400	6790	3010	1710
7	1760	1340	1260	1140	e1100	e1150	1170	2900	12400	6580	2890	1750
8	1730	1350	1220	1110	e1150	e1150	1160	2810	12100	6400	2800	1760
9	1730	1390	1180	1110	e1150	e1200	1160	2810	13100	6170	2740	1750
10	1690	1390	1180	e1100	1170	e1200	1220	2710	14600	5910	2730	1740
11	1650	1350	1190	e1100	1170	1160	1380	2670	15000	5710	2660	1720
12	1690	1350	1240	1150	1180	1170	1630	2640	14500	5570	2600	1720
13	1640	1350	1220	1170	1160	1170	2000	2770	13900	5390	2520	1720
14	1620	1340	1260	1160	1160	1220	2420	3250	13800	5210	2460	1680
15	1640	1350	1250	1160	1170	1230	2840	4120	14000	5040	2410	1640
16	1630	1310	1240	1150	1170	1210	2860	5420	13700	4860	2400	1660
17	1610	1290	1240	e1150	1170	1220	2550	6910	13800	4710	2340	1660
18	1590	1320	1230	e1150	1160	1200	2360	7270	13800	4550	2340	1640
19	1570	1310	1140	1130	1160	1150	2160	6050	13600	4440	2300	1590
20	1530	1320	e1100	1150	1140	1140	2010	5040	13100	4330	2240	1590
21	1530	1310	e1200	1150	1150	1150	2020	4930	12600	4250	2180	1570
22	1510	1310	1210	e1150	1170	1150	2450	5320	11200	4130	2130	1540
23	1500	1330	1200	e1150	e1150	1160	3070	7810	10300	4020	2100	1500
24	1490	1330	e1200	e1150	e1100	1180	3420	10600	9490	3940	2080	1490
25	1510	1180	e1050	1150	e1100	1140	3310	14200	8900	3900	2020	1470
26	1460	e1250	e1200	1150	e1150	1160	3640	16800	8420	4060	1970	1450
27	1440	1290	e1200	1170	e1200	1180	3610	17800	8150	3940	1940	1450
28	1450	1360	e1250	1180	e1200	1140	3140	20100	8150	3740	1910	1430
29	1470	1340	1230	1160	---	1130	2930	22600	8310	3550	1900	1440
30	1450	1320	1190	1160	---	1130	2790	24500	8290	3430	1880	1430
31	e1350	---	1170	1160	---	1140	---	23900	---	3320	1870	---
TOTAL	49650	39790	37830	35650	32440	36230	64580	243040	393810	162360	76230	48970
MEAN	1602	1326	1220	1150	1159	1169	2153	7840	13130	5237	2459	1632
MAX	1810	1390	1310	1180	1250	1230	3640	24500	24800	8260	3260	1840
MIN	1350	1180	1050	1100	1100	1130	1160	2640	8150	3320	1870	1430
AC-FT	98480	78920	75040	70710	64340	71860	128100	482100	781100	322000	151200	97130

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1897 - 2003, BY WATER YEAR (WY)*

MEAN	2020	1683	1386	1222	1218	1298	1964	7009	13400	7693	3633	2408
MAX	3115	2599	1984	1757	1800	1901	3852	13070	27140	14990	6000	3806
(WY)	1973	1984	1984	1984	1898	1898	1990	1897	1997	1975	1899	1968
MIN	1131	1099	930	727	763	899	1174	2751	4999	2748	1713	1281
(WY)	1989	1932	2002	1989	1989	1964	1961	1905	1987	1931	1988	2001

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1897 - 2003*	
ANNUAL TOTAL	1219910		1220580			
ANNUAL MEAN	3342		3344		3743	
HIGHEST ANNUAL MEAN					6119	1997
LOWEST ANNUAL MEAN					2395	2001
HIGHEST DAILY MEAN	24100	Jun 2	24800	Jun 1	36000	Jun 6 1997
LOWEST DAILY MEAN	850	Jan 3	1050	Dec 25	540	Feb 4 1989
ANNUAL SEVEN-DAY MINIMUM	886	Jan 29	1130	Jan 6	571	Feb 1 1989
MAXIMUM PEAK FLOW			27200	Jun 1	38000	Jun 6 1997
MAXIMUM PEAK STAGE			9.46	Jun 1	10.72	Jun 6 1997
ANNUAL RUNOFF (AC-FT)	2420000		2421000		2711000	
10 PERCENT EXCEEDS	9790		8270		9820	
50 PERCENT EXCEEDS	1630		1540		1880	
90 PERCENT EXCEEDS	950		1150		1130	

*--During periods operation (May 1897 to December 1905, August 1928 to September 1932, October 1937 to current year).
e--Estimated.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1965, 1970-94, May 1999 to current year.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: December 1999 to current year (seasonal records since 2003).
SUSPENDED-SEDIMENT DISCHARGE: May 1985 to September 1986.

INSTRUMENTATION.--Temperature recorder installed Nov. 23, 1999.

REMARKS.--Seasonal daily water temperature record good. Unpublished records of instantaneous water temperature and specific conductance are available in files of District office.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Maximum, 22.5°C, several days in July and Aug. 15, 16, 2003; minimum, 0.0°C on many days during winter period.
SEDIMENT CONCENTRATION: Maximum daily mean, 790 mg/L, May 28, 1986; minimum daily mean, 4 mg/L on several days in August 1985 and September 1986.
SEDIMENT LOAD: Maximum daily, 33,700 tons, June 2, 1986; minimum daily, 28 tons on several days in August and September 1985 and 1986.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: During period of seasonal operation, maximum, 22.5°C, several days in July and Aug. 15, 16; minimum, 3.5°C, Apr. 5.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instan-taneous dis-charge, cfs (00061)	pH, water, unfltrd field, std units (00400)	Specif. conduc-tance, wat unf uS/cm 25 degC (00095)	Temper-ature, air, deg C (00020)	Temper-ature, water, deg C (00010)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)
APR 2003									
15...	1430	2820	8.0	193	7.5	9.0	.60	.238	.010
MAY									
21...	1245	4960	8.3	144	15.0	9.0	.26	.069	.004
JUN									
03...	1315	18200	8.0	93	18.0	10.0	.35	.048	E.002
JUL									
30...	1000	3460	8.2	169	19.0	18.5	.14	E.017	<.002

Date	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Phos-phorus, water, unfltrd mg/L (00665)	Suspnd. sedi-ment, sieve diametr percent <.063mm (70331)	Sus-pended sedi-ment concen-tration mg/L (80154)	Sus-pended sedi-ment load, tons/d (80155)
APR 2003					
15...	.028	.165	80	88	670
MAY					
21...	.017	.072	64	40	536
JUN					
03...	.023	.23	58	290	14300
JUL					
30...	E.005	.022	65	8	75

Date	Time	Hard-ness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Potas-sium, water, fltrd, mg/L (00935)	Sodium adsorp-tion ratio (00931)	Sodium, water, fltrd, mg/L (00930)	Alka-linity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chlor-ide, water, fltrd, mg/L (00940)	Fluor-ide, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)
MAY 2003											
21...	1245	49	12.7	4.16	2.29	.6	9.03	52	3.90	.4	19.6
JUL											
30...	1000	54	14.1	4.68	2.93	.8	13.2	56	6.31	.6	17.4

E--Estimated.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003--Continued

Date	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of consti-tuents mg/L (70301)	Residue water, fltrd, tons/ acre-ft (70303)	Residue water, fltrd, tons/d (70302)	Arsenic water unfltrd ug/L (01002)	Cadmium water, unfltrd ug/L (01027)	Chrom-ium, water, unfltrd recover -able, ug/L (01034)	Copper, water, unfltrd recover -able, ug/L (01042)	Lead, water, unfltrd recover -able, ug/L (01051)	Nickel, water, unfltrd recover -able, ug/L (01067)	Zinc, water, unfltrd recover -able, ug/L (01092)
MAY 2003											
21...	12.3	96	.13	1290	13	<.2	1.0	4.0	.80	1.56	6
JUL											
30...	15.8	109	.15	1020	18	<.04	<.8	3.9	1.26	1.09	E2

E--Estimated.

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR APRIL 2003 TO SEPTEMBER 2003

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		APRIL			MAY			JUNE			JULY	
1	9.0	7.5	8.0	11.0	8.0	9.0	9.0	8.0	8.5	18.0	14.5	16.0
2	8.0	6.5	7.0	11.0	8.0	9.5	9.0	7.5	8.5	17.5	14.0	16.0
3	7.0	5.5	6.0	11.0	8.0	9.5	10.0	7.0	8.5	17.5	14.5	16.0
4	6.5	4.0	5.5	10.0	9.0	9.5	9.5	7.5	8.5	17.5	14.0	16.0
5	8.0	3.5	6.0	10.5	8.0	9.0	10.0	7.5	8.5	18.0	14.0	16.0
6	7.5	5.5	6.5	9.5	7.5	9.0	9.5	7.5	8.5	18.5	14.5	16.5
7	8.0	4.5	6.5	12.0	7.0	9.0	11.0	7.0	9.0	19.0	14.5	17.0
8	9.5	5.0	7.5	10.5	7.5	9.0	12.5	8.0	10.0	18.0	15.5	16.5
9	11.0	6.5	9.0	10.0	7.5	8.5	13.0	9.5	11.0	18.5	14.5	16.5
10	12.0	8.5	10.5	11.0	7.0	9.0	12.5	10.5	11.5	19.0	14.5	17.0
11	13.5	9.0	11.5	10.5	7.0	9.0	13.0	9.5	11.0	20.0	16.0	18.0
12	13.5	10.0	11.5	10.5	8.5	9.5	12.5	9.0	10.5	21.0	16.5	19.0
13	13.5	10.0	11.5	13.0	8.5	10.5	12.5	8.5	10.5	20.0	17.5	19.0
14	11.5	9.5	10.5	13.5	9.5	11.5	12.5	9.5	11.0	20.5	17.0	18.5
15	11.0	8.0	9.5	13.0	11.0	12.0	12.0	10.0	11.0	20.0	17.0	18.5
16	10.0	6.5	8.0	12.0	9.0	10.0	14.0	10.0	12.0	19.5	17.0	18.5
17	9.5	6.5	8.0	11.5	7.5	9.0	15.0	11.0	13.0	20.5	17.5	19.5
18	8.5	7.5	8.0	9.0	6.5	7.5	15.5	11.5	13.5	22.0	18.0	20.0
19	10.0	7.0	8.5	8.0	4.5	6.0	15.0	11.5	13.5	22.0	18.5	20.5
20	12.0	7.0	9.5	9.5	5.0	7.5	15.0	12.0	13.5	22.5	19.0	20.5
21	12.5	8.0	10.5	10.0	8.0	9.0	13.5	11.5	12.5	22.5	19.0	21.0
22	12.5	9.5	11.0	12.5	8.5	10.5	12.5	10.5	11.5	22.0	18.5	20.5
23	11.5	9.5	10.0	13.5	9.5	11.5	11.0	9.0	10.0	22.5	19.0	20.5
24	11.0	9.0	9.5	12.0	8.5	10.0	11.5	9.0	10.0	22.0	19.5	20.5
25	10.5	8.0	9.0	11.0	8.5	9.5	12.0	9.0	10.5	21.0	19.5	20.0
26	9.5	7.5	8.5	10.0	8.0	8.5	14.0	10.5	12.0	21.0	19.0	20.0
27	9.5	6.0	7.5	10.0	7.5	9.0	16.0	11.5	13.5	22.5	19.0	20.5
28	8.5	6.5	7.0	10.5	8.0	9.5	17.0	12.5	14.5	22.5	19.0	21.0
29	8.5	6.0	7.5	11.0	8.5	10.0	17.0	13.5	15.0	22.0	19.0	20.5
30	9.5	7.0	8.0	10.0	8.5	9.5	17.5	13.5	15.5	22.0	18.5	20.5
31	---	---	---	9.5	8.0	9.0	---	---	---	20.5	18.5	19.5
MONTH	13.5	3.5	8.6	13.5	4.5	9.3	17.5	7.0	11.2	22.5	14.0	18.7

YELLOWSTONE RIVER BASIN

06192500 YELLOWSTONE RIVER NEAR LIVINGSTON, MT--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR APRIL 2003 TO SEPTEMBER 2003--Continued

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN
		AUGUST			SEPTEMBER	
1	21.5	17.5	19.5	18.5	14.5	16.5
2	22.0	18.0	20.0	18.0	15.0	16.5
3	21.5	19.5	20.5	18.5	14.5	17.0
4	21.5	19.0	20.0	19.0	15.0	17.0
5	21.5	18.0	19.5	18.0	15.5	17.0
6	21.5	18.0	19.5	17.0	15.5	16.5
7	22.0	18.0	20.0	18.0	15.0	16.5
8	20.5	17.5	19.0	17.0	15.0	16.0
9	20.0	17.0	18.5	15.0	12.5	14.0
10	19.5	16.0	17.5	14.5	13.0	14.0
11	21.5	17.0	19.0	13.5	12.0	13.0
12	21.0	18.0	19.5	13.0	11.5	12.5
13	22.0	17.5	20.0	13.5	10.5	12.0
14	22.0	18.5	20.0	13.5	9.5	11.5
15	22.5	19.0	20.5	13.0	11.0	12.0
16	22.5	18.5	20.5	12.0	10.5	11.0
17	21.0	17.5	19.0	11.0	9.0	10.0
18	19.5	15.5	17.5	11.5	9.0	10.5
19	20.0	16.0	18.0	11.0	8.5	10.0
20	21.0	17.0	19.0	12.0	9.0	10.5
21	19.5	17.5	18.5	13.0	9.5	11.0
22	20.5	17.5	18.5	13.5	9.5	11.5
23	20.0	16.5	18.5	14.0	10.5	12.5
24	20.5	16.5	18.5	13.5	10.5	12.0
25	21.0	16.5	18.5	14.0	11.0	12.5
26	20.5	16.5	18.5	15.0	12.0	13.5
27	19.0	16.5	17.5	14.5	11.5	13.0
28	19.0	16.0	17.5	14.0	11.0	12.5
29	17.5	14.5	15.5	13.0	10.5	11.5
30	17.5	13.5	15.5	12.5	9.5	11.0
31	18.5	14.0	16.0	---	---	---
MONTH	22.5	13.5	18.7	19.0	8.5	13.2

YELLOWSTONE RIVER BASIN

06195600 SHIELDS RIVER NEAR LIVINGSTON, MT

LOCATION.--Lat 45°44'18", long 110°28'45" (NAD 27), in NE$^1/_4$SE$^1/_4$NW$^1/_4$ sec.22, T.1 S., R.10 E., Park County, Hydrologic Unit 10070003, on right bank 0.2 mi downstream from private road bridge, 6.5 mi northeast of Livingston, and at river mile 2.0.
DRAINAGE AREA.--852 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1978 to current year.
GAGE.--Water-stage recorder. Elevation of gage is 4,420 ft (NGVD 29). Oct. 1, 1978, to Aug. 12, 1980, water-stage recorder at site 0.2 mi upstream at elevation 7.89 ft higher.
REMARKS.--Water-discharge records good except those for estimated daily discharges, which are poor. Diversions for irrigation of about 32,000 acres upstream from station. National Weather Service satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	110	e105	98	80	277	e70	267	730	1510	215	50	43
2	111	e110	104	80	226	e70	304	689	1270	202	50	41
3	113	e110	103	82	137	e70	311	667	946	185	51	41
4	116	e110	93	80	129	e70	254	667	694	177	57	41
5	115	111	98	84	113	e70	239	706	541	174	53	38
6	115	109	92	81	e85	e70	234	694	493	165	48	38
7	111	108	91	80	e80	e65	216	651	469	150	48	41
8	108	113	e90	81	e90	e60	207	606	401	127	45	42
9	106	112	e100	e75	e100	e60	213	577	394	125	46	42
10	108	110	103	e60	109	e60	260	539	559	119	48	40
11	107	108	93	e65	e100	e90	308	518	810	109	52	40
12	105	105	91	75	e100	310	344	508	670	106	58	42
13	105	108	86	79	e100	882	407	607	565	103	55	51
14	109	108	94	76	e100	1410	461	654	487	93	49	67
15	108	106	93	74	93	1120	587	694	453	86	44	65
16	107	102	88	e65	83	650	627	764	443	85	43	64
17	107	104	e85	e60	92	361	513	793	424	72	46	65
18	108	103	80	e65	85	302	503	763	405	68	49	66
19	107	102	e75	e70	84	231	477	710	383	62	48	67
20	105	105	75	e75	83	206	435	615	352	54	40	67
21	105	108	e75	e65	87	201	441	533	372	52	41	66
22	105	108	e70	e55	86	189	491	518	371	47	43	66
23	104	111	e65	e65	62	229	670	589	362	43	45	62
24	102	e100	e60	e70	e50	210	1190	856	340	42	41	60
25	99	e85	e70	e75	e55	187	1260	1190	326	48	38	61
26	96	e105	e80	92	e60	180	1210	1540	304	58	38	58
27	97	105	e85	127	e65	180	1050	1670	273	58	40	56
28	103	105	e90	238	e70	165	868	1630	253	60	43	57
29	106	105	e90	166	---	160	777	1590	245	55	44	59
30	e100	99	e85	129	---	174	758	1650	235	51	45	60
31	e100	---	81	124	---	223	---	1550	---	48	44	---
TOTAL	3298	3180	2683	2693	2801	8325	15882	26468	15350	3039	1442	1606
MEAN	106	106	86.5	86.9	100	269	529	854	512	98.0	46.5	53.5
MAX	116	113	104	238	277	1410	1260	1670	1510	215	58	67
MIN	96	85	60	55	50	60	207	508	235	42	38	38
AC-FT	6540	6310	5320	5340	5560	16510	31500	52500	30450	6030	2860	3190

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1979 - 2003, BY WATER YEAR (WY)

MEAN	148	133	108	102	124	181	376	817	761	314	131	130
MAX	275	195	145	225	363	461	627	1962	2260	1135	677	388
(WY)	1979	1984	1990	1984	1996	1997	1996	1997	1997	1993	1993	1993
MIN	51.5	73.8	73.6	55.5	59.8	76.9	145	198	152	53.6	25.6	31.2
(WY)	1989	1989	1988	1988	1988	2002	2000	1987	1985	1988	1988	1988

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1979 - 2003	
ANNUAL TOTAL	61851		86767			
ANNUAL MEAN	169		238		278	
HIGHEST ANNUAL MEAN					610	1997
LOWEST ANNUAL MEAN					114	2000
HIGHEST DAILY MEAN	1290	Jun 3	1670	May 27	4760	Jun 20 1979
LOWEST DAILY MEAN	50	Feb 25	38	Aug 25	20	Aug 21 1988
ANNUAL SEVEN-DAY MINIMUM	63	Feb 19	40	Sep 5	22	Aug 20 1988
MAXIMUM PEAK FLOW			1850	Mar 14	5600	Jun 20 1979
MAXIMUM PEAK STAGE			4.64	Mar 14	b6.80	Jun 20 1979
INSTANTANEOUS LOW FLOW			a34	Sep 5	c17	Aug 20 1988
ANNUAL RUNOFF (AC-FT)	122700		172100		201000	
10 PERCENT EXCEEDS	440		659		687	
50 PERCENT EXCEEDS	99		104		138	
90 PERCENT EXCEEDS	70		48		70	

a--Gage height, 1.75 ft.
b--Site and datum then in use.
c--Gage height, 1.44 ft.
e--Estimated.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--May 1999 to current year.
PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: October 1999 to current year (seasonal records, except for water year 2002).
INSTRUMENTATION.--Temperature recorder installed Sept. 14, 1999.
REMARKS.--Water temperature records excellent. Unpublished records of instantaneous water temperature and specific conductance are available in files of the District office.
EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Maximum, 25.0°C, July 1-3, 2001, July 13, 2002, July 18, 20, 2003; minimum, 0.0°C on many days during winter months.
EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: During period of seasonal operation, maximum, 25.0°C, July 18, 20; minimum, 1.5°C, Apr. 4.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instan-taneous dis-charge, cfs (00061)	pH, water, unfltrd field, std units (00400)	Specif. conduc-tance, wat unf uS/cm 25 degC (00095)	Temper-ature, air, deg C (00020)	Temper-ature, water, deg C (00010)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)
APR 2003									
16...	0930	653	8.3	353	5.0	4.5	.91	.155	.004
MAY									
21...	1020	540	8.6	314	10.0	9.0	.30	<.022	<.002
JUN									
03...	1700	866	8.4	249	20.0	13.0	.48	.119	<.002
JUL									
30...	0750	53	8.4	512	16.0	15.0	.27	.163	.004

Date	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Phos-phorus, water, unfltrd mg/L (00665)	Suspnd. sedi-ment, sieve diametr percent <.063mm (70331)	Sus-pended sedi-ment concen-tration mg/L (80154)	Sus-pended sedi-ment load, tons/d (80155)
APR 2003					
16...	<.007	.26	84	192	339
MAY					
21...	<.007	.048	76	33	48
JUN					
03...	.008	.198	70	147	344
JUL					
30...	<.007	.016	42	35	5.0

Date	Time	Hard-ness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Potas-sium, water, fltrd, mg/L (00935)	Sodium adsorp-tion ratio (00931)	Sodium, water, fltrd, mg/L (00930)	Alka-linity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chlor-ide, water, fltrd, mg/L (00940)	Fluor-ide, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)
MAY 2003											
21...	1020	150	43.9	8.76	.86	.5	13.4	148	3.72	.2	8.13
JUL											
30...	0750	220	63.1	13.9	1.46	.9	30.5	226	6.42	.3	9.71

Date	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of consti-tuents mg/L (70301)	Residue water, fltrd, tons/ acre-ft (70303)	Residue water, fltrd, tons/d (70302)	Arsenic water unfltrd ug/L (01002)	Cadmium water, unfltrd ug/L (01027)	Chrom-ium, water, unfltrd recover-able, ug/L (01034)	Copper, water, unfltrd recover-able, ug/L (01042)	Lead, water, unfltrd recover-able, ug/L (01051)	Nickel, water, unfltrd recover-able, ug/L (01067)	Zinc, water, unfltrd recover-able, ug/L (01092)
MAY 2003											
21...	18.0	186	.25	271	<2	<.2	1.0	2.1	.56	1.65	3
JUL											
30...	31.0	293	.40	41.9	<2	<.04	<.8	1.1	.13	1.62	<2

WATER TEMPERATURE, DEGREES CELSIUS, APRIL 2003 TO SEPTEMBER 2003

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		APRIL			MAY			JUNE			JULY	
1	8.0	6.0	7.0	9.5	6.5	7.5	14.0	11.0	12.5	21.0	15.0	18.0
2	7.0	4.5	5.5	10.0	6.5	8.5	12.5	9.5	11.0	21.5	15.0	18.0
3	5.0	3.5	4.5	10.0	7.0	8.5	13.5	8.5	11.0	21.0	14.5	18.0
4	5.5	1.5	3.5	11.0	7.5	9.0	12.5	10.5	11.5	21.0	15.0	18.0
5	8.0	2.0	5.0	9.5	6.0	8.0	12.5	9.5	11.0	21.0	14.0	17.5
6	8.0	4.0	5.5	10.0	6.0	8.0	11.5	9.5	10.0	22.0	14.5	18.0
7	8.5	3.0	6.0	12.0	7.0	9.0	14.5	8.0	11.5	22.0	14.5	18.0
8	10.0	3.5	6.5	10.0	7.0	8.5	17.5	11.0	14.0	19.0	15.5	17.0
9	12.0	5.5	9.0	9.5	6.0	7.5	18.0	13.5	15.5	21.5	13.5	17.5
10	13.0	7.5	10.0	9.5	6.5	8.0	16.5	12.5	15.0	22.5	14.5	18.5
11	11.5	7.0	9.5	10.5	6.0	8.0	15.5	12.0	14.0	22.5	15.5	19.0
12	12.0	7.0	9.5	10.5	8.5	9.5	16.5	11.0	14.0	23.5	15.5	20.0
13	12.0	8.0	10.0	13.0	8.0	10.5	15.5	12.5	14.0	23.0	16.0	19.5
14	12.0	8.0	9.5	14.5	8.5	11.5	17.0	12.0	14.5	23.0	15.5	19.0
15	9.5	6.0	7.5	13.5	10.5	12.0	16.5	13.0	15.0	23.0	15.0	19.0
16	9.5	4.0	6.5	12.0	9.0	10.0	19.5	13.5	16.5	23.0	16.0	19.5
17	9.5	6.0	7.5	11.0	7.5	9.0	20.0	14.5	17.5	24.0	16.0	20.0
18	8.0	6.5	7.0	10.0	6.5	8.0	19.5	14.5	17.0	25.0	17.0	21.0
19	9.0	5.5	7.0	9.0	4.0	6.0	19.0	14.5	17.0	24.5	16.5	20.5
20	11.5	5.5	8.5	11.0	5.5	8.5	17.5	13.5	15.5	25.0	16.5	21.0
21	12.5	7.0	9.5	11.5	9.0	10.0	15.5	12.5	13.5	24.5	16.5	20.5
22	12.5	8.0	10.5	15.5	9.0	12.0	13.5	11.5	12.5	24.5	15.5	20.0
23	11.0	8.5	9.5	16.0	11.5	14.0	14.0	9.0	11.5	24.5	15.5	20.0
24	10.0	6.5	8.5	16.5	11.5	14.0	12.5	10.5	11.5	23.5	16.0	19.5
25	11.0	7.5	9.0	15.5	11.5	13.5	15.0	9.0	11.5	19.0	16.5	17.5
26	9.5	6.5	8.0	13.5	10.0	12.0	17.0	10.5	13.5	21.5	15.5	18.0
27	8.5	4.0	6.5	15.5	10.0	12.5	19.0	12.0	15.5	23.0	15.5	19.5
28	8.0	6.0	6.5	15.5	10.0	13.0	19.5	14.5	17.0	23.5	15.5	19.5
29	7.5	5.5	6.5	16.0	11.5	14.0	21.0	14.0	17.5	23.0	15.0	19.0
30	7.5	6.0	6.5	15.0	10.5	12.0	21.5	15.5	18.0	23.0	14.5	19.0
31	---	---	---	13.5	9.5	11.5	---	---	---	21.0	15.0	18.0
MONTH	13.0	1.5	7.5	16.5	4.0	10.0	21.5	8.0	14.0	25.0	13.5	19.0

		AUGUST			SEPTEMBER	
1	23.0	14.0	18.5	20.0	11.5	15.5
2	24.0	15.0	19.0	18.5	12.0	15.0
3	20.0	16.5	18.0	19.5	11.5	15.5
4	22.0	15.5	18.0	19.5	12.0	15.5
5	21.5	13.5	17.5	17.5	13.0	15.0
6	22.5	14.5	18.0	17.0	14.0	15.5
7	22.5	14.0	18.0	19.5	13.5	16.0
8	21.0	14.0	17.5	16.5	13.0	14.5
9	21.5	14.0	17.0	16.5	10.5	13.5
10	20.0	13.5	16.5	15.0	11.5	13.0
11	22.0	13.5	17.0	13.5	10.5	12.0
12	21.5	14.5	18.0	13.5	11.0	12.0
13	22.5	14.5	18.5	14.0	9.5	11.5
14	22.5	15.0	19.0	15.5	7.5	11.5
15	23.0	15.5	19.0	14.0	10.0	12.0
16	22.5	15.5	19.0	12.0	10.0	11.0
17	18.0	14.0	16.0	11.5	8.0	10.0
18	20.5	12.0	16.0	12.0	7.0	9.5
19	21.5	13.5	17.5	12.0	7.0	9.5
20	22.0	14.5	18.0	13.5	8.0	11.0
21	20.0	13.5	17.0	13.5	8.0	10.5
22	20.5	15.0	17.5	14.5	8.0	11.5
23	21.0	14.5	17.5	14.5	9.5	12.0
24	22.0	13.0	17.0	15.0	10.0	12.0
25	22.0	13.5	17.5	15.5	10.0	12.5
26	21.0	13.0	17.0	16.0	11.0	13.5
27	17.0	14.5	15.5	15.0	9.5	12.5
28	19.5	12.0	15.5	14.5	9.0	11.5
29	16.5	12.5	14.5	13.0	9.0	11.0
30	18.5	11.0	14.5	13.0	7.5	10.5
31	19.5	11.5	15.5	---	---	---
MONTH	24.0	11.0	17.5	20.0	7.0	12.5

YELLOWSTONE RIVER BASIN

06200000 BOULDER RIVER AT BIG TIMBER, MT

LOCATION.--Lat 45°50'03", long 109°56'17" (NAD 27), in $SE^1/_4NE^1/_4SE^1/_4$ sec.14, T.1 N., R.14 E., Sweet Grass County, Hydrologic Unit 10070002, on left bank 150 ft upstream from Old Boulder Bridge, 1 mi east of Big Timber, and at river mile 1.6.

DRAINAGE AREA.--523 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1947 to December 1953, March 1955 to current year. Monthly discharge only for April 1947, published in WSP 1309.

GAGE.--Water-stage recorder. Elevation of gage is 4,056.39 ft (NGVD 29) (levels by U.S. Army Corps of Engineers).

REMARKS.--Water-discharge records good except those for estimated daily discharges, which are poor. Diversions for irrigation of about 13,300 acres, of which about 250 acres is downstream from station. Several observations of water temperature and specific conductance were made during the year. U.S. Geological Survey satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	69	e90	124	e110	113	e80	126	243	5270	1760	178	66
2	76	e100	121	112	129	e90	137	228	4190	1670	165	64
3	77	e120	124	117	103	e90	129	210	2920	1520	145	63
4	82	e140	115	112	111	e80	121	213	2570	1300	146	62
5	84	152	e110	114	e90	e90	114	227	2020	1130	136	60
6	92	150	123	107	e80	e90	110	222	1820	1030	121	59
7	96	146	114	103	e70	e80	110	201	1610	967	115	60
8	108	145	e100	102	e85	e80	104	180	1500	901	107	63
9	121	142	e110	96	e90	e90	105	178	1970	808	104	63
10	125	140	123	e65	e95	e100	108	185	2870	683	106	62
11	124	134	118	e75	e90	e110	117	170	3050	612	104	62
12	136	130	114	e100	e95	121	133	157	2950	582	101	62
13	135	133	126	e120	e100	130	158	168	2770	564	98	65
14	135	133	118	119	118	149	198	198	3050	535	94	68
15	134	132	117	e110	108	138	253	245	3130	486	90	66
16	124	130	114	e85	104	126	257	364	2730	446	88	68
17	119	128	111	e90	101	119	222	490	2970	408	88	89
18	125	127	105	e100	99	115	208	520	3090	371	88	101
19	138	126	86	e105	96	110	193	473	3300	353	86	91
20	151	124	82	111	93	103	177	405	3190	326	82	88
21	155	124	e80	e90	101	100	166	381	2910	302	79	85
22	155	127	e80	e60	e90	100	170	393	2140	283	78	82
23	150	132	e75	e80	e70	105	208	591	1680	260	76	78
24	128	e110	e75	e110	e55	110	277	1140	1450	240	74	76
25	144	e90	e70	e120	e60	101	324	1870	1250	237	72	76
26	149	e100	e80	126	e70	101	350	2570	1120	286	71	74
27	143	143	e90	137	e80	110	328	3030	1120	308	69	74
28	145	138	e100	124	e80	105	287	3420	1390	264	70	72
29	e140	135	e110	109	---	106	275	4370	1550	233	70	75
30	e120	129	e110	107	---	105	255	5370	1640	211	72	77
31	e100	---	e110	105	---	118	---	4750	---	188	69	---
TOTAL	3780	3850	3235	3221	2576	3252	5720	33162	73220	19264	3042	2151
MEAN	122	128	104	104	92.0	105	191	1070	2441	621	98.1	71.7
MAX	155	152	126	137	129	149	350	5370	5270	1760	178	101
MIN	69	90	70	60	55	80	104	157	1120	188	69	59
AC-FT	7500	7640	6420	6390	5110	6450	11350	65780	145200	38210	6030	4270

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1948 - 2003, BY WATER YEAR (WY)*

MEAN	218	190	153	135	128	128	209	1139	2756	1242	238	189
MAX	417	282	214	214	197	179	390	2241	4638	4307	709	534
(WY)	1973	1998	1976	1984	1985	1979	1962	1976	1997	1975	1968	1968
MIN	74.9	108	71.8	54.7	55.2	92.9	66.7	429	894	193	21.9	27.7
(WY)	2002	1988	1988	2001	2001	2002	1961	1953	1987	1988	1961	1988

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1948 - 2003*	
ANNUAL TOTAL	142255		156473			
ANNUAL MEAN	390		429		563	
HIGHEST ANNUAL MEAN					905	1975
LOWEST ANNUAL MEAN					310	2001
HIGHEST DAILY MEAN	4610	Jun 2	5370	May 30	8540	Jul 5 1975
LOWEST DAILY MEAN	60	Jan 1	55	Feb 24	12	Aug 26 1961
ANNUAL SEVEN-DAY MINIMUM	64	Sep 22	61	Sep 4	13	Aug 25 1961
MAXIMUM PEAK FLOW			5920	May 30	a9940	Jun 5 1997
MAXIMUM PEAK STAGE			6.86	May 30	9.00	Jun 5 1997
INSTANTANEOUS LOW FLOW					10	Aug 26 1961
ANNUAL RUNOFF (AC-FT)	282200		310400		408000	
10 PERCENT EXCEEDS	1260		1410		1730	
50 PERCENT EXCEEDS	115		120		180	
90 PERCENT EXCEEDS	77		75		100	

*--During periods of operation (April 1947 to December 1953, March 1955 to current year).
a--From rating curve extended above 6,000 ft^3/s.
e--Estimated.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water year 1965, May 1999 to current year.
PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Seasonal records, August 1999 to current year.
INSTRUMENTATION.--Temperature recorder installed Aug. 26, 1999.
REMARKS--Seasonal daily water temperature record good. Unpublished records of instantaneous specific conductance and temperature data are available in files of the District office.
EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE (seasonal records).: Maximum, 24.5°C, Aug. 6, 2001; minimum, 0.0°C, Apr. 2, 3, 2002.
EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: For period of seasonal operation, maximum, 23.0°C, Aug. 6, 14, 15; minimum, 2.0°C, Apr. 4.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instan-taneous dis-charge, cfs (00061)	pH, water, unfltrd field, std units (00400)	Specif. conduc-tance, wat unf uS/cm 25 degC (00095)	Temper-ature, air, deg C (00020)	Temper-ature, water, deg C (00010)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)
APR 2003									
15...	1930	270	8.4	190	3.0	10.0	.26	E.016	<.002
MAY									
21...	0750	383	8.2	152	6.0	9.5	.16	.022	<.002
JUN									
04...	0730	2750	7.9	69	9.0	7.5	.17	.053	<.002
JUL									
29...	1800	231	8.7	212	29.0	21.5	.11	E.012	<.002

Date	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Phos-phorus, water, unfltrd mg/L (00665)	Suspnd. sedi-ment, sieve diametr percent <.063mm (70331)	Sus-pended sedi-ment concen-tration mg/L (80154)	Sus-pended sedi-ment load, tons/d (80155)
APR 2003					
15...	<.007	.021	70	12	8.7
MAY					
21...	<.007	.009	67	11	11
JUN					
04...	<.007	.030	60	30	223
JUL					
29...	<.007	.006	70	2	1.2

Date	Time	Hard-ness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Potas-sium, water, fltrd, mg/L (00935)	Sodium adsorp-tion ratio (00931)	Sodium, water, fltrd, mg/L (00930)	Alka-linity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chlor-ide, water, fltrd, mg/L (00940)	Fluor-ide, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)
MAY 2003											
21...	0750	71	19.6	5.38	1.23	.2	2.91	63	.62	<.2	8.19
JUL											
29...	1800	100	29.3	7.60	1.53	.2	3.88	91	.84	<.2	9.58

Date	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of consti-tuents mg/L (70301)	Residue water, fltrd, tons/ acre-ft (70303)	Residue water, fltrd, tons/d (70302)	Arsenic water unfltrd ug/L (01002)	Cadmium water, unfltrd ug/L (01027)	Chrom-ium, water, unfltrd recover-able, ug/L (01034)	Copper, water, unfltrd recover-able, ug/L (01042)	Lead, water, unfltrd recover-able, ug/L (01051)	Nickel, water, unfltrd recover-able, ug/L (01067)	Zinc, water, unfltrd recover-able, ug/L (01092)
MAY 2003											
21...	13.5	89	.12	92.2	<2	<.2	E.5	1.0	.13	.71	3
JUL											
29...	18.0	125	.17	77.9	<2	<.04	<.8	.6	<.06	.78	<2

E--Estimated.

YELLOWSTONE RIVER BASIN

06200000 BOULDER RIVER AT BIG TIMBER, MT--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR APRIL 2003 TO SEPTEMBER 2003

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		APRIL			MAY			JUNE			JULY	
1	10.0	7.5	9.0	11.5	7.0	8.5	9.0	6.5	8.0	14.5	11.5	13.0
2	7.5	5.5	6.5	13.5	7.0	10.0	8.0	6.0	7.0	15.0	11.5	13.0
3	7.5	4.0	5.5	12.0	7.5	10.0	9.5	6.0	8.0	15.5	11.5	13.5
4	8.5	2.0	5.0	13.0	8.5	10.5	9.5	7.0	8.0	15.5	11.5	13.5
5	9.5	2.5	5.5	12.0	7.0	9.5	8.0	6.0	7.0	16.5	11.5	14.0
6	8.0	4.0	6.0	13.0	6.5	9.5	9.0	6.0	7.5	16.5	12.5	14.5
7	10.0	3.5	6.5	14.0	8.0	11.0	11.0	5.5	8.0	17.0	12.5	14.5
8	13.0	4.0	8.0	12.5	9.0	10.5	13.0	8.0	10.5	16.0	13.0	14.5
9	15.0	6.5	10.5	10.5	8.0	9.5	11.5	9.5	10.5	17.0	12.0	14.5
10	15.0	8.0	11.5	10.5	7.0	8.5	10.5	8.5	9.5	18.0	12.5	15.5
11	14.5	8.5	11.5	14.0	7.0	10.5	11.0	8.0	9.5	19.0	13.5	16.0
12	16.0	9.0	12.0	14.0	8.5	11.0	11.0	7.5	9.5	19.5	14.0	17.0
13	15.0	9.0	12.0	15.5	8.5	12.0	10.5	8.0	9.0	18.5	15.0	17.0
14	14.0	10.5	12.0	18.0	9.5	13.5	11.0	8.0	9.5	19.0	13.5	16.5
15	12.5	8.0	10.0	16.5	11.5	14.0	10.0	8.5	9.0	19.0	14.0	16.5
16	12.0	5.5	8.5	13.5	10.0	11.5	12.0	8.0	10.0	19.0	14.0	16.5
17	11.0	6.5	9.0	12.5	8.5	10.5	12.5	9.0	10.5	20.5	14.5	17.5
18	9.0	7.5	8.5	11.0	6.5	8.5	12.0	9.0	11.0	21.0	15.0	18.0
19	13.0	7.0	9.5	9.5	4.5	6.5	11.5	9.0	10.5	21.5	15.5	18.5
20	14.5	6.5	10.0	12.5	5.5	9.0	10.5	9.0	10.0	21.5	15.5	18.5
21	15.5	8.0	11.5	13.0	9.5	11.0	10.0	8.5	9.5	22.0	16.0	19.0
22	16.5	9.0	12.5	15.5	10.0	12.0	9.0	7.5	8.5	22.0	15.5	18.5
23	13.0	10.5	11.5	15.5	11.5	13.5	9.5	6.5	8.0	22.5	16.0	19.0
24	15.0	9.5	12.0	14.0	10.0	12.5	8.5	7.5	8.0	21.5	16.5	18.5
25	14.5	10.5	12.0	13.0	9.0	10.5	11.0	6.5	9.0	19.0	16.5	17.5
26	11.0	7.5	9.5	10.5	7.5	8.5	13.5	9.0	11.5	20.0	15.5	17.5
27	11.5	5.0	8.0	10.5	7.0	8.5	15.5	10.0	12.5	21.0	16.0	18.0
28	9.0	6.5	7.5	10.5	6.5	8.5	15.5	11.5	13.5	21.5	16.0	18.5
29	7.5	6.0	6.5	10.5	7.0	9.0	15.5	11.0	13.5	21.5	15.5	18.5
30	8.5	6.5	7.5	10.0	6.0	7.5	14.5	12.0	13.0	22.0	15.0	18.5
31	---	---	---	8.5	6.5	7.5	---	---	---	20.5	15.0	17.5
MONTH	16.5	2.0	9.0	18.0	4.5	10.0	15.5	5.5	9.5	22.5	11.5	16.5

		AUGUST			SEPTEMBER	
1	22.0	14.5	18.0	20.0	12.0	16.0
2	22.5	15.0	18.5	19.5	13.0	16.0
3	19.0	16.5	17.5	19.5	12.0	15.5
4	21.5	15.5	18.0	19.5	12.5	16.0
5	22.0	14.0	17.5	17.5	13.5	15.5
6	23.0	15.0	19.0	17.5	14.5	16.0
7	22.5	15.5	19.0	19.0	14.0	16.5
8	20.5	15.0	18.0	16.0	12.5	14.5
9	21.5	14.0	17.5	15.5	9.5	12.5
10	19.0	14.0	16.5	14.5	11.5	12.5
11	19.0	14.0	16.5	15.5	10.0	12.5
12	20.5	15.0	17.5	13.5	10.0	12.0
13	22.5	15.0	18.5	13.5	8.5	10.5
14	23.0	15.5	19.0	15.0	8.0	11.5
15	23.0	16.0	19.5	14.0	10.5	12.5
16	22.0	16.0	19.0	12.5	10.0	11.0
17	18.5	14.5	15.5	11.5	8.5	9.5
18	21.0	13.0	16.5	12.0	7.0	9.5
19	21.5	14.5	17.5	12.5	8.0	10.0
20	22.0	15.0	18.0	15.0	9.0	11.5
21	20.5	14.5	17.5	13.5	8.5	11.0
22	21.5	15.5	18.0	14.5	8.0	11.0
23	22.0	15.0	18.0	15.0	10.0	12.5
24	21.5	14.5	18.0	15.0	10.5	12.5
25	21.5	14.5	18.0	16.0	10.0	12.5
26	21.5	14.0	17.5	16.5	11.0	13.5
27	19.0	15.5	17.0	15.5	10.0	12.5
28	20.0	13.5	16.5	15.0	9.0	12.0
29	16.0	13.0	14.5	13.0	9.0	11.0
30	18.5	10.5	14.0	13.5	8.0	10.5
31	19.5	12.0	15.5	---	---	---
MONTH	23.0	10.5	17.5	20.0	7.0	12.5

06204050 WEST ROSEBUD CREEK NEAR ROSCOE, MT

LOCATION.--Lat 45°14'35", long 109°43'50" (NAD 27), in NE$^1/_4$ sec.10, T.7 S., R.16 E., Stillwater County, Hydrologic Unit 10070005, on left bank at Mystic Lake powerplant, 2.0 mi downstream from Mystic Lake, 13.5 mi southwest of Roscoe, and at river mile 26.8.
DRAINAGE AREA.--52.1 mi^2.
PERIOD OF RECORD.--September 1965 to current year.
GAGE.--Water-stage recorder and rectangular weir. Elevation of gage is 6,535.60 ft (NGVD 29).
REMARKS.--Records good. Flow regulated by Mystic Lake (station number 06204000). Several observations of water temperature and specific conductance were made during the year. U.S. Geological Survey satellite telemeter at station.
AVERAGE DISCHARGE.--38 years, 122 ft^3/s, 31.80 in/yr, 88,390 acre-ft/yr, adjusted for change in contents in Mystic Lake.
EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,630 ft^3/s, July 6, 1975, gage height, 4.71 ft; minimum daily, 2.5 ft^3/s, Apr. 3, 4, 6, 7, 1967.
EXTREMES FOR CURRENT YEAR.--Maximum discharge, 466 ft^3/s, July 2, gage height, 2.07 ft; minimum daily, 20 ft^3/s, Apr 6-8.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	118	114	103	79	68	83	38	55	122	359	229	139
2	118	113	104	78	67	81	37	55	115	439	217	139
3	118	111	108	77	67	81	37	55	110	430	211	139
4	118	111	116	75	68	82	31	51	107	408	210	140
5	118	110	116	75	67	81	21	38	132	385	205	139
6	118	110	115	75	67	82	20	38	170	370	203	140
7	93	110	114	73	72	82	20	37	167	370	199	140
8	70	109	114	74	81	82	20	37	169	391	197	140
9	81	108	114	74	80	81	21	37	171	353	196	136
10	116	110	114	74	81	81	23	37	174	314	194	105
11	118	114	114	74	81	81	24	38	177	264	190	90
12	117	113	112	72	80	81	25	39	176	287	187	90
13	117	110	111	72	81	84	27	39	176	350	186	90
14	117	110	111	72	81	84	26	40	178	355	185	91
15	117	110	111	72	81	83	27	41	177	353	185	90
16	116	109	111	72	81	84	25	44	177	327	184	91
17	118	110	111	71	82	84	23	44	178	305	184	91
18	118	108	86	70	82	84	22	43	176	269	182	91
19	118	106	82	69	81	83	21	42	178	210	181	91
20	117	107	62	70	81	83	21	39	181	238	182	92
21	118	108	81	70	81	83	21	40	298	264	185	92
22	118	108	81	69	81	82	50	40	411	270	185	92
23	118	108	77	68	81	84	65	46	336	270	185	93
24	118	106	79	68	81	52	42	59	265	269	185	93
25	118	106	79	68	82	35	41	80	231	304	168	92
26	118	106	79	66	82	36	41	88	200	375	133	93
27	118	106	79	67	81	36	39	99	190	374	133	95
28	116	106	79	67	81	35	49	110	187	326	135	95
29	114	104	77	66	---	35	55	116	192	281	137	95
30	113	103	66	67	---	35	54	120	242	264	135	90
31	113	---	79	68	---	36	---	121	---	246	136	---
TOTAL	3523	3264	2985	2212	2179	2196	966	1768	5763	10020	5624	3194
MEAN	114	109	96.3	71.4	77.8	70.8	32.2	57.0	192	323	181	106
MAX	118	114	116	79	82	84	65	121	411	439	229	140
MIN	70	103	62	66	67	35	20	37	107	210	133	90
AC-FT	6990	6470	5920	4390	4320	4360	1920	3510	11430	19870	11160	6340

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1966 - 2003, BY WATER YEAR (WY)

MEAN	94.2	83.1	74.3	66.9	60.5	55.0	42.5	73.9	220	366	196	122
MAX	167	178	118	148	92.0	124	108	134	558	712	277	183
(WY)	1977	1986	1980	1980	1979	1979	1979	1969	1974	1975	1997	1971
MIN	33.4	31.2	28.4	25.7	28.9	21.7	3.57	16.2	76.5	158	103	38.5
(WY)	1989	1975	1979	1979	1985	1987	1967	1978	1998	1985	1988	1988

ADJUSTED FOR CHANGE IN CONTENTS IN MYSTIC LAKE

MEAN †	76.4	56.3	40.3	27.5	25.7	21.8	32.5	179	400	336	145	68.1
CFSM †	1.47	1.08	0.77	0.53	0.49	0.42	0.62	3.44	7.68	6.45	2.78	1.31
IN †	1.69	1.21	0.89	0.61	0.51	0.48	0.70	3.96	8.57	7.45	3.21	1.46
AC-FT†	4700	3350	2480	1690	1430	1340	1930	11000	23800	20690	8920	4050

OBSERVED

CAL YR 2002	TOTAL	44450	MEAN	122	MAX	634	MIN	29	AC-FT	88160		
WTR YR 2003	TOTAL	43690	MEAN	120	MAX	439	MIN	20	AC-FT	86670		

ADJUSTED

CAL YR 2002	TOTAL	45910	MEAN	126	CFSM	2.42	IN	32.77	AC-FT	91060		
WTR YR 2003	TOTAL	43050	MEAN	118	CFSM	2.26	IN	30.72	AC-FT	85370		

†--Adjusted for change in contents in Mystic Lake.

YELLOWSTONE RIVER BASIN

06205000 STILLWATER RIVER NEAR ABSAROKEE, MT

LOCATION.--Lat 45°33'04", long 109°23'12" (NAD 27), in $NE^1/_4NE^1/_4NW^1/_4$ sec.28, T.3 S., R.19 E., Stillwater County, Hydrologic Unit 10070005, on right bank 3 mi downstream from Rosebud Creek, 3.5 mi northeast of Absarokee, 9 mi southwest of Columbus, and at river mile 9.4.
DRAINAGE AREA.--975 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1910 to September 1914 (no winter records), March 1935 to September 1995, October 1995 to September 2000 (seasonal records only), October 2000 to current year.
REVISED RECORDS.--WSP 1309: 1911(M). WSP 1729: Drainage area.
GAGE.--Water-stage recorder. Elevation of gage is 3,873.8 ft (NGVD 29) (levels by U.S. Army Corps of Engineers). Prior to Oct. 1, 1914, nonrecording gage, and Mar. 26, 1935, to Sept. 30, 1942, nonrecording gage, at bridge 2 mi upstream at different elevations.
REMARKS.--Water-discharge records good except those for estimated daily discharges, which are poor. Flow partly regulated by Mystic Lake (station number 06204000). Diversions for irrigation of about 24,300 acres, of which 400 acres lies downstream from station. U. S. Geological Survey satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	415	311	317	272	277	260	391	610	6140	2700	911	397
2	440	344	317	261	309	235	389	585	5040	2780	835	375
3	445	366	319	279	243	e230	366	529	3750	2670	758	376
4	460	377	294	272	e240	e230	327	522	3130	2510	737	367
5	440	370	e295	267	e230	227	307	533	2580	2370	698	348
6	428	369	e295	254	219	e225	295	506	2440	2270	693	347
7	416	370	e295	246	199	e220	294	483	2130	2230	648	359
8	389	366	297	248	251	218	283	485	1940	2190	624	380
9	372	357	e295	236	251	212	279	533	2240	2030	601	395
10	375	352	e290	178	265	268	287	658	3070	1870	587	395
11	407	345	e290	167	254	297	315	665	3530	1830	563	371
12	416	330	287	249	251	319	353	632	3420	1770	534	363
13	415	332	327	e250	259	391	398	667	3330	1810	516	371
14	405	319	311	e235	278	607	458	694	3520	1790	496	365
15	403	323	309	e220	266	635	504	741	3660	1740	477	355
16	403	322	303	213	258	492	538	869	3530	1650	480	361
17	398	323	300	215	259	416	478	1080	3800	1520	505	372
18	388	314	289	225	254	373	455	1120	3940	1470	510	389
19	383	331	220	257	243	346	433	1020	4080	1380	488	398
20	383	330	185	251	244	328	408	883	4020	1300	469	386
21	381	322	e180	228	262	322	399	823	3790	1260	461	378
22	e375	321	e175	172	248	328	429	806	3180	1230	470	377
23	373	e310	e170	174	201	356	527	974	2510	1180	448	357
24	364	e290	e170	299	163	344	579	1380	2210	1180	459	343
25	379	277	165	267	191	301	594	2240	1880	1240	467	326
26	367	305	155	249	268	282	622	3350	1580	1610	432	315
27	361	341	226	313	276	294	595	4090	1440	1610	408	311
28	e350	340	e260	272	263	299	547	4520	1590	1420	406	309
29	e340	333	e270	251	---	275	536	5160	1940	1220	410	323
30	329	322	274	250	---	278	544	6260	2290	1090	433	333
31	316	---	271	247	---	336	---	5610	---	991	419	---
TOTAL	12116	10012	8151	7517	6922	9944	12930	49028	91700	53911	16943	10842
MEAN	391	334	263	242	247	321	431	1582	3057	1739	547	361
MAX	460	377	327	313	309	635	622	6260	6140	2780	911	398
MIN	316	277	155	167	163	212	279	483	1440	991	406	309
AC-FT	24030	19860	16170	14910	13730	19720	25650	97250	181900	106900	33610	21510

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1935 - 2003, BY WATER YEAR (WY)*

MEAN	512	402	317	276	264	285	410	1503	3459	2328	870	606
MAX	852	574	430	413	449	565	1185	2879	5776	6368	1639	1099
(WY)	1942	1984	1962	1942	1972	1979	1943	1976	1957	1975	1997	1941
MIN	270	227	184	116	103	162	144	661	1565	626	280	275
(WY)	1937	1936	1937	1937	1936	1936	1961	1960	1939	1936	1988	1939

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1935 - 2003*	
ANNUAL TOTAL	283323		290016			
ANNUAL MEAN	776		795		936	
HIGHEST ANNUAL MEAN					1468	1975
LOWEST ANNUAL MEAN					507	1936
HIGHEST DAILY MEAN	6440	Jun 2	6260	May 30	10900	Jun 18 1974
LOWEST DAILY MEAN	130	Feb 25	155	Dec 26	58	Apr 2 1936
ANNUAL SEVEN-DAY MINIMUM	154	Feb 24	171	Dec 20	72	Mar 29 1936
MAXIMUM PEAK FLOW			7140	May 30	12000	Jun 15 1967
MAXIMUM PEAK STAGE			5.73	May 30	7.17	Jun 15 1967
INSTANTANEOUS LOW FLOW			a130	Dec 26	b58	Apr 2 1936
ANNUAL RUNOFF (AC-FT)	562000		575200		678100	
10 PERCENT EXCEEDS	2180		2220		2530	
50 PERCENT EXCEEDS	370		373		445	
90 PERCENT EXCEEDS	190		243		230	

*--During period of operation (1911-12, 1936 to current year. Seasonal records from 1996-2000).
a--Gage height, 0.19 ft.
b--Observed.
e--Estimated.

06205000 STILLWATER RIVER NEAR ABSAROKEE, MT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1965, 1981, May 1999 to current year.
PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Seasonal records, May 2001 to September 2002.
REMARKS--Unpublished records of instantaneous specific conductance and temperature data are available in files of the District office.
EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE (seasonal records).: Maximum, 31.5°C, Aug. 7, 2001; minimum observed, 0.0°C, Apr. 4, 2002.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instan-taneous dis-charge, cfs (00061)	pH, water, unfltrd field, std units (00400)	Specif. conduc-tance, wat unf uS/cm 25 degC (00095)	Temper-ature, air, deg C (00020)	Temper-ature, water, deg C (00010)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)
APR 2003									
14...	0900	432	7.8	136	10.0	9.5	.23	.064	<.002
JUN									
18...	0820	4620	7.8	55	20.0	10.5	.20	.078	<.002
JUL									
22...	0830	1250	8.1	95	18.0	15.0	.11	.055	E.002
SEP									
08...	0845	382	8.2	200	15.5	13.0	.23	.028	<.002

Date	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Phos-phorus, water, unfltrd mg/L (00665)	Suspnd. sedi-ment, sieve diametr percent <.063mm (70331)	Sus-pended sedi-ment concen-tration mg/L (80154)	Sus-pended sedi-ment load, tons/d (80155)
APR 2003					
14...	<.007	.019	85	11	13
JUN					
18...	<.007	.028	78	18	225
JUL					
22...	E.005	.023	90	6	20
SEP					
08...	.009	.032	90	4	4.1

Date	Time	Hard-ness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Potas-sium, water, fltrd, mg/L (00935)	Sodium adsorp-tion ratio (00931)	Sodium, water, fltrd, mg/L (00930)	Alka-linity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chlor-ide, water, fltrd, mg/L (00940)	Fluor-ide, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)
JUN 2003											
18...	0820	24	6.45	1.89	.59	.1	1.47	24	.26	<.2	4.93
SEP											
08...	0845	82	22.5	6.21	1.56	.3	6.55	96	1.03	<.2	8.24

Date	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of consti-tuents mg/L (70301)	Residue water, fltrd, tons/ acre-ft (70303)	Residue water, fltrd, tons/d (70302)	Arsenic water unfltrd ug/L (01002)	Cadmium water, unfltrd ug/L (01027)	Chrom-ium, water, unfltrd recover -able, ug/L (01034)	Copper, water, unfltrd recover -able, ug/L (01042)	Lead, water, unfltrd recover -able, ug/L (01051)	Nickel, water, unfltrd recover -able, ug/L (01067)	Zinc, water, unfltrd recover -able, ug/L (01092)
JUN 2003											
18...	3.0	33	.05	416	<2	<.2	1.2	3.7	.43	1.61	4
SEP											
08...	7.2	111	.15	114	<2	<.04	.8	1.1	.13	1.02	2

E--Estimated.

YELLOWSTONE RIVER BASIN

06205450 CLARKS FORK YELLOWSTONE RIVER AT MONTANA-WYOMING STATE LINE, NEAR COOKE CITY, MT

LOCATION.--Lat 44°57'28", long 109°48'21" (NAD 27), Park County, WY, Hydrologic Unit 10070006, Shoshone National Forest, at bridge on U.S. Highway 12, 300 ft upstream from Pilot Creek, 0.9 mi downstream from Rock Creek, 1.8 mi northwest of Crazy Creek Campground, and 7.5 mi southeast of Cooke City, MT.

PERIOD OF RECORD.--August 1975 to October 1977, November 1990 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instantaneous discharge, cfs (00061)	Barometric pressure, mm Hg (00025)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	Specif. conductance, wat unf uS/cm 25 degC (00095)	Temperature, air, deg C (00020)	Temperature, water, deg C (00010)	Hardness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)
OCT 2002											
31...	0900	6.9	590	11.0	99	8.2	138	-15.0	.5	68	22.1
FEB 2003											
05...	0900	21	587	11.0	98	8.0	102	-15.0	.0	49	15.6
MAY											
28...	1330	1150	597	10.3	103	7.4	42	30.0	5.0	18	5.54
AUG											
06...	0850	85	596	7.8	95	8.4	69	15.0	13.0	33	10.6

Date	Magnesium, water, fltrd, mg/L (00925)	Potassium, water, fltrd, mg/L (00935)	Sodium adsorption ratio (00931)	Sodium, water, fltrd, mg/L (00930)	Alkalinity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chloride, water, fltrd, mg/L (00940)	Fluoride, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of constituents mg/L (70301)	Residue water, fltrd, tons/acre-ft (70303)
OCT 2002											
31...	3.15	.41	.1	1.56	68	E.17	<.17	5.6	6.0	--	--
FEB 2003											
05...	2.29	.40	.1	1.20	47	E.10	.01	4.8	4.9	--	--
MAY											
28...	1.03	.31	.1	.84	18	.35	<.2	4.3	2.6	26	.04
AUG											
06...	1.57	.21	.1	.90	31	E.19	<.2	3.3	4.0	--	--

Date	Residue water, fltrd, tons/d (70302)	Ammonia water, fltrd, mg/L as N (00608)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Orthophosphate, water, fltrd, mg/L as P (00671)	Aluminum, water, fltrd, ug/L (01106)	Antimony, water, fltrd, ug/L (01095)	Arsenic water, fltrd, ug/L (01000)	Barium, water, fltrd, ug/L (01005)	Beryllium, water, fltrd, ug/L (01010)	Boron, water, fltrd, ug/L (01020)
OCT 2002											
31...	--	<.04	E.03	<.008	<.02	3	<.30	E.2	20	<.06	<13
FEB 2003											
05...	--	<.04	.08	<.008	<.02	4	<.30	E.2	15	<.06	<13
MAY											
28...	81.3	<.04	E.04	<.008	<.02	33	<.30	E.2	10	<.06	<7.0
AUG											
06...	--	<.04	<.06	<.008	<.02	8	<.30	E.2	11	<.06	E3.7

Date	Cadmium water, fltrd, ug/L (01025)	Chromium, water, fltrd, ug/L (01030)	Cobalt water, fltrd, ug/L (01035)	Copper, water, fltrd, ug/L (01040)	Iron, water, fltrd, ug/L (01046)	Lead, water, fltrd, ug/L (01049)	Lithium water, fltrd, ug/L (01130)	Manganese, water, fltrd, ug/L (01056)	Mercury water, fltrd, ug/L (71890)	Molybdenum, water, fltrd, ug/L (01060)	Nickel, water, fltrd, ug/L (01065)
OCT 2002											
31...	.12	<.8	.050	.7	<10	<.08	<4	1.4	<.02	E.2	1.19
FEB 2003											
05...	.04	E.4	.039	.9	17	<.08	<4	1.4	<.02	E.3	.56
MAY											
28...	<.04	<.8	.046	2.8	26	<.08	<3	4.1	E.01	<.3	.40
AUG											
06...	<.04	<.8	.028	.9	14	<.08	<3	1.1	E.01	E.2	.36

E--Estimated.

06205450 CLARKS FORK YELLOWSTONE RIVER AT MONTANA-WYOMING STATE LINE, NEAR COOKE CITY, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003--Continued

Date	Selenium, water, fltrd, ug/L (01145)	Silver, water, fltrd, ug/L (01075)	Strontium, water, fltrd, ug/L (01080)	Vanadium, water, fltrd, ug/L (01085)	Zinc, water, fltrd, ug/L (01090)	Uranium natural water, fltrd, ug/L (22703)
OCT 2002						
31...	<.5	<.2	55.8	<8	2	.14
FEB 2003						
05...	<.5	<.2	41.7	<8	4	.19
MAY						
28...	<.5	<.2	21.5	<6	7	.07
AUG						
06...	<.5	<.2	28.4	<6	<2	.07

YELLOWSTONE RIVER BASIN

06207500 CLARKS FORK YELLOWSTONE RIVER NEAR BELFRY, MT

LOCATION.--Lat 45°00'37", long 109°03'53" (NAD 27), in $NW^1/_4SW^1/_4NW^1/_4$ sec.32, T.9 S., R.22 E., Carbon County, Hydrologic Unit 10070006, on left bank 0.2 mi upstream from county road bridge and Big Sand Coulee, 0.8 mi north of Wyoming-Montana State line, 9.5 mi southwest of Belfry, and at river mile 71.2.

DRAINAGE AREA.--1,154 mi^2.

PERIOD OF RECORD.--July 1921 to current year. Monthly discharge only for some periods, published in WSP 1309. Published as Clarks Fork at Chance prior to October 1956 and as Clarks Fork Yellowstone River at Chance October 1956 to September 1968.

REVISED RECORDS.--WSP 1309: 1922 (M). WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 3,986.24 ft (NGVD 29) (levels by U.S. Army Corps of Engineers). Prior to Nov. 15, 1934, nonrecording gage, and Nov. 15, 1934, to July 26, 1951, water-stage recorder at bridge 0.4 mi downstream from different elevation. July 27, 1951 to Sept. 30, 1953, water-stage recorder at present site at elevation 0.98 ft higher.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Diversions for irrigation of about 11,100 acres upstream from station. U. S. Geological Survey satellite telemeter at station. Several observations of water temperature and specific conductance were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	101	e180	258	230	279	e180	310	680	10000	3210	604	129
2	101	e200	263	220	313	e180	348	633	8420	3190	534	122
3	102	e220	263	239	280	e180	342	588	5860	3070	487	117
4	103	e240	244	242	255	e170	331	564	4800	2880	475	116
5	104	e260	245	237	241	e160	294	539	3910	2670	462	113
6	103	e280	242	231	e230	e170	272	489	3380	2560	431	113
7	104	e300	237	220	e200	e160	272	456	2840	2470	401	118
8	103	e290	205	218	e220	e160	257	448	2720	2380	365	124
9	103	e280	200	e180	e250	e170	261	453	3190	2190	346	119
10	106	e270	225	e140	e270	e190	316	434	4120	2050	330	120
11	e110	e260	245	e150	e270	e260	439	409	4960	1990	301	124
12	e130	e250	225	e170	e260	e290	561	409	4790	1950	280	122
13	e150	e240	250	e240	e250	e320	645	451	4580	1940	262	122
14	e120	e240	251	235	e240	e350	807	538	4420	1870	251	125
15	e120	e240	238	218	245	e340	804	795	4720	1770	242	114
16	e120	e240	230	e200	242	340	724	1360	5360	1630	239	110
17	e110	e230	228	e160	231	335	621	1790	5540	1480	237	111
18	e110	e230	228	e170	231	312	570	1950	5740	1390	233	108
19	e110	e230	189	e180	221	287	521	1540	5690	1340	225	105
20	e110	e230	e130	e190	216	276	482	1250	5300	1290	204	103
21	e110	e230	e120	e160	224	269	507	1220	4870	1230	187	102
22	e120	e230	e110	e140	e170	275	694	1290	3850	1130	178	101
23	e110	e220	e100	e160	e130	280	833	2230	2950	1060	171	97
24	e100	e200	e90	e180	e90	290	837	3120	2300	1010	166	94
25	e120	e180	e90	e170	e120	262	861	4770	1880	1030	159	96
26	e140	e210	e110	e160	e160	268	1020	5810	1560	1090	149	94
27	e160	e250	e130	e190	e190	275	924	6390	1470	1110	142	99
28	e180	e290	285	e210	e200	258	784	7120	1780	1020	138	92
29	e200	284	250	e230	---	251	692	8480	2290	909	140	86
30	e180	267	221	240	---	256	618	9950	2840	786	143	88
31	e160	---	224	242	---	271	---	9750	---	677	138	---
TOTAL	3800	7271	6326	6152	6228	7785	16947	75906	126130	54372	8620	3284
MEAN	123	242	204	198	222	251	565	2449	4204	1754	278	109
MAX	200	300	285	242	313	350	1020	9950	10000	3210	604	129
MIN	100	180	90	140	90	160	257	409	1470	677	138	86
AC-FT	7540	14420	12550	12200	12350	15440	33610	150600	250200	107800	17100	6510

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1921 - 2003, BY WATER YEAR (WY)

MEAN	278	294	262	231	223	222	426	2047	4108	2188	612	312
MAX	725	648	379	359	329	364	1167	5704	7225	5744	1453	834
(WY)	1931	1928	1951	1997	1963	1972	1943	1928	1997	1975	1951	1941
MIN	45.5	115	110	110	100	96.3	110	839	1607	349	66.5	50.1
(WY)	1989	1989	1922	1922	1922	1922	1961	1968	1987	1988	1988	1988

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1921 - 2003	
ANNUAL TOTAL	339434		322821			
ANNUAL MEAN	930		884		935	
HIGHEST ANNUAL MEAN					1485	1997
LOWEST ANNUAL MEAN					547	1977
HIGHEST DAILY MEAN	10600	Jun 2	10000	Jun 1	12300	Jun 9 1981
LOWEST DAILY MEAN	90	Dec 24	86	Sep 29	33	Apr 26 1961
ANNUAL SEVEN-DAY MINIMUM	98	Sep 17	93	Sep 24	37	Oct 8 1988
MAXIMUM PEAK FLOW			11100	May 30	14800	Jun 9 1981
MAXIMUM PEAK STAGE			8.19	May 30	9.97	Jun 9 1981
INSTANTANEOUS LOW FLOW			a84	Sep 29	b32	Apr 26 1961
ANNUAL RUNOFF (AC-FT)	673300		640300		677500	
10 PERCENT EXCEEDS	2940		2690		2870	
50 PERCENT EXCEEDS	230		250		300	
90 PERCENT EXCEEDS	106		110		170	

a--Also occurred on Sept. 30.
b--Result of discharge measurement.
e--Estimated.

YELLOWSTONE RIVER BASIN

06208500 CLARKS FORK YELLOWSTONE RIVER AT EDGAR, MT

LOCATION.--Lat 45°27'58", long 108°50'35" (NAD 27), in $SE^1/_4SE^1/_4SE^1/_4$ sec.23, T.4 S., R.23 E., Carbon County, Hydrologic Unit 10070006, on right bank 400 ft downstream from county bridge, 0.5 mi east of Edgar, 6 mi upstream from Rock Creek, and at river mile 22.1.
DRAINAGE AREA (REVISED).--2,022 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1921 to September 1969, October 1986 to current year.
REVISED RECORDS.--WSP 1509: 1924, 1932(M). WSP 1729: Drainage area. WDR MT-04-1: Drainage area.
GAGE.--Water-stage recorder. Elevation of gage is 3,460 ft (NGVD 29). Prior to Aug. 31, 1953, nonrecording gage at same site and elevation.
REMARKS.--Water-discharge records good except those for the estimated daily discharges, which are poor. Diversions for irrigation of about 41,500 acres, of which about 840 acres lies downstream from the station. In addition, about 6,300 acres of land upstream from the station are irrigated by diversions from the adjoining Rock Creek basin. U.S. Geological Survey satellite telemeter at station. **Discharge values given herein have the diversion of White Horse Canal subtracted.**

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	366	e380	447	392	e420	e340	365	797	8760	2830	623	172
2	389	e400	437	422	e400	e340	420	828	8660	2950	571	152
3	416	e420	440	381	e400	e320	454	723	6270	2810	512	149
4	435	e440	434	398	e380	e320	438	695	4810	2640	476	148
5	426	e460	437	366	e340	e320	412	691	4030	2480	431	143
6	423	e480	464	358	e300	e300	375	629	3560	2310	401	152
7	433	500	428	347	e300	e300	356	596	3220	2220	370	163
8	417	494	418	336	e380	e320	347	561	2840	2120	320	183
9	408	488	395	334	535	e340	330	606	3020	1980	297	205
10	427	474	407	e320	564	e300	339	654	3740	1800	272	227
11	434	469	449	e300	588	e420	416	641	4680	1680	249	242
12	459	458	454	e320	606	e500	568	576	4800	1620	213	248
13	476	444	448	e360	603	e700	700	558	4590	1610	199	271
14	434	451	421	e340	540	e1100	798	595	4350	1570	183	288
15	424	452	413	e340	523	1000	987	652	4440	1470	166	287
16	428	447	399	e320	467	741	929	1080	4860	1360	150	279
17	411	436	390	e340	461	579	806	1680	5300	1280	146	282
18	415	435	389	e340	445	526	727	1870	5290	1190	144	298
19	415	440	391	e360	439	481	666	1830	5400	1140	149	301
20	417	434	389	e380	425	419	618	1410	5160	1120	146	279
21	415	433	340	e340	418	390	569	1250	4780	1080	135	278
22	431	440	e320	e280	426	378	633	1240	4080	1000	136	282
23	e400	e440	e300	e320	e260	380	849	1710	3220	943	132	279
24	e380	e400	e280	e360	e240	390	986	2530	2520	889	125	273
25	e400	e380	e300	e400	e260	385	912	3620	2120	855	132	273
26	e420	e400	e340	e400	e280	365	1010	4690	1750	928	122	259
27	e440	431	e360	e420	e340	375	1140	5250	1460	1020	126	258
28	e440	441	e380	e400	e360	369	912	5920	1490	1020	116	259
29	e420	482	469	e400	---	348	810	6700	1880	920	125	264
30	e400	471	441	e420	---	341	751	8180	2440	789	140	263
31	e360	---	396	e420	---	346	---	8610	---	677	164	---
TOTAL	12959	13320	12376	11214	11700	13733	19623	67372	123520	48301	7471	7157
MEAN	418	444	399	362	418	443	654	2173	4117	1558	241	239
MAX	476	500	469	422	606	1100	1140	8610	8760	2950	623	301
MIN	360	380	280	280	240	300	330	558	1460	677	116	143
AC-FT	25700	26420	24550	22240	23210	27240	38920	133600	245000	95810	14820	14200

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1921 - 2003, BY WATER YEAR (WY)*

MEAN	532	500	409	351	350	365	560	2109	4074	2023	610	474
MAX	1010	777	593	512	584	554	1398	5578	7256	4771	1541	1395
(WY)	1942	1928	1996	1997	1963	1943	1943	1928	1996	1943	1951	1941
MIN	298	310	217	200	180	220	123	757	1768	290	49.5	156
(WY)	1956	1936	1937	1922	1922	1924	1961	1968	1987	1988	1988	1988

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1921 - 2003*	
ANNUAL TOTAL	317375		348746			
ANNUAL MEAN	870		955		1031	
HIGHEST ANNUAL MEAN					1623	1997
LOWEST ANNUAL MEAN					644	2001
HIGHEST DAILY MEAN	8240	Jun 2	8760	Jun 1	10600	Jun 2 1936
LOWEST DAILY MEAN	98	Sep 6	116	Aug 28	37	May 11 1961
ANNUAL SEVEN-DAY MINIMUM	114	Aug 22	125	Aug 23	43	Apr 18 1961
MAXIMUM PEAK FLOW			9540	Jun 1	11100	Jun 12 1997
MAXIMUM PEAK STAGE			8.66	Jun 1	9.30	Jun 12 1997
INSTANTANEOUS LOW FLOW					36	Apr 22 1961
ANNUAL RUNOFF (AC-FT)	629500		691700		747000	
10 PERCENT EXCEEDS	2410		2500		2840	
50 PERCENT EXCEEDS	400		428		469	
90 PERCENT EXCEEDS	220		259		270	

*--During period of operation (water years 1921-69, 1987 to current year).
e--Estimated.

06208500 CLARKS FORK YELLOWSTONE RIVER AT EDGAR, MT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1964 to 1965, January 1999 to current year.
PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: April 2002 to current year. (seasonal records).
SUSPENDED-SEDIMENT DISCHARGE: July 1972 to June 1973.
INSTRUMENTATION.--Temperature probe installed April 3, 2002.
REMARKS.--Temperature records for Apr. 1 to July 19 missing due to equipment problems; remaining period of record rated good. Unpublished records of instantaneous water temperature and specific conductance are available in files of the District Office.
EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE (seasonal records): Maximum daily, 26.0°C, July 13, 2002; minimum daily, 1.5°C, Apr. 4, 2002.
SEDIMENT CONCENTRATION: Maximum daily mean, 4,180 mg/L Apr. 28, 1973; minimum daily mean, 30 mg/L Nov. 1, 1972.
SEDIMENT LOAD: Maximum daily, 30,100 tons May 20, 1973; minimum daily, 23 tons Dec. 4, 1972.
EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: For available data during period of seasonal operation, maximum daily, 25.5°C, Aug. 15; minimum daily, 9.0°C, Sept. 18.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instan-taneous dis-charge, cfs (00061)	pH, water, unfltrd field, std units (00400)	Specif. conduc-tance, wat unf uS/cm 25 degC (00095)	Temper-ature, air, deg C (00020)	Temper-ature, water, deg C (00010)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)
APR 2003									
14...	1330	804	7.8	349	21.0	15.0	.58	.198	E.002
JUN									
05...	0845	4090	8.3	142	11.5	9.5	.35	.171	.005
JUL									
22...	1020	990	8.4	334	22.0	19.0	.31	.116	.004
SEP									
04...	0815	153	8.4	985	13.5	16.0	.52	.797	.013

Date	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Phos-phorus, water, unfltrd mg/L (00665)	Suspnd. sedi-ment, sieve diametr percent <.063mm (70331)	Sus-pended sedi-ment concen-tration mg/L (80154)	Sus-pended sedi-ment load, tons/d (80155)
APR 2003					
14...	<.007	.20	95	226	491
JUN					
05...	.031	.42	60	330	3640
JUL					
22...	E.005	.063	98	40	107
SEP					
04...	<.007	.048	78	26	11

Date	Time	Hard-ness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Potas-sium, water, fltrd, mg/L (00935)	Sodium adsorp-tion ratio (00931)	Sodium, water, fltrd, mg/L (00930)	Alka-linity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chlor-ide, water, fltrd, mg/L (00940)	Fluor-ide, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)
JUN 2003											
05...	0845	55	15.5	3.87	.72	.3	5.92	51	.97	<.2	8.68
SEP											
04...	0815	410	101	39.5	4.42	1	69.9	233	4.88	.5	8.79

Date	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of consti-tuents mg/L (70301)	Residue water, fltrd, tons/ acre-ft (70303)	Residue water, fltrd, tons/d (70302)	Arsenic water unfltrd ug/L (01002)	Cadmium water, unfltrd ug/L (01027)	Chrom-ium, water, unfltrd recover -able, ug/L (01034)	Copper, water, unfltrd recover -able, ug/L (01042)	Lead, water, unfltrd recover -able, ug/L (01051)	Nickel, water, unfltrd recover -able, ug/L (01067)	Zinc, water, unfltrd recover -able, ug/L (01092)
JUN 2003											
05...	14.5	82	.11	902	E1	<.2	3.2	22.9	6.00	9.09	33
SEP											
04...	273	645	.88	267	E1	E.02	E.6	3.7	.39	3.25	3

E--Estimated.

YELLOWSTONE RIVER BASIN

06208500 CLARKS FORK YELLOWSTONE RIVER AT EDGAR, MT--Continued

WATER TEMPERATURE, DEGREES CELSIUS, APRIL 2002 TO SEPTEMBER 2002

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		APRIL			MAY			JUNE			JULY	
1	---	---	---	---	---	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---	---	---	---	---	---
4	---	---	---	---	---	---	---	---	---	---	---	---
5	---	---	---	---	---	---	---	---	---	---	---	---
6	---	---	---	---	---	---	---	---	---	---	---	---
7	---	---	---	---	---	---	---	---	---	---	---	---
8	---	---	---	---	---	---	---	---	---	---	---	---
9	---	---	---	---	---	---	---	---	---	---	---	---
10	---	---	---	---	---	---	---	---	---	---	---	---
11	---	---	---	---	---	---	---	---	---	---	---	---
12	---	---	---	---	---	---	---	---	---	---	---	---
13	---	---	---	---	---	---	---	---	---	---	---	---
14	---	---	---	---	---	---	---	---	---	---	---	---
15	---	---	---	---	---	---	---	---	---	---	---	---
16	---	---	---	---	---	---	---	---	---	---	---	---
17	---	---	---	---	---	---	---	---	---	---	---	---
18	---	---	---	---	---	---	---	---	---	---	---	---
19	---	---	---	---	---	---	---	---	---	---	---	---
20	---	---	---	---	---	---	---	---	---	23.5	19.5	21.5
21	---	---	---	---	---	---	---	---	---	23.0	19.5	21.5
22	---	---	---	---	---	---	---	---	---	24.0	18.5	21.5
23	---	---	---	---	---	---	---	---	---	25.0	20.0	22.5
24	---	---	---	---	---	---	---	---	---	24.5	21.0	23.0
25	---	---	---	---	---	---	---	---	---	23.5	21.5	22.5
26	---	---	---	---	---	---	---	---	---	24.0	20.5	22.5
27	---	---	---	---	---	---	---	---	---	25.0	21.0	23.0
28	---	---	---	---	---	---	---	---	---	25.0	20.5	23.0
29	---	---	---	---	---	---	---	---	---	23.5	20.5	22.0
30	---	---	---	---	---	---	---	---	---	24.0	19.5	21.5
31	---	---	---	---	---	---	---	---	---	22.5	20.0	21.0
MONTH	---	---	---	---	---	---	---	---	---	---	---	---

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN
		AUGUST			SEPTEMBER	
1	23.0	18.5	20.5	21.0	15.5	18.5
2	24.0	19.0	21.5	20.5	16.5	18.5
3	23.0	20.5	22.0	20.5	15.5	18.0
4	22.5	19.0	21.0	21.5	16.0	18.5
5	24.0	18.0	21.0	21.0	17.0	19.0
6	23.5	19.5	21.5	19.5	18.0	19.0
7	25.0	19.5	22.5	20.5	16.5	18.5
8	23.5	20.0	22.0	19.0	16.0	17.0
9	22.5	19.5	21.0	17.0	13.5	15.5
10	22.5	18.5	20.5	15.5	13.5	14.0
11	22.0	18.5	20.5	16.5	12.0	14.0
12	21.5	19.0	20.5	15.0	13.0	14.0
13	24.5	19.0	21.5	13.5	11.5	12.5
14	25.0	20.5	23.0	14.5	10.0	12.5
15	25.5	21.0	23.0	15.5	12.0	13.5
16	25.0	20.0	22.5	15.0	13.0	14.0
17	23.5	20.5	22.0	13.5	11.0	12.0
18	23.0	17.5	20.5	12.5	9.0	11.0
19	24.0	18.5	21.5	12.0	9.5	11.0
20	24.0	19.5	21.5	14.5	10.5	12.5
21	22.5	18.5	20.5	14.0	11.0	12.5
22	24.0	19.5	21.5	14.5	10.5	12.5
23	25.0	19.5	22.5	15.5	11.5	13.5
24	24.5	19.5	22.0	15.0	11.5	13.0
25	25.0	20.0	22.5	15.5	11.0	13.5
26	24.5	19.5	22.0	16.0	12.5	14.5
27	23.0	19.5	20.5	15.5	11.5	13.5
28	22.0	17.5	19.5	15.0	11.5	13.5
29	19.5	16.0	17.0	13.5	11.0	12.5
30	19.0	14.0	16.5	13.5	9.5	11.5
31	20.5	15.0	17.5	---	---	---
MONTH	25.5	14.0	21.0	21.5	9.0	14.5

YELLOWSTONE RIVER BASIN

06209500 ROCK CREEK NEAR RED LODGE, MT

LOCATION (REVISED).--Lat 45°05'11", long 109°19'46" (NAD 27), in $NW^1/_4NE^1/_4SW^1/_4$ sec.36, T.8 S., R.19 E., Carbon County, Hydrologic Unit 10070006, on left bank 40 ft downstream from county bridge, 6.7 mi south of Red Lodge, and at river mile 49.1.

DRAINAGE AREA.--105 mi^2.

PERIOD OF RECORD.--April to December 1932, May 1934 to September 1982, May 1985 to September 1986, January 2000 to current year. Monthly discharge only for May 1934, published in WSP 1309.

REVISED RECORDS.--WSP 1729: Drainage area. WDR MT-00-1: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 6,400 ft (NGVD 29). Prior to October 1986, water-stage recorder at elevation 6,099.42 ft, levels by U.S. Army Corps of Engineers, at previous site 3.1 mi downstream. Streamflows are equivalent.

REMARKS.--Records good except those for the estimated daily discharges, which are poor. Flow partly regulated by Glacier Lake. No diversions upstream from station. U.S. Geological Survey satellite telemeter at station. Several observations of water temperature and specific conductance were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	65	e35	35	e27	32	e24	30	48	580	514	258	158
2	64	e35	35	e27	29	e24	28	45	613	510	245	161
3	63	e40	35	e27	e28	e24	27	46	514	496	241	156
4	62	e40	e35	e27	e28	e24	26	46	442	457	246	150
5	61	e40	e35	27	e24	e24	26	46	358	384	235	147
6	60	e40	e34	27	e24	e24	25	45	310	388	223	146
7	59	e40	e34	27	e25	e24	25	44	273	402	214	142
8	58	e40	e33	26	e26	e24	26	45	275	394	204	141
9	57	e40	e33	e26	e26	e24	28	44	360	365	199	135
10	56	40	e33	e26	e26	e24	31	44	525	357	236	134
11	58	40	e32	e26	e26	e24	34	43	519	363	237	129
12	54	39	e32	e26	e26	24	37	44	491	384	240	128
13	56	39	e32	e26	e26	25	40	48	475	404	234	123
14	54	38	e32	e28	26	27	42	51	484	413	233	115
15	54	38	32	e26	25	26	42	60	503	405	228	110
16	52	38	31	e26	25	26	39	80	576	390	235	109
17	52	37	31	e26	24	25	38	92	529	380	281	106
18	50	37	e31	e26	24	24	37	93	525	371	240	102
19	49	37	e31	e26	25	24	36	82	548	372	224	98
20	49	36	e31	e28	28	24	35	78	535	355	216	94
21	49	36	e30	e26	24	24	37	78	495	349	211	91
22	49	37	e30	e26	25	24	41	96	419	339	210	88
23	52	e34	e29	e25	e24	25	47	145	337	329	207	85
24	55	e31	e28	e25	e21	24	50	228	283	345	203	82
25	48	e31	e25	e25	e23	24	54	364	251	400	195	79
26	48	e32	e27	e25	e24	24	56	579	228	401	188	77
27	50	e33	e27	e25	e24	27	52	739	230	391	184	76
28	46	e34	e28	e25	e24	25	49	786	283	356	183	74
29	45	e35	e30	e25	---	25	47	813	375	325	184	73
30	e43	35	e30	25	---	24	47	610	455	300	174	71
31	e35	---	e28	26	---	e27	---	631	---	277	165	---
TOTAL	1653	1107	969	809	712	762	1132	6193	12791	11916	6773	3380
MEAN	53.3	36.9	31.3	26.1	25.4	24.6	37.7	200	426	384	218	113
MAX	65	40	35	28	32	27	56	813	613	514	281	161
MIN	35	31	25	25	21	24	25	43	228	277	165	71
AC-FT	3280	2200	1920	1600	1410	1510	2250	12280	25370	23640	13430	6700

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1932 - 2003, BY WATER YEAR (WY)*

MEAN	82.0	55.0	41.5	34.0	30.8	29.5	40.0	219	593	492	257	140
MAX	124	77.7	56.1	45.1	42.4	39.7	99.2	460	1129	1088	427	219
(WY)	1968	1962	1962	1942	1953	1972	1943	1958	1957	1975	1951	1971
MIN	50.1	36.9	26.6	20.6	19.6	19.6	24.4	87.6	273	220	153	88.6
(WY)	1956	2003	1955	2002	2000	2002	1961	1953	1939	2001	2001	1960

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1932 - 2003*	
ANNUAL TOTAL	50235		48197			
ANNUAL MEAN	138		132		171	
HIGHEST ANNUAL MEAN					251	1943
LOWEST ANNUAL MEAN					97.3	2001
HIGHEST DAILY MEAN	864	Jun 1	813	May 29	2370	Jun 5 1957
LOWEST DAILY MEAN	14	Jan 31	21	Feb 24	14	Nov 29 1954
ANNUAL SEVEN-DAY MINIMUM	17	Jan 27	23	Feb 23	17	Jan 27 2002
MAXIMUM PEAK FLOW			a1110	May 29	c3110	Jun 4 1957
MAXIMUM PEAK STAGE			b7.46	Dec 26	b7.97	Dec 16 2002
ANNUAL RUNOFF (AC-FT)	99640		95600		124000	
10 PERCENT EXCEEDS	452		390		488	
50 PERCENT EXCEEDS	38		45		63	
90 PERCENT EXCEEDS	20		25		29	

*--During periods of operation (April 1932 to December 1932, May 1934 to September 1982, May 1985 to September 1986, January 2000 to current year).
a--Gage height, 7.18 ft.
b--Backwater from ice.
c--Gage height, 4.78 ft, previous site and datum.
e--Estimated.

YELLOWSTONE RIVER BASIN

06211000 RED LODGE CREEK ABOVE COONEY RESERVOIR, NEAR BOYD, MT

LOCATION.--Lat 45°26'16", long 109°15'11" (NAD 27), in NE$^1/_4$SE$^1/_4$SE$^1/_4$ sec.33, T.4 S., R.20 E., Carbon County, Hydrologic Unit 10070006, on right bank 0.6 mi upstream from Cooney Reservoir, 9.5 mi west of Boyd, and at river mile 15.0.

DRAINAGE AREA.--143 mi^2.

PERIOD OF RECORD.--May 1937 to current year (no winter records most years).

REVISED RECORDS.--WSP 1729: Drainage area. WSP 2116: 1937(M), 1942(M), 1943(P), 1944(M), 1948(M), 1952(M), 1957(P), 1962(M), 1963(M).

GAGE.--Water-stage recorder. Elevation of gage is 4,248.0 ft (NGVD 29).

REMARKS.--Seasonal records good. Some return flow from lands irrigated by water diverted from Rock Creek and East Rosebud Creek basins. Diversions for irrigation of about 5,100 acres upstream from station. U. S. Geological Survey satellite telemeter at station. Several observations of water temperature and specific conductance were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY TO DECEMBER 2003
DAILY MEAN VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1				131	108	223	106	35	15	37		
2				144	108	200	110	34	11	42		
3				84	84	173	105	32	10	42		
4				71	80	146	103	41	14	46		
5				62	79	137	98	59	12	50		
6				61	75	167	92	57	10	47		
7				53	74	176	93	48	11	43		
8				51	73	138	91	42	14	43		
9				58	91	134	86	45	18	55		
10				65	146	141	71	41	15	74		
11				71	151	149	69	36	18	90		
12				73	116	138	63	36	23	81		
13				73	117	138	62	33	37	80		
14				76	115	142	57	31	33	77		
15				74	114	143	54	32	34	77		
16				74	113	156	52	29	35	77		
17				60	118	149	40	24	41	78		
18				53	124	145	37	23	43	76		
19				52	130	146	39	23	47	71		
20				48	117	142	42	21	44	60		
21				44	109	139	41	19	34	60		
22				43	107	133	30	17	38	63		
23				46	104	126	29	14	39	57		
24				48	105	165	30	12	37	56		
25				49	115	175	42	13	40	67		
26				50	130	135	52	11	29	70		
27				45	140	121	55	8.7	24	77		
28				42	138	111	55	9.7	29	77		
29				46	146	112	48	12	30	91		
30				59	159	114	51	15	36	95		
31				---	200	---	45	17	---	e90		
TOTAL				1906	3586	4414	1948	870.4	821	2049		
MEAN				63.5	116	147	62.8	28.1	27.4	66.1		
MAX				144	200	223	110	59	47	95		
MIN				42	73	111	29	8.7	10	37		
AC-FT				3780	7110	8760	3860	1730	1630	4060		

STATISTICS OF MONTHLY MEAN DATA FOR SEASONS 1937 - 2003*

MEAN	15.4	27.4	36.5	76.3	156	190	89.7	38.2	46.2	46.3	33.3	19.3
MAX	18.8	35.0	62.9	234	616	575	297	90.2	106	119	69.5	33.6
(WY)	1964	1962	1962	1973	1975	1967	1975	1993	1941	1942	1942	1958
MIN	12.1	18.9	17.4	12.7	10.8	15.3	4.90	4.71	4.20	17.5	16.5	14.5
(WY)	1963	1964	1964	1961	1985	1954	1949	1946	1949	1954	1955	1946

SUMMARY STATISTICS	FOR 2003 SEASON		SEASONS 1937 - 2003*		
ANNUAL MEAN			58.4		
HIGHEST ANNUAL MEAN			67.1		1963
LOWEST ANNUAL MEAN			49.8		1964
HIGHEST DAILY MEAN	223	Jun 1	2000	Jun 15	1967
LOWEST DAILY MEAN	8.7	Aug 27	0.00	Aug 1	1949
ANNUAL SEVEN-DAY MINIMUM			0.00	Aug 9	1949
MAXIMUM PEAK FLOW	263	Jun 24	b2260	Jun 15	1967
MAXIMUM PEAK STAGE	2.62	Jun 24	7.00	Jun 15	1967
INSTANTANEOUS LOW FLOW	a6.2	Aug 29	0.00	Aug 1	1949
ANNUAL RUNOFF (AC-FT)			42340		
10 PERCENT EXCEEDS			170		
50 PERCENT EXCEEDS			30		
90 PERCENT EXCEEDS			15		

*--No winter records most years.
a--Gage height, 1.25 ft.
b--From rating curve extended above 1,700 ft^3/s on basis of contracted-opening measurement of peak flow.
e--Estimated.

YELLOWSTONE RIVER BASIN

06211500 WILLOW CREEK NEAR BOYD, MT

LOCATION.--Lat 45°25'20", long 109°13'47" (NAD 27), in $SW^1/_4SW^1/_4SW^1/_4$ sec.2, T.5 S., R.20 E., Carbon County, Hydrologic Unit 10070006, on left bank 0.5 mi upstream from Cooney Reservoir, 8 mi west of Boyd, and at river mile 2.1.
DRAINAGE AREA.--53.3 mi^2.
PERIOD OF RECORD.--June 1937 to current year (no winter records except 1963-64).
REVISED RECORDS.--WSP 1729: Drainage area. WSP 2116: 1957, 1962. WDR MT-87-1: 1986.
GAGE.--Water-stage recorder. Elevation of gage is 4,260 ft (NGVD 29). Prior to Apr. 23, 1948, at site 0.5 mi downstream at different elevation.
REMARKS.--Seasonal records good. Diversions for irrigation of about 1,800 acres upstream from station. Some return flow from lands irrigated by water diverted from Rock Creek basin. U. S. Geological Survey satellite telemeter at station. Several observations of water temperature and specific conductance were obtained during the year.

DISCHARGE, CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY TO DECEMBER 2003
DAILY MEAN VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1				98	53	37	49	40	23	19		
2				150	56	41	50	37	24	19		
3				54	32	43	53	37	27	19		
4				38	25	39	55	37	29	19		
5				31	25	37	53	38	25	19		
6				26	22	46	52	38	27	19		
7				22	22	72	53	38	28	19		
8				22	22	51	50	38	24	19		
9				30	32	48	49	37	25	19		
10				33	70	55	49	36	24	22		
11				35	65	44	49	35	25	30		
12				31	51	42	50	34	26	30		
13				31	42	47	51	30	35	30		
14				31	38	45	43	30	29	30		
15				29	34	45	48	28	26	29		
16				30	32	47	44	25	29	29		
17				24	30	43	42	23	30	29		
18				22	32	32	40	22	30	29		
19				22	38	33	37	22	32	28		
20				21	33	41	37	22	30	28		
21				19	29	44	36	21	27	28		
22				18	26	40	34	21	27	28		
23				18	25	39	35	21	27	27		
24				18	24	55	37	21	28	27		
25				18	25	95	40	21	25	27		
26				17	26	63	48	21	19	27		
27				16	26	53	48	21	16	27		
28				14	26	47	48	19	17	27		
29				16	25	48	43	21	18	27		
30				20	25	49	41	24	19	28		
31				---	27	---	41	26	---	27		
TOTAL				954	1038	1421	1405	884	771	785		
MEAN				31.8	33.5	47.4	45.3	28.5	25.7	25.3		
MAX				150	70	95	55	40	35	30		
MIN				14	22	32	34	19	16	19		
AC-FT				1890	2060	2820	2790	1750	1530	1560		

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1963 - 1964 AND SEASONS 1938 - 1962, 1965 - 2003*

MEAN	8.00	12.1	15.3	33.8	48.0	55.8	56.0	40.3	37.4	30.5	22.0	17.0
MAX	8.27	17.2	22.5	88.2	215	170	123	75.1	64.3	50.0	31.6	26.6
(WY)	1963	1962	1962	1973	1975	1967	1978	1972	1965	1972	1974	1958
MIN	7.73	5.76	5.89	6.29	3.08	2.05	3.20	11.8	6.02	12.7	14.7	10.6
(WY)	1964	1964	1964	1961	1969	1961	1960	1961	1960	1940	1963	1963

SUMMARY STATISTICS	FOR 2003 SEASON		SEASONS 1938 - 2003*	
HIGHEST DAILY MEAN	150	Apr 2	1150	Jun 15 1967
LOWEST DAILY MEAN	14	Apr 28	0.00	May 29 1969
MAXIMUM PEAK FLOW	240	Apr 2	a1720	Jun 15 1967
MAXIMUM PEAK STAGE	4.34	Apr 2	b7.24	May 29 1942
INSTANTANEOUS LOW FLOW			0.00	May 29 1969

*--Seasonal records except 1963 and 1964 water years.
a--Gage height, 7.08 ft, from rating curve extended above 400 ft^3/s on basis of slope-area measurement of peak flow.
b--Backwater from Cooney Reservoir, site and datum then in use.

06214500 YELLOWSTONE RIVER AT BILLINGS, MT

LOCATION.--Lat 45°48'00", long 108°28'00" (NAD 27), in $SE^1/_4SE^1/_4SE^1/_4$ sec.27, T.1 N., R.26 E., Yellowstone County, Hydrologic Unit 10070007, on right bank 0.3 mi downstream from bridge on U.S. Highway 87, 1 mi northeast of Billings, 10 mi upstream from Pryor Creek, and at river mile 360.3.

DRAINAGE AREA (REVISED).--11,805 mi^2.

PERIOD OF RECORD.--May 1904 to December 1905 (gage heights only January to March, December 1905), August 1928 to current year. Monthly discharge only for some periods, published in WSP 1309. Published as "near Billings" 1904-5.

REVISED RECORDS.--WDR MT 1968: 1967 (M). WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 3,080 ft (NGVD 29). May 1904 to December 1905, nonrecording gage at bridge 0.3 ft upstream at different elevation. Aug. 24, 1928, to June 30, 1932, nonrecording gage at bridge 0.3 mi upstream at elevation 2.0 ft higher. July 1, 1932, to Oct. 12, 1937, water-stage recorder at old diversion dam 3.3 mi upstream at different elevation. Oct. 13, 1937, to Jan. 9, 1963 and Dec. 2, 1967 to Sept. 12, 1990, water-stage recorder 0.3 mi upstream at elevation 3,081.36 ft. Jan. 10, 1963 to Dec. 2, 1967, water-stage recorder at City of Billings Water Department intake, 2.1 mi upstream at elevation 3,069.9 ft.

REMARKS.--records good except those for estimated daily discharges and discharges below 2,000 ft^3/s, which are poor. Diversions for irrigation of about 350,000 acres upstream from station. U.S. Army Corps of Engineers satellite telemeter at station. Several observations of water temperature and specific conductance were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2670	2620	e2300	2400	2580	2460	2540	5310	45800	13400	4160	2340
2	2800	2580	e2500	2360	2630	2410	2690	5210	46500	13800	3950	2240
3	2920	2600	2610	2410	2660	2460	2960	4960	37000	13300	3730	2140
4	3020	2750	2590	2390	2530	2420	2930	4760	27900	12600	3590	2110
5	3020	2900	2520	2420	2440	2070	2750	4740	24000	11900	3390	2080
6	2910	2930	2540	2400	2180	2050	2630	4910	21200	11100	3230	2030
7	2920	2870	2570	2340	2230	2170	2580	4970	19900	10600	3070	2070
8	2940	2850	2530	2260	1870	e1900	2530	4740	17700	10300	2820	2140
9	2830	2810	e2500	2150	1890	e2100	2470	4680	17500	9860	2670	2330
10	2780	2760	e2500	1920	2220	e2300	2440	5060	20300	9240	2650	2370
11	2900	2750	e2450	e1800	2420	2440	2480	4960	24400	8710	2630	2400
12	2930	2710	2460	e1900	2360	3150	2630	4650	25400	8350	2600	2400
13	2970	2670	2480	1920	2320	5000	2990	4550	24000	8170	2550	2420
14	3010	2670	2560	2320	2410	8220	3530	4710	23100	7970	2490	2480
15	3040	2660	2540	2380	2400	7200	4320	5220	23500	7660	2430	2470
16	3040	2650	2530	2200	2380	6000	5100	6330	23500	7310	2410	2440
17	2980	2630	2510	2020	2390	4720	5200	8550	24000	6890	2410	2460
18	2960	2620	2500	1910	2390	3970	4660	10600	24200	6530	2440	2510
19	2920	2610	2400	1950	2380	3340	4210	11200	24900	6260	2440	2520
20	2890	2610	2240	2270	2370	3000	3920	9550	24600	6050	2440	2510
21	2870	2610	1980	2100	2360	2780	3570	8130	23400	5830	2400	2480
22	2880	2600	2190	e1600	2360	2700	3340	7680	21600	5580	2390	2480
23	2930	2630	2370	e1750	2100	2670	3880	8000	18200	5420	2380	2460
24	2960	2660	2230	e1900	e1500	2630	5110	11600	15700	5180	2300	2430
25	2960	2580	2050	1980	e1700	2630	6130	16700	14500	5090	2290	2410
26	2960	2380	e1700	2040	e1900	2550	6220	23600	12900	5310	2200	2370
27	2950	2140	e1900	2270	e2100	2520	6410	29400	11500	6060	2140	2340
28	2890	2050	e2200	2760	2300	2570	6330	32500	11000	5920	2160	2340
29	2910	e1950	2480	2710	---	2490	5570	36100	11600	5350	2130	2360
30	2960	e2100	2510	2610	---	2440	5250	42300	12600	4860	2190	2380
31	2740	---	2420	2540	---	2450	---	46000	---	4440	2350	---
TOTAL	90460	77950	73860	67980	63370	97810	117370	381670	672400	249040	83030	70510
MEAN	2918	2598	2383	2193	2263	3155	3912	12310	22410	8034	2678	2350
MAX	3040	2930	2610	2760	2660	8220	6410	46000	46500	13800	4160	2520
MIN	2670	1950	1700	1600	1500	1900	2440	4550	11000	4440	2130	2030
AC-FT	179400	154600	146500	134800	125700	194000	232800	757000	1334000	494000	164700	139900

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1929 - 2003, BY WATER YEAR (WY)

MEAN	4007	3549	2792	2475	2650	3021	4125	12710	25310	13520	5143	4030
MAX	6803	5163	4451	3834	4382	5478	8799	24070	53910	37180	9776	7301
(WY)	1942	1984	1976	1984	1997	1979	1943	1997	1997	1975	1997	1968
MIN	2128	2283	1579	1363	1559	1767	1438	5635	9849	3410	1462	1527
(WY)	2002	1932	1933	1940	1932	2002	1961	1953	1934	1934	2001	2001

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1929 - 2003	
ANNUAL TOTAL	1865160		2045450			
ANNUAL MEAN	5110		5604		6951	
HIGHEST ANNUAL MEAN					12100	1997
LOWEST ANNUAL MEAN					3763	2001
HIGHEST DAILY MEAN	41100	Jun 3	46500	Jun 2	80100	Jun 12 1997
LOWEST DAILY MEAN	850	Feb 26	1500	Feb 24	450	Dec 12 1932
ANNUAL SEVEN-DAY MINIMUM	1270	Jan 28	1930	Jan 18	794	Dec 10 1932
MAXIMUM PEAK FLOW			48200	Jun 2	82000	Jun 12 1997
MAXIMUM PEAK STAGE			12.04	Jun 2	15.00	Jun 12 1997
INSTANTANEOUS LOW FLOW					430	Dec 12 1932
ANNUAL RUNOFF (AC-FT)	3700000		4057000		5036000	
10 PERCENT EXCEEDS	14400		12700		17700	
50 PERCENT EXCEEDS	2560		2650		3700	
90 PERCENT EXCEEDS	1650		2140		2150	

e--Estimated.

YELLOWSTONE RIVER BASIN

06216000 PRYOR CREEK AT PRYOR, MT

LOCATION.--Lat 45°26'06", long 108°32'01" (NAD 27), in $NE^1/_4NW^1/_4NE^1/_4$ sec.5, T.5 S., R.26 E., Big Horn County, Hydrologic Unit 10070008, on left bank 60 ft upstream from county bridge, 0.5 mi north of Pryor, 1.4 mi downstream from Lost Creek, and at river mile 82.7.
DRAINAGE AREA.--117 mi^2.
PERIOD OF RECORD.--June 1921 to September 1924 (no winter records), November 1966 to current year. Monthly discharge only for some periods, published in WSP 1309.
REVISED RECORDS.--WSP 1729: Drainage area. WDR MT-87-1: 1982-83 (M), 1986 (M).
GAGE.--Water-stage recorder. Elevation of gage is 4,007.35 ft (NGVD 29) (levels by U.S. Army Corps of Engineers). Prior to Oct. 14, 1966, nonrecording gage at approximately same site at different elevation.
REMARKS.--Records good. Diversions for irrigation of about 1,100 acres upstream from station. Several observations of water temperature and specific conductance were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	17	14	17	18	15	12	22	12	11	4.9	9.1
2	14	17	14	18	18	18	12	19	11	7.9	5.1	9.4
3	15	17	14	18	17	15	12	18	12	6.8	4.9	8.1
4	16	17	14	17	17	16	12	18	9.7	6.9	5.6	8.7
5	14	16	14	17	17	18	12	17	8.5	7.0	5.2	7.3
6	14	17	13	17	15	15	12	17	13	6.9	5.4	8.2
7	14	16	14	17	18	21	12	17	15	6.5	5.5	8.4
8	14	16	13	17	16	17	12	18	14	6.2	5.0	8.1
9	14	15	13	16	17	16	11	20	12	5.4	5.4	7.7
10	13	15	14	16	17	17	11	25	13	5.7	5.7	8.0
11	14	15	14	18	17	18	12	25	13	6.4	5.8	8.1
12	14	16	14	17	16	20	12	23	15	6.5	6.7	7.3
13	15	15	14	18	16	37	12	22	14	6.2	6.5	7.5
14	14	16	14	17	17	31	11	21	14	7.0	7.7	6.9
15	14	17	14	17	17	25	12	20	14	6.5	6.9	6.6
16	15	15	14	17	17	22	12	20	14	6.9	5.8	6.5
17	15	14	13	16	17	21	13	20	14	6.6	6.3	6.9
18	15	15	13	18	17	22	12	19	14	6.0	6.1	7.8
19	14	14	13	17	17	22	13	19	13	6.5	5.9	8.1
20	15	14	15	17	17	20	14	20	13	6.8	5.9	7.8
21	16	14	13	19	17	20	13	19	14	6.6	6.2	7.1
22	16	14	13	18	19	19	12	19	13	6.0	6.5	6.5
23	16	16	14	19	17	18	13	19	15	6.2	6.4	7.3
24	16	15	14	18	17	17	12	18	16	7.5	6.4	7.5
25	17	15	14	17	17	17	12	18	18	7.9	5.9	7.7
26	16	15	14	19	16	17	12	18	18	6.5	6.2	10
27	16	15	14	20	15	16	12	18	17	5.9	7.6	13
28	17	16	14	18	17	16	15	17	17	6.0	6.5	14
29	17	15	16	17	---	16	16	16	12	5.0	7.3	13
30	16	14	17	17	---	16	19	10	11	5.0	7.1	13
31	16	---	17	17	---	12	---	11	---	5.1	8.1	---
TOTAL	465	463	435	541	473	590	377	583	409.2	203.4	190.5	255.6
MEAN	15.0	15.4	14.0	17.5	16.9	19.0	12.6	18.8	13.6	6.56	6.15	8.52
MAX	17	17	17	20	19	37	19	25	18	11	8.1	14
MIN	13	14	13	16	15	12	11	10	8.5	5.0	4.9	6.5
AC-FT	922	918	863	1070	938	1170	748	1160	812	403	378	507

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1968 - 2003, BY WATER YEAR (WY)

MEAN	31.7	31.3	30.4	29.2	30.1	32.0	32.1	54.5	40.9	23.4	21.1	26.9
MAX	62.9	62.0	69.7	54.3	55.7	70.9	58.8	251	158	69.3	49.5	61.0
(WY)	1976	1976	1976	1976	1976	1979	1976	1978	1975	1975	1975	1978
MIN	15.0	15.4	14.0	17.5	16.9	18.1	12.6	17.8	13.6	6.56	6.15	8.52
(WY)	2003	2003	2003	2003	2003	2002	2003	2002	2003	2003	2003	2003

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1968 - 2003	
ANNUAL TOTAL	5382.1		4985.7			
ANNUAL MEAN	14.7		13.7		32.0	
HIGHEST ANNUAL MEAN					66.3	1975
LOWEST ANNUAL MEAN					13.7	2003
HIGHEST DAILY MEAN	23	Apr 18	37	Mar 13	1700	May 19 1978
LOWEST DAILY MEAN	4.7	Jul 15	4.9	Aug 1	3.2	Aug 1 1988
ANNUAL SEVEN-DAY MINIMUM	5.6	Jul 13	5.1	Jul 29	5.1	Jul 29 2003
MAXIMUM PEAK FLOW			64	Mar 13	b2280	May 19 1978
MAXIMUM PEAK STAGE			3.78	Mar 13	c8.88	May 19 1978
INSTANTANEOUS LOW FLOW			a4.3	Jul 30	1.8	Jul 31 1988
ANNUAL RUNOFF (AC-FT)	10680		9890		23170	
10 PERCENT EXCEEDS	19		18		48	
50 PERCENT EXCEEDS	16		14		27	
90 PERCENT EXCEEDS	7.2		6.5		16	

a--Gage height, 2.73 ft.
b--From rating curve extended above 410 ft^3/s on basis of contracted-opening measurement.
c--From floodmark.

YELLOWSTONE RIVER BASIN

06279500 BIGHORN RIVER AT KANE, WY

LOCATION.--Lat 44°45'31", long 108°10'51" (NAD 27), in NW$^1/_4$NE$^1/_4$ SW$^1/_4$ sec.9, T.55 N., R.94 W., Big Horn County, Hydrologic Unit 10080010, on right bank 180 ft upstream from Bighorn Canyon National Recreation Area boundary, 0.5 mi upstream from normal high-water line of Bighorn Lake at elevation 3,660 ft, 1.3 mi upstream from Five Springs Creek, and 5.9 mi south of Kane.

DRAINAGE AREA.--15,765 mi^2. Area at sites used prior to May 17, 1956, 15,846 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1928 to current year.

REVISED RECORDS.--WSP 1309: 1929(M). WSP 1509: 1929. WSP 1709: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 3,660 ft (NGVD 29). Aug. 29, 1928, to Apr. 25, 1932, nonrecording gage, and Apr. 25, 1932, to May 16, 1956, water-stage recorder at site 12.5 mi downstream at different elevation.

REMARKS.--Water-discharge records good except those for Nov. 1 to Feb. 28 and those for estimated daily discharges, which are poor. Some regulation by Boysen Reservoir (station 06258900) since October 1951. Diversions for irrigation of about 376,000 acres upstream from station. U.S. Army Corps of Engineers data collection platform with satellite telemetry at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1923, 14.8 ft, Sept. 30, 1923, site and elevation in use April 1932 to May 1956.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	570	e700	e700	e720	743	745	e1000	1310	4980	1400	556	910
2	608	e700	e660	719	783	808	1010	2000	4520	1220	556	888
3	657	e700	e740	703	768	782	862	1050	3160	1160	515	820
4	739	e710	e700	704	750	825	758	775	2380	1100	536	765
5	740	e710	e720	696	e720	753	721	725	1970	1060	514	694
6	703	e720	e740	722	e650	698	690	733	1780	1030	467	693
7	693	e720	e700	710	e600	710	675	747	1720	966	426	724
8	689	719	e640	698	e560	753	663	733	1670	884	402	721
9	678	723	e620	714	600	777	656	1350	1560	788	435	728
10	670	718	e580	691	635	733	615	1490	1570	723	433	812
11	671	715	e560	629	632	758	551	1260	1760	699	463	1140
12	674	705	e550	563	690	1040	563	1290	1940	678	461	1290
13	687	699	e550	538	671	e2000	579	1020	1850	692	424	1020
14	699	704	e600	619	673	2860	601	870	1780	682	432	1040
15	703	700	e700	684	699	2590	605	779	1680	641	430	983
16	704	692	e810	671	685	2280	639	686	1680	583	427	974
17	706	687	e830	629	711	1640	764	667	1680	587	417	951
18	705	688	e740	667	686	1270	771	758	1810	545	446	902
19	705	685	e720	595	686	1120	732	900	1780	580	555	884
20	706	689	e660	624	676	967	704	916	1560	626	798	890
21	707	686	e580	681	665	866	704	860	1470	687	641	857
22	710	e700	e560	749	e660	826	661	748	1390	700	612	769
23	719	e710	e600	666	e600	797	605	688	1290	582	593	748
24	731	e730	e640	621	e560	765	717	905	1270	491	592	714
25	731	731	e580	655	e500	737	686	1630	1850	506	579	703
26	726	e700	e520	690	e460	725	642	2600	2120	476	560	688
27	711	e600	e480	677	e510	755	663	e3500	1640	599	556	672
28	700	e660	e490	699	e650	820	706	e4000	1460	634	592	656
29	707	e700	e560	708	---	862	760	4560	1490	705	570	656
30	706	e740	e730	701	---	860	701	5030	1830	634	591	674
31	e680	---	e760	717	---	e900	---	5080	---	582	735	---
TOTAL	21535	21041	20020	20860	18223	33022	21004	49660	58640	23240	16314	24966
MEAN	695	701	646	673	651	1065	700	1602	1955	750	526	832
MAX	740	740	830	749	783	2860	1010	5080	4980	1400	798	1290
MIN	570	600	480	538	460	698	551	667	1270	476	402	656
AC-FT	42710	41730	39710	41380	36150	65500	41660	98500	116300	46100	32360	49520

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1930 - 2003, BY WATER YEAR (WY)*

MEAN	1789	1660	1447	1358	1525	1812	1793	3150	5750	3112	1432	1515
MAX	3994	2871	2506	2871	3164	3171	3454	7505	14680	11650	6388	3673
(WY)	1983	1984	1983	1972	1983	1972	1943	1947	1944	1967	1930	1973
MIN	524	701	627	580	550	740	684	744	1032	501	305	386
(WY)	1936	2003	1961	1937	1933	1989	2002	2002	1934	1961	1940	1935

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1930 - 2003*	
ANNUAL TOTAL	280334		328525			
ANNUAL MEAN	768		900		2195	
HIGHEST ANNUAL MEAN					3524	1947
LOWEST ANNUAL MEAN					781	2002
HIGHEST DAILY MEAN	5640	Jun 2	5080	May 31	24800	Jun 15 1935
LOWEST DAILY MEAN	368	Aug 2	402	Aug 8	179	Jul 22 1934
ANNUAL SEVEN-DAY MINIMUM	404	Aug 8	434	Aug 12	184	Jul 18 1934
MAXIMUM PEAK FLOW			5920	May 30	a25200	Jun 16 1935
MAXIMUM PEAK STAGE			4.51	May 30	11.10	Jun 16 1935
ANNUAL RUNOFF (AC-FT)	556000		651600		1590000	
10 PERCENT EXCEEDS	967		1560		3940	
50 PERCENT EXCEEDS	700		705		1620	
90 PERCENT EXCEEDS	465		560		760	

*--August 1928 to September 1929 not included in computations, monthly only for selected months.
a--Site and datum then in use.
e--Estimated.

PERIOD OF RECORD.--Water years 1947-1977, 1999 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instantaneous discharge, cfs (00061)	Barometric pressure, mm Hg (00025)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	Specif. conductance, wat unf uS/cm 25 degC (00095)	Temperature, air, deg C (00020)	Temperature, water, deg C (00010)	Ammonia water, fltrd, mg/L as N (00608)	Nitrite + nitrate water fltrd, mg/L as N (00631)
OCT 2002											
30...	1300	698	674	14.3	114	8.8	1180	.5	1.0	<.04	.34
FEB 2003											
03...	1630	816	667	12.3	97	8.2	1110	-7.0	0.0	.11	.57
MAY											
30...	1320	4960	667	7.8	91	7.8	321	29.5	16.0	E.03	.21
AUG											
05...	1610	497	671	14.3	200	8.7	1060	36.0	25.5	<.04	.29

Date	Nitrite water, fltrd, mg/L as N (00613)	Orthophosphate, water, fltrd, mg/L as P (00671)	E coli, modif. m-TEC, water, col/ 100 mL (90902)	E coli, m-TEC MF, water, col/ 100 mL (31633)	Fecal coliform, 0.7u MF col/ 100 mL (31625)	Suspended sediment concentration mg/L (80154)	Suspended sediment load, tons/d (80155)
OCT 2002							
30...	<.008	<.02	--	E10k	E13k	70	132
FEB 2003							
03...	E.006	E.01	--	180	160	334	736
MAY							
30...	E.004	<.02	2000	--	E2500k	1720	23000
AUG							
05...	.008	<.02	E13k	--	E29k	72	97

E--Estimated.
k--Counts outside acceptable range.

YELLOWSTONE RIVER BASIN

06285100 SHOSHONE RIVER NEAR LOVELL, WY

LOCATION.--Lat 44°50'19", long 108°26'04" (NAD 27), in NW¼ NE¼ NE¼ sec.17, T.56 N., R.96 W., Big Horn County, Hydrologic Unit 10080014, on left bank 20 ft upstream from bridge on County Road 9 and 1.5 mi west of Lovell.
DRAINAGE AREA.--2,350 mi², approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1966 to current year.
GAGE.--Water-stage recorder. Elevation of gage is 3,850 ft (NGVD 29). Prior to Oct. 1, 1976, at site 500 ft downstream, at elevation 2.00 ft higher. Oct. 1, 1976 to Sept. 30, 1980, at site 500 ft downstream, at elevation 1.00 ft higher. Oct. 1, 1981 to Nov. 13, 1986, at site 500 ft downstream at same elevation.
REMARKS.--Water-discharge records fair except those for Mar. 13 to July 24, and those for estimated daily discharges, which are poor. Flow regulated by Buffalo Bill Reservoir. (See station 06281500.) Natural flow of stream affected by storage reservoirs, power development, diversions upstream from station for irrigation of about 143,000 acres, of which about 8,000 acres are downstream from station, and return flow from irrigated areas. U.S. Geological Survey satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	533	e422	393	e330	e360	e350	e370	473	304	1660	e508	775
2	605	434	397	e320	e350	e370	341	482	386	2210	517	723
3	681	453	402	e330	345	e370	312	362	408	2040	e536	558
4	620	458	385	e330	340	e350	297	308	439	1340	589	539
5	639	460	384	329	327	e320	280	318	473	1440	508	539
6	591	453	382	326	e290	e340	277	283	530	1400	e490	528
7	584	459	e360	316	e290	e330	239	221	577	1240	469	558
8	554	454	e350	319	e300	e310	201	314	e579	e840	483	611
9	565	460	e350	323	e310	e300	162	658	532	808	459	648
10	558	453	e340	e300	e320	e320	114	513	497	482	475	e630
11	550	453	e350	e280	322	e450	94	513	438	318	487	636
12	480	448	e350	e290	e310	e700	108	506	402	290	474	691
13	410	450	e360	e300	e310	927	94	462	338	256	e484	770
14	e339	452	e360	e320	326	755	e51	386	457	267	407	749
15	338	458	e370	310	326	496	e59	357	1090	267	364	733
16	622	457	375	e290	330	438	e77	329	2710	241	397	644
17	477	454	373	e280	329	398	260	284	3780	234	444	567
18	448	443	369	e270	332	374	217	279	4620	270	508	571
19	404	446	e360	e290	333	364	305	334	5670	275	484	601
20	376	446	e310	e310	339	359	538	288	6380	291	469	574
21	356	448	e340	313	345	349	543	296	5590	302	445	578
22	369	432	e350	e300	e320	345	506	224	5440	310	451	643
23	368	435	e360	e290	e260	344	429	212	4010	e350	472	639
24	370	415	e320	e300	e210	331	314	163	1340	319	490	573
25	e395	403	e280	e310	e230	323	288	168	1240	339	479	592
26	370	e380	e270	e330	e260	324	236	223	1330	389	434	585
27	359	e390	e290	e350	e280	e310	213	237	1240	455	442	550
28	352	404	e310	e400	e320	e330	268	189	1220	508	457	578
29	351	405	e340	371	---	e320	314	193	1230	473	515	616
30	412	399	e340	354	---	e300	284	174	1160	481	608	514
31	450	---	e320	362	---	e320	---	225	---	505	736	---
TOTAL	14526	13124	10840	9843	8714	12217	7791	9974	54410	20600	15081	18513
MEAN	469	437	350	318	311	394	260	322	1814	665	486	617
MAX	681	460	402	400	360	927	543	658	6380	2210	736	775
MIN	338	380	270	270	210	300	51	163	304	234	364	514
AC-FT	28810	26030	21500	19520	17280	24230	15450	19780	107900	40860	29910	36720

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1967 - 2003, BY WATER YEAR (WY)

MEAN	755	705	638	572	594	666	789	866	1860	1714	726	768
MAX	1251	1146	1168	1065	1139	1951	3353	2925	4935	4686	1305	1354
(WY)	1972	1969	1969	1973	1973	1997	1997	1996	1981	1982	1982	1991
MIN	369	297	306	226	228	243	248	193	203	149	207	245
(WY)	1989	1986	1995	1991	1989	1995	1981	1977	1977	1977	1977	1977

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1967 - 2003	
ANNUAL TOTAL	134186		195633			
ANNUAL MEAN	368		536		888	
HIGHEST ANNUAL MEAN					1659	1997
LOWEST ANNUAL MEAN					356	2002
HIGHEST DAILY MEAN	681	Oct 3	6380	Jun 20	15200	Jun 10 1981
LOWEST DAILY MEAN	159	Apr 24	51	Apr 14	27	May 31 1977
ANNUAL SEVEN-DAY MINIMUM	212	Apr 18	85	Apr 10	48	May 30 1977
MAXIMUM PEAK FLOW			a6550	Jun 20	c16400	Jun 10 1981
MAXIMUM PEAK STAGE			b10.61	Jan 23	11.27	Jun 13 2001
ANNUAL RUNOFF (AC-FT)	266200		388000		643500	
10 PERCENT EXCEEDS	491		667		1440	
50 PERCENT EXCEEDS	360		374		653	
90 PERCENT EXCEEDS	256		270		320	

a--Gage height, 9.88 ft.
b--Backwater from ice.
c--Gage height, 9.16 ft, site and datum then in use, at present datum.
e--Estimated.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1967-97, October 1999 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1966 to September 1983.
WATER TEMPERATURE: October 1966 to September 1983.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instan-taneous dis-charge, cfs (00061)	Baro-metric pres-sure, mm Hg (00025)	Dis-solved oxygen, mg/L (00300)	Dis-solved oxygen, percent of sat-uration (00301)	pH, water, unfltrd field, std units (00400)	Specif. conduc-tance, wat unf uS/cm 25 degC (00095)	Temper-ature, air, deg C (00020)	Temper-ature, water, deg C (00010)
OCT 2002									
30...	1525	514	669	13.2	105	8.5	1060	-4.0	0.5
FEB 2003									
04...	0800	347	663	12.1	96	8.4	1090	-10.0	0.0
MAY									
29...	1350	223	662	12.7	170	8.8	745	34.5	22.5
AUG									
05...	1810	481	665	9.2	123	8.6	648	34.5	22.5

Date	Ammonia water, fltrd, mg/L as N (00608)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	E coli, modif. m-TEC, water, col/ 100 mL (90902)	E coli, m-TEC MF, water, col/ 100 mL (31633)	Fecal coli-form, M-FC 0.7u MF col/ 100 mL (31625)
OCT 2002							
30...	E.03	1.60	E.006	<.02	--	88	130
FEB 2003							
04...	.04	1.44	.011	E.01	--	62	57
MAY							
29...	<.04	.85	.028	E.01	240	--	300
AUG							
05...	<.04	1.79	.013	.05	350	--	380

E--Estimated.

06286400 BIGHORN LAKE NEAR ST. XAVIER, MT

LOCATION.--Lat 45°18'27", long 107°57'26" (NAD 27), in $SW^1/_4SE^1/_4$ sec.18, T.6 S., R.30 E., Big Horn County, Hydrologic Unit 10080010, in block 13 of Yellowtail Dam on Bighorn River, 1.3 mi upstream from Grapevine Creek, 15.5 mi southwest of St. Xavier, and at river mile 86.6.

DRAINAGE AREA.--19,626 mi^2.

PERIOD OF RECORD.--November 1965 to current year (monthend contents only). Prior to October 1969, published as "Yellowtail Reservoir." Records of daily elevations and contents on file at the U. S. Geological Survey office in Helena, Montana.

GAGE.--Water-stage recorder in powerhouse control room. Elevation of gage is 3,296.5 ft (NGVD 29) (levels by Bureau of Reclamation).

REMARKS.--Reservoir is formed by thin concrete-arch dam; construction began in 1961; completed in 1967. Storage began Nov. 3, 1965. Usable capacity, 1,312,000 acre-ft, between elevation 3,296.50 ft, river outlet invert, and 3,657.00 ft, top of flood control. Elevation of spillway crest, 3,593.00 ft. Normal maximum operating level, 1,097,000 acre-ft, elevation, 3,640.00 ft. Minimum operating level, 483,400 acre-ft, elevation, 3,547.00 ft. Dead storage, 16,010 acre-ft, below elevation 3,296.50 ft. All elevations are referenced to the National Geodetic Vertical Datum of 1929. Figures given herein represent usable contents. Water is used for power production, flood control, irrigation, and recreation.

COOPERATION.--Elevations and capacity table furnished by Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 1,346,000 acre-ft, July 6, 1967, elevation, 3,656.43 ft; minimum since first filling, 519,400 acre-ft, Mar. 11, 2003, elevation 3,572.81 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 827,900 acre-ft, July 7, elevation, 3,616.02 ft; minimum, 519,400 acre-ft, Mar. 11, elevation, 3,572.81 ft.

MONTHEND ELEVATION AND CONTENTS AT 2400 HOURS, WATER YEAR SEPTEMBER 2002 TO SEPTEMBER 2003

Date	Elevation (feet)	Contents (acre-feet)	Change in Contents (acre-feet)
Sept. 30	3,578.61	619,000	--
Oct. 31	3,584.32	646,900	+27,900
Nov. 30	3,585.46	652,600	+5,700
Dec. 31	3,582.01	635,600	-17,000
CALENDAR YEAR 2002			-90,100
Jan. 31	3,578.07	616,400	-19,200
Feb. 28	3,573.68	595,500	-20,900
Mar. 31	3,576.93	610,900	+15,400
Apr. 30	3,576.34	608,100	-2,800
May 31	3,589.92	675,100	+67,000
June 30	3,614.31	815,800	+140,700
July 31	3,609.48	783,900	-31,900
Aug. 31	3603.21	746,600	-37,300
Sept. 30	3,607.20	769,900	+23,300
WATER YEAR 2003			+150,900

YELLOWSTONE RIVER BASIN

06287000 BIGHORN RIVER NEAR ST. XAVIER, MT

LOCATION.--Lat 45°19'00", long 107°55'05" (NAD 27), in $NW^1/_4NW^1/_4NE^1/_4$ sec.16, T.6 S., R.31 E., Big Horn County, Hydrologic Unit 10080015, on right bank 800 ft downstream from Yellowtail dam, 1,500 ft downstream from Lime Kiln Creek, 14 mi southwest of St. Xavier, and at river mile 83.9.

DRAINAGE AREA.--19,667 mi^2. Area at site used prior to Apr. 16, 1963, 19,626 mi^2.

PERIOD OF RECORD.--October 1934 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 3,158.38 ft (NGVD 29) (levels by U.S. Army Corps of Engineers). Prior to Apr. 16, 1963, and June 13, 1964, to Mar. 31, 1965, water-stage recorder at site 1.2 mi upstream at different elevation. Apr. 1, 1965, to July 31, 1966, water-stage recorder at site 1,300 ft downstream at present elevation.

REMARKS.--Records fair. **Figures of discharge given herein are sum of river flow and flow of Bighorn Canal**. Some regulation by 14 reservoirs in Wyoming with combined capacity of 1,400,000 acre-ft and complete regulation by Bighorn Lake (see preceding page) since Nov. 3, 1965. Diversions for irrigation of about 375,000 acres upstream from station. Bureau of Reclamation satellite telemeter at station. Several observations of water temperature and specific conductance were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1460	1280	1330	1320	1360	1310	1570	1290	1300	1920	1870	1880
2	1460	1310	1330	1330	1360	1310	1570	1280	1300	1930	1980	1870
3	1450	1290	1330	1330	1370	1310	1570	1270	1300	1970	1990	1850
4	1430	1290	1340	1340	1380	1320	1570	1280	1370	1980	1960	1820
5	1430	1280	1360	1350	1310	1320	1580	1270	1380	1980	1930	1760
6	1430	1280	1360	1350	1330	1320	1590	1270	1460	1980	1930	1750
7	1410	1280	1370	1350	1410	1310	1600	1280	1510	2010	1930	1740
8	1450	1270	1190	1360	1420	1320	1310	1270	1550	2050	1920	1710
9	1490	1280	1380	1370	1430	1330	1310	1270	1690	2050	1920	1690
10	1410	1280	1380	1370	1440	1330	1310	1270	1750	2070	1920	1670
11	1310	1270	1380	1370	1450	1330	1310	1270	1820	2070	1920	1640
12	1300	1270	1390	1390	1460	1320	1300	1260	1900	2080	1910	1620
13	1300	1270	1400	1390	1470	1330	1310	1260	1920	2080	1910	1600
14	1290	1260	1410	1380	1480	1330	1300	1260	1940	2080	1910	1600
15	1280	1260	1410	1380	1490	1340	1310	1260	1950	2070	1900	1580
16	1270	1260	1420	1390	1500	1330	1310	1260	1950	2070	1900	1570
17	1450	1260	1420	1400	1520	1340	1310	1260	1950	2080	1900	1540
18	1440	1250	1300	1410	1530	1340	1300	1260	1950	2070	1890	1700
19	1430	1250	1320	1420	1530	1340	1300	1260	1950	2090	1880	1830
20	1420	1250	1340	1420	1540	1330	1290	1260	1940	2090	1880	1830
21	1420	1260	1380	1410	1560	1330	1290	1250	1940	2110	1870	1830
22	1400	1260	1410	1430	1320	1540	1300	1250	1930	2120	1870	1810
23	1380	1270	1420	1290	1320	1540	1300	1250	1930	2120	1870	1790
24	1350	1280	1290	1300	1310	1550	1290	1250	1930	2120	1860	1760
25	1320	1290	1290	1310	1300	1550	1290	1250	1940	2100	1850	1730
26	1300	1310	1290	1320	1310	1560	1290	1250	1930	2100	1810	1710
27	1250	1300	1290	1300	1310	1560	1280	1250	1940	2110	1890	1690
28	1160	1310	1290	1300	1310	1560	1280	1250	1940	2110	1940	1680
29	1150	1320	1290	1310	---	1560	1280	1240	1940	2110	1920	1670
30	1120	1320	1310	1340	---	1570	1280	1250	1920	2060	1910	1660
31	1190	---	1310	1350	---	1580	---	1300	---	1800	1900	---
TOTAL	41950	38360	41730	42080	39520	43410	40900	39150	53220	63580	59040	51580
MEAN	1353	1279	1346	1357	1411	1400	1363	1263	1774	2051	1905	1719
MAX	1490	1320	1420	1430	1560	1580	1600	1300	1950	2120	1990	1880
MIN	1120	1250	1190	1290	1300	1310	1280	1240	1300	1800	1810	1540
AC-FT	83210	76090	82770	83470	78390	86100	81130	77650	105600	126100	117100	102300

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1935 - 2003, BY WATER YEAR (WY)

MEAN	2932	2887	2703	2573	2641	2888	2872	3797	6978	5465	2865	2709
MAX	5142	5151	4999	5267	4384	4809	6675	8744	17900	18890	6784	4544
(WY)	1972	1983	1968	1968	1976	1976	1972	1947	1935	1967	1997	1973
MIN	1224	856	1095	1090	888	327	678	900	1078	1144	1260	1074
(WY)	1978	1966	1935	1935	1936	1966	1966	1966	1966	1960	1966	1966

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1935 - 2003	
ANNUAL TOTAL	529260		554520			
ANNUAL MEAN	1450		1519		3444	
HIGHEST ANNUAL MEAN					5059	1947
LOWEST ANNUAL MEAN					1565	1966
HIGHEST DAILY MEAN	1970	Feb 20	2120	Jul 22	37400	Jun 16 1935
LOWEST DAILY MEAN	1120	Oct 30	1120	Oct 30	112	Apr 2 1967
ANNUAL SEVEN-DAY MINIMUM	1180	Jun 28	1210	Oct 26	195	Mar 25 1966
MAXIMUM PEAK FLOW			2220	Aug 25	37400	Jun 16 1935
MAXIMUM PEAK STAGE			59.98	Nov 26		
INSTANTANEOUS LOW FLOW					49	Mar 29 1966
ANNUAL RUNOFF (AC-FT)	1050000		1100000		2495000	
10 PERCENT EXCEEDS	1600		1940		5760	
50 PERCENT EXCEEDS	1460		1380		2820	
90 PERCENT EXCEEDS	1270		1270		1510	

06287000 BIGHORN RIVER NEAR ST. XAVIER, MT--Continued

SUMMARY STATISTICS	WATER YEARS 1935 - 1961*		WATER YEARS 1967 - 2003**	
ANNUAL MEAN	3426		3435	
HIGHEST ANNUAL MEAN	5059	1947	4839	1999
LOWEST ANNUAL MEAN	1706	1961	1649	2002
HIGHEST DAILY MEAN	37400	Jun 16 1935	24800	Jul 6 1967
LOWEST DAILY MEAN	300	Dec 20 1951	112	Apr 2 1967
ANNUAL SEVEN-DAY MINIMUM	656	Dec 25 1934	518	Mar 25 1970
MAXIMUM PEAK FLOW	37400	Jun 19 1935	25300	Jul 5 1967
MAXIMUM LOW FLOW	228	Dec 9 1937	a112	Apr 2 1967
ANNUAL RUNOFF (AC-FT)	2482000		2489000	
10 PERCENT EXCEEDS	6640		5480	
50 PERCENT EXCEEDS	2450		3100	
90 PERCENT EXCEEDS	1370		1740	

*--Prior to construction of Yellowtail Dam.
**--After completion of Yellowtail Dam.
a--Result of discharge measurement.

YELLOWSTONE RIVER BASIN

06289000 LITTLE BIGHORN RIVER AT STATE LINE, NEAR WYOLA, MT

LOCATION.--Lat 45°00'25", long 107°36'52" (NAD 27), in SW$^1/_4$NW$^1/_4$ sec.36, T.9 S., R.33 E., Bighorn County, Hydrologic Unit 10080016, on right bank 20 ft downstream from county bridge, 0.5 mi north of Wyoming-Montana State line, 1 mi downstream from West Fork, 13 mi southwest of Wyola, and at river mile 115.2.
DRAINAGE AREA (REVISED).--182 mi^2.
PERIOD OF RECORD.--March 1939 to current year. Prior to October 1940, published as Little Horn River at State Line, near Wyola.
REVISED RECORDS.--WSP 1729: Drainage area. WDR MT-04-1: Drainage area.
GAGE.--Water-stage recorder. Elevation of gage is 4,350 ft (NGVD 29).
REMARKS.--Records fair except those for estimated daily discharges, which are poor. Diversions for irrigation of 163 acres upstream from station. Several observations of water temperature and specific conductance were made during the year

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	61	34	53	48	46	e44	60	115	1020	190	103	87
2	61	37	53	47	46	e44	65	108	792	185	100	84
3	62	42	53	47	45	e44	63	110	587	180	99	83
4	64	58	51	47	46	e44	58	125	493	174	99	83
5	62	63	51	47	43	e45	55	119	440	170	98	83
6	62	60	49	46	36	e43	57	117	412	166	96	83
7	60	59	47	46	33	e39	55	113	389	163	94	83
8	60	58	46	46	45	e30	53	119	369	160	93	83
9	60	57	50	43	44	e28	56	115	370	154	93	86
10	58	56	52	27	49	e35	63	114	385	148	92	87
11	61	55	52	31	49	e50	69	110	395	144	92	86
12	57	53	49	46	45	e48	76	118	387	141	91	86
13	58	53	51	55	45	e48	84	144	379	138	91	86
14	59	53	51	51	46	e48	86	164	364	135	89	84
15	59	53	51	49	44	e48	95	193	347	133	88	83
16	58	52	50	48	43	e49	92	237	341	131	87	82
17	57	52	50	47	43	e49	87	289	332	127	98	83
18	60	52	50	46	43	e49	86	305	320	126	100	82
19	60	52	40	46	43	e49	86	271	309	124	92	81
20	59	52	35	46	43	e49	78	244	297	122	91	80
21	59	52	e35	45	43	52	79	237	285	119	89	80
22	57	52	e35	35	42	52	85	270	268	117	88	80
23	56	55	e30	44	e25	54	94	378	253	114	87	80
24	57	50	31	46	e20	52	115	525	257	112	87	80
25	57	40	30	46	e20	51	125	754	247	113	87	80
26	54	38	35	47	e25	52	148	927	241	113	87	78
27	54	60	63	48	e35	52	128	991	224	112	87	78
28	57	59	63	47	e40	51	118	1020	211	108	87	78
29	55	57	54	46	---	49	109	1110	202	106	89	78
30	43	54	51	46	---	51	118	1120	195	105	87	78
31	38	---	50	46	---	53	---	1180	---	103	87	---
TOTAL	1785	1568	1461	1405	1127	1452	2543	11742	11111	4233	2848	2465
MEAN	57.6	52.3	47.1	45.3	40.2	46.8	84.8	379	370	137	91.9	82.2
MAX	64	63	63	55	49	54	148	1180	1020	190	103	87
MIN	38	34	30	27	20	28	53	108	195	103	87	78
AC-FT	3540	3110	2900	2790	2240	2880	5040	23290	22040	8400	5650	4890

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1940 - 2003, BY WATER YEAR (WY)

MEAN	86.3	75.4	67.7	62.7	61.4	61.5	84.9	324	516	218	123	97.7
MAX	120	104	91.2	84.9	88.0	86.4	172	533	1125	689	228	151
(WY)	1976	1942	1976	1946	1946	1946	1946	1977	1975	1975	1975	1975
MIN	57.6	52.3	46.8	43.6	40.2	46.8	50.7	127	145	94.8	69.8	63.6
(WY)	2003	2003	2002	1963	2003	2003	1961	1953	2001	2002	1961	2001

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1940 - 2003	
ANNUAL TOTAL	28558		43740			
ANNUAL MEAN	78.2		120		148	
HIGHEST ANNUAL MEAN					253	1975
LOWEST ANNUAL MEAN					78.7	2002
HIGHEST DAILY MEAN	500	Jun 2	1180	May 31	2340	Jun 4 1944
LOWEST DAILY MEAN	30	Dec 23	20	Feb 24	18	Feb 2 1989
ANNUAL SEVEN-DAY MINIMUM	33	Dec 20	30	Feb 22	27	Dec 18 1983
MAXIMUM PEAK FLOW			1460	May 31	a2730	Jun 3 1944
MAXIMUM PEAK STAGE			3.98	May 31	b5.93	Jun 9 1944
INSTANTANEOUS LOW FLOW					18	Feb 2 1989
ANNUAL RUNOFF (AC-FT)	56640		86760		107500	
10 PERCENT EXCEEDS	150		255		334	
50 PERCENT EXCEEDS	58		62		83	
90 PERCENT EXCEEDS	45		43		56	

a--Gage height, 4.97 ft, from rating curve extended above 1,400 ft^3/s.
b--Result of log jam.
e--Estimated.

YELLOWSTONE RIVER BASIN

06289600 WEST PASS CREEK NEAR PARKMAN, WY

LOCATION.--Lat 44°59'16", long 107°28'56" (NAD 27), in NE$^1/_4$NE$^1/_4$SE$^1/_4$ sec.21, T.58 N., R.88 W., Sheridan County, Hydrologic Unit 10080016, on right bank, anchored to concrete headwall of culvert on county road and 7.6 mi northwest of Parkman.

DRAINAGE AREA.--15.4 mi^2.

PERIOD OF RECORD.--October 1982 to current year (no winter records water years 1985-87).

GAGE.--Water-stage recorder. Elevation of gage is 4,220 ft (NGVD 29). Prior to Apr. 2, 1985, at site 100 ft north (on abandoned channel) at elevation 4.28 ft lower. Apr. 2, 1985 to Mar. 27, 1986, at site 300 ft upstream at elevation 0.95 ft higher. Apr. 2, 1985 to Sept. 30, 1998, at same site at elevation 1.00 ft lower. U.S. Geological Survey data collection platform wtih satellite telemetry at station.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Natural flow of stream affected by diversions for irrigation upstream from station. U.S. Geological Survey satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.1	e5.6	5.1	4.3	5.2	e5.0	8.2	33	50	15	9.2	6.1
2	6.3	e5.4	5.1	4.3	5.0	e4.8	8.0	22	43	15	9.1	6.0
3	6.3	e5.3	5.1	4.5	4.5	e5.0	7.8	20	37	15	8.9	6.1
4	6.7	5.2	4.6	4.5	4.6	e4.8	7.8	21	33	14	8.6	6.0
5	6.6	5.0	5.0	4.5	4.3	e4.7	8.0	21	31	14	8.5	5.9
6	6.4	4.9	e4.9	4.5	e4.0	e5.0	8.3	22	34	13	8.6	5.9
7	6.1	4.9	e4.8	4.5	e4.6	e5.0	8.5	21	32	13	8.4	6.0
8	5.9	4.9	e4.7	4.7	4.6	e5.0	8.7	25	28	13	8.0	6.1
9	6.0	4.9	e4.8	e4.7	4.9	e5.8	8.6	28	28	13	7.9	5.9
10	6.0	4.9	4.9	e4.3	4.9	e6.0	8.7	29	28	12	7.7	6.1
11	6.3	4.9	4.8	e4.1	5.1	7.0	8.7	33	28	12	7.6	6.1
12	6.0	4.9	e4.8	e4.3	e4.4	6.3	8.7	24	27	12	7.8	6.4
13	5.9	4.9	4.8	e4.4	4.8	13	9.0	25	27	11	8.1	6.2
14	5.9	4.9	4.7	4.6	5.1	15	9.2	28	26	11	7.8	6.2
15	6.0	5.1	4.9	4.5	4.9	8.8	9.8	33	25	11	7.6	5.9
16	6.0	5.0	4.7	e4.4	4.8	7.7	10	36	25	11	7.4	5.8
17	5.7	4.9	4.7	4.5	4.9	9.4	10	37	24	11	8.3	6.6
18	5.7	5.0	4.7	e4.5	4.8	7.4	11	38	23	11	7.7	6.3
19	5.7	5.1	e4.6	4.6	4.8	7.1	12	35	23	11	7.1	6.1
20	5.7	5.1	e4.4	4.7	4.8	7.3	12	31	22	10	7.0	6.0
21	5.7	5.1	e4.5	e4.4	4.8	7.4	12	29	21	10	6.8	6.0
22	5.6	5.2	e4.4	e4.0	4.4	10	12	29	21	10	6.7	6.1
23	5.2	5.6	e4.2	e4.4	e4.1	13	13	34	20	10	6.6	5.9
24	5.3	e5.6	e4.0	e5.0	e3.9	8.2	17	41	22	10	6.7	5.9
25	5.7	e5.2	e4.2	e4.8	e4.1	7.3	15	46	20	10	6.8	5.6
26	5.8	e5.0	e4.3	e4.8	e4.3	7.7	17	49	18	10	6.4	5.6
27	5.6	5.3	e4.4	e4.8	e4.7	8.0	19	53	17	10	6.3	5.7
28	5.7	5.9	e4.4	e4.8	e4.8	7.3	19	53	17	9.9	6.5	5.8
29	5.6	5.6	e4.5	4.8	---	7.0	19	55	16	9.4	6.6	5.9
30	e5.4	5.2	4.3	5.2	---	9.1	33	57	16	9.4	6.4	5.9
31	e6.0	---	4.4	5.2	---	9.2	---	53	---	9.2	6.3	---
TOTAL	182.9	154.5	143.7	141.6	130.1	234.3	359.0	1061	782	355.9	233.4	180.1
MEAN	5.90	5.15	4.64	4.57	4.65	7.56	12.0	34.2	26.1	11.5	7.53	6.00
MAX	6.7	5.9	5.1	5.2	5.2	15	33	57	50	15	9.2	6.6
MIN	5.2	4.9	4.0	4.0	3.9	4.7	7.8	20	16	9.2	6.3	5.6
AC-FT	363	306	285	281	258	465	712	2100	1550	706	463	357

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1983 - 2003, BY WATER YEAR (WY)

MEAN	7.62	7.25	6.44	6.24	6.08	7.39	13.1	32.8	24.5	12.7	8.66	7.66
MAX	9.95	9.30	9.02	8.10	7.98	10.5	25.2	79.9	60.6	26.9	14.9	11.6
(WY)	1996	1996	1996	1996	1996	1997	1994	1995	1995	1995	1995	1995
MIN	4.61	4.42	4.64	4.25	4.02	5.64	7.31	13.0	7.82	5.21	4.58	4.63
(WY)	2002	2002	2003	1988	1989	1991	2001	1985	1985	1985	2001	2001

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1983 - 2003	
ANNUAL TOTAL	2578.2		3958.5			
ANNUAL MEAN	7.06		10.8		12.2	
HIGHEST ANNUAL MEAN					21.2	1995
LOWEST ANNUAL MEAN					6.81	2001
HIGHEST DAILY MEAN	33	May 22	57	May 30	291	May 9 1995
LOWEST DAILY MEAN	e1.6	Mar 1	3.9	Feb 24	a0.00	Dec 25 1998
ANNUAL SEVEN-DAY MINIMUM	3.7	Feb 25	4.3	Dec 22	0.81	Feb 3 1989
MAXIMUM PEAK FLOW			63	May 11	340	May 9 1995
MAXIMUM PEAK STAGE			2.70	May 11	b4.76	Apr 28 1984
ANNUAL RUNOFF (AC-FT)	5110		7850		8840	
10 PERCENT EXCEEDS	12		26		24	
50 PERCENT EXCEEDS	5.6		6.3		7.9	
90 PERCENT EXCEEDS	4.5		4.5		5.3	

a--Result of channel blockage or diversion upstream.
b--Backwater from ice, site and datum then in use.
e--Estimated.

YELLOWSTONE RIVER BASIN

06289820 EAST PASS CREEK NEAR DAYTON, WY

LOCATION.--Lat 44°59'23", long 107°25'20" (NAD 27), in $SE^1/_4SE^1/_4NE^1/_4$ sec.24, T.58 N., R.88 W., Sheridan County, Hydrologic Unit 10080016, on right bank 0.4 mi downstream from bridge on county road 144, 5.0 mi northwest of Parkman, and 11.2 mi northwest of Dayton.

DRAINAGE AREA.--21.7 mi^2.

PERIOD OF RECORD.--October 1982 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 4,405 ft (NGVD 29). October 1982 to August 1995 at site 270 ft upstream at different elevation. August 1995 to April 1996 at site 0.3 mi downstream at different elevation.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Several small reservoirs upstream from station, combined capacity, 415 acre-ft, for irrigation. Diversions for irrigation of about 2,900 acres upstream from station. U. S. Geological Survey satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.8	6.0	7.4	6.8	6.9	e6.0	12	30	75	11	3.7	5.3
2	5.3	6.7	7.4	6.7	6.8	e6.3	12	24	64	10	3.4	5.5
3	5.3	6.9	7.3	6.8	6.4	e6.0	12	24	54	9.8	3.2	5.6
4	5.6	6.9	7.0	6.8	5.8	e5.6	12	25	47	9.7	3.0	5.5
5	5.6	6.9	7.1	6.7	e5.4	e6.0	12	26	41	9.6	3.1	5.5
6	5.5	7.0	7.1	6.6	e5.0	e6.0	11	27	42	9.3	3.4	5.4
7	5.1	7.1	7.0	6.6	e5.4	e6.2	11	26	41	11	3.4	5.5
8	5.1	7.1	6.8	6.6	e6.6	e5.8	11	28	37	11	3.3	5.5
9	5.1	7.8	7.0	e6.0	e6.4	e6.6	11	30	38	11	3.2	5.5
10	4.9	8.0	6.9	e4.9	e6.4	e7.5	11	33	39	10	3.2	5.7
11	5.5	7.5	6.8	e5.4	6.2	8.3	11	33	39	10	3.0	5.6
12	5.5	7.4	6.6	e6.4	e6.0	9.2	12	30	37	9.9	3.0	5.9
13	5.3	5.0	6.9	e6.6	e6.0	12	12	36	33	9.8	3.0	5.8
14	5.3	0.84	7.0	6.6	e6.4	16	13	40	29	9.6	3.0	5.6
15	5.2	1.1	7.2	e6.5	6.3	13	14	45	27	9.7	3.2	5.4
16	5.1	1.1	7.2	e6.3	6.2	12	14	50	25	9.6	5.6	5.5
17	5.1	1.1	7.1	6.3	6.3	13	13	48	24	8.8	6.1	6.3
18	5.1	3.1	7.1	e6.0	6.1	12	13	47	22	8.2	5.9	6.0
19	4.9	7.5	e6.0	6.2	6.0	11	13	40	21	8.2	5.4	6.2
20	4.8	7.3	e5.6	6.2	6.0	11	13	36	20	8.0	5.2	6.2
21	5.0	7.1	e6.0	6.0	6.1	10	13	33	17	7.1	5.2	6.1
22	5.9	7.2	e5.8	4.8	e6.0	11	13	31	14	6.8	5.0	6.0
23	5.7	7.8	e5.0	5.6	e6.0	14	15	35	15	6.5	5.0	5.9
24	5.7	6.9	e4.5	e6.0	e5.0	12	19	49	19	6.1	5.0	5.9
25	5.7	e5.5	e4.8	e6.6	e5.6	12	22	66	16	5.1	4.7	6.0
26	5.6	e6.5	e5.1	e7.0	e6.0	12	23	81	15	5.2	4.4	5.8
27	5.7	e7.8	6.6	e7.0	e6.3	11	22	87	15	5.1	4.1	6.0
28	5.9	8.4	6.9	e6.8	e6.0	11	21	85	16	4.6	4.5	6.1
29	5.8	8.2	6.4	6.4	---	11	20	86	13	4.4	5.3	6.1
30	6.0	7.5	6.6	6.8	---	11	25	99	12	4.2	5.4	6.0
31	6.6	---	6.8	6.7	---	12	---	84	---	3.8	5.4	---
TOTAL	167.7	185.24	203.0	196.7	169.6	306.5	436	1414	907	253.1	130.3	173.4
MEAN	5.41	6.17	6.55	6.35	6.06	9.89	14.5	45.6	30.2	8.16	4.20	5.78
MAX	6.6	8.4	7.4	7.0	6.9	16	25	99	75	11	6.1	6.3
MIN	4.8	0.84	4.5	4.8	5.0	5.6	11	24	12	3.8	3.0	5.3
AC-FT	333	367	403	390	336	608	865	2800	1800	502	258	344

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1983 - 2003, BY WATER YEAR (WY)

MEAN	8.62	8.77	8.33	8.46	8.40	9.79	16.3	42.9	34.7	12.7	7.08	7.14
MAX	13.9	11.4	10.5	10.5	10.6	14.2	32.4	90.8	82.8	32.9	14.8	14.8
(WY)	1996	1996	1996	1996	1996	1997	1994	1995	1995	1992	1993	1995
MIN	5.41	6.17	6.55	6.35	6.06	7.29	9.30	15.2	6.65	5.06	2.73	3.92
(WY)	2003	2003	2003	2003	2003	1990	1992	1985	1985	1985	1988	2002

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1983 - 2003	
ANNUAL TOTAL	2706.34		4542.54			
ANNUAL MEAN	7.41		12.4		14.5	
HIGHEST ANNUAL MEAN					23.6	1984
LOWEST ANNUAL MEAN					7.54	2002
HIGHEST DAILY MEAN	31	May 22	99	May 30	304	May 9 1995
LOWEST DAILY MEAN	0.84	Nov 14	a0.84	Nov 14	a0.84	Nov 14 2002
ANNUAL SEVEN-DAY MINIMUM	1.9	Sep 10	2.8	Nov 12	1.9	Sep 10 2002
MAXIMUM PEAK FLOW			106	May 30	b511	May 9 1995
MAXIMUM PEAK STAGE			6.43	May 30	c9.00	Feb 6 1996
INSTANTANEOUS LOW FLOW					1.7	Aug 6 1988
ANNUAL RUNOFF (AC-FT)	5370		9010		10470	
10 PERCENT EXCEEDS	10		30		28	
50 PERCENT EXCEEDS	6.9		6.8		9.1	
90 PERCENT EXCEEDS	3.9		5.0		5.8	

a--Result of pumping upstream of site.
b--Gage height, 4.47 ft, site an datum then in use, from rating cruve extended above 221 ft^3/s.
c--Ice jam, site and datum then in use.
e--Estimated.

06290000 PASS CREEK NEAR WYOLA, MT

LOCATION.--Lat 45°03'23", long 107°21'19" (NAD 27), in NE$^1/_4$NE$^1/_4$SE$^1/_4$ sec.13, T.9 S., R.35 E., Big Horn County, Hydrologic Unit 10080016, on right bank 125 ft downstream from bridge on U.S. Highway 87, 2.0 mi downstream from Twin Creek, 5.5 mi south of Wyola, and at river mile 10.2.

DRAINAGE AREA.--111 mi^2. Drainage area at site used prior to Sept. 30, 1956, 119 mi^2.

PERIOD OF RECORD.--June 1935 to September 1956 (no winter records prior to 1939), October 1982 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 3,920 ft (NGVD 29). Dec. 21, 1950, to Sept. 30, 1956, water-stage recorder, and June 4, 1935, to Dec. 20, 1950, nonrecording gage at site 0.3 mi upstream at different elevation. Flow is equivalent.

REMARKS.--Records fair except those for estimated daily discharges, which are poor. Diversions for irrigation of about 2,500 acres upstream from station. Several observations of water temperature and specific conductance were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	e6.0	12	e9.0	e12	e10	47	182	167	31	e3.5	e7.0
2	11	8.1	12	e9.0	e11	e10	41	164	150	30	e3.5	e7.0
3	11	9.9	12	e9.0	e10	e10	38	101	133	28	e3.5	e7.0
4	10	11	9.5	e9.0	e10	e10	34	81	116	26	e3.0	e7.0
5	10	11	8.8	e9.0	e9.0	e10	31	79	97	24	e3.0	e7.0
6	9.2	11	8.6	e9.0	e8.0	e10	30	78	96	22	e3.0	e7.0
7	9.9	11	9.7	e9.0	e9.0	e9.0	29	77	134	21	e3.0	e7.0
8	9.7	11	9.1	e9.0	e10	e8.0	28	93	119	23	e3.0	e7.0
9	9.7	10	9.1	e9.0	e11	e9.0	27	132	94	22	e3.0	e7.0
10	9.4	11	9.7	e7.0	e11	e12	26	187	90	22	e3.0	e8.0
11	10	11	9.3	e8.0	e11	e20	26	218	86	21	e3.0	e9.0
12	14	10	8.0	e10	e11	e40	26	215	78	21	e3.0	e10
13	11	10	9.2	e10	e11	e80	27	135	71	19	e3.0	e10
14	10	8.7	9.0	e10	e11	e150	29	131	64	18	e3.0	e10
15	9.3	9.4	9.1	e10	e11	e200	30	136	59	15	e5.0	e10
16	9.2	9.8	8.3	e10	e12	160	32	143	58	15	e7.0	e10
17	9.2	9.7	7.5	e10	e15	82	31	144	54	16	e8.0	e11
18	9.4	e10	7.4	e10	e14	79	31	142	50	12	e9.0	e12
19	9.6	9.9	6.1	e10	e12	56	37	140	48	13	e8.0	e13
20	9.7	10	5.5	e10	e11	48	36	126	50	12	e7.0	e12
21	9.4	9.7	e5.0	e8.0	e10	43	33	110	46	11	e7.0	e12
22	12	9.6	e5.0	e6.0	e8.0	49	32	101	43	9.2	e7.0	e12
23	12	12	e5.0	e7.0	e6.0	99	33	104	41	9.3	e7.0	e12
24	12	12	e5.0	e8.0	e4.0	86	51	124	53	7.9	e7.0	e12
25	12	6.6	e4.5	e10	e6.0	55	49	146	59	7.2	e7.0	e12
26	13	4.9	e6.0	e12	e8.0	45	46	163	50	5.8	e7.0	e12
27	12	7.1	e7.0	e12	e9.0	44	48	170	46	7.0	e6.0	e12
28	13	9.6	e8.0	e11	e10	42	47	167	43	6.1	e6.0	e12
29	13	11	e8.0	e11	---	36	46	164	40	5.3	e7.0	e12
30	e9.0	11	e8.0	e12	---	34	57	180	34	3.9	e7.0	e12
31	e8.0	---	e8.0	e12	---	45	---	174	---	3.7	e7.0	---
TOTAL	327.7	292.0	249.4	295.0	281.0	1591.0	1078	4307	2269	487.4	162.5	298.0
MEAN	10.6	9.73	8.05	9.52	10.0	51.3	35.9	139	75.6	15.7	5.24	9.93
MAX	14	12	12	12	15	200	57	218	167	31	9.0	13
MIN	8.0	4.9	4.5	6.0	4.0	8.0	26	77	34	3.7	3.0	7.0
AC-FT	650	579	495	585	557	3160	2140	8540	4500	967	322	591

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1939 - 2003, BY WATER YEAR (WY)*

MEAN	17.4	18.4	16.6	17.9	25.1	38.9	51.5	101	88.0	29.3	13.0	13.4
MAX	27.8	27.9	33.6	32.3	57.8	115	106	324	375	92.6	38.5	29.1
(WY)	1945	1946	1943	1984	1948	1947	1994	1984	1944	1944	1944	1944
MIN	5.73	9.55	5.73	6.55	9.86	8.81	20.3	31.1	16.6	5.91	1.86	1.67
(WY)	1955	2002	2002	2001	2002	2002	1992	1985	1985	1985	1940	2001

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1939 - 2003*	
ANNUAL TOTAL	5018.69		11638.0			
ANNUAL MEAN	13.70		31.9		35.9	
HIGHEST ANNUAL MEAN					76.8	1944
LOWEST ANNUAL MEAN					13.6	2002
HIGHEST DAILY MEAN	90	Apr 7	218	May 11	1120	Jun 20 1947
LOWEST DAILY MEAN	0.00	Sep 1	3.0	Aug 4	0.00	Sep 1 2002
ANNUAL SEVEN-DAY MINIMUM	0.00	Sep 1	3.0	Aug 4	0.00	Sep 1 2002
MAXIMUM PEAK FLOW			a344	May 12	c1150	Jun 4 1944
MAXIMUM PEAK STAGE			b4.72	Mar 14	6.96	May 9 1995
INSTANTANEOUS LOW FLOW					0.00	Aug 3 1935
ANNUAL RUNOFF (AC-FT)	9950		23080		26020	
10 PERCENT EXCEEDS	27		98		78	
50 PERCENT EXCEEDS	9.7		11		21	
90 PERCENT EXCEEDS	4.3		6.4		8.0	

*--During period of operation (1939-1956, 1983 to current year).
a--Gage height, 3.88 ft.
b--Backwater from ice.
c--Gage height, 4.83 ft, from rating extended above 400 ft^3/s.
e--Estimated.

YELLOWSTONE RIVER BASIN

06290500 LITTLE BIGHORN RIVER BELOW PASS CREEK, NEAR WYOLA, MT

LOCATION.--Lat 45°10'38", long 107°23'36" (NAD 27), in W1/2SW$^1/_4$ sec.35, T.7 S., R.35 E., Big Horn County, Hydrologic Unit 10080016, on right bank 3.5 mi north of Wyola, 6 mi downstream from Pass Creek, and at river mile 92.3.

DRAINAGE AREA.--428 mi^2.

PERIOD OF RECORD.--March 1939 to December 1958, August 1959 to September 1975, October 1976 to current year. Prior to October 1940, published as Little Horn River below Pass Creek, near Wyola.

REVISED RECORDS.--WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 3,600 ft (NGVD 29).

REMARKS.--Records fair except those for estimated daily discharges, which are poor. Diversions for irrigation of about 8,300 acres upstream from station. U.S. Geological Survey satellite telemeter at station.Several observations of water temperature and specific conductance were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e80	e70	85	e80	e90	e60	124	341	1050	209	85	62
2	e88	e65	85	e85	e80	e65	124	295	914	204	85	61
3	e88	e70	86	e85	e75	e65	118	233	765	195	82	60
4	e90	77	e80	87	e70	e65	113	226	654	184	80	58
5	e90	83	e75	87	e65	e65	108	236	587	178	77	57
6	e90	84	e70	86	e55	e65	105	215	568	175	74	57
7	e90	83	e70	85	e50	e65	105	206	582	170	77	60
8	e85	83	e75	e80	e45	e60	102	241	532	168	79	65
9	e85	81	e80	e80	e55	e50	101	283	490	162	78	66
10	e85	79	e80	e70	e55	e45	103	378	484	156	80	68
11	e85	79	e80	e60	e60	e60	106	391	485	150	80	85
12	e85	79	e80	e65	e60	e80	110	378	468	149	81	86
13	e85	79	e85	e70	e65	e100	116	273	450	145	83	93
14	e85	78	87	e65	e65	e150	121	270	430	139	78	92
15	e85	79	89	e55	e65	e250	127	283	408	141	72	87
16	e85	79	88	e60	e65	e200	133	304	399	134	71	83
17	85	78	87	e60	e70	190	132	345	389	129	76	86
18	83	78	86	e60	e70	213	131	371	362	123	103	92
19	84	79	e80	e60	e70	167	143	362	332	112	96	93
20	86	78	e75	e60	e70	148	140	318	335	113	86	92
21	86	79	e65	e55	e65	136	131	303	320	105	80	87
22	88	80	e65	e50	e60	142	131	298	308	101	75	87
23	85	83	e65	e45	e50	198	138	349	291	100	77	86
24	88	e80	e60	e55	e40	190	182	463	327	96	70	86
25	90	e75	e60	e60	e35	143	186	607	334	94	69	85
26	88	e70	e60	e65	e40	129	190	777	310	94	66	84
27	87	e75	e65	e70	e50	127	190	849	288	92	60	84
28	87	90	e80	e65	e55	121	187	926	264	89	58	85
29	89	91	e85	e65	---	112	182	980	250	84	61	86
30	84	85	e80	e70	---	109	200	1090	224	75	66	87
31	e75	---	e80	e80	---	118	---	1070	---	78	67	---
TOTAL	2666	2369	2388	2120	1695	3688	4079	13661	13600	4144	2372	2360
MEAN	86.0	79.0	77.0	68.4	60.5	119	136	441	453	134	76.5	78.7
MAX	90	91	89	87	90	250	200	1090	1050	209	103	93
MIN	75	65	60	45	35	45	101	206	224	75	58	57
AC-FT	5290	4700	4740	4210	3360	7320	8090	27100	26980	8220	4700	4680

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1940 - 2003, BY WATER YEAR (WY)*

MEAN	122	118	106	104	115	139	183	464	637	232	112	108
MAX	163	153	162	165	232	281	327	1318	1395	758	237	186
(WY)	1942	1971	1965	1975	1972	1972	1970	1978	1975	1975	1975	1968
MIN	73.6	77.3	58.7	55.4	57.7	62.3	63.1	146	167	57.4	23.8	39.7
(WY)	2002	1986	2002	1950	2002	2002	1961	1953	1985	1960	1961	2002

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1940 - 2003*	
ANNUAL TOTAL	33300		55142			
ANNUAL MEAN	91.2		151		203	
HIGHEST ANNUAL MEAN					381	1978
LOWEST ANNUAL MEAN					88.7	2002
HIGHEST DAILY MEAN	560	Jun 1	1090	May 30	6090	May 19 1978
LOWEST DAILY MEAN	31	Sep 3	35	Feb 25	13	Aug 4 1961
ANNUAL SEVEN-DAY MINIMUM	32	Aug 29	47	Feb 22	14	Aug 3 1961
MAXIMUM PEAK FLOW			1230	May 30	a8010	May 19 1978
MAXIMUM PEAK STAGE			4.78	May 30	10.02	May 19 1978
INSTANTANEOUS LOW FLOW					b12	Aug 5 1961
ANNUAL RUNOFF (AC-FT)	66050		109400		146800	
10 PERCENT EXCEEDS	182		333		427	
50 PERCENT EXCEEDS	70		85		125	
90 PERCENT EXCEEDS	37		60		79	

*--During periods of operation (March 1939 to December 1958, August 1959 to September 1975, and October 1976 to current year).
a--From rating curve extended above 2,000 ft^3/s on basis of slope-area measurement of peak flow.
b--Gage height, 0.89 ft.
e--Estimated.

06291500 LODGE GRASS CREEK ABOVE WILLOW CREEK DIVERSION, NEAR WYOLA, MT

LOCATION.--Lat 45°07'39", long 107°36'01" (NAD 27), in $SE^1/_4NE^1/_4NE^1/_4$ sec.24, T.8 S., R.33 E., Big Horn County, Hydrologic Unit 10080016, on left bank 0.2 mi upstream from Willow Creek diversion canal, 1.1 mi downstream from Spring Creek, 10 mi west of Wyola, 17 mi southwest of Lodge Grass, and at river mile 43.0.

DRAINAGE AREA.--80.7 mi^2.

PERIOD OF RECORD.--March 1939 to September 1974, October 1982 to current year.

REVISED RECORDS.--WSP 1559: 1944-47. WSP 1629: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 4,170 ft (NGVD 29). March 1939 to September 1974 recording gage 0.1 mi upstream at different elevation. Flows are equivalent.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Diversions for irrigation of about 400 acres upstream from station. U.S. Geological Survey satellite telemeter at station.Several observations of water temperature and specific conductance were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e15	e10	16	14	18	e13	26	82	361	79	26	15
2	e15	e9.0	18	14	e17	e14	26	41	334	75	24	13
3	e15	e9.0	20	15	16	e15	26	33	273	72	24	14
4	e15	e9.5	17	14	16	17	26	42	235	68	24	14
5	e15	e10	18	14	16	19	24	39	210	64	24	13
6	e15	e15	18	15	16	20	23	37	200	61	22	13
7	e15	e16	18	15	16	e17	23	33	184	59	22	14
8	e15	e17	18	15	e15	e18	22	55	162	56	20	15
9	e15	e18	18	e13	15	e22	21	65	162	53	20	16
10	e15	e18	18	e10	14	30	21	103	176	50	20	16
11	e15	e19	17	e8.0	12	27	22	81	198	48	19	16
12	e15	e19	17	e9.0	e12	32	24	54	201	46	19	16
13	e15	e20	17	e10	13	51	28	48	200	44	18	17
14	e15	e20	18	11	17	60	32	49	191	42	17	16
15	e15	e20	17	13	17	46	36	56	189	40	16	15
16	e15	e20	17	16	17	38	39	69	183	38	16	15
17	e15	e20	16	15	18	45	36	82	177	37	19	17
18	e15	e19	16	17	18	41	37	90	173	36	21	16
19	e15	e19	16	16	17	34	41	87	163	36	19	16
20	e15	e19	15	15	17	32	37	77	156	34	17	15
21	e15	e18	11	e14	17	33	33	71	148	32	17	15
22	e15	e18	e8.0	e13	e14	48	e37	71	134	32	16	15
23	e15	19	e7.0	e14	e10	55	e40	93	123	30	15	13
24	e15	16	e6.0	e15	e5.0	36	43	130	121	30	16	13
25	e14	13	e6.0	16	e7.0	28	41	184	107	30	16	12
26	e14	13	e6.0	22	e9.0	28	44	222	96	31	14	12
27	e13	12	e6.0	20	e11	28	44	245	89	30	14	13
28	e13	11	e6.0	19	e12	25	44	238	85	28	15	13
29	e12	13	7.2	18	---	23	43	292	82	27	16	13
30	e12	15	8.8	18	---	23	53	371	80	26	16	13
31	e11	---	11	18	---	27	---	355	---	26	17	---
TOTAL	449	474.5	428.0	456.0	402.0	945	992	3495	5193	1360	579	434
MEAN	14.5	15.8	13.8	14.7	14.4	30.5	33.1	113	173	43.9	18.7	14.5
MAX	15	20	20	22	18	60	53	371	361	79	26	17
MIN	11	9.0	6.0	8.0	5.0	13	21	33	80	26	14	12
AC-FT	891	941	849	904	797	1870	1970	6930	10300	2700	1150	861

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1940 - 2003, BY WATER YEAR (WY)*

MEAN	21.1	18.9	16.8	16.5	16.8	20.4	31.7	118	196	63.0	27.9	22.2
MAX	35.5	28.0	25.0	30.3	32.0	36.9	71.4	257	445	176	50.7	40.1
(WY)	1942	1943	1969	1974	1972	1972	1994	1984	1964	1964	1968	1964
MIN	11.5	10.7	8.58	4.87	9.00	10.4	11.2	36.2	52.6	20.1	10.2	6.80
(WY)	1961	1961	1950	1950	1940	1961	2001	1950	2001	1961	2002	2002

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1940 - 2003*	
ANNUAL TOTAL	8122.1		15207.5			
ANNUAL MEAN	22.3		41.7		47.4	
HIGHEST ANNUAL MEAN					85.6	1970
LOWEST ANNUAL MEAN					21.8	1961
HIGHEST DAILY MEAN	129	May 31	371	May 30	908	Jun 9 1964
LOWEST DAILY MEAN	4.5	Sep 5	5.0	Feb 24	2.7	Apr 6 2001
ANNUAL SEVEN-DAY MINIMUM	5.7	Sep 1	6.3	Dec 23	3.0	Apr 13 2001
MAXIMUM PEAK FLOW			401	May 30	a1130	Jun 9 1964
MAXIMUM PEAK STAGE			4.15	May 30	6.14	Jun 9 1964
ANNUAL RUNOFF (AC-FT)	16110		30160		34370	
10 PERCENT EXCEEDS	54		91		114	
50 PERCENT EXCEEDS	15		18		22	
90 PERCENT EXCEEDS	8.3		13		13	

*--During period of operation (1940-74, 1983 to current year).
a--From rating curve extended above 600 ft^3/s.
e--Estimated.

YELLOWSTONE RIVER BASIN

06294000 LITTLE BIGHORN RIVER NEAR HARDIN, MT

LOCATION.--Lat 45°44'09", long 107°33'24" (NAD 27), in $SE^1/_4NE^1/_4NE^1/_4$ sec.19, T.1 S., R.34 E., Big Horn County, Hydrologic Unit 10080016, on left bank 50 ft downstream from bridge on Sarpy Road, 0.2 mi upstream from terminal wasteway of Agency Canal, 0.6 mi upstream from mouth, and 2.3 mi east of Hardin.

DRAINAGE AREA.--1,294 mi^2.

PERIOD OF RECORD.--June 1953 to current year.

REVISED RECORDS.--WDR MT-86-1: 1978.

GAGE.--Water-stage recorder. Elevation of gage is 2,882.29 ft (NGVD 29) (levels by U.S. Army Corps of Engineers). Prior to Oct. 7, 1953, nonrecording gage at site 0.4 mi downstream. Oct. 7, 1953 to May 6, 1963, water-stage recorder at site 0.3 mi downstream. May 6, 1963 to Nov. 6, 1963, nonrecording gage at site 0.4 mi downstream. All at different elevations. Nov. 7, 1963 to Aug. 15, 1976, water-stage recorder at site 35 ft downstream at present elevation. Aug. 15, 1976 to Sept. 30, 1979, water-stage recorders were located on each bank downstream from Sarpy Road bridge and were used depending on control conditions.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Flow partly regulated by Willow Creek Reservoir (capacity 23,000 acre-ft). Diversions for irrigation of 20,980 acres upstream from station. Discharge values given herein include flow of terminal wasteway of Agency Canal. U. S. Geological Survey satellite telemeter at station. Unpublished records of instantaneous water temperature and specific conductance available in files of the District office.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	68	e70	e75	e90	e100	e100	180	230	1220	243	32	80
2	64	e65	e80	e85	e95	e95	188	324	1220	203	30	77
3	65	e60	e60	e85	e95	e90	199	379	1110	220	31	77
4	73	e70	e50	e80	e100	e90	193	343	913	183	37	74
5	76	89	e55	e80	e90	e90	185	345	734	181	37	70
6	79	101	e60	e90	e90	e95	175	329	646	181	36	64
7	77	113	e60	e80	e95	e90	166	308	607	172	47	68
8	77	107	e60	e80	e95	e85	161	290	598	164	53	69
9	77	101	e60	e80	e90	e80	159	306	556	152	50	71
10	75	103	e60	e80	e100	e90	154	442	514	131	45	89
11	77	100	e65	e75	e95	e100	151	570	491	132	42	109
12	83	98	e65	e70	e100	e150	150	656	483	117	48	120
13	87	98	e70	e75	e100	e200	154	574	478	106	47	126
14	92	96	e75	e80	e100	e300	154	414	451	106	53	125
15	85	97	e80	e80	e100	e700	158	346	436	95	58	125
16	82	99	e75	e80	e100	e650	164	332	419	85	59	117
17	82	99	e80	e80	e110	e600	168	344	398	81	61	111
18	80	97	e75	e80	e100	538	172	377	386	85	70	115
19	82	97	e75	e80	e100	471	170	415	347	61	72	119
20	80	95	e70	e80	e95	386	171	422	343	61	110	110
21	83	97	e70	e70	e95	298	176	381	372	61	98	96
22	85	96	e65	e70	e95	269	168	371	376	53	90	98
23	86	95	e70	e75	e90	257	162	367	373	58	87	87
24	91	e90	e70	e75	e90	277	174	386	349	46	77	86
25	89	e75	e70	e65	e80	331	185	457	367	42	70	88
26	91	e70	e70	e70	e85	278	214	583	386	38	64	87
27	93	e75	e65	e70	e85	233	212	767	349	34	70	84
28	92	e80	e70	e75	e90	214	220	891	322	39	68	78
29	90	e75	e80	e75	---	206	216	1010	297	36	72	77
30	90	e75	e85	e80	---	195	220	1050	278	31	74	73
31	89	---	e90	e90	---	184	---	1140	---	29	73	---
TOTAL	2540	2683	2155	2425	2660	7742	5319	15149	15819	3226	1861	2770
MEAN	81.9	89.4	69.5	78.2	95.0	250	177	489	527	104	60.0	92.3
MAX	93	113	90	90	110	700	220	1140	1220	243	110	126
MIN	64	60	50	65	80	80	150	230	278	29	30	64
AC-FT	5040	5320	4270	4810	5280	15360	10550	30050	31380	6400	3690	5490

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1954 - 2003, BY WATER YEAR (WY)

MEAN	154	152	135	140	200	312	313	611	821	264	118	127
MAX	276	248	223	366	610	987	748	2852	1981	1333	382	267
(WY)	1979	1979	1979	1975	1971	1972	1965	1978	1968	1975	1975	1978
MIN	60.7	82.6	65.6	71.6	70.3	71.1	54.8	71.9	117	8.50	2.46	19.1
(WY)	2002	2002	2002	1988	1989	2002	1961	1961	1961	1961	1961	1960

YELLOWSTONE RIVER BASIN

06294000 LITTLE BIGHORN RIVER NEAR HARDIN, MT

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1954 - 2003	
ANNUAL TOTAL	31636.3		64349			
ANNUAL MEAN	86.7		176		279	
HIGHEST ANNUAL MEAN					676	1975
LOWEST ANNUAL MEAN					70.4	1961
HIGHEST DAILY MEAN	453	Jun 3	a1220	Jun 1	15800	May 20 1978
LOWEST DAILY MEAN	2.4	Jul 11	a29	Jul 31	0.30	Aug 5 1961
ANNUAL SEVEN-DAY MINIMUM	3.6	Jul 10	32	Jul 29	0.40	Aug 3 1961
MAXIMUM PEAK FLOW			b1280	Jun 2	c22600	May 19 1978
MAXIMUM PEAK STAGE					d11.78	Mar 20 1960
INSTANTANEOUS LOW FLOW					f0.20	Aug 7 1961
ANNUAL RUNOFF (AC-FT)	62750		127600		202000	
10 PERCENT EXCEEDS	133		391		603	
50 PERCENT EXCEEDS	75		92		162	
90 PERCENT EXCEEDS	15		61		75	

a--Includes Agency Canal.
b--Gage height, 4.63 ft. Peak flow includes Agency Canal.
c--Gage height, 11.20 ft.
d--Site and elevation then in use.
e--Estimated.
f--Result of discharge measurement.

YELLOWSTONE RIVER BASIN

06294500 BIGHORN RIVER ABOVE TULLOCK CREEK, NEAR BIGHORN, MT

LOCATION.--Lat 46°07'29", long 107°28'06" (NAD 27), in $SE^1/_4SE^1/_4NE^1/_4$ sec.3, T.4 N., R.34 E., Treasure County, Hydrologic Unit 10080015, on right bank 1.9 mi upstream from Tullock Creek, 3.6 mi southwest of Bighorn, 4.5 mi southeast of Custer, and at river mile 3.0.
DRAINAGE AREA.--22,414 mi^2. Area at site used Oct. 7, 1955, to Sept. 30, 1981, 22,885 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1981 to current year. Previously published as "06294700 Bighorn River at Bighorn, MT" 1956-81, and as "near Custer" 1945-55. Flows are equivalent at all sites.
GAGE.--Water-stage recorder. Elevation of gage is 2,700 ft (NGVD 29). May 11, 1945 to Dec. 6, 1945, nonrecording gage, and Dec. 7, 1945 to Oct. 6, 1955, water-stage recorder 1.7 mi upstream at different elevation. Oct. 7, 1955 to Sept. 30, 1981, at site 2.3 mi downstream at different elevation.
REMARKS.--Water-discharge records good except those for estimated daily discharges, which are poor. Flow regulated by Bighorn Lake beginning November 1965 (usable capacity, 1,312,000 acre-ft). Major regulation prior to November 1965 by 14 reservoirs in Wyoming and 1 in Montana with combined usable capacity of about 1,400,000 acre-ft. Diversion for irrigation of about 445,200 acres upstream from station. U.S. Army Corps of Engineers satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1140	1020	1320	1400	e1400	e1400	1720	e1450	e2450	1590	1450	1530
2	1180	1140	1370	1390	e1450	e1400	1690	e1500	e2450	1470	1420	1490
3	1140	1190	1400	1390	e1450	e1400	1710	e1600	e2300	1440	1530	1480
4	1150	1180	1350	1390	e1500	e1400	1720	e1550	e2150	1490	1600	1500
5	1140	1190	e1300	1390	e1500	e1450	1670	e1550	e1950	1500	1530	1470
6	1130	1210	e1300	1400	1530	e1450	1630	e1550	e1850	1520	1470	1510
7	1120	1230	e1200	1400	1660	e1400	1630	e1550	e1800	1540	1450	1390
8	1140	1230	e1150	1410	1700	e1450	1600	e1500	e1850	1570	1500	1380
9	1120	1220	e1300	e1400	1670	e1450	1340	e1550	e1950	1600	1480	1420
10	1210	1210	e1400	e1450	1600	e1450	1330	e1600	e1900	1540	1510	1350
11	1160	1230	1420	e1450	1610	e1400	1340	e1700	e1900	1540	1510	1350
12	1130	1220	1420	e1450	1610	e1400	1340	e1850	e1900	1550	1530	1340
13	1070	1220	1440	e1450	1620	e1400	1520	e1750	e1850	1580	1480	1370
14	1060	1220	1460	e1450	1670	e1450	1450	e1650	e1850	1590	1430	1370
15	1040	1220	1470	e1450	1700	e1450	1400	e1600	e1850	1500	1420	1330
16	1020	1230	1490	e1450	1680	e1500	1430	e1650	e1850	1480	1400	1300
17	1010	1240	1500	e1450	1740	e1500	1340	e1650	e1800	1500	1450	1270
18	1110	1240	1510	e1450	1780	e1500	1400	e1600	1740	1490	1510	1240
19	1130	1240	1380	e1500	1780	e1500	1460	e1600	1710	1480	1470	1320
20	1140	1250	1370	e1450	1730	e1600	1430	e1650	1750	1490	1460	1450
21	1120	1260	1500	e1450	1740	e1700	1380	e1600	1810	1510	1510	1440
22	1120	1260	1600	e1400	e1300	1740	1370	e1550	1860	1530	1480	1420
23	1120	1270	1600	e1350	e1100	1890	1390	e1550	1850	1540	1390	1420
24	1110	1280	1580	e1350	e1200	1830	1490	e1550	1890	1550	1400	1360
25	1110	1270	1450	e1350	e1300	1900	1330	e1600	2000	1550	1370	1330
26	1100	1290	e1400	e1350	e1400	1890	e1400	e1750	2010	1590	1320	1250
27	1090	1300	e1350	e1350	e1400	1800	e1400	e1850	1920	1650	1270	1240
28	1070	1320	e1350	e1350	e1400	1780	e1450	e2000	1810	1660	1260	1230
29	1020	1350	1370	e1400	---	1740	e1400	e2100	1770	1620	1390	1210
30	999	1330	1370	e1400	---	1710	e1450	e2150	1690	1640	1490	1190
31	996	---	1390	e1400	---	1730	---	e2300	---	1580	1540	---
TOTAL	34195	37060	43510	43720	43220	48660	44210	52100	57460	47880	45020	40950
MEAN	1103	1235	1404	1410	1544	1570	1474	1681	1915	1545	1452	1365
MAX	1210	1350	1600	1500	1780	1900	1720	2300	2450	1660	1600	1530
MIN	996	1020	1150	1350	1100	1400	1330	1450	1690	1440	1260	1190
AC-FT	67830	73510	86300	86720	85730	96520	87690	103300	114000	94970	89300	81220

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1945 - 2003, BY WATER YEAR (WY)

MEAN	3216	3282	3126	3015	3185	3677	3530	4365	6908	5292	2840	2831
MAX	5546	5599	4907	5478	5314	6580	7881	9102	15180	19090	6972	4952
(WY)	1972	1974	1968	1968	1971	1972	1997	1947	1948	1967	1997	1973
MIN	1103	1223	1280	1382	1544	908	1063	1304	1050	707	868	1009
(WY)	2003	1978	1961	1961	2003	1966	1966	1966	1966	1960	1961	1966

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1945 - 2003	
ANNUAL TOTAL	542445		537985			
ANNUAL MEAN	1486		1474		3755	
HIGHEST ANNUAL MEAN					5594	1997
LOWEST ANNUAL MEAN					1474	2003
HIGHEST DAILY MEAN	2140	May 23	2450	Jun 1	50000	May 20 1978
LOWEST DAILY MEAN	953	Jul 3	996	Oct 31	400	Apr 4 1967
ANNUAL SEVEN-DAY MINIMUM	973	Jul 3	1040	Oct 26	528	May 6 1961
MAXIMUM PEAK FLOW			unknown		b59200	May 20 1978
MAXIMUM PEAK STAGE			a6.38	Mar 14	14.15	May 20 1978
INSTANTANEOUS LOW FLOW					c275	Nov 15 1959
ANNUAL RUNOFF (AC-FT)	1076000		1067000		2720000	
10 PERCENT EXCEEDS	1770		1790		6270	
50 PERCENT EXCEEDS	1500		1450		3170	
90 PERCENT EXCEEDS	1140		1190		1700	

06294500 BIGHORN RIVER ABOVE TULLOCK CREEK, NEAR BIGHORN, MT--Continued

SUMMARY STATISTICS	WATER YEARS 1946-1961*		WATER YEARS 1967 - 2003**	
ANNUAL TOTAL	3358			
ANNUAL MEAN	5501	1947	3805	
HIGHEST ANNUAL MEAN	1623	1961	5594	1997
LOWEST ANNUAL MEAN	25700	Jun 23 1947	1474	2003
HIGHEST DAILY MEAN	462	May 12 1961	50000	May 20 1978
LOWEST DAILY MEAN	528	May 6 1961	400	Apr 4 1967
ANNUAL SEVEN-DAY MINIMUM	d26200	Jun 24 1947	843	Nov 18 1977
MAXIMUM PEAK FLOW	10.65	May 20 1947	b59200	May 20 1978
MAXIMUM PEAK STAGE	c275	Nov 15 1959	14.15	May 20 1978
INSTANTANEOUS LOW FLOW	2578000			
ANNUAL RUNOFF (AC-FT)	6200		2757000	
10 PERCENT EXCEEDS	2810		6210	
50 PERCENT EXCEEDS	1500		3380	
90 PERCENT EXCEEDS			1810	

*--Prior to construction of Yellowtail Dam.
**--After completion of Yellowtail Dam.
a--Backwater from ice.
b--Gage height, 14.50 ft, at different site and elevation.
c--About, result of freezup.
d--Gage height, 8.79 ft, at different site and elevation.
e--Estimated.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--May 1999 to current year.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: April 2000 to current year (seasonal records).

INSTRUMENTATION.--Temperature recorder installed Aug. 27, 1999.

REMARKS.--Seasonal daily water temperature record good. However, missing temperature data for Aug 1-4, Aug. 26-Sept. 8, and Sept. 19 and 20 occurred due to equipment problems. Unpublished records of instantaneous water temperature and specific conductance are available in files of the District office.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE (seasonal records): Maximum, 40.0°C, July 8, 2002; minimum, 3.5°C, Apr. 3, 2000.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: During period of seasonal operation, maximum, 27.0°C, July 19; minimum, 6.0°C, Apr. 5.

WATER QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instan-taneous dis-charge, cfs (00061)	pH, water, unfltrd field, std units (00400)	Specif. conduc-tance, wat unf uS/cm 25 degC (00095)	Temper-ature, air, deg C (00020)	Temper-ature, water, deg C (00010)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)
MAR 2003									
27...	0840	1800	8.6	1090	8.0	6.5	.57	.679	.004
MAY									
08...	1015	E1500	8.7	1120	13.0	11.5	.68	.584	.007
JUN									
25...	1030	2020	8.6	993	11.0	12.5	.42	.428	.007
AUG									
06...	1030	1450	8.2	1080	24.0	19.5	.41	.487	.004

Date	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Phos-phorus, water, unfltrd mg/L (00665)	Suspnd. sedi-ment, sieve diametr percent <.063mm (70331)	Sus-pended sedi-ment concen-tration mg/L (80154)	Sus-pended sedi-ment load, tons/d (80155)
MAR 2003					
27...	<.007	.101	94	152	739
MAY					
08...	<.007	.117	97	167	E171
JUN					
25...	<.007	.048	95	101	551
AUG					
06...	<.007	.042	88	100	392

06294500 BIGHORN RIVER ABOVE TULLOCK CREEK, NEAR BIGHORN, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003--Continued

Date	Time	Hardness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnesium, water, fltrd, mg/L (00925)	Potassium, water, fltrd, mg/L (00935)	Sodium adsorption ratio (00931)	Sodium, water, fltrd, mg/L (00930)	Alkalinity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chloride, water, fltrd, mg/L (00940)	Fluoride, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)
MAR 2003											
27...	0840	380	95.1	35.7	4.13	2	101	214	11.6	.47	8.05
AUG											
06...	1030	350	85.9	32.6	4.36	2	96	188	15.4	.5	2.57

Date	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of constituents mg/L (70301)	Residue water, fltrd, tons/acre-ft (70303)	Residue water, fltrd, tons/d (70302)	Arsenic water unfltrd ug/L (01002)	Cadmium water, unfltrd ug/L (01027)	Chromium, water, unfltrd recoverable, ug/L (01034)	Copper, water, unfltrd recoverable, ug/L (01042)	Lead, water, unfltrd recoverable, ug/L (01051)	Nickel, water, unfltrd recoverable, ug/L (01067)	Zinc, water, unfltrd recoverable, ug/L (01092)
MAR 2003											
27...	360	748	1.02	3630	E2	<.2	.9	5.4	1.64	5.13	9
AUG											
06...	346	698	.95	2730	E1	E.02	<.8	4.7	.65	5.49	25

WATER TEMPERATURE, DEGREES CELSIUS, APRIL 2003 TO SEPTEMBER 2003

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		APRIL			MAY			JUNE			JULY	
1	11.0	8.0	9.5	11.5	8.5	9.5	19.5	18.5	19.0	24.5	19.5	22.0
2	10.0	7.0	9.0	13.0	8.5	11.0	18.5	16.5	17.5	25.0	20.5	22.5
3	9.0	6.5	7.5	14.0	11.0	12.5	19.0	16.0	17.0	24.5	20.0	22.5
4	9.0	6.5	7.5	13.5	11.0	12.5	16.5	15.0	16.0	22.5	20.5	21.5
5	9.0	6.0	7.5	11.0	9.5	10.0	17.0	14.0	15.5	23.0	18.5	20.5
6	8.5	7.0	8.0	12.0	8.5	10.0	16.0	14.0	15.0	23.0	18.5	20.5
7	10.0	6.5	8.0	13.5	10.0	11.5	15.5	13.0	14.5	23.0	18.5	20.5
8	10.5	7.0	8.5	12.0	10.5	11.5	17.5	13.0	15.5	21.0	19.0	19.5
9	13.0	8.0	10.0	10.5	8.5	9.5	17.5	16.0	17.0	22.0	17.5	19.5
10	14.5	10.0	12.0	9.5	8.0	8.5	17.5	15.5	16.5	22.5	18.0	20.5
11	16.0	11.0	13.5	11.0	8.0	9.5	19.5	16.0	17.5	23.0	18.5	20.5
12	16.0	12.0	14.0	13.5	10.0	11.5	22.0	17.0	19.0	24.0	19.0	21.5
13	15.0	12.5	13.5	15.5	12.5	14.0	22.0	18.0	20.0	24.0	20.0	22.0
14	16.0	11.5	13.5	17.0	13.5	15.0	22.5	19.0	21.0	24.0	19.5	21.5
15	14.0	11.5	12.5	19.0	14.5	16.5	21.5	19.5	20.5	24.0	19.5	21.5
16	14.5	10.5	12.5	17.5	14.0	15.5	22.0	18.5	20.0	24.5	20.5	22.5
17	15.0	9.5	12.0	15.5	12.5	14.0	23.0	19.0	21.0	24.0	21.0	22.5
18	13.0	10.5	11.5	14.0	10.0	11.5	23.5	20.0	21.5	24.5	21.0	22.5
19	12.0	9.5	10.5	12.5	9.5	10.5	24.0	20.0	21.5	27.0	21.0	23.5
20	14.5	9.0	11.5	14.0	9.0	11.5	21.5	19.0	20.0	24.5	21.0	22.5
21	15.5	10.0	13.0	14.5	12.0	13.0	20.0	17.5	18.5	24.0	20.5	22.0
22	17.0	12.0	14.5	18.0	14.0	15.5	19.5	16.5	18.0	23.5	20.0	22.0
23	18.5	13.5	15.5	19.5	16.0	17.5	17.5	16.0	17.0	24.5	20.5	22.0
24	16.0	14.0	15.0	20.5	15.5	18.0	16.0	14.0	15.0	24.5	21.0	22.5
25	17.5	13.5	15.0	22.5	17.5	20.0	15.0	12.5	14.0	23.5	21.0	22.0
26	16.0	13.0	14.5	23.0	19.5	21.5	17.0	13.5	15.0	23.5	20.5	21.5
27	15.5	11.0	13.0	23.0	20.0	21.5	19.0	15.5	17.5	23.5	20.5	22.0
28	13.0	10.0	11.5	22.5	18.5	20.5	20.5	17.0	18.5	23.5	20.5	22.0
29	10.0	9.0	9.5	23.0	19.5	21.5	22.0	17.5	19.5	23.0	20.5	21.5
30	9.5	8.5	9.0	21.5	19.5	20.5	23.5	19.0	21.0	23.0	19.0	21.0
31			---	21.0	18.5	19.5	---	---	---	22.0	19.5	20.5
MONTH	18.5	6.0	11.5	23.0	8.0	14.5	24.0	12.5	18.0	27.0	17.5	21.5

WATER TEMPERATURE, DEGREES CELSIUS, APRIL 2003 TO SEPTEMBER 2003--Continued

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN
		AUGUST			SEPTEMBER	
1	---	---	---	---	---	---
2	---	---	---	---	---	---
3	---	---	---	---	---	---
4	---	---	---	---	---	---
5	22.5	19.0	20.5	---	---	---
6	22.5	19.5	21.0	---	---	---
7	23.5	20.0	21.5	---	---	---
8	23.5	20.5	22.0	---	---	---
9	23.5	20.5	22.0	19.5	17.0	18.0
10	23.0	20.0	21.5	17.0	14.0	15.5
11	22.5	19.5	21.0	15.5	13.0	14.0
12	23.5	20.0	21.5	15.0	13.0	14.0
13	24.0	19.0	22.0	14.5	12.5	13.0
14	24.0	21.5	22.5	15.0	11.0	13.0
15	24.0	21.0	22.5	16.0	12.5	14.0
16	24.0	20.5	22.0	16.0	14.0	14.5
17	22.0	19.0	20.5	14.0	11.5	12.5
18	20.5	17.5	19.0	14.0	10.0	12.0
19	21.5	18.5	20.0	---	---	---
20	21.5	19.0	20.5	---	---	---
21	21.0	18.5	20.0	14.5	12.5	13.5
22	22.5	19.5	21.0	14.5	11.5	13.0
23	23.0	20.5	21.5	15.0	12.5	13.5
24	23.0	19.5	21.5	15.5	13.0	14.0
25	23.0	20.0	21.5	16.0	12.5	14.0
26	---	---	---	15.5	13.5	14.5
27	---	---	---	15.0	11.5	13.0
28	---	---	---	15.5	13.0	14.0
29	---	---	---	16.0	13.0	14.0
30	---	---	---	15.0	11.0	12.5
31	---	---	---	---	---	---
MONTH	---	---	---	---	---	---

YELLOWSTONE RIVER BASIN

06295000 YELLOWSTONE RIVER AT FORSYTH, MT

(National water-quality assessment program)

LOCATION.--Lat 46°15'58", long 106°41'24" (NAD 27), in $NE^1/_4NW^1/_4NW^1/_4$ sec.23, T.6 N., R.40 E., Rosebud County, Hydrologic Unit 10100001, on right bank 0.3 mi downstream from U.S. Highway 12 bridge, at intake for Forsyth water supply, at Forsyth, and at river mile 238.2.

DRAINAGE AREA (REVISED).--40,146 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 16, 1921 to September 30, 1923 (no winter records), October 1977 to current year. Miscellaneous discharge measurements were made in 1974 to 1976 and are available in files of Helena district office.

REVISED RECORDS.--WDR MT-04-1: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 2,504.62 ft (NGVD 29), from nearby elevation determined by City of Forsyth. July 1921 to March 1922, nonrecording gage on discontinued highway bridge 10 ft downstream from gage at different elevation. March 1922 to September 1923, nonrecording gage on discontinued highway bridge 10 ft downstream from gage at elevation 2 ft higher.

REMARKS.--Water-discharge records good except those for estimated daily discharges, which are poor. Diversions for irrigation of about 838,000 acres upstream from station. Flow regulated to some extent by Bighorn Lake, usable capacity, 1,356,000 acre-ft, on Bighorn River. Small diversion dam about 4,200 ft downstream from station. Bureau of Reclamation satellite telemeter at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of 1918 reached a stage of about 20 ft, elevation used in 1921, information from local residents.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4530	4580	e4200	e3800	e3900	e3800	4990	7680	46900	14100	5830	3520
2	4310	4380	e4100	e3700	e3900	e3900	5000	7740	48000	14800	5370	3570
3	4390	4310	e4000	e3700	e4000	e3900	5150	7680	49100	15100	5200	3460
4	4610	4450	e3900	e3700	e4000	e3900	5470	7840	43800	14600	5190	3330
5	4860	4560	e3900	e3700	e4000	e3900	5550	8620	33100	14000	4920	3250
6	4790	4760	e3800	e3800	e3900	e3700	5370	8060	28300	13300	4660	3240
7	4690	4880	e3800	e3800	e3900	e3600	5130	7780	25200	12600	4480	3210
8	4640	4880	e3700	e3800	e3900	e3600	4930	7640	23400	12200	4400	3240
9	4720	4880	e3600	e3700	e3700	e3200	4720	7430	21200	11800	4210	3260
10	4640	4840	e3600	e3600	e3700	e2900	4370	7810	20900	11400	4130	3330
11	4610	4820	e3700	e3500	e3900	e3200	4260	8500	24000	10800	4080	3440
12	4630	4780	e3700	e3300	e4100	e3900	4210	8990	28100	10200	3980	3600
13	4640	4740	e3800	e3200	e4000	e6200	4380	8550	29400	9800	3940	3670
14	4570	4680	e3800	e3500	e4000	e14000	4780	7740	27900	9530	3720	3640
15	4620	4650	e3900	e3800	e4100	25400	5290	7320	26800	9340	3600	3720
16	4610	4630	e3900	e3800	e4100	17500	5920	7490	27300	8930	3490	3790
17	4570	4620	e3900	e3700	e4100	12800	6720	8110	27200	8600	3430	3780
18	4540	4620	e3900	e3500	e4200	10500	7210	10400	27300	8220	3530	3760
19	4610	4590	e3900	e3400	e4200	9220	6880	13000	27300	7850	3480	3820
20	4610	4560	e3400	e3500	e4200	7940	6400	14000	27700	7500	3480	4020
21	4600	4590	e3400	e3700	e4200	6940	6090	12700	27800	7230	3470	4080
22	4570	4590	e3700	e3600	e4200	6370	5710	10900	26700	7030	3480	4000
23	4540	4580	e3800	e2800	e3800	5920	5390	10100	24600	6810	3380	3970
24	4620	4600	e3900	e2700	e3500	5820	5660	10200	21400	6730	3350	3880
25	4710	4680	e3800	e2700	e3500	5750	6670	13000	18900	6530	3310	3740
26	4750	4600	e3600	e3400	e3500	5540	8270	18300	17400	6460	3230	3680
27	4710	4370	e2800	e3500	e3500	5620	8630	25200	15800	6530	3140	3560
28	4750	e4400	e2800	e3600	e3600	5330	8620	31000	14100	7270	3020	3470
29	4710	e4300	e3400	e4000	---	5330	8750	34200	13200	7320	3100	3460
30	4620	e4200	e3800	e4000	---	5270	8100	37400	13400	6790	3250	3450
31	4670	---	e3800	e3900	---	5090	---	42000	---	6290	3400	---
TOTAL	143440	138120	115300	110400	109600	210040	178620	417380	806200	299660	121250	107940
MEAN	4627	4604	3719	3561	3914	6775	5954	13460	26870	9666	3911	3598
MAX	4860	4880	4200	4000	4200	25400	8750	42000	49100	15100	5830	4080
MIN	4310	4200	2800	2700	3500	2900	4210	7320	13200	6290	3020	3210
AC-FT	284500	274000	228700	219000	217400	416600	354300	827900	1599000	594400	240500	214100

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1978 - 2003, BY WATER YEAR (WY)

MEAN	7382	6895	6014	5634	6053	7049	7655	17110	29650	17940	7985	6830
MAX	10720	10490	8927	7796	10210	15120	13270	27850	63710	34430	17570	11320
(WY)	1983	1983	1983	1983	1997	1979	1997	1997	1997	1982	1997	1978
MIN	3519	4186	3624	3242	3511	3223	4220	11240	14690	6135	2742	2723
(WY)	2002	2002	2002	2002	2002	2002	1981	2002	1987	1988	2001	2001

06295000 YELLOWSTONE RIVER AT FORSYTH, MT--Continued

(National water-quality assessment program)

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1978 - 2003	
ANNUAL TOTAL	2597450		2757950			
ANNUAL MEAN	7116		7556		10530	
HIGHEST ANNUAL MEAN					17590	1997
LOWEST ANNUAL MEAN					6026	2001
HIGHEST DAILY MEAN	44200	Jun 4	49100	Jun 3	97000	May 21 1978
LOWEST DAILY MEAN	2200	Mar 1	2700	Jan 24	1400	Nov 23 1977
ANNUAL SEVEN-DAY MINIMUM	2570	Feb 25	3190	Jan 22	2030	Aug 26 2001
MAXIMUM PEAK FLOW			a49700	Jun 3	106000	May 21 1978
MAXIMUM PEAK STAGE			b9.61	Mar 15	14.53	May 21 1978
ANNUAL RUNOFF (AC-FT)	5152000		5470000		7625000	
10 PERCENT EXCEEDS	17000		14900		22400	
50 PERCENT EXCEEDS	4540		4590		7200	
90 PERCENT EXCEEDS	3000		3470		4300	

a--Gage height, 8.72 ft.
b--Backwater from ice.
e--Estimated.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1974 to 1982, January 1999 to current year.

REMARKS.--Unpublished records of instantaneous water temperature and specific conductance are available in files of the District Office. Samples collected this year as part of the National Water-Quality Assessment Program (NAWQA) for the Yellowstone River study unit under the direction of the Wyoming District.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instantaneous discharge, cfs (00061)	Barometric pressure, mm Hg (00025)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	Specif. conductance, wat unf uS/cm 25 degC (00095)	Temperature, air, deg C (00020)	Temperature, water, deg C (00010)	Alkalinity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Alkalinity, wat flt inc tit field, mg/L as CaCO3 (39086)	Bicarbonate, wat flt incrm. titr., field, mg/L (00453)
OCT 2002												
04...	1100	4520	695	10.4	104	8.3	630	10.5	11.0	E159	142	159
NOV												
13...	1300	4620	693	13.0	115	8.0	636	13.0	6.0	E147	142	163
DEC												
12...	1200	E3700	694	13.9	105	8.3	701	-1.0	0.0	E166	154	188
JAN 2003												
23...	1000	E2800	699	11.4	85	8.2	735	-8.0	0.0	174	160	195
FEB												
20...	0900	E4200	694	10.0	75	8.0	692	6.0	0.0	161	148	181
MAR												
19...	1130	9110	701	11.9	97	7.7	538	9.0	3.5	110	106	130
MAY												
22...	1030	11000	699	8.9	93	7.7	358	21.0	13.0	93	78	95
JUN												
17...	1600	26900	700	8.0	95	8.1	217	29.0	19.5	62	58	70
JUL												
17...	1000	8770	700	7.3	94	8.3	422	26.0	23.5	103	102	115
AUG												
21...	1000	3470	699	8.2	103	8.3	701	23.0	22.0	152	106	120
SEP												
08...	1300	3250	686	10.9	139	8.3	699	29.0	22.0	161	106	124

E--Estimated.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003--Continued

Date	Carbonate, wat flt incrm. titr., field, mg/L (00452)	Chloride, water, fltrd, mg/L (00940)	Sulfate water, fltrd, mg/L (00945)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Ammonia water, fltrd, mg/L as N (00608)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Orthophosphate, water, fltrd, mg/L as P (00671)	Phosphorus, water, unfltrd mg/L (00665)	Suspended sediment concentration mg/L (80154)	Suspended sediment load, tons/d (80155)
OCT 2002											
04...	7	8.43	162	.23	<.04	.27	E.007	<.02	.033	19	232
NOV											
13...	5	8.50	163	.26	<.04	.29	.010	<.02	.038	45	561
DEC											
12...	0	8.72	180	.19	<.04	.57	E.007	<.02	.014	19	E190
JAN 2003											
23...	0	9.46	206	.30	.07	.65	E.004	<.02	.009	19	E144
FEB											
20...	0	8.83	200	.57	.05	.48	E.005	<.02	.100	77	E873
MAR											
19...	0	6.56	146	2.2	.18	.46	.014	.03	.72	976	24000
MAY											
22...	0	4.33	74.5	.58	<.04	.19	.009	E.01	.186	143	4250
JUN											
17...	0	3.03	34.5	.34	<.04	.10	<.008	E.01	.166	151	11000
JUL											
17...	5	6.25	96.1	.40	<.04	E.04	E.005	<.02	.083	62	1470
AUG											
21...	5	10.5	195	.42	<.04	E.06	<.008	<.02	.042	22	206
SEP											
08...	2	10.9	198	.45	<.04	.10	E.004	<.02	.046	26	228

Date	Time	2,6-Diethylaniline water fltrd 0.7u GF ug/L (82660)	CIAT, water, fltrd, ug/L (04040)	Acetochlor, water, fltrd, ug/L (49260)	Alachlor, water, fltrd, ug/L (46342)	alpha-HCH, water, fltrd, ug/L (34253)	Atrazine, water, fltrd, ug/L (39632)	Azinphosmethyl, water, fltrd 0.7u GF ug/L (82686)	Benfluralin, water, fltrd 0.7u GF ug/L (82673)	Butylate, water, fltrd, ug/L (04028)	Carbaryl, water, fltrd 0.7u GF ug/L (82680)
NOV 2002											
13...	1300	<.006	<.006	<.006	<.004	<.005	E.005	<.050	<.010	<.002	<.041
JAN 2003											
23...	1000	<.006	<.006	<.006	<.004	<.005	<.007	<.050	<.010	<.002	<.041
MAR											
19...	1130	<.006	<.006	<.006	<.004	<.005	<.007	<.050	<.010	<.002	<.041
MAY											
22...	1030	<.006	<.006	<.006	<.004	<.005	<.007	<.050	<.010	<.002	<.041
JUN											
17...	1600	<.006	<.006	<.006	<.004	<.005	<.007	<.050	<.010	<.002	<.041
JUL											
17...	1000	<.006	<.006	<.006	<.004	<.005	E.006	<.050	<.010	<.002	<.041
AUG											
21...	1000	<.006	E.004	<.006	<.004	<.005	.008	<.050	<.010	<.002	<.041
SEP											
08...	1300	<.006	<.006	<.006	<.004	<.005	E.006	<.050	<.010	<.002	<.041

Date	Carbofuran, water, fltrd 0.7u GF ug/L (82674)	Chlorpyrifos water, fltrd, ug/L (38933)	Cispermethrin water fltrd 0.7u GF ug/L (82687)	Cyanazine, water, fltrd, ug/L (04041)	DCPA, water fltrd 0.7u GF ug/L (82682)	Desulfinyl fipronil, water, fltrd, ug/L (62170)	Diazinon, water, fltrd, ug/L (39572)	Dieldrin, water, fltrd, ug/L (39381)	Disulfoton, water, fltrd 0.7u GF ug/L (82677)	EPTC, water, fltrd 0.7u GF ug/L (82668)	Ethalfluralin, water, fltrd 0.7u GF ug/L (82663)
NOV 2002											
13...	<.020	<.005	<.006	<.018	<.003	<.004	<.005	<.005	<.02	<.002	<.009
JAN 2003											
23...	<.020	<.005	<.006	<.018	<.003	<.004	<.005	<.005	<.02	<.002	<.009
MAR											
19...	<.020	<.005	<.006	<.018	<.003	<.004	<.005	<.005	<.02	<.040	<.009
MAY											
22...	<.020	<.005	<.006	<.018	<.003	<.004	<.005	<.005	<.02	<.002	<.009
JUN											
17...	<.020	<.005	<.006	<.018	<.003	<.004	<.005	<.005	<.02	<.002	<.009
JUL											
17...	<.020	<.005	<.006	<.018	<.003	<.004	<.005	<.005	<.02	<.030	<.009
AUG											
21...	<.020	<.005	<.006	<.018	<.003	<.004	<.005	<.005	<.02	<.002	<.009
SEP											
08...	<.020	--	<.006	<.018	<.003	<.004	--	<.005	--	<.002	<.009

E--Estimated.

Date	Etho-prop, water, fltrd 0.7u GF ug/L (82672)	Desulf-inyl-fipro-nil amide, wat flt ug/L (62169)	Fipro-nil sulfide water, fltrd, ug/L (62167)	Fipro-nil sulfone water, fltrd, ug/L (62168)	Fipro-nil, water, fltrd, ug/L (62166)	Fonofos water, fltrd, ug/L (04095)	Lindane water, fltrd, ug/L (39341)	Linuron water fltrd 0.7u GF ug/L (82666)	Mala-thion, water, fltrd, ug/L (39532)	Methyl para-thion, water, fltrd 0.7u GF ug/L (82667)	Metola-chlor, water, fltrd, ug/L (39415)
NOV 2002											
13...	<.005	E.005	<.005	<.005	<.007	<.003	<.004	<.035	<.027	<.006	<.013
JAN 2003											
23...	<.005	<.009	<.005	<.005	<.007	<.003	<.004	<.035	<.027	<.006	<.013
MAR											
19...	<.005	<.009	<.005	<.005	<.007	<.003	<.004	<.035	<.027	<.006	<.013
MAY											
22...	<.005	<.009	<.005	<.005	<.007	<.003	<.004	<.035	<.027	<.006	<.013
JUN											
17...	<.005	<.009	<.005	<.005	<.007	<.003	<.004	<.035	<.027	<.006	E.003
JUL											
17...	<.005	<.009	<.005	<.005	<.007	<.003	<.004	<.035	<.027	<.006	.034
AUG											
21...	<.005	<.009	<.005	<.005	<.007	<.003	<.004	<.035	<.027	<.006	.018
SEP											
08...	--	<.009	<.005	<.005	<.007	--	<.004	<.035	--	--	E.009

Date	Metri-buzin, water, fltrd, ug/L (82630)	Moli-nate, water, fltrd 0.7u GF ug/L (82671)	Naprop-amide, water, fltrd 0.7u GF ug/L (82684)	p,p'-DDE, water, fltrd, ug/L (34653)	Para-thion, water, fltrd, ug/L (39542)	Peb-ulate, water, fltrd 0.7u GF ug/L (82669)	Pendi-meth-alin, water, fltrd 0.7u GF ug/L (82683)	Phorate water fltrd 0.7u GF ug/L (82664)	Prome-ton, water, fltrd, ug/L (04037)	Pron-amide, water, fltrd 0.7u GF ug/L (82676)	Propa-chlor, water, fltrd, ug/L (04024)
NOV 2002											
13...	<.006	<.002	<.007	<.003	<.010	<.004	<.022	<.011	E.01	<.004	<.010
JAN 2003											
23...	<.006	<.002	<.007	<.003	<.010	<.004	<.022	<.011	<.01	<.004	<.010
MAR											
19...	<.006	<.007	<.007	<.003	<.010	<.004	<.022	<.011	<.01	<.004	<.010
MAY											
22...	<.006	<.002	<.007	<.003	<.010	<.004	<.022	<.011	<.01	<.004	<.010
JUN											
17...	<.006	<.002	<.007	<.003	<.010	<.004	<.022	<.011	<.01	<.004	<.010
JUL											
17...	<.006	<.002	<.007	<.003	<.010	<.004	<.022	<.011	<.01	<.004	<.010
AUG											
21...	<.006	<.002	<.007	<.003	<.010	<.004	<.022	<.011	<.01	<.004	<.010
SEP											
08...	<.006	<.002	<.007	<.003	--	<.004	<.022	--	<.01	<.004	<.010

Date	Pro-panil, water, fltrd 0.7u GF ug/L (82679)	Propar-gite, water, fltrd 0.7u GF ug/L (82685)	Sima-zine, water, fltrd, ug/L (04035)	Tebu-thiuron water fltrd 0.7u GF ug/L (82670)	Terba-cil, water, fltrd 0.7u GF ug/L (82665)	Terbu-fos, water, fltrd 0.7u GF ug/L (82675)	Thio-bencarb water fltrd 0.7u GF ug/L (82681)	Tri-allate, water, fltrd 0.7u GF ug/L (82678)	Tri-flur-alin, water, fltrd 0.7u GF ug/L (82661)
NOV 2002									
13...	<.011	<.02	<.005	<.02	<.034	<.02	<.005	.010	<.009
JAN 2003									
23...	<.011	<.02	<.005	<.02	<.034	<.02	<.005	.007	<.009
MAR									
19...	<.011	<.02	<.005	<.02	<.034	<.02	<.005	.008	<.009
MAY									
22...	<.011	<.02	<.005	<.02	<.034	<.02	<.005	<.005	<.009
JUN									
17...	<.011	<.02	<.005	<.02	<.034	<.02	<.005	.007	<.009
JUL									
17...	<.011	<.02	<.005	<.02	<.034	<.02	<.005	.006	<.009
AUG									
21...	<.011	<.02	<.005	<.02	<.034	<.02	<.005	<.002	<.009
SEP									
08...	<.011	.41	<.005	<.02	<.034	--	<.005	<.010	<.009

E--Estimated.

YELLOWSTONE RIVER BASIN

451302106583201 ROSEBUD CREEK NEAR ROSEBUD BATTLEFIELD, NEAR KIRBY, MT

LOCATION.--Lat 45°13'02", long 106°58'32" (NAD 27), $NE^1/_4SE^1/_4$ sec. 20, T.7S., R.39E., Bighorn County, Hydrologic Unit 10100003, at farm road crossing, on Kobold Ranch 0.1 mi south of county road, and about 15 mi south of Busby.

DRAINAGE AREA.--28.9 mi^2.

PERIOD OF RECORD.--May 2003.

GAGE.--None. Elevation at sampling site is 4,270 ft (NGVD 29).

REMARKS.--Due to extensive ponding of water by beaver dams, actual sampling location was upstream at Rosebud Battlefield.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instantaneous discharge, cfs (00061)	Turbidity, NTU (00076)	Barometric pressure, mm Hg (00025)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	Specif. conductance, wat unf uS/cm 25 degC (00095)	Temperature, air, deg C (00020)	Temperature, water, deg C (00010)	Hardness, water, unfltrd mg/L as CaCO3 (00900)
MAY 2003											
22...	0915	2.1	5.4	656	7.7	83	8.4	1100	17.0	12.0	610

Date	Calcium water, fltrd, mg/L (00915)	Magnesium, water, fltrd, mg/L (00925)	Potassium, water, fltrd, mg/L (00935)	Sodium adsorption ratio (00931)	Sodium, water, fltrd, mg/L (00930)	Alkalinity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chloride, water, fltrd, mg/L (00940)	Fluoride, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of constituents mg/L (70301)
MAY 2003											
22...	107	82.2	6.00	.4	23.2	414	2.68	.5	10.7	245	726

Date	Residue water, fltrd, tons/ acre-ft (70303)	Residue water, fltrd, tons/d (70302)	Phosphorus, water, unfltrd mg/L (00665)	Arsenic water unfltrd ug/L (01002)	Barium, water, unfltrd recoverable, ug/L (01007)	Boron, water, unfltrd recoverable, ug/L (01022)	Cadmium water, unfltrd ug/L (01027)	Chromium, water, unfltrd recoverable, ug/L (01034)	Copper, water, unfltrd recoverable, ug/L (01042)	Iron, water, unfltrd recoverable, ug/L (01045)	Lead, water, unfltrd recoverable, ug/L (01051)
MAY 2003											
22...	.99	4.13	.038	<2	51	70	E.02	<.8	3.9	280	.14

Date	Manganese, water, unfltrd recoverable, ug/L (01055)	Mercury water, unfltrd recover -able, ug/L (71900)	Nickel, water, unfltrd recoverable, ug/L (01067)	Selenium, water, unfltrd ug/L (01147)	Silver, water, unfltrd recover -able, ug/L (01077)	Zinc, water, unfltrd recover -able, ug/L (01092)	Suspnd. sediment, sieve diametr percent <.063mm (70331)	Suspended sediment concentration mg/L (80154)	Suspended sediment load, tons/d (80155)
MAY 2003									
22...	136	<.02	5.17	.8	<.16	7	83	8	.05

E--Estimated.

YELLOWSTONE RIVER BASIN

451618106590001 INDIAN CREEK AT MOUTH, NEAR KIRBY, MT

LOCATION.--Lat 45°16'18", long 106°59'00" (NAD 27), NE$^1/_4$SE$^1/_4$SW$/_4$ sec. 32, T.6S., R.39E., Bighorn County, Hydrologic Unit 10100003 on county road 68, 0.1 mi west of Highway 314, and 5.0 mi south of Kirby.
DRAINAGE AREA.--25.0 mi^2.
PERIOD OF RECORD.--October 2002 to September 2003.
GAGE.--None. Elevation at sampling site is 4,000 ft (NGVD 29).

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instantaneous discharge, cfs (00061)	Turbidity, NTU (00076)	Barometric pressure, mm Hg (00025)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	Specif. conductance, wat unf uS/cm 25 degC (00095)	Temperature, air, deg C (00020)	Temperature, water, deg C (00010)	Hardness, water, unfltrd mg/L as CaCO3 (00900)
OCT 2002											
22...	1020	.06	5.0	670	9.4	82	8.3	873	-1.0	4.0	440
MAY 2003											
22...	1500	2.2	1.7	695	9.2	107	8.5	715	23.0	18.0	370
SEP											
03...	0930	<.001	4.2	668	7.2	75	7.9	1010	25.0	11.0	500

Date	Calcium water, fltrd, mg/L (00915)	Magnesium, water, fltrd, mg/L (00925)	Potassium, water, fltrd, mg/L (00935)	Sodium adsorption ratio (00931)	Sodium, water, fltrd, mg/L (00930)	Alkalinity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chloride, water, fltrd, mg/L (00940)	Fluoride, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of constituents mg/L (70301)
OCT 2002											
22...	68.5	64.7	8.84	.5	23.6	362	4.27	.75	17.9	69.4	475
MAY 2003											
22...	64.7	50.8	7.54	.4	15.6	342	2.99	.6	14.5	68.0	430
SEP											
03...	73.0	76.2	9.63	.7	37.0	438	3.85	.7	26.7	142	631

Date	Residue water, fltrd, tons/ acre-ft (70303)	Residue water, fltrd, tons/d (70302)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Ammonia water, fltrd, mg/L as N (00608)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Ortho-phosphate, water, fltrd, mg/L as P (00671)	Phosphorus, water, unfltrd mg/L (00665)	Arsenic water unfltrd ug/L (01002)	Barium, water, unfltrd recover -able, ug/L (01007)	Boron, water, unfltrd recover -able, ug/L (01022)
OCT 2002											
22...	.65	.08	.33	E.008	<.022	<.002	E.005	.032	<2	115	96
MAY 2003											
22...	.58	2.61	.34	E.012	.031	E.002	.012	.026	<2	114	100
SEP											
03...	.86	<.002	.25	.017	<.022	<.002	.024	.058	E1	105	171

Date	Cadmium water, unfltrd ug/L (01027)	Chromium, water, unfltrd recover -able, ug/L (01034)	Copper, water, unfltrd recover -able, ug/L (01042)	Iron, water, unfltrd recover -able, ug/L (01045)	Lead, water, unfltrd recover -able, ug/L (01051)	Manganese, water, unfltrd recover -able, ug/L (01055)	Mercury water, unfltrd recover -able, ug/L (71900)	Nickel, water, unfltrd recover -able, ug/L (01067)
OCT 2002								
22...	.08	<.8	1.5	350	3.24	87.2	<.02	3.66
MAY 2003								
22...	E.02	<.8	2.0	60	E.03	12.9	<.02	2.35
SEP								
03...	<.04	<.8	1.6	230	E.03	158	<.02	2.25

Date	Selenium, water, unfltrd ug/L (01147)	Silver, water, unfltrd recover -able, ug/L (01077)	Zinc, water, unfltrd recover -able, ug/L (01092)	Suspnd. sediment, sieve diametr percent <.063mm (70331)	Suspended sediment concentration mg/L (80154)	Suspended sediment load, tons/d (80155)
OCT 2002						
22...	<.5	<.16	<2	60	14	<.01
MAY 2003						
22...	.5	<.16	8	93	2	.01
SEP						
03...	1.1	<.16	<2	67	32	<.01

E--Estimated.

YELLOWSTONE RIVER BASIN

06295113 ROSEBUD CREEK AT RESERVATION BOUNDARY, NEAR KIRBY, MT

LOCATION.--Lat 45°21'40", long 106°59'23" (NAD 27), in NE$^1/_4$NE$^1/_4$SW$^1/_4$ sec.36, T.5 S., R.38 E., Big Horn County, Hydrologic Unit 10100003, on right bank, 0.2 mi upstream from Dry Creek, 0.5 mi north of reservation boundary, 1.9 mi downstream from Cache Creek, 2.0 mi north of Kirby, and at river mile 179.6.

DRAINAGE AREA.-- 123 mi^2.

SURFACE-WATER RECORDS

PERIOD OF RECORD.--October 1979 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 3,780 ft (NGVD 29).

REMARKS.--Surface-water records fair except those for estimated daily discharges, which are poor. Numerous small diversions for irrigation upstream from station.

EXTREMES OUTSIDE PERIOD OF RECORD.--A discharge of 231 ft^3/s was measured May 9, 1978, at site 1.9 mi upstream from present site. Flow was known to be higher during flood of May 19-21, 1978, from information by local resident.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.00	0.54	0.92	e0.90	e1.4	e1.0	6.9	8.2	2.5	e1.7	0.71	0.01
2	0.00	0.57	e0.80	e1.0	e1.2	e1.0	12	8.5	2.2	e1.7	0.38	0.04
3	0.24	0.57	e0.70	e1.0	e1.0	e1.0	16	12	2.2	e1.7	0.31	0.00
4	0.33	0.61	e0.70	e1.1	e1.0	e1.0	12	17	2.0	e1.8	0.21	0.00
5	0.40	0.59	e0.70	e1.1	e1.0	e1.0	9.3	17	2.3	e1.8	0.11	0.00
6	0.38	0.59	e0.70	e1.2	e1.0	e1.0	8.2	14	2.8	e1.8	0.05	0.00
7	0.40	0.64	e0.70	e1.3	e1.0	e0.90	7.2	15	3.4	e1.8	0.05	0.00
8	0.39	0.69	e0.70	e1.3	e1.1	e1.0	6.2	19	3.0	1.8	0.04	0.00
9	0.45	0.70	e0.70	e1.2	e1.1	e1.0	5.6	20	3.1	1.8	0.04	0.00
10	0.41	0.62	e0.70	e1.0	e1.2	e1.2	4.8	22	3.1	1.6	0.02	0.00
11	0.88	0.49	e0.70	e0.90	e1.2	e2.0	4.5	21	2.5	1.4	0.01	0.00
12	0.83	0.57	e0.70	e1.0	e1.2	e3.0	5.7	22	2.7	1.3	0.01	0.03
13	0.64	0.58	e0.80	e1.0	e1.3	e4.0	5.9	20	2.2	1.1	0.00	0.00
14	0.46	0.54	e0.80	e1.0	e1.3	e10	5.5	16	2.0	0.80	0.00	0.00
15	0.44	0.55	e0.80	e1.0	e1.3	e20	5.2	13	1.8	0.70	0.00	0.00
16	0.45	0.51	e0.90	e1.0	e1.3	e40	4.9	10	1.6	0.52	0.00	0.00
17	0.42	0.50	e0.90	e1.1	e1.3	e35	4.7	8.4	1.4	0.34	0.07	0.00
18	0.43	0.53	e0.80	e1.1	e1.3	e30	4.8	7.6	1.3	0.24	0.04	0.00
19	0.50	0.75	e0.70	e1.3	e1.2	e23	5.7	7.3	1.1	0.23	0.01	0.00
20	0.46	0.71	e0.60	e1.1	e1.1	e20	5.6	6.6	1.0	0.16	0.01	0.00
21	0.49	0.70	e0.60	e0.80	e1.0	e17	5.3	6.1	0.95	0.07	0.01	0.00
22	0.56	0.71	e0.60	e0.70	e0.70	e15	5.4	5.8	0.97	0.03	0.01	0.00
23	0.56	0.87	e0.60	e0.90	e0.50	e14	5.2	5.4	1.0	0.01	0.01	0.00
24	0.68	0.71	e0.60	e1.0	e0.40	e13	4.7	5.3	2.1	0.00	0.01	0.00
25	0.64	0.76	e0.60	e1.1	e0.50	e12	5.2	4.8	2.7	0.01	0.00	0.00
26	0.69	0.73	e0.60	e1.3	e0.70	e11	4.5	4.4	2.7	0.04	0.01	0.00
27	0.82	0.77	e0.70	e1.4	e1.0	10	4.5	4.2	2.0	0.77	0.01	0.01
28	0.75	0.92	e0.70	e1.1	e1.0	7.8	4.6	3.8	1.6	1.2	0.01	0.29
29	0.63	0.99	e0.80	e1.4	---	6.2	4.7	3.4	1.7	1.5	0.01	0.26
30	0.60	0.87	e0.80	e1.5	---	5.0	6.5	2.9	e1.7	1.5	0.03	0.60
31	0.58	---	e0.90	e1.5	---	4.3	---	2.7	---	1.1	0.02	---
TOTAL	15.51	19.88	22.52	34.30	29.30	312.40	191.3	333.4	61.62	30.52	2.20	1.24
MEAN	0.50	0.66	0.73	1.11	1.05	10.1	6.38	10.8	2.05	0.98	0.071	0.041
MAX	0.88	0.99	0.92	1.5	1.4	40	16	22	3.4	1.8	0.71	0.60
MIN	0.00	0.49	0.60	0.70	0.40	0.90	4.5	2.7	0.95	0.00	0.00	0.00
AC-FT	31	39	45	68	58	620	379	661	122	61	4.4	2.5

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1980 - 2003, BY WATER YEAR (WY)

MEAN	2.80	3.15	3.16	3.29	6.12	13.3	14.6	12.2	8.26	3.53	1.59	1.57
MAX	8.02	11.7	12.7	10.0	29.0	41.8	40.7	23.9	19.7	11.1	4.60	3.18
(WY)	1980	1980	1980	1980	1996	1996	1985	1984	1986	1993	1993	1984
MIN	0.33	0.37	0.34	1.02	1.01	1.01	2.33	1.77	1.04	0.031	0.014	0.000
(WY)	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002	2002

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1980 - 2003	
ANNUAL TOTAL	306.66		1054.19			
ANNUAL MEAN	0.84		2.89		6.12	
HIGHEST ANNUAL MEAN					11.7	1996
LOWEST ANNUAL MEAN					0.77	2002
HIGHEST DAILY MEAN	3.2	Apr 22	40	Mar 16	170	Mar 13 1996
LOWEST DAILY MEAN	0.00	Jul 11	0.00	Many days	0.00	Sep 16 1990
ANNUAL SEVEN-DAY MINIMUM	0.00	Jul 11	0.00	Sep 3	0.00	Sep 26 2001
MAXIMUM PEAK FLOW					b219	Mar 17 1996
MAXIMUM PEAK STAGE			unknown		a8.28	Mar 13 1996
INSTANTANEOUS LOW FLOW					0.00	Sep 6 1989
ANNUAL RUNOFF (AC-FT)	608		2090		4440	
10 PERCENT EXCEEDS	2.0		8.0		14	
50 PERCENT EXCEEDS	0.70		1.0		3.4	
90 PERCENT EXCEEDS	0.00		0.01		0.81	

a--Backwater from ice.
b--Gage height, 6.30 ft.
e--Estimated.

06295113 ROSEBUD CREEK AT RESERVATION BOUNDARY, NEAR KIRBY, MT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1980-84, July 2003 to September 2003.

REMARKS.--Unpublished records of instantaneous water temperature and specific conductance are available in files of District office.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instantaneous discharge, cfs (00061)	Barometric pressure, mm Hg (00025)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	Specif. conductance, wat unf uS/cm 25 degC (00095)	Temperature, air, deg C (00020)	Temperature, water, deg C (00010)	Hardness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)
JUL 2003											
01...	1000	1.2	663	6.2	77	7.9	979	27.0	18.5	460	59.9
AUG											
05...	1445	.10	667	5.8	76	8.1	1090	20.5	21.5	520	66.0
SEP											
02...	0930	.01	672	6.4	69	8.2	1120	23.0	12.5	490	56.8

Date	Magnesium, water, fltrd, mg/L (00925)	Potassium, water, fltrd, mg/L (00935)	Sodium adsorption ratio (00931)	Sodium, water, fltrd, mg/L (00930)	Alkalinity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chloride, water, fltrd, mg/L (00940)	Fluoride, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of constituents mg/L (70301)	Residue water, fltrd, tons/ acre-ft (70303)
JUL 2003											
01...	76.2	7.86	.8	42.0	462	3.48	.8	10.7	120	598	.81
AUG											
05...	85.6	10.3	1	56.1	527	5.23	1.0	15.6	116	672	.91
SEP											
02...	84.5	12.1	1	57.1	529	6.95	1.1	8.3	142	686	.93

Date	Residue water, fltrd, tons/d (70302)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Orthophosphate, water, fltrd, mg/L as P (00671)	Phosphorus, water, unfltrd mg/L (00665)	Suspnd. sediment, sieve diametr percent <.063mm (70331)	Suspended sediment concentration mg/L (80154)	Suspended sediment load, tons/d (80155)
JUL 2003									
01...	2.00	.46	<.022	<.002	.026	.050	81	46	.15
AUG									
05...	.18	.55	<.022	<.002	.067	.102	69	62	.02
SEP									
02...	.02	.47	<.022	<.002	.049	.083	35	42	.00

YELLOWSTONE RIVER BASIN

452800107001101 THOMPSON CREEK NEAR BUSBY, MT

LOCATION.--Lat 45°28'00", long 107°00'11" (NAD 27), $SE^1/_4NW^1/_4NE^1/_4$ sec. 26, T.4S., R.38E., Bighorn County, Hydrologic Unit 10100003, 0.5 mi upstream from mouth at Highway 314 bridge crossing, and 7 .0 mi south of Busby.
DRAINAGE AREA.--21.9 mi^2.
PERIOD OF RECORD.--October 2002 to September 2003.
GAGE.--None. Elevation at sampling site is 3,560 ft (NGVD 29).

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instantaneous discharge, cfs (00061)	Turbidity, NTU (00076)	Barometric pressure, mm Hg (00025)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	Specif. conductance, wat unf uS/cm 25 degC (00095)	Temperature, air, deg C (00020)	Temperature, water, deg C (00010)	Hardness, water, unfltrd mg/L as CaCO3 (00900)
OCT 2002											
22...	1345	.25	3.0	681	11.2	101	8.6	1090	.5	6.0	550
MAY 2003											
22...	1100	.30	8.3	695	11.4	126	9.0	943	21.0	15.5	450
SEP											
03...	1230	<.001	22	678	6.1	74	7.7	1310	29.0	18.5	620

Date	Calcium water, fltrd, mg/L (00915)	Magnesium, water, fltrd, mg/L (00925)	Potassium, water, fltrd, mg/L (00935)	Sodium adsorption ratio (00931)	Sodium, water, fltrd, mg/L (00930)	Alkalinity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chloride, water, fltrd, mg/L (00940)	Fluoride, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of constituents mg/L (70301)
OCT 2002											
22...	67.0	92.3	9.81	.9	49.3	393	5.61	.47	16.3	171	647
MAY 2003											
22...	47.9	80.5	9.39	.9	45.8	375	4.44	.5	11.0	174	598
SEP											
03...	81.2	100	12.2	1	61.9	610	6.39	.7	17.3	173	819

Date	Residue water, fltrd, tons/acre-ft (70303)	Residue water, fltrd, tons/d (70302)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Ammonia water, fltrd, mg/L as N (00608)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Orthophosphate, water, fltrd, mg/L as P (00671)	Phosphorus, water, unfltrd mg/L (00665)	Arsenic water unfltrd ug/L (01002)	Barium, water, unfltrd recoverable, ug/L (01007)	Boron, water, unfltrd recoverable, ug/L (01022)
OCT 2002											
22...	.88	.44	.41	E.014	<.022	E.002	<.007	.024	<2	43	172
MAY 2003											
22...	.81	.48	.49	E.014	<.022	E.002	<.007	.037	<2	30	223
SEP											
03...	1.11	<.002	.91	.110	<.022	<.002	<.007	.062	8	98	294

Date	Cadmium water, unfltrd ug/L (01027)	Chromium, water, unfltrd recoverable, ug/L (01034)	Copper, water, unfltrd recoverable, ug/L (01042)	Iron, water, unfltrd recoverable, ug/L (01045)	Lead, water, unfltrd recoverable, ug/L (01051)	Manganese, water, unfltrd recoverable, ug/L (01055)	Mercury water, unfltrd recoverable, ug/L (71900)	Nickel, water, unfltrd recoverable, ug/L (01067)
OCT 2002								
22...	<.04	<.8	2.0	100	.10	11.9	<.02	3.37
MAY 2003								
22...	<.04	<.8	2.8	230	.23	13.2	<.02	2.38
SEP								
03...	E.02	<.8	2.0	3500	.20	1120	<.02	5.37

Date	Selenium, water, unfltrd ug/L (01147)	Silver, water, unfltrd recoverable, ug/L (01077)	Zinc, water, unfltrd recoverable, ug/L (01092)	Suspnd. sediment, sieve diametr percent <.063mm (70331)	Suspended sediment concentration mg/L (80154)	Suspended sediment load, tons/d (80155)
OCT 2002						
22...	<.5	<.16	E1	76	48	.03
MAY 2003						
22...	.7	<.16	2	96	10	.01
SEP						
03...	.5	<.16	E2	62	43	<.01

E--Estimated.

453021107000001 DAVIS CREEK NEAR BUSBY, MT

LOCATION.--Lat 45°30'21", long 107°00'00" (NAD 27), $NE^1/_4NE^1/_4SE^1/_4$ sec. 11, T.4S., R.83E., Rosebud County, Hydrologic Unit 10100003, at Highway 314 bridge crossing, and about 3 mi south of Busby.

DRAINAGE AREA.--30.1 mi^2.

PERIOD OF RECORD.--May 2003.

GAGE.--None. Elevation at sampling site is 3,480 ft (NGVD 29).

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instantaneous discharge, cfs (00061)	Turbidity, NTU (00076)	Barometric pressure, mm Hg (00025)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	Specif. conductance, wat unf uS/cm 25 degC (00095)	Temperature, air, deg C (00020)	Temperature, water, deg C (00010)	Hardness, water, unfltrd mg/L as CaCO3 (00900)
MAY 2003 22...	1300	.08	2.7	695	7.0	77	8.4	1790	23.0	15.0	660

Date	Calcium water, fltrd, mg/L (00915)	Magnesium, water, fltrd, mg/L (00925)	Potassium, water, fltrd, mg/L (00935)	Sodium adsorption ratio (00931)	Sodium, water, fltrd, mg/L (00930)	Alkalinity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chloride, water, fltrd, mg/L (00940)	Fluoride, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of constituents mg/L (70301)
MAY 2003 22...	103	97.4	8.94	2	120	535	10.3	.3	9.7	505	1180

Date	Residue water, fltrd, tons/ acre-ft (70303)	Residue water, fltrd, tons/d (70302)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Ammonia water, fltrd, mg/L as N (00608)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Orthophosphate, water, fltrd, mg/L as P (00671)	Phosphorus, water, unfltrd mg/L (00665)	Arsenic water unfltrd ug/L (01002)	Barium, water, unfltrd recoverable, ug/L (01007)	Boron, water, unfltrd recoverable, ug/L (01022)
MAY 2003 22...	1.60	.25	1.4	.028	<.022	.004	.033	.084	E2	58	211

Date	Cadmium water, unfltrd ug/L (01027)	Chromium, water, unfltrd recoverable, ug/L (01034)	Copper, water, unfltrd recoverable, ug/L (01042)	Iron, water, unfltrd recoverable, ug/L (01045)	Lead, water, unfltrd recoverable, ug/L (01051)	Manganese, water, unfltrd recoverable, ug/L (01055)	Mercury water, unfltrd recoverable, ug/L (71900)	Nickel, water, unfltrd recoverable, ug/L (01067)
MAY 2003 22...	.04	<.8	6.2	370	.66	133	<.02	6.18

Date	Selenium, water, unfltrd 2ug/L (01147)	Silver, water, unfltrd recoverable, ug/L (01077)	Zinc, water, unfltrd recoverable, ug/L (01092)	Suspnd. sediment, sieve diametr percent <.063mm (70331)	Suspended sediment concentration mg/L (80154)	Suspended sediment load, tons/d (80155)
MAY 2003 22...	.9	<.16	5	58	5	<.01

YELLOWSTONE RIVER BASIN

06295250 ROSEBUD CREEK NEAR COLSTRIP, MT

LOCATION.--Lat 45°46'03", long 106°34'10" (NAD 27), in $SE^1/_4SW^1/_4NE^1/_4$ sec.8, T.1 S., R.42 E., Rosebud County, Hydrologic Unit 10100003, on left bank 10 ft downstream from bridge on FAS Route 315, 1.5 mi downstream from Lee Coulee, 8.4 mi southeast of Colstrip, and at river mile 85.6.
DRAINAGE AREA.--799 mi^2.
PERIOD OF RECORD.--October 1974 to current year.
GAGE.--Water-stage recorder. Elevation of gage is 3,000 ft (NGVD 29).
REMARKS.--Records fair except those for estimated daily discharges, which are poor. Diversions for irrigation of about 800 acres upstream from station. Several observations of water temperature and specific conductance were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.00	0.00	0.00	e0.00	e0.00	e3.0	23	15	9.8	5.0	0.00	0.00
2	0.00	0.00	0.00	e0.00	e0.00	e2.0	21	17	9.6	4.6	0.00	0.00
3	0.00	0.00	0.00	e0.00	e0.00	e1.0	20	17	8.7	4.9	0.00	0.00
4	0.00	0.00	0.00	e0.00	e0.00	e1.0	18	17	10	4.6	0.00	0.00
5	0.00	0.00	0.00	e0.00	e0.00	e0.50	17	18	9.2	4.7	0.00	0.00
6	0.00	0.00	0.00	e0.00	e0.00	e0.50	16	20	8.7	4.4	0.00	0.00
7	0.00	0.00	0.00	e0.00	e0.50	e1.0	16	21	8.7	4.1	0.00	0.00
8	0.00	0.00	0.00	e0.00	e1.0	e2.0	19	25	8.3	4.0	0.00	0.00
9	0.00	0.00	0.00	e0.00	e1.5	e3.0	23	29	8.4	3.4	0.00	0.00
10	0.00	0.00	0.00	e0.00	e1.0	e4.0	21	29	8.1	3.6	0.00	0.00
11	0.00	0.00	e0.00	e0.00	e1.00	e6.5	20	31	7.9	2.9	0.00	0.00
12	0.00	0.00	e0.00	e0.00	e1.0	e8.0	19	32	6.7	2.7	0.00	0.00
13	0.00	0.00	e0.00	e0.00	e1.0	e60	18	33	6.2	1.9	0.00	0.00
14	0.00	0.00	e0.00	e0.00	e1.0	e150	17	32	5.6	1.6	0.00	0.00
15	0.00	0.00	e0.00	e0.00	e1.0	e250	16	30	4.9	1.6	0.00	0.00
16	0.00	0.00	e0.00	e0.00	e1.0	e300	16	28	4.4	1.3	0.00	0.00
17	0.00	0.00	e0.00	e0.00	e1.0	388	15	25	4.4	1.1	0.00	0.00
18	0.00	0.00	e0.00	e0.00	e2.0	465	15	24	4.8	0.91	0.00	0.00
19	0.00	0.00	e0.00	e0.00	e6.0	369	15	22	4.3	0.63	0.00	0.00
20	0.00	0.00	e0.00	e0.00	e8.0	153	14	21	4.7	0.42	0.00	0.00
21	0.00	0.00	e0.00	e0.00	e10	125	14	20	9.5	0.37	0.00	0.00
22	0.00	0.00	e0.00	e0.00	e10	119	14	19	6.0	0.29	0.00	0.00
23	0.00	0.00	e0.00	e0.00	e9.5	94	14	18	4.9	0.17	0.00	0.00
24	0.00	0.00	e0.00	e0.00	e9.0	78	13	17	5.1	0.10	0.00	0.00
25	0.00	0.00	e0.00	e0.00	e7.0	60	13	15	5.8	0.06	0.00	0.00
26	0.00	0.00	e0.00	e0.00	e5.0	53	13	15	5.8	0.04	0.00	0.00
27	0.00	0.00	e0.00	e0.00	e4.0	48	13	14	5.5	0.02	0.00	0.00
28	0.00	0.00	e0.00	e0.00	e4.0	38	13	13	4.9	0.02	0.00	0.00
29	0.00	0.00	e0.00	e0.00	---	31	14	12	4.9	0.01	0.00	0.00
30	0.00	0.00	e0.00	e0.00	---	28	14	11	4.9	0.00	0.00	0.00
31	0.00	---	e0.00	e0.00	---	25	---	10	---	0.00	0.00	---
TOTAL	0.00	0.00	0.00	0.00	85.50	2866.50	494	650	200.7	59.44	0.00	0.00
MEAN	0.000	0.000	0.000	0.000	3.05	92.5	16.5	21.0	6.69	1.92	0.000	0.000
MAX	0.00	0.00	0.00	0.00	10	465	23	33	10	5.0	0.00	0.00
MIN	0.00	0.00	0.00	0.00	0.00	0.50	13	10	4.3	0.00	0.00	0.00
AC-FT	0.00	0.00	0.00	0.00	170	5690	980	1290	398	118	0.00	0.00

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1975 - 2003, BY WATER YEAR (WY)

MEAN	9.31	12.0	12.1	14.5	26.5	47.1	39.9	50.6	35.5	17.9	8.90	6.57
MAX	47.5	46.2	46.0	70.3	105	164	185	306	212	104	57.1	55.8
(WY)	1979	1979	1979	1975	1996	1994	1979	1975	1978	1975	1975	1978
MIN	0.000	0.000	0.000	0.000	3.05	7.42	8.88	4.15	0.78	0.000	0.000	0.000
(WY)	1991	2003	2003	2003	2003	1991	1992	2002	2002	2002	2001	1983

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1975 - 2003	
ANNUAL TOTAL	1067.03		4356.14			
ANNUAL MEAN	2.92		11.9		23.4*	
HIGHEST ANNUAL MEAN					95.9	1975
LOWEST ANNUAL MEAN					2.96	2002
HIGHEST DAILY MEAN	15	Apr 11	465	Mar 18	668	Mar 3 1994
LOWEST DAILY MEAN	0.00	Jun 21	0.00	Oct 1	0.00	Aug 31 1981
ANNUAL SEVEN-DAY MINIMUM	0.00	Jun 25	0.00	Oct 1	0.00	Aug 31 1981
MAXIMUM PEAK FLOW			493	Mar 18	a754	Mar 2 1994
MAXIMUM PEAK STAGE			7.49	Mar 18	9.03	May 21 1978
ANNUAL RUNOFF (AC-FT)	2120		8640		16940	
10 PERCENT EXCEEDS	10		21		50	
50 PERCENT EXCEEDS	0.00		0.00		11	
90 PERCENT EXCEEDS	0.00		0.00		0.21	

*--Median of yearly mean discharge, 14.5 cfs, 10,510 acre-ft/yr.
a--Gage height, 8.42 ft.
e--Estimated.

YELLOWSTONE RIVER BASIN

06296003 ROSEBUD CREEK AT MOUTH, NEAR ROSEBUD, MT

LOCATION.--Lat 46°15'53", long 106°28'30" (NAD 27), in $SW^1/_4NW^1/_4NE^1/_4$ sec.21, T.6 N., R.42 E., Rosebud County, Hydrologic Unit 10100003, on left bank 0.4 mi upstream from bridge on Interstate Highway 94, 0.8 mi upstream from mouth, and 1.6 mi southwest of Rosebud.

DRAINAGE AREA.--1,302 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1974 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 2,480 ft (NGVD 29).

REMARKS.--Water-discharge records fair except those for estimated daily discharges, which are poor. Diversions for irrigation of about 2,000 acres upstream from station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.58	e0.10	e0.10	e0.10	e0.20	e0.50	40	8.6	7.4	0.87	0.00	0.00
2	0.52	e0.10	e0.10	e0.10	e0.30	e0.50	37	9.9	8.7	1.0	0.00	0.00
3	0.45	e0.10	e0.10	e0.10	e0.40	e0.50	34	11	8.1	0.47	0.00	0.00
4	0.45	e0.10	e0.10	e0.10	e0.40	e0.50	30	14	8.6	0.26	0.00	0.00
5	0.45	e0.10	e0.10	e0.10	e0.40	e0.30	26	17	12	0.24	0.00	0.00
6	0.45	e0.10	e0.10	e0.10	e0.40	e0.10	25	22	16	0.17	0.00	0.00
7	0.45	e0.10	e0.10	e0.10	e0.40	e0.10	20	22	25	0.07	0.00	0.00
8	0.42	e0.10	e0.10	e0.10	e0.40	e0.20	18	19	18	0.18	0.00	0.00
9	0.40	e0.10	e0.10	e0.10	e0.40	e0.30	13	21	9.8	0.18	0.00	0.00
10	0.40	e0.10	e0.10	e0.10	e0.40	e0.30	12	30	6.9	0.08	0.00	0.00
11	0.39	e0.10	e0.10	e0.10	e1.0	e0.40	12	37	7.6	0.05	0.00	0.00
12	0.35	e0.10	e0.10	e0.10	e1.0	e0.40	11	40	9.5	0.04	0.00	0.00
13	0.35	e0.10	e0.10	e0.00	e1.0	e4.0	8.7	33	17	0.05	0.00	0.00
14	0.30	e0.10	e0.10	e0.00	e2.0	e50	6.8	32	10	0.07	0.00	0.00
15	0.30	e0.10	e0.10	e0.00	e4.0	e500	4.3	27	7.4	0.12	0.00	0.00
16	0.26	e0.10	e0.10	e0.00	e7.0	e300	4.0	27	5.7	0.14	0.00	0.00
17	0.25	e0.10	e0.10	e0.00	e10	178	3.7	27	22	0.11	0.00	0.00
18	0.23	e0.10	e0.10	e0.00	e15	154	4.2	28	7.1	0.07	0.00	0.00
19	0.21	e0.10	e0.10	e0.00	e17	172	4.1	28	3.1	0.00	0.00	0.00
20	0.21	e0.10	e0.10	e0.00	e20	198	3.9	26	2.4	0.00	0.00	0.00
21	0.19	e0.10	e0.10	e0.00	e10	209	3.2	24	2.1	0.00	0.00	0.00
22	0.18	e0.10	e0.10	e0.00	e1.0	207	3.0	22	3.7	0.00	0.00	0.00
23	e0.10	e0.10	e0.10	e0.00	e0.20	199	3.0	20	3.2	0.00	0.00	0.00
24	e0.10	e0.10	e0.10	e0.00	e0.30	141	3.0	16	1.6	0.00	0.00	0.00
25	e0.10	e0.10	e0.10	e0.00	e0.40	107	3.0	13	1.2	0.00	0.00	0.00
26	e0.10	e0.10	e0.10	e0.00	e0.50	92	3.2	11	1.0	0.00	0.00	0.00
27	e0.10	e0.10	e0.10	e0.02	e0.60	78	3.1	11	0.88	0.00	0.00	0.00
28	e0.10	e0.10	e0.10	e0.04	e0.50	66	5.3	11	0.87	0.00	0.00	0.00
29	e0.10	e0.10	e0.10	e0.05	---	58	7.0	10	0.83	0.00	0.00	0.00
30	e0.10	e0.10	e0.10	e0.07	---	52	7.4	7.3	0.83	0.00	0.00	0.00
31	e0.10	---	e0.10	e0.10	---	45	---	8.2	---	0.00	0.00	---
TOTAL	8.69	3.00	3.10	1.48	95.20	2814.10	358.9	633.0	228.51	4.17	0.00	0.00
MEAN	0.28	0.10	0.10	0.048	3.40	90.8	12.0	20.4	7.62	0.13	0.000	0.000
MAX	0.58	0.10	0.10	0.10	20	500	40	40	25	1.0	0.00	0.00
MIN	0.10	0.10	0.10	0.00	0.20	0.10	3.0	7.3	0.83	0.00	0.00	0.00
AC-FT	17	6.0	6.1	2.9	189	5580	712	1260	453	8.3	0.00	0.00

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1975 - 2003, BY WATER YEAR (WY)

MEAN	8.12	9.10	9.81	18.6	37.3	72.9	42.5	59.4	39.8	17.5	7.94	8.25
MAX	45.7	47.6	47.8	159	187	428	180	478	286	133	47.8	77.3
(WY)	1979	1979	1979	1999	1997	1994	1979	1978	1978	1993	1975	1978
MIN	0.000	0.009	0.033	0.033	0.066	0.039	4.99	0.39	0.48	0.000	0.000	0.000
(WY)	2002	2002	2002	2002	2002	2002	2002	2002	1988	2002	2003	1990

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1975 - 2003	
ANNUAL TOTAL	379.38		4150.15			
ANNUAL MEAN	1.04		11.4		27.6*	
HIGHEST ANNUAL MEAN					113	1978
LOWEST ANNUAL MEAN					1.00	2002
HIGHEST DAILY MEAN	56	Aug 5	500	Mar 15	2800	Mar 4 1994
LOWEST DAILY MEAN	0.00	Apr 13	0.00	Jan 13	a0.00	Aug 28 1984
ANNUAL SEVEN-DAY MINIMUM	0.00	Jun 27	0.00	Jan 13	0.00	Aug 5 1988
MAXIMUM PEAK FLOW			unknown		3700	Mar 4 1994
MAXIMUM PEAK STAGE			5.87	Mar 15	7.70	Mar 4 1994
ANNUAL RUNOFF (AC-FT)	753		8230		19960	
10 PERCENT EXCEEDS	0.60		24		60	
50 PERCENT EXCEEDS	0.10		0.10		7.6	
90 PERCENT EXCEEDS	0.00		0.00		0.10	

*--Median of yearly mean discharge, 15.1 ft^3/s, 10,900 acre-ft/yr.
a--No flow many days in 1984, 1990-1992, 2000-2003.
e--Estimated.

YELLOWSTONE RIVER BASIN

06296003 ROSEBUD CREEK AT MOUTH, NEAR ROSEBUD, MT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1975-86, 1988-93, May 1999 to current year.

REMARKS.--Unable to collect a sample in August or September due to no flow. Unpublished records of instantaneous water temperature and specific conductance are available in files of District office.

WATER QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instan-taneous dis-charge, cfs (00061)	pH, water, unfltrd field, std units (00400)	Specif. conduc-tance, wat unf uS/cm 25 degC (00095)	Temper-ature, air, deg C (00020)	Temper-ature, water, deg C (00010)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)
MAR 2003									
19...	1000	176	7.8	415	4.0	.5	1.8	.351	.013
MAY									
22...	0830	22	8.3	1960	16.0	14.0	.78	<.022	<.002
JUN									
02...	1130	8.6	8.3	2260	20.0	18.5	.67	<.022	<.002

Date	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Phos-phorus, water, unfltrd mg/L (00665)	Suspnd. sedi-ment, sieve diametr percent <.063mm (70331)	Sus-pended sedi-ment concen-tration mg/L (80154)	Sus-pended sedi-ment load, tons/d (80155)
MAR 2003					
19...	.008	.67	99	1210	576
MAY					
22...	<.007	.089	99	237	14
JUN					
02...	<.007	.051	98	188	4.4

Date	Time	Hard-ness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Potas-sium, water, fltrd, mg/L (00935)	Sodium adsorp-tion ratio (00931)	Sodium, water, fltrd, mg/L (00930)	Alka-linity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chlor-ide, water, fltrd, mg/L (00940)	Fluor-ide, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)
MAY 2003											
22...	0830	790	88.1	139	13.1	3	163	443	9.62	.7	10.9

Date	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of consti-tuents mg/L (70301)	Residue water, fltrd, tons/ acre-ft (70303)	Residue water, fltrd, tons/d (70302)	Arsenic water unfltrd ug/L (01002)	Cadmium water, unfltrd ug/L (01027)	Chrom-ium, water, unfltrd recover-able, ug/L (01034)	Copper, water, unfltrd recover-able, ug/L (01042)	Lead, water, unfltrd recover-able, ug/L (01051)	Nickel, water, unfltrd recover-able, ug/L (01067)	Zinc, water, unfltrd recover-able, ug/L (01092)
MAY 2003											
22...	704	1390	1.90	82.8	E1	<.2	1.5	9.3	1.57	7.12	10

E--Estimated.

YELLOWSTONE RIVER BASIN

445729106573501 ASH CREEK ABOVE MOUTH, NEAR ACME, WY

LOCATION.--Lat 44°57'00", long 106°56'31" (NAD 27), SW$^1/_4$NE$/_4$SW$^1/_4$ sec. 35, T.58N., R.29E., Sheridan County, WY, Hydrologic Unit 10090101 at dirt road culvert crossing, 0.75 mi upstream from Wyoming Highway 338, 1 mi upstream from mouth, and 2.5 mi north of Acme, WY.

DRAINAGE AREA.--26.6 mi^2.

PERIOD OF RECORD.--May to September 2003.

GAGE.--None. Elevation at sampling site is 3,620 ft (NGVD 29).

REMARKS.--No samples collected on two other site visits due to no flow.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instantaneous discharge, cfs (00061)	Turbidity, NTU (00076)	Barometric pressure, mm Hg (00025)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	Specif. conduct-ance, wat unf uS/cm 25 degC (00095)	Temperature, air, deg C (00020)	Temperature, water, deg C (00010)	Hardness, water, unfltrd mg/L as CaCO3 (00900)
MAY 2003 22...	1640	1.6	2.9	695	8.9	104	8.5	1800	23.5	18.0	840

Date	Calcium water, fltrd, mg/L (00915)	Magnesium, water, fltrd, mg/L (00925)	Potassium, water, fltrd, mg/L (00935)	Sodium adsorption ratio (00931)	Sodium, water, fltrd, mg/L (00930)	Alkalinity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chloride, water, fltrd, mg/L (00940)	Fluoride, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of constituents mg/L (70301)
MAY 2003 22...	132	123	18.2	2	114	449	30.5	.7	18.4	583	1290

Date	Residue water, fltrd, tons/ acre-ft (70303)	Residue water, fltrd, tons/d (70302)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Ammonia water, fltrd, mg/L as N (00608)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Orthophosphate, water, fltrd, mg/L as P (00671)	Phosphorus, water, unfltrd mg/L (00665)	Arsenic water unfltrd ug/L (01002)	Barium, water, unfltrd recover-able, ug/L (01007)	Boron, water, unfltrd recover-able, ug/L (01022)
MAY 2003 22...	1.75	5.64	.56	.033	E.018	.003	.015	.039	<2	59	340

Date	Cadmium water, unfltrd ug/L (01027)	Chromium, water, unfltrd recover-able, ug/L (01034)	Copper, water, unfltrd recover-able, ug/L (01042)	Iron, water, unfltrd recover-able, ug/L (01045)	Lead, water, unfltrd recover-able, ug/L (01051)	Manganese, water, unfltrd recover-able, ug/L (01055)	Mercury water, unfltrd recover-able, ug/L (71900)	Nickel, water, unfltrd recover-able, ug/L (01067)
MAY 2003 22...	E.02	<.8	7.2	90	.06	19.2	<.02	5.84

Date	Selenium, water, unfltrd ug/L (01147)	Silver, water, unfltrd recover-able, ug/L (01077)	Zinc, water, unfltrd recover-able, ug/L (01092)	Suspnd. sediment, sieve diametr percent <.063mm (70331)	Suspended sediment concentration mg/L (80154)	Suspended sediment load, tons/d (80155)
MAY 2003 22...	3.4	<.16	4	54	6	.03

E--Estimated.

450137106595101 YOUNGS CREEK NEAR RESERVATION BOUNDARY, NEAR DECKER, MT

LOCATION.--Lat 44°01'37", long 106°59'51" (NAD 27), $SE^1/_4NW^1/_4SE^1/_4$ sec. 25, T.9s., R.83e., Bighorn County, Hydrologic Unit 10090101, at dirt road crossing about 7 mi upstream from Wyoming Highway 338, 1.5 mi northeast of Pearl School, and 6.5 mi west of Decker.
DRAINAGE AREA.--21.5 mi^2.
PERIOD OF RECORD.-October 2002 to September 2003.
GAGE.--None. Elevation at sampling site is 3,780 ft (NGVD 29).

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instantaneous discharge, cfs (00061)	Turbidity, NTU (00076)	Barometric pressure, mm Hg (00025)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	Specif. conductance, wat unf uS/cm 25 degC (00095)	Temperature, air, deg C (00020)	Temperature, water, deg C (00010)	Hardness, water, unfltrd mg/L as CaCO3 (00900)
OCT 2002											
21...	1630	.53	6.0	663	10.2	98	8.3	856	13.0	7.5	420
MAY 2003											
21...	1610	3.8	29	667	8.9	101	8.7	606	22.0	15.0	310
SEP											
02...	1530	.26	5.7	671	8.5	101	8.6	678	26.0	17.5	360

Date	Calcium water, fltrd, mg/L (00915)	Magnesium, water, fltrd, mg/L (00925)	Potassium, water, fltrd, mg/L (00935)	Sodium adsorption ratio (00931)	Sodium, water, fltrd, mg/L (00930)	Alkalinity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chloride, water, fltrd, mg/L (00940)	Fluoride, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of constituents mg/L (70301)
OCT 2002											
21...	78.5	54.4	7.07	.4	19.6	323	2.36	.68	18.0	90.4	465
MAY 2003											
21...	61.7	39.0	5.30	.3	13.2	304	2.17	.5	14.9	48.2	367
SEP											
02...	61.6	49.3	7.38	.3	14.9	334	2.19	.6	18.0	40.3	395

Date	Residue water, fltrd, tons/ acre-ft (70303)	Residue water, fltrd, tons/d (70302)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Ammonia water, fltrd, mg/L as N (00608)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Orthophosphate, water, fltrd, mg/L as P (00671)	Phosphorus, water, unfltrd mg/L (00665)	Arsenic water unfltrd ug/L (01002)	Barium, water, unfltrd recoverable, ug/L (01007)	Boron, water, unfltrd recoverable, ug/L (01022)
OCT 2002											
21...	.63	.67	.29	E.009	<.022	<.002	.017	.039	E1	112	85
MAY 2003											
21...	.50	3.78	.46	E.013	E.016	E.002	.014	.070	2	102	66
SEP											
02...	.54	.28	.44	<.015	<.022	<.002	.014	.046	3	127	97

Date	Cadmium water, unfltrd ug/L (01027)	Chromium, water, unfltrd recoverable, ug/L (01034)	Copper, water, unfltrd recoverable, ug/L (01042)	Iron, water, unfltrd recoverable, ug/L (01045)	Lead, water, unfltrd recoverable, ug/L (01051)	Manganese, water, unfltrd recoverable, ug/L (01055)	Mercury water, unfltrd recoverable, ug/L (71900)	Nickel, water, unfltrd recoverable, ug/L (01067)
OCT 2002								
21...	<.04	<.8	2.1	190	.14	17.9	<.02	4.35
MAY 2003								
21...	E.02	E.4	2.7	700	.60	77.9	<.02	3.28
SEP								
02...	E.02	<.8	1.6	170	.16	28.2	<.02	3.81

Date	Selenium, water, unfltrd ug/L (01147)	Silver, water, unfltrd recoverable, ug/L (01077)	Zinc, water, unfltrd recoverable, ug/L (01092)	Suspnd. sediment, sieve diametr percent <.063mm (70331)	Suspended sediment concentration mg/L (80154)	Suspended sediment load, tons/d (80155)
OCT 2002						
21...	<.5	<.16	E2	71	30	.04
MAY 2003						
21...	.7	<.16	4	91	39	.40
SEP						
02...	.6	<.16	<2	81	17	.01

E--Estimated.

445832106551401 YOUNGS CREEK ABOVE MOUTH, NEAR DECKER, MT

LOCATION.--Lat 44°58'32", long 106°55'14" (NAD 27), $SW^1/_4NW^1/_4$ sec. 30, T.58N., R.83W., Sheridan County, WY, Hydrologic Unit 10090101, at Wyoming Highway 338, 1.2 mi upstream from mouth, near Decker.
DRAINAGE AREA.--62.3 mi^2.
PERIOD OF RECORD.-October 2002 to September 2003.
GAGE.--None. Elevation at sampling site is 3,570 ft (NGVD 29).

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instantaneous discharge, cfs (00061)	Turbidity, NTU (00076)	Barometric pressure, mm Hg (00025)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	Specif. conductance, wat unf uS/cm 25 degC (00095)	Temperature, air, deg C (00020)	Temperature, water, deg C (00010)	Hardness, water, unfltrd mg/L as CaCO3 (00900)
OCT 2002											
22...	1600	.54	5.0	681	11.6	95	8.1	1340	--	2.5	660
MAY 2003											
21...	1730	2.6	15	675	8.5	96	8.7	1360	17.0	15.0	640
SEP											
02...	1330	.33	28	678	9.2	109	8.7	1050	27.0	17.5	510

Date	Calcium water, fltrd, mg/L (00915)	Magnesium, water, fltrd, mg/L (00925)	Potassium, water, fltrd, mg/L (00935)	Sodium adsorption ratio (00931)	Sodium, water, fltrd, mg/L (00930)	Alkalinity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chloride, water, fltrd, mg/L (00940)	Fluoride, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of constituents mg/L (70301)
OCT 2002											
22...	93.2	103	10.8	1	64.7	384	3.74	.83	16.5	331	855
MAY 2003											
21...	89.2	102	10.5	1	66.2	388	3.99	.8	14.2	371	891
SEP											
02...	69.8	80.8	10.5	.9	45.6	368	3.69	.8	15.6	200	648

Date	Residue water, fltrd, tons/ acre-ft (70303)	Residue water, fltrd, tons/d (70302)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Ammonia water, fltrd, mg/L as N (00608)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Orthophosphate, water, fltrd, mg/L as P (00671)	Phosphorus, water, unfltrd mg/L (00665)	Arsenic water unfltrd ug/L (01002)	Barium, water, unfltrd recoverable, ug/L (01007)	Boron, water, unfltrd recoverable, ug/L (01022)
OCT 2002											
22...	1.16	1.25	.40	E.008	<.022	E.002	.028	.053	E2	57	183
MAY 2003											
21...	1.21	6.33	.48	.018	.037	E.002	.019	.062	E2	63	187
SEP											
02...	.88	.58	.46	E.008	.022	<.002	.048	.075	3	69	198

Date	Cadmium water, unfltrd ug/L (01027)	Chromium, water, unfltrd recoverable, ug/L (01034)	Copper, water, unfltrd recoverable, ug/L (01042)	Iron, water, unfltrd recoverable, ug/L (01045)	Lead, water, unfltrd recoverable, ug/L (01051)	Manganese, water, unfltrd recoverable, ug/L (01055)	Mercury water, unfltrd recoverable, ug/L (71900)	Nickel, water, unfltrd recoverable, ug/L (01067)
OCT 2002								
22...	E.03	<.8	3.5	180	E.18	10.0	<.02	5.87
MAY 2003								
21...	E.03	<.8	5.0	370	.30	73.3	<.02	5.35
SEP								
02...	E.03	<.8	2.9	590	.52	60.7	<.02	4.90

Date	Selenium, water, unfltrd ug/L (01147)	Silver, water, unfltrd recoverable, ug/L (01077)	Zinc, water, unfltrd recoverable, ug/L (01092)	Suspnd. sediment, sieve diametr percent <.063mm (70331)	Suspended sediment concentration mg/L (80154)	Suspended sediment load, tons/d (80155)
OCT 2002						
22...	E.4	<.16	E2	63	10	.01
MAY 2003						
21...	1.1	<.16	5	66	76	.54
SEP						
02...	.9	<.16	3	98	58	.05

E--Estimated.

451024106585101 TANNER CREEK NEAR MOUTH, NEAR DECKER, MT

LOCATION.--Lat 45°101'24", long 106°58'51" (NAD 27), $NE^1/_4NE^1/_4NW^1/_4$ sec.29, T.9S., R.39E., Bighorn County, Hydrologic Unit 10090101 near the confluence with Youngs Creek, 1 mi north of Pearl School, and 6 mi west of Decker.

DRAINAGE AREA.--14.8 mi^2.

PERIOD OF RECORD.--October 2002.

GAGE.--None. Elevation at sampling site is 3,775 ft (NGVD 29).

REMARKS.--Stream water probably represents localized irrigation return flow; channel dry about 1 mi upstream.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instantaneous discharge, cfs (00061)	Barometric pressure, mm Hg (00025)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	Specif. conductance, wat unf uS/cm 25 degC (00095)	Temperature, air, deg C (00020)	Temperature, water, deg C (00010)	Hardness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)
OCT 2002 21...	1730	<.01	664	4.6	47	7.8	2470	12.0	10.0	1300	159

Date	Magnesium, water, fltrd, mg/L (00925)	Potassium, water, fltrd, mg/L (00935)	Sodium adsorption ratio (00931)	Sodium, water, fltrd, mg/L (00930)	Alkalinity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chloride, water, fltrd, mg/L (00940)	Fluoride, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of constituents mg/L (70301)	Residue water, fltrd, tons/ acre-ft (70303)
OCT 2002 21...	216	16.9	2	138	432	5.93	.75	19.3	1060	1880	2.55

Date	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Ammonia water, fltrd, mg/L as N (00608)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Orthophosphate, water, fltrd, mg/L as P (00671)	Phosphorus, water, unfltrd mg/L (00665)	Arsenic water unfltrd ug/L (01002)	Barium, water, unfltrd recover-able, ug/L (01007)	Boron, water, unfltrd recover-able, ug/L (01022)	Cadmium water, unfltrd ug/L (01027)	Chromium, water, unfltrd recover-able, ug/L (01034)
OCT 2002 21...	.20	E.009	<.022	<.002	E.006	.056	<2	37	220	.04	E.7

Date	Copper, water, unfltrd recover-able, ug/L (01042)	Iron, water, unfltrd recover-able, ug/L (01045)	Lead, water, unfltrd recover-able, ug/L (01051)	Manganese, water, unfltrd recover-able, ug/L (01055)	Mercury water, unfltrd recover-able, ug/L (71900)	Nickel, water, unfltrd recover-able, ug/L (01067)	Selenium, water, unfltrd ug/L (01147)	Silver, water, unfltrd recover-able, ug/L (01077)	Zinc, water, unfltrd recover-able, ug/L (01092)
OCT 2002 21...	9.2	920	.78	36.9	<.02	9.38	2.0	<.16	7

E--Estimated.

450047106514201 SQUIRREL CREEK ABOVE MOUTH, AT DECKER, MT

LOCATION.--Lat 45°00'47", long 106°51'42" (NAD 27), NW$^1/_4$SE$^1/_4$SW$^1/_4$ sec. 29, T.9S., R.40E., Bighorn County, Hydrologic Unit 10090101 at Montana Highway 314, 2 mi north of Montana-Wyoming state line, 0.7 mi upstream from mouth, and 200 yards north of Decker.
DRAINAGE AREA.--49.3 mi^2.
PERIOD OF RECORD.--October 2002 to September 2003.
GAGE.--None. Elevation at sampling site is 3,510 ft (NGVD 29).

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instantaneous discharge, cfs (00061)	Turbidity, NTU (00076)	Barometric pressure, mm Hg (00025)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	Specif. conductance, wat unf uS/cm 25 degC (00095)	Temperature, air, deg C (00020)	Temperature, water, deg C (00010)	Hardness, water, unfltrd mg/L as CaCO3 (00900)
OCT 2002											
21...	1400	.02	5.0	694	11.9	109	8.4	5770	18.0	6.5	2200
MAY 2003											
21...	1345	.20	15	676	10.0	113	8.6	5030	24.5	14.5	2100
SEP											
02...	1045	.01	8.6	678	10.9	131	8.6	5110	25.0	17.5	3100

Date	Calcium water, fltrd, mg/L (00915)	Magnesium, water, fltrd, mg/L (00925)	Potassium, water, fltrd, mg/L (00935)	Sodium adsorption ratio (00931)	Sodium, water, fltrd, mg/L (00930)	Alkalinity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chloride, water, fltrd, mg/L (00940)	Fluoride, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of constituents mg/L (70301)
OCT 2002											
21...	171	430	18.9	8	866	635	13.0	.84	9.5	3140	5030
MAY 2003											
21...	56.0	465	14.8	8	816	729	11.7	.8	8.1	2610	4420
SEP											
02...	99.7	359	25.6	8	780	655	14.6	.9	2.4	2470	5060

Date	Residue water, fltrd, tons/ acre-ft (70303)	Residue water, fltrd, tons/d (70302)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Ammonia water, fltrd, mg/L as N (00608)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Orthophosphate, water, fltrd, mg/L as P (00671)	Phosphorus, water, unfltrd mg/L (00665)	Arsenic water unfltrd ug/L (01002)	Barium, water, unfltrd recover -able, ug/L (01007)	Boron, water, unfltrd recover -able, ug/L (01022)
OCT 2002											
21...	6.84	.27	.72	.022	<.022	E.002	.008	.030	E1	19	426
MAY 2003											
21...	6.01	2.39	.93	.079	<.022	.003	.011	.063	E1	34	374
SEP											
02...	6.88	.14	.94	.016	<.022	<.002	<.007	.057	2	28	532

Date	Cadmium water, unfltrd ug/L (01027)	Chromium, water, unfltrd recover -able, ug/L (01034)	Copper, water, unfltrd recover -able, ug/L (01042)	Iron, water, unfltrd recover -able, ug/L (01045)	Lead, water, unfltrd recover -able, ug/L (01051)	Manganese, water, unfltrd recover -able, ug/L (01055)	Mercury water, unfltrd recover -able, ug/L (71900)	Nickel, water, unfltrd recover -able, ug/L (01067)
OCT 2002								
21...	<.10	<.8	15.5	150	<.18	42.7	<.02	12.6
MAY 2003								
21...	<.07	<.8	24.0	850	.29	269	<.02	13.0
SEP								
02...	E.04	<.8	16.8	220	.15	57.0	<.02	7.88

Date	Selenium, water, unfltrd ug/L (01147)	Silver, water, unfltrd recover -able, ug/L (01077)	Zinc, water, unfltrd recover -able, ug/L (01092)	Suspnd. sediment, sieve diametr percent <.063mm (70331)	Suspended sediment concentration mg/L (80154)	Suspended sediment load, tons/d (80155)
OCT 2002						
21...	2.4	<.48	9	52	42	<.01
MAY 2003						
21...	2.0	<.32	13	92	45	.02
SEP						
02...	1.4	<.32	9	78	77	<.01

E--Estimated.

YELLOWSTONE RIVER BASIN

06306300 TONGUE RIVER AT STATE LINE, NEAR DECKER, MT

LOCATION.--Lat 45°00'32", long 106°50'08" (NAD 27), in $NW^1/_4NW^1/_4NE^1/_4$ sec.33, T.9 S., R.40 E., Big Horn County, Hydrologic Unit 10090101, on left bank 1 mi north of Wyoming-Montana State line, 1.4 mi southeast of Decker, 1.6 mi upstream from Badger Creek, and at river mile 200.9.
DRAINAGE AREA (REVISED).--1,453 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1960 to current year. Records published as "near Decker" May 1928 to September 1938, not equivalent owing to intervening drainage area.
REVISED RECORDS.--WDR MT-04-1: Drainage area.
GAGE.--Water-stage recorder. Elevation of gage is 3,429.14 ft (NGVD 29) (levels by U.S. Army Corps of Engineers).
REMARKS.--Water-discharge records good except those for estimated daily discharges, which are poor. Flow regulated by many small reservoirs in Wyoming, combined capacity, about 15,000 acre-ft. Diversions for irrigation of about 64,300 acres upstream from station. U.S. Geological Survey satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	136	e120	e130	e150	e180	e130	234	638	2520	796	65	109
2	149	e120	e120	e150	e190	e130	252	687	2690	750	62	103
3	156	e120	e110	e160	e180	e140	267	565	2180	684	59	97
4	153	e130	e100	e160	e160	e150	267	530	1780	619	62	91
5	157	e140	e100	e160	e140	e150	238	536	1550	569	58	86
6	162	148	e110	e160	e130	e160	215	491	1440	523	56	83
7	162	150	e110	e170	e120	e170	212	461	1410	464	55	92
8	159	149	e120	e160	e100	e220	205	461	1370	441	62	97
9	160	149	e130	e140	e130	e280	195	558	1260	402	60	110
10	163	150	e130	e120	e140	e300	192	536	1170	343	63	139
11	156	147	e130	e110	e150	349	201	660	1190	324	65	156
12	159	144	e120	e130	e150	464	227	579	1310	299	71	193
13	155	140	e130	e140	e150	926	252	535	1280	270	68	188
14	147	138	e140	e130	e150	1810	297	550	1250	242	67	216
15	146	140	e140	e120	e160	1890	322	578	1170	219	62	207
16	143	144	e130	e120	e170	1480	361	642	1120	197	59	207
17	143	140	e130	e120	e180	615	359	758	1150	189	60	206
18	143	143	e140	e130	e180	589	337	908	1090	173	70	217
19	136	142	e130	e140	e180	464	336	952	1010	163	108	226
20	138	141	e120	e150	e170	328	336	877	961	159	116	225
21	140	140	e110	e150	e140	312	300	821	903	164	97	214
22	147	135	e100	e130	e120	318	292	779	849	151	84	214
23	161	137	e100	e120	e90	321	304	843	759	129	77	217
24	149	e140	e100	e130	e100	331	330	1030	780	104	74	211
25	143	e130	e110	e140	e110	294	400	1260	1030	98	72	197
26	144	e110	e120	e160	e120	259	451	1590	961	78	63	196
27	142	e120	e130	e150	e130	252	502	1860	960	71	61	191
28	139	e130	e140	e160	e130	245	465	2140	922	72	61	187
29	e140	e120	e130	e170	---	231	439	2260	936	69	65	189
30	e130	e120	e130	e190	---	211	420	2450	908	70	75	189
31	e120	---	e140	e170	---	213	---	2550	---	66	91	---
TOTAL	4578	4077	3780	4490	4050	13732	9208	30085	37909	8898	2168	5053
MEAN	148	136	122	145	145	443	307	970	1264	287	69.9	168
MAX	163	150	140	190	190	1890	502	2550	2690	796	116	226
MIN	120	110	100	110	90	130	192	461	759	66	55	83
AC-FT	9080	8090	7500	8910	8030	27240	18260	59670	75190	17650	4300	10020

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1961 - 2003, BY WATER YEAR (WY)

MEAN	251	222	178	176	227	306	354	1132	1630	457	173	216
MAX	403	324	271	330	672	855	676	3283	3570	1674	475	615
(WY)	1969	1974	1976	1974	1971	1972	1977	1978	1978	1975	1968	1968
MIN	116	126	102	78.7	79.8	88.5	124	268	176	54.7	13.1	73.3
(WY)	1961	2002	1985	2002	2002	2002	1961	2002	2001	2001	2001	2001

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1961 - 2003	
ANNUAL TOTAL	52055		128028			
ANNUAL MEAN	143		351		443	
HIGHEST ANNUAL MEAN					862	1978
LOWEST ANNUAL MEAN					138	2002
HIGHEST DAILY MEAN	874	Jun 2	2690	Jun 2	15400	May 19 1978
LOWEST DAILY MEAN	46	Aug 4	55	Aug 7	5.4	Aug 24 1961
ANNUAL SEVEN-DAY MINIMUM	52	Aug 2	59	Aug 3	7.2	Aug 22 1961
MAXIMUM PEAK FLOW			2820	May 31	17500	May 12 1978
MAXIMUM PEAK STAGE			6.84	May 31	14.25	May 12 1978
INSTANTANEOUS LOW FLOW			50	Aug 7	3.0	Aug 23 1961
ANNUAL RUNOFF (AC-FT)	103300		253900		321200	
10 PERCENT EXCEEDS	219		930		1040	
50 PERCENT EXCEEDS	120		159		231	
90 PERCENT EXCEEDS	70		91		112	

e--Estimated.

06306300 TONGUE RIVER AT STATE LINE, NEAR DECKER, MT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1966 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1965 to September 1976, November 1980 to December 1986, August 2000 to current year.
WATER TEMPERATURE: October 1965 to September 1976.

INSTRUMENTATION: Specific conductance probe installed Aug. 21, 2000.

REMARKS.--Missing conductance data for Nov. 21 to Apr. 9 due to ice conditions and for Sept. 19-21 and Sept. 26-29 due to erroneous values. Records are rated good except for the period from Apr. 26 to June 4, which is rated fair. Unpublished records of instantaneous water temperature and specific conductance are available in files of the District office.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 1,490 microsiemens per centimeter (µS/cm), Aug. 12, 1966, Jan. 11, 1972; minimum daily, 161 µS/cm, May 30 and June 1, 2003.
WATER TEMPERATURE: Maximum, 30.5°C, July 16, 1966; minimum, 0.0°C on many days during winter.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum, 827 microsiemens per centimeter (µS/cm), Oct. 29; minimum, 161 µS/cm, May 30 and June 1.

WATER QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instantaneous discharge, cfs (00061)	Barometric pressure, mm Hg (00025)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	Specif. conductance, wat unf uS/cm 25 degC (00095)	Temperature, air, deg C (00020)	Temperature, water, deg C (00010)	Hardness, water, unfltrd mg/L as CaCO3 (00900)
OCT 2002										
01...	1700	134	680	8.8	90	8.4	694	6.0	11.0	320
NOV										
21...	1530	140	676	13.8	127	8.3	725	15.0	6.5	330
DEC										
18...	0900	E140	667	10.8	85	8.2	680	0.0	0.0	310
JAN 2003										
07...	1000	E170	679	12.3	95	8.2	598	5.5	0.0	260
FEB										
06...	1200	130	683	9.5	73	7.9	711	-6.0	0.0	310
MAR										
07...	1200	E170	667	9.6	75	8.0	751	-7.0	0.0	360
APR										
10...	0830	198	676	9.6	96	7.9	813	7.0	10.0	350
MAY										
06...	1430	480	678	9.9	104	8.0	488	12.0	12.0	210
JUN										
04...	1515	1740	674	8.6	93	8.0	222	16.0	13.5	91
JUL										
01...	1530	769	668	8.6	114	8.4	282	34.0	22.5	120
AUG										
05...	1630	57	667	9.4	141	8.4	657	26.5	29.0	260
SEP										
02...	1130	106	679	6.7	81	8.5	796	24.0	18.5	320

E--Estimated.

Date	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Potas-sium, water, fltrd, mg/L (00935)	Sodium adsorp-tion ratio (00931)	Sodium, water, fltrd, mg/L (00930)	ANC, wat unf fixed end pt, lab, mg/L as CaCO3 (90410)	Alka-linity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chlor-ide, water, fltrd, mg/L (00940)	Fluor-ide, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)	Sulfate water, fltrd, mg/L (00945)
OCT 2002											
01...	63.4	39.6	2.94	.9	35.2	E197	E175	3.98	.33	5.85	146
NOV											
21...	65.5	39.9	2.70	.8	32.9	E222	212	4.24	.32	4.43	153
DEC											
18...	65.3	36.7	2.17	.7	30.4	E228	E215	5.06	.28	6.62	136
JAN 2003											
07...	56.1	29.8	1.86	.7	26.8	225	225	3.63	.28	5.54	90.6
FEB											
06...	63.8	35.9	4.77	.9	34.5	242	241	6.39	.30	7.65	142
MAR											
07...	73.2	43.0	2.88	.9	37.1	259	299	6.60	.28	5.67	161
APR											
10...	68.7	43.2	3.26	.9	39.6	255	254	4.55	.28	2.71	201
MAY											
06...	46.6	23.8	2.25	.6	20.4	162	158	3.45	.18	7.43	99.1
JUN											
04...	21.7	8.83	1.09	.3	6.33	85	82	1.14	<.2	8.61	25.6
JUL											
01...	27.7	13.1	1.24	.4	9.26	110	109	1.49	<.2	8.13	38.7
AUG											
05...	51.3	32.5	3.18	1	38.2	225	222	4.74	.3	6.51	126
SEP											
02...	59.6	40.4	3.64	.9	35.4	235	215	5.47	.3	6.23	162

Date	Residue on evap. at 180degC wat flt mg/L (70300)	Residue water, fltrd, sum of consti-tuents mg/L (70301)	Residue water, fltrd, tons/ acre-ft (70303)	Residue water, fltrd, tons/d (70302)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Ammonia water, fltrd, mg/L as N (00608)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Phos-phorus, water, unfltrd mg/L (00665)	Alum-inum, water, unfltrd recover-able, ug/L (01105)
OCT 2002											
01...	441	E402	E.55	E145	.24	<.04	<.022	<.002	<.007	.020	60
NOV											
21...	448	430	.61	169	.20	E.02	<.022	<.002	<.007	.011	77
DEC											
18...	451	E412	E.56	E156	.16	<.04	.051	.006	<.007	E.02	51
JAN 2003											
07...	365	349	.50	E160	.37	<.04	<.022	<.002	<.007	.016	19
FEB											
06...	411	440	.56	144	.42	.05	.184	.004	.029	.066	71
MAR											
07...	508	510	.69	E234	.20	E.02	.135	.003	<.007	.019	38
APR											
10...	546	515	.74	292	.40	<.04	<.022	<.002	E.004	.055	335
MAY											
06...	317	298	.43	411	.64	<.04	E.021	E.002	.008	.117	672
JUN											
04...	137	123	.19	646	.53	<.04	.063	.004	.013	.103	558
JUL											
01...	182	165	.25	378	.37	<.04	<.022	<.002	.010	.072	377
AUG											
05...	419	396	.57	64.4	.30	<.04	<.022	<.002	<.007	.030	127
SEP											
02...	490	442	.67	140	.34	<.04	<.022	<.002	<.007	.020	79

E--Estimated.

06306300 TONGUE RIVER AT STATE LINE, NEAR DECKER, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003--Continued

Date	Arsenic water, fltrd, ug/L (01000)	Arsenic water unfltrd ug/L (01002)	Barium, water, unfltrd recover -able, ug/L (01007)	Beryll-ium, water, unfltrd recover -able, ug/L (01012)	Boron, water, unfltrd recover -able, ug/L (01022)	Cadmium water, unfltrd ug/L (01027)	Chrom-ium, water, unfltrd recover -able, ug/L (01034)	Copper, water, unfltrd recover -able, ug/L (01042)	Iron, water, fltrd, ug/L (01046)	Iron, water, unfltrd recover -able, ug/L (01045)	Lead, water, unfltrd recover -able, ug/L (01051)
OCT 2002											
01...	.6	<2	41	<.06	61	<.04	<.8	1.1	E9	140	.16
NOV											
21...	.5	<2	47	<.06	84	<.04	<.8	2.7	12	110	.09
DEC											
18...	.3	<2	44	<.06	67	<.04	<.8	1.4	E9	190	.36
JAN 2003											
07...	.3	<2	46	<.06	54	<.04	<.8	.8	13	80	.09
FEB											
06...	.3	<2	52	<.06	63	<.04	E.4	2.3	28	210	.18
MAR											
07...	.3	<2	53	<.06	65	<.04	<.8	1.5	26	120	E.04
APR											
10...	.6	E1	58	E.04	77	E.02	E.6	2.6	26	750	.64
MAY											
06...	.5	<2	56	.12	47	.05	1.6	3.6	<10	1120	1.79
JUN											
04...	.4	E2	35	.06	18	E.03	.9	4.5	42	1050	1.16
JUL											
01...	.5	3	35	E.04	30	E.02	E.6	1.7	20	730	.83
AUG											
05...	.8	E1	68	<.06	90	<.04	<.8	2.4	<8	220	.26
SEP											
02...	.7	E2	57	<.06	100	E.03	<.8	2.4	E5	160	.17

Date	Manganese, water, fltrd, ug/L (01056)	Manganese, water, unfltrd recover -able, ug/L (01055)	Mercury water, unfltrd recover -able, ug/L (71900)	Nickel, water, unfltrd recover -able, ug/L (01067)	Selenium, water, unfltrd ug/L (01147)	Zinc, water, unfltrd recover -able, ug/L (01092)	Suspnd. sediment, sieve diametr percent <.063mm (70331)	Suspended sediment concentration mg/L (80154)	Suspended sediment load, tons/d (80155)
OCT 2002									
01...	10.9	21.8	--	3.54	.5	E2	72	68	25
NOV									
21...	14.4	17.3	--	4.34	.6	4	44	42	16
DEC									
18...	11.7	16.4	--	4.10	.5	E2	27	44	E18
JAN 2003									
07...	10.2	10.8	--	3.82	E.2	E2	73	7	E3.0
FEB									
06...	18.8	28.3	--	4.11	.5	3	96	7	2.5
MAR									
07...	18.1	21.4	--	3.06	.5	2	37	35	E22
APR									
10...	37.4	80.5	--	3.68	.9	5	82	65	35
MAY									
06...	9.8	72.7	--	2.96	.5	9	97	98	127
JUN									
04...	10.1	61.0	E.01	2.08	E.4	6	81	85	399
JUL									
01...	6.9	53.4	--	1.94	E.3	19	80	46	96
AUG									
05...	6.5	31.4	--	3.53	.9	3	86	42	6.5
SEP									
02...	6.2	20.3	--	3.42	.6	21	75	51	15

E--Estimated.

YELLOWSTONE RIVER BASIN

06306300 TONGUE RIVER AT STATE LINE, NEAR DECKER, MT--Continued

SPECIFIC CONDUCTANCE, WATER, UNFILTERED, MICROSIEMENS PER CENTIMETER
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	721	694	708	844	760	799	---	---	---	---	---	---
2	726	681	708	900	833	852	---	---	---	---	---	---
3	699	667	686	1030	832	881	---	---	---	---	---	---
4	712	680	695	917	828	873	---	---	---	---	---	---
5	690	668	681	895	806	853	---	---	---	---	---	---
6	698	670	684	863	801	837	---	---	---	---	---	---
7	695	668	682	855	763	812	---	---	---	---	---	*598
8	697	674	685	805	773	785	---	---	---	---	---	---
9	696	665	682	787	764	775	---	---	---	---	---	---
10	706	676	693	775	750	764	---	---	---	---	---	---
11	718	694	708	770	744	759	---	---	---	---	---	---
12	736	700	719	766	695	748	---	---	---	---	---	---
13	757	730	744	765	689	742	---	---	---	---	---	---
14	769	716	744	781	728	762	---	---	---	---	---	---
15	761	716	737	767	744	757	---	---	---	---	---	---
16	776	742	756	762	733	750	---	---	---	---	---	---
17	780	740	758	779	752	766	---	---	---	---	---	---
18	768	734	751	764	734	752	---	---	*680	---	---	---
19	779	724	755	765	737	752	---	---	---	---	---	---
20	775	738	756	769	731	750	---	---	---	---	---	---
21	780	748	762	---	---	*725	---	---	---	---	---	---
22	761	725	746	---	---	---	---	---	---	---	---	---
23	742	711	729	---	---	---	---	---	---	---	---	---
24	743	715	732	---	---	---	---	---	---	---	---	---
25	749	729	739	---	---	---	---	---	---	---	---	---
26	774	732	750	---	---	---	---	---	---	---	---	---
27	789	739	755	---	---	---	---	---	---	---	---	---
28	812	740	779	---	---	---	---	---	---	---	---	---
29	827	745	796	---	---	---	---	---	---	---	---	---
30	814	767	787	---	---	---	---	---	---	---	---	---
31	808	769	785	---	---	---	---	---	---	---	---	---
MONTH	827	665	732	---	---	---	---	---	---	---	---	---

	FEBRUARY			MARCH			APRIL			MAY		
1	---	---	---	---	---	---	---	---	---	507	474	489
2	---	---	---	---	---	---	---	---	---	546	499	524
3	---	---	---	---	---	---	---	---	---	566	546	557
4	---	---	---	---	---	---	---	---	---	567	555	560
5	---	---	---	---	---	---	---	---	---	555	499	531
6	---	---	*711	---	---	---	---	---	---	501	480	487
7	---	---	---	---	---	*751	---	---	---	495	482	488
8	---	---	---	---	---	---	---	---	---	485	471	478
9	---	---	---	---	---	---	---	---	---	490	457	473
10	---	---	---	---	---	---	---	---	---	524	490	515
11	---	---	---	---	---	---	824	779	800	538	503	517
12	---	---	---	---	---	---	794	732	756	597	538	574
13	---	---	---	---	---	---	737	670	701	574	538	557
14	---	---	---	---	---	---	670	585	618	544	389	501
15	---	---	---	---	---	---	585	529	549	507	441	487
16	---	---	---	---	---	---	533	491	513	509	486	502
17	---	---	---	---	---	---	491	472	478	488	449	469
18	---	---	---	---	---	---	490	468	481	449	396	419
19	---	---	---	---	---	---	491	483	486	399	377	386
20	---	---	---	---	---	---	504	481	492	380	371	374
21	---	---	---	---	---	---	545	502	521	377	368	372
22	---	---	---	---	---	---	544	525	534	375	360	369
23	---	---	---	---	---	---	538	514	529	361	338	350
24	---	---	---	---	---	---	516	488	503	340	294	318
25	---	---	---	---	---	---	489	438	458	297	273	287
26	---	---	---	---	---	---	489	427	443	280	257	269
27	---	---	---	---	---	---	520	489	508	262	195	237
28	---	---	---	---	---	---	507	487	495	202	180	193
29	---	---	---	---	---	---	497	469	482	184	166	177
30	---	---	---	---	---	---	485	466	475	174	161	169
31	---	---	---	---	---	---	---	---	---	182	168	175
MONTH	---	---	---	---	---	---	---	---	---	597	161	413

*--Instantaneous values from USGS cross-section collected during winter ice period.

YELLOWSTONE RIVER BASIN

06306300 TONGUE RIVER AT STATE LINE, NEAR DECKER, MT--Continued

SPECIFIC CONDUCTANCE, WATER, UNFILTERED, MICROSIEMENS PER CENTIMETER--Continued
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	177	161	170	290	275	284	673	633	653	711	685	698
2	190	167	178	299	288	293	670	636	652	760	688	725
3	205	189	197	308	294	302	705	635	660	754	727	742
4	219	201	211	328	305	316	751	705	731	751	726	741
5	230	215	225	340	322	330	715	621	658	746	721	736
6	242	224	235	353	336	342	714	653	691	747	727	734
7	260	239	250	370	352	359	680	633	654	757	732	744
8	279	247	264	390	368	377	770	660	738	753	722	739
9	268	246	261	389	370	381	760	717	743	781	723	750
10	267	258	262	400	374	382	806	758	783	777	695	733
11	263	246	257	421	395	411	784	738	759	715	690	701
12	249	218	229	423	403	411	776	716	745	713	684	702
13	230	213	221	428	412	417	761	706	734	685	671	677
14	231	224	227	439	421	432	763	732	750	680	632	652
15	240	228	234	453	428	443	781	722	754	644	618	631
16	244	234	239	461	447	455	770	711	740	639	615	627
17	248	233	242	541	459	507	761	724	745	624	612	618
18	254	233	243	514	493	505	763	694	728	613	580	597
19	261	246	253	513	482	497	727	663	699	---	---	---
20	263	254	257	570	512	535	707	665	685	---	---	---
21	269	257	263	567	543	557	685	651	669	---	---	---
22	280	266	272	570	541	553	669	630	651	587	566	576
23	302	278	291	597	548	570	688	637	663	584	564	575
24	307	299	303	596	558	581	715	684	700	581	556	570
25	329	298	311	639	578	604	739	701	725	594	568	584
26	335	316	328	646	621	634	742	696	710	---	---	---
27	318	306	312	653	621	638	726	702	713	---	---	---
28	309	296	301	657	621	640	745	717	730	---	---	---
29	304	279	295	674	625	652	748	722	737	---	---	---
30	281	268	272	653	596	619	737	703	716	606	589	598
31	---	---	---	668	630	657	717	675	694	---	---	---
MONTH	335	161	253	674	275	474	806	621	710	---	---	---

06307500 TONGUE RIVER AT TONGUE RIVER DAM, NEAR DECKER, MT

LOCATION.--Lat 45°08'29", long 106°46'15" (NAD 27), in $SW^1/_4SE^1/_4SE^1/_4$ sec.12, T.8 S., R.40 E., Big Horn County, Hydrologic Unit 10090101, on left bank 0.5 mi downstream from Tongue River Dam, 4 mi upstream from Post Creek, 8 mi northeast of Decker, 16 mi southeast of Kirby, and at river mile 188.4.

DRAINAGE AREA.--1,770 mi^2.

PERIOD OF RECORD.--May 1939 to current year.

REVISED RECORDS.--WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 3,344.40 ft (NGVD 29) (levels by Bureau of Reclamation). Prior to Aug. 5, 1975, at elevation 10.00 ft lower.

REMARKS.--Records good except those for estimated daily discharges, which are fair. Flow regulated by Tongue River Reservoir (station number 06307000) and many small reservoirs, combined capacity, about 15,000 acre-ft. Diversion for irrigation of about 64,800 acres upstream from station. U.S. Geological Survey satellite telemeter at station. Several observations of water temperature and specific conductance were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	106	107	105	98	86	86	90	356	1480	862	e410	e370
2	106	107	105	98	86	86	90	387	2140	804	e400	e360
3	106	107	105	98	86	86	90	399	2220	749	e400	e350
4	105	107	105	98	86	86	90	442	1900	702	e410	e350
5	105	107	105	98	86	86	90	443	1650	682	e400	e350
6	105	107	105	98	85	86	90	444	1530	674	e390	e340
7	105	107	105	98	85	86	90	445	1450	592	e380	e330
8	105	107	105	98	85	86	90	446	1420	513	e380	320
9	105	107	105	98	85	85	91	442	1380	514	e390	318
10	105	107	105	98	85	85	92	444	1320	518	e390	316
11	106	107	105	98	85	86	92	455	1110	519	e390	313
12	106	107	105	98	85	89	92	509	1210	523	e390	312
13	106	107	101	91	85	89	93	509	1290	524	e390	309
14	105	107	99	86	86	86	94	509	1300	528	e380	308
15	105	107	99	86	86	86	96	510	1270	532	e380	305
16	106	107	100	86	86	87	106	512	1220	538	e380	299
17	106	107	99	86	86	88	106	512	1190	520	e380	266
18	106	107	99	86	86	89	107	515	1150	e480	e370	216
19	107	107	100	86	86	88	108	591	974	e460	e380	221
20	107	107	100	87	86	88	108	593	976	e470	e370	220
21	107	107	100	86	86	88	126	593	951	e450	e370	217
22	107	105	99	86	86	89	178	598	919	e420	e370	216
23	107	105	99	86	86	88	198	598	875	e410	e370	198
24	107	105	98	86	86	88	230	597	828	e430	e370	180
25	107	105	98	86	86	88	230	598	785	e430	e370	178
26	107	105	98	86	86	88	230	598	875	e420	e370	176
27	107	105	98	86	86	90	230	644	889	e410	e350	175
28	107	105	98	86	86	90	263	788	899	e410	e370	171
29	107	104	98	86	---	90	308	1000	884	e400	e370	168
30	107	104	98	86	---	90	311	1190	906	e400	e370	165
31	107	---	98	86	---	90	---	1270	---	e400	e380	---
TOTAL	3290	3190	3139	2816	2400	2713	4209	17937	36991	16284	11820	8017
MEAN	106	106	101	90.8	85.7	87.5	140	579	1233	525	381	267
MAX	107	107	105	98	86	90	311	1270	2220	862	410	370
MIN	105	104	98	86	85	85	90	356	785	400	350	165
AC-FT	6530	6330	6230	5590	4760	5380	8350	35580	73370	32300	23440	15900

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1939 - 2003, BY WATER YEAR (WY)

MEAN	272	252	187	172	178	222	359	898	1426	570	362	307
MAX	665	554	369	287	592	676	958	2714	3824	2083	767	775
(WY)	1946	1942	1979	1983	1971	1971	1965	1978	1944	1975	1975	1998
MIN	71.1	40.6	61.7	79.9	56.9	22.7	14.9	157	183	169	103	107
(WY)	1989	1976	1989	1961	1961	1961	1940	2002	2001	1956	1943	2001

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1939 - 2003	
ANNUAL TOTAL	49689		112806			
ANNUAL MEAN	136		309		435	
HIGHEST ANNUAL MEAN					853	1978
LOWEST ANNUAL MEAN					133	2002
HIGHEST DAILY MEAN	324	Jun 2	2220	Jun 3	9580	May 20 1978
LOWEST DAILY MEAN	71	Mar 14	85	Feb 6	0.50	Apr 17 1940
ANNUAL SEVEN-DAY MINIMUM	71	Mar 14	85	Feb 6	0.50	Apr 17 1940
MAXIMUM PEAK FLOW			2360	Jun 3	10800	May 20 1978
MAXIMUM PEAK STAGE			14.41	Jun 3	a20.00	May 20 1978
INSTANTANEOUS LOW FLOW					b0.00	Nov 12 1969
ANNUAL RUNOFF (AC-FT)	98560		223800		315200	
10 PERCENT EXCEEDS	281		763		907	
50 PERCENT EXCEEDS	105		107		253	
90 PERCENT EXCEEDS	76		86		111	

a--From floodmark in well.
b--Results from dam closure.
e--Estimated.

06307600 HANGING WOMAN CREEK NEAR BIRNEY, MT

LOCATION.--Lat 45°17'57", long 106°30'28" (NAD 27), in $N^1/_2NW^1/_4SE^1/_4$ sec.19, T.6 S., R.43 E.,Rosebud County, Hydrologic Unit 10090101, on right bank 0.5 mi downstream from bridge on Birney-Otter road, 1.2 mi south of Birney, 1.2 mi downstream from East Fork, and at river mile 3.3.
DRAINAGE AREA.--470 mi^2.
GAGE.--Water-stage recorder. Elevation of gage is 3,150 ft (NGVD 29).WATER-QUALITY RECORDS
PERIOD OF RECORD.--Water years 1975-95, July 2003 to September 2003.
PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: November 1980 to July 1983, October 1985 to September 1987.
REMARKS.--Unable to collect a sample in September due to no flow. Unpublished records of daily and instantaneous temperature and instantaneous specific conductance are available in files of the District office.
EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily mean, 3,780 microsiemens per centimeter (µS/cm), July 3, 1986; minimum daily mean, 263 µS/cm , Feb. 27, 1986.

WATER QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instan-taneous dis-charge, cfs (00061)	Baro-metric pres-sure, mm Hg (00025)	Dis-solved oxygen, mg/L (00300)	Dis-solved oxygen, percent of sat-uration (00301)	pH, water, unfltrd field, std units (00400)	Specif. conduc-tance, wat unf uS/cm 25 degC (00095)	Temper-ature, air, deg C (00020)	Temper-ature, water, deg C (00010)	Hard-ness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)
JUL 2003											
01...	1230	.34	675	11.9	160	8.3	2640	30.0	23.5	810	96.6
AUG											
05...	1130	.03	667	6.3	83	8.1	1920	--	22.0	540	42.2

Date	Magnes-ium, water, fltrd, mg/L (00925)	Potas-sium, water, fltrd, mg/L (00935)	Sodium adsorp-tion ratio (00931)	Sodium, water, fltrd, mg/L (00930)	Alka-linity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chlor-ide, water, fltrd, mg/L (00940)	Fluor-ide, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of consti-tuents mg/L (70301)	Residue water, fltrd, tons/ acre-ft (70303)
JUL 2003											
01...	138	17.9	6	379	539	13.6	1.1	9.8	1010	1990	2.70
AUG											
05...	106	12.7	5	264	520	10.6	1.4	5.1	567	1320	1.80

Date	Residue water, fltrd, tons/d (70302)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Phos-phorus, water, unfltrd mg/L (00665)	Suspnd. sedi-ment, sieve diametr percent <.063mm (70331)	Sus-pended sedi-ment concen-tration mg/L (80154)	Sus-pended sedi-ment load, tons/d (80155)
JUL 2003									
01...	1.82	.58	<.022	E.002	.015	.061	94	104	.10
AUG									
05...	.11	.54	<.022	<.002	<.007	.038	57	51	.00

E--Estimated.

YELLOWSTONE RIVER BASIN

06307616 TONGUE RIVER AT BIRNEY DAY SCHOOL BRIDGE, NEAR BIRNEY, MT

LOCATION.--Lat 45°24'42", long 106°27'26" (NAD 27), in $SE^1/_4SW^1/_4SW^1/_4$ sec.8, T.5 S., R.43 E., Rosebud County, Hydrologic Unit 10090102, on left bank, 60 ft upstream from Bureau of Indian Affairs bridge, 0.2 mi east of Birney Day School, 5.5 mi downstream from Cook Creek, 6.5 mi northeast of Birney, and at river mile 144.3.

DRAINAGE AREA.--2,621 mi^2.

PERIOD OF RECORD.--October 1979 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 3,060 ft (NGVD 29).

REMARKS.--Records good except those for estimated daily discharges, which are fair. Flow regulated by Tongue River Reservoir (station number 06307000), and many small reservoirs in Wyoming (combined capacity, about 15,000 acre-ft). Numerous diversions for irrigation upstream from station. Several observations of water temperature and specific conductance were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	114	e92	e105	e105	e90	e92	102	323	1260	871	374	347
2	103	e100	e105	e105	e90	e92	101	355	1740	826	380	343
3	100	e110	e105	e105	e90	e92	102	373	2230	773	367	327
4	100	e110	e105	e105	e90	e92	105	410	2120	714	370	317
5	100	e110	e105	e105	e90	e92	100	439	1850	676	382	319
6	100	e110	e105	e105	e90	e92	99	437	1650	661	373	309
7	98	114	e105	e105	e90	e92	97	439	1530	631	353	277
8	99	113	e105	e105	e90	e90	96	464	1460	562	350	251
9	99	113	e105	e105	e90	e100	96	451	1430	503	358	227
10	97	111	e105	e105	e90	e200	96	459	1370	493	359	225
11	102	112	e105	e105	e90	e300	96	450	1250	499	358	229
12	112	111	e105	e100	e90	e400	96	470	1150	500	356	228
13	101	112	e100	e94	e92	896	96	506	1250	502	359	228
14	99	111	e100	e90	e92	1760	96	509	1300	492	354	222
15	99	111	e105	e90	e92	1120	96	512	1300	492	348	221
16	99	111	e105	e90	e92	784	96	516	1270	481	347	220
17	98	111	e105	e90	e92	448	105	518	1220	489	353	221
18	98	111	e105	e90	e92	327	108	525	1200	464	344	205
19	98	111	e105	e92	e92	254	112	545	1120	441	338	161
20	99	111	e105	e90	e92	172	111	590	1040	423	347	164
21	100	110	e105	e90	e92	148	108	600	1030	432	339	161
22	101	109	e105	e90	e92	125	113	604	1010	395	339	159
23	102	111	e105	e90	e90	119	163	606	992	380	343	159
24	102	e105	e100	e90	e84	115	191	610	1020	376	347	149
25	102	e100	e100	e90	e88	112	212	611	864	401	345	134
26	102	e105	e100	e90	e92	109	215	616	814	399	339	132
27	102	e105	e100	e90	e92	107	219	630	866	393	336	134
28	102	e105	e100	e90	e92	105	218	693	864	388	319	131
29	102	e105	e100	e90	---	104	263	863	880	370	336	131
30	101	e105	e100	e90	---	104	306	1030	874	373	340	131
31	100	---	e105	e90	---	104	---	1210	---	372	343	---
TOTAL	3131	3255	3210	2971	2538	8747	4014	17364	37954	15772	10896	6462
MEAN	101	108	104	95.8	90.6	282	134	560	1265	509	351	215
MAX	114	114	105	105	92	1760	306	1210	2230	871	382	347
MIN	97	92	100	90	84	90	96	323	814	370	319	131
AC-FT	6210	6460	6370	5890	5030	17350	7960	34440	75280	31280	21610	12820

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1980 - 2003, BY WATER YEAR (WY)

MEAN	240	214	176	176	193	228	269	650	1125	554	397	316
MAX	381	347	260	287	350	434	583	1769	2921	1269	676	694
(WY)	1996	1987	1987	1983	1983	1996	1996	1984	1984	1995	1997	1998
MIN	84.7	65.6	63.5	91.3	90.0	78.0	65.9	144	225	234	159	113
(WY)	1989	1989	1989	1989	2002	1987	1992	2002	2001	2001	2002	2002

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1980 - 2003	
ANNUAL TOTAL	48878		116314			
ANNUAL MEAN	134		319		378	
HIGHEST ANNUAL MEAN					644	1984
LOWEST ANNUAL MEAN					133	2002
HIGHEST DAILY MEAN	375	Jun 22	2230	Jun 3	3740	Jun 14 1984
LOWEST DAILY MEAN	80	Mar 15	84	Feb 24	28	Apr 6 1987
ANNUAL SEVEN-DAY MINIMUM	80	Mar 15	90	Jan 20	28	Apr 5 1987
MAXIMUM PEAK FLOW			2370	Mar 14	a4520	Jun 14 1984
MAXIMUM PEAK STAGE			5.05	Mar 14	b6.92	Feb 8 1996
ANNUAL RUNOFF (AC-FT)	96950		230700		274200	
10 PERCENT EXCEEDS	257		841		684	
50 PERCENT EXCEEDS	102		112		250	
90 PERCENT EXCEEDS	83		92		107	

a--Gage height, 6.43 ft, from rating curve extended above 2,700 ft^3/s.
b--Backwater from ice.
e--Estimated.

06307740 OTTER CREEK AT ASHLAND, MT

LOCATION.--Lat 45°38'18", long 106°15'17" (NAD 27), in $NE^1/_4NE^1/_4SE^1/_4$ sec.11, T.3 S., R.44 E.,Rosebud County, Hydrologic Unit 10090102, on left bank 200 ft downstream from bridge on U.S. Highway 212, 0.3 mi southeast of Ashland, and at river mile 2.7.
DRAINAGE AREA.--707 mi^2.
GAGE.--Water-stage recorder. Elevation of gage is 2,916.5 ft (NGVD 29).
PERIOD OF RECORD.--Water years 1975-85, July 2003 to September 2003.
PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: November 1980 to August 1985.
REMARKS.--Unpublished records of daily and instantaneous temperature and instantaneous specific conductance are available in files of the District office.
EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily mean, 3,850 microsiemens per centimeter (µS/cm), Dec. 3, 1983; minimum daily mean, 942 µS/cm , Feb. 19, 1982.

WATER QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instantaneous discharge, cfs (00061)	Barometric pressure, mm Hg (00025)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	Specif. conductance, wat unf uS/cm 25 degC (00095)	Temperature, air, deg C (00020)	Temperature, water, deg C (00010)	Hardness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)
JUL 2003											
02...	1200	1.7	682	6.2	87	8.2	3120	28.0	26.5	920	84.4
AUG											
05...	1245	.65	667	5.8	81	8.2	2840	25.5	25.0	770	65.0
SEP											
02...	1830	E.08	691	11.1	144	8.8	2480	27.0	23.0	700	50.3

Date	Magnesium, water, fltrd, mg/L (00925)	Potassium, water, fltrd, mg/L (00935)	Sodium adsorption ratio (00931)	Sodium, water, fltrd, mg/L (00930)	Alkalinity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chloride, water, fltrd, mg/L (00940)	Fluoride, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of constituents mg/L (70301)	Residue water, fltrd, tons/acre-ft (70303)
JUL 2003											
02...	171	21.6	6	431	577	13.1	.9	8.4	1290	2370	3.22
AUG											
05...	148	19.1	7	424	599	14.8	.9	13.8	1070	2120	2.88
SEP											
02...	141	20.1	6	370	523	13.9	.9	11.1	894	1810	2.47

Date	Residue water, fltrd, tons/d (70302)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Orthophosphate, water, fltrd, mg/L as P (00671)	Phosphorus, water, unfltrd mg/L (00665)	Suspnd. sediment, sieve diametr percent <.063mm (70331)	Suspended sediment concentration mg/L (80154)	Suspended sediment load, tons/d (80155)
JUL 2003									
02...	11.0	.95	<.022	<.002	<.007	.098	78	193	.90
AUG									
05...	3.71	1.0	<.022	<.002	<.007	.084	91	61	.11
SEP									
02...	E.39	.68	<.022	<.002	<.007	.052	93	49	E.01

E--Estimated.

YELLOWSTONE RIVER BASIN

06307830 TONGUE RIVER BELOW BRANDENBERG BRIDGE, NEAR ASHLAND MT

LOCATION.--Lat 45°50'24", long 106°13'22" (NAD 27), in $SE^1/_4SW^1/_4NE^1/_4$ sec.14, T.1N., R.44E., Rosebud County, Hydrologic Unit 10090102, on right bank downstream from county bridge, 22 mi north of Ashland, and at river mile 81.3.
DRAINAGE AREA.--3,948 mi^2. Area at site used prior to July 2000, 4,062 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1973 to September 1984, July 2000 to current year.
GAGE--Water-stage recorder. Elevation of gage is 2,760 ft (NGVD 29), from topographic map. October 1973 to September 1984, water-stage recorder at site 6.5 mi downstream at different elevation.
REMARKS.--Water-discharge records good except those for estimated daily discharges, which are poor. Flow regulated by Tongue River Reservoir (station number 06307000), and many small reservoirs in Wyoming combined capacity (about 15,000 acre-ft). Diversions for irrigation for about 73,000 acres above station. U. S. Geological Survey satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	123	e90	e100	e110	e140	e100	151	295	1120	892	355	349
2	124	e90	e100	e110	e150	e100	147	307	1190	876	349	336
3	123	e100	e90	e110	e150	e100	145	326	1680	828	364	339
4	119	e110	e60	e120	e140	e100	142	386	2150	781	360	329
5	118	e110	e50	e120	e140	e100	141	424	2000	722	346	322
6	118	e110	e70	e120	e130	e100	139	417	1770	685	352	312
7	116	e110	e90	e120	e110	e90	140	431	1600	662	345	328
8	115	e110	e100	e110	e100	e80	133	433	1490	627	325	305
9	113	112	e100	e110	e110	e90	131	459	1460	571	324	288
10	111	112	e100	e110	e110	e100	135	464	1420	509	334	253
11	113	110	e100	e100	e110	e150	134	472	1350	484	333	245
12	119	109	e100	e90	e100	e200	130	460	1230	479	336	255
13	122	106	e100	e90	e100	e400	129	469	1150	466	344	252
14	120	107	e100	e90	e110	e1000	127	505	1220	449	333	260
15	113	106	e100	e100	e110	e2500	129	512	1260	447	328	253
16	113	106	e110	e100	e110	1460	145	513	1240	437	321	240
17	112	105	e110	e100	e120	849	132	514	1200	437	327	242
18	112	107	e110	e100	e120	558	129	527	1150	440	348	242
19	112	107	e110	e110	e130	379	138	541	1140	441	326	243
20	113	107	e110	e110	e130	302	138	549	1060	428	318	202
21	113	108	e100	e100	e120	260	138	591	1010	407	324	198
22	114	108	e100	e90	e100	243	136	598	1000	407	316	198
23	114	106	e100	e90	e80	231	131	599	961	385	315	190
24	116	e100	e95	e90	e50	203	151	601	943	358	325	184
25	116	e80	e95	e90	e60	189	192	597	930	349	326	183
26	115	e85	e95	e100	e80	180	204	600	841	364	319	171
27	113	e90	e95	e100	e100	176	233	603	868	387	313	164
28	113	e100	e95	e110	e100	167	226	606	904	383	312	166
29	112	e100	e95	e110	---	162	212	641	902	372	307	166
30	e110	e100	e100	e120	---	158	229	787	907	356	332	164
31	e100	---	e100	e130	---	153	---	951	---	354	348	---
TOTAL	3565	3101	2980	3260	3110	10880	4587	16178	37146	15783	10305	7379
MEAN	115	103	96.1	105	111	351	153	522	1238	509	332	246
MAX	124	112	110	130	150	2500	233	951	2150	892	364	349
MIN	100	80	50	90	50	80	127	295	841	349	307	164
AC-FT	7070	6150	5910	6470	6170	21580	9100	32090	73680	31310	20440	14640

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1974 - 2003, BY WATER YEAR (WY)*

MEAN	265	208	187	211	221	294	310	800	1404	658	419	304
MAX	511	388	389	334	406	705	594	2502	3452	2261	915	436
(WY)	1974	1974	1979	1975	1983	1975	1975	1978	1978	1975	1975	1979
MIN	104	84.3	95.5	93.1	90.4	81.3	98.3	111	224	183	125	120
(WY)	2002	1976	2002	2002	2002	2002	2002	2002	2002	2002	2001	2002

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1974 - 2003*	
ANNUAL TOTAL	44306		118274			
ANNUAL MEAN	121		324		443	
HIGHEST ANNUAL MEAN					885	1975
LOWEST ANNUAL MEAN					120	2002
HIGHEST DAILY MEAN	461	Jun 24	2500	Mar 15	7600	May 22 1978
LOWEST DAILY MEAN	50	Dec 5	50	Dec 5	45	Nov 30 1975
ANNUAL SEVEN-DAY MINIMUM	73	Mar 16	80	Dec 1	53	Nov 25 1975
MAXIMUM PEAK FLOW			unknown	Mar 15	b8280	May 22 1978
MAXIMUM PEAK STAGE			a11.49	Mar 15	a11.49	Mar 15 2003
ANNUAL RUNOFF (AC-FT)	87880		234600		320700	
10 PERCENT EXCEEDS	197		844		906	
50 PERCENT EXCEEDS	106		150		286	
90 PERCENT EXCEEDS	80		100		110	

*--During periods of operation (October 1973 to September 1984, July 2000 to current year).
a--Backwater from ice.
b--Gage height, 9.96 ft, site and datum then in use.
e--Estimated.

06307830 TONGUE RIVER BELOW BRANDENBERG BRIDGE, NEAR ASHLAND MT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1974-81, June 2000 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: August 2000 to current year, (seasonal operation dependent on ice conditions).
SUSPENDED-SEDIMENT DISCHARGE: October 1974 to September 1981.

INSTRUMENTATION.--Conductance probe installed Aug. 23, 2000.

REMARKS.--Specific conductance collected during open water this year: Oct. 1 to Nov. 20, and Apr. 24 to Sept. 30. Seasonal specific conductance records are rated fair. Missing specific conductance data for May 10-11, June 2-16, Sept. 2-10, 19-21and 23-25 are due to silt problems and/or erroneous values. Unpublished records of daily and instantaneous temperature and instantaneous specific conductance are available in files of the District office.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum, 1,140 microsiemens per centimeter (µS/cm), Jan. 2, 3, 2002; minimum, 361 µS/cm, July 1 and 2, 2003.
SEDIMENT CONCENTRATION: Maximum daily mean, 6,400 mg/L July 26, 1979; minimum daily mean, 1 mg/L Oct. 18, 24, 1976.
SEDIMENT LOAD: Maximum daily, 27,200 tons May 19, 1978; minumum daily, 0.47 ton Nov. 15-17, 1975.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: During period of seasonal operation, maximum, 1,060 microsiemens per centimeter (µS/cm), Apr. 24; minimum, 361 µS/cm, July 1 and 2.

WATER QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instantaneous discharge, cfs (00061)	Barometric pressure, mm Hg (00025)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	Specif. conductance, wat unf uS/cm 25 degC (00095)	Temperature, air, deg C (00020)	Temperature, water, deg C (00010)	Hardness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)
OCT 2002											
01...	1200	122	696	9.9	100	8.1	720	6.0	11.5	280	48.7
NOV											
21...	0815	106	699	11.3	96	8.2	826	9.0	4.5	320	57.2
DEC											
05...	0800	19	697	11.1	83	8.2	888	-10.0	0.0	340	61.6
JAN 2003											
07...	1500	E120	693	11.4	86	8.4	808	16.5	0.0	320	60.7
FEB											
05...	1100	143	690	9.5	72	7.9	640	-2.0	0.0	230	45.3
MAR											
06...	1030	E100	685	11.2	85	8.0	905	-3.0	0.0	300	55.0
APR											
23...	1200	133	679	9.5	115	8.5	1070	21.0	18.5	390	65.8
MAY											
05...	1100	430	684	9.6	97	8.8	772	7.5	10.5	310	56.9
JUN											
16...	1230	1230	694	7.3	92	8.2	398	27.0	22.0	160	35.7
JUL											
02...	1000	882	687	6.7	88	8.0	381	23.0	23.5	150	34.3
AUG											
04...	1540	355	668	6.4	92	8.3	464	28.0	27.0	190	40.5
SEP											
02...	1530	333	696	9.2	115	8.5	507	29.0	21.5	210	43.5

E--Estimated.

WATER QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003--Continued

Date	Magnes-ium, water, fltrd, mg/L (00925)	Potas-sium, water, fltrd, mg/L (00935)	Sodium adsorp-tion ratio (00931)	Sodium, water, fltrd, mg/L (00930)	Alka-linity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chlor-ide, water, fltrd, mg/L (00940)	Fluor-ide, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of consti-tuents mg/L (70301)	Residue water, fltrd, tons/ acre-ft (70303)
OCT 2002											
01...	38.1	4.21	1	56.1	199	4.69	.36	3.3	175	450	.61
NOV											
21...	41.9	4.16	1	56.6	247	4.91	.37	4.7	203	521	.71
DEC											
05...	45.5	4.73	2	64.7	244	4.81	.40	7.1	219	554	.75
JAN 2003											
07...	42.0	3.98	1	56.2	257	4.68	.35	4.9	191	518	.70
FEB											
05...	29.5	6.54	1	40.5	196	3.38	.31	5.7	142	392	.53
MAR											
06...	38.5	3.95	1	52.1	251	5.56	.37	4.7	226	537	.73
APR											
23...	55.5	6.86	2	85.7	284	5.88	.37	4.5	295	690	.94
MAY											
05...	39.7	4.83	1	48.3	210	5.93	.30	3.3	192	477	.65
JUN											
16...	17.9	2.44	.6	17.4	130	4.25	.2	5.7	48.6	210	.29
JUL											
02...	16.5	2.29	.6	16.0	132	2.11	<.2	5.7	60.8	217	.30
AUG											
04...	21.9	2.42	.7	22.9	158	2.44	.2	8.7	79.9	273	.37
SEP											
02...	23.8	3.10	.7	24.0	171	2.75	.2	3.5	91.9	295	.40

Date	Residue water, fltrd, tons/d (70302)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Phos-phorus, water, unfltrd mg/L (00665)	Suspnd. sedi-ment, sieve diametr percent <.063mm (70331)	Sus-pended sedi-ment concen-tration mg/L (80154)	Sus-pended sedi-ment load, tons/d (80155)
OCT 2002									
01...	148	.57	<.022	E.002	<.007	.058	96	86	28
NOV									
21...	149	.24	<.022	<.002	<.007	.011	86	56	16
DEC									
05...	28.4	.27	<.022	<.002	<.007	.020	83	61	3.1
JAN 2003									
07...	E166	.20	<.022	<.002	<.007	.012	66	29	E9.4
FEB									
05...	151	.67	.317	.007	<.007	.091	97	53	20
MAR									
06...	E145	.24	<.022	<.002	<.007	.014	95	30	E8.1
APR									
23...	248	.45	<.022	<.002	<.007	.045	92	76	27
MAY									
05...	554	.79	<.022	<.002	<.007	.166	93	203	236
JUN									
16...	697	.74	<.022	<.002	<.007	.187	84	216	717
JUL									
02...	517	.53	E.019	<.002	<.007	.118	93	129	307
AUG									
04...	262	.39	<.022	<.002	<.007	.049	89	46	44
SEP									
02...	265	.34	<.022	<.002	<.007	.039	93	30	27

E--Estimated.

YELLOWSTONE RIVER BASIN

06307830 TONGUE RIVER BELOW BRANDENBERG BRIDGE, NEAR ASHLAND MT--Continued

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM), WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	716	677	708	830	801	815	---	---	---	---	---	---
2	723	710	719	839	810	824	---	---	---	---	---	---
3	720	711	715	845	813	834	---	---	---	---	---	---
4	719	710	715	849	806	824	---	---	---	---	---	---
5	731	715	722	836	796	815	---	---	*888	---	---	---
6	726	721	724	822	788	803	---	---	---	---	---	---
7	729	711	726	794	774	780	---	---	---	---	---	*808
8	734	728	731	786	770	779	---	---	---	---	---	---
9	738	693	732	810	780	793	---	---	---	---	---	---
10	745	717	741	802	795	797	---	---	---	---	---	---
11	747	732	743	810	802	806	---	---	---	---	---	---
12	734	723	730	815	810	813	---	---	---	---	---	---
13	731	725	728	816	812	814	---	---	---	---	---	---
14	726	723	725	816	810	814	---	---	---	---	---	---
15	735	726	731	822	810	816	---	---	---	---	---	---
16	741	732	736	826	822	824	---	---	---	---	---	---
17	743	735	740	824	820	822	---	---	---	---	---	---
18	759	638	748	827	823	825	---	---	---	---	---	---
19	765	754	761	847	823	834	---	---	---	---	---	---
20	770	761	765	846	834	839	---	---	---	---	---	---
21	770	764	768	---	---	*826	---	---	---	---	---	---
22	767	761	764	---	---	---	---	---	---	---	---	---
23	772	754	765	---	---	---	---	---	---	---	---	---
24	773	765	771	---	---	---	---	---	---	---	---	---
25	772	766	769	---	---	---	---	---	---	---	---	---
26	776	755	769	---	---	---	---	---	---	---	---	---
27	773	767	770	---	---	---	---	---	---	---	---	---
28	775	770	772	---	---	---	---	---	---	---	---	---
29	779	770	775	---	---	---	---	---	---	---	---	---
30	799	777	789	---	---	---	---	---	---	---	---	---
31	825	791	808	---	---	---	---	---	---	---	---	---
MONTH	825	638	747	---	---	---	---	---	---	---	---	---
		FEBRUARY			MARCH			APRIL			MAY	
1	---	---	---	---	---	---	---	---	---	836	784	807
2	---	---	---	---	---	---	---	---	---	804	782	790
3	---	---	---	---	---	---	---	---	---	814	794	809
4	---	---	---	---	---	---	---	---	---	794	753	769
5	---	---	*640	---	---	---	---	---	---	781	749	764
6	---	---	---	---	---	*905	---	---	---	849	774	792
7	---	---	---	---	---	---	---	---	---	868	836	855
8	---	---	---	---	---	---	---	---	---	837	805	827
9	---	---	---	---	---	---	---	---	---	805	761	791
10	---	---	---	---	---	---	---	---	---	---	---	---
11	---	---	---	---	---	---	---	---	---	---	---	---
12	---	---	---	---	---	---	---	---	---	805	790	801
13	---	---	---	---	---	---	---	---	---	818	800	812
14	---	---	---	---	---	---	---	---	---	815	779	798
15	---	---	---	---	---	---	---	---	---	779	761	772
16	---	---	---	---	---	---	---	---	---	761	723	737
17	---	---	---	---	---	---	---	---	---	725	716	720
18	---	---	---	---	---	---	---	---	---	719	707	713
19	---	---	---	---	---	---	---	---	---	710	701	706
20	---	---	---	---	---	---	---	---	---	726	703	713
21	---	---	---	---	---	---	---	---	---	717	708	712
22	---	---	---	---	---	---	---	---	---	709	697	701
23	---	---	---	---	---	---	---	---	---	705	693	701
24	---	---	---	---	---	---	1060	1020	1050	693	678	683
25	---	---	---	---	---	---	1020	934	979	683	667	674
26	---	---	---	---	---	---	936	887	910	686	678	681
27	---	---	---	---	---	---	898	877	884	680	645	665
28	---	---	---	---	---	---	880	856	866	649	639	643
29	---	---	---	---	---	---	870	859	864	645	628	636
30	---	---	---	---	---	---	865	836	856	640	613	631
31	---	---	---	---	---	---	---	---	---	635	598	607
MONTH	---	---	---	---	---	---	---	---	---	---	---	---

*--Instantaneous values from USGS cross-section collected during winter ice period.

YELLOWSTONE RIVER BASIN

06307830 TONGUE RIVER BELOW BRANDENBERG BRIDGE, NEAR ASHLAND MT--Continued

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM), WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003--Continued

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	650	635	643	372	361	368	466	456	461	512	498	505
2	---	---	---	376	361	370	467	455	460	---	---	---
3	---	---	---	380	366	374	459	447	454	---	---	---
4	---	---	---	390	373	380	459	447	455	---	---	---
5	---	---	---	396	379	388	466	454	461	---	---	---
6	---	---	---	406	387	396	464	456	459	---	---	---
7	---	---	---	416	394	402	464	456	460	---	---	---
8	---	---	---	410	392	400	477	461	468	---	---	---
9	---	---	---	425	409	415	472	461	467	---	---	---
10	---	---	---	439	425	429	470	463	468	---	---	---
11	---	---	---	451	437	444	471	459	464	590	566	581
12	---	---	---	450	427	438	470	461	464	593	575	587
13	---	---	---	442	431	435	470	457	464	579	567	574
14	---	---	---	439	431	435	471	462	466	588	570	582
15	---	---	---	437	430	434	479	463	470	584	566	577
16	---	---	---	434	430	433	482	468	474	578	568	573
17	401	366	383	437	427	433	482	474	478	588	577	584
18	369	365	367	432	426	429	483	473	477	585	578	582
19	375	366	371	434	429	431	489	476	482	---	---	---
20	386	370	379	435	426	431	491	484	487	---	---	---
21	386	373	381	456	433	449	505	489	498	---	---	---
22	381	366	372	451	440	444	497	486	490	673	648	661
23	379	365	371	451	442	446	497	488	491	---	---	---
24	382	366	374	481	445	457	499	492	496	---	---	---
25	391	367	381	463	448	457	506	496	500	---	---	---
26	395	377	386	457	446	454	499	486	493	684	668	674
27	409	374	397	450	438	446	504	487	494	692	684	687
28	387	373	379	450	437	445	504	492	497	698	684	691
29	393	370	381	458	450	454	508	488	497	688	676	685
30	388	366	374	467	453	462	510	500	505	689	684	686
31	---	---	---	468	461	465	506	494	499	---	---	---
MONTH	---	---	---	481	361	427	510	447	477	---	---	---

YELLOWSTONE RIVER BASIN

06308500 TONGUE RIVER AT MILES CITY, MT

LOCATION.--Lat 46°23'05", long 105°50'41" (NAD 27), in $SE^1/_4SE^1/_4SE^1/_4$ sec. 4, T.7 N., R.47 E., Custer County, Hydrologic Unit 10090102, on right bank 1.5 mi south of Miles City and at river mile 2.3.

DRAINAGE AREA.--5,397 mi^2. Area at site used prior to Oct. 4, 1995, 5,379 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1938 to April 1942, April 1946 to current year. Published as "near Miles City" April 1938 to April 1942. Not equivalent to records published as "near Miles City" May 1929 to October 1932. April 1946 to Oct. 4, 1995, at site 2.5 mi upstream from present site. Flows at present site are equivalent with flows at site operated from 1946. Monthly discharge only for some periods, published in WSP 1309.

REVISED RECORDS.--WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 2,360 ft (NGVD 29). April 1938 to April 1942, nonrecording gage at site 8 mi upstream from present site at different elevation. April 1946 to Sept. 30, 1963, at elevation 1.00 ft higher than present site. Oct. 4, 1995, gage was moved 2.5 miles downstream.

REMARKS.--Water-discharge records good except those for estimated daily discharges, which are poor. Flow regulation by Tongue River Reservoir (station 0630700) with capacity of 79,100 acre-feet, and many small reservoirs in Wyoming with combined capacity about 15,000 acre-ft. Diversions for irrigation of about 100,800 acres upstream from station. U. S. Army Corps of Engineers satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	35	93	e90	e100	e80	e70	184	182	702	721	98	146
2	48	95	e110	e100	e80	e70	179	207	900	677	91	160
3	52	102	e110	e100	e80	e70	177	250	957	632	98	161
4	54	108	e110	e100	e80	e70	174	270	1440	589	116	155
5	58	121	e100	e100	e70	e70	171	349	1870	574	99	151
6	58	138	e100	e100	e70	e70	168	415	1750	521	83	152
7	60	182	e100	e100	e70	e60	165	406	1620	453	72	149
8	64	162	e100	e100	e70	e60	164	402	1540	393	100	162
9	63	145	e100	e90	e70	e60	163	410	1430	376	80	171
10	61	130	e100	e90	e70	e65	159	450	1390	312	80	152
11	63	115	e100	e90	e70	e70	157	520	1390	246	88	139
12	70	112	e100	e80	e75	e70	154	470	1310	207	92	120
13	105	111	e100	e80	e80	e250	153	369	1200	203	80	116
14	115	109	e100	e80	e80	e1500	150	281	1100	216	84	117
15	118	108	e100	e80	e80	e4000	151	299	1140	165	79	120
16	117	107	e100	e80	e80	3120	168	337	1190	138	87	124
17	111	107	e100	e70	e80	1680	231	335	1160	152	104	126
18	108	107	e100	e70	e80	1210	159	349	1100	154	105	126
19	108	106	e100	e70	e80	906	151	362	1060	153	109	125
20	109	108	e90	e80	e80	792	150	366	1000	141	111	142
21	109	109	e90	e80	e70	694	148	363	931	135	75	127
22	109	109	e80	e80	e70	648	144	396	861	111	80	131
23	109	108	e80	e80	e70	683	144	418	857	114	83	117
24	110	100	e80	e80	e70	509	144	382	834	127	82	112
25	111	96	e90	e80	e70	356	144	389	860	119	102	127
26	112	91	e90	e80	e70	271	150	388	823	117	105	122
27	113	e70	e90	e80	e70	239	167	386	760	119	100	122
28	115	e70	e90	e80	e70	220	175	364	704	139	93	100
29	116	e80	e90	e80	---	206	187	384	759	136	116	89
30	103	e80	e90	e80	---	196	186	376	731	102	117	83
31	111	---	e90	e80	---	192	---	515	---	101	131	---
TOTAL	2795	3279	2970	2640	2085	18477	4917	11390	33369	8343	2940	3944
MEAN	90.2	109	95.8	85.2	74.5	596	164	367	1112	269	94.8	131
MAX	118	182	110	100	80	4000	231	520	1870	721	131	171
MIN	35	70	80	70	70	60	144	182	702	101	72	83
AC-FT	5540	6500	5890	5240	4140	36650	9750	22590	66190	16550	5830	7820

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1938 - 2003, BY WATER YEAR (WY)*

MEAN	244	254	190	195	278	533	437	687	1263	463	181	199
MAX	694	585	423	529	1794	1783	1693	2983	3825	2207	700	599
(WY)	1972	1942	1950	1999	1971	1971	1965	1978	1978	1975	1975	1968
MIN	10.3	60.9	68.0	76.9	73.8	74.5	12.5	29.2	41.9	12.6	6.08	2.40
(WY)	1961	1989	1990	2002	2003	2002	1961	1961	2002	1960	1949	1938

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1938 - 2003*	
ANNUAL TOTAL	25508.5		97113			
ANNUAL MEAN	69.9		266		407	
HIGHEST ANNUAL MEAN					986	1978
LOWEST ANNUAL MEAN					57.2	1961
HIGHEST DAILY MEAN	262	Jun 25	4000	Mar 15	9290	Jun 15 1962
LOWEST DAILY MEAN	7.3	Jul 16	35	Oct 1	0.00	Jul 9 1940
ANNUAL SEVEN-DAY MINIMUM	10	Jul 21	52	Oct 1	0.00	Jul 9 1940
MAXIMUM PEAK FLOW			a4000	Mar 15	c13300	Jun 15 1962
MAXIMUM PEAK STAGE			b10.00	Mar 15	c13.27	Mar 19 1960
ANNUAL RUNOFF (AC-FT)	50600		192600		294900	
10 PERCENT EXCEEDS	113		711		911	
50 PERCENT EXCEEDS	75		112		222	
90 PERCENT EXCEEDS	14		70		69	

*--During period of record (April 1938 to April 1942, April 1946 to current year).
a--Estimated discharge during period or ice effect.
b--Backwater from ice.
c--At previous site and elevation.
e--Estimated.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1946 to September 1994, October 1977 to December 1985, May 1999 to current year.
PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1965 to September 1981.
WATER TEMPERATURE: Sesonal records, April 2000 to current year.
SUSPENDED-SEDIMENT DISCHARGE: October 1977 to December 1985.
INSTRUMENTATION.--Temperature probe installed Mar. 22, 2000.
REMARKS--Daily water temperature record good except for period July 19-29, which is either poor or missing (July 26, 27). Maximum and minimum values for July 19-29 may not reflect actual extremes due to incomplete record. Unpublished records of instantaneous specific conductance and temperature data are available in files of the District office.
EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 1,520 microsiemens per centimeter (µS/cm) at 25.0°C, May 24, 1981; minimum daily, 215 µS/cm at 25.0°C, Feb. 16, 1971.
WATER TEMPERATURE (seasonal records): Maximum, 37.0°C, Aug. 22, 2001; minimum 0.0°C, Apr. 5, 2002.
SEDIMENT CONCENTRATION: Maximum daily mean, 14,200 mg/L, Aug. 3, 1985; minimum daily mean, 3 mg/L, Dec. 20, 1983.
SEDIMENT LOAD: Maximum daily, 84,400 tons May 18, 1978; minimum daily, .13 tons May 5, 1981.
EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: During period of seasonal operation, maximum, 32.0°C, July 19.; minimum 4.0°C, Apr. 3.

WATER QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instan-taneous dis-charge, cfs (00061)	pH, water, unfltrd field, std units (00400)	Specif. conduc-tance, wat unf uS/cm 25 degC (00095)	Temper-ature, air, deg C (00020)	Temper-ature, water, deg C (00010)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)
MAR 2003									
19...	0800	924	7.6	401	3.0	1.0	3.1	.363	.012
MAY									
21...	1615	368	8.3	801	24.0	16.0	.64	<.022	<.002
JUN									
02...	1300	958	8.3	682	21.0	18.0	1.3	.120	.003
AUG									
20...	1600	111	8.3	637	29.0	26.0	.33	<.022	<.002

Date	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Phos-phorus, water, unfltrd mg/L (00665)	Suspnd. sedi-ment, sieve diametr percent <.063mm (70331)	Sus-pended sedi-ment concen-tration mg/L (80154)	Sus-pended sedi-ment load, tons/d (80155)
MAR 2003					
19...	.010	.97	98	1580	3930
MAY					
21...	<.007	.126	98	173	172
JUN					
02...	<.007	.46	97	652	1690
AUG					
20...	<.007	.022	89	10	3.0

06308500 TONGUE RIVER AT MILES CITY, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003--Continued

Date	Time	Hardness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnesium, water, fltrd, mg/L (00925)	Potassium, water, fltrd, mg/L (00935)	Sodium adsorption ratio (00931)	Sodium, water, fltrd, mg/L (00930)	Alkalinity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chloride, water, fltrd, mg/L (00940)	Fluoride, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)
MAY 2003											
21...	1615	300	57.4	38.2	4.97	1	50.2	225	6.10	.3	2.79
AUG											
20...	1600	230	48.0	27.4	4.18	1	45.0	202	3.43	.3	8.46

Date	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of constituents mg/L (70301)	Residue water, fltrd, tons/acre-ft (70303)	Residue water, fltrd, tons/d (70302)	Arsenic water unfltrd ug/L (01002)	Cadmium water, unfltrd ug/L (01027)	Chromium, water, unfltrd recoverable, ug/L (01034)	Copper, water, unfltrd recoverable, ug/L (01042)	Lead, water, unfltrd recoverable, ug/L (01051)	Nickel, water, unfltrd recoverable, ug/L (01067)	Zinc, water, unfltrd recoverable, ug/L (01092)
MAY 2003											
21...	196	491	.67	488	2	<.2	1.6	5.9	2.36	4.65	9
AUG											
20...	131	388	.53	116	3	E.02	E.6	2.3	.20	3.13	3

E--Estimated.

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR APRIL 2003 TO SEPTEMBER 2003

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		APRIL			MAY			JUNE			JULY	
1	15.0	10.0	12.5	15.5	10.0	12.5	19.5	18.5	19.0	28.5	23.0	26.0
2	12.0	6.0	8.5	15.5	9.0	12.5	21.0	17.5	19.0	29.0	24.5	27.0
3	9.0	4.0	6.0	18.5	12.5	15.5	20.5	17.5	19.0	28.5	24.0	26.0
4	11.0	4.5	7.5	17.0	14.0	15.5	19.5	17.0	18.0	26.5	23.0	25.0
5	13.0	6.5	9.5	14.0	9.5	11.0	17.0	15.5	16.5	27.0	22.0	24.5
6	10.5	8.0	9.5	13.0	8.5	10.5	16.5	15.5	16.0	26.0	22.0	24.0
7	13.0	6.5	9.5	16.0	10.0	13.0	15.5	14.5	15.0	25.5	21.0	23.0
8	14.0	8.0	11.0	14.0	11.0	12.5	18.0	14.0	16.0	23.0	20.5	21.5
9	16.5	9.0	12.5	11.0	10.0	10.5	17.5	17.0	17.0	25.0	19.5	22.0
10	17.0	11.0	14.0	12.0	10.0	11.0	17.5	16.0	16.5	26.0	20.0	23.0
11	18.5	11.5	14.5	15.0	9.0	12.0	19.5	16.0	17.5	27.5	20.0	24.0
12	20.5	12.5	16.5	18.0	11.5	14.5	22.5	18.0	20.0	29.0	21.5	25.0
13	19.0	15.0	17.0	18.5	15.0	16.5	24.5	20.0	22.0	29.5	23.5	26.5
14	19.5	13.5	16.5	21.0	13.5	17.5	25.5	21.5	23.5	27.5	22.5	25.0
15	19.5	13.5	16.0	22.0	15.5	19.0	26.0	22.5	24.5	29.0	21.0	25.0
16	16.5	13.0	15.0	19.5	17.0	18.0	25.5	22.0	24.0	30.5	23.5	27.0
17	16.0	11.0	14.0	18.5	15.0	17.0	26.5	22.5	24.5	30.5	23.5	27.0
18	14.5	12.0	13.0	17.5	12.0	14.5	26.5	23.0	24.5	31.5	25.5	28.0
19	13.0	10.0	11.5	14.0	10.5	12.0	26.0	21.5	24.0	32.0	25.0	28.5
20	17.0	8.5	13.0	17.0	9.5	13.0	26.0	23.0	24.5	28.5	24.5	26.0
21	18.5	12.0	15.0	17.0	13.5	15.5	24.5	21.5	23.0	28.0	23.5	25.5
22	19.0	12.0	15.5	19.0	14.5	16.5	23.0	21.0	22.0	25.0	22.0	23.5
23	21.0	14.0	17.0	20.5	16.5	18.5	21.5	19.5	20.5	30.5	22.0	26.5
24	17.5	13.5	15.5	23.5	16.5	19.5	20.5	16.0	18.0	30.0	24.0	26.0
25	18.0	11.0	14.5	24.0	18.0	21.0	18.0	14.5	16.5	27.5	24.5	25.5
26	15.5	13.0	14.0	26.0	19.0	22.5	20.5	16.0	18.5	---	---	---
27	17.0	10.5	13.5	26.0	21.5	23.5	22.0	18.5	20.5	---	---	---
28	14.5	11.0	13.0	26.0	20.0	23.5	21.5	19.0	20.0	29.5	26.0	29.0
29	12.5	10.5	11.5	26.5	21.5	24.0	25.0	19.0	22.0	28.0	24.5	27.0
30	12.0	10.0	11.0	24.5	20.5	22.5	26.5	21.0	23.5	29.0	20.5	25.0
31	---	---	---	22.5	19.5	20.5	---	---	---	27.5	21.5	24.5
MONTH	21.0	4.0	13.0	26.5	8.5	16.5	26.5	14.0	20.0	---	---	---

YELLOWSTONE RIVER BASIN

06308500 TONGUE RIVER AT MILES CITY, MT--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR APRIL 2003 TO SEPTEMBER 2003--Continued

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN
		AUGUST			SEPTEMBER	
1	21.0	21.0	24.5	18.0	18.0	21.0
2	21.0	21.0	25.0	18.0	18.0	20.5
3	21.5	21.5	25.5	23.0	16.5	20.0
4	23.5	23.5	25.5	17.5	17.5	21.0
5	22.0	22.0	25.5	18.5	18.5	21.5
6	22.5	22.5	25.5	19.5	19.5	22.0
7	21.0	21.0	25.5	19.5	19.5	21.5
8	23.5	23.5	27.5	20.0	20.0	22.5
9	24.0	24.0	27.0	23.0	19.0	21.5
10	23.0	23.0	26.5	20.0	15.0	17.0
11	21.5	21.5	25.5	19.0	13.5	16.5
12	23.0	23.0	27.0	17.5	14.0	16.0
13	25.0	25.0	28.5	14.5	11.5	13.0
14	25.0	25.0	28.0	18.0	10.5	14.0
15	25.0	25.0	27.5	19.5	13.0	16.0
16	23.5	23.5	27.0	18.0	15.0	16.5
17	22.5	22.5	24.0	15.5	10.0	12.5
18	20.0	20.0	22.5	15.0	8.5	11.5
19	21.5	21.5	25.0	16.5	10.0	13.5
20	22.0	22.0	24.5	16.5	12.5	14.5
21	19.5	19.5	22.5	14.5	11.5	12.5
22	19.5	19.5	23.5	16.5	9.0	12.5
23	22.5	22.5	25.0	16.5	11.5	14.0
24	21.0	21.0	24.5	15.5	10.5	13.0
25	22.0	22.0	24.5	17.0	10.0	13.0
26	20.0	20.0	23.5	15.5	12.5	14.0
27	20.5	20.5	22.0	15.0	10.0	12.5
28	18.0	18.0	20.0	16.0	9.5	13.0
29	17.0	17.0	19.0	17.0	11.5	14.0
30	15.5	15.5	18.5	15.5	8.5	12.0
31	17.0	17.0	20.5	---	---	---
MONTH	25.0	15.5	24.5	23.0	8.5	16.0

06309000 YELLOWSTONE RIVER AT MILES CITY, MT

LOCATION.--Lat 46°25'18", long 105°51'38" (NAD 27), in NE$^1/_4$SW$^1/_4$NW$^1/_4$ sec.28, T.8 N., R.47 E., Custer County, Hydrologic Unit 10100001, on left bank at upstream side of bridge on State Highway 22 at Miles City, 0.8 mi downstream from Tongue River, and at river mile 184.2.

DRAINAGE AREA.--48,253 mi^2.

PERIOD OF RECORD.--September 1922 to September 1923, August 1928 to current year. Monthly discharge only for some periods, published in WSP 1309.

REVISED RECORDS.--WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 2,333.3 ft (NGVD 29) (levels by U.S. Army Corps of Engineers). Prior to May 6, 1929, nonrecording gages at pumping plant 1.2 mi downstream at different elevations. May 6, 1929, to Sept. 30, 1931, nonrecording gage, and Oct. 1, 1931, to Nov. 10, 1937, water- stage recorder 300 ft upstream from present site at same elevation. Nov. 11, 1937, to Sept. 30, 1946, water-stage recorder at pumping plant 1.2 mi downstream at different elevation. Oct. 1, 1946, to Mar. 15, 1979, water-stage recorder at site 300 ft upstream at present elevation. Mar. 16, 1979, to Sept. 21, 1979, nonrecording gage at present site and elevation. Sept. 22, 1979, recording gage established at same site and elevation.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Some regulation by reservoirs on tributary streams. Diversions for irrigation of about 1,100,000 acres upstream from station (does not include flood irrigation). Several observations of water temperature and specific conductance were obtained during the year. U.S. Army Corps of Engineers satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4280	4290	4200	e3800	e4100	e3100	5080	7440	46900	14500	5790	3170
2	4280	4130	4250	e3800	e4100	e3900	4710	7360	50400	15200	5350	3270
3	4290	4090	e4100	e3900	e4100	e4000	4700	7470	50900	15600	5040	3310
4	4390	4070	e4000	e3800	e4100	e4000	4820	7460	50100	15300	5060	3220
5	4690	4130	e4000	e3800	e4200	e3900	5140	7880	39100	14700	4870	3150
6	4790	4350	e4000	e3800	e4300	e3800	5020	8710	32200	13800	4520	3110
7	4710	4430	e3900	e3900	e4200	e3700	4820	7900	28500	13000	4230	3100
8	4640	4520	e3900	e3500	e4200	e2700	4620	7390	26600	12300	4150	3130
9	4590	4520	e3600	e3500	4170	2720	4690	7200	24300	11900	3990	3280
10	4640	4430	e3600	e3300	4420	2420	4520	7170	22700	11400	3830	3350
11	e4500	4370	e3800	e3600	4350	2700	4370	7920	24200	10800	3790	3480
12	e4500	4340	e3800	e3400	e3400	3210	4410	8830	29000	10200	3810	3560
13	e4500	4310	e3900	e3400	e3900	4840	4400	8650	31800	9810	3770	3700
14	e4500	4290	e3900	e3600	e4000	8220	4590	7870	31200	9430	3690	3720
15	e4500	4230	e4000	3530	e4100	e14000	5010	7340	29700	9230	3450	3750
16	4480	4210	e4000	3660	e4200	e28000	5620	7190	29300	8880	3360	3810
17	4460	4210	e4000	3950	e4200	21600	6520	7430	29900	8610	3170	3780
18	4420	4210	e4000	e3800	e4300	16800	7070	8520	29300	8260	3150	3740
19	4410	4170	e4000	e3600	e4300	12900	7190	11200	29800	8010	3280	3790
20	4440	4150	e3500	e3600	e4300	11700	6660	13100	29800	7500	3130	3860
21	4430	4140	e3400	e3800	e4300	8760	6270	13100	29900	7150	3050	3960
22	4390	4160	e3700	e3700	e4200	7970	5920	11300	29000	6820	3110	4020
23	4330	4130	e3800	e3100	e4000	7230	5620	10100	27200	6690	3140	3950
24	4330	4130	e3700	e2500	e3800	6460	5250	9850	23700	6640	3050	3860
25	4380	4100	e2800	3020	e3000	6030	5910	10800	20600	6470	3070	3820
26	4390	4120	e2600	2660	2550	5790	7130	15900	18700	6070	2960	3670
27	4410	4010	e2300	e3800	3030	5560	8390	22700	17100	6080	2880	3610
28	4410	4010	e2600	e4000	e3000	5070	8320	29900	15100	6570	2690	3460
29	4530	4010	e2300	e4000	---	4790	8370	34500	14100	7150	2540	3340
30	4580	4120	3600	e4000	---	5020	8110	37300	13800	6800	2700	3260
31	4300	---	e3500	e4100	---	5200	---	41000	---	6230	2940	---
TOTAL	138490	126380	112750	111920	110820	226090	173250	400480	874900	301100	113560	106230
MEAN	4467	4213	3637	3610	3958	7293	5775	12920	29160	9713	3663	3541
MAX	4790	4520	4250	4100	4420	28000	8390	41000	50900	15600	5790	4020
MIN	4280	4010	2300	2500	2550	2420	4370	7170	13800	6070	2540	3100
AC-FT	274700	250700	223600	222000	219800	448400	343600	794400	1735000	597200	225200	210700

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1922 - 2003, BY WATER YEAR (WY)*

MEAN	7703	7097	5727	5290	6163	8269	8226	17250	34700	20100	8120	7163
MAX	12970	10850	9342	8897	16160	18560	15210	29100	61860	46310	16540	13710
(WY)	1972	1973	1983	1968	1971	1929	1943	1978	1997	1967	1997	1941
MIN	4116	3976	2921	2034	2344	3027	2729	7334	13030	3988	2615	2964
(WY)	1936	1932	1933	1937	1932	2002	1961	1961	1934	1934	1961	1934

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1922 - 2003*	
ANNUAL TOTAL	2567110		2795970			
ANNUAL MEAN	7033		7660		11320	
HIGHEST ANNUAL MEAN					17470	1997
LOWEST ANNUAL MEAN					6141	1934
HIGHEST DAILY MEAN	43500	Jun 4	50900	Jun 3	92400	May 30 1923
LOWEST DAILY MEAN	2300	Dec 27	2300	Dec 27	996	Dec 14 1932
ANNUAL SEVEN-DAY MINIMUM	2640	Mar 18	2810	Dec 25	1220	Dec 12 1932
MAXIMUM PEAK FLOW			a51900	Jun 4	c102000	May 22 1978
MAXIMUM PEAK STAGE			b11.45	Mar 16	b21.70	Mar 20 1944
INSTANTANEOUS LOW FLOW					1800	Mar 7 1995
ANNUAL RUNOFF (AC-FT)	5092000		5546000		8203000	
10 PERCENT EXCEEDS	16900		15700		25300	
50 PERCENT EXCEEDS	4290		4330		7500	
90 PERCENT EXCEEDS	3300		3170		4040	

06309000 YELLOWSTONE RIVER AT MILES CITY, MT--Continued

SUMMARY STATISTICS	WATER YEARS 1922 - 1961**		WATER YEARS 1967 - 2003***	
ANNUAL MEAN	10710		11780	
HIGHEST ANNUAL MEAN	16600	1943	17470	1997
LOWEST ANNUAL MEAN	6141	1934	6176	2001
HIGHEST DAILY MEAN	92400	May 30 1923	82300	Jun 15 1997
LOWEST DAILY MEAN	996	Dec 14 1932	1640	Nov 25 1977
ANNUAL SEVEN-DAY MINIMUM	1220	Dec 12 1932	2270	Nov 20 1977
MAXIMUM PEAK FLOW	96300	Jun 19 1944	a102000	May 22 1978
MAXIMUM PEAK STAGE	b21.70	Mar 20 1944	b21.70	Mar 15 1979
ANNUAL RUNOFF (AC-FT	7756000		8537000	
10 PERCENT EXCEEDS	25000		25400	
50 PERCENT EXCEEDS	6620		8200	
90 PERCENT EXCEEDS	3500		4750	

*--During period of operation (1922-23, 1928 to current year).
**--Prior to construction of Yellowtail Dam, during period of operation (1922-23, 1928-61).
***--After completion of Yellowtail Dam.
a--Gage height, 10.63 ft.
b--Backwater from ice jam.
c--Gage height, 16.50 ft.
e--Estimated.

YELLOWSTONE RIVER BASIN

06324500 POWDER RIVER AT MOORHEAD, MT

LOCATION (REVISED).--Lat 45°03'28", long 105°52'39" (NAD 27), in $SE^1/_4NE^1/_4NE^1/_4$ sec.18, T.9S., R.48E., Powder River County, Hydrologic Unit 10090207, on left bank 25 ft downstream from bridge on Powder River, 7.3 mi upstream from Buffalo Creek, and at river mile 183.7.
DRAINAGE AREA (REVISED).--8,086 mi^2; Sept. 13, 1956 to Aug. 27, 2001 published as 8,088 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1929 to September 1972, October 1974 to current year. Monthly discharge only for some periods, published in WSP 1309.
REVISED RECORDS.--WSP 1309: 1932(M). WSP 1729: Drainage area; WDR MT-04-01: 2003.
GAGE.--Water-stage recorder. Elevation of gage is 3,350.6 ft (NGVD 29). Prior to Aug. 28, 1931, nonrecording gage at site 0.8 mi downstream at different elevation. Aug. 28, 1931, to Mar. 21, 1956, water-stage recorder at site 0.1 mi upstream at different elevation. Mar. 22 to July 24, 1956, nonrecording gage at site 1.4 mi downstream at different elevation. July 25 to Sept. 12, 1956, nonrecording gage at different site and elevation. Sept. 13, 1956 to Aug. 27, 2001, water-stage recoder during period of gage operation 1.1 mi downstream at different elevation.
REMARKS.--Water-discharge records good except those for estimated daily discharges, which are poor. Some regulation by three reservoirs in Wyoming with combined usable capacity of 36,800 acre-ft. Diversions for irrigation of about 66,300 acres upstream from station. U.S. Geological Survey satellite telemeter at station.
EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Sept. 30, 1923, reached a stage of 19 ft, site and elevation used 1931-56, from information by local residents.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	102	e150	e180	e140	e300	e290	357	523	1230	677	25	15
2	106	e170	e160	e150	e290	e310	314	582	1310	585	19	15
3	112	e180	e140	e160	e240	e300	695	1210	1350	543	27	17
4	120	e200	e130	e160	e210	e300	1060	1030	1110	438	24	24
5	142	e200	e130	e170	e210	e310	911	735	937	341	18	20
6	147	e190	e130	e170	e200	e300	737	528	756	281	20	16
7	144	e200	e130	e160	e180	e300	611	411	594	229	18	15
8	162	e190	e130	e140	e160	e290	538	386	503	206	22	15
9	165	e200	e130	e120	e160	e290	457	435	434	217	23	17
10	162	e190	e130	e100	e180	e300	405	413	368	286	25	23
11	160	e200	e130	e100	e200	e350	350	397	380	202	20	24
12	164	201	e120	e120	e210	e400	340	356	368	136	20	29
13	162	197	e140	e120	e250	e600	344	324	357	101	20	36
14	161	195	e150	e130	e250	e1000	562	334	318	77	19	58
15	175	194	e150	e130	e240	e1500	688	399	286	69	20	57
16	171	189	e140	e140	e250	e2000	908	323	267	62	18	62
17	174	184	e150	e160	e250	1120	993	305	261	56	15	82
18	179	186	e150	e170	e240	883	952	309	276	50	14	83
19	177	187	e140	e160	e200	723	922	362	862	40	13	90
20	172	189	e120	e140	e170	595	780	426	1180	33	11	108
21	167	187	e100	e100	e140	530	570	418	879	26	42	107
22	167	187	e90	e90	e100	532	455	434	880	22	48	102
23	190	184	e80	e100	e90	533	455	395	719	19	31	98
24	173	181	e80	e120	e70	475	411	344	639	15	59	124
25	172	e180	e90	e140	e100	471	445	295	644	14	69	132
26	166	e180	e120	e160	e200	730	453	339	633	11	53	128
27	164	e200	e140	e180	e250	737	390	926	537	29	39	116
28	173	e210	e150	e210	e300	618	441	1060	583	13	28	109
29	173	e210	e140	e240	---	530	432	1120	594	11	22	98
30	182	e200	e140	e290	---	481	367	1250	733	14	18	99
31	e170	---	e140	e300	---	416	---	1410	---	13	16	---
TOTAL	4954	5711	4050	4770	5640	18214	17343	17779	19988	4816	816	1919
MEAN	160	190	131	154	201	588	578	574	666	155	26.3	64.0
MAX	190	210	180	300	300	2000	1060	1410	1350	677	69	132
MIN	102	150	80	90	70	290	314	295	261	11	11	15
AC-FT	9830	11330	8030	9460	11190	36130	34400	35260	39650	9550	1620	3810

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1930 - 2003, BY WATER YEAR (WY)*

MEAN	225	224	159	154	287	612	509	1050	1356	462	173	144
MAX	897	660	326	445	1200	2290	1314	5553	4131	2500	1219	686
(WY)	1995	1999	1981	1981	1930	1947	1965	1978	1967	1937	1941	1982
MIN	16.1	80.0	56.2	27.2	20.9	185	117	82.6	39.5	33.9	0.60	1.28
(WY)	1955	1936	1933	1950	1933	2002	1961	1934	1954	1961	1966	1960

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1930 - 2003*	
ANNUAL TOTAL	65085.3		106000			
ANNUAL MEAN	178		290		446	
HIGHEST ANNUAL MEAN					1091	1978
LOWEST ANNUAL MEAN					109	1961
HIGHEST DAILY MEAN	2580	Aug 30	2000	Mar 16	27500	May 20 1978
LOWEST DAILY MEAN	1.6	Aug 17	11	Jul 26	0.00	Jul 15 1931
ANNUAL SEVEN-DAY MINIMUM	3.2	Aug 14	15	Jul 25	0.00	Sep 4 1960
MAXIMUM PEAK FLOW			unknown	Mar 16	c33000	May 20 1978
MAXIMUM PEAK STAGE			a8.40	Mar 16	d17.70	Mar 21 1956
INSTANTANEOUS LOW FLOW			b9.2	Jul 29	f0.00	Jul 15 1931
ANNUAL RUNOFF (AC-FT)	129100		210300		323300	
10 PERCENT EXCEEDS	300		705		1040	
50 PERCENT EXCEEDS	165		180		220	
90 PERCENT EXCEEDS	13		23		45	

*--During period of operation (1930-72, 1975 to current year).
a--Backwater from ice.
b--Gage height, 1.88 ft.
c--Gage height, 15.24 ft, site and datum then in use.
d--Ice jam, site and datum then in use.
e--Estimated.
f--Site and datum then in use.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1951-53, 1956-67, 1969-72, 1975-77, 2001 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: July 1986 to November 1989, May 2001 to current year.

WATER TEMPERATURE: February 1951 to September 1953, October 1955 to September 1957, October 1974 to September 1977, March 1978 to September 1981 (seasonal records only).

SUSPENDED-SEDIMENT DISCHARGE: October 1974 to September 1977, March 1978 to September 1996 (seasonal records only).

INSTRUMENTATION.--Specific conductance probe installed May 20, 2001.

REMARKS.--Specific conductance records rated fair. Seasonal data collected during open-water conditions; no data for Oct. 31 to Nov. 13 due to ice conditions and probe was removed from Nov. 26 to Mar. 17 for the winter season. Missing data for Mar. 19-23, Mar. 31, Apr. 1, Apr. 14-16, Apr. 28 to May 1, and June 28 to July 1 due to erroneous values. Unpublished records of instantaneous water temperature and specific conductance are available in files of District office.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE : Maximum daily, 5,920 microsiemens per centimeter (µS/cm), July 16, 2002; minimum daily, 642 µS/cm at 25.0°C, May 20, 1988.

WATER TEMPERATURE: Maximum daily, 33.0°C, July 14, 1981; minimum daily 0.0°C on many days during winter.

SEDIMENT CONCENTRATION: Maximum daily mean, 53,500 mg/L May 27, 1980; minimum daily mean, 3 mg/L Sept. 16-18, 1996.

SEDIMENT LOAD: Maximum daily, 2,230,000 tons May 20, 1978; minimum daily, 0.17 ton Aug. 1, 1988 and Sept. 16, 1996.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: For period of available record, maximum recorded, 3,710 microsiemens per centimeter (µS/cm), Aug. 24; minimum recorded, 474 µS/cm, June 3.

06324500 POWDER RIVER AT MOORHEAD, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instantaneous discharge, cfs (00061)	Barometric pressure, mm Hg (00025)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	Specif. conductance, wat unf uS/cm 25 degC (00095)	Temperature, air, deg C (00020)	Temperature, water, deg C (00010)	Hardness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)
OCT 2002											
02...	1130	108	682	8.7	83	8.1	2140	4.0	8.5	650	156
NOV											
20...	1130	189	681	11.7	102	8.3	1920	18.0	4.5	580	136
DEC											
04...	1230	E130	683	11.0	84	8.4	2010	0.0	0.0	620	140
17...	1500	E150	660	11.0	88	8.3	2080	7.0	0.0	620	139
JAN 2003											
08...	1030	E140	683	10.9	84	8.3	1930	4.0	0.0	650	159
21...	1300	E100	677	11.2	87	8.2	2220	-10.0	0.0	680	162
FEB											
05...	1500	E210	762	11.6	80	8.1	1590	-5.0	0.0	480	116
18...	1200	E240	675	10.4	81	7.9	2010	8.0	0.0	590	139
MAR											
06...	1530	E300	671	9.4	74	8.0	2600	2.0	0.0	710	171
17...	1400	1300	670	11.2	93	7.8	1160	3.0	2.0	380	95.2
APR											
09...	1430	418	673	9.0	99	8.1	2010	24.0	13.5	600	148
22...	1300	438	667	8.6	99	8.1	1050	20.5	15.5	310	75.5
MAY											
05...	1500	703	670	9.1	95	8.6	1600	8.0	11.5	350	86.6
20...	1230	448	681	9.8	104	8.2	1680	15.0	12.5	500	117
JUN											
03...	1600	1320	675	8.0	96	8.0	483	20.0	18.0	150	38.0
16...	1700	275	678	7.0	99	8.4	1460	24.0	27.0	450	108
JUL											
02...	1530	597	672	6.5	94	8.2	1310	30.0	27.5	340	85.1
14...	1500	77	677	7.9	113	8.3	1520	28.0	27.0	480	122
AUG											
05...	0800	18	667	7.4	93	8.0	2100	21.5	19.5	740	148
19...	1300	15	673	8.6	119	8.2	1680	36.0	25.0	660	133
SEP											
03...	1130	17	682	10.1	119	8.3	1940	22.0	17.5	650	138
16...	1130	64	669	9.4	106	8.4	1710	18.5	14.5	690	151

Date	Magnesium, water, fltrd, mg/L (00925)	Potassium, water, fltrd, mg/L (00935)	Sodium adsorption ratio (00931)	Sodium, water, fltrd, mg/L (00930)	ANC, wat unf fixed end pt, lab, mg/L as CaCO3 (90410)	Alkalinity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chloride, water, fltrd, mg/L (00940)	Fluoride, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of constituents mg/L (70301)
OCT 2002											
02...	62.6	7.70	4	252	218	156	119	.54	7.21	801	1500
NOV											
20...	58.0	6.05	4	204	246	190	124	.51	6.40	646	1300
DEC											
04...	64.5	6.51	4	218	251	191	114	.45	6.81	684	1350
17...	66.8	6.66	4	231	287	E187	127	.44	9.05	695	1450
JAN 2003											
08...	61.2	7.50	4	221	271	264	131	.50	11.6	623	1370
21...	66.9	7.47	4	254	306	278	156	.57	9.87	711	1540
FEB											
05...	45.1	6.19	3	155	226	222	96.9	.47	7.90	498	1060
18...	58.2	7.54	4	236	E299	265	123	.45	8.69	636	1370
MAR											
06...	69.5	7.76	5	281	209	238	160	.56	9.08	853	1700
17...	33.7	6.84	2	108	403	149	51.5	.31	13.7	385	791
APR											
09...	55.2	6.67	4	240	378	170	53.7	.62	5.76	887	1500
22...	29.6	5.32	2	97.8	221	141	43.1	.44	6.74	325	669
MAY											
05...	33.1	6.16	5	195	472	130	47.5	.56	5.63	637	1090
20...	50.3	6.21	3	172	219	196	70.4	.49	6.34	606	1150
JUN											
03...	13.3	2.76	1	40.9	112	82	15.8	.18	8.09	127	295
16...	44.8	6.62	3	164	180	169	68.5	.39	7.83	504	1010
JUL											
02...	31.2	6.02	3	147	204	140	55.9	.38	9.10	448	868
14...	43.4	7.68	3	143	166	142	45.6	.48	6.33	596	1050
AUG											
05...	90.0	9.79	4	228	154	153	63.1	.32	5.94	890	1530
19...	80.6	9.62	2	142	128	127	16.6	.28	3.23	789	1250
SEP											
03...	74.5	9.83	3	192	167	155	42.7	.38	5.99	819	1380
16...	76.8	9.72	2	142	217	170	29.6	.28	7.29	733	1250

E--Estimated.

YELLOWSTONE RIVER BASIN

06324500 POWDER RIVER AT MOORHEAD, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003--Continued

Date	Residue water, fltrd, tons/ acre-ft (70303)	Residue water, fltrd, tons/d (70302)	Residue on evap. at 180degC wat flt mg/L (70300)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Ammonia water, fltrd, mg/L as N (00608)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Phos-phorus, water, unfltrd mg/L (00665)	Alum-inum, water, unfltrd recover -able, ug/L (01105)	Arsenic water, fltrd, ug/L (01000)
02...	2.23	477	1640	.83	<.04	.103	.003	<.007	.23	2730	.9
NOV											
20...	1.92	719	1410	.57	E.04	.115	<.002	<.007	.21	3580	.9
DEC											
04...	2.08	E575	1530	.36	E.04	.182	E.002	<.007	.113	1320	.8
17...	2.06	E570	1510	.47	.05	.362	.003	<.007	.151	E2130	.9
JAN 2003											
08...	1.98	E578	1460	.34	<.04	.381	.004	<.007	.079	1130	.8
21...	2.27	E408	1670	.31	<.04	.420	.005	<.007	.054	1720	.7
FEB											
05...	1.55	E646	1140	.26	<.04	.360	.004	<.007	.051	670	.7
18...	2.00	E954	1470	.52	.05	.419	.006	<.007	.093	861	.9
MAR											
06...	2.54	E1510	1870	.37	E.04	.534	.006	<.007	.056	1020	.7
17...	1.52	2780	1120	7.7	.28	.413	.051	--	4.03	29400	2.1
APR											
09...	2.21	1830	1620	5.9	<.04	.756	.003	E.004	3.00	31700	1.1
22...	.98	856	724	2.8	<.04	.226	E.002	E.006	1.17	14900	.7
MAY											
05...	1.62	2260	1190	12	<.04	.891	.005	.009	5.74	51300	.9
20...	1.72	1530	1260	1.2	<.04	.067	E.002	E.006	.52	6210	.9
JUN											
03...	.44	1140	321	2.1	<.04	.125	.004	E.004	1.06	7720	.7
16...	1.46	798	1070	.85	<.04	<.022	<.002	E.005	.22	2430	1.2
JUL											
02...	1.27	1510	936	3.7	<.04	.341	E.002	.010	1.61	20700	1.2
14...	1.55	237	1140	1.4	<.04	<.022	<.002	<.007	.35	5580	1.0
AUG											
05...	2.35	84.1	1730	.66	<.04	<.022	<.002	<.007	.043	138	1.2
19...	1.91	56.7	1400	.60	<.04	<.022	<.002	<.007	.034	218	.9
SEP											
03...	2.04	68.7	1500	.83	<.04	<.022	<.002	<.007	.145	2150	.9
16...	1.91	243	1410	.75	<.04	<.022	<.002	<.007	.114	1400	1.0

Date	Arsenic water unfltrd ug/L (01002)	Barium, water, unfltrd recover -able, ug/L (01007)	Beryll-ium, water, unfltrd recover -able, ug/L (01012)	Boron, water, unfltrd recover -able, ug/L (01022)	Cadmium water, unfltrd ug/L (01027)	Chrom-ium, water, unfltrd recover -able, ug/L (01034)	Copper, water, unfltrd recover -able, ug/L (01042)	Iron, water, fltrd, ug/L (01046)	Iron, water, unfltrd recover -able, ug/L (01045)	Lead, water, unfltrd recover -able, ug/L (01051)	Mangan-ese, water, fltrd, ug/L (01056)
OCT 2002											
02...	3	84	.25	184	.20	3.2	10.3	<10	4890	4.19	4.8
NOV											
20...	2	81	.33	237	.20	2.9	12.9	<10	5600	4.52	4.4
DEC											
04...	E1	49	.09	186	.08	1.3	7.1	<10	2080	1.61	15.2
17...	E1	68	.14	204	.12	2.0	8.0	<10	3530	2.80	E1.1
JAN 2003											
08...	E1	50	.08	216	.07	1.2	5.6	<10	1800	1.49	4.0
21...	E2	57	.07	235	E.03	1.6	5.0	<10	1410	1.27	5.8
FEB											
05...	<2	37	E.05	161	<.04	E.7	6.1	<10	970	.81	5.1
18...	E1	50	.08	192	E.03	E.7	6.9	14	1540	1.30	14.5
MAR											
06...	<2	56	<.12	248	<.07	1.1	5.7	<30	<20	.91	7.9
17...	12	166	3.36	140	2.56	20.6	81.9	--	60500	72.7	--
APR											
09...	13	413	3.09	222	2.15	31.7	76.2	<10	56900	58.2	3.0
22...	12	241	1.41	133	.85	14.2	35.7	<10	27000	26.1	2.0
MAY											
05...	20	5810	6.49	202	3.44	41.2	121	<10	99800	116	E.8
20...	5	96	.51	167	.32	5.4	18.2	<10	11500	11.1	2.9
JUN											
03...	6	114	.88	63	.56	7.9	21.8	20	17700	18.9	1.5
16...	2	72	.22	156	.11	2.0	13.8	<8	4000	3.91	1.5
JUL											
02...	8	366	2.03	170	.82	21.4	38.0	<8	41600	37.8	1.0
14...	3	105	.47	175	.21	4.9	13.9	E6	9220	7.91	2.8
AUG											
05...	<2	46	<.06	27	.05	E.5	6.1	E5	450	2.97	25.9
19...	3	67	<.06	184	E.02	<.8	7.5	<8	400	.58	11.3
SEP											
03...	2	64	.15	211	.12	2.1	9.9	<8	3100	2.33	4.4
16...	E2	58	.11	187	.09	1.5	7.8	<8	2190	1.80	4.3

E--Estimated.

Date	Mangan-ese, water, unfltrd recover-able, ug/L (01055)	Mercury water, unfltrd recover-able, ug/L (71900)	Nickel, water, unfltrd recover-able, ug/L (01067)	Selen-ium, water, unfltrd ug/L (01147)	Zinc, water, unfltrd recover-able, ug/L (01092)	Suspnd. sedi-ment, sieve diametr percent <.063mm (70331)	Sus-pended sedi-ment concen-tration mg/L (80154)	Sus-pended sedi-ment load, tons/d (80155)
OCT 2002								
02...	103	--	13.4	2.6	27	99	373	109
NOV								
20...	99.2	--	15.1	2.9	29	98	405	207
DEC								
04...	44.5	--	12.0	2.5	12	72	401	E141
17...	62.6	--	13.3	2.5	17	95	349	E141
JAN 2003								
08...	37.7	--	11.7	2.3	9	96	229	E86.6
21...	27.7	--	8.83	2.6	9	89	278	E75.1
FEB								
05...	23.4	--	7.54	2.2	7	90	181	E103
18...	43.3	--	10.3	2.4	9	91	99	E64.2
MAR								
06...	26.2	--	9.66	3.9	8	91	135	E109
17...	1900	--	83.9	3.5	286	82	5660	19900
APR								
09...	1250	--	83.3	8.2	267	99	4880	5510
22...	817	--	35.8	2.9	119	95	1740	2060
MAY								
05...	3000	.21	128	6.6	447	96	9840	18700
20...	253	--	15.3	3.1	56	90	847	1020
JUN								
03...	598	.04	22.1	1.4	74	30	3180	11300
16...	125	--	7.25	2.5	19	96	237	176
JUL								
02...	643	--	49.0	3.4	175	96	2690	4340
14...	152	--	14.1	2.9	37	99	478	99
AUG								
05...	16.9	--	1.81	.5	15	80	54	2.6
19...	42.5	--	8.02	1.0	4	97	21	.85
SEP								
03...	83.8	--	10.3	2.8	17	99	168	7.7
16...	56.8	--	7.42	1.5	14	99	165	29

E--Estimated.

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	2240	2170	2210	---	---	---	---	---	---	---	---	---
2	2180	2130	2150	---	---	---	---	---	---	---	---	---
3	2130	2070	2110	---	---	---	---	---	*1830	---	---	*2310
4	2080	1990	2030	---	---	---	---	---	*2010	---	---	---
5	2030	1980	2010	---	---	*2070	---	---	*2090	---	---	---
6	1990	1930	1960	---	---	---	---	---	---	---	---	---
7	1930	1880	1910	---	---	---	---	---	---	---	---	---
8	1910	1850	1880	---	---	*1970	---	---	---	---	---	*2150
9	1910	1880	1890	---	---	---	---	---	---	---	---	---
10	1920	1870	1890	---	---	---	---	---	*2200	---	---	---
11	1950	1860	1920	---	---	---	---	---	---	---	---	*1950
12	1860	1790	1820	---	---	*1880	---	---	*2190	---	---	---
13	1810	1790	1800	---	---	---	---	---	---	---	---	---
14	1840	1810	1830	---	---	---	---	---	---	---	---	*2030
15	1840	1740	1790	1990	1950	1970	---	---	---	---	---	---
16	1790	1760	1780	1960	1910	1930	---	---	---	---	---	---
17	1800	1740	1770	1950	1920	1930	---	---	*2120	---	---	*2110
18	1810	1760	1790	1960	1910	1940	---	---	---	---	---	---
19	1810	1780	1800	1970	1940	1950	---	---	---	---	---	---
20	1830	1800	1810	1960	1920	1940	---	---	---	---	---	---
21	1840	1800	1820	1950	1920	1930	---	---	*2240	---	---	*2250
22	1830	1800	1820	1970	1940	1960	---	---	---	---	---	---
23	---	---	---	1970	1940	1950	---	---	---	---	---	---
24	---	---	---	2020	1960	1970	---	---	---	---	---	*1990
25	1900	1850	1890	---	---	---	---	---	*2430	---	---	---
26	1940	1890	1910	---	---	---	---	---	---	---	---	---
27	1990	1940	1960	---	---	---	---	---	---	---	---	---
28	2000	1920	1960	---	---	*2430	---	---	*2230	---	---	*1900
29	1950	1900	1920	---	---	---	---	---	---	---	---	---
30	---	---	---	---	---	---	---	---	---	---	---	---
31	---	---	---	---	---	---	---	---	*2300	---	---	*1450
MONTH	---	---	---	---	---	---	---	---	---	---	---	---

*--Instanteous value from USGS and observer samples.

YELLOWSTONE RIVER BASIN

06324500 POWDER RIVER AT MOORHEAD, MT--Continued

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES--Continued

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	---	---	---	---	---	---	---	---	*2330	---	---	*1590
2	---	---	---	---	---	---	2320	2240	2280	1540	1460	1500
3	---	---	---	---	---	---	2410	2250	2310	1710	1380	1530
4	---	---	---	---	---	*2290	2570	2380	2470	2170	1710	1970
5	---	---	*1610	---	---	---	2520	2370	2440	1780	1590	1640
6	---	---	---	---	---	*2600	2560	2220	2480	1650	1600	1630
7	---	---	---	---	---	*2240	2390	2060	2240	1730	1640	1690
8	---	---	*1700	---	---	---	2160	2120	2140	1740	1700	1730
9	---	---	---	---	---	---	2140	2050	2090	1830	1730	1790
10	---	---	---	---	---	---	2050	2010	2020	1820	1720	1770
11	---	---	*1880	---	---	*2120	2050	2020	2030	1760	1710	1730
12	---	---	---	---	---	---	2120	2050	2090	1820	1750	1780
13	---	---	---	---	---	---	2160	2020	2130	1890	1820	1860
14	---	---	*1910	---	---	*1130	---	---	---	1910	1880	1900
15	---	---	---	---	---	---	---	---	---	1960	1900	1930
16	---	---	---	---	---	---	---	---	*1850	1910	1870	1890
17	---	---	---	---	---	*1160	1690	1500	1600	1920	1840	1880
18	---	---	*1900	1370	1160	1220	1560	1230	1380	1900	1860	1880
19	---	---	---	---	---	*1790	1240	1080	1150	1880	1750	1840
20	---	---	---	---	---	---	1100	1050	1080	1750	1600	1670
21	---	---	---	---	---	---	1090	1050	1070	1610	1580	1590
22	---	---	*1620	---	---	*1750	1070	1060	1060	1590	1550	1580
23	---	---	---	---	---	---	1160	1060	1110	1590	1570	1580
24	---	---	---	1870	1750	1830	1300	1160	1220	1570	1140	1460
25	---	---	*1900	1870	1800	1840	1380	1300	1350	1140	891	962
26	---	---	---	1940	1700	1870	1450	1370	1410	1110	786	854
27	---	---	---	2090	1900	1960	1480	1430	1460	1270	847	1070
28	---	---	*2100	2440	2090	2320	---	---	---	856	697	791
29	---	---	---	2420	2280	2350	---	---	---	817	697	748
30	---	---	---	2320	1920	2180	---	---	---	769	640	701
31	---	---	---	---	---	---	---	---	---	668	545	605
MONTH	---	---	---	---	---	---	---	---	---	---	---	---

		JUNE			JULY			AUGUST			SEPTEMBER	
1	608	562	585	---	---	---	3230	2860	3030	2350	2210	2290
2	600	521	565	1410	1260	1320	3220	2560	2930	2210	2060	2120
3	531	474	492	1350	1270	1310	2560	2250	2350	2060	1880	1950
4	595	512	560	1270	1190	1220	2560	2270	2420	1890	1680	1770
5	702	595	646	1210	1190	1200	2350	2040	2120	1740	1690	1720
6	838	702	769	1220	1190	1200	2160	2070	2100	1760	1710	1730
7	999	837	919	1280	1220	1250	2320	2160	2270	1790	1750	1760
8	1130	999	1080	1320	1270	1290	2310	1970	2110	1880	1750	1800
9	1190	1130	1160	1440	1320	1360	1970	1650	1800	1800	1670	1750
10	1260	1190	1230	2180	1440	1860	1650	1570	1600	1760	1380	1600
11	1330	1260	1310	2150	1890	1980	1690	1610	1640	1610	1410	1530
12	1360	1300	1310	2020	1880	1960	1630	1580	1610	1610	1540	1580
13	1460	1360	1400	1910	1580	1710	1660	1600	1630	1910	1570	1720
14	1560	1460	1530	1580	1510	1540	1660	1600	1630	1900	1770	1840
15	1550	1490	1510	1770	1560	1670	1630	1590	1610	1850	1770	1810
16	1510	1460	1490	1870	1710	1770	1630	1590	1610	1850	1690	1770
17	1490	1450	1470	2240	1870	2070	1670	1620	1640	1690	1380	1510
18	1560	1460	1490	2310	1880	2170	1690	1660	1670	1380	1280	1320
19	2110	1480	1700	2440	1920	2220	1740	1690	1720	1360	1170	1240
20	2380	1720	2020	2580	2440	2530	1790	1740	1760	1490	1360	1440
21	2370	2020	2200	2790	2580	2650	2010	1740	1860	1440	1430	1440
22	2040	1760	1860	2900	2790	2840	1740	1500	1620	1440	1390	1420
23	1980	1510	1720	2980	2900	2940	1770	1620	1720	1400	1300	1360
24	1560	1290	1430	3020	2940	2990	3710	1300	1870	2120	1280	1460
25	1290	1260	1260	3090	2980	3040	3580	2590	2940	2340	2120	2270
26	1290	1230	1270	3120	2880	3090	2600	2450	2520	2240	1960	2100
27	1230	1200	1210	2910	1220	2000	2540	2430	2480	1960	1720	1850
28	---	---	---	2600	1560	1940	2940	2520	2730	1720	1590	1640
29	---	---	---	3170	2600	3000	2980	2830	2910	1590	1520	1550
30	---	---	---	3310	3170	3260	2870	2670	2800	1540	1440	1480
31	---	---	---	3310	2940	3120	2670	2330	2460	---	---	---
MONTH	---	---	---	---	---	---	3710	1300	2100	2350	1170	1690

*--Instanteous value from USGS and observer samples.

YELLOWSTONE RIVER BASIN

06324970 LITTLE POWDER RIVER ABOVE DRY CREEK, NEAR WESTON, WY

LOCATION.--Lat 44°55'37", long 105°21'10" (NAD 27), in $NW^1/_4SW^1/_4SW^1/_4$ sec.13, T.57 N., R.71 W., Campbell County, Hydrologic Unit 10090208, on left bank 3.1 mi upstream from Dry Creek, 5.0 mi south of the Wyoming-Montana State line, and 20 mi north of Weston.
DRAINAGE AREA.--1,235 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1972 to current year.
REVISED RECORDS.--WDR WY-77-1: Drainage area. WDR WY-78-1: 1976(M).
GAGE.--Water-stage recorder. Elevation of gage is 3,410 ft (NGVD 29).
REMARKS.--Water-discharge records fair except those for estimated daily discharges, which are poor. Diversion upstream from station for irrigation of about 80 acres downstream from station. Flow occasionally affected by contributions from mine dewatering. U. S. Geological Survey satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.01	e0.01	0.92	e0.90	e1.7	e1.3	32	9.3	1.9	e2.1	0.01	0.02
2	0.01	e0.01	1.0	e1.0	e1.5	e1.2	30	14	2.1	e1.8	0.01	0.02
3	0.01	e0.01	0.99	e1.1	e1.3	1.3	e40	15	1.8	e1.6	0.01	0.02
4	0.01	e0.01	1.2	e1.2	e1.2	1.3	e32	12	2.0	e1.4	0.01	0.02
5	0.01	0.02	1.1	e1.3	e1.1	1.1	e25	15	2.3	e1.2	0.00	0.02
6	0.01	0.06	1.1	e1.4	e0.92	0.98	e20	16	2.7	e1.0	0.00	0.02
7	0.01	0.06	1.2	e1.4	e1.0	1.0	e19	15	3.7	e0.90	0.00	0.02
8	0.01	0.07	1.2	e1.2	e1.0	e0.90	e19	13	4.0	e0.80	0.00	0.02
9	0.01	0.07	1.2	e0.92	e0.94	e0.98	e17	18	5.3	0.30	0.00	0.02
10	0.01	0.05	1.2	e0.64	e1.1	e1.1	e14	19	8.0	0.17	0.01	0.03
11	0.01	0.04	1.2	e0.82	e1.4	1.1	e12	25	8.1	0.13	0.01	0.02
12	0.01	0.07	1.2	e1.2	e1.6	27	e11	50	5.0	0.08	0.01	0.03
13	0.01	0.08	1.3	e1.0	e1.9	e130	e10	48	3.6	0.07	0.01	0.02
14	0.01	0.08	2.6	e0.84	e1.8	e135	e9.0	25	2.7	0.06	0.01	0.02
15	0.01	0.08	2.1	e0.88	e2.1	e119	e8.2	15	17	0.06	0.01	0.03
16	0.01	0.10	1.4	e0.84	e3.2	e106	7.9	9.7	7.7	0.02	0.01	0.03
17	0.01	e0.11	1.3	e0.80	e4.4	e93	6.8	6.9	5.2	0.02	0.01	0.03
18	0.01	0.12	e1.2	e0.76	e5.8	104	6.4	5.7	3.0	0.02	e0.01	0.02
19	0.01	0.13	e1.1	e0.74	e7.0	e110	6.8	5.2	55	0.02	0.01	0.02
20	0.01	0.18	e0.90	e0.72	e10	e91	5.7	4.6	19	0.02	0.01	0.02
21	0.01	0.23	e0.80	e0.71	e7.4	e77	4.8	4.0	6.7	0.01	0.01	0.02
22	0.01	0.27	e0.70	e0.62	e5.0	e75	4.2	3.7	6.2	0.01	0.01	0.02
23	0.01	e0.27	e0.66	e0.70	e3.2	95	3.4	3.1	4.2	0.01	0.01	0.02
24	0.01	0.27	e0.62	e0.84	e2.9	e122	3.6	2.8	2.7	0.01	0.01	0.02
25	0.01	0.29	e0.56	e0.78	e2.6	e118	3.1	2.2	3.6	0.01	0.01	0.01
26	0.01	0.39	0.51	e0.88	e2.3	e105	2.9	1.9	3.0	0.01	0.01	0.02
27	0.01	0.42	0.48	e0.94	1.9	90	3.8	2.1	60	0.01	0.01	0.02
28	0.01	0.55	0.72	e0.98	1.3	76	2.7	1.9	15	0.01	0.02	0.01
29	0.01	0.76	e0.90	e1.1	---	66	3.0	1.6	6.4	0.01	0.02	0.01
30	e0.01	0.71	e0.96	e1.3	---	48	3.7	2.0	3.0	0.01	0.02	0.01
31	e0.01	---	e1.0	e1.5	---	34	---	1.9	---	0.01	0.02	---
TOTAL	0.31	5.52	33.32	30.01	77.56	1833.26	367.0	368.6	270.9	11.88	0.30	0.61
MEAN	0.010	0.18	1.07	0.97	2.77	59.1	12.2	11.9	9.03	0.38	0.010	0.020
MAX	0.01	0.76	2.6	1.5	10	135	40	50	60	2.1	0.02	0.03
MIN	0.01	0.01	0.48	0.62	0.92	0.90	2.7	1.6	1.8	0.01	0.00	0.01
AC-FT	0.6	11	66	60	154	3640	728	731	537	24	0.6	1.2

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1973 - 2003, BY WATER YEAR (WY)

MEAN	11.0	3.73	2.50	7.84	36.5	60.0	23.4	56.5	27.7	10.7	5.36	3.87
MAX	172	25.4	9.97	89.0	336	613	99.3	703	187	68.8	44.8	60.8
(WY)	1995	1999	1995	1974	1997	1978	1999	1978	1984	1982	1993	1986
MIN	0.009	0.015	0.21	0.10	0.46	1.34	0.75	1.04	0.90	0.044	0.000	0.002
(WY)	1992	1982	1982	1991	1989	1981	1981	1992	2002	1980	1991	1991

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1973 - 2003	
ANNUAL TOTAL	591.57		2999.27			
ANNUAL MEAN	1.62		8.22		20.7	
HIGHEST ANNUAL MEAN					127	1978
LOWEST ANNUAL MEAN					1.49	1992
HIGHEST DAILY MEAN	23	Apr 1,8,9	135	Mar 14	5000	May 19 1978
LOWEST DAILY MEAN	0.01	Many days	0.00	Aug 5	0.00	Many days, some years
ANNUAL SEVEN-DAY MINIMUM	0.01	Oct 1	0.00	Aug 3	0.00	Many days, some years
MAXIMUM PEAK FLOW			142	Mar 14	a5300	May 19 1978
MAXIMUM PEAK STAGE			4.55	Mar 14	11.63	Mar 20 1978
ANNUAL RUNOFF (AC-FT)	1170		5950		15000	
10 PERCENT EXCEEDS	3.8		18		34	
50 PERCENT EXCEEDS	0.52		0.98		2.8	
90 PERCENT EXCEEDS	0.02		0.01		0.02	

a--Gage height, 11.62 ft.
e--Estimated.

YELLOWSTONE RIVER BASIN

06324970 LITTLE POWDER RIVER ABOVE DRY CREEK, NEAR WESTON, WY--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1975-82, 1985 to current year.

REMARKS.--Record includes samples collected as part of the National Water-Quality Assessment Program (NAWQA) for the Yellowstone River study unit under the direction of the Wyoming District.

WATER QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instantaneous discharge, cfs (00061)	Barometric pressure, mm Hg (00025)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	Specif. conductance, wat unf uS/cm 25 degC (00095)	Temperature, air, deg C (00020)	Temperature, water, deg C (00010)	Hardness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)
OCT 2002											
17...	1000	.01	669	10.0	89	8.0	3030	10.5	4.5	890	176
NOV											
05...	1200	.02	672	10.9	102	7.6	3510	10.5	6.5	1000	204
DEC											
17...	1200	1.2	658	10.6	87	8.0	4010	6.5	0.5	990	186
JAN 2003											
21...	1600	.7	676	8.7	68	7.9	4470	-10.0	0.0	1100	221
FEB											
18...	1500	4.9	673	11.3	88	7.9	2470	10.0	0.0	630	128
MAR											
26...	1200	112	669	10.7	100	8.1	1020	14.0	6.5	220	40.3
APR											
22...	1700	4.4	665	9.7	115	8.1	3310	17.0	16.0	890	160
MAY											
20...	1500	4.9	679	10.2	115	8.0	2800	16.0	15.0	730	139
JUN											
16...	1930	6.6	678	8.2	113	8.3	3090	21.5	25.0	660	117
JUL											
14...	1300	.05	695	7.2	100	8.0	2930	31.0	26.5	810	164
AUG											
19...	1530	.01	669	6.4	88	8.0	3390	32.5	24.0	950	183
SEP											
16...	1330	.03	665	10.2	123	8.3	3170	23.0	17.0	870	163

Date	Magnesium, water, fltrd, mg/L (00925)	Potassium, water, fltrd, mg/L (00935)	Sodium adsorption ratio (00931)	Sodium, water, fltrd, mg/L (00930)	ANC, wat unf fixed end pt, lab, mg/L as CaCO3 (90410)	Alkalinity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Alkalinity, wat flt inc tit field, mg/L as CaCO3 (39086)	Bicarbonate, wat flt incrm. titr., field, mg/L (00453)	Carbonate, wat flt incrm. titr., field, mg/L (00452)	Chloride, water, fltrd, mg/L (00940)	Fluoride, water, fltrd, mg/L (00950)
OCT 2002											
17...	109	15.2	6	407	E344	E314	365	445	--	109	.80
NOV											
05...	126	14.9	6	474	372	E234	393	479	--	148	.80
DEC											
17...	128	20.6	9	652	E332	E373	434	499	14	81.5	.94
JAN 2003											
21...	143	23.9	10	738	543	543	480	586	--	118	.97
FEB											
18...	75.4	15.9	6	374	361	324	262	315	--	33.9	.60
MAR											
26...	30.1	7.13	4	129	124	119	99	122	--	20.5	.25
APR											
22...	120	21.1	7	480	467	340	376	447	--	66.2	.65
MAY											
20...	93.6	18.2	6	357	327	327	285	346	--	100	.5
JUN											
16...	90.2	18.5	9	523	355	352	291	356	--	90.2	.7
JUL											
14...	97.0	16.9	6	416	333	332	276	336	--	99.5	.7
AUG											
19...	119	20.3	7	518	404	356	--	--	--	101	1.0
SEP											
16...	112	15.9	7	469	301	271	263	316	2	95.4	.9

E--Estimated.

Date	Silica, water, fltrd, mg/L (00955)	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of constituents mg/L (70301)	Residue water, fltrd, tons/ acre-ft (70303)	Residue water, fltrd, tons/d (70302)	Residue on evap. at 180degC wat flt mg/L (70300)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Ammonia water, fltrd, mg/L as N (00608)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Ortho-phos-phate, water, fltrd, mg/L as P (00671)
OCT 2002											
17...	10.4	1240	2280	3.39	.07	2500	.56	<.04	<.06	<.008	<.02
NOV											
05...	10.7	1420	2630	3.95	.16	2900	.37	<.04	<.06	<.008	<.02
DEC											
17...	10.3	1790	3130	4.63	11.0	3400	.35	E.03	<.06	<.008	<.02
JAN 2003											
21...	11.7	2020	3570	5.07	7.15	3730	.34	E.02	<.06	<.008	<.02
FEB											
18...	9.11	1050	1840	2.67	26.0	1970	.70	E.02	.09	E.006	<.02
MAR											
26...	7.53	353	648	.97	217	716	1.9	<.04	.08	<.008	E.01
APR											
22...	9.12	1410	2490	3.69	32.3	2720	--	--	--	--	--
MAY											
20...	8.24	1130	2010	3.01	29.3	2210	.97	<.04	<.06	<.008	<.02
JUN											
16...	5.25	1270	2290	3.26	42.7	2400	--	--	--	--	--
JUL											
14...	10.9	1210	2180	3.11	.31	2290	.89	<.04	<.06	<.008	<.02
AUG											
19...	11.8	1460	2630	3.77	.07	2770	--	--	--	--	--
SEP											
16...	12.5	1360	2380	3.54	.21	2610	.35	<.04	<.06	<.008	<.02

Date	Phos-phorus, water, unfltrd mg/L (00665)	Alum-inum, water, unfltrd recover-able, ug/L (01105)	Arsenic water, fltrd, ug/L (01000)	Arsenic water unfltrd ug/L (01002)	Barium, water, unfltrd recover-able, ug/L (01007)	Beryll-ium, water, unfltrd recover-able, ug/L (01012)	Boron, water, unfltrd recover-able, ug/L (01022)	Cadmium water, unfltrd ug/L (01027)	Chrom-ium, water, unfltrd recover-able, ug/L (01034)	Copper, water, unfltrd recover-able, ug/L (01042)	Iron, water, fltrd, ug/L (01046)
OCT 2002											
17...	.038	117	.7	<2	27	<.12	157	<.07	<.8	5.5	E23
NOV											
05...	.020	55	1.0	<2	34	<.12	179	<.07	<.8	9.6	E24
DEC											
17...	.016	90	1.1	<2	23	<.12	256	<.07	<.8	9.5	E19
JAN 2003											
21...	.010	52	1.1	E1	25	<.12	257	<.07	<.8	6.5	E21
FEB											
18...	.051	165	.7	<2	20	<.12	153	<.07	<.8	10.7	60
MAR											
26...	.33	8920	1.1	3	124	1.01	65	.27	5.0	20.2	27
APR											
22...	--	270	1.2	2	63	<.12	223	<.07	<.8	8.6	<30
MAY											
20...	.061	1580	1.1	<2	63	E.06	197	.05	E.6	11.9	E6
JUN											
16...	--	788	1.3	E2	58	E.09	244	<.07	E.7	10.3	<16
JUL											
14...	.077	865	1.6	E2	102	E.09	164	<.07	1.0	6.9	<24
AUG											
19...	--	1360	1.5	3	75	.16	189	E.04	1.1	11.0	<24
SEP											
16...	.034	561	1.0	E1	23	<.12	161	<.07	2.2	7.3	<24

E--Estimated.

WATER QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003--Continued

Date	Iron, water, unfltrd recover -able, ug/L (01045)	Lead, water, unfltrd recover -able, ug/L (01051)	Mangan- ese, water, fltrd, ug/L (01056)	Mangan- ese, water, unfltrd recover -able, ug/L (01055)	Nickel, water, unfltrd recover -able, ug/L (01067)	Selen- ium, water, unfltrd ug/L (01147)	Zinc, water, unfltrd recover -able, ug/L (01092)	Sus- pended sedi- ment concen- tration mg/L (80154)	Sus- pended sedi- ment load, tons/d (80155)
OCT 2002									
17...	830	.34	252	263	8.91	1.2	7	117	.00
NOV									
05...	720	.14	365	383	16.6	1.5	6	53	.00
DEC									
17...	70	.15	71.8	67.9	12.6	1.6	6	101	.33
JAN 2003									
21...	150	<.12	131	126	7.89	1.8	4	98	.19
FEB									
18...	250	.33	76.9	70.7	10.5	E.7	9	13	.17
MAR									
26...	6930	18.9	19.8	118	14.7	1.1	69	1210	365
APR									
22...	490	.77	217	281	9.78	1.7	10	211	2.5
MAY									
20...	880	1.35	195	242	7.09	1.4	9	77	1.0
JUN									
16...	1010	1.68	69.2	127	6.39	1.3	10	144	2.6
JUL									
14...	1140	1.82	402	1320	9.08	1.4	9	131	.02
AUG									
19...	1670	2.60	381	448	10.9	1.1	12	293	.01
SEP									
16...	610	.72	73.0	156	5.37	1.6	6	71	.01

E--Estimated.

YELLOWSTONE RIVER BASIN

06325500 LITTLE POWDER RIVER NEAR BROADUS, MT

WATER-QUALITY RECORDS

LOCATION.--Lat 45°23'25", long 105°18'15" (NAD 27), in NW$^1/_4$NE$^1/_4$ sec. 21, T.5 S., R.52 E., Powder River County, Hydrologic Unit 10090208, on left bank 1.5 mi downstream from East Fork, 5.5 mi southeast of Broadus, and 8 mi upstream from mouth.
DRAINAGE AREA.--1,974 mi^2.
PERIOD OF RECORD.--March 2002 to current year.
GAGE.--None. Elevation of site is 3,020 ft (NGVD 29).
REMARKS.--Data collected from April 2001 to February 2002 at station 06325550, Little Powder River at mouth, near Broadus. Site moved to current location in March 2002.

WATER QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instantaneous discharge, cfs (00061)	Barometric pressure, mm Hg (00025)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	Specif. conductance, wat unf uS/cm 25 degC (00095)	Temperature, air, deg C (00020)	Temperature, water, deg C (00010)	Hardness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)
OCT 2002											
02...	1345	.50	688	7.7	75	8.6	1760	6.5	9.5	120	27.7
NOV											
20...	1430	E1.0	688	10.8	95	8.4	2570	15.5	5.0	300	65.3
DEC											
04...	1530	4.7	690	12.0	93	8.3	2540	-10.0	0.5	490	103
JAN 2003											
08...	0800	4.5	684	9.2	71	8.4	2700	-5.0	0.0	530	119
FEB											
18...	1700	10	682	10.4	80	8.1	2090	5.0	0.0	460	109
MAR											
06...	1730	7.3	680	9.6	74	8.1	2390	0.0	0.0	460	106
APR											
23...	0830	9.9	671	8.6	92	8.4	2800	13.5	12.5	670	135
MAY											
05...	1730	25	676	9.6	98	8.8	3010	7.0	10.5	720	147
JUN											
03...	1230	11	682	8.5	103	8.3	2150	17.0	19.0	510	109
JUL											
14...	1730	2.4	683	8.3	122	8.4	2170	31.0	29.0	300	58.7
AUG											
19...	1700	E1.1	678	8.9	123	8.6	1790	31.0	25.5	110	22.8
SEP											
03...	0800	E1.5	691	7.8	88	8.5	1700	10.5	16.0	110	25.9

Date	Magnesium, water, fltrd, mg/L (00925)	Potassium, water, fltrd, mg/L (00935)	Sodium adsorption ratio (00931)	Sodium, water, fltrd, mg/L (00930)	Alkalinity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chloride, water, fltrd, mg/L (00940)	Fluoride, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of constituents mg/L (70301)	Residue water, fltrd, tons/acre-ft (70303)
OCT 2002											
02...	12.1	3.02	15	371	409	4.33	.21	10.3	471	1150	1.56
NOV											
20...	34.5	5.92	10	405	379	15.1	.30	7.1	803	1560	2.13
DEC											
04...	55.7	13.2	9	432	361	32.0	.49	10.0	970	1830	2.49
JAN 2003											
08...	57.0	14.1	8	410	413	35.9	.62	11.3	1010	1900	2.59
FEB											
18...	46.5	12.8	6	321	329	32.4	.58	11.9	793	1520	2.07
MAR											
06...	48.5	12.0	8	389	458	29.7	.54	11.4	867	1740	2.36
APR											
23...	80.0	19.2	7	434	401	37.5	.55	8.8	1140	2100	2.85
MAY											
05...	86.3	20.7	7	405	284	53.8	.71	9.1	1280	2170	2.95
JUN											
03...	57.1	17.7	7	338	294	36.7	.6	8.1	824	1570	2.13
JUL											
14...	38.3	12.2	10	387	333	17.9	.5	7.0	769	1490	2.03
AUG											
19...	11.8	3.52	15	361	435	5.16	.3	5.1	479	1150	1.56
SEP											
03...	11.7	3.17	15	364	429	4.79	.2	9.6	447	1120	1.53

E--Estimated.

YELLOWSTONE RIVER BASIN

06325500 LITTLE POWDER RIVER NEAR BROADUS, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003--Continued

Date	Residue water, fltrd, tons/d (70302)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Ammonia water, fltrd, mg/L as N (00608)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Phos-phorus, water, unfltrd mg/L (00665)	Arsenic water unfltrd ug/L (01002)	Barium, water, unfltrd recover-able, ug/L (01007)	Boron, water, unfltrd recover-able, ug/L (01022)	Cadmium water, unfltrd ug/L (01027)
OCT 2002											
02...	1.55	.51	<.04	<.022	E.002	<.007	.069	4	40	58	.06
NOV											
20...	E4.22	.39	E.03	<.022	<.002	<.007	.048	E2	50	104	.05
DEC											
04...	23.3	.38	.05	.053	.003	<.007	.045	E2	40	117	E.04
JAN 2003											
08...	23.0	.35	E.03	.024	.003	<.007	.029	E2	33	124	<.07
FEB											
18...	43.2	.52	E.03	.048	.003	.010	.074	E2	35	96	<.04
MAR											
06...	34.4	.44	E.03	.039	E.002	<.007	.044	E1	33	103	<.04
APR											
23...	56.4	.74	<.04	<.022	<.002	<.007	.064	4	62	169	E.05
MAY											
05...	147	.72	<.04	<.022	<.002	<.007	.063	E2	52	190	E.04
JUN											
03...	45.3	1.0	<.04	<.022	E.002	<.007	.174	3	58	187	.10
JUL											
14...	9.54	.80	<.04	<.022	<.002	<.007	.095	3	54	147	.05
AUG											
19...	E3.47	.72	<.04	<.022	<.002	<.007	.100	7	56	99	.06
SEP											
03...	E4.55	.58	<.04	<.022	<.002	<.007	.095	7	51	85	.07

Date	Chrom-ium, water, unfltrd recover-able, ug/L (01034)	Copper, water, unfltrd recover-able, ug/L (01042)	Iron, water, unfltrd recover-able, ug/L (01045)	Lead, water, unfltrd recover-able, ug/L (01051)	Mangan-ese, water, unfltrd recover-able, ug/L (01055)	Nickel, water, unfltrd recover-able, ug/L (01067)	Selen-ium, water, unfltrd ug/L (01147)	Zinc, water, unfltrd recover-able, ug/L (01092)	Suspnd. sedi-ment, sieve diametr percent <.063mm (70331)	Sus-pended sedi-ment concen-tration mg/L (80154)	Sus-pended sedi-ment load, tons/d (80155)
OCT 2002											
02...	1.0	5.3	1330	1.99	74.8	4.37	1.0	9	99	112	.15
NOV											
20...	1.1	9.7	1400	1.58	240	6.82	1.4	12	97	223	E.60
DEC											
04...	1.0	8.7	1130	1.19	41.3	8.85	1.1	9	88	140	1.8
JAN 2003											
08...	E.6	5.8	800	.80	87.6	9.02	<1.0	6	90	168	2.0
FEB											
18...	E.7	7.4	1460	1.43	103	8.47	.9	8	89	119	3.4
MAR											
06...	1.0	5.0	<20	.98	101	5.49	.9	6	97	48	.95
APR											
23...	1.1	8.4	1320	1.81	303	8.91	1.7	12	97	229	6.2
MAY											
05...	.8	7.7	940	1.41	176	8.61	1.2	10	98	93	6.3
JUN											
03...	3.1	10.2	3810	5.56	192	9.29	1.6	27	97	388	11
JUL											
14...	1.2	7.2	1770	2.35	118	5.25	.9	10	100	172	1.1
AUG											
19...	11.9	7.7	1590	3.22	124	4.98	.5	9	98	80	E.24
SEP											
03...	1.3	7.7	2390	3.38	114	4.67	.9	13	99	101	E.41

E--Estimated.

YELLOWSTONE RIVER BASIN

06326500 POWDER RIVER NEAR LOCATE, MT

LOCATION.--Lat 46°25'48", long 105°18'34" (NAD 27), in $SW^1/_4SW^1/_4SE^1/_4$ sec. 23, T.8 N., R.51 E., Custer County, Hydrologic Unit 10090209, on left bank at downstream side of bridge on U.S. Highway 12, 0.1 mi west of Locate, and 25 mi east of Miles City, and at river mile 29.4.

DRAINAGE AREA (REVISED).--13,068 mi^2.

PERIOD OF RECORD.--March 1938 to current year.

WATER-DISCHARGE RECORDS

REVISED RECORDS.--WSP 926: 1939. WSP 1309: 1938-39 (M). WSP 1729: Drainage area. WDR MT-04-1: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 2,384.79 ft (NGVD 29) (levels by U.S. Army Corps of Engineers). Prior to July 11, 1947, nonrecording gage at bridge 1.5 mi upstream, and July 11, 1947 to Sept. 30, 1965, water-stage recorder at site near upstream bridge at different elevation. Oct. 1, 1965 to Oct. 4, 1966, nonrecording gage, and Oct. 5, 1966 to Mar. 21, 1978, water-stage recorder at present site and elevation. Mar. 22, 1978 to Apr. 23, 1981, water-stage recorder 1.5 mi upstream at different elevation, Apr. 24 to Aug. 20, 1981, water-stage recorder at present site and elevation, and Aug. 21, 1981 to Sept. 30, 1981, water-stage recorder 1.5 mi upstream at different elevation. Oct. 1, 1981 to Apr. 5, 1995 water-stage recorder at site 1.5 miles downstream at different elevation. Apr. 7, 1995 to present, water-stage recorders located on each bank and used depending on control conditions.

REMARKS.--Water-discharge records good except those for estimated daily discharges, which are poor. Some regulation by three reservoirs in Wyoming with combined usable capacity of 36,800 acre-ft. Diversions for irrigation of about 101,800 acres upstream from station. U.S. Army Corps of Engineers satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	92	e200	114	e150	e250	e200	613	358	765	437	12	0.40
2	92	e190	150	e150	e300	e260	536	377	960	438	12	0.28
3	89	e200	164	e150	e310	e310	486	365	939	481	11	0.16
4	97	e170	e150	e150	e310	e300	454	409	998	445	11	0.17
5	106	e190	e140	e160	e300	e320	454	619	1110	367	10	0.15
6	140	e200	e130	e170	e250	e310	644	892	946	346	9.3	0.20
7	135	e220	e100	e170	e220	e310	815	745	898	325	8.6	0.14
8	129	e220	e80	e180	e220	e320	690	602	870	293	8.7	0.10
9	122	e220	e80	e180	e210	e310	582	534	720	225	7.5	1.1
10	120	e220	e80	e170	e190	e310	536	536	647	185	7.1	2.2
11	124	e220	e80	e150	e170	e300	481	496	593	148	e7.0	2.3
12	133	e230	e80	e130	e170	e300	452	486	528	118	7.6	4.1
13	144	244	e80	e110	e170	e300	423	470	468	101	e7.5	8.7
14	145	241	e80	e110	e190	e500	406	444	429	104	e8.0	15
15	154	212	e80	e130	e210	e900	388	410	422	103	8.9	15
16	149	179	e80	e130	e220	1170	384	384	393	74	e6.0	16
17	152	170	e90	e140	e220	1440	389	390	392	62	e4.0	13
18	166	171	e90	e140	e220	2000	519	407	363	46	e3.0	16
19	186	173	e90	e150	e220	1290	742	385	341	44	e2.5	16
20	181	173	e90	e170	e220	1300	757	364	321	32	2.4	14
21	186	173	e90	e180	e220	1340	746	359	310	26	3.1	18
22	197	183	e90	e170	e200	1190	727	342	572	20	3.0	23
23	196	190	e90	e150	e170	1190	630	336	924	16	2.3	27
24	202	175	e90	e110	e140	1020	539	337	814	16	1.6	29
25	282	118	e90	e100	e100	868	498	358	768	15	1.3	38
26	216	128	e90	e110	e90	813	443	348	626	15	0.90	39
27	225	94	e90	e130	e80	754	405	337	562	15	0.57	47
28	233	114	e100	e150	e100	748	354	290	487	15	0.37	54
29	284	125	e130	e170	---	746	341	244	467	14	0.20	59
30	252	105	e150	e190	---	728	347	457	470	14	0.33	71
31	224	---	e160	e220	---	670	---	699	---	13	0.32	---
TOTAL	5153	5448	3198	4670	5670	22517	15781	13780	19103	4553	168.09	530.00
MEAN	166	182	103	151	202	726	526	445	637	147	5.42	17.7
MAX	284	244	164	220	310	2000	815	892	1110	481	12	71
MIN	89	94	80	100	80	200	341	244	310	13	0.20	0.10
AC-FT	10220	10810	6340	9260	11250	44660	31300	27330	37890	9030	333	1050

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1939 - 2003, BY WATER YEAR (WY)

MEAN	251	220	150	143	430	1229	741	1143	1601	565	213	169
MAX	921	790	417	476	3850	4627	3062	5970	8045	2015	1096	898
(WY)	1941	1999	1942	1981	1943	1972	1965	1978	1944	1993	1941	1941
MIN	1.77	12.5	12.5	4.53	2.82	80.2	109	114	48.0	10.0	1.30	0.19
(WY)	1961	1961	1961	1950	1950	1950	1961	2001	2002	2002	1988	1960

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1939 - 2003	
ANNUAL TOTAL	51454.51		100571.09			
ANNUAL MEAN	141		276		571	
HIGHEST ANNUAL MEAN					1622	1944
LOWEST ANNUAL MEAN					79.4	1961
HIGHEST DAILY MEAN	1500	Sep 1	2000	Mar 18	26000	Feb 19 1943
LOWEST DAILY MEAN	0.37	Jul 27	0.10	Sep 8	0.00	Jan 16 1950
ANNUAL SEVEN-DAY MINIMUM	1.3	Aug 17	0.17	Sep 2	0.00	Jan 16 1950
MAXIMUM PEAK FLOW			3220	Mar 18	31000	Feb 19 1943
MAXIMUM PEAK STAGE			4.85	Mar 18	a12.20	Mar 16 1978
INSTANTANEOUS LOW FLOW					b0.00	Jul 30 1998
ANNUAL RUNOFF (AC-FT)	102100		199500		413700	
10 PERCENT EXCEEDS	277		694		1340	
50 PERCENT EXCEEDS	105		180		237	
90 PERCENT EXCEEDS	7.6		8.7		40	

a--Backwater from ice.
b--On many days in 1950, 1960-61, and 1998.
e--Estimated.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1948-63, 1975 to September 1994, January 1999 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: January 1951 to September 1962, October 1974 to September 1981, July 1988 to January 1990.
SUSPENDED-SEDIMENT DISCHARGE: October 1974 to September 1984.

REMARKS.--Unpublished records of instantaneous water temperature and specific conductance are available in files of District office.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE (water years 1951-62, 1975-81, 1988-90): Maximum daily, 4,000 microsiemens per centimeter (µS/cm) at 25.0°C, Apr. 1, 1977; minimum daily, 523 µS/cm at 25.0°C, Mar. 11, 12, 1989.
SEDIMENT CONCENTRATION: Maximum daily mean, 56,800 mg/L May 6, 1975; minimum daily mean, 1.8 mg/L July 30, 1977.
SEDIMENT LOAD: Maximum daily, 906,000 tons May 6, 1975; minimum daily, 1.2 tons July 20, 1981.

WATER QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instan-taneous dis-charge, cfs (00061)	Baro-metric pres-sure, mm Hg (00025)	Dis-solved oxygen, mg/L (00300)	Dis-solved oxygen, percent of sat-uration (00301)	pH, water, unfltrd field, std units (00400)	Specif. conduc-tance, wat unf uS/cm 25 degC (00095)	Temper-ature, air, deg C (00020)	Temper-ature, water, deg C (00010)	Hard-ness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)
OCT 2002											
03...	1700	97	--	--	--	8.3	2580	10.5	13.0	660	154
NOV											
13...	0900	249	--	--	--	8.4	1980	10.0	4.0	580	133
DEC											
12...	0830	E80	--	--	--	8.2	2910	-5.0	0.0	810	186
JAN 2003											
22...	0900	E170	713	9.0	66	8.0	2190	-20.0	0.0	690	162
FEB											
19...	0900	E220	700	9.6	72	7.9	1460	3.0	0.0	410	101
MAR											
18...	1000	1970	699	11.7	88	7.8	1170	0.0	0.0	300	73.0
APR											
08...	1100	689	705	10.7	96	8.2	2410	13.0	7.0	610	149
MAY											
21...	0830	334	704	9.4	96	8.3	2150	15.0	12.5	600	139
JUN											
02...	1500	868	695	8.1	97	8.3	929	20.0	19.5	240	56.9
JUL											
16...	0900	75	700	9.4	118	8.2	1990	26.0	22.0	550	129
AUG											
20...	0830	3.1	695	8.7	104	8.0	3000	27.0	19.0	600	129
SEP											
03...	1530	.20	705	6.7	94	8.1	2830	30.0	28.0	610	149

E--Estimated.

Date	Magnes-ium, water, fltrd, mg/L (00925)	Potas-sium, water, fltrd, mg/L (00935)	Sodium adsorp-tion ratio (00931)	Sodium, water, fltrd, mg/L (00930)	ANC, wat unf fixed end pt, lab, mg/L as CaCO3 (90410)	Alka-linity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chlor-ide, water, fltrd, mg/L (00940)	Fluor-ide, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of consti-tuents mg/L (70301)
OCT 2002											
03...	66.5	9.52	6	332	242	170	158	.51	8.6	992	1820
NOV											
13...	59.3	7.00	4	220	309	208	94.3	.44	7.6	718	1360
DEC											
12...	84.7	9.33	5	352	346	306	134	.48	11.1	1090	2050
JAN 2003											
22...	70.0	7.91	5	280	324	324	131	.53	10.6	760	1620
FEB											
19...	39.7	6.89	4	179	E243	211	75.0	.36	8.0	476	1010
MAR											
18...	29.8	5.64	3	130	595	142	55.2	.34	5.6	368	754
APR											
08...	58.3	7.63	5	300	477	214	127	.61	7.5	931	1710
MAY											
21...	60.1	8.83	5	259	258	226	89.7	.58	8.5	827	1530
JUN											
02...	23.8	5.15	3	92.8	278	124	38.2	.44	8.4	290	591
JUL											
16...	56.1	9.74	5	269	232	205	70.7	.46	11.6	772	1440
AUG											
20...	67.9	15.9	9	481	259	266	106	.46	14.2	1250	2230
SEP											
03...	58.5	15.0	8	452	336	383	69.7	.51	16.0	990	1980

Date	Residue water, fltrd, tons/ acre-ft (70303)	Residue water, fltrd, tons/d (70302)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Ammonia water, fltrd, mg/L as N (00608)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Phos-phorus, water, unfltrd mg/L (00665)	Arsenic water unfltrd ug/L (01002)	Barium, water, unfltrd recover-able, ug/L (01007)	Boron, water, unfltrd recover-able, ug/L (01022)
OCT 2002											
03...	2.48	477	.65	<.04	<.022	<.002	<.007	.244	3	96	216
NOV											
13...	1.86	918	1.4	<.04	.139	<.002	E.004	.658	5	182	191
DEC											
12...	2.79	E443	.48	.07	.189	<.002	E.005	.121	E1	69	240
JAN 2003											
22...	2.20	E742	.29	<.04	.365	E.002	<.007	.049	E1	45	221
FEB											
19...	1.38	E601	.95	E.02	.646	.007	.015	.272	2	110	166
MAR											
18...	1.03	4010	11	.10	.507	.007	E.004	5.96	14	780	160
APR											
08...	2.33	3190	6.6	<.04	.814	.003	E.005	3.26	15	443	244
MAY											
21...	2.08	1380	1.3	<.04	.256	E.002	.009	.573	5	114	186
JUN											
02...	.80	1390	3.7	<.04	.177	.004	.008	2.26	10	155	152
JUL											
16...	1.96	292	.72	<.04	<.022	<.002	<.007	.179	2	87	220
AUG											
20...	3.03	18.6	.37	<.04	<.022	<.002	<.007	.011	2	69	371
SEP											
03...	2.69	1.07	.36	<.04	<.022	<.002	<.007	.015	<2	51	525

E--Estimated.

WATER QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003--Continued

Date	Cadmium water, unfltrd ug/L (01027)	Chrom-ium, water, unfltrd recover -able, ug/L (01034)	Copper, water, unfltrd recover -able, ug/L (01042)	Iron, water, unfltrd recover -able, ug/L (01045)	Lead, water, unfltrd recover -able, ug/L (01051)	Mangan-ese, water, unfltrd recover -able, ug/L (01055)	Mercury water, unfltrd recover -able, ug/L (71900)
OCT 2002							
03...	.19	3.0	10.4	4920	4.20	133	--
NOV							
13...	.56	9.0	23.9	15300	12.1	336	--
DEC							
12...	.11	1.9	10.8	2520	2.10	49.4	--
JAN 2003							
22...	E.03	1.2	5.4	1150	1.02	26.7	--
FEB							
19...	.13	6.2	17.4	6950	9.13	119	--
MAR							
18...	4.59	27.8	125	78200	143	2970	.28
APR							
08...	2.38	27.7	82.1	56700	66.0	1820	--
MAY							
21...	.35	6.3	21.9	13500	13.2	334	--
JUN							
02...	1.29	18.3	50.8	38600	43.4	1250	--
JUL							
16...	.12	2.3	7.9	3520	2.66	91.2	--
AUG							
20...	<.07	<.8	8.5	20	<.12	22.9	--
SEP							
03...	<.07	<.8	3.5	150	.97	56.3	--

Date	Nickel, water, unfltrd recover -able, ug/L (01067)	Selen-ium, water, unfltrd ug/L (01147)	Zinc, water, unfltrd recover -able, ug/L (01092)	Suspnd. sedi-ment, sieve diametr percent <.063mm (70331)	Sus-pended sedi-ment concen-tration mg/L (80154)	Sus-pended sedi-ment load, tons/d (80155)
OCT 2002						
03...	14.2	2.5	26	98	394	103
NOV						
13...	27.6	2.9	74	94	1310	882
DEC						
12...	16.5	2.8	15	99	350	E75.6
JAN 2003						
22...	9.14	2.5	10	--	--	--
FEB						
19...	18.1	1.8	39	97	588	E349
MAR						
18...	145	4.2	402	55	16000	85100
APR						
08...	82.1	7.4	282	75	6680	12400
MAY						
21...	17.9	3.9	61	37	2340	2110
JUN						
02...	53.1	2.6	167	57	5220	12200
JUL						
16...	8.24	1.9	18	97	216	44
AUG						
20...	8.46	1.4	E4	68	32	.27
SEP						
03...	4.84	E.9	5	77	105	.06

E--Estimated.

06327500 YELLOWSTONE RIVER AT GLENDIVE, MT

LOCATION.--Lat 47°06'21", long 104°43'07" (NAD 27), in $SE^1/_4NW^1/_4NE^1/_4$ sec. 35, T. 16N., R. 55E., Dawson County, Hydrologic Unit 10100004, on right bank at bridge at City of Glendive water treatment plant, 50 feet upstream from Bell Street Bridge, and at river mile 92.4.

DRAINAGE AREA.--65,900 mi^2.

PERIOD OF RECORD.--October 1897 to December 1910, October 1931 to September 1934, October 2002 to September 2003.

GAGE.--Water-stage recorder. Elevation of gage is 1,881.3 ft (NGVD 29) from City of Glendive. October 1897 to December 1910, October 1931 to September 1934 nonrecording gage at different datum.

REMARKS.-- Records good except those for October 1 to March 18, which are poor. Diversions for irrigation of about 1,200,000 acres upstream of station. Some regulation on tributary streams. U.S. Geological Survey satellite telemeter at station. Several observations of water temperature and specific conductance were obtained during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4610	4760	e4500	e3800	e4300	e2900	6230	9210	43500	13800	5960	3480
2	4640	5250	4410	e4000	e4300	e3600	5940	8500	49500	14400	5530	3740
3	4580	4610	4530	e4000	e4300	e3800	5770	8400	51700	15500	5010	3880
4	4580	4380	4180	e4000	e4400	e4500	5950	8560	53000	15700	4790	3960
5	4700	4350	e3800	e4000	e4400	e4600	6120	9140	48800	15200	4750	3890
6	4670	4500	e4000	e4000	e4600	e4500	6440	10100	37100	14500	4580	3820
7	4670	4670	e3900	e4000	e4600	e4200	6600	10900	32000	13700	4260	3780
8	5030	4850	e3900	e3900	e4400	e3500	6660	9570	28400	12900	3940	3780
9	5030	5030	e3700	e3700	e4400	e3100	6180	9180	26400	12400	3900	3830
10	4970	5000	e3600	e3500	e4600	e2800	6010	8680	23600	11700	3740	3870
11	5000	5030	e3800	e3300	e4600	e2400	5700	9110	23200	11200	3360	3910
12	4850	5000	e3900	e3100	e4400	e2200	5390	9990	26100	10500	3510	4020
13	5030	4910	e3900	e2900	e4200	e4800	5210	10500	29700	9710	3510	4300
14	4910	4910	e4000	e2700	e4200	e7300	4860	10100	30900	9450	3420	4450
15	4850	4880	e4000	e2700	e4200	e13800	5250	9180	29600	9130	3330	4490
16	4790	4760	e4000	e2800	e4400	e24500	5650	8310	28500	8600	2970	4480
17	4730	4850	e4000	e2600	e4500	e29500	6050	8210	28700	8150	2920	4560
18	4820	4730	e3800	e2800	e4500	e27500	5730	8290	28700	7900	2890	4630
19	4760	4760	e3700	e3400	e4500	20800	6290	10000	28400	7580	2930	4630
20	4730	4670	e3500	e3800	e4500	16800	6250	13200	28500	7190	3100	4580
21	4730	4620	e3300	e3800	e4300	14700	6410	14700	29000	6880	2990	4610
22	4760	4580	e3100	e3800	e4200	11800	6000	14200	29100	6590	2950	4780
23	4820	4540	e2700	e3500	e4000	10600	6530	12300	28400	6290	2990	4800
24	4730	4550	e2200	e3200	e3800	9350	6530	11200	26900	6100	3030	4650
25	4700	4500	e1800	e3000	e3500	8370	6080	10800	23700	5960	3050	4580
26	4730	e4500	e2000	e2700	e3300	7210	6850	12300	20800	5880	2950	4590
27	4730	4440	e2300	e3000	e3200	6950	8120	18100	19000	5680	2910	4410
28	4880	e4400	e2600	e3100	e2800	6410	9270	25300	17200	5670	2870	4270
29	4760	e4500	e2900	e3800	---	6500	9360	31400	15300	6080	2970	4150
30	4820	e4500	e3200	e4100	---	6330	9570	34700	14100	6700	3150	4020
31	4790	---	e3500	e4200	---	6220	---	38300	---	6370	3240	---
TOTAL	148400	141030	108720	107200	117400	281540	193000	412430	899800	297410	111500	126940
MEAN	4787	4701	3507	3458	4193	9082	6433	13300	29990	9594	3597	4231
MAX	5030	5250	4530	4200	4600	29500	9570	38300	53000	15700	5960	4800
MIN	4580	4350	1800	2600	2800	2200	4860	8210	14100	5670	2870	3480
AC-FT	294400	279700	215600	212600	232900	558400	382800	818100	1785000	589900	221200	251800

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1898 - 2003, BY WATER YEAR (WY)*

MEAN	6613	5541	4569	4501	4611	8808	9575	21680	47480	29600	11370	7776
MAX	9503	7390	6670	5700	5940	18790	23500	44700	74220	72000	24110	12100
(WY)	1909	1902	1898	1904	1902	1910	1899	1901	1909	1899	1907	1909
MIN	4787	4200	2924	3268	3361	5040	4374	9661	12950	4054	2785	2856
(WY)	2003	1900	1932	1932	1933	1899	1905	1905	1934	1934	1934	1934

SUMMARY STATISTICS	FOR 2003 WATER YEAR		WATER YEARS 1898 - 2003*	
ANNUAL TOTAL	2945370			
ANNUAL MEAN	8070		13620	
HIGHEST ANNUAL MEAN			19610	1899
LOWEST ANNUAL MEAN			6061	1934
HIGHEST DAILY MEAN	53000	Jun 4	107000	Jun 9 1909
LOWEST DAILY MEAN	1800	Dec 25	1060	Dec 14 1932
ANNUAL SEVEN-DAY MINIMUM	2360	Dec 23	1380	Dec 12 1932
MAXIMUM PEAK FLOW	a54300	Jun 4	c118000	Jun 8 1909
MAXIMUM PEAK STAGE	b60.16	Mar 16	b60.16	Mar 16 2003
INSTANTANEOUS LOW FLOW			d1060	Dec 14 1932
ANNUAL RUNOFF (AC-FT)	5842000		9867000	
10 PERCENT EXCEEDS	17600		36200	
50 PERCENT EXCEEDS	4730		6700	
90 PERCENT EXCEEDS	3100		4140	

*--During periods of operation (October 1897 to December 1910, October 1931 to September 1934, October 2002 to September 2003).
a--Gage height, 49.69 ft.
b--Backwater from ice.
c--Observed, gage height, 12.7 ft, datum in use.
d--Observed.
e--Estimated.

YELLOWSTONE RIVER BASIN

06329500 YELLOWSTONE RIVER NEAR SIDNEY

(National water-quality assessment program)

LOCATION.--Lat 47°40'42", long 104°09'22" (NAD 27), in $SW^1/_4NE^1/_4SW^1/_4$ sec.9, T.22 N., R.59 E., Richland County, Hydrologic Unit 10100004, on left bank at Montana-Dakota Utilities Company powerplant, 0.2 mi downstream from bridge on State Highway 23, 2.5 mi south of Sidney, 3.0 mi downstream from Fox Creek, and at river mile 29.2.

DRAINAGE AREA (REVISED).--69,083 mi^2. Area at site 4.5 mi upstream, 68,812 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1910 to September 1931 (published as "at Intake"), October 1933 to current year. If monthly figures of diversions to Lower Yellowstone Canal at Intake are added to records at this site, records equivalent to those published as Yellowstone River at Glendive (1898-1910, 1931-34) can be obtained. Monthly discharge only for some periods, published in WSP 1309. Monthly figures of diversions into Lower Yellowstone Canal prior to 1951 published in WSP 1309, 1951-60 published in WSP 1729, 1961-65 published in WSP 1916, 1966-70 published in WSP 2116, and 1971 to current year are published in annual reports.

REVISED RECORDS.--WDR MT-04-1: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 1,881.3 ft (NGVD 29) (levels by U.S. Army Corps of Engineers). Jan. 1, 1911, to Sept. 30, 1931, nonrecording gage at site 32 miles upstream at different elevation. Apr. 9, 1934, water-stage recorder at two sites within 500 ft of highway bridge 0.2 mi upstream and May 17, 1945, to Apr. 3, 1952, nonrecording gage on same bridge at elevation 1.36 ft higher. Apr. 4, 1952, to Nov. 19, 1967, water-stage recorder at site 4.5 mi upstream at different elevation.

REMARKS.--Water-discharge records good except those for estimated daily discharges, which are poor. Flow regulated to some extent by Bighorn Lake, usable capacity, 1,312,000 acre-ft, on the Bighorn River and on other tributary streams in Wyoming and Montana. Diversion for irrigation of about 1,250,000 acres upstream from station. Lower Yellowstone Project Main Canal diverts from left bank in $NW^1/_4$ sec.36, T.18 N., R.56 E., at Lower Yellowstone diversion dam at Intake about 36.6 mi upstream for irrigation of about 52,000 acres of which about one-third lies upstream from station. U. S. Army Corps of Engineers satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4570	5250	e4700	e3700	e4400	e3000	6400	8190	36600	12700	5050	1850
2	4830	5130	e4700	e4000	e4500	e3100	6080	7820	41800	12600	4660	2070
3	4970	5300	e4900	e4200	e4500	e3800	5740	7400	45900	13800	4340	2260
4	5020	4970	e4700	e4200	e4500	e4000	5690	7480	47400	13800	3930	2450
5	5000	4750	e4300	e4200	e4600	e4700	5740	7760	48400	13900	3710	2560
6	5120	4740	e4000	e4200	e4600	e4800	5910	8600	40300	13200	3690	2560
7	5360	4810	e4200	e4200	e4800	e4700	6140	10000	33000	12600	3730	2510
8	5440	5080	e4100	e4200	e4800	e4400	6340	9610	29000	11900	3350	2490
9	5380	5250	e4100	e4100	e4600	e3700	6280	8700	26300	11600	3190	2660
10	5310	5360	e3900	e3900	e4600	e3300	5990	8430	23900	10900	3190	2650
11	5250	5360	e3800	e3700	e4800	e3000	5730	8230	21700	10200	2900	2720
12	5250	5330	e4000	e3500	e4800	e2600	5410	8500	22900	9690	2720	2840
13	5220	5310	e4100	e3300	e4600	e2400	5140	9210	26200	8940	2600	2960
14	5160	5270	e4100	e3100	e4400	e5000	5020	9580	28600	8310	2560	3220
15	5240	5220	e4200	e2900	e4400	e7500	4990	8970	28500	8060	2450	3380
16	5200	5180	e4200	e2900	e4400	e14000	5190	8080	27000	7690	2320	3410
17	5180	5100	e4200	e3000	e4600	e25000	5640	7490	26200	7290	2080	3400
18	5200	5070	e4200	e2800	e4700	e30000	6210	7500	26500	6860	1980	3500
19	5160	5050	e4000	e3000	e4700	e28000	6960	8040	25800	6610	1860	3570
20	5120	5060	e3900	e3600	e4700	20500	7560	10100	26200	6250	1810	3590
21	5170	5030	e3700	e4000	e4700	18000	7630	12600	26400	5950	1910	3600
22	5220	5010	e3500	e4000	e4500	14000	7150	13400	26900	5630	1840	3750
23	5180	5000	e3300	e4000	e4400	12300	6790	12300	26600	5320	1840	3990
24	5110	5000	e2900	e3700	e4200	10600	6460	10900	25700	5090	1860	4010
25	5090	4990	e2400	e3400	e4000	9130	6070	10200	23500	4920	1950	3920
26	5100	e4900	e2000	e3200	e3700	8190	5800	10100	20500	4760	1950	3960
27	5150	e4700	e2200	e2900	e3500	7270	6490	12900	18400	4650	1810	3950
28	5180	e4600	e2500	e3200	e3400	6900	7820	18600	16900	4580	1780	4000
29	5190	e4600	e2800	e3300	---	6660	8430	25100	15200	4550	1760	4100
30	5170	e4700	e3100	e4000	---	6340	8330	29500	13600	4890	1720	4010
31	5200	---	e3400	e4300	---	6260	---	32400	---	5360	1750	---
TOTAL	159740	151120	116100	112700	124400	283150	189130	357690	845900	262600	82290	95940
MEAN	5153	5037	3745	3635	4443	9134	6304	11540	28200	8471	2655	3198
MAX	5440	5360	4900	4300	4800	30000	8430	32400	48400	13900	5050	4100
MIN	4570	4600	2000	2800	3400	2400	4990	7400	13600	4550	1720	1850
AC-FT	316800	299700	230300	223500	246700	561600	375100	709500	1678000	520900	163200	190300

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1911 - 2003, BY WATER YEAR (WY)*

MEAN	8270	7325	5937	5710	6841	10920	10290	18230	38720	22880	8658	7112
MAX	29130	12150	9594	13110	17750	25980	39160	38100	77280	55000	20470	16000
(WY)	1924	1924	1976	1925	1971	1972	1924	1928	1918	1917	1912	1941
MIN	3726	3700	3019	2087	2702	3235	2821	5409	11580	3311	1602	2389
(WY)	1922	1922	1961	1937	1936	2002	1961	1961	1919	1919	1961	1934

06329500 YELLOWSTONE RIVER NEAR SIDNEY--Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1911 – 2003*	
ANNUAL TOTAL	2582560		2780760			
ANNUAL MEAN	7076		7619		12590	
HIGHEST ANNUAL MEAN					21250	1924
LOWEST ANNUAL MEAN					5814	1934
HIGHEST DAILY MEAN	42600	Jun 6	48400	Jun 5	142000	Jun 21 1921
LOWEST DAILY MEAN	2000	Dec 26	1720	Aug 30	570	May 17 1961
ANNUAL SEVEN-DAY MINIMUM	2530	Jan 1	1800	Aug 26	1010	Aug 8 1961
MAXIMUM PEAK FLOW			a49100	Jun 5	c159000	Jun 21 1921
MAXIMUM PEAK STAGE			b15.26	Mar 18	b24.03	Mar 6 1994
INSTANTANEOUS LOW FLOW					d470	May 17 1961
ANNUAL RUNOFF (AC-FT)	5123000		5516000		9119000	
10 PERCENT EXCEEDS	16200		17300		28200	
50 PERCENT EXCEEDS	4800		4990		8000	
90 PERCENT EXCEEDS	3200		2720		4100	

SUMMARY STATISTICS	FOR WATER YEARS 1911 – 1965**		WATER YEARS 1967 - 2003***	
ANNUAL TOTAL				
ANNUAL MEAN	12890		12270	
HIGHEST ANNUAL MEAN	21250	1924	19150	1997
LOWEST ANNUAL MEAN	5814	1934	6387	2001
HIGHEST DAILY MEAN	142000	Jun 21 1921	104000	May 23 1978
LOWEST DAILY MEAN	570	May 17 1961	800	Jan 2 1989
ANNUAL SEVEN-DAY MINIMUM	1010	Aug 8 1961	1060	Aug 23 2001
MAXIMUM PEAK FLOW	c159000	Jun 21 1921	f111000	May 23 1978
MAXIMUM PEAK STAGE	b21.85	Mar 22 1947	b24.03	Mar 6 1994
INSTANTANEOUS LOW FLOW	d470	May 17 1961		
ANNUAL RUNOFF (AC-FT)	9341000		8889000	
10 PERCENT EXCEEDS	29900		26400	
50 PERCENT EXCEEDS	7690		8550	
90 PERCENT EXCEEDS	3820		4680	

*--During period of operation 1911-31, 1934 to current year. Published as “at Intake” 1911-31.
**--Prior to Bighorn lake reaching operational level.
***--After Bighorn lake reached operational level.
a--Gage height, 13.53 ft.
b--Backwater from ice.
c--Gage height, 12.6 ft, site and datum then in use.
d--Gage height, 2.73 ft, site and datum then in use.
e--Estimated.
f--Gage height, 20.02 ft.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1948 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1964 to September 1981.
WATER TEMPERATURE: January 1951 to September 1985.
SUSPENDED-SEDIMENT DISCHARGE: October 1971 to September 1981, October 1982 to September 1991, seasonal records (March to November) only from October 1991 to current year .

REMARKS.--Daily sediment records rated good except for several periods of storm runoff, which are rated poor. Daily sediment data collected during open water; no data available during ice effect from Dec. 1 to Mar. 17. Unpublished records of instantaneous water temperature and specific conductance are available in files of District office. Prior to July 1972, sediment sampling and record computation was completed under the supervision of U.S. Army Corps of Engineers. Samples were collected this year as part of the National Water-Quality Assessment Program (NAWQA) for the Yellowstone River study unit under the direction of the Wyoming District.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE (water years 1965-81): Maximum daily, 1,220 microsiemens per centimeter (µS/cm) at 25.0°C, Apr. 6, 1979; minimum daily, 261 µS/cm at 25.0°C, June 4, 1966.
WATER TEMPERATURE (water years 1951-85): Maximum, 29.0°C July 23, 1960; minimum, 0.0°C on many days during winter.
SEDIMENT CONCENTRATION: Maximum daily mean, 26,800 mg/L May 8, 1975; minimum daily mean, 8 mg/L Jan. 9, 1973.
SEDIMENT LOAD: Maximum daily, 3,030,000 tons May 8, 1975; minimum daily, 63 tons Jan. 2, 1989.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATION (seasonal records): Maximum daily mean, 3,410 mg/L, Mar. 21; minimum daily mean, 21 mg/L, Aug. 6.
SEDIMENT LOAD (seasonal records): Maximum daily, 238,000 tons, June 3; minimum daily, 125 tons, Aug. 30.

YELLOWSTONE RIVER BASIN

06329500 YELLOWSTONE RIVER NEAR SIDNEY--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instantaneous discharge, cfs (00061)	Barometric pressure, mm Hg (00025)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	Specif. conductance, wat unf uS/cm 25 degC (00095)	Temperature, air, deg C (00020)	Temperature, water, deg C (00010)	Alkalinity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Alkalinity, wat flt inc tit field, mg/L as CaCO3 (39086)	Bicarbonate, wat flt incrm. titr., field, mg/L (00453)
OCT 2002												
03...	1300	4920	707	10.8	103	8.4	727	18.0	10.0	E158	153	179
NOV												
12...	1300	5350	715	14.0	108	8.4	779	4.0	2.0	E153	176	200
DEC												
11...	1300	E3800	705	13.8	102	8.4	790	9.0	0.0	E175	176	210
JAN 2003												
22...	1400	E4000	729	11.1	80	8.3	917	-16.0	0.0	212	182	222
FEB												
19...	1400	E4700	710	11.2	82	8.0	788	8.0	0.0	185	172	205
MAR												
18...	1500	E30000	714	10.8	79	7.4	474	2.0	0.0	102	104	126
MAY												
21...	1200	12700	715	9.2	95	8.0	627	20.0	14.0	145	199	143
JUN												
17...	1000	26200	716	7.7	92	7.9	268	23.0	21.0	72	72	88
JUL												
16...	1300	7730	--	7.3	--	8.2	440	29.0	24.5	109	88	107
AUG												
20...	1300	1800	627	6.3	92	8.2	745	27.5	24.0	171	144	166
SEP												
09...	1600	2630	625	7.2	100	8.3	771	25.0	21.0	175	167	203

Date	Carbonate, wat flt incrm. titr., field, mg/L (00452)	Chloride, water, fltrd, mg/L (00940)	Sulfate water, fltrd, mg/L (00945)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Ammonia water, fltrd, mg/L as N (00608)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Orthophosphate, water, fltrd, mg/L as P (00671)	Phosphorus, water, unfltrd mg/L (00665)	Suspnd. sediment, sieve diametr percent <.063mm (70331)	Suspended sediment concentration mg/L (80154)	Suspended sediment load, tons/d (80155)
OCT 2002												
03...	4	11.8	206	.30	<.04	.16	<.008	<.02	.061	96	60	797
NOV												
12...	7	13.5	205	.26	<.04	.46	.009	<.02	.061	96	75	1080
DEC												
11...	2	11.5	208	.28	<.04	.52	E.006	<.02	.045	85	67	E687
JAN 2003												
22...	0	17.2	268	.30	.05	.66	<.008	<.02	.025	99	66	E713
FEB												
19...	2	12.3	220	.38	.09	.56	E.005	<.02	.063	94	63	800
MAR												
18...	0	7.26	115	2.9	.23	.62	.015	E.01	1.41	86	2470	200000
MAY												
21...	1	9.71	158	1.3	<.04	.23	E.006	E.01	.60	82	866	29700
JUN												
17...	0	4.26	49.0	.74	<.04	.15	<.008	E.01	.40	74	667	47200
JUL												
16...	0	6.55	101	.40	<.04	<.06	<.008	<.02	.091	83	90	1880
AUG												
20...	5	10.8	203	.44	<.04	<.06	<.008	<.02	.052	97	35	170
SEP												
09...	0	11.4	209	.39	<.04	<.06	<.008	<.02	.045	97	30	213

Date	Time	Hardness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnesium, water, fltrd, mg/L (00925)	Potassium, water, fltrd, mg/L (00935)	Sodium adsorption ratio (00931)	Sodium, water, fltrd, mg/L (00930)	Alkalinity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chloride, water, fltrd, mg/L (00940)	Fluoride, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)
JUN 2003											
17...	1000	88	22.5	7.63	1.96	.8	18.2	72	4.26	.2	11.1
AUG											
20...	1300	240	56.5	25.1	4.88	2	67.9	171	10.8	.5	9.99

E--Estimated.

Date	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of consti-tuents mg/L (70301)	Residue water, fltrd, tons/ acre-ft (70303)	Residue water, fltrd, tons/d (70302)	Arsenic water unfltrd ug/L (01002)	Cadmium water, unfltrd ug/L (01027)	Chrom-ium, water, unfltrd recover -able, ug/L (01034)	Copper, water, unfltrd recover -able, ug/L (01042)	Lead, water, unfltrd recover -able, ug/L (01051)	Nickel, water, unfltrd recover -able, ug/L (01067)	Zinc, water, unfltrd recover -able, ug/L (01092)
JUN 2003											
17...	49.0	158	.22	11200	6	E.2	7.0	13.3	8.98	12.8	32
AUG											
20...	203	465	.63	2260	7	E.02	E.6	3.7	.67	4.34	4

Date	Time	2,6-Di-ethyl-aniline water fltrd 0.7u GF ug/L (82660)	CIAT, water, fltrd, ug/L (04040)	Aceto-chlor, water, fltrd, ug/L (49260)	Ala-chlor, water, fltrd, ug/L (46342)	alpha-HCH, water, fltrd, ug/L (34253)	Atra-zine, water, fltrd, ug/L (39632)	Azin-phos-methyl, water, fltrd 0.7u GF ug/L (82686)	Ben-flur-alin, water, fltrd 0.7u GF ug/L (82673)	Butyl-ate, water, fltrd, ug/L (04028)	Car-baryl, water, fltrd 0.7u GF ug/L (82680)
NOV 2002											
12...	1300	<.006	<.006	<.006	<.004	<.005	E.005	<.050	<.010	<.002	<.041
JAN 2003											
22...	1400	<.006	<.006	<.006	<.004	<.005	<.007	<.050	<.010	<.002	<.041
MAR											
18...	1500	<.006	<.006	<.006	<.004	<.005	E.005	<.050	<.010	<.002	<.041
MAY											
21...	1200	<.006	<.006	<.006	<.004	<.005	.009	<.050	<.010	<.002	<.041
JUN											
17...	1000	<.006	<.006	<.006	<.004	<.005	<.007	<.050	<.010	<.002	<.041
JUL											
16...	1300	<.006	<.006	<.006	<.004	<.005	.009	<.050	<.010	<.002	<.041
AUG											
20...	1300	<.006	E.004	<.006	<.004	<.005	.007	<.050	<.010	<.002	<.041
SEP											
09...	1600	<.006	<.006	<.006	<.004	<.005	E.005	<.050	<.010	<.002	<.041

Date	Carbo-furan, water, fltrd 0.7u GF ug/L (82674)	Chlor-pyrifos water, fltrd, ug/L (38933)	Cis-per-methrin water fltrd 0.7u GF ug/L (82687)	Cyana-zine, water, fltrd, ug/L (04041)	DCPA, water fltrd 0.7u GF ug/L (82682)	Desulf-inyl fipro-nil, water, fltrd, ug/L (62170)	Diazi-non, water, fltrd, ug/L (39572)	Diel-drin, water, fltrd, ug/L (39381)	Disul-foton, water, fltrd 0.7u GF ug/L (82677)	EPTC, water, fltrd 0.7u GF ug/L (82668)	Ethal-flur-alin, water, fltrd 0.7u GF ug/L (82663)
NOV 2002											
12...	<.020	<.005	<.006	<.018	<.003	<.004	<.005	<.005	<.02	<.002	<.009
JAN 2003											
22...	<.020	<.005	<.006	<.018	<.003	<.004	<.005	<.005	<.02	<.002	<.009
MAR											
18...	<.020	<.005	<.006	<.018	<.003	<.004	<.005	<.005	<.02	<.020	<.009
MAY											
21...	<.020	<.005	<.006	<.018	<.003	<.004	<.005	<.005	<.02	<.002	<.009
JUN											
17...	<.020	<.005	<.006	<.018	<.003	<.004	<.005	<.005	<.02	<.002	<.009
JUL											
16...	<.020	<.005	<.006	<.018	<.003	<.004	<.005	<.005	<.02	<.002	<.009
AUG											
20...	<.020	<.005	<.006	<.018	<.003	<.004	<.005	<.005	<.02	<.002	<.009
SEP											
09...	<.020	--	<.006	<.018	<.003	<.004	--	<.005	--	<.002	<.009

E--Estimated.

Date	Ethoprop, water, fltrd 0.7u GF ug/L (82672)	Desulfinylfipronil amide, wat flt ug/L (62169)	Fipronil sulfide water, fltrd, ug/L (62167)	Fipronil sulfone water, fltrd, ug/L (62168)	Fipronil, water, fltrd, ug/L (62166)	Fonofos water, fltrd, ug/L (04095)	Lindane water, fltrd, ug/L (39341)	Linuron water fltrd 0.7u GF ug/L (82666)	Malathion, water, fltrd, ug/L (39532)	Methyl parathion, water, fltrd 0.7u GF ug/L (82667)	Metolachlor, water, fltrd, ug/L (39415)
NOV 2002											
12...	<.005	<.009	<.005	<.005	<.007	<.003	<.004	<.035	<.027	<.006	<.013
JAN 2003											
22...	<.005	<.009	<.005	<.005	<.007	<.003	<.004	<.035	<.027	<.006	<.013
MAR											
18...	<.005	<.009	<.005	<.005	<.007	<.003	<.004	<.035	<.027	<.006	<.013
MAY											
21...	<.005	<.009	<.005	<.005	<.007	<.003	<.004	<.035	<.027	<.006	<.013
JUN											
17...	<.005	<.009	<.005	<.005	<.007	<.003	<.004	<.035	<.027	<.006	<.013
JUL											
16...	<.005	<.009	<.005	<.005	<.007	<.003	<.004	<.035	<.027	<.006	.019
AUG											
20...	<.005	<.009	<.005	<.005	<.007	<.003	<.004	<.035	<.027	<.006	E.013
SEP											
09...	--	<.009	<.005	<.005	<.007	--	<.004	<.035	--	--	E.007

Date	Metribuzin, water, fltrd, ug/L (82630)	Molinate, water, fltrd 0.7u GF ug/L (82671)	Napropamide, water, fltrd 0.7u GF ug/L (82684)	p,p'-DDE, water, fltrd, ug/L (34653)	Parathion, water, fltrd, ug/L (39542)	Pebulate, water, fltrd 0.7u GF ug/L (82669)	Pendimethalin, water, fltrd 0.7u GF ug/L (82683)	Phorate water fltrd 0.7u GF ug/L (82664)	Prometon, water, fltrd, ug/L (04037)	Pronamide, water, fltrd 0.7u GF ug/L (82676)	Propachlor, water, fltrd, ug/L (04024)
NOV 2002											
12...	<.006	<.002	<.007	<.003	<.010	<.004	<.022	<.011	E.01	<.004	<.010
JAN 2003											
22...	<.006	<.002	<.007	<.003	<.010	<.004	<.022	<.011	<.01	<.004	<.010
MAR											
18...	<.006	<.002	<.007	<.003	<.010	<.004	<.022	<.011	<.01	<.004	<.010
MAY											
21...	<.006	<.002	<.007	<.003	<.010	<.004	<.022	<.011	<.01	<.004	<.010
JUN											
17...	<.006	<.002	<.007	<.003	<.010	<.004	<.022	<.011	<.01	<.004	<.010
JUL											
16...	<.006	<.002	<.007	<.003	<.010	<.004	<.022	<.011	<.01	<.004	<.010
AUG											
20...	<.006	<.002	<.007	<.003	<.010	<.004	<.022	<.011	<.01	<.004	<.010
SEP											
09...	<.006	<.002	<.007	<.003	--	<.004	<.022	--	<.01	<.004	<.010

Date	Propanil, water, fltrd 0.7u GF ug/L (82679)	Propargite, water, fltrd 0.7u GF ug/L (82685)	Simazine, water, fltrd, ug/L (04035)	Tebuthiuron water fltrd 0.7u GF ug/L (82670)	Terbacil, water, fltrd 0.7u GF ug/L (82665)	Terbufos, water, fltrd 0.7u GF ug/L (82675)	Thiobencarb water fltrd 0.7u GF ug/L (82681)	Triallate, water, fltrd 0.7u GF ug/L (82678)	Trifluralin, water, fltrd 0.7u GF ug/L (82661)
NOV 2002									
12...	<.011	<.02	<.005	<.02	<.034	<.02	<.005	.004	<.009
JAN 2003									
22...	<.011	<.02	<.005	<.02	<.034	<.02	<.005	<.002	<.009
MAR									
18...	<.011	<.02	<.005	<.02	<.034	<.02	<.005	.008	<.009
MAY									
21...	<.011	<.02	<.005	<.02	<.034	<.02	<.005	.006	<.009
JUN									
17...	<.011	<.02	<.005	<.02	<.034	<.02	<.005	.006	<.009
JUL									
16...	<.011	<.02	<.005	<.02	<.034	<.02	<.005	.003	<.009
AUG									
20...	<.011	<.02	<.005	<.02	<.034	<.02	<.005	<.002	<.009
SEP									
09...	<.011	<.02	<.005	<.02	<.034	--	<.005	.004	<.009

E--Estimated.

06329500 YELLOWSTONE RIVER NEAR SIDNEY--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003--Continued

Date	Time	Instantaneous discharge, cfs (00061)	Specif. conductance, wat unf uS/cm 25 degC (00095)	Temperature, water, deg C (00010)	Suspnd. sediment, sieve diametr percent <.063mm (70331)	Suspended sediment concentration mg/L (80154)	Suspended sediment load, tons/d (80155)	Bed sediment, dry svd sve dia percent <.063mm (80164)	Bed sediment, dry svd sve dia percent <.125mm (80165)
OCT 2002									
02...	1330	4790	775	11.5	96	84	1090	1	5
MAR 2003									
19...	1020	E28000	520	2.5	80	3220	243000	--	--
APR									
09...	1630	6230	895	13.5	98	434	7300	<1	4
JUN									
06...	1045	40300	214	14.0	69	1000	109000	<1	1
11...	1030	21600	300	15.5	55	580	33800	<1	1
AUG									
08...	1335	3310	635	26.0	97	36	322	1	4

Date	Bed sediment, dry svd sve dia percent <.25mm (80166)	Bed sediment, dry svd sve dia percent <.5 mm (80167)	Bed sediment, dry svd sve dia percent <1 mm (80168)	Bed sediment, dry svd sve dia percent <2 mm (80169)	Bed sediment, dry svd sve dia percent <4 mm (80170)	Bed sediment, dry svd sve dia percent <8 mm (80171)	Bed sediment, dry svd sve dia percent <16 mm (80172)	Bed sediment, dry svd sve dia percent <32 mm (80173)	Bed sediment, dry svd sve dia percent <64 mm (80174)
OCT 2002									
02...	78	96	97	97	98	100	100	100	100
MAR 2003									
19...	--	--	--	--	--	--	--	--	--
APR									
09...	67	72	72	72	73	78	98	100	100
JUN									
06...	32	46	47	48	50	57	75	100	100
11...	59	72	72	73	73	76	91	100	100
AUG									
08...	45	54	54	55	56	62	77	86	100

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

DAY	MEAN CONCENTRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCENTRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCENTRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCENTRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCENTRATION (MG/L)	LOAD (TONS/DAY)	MEAN CONCENTRATION (MG/L)	LOAD (TONS/DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	78	962	33	468	---	---	---	---	---	---	---	---
2	85	1110	36	499	---	---	---	---	---	---	---	---
3	62	832	47	673	---	---	---	---	---	---	---	---
4	56	759	51	684	---	---	---	---	---	---	---	---
5	58	783	41	526	---	---	---	---	---	---	---	---
6	64	885	33	422	---	---	---	---	---	---	---	---
7	74	1070	27	351	---	---	---	---	---	---	---	---
8	84	1230	26	357	---	---	---	---	---	---	---	---
9	88	1280	29	411	---	---	---	---	---	---	---	---
10	86	1230	43	622	---	---	---	---	---	---	---	---
11	77	1090	63	912	---	---	---	---	---	---	---	---
12	67	950	75	1080	---	---	---	---	---	---	---	---
13	57	803	69	989	---	---	---	---	---	---	---	---
14	50	697	64	911	---	---	---	---	---	---	---	---
15	48	679	62	874	---	---	---	---	---	---	---	---
16	47	660	59	825	---	---	---	---	---	---	---	---
17	46	643	54	744	---	---	---	---	---	---	---	---
18	45	632	50	684	---	---	---	---	---	---	2780	225000
19	44	613	48	654	---	---	---	---	---	---	3110	235000
20	42	581	45	615	---	---	---	---	---	---	3400	188000
21	37	516	38	516	---	---	---	---	---	---	3410	166000
22	31	437	34	460	---	---	---	---	---	---	2700	102000
23	26	364	30	405	---	---	---	---	---	---	2760	91700
24	25	345	29	392	---	---	---	---	---	---	2100	60100
25	28	385	29	391	---	---	---	---	---	---	1650	40700
26	32	441	30	397	---	---	---	---	---	---	1550	34300
27	35	487	31	393	---	---	---	---	---	---	1240	24300
28	37	517	31	385	---	---	---	---	---	---	491	9150
29	37	518	33	410	---	---	---	---	---	---	368	6620
30	35	489	36	457	---	---	---	---	---	---	280	4790
31	33	463	---	---	---	---	---	---	---	---	258	4360
TOTAL	---	22451	---	17507	---	---	---	---	---	---	---	---

YELLOWSTONE RIVER BASIN

06329500 YELLOWSTONE RIVER NEAR SIDNEY--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003--Continued

DAY	APRIL MEAN CONCEN-TRATION (MG/L)	APRIL LOAD (TONS/ DAY)	MAY MEAN CONCEN-TRATION (MG/L)	MAY LOAD (TONS/ DAY)	JUNE MEAN CONCEN-TRATION (MG/L)	JUNE LOAD (TONS/ DAY)	JULY MEAN CONCEN-TRATION (MG/L)	JULY LOAD (TONS/ DAY)	AUGUST MEAN CONCEN-TRATION (MG/L)	AUGUST LOAD (TONS/ DAY)	SEPTEMBER MEAN CONCEN-TRATION (MG/L)	SEPTEMBER LOAD (TONS/ DAY)
1	271	4680	327	7230	1610	159000	553	19000	38	518	27	135
2	277	4550	178	3760	1930	218000	410	13900	31	390	28	156
3	232	3600	128	2560	1920	238000	1850	68900	25	293	29	177
4	222	3410	110	2220	1680	215000	2680	99900	23	244	29	192
5	256	3970	132	2770	1450	189000	550	20600	22	220	30	207
6	278	4440	330	7660	979	107000	303	10800	21	209	30	207
7	268	4440	1650	44600	909	81000	212	7210	34	342	29	197
8	255	4370	1310	34000	1070	83800	189	6070	34	308	28	188
9	340	5770	1380	32400	770	54700	283	8860	35	301	30	215
10	406	6570	1340	30500	800	51600	255	7500	59	508	39	279
11	410	6340	1290	28700	620	36300	144	3970	51	399	46	338
12	478	6980	891	20400	910	56300	127	3320	67	492	36	276
13	587	8150	935	23300	1460	103000	117	2820	52	365	31	248
14	688	9330	972	25100	981	75800	108	2420	38	263	30	261
15	671	9040	719	17400	738	56800	98	2130	31	205	29	265
16	600	8410	467	10200	638	46500	89	1850	32	200	28	258
17	470	7160	532	10800	665	47000	83	1630	34	191	28	257
18	352	5900	564	11400	669	47900	76	1410	33	176	26	246
19	293	5510	449	9750	521	36300	70	1250	33	166	25	241
20	327	6670	521	14200	511	36100	62	1050	35	171	25	242
21	315	6490	859	29200	473	33700	53	851	37	191	25	243
22	363	7010	900	32600	494	35900	48	730	34	169	26	263
23	324	5940	668	22200	411	29500	46	661	28	139	26	280
24	328	5720	413	12200	321	22300	44	605	28	141	29	314
25	324	5310	339	9340	323	20500	41	545	31	163	36	381
26	288	4510	260	7090	322	17800	36	463	32	168	38	406
27	247	4330	438	15300	535	26600	32	402	30	147	35	373
28	240	5070	1660	83400	1040	47500	31	383	28	135	30	324
29	282	6420	2380	161000	942	38700	31	381	27	128	26	288
30	263	5920	2160	172000	741	27200	36	475	27	125	25	271
31	---	---	1740	152000	---	---	44	637	27	128	---	---
TOTAL	---	176010	---	1035280	---	2238800	---	290723	---	7595	---	7728

SMALLER RESERVOIRS IN MISSOURI RIVER BASIN IN MONTANA

All elevations listed for the following reservoirs are referenced to the National Geodetic Vertical Datum of 1929.

06012000 LIMA RESERVOIR--Lat 44°39'16", long 112°21'54" (NAD 27), in $SW^1/_4$ sec.32, T.13 S., R.6 W., Beaverhead County, Hydrologic Unit 10020001, at Lima Dam on Red Rock River, 7 mi northwest of Monida, and at river mile 2,542.2. DRAINAGE AREA, 570 mi^2. PERIOD OF RECORD, April 1940 to current year. Records prior to October 1950, published only in WSP 1309, and those for April 1955, published only in WSP 1729. Records of daily elevations available in files of Helena district office. Elevation of gage is at sea level (levels by Montana Department of Natural Resources and Conservation).

Reservoir is formed by earthfill dam with concrete spillway completed in 1902. Usable capacity, 84,050 acre-ft between elevation 6,537.30 ft, bottom of tunnel, and 6,582.7 ft, spillway crest. No dead storage. Figures given herein represent usable contents. Water is used for irrigation, flood control, and recreation. Records furnished by Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 85,870 acre-ft, May 27, 28, June 14, 15, 1984, elevation, 6,582.98 ft; no usable storage Sept. 20-26, 1979, Sept. 13-30, 1987, Oct. 1987, July 18 to Sept. 30, 1992.

EXTREMES FOR CURRENT YEAR: Maximum contents, 35,610 acre-ft, May 23, elevation 6,572.16 ft; minimum contents, 4,260 acre-ft, Aug. 25-28, elevation, 6,552.94 ft.

06038000 HEBGEN LAKE.--Lat 44°51'51", long 111°20'09" (NAD 27), in $SW^1/_4NW^1/_4$ sec.23, T.11 S., R.3 E., Gallatin County, Hydrologic Unit 10020007, at Hebgen Dam on Madison River, 18 mi northwest of West Yellowstone, and at river mile 103. DRAINAGE AREA, 904 mi^2. PERIOD OF RECORD, January 1936 to current year. Records prior to October 1939, published only in WSP 1309. Figures of contents published in WSP 1629, 1709, and 1729 have been found to be in error and should not be used. Prior to Oct. 1, 1949, published as Hebgen Reservoir near West Yellowstone. Records of daily elevations since October 1955 on file in Helena district office. Elevation of gage is at sea level (levels by The Montana Power Co.). Prior to earthquake of Aug. 17, 1959, elevation of gage was 9.74 ft higher, also at sea level. Reservoir is formed by earthfill dam with concrete core and spillway completed in 1915, repaired in 1960 following severe earthquake of Aug. 17, 1959, which lowered dam 9.74 ft and deformed reservoir area. Subsequent usable capacity, 378,800 acre-ft, between elevation 6,473.00 ft, bottom of outlet tower, and 6,534.87 ft, spillway crest. Dead storage, 7,340 acre-ft below elevation 6,473.00 ft. Prior to Aug. 17, 1959, usable capacity, 344,700 acre-ft between 6,483.11 ft, bottom of outlet tower, and 6,544.61 ft, spillway crest. Observations of reservoir level prior and subsequent to earthquake indicate smaller increases in capacity than indicated by new capacity table. Figures given herein represent usable contents. Water is used for power and recreation. Records furnished by The Montana Power Co. REVISED RECORDS, WSP 1916: 1959-60.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 380,500 acre-ft, July 21, 1987, elevation, 6,535.0 ft; minimum monthend, 670 acre-ft, Dec. 31, 1936, by capacity table used prior to August 1959.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 374,900 acre-ft, June 24-26, elevation, 6,534.57 ft; minimum observed, 280,000 acre-ft, Apr. 10, elevation, 6,526.54 ft.

06040500 ENNIS LAKE.--Lat 45°28'12", long 111°38'15" (NAD 27), in $NW^1/_4SW^1/_4$ sec.20, T.4 S., R.1 E., Madison County, Hydrologic Unit 10020007, at Madison Dam on Madison River, 5 mi northeast of McAllister, and at river mile 40.3. DRAINAGE AREA, 2,181 mi^2. PERIOD OF RECORD, January 1936 to September 1975 (total contents), October 1975 to current year (usable contents). Records prior to October l939, published only in WSP 1309. Prior to 1949, published as Madison Reservoir near McAllister. Records of daily elevations since October 1955 on file in Helena district office. Elevation of gage is at sea level (levels by The Montana Power Co.).

Reservoir is formed by timber crib dam completed in 1900. Usable capacity, 41,020 acre-ft between elevation 4,826.5 ft, bottom of penstock, and 4,841.5 ft, top of flashboard. Dead storage, 1,040 acre-ft below elevation 4,826.5 ft. Not normally drawn below 4,831.0 ft, 6,810 acre-ft. Figures given herein represent usable contents. Water is used for power and recreation. Records furnished by PPL EnergyPlus, LLC.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 40,830 acre-ft, June 20, 1968, elevation, 4,841.45 ft; minimum observed, 2,600 acre-ft, Mar. 31, 1937, elevation, 4,828.8 ft.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 37,320 acre-ft, July 10 and 11, Aug. 19 and 21, elevation, 4,840.80 ft; minimum observed, 27,810 acre-ft, Dec. 27, Jan. 11, 12, Feb. 25-27, elevation, 4,838.20 ft.

06064500 LAKE HELENA.--Lat 46°45'58", long 111°53'10" (NAD 27), in $SE^1/_4SW^1/_4$ sec. 29, T.12 N., R.2 W., Lewis and Clark County, Hydrologic Unit 10030101, at Hauser Dam on Missouri River, 13 mi northeast of Helena, and at river mile 2,239.1. DRAINAGE AREA, 610 mi^2 above dam and control works on Prickly Pear Creek. PERIOD OF RECORD, May 1945 to current year. April to July 1953 scattered daily elevation and contents, published in WSP 1320-B. May to June 1964 daily elevations and contents, published in WSP 1840-B. Records of daily elevations since October 1955 on file in Helena district office. Nonrecording gage at Hauser Dam read hourly. Elevation of gage is at sea level (levels by The Montana Power Co.).

Gage heights collected at Hauser Dam are effective on Lake Helena at control dam. Prior to April 1945, contents of Lake Helena included with records of Hauser Lake. Since that date, a dam and control works has separated the two lakes to allow independent regulation of Lake Helena, if needed. Usable capacity, 12,710 acre-ft, between elevation 3,624.00 ft, bottom of control works, and 3,635.00 ft, top of flashboards. No dead storage. Figures given herein represent usable contents. Water is used for recreation, wildlife, and power production through Hauser Dam. Records furnished by PPL EnergyPlus, LLC.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 12,040 acre-ft, Mar. 14, 2003, elevation, 3,635.70 ft; no storage Mar. 29 to Apr. 7, 1958, Feb. 12, 20, 1962, May 4-10, 1979.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 12,040 acre-ft, Mar. 14, elevation, 3,635.70 ft; minimum observed, 10,050 acre-ft, May 9, elevation, 3,634.80 ft.

SMALLER RESERVOIRS IN MISSOURI RIVER BASIN IN MONTANA--Continued

06065000 HAUSER LAKE.--Lat 46°45'58", long 111°53'10" (NAD 27), in $SE^1/_4SW^1/_4$ sec.29, T.12 N., R.2 W., Lewis and Clark County, Hydrologic Unit 10030101, at Hauser Dam on Missouri River, 1.6 mi downstream from Prickly Pear Creek, 13 mi northeast of Helena, and at river mile 2,226.4. DRAINAGE AREA, 16,876 mi^2. PERIOD OF RECORD, January 1936 to current year. Records prior to October 1939, published only in WSP 1309. April to July 1953 scattered daily elevations and contents, published in WSP 1320-B. May to June 1964 daily elevations and contents, published in WSP 1840-B. Monthend contents prior to May 1945 include contents of Lake Helena, excluded thereafter. Records of daily elevations since October 1955 on file in Helena district office. Nonrecording gage read hourly. Elevation of gage is at sea level (levels by The Montana Power Co.).

Reservoir is formed by concrete dam completed in 1907; separated from Lake Helena in April 1945. Usable contents, 61,870 acre-ft, between elevation 3,617.00 ft, bottom of tunnel, and 3,635.00 ft top of flashboards. Dead storage, 46,810 acre-ft below elevation 3,617.00 ft. Prior to Nov. 28, 1949, usable capacity, 52,090 acre-ft at elevation 3,635.00 ft, decrease caused by construction of Canyon Ferry Dam in backwater of Hauser Dam. Not normally drawn below 3,621.00 ft, 8,870 acre-ft. Capacity above elevation 3625.0 updated in 1990. Figures given herein represent usable contents. Water is used for power and recreation. Records furnished by PPL EnergyPlus, LLC. REVISED RECORDS, WSP 1729: 1949-57.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 66,040 acre-ft, Mar. 14, 2003, elevation, 3,635.70 ft; no storage Jan. 31, Feb. 29, 1936.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 66,040 acre-ft, Mar. 14, elevation, 3,635.70 ft; minimum observed, 60,740 acre-ft, May 9, elevation, 3,634.80 ft.

06066000 HOLTER LAKE.--Lat 46°59'28", long 112°00'17" (NAD 27), on line between $SE^1/_4$ sec.5 and $NE^1/_4$ sec.8, T.14 N., R.3 W., Lewis and Clark County, Hydrologic Unit 10030101, at Holter Dam on Missouri River, 3.3 mi east of Wolf Creek, and at river mile 2,211.1. DRAINAGE AREA, 17,149 mi^2. PERIOD OF RECORD, January 1936 to current year. Records prior to October 1939, published only in WSP 1309. April to July 1953 scattered daily elevations and contents, published in WSP 1320-B. May to June 1964 daily elevations and contents, published in WSP 1840-B. Records of daily elevations since October 1955 on file in Helena district office. Prior to 1950, published as Holter Reservoir near Wolf Creek. Nonrecording gage read three times daily. Elevation of gage is at sea level (levels by The Montana Power Co.).

Reservoir is formed by concrete dam completed in 1918. Usable capacity, 81,920 acre-ft between elevation 3,543.00 ft, bottom of tunnel, and 3,564.00 ft, top of flashboards. Dead storage, 158,500 acre-ft below elevation 3,543.00 ft. Not normally drawn below 3,548.00 ft, 16,660 acre-ft. Figures given herein represent usable contents. Water is used for power and recreation. Records furnished by PPL EnergyPlus, LLC.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 85,250 acre-ft, June 19, 1970, elevation, 3,564.70 ft; no storage Feb. 29, Dec. 31, 1936.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 82,060 acre-ft, Dec. 12, elevation, 3,564.03 ft; minimum observed, 77,580 acre-ft, Sept. 23, elevation, 3,563.08 ft.

06079500 GIBSON RESERVOIR.--Lat 47°36'09", long 112°45'39" (NAD 27), in $NE^1/_4NW^1/_4$ $SE^1/_4$ sec.4, T.21 N., R.9 W., Teton County, Hydrologic Unit 10030104, at Gibson Dam on Sun River, 19 mi northwest of Augusta, and at river mile 100.8. DRAINAGE AREA, 575 mi^2. PERIOD OF RECORD, January 1930 to current year. Records prior to October 1940, published only in WSP 1309. April to July 1953 scattered daily elevations and contents, published in WSP 1320-B. May to June 1964 daily elevations and contents, published in WSP 1840-B. Nonrecording gage read daily. Records of daily elevations on file in Helena district office. Elevation of gage is at sea level (levels by Bureau of Reclamation).

Reservoir is formed by concrete dam with glory-hole spillway completed in 1929. usable capacity, 96,480 acre-ft, between elevation 4,557.5 ft, bottom of outlet, and 4,724.0 ft, top of glory-hole, by capacity table effective Oct. 1, 1997; see previous reports for superseded figures. Water is used for irrigation and recreation. Records furnished by Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD: Maximum contents, 116,300 acre-ft, June 8, 1964, elevation 4,732.23 ft, from floodmark, of which 11,600 acre-ft was uncontrolled storage, by capacity table used Oct. 1, 1965 to July 30, 1975; minimum observed, 11 acre-ft, Oct. 13, 1936, elevation, 4,560.9 ft by capacity table used prior to 1939.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 96,410 acre-ft, May 25, elevation, 4,723.95 ft; minimum, 4,570 acre-ft, Sept. 2, elevation, 4,607.45 ft.

06136500 FRESNO RESERVOIR.--Lat 48°36'304", long 109°56'45" (NAD 27), in $SE^1/_4$ sec, 19, T. 33 N., R.14E, Hill County, Hydrologic Unit 10050002, at dam on Milk River, 13. mi west of Havre and at river mile 437.3. DRAINAGE AREA., 3,766 mi^2 of which 670 mi^2 is probably noncontributing. PERIOD OF RECORD, January 1, 1940 to current year. Records prior to September 1940, published only in WSP 1309. March to May 1952 daily elevations and contents published in WSP 1260-B. April to July 1953 scattered daily elevations and contents published in WSP 1320-B. Records of daily contents in files of Helena district office. Nonrecording gage read daily. Elevation of gage is at sea level (levels by Bureau of Reclamation).

Reservoir is formed by earthfill dam with concrete spillway completed in 1939. Usable capacity, 103,000 acre-ft, between elevation 2,530.00 ft, invert of tunnel inlet, and 2,575.00 ft, spillway crest, from capacity table effective Feb. 1, 1983. Elevation of maximum water surface is 2,592.93 ft, 224,700 acre-ft. Crest of dam is 2,596.10 ft. There are no gates in the spillway. Dead storage, 448 acre-ft, below elevation 2,530.00 ft. Figures given herein represent usable contents. Water is used for irrigation and recreation. Records furnished by Bureau of Reclamation. REVISED RECORDS, WSP 1729: Drainage area.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 154,000 acre-ft, Apr. 3, 1952, elevation, 2,579.3 ft, of which 26,800 acre-ft was uncontrolled storage, capacity table then in use; no storage Feb. 18 to Mar. 6, 1950.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 94,010 acre-ft, May 11, 12 elevation, 2,575.32 ft; minimum observed, 19,390 acre-ft, Aug. 29, elevation, 2,549.22 ft.

SMALLER RESERVOIRS IN MISSOURI RIVER BASIN IN MONTANA--Continued

06204000 MYSTIC LAKE.--Lat 45°13'30", long 109°45'36" (NAD 27), in sec.9, T.7 S., R.16 E., (unsurveyed), Stillwater County, Hydrologic Unit 10070005, at dam on West Rosebud Creek, 15 mi southwest of Roscoe, 25 mi southwest of Absarokee and at river mile 28.8. DRAINAGE AREA, 46.9 mi^2. PERIOD OF RECORD, January 1936 to current year. Records prior to September 1939, published only in WSP 1309. Record of daily elevations since October 1965 available in files of Helena district office. Water-stage recorder. Prior to October 1965, only monthend figures furnished. Elevation of gage is at sea level (levels by The Montana Power Co.).

Reservoir is formed by thin-section reinforced concrete arch dam completed in 1925. Usable capacity, 21,000 acre-ft between elevation 7,612.00 ft, minimum operating level, and 7,673.50 ft, top of 3.5 ft stop logs. No dead storage. Figures given herein represent usable contents. Water is used for power development and recreation. Records furnished by PPL EnergyPlus, LLC. REVISED RECORDS, WSP 1916: Drainage area.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 21,130 acre-ft, July 10, 1983, elevation, 7,673.8 ft; no storage most days Mar. 23 to May 5, 1981, Apr. 10 to May 19, 1982, May 4,5, 1983, May 14, 1984, Mar. 23,26,27, 1986, Apr. 8-11, 1988, Apr. 18-20, 1999, Apr. 12 to May 1, 2000, and several days in April 2003.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 20,990 acre-ft, July 27, elevation, 7,673.47 ft; no storage, several days in April.

06307000 TONGUE RIVER RESERVOIR.--Lat 45°07'48" (NAD 27), long 106°46'13", in $SE^1/_4SE^1/_4NE^1/_4$ sec.13, T.8 W., R.40 E., Big Horn County, Hydrologic Unit 10090101, at dam on Tongue River, 4 mi upstream from Post Creek, 7 mi northeast of Decker, and at river mile 189.1. DRAINAGE AREA, 1,770 mi^2. PERIOD OF RECORD, December 1938 to current year. Record prior to September 1939, published only in WSP 1309 and those for January, February 1956, published only in WSP 1729. Nonrecording gage read most days. Elevation of gage is at sea level (levels by Bureau of Reclamation) New capacity table effective September 1, 1996.

Reservoir is formed by earthfill dam with concrete spillway completed in May 1939. Total capacity, 79,070 acre-ft between elevation 3,374.4 ft, bottom of outlet, and 3,428.4 ft, spillway crest. Prior to October 1947, usable contents was 73,950 acre-ft at same elevations, due to sedimentation study. Dead storage, 711 acre-ft below elevation, 3,374.4 ft. Figures given herein represent usable contents. Water is used for irrigation. Records furnished by Montana Department of Natural Resources and Conservation. REVISED RECORDS, WSP 1309: 1947-50. WSP 1729: 1951, drainage area.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 79,500 acre-ft, June 21, 1999 and June 30, 2003, elevation, 3,428.70 ft; no storage October 1939 to February 1940.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 79,500 acre-ft, June 30, elevation, 3,428.70 ft; minimum observed, 27,520 acre-ft, Oct. 15, elevation, 3,409.80 ft.

MONTHEND CONTENTS, IN ACRE-FEET, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Lima Reservoir	Hebgen Lake	Ennis Lake	Lake Helena	Hauser Lake
Oct. 31	5,950	314,200	35,930	10,680	62,460
Nov. 30	7,900	306,400	31,750	11,130	63,660
Dec. 30	10,430	299,500	28,880	10,900	63,060
Jan. 31	12,040	291,800	29,940	10,900	63,060
Feb. 28	14,230	284,700	28,160	10,900	63,060
Mar. 31	16,630	280,800	29,940	10,900	62,060
Apr 30.	28,430	291,700	29,590	10,900	63,060
May 31	31,940	349,500	35,070	10,680	62,460
June 30	4,910	374,300	35,440	11,130	63,660
July 31	4,290	339,400	36,950	11,360	64,250
Aug. 31	4,280	317,200	35,070	10,680	62,460
Sept. 30	4,300	302,500	36,200	10,900	63,060

Date	Holter Lake	Gibson Reservoir	Fresno Reservoir	Mystic Lake	Tongue River Reservoir
Oct. 31	81,250	32,950	47,900	15,310	28,250
Nov. 30	81,720	35,900	50,560	12,190	a30,650
Dec. 30	81,810	37,800	50,880	8,750	b30,710
Jan. 31	81,580	39,960	49,360	6,050	32,170
Feb. 28	81,060	42,760	48,080	3,160	35,050
Mar. 31	80,820	48,780	75,850	144	47,150
Apr 30.	81,200	81,960	86,960	158	55,050
May 31	80,780	95,100	84,710	7,650	78,360
June 30	80,540	83,340	66,960	20,020	79,500
July 31	80,630	18,730	36,970	20,840	63,300
Aug. 31	80,680	4,590	20,110	18,600	43,760
Sept. 30	81,250	6,250	27,310	16,310	39,050

a--Interpolated.
b--Figure of contents for first day of following month.

06334500 LITTLE MISSOURI RIVER AT CAMP CROOK, SD

LOCATION.--Lat 45°32'49", long 103°58'23" (NAD 27), in SW$^1/_4$ sec.2, T.18 N., R.1 E., Harding County, Hydrologic Unit 10110201, on left bank 15 ft upstream from bridge on State Highway 20 at east edge of Camp Crook.

DRAINAGE AREA.--1,970 mi^2, approximately.

PERIOD OF RECORD.--September 1903 to November 1906, May 1956 to current year. Monthly discharge only for some periods, published in WSP 1309.

REVISED RECORDS.--WSP 1309: 1904. WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 3,108.98 ft (NGVD 29). Sept. 2, 1903, to Nov. 30, 1906, nonrecording gage at site 0.5 mi upstream at different elevation. May 1956 to Oct. 8, 1957, nonrecording gage at site 15 ft downstream, and Oct. 9, 1957, to Sept. 30, 1976, water-stage recorder at present site both at elevation 2.00 ft higher.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Small diversions upstream from station for irrigation. Satellite data-collection platform at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of 1952 reached a stage of about 18 ft, present elevation, from local residents.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.88	7.6	e3.1	e3.0	e3.8	e2.7	33	9.0	25	14	0.56	0.84
2	1.1	e7.4	e3.0	e3.0	e4.0	e2.4	28	5.1	15	17	0.59	0.73
3	1.1	e7.0	e2.7	e3.0	e4.1	e2.2	18	6.2	8.3	13	0.57	0.65
4	1.2	e6.4	e2.4	e3.0	e4.0	e2.2	11	3.7	4.6	15	0.56	0.64
5	1.4	e6.4	e2.4	e3.1	e3.7	e2.1	7.7	3.7	3.0	15	0.49	0.58
6	1.3	6.8	e2.5	e3.2	e3.1	e2.0	6.1	3.5	4.1	11	0.55	0.58
7	1.7	7.9	e2.5	e3.7	e2.7	e2.0	10	16	5.6	6.9	0.52	0.60
8	2.1	8.2	e2.6	e3.8	e2.6	e2.1	6.3	53	6.3	4.1	0.52	0.63
9	2.5	8.8	e2.6	e3.9	e2.6	e2.2	3.2	32	6.3	5.4	0.50	0.54
10	2.4	8.9	e2.6	e3.8	e2.5	e2.3	1.2	22	4.4	4.5	0.49	7.4
11	2.6	10	e2.6	e3.5	e2.5	e2.6	1.7	16	7.0	3.4	0.45	73
12	3.0	10	e2.6	e3.4	e2.4	e3.3	2.9	12	38	2.6	0.43	192
13	3.4	10	e2.6	e3.4	e2.4	e4.9	2.2	17	20	2.4	0.44	59
14	3.6	10	e2.6	e3.3	e2.3	e7.3	1.4	13	14	1.9	0.45	31
15	3.7	e10	e2.6	e3.2	e2.2	e12	1.2	9.8	45	1.3	0.43	62
16	4.5	e10	e2.5	e3.2	e2.3	e7.0	0.98	7.8	25	1.00	0.42	34
17	4.9	e10	e2.5	e3.2	e2.7	e34	0.99	6.6	16	1.1	0.45	23
18	4.8	11	e2.5	e3.3	e3.1	e51	1.4	9.3	11	1.2	0.43	17
19	5.1	12	e2.5	e3.2	e3.6	e20	1.5	15	7.8	1.2	0.60	14
20	5.8	13	e2.4	e3.1	e4.2	e400	3.3	25	6.0	1.1	0.63	8.6
21	6.6	e13	e2.2	e3.1	e4.2	e290	3.1	19	7.1	0.85	0.59	11
22	7.3	e9.0	e2.0	e3.0	e4.0	e200	2.6	15	6.2	0.78	0.54	12
23	6.9	e4.5	e1.8	e2.9	e3.8	e180	2.2	12	5.3	0.75	0.46	8.3
24	6.9	e2.3	e1.6	e3.0	e3.5	e150	2.3	5.4	6.7	0.69	0.46	6.2
25	8.0	e2.3	e1.7	e3.2	e3.2	129	2.1	2.9	21	0.69	0.43	4.4
26	7.9	e2.4	e1.9	e3.2	e3.1	65	2.2	2.3	13	0.63	0.39	4.1
27	8.0	e2.9	e2.1	e3.2	e2.9	52	1.9	2.3	9.0	0.72	0.45	2.8
28	8.1	e2.9	e2.4	e3.2	e2.8	80	2.4	2.2	6.3	0.72	0.44	2.1
29	7.9	e3.1	e2.8	e3.1	---	69	4.9	2.0	4.6	0.61	0.72	1.8
30	8.1	e3.2	e2.9	e3.3	---	51	14	37	3.1	0.52	0.96	1.6
31	8.2	---	e3.0	e3.6	---	39	---	49	---	0.49	0.93	---
TOTAL	140.98	227.0	76.2	101.1	88.3	1869.3	179.77	434.8	354.7	130.55	16.45	581.09
MEAN	4.55	7.57	2.46	3.26	3.15	60.3	5.99	14.0	11.8	4.21	0.53	19.4
MAX	8.2	13	3.1	3.9	4.2	400	33	53	45	17	0.96	192
MIN	0.88	2.3	1.6	2.9	2.2	2.0	0.98	2.0	3.0	0.49	0.39	0.54
AC-FT	280	450	151	201	175	3710	357	862	704	259	33	1150

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1904 - 2003, BY WATER YEAR (WY)

MEAN	56.1	12.7	6.74	7.42	82.4	341	203	331	254	95.0	40.4	30.1
MAX	876	103	34.9	59.7	1112	2121	1198	1894	1107	961	537	244
(WY)	1972	1972	1972	1974	1996	1978	1971	1978	1967	1905	1906	1905
MIN	0.29	0.000	0.000	0.000	0.000	1.95	1.97	1.12	0.11	0.000	0.000	0.61
(WY)	1905	1905	1905	1905	1969	1992	1981	1992	1961	1961	1904	1958

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1904 - 2003	
ANNUAL TOTAL	1723.21		4200.24			
ANNUAL MEAN	4.72		11.5		a122	
HIGHEST ANNUAL MEAN					492	1978
LOWEST ANNUAL MEAN					4.68	1961
HIGHEST DAILY MEAN	26	Apr 4	400	Mar 20	b8560	Mar 24 1978
LOWEST DAILY MEAN	0.60	Aug 1	0.39	Aug 26	0.00	Jul 31 1904
ANNUAL SEVEN-DAY MINIMUM	0.68	Jul 29	0.44	Aug 12	0.00	Jul 31 1904
MAXIMUM PEAK FLOW			750	Mar 20	9420	Mar 24 1978
MAXIMUM PEAK STAGE			6.53	Mar 20	c16.90	Mar 24 1978
ANNUAL RUNOFF (AC-FT)	3420		8330		88390	
10 PERCENT EXCEEDS	9.8		19		230	
50 PERCENT EXCEEDS	3.1		3.2		10	
90 PERCENT EXCEEDS	0.86		0.63		1.2	

a--Median of annual mean discharges, 100 ft^3/s.
b--No flow at times in some years.
c--Backwater from ice.
e--Estimated.

LITTLE MISSOURI RIVER BASIN

06336600 BEAVER CREEK NEAR TROTTERS, ND

LOCATION.--Lat 47°09'47", long 103°59'32" (NAD 27), in $SW^1/_4SW^1/_4NE^1/_4$ sec.33, T.143 N., R.105 W., Golden Valley County, Hydrologic Unit 10110204, on left bank 100 ft upstream from bridge on county road, 2.4 mi east of Montana-North Dakota State line, 13 mi southwest of Trotters, 17 mi north of Beach, 20 mi upstream from Elk Creek, and at river mile 27.
DRAINAGE AREA.--616 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORDS.--October 1977 to current year (seasonal records only since 1984).
REVISED RECORDS.--1982: Drainage area.
GAGE.--Water-stage recorder. Elevation of gage is 2,371.96 ft (NGVD 29).
REMARKS.--Water-discharge records good except those for estimated daily discharges, which are poor.
EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,130 ft^3/s, Mar. 15, gage height, 16.56 ft; minimum daily, no flow, Aug. 14 to Sept. 9.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1					e12	e1.8	42	7.9	6.0	3.5	0.24	0.00
2					e15	e1.8	40	7.7	6.3	3.3	0.23	0.00
3					e12	e1.9	37	7.3	7.2	8.3	0.23	0.00
4					e9.3	e1.9	34	7.1	7.6	5.2	0.23	0.00
5					e8.0	e1.9	32	8.1	7.2	3.3	0.28	0.00
6					e6.3	e2.0	30	9.1	7.1	3.1	0.35	0.00
7					e5.2	e2.0	29	9.2	8.9	3.0	3.5	0.00
8					e4.7	e2.0	27	9.2	8.9	2.4	2.7	0.00
9					e4.0	e2.0	26	10	8.6	7.8	0.85	0.00
10					e3.5	e2.0	24	11	8.3	6.1	0.68	e0.10
11					e3.1	e2.0	23	11	8.8	2.3	0.06	e0.40
12					e3.3	e2.0	21	11	9.2	2.0	0.03	e0.35
13					e3.5	e110	20	12	8.8	1.7	0.03	e0.30
14					e2.8	e1000	19	11	7.6	1.7	0.00	e0.26
15					e2.5	1930	18	10	8.2	1.5	0.00	e0.22
16					e2.2	1750	17	9.2	10	1.5	0.00	e0.19
17					e2.4	1210	17	8.9	7.5	1.2	0.00	e0.16
18					e2.8	706	16	8.6	6.6	0.70	0.00	e0.13
19					e3.0	392	15	8.1	4.9	2.2	0.03	e0.11
20					e2.7	291	14	7.6	4.1	1.4	0.00	e0.10
21					e2.1	202	14	7.4	4.0	0.89	0.00	e0.10
22					e1.7	142	12	7.4	3.9	0.86	0.00	e0.10
23					e1.4	111	11	7.4	3.8	0.90	0.00	e0.11
24					e1.5	95	11	6.9	3.8	0.75	0.00	e0.11
25					e1.6	82	10	6.6	4.3	0.46	0.00	e0.11
26					e1.6	76	9.6	6.2	3.9	0.36	0.00	e0.12
27					e1.7	69	9.2	6.2	3.8	0.28	0.00	e0.12
28					e1.8	60	8.8	6.0	3.7	1.4	0.00	e0.12
29					---	54	8.5	5.4	3.5	1.2	0.00	e0.11
30					---	49	8.2	5.2	3.6	0.55	0.00	e0.10
31					---	45	---	5.4	---	0.29	0.00	---
TOTAL					121.7	8397.3	603.3	254.1	190.1	70.14	9.44	3.42
MEAN					4.35	271	20.1	8.20	6.34	2.26	0.30	0.11
MAX					15	1930	42	12	10	8.3	3.5	0.40
MIN					1.4	1.8	8.2	5.2	3.5	0.28	0.00	0.00
AC-FT					241	16660	1200	504	377	139	19	6.8

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1978 - 2003, BY WATER YEAR (WY)

MEAN	1.10	2.62	2.59	4.40	27.7	119	47.0	15.6	18.4	10.4	2.11	0.70
MAX	3.29	6.34	5.13	14.7	141	609	406	50.2	125	64.2	18.4	4.72
(WY)	1983	1983	1979	1983	1983	1978	1979	1999	1982	1997	1993	1986
MIN	0.006	0.010	0.032	0.000	0.000	1.21	1.11	1.05	0.12	0.000	0.000	0.000
(WY)	1982	1982	1982	1982	1989	1991	1991	1981	1992	1988	1985	1981

SUMMARY STATISTICS WATER YEARS 1978 - 2003

ANNUAL MEAN	33.3		
HIGHEST ANNUAL MEAN	79.7		1978
LOWEST ANNUAL MEAN	2.77		1981
HIGHEST DAILY MEAN	2500	Mar 22	1978
LOWEST DAILY MEAN	0.00	Aug 1	1981
ANNUAL SEVEN-DAY MINIMUM	0.00	Aug 10	1981
MAXIMUM PEAK FLOW	2720	Mar 29	1978
MAXIMUM PEAK STAGE	a19.27	Mar 22	1978
ANNUAL RUNOFF (AC-FT)	b24110		
10 PERCENT EXCEEDS	51		
50 PERCENT EXCEEDS	2.8		
90 PERCENT EXCEEDS	0.03		

a--Backwater from ice.
b--Based on complete water years only (1978-83).
e--Estimated.

06336600 BEAVER CREEK NEAR TROTTERS, ND--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water year 1978 to current year.

REMARKS.--Several observations of water temperature and specific conductance were made during the year and are on available in the North Dakota District files.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instan-taneous dis-charge, cfs (00061)	pH, water, unfltrd field, std units (00400)	Specif. conduc-tance, wat unf uS/cm 25 degC (00095)	Temper-ature, air, deg C (00020)	Temper-ature, water, deg C (00010)	Hard-ness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Potas-sium, water, fltrd, mg/L (00935)	Sodium adsorp-tion ratio (00931)
MAR 2003											
15...	1530	1990	8.3	720	17.5	3.5	200	28.0	32.0	13.0	2
JUL											
08...	1350	2.5	8.3	2430	20.0	20.5	540	77.0	83.6	10.7	7

Date	Sodium, water, fltrd, mg/L (00930)	Sodium, percent (00932)	ANC, wat unf fixed end pt, lab, mg/L as CaCO3 (90410)	Chlor-ide, water, fltrd, mg/L (00940)	Fluor-ide, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of consti-tuents mg/L (70301)	Residue water, fltrd, tons/d (70302)	Residue on evap. at 180degC wat flt mg/L (70300)	Arsenic water, fltrd, ug/L (01000)
MAR 2003											
15...	70.0	41	99	7.6	.10	--	270	480	2620	487	2.0
JUL											
08...	382	60	310	9.5	.24	<2.0	940	1690	11.3	--	1.2

Date	Iron, water, fltrd, ug/L (01046)	Lead, water, fltrd, ug/L (01049)	Lithium water, fltrd, ug/L (01130)	Mangan-ese, water, fltrd, ug/L (01056)	Mercury water, fltrd, ug/L (71890)	Molyb-denum, water, fltrd, ug/L (01060)	Selen-ium, water, fltrd, ug/L (01145)	Stront-ium, water, fltrd, ug/L (01080)
MAR 2003								
15...	170	<1	20	70	<.10	<1	2	280
JUL								
08...	20	<1	60	<10	<.20	4	<1	1400

12300110 LAKE KOOCANUSA AT INTERNATIONAL BOUNDARY

LOCATION.--Lat 48°59'44", long 115°10'43" (NAD 27), in NE$^{1}/_{4}$SW$^{1}/_{4}$SE$^{1}/_{4}$ sec.1, T.37 N., R.28 W., Lincoln County, Hydrologic Unit 17010101, 0.3 mi south of international boundary, in middle of old channel 1.9 mi upstream from Young Creek, and 6.4 mi north of Rexford.
PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Sampling depth, feet (00003)	Incident light remaining at depth, percent (00031)	Dissolved oxygen, mg/L (00300)	pH, water, unfltrd field, std units (00400)	Specif. conduct- tance, wat unf uS/cm 25 degC (00095)	Temperature, water, deg C (00010)
OCT 2002						
17...	0.5	77.7	10.1	8.6	234	12.9
17...	2	61.3	10.0	8.6	234	12.9
17...	5	41.1	10.0	8.6	234	13.0
17...	10	28.9	10.0	8.6	234	13.0
17...	15	20.8	10.0	8.6	233	13.0
17...	20	13.7	9.9	8.6	233	13.0
17...	25	8.81	9.9	8.6	233	13.0
17...	30	5.73	9.9	8.6	233	13.0
17...	35	3.74	9.9	8.6	233	12.9
17...	40	2.65	9.8	8.6	233	13.0
17...	45	1.77	9.8	8.6	232	13.0
17...	50	1.23	9.8	8.6	237	12.9
17...	60	.52	9.8	8.5	250	12.4
17...	70	--	9.7	8.5	266	12.0
17...	80	--	9.4	8.4	267	11.9
17...	90	--	7.8	8.0	206	9.9
17...	100	--	7.4	7.9	210	8.8
17...	110	--	6.9	7.8	216	8.4
17...	115	--	6.5	7.8	216	8.4
JUN 2003						
17...	2	45.0	10.6	8.4	227	18.4
17...	5	36.4	11.2	8.4	229	15.7
17...	10	16.2	11.2	8.4	224	15.0
17...	15	7.00	11.1	8.4	222	14.6
17...	20	3.24	10.9	8.4	210	14.1
17...	25	1.25	10.7	8.4	201	13.4
17...	30	.44	10.7	8.3	199	13.1
17...	35	.16	10.7	8.3	187	12.9
17...	40	.05	10.7	8.3	186	12.7
17...	45	--	10.6	8.3	184	12.5
17...	50	--	10.8	8.3	180	11.5
17...	60	--	10.9	8.3	172	10.9
17...	70	--	10.9	8.2	174	10.6
17...	80	--	10.9	8.2	174	10.4
17...	90	--	10.9	8.2	181	10.1
17...	100	--	10.9	8.2	196	9.8
17...	110	--	10.7	8.1	254	7.9
17...	115	--	10.5	8.1	267	7.5
17...	120	--	10.5	8.1	271	7.0
17...	125	--	10.4	8.1	275	6.7
17...	127	--	10.2	8.1	227	6.6
JUL 2003						
14...	0.5	47.8	8.3	8.6	217	19.1
14...	2	36.8	8.2	8.6	215	19.1
14...	5	18.1	8.2	8.6	215	19.0
14...	10	6.82	8.3	8.6	214	18.8
14...	15	3.13	8.3	8.6	214	18.3
14...	20	1.28	8.2	8.6	213	18.1
14...	25	.49	8.2	8.6	213	18.0
14...	30	.26	8.2	8.5	211	17.3
14...	35	.14	8.2	8.5	212	17.2
14...	40	--	8.1	8.4	210	17.0
14...	45	--	7.9	8.4	208	16.1
14...	50	--	7.8	8.3	217	15.4
14...	55	--	7.8	8.3	208	14.4
14...	60	--	7.8	8.2	205	14.3
14...	70	--	7.8	8.2	201	14.0
14...	80	--	7.8	8.2	197	12.2
14...	90	--	7.9	8.1	206	10.2
14...	100	--	8.0	8.1	220	9.5
14...	110	--	7.9	8.0	246	8.4
14...	120	--	7.8	8.0	255	7.8
14...	130	--	7.8	8.0	257	7.7
14...	139	--	7.7	8.0	258	7.6

Date	Sampling depth, feet (00003)	Incident light remaining at depth, percent (00031)	Dissolved oxygen, mg/L (00300)	pH, water, unfltrd field, std units (00400)	Specif. conduct-ance, wat unf uS/cm 25 degC (00095)	Temperature, water, deg C (00010)
AUG 2003						
12...	0.5	62.5	7.6	8.5	226	23.0
12...	2	51.1	7.5	8.5	226	23.0
12...	5	35.0	7.5	8.5	225	22.8
12...	10	18.4	7.5	8.5	225	22.1
12...	15	10.3	7.6	8.5	225	21.8
12...	20	6.10	7.6	8.5	224	21.8
12...	25	3.51	7.6	8.5	225	21.6
12...	30	2.27	7.6	8.5	225	21.5
12...	35	1.38	7.6	8.4	225	21.5
12...	40	.89	7.5	8.4	231	20.0
12...	45	.67	7.4	8.3	247	19.6
12...	50	.39	7.3	8.2	247	18.8
12...	55	.26	6.8	8.1	234	17.9
12...	60	.17	6.8	8.1	234	16.9
12...	65	--	6.6	8.0	218	15.9
12...	70	--	6.7	8.0	209	14.1
12...	75	--	6.8	8.0	205	13.6
12...	80	--	7.1	7.9	203	12.9
12...	90	--	7.2	7.9	203	12.0
12...	100	--	7.1	7.9	216	10.2
12...	110	--	6.9	7.8	220	10.0
12...	120	--	6.8	7.8	232	9.2
12...	130	--	6.8	7.8	253	8.7
12...	136	--	6.4	7.8	258	7.8
SEP 2003						
17...	0.5	46.6	8.4	8.6	241	17.5
17...	2	41.6	8.4	8.6	240	17.6
17...	5	26.5	8.4	8.6	248	17.6
17...	10	15.5	8.4	8.6	245	17.6
17...	15	9.37	8.4	8.6	246	17.6
17...	20	5.62	8.4	8.6	244	17.6
17...	25	3.50	8.4	8.6	246	17.6
17...	30	2.27	8.4	8.6	248	17.6
17...	35	1.50	8.4	8.6	248	17.6
17...	40	.98	8.4	8.6	248	17.5
17...	45	.64	8.4	8.5	247	17.5
17...	50	.43	8.3	8.5	249	17.5
17...	55	--	8.1	8.5	238	17.0
17...	60	--	7.0	8.1	210	13.7
17...	65	--	7.3	8.0	200	10.7
17...	70	--	7.4	8.0	210	9.3
17...	75	--	7.4	7.9	230	8.9
17...	80	--	7.8	7.9	248	8.5
17...	85	--	7.5	7.9	254	8.2
17...	90	--	7.2	7.8	270	7.6
17...	95	--	7.0	7.8	270	7.4
17...	100	--	6.8	7.4	272	7.3
17...	105	--	6.7	7.8	275	7.3
17...	110	--	6.6	7.8	277	7.2
17...	112	--	6.6	7.8	279	7.2

Date	Time	Sampling depth, feet (00003)	Depth to 1% of surface light, feet (00034)	Incident light intnsty 400-700 nm, uE/m2/s (00200)	Light attenuation coeffi-cient, alpha/m (70971)	Transparency water unfltrd secchi disc feet (49701)	Barometric pressure, mm Hg (00025)
OCT 2002							
17...	1000	10	53.0	99.3	.08	17.2	786
17...	1030	115	--	--	--	--	--
JUN 2003							
17...	1415	10	26.0	1710	.18	10.0	700
17...	1445	127	--	--	--	--	--
JUL							
14...	1445	10	21.0	1860	.17	6.8	694
14...	1515	139	--	--	--	--	--
AUG							
12...	1500	10	38.0	1850	.10	11.4	689
12...	1530	136	--	--	--	--	--
SEP							
17...	1015	10	39.0	1120	.10	15.5	692
17...	1045	112	--	--	--	--	--

12300110 LAKE KOOCANUSA AT INTERNATIONAL BOUNDARY--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003--Continued

Date	Time	Temperature, air, deg C (00020)	Silica, water, fltrd, mg/L (00955)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Ammonia water, fltrd, mg/L as N (00608)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Ortho-phosphate, water, fltrd, mg/L as P (00671)	Phosphorus, water, unfltrd mg/L (00665)
OCT 2002								
17...	1000	8.0	2.1	E.08	<.015	E.012	<.007	E.003
17...	1030	--	5.6	E.10	E.009	.214	<.007	.010
JUN 2003								
17...	1415	24.0	3.9	E.09	<.015	.081	<.007	.005
17...	1445	--	4.3	.11	.020	.116	<.007	.008
JUL								
14...	1445	26.0	3.5	.11	<.015	.041	<.007	.007
14...	1515	--	4.4	E.05	<.015	.147	<.007	.004
AUG								
12...	1500	28.0	2.3	E.07	<.015	<.022	<.007	.015
12...	1530	--	4.7	<.10	<.015	.161	<.007	.004
SEP								
17...	1015	10.0	2.9	E.08	<.015	<.022	<.007	.004
17...	1045	--	5.3	E.09	<.015	.187	<.007	.005

Date	Time	Sampling depth, feet (00003)	Hardness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnesium, water, fltrd, mg/L (00925)	Potassium, water, fltrd, mg/L (00935)	Sodium adsorption ratio (00931)	Sodium, water, fltrd, mg/L (00930)	Alkalinity, wat flt fxd end lab, mg/L as CaCO3 (29801)
JUN 2003									
17...	1415	10	110	29.7	8.03	.48	.1	2.64	96
17...	1445	127	130	36.2	10.6	.62	.2	4.40	114
AUG									
12...	1500	10	110	29.7	8.30	.47	.1	2.26	96
12...	1530	136	120	33.9	9.35	.45	.1	3.37	105

Date	Chloride, water, fltrd, mg/L (00940)	Fluoride, water, fltrd, mg/L (00950)	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of constituents mg/L (70301)	Residue water, fltrd, tons/ acre-ft (70303)
JUN 2003					
17...	2.49	<.2	17.3	123	.17
17...	3.75	<.2	24.9	154	.21
AUG					
12...	2.35	<.2	16.3	119	.16
12...	3.01	<.2	19.8	138	.19

Date	Pheophytin a, phytoplankton, ug/L (62360)	Chlorophyll a phytoplankton, fluoro, ug/L (70953)
JUN 2003		
17...	.7	1.8
JUL		
14...	.9	2.8
AUG		
12...	.6	1.1
SEP		
17...	.7	1.6

E--Estimated.

KOOTENAI RIVER BASIN

12301300 TOBACCO RIVER NEAR EUREKA, MT

LOCATION.--Lat 48°53'37", long 115°05'13" (NAD 27), in NW$^1/_4$SE$^1/_4$SE$^1/_4$ sec.9, T.36 N., R.27 W., Lincoln County, Hydrologic Unit 17010101, on right bank 0.2 mi upstream from Indian Creek, 1.8 mi northwest of Eureka, and 2.8 mi upstream from Lake Koocanusa flow line.
DRAINAGE AREA.--440 mi^2.
PERIOD OF RECORD.--September 1958 to current year.
GAGE.--Water-stage recorder. Elevation of gage is 2,518.85 ft (NGVD 29).
REMARKS.--Records good except those for estimated daily discharges, which are fair. Diversions for irrigation of about 4,500 acres upstream from station. U. S. Geological Survey satellite telemeter at station. Several observations of water temperature and specific conductance were made during the year.
EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of about May 22, 1948, reached a discharge of 2,810 ft^3/s, from slope-area measurement of peak flow at site 1.5 mi downstream.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	89	e50	70	68	88	62	391	390	831	296	68	38
2	84	e55	70	69	83	62	378	397	815	276	67	37
3	90	e60	71	74	80	61	304	437	769	259	70	37
4	90	e65	69	73	77	58	250	513	686	240	72	36
5	89	70	68	75	72	59	217	536	638	221	70	35
6	88	84	68	71	e55	58	193	510	612	212	70	35
7	88	83	68	68	e45	54	176	464	614	201	67	33
8	86	83	68	63	e50	54	166	425	636	192	59	37
9	85	91	68	58	e55	59	186	397	724	179	54	50
10	84	90	68	e50	e60	62	262	374	711	164	53	51
11	83	84	68	e42	64	73	348	356	714	155	54	53
12	82	84	68	e50	59	79	442	342	645	144	50	54
13	82	93	68	e60	62	117	465	333	613	137	48	53
14	82	95	72	72	68	126	463	342	597	134	46	69
15	82	92	80	69	69	121	465	380	556	131	45	72
16	82	86	85	65	66	129	438	407	524	130	47	74
17	82	84	83	63	68	133	409	391	502	128	51	78
18	82	81	73	62	66	127	406	362	498	122	48	75
19	82	80	e65	61	65	124	389	340	519	117	46	74
20	82	83	e55	62	65	120	373	306	675	112	43	72
21	81	85	47	60	68	121	390	295	623	108	42	73
22	79	89	e40	53	65	124	432	288	560	104	44	71
23	78	92	e43	56	45	140	505	297	516	99	48	70
24	77	85	e48	68	e50	161	570	365	475	96	45	68
25	78	64	60	68	e55	145	634	558	444	93	42	68
26	78	e66	66	73	e60	132	654	775	417	90	40	66
27	77	e68	67	95	65	132	575	745	396	88	39	65
28	81	70	68	82	66	123	497	717	365	83	40	65
29	76	76	67	76	---	119	444	796	342	79	40	65
30	54	71	e60	76	---	117	410	860	320	76	39	64
31	e45	---	e65	77	---	162	---	794	---	73	38	---
TOTAL	2498	2359	2036	2059	1791	3214	11832	14492	17337	4539	1585	1738
MEAN	80.6	78.6	65.7	66.4	64.0	104	394	467	578	146	51.1	57.9
MAX	90	95	85	95	88	162	654	860	831	296	72	78
MIN	45	50	40	42	45	54	166	288	320	73	38	33
AC-FT	4950	4680	4040	4080	3550	6370	23470	28740	34390	9000	3140	3450
CFSM	0.18	0.18	0.15	0.15	0.15	0.24	0.90	1.06	1.31	0.33	0.12	0.13
IN.	0.21	0.20	0.17	0.17	0.15	0.27	1.00	1.23	1.47	0.38	0.13	0.15

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 2003, BY WATER YEAR (WY)

MEAN	112	131	114	101	110	155	424	770	738	307	126	107
MAX	343	368	415	248	492	422	883	1469	1498	576	235	239
(WY)	1960	1990	1996	1974	1996	1972	1996	1997	1974	1974	1993	1959
MIN	50.7	56.3	60.3	53.5	49.9	66.6	140	371	196	79.7	36.7	28.9
(WY)	1995	1995	2002	1989	1988	2001	1970	2001	1992	1977	1988	2001

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1959 - 2003	
ANNUAL TOTAL	93455		65480			
ANNUAL MEAN	256		179		266	
HIGHEST ANNUAL MEAN					496	1996
LOWEST ANNUAL MEAN					109	2001
HIGHEST DAILY MEAN	1540	May 22	860	May 30	2510	May 13 1991
LOWEST DAILY MEAN	40	Dec 22	33	Sep 7	20	Jan 11 1963
ANNUAL SEVEN-DAY MINIMUM	51	Dec 19	36	Sep 2	23	Sep 6 1988
MAXIMUM PEAK FLOW			908	May 30	3180	May 13 1991
MAXIMUM PEAK STAGE			4.22	May 30	7.16	May 13 1991
INSTANTANEOUS LOW FLOW			22	Jan 10	22	Feb 7 2001
ANNUAL RUNOFF (AC-FT)	185400		129900		193000	
ANNUAL RUNOFF (CFSM)	0.58		0.41		0.61	
ANNUAL RUNOFF (INCHES)	7.90		5.54		8.23	
10 PERCENT EXCEEDS	776		503		708	
50 PERCENT EXCEEDS	93		81		130	
90 PERCENT EXCEEDS	66		50		68	

e--Estimated.

12301830 LAKE KOOCANUSA AT TENMILE CREEK, NEAR LIBBY, MT

LOCATION.--Lat 48°35'06", long 115°13'52" (NAD 27), in $NW^1/_4NE^1/_4NW^1/_4$ sec.33, T.33 N., R.28 W., Lincoln County, Hydrologic Unit 17010101, in middle of old channel at Tenmile Creek, and 20.1 mi northeast of Libby.

PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Sampling depth, feet (00003)	Incident light remaining at depth, percent (00031)	Dissolved oxygen, mg/L (00300)	pH, water, unfltrd field, std units (00400)	Specif. conduct-ance, wat unf uS/cm 25 degC (00095)	Temperature, water, deg C (00010)
OCT 2002						
16...	0.5	50.9	10.0	8.4	208	12.9
16...	2	24.4	9.9	8.4	207	12.9
16...	5	26.4	9.9	8.4	208	12.9
16...	10	14.8	9.8	8.4	207	12.9
16...	15	8.59	9.8	8.4	208	12.9
16...	20	5.14	9.8	8.4	208	12.9
16...	25	3.58	9.8	8.4	208	12.9
16...	30	2.14	9.8	8.4	207	12.9
16...	35	1.39	9.7	8.4	208	12.9
16...	40	.94	10.2	8.4	208	12.9
16...	45	.64	9.7	8.4	207	12.9
16...	50	.40	9.7	8.4	207	12.9
16...	55	--	9.7	8.4	208	12.9
16...	60	--	9.6	8.4	207	12.9
16...	70	--	9.6	8.4	207	12.9
16...	70	--	8.3	8.0	197	12.0
16...	90	--	8.3	7.9	195	11.1
16...	100	--	8.7	7.8	186	10.6
16...	110	--	8.8	7.8	194	10.2
16...	120	--	9.0	7.8	197	9.6
16...	130	--	9.2	7.8	202	9.1
16...	140	--	9.2	7.8	209	8.7
16...	150	--	9.3	7.8	215	8.2
16...	160	--	9.4	7.8	218	7.8
16...	170	--	9.4	7.8	225	7.4
16...	180	--	9.3	7.8	236	6.8
16...	190	--	9.3	7.8	243	6.5
16...	200	--	9.2	7.8	250	6.1
16...	210	--	9.2	7.8	259	5.7
16...	214	--	9.1	7.8	260	5.6
MAY 2003						
13...	0.5	110	9.6	8.3	254	8.5
13...	2	74.3	9.5	8.3	254	8.5
13...	5	53.6	9.5	8.3	254	8.5
13...	10	24.5	9.5	8.4	252	8.4
13...	15	13.9	9.4	8.4	253	8.4
13...	20	8.43	9.4	8.4	252	7.9
13...	25	5.43	9.5	8.4	240	7.1
13...	30	3.40	9.5	8.3	238	6.8
13...	35	2.06	9.5	8.3	237	6.6
13...	40	1.85	9.4	8.3	238	6.5
13...	45	1.10	9.4	8.3	239	6.4
13...	50	.93	9.4	8.3	240	6.3
13...	55	1.07	9.4	8.3	238	6.0
13...	60	.34	9.4	8.3	239	5.9
13...	65	--	9.3	8.3	240	5.8
13...	70	--	9.3	8.2	241	5.6
13...	75	--	9.3	8.2	241	5.5
13...	80	--	9.3	8.2	240	5.4
13...	90	--	9.2	8.2	242	4.7
13...	100	--	9.2	8.2	245	4.3
13...	110	--	9.1	8.2	245	4.2
13...	120	--	9.1	8.2	246	3.9
13...	130	--	9.1	8.1	249	3.8
13...	140	--	9.1	8.1	251	3.8
13...	150	--	9.1	8.2	256	4.0
13...	160	--	9.1	8.2	259	4.1
13...	170	--	9.1	8.2	261	4.2
13...	180	--	9.0	8.1	263	4.2
13...	190	--	9.0	8.1	268	4.1
13...	200	--	9.0	8.1	270	4.1
13...	210	--	9.0	8.1	270	4.1
13...	220	--	9.0	8.1	270	4.1
13...	230	--	9.0	8.1	271	4.1
13...	237	--	8.9	8.1	272	4.1

12301830 LAKE KOOCANUSA AT TENMILE CREEK, NEAR LIBBY, MT--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003--Continued

Date	Sampling depth, feet (00003)	Incident light remaining at depth, percent (00031)	Dissolved oxygen, mg/L (00300)	pH, water, unfltrd field, std units (00400)	Specif. conduct-ance, wat unf uS/cm 25 degC (00095)	Temper-ature, water, deg C (00010)
JUN 2003						
17...	2	37.9	10.3	8.7	254	17.5
17...	5	28.2	10.3	8.7	251	17.4
17...	10	13.1	10.4	8.7	250	17.0
17...	15	7.42	10.5	8.7	250	16.5
17...	20	4.15	10.8	8.6	247	15.0
17...	25	2.11	10.8	8.5	222	12.8
17...	30	.95	10.8	8.5	211	11.4
17...	40	.10	10.7	8.4	199	10.2
17...	50	--	10.6	8.3	201	9.9
17...	60	--	10.5	8.3	201	9.7
17...	70	--	10.6	8.3	210	9.4
17...	80	--	10.5	8.3	238	9.1
17...	90	--	10.6	8.3	261	8.7
17...	100	--	10.8	8.3	267	8.1
17...	110	--	10.8	8.3	262	7.7
17...	120	--	11.0	8.3	255	8.3
17...	130	--	11.0	8.3	257	6.7
17...	140	--	11.2	8.3	255	6.2
17...	150	--	11.2	8.2	253	5.8
17...	160	--	11.2	8.2	253	5.4
17...	170	--	11.1	8.2	255	5
17...	180	--	11.1	8.2	255	4.8
17...	190	--	11.0	8.2	258	4.8
17...	200	--	11.0	8.2	257	4.6
17...	210	--	11.0	8.2	260	4.4
17...	220	--	11.0	8.2	260	4.3
17...	230	--	10.9	8.2	265	4.2
17...	240	--	10.8	8.2	264	4.2
17...	250	--	10.7	8.2	264	4.2
17...	260	--	10.5	8.2	265	4.2
17...	263	--	10.2	8.1	266	4.2
JUL 2003						
14...	0.5	65.4	8.3	8.6	221	19.0
14...	2	45.6	8.3	8.6	222	19.0
14...	5	29.7	8.3	8.8	220	19.0
14...	10	18.6	8.3	8.7	218	18.9
14...	15	10.0	8.5	8.7	218	18.3
14...	20	5.16	8.5	8.6	213	16.5
14...	25	3.00	8.3	8.5	208	15.5
14...	30	1.70	8.0	8.4	207	14.5
14...	35	1.01	7.9	8.4	206	14.0
14...	40	.63	7.8	8.3	203	13.3
14...	45	.37	7.9	8.3	203	12.8
14...	50	.22	7.9	8.3	196	12.3
14...	55	--	7.9	8.2	200	12.0
14...	60	--	7.9	8.2	200	11.7
14...	70	--	7.9	8.2	204	11.0
14...	80	--	8.0	8.2	206	10.6
14...	90	--	8.0	8.2	208	10.0
14...	100	--	8.1	8.1	222	9.5
14...	115	--	8.3	8.1	260	8.6
14...	130	--	8.5	8.1	260	7.4
14...	145	--	8.6	8.1	263	6.5
14...	160	--	8.7	8.1	260	5.8
14...	175	--	8.7	8.1	260	5.3
14...	190	--	8.7	8.1	260	5.0
14...	205	--	8.7	8.1	260	4.8
14...	220	--	8.6	8.0	262	4.6
14...	235	--	8.6	8.0	261	4.5
14...	250	--	8.6	8.0	262	4.4
14...	265	--	8.5	8.0	263	4.4
14...	274	--	8.5	8.0	262	4.4

Date	Sampling depth, feet (00003)	Incident light remaining at depth, percent (00031)	Dissolved oxygen, mg/L (00300)	pH, water, unfltrd field, std units (00400)	Specif. conductance, wat unf uS/cm 25 degC (00095)	Temperature, water, deg C (00010)
AUG 2003						
12...	0.5	28.2	7.3	8.6	218	16.0
12...	2	20.6	7.4	8.6	219	21.0
12...	5	9.85	7.4	8.6	218	21.0
12...	10	8.39	7.4	8.6	218	21.0
12...	15	5.99	7.3	8.6	218	21.0
12...	20	4.01	7.3	8.6	218	21.0
12...	25	2.48	7.3	8.6	218	21.0
12...	30	1.68	7.4	8.6	218	20.5
12...	35	1.15	7.3	8.5	218	19.5
12...	40	.79	7.3	8.4	217	18.0
12...	45	.55	7.5	8.4	207	15.0
12...	50	.38	7.5	8.3	207	14.5
12...	55	.26	7.5	8.3	203	13.8
12...	60	.17	7.4	8.2	204	13.4
12...	70	--	7.4	8.2	204	11.2
12...	80	--	7.4	8.1	204	11.2
12...	90	--	7.6	8.1	234	9.8
12...	100	--	7.6	8.1	250	9.1
12...	110	--	7.8	8.0	257	7.6
12...	120	--	7.8	8.0	257	7.6
12...	130	--	7.9	8.0	261	7.2
12...	140	--	7.8	8.0	262	7.0
12...	150	--	7.8	8.0	263	6.6
12...	165	--	7.9	8.0	265	6.5
12...	180	--	7.9	8.0	265	6.0
12...	195	--	7.9	8.0	264	5.7
12...	210	--	8.0	8.0	263	5.1
12...	225	--	8.0	8.0	262	4.7
12...	240	--	8.0	7.9	263	4.8
12...	265	--	8.0	7.9	262	4.6
12...	270	--	8.0	7.9	262	4.6
SEP 2003						
16...	0.5	71.5	8.7	8.4	222	17.5
16...	2	37.2	8.7	8.5	222	17.5
16...	5	17.6	8.6	8.4	222	17.5
16...	10	26.6	8.6	8.5	222	17.5
16...	15	19.4	8.6	8.5	222	17.5
16...	20	12.2	8.6	8.5	222	17.5
16...	25	8.16	8.6	8.5	222	17.5
16...	30	6.10	8.5	8.5	222	17.5
16...	35	3.93	8.5	8.5	222	17.4
16...	40	3.15	8.5	8.5	222	17.4
16...	45	2.11	8.5	8.5	222	17.4
16...	50	1.18	8.5	8.5	222	17.4
16...	55	.99	7.8	8.4	224	15.9
16...	60	.55	7.5	8.2	218	14.7
16...	65	.40	7.6	8.2	210	13.2
16...	70	--	7.8	8.1	203	12.7
16...	80	--	7.9	7.9	204	11.3
16...	90	--	8.0	7.9	209	10.5
16...	100	--	8.2	7.9	222	9.5
16...	110	--	8.5	7.9	247	8.7
16...	120	--	8.7	7.9	253	7.8
16...	130	--	8.8	7.9	255	7.3
16...	140	--	8.8	7.9	256	6.9
16...	150	--	8.8	7.9	259	6.5
16...	160	--	8.9	7.9	260	6.1
16...	170	--	8.9	7.9	260	5.7
16...	180	--	9.0	7.9	260	5.3
16...	190	--	9.0	7.9	260	5.1
16...	200	--	9.0	7.9	259	4.9
16...	210	--	9.0	7.8	259	4.7
16...	220	--	8.9	7.8	260	4.6
16...	230	--	8.9	7.8	260	4.6
16...	240	--	8.9	7.8	259	4.6
16...	250	--	8.8	7.8	260	4.5
16...	254	--	8.8	7.8	260	4.5

Date	Time	Sampling depth, feet (00003)	Depth to 1% of surface light, feet (00034)	Incident light intnsty 400-700 nm, uE/m2/s (00200)	Light attenuation coeffi-cient, alpha/m (70971)	Transparency water unfltrd secchi disc feet (49701)	Barometric pressure, mm Hg (00025)	Temperature, air, deg C (00020)
OCT 2002								
16...	1200	10	39.0	1340	.09	19.5	791	12.0
16...	1230	214	--	--	--	--	--	--
MAY 2003								
13...	1230	10	49.5	291	.89	13.0	702	13.5
13...	1301	237	--	--	--	--	--	--
JUN								
17...	0930	10	29.0	1720	.15	11.6	700	18.5
17...	1000	263	--	--	--	--	--	--
JUL								
14...	0930	10	35.0	1640	.11	13.2	694	20.0
14...	1000	274	--	--	--	--	--	--
AUG								
12...	0915	10	37.0	1370	.08	17.8	689	18.5
12...	0945	270	--	--	--	--	--	--
SEP								
16...	1100	10	55.0	1360	.07	20.1	674	16.0
16...	1137	254	--	--	--	--	--	--

Date	Silica, water, fltrd, mg/L (00955)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Ammonia water, fltrd, mg/L as N (00608)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Phos-phorus, water, unfltrd mg/L (00665)
OCT 2002						
16...	2.0	E.08	<.015	E.011	<.007	E.002
16...	6.0	E.06	<.015	.148	<.007	.004
MAY 2003						
13...	4.0	.14	<.015	.065	<.007	E.004
13...	3.8	E.06	E.010	.096	<.007	E.003
JUN						
17...	3.5	E.09	<.015	.030	<.007	E.003
17...	3.9	.11	E.013	.108	<.007	.004
JUL						
14...	3.3	.10	<.015	.028	<.007	.005
14...	4.3	E.05	<.015	.123	<.007	E.004
AUG						
12...	3.1	E.09	<.015	<.022	<.007	E.003
12...	4.3	E.06	<.015	.116	<.007	E.004
SEP						
16...	3.0	E.09	<.015	<.022	<.007	.004
16...	4.4	E.10	<.015	.134	<.007	E.003

Date	Time	Sampling depth, feet (00003)	Hardness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnesium, water, fltrd, mg/L (00925)	Potassium, water, fltrd, mg/L (00935)	Sodium adsorption ratio (00931)	Sodium, water, fltrd, mg/L (00930)	Alkalinity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chloride, water, fltrd, mg/L (00940)	Fluoride, water, fltrd, mg/L (00950)	Sulfate water, fltrd, mg/L (00945)
MAY 2003												
13...	1230	10	120	33.5	9.46	.60	.2	4.07	106	3.76	<.2	23.9
13...	1301	237	130	35.7	10.1	.67	.2	4.43	114	4.02	<.2	26.2
AUG												
12...	0915	10	110	30.0	8.23	.43	.1	2.31	93	2.26	<.2	15.6
12...	0945	270	130	36.3	10.5	.50	.2	4.13	111	3.52	<.2	22.6

Date	Residue water, fltrd, sum of consti-tuents mg/L (70301)	Residue water, fltrd, tons/ acre-ft (70303)	Alum-inum, water, fltrd, ug/L (01106)	Arsenic water, fltrd, ug/L (01000)	Cadmium water, fltrd, ug/L (01025)	Chrom-ium, water, fltrd, ug/L (01030)	Copper, water, fltrd, ug/L (01040)	Lead, water, fltrd, ug/L (01049)	Mercury water, fltrd, ug/L (71890)	Nickel, water, fltrd, ug/L (01065)	Zinc, water, fltrd, ug/L (01090)
MAY 2003											
13...	143	.19	5	.4	E.03	<.8	.5	<.08	<.02	1.41	<1
13...	154	.21	<2	.4	<.04	<.8	.5	E.07	<.02	1.45	<1
AUG											
12...	118	.16	4	.3	<.04	<.8	.5	<.08	E.01	1.05	1
12...	149	.20	E2	.3	<.04	<.8	.6	<.08	E.01	1.29	<1

Date	Pheo-phytin a, phyto-plank-ton, ug/L (62360)	Chloro-phyll a phyto-plank-ton, fluoro, ug/L (70953)	Chloro-phyll b phyto-plank-ton, fluoro, ug/L (70954)
OCT 2002			
16...	--	1.2	<.1
MAY 2003			
13...	1.1	3.4	--
JUN			
17...	1.1	2.6	--
JUL			
14...	.6	2.5	--
AUG			
12...	.8	1.3	--
SEP			
16...	.5	1.6	--

E--Estimated.

12301919 LAKE KOOCANUSA AT FOREBAY, NEAR LIBBY, MT

LOCATION.--Lat 48°24'43", long 115°18'33" (NAD 27), in $SW^1/_4NW^1/_4NE^1/_4$ sec.33, T.31 N., R.29 W., Lincoln County, Hydrologic Unit 17010101, in middle of old channel 0.2 mi upstream from Libby Dam, and 11.6 mi east of Libby.
PERIOD OF RECORD.--Water years 1972 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Sampling depth, feet (00003)	Incident light remaining at depth, percent (00031)	Dissolved oxygen, mg/L (00300)	pH, water, unfltrd field, std units (00400)	Specif. conduct-ance, wat unf uS/cm 25 degC (00095)	Temperature, water, deg C (00010)
OCT 2002						
16...	0.5	70.7	10	8.4	199	12.7
16...	2	58.9	10	8.4	199	12.7
16...	5	35.1	9.9	8.4	199	12.6
16...	10	20.0	9.9	8.4	198	12.5
16...	15	10.9	9.9	8.4	199	12.5
16...	20	5.98	9.8	8.4	198	12.5
16...	25	3.57	9.8	8.4	198	12.4
16...	30	2.11	9.8	8.4	198	12.4
16...	35	1.27	9.8	8.4	198	12.4
16...	40	.83	9.7	8.4	198	12.4
16...	45	.53	9.7	8.3	197	12.4
16...	50	.33	9.7	8.3	197	12.4
16...	60	--	9.6	8.3	197	12.4
16...	70	--	9.6	8.3	197	12.4
16...	80	--	9.6	8.3	197	12.4
16...	90	--	9.3	8.2	194	12.2
16...	100	--	8.9	7.9	194	11.1
16...	110	--	9.1	7.9	193	10.2
16...	120	--	9.3	7.9	199	9.8
16...	130	--	9.3	7.9	205	9.4
16...	145	--	9.5	7.9	218	8.5
16...	160	--	9.7	7.9	228	7.9
16...	175	--	9.9	7.9	237	7.3
16...	190	--	10	7.9	249	6.6
16...	205	--	10	7.9	257	6.0
16...	220	--	10	7.9	261	5.6
16...	235	--	10	7.9	265	5.3
16...	250	--	9.9	7.8	267	5.1
16...	265	--	9.8	7.9	268	4.9
16...	277	--	9.6	7.8	268	4.9
MAY 2003						
13...	0.5	64.6	9.7	8.4	239	9.5
13...	2	50.4	9.7	8.4	239	9.5
13...	5	41.9	9.7	8.4	238	9.2
13...	10	21.3	9.8	8.4	237	8.3
13...	15	11.4	9.9	8.4	237	8.1
13...	20	5.87	9.8	8.4	237	7.6
13...	25	3.67	9.8	8.4	236	7.4
13...	30	1.98	9.7	8.4	236	7.3
13...	35	1.28	9.7	8.3	236	7.2
13...	40	.38	9.6	8.3	236	7.2
13...	45	.22	9.6	8.3	237	7.1
13...	50	.14	9.5	8.3	237	6.9
13...	60	--	9.5	8.3	236	6.2
13...	65	--	9.4	8.2	239	5.5
13...	70	--	9.3	8.2	240	5.2
13...	80	--	9.3	8.2	244	4.5
13...	90	--	9.2	8.2	248	4.1
13...	100	--	9.1	8.1	242	4.1
13...	110	--	9.0	8.1	266	4.0
13...	120	--	8.9	8.1	247	3.8
13...	130	--	8.9	8.1	251	3.7
13...	140	--	8.9	8.1	258	3.7
13...	150	--	8.9	8.1	251	3.7
13...	160	--	9.0	8.1	252	3.6
13...	170	--	9.0	8.1	254	3.6
13...	180	--	9.0	8.1	253	3.6
13...	195	--	9.0	8.1	255	3.6
13...	210	--	9.0	8.1	258	3.6
13...	225	--	9.0	8.1	260	3.6
13...	240	--	9.0	8.1	264	3.6
13...	255	--	9.0	8.1	261	3.6
13...	270	--	9.0	8.1	265	3.6
13...	285	--	9.0	8.1	259	3.6
13...	289	--	8.9	8.1	265	3.6

Date	Sampling depth, feet (00003)	Incident light remaining at depth, percent (00031)	Dissolved oxygen, mg/L (00300)	pH, water, unfltrd field, std units (00400)	Specif. conduct-tance, wat unf uS/cm 25 degC (00095)	Temperature, water, deg C (00010)
JUN 2003						
17...	2	53.6	11.2	8.4	251	16.7
17...	5	40.6	11.2	8.5	249	16.1
17...	10	22.8	11.4	8.5	249	15.0
17...	15	12.1	11.9	8.5	246	12.8
17...	20	6.30	11.9	8.5	257	11.7
17...	25	3.42	11.7	8.4	252	11.1
17...	30	1.93	11.3	8.3	253	10.5
17...	35	1.03	11.2	8.3	247	10.2
17...	40	.55	11.1	8.3	247	10.1
17...	45	.29	11.0	8.3	248	10.1
17...	50	.16	10.9	8.3	245	10.0
17...	60	.04	10.9	8.3	246	9.9
17...	70	--	10.9	8.3	253	9.8
17...	80	--	11.0	8.3	255	9.6
17...	90	--	11.2	8.3	249	8.7
17...	100	--	11.6	8.3	247	8.2
17...	110	--	11.8	8.3	242	7.5
17...	120	--	11.9	8.3	242	7.1
17...	130	--	11.9	8.3	241	6.5
17...	140	--	11.9	8.2	241	6.0
17...	150	--	12.0	8.2	240	5.5
17...	160	--	11.9	8.2	242	5.0
17...	175	--	11.9	8.2	244	4.5
17...	190	--	11.9	8.2	251	4.1
17...	205	--	11.8	8.2	254	3.9
17...	220	--	11.7	8.1	259	3.9
17...	235	--	11.6	8.1	262	3.8
17...	250	--	11.6	8.1	262	3.8
17...	265	--	11.5	8.1	261	3.8
17...	280	--	11.4	8.1	263	3.9
17...	295	--	11.3	8.1	264	3.9
17...	303	--	11.1	8.1	262	3.9
JUL 2003						
14...	0.5	83.0	10.9	8.6	209	18.0
14...	2	66.0	10.4	8.6	222	18.0
14...	5	44.5	10.4	8.7	205	17.3
14...	10	24.8	10.2	8.7	209	16.5
14...	15	13.1	9.9	8.7	203	16.1
14...	20	7.10	9.9	8.7	215	15.7
14...	25	3.82	9.3	8.6	213	15.3
14...	30	2.22	9.1	8.6	214	15.0
14...	35	1.16	8.9	8.6	213	14.6
14...	40	.79	8.6	8.5	210	14.3
14...	45	.47	8.5	8.4	206	13.5
14...	50	.29	8.4	8.4	204	13.1
14...	55	--	8.4	8.3	200	12.8
14...	60	--	8.2	8.3	204	12.1
14...	70	--	8.1	8.2	209	11.8
14...	80	--	8.1	8.2	213	11.5
14...	90	--	8.1	8.2	214	10.7
14...	100	--	8.1	8.1	218	10.1
14...	115	--	8.1	8.1	231	9.6
14...	130	--	8.4	8.1	231	8.7
14...	145	--	8.8	8.1	234	7.1
14...	160	--	8.9	8.1	235	6.2
14...	175	--	8.9	8.1	236	5.4
14...	190	--	9.1	8.1	237	4.7
14...	205	--	9.1	8.1	238	4.5
14...	220	--	9.1	8.0	237	4.3
14...	235	--	9.1	8.0	237	4.0
14...	250	--	8.9	8.0	239	4.0
14...	265	--	8.9	8.0	240	4.0
14...	280	--	8.9	8.0	243	3.9
14...	295	--	8.7	8.0	245	3.9
14...	310	--	8.6	8.0	245	3.9
14...	327	--	8.4	8.0	246	3.9

12301919 LAKE KOOCANUSA AT FOREBAY, NEAR LIBBY, MT--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003--Continued

Date	Sampling depth, feet (00003)	Incident light remaining at depth, percent (00031)	Dissolved oxygen, mg/L (00300)	pH, water, unfltrd field, std units (00400)	Specif. conduct-tance, wat unf uS/cm 25 degC (00095)	Temperature, water, deg C (00010)
AUG 2003						
12...	0.5	67.0	9.3	8.7	221	20.5
12...	2	57.3	8.6	8.7	220	20.5
12...	5	41.5	8.5	8.7	217	20.6
12...	10	25.4	8.3	8.7	213	20.4
12...	15	16.2	8.2	8.7	216	20.2
12...	20	10.6	8.2	8.6	217	20.0
12...	25	6.73	7.9	8.6	219	19.5
12...	30	4.60	7.9	8.6	215	19.4
12...	35	3.16	8.1	8.6	211	18.7
12...	40	2.07	8.2	8.5	209	17.9
12...	45	1.44	8.2	8.5	214	17.0
12...	50	1.01	7.7	8.3	216	15.2
12...	60	.45	7.6	8.2	218	14.3
12...	70	.21	7.6	8.2	216	12.8
12...	80	.09	7.6	8.1	209	10.9
12...	90	--	7.8	8.0	206	9.7
12...	100	--	8.0	8.0	247	9.0
12...	110	--	8.2	8.1	258	7.9
12...	125	--	8.3	8.1	244	7.8
12...	140	--	8.4	8.0	244	7.3
12...	155	--	8.6	8.0	255	6.5
12...	170	--	8.6	8.0	245	5.8
12...	185	--	8.7	8.0	241	5.1
12...	200	--	8.7	8.0	255	4.7
12...	215	--	8.7	8.0	258	4.4
12...	230	--	8.6	8.0	256	4.2
12...	245	--	8.5	7.9	259	4.2
12...	260	--	8.4	7.9	264	4.1
12...	275	--	8.3	7.9	262	4.0
12...	290	--	8.3	7.9	260	4.0
12...	305	--	8.2	7.9	263	4.0
12...	310	--	8.1	7.9	267	4.0
SEP 2003						
16...	0.5	69.0	8.9	8.0	219	16.9
16...	2	56.3	8.8	8.2	219	16.9
16...	5	41.9	8.8	8.3	219	16.9
16...	10	27.8	8.8	8.3	219	16.9
16...	15	17.2	8.8	8.4	219	16.9
16...	20	11.8	8.7	8.4	219	16.8
16...	25	7.58	8.7	8.4	218	16.8
16...	30	5.23	8.7	8.4	218	16.8
16...	35	3.47	8.7	8.4	218	16.7
16...	40	2.35	8.6	8.4	218	16.7
16...	45	1.52	8.6	8.4	217	16.5
16...	50	1.01	8.3	8.2	204	13.8
16...	55	.69	8.2	8.1	201	12.7
16...	60	.51	8.2	8.0	201	12.0
16...	70	--	8.2	8.0	205	10.9
16...	80	--	8.2	8.0	210	10.3
16...	90	--	8.4	7.9	226	9.5
16...	100	--	8.5	7.9	241	9.0
16...	110	--	8.8	7.9	251	8.3
16...	120	--	9.1	7.9	249	7.4
16...	130	--	9.3	7.9	249	6.8
16...	145	--	9.4	7.9	252	6.2
16...	160	--	9.5	7.9	253	5.7
16...	175	--	9.5	7.9	253	5.2
16...	190	--	9.5	7.9	254	4.7
16...	205	--	9.5	7.9	255	4.4
16...	220	--	9.4	7.9	256	4.3
16...	235	--	9.3	7.9	258	4.1
16...	250	--	9.2	7.9	259	4.1
16...	265	--	9.1	7.8	260	4.1
16...	280	--	8.9	7.8	261	4.0
16...	295	--	8.7	7.8	261	4.0
16...	307	--	8.4	7.8	262	4.0

Date	Time	Sampling depth, feet (00003)	Depth to 1% of surface light, feet (00034)	Incident light intnsty 400-700 nm, uE/m2/s (00200)	Light attenuation coeffi-cient, alpha/m (70971)	Transparency water unfltrd secchi disc feet (49701)	Barometric pressure, mm Hg (00025)	Temperature, air, deg C (00020)
OCT 2002								
16...	1400	10	38.0	1170	.11	13.4	790	10.0
16...	1430	277	--	--	--	--	--	--
MAY 2003								
13...	1000	10	36.5	1280	.12	14.0	702	12.5
13...	1031	289	--	--	--	--	--	--
JUN								
17...	1115	10	35.5	1860	.12	14.5	700	21.5
17...	1145	303	--	--	--	--	--	--
JUL								
14...	1130	10	37.0	1730	.12	12.7	694	24.0
14...	1200	327	--	--	--	--	--	--
AUG								
12...	1145	10	50.0	1740	.08	24.5	689	20.0
12...	1215	310	--	--	--	--	--	--
SEP								
16...	1445	10	50.0	277	.08	12.9	676	17.0
16...	1515	307	--	--	--	--	--	--

Date	Silica, water, fltrd, mg/L (00955)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Ammonia water, fltrd, mg/L as N (00608)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Ortho-phosphate, water, fltrd, mg/L as P (00671)	Phosphorus, water, unfltrd mg/L (00665)
OCT 2002						
16...	2.5	E.07	<.015	.025	<.007	.004
16...	5.7	.14	<.015	.133	<.007	.004
MAY 2003						
13...	3.7	<.10	<.015	.058	<.007	.005
13...	3.9	E.09	E.011	.096	<.007	.004
JUN						
17...	3.4	.10	<.015	.038	<.007	E.003
17...	3.8	.13	E.011	.106	<.007	<.004
JUL						
14...	3.4	.14	<.015	.124	<.007	E.004
14...	4.2	E.09	<.015	.044	<.007	E.003
AUG						
12...	3.4	E.09	<.015	<.022	<.007	E.002
12...	4.0	E.06	<.015	.115	<.007	<.004
SEP						
16...	3.0	.10	<.015	E.015	<.007	E.003
16...	4.1	E.09	<.015	.113	<.007	.004

Date	Time	Sampling depth, feet (00003)	Hardness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnesium, water, fltrd, mg/L (00925)	Potassium, water, fltrd, mg/L (00935)	Sodium adsorption ratio (00931)	Sodium, water, fltrd, mg/L (00930)
MAY 2003								
13...	1000	10	120	33.2	9.00	.54	.1	3.18
13...	1031	289	130	36.4	10.3	.57	.2	4.27
AUG								
12...	1145	10	110	29.8	8.20	.40	.1	2.27
12...	1215	310	130	35.9	10.4	.57	.2	4.06

E--Estimated.

Date	Alka-linity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chlor-ide, water, fltrd, mg/L (00940)	Fluor-ide, water, fltrd, mg/L (00950)	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of consti-tuents mg/L (70301)	Residue water, fltrd, tons/ acre-ft (70303)
MAY 2003						
13...	103	2.87	<.17	20.3	134	.18
13...	112	3.66	<.17	25.1	152	.21
AUG						
12...	89	2.09	<.2	14.7	114	.16
12...	112	3.43	<.2	23.0	149	.20

Date	Time	Pheo-phytin a, phyto-plank-ton, ug/L (62360)	Chloro-phyll a phyto-plank-ton, fluoro, ug/L (70953)
MAY 2003			
13...	1045	1.0	3.5
JUN			
17...	1130	.8	3.4
JUL			
14...	1145	1.1	2.9
AUG			
12...	1200	.9	1.7
SEP			
16...	1500	.6	1.9

E--Estimated.

12301920 LAKE KOOCANUSA NEAR LIBBY, MT

LOCATION.--Lat 48°24'38", long 115°18'47" (NAD 27), in NW$^1/_4$ sec.33, T.31 N., R.29 W., Lincoln County, Hydrologic Unit 17010101, Kootenai National Forest, in block 18 of Libby Dam on Kootenai River, 11 mi east of Libby and at river mile 221.8.

DRAINAGE AREA.--8,985 mi^2, approximately.

PERIOD OF RECORD.--March 1972 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 2,201.5 (NGVD 29) (levels by U.S. Army Corps of Engineers). Prior to July 2, 1973, nonrecording gage on upstream face of dam at same elevation.

REMARKS.--Reservoir and flow completely controlled by gravity type dam with taintor gated spillway; construction began in 1967; completed in 1973. Storage began Mar. 21, 1972. Usable capacity, 5,748,000 acre-ft between elevation 2,201.5 ft, bottom of sluice gate, and 2,459 ft, controlled spillway elevation. Dead storage, 121,200 acre-ft below elevation 2,201.5 ft. Minimum operating level, 768,700 acre-ft, elevation 2,287.0 ft for on-site power generation. All elevations are referenced to the National Geodetic Vertical Datum of 1929. Figures given herein represent usable contents. Water is used for power production, flood control, irrigation, and recreation.

COOPERATION.--Capacity table and elevations provided by U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 5,753,000 acre-ft, Aug. 6, 1976 and Aug. 16, 1982, maximum elevation, 2,459.12 ft, Aug. 16, 1982; minimum contents observed since normal low operating level reached in May 1972, 139,600 acre-ft, Dec. 16-21, 1972, elevation, 2,226.5 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents observed, 5,707,000 acre-ft, July 3, elevation, 2,458.11 ft; minimum, 3,508,000 acre-ft, Mar. 30, elevation, 2,404.22 ft.

Capacity table (elevation, in feet, and contents, in acre-feet)

Elevation	Contents
2,360	2,232,000
2,380	2,765,000
2,400	3,367,000
2,420	4,085,000
2,440	4,899,000
2,460	5,795,000

ELEVATION (FEET NGVD 1929), WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY OBSERVATION AT 2400 HOURS

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2440.48	2437.76	2434.71	2410.97	2408.38	2405.50	2404.46	2411.88	2438.76	2457.96	2453.30	2438.38
2	2440.40	2437.65	2433.94	2410.89	2408.30	2405.39	2404.56	2412.35	2440.78	2458.09	2452.82	2438.03
3	2440.32	2437.54	2432.92	2410.85	2408.28	2405.30	2404.57	2412.78	2442.52	2458.11	2452.19	2437.70
4	2440.27	2437.42	2431.88	2410.82	2408.20	2405.17	2404.64	2413.24	2443.83	2458.05	2451.79	2437.39
5	2440.20	2437.31	2431.00	2410.71	2408.11	2405.03	2404.68	2413.69	2444.88	2458.02	2451.34	2437.14
6	2440.10	2437.20	2430.45	2410.64	2408.00	2405.00	2404.69	2414.14	2445.48	2457.97	2450.84	2436.95
7	2440.05	2437.14	2429.60	2410.55	2407.91	2404.95	2404.68	2414.58	2446.07	2458.00	2450.42	2436.76
8	2439.94	2437.08	2428.63	2410.53	2407.79	2404.80	2404.67	2415.04	2446.87	2457.99	2449.90	2436.61
9	2439.86	2437.02	2427.54	2410.43	2407.68	2404.61	2404.64	2415.39	2447.90	2458.04	2449.40	2436.30
10	2439.80	2436.93	2426.51	2410.33	2407.58	2404.43	2404.71	2415.69	2448.61	2458.08	2448.86	2435.98
11	2439.67	2436.90	2425.36	2410.17	2407.50	2404.33	2404.76	2416.07	2449.33	2458.05	2448.36	2435.80
12	2439.61	2436.83	2424.26	2409.99	2407.40	2404.30	2404.91	2416.32	2450.02	2458.04	2447.86	2435.63
13	2439.51	2436.73	2423.40	2409.99	2407.30	2404.27	2405.11	2416.68	2450.60	2457.98	2447.30	2435.52
14	2439.36	2436.67	2422.54	2409.85	2407.16	2404.29	2405.31	2417.07	2451.04	2458.02	2446.78	2435.47
15	2439.17	2436.60	2421.55	2409.78	2407.07	2404.35	2405.53	2417.51	2451.50	2458.03	2446.20	2435.34
16	2439.02	2436.47	2420.58	2409.69	2406.93	2404.35	2405.67	2418.13	2451.71	2457.96	2445.68	2435.22
17	2438.89	2436.43	2419.48	2409.57	2406.83	2404.40	2405.88	2418.71	2451.95	2457.85	2445.17	2435.04
18	2438.80	2436.33	2418.30	2409.47	2406.74	2404.38	2406.04	2419.22	2452.27	2457.75	2444.60	2434.97
19	2438.76	2436.27	2417.17	2409.36	2406.67	2404.40	2406.20	2419.67	2452.91	2457.65	2444.10	2434.88
20	2438.72	2436.20	2415.98	2409.28	2406.58	2404.38	2406.38	2420.00	2453.84	2457.46	2443.51	2434.78
21	2438.70	2436.09	2414.80	2409.27	2406.52	2404.38	2406.57	2420.34	2454.70	2457.17	2442.95	2434.70
22	2438.60	2436.06	2413.76	2409.13	2406.47	2404.42	2406.81	2420.70	2455.39	2456.88	2442.54	2434.61
23	2438.53	2435.99	2413.06	2408.97	2406.28	2404.41	2407.16	2421.09	2455.95	2456.58	2442.19	2434.52
24	2438.46	2435.86	2413.06	2408.86	2406.14	2404.46	2407.69	2421.65	2456.22	2456.18	2441.77	2434.40
25	2438.38	2435.74	2412.31	2408.78	2406.02	2404.47	2408.36	2422.76	2456.46	2455.83	2441.42	2434.30
26	2438.30	2435.53	2412.09	2408.73	2405.89	2404.46	2409.11	2425.02	2456.64	2455.46	2441.00	2434.26
27	2438.20	2435.37	2411.72	2408.67	2405.74	2404.44	2409.92	2427.46	2456.87	2455.04	2440.52	2434.14
28	2438.19	2435.26	2411.65	2408.62	2405.65	2404.36	2410.62	2429.65	2457.21	2454.68	2440.08	2434.06
29	2438.07	2435.13	2411.34	2408.56	---	2404.32	2411.10	2431.82	2457.60	2454.41	2439.70	2433.92
30	2437.96	2435.08	2411.24	2408.51	---	2404.22	2411.48	2434.24	2457.76	2454.00	2439.26	2433.85
31	2437.88	---	2411.13	2408.42	---	2404.33	---	2436.58	---	2453.72	2438.79	---
MAX	2440.48	2437.76	2434.71	2410.97	2408.38	2405.50	2411.48	2436.58	2457.76	2458.11	2453.30	2438.38
MIN	2437.88	2435.08	2411.13	2408.42	2405.65	2404.22	2404.46	2411.88	2438.76	2453.72	2438.79	2433.85

CONTENTS IN THOUSANDS OF ACRE-FEET, AT END OF MONTH

OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
4809	4691	3752	3655	3557	3512	3765	4754	5691	5505	4848	4640

CHANGE IN CONTENTS, IN ACRE-FEET

OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
-113000	-118000	-939000	-97000	-98000	-45000	+253000	+989000	+937000	-186000	-657000	-208000

CALENDAR YEAR 2002. . . . . +76000
WATER YEAR 2003. . . . . -282000

KOOTENAI RIVER BASIN

12301933 KOOTENAI RIVER BELOW LIBBY DAM, NEAR LIBBY, MT

LOCATION.--Lat 48°24'03", long 115°19'11" (NAD 27), in $SW^1/_4SW^1/_4SW^1/_4$ sec.33, T.31 N., R.29 W., Lincoln County, Hydrologic Unit 17010101, Kootenai National Forest, on right bank 0.7 mi downstream from Libby Dam, 2.8 mi upstream from Fisher River, 11 mi east of Libby, and at river mile 221.4.

DRAINAGE AREA.--8,985 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1971 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 2,100 ft (NGVD 29) (U.S. Army Corps of Engineers bench mark). Prior to Feb. 13, 1974, nonrecording gage at site 0.4 mi upstream at same elevation.

REMARKS.--Water-discharge records good. Flow completely regulated by Lake Koocanusa since Mar. 21, 1972 . Diversions for irrigation of about 13,000 acres, revised, from tributaries upstream from station in Canada and the United States. U.S. Army Corps of Engineers satellite telemetry at station.

AVERAGE DISCHARGE.--32 years, 11,070 ft^3/s, 16.73 in/yr, 8,020,000 acre-ft/yr, adjusted for change in contents in Lake Koocanusa since Mar. 21, 1972.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 47,200 ft^3/s, Aug. 5, 1974, gage height, 27.50 ft; minimum daily, 1,900 ft^3/s, Jan. 29, 1972.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 26,600 ft^3/s, Dec. 18, gage height, 24.05 ft; minimum daily, 3,960 ft^3/s, May 23.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5950	4800	9390	4530	4050	4110	4050	3980	5860	18900	18200	13900
2	5960	4800	19100	4150	4040	4130	4030	4000	8310	18900	18100	12000
3	5960	4800	24000	4060	4020	4130	4040	4010	12300	18900	18000	11100
4	5960	4800	24100	4040	4020	4100	4050	3990	15000	18900	18100	11000
5	5960	4800	21200	4050	4020	4100	4040	3990	16700	18700	18100	9860
6	5970	4800	14300	4050	4000	4090	4030	4000	23200	16000	18100	8860
7	5960	4800	21400	4060	4020	4050	4050	3980	25000	15400	18100	7930
8	5960	4810	22200	4050	4050	4060	4050	3980	24200	14100	18100	8020
9	5970	4800	23500	4020	4050	4060	4060	4000	24700	14100	18100	11200
10	5970	4800	24900	4030	4050	4070	4050	4000	24200	14100	18200	11000
11	5970	4790	26100	4040	4050	4080	4050	3990	24600	14100	18200	8910
12	5970	4790	24600	4040	4040	4070	4040	3990	24500	14100	18200	7950
13	5970	4810	21000	4050	4050	4070	4040	3980	24500	14100	18100	7160
14	7300	4830	20900	4050	4050	4090	4060	4040	24400	14100	18000	6980
15	8020	4820	20900	4040	4050	4090	4050	4040	24300	14100	18000	7060
16	7400	4830	24400	4070	4050	4090	4060	4010	24400	14100	18000	7040
17	6390	4830	26100	4050	4050	4100	4090	3990	24300	14100	18100	6990
18	5300	4840	26000	4050	4040	4090	4040	3990	24100	14100	18100	6010
19	4820	4830	26100	4050	4030	4080	4030	3980	19300	14100	18100	5980
20	4820	4820	26000	4050	4040	4070	4020	3980	19100	14600	18000	6020
21	4800	4820	26100	4060	4040	4080	4030	4020	19100	18100	17800	6010
22	4810	4830	20700	4050	4020	4080	4020	3970	19100	18100	13900	6030
23	4800	4830	15400	4060	4080	4090	4010	3960	19000	17100	14000	5990
24	4790	4830	10100	4060	4080	4090	4040	4000	19000	18200	14000	6010
25	4810	5930	7300	4060	4080	4080	4030	3980	19000	18200	14000	6000
26	4810	6870	7310	4070	4090	4090	4040	4010	19000	18200	14000	6010
27	4810	6050	7310	4050	4110	4130	4020	3990	19000	18200	14000	6010
28	4810	5010	7320	4040	4130	4100	4000	3980	16300	17000	14000	6010
29	4790	4810	6790	4040	---	4110	3980	3970	17600	14800	14000	5710
30	4820	4820	5800	4030	---	4080	3970	3980	18900	18100	14000	5420
31	4820	---	5050	4040	---	4070	---	3990	---	18200	14100	---
TOTAL	174450	149000	565370	126090	113400	126730	121070	123770	598970	503700	519700	234170
MEAN	5627	4967	18240	4067	4050	4088	4036	3993	19970	16250	16760	7806
MAX	8020	6870	26100	4530	4130	4130	4090	4040	25000	18900	18200	13900
MIN	4790	4790	5050	4020	4000	4050	3970	3960	5860	14100	13900	5420
AC-FT	346000	295500	1121000	250100	224900	251400	240100	245500	1188000	999100	1031000	464500
CFSM	0.63	0.55	2.03	0.45	0.45	0.45	0.45	0.44	2.22	1.81	1.87	0.87
IN.	0.72	0.62	2.34	0.52	0.47	0.52	0.50	0.51	2.48	2.09	2.15	0.97
MEAN †	3789	2983	2960	2490	2285	3357	8287	20080	35710	13220	6082	4311
CFSM †	.42	.33	.33	.28	.25	.37	.92	2.23	3.97	1.47	.68	.48
IN †	.49	.37	.38	.32	.26	.43	1.03	2.58	4.43	1.70	.78	.54
AC-FT†	233000	177500	182000	153100	126900	206400	493100	1234500	2125000	813100	374000	256500

OBSERVED

CALENDAR YEAR 2002	TOTAL	4309070	MEAN	11810	MAX	39700	MIN	3990	AC-FT	8547000
WATER YEAR 2003	TOTAL	3356420	MEAN	9196	MAX	26100	MIN	3960	AC-FT	6657000

ADJUSTED

CALENDAR YEAR 2002	TOTAL	4319737	MEAN	11830	CFSM	1.32	IN	17.99	AC-FT	8623000
WATER YEAR 2003	TOTAL	3214066	MEAN	8806	CFSM	.98	IN	13.30	AC-FT	6375000

†--Adjusted for change in contents in Lake Koocanusa.

12301933 KOOTENAI RIVER BELOW LIBBY DAM, NEAR LIBBY, MT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1967 to current year. Prior to March 25, 1974, at site 3.2 mi downstream.
PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1967 to September 1969.
WATER TEMPERATURE: October 1967 to September 1977; seasonal records, April 2001 to current year.
SUSPENDED SEDIMENT DISCHARGE: October 1967 to January 1976.
INSTRUMENTATION.--The temperature sensing probe is owned and maintained by the U.S. Army Corps of Engineers.
REMARKS.--Daily water temperature record fair. During June, July, and August, problems occurred with the temperature probe. During this period, some temperature data could be estimated from available partial-day data. Insufficient data was available for July 2, 6-10, and 27. Unpublished records of instantaneous water temperature and specific conductance are available in files of the District office.
EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 525 microsiemens per centimeter (µS/cm) at 25.0°C, Dec. 24, 1967; minimum daily, 174 µS/cm at 25.0°C, May 26, 1969.
WATER TEMPERATURE: Maximum, 21.5°C, Aug. 6, 1970; minimum 0.0°C on many days during winter periods most years prior to Libby Dam.
SEDIMENT CONCENTRATION: Maximum daily mean, 1,200 mg/L, June 5, 1968; minimum daily mean, 1 mg/L on many days in 1968, 1969, 1972-75.
SEDIMENT LOAD: Maximum daily, 200,000 tons, June 5, 1968; minimum daily, 5.4 tons, Jan. 28, 1972.
EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: During period of seasonal operation, maximum, 17.0°C, Aug. 15, 16; minimum 3.0°C, several days in April and May 17.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instantaneous discharge, cfs (00061)	Barometric pressure, mm Hg (00025)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	Specif. conductance, wat unf uS/cm 25 degC (00095)	Temperature, air, deg C (00020)	Temperature, water, deg C (00010)	Silica, water, fltrd, mg/L (00955)
OCT 2002										
17...	1400	5990	706	9.3	92	9.5	206	8.0	11.5	3.0
DEC										
17...	1115	26000	695	9.4	86	8.0	222	6.0	7.5	4.0
FEB 2003										
18...	0845	4040	707	10.5	88	8.1	220	1.0	4.5	4.1
MAY										
12...	1215	4010	705	11.4	94	7.2	252	13.5	4.0	3.8
JUN										
18...	0915	24200	697	9.8	99	8.4	251	25.0	12.0	3.7
JUL										
15...	1000	14100	697	9.6	98	8.5	229	13.0	12.0	3.7
AUG										
13...	1015	18000	699	9.3	99	8.0	227	16.5	14.5	3.6
SEP										
17...	1530	7060	701	10.2	109	8.4	228	13.0	14.5	3.3

Date	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Ammonia water, fltrd, mg/L as N (00608)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Ortho-phosphate, water, fltrd, mg/L as P (00671)	Phosphorus, water, unfltrd mg/L (00665)	Suspnd. sediment, sieve diametr percent <.063mm (70331)	Suspended sediment concentration mg/L (80154)	Suspended sediment load, tons/d (80155)
OCT 2002								
17...	E.08	<.015	.050	<.007	E.003	93	2	32
DEC								
17...	E.09	<.015	.121	<.007	.004	--	--	--
FEB 2003								
18...	E.09	<.015	.108	<.007	<.004	--	--	--
MAY								
12...	E.06	<.015	.098	<.007	E.003	86	1	11
JUN								
18...	.16	.018	.075	<.007	.005	83	1	65
JUL								
15...	E.09	E.009	.093	<.007	E.004	94	1	38
AUG								
13...	E.07	<.015	.065	<.007	E.003	86	1	49
SEP								
17...	E.09	<.015	.036	<.007	.012	86	2	38

E--Estimated.

12301933 KOOTENAI RIVER BELOW LIBBY DAM, NEAR LIBBY, MT--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003--Continued

Date	Time	Hardness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnesium, water, fltrd, mg/L (00925)	Potassium, water, fltrd, mg/L (00935)	Sodium adsorption ratio (00931)	Sodium, water, fltrd, mg/L (00930)	Alkalinity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chloride, water, fltrd, mg/L (00940)	Fluoride, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)
MAY 2003											
12...	1215	120	34.1	9.40	.57	.1	3.64	108	3.42	<.17	3.8
JUL											
15...	1000	110	29.6	7.73	.48	.1	2.57	96	2.17	<.17	3.7

Date	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of constituents mg/L (70301)	Residue water, fltrd, tons/acre-ft (70303)	Residue water, fltrd, tons/d (70302)	Aluminum, water, fltrd, ug/L (01106)	Arsenic water, fltrd, ug/L (01000)	Arsenic water unfltrd ug/L (01002)	Cadmium water, fltrd, ug/L (01025)	Cadmium water, unfltrd ug/L (01027)	Chromium, water, fltrd, ug/L (01030)	Chromium, water, unfltrd recoverable, ug/L (01034)
MAY 2003											
12...	22.9	143	.19	1550	<2	.4	E2	<.04	<.22	<.8	<.8
JUL											
15...	17.4	122	.17	4640	5	.3	<2	E.04	.05	<.8	<.8

Date	Copper, water, fltrd, ug/L (01040)	Copper, water, unfltrd recoverable, ug/L (01042)	Lead, water, fltrd, ug/L (01049)	Lead, water, unfltrd recoverable, ug/L (01051)	Mercury water, fltrd, ug/L (71890)	Nickel, water, fltrd, ug/L (01065)	Nickel, water, unfltrd recoverable, ug/L (01067)	Zinc, water, fltrd, ug/L (01090)	Zinc, water, unfltrd recoverable, ug/L (01092)
MAY 2003									
12...	.8	1.2	E.06	.86	<.02	1.47	.71	<1	5
JUL									
15...	1.0	2.0	E.07	.28	.02	.51	1.02	1	E1

E--Estimated.

12301933 KOOTENAI RIVER BELOW LIBBY DAM, NEAR LIBBY, MT--Continued

WATER TEMPERATURE, DEGREES CELSIUS, APRIL 2003 TO SEPTEMBER 2003

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		APRIL			MAY			JUNE			JULY	
1	3.5	3.5	3.5	5.0	4.5	4.5	8.5	7.5	8.0	11.0	10.0	10.5
2	3.5	3.5	3.5	5.0	4.5	4.5	7.5	6.5	7.0	11.0	10.0	10.5
3	3.5	3.5	3.5	4.5	4.0	4.5	7.5	6.5	7.0	10.5	10.0	10.0
4	3.5	3.5	3.5	4.0	4.0	4.0	8.0	7.0	7.5	10.5	10.0	10.0
5	3.5	3.5	3.5	4.0	3.5	4.0	9.0	7.5	8.0	10.0	9.5	10.0
6	3.5	3.5	3.5	4.0	3.5	4.0	11.5	9.0	10.5	10.5	10.0	10.5
7	3.5	3.5	3.5	3.5	3.5	3.5	10.0	9.0	9.5	12.5	10.5	11.5
8	4.0	3.5	3.5	4.0	3.5	3.5	11.0	9.0	10.0	12.5	11.5	12.0
9	4.0	3.5	3.5	4.5	4.0	4.5	11.0	10.0	10.5	12.0	11.5	11.5
10	4.0	3.5	3.5	5.0	4.0	4.5	11.0	10.0	10.5	12.0	11.5	11.5
11	3.5	3.5	3.5	4.5	3.5	4.0	10.5	10.0	10.0	12.5	11.5	12.0
12	3.5	3.5	3.5	4.0	3.5	3.5	10.0	9.0	9.5	12.5	12.0	12.5
13	4.0	3.5	3.5	4.5	3.5	4.0	9.5	8.5	9.0	12.5	11.5	12.0
14	3.5	3.5	3.5	5.0	3.5	4.5	9.0	8.5	8.5	12.0	11.0	11.5
15	3.5	3.5	3.5	4.5	3.5	4.0	8.5	8.5	8.5	12.0	11.0	11.5
16	3.5	3.5	3.5	4.0	3.5	3.5	9.0	8.5	9.0	12.5	11.5	11.5
17	3.5	3.0	3.5	3.5	3.0	3.5	11.5	9.0	9.5	12.5	11.5	12.0
18	3.5	3.0	3.0	3.5	3.5	3.5	12.5	11.5	12.0	13.0	12.0	12.5
19	3.5	3.0	3.0	4.0	3.5	3.5	12.0	11.0	11.5	13.0	12.5	12.5
20	3.5	3.0	3.0	4.0	3.5	4.0	11.0	10.0	10.5	13.5	12.5	13.0
21	3.5	3.0	3.5	5.0	4.0	5.0	10.0	9.5	10.0	13.0	12.5	13.0
22	3.5	3.5	3.5	6.0	5.0	5.5	9.5	9.0	9.0	13.0	12.5	12.5
23	3.5	3.0	3.5	6.5	6.0	6.0	9.5	8.5	9.0	13.0	12.5	13.0
24	3.5	3.0	3.5	7.0	6.0	6.5	10.5	9.0	9.5	13.0	12.0	12.5
25	3.5	3.0	3.5	6.5	6.5	6.5	10.5	10.0	10.0	13.0	12.0	12.5
26	3.5	3.0	3.5	6.5	6.0	6.5	10.5	10.0	10.5	13.0	12.5	13.0
27	3.5	3.0	3.0	7.0	6.5	7.0	10.5	10.5	10.5	13.5	13.0	13.5
28	3.5	3.0	3.5	7.5	6.5	7.0	10.5	10.0	10.5	13.5	13.0	13.5
29	4.0	3.5	3.5	9.0	7.0	8.0	11.5	10.5	11.0	14.0	13.5	13.5
30	4.5	3.5	4.5	7.5	7.0	7.0	11.5	10.0	11.0	14.5	13.5	14.0
31	---	---	---	9.0	7.5	8.5	---	---	---	15.0	14.0	14.5
MONTH	4.5	3.0	3.5	9.0	3.0	5.0	12.5	6.5	9.5	15.0	9.5	12.0

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN
		AUGUST			SEPTEMBER	
1	15.0	14.5	15.0	15.5	14.5	15.0
2	15.0	14.5	14.5	15.0	14.5	14.5
3	14.5	13.0	14.0	15.5	14.5	15.0
4	13.5	12.5	13.0	15.5	15.0	15.0
5	14.0	13.0	13.0	15.0	14.0	14.5
6	15.0	14.0	14.5	14.5	14.0	14.5
7	15.5	15.0	15.5	14.5	13.0	14.0
8	16.5	15.0	16.0	15.0	13.0	14.0
9	16.5	16.0	16.5	14.5	13.5	14.0
10	16.0	15.0	15.5	14.5	13.0	13.5
11	15.0	14.0	15.0	13.0	12.0	13.0
12	15.0	14.0	14.5	13.5	12.0	12.5
13	15.0	14.0	14.5	13.5	12.0	13.0
14	15.0	14.5	15.0	14.0	13.5	13.5
15	17.0	15.0	15.5	14.5	14.0	14.0
16	17.0	15.5	16.5	14.5	13.5	14.0
17	16.5	15.5	16.0	14.5	14.5	14.5
18	15.5	15.0	15.5	14.5	14.5	14.5
19	15.0	13.0	14.0	14.5	13.5	14.0
20	13.5	13.0	13.5	13.5	13.0	13.5
21	15.0	13.5	14.0	13.0	12.5	13.0
22	15.0	14.5	15.0	13.5	11.5	12.5
23	15.0	14.0	14.5	12.0	10.5	11.5
24	14.5	14.0	14.0	12.0	10.0	11.0
25	14.0	13.5	14.0	12.5	11.5	12.0
26	14.0	13.5	14.0	12.5	11.5	12.0
27	15.0	14.0	14.5	12.5	12.0	12.0
28	16.5	14.5	15.0	13.0	12.5	13.0
29	16.5	15.5	16.0	13.0	13.0	13.0
30	16.5	16.0	16.0	13.5	13.0	13.0
31	16.0	15.5	16.0	---	---	---
MONTH	17.0	12.5	15.0	15.5	10.0	13.5

KOOTENAI RIVER BASIN

12302055 FISHER RIVER NEAR LIBBY, MT

LOCATION.--Lat 48°21'20", long 115°18'50" (NAD 27), in NW$^1/_4$ NE$^1/_4$NW$^1/_4$ sec.21, T.30 N., R.29 W., Lincoln County, Hydrologic Unit 17010102, on left bank 0.8 mi upstream from mouth and 11.4 mi east of Libby.
DRAINAGE AREA.--838 mi^2.
PERIOD OF RECORD.--September 1967 to current year.

WATER-DISCHARGE RECORDS

GAGE.--Water-stage recorder. Elevation of gage is 2,134.10 ft (NGVD 29) (U.S. Army Corps of Engineers bench mark).
REMARKS.--Water-discharge records good except those for estimated daily discharges, which are poor. Diversions of about 700 acres upstream from station. U.S. Army Corps of Engineers satellite telemeter at station.
EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of about May 22, 1948, reached a discharge of 6,560 ft^3/s, by slope-area measurement at site 0.5 mi upstream.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	99	87	109	112	952	162	1250	720	808	219	85	63
2	100	99	107	110	802	155	1300	722	745	209	84	62
3	97	106	106	113	603	153	1150	758	658	199	92	63
4	96	107	106	126	492	151	991	797	600	190	98	64
5	95	103	105	124	414	149	870	816	559	181	95	62
6	94	99	105	125	360	152	775	770	542	177	95	61
7	92	93	103	123	317	152	696	708	533	172	91	61
8	91	87	102	120	298	151	636	651	518	167	87	65
9	91	88	100	112	276	149	612	605	555	164	85	69
10	90	93	99	89	256	150	674	571	541	157	81	78
11	91	97	100	76	239	176	782	552	528	152	79	78
12	91	100	103	e90	225	316	969	547	474	146	77	81
13	90	111	103	e120	213	422	1040	565	453	141	76	78
14	90	124	111	e115	212	555	1080	601	435	139	75	74
15	90	119	136	114	203	649	1080	677	403	134	73	72
16	90	115	174	106	197	668	1010	690	382	132	73	71
17	89	111	172	104	199	676	934	628	366	132	73	74
18	88	110	156	103	198	630	882	580	359	126	73	78
19	88	108	145	103	189	580	818	537	363	121	73	78
20	88	110	135	103	187	545	769	497	377	117	72	85
21	88	116	126	103	195	525	755	474	349	112	70	84
22	88	117	121	103	202	550	810	468	319	109	68	80
23	87	123	119	103	186	932	948	501	302	106	71	79
24	85	139	115	111	143	921	1080	629	279	102	71	77
25	83	125	113	114	147	810	1110	927	265	100	68	75
26	83	119	111	119	173	731	1110	1100	254	98	67	71
27	82	120	112	420	182	666	994	913	250	95	65	69
28	85	115	115	396	168	594	879	849	246	92	64	68
29	88	113	118	323	---	546	802	928	238	90	64	68
30	e65	111	115	294	---	515	750	953	228	88	64	68
31	73	---	114	304	---	621	---	801	---	87	64	---
TOTAL	2747	3265	3656	4578	8228	14152	27556	21535	12929	4254	2373	2156
MEAN	88.6	109	118	148	294	457	919	695	431	137	76.5	71.9
MAX	100	139	174	420	952	932	1300	1100	808	219	98	85
MIN	65	87	99	76	143	149	612	468	228	87	64	61
AC-FT	5450	6480	7250	9080	16320	28070	54660	42710	25640	8440	4710	4280
CFSM	0.11	0.13	0.14	0.18	0.35	0.54	1.10	0.83	0.51	0.16	0.09	0.09
IN.	0.12	0.14	0.16	0.20	0.37	0.63	1.22	0.96	0.57	0.19	0.11	0.10

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1968 - 2003, BY WATER YEAR (WY)

MEAN	135	228	241	255	352	590	1220	1397	823	292	138	119
MAX	305	819	1174	1272	1965	2401	2752	3300	1796	532	244	204
(WY)	1986	1996	1996	1974	1996	1972	1997	1997	1974	1971	1997	1968
MIN	76.4	87.0	90.4	77.9	95.0	134	318	482	221	92.7	56.0	54.6
(WY)	2002	1980	1993	1979	1993	2001	2001	1977	1977	1977	1994	2001

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1968 - 2003	
ANNUAL TOTAL	215665		107429			
ANNUAL MEAN	591		294		482	
HIGHEST ANNUAL MEAN					938	1996
LOWEST ANNUAL MEAN					169	1977
HIGHEST DAILY MEAN	6330	Apr 15	1300	Apr 2	7790	Feb 9 1996
LOWEST DAILY MEAN	65	Oct 30	61	Sep 6	35	Jan 2 1977
ANNUAL SEVEN-DAY MINIMUM	80	Oct 25	62	Sep 1	50	Aug 18 1994
MAXIMUM PEAK FLOW			1350	Apr 1	a12000	Feb 9 1996
MAXIMUM PEAK STAGE			5.38	Apr 1	10.35	Feb 9 1996
INSTANTANEOUS LOW FLOW			59	Sep 8	29	Jan 2 1977
ANNUAL RUNOFF (AC-FT)	427800		213100		349400	
ANNUAL RUNOFF (CFSM)	0.71		0.35		0.58	
ANNUAL RUNOFF (INCHES)	9.57		4.77		7.82	
10 PERCENT EXCEEDS	1670		788		1270	
50 PERCENT EXCEEDS	195		125		210	
90 PERCENT EXCEEDS	97		74		97	

a--From indirect measurement.
e--Estimated.

12302055 FISHER RIVER NEAR LIBBY, MT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1967-85, May 1999 to current year.
PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: October 1967 to September 1985.
SUSPENDED SEDIMENT DISCHARGE: October 1967 to January 1976.
REMARKS.--Unpublished records of instantaneous water temperature and specific conductance are available in files of the District office.
EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Maximum, 21.5°C, Aug. 6, 1970; minimum 0.0°C on many days during winter periods most years.
SEDIMENT CONCENTRATION: Maximum daily mean, 4,600 mg/L, June 5, 1968; minimum daily mean, 1 mg/L on many days in 1970-76.
SEDIMENT LOAD: Maximum daily, 91,200 tons, Jan. 16, 1974; minimum daily, 0.17 tons, Sept. 7, 1973.

WATER QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instan-taneous dis-charge, cfs (00061)	pH, water, unfltrd field, std units (00400)	Specif. conduc-tance, wat unf uS/cm 25 degC (00095)	Temper-ature, air, deg C (00020)	Temper-ature, water, deg C (00010)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)
MAY 2003									
12...	1500	550	8.1	116	15.5	9.0	.12	<.022	<.002
JUN									
18...	1015	360	8.1	120	25.0	15.0	.11	<.022	<.002
JUL									
15...	1200	132	8.6	182	26.0	18.0	.11	<.022	<.002
AUG									
13...	1115	76	8.3	222	22.0	18.0	.11	<.022	<.002

Date	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Phos-phorus, water, unfltrd mg/L (00665)	Suspnd. sedi-ment, sieve diametr percent <.063mm (70331)	Sus-pended sedi-ment concen-tration mg/L (80154)	Sus-pended sedi-ment load, tons/d (80155)
MAY 2003					
12...	<.007	.011	96	8	12
JUN					
18...	<.007	.011	97	11	11
JUL					
15...	<.007	.004	83	4	1.4
AUG					
13...	<.007	.005	90	1	.21

Date	Time	Hard-ness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Potas-sium, water, fltrd, mg/L (00935)	Sodium adsorp-tion ratio (00931)	Sodium, water, fltrd, mg/L (00930)	Alka-linity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chlor-ide, water, fltrd, mg/L (00940)	Fluor-ide, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)
MAY 2003											
12...	1500	56	14.2	4.99	.72	.1	2.15	58	.53	<.17	10.5
JUL											
15...	1200	86	21.4	8.01	.80	.1	2.73	92	.61	<.2	9.60

Date	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of consti-tuents mg/L (70301)	Residue water, fltrd, tons/ acre-ft (70303)	Residue water, fltrd, tons/d (70302)	Arsenic water unfltrd ug/L (01002)	Cadmium water, unfltrd ug/L (01027)	Chrom-ium, water, unfltrd recover -able, ug/L (01034)	Copper, water, unfltrd recover -able, ug/L (01042)	Lead, water, unfltrd recover -able, ug/L (01051)	Nickel, water, unfltrd recover -able, ug/L (01067)	Zinc, water, unfltrd recover -able, ug/L (01092)
MAY 2003											
12...	2.8	71	.10	105	E1	<.2	<.8	2.3	.26	.42	E2
JUL											
15...	3.8	102	.14	36.5	<2	<.04	<.8	.7	.07	.63	<2

E--Estimated.

KOOTENAI RIVER BASIN

12304500 YAAK RIVER NEAR TROY, MT

LOCATION.--Lat 48°33'43", long 115°58'09" (NAD 27), in NE$^1/_4$SE$^1/_4$SE$^1/_4$ sec.5, T.32 N., R.34 W., Lincoln County, Hydrologic Unit 17010103, Kootenai National Forest, on right bank 500 ft upstream from bridge on U.S. Highway 2, 0.3 mi upstream from mouth, and 7.7 mi northwest of Troy.

DRAINAGE AREA.--766 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1910 to September 1916 (fragmentary record), March 1956 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,839.2 ft (NGVD 29). Oct. 15, 1910, to Sept. 30, 1916, nonrecording gage at several sites within 11 mi of present site at various elevations.

REMARKS.--Water-discharge records good. Minor diversions for irrigation upstream from station. U.S. Army Corps of Engineers satellite telemeter at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in May to June 1948 reached a stage of 11.0 ft, from floodmarks; discharge, 12,500 ft^3/s. Flood in May 1954 reached a stage of 11.4 ft, from floodmarks; discharge, 13,400 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	116	e90	e90	e100	317	173	1910	1490	2540	351	109	66
2	111	e100	89	105	296	138	1640	1600	2270	332	107	65
3	109	e110	87	122	261	129	1350	1700	2020	313	107	63
4	104	e120	86	138	235	124	1130	1710	1730	295	107	63
5	101	e115	86	130	202	121	983	1690	1590	287	107	62
6	98	e120	86	126	181	124	879	1600	1550	279	107	60
7	94	e125	86	118	167	124	796	1470	1460	267	107	60
8	92	e130	86	108	185	117	744	1350	1450	255	103	62
9	88	e135	86	92	175	114	871	1250	1480	245	98	85
10	88	e140	86	e85	167	123	1210	1190	1350	239	93	95
11	87	e135	87	e105	161	125	1410	1160	1350	230	88	87
12	86	134	87	e115	149	174	1700	1200	1280	220	85	102
13	86	135	e85	120	144	515	1760	1310	1200	209	83	90
14	86	136	e90	116	156	855	1870	1450	1100	204	81	81
15	87	125	e95	112	145	946	1860	1660	947	197	80	78
16	87	113	e100	105	147	947	1700	1640	856	192	82	77
17	87	107	e95	101	163	930	1580	1470	798	184	89	77
18	87	105	e90	98	158	816	1490	1330	756	174	89	79
19	87	108	e85	97	152	727	1380	1220	717	169	86	79
20	87	117	e95	97	152	686	1310	1130	706	162	81	80
21	87	126	e105	e90	156	700	1370	1080	681	155	78	78
22	87	127	e110	e85	155	1050	1610	1070	621	150	74	74
23	85	136	e105	e90	132	1790	1970	1200	582	147	76	71
24	81	122	e100	e95	115	1350	2180	1660	540	141	77	70
25	85	93	e95	104	145	1040	2410	2940	504	136	74	68
26	86	92	e97	129	173	867	2480	3200	473	131	72	66
27	91	89	101	339	189	746	2160	2830	450	127	70	65
28	87	95	108	310	185	674	1880	2680	425	124	68	64
29	91	99	111	247	---	625	1690	2860	397	119	67	62
30	82	e95	110	216	---	613	1560	2720	371	117	66	61
31	e75	---	e95	231	---	1120	---	2560	---	112	66	---
TOTAL	2805	3474	2914	4126	4963	18583	46883	53420	32194	6263	2677	2190
MEAN	90.5	116	94.0	133	177	599	1563	1723	1073	202	86.4	73.0
MAX	116	140	111	339	317	1790	2480	3200	2540	351	109	102
MIN	75	89	85	85	115	114	744	1070	371	112	66	60
AC-FT	5560	6890	5780	8180	9840	36860	92990	106000	63860	12420	5310	4340
CFSM	0.12	0.15	0.12	0.17	0.23	0.78	2.04	2.25	1.40	0.26	0.11	0.10
IN.	0.14	0.17	0.14	0.20	0.24	0.90	2.28	2.59	1.56	0.30	0.13	0.11

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1957 - 2003, BY WATER YEAR (WY)

MEAN	198	319	320	293	355	598	1925	3495	1925	494	195	162
MAX	833	1192	1630	1552	1626	1872	3754	6463	4992	970	373	506
(WY)	1960	1996	1996	1974	1996	1972	1969	1997	1974	1969	1993	1959
MIN	84.0	93.2	94.0	94.6	83.0	134	421	1026	377	151	80.9	53.2
(WY)	1988	1980	2003	1988	2001	2001	2001	1977	1992	1977	2001	2001

12304500 YAAK RIVER NEAR TROY, MT--Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1957 - 2003	
ANNUAL TOTAL	345735		180492			
ANNUAL MEAN	947		494		858	
HIGHEST ANNUAL MEAN					1562	1974
LOWEST ANNUAL MEAN					278	1977
HIGHEST DAILY MEAN	10900	May 22	3200	May 26	11600	May 16 1997
LOWEST DAILY MEAN	75	Oct 31	60	Sep 6	49	Sep 19 2001
ANNUAL SEVEN-DAY MINIMUM	85	Oct 25	62	Sep 2	49	Sep 19 2001
MAXIMUM PEAK FLOW			3440	May 26	a12600	May 17 1997
MAXIMUM PEAK STAGE			6.67	May 26	b9.70	May 21 1956
INSTANTANEOUS LOW FLOW			59	Sep 7	47	Sep 22 2001
ANNUAL RUNOFF (AC-FT)	685800		358000		621400	
ANNUAL RUNOFF (CFSM)	1.24		0.65		1.12	
ANNUAL RUNOFF (INCHES)	16.79		8.77		15.22	
10 PERCENT EXCEEDS	2450		1580		2560	
50 PERCENT EXCEEDS	249		129		286	
90 PERCENT EXCEEDS	90		80		120	

a--Gage height, 9.58 ft.
b--Gage height in well; 10.8 ft, from outside gage.
e--Estimated.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1963-73, 1975-85, May 1999 to current year.
PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Seasonal records 1963-73, 1975-85, April 2000 to current year.
INSTRUMENTATION.--Water temperature probe installed by U.S. Army Corps of Engineers.
REMARKS.--Prior to March 25, 1975, temperature records furnished by U.S. Army Corps of Engineers. Daily water temperature records good, except for June and July, which are fair. Missing maximum temperature data for Aug. 29 due to equipment problems. Unpublished records of instantaneous water temperature are available in files of the District office.
EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE (seasonal records 1963-73, 1975-85, 2001): Maximum, 31.0°C, Aug. 11, 2001; minimum 0.0°C on many days during winter periods.
EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: During period of seasonal operation, maximum, 27.0°C, July 30; minimum 1.5°C on Apr. 2-7.

WATER QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instantaneous discharge, cfs (00061)	pH, water, unfltrd field, std units (00400)	Specif. conductance, wat unf uS/cm 25 degC (00095)	Temperature, air, deg C (00020)	Temperature, water, deg C (00010)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)
MAY 2003									
12...	1800	1200	7.8	66	15.0	8.5	.12	<.022	<.002
JUN									
18...	0745	770	7.6	64	16.0	13.5	E.09	<.022	<.002
JUL									
15...	0815	195	8.1	108	15.0	16.0	E.08	<.022	<.002
AUG									
13...	0800	82	7.6	125	10.5	16.5	.11	<.022	<.002

Date	Orthophosphate, water, fltrd, mg/L as P (00671)	Phosphorus, water, unfltrd mg/L (00665)	Suspnd. sediment, sieve diametr percent <.063mm (70331)	Suspended sediment concentration mg/L (80154)	Suspended sediment load, tons/d (80155)
MAY 2003					
12...	<.007	.004	86	1	3.2
JUN					
18...	<.007	.005	74	2	4.2
JUL					
15...	<.007	E.002	78	1	.53
AUG					
13...	<.007	E.003	69	1	.22

E--Estimated.

WATER QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003--Continued

Date	Time	Hardness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnesium, water, fltrd, mg/L (00925)	Potassium, water, fltrd, mg/L (00935)	Sodium adsorption ratio (00931)	Sodium, water, fltrd, mg/L (00930)	Alkalinity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chloride, water, fltrd, mg/L (00940)	Fluoride, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)
MAY 2003											
12...	1800	30	9.04	1.92	.56	.1	1.34	32	.25	<.17	10.3
JUL											
15...	0815	47	13.9	2.94	.76	.1	1.97	53	.30	<.2	9.08

Date	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of constituents mg/L (70301)	Residue water, fltrd, tons/acre-ft (70303)	Residue water, fltrd, tons/d (70302)	Arsenic water unfltrd ug/L (01002)	Cadmium water, unfltrd ug/L (01027)	Chromium, water, unfltrd recoverable, ug/L (01034)	Copper, water, unfltrd recoverable, ug/L (01042)	Lead, water, unfltrd recoverable, ug/L (01051)	Nickel, water, unfltrd recoverable, ug/L (01067)	Zinc, water, unfltrd recoverable, ug/L (01092)
MAY 2003											
12...	1.1	43	.06	141	<2	<.2	<.8	.9	.18	.25	E2
JUL											
15...	1.3	62	.08	32.7	<2	<.04	<.8	.9	.10	.47	<2

E--Estimated.

WATER TEMPERATURE, DEGREES CELSIUS, APRIL 2003 TO SEPTEMBER 2003

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		APRIL			MAY			JUNE			JULY	
1	6.0	2.0	3.0	10.0	5.5	7.5	10.5	7.0	9.0	18.5	14.5	17.0
2	3.5	1.5	2.5	9.0	5.5	7.0	11.0	8.0	9.5	20.0	15.0	17.5
3	4.0	1.5	2.5	7.0	5.0	6.0	12.0	7.0	9.5	18.5	13.0	16.0
4	3.5	1.5	2.5	6.5	5.0	6.0	12.0	7.0	9.5	18.5	14.0	16.5
5	3.5	1.5	2.5	7.0	4.5	5.5	14.0	8.0	10.5	20.5	15.0	17.0
6	5.5	1.5	3.0	8.0	4.0	6.0	13.5	9.5	11.5	19.5	15.0	17.5
7	6.0	1.5	4.0	7.5	5.0	6.0	14.0	9.0	11.5	19.0	16.0	18.0
8	9.0	3.0	5.5	7.5	4.5	6.0	15.0	9.5	12.0	18.5	15.0	17.0
9	8.5	4.0	6.0	8.5	4.0	6.5	14.5	10.0	12.0	20.5	15.5	18.0
10	7.0	2.5	5.0	9.0	4.0	6.5	13.0	10.5	12.0	22.5	17.0	19.5
11	7.0	4.5	5.5	10.5	4.5	7.0	13.0	9.0	11.0	23.0	17.5	20.0
12	6.0	3.0	4.5	9.0	5.5	7.0	14.5	9.5	11.5	23.5	19.0	21.0
13	6.5	3.0	4.5	10.5	7.0	8.5	14.5	9.5	12.0	21.0	18.5	20.0
14	6.5	3.5	4.5	10.5	6.5	8.0	15.0	9.5	12.0	21.0	16.0	18.0
15	6.5	3.5	5.0	9.0	7.0	8.0	15.0	9.0	12.0	21.5	16.0	18.0
16	7.0	3.5	5.0	7.5	5.5	6.5	16.0	10.5	13.0	23.0	18.0	19.5
17	8.0	3.5	4.5	7.0	4.5	5.5	17.5	11.0	14.0	23.5	18.0	20.5
18	7.0	3.5	5.0	6.5	4.5	5.5	20.0	14.0	17.0	25.0	17.0	20.5
19	6.5	2.5	4.5	8.0	4.0	5.5	20.0	16.5	18.5	24.5	18.0	20.5
20	7.0	2.5	4.5	8.5	4.5	6.5	19.5	13.5	16.0	24.5	19.0	21.0
21	10.0	4.5	7.0	8.5	6.0	7.0	13.5	12.0	12.5	25.5	18.5	21.5
22	8.0	4.5	6.5	8.0	6.5	7.5	13.0	10.5	11.5	26.5	20.0	22.5
23	7.5	6.0	6.5	12.5	7.0	9.5	15.0	10.5	12.5	26.5	19.5	23.0
24	7.0	5.0	5.5	14.0	8.0	11.0	16.5	11.0	14.0	25.5	20.5	22.5
25	6.5	5.0	5.5	12.0	8.0	9.0	17.0	11.0	14.0	25.5	19.0	21.5
26	7.0	4.0	5.5	9.0	6.5	7.5	18.0	12.5	15.5	25.0	19.0	21.5
27	6.5	3.5	5.0	11.5	7.0	9.0	20.0	14.0	17.0	25.5	19.0	22.0
28	7.0	3.0	5.0	12.0	7.5	9.5	20.0	14.5	17.5	26.0	19.5	22.5
29	7.0	4.0	5.5	13.0	8.5	10.5	21.5	15.5	19.0	26.0	19.5	22.5
30	9.0	4.5	6.5	11.5	7.0	9.0	21.5	16.5	19.0	27.0	19.5	22.5
31	---	---	---	10.0	7.5	8.5	---	---	---	26.0	19.0	22.0
MONTH	10.0	1.5	5.0	14.0	4.0	7.5	21.5	7.0	13.2	27.0	13.0	20.0

12304500 YAAK RIVER NEAR TROY, MT--Continued

WATER TEMPERATURE, DEGREES CELSIUS, APRIL 2003 TO SEPTEMBER 2003--Continued

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN
		AUGUST			SEPTEMBER	
1	26.0	19.0	22.0	20.5	13.0	16.5
2	23.5	18.5	21.0	20.5	13.0	16.5
3	21.5	19.5	20.5	20.5	13.0	16.5
4	25.0	19.0	21.5	20.5	14.0	17.0
5	22.0	17.5	19.5	21.0	14.0	17.5
6	24.0	17.0	20.0	20.0	14.0	17.0
7	24.5	18.0	21.0	20.0	15.0	17.5
8	24.5	17.5	20.5	18.0	15.0	16.0
9	26.5	17.5	21.0	16.5	13.0	14.5
10	25.0	18.0	21.0	14.5	11.5	13.0
11	25.0	17.5	20.5	16.0	12.0	14.0
12	24.5	16.5	20.5	14.0	11.0	12.5
13	24.5	16.0	20.0	15.0	9.0	11.5
14	24.5	16.0	20.0	15.0	9.0	12.0
15	22.5	16.0	19.5	15.5	11.0	13.0
16	21.0	18.0	19.0	14.0	11.0	12.0
17	22.0	16.5	19.0	13.5	9.5	11.5
18	24.5	16.0	20.0	13.0	8.0	10.5
19	24.5	17.0	20.0	13.0	10.0	11.0
20	23.5	17.5	20.5	15.0	10.0	12.0
21	22.5	15.5	19.0	14.5	9.0	11.5
22	20.0	16.5	17.5	14.5	8.0	11.0
23	20.5	16.5	18.0	14.0	9.5	11.0
24	21.0	15.5	17.5	14.5	8.0	10.5
25	21.5	13.5	17.0	15.5	9.0	11.5
26	21.5	14.0	17.5	16.5	10.0	12.5
27	21.0	15.0	18.0	15.0	9.0	12.0
28	20.5	14.5	17.0	14.5	8.0	11.0
29	20.0	14.0	17.0	14.5	9.5	11.5
30	19.5	12.5	16.0	13.5	8.0	10.5
31	20.0	12.5	16.0	---	---	---
MONTH	26.5	12.5	19.5	21.0	8.0	13.0

12305000 KOOTENAI RIVER AT LEONIA, ID

LOCATION.--Lat 48°37'04", long 116°02'47" (NAD 27), in $NW^1/_4NW^1/_4NW^1/_4$ sec. 20, T.33 N., R.34 W., principal Meridian, Lincoln County, Mont., Hydrologic Unit l70l0l04, on right bank at Leonia, 450 ft east of Montana-Idaho State line, 0.5 mi upstream from Boulder Creek, and at mile 171.6.

DRAINAGE AREA.--11,740 mi^2, approximately.

PERIOD OF RECORD.--March 1928 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,790.25 ft (NGVD 29). Prior to Oct. 1, 1970, at elevation 90 ft lower. Prior to Nov. 13, 1928, nonrecording gage on bridge 250 ft upstream at elevation 90.41 ft lower.

REMARKS.--Records good except those for October to January, which are fair. Station equipment includes satellite telemetry. Diversions above station for irrigation of about 14,600 acres. Flow regulated by Lake Koocanusa since Mar. 21, 1972.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge (1929-71), 123,000 ft^3/s May 28, 1948, gage height, 33.40 ft; minimum, 996 ft^3/s, Dec. 9, 1936, minimum gage height, 7.56 ft, Dec. 10, 1929. Maximum discharge since regulation (1972 to current year), 62,000 ft^3/s, Jan. 16, 1974, gage height, 24.15 ft; maximum gage height, 25.06 ft, Feb. 9, 1996; minimum daily, 2,270 ft^3/s, Dec. 9, 1972.

EXTREMES OUTSIDE PERIOD OF RECORD.--Floods of June 1894 and 1916 reached stages of 34.6 and 31.6 ft, respectively, present elevation, from information by Great Northern Railway.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 31,000 ft^3/s, June 7, gage height, 19.25 ft; minimum daily, 4,370 ft^3/s, Jan. 11.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6620	5160	7560	5460	7780	5050	12200	9060	12500	20200	18200	14000
2	6600	5180	15600	4910	7850	5020	11300	9380	14100	20000	18200	12900
3	6600	5210	23000	4750	7020	5010	10200	9670	16300	19900	18100	11700
4	6580	5220	24700	4750	6530	4960	9420	9700	20200	19800	18200	11300
5	6570	5230	23400	4720	6160	4940	8850	9620	20000	19800	18200	10600
6	6560	5290	16300	4710	5900	4930	8420	9330	26600	17800	18200	9730
7	6560	5300	19000	4680	5730	4910	8030	8940	30700	16900	18200	8930
8	6550	5370	22800	4650	5680	4880	7760	8610	30000	15000	18200	8180
9	6540	5480	23500	4530	5580	4860	7930	8350	30600	14800	18200	10500
10	6540	5480	25000	4370	5460	4870	8580	8160	30400	14800	18200	11400
11	6560	5410	26900	4320	5360	5000	9070	8070	29900	14700	18200	10200
12	6540	5440	26900	4520	5260	5600	9860	8200	29600	14700	18200	9030
13	6540	5550	21900	4640	5190	6980	10200	8490	29300	14700	18100	8200
14	6880	5580	21800	4660	5180	8160	10400	8980	28900	14600	18000	7670
15	8810	5530	22500	4600	5170	8730	10400	9620	28400	14600	18000	7610
16	8760	5480	24500	4570	5160	8720	9980	9620	28100	14600	18100	7610
17	7640	5460	27900	4550	5190	8570	9700	9100	27900	14500	18100	7620
18	6520	5450	27600	4520	5180	8200	9410	8660	27800	14500	18100	7050
19	5310	5460	27400	4500	5140	7830	9080	8260	24200	14500	18100	6540
20	5230	5500	27400	4490	5130	7590	8850	7970	22100	14400	18000	6530
21	5210	5520	27300	4490	5160	7580	8870	7820	21700	17400	18000	6520
22	5200	5560	23600	4470	5160	8670	9380	7830	21300	18400	15400	6550
23	5210	5660	17700	4460	5070	11200	10300	8280	21100	17400	14100	6440
24	5190	5620	12500	4510	4900	10200	11100	9690	20800	18300	14100	6460
25	5180	5540	8840	4550	4870	9240	11600	13500	20700	18400	14100	6440
26	5190	7750	8100	5140	4970	8640	11600	14500	20600	18400	14000	6430
27	5200	7280	8120	6880	5060	8180	10800	12900	20600	18400	14000	6420
28	5270	6300	8070	6590	5080	7790	10000	12400	20500	18400	14000	6420
29	5260	5580	8060	6100	---	7490	9560	13100	16500	13900	14000	6380
30	5160	5450	7050	5820	---	7290	9220	12900	20200	18100	14000	5880
31	5130	---	6050	5910	---	8740	---	12000	---	18300	14000	---
TOTAL	191710	168040	591050	151820	155920	219830	292070	302710	711600	520200	522500	251240
MEAN	6184	5601	19070	4897	5569	7091	9736	9765	23720	16780	16850	8375
MAX	8810	7750	27900	6880	7850	11200	12200	14500	30700	20200	18200	14000
MIN	5130	5160	6050	4320	4870	4860	7760	7820	12500	13900	14000	5880
AC-FT	380300	333300	1172000	301100	309300	436000	579300	600400	1411000	1032000	1036000	498300

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1929 - 1971, BY WATER YEAR (WY) (UNREGULATED)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	6511	5700	4765	4024	4338	4896	14480	38710	45100	22770	9926	7020
MAX	15540	11280	13700	11330	10630	10390	39940	61770	74280	47510	16910	16560
(WY)	1948	1934	1934	1934	1951	1934	1934	1956	1967	1954	1954	1959
MIN	3532	2748	2477	1922	1994	2693	4334	18630	20630	9819	6142	4744
(WY)	1937	1937	1945	1937	1936	1944	1945	1944	1941	1944	1941	1936

SUMMARY STATISTICS — WATER YEARS 1929 - 1971*

ANNUAL MEAN	14150	
HIGHEST ANNUAL MEAN	19240	1956
LOWEST ANNUAL MEAN	7416	1944
HIGHEST DAILY MEAN	122000	May 28 1948
LOWEST DAILY MEAN	1070	Dec 8 1936
ANNUAL SEVEN-DAY MINIMUM	1310	Jan 2 1937
ANNUAL RUNOFF (AC-FT)	10180000	
10 PERCENT EXCEEDS	37400	
50 PERCENT EXCEEDS	6710	
90 PERCENT EXCEEDS	3230	

12305000 KOOTENAI RIVER AT LEONIA, ID--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1972 - 2003, BY WATER YEAR (WY) (REGULATED, UNADJUSTED)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	14430	16320	16220	15270	12770	8877	11050	15370	17400	13090	11550	11090
MAX	31980	26400	28140	28610	24790	15160	25570	31670	39200	29740	20310	20960
(WY)	1973	1992	1991	1976	1990	1990	1996	1997	1972	2002	1976	1972
MIN	5635	5004	3423	3109	3724	4350	5588	8352	5374	4139	3956	5539
(WY)	1972	1972	1972	1972	1973	1973	2001	1977	1977	1988	1975	1994

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1972 - 2003**	
ANNUAL TOTAL	5658660		4078690			
ANNUAL MEAN	15500		11170		13620	
HIGHEST ANNUAL MEAN					20400	1996
LOWEST ANNUAL MEAN					7466	2001
HIGHEST DAILY MEAN	48400	Jul 2	30700	Jun 7	56200	Jan 16 1974
LOWEST DAILY MEAN	5130	Oct 31	4320	Jan 11	2270	Dec 9 1972
ANNUAL SEVEN-DAY MINIMUM	5180	Oct 30	4490	Jan 18	2420	Dec 7 1972
ANNUAL RUNOFF (AC-FT)	11220000		8090000		9869000	
10 PERCENT EXCEEDS	29400		20900		24300	
50 PERCENT EXCEEDS	12500		8610		11800	
90 PERCENT EXCEEDS	5570		5020		5040	

*--Unregulated.
**--Regulated.

PEND OREILLE RIVER BASIN

12323230 BLACKTAIL CREEK AT HARRISON AVENUE AT BUTTE, MT

LOCATION.--Lat 45°59'07", long 112°30'26" (NAD 27), in $NE^1/_4SE^1/_4NE^1/_4$ sec.30, T.3 N., R.7 W., Silver Bow County, Hydrologic Unit 17010201, at culvert on Harrison Avenue near interchange off Interstate 90, at Butte.

PERIOD OF RECORD.--March 1993 to August 1995, December 1996 to current year. Formerly published as 4558531123026.

GAGE.--None. Elevation at site is 5,455 ft (NGVD 29).

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instan-taneous dis-charge, cfs (00061)	pH, water, unfltrd field, std units (00400)	Specif. conduc-tance, wat unf uS/cm 25 degC (00095)	Temper-ature, air, deg C (00020)	Temper-ature, water, deg C (00010)	Hard-ness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Arsenic water, fltrd, ug/L (01000)	Arsenic water unfltrd ug/L (01002)
MAR 2003											
17...	0850	9.0	7.6	246	-0.5	1.5	87	24.4	6.27	5.0	6
APR											
02...	0850	16	7.8	211	1.5	3.0	77	21.4	5.66	4.4	6
28...	1015	15	7.8	242	7.0	4.5	93	26.8	6.31	3.6	5
MAY											
26...	0810	6.8	7.8	251	15.0	12.0	100	29.5	6.76	5.1	6
JUN											
03...	1550	6.9	8.4	266	21.0	16.0	110	32.2	7.37	6.1	7
16...	0720	3.5	7.7	323	12.0	9.5	130	35.6	9.00	2.8	3
JUL											
28...	1000	2.6	7.8	342	24.5	11.5	140	41.5	9.54	2.0	E2
AUG											
25...	1015	2.7	7.8	337	23.0	11.0	140	39.3	9.43	1.6	3

Date	Cadmium water, fltrd, ug/L (01025)	Cadmium water, unfltrd ug/L (01027)	Copper, water, fltrd, ug/L (01040)	Copper, water, unfltrd recover-able, ug/L (01042)	Iron, water, fltrd, ug/L (01046)	Iron, water, unfltrd recover-able, ug/L (01045)	Lead, water, fltrd, ug/L (01049)	Lead, water, unfltrd recover-able, ug/L (01051)	Mangan-ese, water, fltrd, ug/L (01056)	Mangan-ese, water, unfltrd recover-able, ug/L (01055)
MAR 2003										
17...	.04	.09	5.5	12.5	278	1130	.40	3.78	140	164
APR										
02...	.10	.11	6.8	16.9	312	1450	.62	4.86	39.7	72
28...	.09	.05	5.6	7.8	280	590	.32	.81	30.5	35
MAY										
26...	.07	.04	5.0	6.3	188	370	.16	.36	30.4	32
JUN										
03...	E.03	.04	4.1	5.2	209	420	.10	.38	18.6	24
16...	.04	E.03	2.1	2.5	72	260	.35	.26	50.2	50
JUL										
28...	.06	E.02	1.4	2.2	25	200	<.08	.20	38.8	41
AUG										
25...	.08	E.03	1.8	3.1	22	190	<.08	.22	39.7	45

Date	Zinc, water, fltrd, ug/L (01090)	Zinc, water, unfltrd recover-able, ug/L (01092)	Suspnd. sedi-ment, sieve diametr percent <.063mm (70331)	Sus-pended sedi-ment concen-tration mg/L (80154)	Sus-pended sedi-ment load, tons/d (80155)
MAR 2003					
17...	5	15	85	23	.56
APR					
02...	8	27	82	31	1.3
28...	4	6	82	7	.28
MAY					
26...	5	4	89	3	.06
JUN					
03...	<1	3	87	5	.09
16...	5	3	96	2	.02
JUL					
28...	3	3	83	3	.02
AUG					
25...	3	3	81	3	.02

E--Estimated.

12323240 BLACKTAIL CREEK AT BUTTE, MT

LOCATION.--Lat 45°54'38", long 112°31'38" (NAD 27), in SW$^1/_4$NE$^1/_4$SE$^1/_4$ sec.24, T.3 N., R.8 W., Silver Bow County, Hydrologic Unit 17010201, on left bank, 70 feet upstream from George Street culvert in Butte, and 0.2 mi upstream from Silver Bow Creek.
DRAINAGE AREA.--95.4 mi^2.
PERIOD OF RECORD.--October 1988 to current year.
REVISED RECORDS.--WDR-MT-93-1: 1989-92 (M).
GAGE.--Water-stage recorder. Elevation of gage is 5,430 ft (NGVD 29).
REMARKS.--Records good except those for May 15 through Sept. 15 and estimated daily discharges, which are fair. Slight regulation by Basin Creek Reservoir. Diversions for irrigation of about 1,400 acres upstream from station. U.S. Geological Survey satellite telemeter at station. Several observations of water temperature and specific conductance were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.6	7.2	7.8	6.9	16	6.8	18	18	12	6.8	6.1	6.1
2	7.7	7.1	7.8	6.9	10	7.0	18	18	12	6.6	6.1	6.2
3	7.3	7.2	7.8	7.1	8.7	6.8	16	17	11	6.5	12	6.1
4	7.4	7.5	7.9	7.2	8.2	6.8	13	18	10	6.4	9.1	5.9
5	7.7	7.5	7.9	7.4	8.0	6.8	13	19	9.4	6.4	6.9	6.1
6	7.4	7.6	7.9	7.3	7.8	6.9	12	18	9.8	6.4	7.7	6.1
7	7.1	7.7	7.7	7.3	7.6	7.8	12	17	9.7	6.4	7.1	6.6
8	7.3	7.9	7.6	7.2	7.9	8.4	12	16	9.9	6.4	8.0	6.3
9	7.5	7.9	7.6	7.1	7.8	8.5	13	15	9.3	5.9	7.7	6.5
10	7.5	7.8	7.1	7.1	7.8	15	17	15	10	5.6	7.5	6.2
11	7.2	7.8	6.8	7.1	7.8	16	19	16	9.2	5.4	7.4	6.4
12	7.2	7.9	6.8	7.1	7.7	37	19	16	9.5	5.4	7.5	6.5
13	7.2	7.9	6.8	7.3	7.5	97	19	17	10	5.4	7.3	6.5
14	7.1	8.0	7.0	7.5	8.1	117	19	17	7.4	5.4	6.0	6.3
15	7.2	8.1	7.1	7.4	7.9	38	18	16	6.6	5.4	6.0	6.3
16	7.2	8.1	7.0	7.3	7.6	28	16	15	6.6	5.4	6.4	6.4
17	7.2	7.8	7.0	7.2	7.7	19	16	14	7.5	5.8	6.5	6.7
18	7.6	7.9	e6.8	7.2	7.5	17	15	14	7.2	5.6	6.7	6.8
19	7.1	7.8	6.9	7.4	7.4	14	14	13	7.9	5.5	6.2	6.4
20	7.1	7.9	6.8	7.5	7.4	13	13	13	7.7	5.7	6.2	6.5
21	7.4	8.0	6.8	7.7	7.5	12	14	13	7.9	5.8	6.2	6.6
22	7.4	7.9	6.8	7.7	7.8	13	15	13	8.8	5.7	10	7.3
23	7.4	8.0	6.9	7.8	7.4	13	23	13	8.7	6.3	15	6.7
24	7.3	7.6	6.8	7.7	e7.1	13	28	13	8.8	6.9	6.6	6.7
25	7.3	7.4	e6.6	7.7	e6.5	12	30	13	8.8	6.9	6.9	6.6
26	7.3	7.4	6.6	11	e6.5	12	24	12	8.3	6.8	6.8	7.0
27	7.1	7.4	7.0	16	6.8	11	19	12	7.7	6.8	8.9	6.6
28	7.1	7.7	7.1	10	6.8	11	17	12	7.5	6.1	7.4	6.6
29	6.9	7.8	7.0	8.3	---	11	18	10	7.1	6.1	7.6	6.6
30	7.2	7.8	6.8	9.5	---	11	17	11	6.6	6.1	6.4	6.6
31	7.2	---	6.9	13	---	13	---	11	---	6.2	6.1	---
TOTAL	226.2	231.6	221.4	250.9	222.8	608.8	517	455	262.9	188.1	232.3	194.2
MEAN	7.30	7.72	7.14	8.09	7.96	19.6	17.2	14.7	8.76	6.07	7.49	6.47
MAX	7.7	8.1	7.9	16	16	117	30	19	12	6.9	15	7.3
MIN	6.9	7.1	6.6	6.9	6.5	6.8	12	10	6.6	5.4	6.0	5.9
AC-FT	449	459	439	498	442	1210	1030	902	521	373	461	385

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1989 - 2003, BY WATER YEAR (WY)

MEAN	10.0	9.94	9.09	8.93	10.9	14.8	16.8	19.6	20.0	11.8	9.73	8.99
MAX	15.0	13.9	12.6	12.6	25.5	29.9	28.6	41.9	61.5	26.0	17.7	13.6
(WY)	1998	1999	1999	1999	1995	1997	1996	1995	1995	1997	1997	1995
MIN	6.98	6.90	7.08	6.96	6.33	7.42	9.36	7.31	8.11	6.07	5.28	5.98
(WY)	2002	2001	2002	1993	1993	1991	1992	1992	2000	2003	2000	1992

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1989 - 2003	
ANNUAL TOTAL	3012.1		3611.2			
ANNUAL MEAN	8.25		9.89		12.5	
HIGHEST ANNUAL MEAN					19.9	1995
LOWEST ANNUAL MEAN					8.21	2002
HIGHEST DAILY MEAN	22	Jun 2	117	Mar 14	211	Feb 20 1995
LOWEST DAILY MEAN	4.4	Aug 16	5.4	Jul 11	4.2	Aug 22 2000
ANNUAL SEVEN-DAY MINIMUM	5.0	Aug 12	5.4	Jul 10	4.4	Aug 19 2000
MAXIMUM PEAK FLOW			234	Mar 13	b303	Feb 19 1995
MAXIMUM PEAK STAGE			4.54	Mar 13	5.28	Feb 19 1995
INSTANTANEOUS LOW FLOW			a4.8	Jul 11		
ANNUAL RUNOFF (AC-FT)	5970		7160		9080	
10 PERCENT EXCEEDS	12		16		20	
50 PERCENT EXCEEDS	7.4		7.5		10	
90 PERCENT EXCEEDS	6.3		6.3		6.9	

a--Gage height, 0.70 ft.
b--From indirect measurement.
e--Estimated.

12323250 SILVER BOW CREEK BELOW BLACKTAIL CREEK, AT BUTTE, MT

LOCATION.--Lat 45°59'47", long 112°33'45" (NAD 27), in $SW^1/_4SE^1/_4NW^1/_4$ sec. 23, T.3 N., R.8 W., Silver Bow County, Hydrologic Unit 17010201, on right bank at Interstate 90 overpass in Butte, 0.8 mi upstream from Whiskey Gulch, 1.3 mi downstream from Blacktail Creek, and at river mile 20.2.

DRAINAGE AREA.--103 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1983 to current year.

REVISED RECORDS.--WDR-MT-92-1: 1984-90 (M). WDR-MT-98-1: Drainage area. WDR-MT-2000-1: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 5,409.47 ft (NGVD 29). October 1983 to Sept. 14, 1997, water-stage recorder 150 ft upstream at elevation 1.40 ft higher. Sept. 15, 1997 to Dec. 3, 1997, no gage in operation due to channel reconstruction during EPA Superfund cleanup operations. Dec. 3, 1997 to Aug. 16, 1999, water-stage recorder 0.8 mi downstream at different elevation. Aug. 16, 1999 to May 10, 2000, water-stage recorder 2.1 mi downstream at different elevation.

REMARKS.--Water-discharge records good. Flow slightly regulated by Silver Bow County sewage treatment plant. U.S. Geological Survey satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15	16	16	14	27	14	28	29	21	13	13	14
2	15	16	15	14	18	14	29	28	20	13	12	14
3	14	15	15	14	16	14	27	27	18	13	20	14
4	14	15	16	14	15	14	23	28	18	13	18	14
5	15	15	16	14	15	14	22	30	17	12	15	14
6	14	15	16	14	15	14	22	28	18	12	15	14
7	14	15	16	15	15	15	21	27	17	12	14	15
8	14	15	15	15	15	17	21	26	16	13	15	15
9	15	15	16	14	15	17	22	25	17	12	14	15
10	15	15	15	14	15	29	25	24	19	12	14	15
11	14	15	15	14	15	33	28	26	17	11	14	15
12	14	15	15	14	14	62	28	27	17	11	14	16
13	14	15	15	14	14	128	28	27	19	11	14	15
14	14	15	15	14	15	136	29	26	17	11	14	15
15	14	15	15	14	15	47	27	25	15	12	14	15
16	15	16	15	14	14	38	25	25	15	12	15	16
17	15	16	15	14	14	29	25	24	15	13	15	16
18	15	16	16	14	14	26	24	23	15	12	15	16
19	15	15	15	14	14	24	23	22	16	12	14	14
20	15	16	14	14	14	22	22	22	16	12	14	14
21	15	16	14	15	14	22	22	22	16	12	14	15
22	15	16	14	15	14	22	24	21	17	12	19	15
23	15	16	15	15	14	23	35	21	16	12	26	15
24	15	15	15	14	14	22	36	21	16	13	15	14
25	15	15	14	14	15	22	41	20	16	14	15	15
26	15	16	14	20	14	22	34	20	15	13	14	15
27	15	16	14	28	14	21	30	20	14	13	17	14
28	15	15	14	18	14	20	27	19	14	13	15	14
29	15	16	14	16	---	20	29	18	13	13	15	14
30	16	16	14	17	---	20	28	21	13	13	14	14
31	16	---	14	24	---	22	---	21	---	13	14	---
TOTAL	457	463	462	478	422	943	805	743	493	383	471	441
MEAN	14.7	15.4	14.9	15.4	15.1	30.4	26.8	24.0	16.4	12.4	15.2	14.7
MAX	16	16	16	28	27	136	41	30	21	14	26	16
MIN	14	15	14	14	14	14	21	18	13	11	12	14
AC-FT	906	918	916	948	837	1870	1600	1470	978	760	934	875

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1984 - 2003, BY WATER YEAR (WY)

MEAN	20.1	19.7	18.4	18.0	20.0	25.1	28.0	30.2	29.3	21.6	20.3	19.0
MAX	26.7	25.7	24.0	25.6	38.0	40.7	42.2	53.5	75.2	37.0	28.7	25.9
(WY)	1984	1984	1998	1984	1995	1997	1998	1995	1995	1995	1993	1995
MIN	14.7	15.4	14.9	13.4	14.2	17.2	14.9	12.6	15.5	12.4	14.0	14.1
(WY)	2003	2003	2003	1989	2001	1991	1992	1992	2000	2003	2001	2000

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1984 - 2003	
ANNUAL TOTAL	5873		6561			
ANNUAL MEAN	16.1		18.0		22.5	
HIGHEST ANNUAL MEAN					30.8	1995
LOWEST ANNUAL MEAN					16.4	2002
HIGHEST DAILY MEAN	43	Aug 8	136	Mar 14	258	Feb 20 1995
LOWEST DAILY MEAN	12	Jul 5	11	Jul 11	8.0	May 8 1992
ANNUAL SEVEN-DAY MINIMUM	13	Jul 28	11	Jul 9	11	May 2 1992
MAXIMUM PEAK FLOW			314	Mar 13	b447	Jul 30 1998
MAXIMUM PEAK STAGE			3.51	Mar 13	c8.11	Jul 30 1998
INSTANTANEOUS LOW FLOW			a9.5	Jul 5	6.4	Aug 27 1996
ANNUAL RUNOFF (AC-FT)	11650		13010		16280	
10 PERCENT EXCEEDS	19		26		33	
50 PERCENT EXCEEDS	15		15		20	
90 PERCENT EXCEEDS	13		14		15	

a--Gage height, 1.47 ft.
b--From culvert computation.
c--Site and datum then in use.

12323250 SILVER BOW CREEK BELOW BLACKTAIL CREEK, AT BUTTE, MT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--March 1993 to August 1995, December 1996 to current year.

REMARKS.--Unpublished records of instantaneous water temperature and specific conductance are available in files of the District office.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instan-taneous dis-charge, cfs (00061)	pH, water, unfltrd field, std units (00400)	Specif. conduc-tance, wat unf uS/cm 25 degC (00095)	Temper-ature, air, deg C (00020)	Temper-ature, water, deg C (00010)	Hard-ness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Arsenic water, fltrd, ug/L (01000)	Arsenic water unfltrd ug/L (01002)
MAR 2003											
17...	1000	29	7.6	402	2.5	3.0	120	34.4	8.58	6.4	9
APR											
02...	1010	31	7.5	400	5.5	5.0	120	34.6	8.81	5.2	8
28...	1120	28	7.5	435	7.5	7.5	140	38.4	9.55	5.3	6
MAY											
26...	0845	20	7.7	451	15.0	12.5	150	42.2	10.7	6.4	8
JUN											
03...	1700	18	8.0	482	18.5	17.0	160	44.0	10.9	7.5	9
16...	0830	15	7.6	532	15.0	13.0	160	45.3	11.8	5.4	6
JUL											
28...	1120	14	7.9	512	31.0	18.0	160	44.3	10.8	6.4	6
AUG											
25...	1040	16	7.6	539	25.0	17.5	160	43.5	11.5	5.6	6

Date	Cadmium water, fltrd, ug/L (01025)	Cadmium water, unfltrd ug/L (01027)	Copper, water, fltrd, ug/L (01040)	Copper, water, unfltrd recover -able, ug/L (01042)	Iron, water, fltrd, ug/L (01046)	Iron, water, unfltrd recover -able, ug/L (01045)	Lead, water, fltrd, ug/L (01049)	Lead, water, unfltrd recover -able, ug/L (01051)	Mangan-ese, water, fltrd, ug/L (01056)	Mangan-ese, water, unfltrd recover -able, ug/L (01055)
MAR 2003										
17...	.25	.52	10.3	32.3	191	1060	.79	7.38	245	297
APR										
02...	.23	.40	14.1	35.8	173	1380	.74	10.5	144	212
28...	.24	.28	10.9	17.2	145	440	.30	1.60	178	163
MAY										
26...	.24	.30	12.2	21.8	84	380	.24	1.89	196	196
JUN										
03...	.13	.24	12.2	21.3	44	320	.19	1.53	132	146
16...	.23	.29	13.2	20.0	30	250	.26	1.50	153	156
JUL										
28...	.09	.11	8.4	15.6	22	120	.20	.65	22.2	26
AUG										
25...	.15	.17	9.8	16.2	24	120	.24	1.03	75.6	85

Date	Zinc, water, fltrd, ug/L (01090)	Zinc, water, unfltrd recover -able, ug/L (01092)	Suspnd. sedi-ment, sieve diametr percent <.063mm (70331)	Sus-pended sedi-ment concen-tration mg/L (80154)	Sus-pended sedi-ment load, tons/d (80155)
MAR 2003					
17...	110	169	83	24	1.9
APR					
02...	86	139	92	39	3.3
28...	102	111	88	7	.53
MAY					
26...	80	107	87	7	.38
JUN					
03...	47	77	90	6	.29
16...	88	106	92	4	.16
JUL					
28...	34	45	86	4	.15
AUG					
25...	59	66	86	2	.09

PEND OREILLE RIVER BASIN

12323600 SILVER BOW CREEK AT OPPORTUNITY, MT

LOCATION.--Lat 46°06'28", long 112°48'17" (NAD 27), in $SE^1/_4SW^1/_4SE^1/_4$ sec.11, T.4 N., R.10 W., Deer Lodge County, Hydrologic Unit 17010201, on left bank 200 ft downstream from Stuart Street bridge, 0.5 mi east of Opportunity, and 1.0 mi upstream from Mill Creek.
DRAINAGE AREA.--363 mi^2. Prior to water year 2001, drainage area published as 284 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1988 to current year. Prior to October 1991, seasonal records only.
REVISED RECORDS.--WDR MT-2001-01: Drainage area.
GAGE.--Water-stage recorder. Elevation of gage is 4,912.37 ft (NGVD 29).
REMARKS.--Water-discharge records good except those for estimated daily discharges, which are fair. Numerous diversions upstream from station for irrigation and municipal use. U.S. Geological Survey satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23	e21	e25	e24	e50	e30	61	89	122	23	12	18
2	23	e21	e25	e24	e40	e30	63	94	107	22	11	18
3	25	e21	e26	e24	e35	e30	56	87	94	22	14	17
4	25	e22	e26	e24	e32	e30	48	96	83	22	33	16
5	24	e22	e26	e24	e30	e32	45	99	76	22	19	16
6	25	e22	26	e25	e28	e32	44	91	70	21	19	17
7	24	e22	e24	e25	e27	e35	42	88	65	21	15	18
8	24	e23	e24	e25	e30	e35	42	84	58	24	14	19
9	24	e23	e25	e24	e30	e40	45	80	56	24	13	19
10	24	e23	e27	e23	e30	e50	54	76	57	22	13	19
11	24	e23	e27	e23	e30	e80	64	74	50	21	13	19
12	24	24	e27	e23	e30	207	69	83	47	20	13	19
13	24	24	e27	e23	e30	365	74	81	45	19	13	19
14	24	24	e26	e23	e30	359	74	77	48	16	13	19
15	24	24	26	e23	30	186	69	80	42	14	12	19
16	24	24	26	e23	30	116	60	83	40	15	12	19
17	24	24	25	e22	30	74	55	80	39	15	15	20
18	24	24	e24	e22	32	56	59	78	38	13	14	20
19	24	24	e23	e23	31	50	54	74	36	12	13	19
20	24	24	e22	e23	36	47	52	69	41	12	12	18
21	24	25	e22	e24	30	48	54	70	38	12	12	19
22	24	25	e22	e24	e28	46	62	73	38	12	14	19
23	24	e24	e23	e24	e25	49	97	76	40	12	35	20
24	23	e23	e23	e25	e20	46	110	84	38	12	20	19
25	23	e23	e22	e30	e25	43	115	92	38	14	17	19
26	23	e24	e22	e60	e30	43	109	101	35	15	16	18
27	24	e25	e23	e150	e30	40	87	107	32	14	17	16
28	24	e25	e24	e70	e30	39	78	110	29	12	19	16
29	e23	e25	e24	e35	---	38	76	116	27	12	16	16
30	e22	e25	e24	e40	---	40	88	120	25	12	19	16
31	e21	---	e24	e45	---	46	---	131	---	12	18	---
TOTAL	736	703	760	997	859	2362	2006	2743	1554	519	496	546
MEAN	23.7	23.4	24.5	32.2	30.7	76.2	66.9	88.5	51.8	16.7	16.0	18.2
MAX	25	25	27	150	50	365	115	131	122	24	35	20
MIN	21	21	22	22	20	30	42	69	25	12	11	16
AC-FT	1460	1390	1510	1980	1700	4690	3980	5440	3080	1030	984	1080

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1988 - 2003, BY WATER YEAR (WY)

MEAN	37.4	37.0	34.2	36.9	52.0	55.5	65.4	96.4	97.4	46.2	30.0	32.0
MAX	55.8	49.5	49.2	68.6	184	86.6	120	261	281	107	69.5	59.8
(WY)	1998	1996	1998	1997	1996	1997	1996	1997	1997	1995	1993	1993
MIN	23.7	23.4	23.0	22.2	21.9	31.6	41.3	31.3	23.6	16.7	14.5	18.2
(WY)	2003	2003	2002	2001	2001	2002	2002	1992	2000	2003	2000	2003

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1988 - 2003	
ANNUAL TOTAL	11380		14281			
ANNUAL MEAN	31.2		39.1		53.4	
HIGHEST ANNUAL MEAN					99.0	1997
LOWEST ANNUAL MEAN					30.4	2001
HIGHEST DAILY MEAN	117	Jun 2	365	Mar 13	1300	Feb 11 1996
LOWEST DAILY MEAN	14	Jul 31	11	Aug 2	11	Aug 2 2003
ANNUAL SEVEN-DAY MINIMUM	14	Jul 31	12	Jul 18	12	Jul 18 2003
MAXIMUM PEAK FLOW			a571	Mar 13	d1300	Feb 11 1996
MAXIMUM PEAK STAGE			b5.22	Jan 26	b6.91	Feb 11 1996
INSTANTANEOUS LOW FLOW			c9.7	Jul 29	c9.7	Jul 29 2003
ANNUAL RUNOFF (AC-FT)	22570		28330		38670	
10 PERCENT EXCEEDS	50		80		97	
50 PERCENT EXCEEDS	25		25		40	
90 PERCENT EXCEEDS	19		16		22	

a--Gage height, 5.18 ft.
b--Backwater from ice.
c--Gage height, 2.20 ft.
d--Estimated daily discharge during period of ice effect.
e--Estimated.

12323600 SILVER BOW CREEK AT OPPORTUNITY, MT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--March 1993 to August 1995, December 1996 to current year.
PERIOD OF DAILY RECORD.--
SUSPENDED-SEDIMENT DISCHARGE: March 1993 to September 1995.
REMARKS.--Unpublished records of instantaneous water temperature and specific conductance are available in files of District office.
EXTREMES FOR PERIOD OF DAILY RECORD.--
SEDIMENT CONCENTRATION: Maximum daily mean, 563 mg/L, July 13, 1995; minimum daily mean, 3 mg/L, Sep. 16, 1993; Feb. 3-7, July 22, 1994.
SEDIMENT LOAD: Maximum daily, 495 tons, June 6, 1995; minimum daily, 0.19 ton, Feb. 4-7, 1994.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instan-taneous dis-charge, cfs (00061)	pH, water, unfltrd field, std units (00400)	Specif. conduc-tance, wat unf uS/cm 25 degC (00095)	Temper-ature, air, deg C (00020)	Temper-ature, water, deg C (00010)	Hard-ness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Arsenic water, fltrd, ug/L (01000)	Arsenic water unfltrd ug/L (01002)
MAR 2003											
15...	0930	176	7.8	276	6.5	1.5	81	24.2	4.96	14.7	91
APR											
02...	1115	61	8.1	418	5.0	5.5	140	40.3	9.01	11.0	27
28...	1220	75	8.4	385	6.0	6.5	140	41.7	8.72	10.3	15
MAY											
26...	1000	101	8.4	331	15.0	10.5	130	40.8	7.15	11.5	14
JUN											
03...	1430	90	8.7	318	19.5	14.0	130	40.5	7.25	9.5	14
16...	1145	39	9.1	407	21.0	16.0	160	48.5	9.74	12.5	15
JUL											
28...	1225	13	8.9	574	30.5	21.0	210	61.9	12.9	22.1	22
AUG											
25...	1315	17	8.8	572	28.0	20.0	200	59.1	13.3	19.3	28

Date	Cadmium water, fltrd, ug/L (01025)	Cadmium water, unfltrd ug/L (01027)	Copper, water, fltrd, ug/L (01040)	Copper, water, unfltrd recover-able, ug/L (01042)	Iron, water, fltrd, ug/L (01046)	Iron, water, unfltrd recover-able, ug/L (01045)	Lead, water, fltrd, ug/L (01049)	Lead, water, unfltrd recover-able, ug/L (01051)	Mangan-ese, water, fltrd, ug/L (01056)	Mangan-ese, water, unfltrd recover-able, ug/L (01055)
MAR 2003										
15...	2.08	5.22	142	860	141	8760	3.17	269	767	1190
APR										
02...	1.45	2.23	69.7	214	71	1600	1.38	52.9	521	635
28...	.84	1.18	50.0	97.0	90	760	.92	15.5	343	349
MAY										
26...	.37	.78	28.5	73.9	55	780	.39	12.4	227	274
JUN										
03...	.29	.58	25.4	60.6	38	620	.27	10.2	172	211
16...	.35	.69	30.4	61.1	30	430	.31	7.47	203	248
JUL										
28...	.23	.52	25.3	54.3	32	280	.39	5.38	85.7	117
AUG										
25...	.78	1.31	37.8	95.2	9	290	.26	7.43	279	329

Date	Zinc, water, fltrd, ug/L (01090)	Zinc, water, unfltrd recover-able, ug/L (01092)	Suspnd. sedi-ment, sieve diametr percent <.063mm (70331)	Sus-pended sedi-ment concen-tration mg/L (80154)	Sus-pended sedi-ment load, tons/d (80155)
MAR 2003					
15...	491	1230	83	238	113
APR					
02...	336	539	88	56	9.2
28...	177	251	91	18	3.6
MAY					
26...	59	163	86	28	7.6
JUN					
03...	40	119	84	17	4.1
16...	38	139	84	9	.95
JUL					
28...	28	97	81	5	.18
AUG					
25...	82	204	80	6	.28

PEND OREILLE RIVER BASIN

12323700 MILL CREEK AT OPPORTUNITY, MT

LOCATION.--Lat 46°06'57", long 112°49'08" (NAD 27), in $SE^1/_4SE/_4NE^1/_4$ sec. 10, T.4N., R.10W., Deer Lodge County, Hydrologic Unit 17010201, on right bank at Opportunity, 0.9 mi upstream from Mill-Willow Bypass, and at river mile 0.9.

DRAINAGE AREA .--43.2 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 2003 to September 2003.

GAGE.--Water-stage recorder. Elevation of gage is 4,940 ft (NGVD 29).

REMARKS.--Water-discharge records good. No regulation. Minor diversions for irrigation upstream from station. U.S. Geological Survey satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1							e15	17	260	31	2.8	2.0
2							14	17	202	29	2.6	2.1
3							13	19	162	26	2.7	2.2
4							12	23	139	24	3.5	1.8
5							12	23	114	23	3.2	1.0
6							12	23	105	23	3.2	1.6
7							11	23	95	19	2.7	1.5
8							10	20	93	15	2.3	1.6
9							10	19	93	15	2.1	1.5
10							11	18	89	14	2.0	1.5
11							13	19	89	12	2.0	1.4
12							16	20	78	9.4	2.1	1.4
13							17	20	75	5.2	2.7	1.4
14							17	20	83	4.8	2.1	1.3
15							15	24	77	4.2	2.1	1.2
16							13	27	74	3.9	1.9	1.3
17							13	27	76	3.4	2.0	2.0
18							13	27	77	3.4	2.0	1.6
19							11	26	76	4.4	1.9	1.4
20							12	24	76	4.0	1.8	1.3
21							13	22	68	3.8	1.8	1.1
22							15	23	59	4.7	1.8	1.0
23							23	27	52	4.2	2.4	0.91
24							27	40	49	4.3	2.1	0.89
25							32	79	42	4.6	1.9	0.87
26							30	108	35	4.6	2.1	1.3
27							25	120	33	4.2	2.1	1.3
28							21	137	34	3.5	2.2	0.91
29							20	191	33	2.6	2.3	0.91
30							19	228	32	2.9	2.0	1.0
31							---	255	---	2.9	2.0	---
TOTAL							485	1666	2570	316.0	70.4	41.29
MEAN							16.2	53.7	85.7	10.2	2.27	1.38
MAX							32	255	260	31	3.5	2.2
MIN							10	17	32	2.6	1.8	0.87
AC-FT							962	3300	5100	627	140	82

SUMMARY STATISTICS	FOR 2003 WATER YEAR	
HIGHEST DAILY MEAN	260	Jun 1
LOWEST DAILY MEAN	0.87	Sep 25
MAXIMUM PEAK FLOW	284	Jun 1
MAXIMUM PEAK STAGE	3.34	Jun 1
INSTANTANEOUS LOW FLOW	a0.79	Sep 29

a--Gage height, 0.89 ft.
e--Estimated.

12323700 MILL CREEK AT OPPORTUNITY, MT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--March 2003 to August 2003.

REMARKS.--Unpublished records of instantaneous water temperature and specific conductance are available in files of the District office.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instantaneous discharge, cfs (00061)	pH, water, unfltrd field, std units (00400)	Specif. conductance, wat unf uS/cm 25 degC (00095)	Temperature, air, deg C (00020)	Temperature, water, deg C (00010)	Hardness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnesium, water, fltrd, mg/L (00925)	Arsenic water, fltrd, ug/L (01000)	Arsenic water unfltrd ug/L (01002)
MAR 2003											
17...	1210	9.6	8.2	207	5.0	3.0	85	23.0	6.57	37.0	38
APR											
02...	1255	14	8.0	186	5.0	5.0	73	20.0	5.69	33.2	36
28...	1345	21	8.0	129	7.0	5.5	51	14.4	3.74	33.6	35
MAY											
26...	1220	110	7.8	81	21.0	9.5	32	9.14	2.23	29.9	50
JUN											
01...	1430	261	7.8	59	23.5	9.5	24	7.01	1.57	23.0	36
16...	1005	79	7.9	83	18.5	9.0	37	10.6	2.55	20.5	22
JUL											
28...	1420	3.6	8.1	169	32.0	18.5	74	21.0	5.36	31.5	32
AUG											
25...	1230	2.1	8.1	195	28.0	16.0	85	23.5	6.32	29.7	35

Date	Cadmium water, fltrd, ug/L (01025)	Cadmium water, unfltrd ug/L (01027)	Copper, water, fltrd, ug/L (01040)	Copper, water, unfltrd recover-able, ug/L (01042)	Iron, water, fltrd, ug/L (01046)	Iron, water, unfltrd recover-able, ug/L (01045)	Lead, water, fltrd, ug/L (01049)	Lead, water, unfltrd recover-able, ug/L (01051)	Manganese, water, fltrd, ug/L (01056)	Manganese, water, unfltrd recover-able, ug/L (01055)
MAR 2003										
17...	.08	.11	3.7	5.0	39	120	.18	.48	3.6	6
APR										
02...	.09	.11	4.7	7.5	37	200	.17	1.08	4.8	10
28...	.10	.15	5.2	8.0	51	210	.23	1.19	4.4	14
MAY										
26...	.08	.85	5.8	38.8	53	1960	.32	12.7	15.7	113
JUN										
01...	.08	.51	6.0	25.1	50	1300	.27	8.01	7.0	64
16...	.06	.13	3.3	6.9	41	320	.22	1.74	6.4	17
JUL										
28...	.05	.06	2.4	3.3	45	100	.14	.30	11.1	12
AUG										
25...	.05	.06	2.2	3.2	60	100	.11	.17	9.8	11

Date	Zinc, water, fltrd, ug/L (01090)	Zinc, water, unfltrd recover-able, ug/L (01092)	Suspnd. sediment, sieve diametr percent <.063mm (70331)	Suspended sediment concentration mg/L (80154)	Suspended sediment load, tons/d (80155)
MAR 2003					
17...	3	5	78	1	.03
APR					
02...	4	8	87	5	.19
28...	6	7	78	6	.34
MAY					
26...	3	41	49	107	32
JUN					
01...	4	26	52	78	55
16...	3	10	51	10	2.1
JUL					
28...	2	2	88	1	.01
AUG					
25...	2	3	80	1	.01

PEND OREILLE RIVER BASIN

12323720 WILLOW CREEK AT OPPORTUNITY, MT

LOCATION.--Lat 46°06'22", long 112°48'41" (NAD 27), in $NW^1/_4$ $NE^1/_4$ $NW^1/_4$ sec. 14, T4N., R.10W., Deer Lodge County, Hydrologic Unit 17010201, 1,300 ft upstream from Stuart Street culverts, at Opportunity, 1.2 mi upstream from Mill-Willow Bypass, and at river mile 1.2.

DRAINAGE AREA .--30.8 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April to September 2003.

GAGE.--Water-stage recorder. Elevation of gage is 4,930 ft (NGVD 29).

REMARKS.--Water-discharge records good. No regulation. Minor diversions for irrigation upstream from station. U.S. Geological Survey satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1							e17	24	51	8.8	5.2	6.1
2							14	24	39	8.3	5.1	5.5
3							13	25	33	8.2	5.5	5.3
4							10	31	27	7.9	6.1	5.6
5							9.8	33	23	7.2	6.3	6.1
6							9.3	29	22	7.0	6.4	6.2
7							8.3	28	20	6.8	6.4	6.1
8							8.1	26	18	7.0	6.2	6.2
9							7.9	25	16	7.2	5.9	6.3
10							9.1	23	17	6.7	5.8	6.7
11							11	20	17	6.7	5.7	6.8
12							13	22	15	6.5	6.0	6.7
13							16	21	15	6.2	6.3	6.6
14							18	21	15	6.2	6.4	6.7
15							17	22	14	6.4	6.0	6.8
16							15	24	14	6.7	5.9	7.1
17							14	26	14	7.0	6.5	7.7
18							12	27	13	7.0	6.9	7.9
19							10	26	13	6.8	6.6	7.5
20							10	24	17	6.4	6.3	7.3
21							11	23	18	6.2	6.1	7.4
22							12	24	16	6.2	6.2	7.2
23							20	23	15	6.0	7.6	7.0
24							21	27	15	6.1	6.9	7.1
25							22	33	14	6.6	6.6	7.2
26							22	44	12	6.9	6.5	6.9
27							20	49	11	6.9	6.9	6.9
28							19	56	10	5.9	7.2	6.9
29							20	46	9.8	5.2	7.1	7.2
30							24	49	9.3	5.0	6.8	7.6
31							---	61	---	5.1	6.5	---
TOTAL							433.5	936	543.1	207.1	195.9	202.6
MEAN							14.4	30.2	18.1	6.68	6.32	6.75
MAX							24	61	51	8.8	7.6	7.9
MIN							7.9	20	9.3	5.0	5.1	5.3
AC-FT							860	1860	1080	411	389	402

SUMMARY STATISTICS	FOR 2003 WATER YEAR	
HIGHEST DAILY MEAN	61	May 31
LOWEST DAILY MEAN	5.0	Jul 30
MAXIMUM PEAK FLOW	65	May 28
MAXIMUM PEAK STAGE	5.00	May 28
INSTANTANEOUS LOW FLOW	a4.6	Jul 29

a--Gage height, 3.92 ft.
e--Estimated.

12323720 WILLOW CREEK AT OPPORTUNITY, MT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--March 2003 to August 2003.

REMARKS.--Unpublished records of instantaneous water temperature and specific conductance are available in files of the District office.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instan-taneous dis-charge, cfs (00061)	pH, water, unfltrd field, std units (00400)	Specif. conduc-tance, wat unf uS/cm 25 degC (00095)	Temper-ature, air, deg C (00020)	Temper-ature, water, deg C (00010)	Hard-ness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Arsenic water, fltrd, ug/L (01000)	Arsenic water unfltrd ug/L (01002)
MAR 2003											
17...	1100	9.8	8.0	318	5.5	3.5	140	38.7	9.38	33.1	35
APR											
02...	1145	14	8.3	333	5.0	5.5	130	36.8	9.27	57.0	65
28...	1250	20	8.1	181	7.5	6.0	73	22.0	4.37	26.1	27
MAY											
26...	1040	46	7.9	225	15.0	11.5	98	28.5	6.58	101	104
JUN											
03...	1445	33	7.9	213	17.5	13.5	95	27.8	6.19	69.4	69
16...	0925	14	7.9	261	20.5	11.5	110	31.9	7.80	42.6	44
JUL											
28...	1305	6.3	8.2	322	30.5	17.0	150	42.6	9.89	24.2	23
AUG											
25...	1200	6.6	8.0	307	27.0	14.5	130	38.3	9.53	13.2	16

Date	Cadmium water, fltrd, ug/L (01025)	Cadmium water, unfltrd ug/L (01027)	Copper, water, fltrd, ug/L (01040)	Copper, water, unfltrd recover-able, ug/L (01042)	Iron, water, fltrd, ug/L (01046)	Iron, water, unfltrd recover-able, ug/L (01045)	Lead, water, fltrd, ug/L (01049)	Lead, water, unfltrd recover-able, ug/L (01051)
MAR 2003								
17...	.06	.07	4.2	10.6	34	210	.24	2.12
APR								
02...	.05	.10	7.9	17.1	49	250	.28	1.98
28...	.04	.11	5.6	11.8	70	410	.30	2.67
MAY								
26...	.08	.30	14.1	36.9	87	840	.50	8.41
JUN								
03...	.05	.13	9.2	17.0	48	290	.21	2.55
16...	.05	.09	4.5	9.5	47	220	.28	1.72
JUL								
28...	E.03	.04	2.7	4.5	14	80	E.06	.78
AUG								
25...	.05	.05	2.4	4.4	8	100	.19	.71

Date	Manganese, water, fltrd, ug/L (01056)	Manganese, water, unfltrd recover-able, ug/L (01055)	Zinc, water, fltrd, ug/L (01090)	Zinc, water, unfltrd recover-able, ug/L (01092)	Suspnd. sedi-ment, sieve diametr percent <.063mm (70331)	Sus-pended sedi-ment concen-tration mg/L (80154)	Sus-pended sedi-ment load, tons/d (80155)
MAR 2003							
17...	49.3	62	8	16	93	5	.13
APR							
02...	37.9	46	6	15	94	9	.34
28...	24.2	38	10	14	86	17	.92
MAY							
26...	32.8	70	8	41	76	51	6.3
JUN							
03...	18.7	31	5	15	76	15	1.3
16...	19.0	24	5	10	91	6	.23
JUL							
28...	10.6	14	2	4	88	3	.05
AUG							
25...	13.2	18	2	4	96	2	.04

E--Estimated.

PEND OREILLE RIVER BASIN

12323750 SILVER BOW CREEK AT WARM SPRINGS, MT

LOCATION.--Lat 46°10'50", long 112°46'46" (NAD 27), in $SW^1/_4SE^1/_4SW^1/_4$ sec.18, T.5 N., R.9 W., Deer Lodge County, Hydrologic Unit 17010201, on left bank 1.0 mi upstream from confluence with Warm Springs Creek, 1.1 mi upstream from county highway bridge, and 0.5 mi east of Warm Springs.

DRAINAGE AREA.--473 mi^2; area at site used prior to May 24, 1994, 483 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1972 to September 1979, April 1993 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 4,800.31 ft (NGVD 29). Prior to May 24, 1994, gage located at sites 0.8 mi downstream at different elevation.

REMARKS.--Water-discharge records good. Flow is regulated by dam on tailing ponds about 0.2 mi upstream from gage. Diversions for irrigation of about 4,650 acres upstream from station. U.S. Geological Survey satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	25	33	43	48	109	57	99	144	422	59	20	23
2	25	33	43	49	105	56	113	143	368	57	19	23
3	26	33	44	51	97	57	121	141	325	54	21	24
4	27	33	45	52	91	63	102	157	288	54	24	24
5	27	35	46	54	83	64	88	174	238	51	25	23
6	28	36	45	52	77	65	86	191	212	49	25	24
7	29	37	43	50	70	69	85	189	198	44	25	23
8	29	38	41	50	69	68	87	167	184	39	25	21
9	29	38	42	49	66	67	86	151	176	39	26	21
10	30	40	42	46	64	78	82	146	172	37	25	22
11	28	40	42	43	63	116	84	141	176	37	22	22
12	28	41	43	47	59	141	88	135	156	36	23	24
13	28	42	44	48	56	203	91	130	145	31	24	24
14	27	42	46	50	58	355	100	130	152	30	25	23
15	26	41	48	52	58	352	103	130	139	29	24	22
16	26	41	47	50	58	327	101	131	134	29	22	23
17	27	40	47	50	58	227	97	135	133	28	23	24
18	28	40	43	51	55	131	97	136	127	28	24	25
19	28	41	42	51	53	94	91	128	118	28	24	24
20	29	41	42	51	55	81	87	116	125	28	24	23
21	30	41	43	50	56	80	85	109	121	26	22	24
22	30	42	43	e45	61	80	89	107	107	26	22	24
23	32	e40	44	62	e48	80	108	111	100	25	27	24
24	32	e38	40	57	e45	78	127	128	94	24	26	24
25	32	e38	39	54	e48	83	146	166	90	25	24	24
26	33	42	41	124	55	82	150	208	81	26	22	24
27	32	41	43	134	56	82	142	241	74	24	24	24
28	32	40	48	97	59	81	136	266	71	22	25	24
29	e31	42	48	98	---	77	137	315	71	20	27	22
30	e31	43	47	92	---	75	146	361	64	21	27	23
31	e31	---	48	93	---	76	---	420	---	21	25	---
TOTAL	896	1172	1362	1900	1832	3545	3154	5347	4861	1047	741	699
MEAN	28.9	39.1	43.9	61.3	65.4	114	105	172	162	33.8	23.9	23.3
MAX	33	43	48	134	109	355	150	420	422	59	27	25
MIN	25	33	39	43	45	56	82	107	64	20	19	21
AC-FT	1780	2320	2700	3770	3630	7030	6260	10610	9640	2080	1470	1390

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1972 - 2003, BY WATER YEAR (WY)*

MEAN	70.4	77.2	71.9	76.6	81.2	110	130	242	273	116	66.7	61.5
MAX	193	161	156	152	130	207	281	586	770	356	201	137
(WY)	1976	1976	1976	1974	1996	1976	1976	1976	1975	1975	1975	1975
MIN	27.5	31.7	30.9	37.1	36.9	45.5	54.4	70.2	57.2	28.8	16.8	20.1
(WY)	2002	2001	2002	2002	2001	2002	2000	2000	2000	2000	2000	2000

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1972 - 2003*	
ANNUAL TOTAL	18464		26556			
ANNUAL MEAN	50.6		72.8		114	
HIGHEST ANNUAL MEAN					228	1975
LOWEST ANNUAL MEAN					43.0	2000
HIGHEST DAILY MEAN	195	Jun 10	422	Jun 1	1220	Jun 20 1975
LOWEST DAILY MEAN	22	Aug 20	19	Aug 2	15	Sep 12 1973
ANNUAL SEVEN-DAY MINIMUM	23	Aug 17	21	Jul 28	16	Aug 4 2000
MAXIMUM PEAK FLOW			457	Mar 14	a1320	Jun 20 1975
MAXIMUM PEAK STAGE			3.33	Mar 14	b8.64	Jan 16 1974
ANNUAL RUNOFF (AC-FT)	36620		52670		82630	
10 PERCENT EXCEEDS	101		144		228	
50 PERCENT EXCEEDS	40		48		79	
90 PERCENT EXCEEDS	26		24		33	

*--During periods of operation (March 1972 to September 1979, April 1993 to current year).
a--Gage height, 7.47 ft, site and datum then in use.
b--Backwater from ice, site and datum then in use.
e--Estimated.

12323750 SILVER BOW CREEK AT WARM SPRINGS, MT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--March 1993 to current year.
PERIOD OF DAILY RECORD.--
SUSPENDED-SEDIMENT DISCHARGE: April 1993 to September 1995.
REMARKS.--Unpublished records of instantaneous water temperature and specific conductance are available in files of the District office.
EXTREMES FOR PERIOD OF DAILY RECORD.--
SEDIMENT CONCENTRATION: Maximum daily mean, 429 mg/L, Mar. 15, 1994; minimum daily mean, 1 mg/L, several days in October 1995.
SEDIMENT LOAD: Maximum daily, 302 tons, June 6, 1995; minimum daily, 0.12 ton, several days in August 1995.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instan-taneous dis-charge, cfs (00061)	pH, water, unfltrd field, std units (00400)	Specif. conduc-tance, wat unf uS/cm 25 degC (00095)	Temper-ature, air, deg C (00020)	Temper-ature, water, deg C (00010)	Hard-ness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Arsenic water, fltrd, ug/L (01000)	Arsenic water unfltrd ug/L (01002)
MAR 2003											
18...	0925	132	8.4	494	4.0	4.5	190	57.3	11.6	19.5	31
APR											
02...	1435	121	8.5	492	6.0	7.0	200	58.6	12.3	15.8	19
28...	1500	137	8.4	438	5.5	8.5	170	51.2	10.9	16.3	19
MAY											
26...	1350	213	8.9	278	19.5	14.0	110	30.5	7.35	37.9	43
JUN											
01...	1650	424	8.6	253	19.5	15.5	110	31.1	6.68	39.3	43
16...	1310	137	9.0	265	23.0	15.5	100	30.0	7.18	28.6	30
JUL											
28...	1520	22	9.0	524	31.0	25.0	240	69.5	16.0	30.6	30
AUG											
25...	1415	24	9.0	578	28.0	21.5	260	75.9	17.7	26.0	32

Date	Cadmium water, fltrd, ug/L (01025)	Cadmium water, unfltrd ug/L (01027)	Copper, water, fltrd, ug/L (01040)	Copper, water, unfltrd recover-able, ug/L (01042)	Iron, water, fltrd, ug/L (01046)	Iron, water, unfltrd recover-able, ug/L (01045)	Lead, water, fltrd, ug/L (01049)	Lead, water, unfltrd recover-able, ug/L (01051)	Mangan-ese, water, fltrd, ug/L (01056)	Mangan-ese, water, unfltrd recover-able, ug/L (01055)
MAR 2003										
18...	.31	.56	27.8	96.8	26	1420	.57	41.8	405	493
APR										
02...	.04	.11	7.0	18.4	15	340	.14	5.13	122	172
28...	.05	.17	6.3	13.3	16	270	.11	2.16	78.7	114
MAY										
26...	.05	.36	8.6	23.8	36	760	.27	6.32	34.2	110
JUN										
01...	.06	.15	8.5	14.4	43	320	.17	1.78	69.1	117
16...	.04	.10	5.7	8.9	35	200	.14	1.20	42.3	81
JUL										
28...	E.03	.06	3.5	7.1	10	110	<.08	.73	53.0	98
AUG										
25...	.07	.05	4.5	6.6	E6	100	E.06	.47	72.4	122

Date	Zinc, water, fltrd, ug/L (01090)	Zinc, water, unfltrd recover-able, ug/L (01092)	Suspnd. sedi-ment, sieve diametr percent <.063mm (70331)	Sus-pended sedi-ment concen-tration mg/L (80154)	Sus-pended sedi-ment load, tons/d (80155)
MAR 2003					
18...	37	158	97	24	8.6
APR					
02...	7	32	92	7	2.3
28...	2	18	88	8	3.0
MAY					
26...	<1	28	90	31	18
JUN					
01...	1	12	83	11	13
16...	2	8	86	5	1.8
JUL					
28...	1	5	83	4	.24
AUG					
25...	7	5	53	5	.32

E--Estimated.

PEND OREILLE RIVER BASIN

12323760 WARM SPRINGS CREEK NEAR ANACONDA, MT

LOCATION.--Lat 46°08'01", long 112°54'48" (NAD 27), in $SW^1/_4NW^1/_4NE^1/_4$ sec. 1, T.4N., R.11W., Deer Lodge County, Hydrologic Unit 17010201, on left bank 0.3 mi downstream from Arbiter Bridge on private road, 1.0 mi upstream from Dutchman Creek, 1.2 mi northeast of Anaconda, and at river mile 9.5.

DRAINAGE AREA.--157 mi^2.

PERIOD OF RECORD.--October 1997 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 5,150 ft (NGVD 29).

REMARKS.--Records good except those for estimated daily discharges, which are fair. Some regulation by Storm King Lake. Minor diversions upstream from station for irrigation and municipal use. U. S. Geological Survey satellite telemeter at station. Several observations of water temperature and specific conductance were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	66	e56	55	45	65	39	59	80	558	167	83	82
2	65	e58	56	46	56	39	54	77	450	147	82	81
3	65	e60	55	49	52	40	53	76	387	139	84	81
4	64	63	55	50	51	40	47	81	332	130	87	81
5	63	66	57	52	49	40	49	79	293	123	84	80
6	62	75	54	51	45	41	47	75	263	115	91	81
7	61	75	49	50	e43	42	45	72	237	110	91	83
8	58	78	49	49	e45	42	47	70	237	117	86	83
9	58	64	48	45	46	43	50	68	267	120	85	83
10	58	61	48	e40	47	47	53	67	285	109	83	83
11	58	59	48	e43	45	51	55	65	304	103	81	78
12	59	59	47	48	44	72	59	66	265	100	83	73
13	59	62	48	53	44	79	62	66	258	97	82	72
14	58	67	51	57	46	65	63	68	256	93	81	70
15	57	70	53	56	45	57	59	76	237	88	84	69
16	57	69	52	55	44	56	55	80	237	87	86	72
17	57	67	52	e50	44	51	54	75	252	83	93	74
18	57	58	e43	e52	44	49	54	73	258	83	90	73
19	56	57	e40	55	43	47	51	73	255	88	87	72
20	56	59	e41	55	44	47	51	72	282	87	87	70
21	56	60	42	e50	44	47	53	70	282	85	85	69
22	55	59	43	e45	46	48	58	72	239	84	87	68
23	55	61	43	e50	e40	51	83	87	221	82	97	65
24	66	55	e40	55	e30	46	83	135	218	81	91	62
25	70	e50	e35	55	e32	46	90	203	203	84	89	61
26	71	51	e36	78	e35	46	84	287	189	84	86	59
27	71	52	39	69	e38	45	75	323	183	83	87	58
28	75	52	42	52	e40	45	70	361	183	78	87	58
29	71	55	43	49	---	45	72	434	177	76	85	58
30	e65	55	42	51	---	46	77	508	173	74	85	59
31	e55	---	44	68	---	51	---	598	---	80	85	---
TOTAL	1904	1833	1450	1623	1247	1503	1812	4537	7981	3077	2674	2158
MEAN	61.4	61.1	46.8	52.4	44.5	48.5	60.4	146	266	99.3	86.3	71.9
MAX	75	78	57	78	65	79	90	598	558	167	97	83
MIN	55	50	35	40	30	39	45	65	173	74	81	58
AC-FT	3780	3640	2880	3220	2470	2980	3590	9000	15830	6100	5300	4280

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1998 - 2003, BY WATER YEAR (WY)

MEAN	80.3	66.6	53.4	52.1	50.0	50.9	55.5	116	195	111	85.0	78.8
MAX	113	99.5	78.6	71.0	68.0	67.3	66.5	159	266	196	99.0	95.1
(WY)	1998	1998	1998	1998	1998	1998	1998	1998	2003	1998	1999	1999
MIN	57.8	44.9	42.0	42.6	40.5	40.8	46.2	70.0	93.0	65.2	63.2	68.4
(WY)	2001	2001	2002	2001	2001	2002	2001	2002	2000	2000	2000	2000

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1998 - 2003	
ANNUAL TOTAL	26509		31799			
ANNUAL MEAN	72.6		87.1		83.0	
HIGHEST ANNUAL MEAN					112	1998
LOWEST ANNUAL MEAN					64.7	2000
HIGHEST DAILY MEAN	243	Jun 17	598	May 31	598	May 31 2003
LOWEST DAILY MEAN	35	Jan 1	30	Feb 24	30	Feb 24 2003
ANNUAL SEVEN-DAY MINIMUM	39	Jan 1	36	Feb 24	35	Dec 24 2001
MAXIMUM PEAK FLOW			675	May 31	a675	May 31 2003
MAXIMUM PEAK STAGE			4.17	May 31	b4.89	Dec 26 1998
ANNUAL RUNOFF (AC-FT)	52580		63070		60110	
10 PERCENT EXCEEDS	127		175		133	
50 PERCENT EXCEEDS	57		63		66	
90 PERCENT EXCEEDS	40		44		43	

a--Gage height, 4.17 ft.
b--Backwater from ice.
e--Estimated.

PEND OREILLE RIVER BASIN

12323770 WARM SPRINGS CREEK AT WARM SPRINGS, MT

LOCATION.--Lat 46°10'50", long 112°47'04" (NAD 27), in $SW^1/_4SW^1/_4SW^1/_4$ sec.18, T.5 N., R.9 W., Deer Lodge County, Hydrologic Unit 17010201, on right bank at I-90 frontage road bridge 0.2 mi southeast of Warm Springs post office, and at river mile 0.9.

DRAINAGE AREA.--163 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1983 to current year. October 1983 to June 26, 2002 at site 200 ft upstream.

GAGE.--Water-stage recorder. Elevation of gage is 4,810 ft (NGVD 29).

REMARKS.--Water-discharge records good except those for estimated daily discharges, which are fair. Numerous diversions upstream from station for irrigation and municipal use. U.S. Geological Survey satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	39	e25	32	e30	52	e27	49	65	377	106	14	38
2	39	e28	32	e30	44	e26	46	64	332	98	16	37
3	39	e35	32	31	41	e25	45	63	271	93	19	35
4	39	e40	32	31	41	e25	40	68	231	89	21	34
5	38	e45	32	31	39	e26	42	66	203	85	20	36
6	37	e45	32	31	e38	e28	41	62	181	80	28	38
7	36	e45	e30	e30	e37	e29	37	61	165	74	31	41
8	34	43	e28	e27	e36	e30	35	58	156	76	28	36
9	33	37	e30	e25	e35	29	36	56	169	81	26	35
10	34	33	e31	e23	38	33	38	54	178	75	23	37
11	39	32	e32	e22	36	39	40	53	195	70	22	33
12	38	30	e31	e25	e35	55	42	53	173	67	26	28
13	37	31	31	e28	e35	67	43	53	159	66	20	33
14	34	30	32	e30	38	57	48	53	160	61	14	32
15	30	30	33	30	36	48	45	57	152	41	15	29
16	30	30	33	e30	36	46	42	49	149	40	16	31
17	30	30	32	e25	36	41	41	47	153	38	27	36
18	30	30	e31	e28	33	38	41	45	153	37	36	37
19	30	31	e29	e30	31	37	39	45	150	40	33	41
20	30	31	e27	e30	32	36	39	44	163	39	33	44
21	30	32	e25	e27	32	37	40	42	168	36	34	43
22	25	32	e27	e20	34	36	43	35	148	33	34	43
23	25	e30	e28	e25	e17	40	57	40	138	31	43	39
24	29	e27	e23	e30	e15	34	61	64	137	29	42	35
25	36	e25	e20	36	e20	26	69	93	129	30	39	33
26	40	e27	e22	52	e25	25	68	130	122	32	34	33
27	41	e30	e25	59	e26	25	62	173	118	31	35	31
28	43	e32	e30	43	e27	34	58	223	116	25	35	31
29	41	e32	e30	39	---	34	57	287	114	25	34	25
30	32	32	e30	40	---	37	64	343	111	24	37	20
31	e23	---	e30	50	---	41	---	376	---	20	38	---
TOTAL	1061	980	912	988	945	1111	1408	2922	5171	1672	873	1044
MEAN	34.2	32.7	29.4	31.9	33.8	35.8	46.9	94.3	172	53.9	28.2	34.8
MAX	43	45	33	59	52	67	69	376	377	106	43	44
MIN	23	25	20	20	15	25	35	35	111	20	14	20
AC-FT	2100	1940	1810	1960	1870	2200	2790	5800	10260	3320	1730	2070

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1984 - 2003, BY WATER YEAR (WY)

MEAN	44.3	44.4	34.0	36.5	36.1	35.5	42.2	83.4	138	54.2	25.5	32.1
MAX	95.2	84.5	77.8	82.1	63.0	53.5	62.8	196	362	170	125	81.6
(WY)	1998	1998	1985	1985	1986	1998	1986	1997	1997	1997	1997	1997
MIN	10.6	13.1	5.89	4.21	4.54	18.9	13.3	19.3	7.05	0.42	0.46	2.61
(WY)	1988	1993	1993	1993	1993	1991	1991	1992	1992	1985	1988	1988

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1984 - 2003	
ANNUAL TOTAL	14547		19087			
ANNUAL MEAN	39.9		52.3		50.5	
HIGHEST ANNUAL MEAN					108	1997
LOWEST ANNUAL MEAN					16.6	1992
HIGHEST DAILY MEAN	121	Jun 7	377	Jun 1	475	Jun 6 1997
LOWEST DAILY MEAN	15	Feb 25	14	Aug 1	0.00	Aug 4 1988
ANNUAL SEVEN-DAY MINIMUM	18	Jul 27	19	Jul 30	0.05	Aug 3 1988
MAXIMUM PEAK FLOW			399	Jun 1	b494	Jun 5 1997
MAXIMUM PEAK STAGE			5.22	Jun 1	c5.70	Feb 2 1986
INSTANTANEOUS LOW FLOW			a10	Jul 31		
ANNUAL RUNOFF (AC-FT)	28850		37860		36550	
10 PERCENT EXCEEDS	68		108		97	
50 PERCENT EXCEEDS	33		36		37	
90 PERCENT EXCEEDS	24		25		7.0	

a--Gage height, 2.48 ft.
b--Gage height, 4.55 ft, site and datum then in use.
c--Backwater from ice.
e--Estimated.

12323770 WARM SPRINGS CREEK AT WARM SPRINGS, MT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--March 1993 to current year.
PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: July 2000 to current year.
INSTRUMENTATION.--Temperature recorder installed July 6, 2000.
REMARKS.--Daily water temperature record good. Unpublished records of instantaneous water temperature and specific conductance are available in files of the District office.
EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Maximum, 23.5°C, July 21, 29, 2000, July 14, 2002; minimum 0.0°C, many days during winter period.
EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: Maximum, 22.5°C, July 19-22, 30, Aug. 1; minimum 0.0°C, many days October through March.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instan-taneous dis-charge, cfs (00061)	pH, water, unfltrd field, std units (00400)	Specif. conduc-tance, wat unf uS/cm 25 degC (00095)	Temper-ature, air, deg C (00020)	Temper-ature, water, deg C (00010)	Hard-ness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Arsenic water, fltrd, ug/L (01000)	Arsenic water unfltrd ug/L (01002)
MAR 2003											
18...	0910	39	8.4	369	4.0	3.0	180	54.6	10.8	4.9	5
APR											
02...	1415	46	8.5	358	6.0	5.5	170	51.3	10.4	4.8	4
28...	1425	57	8.5	308	5.5	6.5	150	45.1	8.65	4.4	4
MAY											
26...	1425	137	8.1	179	19.5	11.5	86	26.9	4.54	7.8	17
JUN											
01...	1510	389	8.0	155	18.5	10.0	72	22.5	3.85	11.6	20
16...	1225	154	8.2	185	22.0	11.5	85	25.9	5.05	5.2	6
JUL											
28...	1500	25	8.7	312	31.0	20.0	160	48.3	8.53	9.3	9
AUG											
25...	1355	36	8.5	292	29.0	16.0	140	43.6	8.10	5.8	7

Date	Cadmium water, fltrd, ug/L (01025)	Cadmium water, unfltrd ug/L (01027)	Copper, water, fltrd, ug/L (01040)	Copper, water, unfltrd recover-able, ug/L (01042)	Iron, water, fltrd, ug/L (01046)	Iron, water, unfltrd recover-able, ug/L (01045)	Lead, water, fltrd, ug/L (01049)	Lead, water, unfltrd recover-able, ug/L (01051)
MAR 2003								
18...	.06	E.03	2.5	7.5	E9	110	.32	.79
APR								
02...	E.04	E.03	3.0	7.1	11	80	E.07	.44
28...	E.03	.06	3.1	8.9	E8	110	E.05	.76
MAY								
26...	E.03	.36	5.1	89.5	22	1670	.12	10.7
JUN								
01...	.06	.24	11.1	66.6	28	1010	.12	5.58
16...	E.03	.07	3.4	12.5	15	180	E.05	1.08
JUL								
28...	E.03	E.03	3.2	5.9	12	60	<.08	.27
AUG								
25...	E.03	.04	2.9	6.9	9	80	E.08	.40

Date	Mangan-ese, water, fltrd, ug/L (01056)	Mangan-ese, water, unfltrd recover-able, ug/L (01055)	Zinc, water, fltrd, ug/L (01090)	Zinc, water, unfltrd recover-able, ug/L (01092)	Suspnd. sedi-ment, sieve diametr percent <.063mm (70331)	Sus-pended sedi-ment concen-tration mg/L (80154)	Sus-pended sedi-ment load, tons/d (80155)
MAR 2002							
18...	210	255	2	4	69	5	.53
APR							
02...	143	182	<1	3	58	5	.62
28...	110	150	<1	4	71	6	.92
MAY							
26...	91.3	580	<1	38	68	94	35
JUN							
01...	41.2	189	2	24	70	56	59
16...	65.3	93	2	5	69	8	3.3
JUL							
28...	52.8	80	<1	E2	74	2	.14
AUG							
25...	36.8	95	<1	E2	80	3	.29

E--Estimated.

PEND OREILLE RIVER BASIN

12323770 WARM SPRINGS CREEK AT WARM SPRINGS, MT--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	6.0	4.0	5.0	0.0	0.0	0.0	2.0	1.0	1.5	0.5	0.0	0.0
2	7.5	2.0	4.5	0.0	0.0	0.0	2.0	0.5	1.5	1.5	0.0	1.0
3	6.0	4.5	5.0	0.0	0.0	0.0	2.5	1.5	2.0	3.0	1.5	2.0
4	9.0	5.5	7.0	0.0	0.0	0.0	3.0	1.5	2.0	2.5	1.0	1.5
5	8.5	6.0	7.0	0.0	0.0	0.0	3.0	1.5	2.0	3.5	2.0	2.5
6	10.5	6.5	8.0	0.5	0.0	0.0	2.0	0.5	1.0	2.0	0.0	1.0
7	10.5	6.5	8.5	2.5	0.0	1.5	0.5	0.0	0.0	1.0	0.0	0.0
8	10.5	6.5	8.5	3.5	2.0	2.5	0.5	0.0	0.0	0.5	0.0	0.0
9	11.0	6.0	8.5	4.0	2.0	3.0	0.5	0.0	0.0	0.0	0.0	0.0
10	9.5	5.5	7.5	4.0	2.0	3.0	0.5	0.0	0.5	0.0	0.0	0.0
11	7.0	4.5	6.0	4.0	2.0	3.0	0.5	0.0	0.0	0.0	0.0	0.0
12	7.5	2.5	4.5	3.0	1.5	2.5	1.0	0.0	0.5	0.0	0.0	0.0
13	8.5	2.0	5.0	4.5	3.0	3.5	2.5	1.0	1.5	0.0	0.0	0.0
14	8.0	3.0	5.0	4.0	2.5	3.0	3.0	2.0	2.5	2.0	0.0	1.0
15	7.5	3.0	5.0	3.5	2.0	2.5	3.5	2.0	3.0	2.0	0.5	1.5
16	9.0	3.0	5.5	3.5	1.0	2.0	2.0	1.0	1.5	0.5	0.0	0.0
17	8.0	3.0	5.5	4.0	2.0	3.0	2.0	0.0	1.5	0.0	0.0	0.0
18	8.0	3.0	5.5	3.0	1.5	2.5	0.0	0.0	0.0	0.0	0.0	0.0
19	7.0	3.0	5.0	4.0	2.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0
20	7.5	3.5	5.5	7.0	4.0	5.5	0.0	0.0	0.0	2.0	0.0	1.0
21	8.0	3.5	5.5	6.0	3.5	4.5	0.0	0.0	0.0	2.0	0.0	1.0
22	5.5	3.0	4.0	5.5	3.5	4.5	0.0	0.0	0.0	0.0	0.0	0.0
23	5.5	2.5	3.5	5.0	0.5	2.0	0.0	0.0	0.0	0.0	0.0	0.0
24	4.5	0.5	2.5	0.5	0.0	0.0	0.0	0.0	0.0	1.5	0.0	0.5
25	4.5	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	1.5	2.5
26	4.0	0.0	2.0	0.5	0.0	0.0	0.0	0.0	0.0	4.5	1.5	3.0
27	3.5	0.5	2.0	0.5	0.0	0.0	0.0	0.0	0.0	4.0	2.5	3.0
28	4.0	2.0	3.0	0.5	0.0	0.0	0.0	0.0	0.0	3.0	1.5	2.0
29	2.0	0.0	0.0	2.0	0.0	1.0	0.0	0.0	0.0	2.5	0.0	1.5
30	0.0	0.0	0.0	3.0	0.5	1.5	0.0	0.0	0.0	5.5	2.0	3.0
31	0.0	0.0	0.0	---	---	---	0.0	0.0	0.0	6.0	3.0	4.5
MONTH	11.0	0.0	4.5	7.0	0.0	2.0	3.5	0.0	0.5	6.0	0.0	1.0
		FEBRUARY			MARCH			APRIL			MAY	
1	4.5	3.0	3.5	0.5	0.0	0.0	7.5	4.0	6.0	10.0	7.0	8.5
2	4.0	1.5	2.5	0.5	0.0	0.0	6.0	4.0	5.5	11.0	5.0	8.0
3	2.5	0.0	1.0	0.5	0.0	0.0	7.0	3.0	4.5	8.5	6.0	7.5
4	2.5	0.0	1.0	0.5	0.0	0.0	6.5	1.0	4.0	11.5	6.0	8.0
5	2.0	0.0	0.5	0.5	0.0	0.5	7.0	2.0	4.5	11.0	5.5	7.5
6	0.5	0.0	0.0	0.5	0.0	0.5	7.5	2.0	4.5	10.5	4.0	7.5
7	0.0	0.0	0.0	1.0	0.0	0.5	9.0	1.5	5.0	12.0	4.0	8.0
8	0.0	0.0	0.0	4.0	0.5	2.0	12.0	3.5	7.5	11.0	5.5	8.0
9	1.5	0.0	0.5	5.0	1.5	3.0	12.0	5.5	8.5	9.5	5.0	7.0
10	3.5	0.5	1.5	6.5	3.0	4.5	13.0	6.0	9.5	11.5	5.5	8.0
11	2.5	0.0	1.0	8.0	4.0	5.5	13.0	6.5	9.5	11.0	5.0	8.5
12	2.0	0.0	0.5	8.0	3.5	5.5	13.5	7.0	10.0	10.5	5.5	8.0
13	2.0	0.0	0.5	9.0	2.5	5.5	11.0	7.5	9.5	15.5	6.5	10.5
14	4.0	1.0	2.5	7.5	4.5	5.5	10.0	6.0	8.0	16.5	7.5	12.0
15	4.0	1.0	2.5	7.5	3.0	5.0	8.5	6.0	7.5	14.0	9.0	12.0
16	3.0	1.0	2.0	8.0	5.0	6.0	10.5	3.0	6.5	14.5	7.5	10.5
17	3.5	0.5	1.5	6.0	2.0	4.0	9.0	4.0	6.5	13.5	5.0	9.0
18	3.5	0.5	1.5	7.0	3.0	4.5	8.0	5.0	6.5	8.5	5.0	6.5
19	3.0	0.0	1.5	8.5	2.0	5.0	12.5	3.5	7.5	13.5	4.0	8.0
20	2.5	0.5	1.5	9.0	2.0	5.5	13.0	5.0	9.0	13.5	5.5	9.5
21	4.5	1.0	2.5	9.0	3.5	6.0	14.5	6.0	10.0	12.0	8.5	10.0
22	4.0	0.0	2.0	8.0	4.0	6.5	15.0	8.0	11.5	16.0	8.0	12.0
23	0.0	0.0	0.0	8.5	3.5	6.0	11.5	8.5	9.5	19.0	10.5	14.5
24	1.0	0.0	0.0	6.5	1.5	3.5	13.0	7.5	9.5	18.0	11.0	14.5
25	1.0	0.0	0.0	6.0	1.5	3.5	10.0	6.5	8.5	15.0	11.0	12.5
26	0.5	0.0	0.0	5.0	3.0	4.0	7.0	4.0	5.5	13.5	8.5	11.0
27	0.5	0.0	0.0	5.5	1.5	3.0	11.0	3.0	6.5	13.0	7.0	10.0
28	0.5	0.0	0.0	8.5	2.5	5.0	7.0	4.0	5.5	13.0	7.0	10.0
29	---	---	---	9.0	2.0	5.5	7.5	4.5	5.5	13.5	7.5	10.5
30	---	---	---	12.0	5.0	8.0	12.0	4.0	7.5	11.0	7.0	9.5
31	---	---	---	11.0	6.0	8.0	---	---	---	12.0	6.5	8.5
MONTH	4.5	0.0	1.0	12.0	0.0	4.0	15.0	1.0	7.5	19.0	4.0	9.5

PEND OREILLE RIVER BASIN

12323770 WARM SPRINGS CREEK AT WARM SPRINGS, MT--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003--Continued

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	12.0	6.5	9.0	18.0	12.0	15.0	22.5	14.5	18.0	17.5	11.0	14.0
2	10.0	6.5	8.5	16.0	11.5	14.0	20.5	14.5	17.5	17.0	11.0	14.0
3	11.5	6.0	8.5	16.5	10.5	13.5	19.0	16.0	17.5	17.0	11.0	14.0
4	11.0	6.5	9.0	17.5	11.0	14.0	21.0	14.0	17.0	17.0	11.0	14.0
5	12.0	6.0	9.0	17.5	11.0	14.5	19.5	13.5	16.0	16.0	12.0	14.0
6	10.5	7.0	8.5	18.0	11.5	14.5	18.0	13.0	15.5	15.5	12.0	14.0
7	12.5	6.0	9.0	18.5	11.5	15.0	20.0	12.5	16.0	17.5	12.0	14.5
8	13.5	8.0	10.5	17.0	12.5	14.5	18.5	13.0	16.0	15.0	11.0	13.0
9	13.0	9.0	11.0	18.5	11.0	14.5	20.5	13.0	16.5	13.5	8.5	11.0
10	12.5	9.0	10.5	19.0	11.5	15.0	21.0	13.5	17.0	11.5	9.0	10.5
11	13.5	8.0	10.5	20.0	12.5	16.5	19.5	13.5	16.5	12.5	9.0	10.5
12	14.0	7.5	10.5	20.5	13.5	17.0	18.0	13.5	15.5	11.5	9.5	10.5
13	12.0	9.0	10.5	19.5	14.0	16.5	20.5	13.0	16.5	12.5	6.5	9.5
14	13.0	8.5	11.0	19.5	12.5	16.0	20.5	14.0	17.0	13.5	7.0	10.0
15	14.0	9.0	11.5	20.5	13.0	16.5	20.0	14.5	17.0	12.0	9.0	10.5
16	15.5	9.0	12.0	21.0	13.5	17.5	20.0	15.5	17.5	11.5	8.5	10.0
17	15.0	10.0	12.5	21.0	14.0	17.5	18.5	13.5	15.5	9.0	6.0	7.5
18	15.5	10.5	13.0	22.0	13.5	17.5	19.0	12.0	15.5	10.0	5.0	7.5
19	14.5	11.5	13.5	22.5	15.0	18.5	20.0	13.0	16.5	11.5	6.5	8.5
20	12.5	10.0	11.0	22.5	15.0	18.5	20.0	14.5	17.0	13.0	8.0	10.0
21	11.0	8.5	9.5	22.5	14.5	18.0	18.0	12.5	15.0	12.0	7.0	9.5
22	10.0	7.5	8.5	22.5	14.5	18.5	18.5	14.5	16.0	13.0	7.0	9.5
23	13.0	6.0	9.0	20.5	14.5	18.0	17.0	13.0	15.0	13.5	8.5	10.5
24	11.0	7.5	9.0	21.0	15.0	17.5	18.5	12.0	15.0	13.5	7.5	10.5
25	12.5	7.5	10.0	19.5	15.5	17.0	19.5	12.5	15.5	14.5	9.0	11.0
26	14.5	9.0	11.5	19.5	15.0	17.0	18.0	12.5	15.0	15.0	9.5	12.0
27	16.5	10.0	13.0	22.0	13.5	17.0	18.0	14.0	15.5	14.0	8.5	11.5
28	17.0	11.0	13.5	22.0	13.5	17.5	17.5	11.5	14.5	13.5	8.0	10.5
29	18.0	11.0	14.5	22.0	14.0	18.0	17.0	10.5	13.5	12.5	8.0	10.0
30	18.5	12.0	15.0	22.5	14.0	18.0	17.0	10.5	13.5	12.5	6.0	9.0
31	---	---	---	22.0	14.5	18.0	17.5	10.5	13.5	---	---	---
MONTH	18.5	6.0	11.0	22.5	10.5	16.5	22.5	10.5	16.0	17.5	5.0	11.0

PEND OREILLE RIVER BASIN

12323800 CLARK FORK NEAR GALEN, MT

LOCATION.--Lat 46°12'30", long 112°45'59" (NAD 27), in $NE^1/_4NE^1/_4NE^1/_4$ sec.7, T.5 N., R.9 W., Deer Lodge County, Hydrologic Unit 17010201, on right bank at upstream side of bridge on county road, 2.6 mi downstream from Silver Bow Creek and Warm Springs Creek, 2 mi south of Galen, and at river mile 482.7.

DRAINAGE AREA.--651 mi^2, area at site used prior to Oct. 1, 1994, 793 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1988 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 4,749.24 ft (NGVD 29).

REMARKS.--Water-discharge records good except those for estimated daily discharges, which are fair. Some regulation by settling ponds on Silver Bow Creek near Warm Springs. Numerous diversions upstream from station for irrigation and municipal use. U.S. Geological Survey satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	70	e60	86	81	167	78	150	215	881	158	29	59
2	69	e62	87	81	155	e85	163	218	766	149	33	59
3	70	e65	87	85	144	86	175	211	627	136	35	56
4	70	e75	87	86	136	95	154	234	528	132	41	56
5	70	e85	87	88	124	95	138	254	442	125	41	57
6	70	90	88	87	113	97	134	273	389	119	47	59
7	71	94	83	86	109	100	132	274	356	110	50	62
8	67	94	83	86	105	100	130	250	328	101	48	56
9	67	88	81	81	102	99	128	228	330	109	47	55
10	68	85	85	74	100	115	124	222	331	101	42	55
11	72	85	82	67	97	159	127	215	358	96	39	53
12	71	83	83	75	93	205	134	207	317	94	42	50
13	69	86	83	82	92	282	135	199	288	86	41	55
14	65	85	86	82	93	413	149	197	297	82	34	53
15	60	85	89	83	91	402	150	196	276	64	34	51
16	60	84	89	79	91	382	145	192	269	60	33	53
17	60	84	88	e78	92	286	140	193	271	57	41	60
18	61	84	80	e80	86	183	138	193	267	56	54	62
19	61	84	81	e85	81	144	132	186	258	58	52	64
20	63	84	75	86	83	127	128	170	275	57	51	66
21	63	85	72	82	83	125	127	162	280	53	51	65
22	58	85	74	66	90	124	132	153	249	51	52	65
23	60	e75	78	95	e65	124	163	158	230	48	64	63
24	64	e70	e65	98	e60	120	185	192	223	45	63	59
25	73	e68	e60	95	e65	116	209	253	213	48	59	58
26	77	78	e62	171	e70	113	219	329	196	50	54	58
27	77	82	63	223	e75	111	205	410	185	49	56	57
28	81	87	81	149	e78	118	193	502	179	42	58	57
29	84	86	81	145	---	115	195	630	179	39	58	52
30	e70	87	e75	138	---	114	216	739	168	39	61	46
31	e60	---	79	146	---	119	---	862	---	37	61	---
TOTAL	2101	2445	2480	3040	2740	4832	4650	8717	9956	2451	1471	1721
MEAN	67.8	81.5	80.0	98.1	97.9	156	155	281	332	79.1	47.5	57.4
MAX	84	94	89	223	167	413	219	862	881	158	64	66
MIN	58	60	60	66	60	78	124	153	168	37	29	46
AC-FT	4170	4850	4920	6030	5430	9580	9220	17290	19750	4860	2920	3410

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1988 - 2003, BY WATER YEAR (WY)

MEAN	90.7	96.0	83.4	86.3	93.9	117	138	255	358	139	71.2	70.7
MAX	170	159	132	169	174	167	257	668	974	381	233	184
(WY)	1998	1998	1998	1997	1996	1997	1996	1997	1997	1997	1997	1993
MIN	40.6	50.7	40.7	42.5	43.5	77.2	80.5	68.6	51.1	21.4	10.2	20.3
(WY)	1989	1993	1993	1993	1993	1991	1991	1992	1992	1988	1988	1988

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1988 - 2003	
ANNUAL TOTAL	34733		46604			
ANNUAL MEAN	95.2		128		135	
HIGHEST ANNUAL MEAN					288	1997
LOWEST ANNUAL MEAN					59.6	1992
HIGHEST DAILY MEAN	311	Jun 3	881	Jun 1	1210	Jun 7 1997
LOWEST DAILY MEAN	40	Aug 19	29	Aug 1	9.7	Aug 11 1988
ANNUAL SEVEN-DAY MINIMUM	46	Jul 28	36	Jul 29	9.8	Aug 15 1988
MAXIMUM PEAK FLOW			912	Jun 1	1240	Jun 7 1997
MAXIMUM PEAK STAGE			4.11	Jun 1	5.07	Jun 7 1997
INSTANTANEOUS LOW FLOW			a26	Aug 1	b9.0	Aug 9 1988
ANNUAL RUNOFF (AC-FT)	68890		92440		97460	
10 PERCENT EXCEEDS	158		251		276	
50 PERCENT EXCEEDS	79		86		91	
90 PERCENT EXCEEDS	59		53		43	

a--Gage height, 1.61 ft.
b--Gage height, 1.39 ft.
e--Estimated.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1971-74, 1988 to current year.
PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: October 1991 to September 1998, October 2000 to September 2002.
REMARKS.--Sampling conducted since 1988 as part of EPA Superfund program. Unpublished records of instantaneous water temperature and specific conductance are available in files of the District office.
EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Maximum, 25.5°C, June 23, 1991; minimum, 0.0°C, on many days during winter period.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instan-taneous dis-charge, cfs (00061)	pH, water, unfltrd field, std units (00400)	Specif. conduc-tance, wat unf uS/cm 25 degC (00095)	Temper-ature, air, deg C (00020)	Temper-ature, water, deg C (00010)	Hard-ness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Arsenic water, fltrd, ug/L (01000)	Arsenic water unfltrd ug/L (01002)
MAR 2003											
18...	1015	180	8.3	471	5.5	4.5	190	57.8	11.6	16.1	26
APR											
02...	1535	175	8.5	462	4.5	6.5	190	56.8	11.7	12.5	17
28...	1545	193	8.4	408	7.0	8.0	170	50.7	10.5	13.0	15
MAY											
26...	1515	352	8.5	243	19.0	14.5	100	30.5	6.51	27.0	36
JUN											
01...	1610	905	8.3	216	20.5	13.0	91	27.5	5.46	26.2	37
16...	1350	275	8.6	232	28.5	14.5	97	28.7	6.25	16.6	19
JUL											
28...	1620	42	8.6	430	32.0	21.5	200	60.9	12.3	17.1	17
AUG											
25...	1515	56	8.6	414	32.0	19.0	190	55.8	12.1	12.7	17

Date	Cadmium water, fltrd, ug/L (01025)	Cadmium water, unfltrd ug/L (01027)	Copper, water, fltrd, ug/L (01040)	Copper, water, unfltrd recover-able, ug/L (01042)	Iron, water, fltrd, ug/L (01046)	Iron, water, unfltrd recover-able, ug/L (01045)	Lead, water, fltrd, ug/L (01049)	Lead, water, unfltrd recover-able, ug/L (01051)
MAR 2003								
18...	.25	.43	21.1	74.9	18	1120	.46	31.0
APR								
02...	.05	.11	6.3	21.8	12	340	.12	4.38
28...	.05	.15	5.7	16.7	14	260	.09	2.15
MAY								
26...	E.03	.44	8.2	68.0	27	1250	.23	10.1
JUN								
01...	.07	.30	11.1	56.8	31	950	.18	6.94
16...	E.04	.10	5.0	15.7	22	240	.09	1.91
JUL								
28...	.04	.06	4.0	9.1	10	110	<.08	.78
AUG								
25...	E.03	.06	3.9	8.9	E5	140	E.05	.65

Date	Mangan-ese, water, fltrd, ug/L (01056)	Mangan-ese, water, unfltrd recover-able, ug/L (01055)	Zinc, water, fltrd, ug/L (01090)	Zinc, water, unfltrd recover-able, ug/L (01092)	Suspnd. sedi-ment, sieve diametr percent <.063mm (70331)	Sus-pended sedi-ment concen-tration mg/L (80154)	Sus-pended sedi-ment load, tons/d (80155)
MAR 2003							
18...	325	410	31	116	90	23	11
APR							
02...	105	183	6	28	74	11	5.2
28...	74.2	138	4	18	76	10	5.2
MAY							
26...	63.0	406	<1	46	80	62	59
JUN							
01...	52.4	227	5	41	55	52	127
16...	49.6	103	2	12	68	9	6.7
JUL							
28...	53.2	97	2	6	85	3	.34
AUG							
25...	36.3	82	2	5	78	3	.45

E--Estimated.

PEND OREILLE RIVER BASIN

12323850 LOST CREEK NEAR GALEN, MT

LOCATION.--Lat 46°13'07", long 112°46'23" (NAD 27), in $NW^1/_4SW^1/_4SE^1/_4$ sec. 6, T.5N., R.9W., Deer Lodge County, Hydrologic Unit 17010201, on left bank 40 ft upstream from frontage road bridge, 1.2 mi south of Galen, and at river mile 1.8.

DRAINAGE AREA .--60.5 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 2003 to September 2003.

GAGE.--Water-stage recorder. Elevation of gage is 4,750 ft (NGVD 29).

REMARKS.--Water-discharge records good. No regulation. Numerous diversions for irrigation upstream from station. U.S. Geological Survey satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1							e60	23	18	4.5	1.4	4.9
2							e60	21	12	4.8	1.5	4.8
3							56	21	14	4.8	1.7	4.8
4							49	29	11	4.5	2.0	5.0
5							46	37	8.1	4.5	1.9	5.2
6							45	24	3.7	4.5	1.8	5.4
7							43	23	3.5	4.7	1.9	5.6
8							45	21	3.5	5.5	1.8	7.4
9							44	19	4.7	6.1	1.7	8.2
10							37	19	5.9	6.1	1.7	7.6
11							34	19	5.4	5.6	1.7	7.0
12							34	19	3.9	5.2	1.8	7.2
13							34	18	3.8	5.3	1.8	6.6
14							34	17	4.2	5.3	1.7	6.4
15							33	17	3.9	5.4	1.8	6.1
16							32	20	4.1	5.9	1.9	7.0
17							32	22	3.8	5.7	2.0	9.9
18							34	23	3.7	5.7	2.1	13
19							28	23	3.9	5.5	1.9	13
20							20	22	5.6	5.4	1.9	12
21							20	18	7.1	4.6	1.9	11
22							19	10	6.3	1.5	2.0	11
23							27	11	5.5	1.5	3.1	21
24							25	12	5.5	1.5	4.4	20
25							23	13	5.3	1.7	5.4	20
26							22	13	5.2	1.7	4.9	20
27							20	14	4.9	1.6	6.0	21
28							18	11	4.7	1.5	6.0	21
29							19	8.9	4.7	1.5	5.4	21
30							26	9.6	4.5	1.4	5.2	21
31							---	20	---	1.4	5.1	---
TOTAL							1019	577.5	180.4	124.9	85.4	334.1
MEAN							34.1	18.6	6.01	4.03	2.75	11.1
MAX							65	37	18	6.1	6.0	21
MIN							18	8.9	3.5	1.4	1.4	4.8
AC-FT							2020	1150	358	248	169	663

SUMMARY STATISTICS	FOR 2003 WATER YEAR	
HIGHEST DAILY MEAN	60	Apr 1
LOWEST DAILY MEAN	1.4	Jul 30
MAXIMUM PEAK FLOW	61	Apr 2
MAXIMUM PEAK STAGE	2.08	Apr 2
INSTANTANEOUS LOW FLOW	a1.2	Jul 22

a--Gage height, 1.16 ft.
e--Estimated.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--March 2003 to August 2003.

REMARKS.--Unpublished records of instantaneous water temperature and specific conductance are available in files of the District office.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instan-taneous dis-charge, cfs (00061)	pH, water, unfltrd field, std units (00400)	Specif. conduc-tance, wat unf uS/cm 25 degC (00095)	Temper-ature, air, deg C (00020)	Temper-ature, water, deg C (00010)	Hard-ness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Arsenic water, fltrd, ug/L (01000)	Arsenic water unfltrd ug/L (01002)
MAR 2003											
18...	1050	48	8.4	643	5.5	4.5	320	92.0	20.8	19.5	21
APR											
02...	1605	59	8.5	861	4.5	7.0	420	117	32.3	41.8	43
28...	1610	18	8.6	627	7.0	8.5	300	88.2	20.3	11.7	11
MAY											
26...	1545	13	8.7	549	23.0	19.0	270	77.4	18.0	14.8	14
JUN											
03...	1250	15	8.6	579	23.5	13.5	290	84.3	19.0	15.5	16
16...	1435	4.4	8.6	625	29.0	23.0	280	78.8	21.2	10.5	10
JUL											
28...	1700	1.3	8.6	540	32.5	26.5	200	48.5	19.9	10.3	9
AUG											
25...	1540	5.0	8.5	638	30.5	22.5	290	79.7	22.0	13.2	16

Date	Cadmium water, fltrd, ug/L (01025)	Cadmium water, unfltrd ug/L (01027)	Copper, water, fltrd, ug/L (01040)	Copper, water, unfltrd recover-able, ug/L (01042)	Iron, water, fltrd, ug/L (01046)	Iron, water, unfltrd recover-able, ug/L (01045)	Lead, water, fltrd, ug/L (01049)	Lead, water, unfltrd recover-able, ug/L (01051)	Mangan-ese, water, fltrd, ug/L (01056)	Mangan-ese, water, unfltrd recover-able, ug/L (01055)
MAR 2003										
18...	E.03	.06	2.9	13.0	E7	270	.10	1.23	19.5	30
APR										
02...	.05	.11	6.7	22.5	18	280	.33	1.30	23.6	33
28...	E.03	.05	2.5	5.8	E6	70	<.08	.32	14.2	15
MAY										
26...	E.03	.04	3.5	6.8	E6	70	E.05	.30	8.5	13
JUN										
03...	E.03	.04	3.4	7.3	E6	80	<.08	.32	8.6	13
16...	E.02	E.03	3.0	4.4	E4	40	<.08	.14	5.3	8
JUL										
28...	E.02	E.03	3.2	4.5	<8	20	<.08	E.04	2.0	2
AUG										
25...	E.02	E.02	2.6	4.5	<8	10	<.08	E.04	1.9	3

Date	Zinc, water, fltrd, ug/L (01090)	Zinc, water, unfltrd recover-able, ug/L (01092)	Suspnd. sedi-ment, sieve diametr percent <.063mm (70331)	Sus-pended sedi-ment concen-tration mg/L (80154)	Sus-pended sedi-ment load, tons/d (80155)
MAR 2003					
18...	1	7	65	16	2.1
APR					
02...	2	9	59	24	3.8
28...	<1	3	66	5	.24
MAY					
26...	<1	3	43	9	.32
JUN					
03...	<1	3	46	9	.36
16...	1	E2	18	8	.10
JUL					
28...	<1	E1	77	2	.01
AUG					
25...	<1	<2	51	16	.22

E--Estimated.

PEND OREILLE RIVER BASIN

12324200 CLARK FORK AT DEER LODGE, MT

LOCATION.--Lat 46°23'52", long 112°44'31" (NAD 27), in $SW^1/_4SW^1/_4SW^1/_4$ sec.33, T.8 N., R.9 W., Powell County, Hydrologic Unit 17010201, on left bank 35 ft upstream from Milwaukee Avenue Bridge in Deer Lodge, 0.05 mi upstream from Taylor Creek, 0.24 mi downstream from Tin Cup Joe Creek, and at river mile 461.2.

DRAINAGE AREA.--995 mi^2, area at site used prior to Oct. 1, 1994, 1,005 mi^2. Area used Octobert 1994 to September 2000, 916 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1978 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 4,502.24 ft (NGVD 29).

REMARKS.--Water-discharge records good except for estimated daily discharges, which are fair. Diversions upstream from station for irrigation of about 31,000 acres. Some regulation by settling ponds on Silver Bow Creek near Warm Springs. U. S. Geological Survey satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	134	e110	199	186	416	165	283	323	1020	198	38	92
2	141	e115	199	187	353	176	330	322	968	190	37	89
3	170	e125	199	199	287	177	343	312	806	182	37	86
4	173	e135	199	207	269	176	312	361	650	169	40	88
5	172	e160	202	219	250	189	280	452	555	161	45	87
6	168	e180	201	199	229	186	263	424	471	154	45	88
7	165	205	e170	180	201	186	248	400	424	148	52	92
8	159	218	e160	e170	223	188	240	356	374	137	53	93
9	161	220	e160	e150	220	189	234	324	370	138	51	87
10	160	220	e170	e140	214	242	218	301	381	120	46	88
11	164	201	e180	e130	200	417	219	291	449	104	43	88
12	160	198	190	e140	197	601	228	286	426	92	45	87
13	155	213	196	185	191	661	234	277	367	86	49	91
14	152	213	210	186	196	634	253	267	390	84	49	94
15	148	205	236	188	191	589	256	268	364	75	49	94
16	152	198	218	172	191	560	242	270	339	65	49	93
17	154	197	204	e160	192	481	232	275	326	59	45	106
18	152	193	173	e170	189	344	232	274	318	55	57	114
19	156	189	e160	e180	178	283	223	271	309	54	64	109
20	156	191	e160	193	179	245	202	247	350	56	62	104
21	161	191	177	e150	179	237	195	234	413	53	63	109
22	159	191	181	e130	196	233	197	215	374	48	63	107
23	153	205	179	e160	e140	237	237	201	337	44	85	111
24	152	e170	e150	227	e100	228	300	234	311	42	81	113
25	158	e150	e130	202	e120	214	312	303	285	40	81	137
26	166	e160	e140	249	e140	218	338	428	258	42	74	130
27	168	e170	e150	520	e160	217	313	526	241	45	76	117
28	172	e180	189	315	e170	217	285	607	230	46	88	114
29	169	e190	192	266	---	213	289	722	231	40	85	112
30	139	203	178	262	---	208	335	818	219	38	94	111
31	e120	---	190	311	---	210	---	961	---	36	95	---
TOTAL	4869	5496	5642	6333	5771	9121	7873	11550	12556	2801	1841	3031
MEAN	157	183	182	204	206	294	262	373	419	90.4	59.4	101
MAX	173	220	236	520	416	661	343	961	1020	198	95	137
MIN	120	110	130	130	100	165	195	201	219	36	37	86
AC-FT	9660	10900	11190	12560	11450	18090	15620	22910	24900	5560	3650	6010

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1979 - 2003, BY WATER YEAR (WY)

MEAN	239	250	222	223	246	268	281	391	495	217	105	173
MAX	421	384	353	342	481	387	422	971	1450	593	337	315
(WY)	1983	1981	1981	1983	1982	1979	1982	1981	1997	1982	1997	1993
MIN	115	156	122	140	137	185	161	80.2	57.8	29.9	27.8	57.8
(WY)	1989	1989	1993	1992	1989	1991	1992	1992	1992	1985	1988	1988

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1979 - 2003	
ANNUAL TOTAL	59816		76884			
ANNUAL MEAN	164		211		259	
HIGHEST ANNUAL MEAN					465	1997
LOWEST ANNUAL MEAN					130	1992
HIGHEST DAILY MEAN	429	Jun 10	1020	Jun 1	2390	May 23 1981
LOWEST DAILY MEAN	59	Aug 3	36	Jul 31	22	Aug 18 1988
ANNUAL SEVEN-DAY MINIMUM	67	Jul 30	38	Jul 29	23	Aug 9 1991
MAXIMUM PEAK FLOW			1060	Jun 1	b2500	May 23 1981
MAXIMUM PEAK STAGE			4.11	Jun 1	c5.92	Nov 1 1991
INSTANTANEOUS LOW FLOW			a35	Jul 31	d21	Aug 6 1991
ANNUAL RUNOFF (AC-FT)	118600		152500		187500	
10 PERCENT EXCEEDS	219		358		407	
50 PERCENT EXCEEDS	164		189		222	
90 PERCENT EXCEEDS	86		64		92	

a--Gage height, 2.17 ft.
b--Gage height, 5.35 ft.
c--Backwater from ice.
d--Gage height, 2.19 ft.
e--Estimated.

12324200 CLARK FORK AT DEER LODGE, MT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1963, 1969-71, 1979-83, 1985 to current year.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: October 1978 to September 1983, October 1991 to September 1998, seasonal records for May 2001 to September 2002.
SUSPENDED-SEDIMENT DISCHARGE: March 1985 through August 1986, April 1987 to March 2003, August 2003 to September 2003.

REMARKS.--Missing daily sediment data for April through July due to temporary suspension of daily sediment program. Unpublished records of instantaneous water temperature and specific conductance for many days are available in files of District office.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE : Maximum, 24.5°C, July 26, 1998, July 11-14, 2002; minimum, 0.0°C on many days during winter periods.
SEDIMENT CONCENTRATION: Maximum daily mean, 835 mg/L, Feb. 8, 1996; minimum daily mean, 1 mg/L, Aug. 19, 2002.
SEDIMENT LOAD: Maximum daily, 2,840 tons, Feb. 24, 1986; minimum daily, 0.18 ton, Aug. 19, 2002.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATION: During period of operation, maximum daily mean, 300 mg/L, Jan. 27; minimum daily mean, 3 mg/L, Aug. 1. High flow period of April through July was not sampled; higher maximum daily concentrations may have occurred during those months.
SEDIMENT LOAD: Maximum daily, 421 tons, Jan. 27; minimum daily, 0.31 ton, Aug. 1.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instan-taneous dis-charge, cfs (00061)	pH, water, unfltrd field, std units (00400)	Specif. conduc-tance, wat unf uS/cm 25 degC (00095)	Temper-ature, air, deg C (00020)	Temper-ature, water, deg C (00010)	Hard-ness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Arsenic water, fltrd, ug/L (01000)	Arsenic water unfltrd ug/L (01002)
MAR 2003											
18...	1215	342	8.2	515	7.5	5.0	220	64.6	13.5	16.2	27
APR											
03...	0720	347	8.2	576	-1.0	3.5	250	72.4	17.2	16.7	25
28...	1730	282	8.6	460	7.5	9.5	190	57.2	12.3	13.7	17
MAY											
26...	1725	471	8.1	278	20.5	16.5	120	34.7	7.26	19.5	34
JUN											
01...	1900	1010	8.0	250	19.0	14.0	110	32.2	6.44	23.7	53
16...	1515	347	8.3	303	29.0	18.5	130	38.6	8.19	17.0	21
JUL											
29...	0730	40	8.0	495	14.0	15.5	210	63.8	12.8	17.8	17
AUG											
25...	1635	80	8.6	495	30.0	21.0	220	64.6	13.5	15.8	20

Date	Cadmium water, fltrd, ug/L (01025)	Cadmium water, unfltrd ug/L (01027)	Copper, water, fltrd, ug/L (01040)	Copper, water, unfltrd recover-able, ug/L (01042)	Iron, water, fltrd, ug/L (01046)	Iron, water, unfltrd recover-able, ug/L (01045)	Lead, water, fltrd, ug/L (01049)	Lead, water, unfltrd recover-able, ug/L (01051)	Mangan-ese, water, fltrd, ug/L (01056)	Mangan-ese, water, unfltrd recover-able, ug/L (01055)
MAR 2003										
18...	.12	.41	14.0	95.8	12	1420	.25	22.1	83.9	259
APR										
03...	.07	.33	9.9	66.1	18	1040	.14	10.2	51.2	204
28...	.06	.18	7.6	31.1	E8	460	E.07	4.08	27.1	112
MAY										
26...	.06	.65	13.0	119	27	2020	.24	18.0	36.2	339
JUN										
01...	.08	.88	18.7	241	44	2910	.54	33.9	40.9	402
16...	.06	.20	9.6	38.3	24	490	.14	4.88	26.2	100
JUL										
29...	.06	.07	8.0	13.5	9	80	<.08	.67	34.4	48
AUG										
25...	.04	.11	6.6	17.8	<8	150	E.06	1.46	17.1	73

E--Estimated.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003--Continued

Date	Zinc, water, fltrd, ug/L (01090)	Zinc, water, unfltrd recover -able, ug/L (01092)	Suspnd. sedi- ment, sieve diametr percent <.063mm (70331)	Sus- pended sedi- ment concen- tration mg/L (80154)	Sus- pended sedi- ment load, tons/d (80155)
MAR 2003					
18...	19	102	68	60	55
APR					
03...	9	67	57	55	52
28...	3	30	68	22	17
MAY					
26...	4	108	70	94	120
JUN					
01...	9	167	52	187	510
16...	6	32	64	24	22
JUL					
29...	8	13	88	3	.32
AUG					
25...	3	13	69	14	3.0

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

DAY	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	10	3.6	19	5.6	20	11	26	13	50	56	55	25
2	18	6.9	18	5.6	22	12	24	12	45	43	55	26
3	38	17	17	5.7	26	14	23	12	40	31	31	15
4	37	17	16	5.8	29	16	21	12	37	27	34	16
5	37	17	15	6.5	29	16	20	12	32	22	39	20
6	37	17	16	7.8	27	15	18	9.7	29	18	38	19
7	37	16	16	8.9	25	11	16	7.8	27	15	33	17
8	37	16	17	10	24	10	15	6.9	28	17	34	17
9	37	16	18	11	23	9.9	13	5.3	28	17	37	19
10	37	16	18	11	24	11	12	4.5	28	16	59	39
11	37	16	19	10	26	13	13	4.6	32	17	170	191
12	35	15	21	11	27	14	16	6.0	35	19	252	409
13	32	13	24	14	25	13	18	9.0	29	15	197	352
14	30	12	25	14	23	13	19	9.5	23	12	127	217
15	29	12	24	13	21	13	18	9.1	23	12	163	259
16	29	12	21	11	20	12	16	7.4	26	13	104	157
17	27	11	18	9.6	19	10	15	6.5	29	15	45	58
18	25	10	15	7.8	21	9.8	15	6.9	31	16	51	47
19	22	9.3	15	7.7	25	11	16	7.8	32	15	43	33
20	20	8.4	16	8.3	27	12	16	8.3	32	15	47	31
21	20	8.7	18	9.3	26	12	17	6.9	32	15	33	21
22	19	8.2	18	9.3	23	11	18	6.3	31	16	32	20
23	18	7.4	19	11	20	9.7	28	12	31	12	28	18
24	17	7.0	19	8.7	18	7.3	38	23	38	10	27	17
25	16	6.8	19	7.7	17	6.0	41	22	48	16	26	15
26	16	7.2	20	8.6	20	7.6	66	44	57	22	24	14
27	16	7.3	20	9.2	27	11	300	421	52	22	19	11
28	16	7.4	20	9.7	30	15	87	74	52	24	17	10
29	16	7.3	20	10	29	15	51	37	---	---	22	13
30	16	6.0	20	11	28	13	44	31	---	---	24	13
31	18	5.8	---	---	27	14	42	35	---	---	22	12
TOTAL	---	340.3	---	278.8	---	368.3	---	882.5	---	548	---	2131

PEND OREILLE RIVER BASIN

12324200 CLARK FORK AT DEER LODGE, MT--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003--Continued

DAY	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1									3	0.31	10	2.5
2									4	0.40	10	2.4
3									4	0.40	10	2.3
4									7	0.76	10	2.4
5									9	1.1	10	2.3
6									10	1.2	10	2.4
7									10	1.4	10	2.5
8									11	1.6	8	2.0
9									11	1.5	8	1.9
10									10	1.2	8	1.9
11									9	1.0	8	1.9
12									9	1.1	9	2.1
13									10	1.3	9	2.2
14									12	1.6	9	2.3
15									13	1.7	9	2.3
16									14	1.9	8	2.0
17									14	1.7	10	2.9
18									16	2.5	16	4.9
19									15	2.6	19	5.6
20									11	1.8	20	5.6
21									11	1.9	19	5.6
22									11	1.9	20	5.8
23									11	2.5	20	6.0
24									12	2.6	20	6.1
25									14	3.1	20	7.4
26									13	2.6	21	7.4
27									10	2.1	21	6.6
28									10	2.4	22	6.8
29									10	2.3	22	6.7
30									10	2.5	23	6.9
31									10	2.6	---	---
TOTAL									---	53.57	---	119.7

PEND OREILLE RIVER BASIN

12324590 LITTLE BLACKFOOT RIVER NEAR GARRISON, MT

LOCATION.--Lat 46°31'11", long 112°47'33" (NAD 27), in NE$^1/_4$NW$^1/_4$SE$^1/_4$ sec.24, T.9 N., R.10 W., Powell County, Hydrologic Unit 17010201, on right bank 20 ft upstream from bridge on frontage road, 0.7 mi southeast of Garrison, and at river mile 0.5.
DRAINAGE AREA.--407 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1972 to current year.
GAGE.--Water-stage recorder. Elevation of gage is 4,343.97 ft (NGVD 29). Prior to Oct. 1, 1992, at site 3.5 mi upstream at different elevation.
REMARKS.--Water-discharge records good except those for estimated daily discharges, which are poor. A few minor irrigation holding reservoirs in upper reaches of drainage. Diversions for irrigation of about 11,000 acres upstream from station. U. S. Geological Survey satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	46	e40	e50	e50	426	e45	339	468	687	86	39	24
2	45	e42	e50	e50	176	e50	272	483	607	84	38	25
3	46	e45	51	52	104	e45	240	458	543	75	36	25
4	49	e48	50	e52	89	e42	199	548	471	73	48	24
5	48	e48	51	52	77	e45	192	575	412	73	50	25
6	47	e50	51	52	e70	e48	178	549	374	69	55	25
7	47	e50	e50	e52	e60	e48	165	503	359	67	54	26
8	47	51	e50	e52	e55	e45	164	483	319	76	46	26
9	48	52	e50	e50	e60	e50	186	452	292	83	42	27
10	50	51	e52	e48	64	e60	284	428	311	78	41	26
11	49	51	e55	e45	62	e80	285	411	311	76	38	27
12	49	51	e55	e50	63	e150	323	421	272	71	34	31
13	51	54	e55	e55	e60	575	387	431	253	67	33	30
14	51	55	e52	e60	62	849	435	408	280	66	31	30
15	47	54	51	e55	58	622	432	393	244	70	27	30
16	49	53	51	e50	57	503	374	469	215	67	29	32
17	54	54	51	e48	58	385	358	501	197	61	30	35
18	50	54	e50	e50	57	253	348	491	181	60	28	36
19	49	54	e48	e50	56	204	317	469	165	54	27	34
20	53	55	e48	e55	55	184	300	428	203	51	25	33
21	52	56	e50	e50	55	193	310	400	237	52	23	38
22	51	56	e50	e48	e55	186	339	394	203	46	20	36
23	51	59	e50	e50	e35	367	409	407	180	30	22	29
24	50	e50	e50	e50	e30	225	521	472	169	34	20	28
25	50	e45	e50	e60	e32	168	632	579	167	36	20	28
26	49	e48	e48	e80	e35	159	648	724	158	35	21	25
27	50	e48	e55	e150	e40	142	573	737	137	37	28	28
28	53	e50	e52	e120	e45	129	517	722	118	35	30	28
29	55	50	e50	83	---	122	472	705	108	37	27	28
30	e45	e50	e48	101	---	137	473	692	94	38	26	30
31	e40	---	e50	346	---	285	---	765	---	37	27	---
TOTAL	1521	1524	1574	2166	2096	6396	10672	15966	8267	1824	1015	869
MEAN	49.1	50.8	50.8	69.9	74.9	206	356	515	276	58.8	32.7	29.0
MAX	55	59	55	346	426	849	648	765	687	86	55	38
MIN	40	40	48	45	30	42	164	393	94	30	20	24
AC-FT	3020	3020	3120	4300	4160	12690	21170	31670	16400	3620	2010	1720

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1972 - 2003, BY WATER YEAR (WY)

MEAN	71.4	70.5	63.3	61.5	83.4	120	228	490	385	134	61.5	56.5
MAX	129	122	199	135	262	271	486	1460	1803	410	191	184
(WY)	1976	1976	1976	1976	1996	1986	1976	1981	1975	1975	1975	1993
MIN	35.4	39.8	32.9	36.3	36.4	55.4	88.8	76.9	60.1	23.6	11.9	19.9
(WY)	1974	1988	1993	1993	1989	1975	1973	1992	1992	1973	1977	1977

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1972 - 2003	
ANNUAL TOTAL	38621		53890			
ANNUAL MEAN	106		148		152	
HIGHEST ANNUAL MEAN					322	1975
LOWEST ANNUAL MEAN					58.4	1973
HIGHEST DAILY MEAN	484	Jun 10	849	Mar 14	6280	May 22 1981
LOWEST DAILY MEAN	30	Sep 5	20	Aug 22	6.5	Aug 23 1977
ANNUAL SEVEN-DAY MINIMUM	35	Sep 14	22	Aug 20	6.7	Aug 22 1977
MAXIMUM PEAK FLOW			1280	Mar 13	8650	May 21 1981
MAXIMUM PEAK STAGE			4.54	Mar 13	b8.79	May 21 1981
INSTANTANEOUS LOW FLOW			a19	Aug 22	c6.0	Aug 24 1977
ANNUAL RUNOFF (AC-FT)	76600		106900		110300	
10 PERCENT EXCEEDS	264		442		374	
50 PERCENT EXCEEDS	60		54		74	
90 PERCENT EXCEEDS	42		30		38	

a--Gage height, 0.87 ft.
b--Site and datum then in use.
c--Gage height, 2.94 ft, site and datum then in use.
e--Estimated.

12324590 LITTLE BLACKFOOT RIVER NEAR GARRISON, MT--Continued

WATER QUALITY RECORDS

PERIOD OF RECORD.--Water years 1963, 1985 to current year.
PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: October 1999 to current year.
INSTRUMENTATION.--Temperature recorder installed Aug. 19, 1999.
REMARKS.--Sampling for the Environmental Protection Agency, Clark Fork program was temporarily suspended; sampling resumed in August. Samples during April through June are part of the Montana Department of Environmental Quality program. Daily water temperature record good. Unpublished records of instantaneous water temperature and specific conductance are available in files of the District office.
EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Maximum, 25.5°C, July 29, 30, Aug. 1, 2, 2000; minimum, 0.0°C on many days during winter period.
EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: Maximum, 25.0°C, July 18, 23, 30, and Aug. 1; minimum, 0.0°C on many days October through March.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instantaneous discharge, cfs (00061)	pH, water, unfltrd field, std units (00400)	Specif. conductance, wat unf uS/cm 25 degC (00095)	Temperature, air, deg C (00020)	Temperature, water, deg C (00010)	Hardness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnesium, water, fltrd, mg/L (00925)	Potassium, water, fltrd, mg/L (00935)	Sodium adsorption ratio (00931)
APR 2003											
04...	1015	194	8.3	265	6.0	2.5	--	--	--	--	--
MAY											
27...	0800	747	7.9	159	9.5	9.5	68	19.5	4.72	1.51	.2
JUN											
04...	0700	486	8.0	201	10.0	10.0	--	--	--	--	--
AUG											
27...	0815	25	8.0	347	14.5	14.5	170	49.3	11.9	3.04	.3
SEP											
22...	1000	40	8.2	321	15.0	9.0	150	44.6	9.84	--	--

Date	Sodium, water, fltrd, mg/L (00930)	Alkalinity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chloride, water, fltrd, mg/L (00940)	Fluoride, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of constituents mg/L (70301)	Residue water, fltrd, tons/acre-ft (70303)	Residue water, fltrd, tons/d (70302)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Nitrite + nitrate water fltrd, mg/L as N (00631)
APR 2003											
04...	--	--	--	--	--	--	--	--	--	.28	E.021
MAY											
27...	3.53	70	1.28	<.2	17.3	8.4	99	.13	199	.51	.022
JUN											
04...	--	--	--	--	--	--	--	--	--	.31	E.019
AUG											
27...	8.44	167	2.56	.2	24.7	13.3	214	.29	14.4	.21	<.022
SEP											
22...	--	--	--	--	--	--	--	--	--	--	--

Date	Nitrite water, fltrd, mg/L as N (00613)	Orthophosphate, water, fltrd, mg/L as P (00671)	Phosphorus, water, unfltrd mg/L (00665)	Arsenic water, fltrd, ug/L (01000)	Arsenic water unfltrd ug/L (01002)	Cadmium water, fltrd, ug/L (01025)	Cadmium water, unfltrd ug/L (01027)	Chromium, water, unfltrd recoverable, ug/L (01034)	Copper, water, fltrd, ug/L (01040)	Copper, water, unfltrd recoverable, ug/L (01042)	Iron, water, fltrd, ug/L (01046)
APR 2003											
04...	<.002	.019	.048	--	--	--	--	--	--	--	--
MAY											
27...	E.002	.021	.142	--	8	--	E.1	1.6	--	4.9	--
JUN											
04...	.003	.020	.058	--	--	--	--	--	--	--	--
AUG											
27...	<.002	.018	.033	5.7	5	<.04	<.04	<.8	.9	1.1	13
SEP											
22...	--	--	--	4.7	5	.04	<.04	--	.8	2.3	E7

E--Estimated.

12324590 LITTLE BLACKFOOT RIVER NEAR GARRISON, MT--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003--Continued

Date	Iron, water, unfltrd recover -able, ug/L (01045)	Lead, water, fltrd, ug/L (01049)	Lead, water, unfltrd recover -able, ug/L (01051)	Mangan- ese, water, fltrd, ug/L (01056)	Mangan- ese, water, unfltrd recover -able, ug/L (01055)	Nickel, water, unfltrd recover -able, ug/L (01067)	Zinc, water, fltrd, ug/L (01090)	Zinc, water, unfltrd recover -able, ug/L (01092)	Suspnd. sedi- ment, sieve diametr percent <.063mm (70331)	Sus- pended sedi- ment concen- tration mg/L (80154)	Sus- pended sedi- ment load, tons/d (80155)
APR 2003											
04...	--	--	--	--	--	--	--	--	93	8	4.2
MAY											
27...	--	--	4.38	--	--	2.05	--	15	56	87	175
JUN											
04...	--	--	--	--	--	--	--	--	70	20	26
AUG											
27...	60	<.08	.06	20.4	28	2.45	1	<2	95	2	.14
SEP											
22...	50	<.08	.07	11.4	19	--	<1	E1	94	2	.22

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	10.0	6.5	8.0	0.5	0.0	0.0	0.5	0.0	0.0	0.5	0.0	0.0
2	10.5	4.0	7.0	0.0	0.0	0.0	2.0	0.0	1.0	1.0	0.0	0.5
3	9.0	7.0	8.0	0.0	0.0	0.0	2.0	0.0	1.0	2.5	0.5	1.5
4	11.5	7.5	9.0	0.0	0.0	0.0	2.0	0.0	1.0	1.5	0.0	0.5
5	9.5	7.5	8.5	0.0	0.0	0.0	3.5	1.5	2.5	3.0	1.0	2.0
6	12.0	8.0	9.5	0.5	0.0	0.0	2.5	0.5	1.5	1.5	0.0	0.5
7	12.0	6.5	9.0	3.5	0.5	2.0	0.5	0.0	0.0	0.0	0.0	0.0
8	12.0	7.5	9.0	3.5	2.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0
9	12.0	6.5	9.0	3.5	2.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0
10	10.5	6.0	8.0	4.0	2.5	3.0	0.0	0.0	0.0	0.0	0.0	0.0
11	8.0	5.5	6.5	4.5	2.5	3.5	0.0	0.0	0.0	0.0	0.0	0.0
12	8.5	3.5	5.5	3.5	2.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0
13	9.0	3.0	5.5	4.5	3.0	3.5	0.0	0.0	0.0	0.0	0.0	0.0
14	9.0	3.5	6.0	4.5	3.0	3.5	2.5	0.0	1.5	0.0	0.0	0.0
15	9.0	3.5	6.0	4.5	2.5	3.5	3.5	1.5	2.5	0.0	0.0	0.0
16	9.0	4.0	6.5	4.0	1.5	2.5	3.0	1.0	2.0	0.0	0.0	0.0
17	9.0	3.5	6.0	4.0	2.5	3.0	2.0	0.0	1.0	0.0	0.0	0.0
18	9.0	3.5	6.0	4.0	2.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0
19	8.0	3.0	5.5	4.5	2.5	3.5	0.0	0.0	0.0	0.0	0.0	0.0
20	9.5	4.5	6.5	8.0	4.5	5.5	0.0	0.0	0.0	0.0	0.0	0.0
21	9.0	4.0	6.5	6.0	4.5	5.5	0.0	0.0	0.0	0.0	0.0	0.0
22	6.0	2.5	4.0	6.0	4.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0
23	6.5	2.0	3.5	4.5	1.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0
24	5.5	0.5	2.5	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25	5.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	5.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27	4.5	0.5	2.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28	6.0	2.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0
29	2.0	0.0	0.0	2.0	0.0	1.0	0.0	0.0	0.0	1.5	0.0	0.5
30	0.0	0.0	0.0	1.5	0.0	0.5	0.0	0.0	0.0	3.5	1.5	2.0
31	0.0	0.0	0.0	---	---	---	0.0	0.0	0.0	2.0	1.0	1.5
MONTH	12.0	0.0	5.5	8.0	0.0	2.0	3.5	0.0	0.5	3.5	0.0	0.5

PEND OREILLE RIVER BASIN

12324590 LITTLE BLACKFOOT RIVER NEAR GARRISON, MT--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003--Continued

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	1.5	1.0	1.0	0.0	0.0	0.0	6.0	3.5	4.5	8.5	6.0	7.5
2	2.5	0.5	1.5	0.0	0.0	0.0	5.0	3.0	4.0	10.0	5.5	8.0
3	2.0	0.5	1.0	0.0	0.0	0.0	5.0	1.5	3.5	8.0	4.5	6.5
4	2.5	0.0	1.0	0.0	0.0	0.0	6.0	1.0	3.5	11.0	6.0	7.5
5	1.5	0.0	0.5	0.0	0.0	0.0	6.0	3.0	4.5	9.0	5.0	7.0
6	0.5	0.0	0.0	0.0	0.0	0.0	7.5	2.5	5.0	8.5	4.5	6.5
7	0.0	0.0	0.0	0.0	0.0	0.0	8.5	1.5	5.0	10.0	5.0	7.5
8	0.5	0.0	0.0	0.5	0.0	0.0	10.5	3.0	6.5	8.5	5.5	7.0
9	1.0	0.0	0.5	0.0	0.0	0.0	11.0	5.0	8.0	9.0	5.5	7.0
10	2.5	0.0	1.0	0.0	0.0	0.0	9.5	4.0	7.0	10.5	6.0	8.0
11	3.0	0.0	1.0	1.5	0.0	0.0	9.5	4.0	7.0	10.0	5.0	8.0
12	1.0	0.0	0.0	4.5	0.5	2.0	9.5	5.0	7.5	9.5	6.5	8.0
13	0.5	0.0	0.0	4.0	0.0	1.5	8.0	5.0	6.5	12.0	6.5	9.0
14	3.5	0.0	1.5	3.0	0.0	1.5	7.0	3.5	5.5	13.0	6.5	10.0
15	4.5	1.5	2.5	3.5	0.0	1.5	6.5	4.5	5.5	12.5	8.5	10.5
16	3.0	0.5	1.5	4.5	1.5	2.5	8.0	2.5	5.0	11.0	7.5	9.0
17	2.5	0.5	1.5	4.0	0.0	2.0	8.5	3.5	6.0	11.0	5.5	8.0
18	2.5	0.0	1.5	5.5	1.5	3.5	7.0	5.0	6.0	8.5	5.0	6.5
19	4.0	0.0	2.0	7.0	1.5	4.0	10.5	3.5	6.5	11.5	4.5	7.5
20	3.0	0.5	2.0	7.0	1.5	4.5	11.0	5.0	8.0	11.0	5.5	8.5
21	3.5	1.5	2.5	5.5	2.5	4.0	11.0	5.5	8.5	10.5	7.5	9.0
22	4.0	0.0	1.0	5.5	3.0	4.5	12.0	7.0	9.5	14.5	7.5	11.0
23	0.0	0.0	0.0	5.0	2.0	3.5	10.0	7.5	8.5	15.0	9.5	12.0
24	0.0	0.0	0.0	4.0	1.0	2.5	10.5	6.0	8.0	16.5	9.5	13.0
25	0.0	0.0	0.0	5.0	1.0	3.0	9.0	6.5	7.5	15.0	11.0	13.0
26	0.0	0.0	0.0	4.5	2.5	3.5	7.0	4.5	5.5	14.0	10.0	12.0
27	0.0	0.0	0.0	6.5	1.5	3.5	8.5	3.0	6.0	15.0	9.0	12.0
28	0.0	0.0	0.0	7.5	1.5	4.0	7.0	4.5	5.5	17.0	10.0	13.5
29	---	---	---	7.0	2.0	4.5	7.0	3.5	5.0	17.5	11.5	14.5
30	---	---	---	9.0	4.0	6.0	9.5	5.0	7.0	15.5	11.5	13.0
31	---	---	---	8.0	4.0	6.0	---	---	---	15.0	10.5	12.5
MONTH	4.5	0.0	1.0	9.0	0.0	2.0	12.0	1.0	6.0	17.5	4.5	9.5

		JUNE			JULY			AUGUST			SEPTEMBER	
1	16.0	10.5	13.0	21.0	13.5	17.0	25.0	14.5	19.0	21.0	11.0	15.5
2	14.0	10.5	12.0	20.0	13.0	16.5	23.0	14.5	18.5	21.5	11.5	16.0
3	14.5	9.0	11.5	19.5	12.0	15.5	22.5	16.5	18.5	21.0	12.0	16.0
4	13.5	10.0	12.0	20.5	12.0	16.0	23.0	15.0	18.5	20.5	11.5	15.5
5	15.0	9.0	11.5	20.5	11.5	16.0	21.5	14.0	17.0	19.5	12.5	16.0
6	13.0	10.0	11.5	21.5	12.5	16.5	22.0	14.5	17.5	18.0	13.0	15.5
7	15.5	8.5	12.0	22.0	12.5	17.0	22.0	14.0	17.5	20.5	13.0	16.0
8	16.0	10.0	13.0	18.0	13.5	15.5	22.5	14.0	18.0	16.0	12.0	14.0
9	17.5	11.5	14.0	21.5	12.0	16.5	24.5	14.5	19.0	16.5	10.5	13.5
10	17.5	11.5	14.5	22.0	12.5	17.5	24.0	15.0	19.0	17.5	11.5	13.5
11	17.0	11.5	14.0	23.0	14.0	18.5	21.5	14.5	18.0	15.0	12.0	13.0
12	18.0	10.5	14.0	23.0	14.5	19.0	20.5	14.0	17.0	15.5	10.5	12.5
13	15.0	11.5	13.5	21.5	14.5	18.0	21.5	14.0	17.5	16.5	8.5	12.0
14	16.5	11.0	14.0	22.5	13.5	17.5	23.0	14.0	18.0	17.5	8.5	12.5
15	19.5	12.0	15.5	23.5	14.0	18.5	23.5	14.5	18.5	16.5	11.0	13.0
16	20.0	12.5	16.0	23.5	15.0	19.0	21.0	16.0	18.0	12.5	9.5	11.0
17	20.0	13.0	16.5	23.5	14.5	19.0	21.5	14.0	17.0	12.5	8.0	10.0
18	21.5	13.5	17.5	25.0	15.0	20.0	22.5	13.5	17.5	14.5	7.5	10.5
19	19.5	14.0	16.5	24.0	15.5	20.0	23.0	13.5	18.0	15.5	8.5	11.5
20	15.5	12.5	14.0	24.5	15.5	19.5	22.5	15.0	18.0	16.0	9.5	12.0
21	14.5	10.5	12.5	24.5	15.0	19.5	21.0	12.5	17.0	15.5	8.0	11.5
22	14.0	10.0	12.0	24.5	15.0	19.5	20.0	14.5	17.0	16.0	8.0	11.5
23	16.5	8.5	12.5	25.0	14.0	19.0	20.5	14.0	16.5	15.5	8.5	11.5
24	15.0	11.0	13.0	21.0	15.0	17.5	21.5	12.5	16.5	16.0	8.5	12.0
25	17.0	10.5	13.5	21.0	15.5	18.0	23.0	12.5	17.5	16.0	8.5	12.0
26	18.5	10.5	14.5	22.5	15.5	18.5	22.0	13.0	17.0	16.0	9.5	12.5
27	19.5	11.5	15.5	24.5	14.0	19.0	20.0	14.5	16.5	16.5	9.0	12.5
28	20.5	11.5	16.5	24.5	14.0	18.5	21.0	12.0	16.0	16.0	8.5	12.0
29	21.5	12.5	17.0	24.5	13.5	18.5	20.0	12.0	15.0	14.0	9.0	11.0
30	21.5	13.5	17.5	25.0	14.5	19.0	21.0	11.0	15.5	15.0	7.0	10.5
31	---	---	---	24.0	14.5	19.0	21.0	11.5	15.5	---	---	---
MONTH	21.5	8.5	14.0	25.0	11.5	18.0	25.0	11.0	17.5	21.5	7.0	13.0

PEND OREILLE RIVER BASIN

12324680 CLARK FORK AT GOLDCREEK, MT

LOCATION.--Lat 46°35'26", long 112°55'40" (NAD 27), in $SE^1/_4NW^1/_4SW^1/_4$ sec.25, T.10 N., R.11 W., Powell County, Hydrologic Unit 17010201, on right bank at county road bridge, 0.4 mi north of the town of Goldcreek, 1.1 mi downstream from Gold Creek, and at river mile 434.7.
DRAINAGE AREA.--1,760 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1977 to current year.
GAGE.--Water-stage recorder. Elevation of gage is 4,172.80 ft (NGVD 29). June 13 to Oct. 21, 1982, nonrecording gage at site 350 ft downstream at same elevation.
REMARKS.--Water-discharge records good except those for estimated daily discharges, which are fair. Some regulation by settling ponds on Silver Bow Creek near Warm Springs. Diversion for irrigation of about 40,100 acres upstream from station. U.S. Geological Survey satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	246	e250	e300	295	998	e280	706	905	2440	371	132	165
2	250	e260	e300	e290	636	e310	709	911	2160	354	130	163
3	278	e280	299	292	506	e300	696	872	1820	326	132	162
4	289	e300	295	294	426	307	628	1010	1480	313	149	162
5	285	e310	296	297	399	307	582	1160	1260	295	147	163
6	286	e320	295	294	376	317	548	1130	1090	280	160	162
7	281	323	284	284	366	317	520	1050	1010	271	163	166
8	277	322	270	288	373	301	504	973	900	273	155	178
9	274	327	e260	263	363	312	524	906	848	272	149	173
10	274	323	e260	233	361	343	612	850	898	258	141	166
11	271	315	e270	228	332	459	618	821	977	238	138	163
12	269	313	e280	254	319	824	662	822	936	223	134	173
13	276	321	e290	312	326	2150	729	831	844	209	134	169
14	277	324	297	299	353	2500	811	797	886	203	123	173
15	273	316	310	295	342	1590	819	769	828	214	117	173
16	282	310	307	312	331	1320	742	840	745	206	137	176
17	295	309	301	271	334	1050	710	884	683	188	130	191
18	294	307	275	274	323	738	695	874	643	188	123	205
19	291	304	266	294	317	612	653	856	594	178	129	200
20	289	306	259	311	315	552	612	791	652	172	126	191
21	289	312	292	308	319	544	615	739	807	169	123	196
22	288	307	297	251	334	518	638	719	755	163	124	207
23	288	315	305	279	e250	721	733	720	697	138	142	191
24	288	301	295	344	e200	559	913	816	644	137	146	195
25	285	292	239	341	e170	486	1050	1110	603	141	141	207
26	291	e270	245	365	e180	480	1100	1590	544	137	154	212
27	293	e280	280	942	e200	457	1020	1760	495	138	159	203
28	300	e280	294	624	e250	439	931	1840	459	141	169	201
29	305	e290	300	416	---	429	875	2000	435	146	168	195
30	286	e290	328	423	---	435	911	2160	412	138	165	202
31	e240	---	310	727	---	586	---	2480	---	135	172	---
TOTAL	8710	9077	8899	10700	9999	20543	21866	33986	27545	6615	4412	5483
MEAN	281	303	287	345	357	663	729	1096	918	213	142	183
MAX	305	327	328	942	998	2500	1100	2480	2440	371	172	212
MIN	240	250	239	228	170	280	504	719	412	135	117	162
AC-FT	17280	18000	17650	21220	19830	40750	43370	67410	54640	13120	8750	10880

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1978 - 2003, BY WATER YEAR (WY)

MEAN	395	400	348	348	418	495	606	1043	1116	483	233	302
MAX	699	651	622	596	860	721	918	2914	3002	1196	646	707
(WY)	1983	1981	1981	1984	1996	1978	1996	1981	1980	1982	1993	1993
MIN	198	244	193	199	208	306	360	198	138	85.7	67.5	99.8
(WY)	1989	1989	1993	1988	1989	1988	1992	1992	1992	1985	2000	1988

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1978 - 2003	
ANNUAL TOTAL	124105		167835			
ANNUAL MEAN	340		460		515	
HIGHEST ANNUAL MEAN					860	1981
LOWEST ANNUAL MEAN					243	1992
HIGHEST DAILY MEAN	1140	Jun 11	2500	Mar 14	9100	May 23 1981
LOWEST DAILY MEAN	160	Feb 26	117	Aug 15	55	Sep 4 1988
ANNUAL SEVEN-DAY MINIMUM	170	Aug 15	126	Aug 14	58	Sep 3 1988
MAXIMUM PEAK FLOW			4200	Mar 13	b12000	May 22 1981
MAXIMUM PEAK STAGE			7.78	Mar 13	c12.50	Jan 2 1997
INSTANTANEOUS LOW FLOW			a115	Aug 15	d54	Sep 3 1988
ANNUAL RUNOFF (AC-FT)	246200		332900		373400	
10 PERCENT EXCEEDS	576		905		924	
50 PERCENT EXCEEDS	286		301		382	
90 PERCENT EXCEEDS	206		162		190	

a--Gage height, 3.90 ft.
b--From rating curve extended above 6,500 ft^3/s on basis of contracted opening computation of peak flow; gage height, 11.17 ft, from floodmark.
c--Backwater from ice.
d--Gage height, 3.73 ft.
e--Estimated.

12324680 CLARK FORK AT GOLDCREEK, MT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--March 1993 to current year.
PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: October 1991 to September 1998.
REMARKS.--Unpublished records of instantaneous water temperature and specific conductance for many days are available in files of the District office.
EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Maximum, 25.5°C, July 26, 1995; minimum, 0.0°C on many days during winter period.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instan-taneous dis-charge, cfs (00061)	pH, water, unfltrd field, std units (00400)	Specif. conduc-tance, wat unf uS/cm 25 degC (00095)	Temper-ature, air, deg C (00020)	Temper-ature, water, deg C (00010)	Hard-ness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Arsenic water, fltrd, ug/L (01000)	Arsenic water unfltrd ug/L (01002)
MAR 2003											
15...	1210	1340	8.1	345	8.0	3.0	140	39.9	8.67	12.3	26
APR											
03...	0900	718	8.4	447	3.0	4.0	190	56.7	12.9	10.4	15
29...	0750	870	8.2	308	5.0	5.0	130	39.7	8.66	7.4	10
MAY											
27...	1000	1760	8.0	206	16.5	11.0	90	27.0	5.43	10.2	19
JUN											
03...	1105	1820	8.1	239	17.5	10.5	100	30.9	6.22	13.3	24
16...	1645	747	8.7	306	30.0	19.5	140	40.1	8.72	12.1	13
JUL											
29...	0825	146	8.3	432	19.5	16.0	200	59.9	11.5	13.3	12
AUG											
26...	0740	146	8.2	492	12.0	15.5	220	65.3	13.8	11.7	15

Date	Cadmium water, fltrd, ug/L (01025)	Cadmium water, unfltrd ug/L (01027)	Copper, water, fltrd, ug/L (01040)	Copper, water, unfltrd recover-able, ug/L (01042)	Iron, water, fltrd, ug/L (01046)	Iron, water, unfltrd recover-able, ug/L (01045)	Lead, water, fltrd, ug/L (01049)	Lead, water, unfltrd recover-able, ug/L (01051)
MAR 2003								
15...	.14	.59	13.8	122	47	2650	.35	20.2
APR								
03...	.06	.20	7.1	42.4	28	750	.14	5.96
29...	E.03	.14	4.3	21.3	28	640	.10	3.24
MAY								
27...	.04	.43	7.4	78.0	71	2020	.26	13.1
JUN								
03...	.06	.50	11.1	98.7	38	1630	.35	13.8
16...	.04	.11	7.0	20.8	14	300	E.06	2.40
JUL								
29...	E.03	.09	4.4	13.0	44	520	<.08	1.56
AUG								
26...	E.03	.08	4.2	11.2	E4	230	E.05	.97

Date	Mangan-ese, water, fltrd, ug/L (01056)	Mangan-ese, water, unfltrd recover-able, ug/L (01055)	Zinc, water, fltrd, ug/L (01090)	Zinc, water, unfltrd recover-able, ug/L (01092)	Suspnd. sedi-ment, sieve diametr percent <.063mm (70331)	Sus-pended sedi-ment concen-tration mg/L (80154)	Sus-pended sedi-ment load, tons/d (80155)
MAR 2003							
15...	35.2	348	11	122	66	129	467
APR							
03...	28.6	106	11	44	76	35	68
29...	14.0	84	3	24	69	32	75
MAY							
27...	11.2	234	2	83	64	123	584
JUN							
03...	19.2	223	6	91	60	93	457
16...	16.4	57	2	17	79	12	24
JUL							
29...	16.2	90	2	15	94	22	8.7
AUG							
26...	13.8	78	2	10	89	13	5.1

E--Estimated.

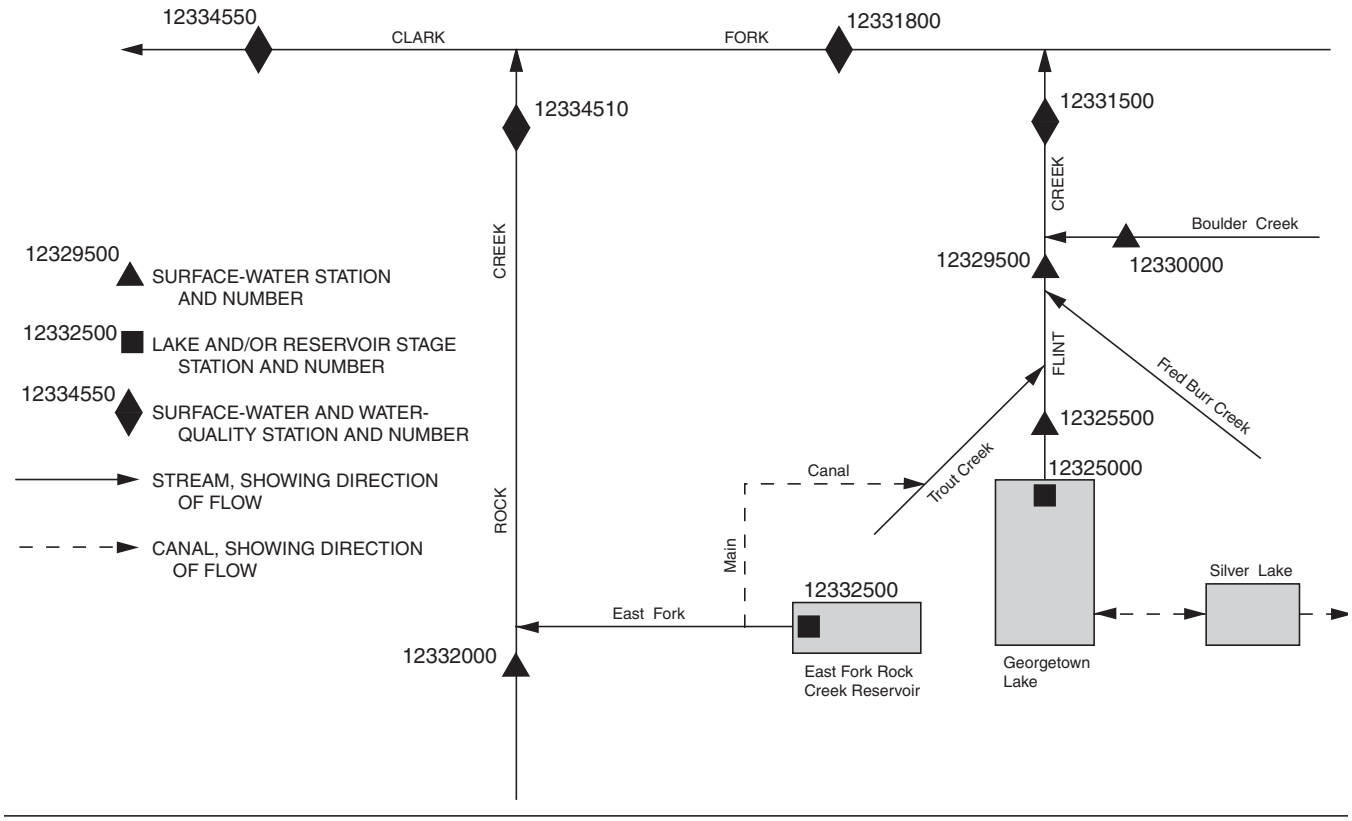


Figure 9. Schematic diagram showing diversions and storage in Flint and Rock Creek Basins.

PEND OREILLE RIVER BASIN

12325500 FLINT CREEK NEAR SOUTHERN CROSS, MT

LOCATION.--Lat 46°13'59", long 113°17'56" (NAD 27), in $SE^1/_4NW^1/_4$ sec.36, T.6 N., R.14 W., Granite County, Hydrologic Unit 17010202, on right wing wall of weir, 0.5 mi downstream from power plant, 2.0 mi downstream from Georgetown Dam, 3.5 mi northwest of Southern Cross, 6.8 mi south of Philipsburg, and at river mile 36.8.

DRAINAGE AREA.--52.6 mi2.

PERIOD OF RECORD.--October 1940 to September 1998, August 2000 to current year (seasonal records only).

REVISED RECORDS.--WSP 1216: 1942(M). WSP 1246: Drainage area.

GAGE.--Water-stage recorder and sharp-crested, contracted, rectangular weir. Elevation of gage is 5,630 ft (NGVD 29). Prior to June 3, 1982, nonrecording gage at same site and elevation. Prior to Nov. 27, 1973, gage at same site and elevation 0.20 ft higher.

REMARKS.--Seasonal records good. Flow regulated by Georgetown Lake (station number 12325000). Flow may be augmented by interbasin diversion from Silver Lake to Georgetown Lake or reduced by pumping from Georgetown Lake to Silver Lake. U.S. Geological Survey satellite telemeter at station. Several observations of water temperature and specific conductance were made during the water year.

DISCHARGE, CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY TO DECEMBER 2003
DAILY MEAN VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1				20	56	135	46	27	44	27		
2				20	62	132	38	27	45	27		
3				19	63	127	37	27	44	27		
4				19	64	121	37	27	41	27		
5				19	70	110	37	27	38	27		
6				19	82	55	37	28	31	27		
7				22	89	26	37	28	29	26		
8				30	99	35	37	34	29	19		
9				31	99	43	31	38	29	19		
10				32	98	43	27	39	29	19		
11				32	98	43	27	39	29	19		
12				33	98	43	27	39	28	19		
13				33	98	43	27	42	28	17		
14				33	98	43	27	47	28	16		
15				33	99	43	27	49	28	16		
16				32	93	43	27	51	28	15		
17				32	77	43	27	51	28	15		
18				32	76	43	27	50	28	15		
19				32	75	43	27	50	28	15		
20				32	51	44	27	46	28	15		
21				33	30	44	27	44	27	15		
22				33	29	44	27	45	27	15		
23				35	41	44	27	45	27	15		
24				35	51	44	27	44	27	15		
25				35	68	44	28	44	27	13		
26				35	99	43	27	44	27	10		
27				34	110	43	27	45	27	9.7		
28				37	110	43	27	45	27	8.7		
29				43	111	45	27	44	27	8.7		
30				45	112	49	27	44	27	8.7		
31				---	126	---	27	44	---	8.7		
TOTAL				920	2532	1701	932	1254	910	534.5		
MEAN				30.7	81.7	56.7	30.1	40.5	30.3	17.2		
MAX				45	126	135	46	51	45	27		
MIN				19	29	26	27	27	27	8.7		
AC-FT				1820	5020	3370	1850	2490	1800	1060		

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1941 - 1998 AND SEASONS 2000 - 2003*

MEAN	18.7	20.1	22.3	25.5	32.5	56.6	46.1	33.1	31.2	25.4	21.9	20.5
MAX	37.5	53.8	80.4	121	106	142	131	78.5	74.3	59.2	62.2	50.0
(WY)	1996	1968	1943	1948	1976	1948	1975	1975	1993	1984	1984	1976
MIN	2.86	3.37	4.10	1.62	7.75	25.9	26.4	21.7	13.0	3.90	3.86	2.66
(WY)	1975	1975	1975	1941	1962	1955	1988	1952	2000	1974	1974	1975

SUMMARY STATISTICS	FOR 2002 SEASON		WATER YEARS 1941 - 1998		SEASONS 2000 - 2003*	
ANNUAL MEAN			29.5			
HIGHEST ANNUAL MEAN			57.9	1976		
LOWEST ANNUAL MEAN			13.2	1962		
HIGHEST DAILY MEAN	135	Jun 1	172	Jun 19 1980	135	May 31 2003
LOWEST DAILY MEAN	8.7	Oct 28	a0.00	Nov 30 1966	4.9	Oct 20 2001
ANNUAL SEVEN-DAY MINIMUM			1.4	Mar 8 1941		
MAXIMUM PEAK FLOW	139	May 31	b174	Jun 13 1942	139	May 31 2003
MAXIMUM PEAK STAGE	2.44	May 31	c2.60	Jun 19 1980	2.44	May 31 2003
INSTANTANEOUS LOW FLOW			0.00	Nov 30 1966		
ANNUAL RUNOFF (AC-FT)			21370			
10 PERCENT EXCEEDS			50			
50 PERCENT EXCEEDS			28			
90 PERCENT EXCEEDS			6.8			

*--During periods of operation (1941 to current year; seasonal records beginning 2000).
a--Partial days of now flow in several years.
b--Gage height, 1.86 ft.
c--Maximum observed.

PEND OREILLE RIVER BASIN

12329500 FLINT CREEK AT MAXVILLE, MT

LOCATION.--Lat 46°27'50", long 113°14'20" (NAD 27), in NE$^1/_4$SW$^1/_4$NW$^1/_4$ sec.9, T.8 N., R.13 W., Granite County, Hydrologic Unit 17010202, on right bank 0.4 mi west of Maxville and 1.0 mi upstream from Boulder Creek.
DRAINAGE AREA.--208 mi^2.
PERIOD OF RECORD.--August 1941 to current year. April 1939 to September 1941 at site 0.5 mi upstream; records not equivalent owing to diversions.
REVISED RECORDS.--WSP 1216: Drainage area.
GAGE.--Water-stage recorder. Elevation of gage is 4,828.38 ft (NGVD 29).
REMARKS.--Records good except those for estimated daily discharges, which are poor. Some regulation by Georgetown Lake. Diversions for irrigation of about 8,200 acres upstream from station. During irrigation season, flow is supplemented by water from East Fork Rock Creek which is diverted in sec.5, T.4 N., R.14 W., 500 ft below Rock Creek Dam, through a canal into Trout Creek, thence into Flint Creek. U.S. Geological Survey satellite telemeter at station. Several observations of water temperature and specific conductance were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	58	e42	e45	e36	e120	e41	98	161	269	75	93	83
2	59	e44	e46	40	77	43	93	165	246	74	90	81
3	61	e44	48	e39	54	43	87	149	234	70	87	80
4	59	e45	47	e36	50	43	78	185	230	72	95	79
5	58	e46	47	e36	46	43	79	206	194	67	94	79
6	58	e47	e45	e35	44	46	75	186	175	68	100	81
7	56	53	e44	e32	e43	44	70	185	133	73	103	82
8	55	54	e43	e30	e42	46	73	183	131	114	98	82
9	55	54	e43	e29	42	49	79	176	141	141	97	86
10	54	54	e43	e30	42	52	90	172	165	121	99	82
11	53	52	e42	e32	e37	60	95	168	205	117	99	79
12	53	52	e41	35	e37	144	104	177	173	106	101	72
13	54	54	e41	42	e37	345	123	174	158	96	98	72
14	52	54	e42	41	e38	349	146	164	155	96	94	70
15	52	53	44	39	40	192	142	159	149	93	97	67
16	52	52	43	34	40	127	124	177	149	89	107	69
17	52	52	43	e33	39	97	118	163	131	82	116	70
18	51	51	e41	e31	39	82	117	158	136	81	110	68
19	50	51	e38	e32	39	78	111	157	141	89	103	67
20	51	53	e36	e35	39	75	106	142	200	90	106	65
21	51	51	33	e36	39	76	108	113	221	97	103	64
22	51	48	35	e34	e36	74	120	107	e175	100	102	63
23	52	e45	37	e35	e30	93	162	111	e150	98	113	60
24	e48	e42	37	e37	e27	77	171	148	136	101	100	60
25	e46	e41	e36	e40	e30	72	175	180	121	97	99	60
26	e46	e41	e37	e50	e33	70	165	215	106	97	99	58
27	e47	e40	39	e150	e36	66	147	216	93	97	101	56
28	52	e42	43	e90	e38	65	131	213	86	99	100	58
29	51	e43	39	53	---	63	129	236	85	104	95	59
30	44	e44	36	57	---	65	150	255	81	105	88	59
31	e43	---	e36	e80	---	76	---	284	---	99	87	---
TOTAL	1624	1444	1270	1359	1214	2796	3466	5485	4769	2908	3074	2111
MEAN	52.4	48.1	41.0	43.8	43.4	90.2	116	177	159	93.8	99.2	70.4
MAX	61	54	48	150	120	349	175	284	269	141	116	86
MIN	43	40	33	29	27	41	70	107	81	67	87	56
AC-FT	3220	2860	2520	2700	2410	5550	6870	10880	9460	5770	6100	4190

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1942 - 2003, BY WATER YEAR (WY)

MEAN	84.2	72.1	60.2	54.2	61.9	76.1	106	138	188	127	107	91.7
MAX	148	121	120	88.1	141	186	310	353	455	324	217	151
(WY)	1976	1984	1976	1976	1996	1943	1948	1976	1948	1975	1975	1993
MIN	50.2	41.3	27.7	26.6	27.3	33.5	48.6	50.9	70.7	48.1	30.1	33.6
(WY)	1992	1993	1993	1993	1993	1955	1961	2002	1987	1973	1992	1992

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1942 - 2003	
ANNUAL TOTAL	22336		31520			
ANNUAL MEAN	61.2		86.4		97.2	
HIGHEST ANNUAL MEAN					165	1976
LOWEST ANNUAL MEAN					53.2	1992
HIGHEST DAILY MEAN	159	Jun 23	349	Mar 14	933	Mar 29 1943
LOWEST DAILY MEAN	25	Feb 24	27	Feb 24	15	Feb 25 1962
ANNUAL SEVEN-DAY MINIMUM	28	Feb 24	32	Jan 6	19	Dec 31 1957
MAXIMUM PEAK FLOW			600	Mar 14	a1680	Mar 28 1943
MAXIMUM PEAK STAGE			5.27	Mar 14	b8.08	Feb 4 1963
INSTANTANEOUS LOW FLOW					15	Feb 25 1962
ANNUAL RUNOFF (AC-FT)	44300		62520		70390	
10 PERCENT EXCEEDS	108		165		167	
50 PERCENT EXCEEDS	51		70		80	
90 PERCENT EXCEEDS	35		37		44	

a--Gage height, 6.79 ft.
b--Backwater from ice.
e--Estimated.

PEND OREILLE RIVER BASIN

12330000 BOULDER CREEK AT MAXVILLE, MT

LOCATION.--Lat 46°28'20", 1ong 113°13'59" (NAD 27), in $SE^1/_4NE^1/_4SW^1/_4$ sec.4, T.8 N., R.13 W., Granite County, Hydrologic Unit 17010202, on right bank 0.2 mi upstream from mouth and 0.7 mi north of Maxville.

DRAINAGE AREA.--71.3 mi^2.

PERIOD OF RECORD.--April 1939 to current year. Monthly discharge only for some periods, published in WSP 1316.

GAGE.--Water-stage recorder. Elevation of gage is 4,750 ft (NGVD 29). Apr. 15, 1939, to July 7, 1941, nonrecording gage at site 75 ft upstream at different elevation. July 8-20, 1941, nonrecording gage at site 175 ft upstream at elevation 1.03 ft higher.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Diversions upstream for irrigation of about 240 acres near the station. U.S. Geological Survey satellite telemeter at station. Several observations of water temperature and specific conductance were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15	e13	20	16	23	e16	23	37	357	48	11	11
2	14	e14	18	15	20	e17	22	37	311	46	17	10
3	14	e15	17	17	19	e16	21	37	258	42	23	9.1
4	14	e16	17	16	18	e15	20	44	224	40	27	9.1
5	14	e16	17	16	17	16	20	47	202	37	25	8.8
6	14	e17	17	16	e16	16	19	44	187	35	25	9.0
7	13	e18	e16	e17	e15	16	19	43	161	34	26	8.8
8	13	19	e15	e22	e15	16	19	40	162	45	24	9.4
9	13	19	e15	e23	e15	16	21	38	184	44	24	10
10	13	19	e15	e22	e15	16	24	37	222	36	23	9.8
11	13	18	e15	e20	e15	16	26	36	228	32	21	9.7
12	13	19	e16	e18	e14	18	28	37	184	30	18	11
13	15	19	17	e17	e14	19	33	38	172	29	16	11
14	19	19	17	e16	e15	21	38	43	165	27	16	11
15	19	19	17	15	15	20	36	57	145	26	16	10
16	19	18	17	15	16	21	33	75	137	25	16	11
17	19	18	17	e14	15	19	32	69	127	25	18	12
18	19	18	e15	e14	15	18	31	63	123	25	17	12
19	19	18	e15	e14	15	18	30	58	123	22	15	12
20	20	19	e15	15	15	18	29	55	158	19	13	12
21	20	19	e15	16	15	18	31	56	152	19	12	12
22	20	19	e16	e15	15	18	36	64	117	18	12	11
23	19	e17	e16	e15	e13	20	48	99	100	17	15	12
24	19	e16	e15	e15	e10	18	54	159	88	16	14	13
25	20	e15	e15	16	e10	18	64	249	79	16	12	13
26	20	e15	e15	16	e12	18	61	325	73	15	12	13
27	19	e16	e15	18	e13	17	47	310	68	14	13	13
28	19	e16	17	17	e14	17	42	335	65	13	13	13
29	20	18	16	16	---	17	39	412	60	13	12	13
30	e17	18	21	16	---	18	38	444	54	13	12	13
31	e15	---	16	19	---	20	---	457	---	12	12	---
TOTAL	520	520	505	517	424	547	984	3845	4686	833	530	332.7
MEAN	16.8	17.3	16.3	16.7	15.1	17.6	32.8	124	156	26.9	17.1	11.1
MAX	20	19	21	23	23	21	64	457	357	48	27	13
MIN	13	13	15	14	10	15	19	36	54	12	11	8.8
AC-FT	1030	1030	1000	1030	841	1080	1950	7630	9290	1650	1050	660

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1940 - 2003, BY WATER YEAR (WY)

MEAN	22.7	23.3	20.7	18.5	18.3	18.5	28.7	115	175	58.9	20.8	17.7
MAX	51.1	44.8	39.0	32.4	30.5	28.6	56.3	261	376	244	68.4	54.1
(WY)	1960	1976	1976	1976	1951	1976	1943	1976	1975	1975	1975	1965
MIN	3.59	11.8	11.0	8.49	10.0	12.3	10.4	54.7	35.0	12.6	8.14	6.59
(WY)	1988	1988	1988	1988	1941	1993	1991	1977	1992	1988	1988	1991

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1940 - 2003	
ANNUAL TOTAL	11434.7		14243.7			
ANNUAL MEAN	31.3		39.0		44.9	
HIGHEST ANNUAL MEAN					82.2	1976
LOWEST ANNUAL MEAN					20.4	1992
HIGHEST DAILY MEAN	225	Jun 2	457	May 31	1140	Jun 19 1975
LOWEST DAILY MEAN	8.7	May 11	8.8	Sep 5	2.8	Oct 13 1991
ANNUAL SEVEN-DAY MINIMUM	11	May 5	9.2	Sep 2	3.4	Oct 8 1987
MAXIMUM PEAK FLOW			535	May 31	1460	Jun 19 1975
MAXIMUM PEAK STAGE			3.63	May 31	4.55	Jun 19 1975
INSTANTANEOUS LOW FLOW					a2.8	Oct 13 1991
ANNUAL RUNOFF (AC-FT)	22680		28250		32500	
10 PERCENT EXCEEDS	90		71		110	
50 PERCENT EXCEEDS	17		18		22	
90 PERCENT EXCEEDS	13		13		12	

a--Result of upstream diversion.
e--Estimated.

PEND OREILLE RIVER BASIN

12331500 FLINT CREEK NEAR DRUMMOND, MT

LOCATION.--Lat 46°37'44", long 113°09'02" (NAD 27), in $NE^1/_4NW^1/_4NE^1/_4$ sec. 18, T.10 N.,R.12 W., Granite County, Hydrologic Unit 17010202, on left bank 10 ft downstream from county bridge, 2.0 mi upstream from mouth, and 2.7 mi south of Drummond.
DRAINAGE AREA.--490 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1990 to April 2003, August 2003 to September 2003.
GAGE.--Water-stage recorder. Elevation of gage is 4,017.27 ft (NGVD 29). June 1948 to September 1949 at same site with different elevation.
REMARKS.--Water-discharge records good except those for estimated daily discharges, which are poor. Daily mean values were not determined from May 1 through July 31 due to temporary suspension of the surface-water program. Some regulation by Georgetown Lake (station number 12325000). Diversions for irrigation of about 25,000 acres of which 1,000 acres are downstream from station. During irrigation season, flow is supplemented by water from East Fork Rock Creek which is diverted in sec.5, T.4 N., R.14 W., 500 ft below Rock Creek Dam, through a canal into Trout Creek, thence into Flint Creek. U.S. Geological Survey satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	45	e80	e110	77	e200	123	203				e10	30
2	48	e80	e110	76	e120	136	202				e9.5	27
3	52	e86	108	93	97	126	196				e9.0	28
4	48	e90	106	89	90	124	181				e8.5	26
5	49	e100	106	87	84	130	193				e8.0	26
6	70	123	104	80	83	125	193				e8.0	26
7	64	124	94	e74	72	104	183				5.6	26
8	69	129	e94	e64	e70	111	187				4.4	28
9	84	129	e92	e60	e68	105	193				5.6	28
10	95	127	e92	e62	e70	115	208				5.8	30
11	98	124	e96	e66	e66	153	216				6.3	30
12	95	123	e96	e72	e64	395	228				7.1	37
13	95	127	e96	e82	e64	811	239				7.9	38
14	98	128	98	e88	e66	658	273				9.5	36
15	97	126	98	e84	e66	403	271				12	36
16	95	122	93	e78	e68	294	245				17	40
17	95	124	92	e72	e68	245	234				29	45
18	95	122	e88	e68	e70	202	228				28	48
19	95	120	e86	e68	e70	189	218				23	48
20	98	124	e86	e70	e70	182	200				23	47
21	97	125	e84	e74	e70	184	196				22	45
22	96	123	e80	e76	e66	178	210				22	46
23	100	e115	e84	e72	e58	208	232				35	47
24	96	e100	e86	e80	e52	179	e260				29	49
25	95	e92	e86	e150	e60	169	e300				25	54
26	97	e90	e84	e200	e68	166	e310				27	51
27	104	e96	e88	e250	e80	159	e310				32	50
28	109	e100	90	e150	e100	154	e290				33	49
29	104	e105	82	88	---	151	e260				35	50
30	88	e110	e78	90	---	153	e240				33	49
31	e84	---	e78	e120	---	173	---				32	---
TOTAL	2655	3364	2865	2860	2180	6605	6899				562.2	1170
MEAN	85.6	112	92.4	92.3	77.9	213	230				18.1	39.0
MAX	109	129	110	250	200	811	310				35	54
MIN	45	80	78	60	52	104	181				4.4	26
AC-FT	5270	6670	5680	5670	4320	13100	13680				1120	2320

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1991 - 2003, BY WATER YEAR (WY)*

MEAN	127	123	98.1	97.4	113	136	159	149	223	123	43.4	68.3
MAX	186	165	144	156	232	256	326	459	627	412	167	196
(WY)	1996	1999	1999	1997	1996	1997	1996	1997	1997	1998	1993	1993
MIN	81.2	91.4	63.8	57.1	56.9	79.5	86.8	14.1	14.9	12.8	6.66	18.0
(WY)	1993	1993	1993	1993	1993	1991	2001	1992	1992	2000	1991	2001

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1991 - 2003*	
ANNUAL TOTAL	28033.8					
ANNUAL MEAN	76.8				122	
HIGHEST ANNUAL MEAN					234	1997
LOWEST ANNUAL MEAN					60.2	1992
HIGHEST DAILY MEAN	199	Jun 23	811	Mar 13	998	Jun 27 1998
LOWEST DAILY MEAN	3.2	May 16	4.4	Aug 8	0.59	May 6 1992
ANNUAL SEVEN-DAY MINIMUM	9.8	May 13			1.8	Aug 9 1992
MAXIMUM PEAK FLOW			a1050	Mar 13	c1100	Feb 8 1996
MAXIMUM PEAK STAGE			b4.67	Jan 26	6.99	Feb 9 1996
ANNUAL RUNOFF (AC-FT)	55610				88070	
10 PERCENT EXCEEDS	123				215	
50 PERCENT EXCEEDS	80				102	
90 PERCENT EXCEEDS	24				21	

* During period of record, August 1990 to April 2003, August 2003 to September 2003.
a--Gage height, 4.53 ft.
b--Backwater from ice jam.
c--About, estimated based on upstream measurement.
e--Estimated.

12331500 FLINT CREEK NEAR DRUMMOND, MT--Continued

WATER QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972-73, 1985 to August 2002, August 2003 to September 2003.

REMARKS.--Flow affected by diversions for irrigation upstream from station. Unpublished records of instantaneous water temperature and specific conductance are available in files of the District office.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instan-taneous dis-charge, cfs (00061)	pH, water, unfltrd field, std units (00400)	Specif. conduc-tance, wat unf uS/cm 25 degC (00095)	Temper-ature, air, deg C (00020)	Temper-ature, water, deg C (00010)	Hard-ness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Arsenic water, fltrd, ug/L (01000)	Arsenic water unfltrd ug/L (01002)
AUG 2003											
26...	0855	26	8.3	529	15.0	12.5	250	70.0	19.0	11.3	13
SEP											
22...	1110	46	8.5	484	14.0	9.5	230	62.3	17.7	8.5	10

Date	Cadmium water, fltrd, ug/L (01025)	Cadmium water, unfltrd ug/L (01027)	Copper, water, fltrd, ug/L (01040)	Copper, water, unfltrd recover-able, ug/L (01042)	Iron, water, fltrd, ug/L (01046)	Iron, water, unfltrd recover-able, ug/L (01045)	Lead, water, fltrd, ug/L (01049)	Lead, water, unfltrd recover-able, ug/L (01051)	Mangan-ese, water, fltrd, ug/L (01056)	Mangan-ese, water, unfltrd recover-able, ug/L (01055)
AUG 2003										
26...	<.04	<.04	1.3	2.1	18	90	.09	.65	89.9	120
SEP										
22...	E.02	E.02	1.1	2.1	9	80	E.06	.75	50.7	75

Date	Zinc, water, fltrd, ug/L (01090)	Zinc, water, unfltrd recover-able, ug/L (01092)	Suspnd. sedi-ment, sieve diametr percent <.063mm (70331)	Sus-pended sedi-ment concen-tration mg/L (80154)	Sus-pended sedi-ment load, tons/d (80155)
AUG 2003					
26...	1	3	50	10	.70
SEP					
22...	1	3	94	3	.37

E--Estimated.

PEND OREILLE RIVER BASIN

12331800 CLARK FORK NEAR DRUMMOND, MT

LOCATION.--Lat 46°42'44", long 113°19'48" (NAD 27), in NE$^1/_4$SW$^1/_4$NW$^1/_4$ sec. 14, T.11 N., R.14 W., in Granite County, Hydrologic Unit 17010201, on right bank 50 ft upstream from country road bridge, 0.3 mi north of Bearmouth, 4.5 mi east of Bearmouth Chalet, 9.0 mi northwest of Drummond, and at river mile 403.9.

DRAINAGE AREA.--2,501 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1993 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 3,790 ft (NGVD 29).

REMARKS.--Water-discharge records good. Some regulation by settling ponds on Silver Bow Creek near Anaconda and Georgetown Lake (station number 12325000) on Flint Creek. Diversions for irrigation of about 88,000 acres upstream from station. U.S. Geological Survey satellite telemeter at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 23, 1981 recorded a discharge of about 16,000 ft^3/s, from measurements made upstream at Clark Fork at Drummond (12331600) and at downstream site, Clark Fork at Clinton (12331900).

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	335	383	455	444	1660	442	927	1260	3200	533	168	276
2	332	381	475	429	1030	438	1020	1250	2910	502	173	265
3	341	389	489	458	700	447	1010	1220	2490	485	169	265
4	366	417	478	464	619	440	943	1330	2070	478	186	264
5	367	438	475	457	573	442	896	1600	1730	455	182	261
6	385	470	474	449	528	458	862	1570	1490	431	204	263
7	381	502	444	411	462	474	822	1460	1330	417	215	265
8	379	511	398	389	496	431	795	1410	1190	430	217	271
9	388	515	392	381	499	464	803	1340	1130	464	215	281
10	412	513	391	321	486	575	879	1270	1180	432	215	264
11	411	504	418	255	471	670	931	1210	1340	410	210	259
12	420	496	442	322	444	1120	973	1190	1300	388	211	280
13	421	500	467	456	432	2560	1030	1190	1150	375	215	283
14	432	507	474	470	470	3730	1130	1140	1150	352	210	278
15	427	500	478	445	460	2430	1180	1110	1140	346	213	283
16	427	490	479	411	451	1790	1130	1160	1040	344	217	288
17	437	487	465	357	458	1590	1070	1240	966	324	230	304
18	447	485	412	329	455	1170	1040	1240	911	304	225	320
19	440	479	374	346	447	968	1010	1220	857	290	222	333
20	437	482	362	448	440	868	949	1140	987	271	216	325
21	434	489	388	417	448	838	930	1030	1240	264	211	317
22	432	491	412	261	469	793	947	988	1180	258	214	331
23	436	512	423	221	425	949	1030	952	1050	247	247	329
24	436	485	394	338	e200	880	1190	1040	945	242	252	325
25	429	412	361	444	e180	766	1350	1340	878	267	242	332
26	431	421	358	605	e200	740	1440	1950	799	245	239	336
27	442	453	412	e1500	341	715	1370	2310	712	248	254	331
28	454	445	452	1170	395	682	1260	2380	649	243	253	326
29	460	482	445	636	---	663	1190	2560	620	229	258	324
30	419	461	398	590	---	656	1230	2780	578	210	258	321
31	376	---	442	856	---	770	---	3130	---	177	273	---
TOTAL	12734	14100	13327	15080	14239	29959	31337	46010	38212	10661	6814	8900
MEAN	411	470	430	486	509	966	1045	1484	1274	344	220	297
MAX	460	515	489	1500	1660	3730	1440	3130	3200	533	273	336
MIN	332	381	358	221	180	431	795	952	578	177	168	259
AC-FT	25260	27970	26430	29910	28240	59420	62160	91260	75790	21150	13520	17650

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1993 - 2003, BY WATER YEAR (WY)

MEAN	595	595	510	517	624	716	814	1174	1499	728	377	436
MAX	859	810	640	754	1377	1048	1356	2557	3560	1731	895	1007
(WY)	1998	1998	1998	1997	1996	1997	1996	1997	1997	1998	1993	1993
MIN	411	448	366	377	375	494	549	298	297	160	112	201
(WY)	2003	2001	2001	2001	2001	2002	2000	2000	2000	2000	2000	1994

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1993 - 2003	
ANNUAL TOTAL	174772		241373			
ANNUAL MEAN	479		661		708	
HIGHEST ANNUAL MEAN					1192	1997
LOWEST ANNUAL MEAN					400	2000
HIGHEST DAILY MEAN	1430	Jun 11	3730	Mar 14	8430	Feb 9 1996
LOWEST DAILY MEAN	210	Aug 20	168	Aug 1	77	Jul 31 2000
ANNUAL SEVEN-DAY MINIMUM	227	Aug 17	180	Jul 31	83	Jul 29 2000
MAXIMUM PEAK FLOW			4580	Mar 14	9800	Feb 9 1996
MAXIMUM PEAK STAGE			7.71	Mar 14	10.03	Feb 9 1996
INSTANTANEOUS LOW FLOW			a135	Feb 24	b75	Jul 30 2000
ANNUAL RUNOFF (AC-FT)	346700		478800		512900	
10 PERCENT EXCEEDS	751		1240		1240	
50 PERCENT EXCEEDS	421		454		559	
90 PERCENT EXCEEDS	288		248		272	

a--Gage height, 2.22 ft, result of freezeup.
b--Gage height, 2.03 ft.
e--Estimated.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--March 1993 to current year.

REMARKS.--Unpublished records of instantaneous water temperature and specific conductance are available in files of the District office.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instan-taneous dis-charge, cfs (00061)	pH, water, unfltrd field, std units (00400)	Specif. conduc-tance, wat unf uS/cm 25 degC (00095)	Temper-ature, air, deg C (00020)	Temper-ature, water, deg C (00010)	Hard-ness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Arsenic water, fltrd, ug/L (01000)	Arsenic water unfltrd ug/L (01002)
MAR 2003											
15...	1330	2290	7.9	309	9.0	3.0	110	32.2	7.52	12.8	37
APR											
03...	1025	1020	8.4	437	6.0	5.5	190	54.7	12.8	9.3	14
29...	0925	1180	8.3	331	7.5	7.0	140	41.8	9.73	7.9	12
MAY											
27...	1225	2310	8.1	237	21.5	13.0	100	30.8	6.68	11.6	32
JUN											
03...	0940	2540	8.1	258	18.0	11.0	110	33.8	7.31	14.4	27
17...	1020	969	8.3	370	25.0	17.5	160	46.6	11.1	12.1	14
JUL											
29...	1035	232	8.3	555	25.5	19.5	260	75.1	18.0	14.0	13
AUG											
26...	1055	238	8.3	589	19.5	17.0	280	77.9	19.7	11.4	14

Date	Cadmium water, fltrd, ug/L (01025)	Cadmium water, unfltrd ug/L (01027)	Copper, water, fltrd, ug/L (01040)	Copper, water, unfltrd recover-able, ug/L (01042)	Iron, water, fltrd, ug/L (01046)	Iron, water, unfltrd recover-able, ug/L (01045)	Lead, water, fltrd, ug/L (01049)	Lead, water, unfltrd recover-able, ug/L (01051)	Mangan-ese, water, fltrd, ug/L (01056)	Mangan-ese, water, unfltrd recover-able, ug/L (01055)
MAR 2003										
15...	.14	1.17	19.6	215	88	5770	.66	43.9	38.4	570
APR										
03...	.07	.22	7.0	42.1	17	780	.19	6.86	27.5	118
29...	.05	.20	4.9	28.6	18	750	.11	4.95	16.0	96
MAY										
27...	.05	.89	10.8	145	40	--	.39	26.1	15.7	420
JUN										
03...	.10	.54	12.6	105	39	2130	.42	17.5	16.4	264
17...	.06	.16	7.1	21.5	10	350	E.06	2.89	19.7	70
JUL										
29...	E.03	.04	4.7	7.2	<8	40	<.08	.34	9.9	26
AUG										
26...	E.03	.08	3.7	9.4	<8	130	<.08	.98	10.4	79

Date	Zinc, water, fltrd, ug/L (01090)	Zinc, water, unfltrd recover-able, ug/L (01092)	Suspnd. sedi-ment, sieve diametr percent <.063mm (70331)	Sus-pended sedi-ment concen-tration mg/L (80154)	Sus-pended sedi-ment load, tons/d (80155)
MAR 2003					
15...	13	276	68	294	1820
APR					
03...	7	50	62	46	127
29...	3	38	66	45	143
MAY					
27...	4	211	63	224	1400
JUN					
03...	9	121	65	133	912
17...	5	25	78	17	44
JUL					
29...	3	6	87	3	1.9
AUG					
26...	3	12	58	18	12

E--Estimated.

12332000 MIDDLE FORK ROCK CREEK NEAR PHILIPSBURG, MT

LOCATION.--Lat 46°11'03", long 113°30'05" (NAD 27), in $SW^1/_4NW^1/_4SE^1/_4$ sec.17, T.5 N., R.15 W., Granite County, Hydrologic Unit 17010202, on left bank 40 ft downstream from bridge on county highway, 1.2 mi upstream from East Fork, 3.4 mi upstream from West Fork, and 15 mi southwest of Philipsburg.

DRAINAGE AREA.--123 mi^2.

PERIOD OF RECORD.--September 1937 to current year. Monthly discharges only January to March 1938, published in WSP 1316.

GAGE.--Water-stage recorder. Elevation of gage is 5,444.08 ft (NGVD 29). Prior to Oct. 25, 1990, gage located at several sites 0.8 to 1.0 mi downstream. See WSP 1736 or 1933 for history of changes prior to Oct. 1, 1955.

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Geological Survey satellite telemeter at station. A few small diversions for irrigation upstream from station. Several observations of water temperature and specific conductance were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	45	e28	e31	e31	e33	e29	e37	128	1220	164	53	38
2	44	e30	e32	e31	e32	e28	e36	128	965	156	52	37
3	44	e33	e32	e32	e32	e28	e36	127	743	148	52	37
4	43	e36	e32	e32	e31	e28	e36	131	613	139	56	36
5	43	e35	32	e32	e30	e28	e37	127	542	129	54	37
6	43	e38	33	e31	e29	e29	e37	120	497	122	55	38
7	42	e37	e32	e30	e29	e30	e36	119	459	117	54	38
8	40	e36	e31	e30	e30	e29	e39	116	454	141	52	38
9	40	e34	e31	e30	e32	e31	e43	112	487	132	50	40
10	40	e34	e30	e28	e31	e32	e48	108	502	114	48	40
11	40	e35	e31	e29	e31	e34	e54	108	497	107	46	40
12	40	32	e32	e30	e31	e33	e70	115	437	101	46	42
13	40	28	e33	e32	e32	e34	e76	118	412	97	45	41
14	40	35	e33	e32	e33	e35	69	124	396	93	44	39
15	39	34	e33	e31	e34	e34	67	145	391	89	44	38
16	39	34	e31	e30	e33	e33	62	175	395	86	45	39
17	37	36	e30	e29	e33	e33	60	178	380	83	49	41
18	35	35	e29	e29	e33	e33	60	177	374	79	48	40
19	35	34	e30	e31	e34	e34	58	168	370	76	45	39
20	35	35	e30	e32	e34	e34	62	161	377	72	44	38
21	35	36	e30	e31	e33	e35	68	162	350	70	43	38
22	34	36	e31	e31	e29	e36	77	167	293	68	44	38
23	34	e35	e32	e31	e26	e35	110	224	261	67	52	37
24	e34	e32	e31	e32	e25	e34	116	357	233	66	47	36
25	e34	e30	e30	e32	e26	e34	143	582	211	68	44	37
26	e34	e31	e29	e33	e28	e34	141	809	196	67	42	36
27	e35	e31	e32	e33	e29	e35	128	933	185	63	42	35
28	e33	e31	e34	e32	e29	e37	121	1010	181	60	43	35
29	e31	e32	e33	e32	---	e38	120	1220	174	58	41	35
30	e29	e32	e32	e32	---	e38	122	1330	170	56	40	35
31	e27	---	e31	e33	---	e38	---	1450	---	54	39	---
TOTAL	1164	1005	973	964	862	1023	2169	10929	12765	2942	1459	1138
MEAN	37.5	33.5	31.4	31.1	30.8	33.0	72.3	353	426	94.9	47.1	37.9
MAX	45	38	34	33	34	38	143	1450	1220	164	56	42
MIN	27	28	29	28	25	28	36	108	170	54	39	35
AC-FT	2310	1990	1930	1910	1710	2030	4300	21680	25320	5840	2890	2260
CFSM	0.31	0.27	0.26	0.25	0.25	0.27	0.59	2.87	3.46	0.77	0.38	0.31
IN.	0.35	0.30	0.29	0.29	0.26	0.31	0.66	3.31	3.86	0.89	0.44	0.34

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1938 - 2003, BY WATER YEAR (WY)

MEAN	49.5	42.8	36.4	32.1	32.9	36.3	74.7	335	481	178	70.2	51.7
MAX	201	104	64.1	60.9	60.3	71.2	190	650	914	496	141	98.5
(WY)	1947	1947	1947	1976	1996	1986	1943	1947	1972	1975	1975	1946
MIN	26.9	25.7	23.6	22.0	16.5	22.7	28.1	137	141	48.7	25.8	30.4
(WY)	1988	1980	1946	1977	1959	1955	1975	1953	1992	1940	1940	1987

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1938 - 2003	
ANNUAL TOTAL	35159		37393			
ANNUAL MEAN	96.3		102		118	
HIGHEST ANNUAL MEAN					183	1997
LOWEST ANNUAL MEAN					62.3	1940
HIGHEST DAILY MEAN	753	Jun 2	1450	May 31	1480	Jun 16 1974
LOWEST DAILY MEAN	26	Feb 25	25	Feb 24	5.3	Feb 9 1953
ANNUAL SEVEN-DAY MINIMUM	28	Feb 25	27	Feb 22	10	Feb 22 1962
MAXIMUM PEAK FLOW			1670	May 31	1680	Jun 16 1974
MAXIMUM PEAK STAGE			a4.37	May 31	b5.58	Jun 16 1974
INSTANTANEOUS LOW FLOW					5.3	Feb 9 1953
ANNUAL RUNOFF (AC-FT)	69740		74170		85820	
ANNUAL RUNOFF (CFSM)	0.78		0.83		0.96	
ANNUAL RUNOFF (INCHES)	10.63		11.31		13.09	
10 PERCENT EXCEEDS	313		183		325	
50 PERCENT EXCEEDS	39		38		47	
90 PERCENT EXCEEDS	30		30		27	

a--Recorded, may have been higher during period of no gage-height record, Dec. 14 to Apr. 13.
b--Site and datum then in use.
e--Estimated.

PEND OREILLE RIVER BASIN

12334510 ROCK CREEK NEAR CLINTON, MT

LOCATION.--Lat 46°43'21", long 113°40'56" (NAD 27), in $NW^1/_4NE^1/_4SW^1/_4$ sec.12, T.11 N., R.17 W., Missoula County, Hydrologic Unit 17010202, on left bank 100 ft downstream from private road bridge, 0.2 mi upstream from mouth, and 3.7 mi southeast of Clinton.

DRAINAGE AREA.--885 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1972 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 3,519.46 ft (NGVD 29).

REMARKS.--Water-discharge records good. Some regulation by East Fork Rock Creek Reservoir (station number 12332500). During irrigation season water is diverted from East Fork Rock Creek in sec.5, T.4 N., R.14 W., 500 ft below Rock Creek Dam, through a canal into Trout Creek, thence into Flint Creek. Diversions for irrigation of about 16,100 acres. U.S. Geological Survey satellite telemeter at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1972 reached a stage of 8.52 ft, from floodmark, discharge, 6,500 ft^3/s; local residents report flood of 1927 reached a stage of about 9.5 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	210	e160	174	175	544	184	550	980	3480	633	287	190
2	211	e170	178	167	397	173	545	1000	3020	598	280	188
3	213	e180	193	187	290	177	481	994	2650	575	280	186
4	212	178	189	177	248	170	413	1060	2320	560	290	185
5	210	176	189	187	228	166	383	1160	2010	541	274	183
6	209	188	181	168	208	172	357	1140	1840	523	267	186
7	207	203	162	140	181	172	329	1080	1710	510	266	189
8	202	208	140	134	190	171	314	1020	1610	520	260	192
9	197	209	138	136	207	178	342	963	1610	581	250	192
10	197	203	146	124	206	189	424	910	1650	523	236	193
11	199	196	166	105	191	202	524	859	1690	488	230	193
12	200	192	169	116	177	260	660	882	1540	463	228	211
13	201	197	177	187	179	398	810	914	1430	457	228	208
14	199	195	197	189	195	574	901	935	1370	443	218	204
15	198	190	196	180	197	502	861	1070	1310	431	212	200
16	199	187	185	158	188	424	763	1290	1270	420	216	200
17	198	189	182	134	190	402	695	1330	1220	410	219	205
18	196	187	160	126	185	348	661	1270	1180	397	227	209
19	194	185	132	133	180	315	616	1190	1140	392	220	208
20	191	187	125	161	178	306	595	1110	1180	384	214	205
21	191	189	143	166	183	313	626	1050	1200	371	208	200
22	190	192	156	163	190	307	715	1060	1090	361	206	196
23	193	205	157	153	e140	383	925	1220	1010	348	232	195
24	191	203	155	163	e100	359	1140	1630	926	343	230	192
25	182	165	139	178	e80	316	1230	2350	854	345	216	190
26	178	152	130	187	e110	308	1260	3180	797	351	205	188
27	180	167	161	246	e160	286	1140	3510	754	342	200	186
28	190	178	189	291	190	268	1020	3510	713	328	200	184
29	197	191	186	214	---	260	942	3610	687	313	196	183
30	173	194	168	204	---	266	978	3670	661	301	194	186
31	153	---	174	234	---	350	---	3750	---	293	192	---
TOTAL	6061	5616	5137	5283	5712	8899	21200	49697	43922	13545	7181	5827
MEAN	196	187	166	170	204	287	707	1603	1464	437	232	194
MAX	213	209	197	291	544	574	1260	3750	3480	633	290	211
MIN	153	152	125	105	80	166	314	859	661	293	192	183
AC-FT	12020	11140	10190	10480	11330	17650	42050	98570	87120	26870	14240	11560
CFSM	0.22	0.21	0.19	0.19	0.23	0.32	0.80	1.81	1.65	0.49	0.26	0.22
IN.	0.25	0.24	0.22	0.22	0.24	0.37	0.89	2.09	1.85	0.57	0.30	0.24
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1973 - 2003, BY WATER YEAR (WY)												
MEAN	252	226	196	185	192	245	506	1469	1716	675	310	260
MAX	474	430	460	329	426	428	1022	3676	3755	1908	635	389
(WY)	1976	1976	1976	1976	1996	1986	1996	1976	1975	1975	1975	1975
MIN	157	149	119	106	109	158	236	544	407	267	156	148
(WY)	1988	1988	1989	1988	1993	2002	1975	1977	1992	1985	1988	1992

12334510 ROCK CREEK NEAR CLINTON, MT--Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1973 - 2003	
ANNUAL TOTAL	145587		178080			
ANNUAL MEAN	399		488		520	
HIGHEST ANNUAL MEAN					966	1976
LOWEST ANNUAL MEAN					258	1992
HIGHEST DAILY MEAN	2440	Jun 2	3750	May 31	5480	May 18 1997
LOWEST DAILY MEAN	110	Feb 26	80	Feb 25	38	Dec 22 1998
ANNUAL SEVEN-DAY MINIMUM	126	Feb 25	132	Jan 6	65	Jan 3 1974
MAXIMUM PEAK FLOW			3950	May 31	a5530	May 18 1997
MAXIMUM PEAK STAGE			7.60	May 31	8.05	Jun 9 1997
INSTANTANEOUS LOW FLOW					b37	Dec 23 1998
ANNUAL RUNOFF (AC-FT)	288800		353200		376800	
ANNUAL RUNOFF (CFSM)	0.45		0.55		0.59	
ANNUAL RUNOFF (INCHES)	6.12		7.49		7.98	
10 PERCENT EXCEEDS	1100		1150		1240	
50 PERCENT EXCEEDS	203		209		264	
90 PERCENT EXCEEDS	139		164		151	

a--Gage height, 7.81 ft.
b--Gage height, 2.56 ft, may have been less during period of ice effect.
e--Estimated.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1979-83, 1985 to current year.
PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: September 1979 to September 1983, April 1995 to September 2002.
IREMARKS--Unpublished records of instantaneous specific conductance and temperature data are available in files of the District office.
EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE : Maximum, 23.0, Aug. 1, 2000; minimum, 0.0°C, on many days during winter periods.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instantaneous discharge, cfs (00061)	pH, water, unfltrd field, std units (00400)	Specif. conductance, wat unf uS/cm 25 degC (00095)	Temperature, air, deg C (00020)	Temperature, water, deg C (00010)	Hardness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnesium, water, fltrd, mg/L (00925)	Potassium, water, fltrd, mg/L (00935)	Sodium adsorption ratio (00931)
APR 2003											
03...	1210	489	8.2	113	2.5	5.5	--	--	--	--	--
MAY											
27...	1415	3580	7.6	55	24.0	9.0	23	5.94	1.93	1.00	.1
JUN											
02...	1305	3000	7.6	59	18.5	9.5	--	--	--	--	--
AUG											
26...	1120	206	8.2	152	26.5	14.5	73	18.5	6.58	1.34	.2
SEP											
22...	1245	195	8.4	160	19.5	10.5	74	19.0	6.39	--	--

Date	Sodium, water, fltrd, mg/L (00930)	Alkalinity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chloride, water, fltrd, mg/L (00940)	Fluoride, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of constituents mg/L (70301)	Residue water, fltrd, tons/acre-ft (70303)	Residue water, fltrd, tons/d (70302)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Nitrite + nitrate water fltrd, mg/L as N (00631)
APR 2003											
03...	--	--	--	--	--	--	--	--	--	.24	<.022
MAY											
27...	1.47	24	.49	<.2	9.61	2.1	37	.05	358	.49	.037
JUN											
02...	--	--	--	--	--	--	--	--	--	.31	E.018
AUG											
26...	3.34	74	.82	<.2	10.0	4.2	89	.12	49.6	.13	<.022
SEP											
22...	--	--	--	--	--	--	--	--	--	--	--

Date	Nitrite water, fltrd, mg/L as N (00613)	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Phos-phorus, water, unfltrd mg/L (00665)	Arsenic water, fltrd, ug/L (01000)	Arsenic water unfltrd ug/L (01002)	Cadmium water, fltrd, ug/L (01025)	Cadmium water, unfltrd ug/L (01027)	Chrom-ium, water, unfltrd recover-able, ug/L (01034)	Copper, water, fltrd, ug/L (01040)	Copper, water, unfltrd recover-able, ug/L (01042)	Iron, water, fltrd, ug/L (01046)
APR 2003											
03...	<.002	.007	.026	--	--	--	--	--	--	--	--
MAY											
27...	E.002	.018	.110	--	E2	--	<.2	.9	--	8.8	--
JUN											
02...	.003	.010	.051	--	--	--	--	--	--	--	--
AUG											
26...	<.002	<.007	.010	.7	E1	<.04	<.04	<.8	.4	.8	10
SEP											
22...	--	--	--	.7	<2	<.04	<.04	--	.3	E.6	E6

Date	Iron, water, unfltrd recover-able, ug/L (01045)	Lead, water, fltrd, ug/L (01049)	Lead, water, unfltrd recover-able, ug/L (01051)	Mangan-ese, water, fltrd, ug/L (01056)	Mangan-ese, water, unfltrd recover-able, ug/L (01055)	Nickel, water, unfltrd recover-able, ug/L (01067)	Zinc, water, fltrd, ug/L (01090)	Zinc, water, unfltrd recover-able, ug/L (01092)	Suspnd. sedi-ment, sieve diametr percent <.063mm (70331)	Sus-pended sedi-ment concen-tration mg/L (80154)	Sus-pended sedi-ment load, tons/d (80155)
APR 2003											
03...	--	--	--	--	--	--	--	--	88	3	4.0
MAY											
27...	--	--	1.04	--	--	1.10	--	6	52	103	996
JUN											
02...	--	--	--	--	--	--	--	--	54	61	494
AUG											
26...	40	<.08	<.06	2.0	5	.89	<1	<2	80	2	1.1
SEP											
22...	30	<.08	E.03	1.7	4	--	<1	<2	82	1	.53

E--Estimated.

PEND OREILLE RIVER BASIN

12334550 CLARK FORK AT TURAH BRIDGE, NEAR BONNER, MT

LOCATION.--Lat 46°49'34", long 113°48'48" (NAD 27), in $SW^1/_4NW^1/_4SW^1/_4$ sec. 1, T.12 N., R.18 W., Missoula County, Hydrologic Unit 17010201, on left bank 0.8 mi southeast of Turah, 4 mi southeast of Bonner, and at river mile 370.2.
DRAINAGE AREA.--3,641 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1985 to current year. Water-discharge records for the period March 1985 to September 1985 are available in files of the Helena district office.
GAGE.--Water-stage recorder. Elevation of gage is 3,320 ft (NGVD 29), from topographic map. Prior to May 9, 1986, non-recording gage at same site at elevation 2.00 ft higher.
REMARKS.--Water-discharge records good except those for estimated daily discharges, which are fair. Some regulation by settling ponds on Silver Bow Creek near Anaconda and by Georgetown Lake (station number 12325000) on Flint Creek. Diversions for irrigation of about 100,000 acres upstream from station. U. S. Geological Survey satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	642	e600	692	640	2150	643	1520	2400	6430	1280	501	479
2	639	e600	691	599	1820	648	1650	2410	5950	1200	487	468
3	641	e600	736	651	1240	e650	1600	2420	5210	1160	484	452
4	661	649	722	651	1040	e650	1510	2520	4590	1130	499	448
5	664	677	714	663	943	e650	1410	2930	3960	1080	498	443
6	669	702	705	636	e850	650	1360	2940	3560	1040	488	448
7	683	741	671	573	e750	676	1310	2760	3270	987	501	454
8	674	768	e600	e550	766	e650	1250	2670	3080	985	496	462
9	671	775	593	537	804	e700	1250	2560	2980	1100	509	477
10	698	764	582	e500	792	749	1360	2430	2980	1030	495	471
11	703	765	627	e450	758	850	1530	2300	3200	963	483	463
12	717	749	654	e500	713	1150	1720	2270	2990	911	466	503
13	712	765	657	609	686	2600	1940	2300	2810	903	480	514
14	715	779	720	711	723	4620	2180	2280	2700	926	463	506
15	721	770	704	662	738	3400	2220	2350	2610	927	432	503
16	721	756	700	609	718	2410	2110	2610	2500	892	439	510
17	723	754	696	e550	722	2280	1950	2770	2370	852	441	523
18	725	746	638	490	708	1780	1870	2680	2240	754	448	545
19	715	737	e550	502	691	1510	1810	2590	2120	746	458	553
20	708	736	541	585	679	1360	1720	2400	2190	734	480	550
21	702	742	605	e550	687	1320	1700	2210	2450	688	460	538
22	699	748	614	e450	727	1280	1760	2130	2360	674	453	534
23	710	776	607	e400	e650	1410	1990	2240	2160	657	495	539
24	715	e700	593	e500	e400	1430	2390	2710	1980	641	519	527
25	708	e600	535	585	e350	1270	2730	3790	1850	655	502	522
26	690	624	494	680	e450	1220	2970	5200	1720	661	475	518
27	707	658	558	1530	e500	1180	2730	5830	1600	647	475	508
28	729	678	651	1840	578	1120	2510	5680	1490	637	480	504
29	e750	703	657	1080	---	1090	2340	5910	1430	597	472	505
30	e700	722	592	904	---	1070	2370	6590	1360	561	470	507
31	e650	---	601	1070	---	1200	---	6790	---	532	468	---
TOTAL	21562	21384	19700	21257	22633	42216	56760	99670	86140	26550	14817	14974
MEAN	696	713	635	686	808	1362	1892	3215	2871	856	478	499
MAX	750	779	736	1840	2150	4620	2970	6790	6430	1280	519	553
MIN	639	600	494	400	350	643	1250	2130	1360	532	432	443
AC-FT	42770	42420	39070	42160	44890	83740	112600	197700	170900	52660	29390	29700

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1986 - 2003, BY WATER YEAR (WY)

MEAN	845	836	724	714	853	1050	1501	2535	2853	1249	631	677
MAX	1287	1173	1233	1149	2124	1664	3072	6345	7090	2920	1423	1423
(WY)	1998	1998	1996	1997	1996	1986	1996	1997	1997	1998	1993	1993
MIN	592	616	492	474	472	712	828	915	639	485	271	357
(WY)	1993	1993	1993	1993	1989	1991	1991	1992	1992	2000	2000	1988

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1986 - 2003	
ANNUAL TOTAL	363805		447663			
ANNUAL MEAN	997		1226		1206	
HIGHEST ANNUAL MEAN					2219	1997
LOWEST ANNUAL MEAN					686	1992
HIGHEST DAILY MEAN	3800	Jun 19	6790	May 31	9530	Jun 2 1997
LOWEST DAILY MEAN	300	Feb 26	350	Feb 25	200	Dec 21 1998
ANNUAL SEVEN-DAY MINIMUM	483	Feb 25	451	Aug 15	224	Aug 15 1992
MAXIMUM PEAK FLOW			7150	May 30	a12400	Feb 9 1996
MAXIMUM PEAK STAGE			7.53	May 30	b10.24	Dec 10 1995
ANNUAL RUNOFF (AC-FT)	721600		887900		873300	
10 PERCENT EXCEEDS	2310		2590		2370	
50 PERCENT EXCEEDS	712		715		841	
90 PERCENT EXCEEDS	550		486		500	

a--Gage height, 9.05 ft.
b--Backwater from ice.
e--Estimated.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1985 to current year.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: October 1991 to September 1998.
SUSPENDED-SEDIMENT DISCHARGE: March 1985 to March 2003, August 2003 to September 2003.

REMARKS.--Missing daily sediment data from Apr. 1 to July 30 due to temporary suspension of daily sediment program. Unpublished records of instantaneous water temperature and specific conductance are available in files of District office.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Maximum, 25.0°C, Aug. 17, 1992; minimum, 0.0°C, on many days during winter.
SEDIMENT CONCENTRATION: Maximum daily mean, 1,140 mg/L, Feb. 25, 1986; minimum daily mean, 1 mg/L, Sep. 12, 1987.
SEDIMENT LOAD: Maximum daily, 24,400 tons, Feb. 25, 1986; minimum daily 1.1 tons, Sep. 12, 1987.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATION: During period of operation, maximum daily mean, 790 mg/L, Mar. 14; minimum daily mean, 2 mg/L,Oct. 1 and Dec. 19. High-flow period of April through July was not sampled; higher maximum daily mean concentrations may have occurred during those months
SEDIMENT LOAD: Maximum daily, 9,850 tons, Mar. 14; minimum daily, 3.0 tons, Dec. 19.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instan-taneous dis-charge, cfs (00061)	pH, water, unfltrd field, std units (00400)	Specif. conduc-tance, wat unf uS/cm 25 degC (00095)	Temper-ature, air, deg C (00020)	Temper-ature, water, deg C (00010)	Hard-ness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Potas-sium, water, fltrd, mg/L (00935)	Sodium adsorp-tion ratio (00931)
MAR 2003											
16...	0850	2440	8.1	308	7.0	4.0	130	37.1	8.95	--	--
APR											
03...	1350	1620	8.5	318	7.0	6.0	140	39.0	9.89	--	--
29...	1140	2300	8.3	236	8.5	6.5	100	29.1	7.42	--	--
MAY											
27...	1615	5780	8.0	139	24.0	12.0	54	14.9	3.97	1.51	.2
*29...	1300	5810	8.0	148	--	14.0	69	18.8	5.28	--	--
*30...	1345	6820	7.8	141	--	13.5	60	17.4	4.07	--	--
*31...	1000	6700	7.8	138	--	11.0	61	17.5	4.18	--	--
JUN											
*01...	1330	6430	7.7	149	--	13.0	64	18.6	4.35	--	--
02...	0820	6200	8.0	156	12.5	11.5	68	19.8	4.60	--	--
*02...	1530	5950	7.8	159	--	13.0	68	19.5	4.66	--	--
17...	0840	2320	8.2	226	20.0	15.0	96	26.6	7.15	--	--
JUL											
29...	1215	590	8.5	316	32.0	18.5	140	39.8	10.6	--	--
AUG											
26...	1300	476	8.6	360	32.5	17.5	160	42.7	12.3	2.75	.3

Date	Sodium, water, fltrd, mg/L (00930)	Alka-linity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chlor-ide, water, fltrd, mg/L (00940)	Fluor-ide, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of consti-tuents mg/L (70301)	Residue water, fltrd, tons/ acre-ft (70303)	Residue water, fltrd, tons/d (70302)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Nitrite + nitrate water fltrd, mg/L as N (00631)
MAR 2003											
16...	--	--	--	--	--	--	--	--	--	--	--
APR											
03...	--	--	--	--	--	--	--	--	--	.35	.069
29...	--	--	--	--	--	--	--	--	--	--	--
MAY											
27...	3.34	52	1.50	<.2	12.1	12.6	82	.11	1280	.90	.040
*29...	--	--	--	--	--	--	--	--	--	--	--
*30...	--	--	--	--	--	--	--	--	--	--	--
*31...	--	--	--	--	--	--	--	--	--	--	--
JUN											
*01...	--	--	--	--	--	--	--	--	--	--	--
02...	--	--	--	--	--	--	--	--	--	.53	.044
*02...	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--
JUL											
29...	--	--	--	--	--	--	--	--	--	--	--
AUG											
26...	9.06	128	4.04	.3	12.2	50.7	211	.29	271	.20	<.022

*--Supplemental samples collected by sediment observer during high flow. Samples were collected by depth integration at a single vertical near midstream.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003--Continued

Date	Nitrite water, fltrd, mg/L as N (00613)	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Phos-phorus, water, unfltrd mg/L (00665)	Arsenic water, fltrd, ug/L (01000)	Arsenic water unfltrd ug/L (01002)	Cadmium water, fltrd, ug/L (01025)	Cadmium water, unfltrd ug/L (01027)	Chrom-ium, water, unfltrd recover-able, ug/L (01034)	Copper, water, fltrd, ug/L (01040)	Copper, water, unfltrd recover-able, ug/L (01042)	Iron, water, fltrd, ug/L (01046)
MAR 2003											
16...	--	--	--	10.3	21	.07	.56	--	11.6	104	57
APR											
03...	<.002	.017	.069	6.1	8	.04	.16	--	5.1	25.3	28
29...	--	--	--	4.8	7	E.03	.12	--	3.8	17.6	29
MAY											
27...	E.002	.026	.24	5.6	13	.04	.53	2.1	6.5	68.8	62
*29...	--	--	--	3.5	7	E.03	.24	--	4.1	34.2	31
*30...	--	--	--	7.0	14	.06	.46	--	9.2	73.1	54
*31...	--	--	--	7.0	16	.05	.56	--	9.8	79.3	61
JUN											
*01...	--	--	--	8.0	15	.06	.45	--	11.3	73.7	51
02...	.003	.021	.143	7.8	15	.05	.38	--	9.0	64.0	58
*02...	--	--	--	8.1	13	.06	.27	--	10.2	53.1	39
17...	--	--	--	5.8	7	.04	.10	--	4.0	12.1	17
JUL											
29...	--	--	--	5.8	6	E.02	E.03	--	2.4	3.7	<8
AUG											
26...	<.002	<.007	.014	5.6	7	<.04	E.03	<.8	2.4	4.3	<8

Date	Iron, water, unfltrd recover-able, ug/L (01045)	Lead, water, fltrd, ug/L (01049)	Lead, water, unfltrd recover-able, ug/L (01051)	Mangan-ese, water, fltrd, ug/L (01056)	Mangan-ese, water, unfltrd recover-able, ug/L (01055)	Nickel, water, unfltrd recover-able, ug/L (01067)	Zinc, water, fltrd, ug/L (01090)	Zinc, water, unfltrd recover-able, ug/L (01092)	Suspnd. sedi-ment, sieve diametr percent <.063mm (70331)	Sus-pended sedi-ment concen-tration mg/L (80154)	Sus-pended sedi-ment load, tons/d (80155)
MAR 2003											
16...	2460	.33	17.5	14.6	278	--	9	135	78	131	863
APR											
03...	580	.16	4.02	10.1	69	--	3	35	77	30	131
29...	530	.10	3.19	6.4	58	--	2	27	68	31	193
MAY											
27...	2680	.31	14.9	15.4	248	E1.9	2	121	55	218	3400
*29...	1470	.22	6.52	2.1	126	--	4	62	--	316	4960
*30...	2720	.30	14.2	2.0	247	--	6	118	--	295	5430
*31...	2910	.33	15.8	2.4	278	--	8	143	--	281	5080
JUN											
*01...	2380	.31	14.0	2.3	231	--	6	115	--	222	3850
02...	1840	.35	10.8	10.2	186	--	6	88	64	134	2240
*02...	1560	.28	9.33	2.3	153	--	6	75	--	146	2350
17...	270	E.04	1.54	12.8	39	--	4	16	66	16	100
JUL											
29...	150	<.08	.18	5.4	13	--	1	4	84	3	4.8
AUG											
26...	40	<.08	.21	4.1	16	10.3	2	4	90	3	3.9

*--Supplemental samples collected by sediment observer during high flow. Samples were collected by depth integration at a single vertical near midstream.
E--Estimated.

PEND OREILLE RIVER BASIN

12334550 CLARK FORK AT TURAH BRIDGE, NEAR BONNER, MT--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

DAY	OCTOBER MEAN CONCEN-TRATION (MG/L)	OCTOBER LOAD (TONS/ DAY)	NOVEMBER MEAN CONCEN-TRATION (MG/L)	NOVEMBER LOAD (TONS/ DAY)	DECEMBER MEAN CONCEN-TRATION (MG/L)	DECEMBER LOAD (TONS/ DAY)	JANUARY MEAN CONCEN-TRATION (MG/L)	JANUARY LOAD (TONS/ DAY)	FEBRUARY MEAN CONCEN-TRATION (MG/L)	FEBRUARY LOAD (TONS/ DAY)	MARCH MEAN CONCEN-TRATION (MG/L)	MARCH LOAD (TONS/ DAY)
1	2	3.5	7	11	7	13	6	10	244	1420	9	16
2	3	5.2	7	11	7	13	6	9.7	109	536	8	14
3	4	6.9	8	13	7	14	5	8.8	39	131	6	11
4	4	7.1	8	14	7	14	5	8.8	21	59	8	14
5	5	9.0	8	15	7	13	5	9.0	17	43	5	8.8
6	6	11	9	17	7	13	5	8.6	15	34	5	8.8
7	6	11	10	20	6	11	5	7.7	14	28	6	11
8	6	11	10	21	6	9.7	4	5.9	12	25	4	7.0
9	6	11	10	21	7	11	4	5.8	11	24	5	9.5
10	6	11	10	21	8	13	4	5.4	11	24	10	20
11	6	11	9	19	8	14	4	4.9	11	23	16	37
12	6	12	9	18	8	14	3	4.0	11	21	75	233
13	6	12	9	19	8	14	11	18	10	19	380	2670
14	6	12	9	19	9	17	16	31	10	20	790	9850
15	6	12	8	17	9	17	9	16	10	20	323	2970
16	7	14	8	16	8	15	5	8.2	12	23	141	917
17	7	14	8	16	5	9.4	4	5.9	14	27	112	689
18	7	14	8	16	3	5.2	4	5.3	11	21	64	308
19	7	14	7	14	2	3.0	5	6.8	8	15	41	167
20	6	11	7	14	3	4.4	5	7.9	7	13	31	114
21	6	11	7	14	4	6.5	5	7.4	7	13	25	89
22	6	11	7	14	6	9.9	6	7.3	7	14	23	79
23	6	12	8	17	6	9.8	5	5.4	7	12	34	129
24	6	12	9	17	5	8.0	5	6.8	7	7.6	42	162
25	6	11	9	15	4	5.8	7	11	7	6.6	19	65
26	6	11	9	15	4	5.3	10	18	7	8.5	16	53
27	6	11	8	14	6	9.0	186	768	6	8.1	15	48
28	6	12	7	13	9	16	230	1140	7	11	14	42
29	7	14	7	13	9	16	85	248	---	---	14	41
30	7	13	7	14	8	13	35	85	---	---	15	43
31	7	12	---	---	6	9.7	72	208	---	---	18	58
TOTAL	---	342.7	---	478	---	346.7	---	2692.6	---	2606.8	---	18884.1

DAY	APRIL MEAN CONCEN-TRATION (MG/L)	APRIL LOAD (TONS/ DAY)	MAY MEAN CONCEN-TRATION (MG/L)	MAY LOAD (TONS/ DAY)	JUNE MEAN CONCEN-TRATION (MG/L)	JUNE LOAD (TONS/ DAY)	JULY MEAN CONCEN-TRATION (MG/L)	JULY LOAD (TONS/ DAY)	AUGUST MEAN CONCEN-TRATION (MG/L)	AUGUST LOAD (TONS/ DAY)	SEPTEMBER MEAN CONCEN-TRATION (MG/L)	SEPTEMBER LOAD (TONS/ DAY)
1	---	---	---	---	*227	3940	---	---	4	5.4	14	18
2	---	---	---	---	*141	2270	---	---	4	5.3	11	14
3	---	---	---	---	---	---	---	---	4	5.2	7	8.5
4	---	---	---	---	---	---	---	---	4	5.4	4	4.8
5	---	---	---	---	---	---	---	---	4	5.4	4	4.8
6	---	---	---	---	---	---	---	---	4	5.3	3	3.6
7	---	---	---	---	---	---	---	---	4	5.4	5	6.1
8	---	---	---	---	---	---	---	---	4	5.4	6	7.5
9	---	---	---	---	---	---	---	---	3	4.1	6	7.7
10	---	---	---	---	---	---	---	---	3	4.0	5	6.4
11	---	---	---	---	---	---	---	---	3	3.9	4	5.0
12	---	---	---	---	---	---	---	---	3	3.8	6	8.1
13	---	---	---	---	---	---	---	---	3	3.9	5	6.9
14	---	---	---	---	---	---	---	---	3	3.8	5	6.8
15	---	---	---	---	---	---	---	---	3	3.5	6	8.1
16	---	---	---	---	---	---	---	---	3	3.6	6	8.3
17	---	---	---	---	---	---	---	---	3	3.6	6	8.5
18	---	---	---	---	---	---	---	---	3	3.6	6	8.8
19	---	---	---	---	---	---	---	---	3	3.7	7	10
20	---	---	---	---	---	---	---	---	3	3.9	7	10
21	---	---	---	---	---	---	---	---	3	3.7	7	10
22	---	---	---	---	---	---	---	---	3	3.7	7	10
23	---	---	---	---	---	---	---	---	4	5.3	7	10
24	---	---	---	---	---	---	---	---	5	7.0	7	10
25	---	---	---	---	---	---	---	---	4	5.4	6	8.5
26	---	---	---	---	---	---	---	---	3	3.8	6	8.4
27	---	---	*205	3230	---	---	---	---	3	3.8	6	8.2
28	---	---	*272	4170	---	---	---	---	4	5.2	6	8.2
29	---	---	*311	4960	---	---	---	---	6	7.6	6	8.2
30	---	---	*300	5340	---	---	---	---	8	10	6	8.2
31	---	---	*276	5060	---	---	4	5.7	11	14	---	---
TOTAL	---	---	---	---	---	---	---	---	---	157.7	---	251.6

*--Daily mean concentrations derived from supplemental high-flow samples (daily sediment program temporarily suspended April 1 to July 30).

PEND OREILLE RIVER BASIN

12335100 BLACKFOOT RIVER ABOVE NEVADA CREEK, NEAR HELMVILLE, MT

LOCATION.--Lat 46°55'09", long 113°00'53" (NAD 27), in $SW^1/_4SW^1/_4SE^1/_4$ sec. 32, T.14 N., R.11 W., Powell County, Hydrologic Unit 17010203, on right bank 40 ft downstream from county road bridge, 1.9 mi south of Browns Lake, 4.2 mi upstream from Nevada Creek, 4.4 mi northwest of Helmville, and at river mile 72.0.

DRAINAGE AREA.--494 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1999 to current year. Records equivalent to those published as "12335000 Blackfoot River near Helmville," September 1940 to October 1953 at site 13.5 mi upstream.

GAGE.--Water-stage recorder. Elevation of gage is 4,280 ft (NGVD 29).

REMARKS.--Water-discharge records good except those for estimated daily discharges, which are fair. Numerous diversions for irrigation upstream from station. Several observations of water temperature and specific conductance were made during the year. U. S. Geological Survey satellite telemeter at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 5, 1953 reached a discharge of 6,040 ft^3/s at 12335000 Blackfoot River near Helmville.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	178	e130	150	139	284	137	246	600	1760	426	183	148
2	176	e140	148	139	275	135	268	585	1640	409	181	146
3	174	e140	148	140	207	133	246	575	1530	394	177	146
4	172	e150	148	142	183	e130	224	603	1370	391	176	146
5	172	e150	147	141	170	133	212	634	1250	376	174	146
6	175	e160	147	140	162	134	207	626	1140	361	182	142
7	173	e160	146	141	161	133	200	604	1080	350	182	140
8	170	161	146	e130	154	102	196	579	982	341	179	142
9	170	162	145	e120	151	158	201	562	943	337	176	147
10	169	160	e145	e110	149	179	215	554	961	322	168	146
11	168	160	e145	e130	146	153	228	548	978	309	163	145
12	170	158	144	e150	145	151	240	536	974	297	163	166
13	170	160	144	e140	145	172	273	536	914	286	165	172
14	169	161	144	e140	141	233	378	543	879	279	166	163
15	168	160	145	e140	140	281	453	586	852	272	163	158
16	168	159	146	e130	140	269	451	673	822	264	163	159
17	168	158	145	e130	141	258	427	756	766	256	165	162
18	167	157	144	e120	140	225	411	743	745	249	162	161
19	166	156	e140	e120	138	202	395	713	745	242	159	158
20	166	158	e140	e130	137	193	388	669	814	235	156	157
21	165	160	e145	e110	138	192	387	637	826	227	154	153
22	164	159	149	e100	138	189	410	619	739	223	159	152
23	164	162	148	e120	e100	233	472	617	666	215	166	148
24	165	157	147	e130	e90	228	561	674	623	209	164	147
25	164	e150	e145	e150	e100	200	691	825	603	211	156	147
26	163	e150	e145	e160	e110	191	795	1170	562	210	152	144
27	163	e150	145	e170	e120	186	773	1450	523	210	153	144
28	162	152	146	e160	e130	179	704	1550	504	201	154	144
29	163	151	145	157	---	174	658	1610	480	192	150	144
30	e140	150	e140	152	---	178	625	1680	462	186	149	141
31	e130	---	e140	165	---	199	---	1820	---	184	148	---
TOTAL	5152	4641	4502	4246	4235	5660	11935	24877	27133	8664	5108	4514
MEAN	166	155	145	137	151	183	398	802	904	279	165	150
MAX	178	162	150	170	284	281	795	1820	1760	426	183	172
MIN	130	130	140	100	90	102	196	536	462	184	148	140
AC-FT	10220	9210	8930	8420	8400	11230	23670	49340	53820	17190	10130	8950

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 2000 - 2003, BY WATER YEAR (WY)

MEAN	163	155	143	139	131	145	250	612	886	342	183	156
MAX	175	180	165	152	151	183	398	802	1457	538	242	179
(WY)	2000	2000	2000	2000	2003	2003	2003	2003	2002	2002	2002	2002
MIN	142	139	128	129	107	121	139	433	578	262	152	135
(WY)	2002	2002	2001	2001	2001	2002	2001	2001	2000	2000	2000	2001

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 2000 - 2003	
ANNUAL TOTAL	121377		110667			
ANNUAL MEAN	333		303		275	
HIGHEST ANNUAL MEAN					328	2002
LOWEST ANNUAL MEAN					215	2001
HIGHEST DAILY MEAN	1820	Jun 18	1820	May 31	1820	Jun 18 2002
LOWEST DAILY MEAN	95	Feb 25	90	Feb 24	90	Feb 14 2001
ANNUAL SEVEN-DAY MINIMUM	105	Feb 24	112	Feb 23	95	Feb 26 2001
MAXIMUM PEAK FLOW			1870	May 31	1890	Jun 19 2002
MAXIMUM PEAK STAGE			6.88	May 31	6.91	Jun 19 2002
ANNUAL RUNOFF (AC-FT)	240800		219500		199500	
10 PERCENT EXCEEDS	1100		681		620	
50 PERCENT EXCEEDS	167		165		163	
90 PERCENT EXCEEDS	128		140		130	

e--Estimated.

12335100 BLACKFOOT RIVER ABOVE NEVADA CREEK, NEAR HELMVILLE, MT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.-November 1995 to August 1998, April 2002 to August 2002.

REMARKS--Unpublished records of instantaneous specific conductance and temperature data are available in files of the District office.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instan-taneous dis-charge, cfs (00061)	pH, water, unfltrd field, std units (00400)	Specif. conduc-tance, wat unf uS/cm 25 degC (00095)	Temper-ature, air, deg C (00020)	Temper-ature, water, deg C (00010)	Hard-ness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Ammonia + org-N, water, unfltrd mg/L as N (00625)
MAY 2003										
14...	1300	543	8.2	244	17.0	10.5	130	33.8	10.5	.12
JUN										
06...	1300	1130	8.4	220	13.5	10.5	120	30.9	9.55	.15
JUL										
23...	1600	213	8.4	291	31.0	21.0	150	40.0	11.8	<.10
AUG										
13...	1415	166	8.5	299	30.0	18.0	170	44.1	14.0	E.06

Date	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Phos-phorus, water, unfltrd mg/L (00665)	Alum-inum, water, fltrd, ug/L (01106)	Alum-inum, water, unfltrd recover-able, ug/L (01105)	Arsenic water unfltrd ug/L (01002)	Cadmium water, unfltrd ug/L (01027)	Copper, water, unfltrd recover-able, ug/L (01042)	Iron, water, unfltrd recover-able, ug/L (01045)
MAY 2003										
14...	<.022	<.002	<.007	.016	2	123	E1	E.02	1.4	180
JUN										
06...	.025	<.002	<.007	.037	2	345	E1	.17	5.0	370
JUL										
23...	<.022	<.002	<.007	.007	E1	22	E1	<.04	.7	60
AUG										
13...	<.022	<.002	<.007	.006	<1	14	E2	<.04	.8	50

Date	Lead, water, unfltrd recover-able, ug/L (01051)	Mangan-ese, water, unfltrd recover-able, ug/L (01055)	Zinc, water, unfltrd recover-able, ug/L (01092)	Suspnd. sedi-ment, sieve diametr percent <.063mm (70331)	Sus-pended sedi-ment concen-tration mg/L (80154)	Sus-pended sedi-ment load, tons/d (80155)
MAY 2003						
14...	.32	14	5	78	15	22
JUN						
06...	1.91	36	7	80	58	177
JUL						
23...	<.06	9	E1	86	2	1.2
AUG						
13...	E.05	8	<2	83	3	1.3

E--Estimated.

PEND OREILLE RIVER BASIN

12335500 NEVADA CREEK ABOVE RESERVOIR, NEAR HELMVILLE, MT

LOCATION.--Lat 46°46'42", long 112°46'00" (NAD 27), in $SW^1/_4NW^1/_4SW^1/_4$ sec.20, T.12 N., R.9 W., Powell County, Hydrologic Unit 17010203, on right bank 0.7 mi upstream from Nevada Lake, 1.1 mi downstream from Gallagher Creek, 11 mi southeast of Helmville, and at river mile 34.5.

DRAINAGE AREA.--116 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1939 to current year. Prior to October 2001, published as "near Finn."

GAGE.--Water-stage recorder. Elevation of gage is 4,640 ft (NGVD 29). Prior to Apr. 30, 1942, nonrecording gage at site 0.1 mi, downstream at different elevation. Apr. 30, 1942 to July 26, 1953, water-stage recorder at site 0.2 mi downstream at different elevation. July 26, 1953, to Nov. 6, 1978, water-stage recorder at site 0.8 mi upstream at different elevation.

REMARKS.--Water-discharge records good except those for estimated daily discharges, which are poor. Diversions for irrigation of about 2,900 acres upstream from station. U.S. Geological Survey satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.5	e8.0	e12	e12	e25	e15	97	67	e200	19	9.1	3.8
2	7.3	e9.0	e13	e12	e20	e15	64	87	e160	19	9.1	3.7
3	7.6	e10	e15	e12	e15	e12	58	67	e130	17	9.8	3.6
4	7.9	e12	e13	e12	e12	e12	47	94	103	16	11	3.7
5	8.1	e16	e12	e12	e11	e12	43	113	87	15	9.5	3.8
6	9.0	18	e11	e12	e10	e15	36	90	77	16	11	3.9
7	8.3	18	e10	e11	e9.0	e15	31	82	69	17	13	4.0
8	8.0	17	e11	e10	e10	e15	31	74	62	21	12	4.5
9	8.3	16	e13	e9.0	e12	e15	41	66	57	24	11	5.4
10	8.3	14	e16	e8.0	e15	e20	51	62	64	20	11	5.3
11	8.0	13	e16	e9.0	e15	e40	57	59	70	19	10	5.8
12	9.3	12	e16	e10	e12	e100	64	56	50	17	9.8	13
13	11	12	e16	e11	e10	e300	78	53	53	15	10	9.6
14	11	12	e18	e10	e12	e240	90	49	58	14	9.4	8.0
15	10	12	e16	e9.0	e15	e220	77	56	44	14	7.4	7.5
16	8.6	13	e14	e8.0	e15	205	62	77	39	12	7.9	8.7
17	9.7	11	e12	e8.0	e12	97	53	81	37	16	8.8	11
18	10	11	e10	e8.0	e12	47	47	83	32	13	7.8	9.4
19	10	11	e10	e9.0	e12	44	43	79	33	12	6.8	8.1
20	10	14	e10	e10	e12	55	41	67	50	11	5.8	8.2
21	8.8	13	e10	e9.0	e12	53	44	61	47	11	5.0	8.1
22	9.6	13	e11	e8.0	e11	64	53	61	40	11	5.3	8.1
23	9.7	13	e12	e8.0	e10	72	80	62	36	11	8.2	7.9
24	9.0	e10	e12	e9.0	e8.0	34	106	86	37	11	6.5	8.0
25	8.5	e9.0	e12	e12	e7.0	26	127	135	32	13	5.5	7.8
26	11	e10	e11	e20	e8.0	26	131	214	28	13	5.3	7.5
27	11	e11	e13	e40	e10	24	114	214	25	13	6.4	7.9
28	12	e12	e12	e30	e12	23	94	194	22	11	7.0	7.7
29	9.8	e12	e12	e20	---	23	81	181	21	9.7	5.7	7.9
30	8.9	e12	e11	e25	---	37	75	193	20	9.3	5.5	8.0
31	e8.0	---	e12	e30	---	59	---	e243	---	9.2	4.4	---
TOTAL	284.2	374.0	392	413.0	344.0	1935	2016	3106	1783	449.2	255.0	209.9
MEAN	9.17	12.5	12.6	13.3	12.3	62.4	67.2	100	59.4	14.5	8.23	7.00
MAX	12	18	18	40	25	300	131	243	200	24	13	13
MIN	7.3	8.0	10	8.0	7.0	12	31	49	20	9.2	4.4	3.6
AC-FT	564	742	778	819	682	3840	4000	6160	3540	891	506	416

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1939 - 2003, BY WATER YEAR (WY)

MEAN	13.8	14.5	12.3	11.6	15.7	34.1	67.0	112	89.6	27.4	14.2	10.2
MAX	32.2	28.8	47.4	54.5	84.6	114	196	356	429	96.5	40.5	28.2
(WY)	1960	1976	1976	1984	1986	1978	1952	1976	1975	1955	1975	1965
MIN	5.52	5.73	3.74	3.83	4.17	7.61	10.0	16.0	11.5	6.19	3.89	3.68
(WY)	1940	1989	1993	1988	1944	1962	1941	1977	1992	1985	1961	1940

12335500 NEVADA CREEK ABOVE RESERVOIR, NEAR HELMVILLE, MT--Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1939 - 2003	
ANNUAL TOTAL	7436.5		11561.3			
ANNUAL MEAN	20.4		31.7		35.4	
HIGHEST ANNUAL MEAN					77.2	1975
LOWEST ANNUAL MEAN					11.8	1988
HIGHEST DAILY MEAN	133	Jun 10	300	Mar 13	1240	May 22 1981
LOWEST DAILY MEAN	5.0	Jan 1	3.6	Sep 3	2.0	Jan 11 1944
ANNUAL SEVEN-DAY MINIMUM	5.7	Sep 14	3.8	Sep 1	2.0	Feb 9 1944
MAXIMUM PEAK FLOW				Unknown	b1800	Jun 2 1953
MAXIMUM PEAK STAGE				Unknown	c7.40	May 29 1953
INSTANTANEOUS LOW FLOW			a3.4	Sep 1	d2.0	Aug 20 1944
ANNUAL RUNOFF (AC-FT)	14750		22930		25680	
10 PERCENT EXCEEDS	52		78		87	
50 PERCENT EXCEEDS	12		12		15	
90 PERCENT EXCEEDS	7.2		7.9		6.4	

a--Gage height, 1.27 ft.
b--Gage height, 6.00 ft, site and datum then in use; from rating extended above 400 ft^3/s, on the basis of inflow-outflow study of Nevada Lake.
c--Site and datum then in use; backwater from diversion dam.
d--Probably less than 2.0 ft^3/s in several years.
e--Estimated.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--April 1994 to January 2000, May 2003 to August 2003.

REMARKS.--Unpublished records of instantaneous water temperature and specific conductance are available in files of the District Office.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instantaneous discharge, cfs (00061)	pH, water, unfltrd field, std units (00400)	Specif. conductance, wat unf uS/cm 25 degC (00095)	Temperature, air, deg C (00020)	Temperature, water, deg C (00010)	Hardness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnesium, water, fltrd, mg/L (00925)	Potassium, water, fltrd, mg/L (00935)	Sodium adsorption ratio (00931)
MAY 2003											
14...	0830	52	8.5	266	3.0	5.0	130	36.7	8.51	2.16	.3
JUN											
06...	0845	81	8.2	217	9.0	9.5	100	28.7	8.09	--	--
JUL											
23...	1015	11	8.2	281	18.0	15.5	140	39.3	10.3	--	--
AUG											
13...	0900	11	8.2	255	18.0	14.0	120	32.8	10.0	2.09	.2

Date	Sodium, water, fltrd, mg/L (00930)	Alkalinity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chloride, water, fltrd, mg/L (00940)	Fluoride, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of constituents mg/L (70301)	Residue water, fltrd, tons/acre-ft (70303)	Residue water, fltrd, tons/d (70302)	Ammonia + org-N, water, unfltrd mg/L as N (00625)
MAY 2003										
14...	7.50	109	2.05	<.17	20.7	29.5	173	.23	24.2	.40
JUN										
06...	--	--	--	--	--	--	--	--	--	.35
JUL										
23...	--	--	--	--	--	--	--	--	--	.28
AUG										
13...	5.18	126	1.15	<.2	20.7	8.0	155	.21	4.62	.19

Date	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Phos-phorus, water, unfltrd mg/L (00665)	Arsenic water unfltrd ug/L (01002)	Cadmium water, unfltrd ug/L (01027)	Chrom-ium, water, unfltrd recover -able, ug/L (01034)	Copper, water, unfltrd recover -able, ug/L (01042)	Iron, water, unfltrd recover -able, ug/L (01045)	Lead, water, unfltrd recover -able, ug/L (01051)
MAY 2003										
14...	<.022	E.002	.025	.055	3	<.2	<.8	1.9	300	.23
JUN										
06...	<.022	<.002	.025	.059	3	<.2	<.8	1.6	370	.31
JUL										
23...	<.022	<.002	.033	.059	5	<.04	<.8	1.2	180	.09
AUG										
13...	<.022	<.002	.029	.047	5	<.04	<.8	1.2	40	.18

Date	Nickel, water, unfltrd recover -able, ug/L (01067)	Zinc, water, unfltrd recover -able, ug/L (01092)	Suspnd. sedi-ment, sieve diametr percent <.063mm (70331)	Sus-pended sedi-ment concen-tration mg/L (80154)	Sus-pended sedi-ment load, tons/d (80155)
MAY 2003					
14...	1.31	10	85	11	1.5
JUN					
06...	1.27	E2	79	16	3.5
JUL					
23...	1.52	<2	90	5	.15
AUG					
13...	1.77	E1	84	5	.15

E--Estimated.

PEND OREILLE RIVER BASIN

12337800 NEVADA CREEK AT MOUTH, NEAR HELMVILLE, MT

LOCATION (REVISED).--Lat 46°53'27", long 113°02'216" (NAD 27), in $SW^1/_4SW^1/_4SW^1/_4$ sec.7, T.13N., R.11W., Powell County, Hydrologic Unit 17010203, on left bank 0.5 mi upstream from private road bridge, 3.8 mi southwest of Browns Lake, 4.0 mi northwest of Helmville, and at river mile 0.7.

DRAINAGE AREA.--308 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 2001 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 4,240 ft (NGVD 29). Oct. 1, 2001 to Oct. 2, 2002, water-stage recorder 0.5 mi downstream at different elevation.

REMARKS.--Water-discharge records fair except those for estimated daily discharges, which are poor. Partial regulation by Nevada lake (station number 12336500). Numerous diversions for irrigation upstream from station. U.S. Geological Survey satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21	e19	e26	e23	e100	e40	87	224	280	46	23	25
2	20	e20	e26	e23	e90	e42	95	216	273	47	21	25
3	19	e21	e27	e24	e70	e38	97	179	253	43	19	24
4	19	e22	e27	e24	e50	e38	93	181	190	43	17	24
5	19	e23	28	e25	e45	e40	83	214	134	42	17	21
6	19	e23	e27	e25	e40	e42	68	206	107	39	18	22
7	19	e24	e25	e24	e40	e38	61	180	96	41	19	23
8	19	e25	e24	e22	e42	e35	58	168	75	42	20	26
9	19	25	e23	e20	e45	e37	59	155	69	35	22	26
10	19	25	e23	e18	e45	e40	62	144	64	34	23	28
11	19	25	e25	e19	e45	e46	65	128	74	30	23	28
12	19	25	e27	e22	e42	e100	70	127	76	28	22	33
13	19	25	e28	e24	e45	e200	78	120	73	28	23	36
14	19	27	e28	e23	e48	e500	112	104	66	27	24	35
15	19	26	e28	e22	e50	e400	132	84	63	29	25	32
16	19	26	e27	e21	e48	275	119	78	59	31	28	30
17	19	26	e25	e20	e45	224	119	76	56	29	28	33
18	19	26	e24	e20	e45	112	109	77	54	27	28	32
19	20	26	e23	e20	48	73	107	71	59	24	28	28
20	21	26	e22	e22	47	65	105	65	78	22	28	24
21	20	27	e23	e20	48	65	104	64	92	21	27	23
22	20	28	e23	e18	46	60	107	63	86	20	26	23
23	20	e27	e22	e20	e40	72	113	59	84	20	31	22
24	19	e25	e22	e22	e30	70	124	59	82	18	30	22
25	e19	e22	e22	e25	e32	69	140	65	80	20	27	21
26	e21	e23	e21	e30	e35	73	162	118	71	24	27	20
27	e23	e25	e22	e50	e38	73	191	147	62	26	28	20
28	25	e25	e24	e40	e40	73	198	146	56	26	28	19
29	e21	e25	e23	e35	---	71	211	184	50	25	26	20
30	e18	e25	e21	e50	---	71	223	215	48	21	24	20
31	e18	---	e22	e80	---	76	---	268	---	21	24	---
TOTAL	610	737	758	831	1339	3158	3352	4185	2910	929	754	765
MEAN	19.7	24.6	24.5	26.8	47.8	102	112	135	97.0	30.0	24.3	25.5
MAX	25	28	28	80	100	500	223	268	280	47	31	36
MIN	18	19	21	18	30	35	58	59	48	18	17	19
AC-FT	1210	1460	1500	1650	2660	6260	6650	8300	5770	1840	1500	1520

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 2002 - 2003, BY WATER YEAR (WY)

MEAN	22.1	24.5	23.2	24.9	34.6	64.2	90.5	84.9	87.2	35.1	26.0	28.4
MAX	24.5	24.6	24.5	26.8	47.8	102	112	135	97.0	40.2	27.7	31.2
(WY)	2002	2003	2003	2003	2003	2003	2003	2003	2003	2002	2002	2002
MIN	19.7	24.4	21.9	23.0	21.3	26.5	69.3	34.7	77.3	30.0	24.3	25.5
(WY)	2003	2002	2002	2002	2002	2002	2002	2002	2002	2003	2003	2003

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 2002 - 2003	
ANNUAL TOTAL	12754		20328			
ANNUAL MEAN	34.9		55.7		45.4	
HIGHEST ANNUAL MEAN					55.7	2003
LOWEST ANNUAL MEAN					35.1	2002
HIGHEST DAILY MEAN	254	Apr 7	500	Mar 14	500	Mar 14 2003
LOWEST DAILY MEAN	15	Feb 25	17	Aug 4	15	Feb 25 2002
ANNUAL SEVEN-DAY MINIMUM	18	Feb 24	19	Aug 2	18	Feb 24 2002
MAXIMUM PEAK FLOW			a500	Mar 14	a500	Mar 14 2003
MAXIMUM PEAK STAGE			b5.86	Feb 2	5.86	Feb 2 2003
INSTANTANEOUS LOW FLOW			c15	Aug 5	c15	Aug 5 2003
ANNUAL RUNOFF (AC-FT)	25300		40320		32900	
10 PERCENT EXCEEDS	62		119		84	
50 PERCENT EXCEEDS	26		28		27	
90 PERCENT EXCEEDS	19		20		20	

a--Estimated daily discharge during period of ice effect.
b--Backwater from ice.
c--Gage height, 2.44 ft.
e--Estimated.

12337800 NEVADA CREEK AT MOUTH, NEAR HELMVILLE, MT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 2001 to current year.
PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: October 2001 to current year.
INSTRUMENTATION.--Temperature probe installed Oct. 25, 2001.
REMARKS--Water temperature record good. Missing temperature data for May 22-27 due to equipment problems. Unpublished records of instantaneous specific conductance and temperature data are available in files of the District office.
EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Maximum, 27.5°C, July 13, 2002; minimum, 0.0°C, many days during winter months.
EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: Maximum, 26.0°C, June 18 and July 19; minimum, 0.0°C, many days October through March.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instan-taneous dis-charge, cfs (00061)	pH, water, unfltrd field, std units (00400)	Specif. conduc-tance, wat unf uS/cm 25 degC (00095)	Temper-ature, air, deg C (00020)	Temper-ature, water, deg C (00010)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)
MAR 2003									
25...	0930	66	7.7	334	1.0	.5	.84	.083	.003
MAY									
14...	1045	108	8.2	314	9.0	10.5	.56	<.022	E.002
JUN									
06...	1045	105	8.2	343	14.0	14.0	.62	<.022	<.002
JUL									
23...	1230	19	8.8	340	29.0	22.0	.41	<.022	<.002
AUG									
13...	1215	24	8.6	377	25.0	20.0	.62	<.022	<.002

Date	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Phos-phorus, water, unfltrd mg/L (00665)	Suspnd. sedi-ment, sieve diametr percent <.063mm (70331)	Sus-pended sedi-ment concen-tration mg/L (80154)	Sus-pended sedi-ment load, tons/d (80155)
MAR 2003					
25...	.070	.194	97	57	10
MAY					
14...	.070	.126	98	24	7.0
JUN					
06...	.102	.170	96	22	6.2
JUL					
23...	.100	.135	98	10	.51
AUG					
13...	.090	.147	99	16	1.0

Date	Time	Hard-ness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Potas-sium, water, fltrd, mg/L (00935)	Sodium adsorp-tion ratio (00931)	Sodium, water, fltrd, mg/L (00930)	Alka-linity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chlor-ide, water, fltrd, mg/L (00940)	Fluor-ide, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)
MAR 2003											
25...	0930	150	40.0	11.1	4.35	.5	13.0	145	4.48	.18	19.9
MAY											
14...	1045	140	39.0	10.7	3.36	.5	12.5	134	3.00	<.17	22.4
JUL											
23...	1230	--	--	--	--	--	--	--	--	--	--

Date	sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of consti-tuents mg/L (70301)	Residue water, fltrd, tons/ acre-ft (70303)	Residue water, fltrd, tons/d (70302)	Arsenic water unfltrd ug/L (01002)	Cadmium water, unfltrd ug/L (01027)	Chrom-ium, water, unfltrd recover-able, ug/L (01034)	Copper, water, unfltrd recover-able, ug/L (01042)	Iron, water, unfltrd recover-able, ug/L (01045)	Lead, water, unfltrd recover-able, ug/L (01051)	Nickel, water, unfltrd recover-able, ug/L (01067)	Zinc, water, unfltrd recover-able, ug/L (01092)
MAR 2003												
25...	29.2	210	.29	37.4	3	<.2	1.0	7.5	--	1.64	2.67	7
MAY												
14...	30.2	202	.27	58.8	4	<.2	E.4	2.2	430	.42	1.74	6
JUL												
23...	--	--	--	--	8	<.04	<.8	1.8	220	.13	1.71	3

E--Estimated.

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	9.5	7.0	8.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	8.5	5.0	7.0	0.5	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0
3	12.0	7.0	8.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	9.5	7.0	8.5	0.5	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0
5	9.0	7.5	8.0	0.5	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0
6	10.0	7.0	8.5	0.5	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0
7	11.0	8.0	9.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	10.5	8.5	9.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	9.0	7.0	8.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	8.5	6.5	8.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	8.0	5.0	6.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	5.5	3.0	4.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	5.5	2.5	4.0	1.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0
14	6.0	3.5	5.0	2.0	1.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0
15	6.0	3.5	5.0	2.5	1.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0
16	6.5	4.0	5.5	1.5	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0
17	6.0	3.5	5.0	2.0	0.5	1.0	0.0	0.0	0.0	0.0	0.0	0.0
18	6.5	4.0	5.5	2.0	1.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0
19	6.0	4.0	5.0	2.0	1.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0
20	7.0	4.5	6.0	3.5	2.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0
21	6.5	4.5	5.5	3.5	2.5	3.5	0.0	0.0	0.0	0.0	0.0	0.0
22	6.0	2.5	4.0	4.5	3.0	3.5	0.0	0.0	0.0	0.0	0.0	0.0
23	2.5	1.0	2.0	4.0	0.5	2.5	0.0	0.0	0.0	0.0	0.0	0.0
24	1.5	0.0	1.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25	1.5	0.0	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	1.5	0.0	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27	1.0	0.0	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28	3.0	1.0	2.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29	2.0	0.0	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30	0.5	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31	0.5	0.0	0.0	---	---	---	0.0	0.0	0.0	0.0	0.0	0.0
MONTH	12.0	0.0	5.0	4.5	0.0	0.5	0.5	0.0	0.0	0.0	0.0	0.0

PEND OREILLE RIVER BASIN

12337800 NEVADA CREEK AT MOUTH, NEAR HELMVILLE, MT--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003--Continued

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	0.0	0.0	0.0	0.0	0.0	0.0	6.5	5.0	6.0	10.5	8.5	9.5
2	0.0	0.0	0.0	0.5	0.0	0.0	5.5	4.0	4.5	10.5	8.5	9.5
3	0.0	0.0	0.0	0.0	0.0	0.0	4.5	2.5	3.5	9.5	8.0	8.5
4	0.0	0.0	0.0	0.0	0.0	0.0	4.5	2.0	3.5	11.5	8.0	9.0
5	0.0	0.0	0.0	0.0	0.0	0.0	5.5	3.0	4.0	9.5	7.0	8.5
6	0.0	0.0	0.0	0.0	0.0	0.0	6.5	3.0	4.5	8.5	6.5	8.0
7	0.0	0.0	0.0	0.0	0.0	0.0	7.5	2.5	5.0	8.5	6.5	7.5
8	0.0	0.0	0.0	0.0	0.0	0.0	10.0	3.5	6.5	10.0	6.5	8.0
9	0.0	0.0	0.0	0.0	0.0	0.0	11.5	6.0	9.0	9.0	7.5	8.5
10	0.0	0.0	0.0	0.0	0.0	0.0	12.0	6.5	9.5	11.0	7.0	9.0
11	0.0	0.0	0.0	0.0	0.0	0.0	12.5	8.0	10.5	12.0	8.0	10.0
12	0.0	0.0	0.0	0.0	0.0	0.0	12.0	8.0	10.5	11.5	9.5	10.5
13	0.0	0.0	0.0	1.0	0.0	0.5	11.0	8.5	9.5	13.5	9.0	11.0
14	0.0	0.0	0.0	2.0	0.0	1.0	9.0	6.5	8.0	14.0	9.5	12.0
15	0.0	0.0	0.0	2.0	0.0	1.0	8.5	6.5	7.5	16.0	11.5	13.5
16	0.5	0.0	0.0	3.5	0.5	1.5	8.0	5.0	6.5	14.5	10.0	12.0
17	1.0	0.0	0.5	3.5	0.0	1.5	9.0	5.0	7.0	11.5	8.0	10.0
18	1.5	0.0	0.5	4.0	0.5	2.0	9.0	7.0	8.0	10.0	7.0	8.5
19	2.0	0.0	1.0	5.5	0.5	3.0	10.0	5.0	7.5	12.5	6.0	9.0
20	2.0	0.0	1.0	6.0	1.0	3.5	12.0	7.0	9.5	13.5	9.5	11.5
21	2.0	0.0	1.0	4.5	2.0	3.5	12.5	9.0	11.0	13.0	11.0	12.0
22	2.0	0.0	0.5	5.5	2.5	4.0	13.5	10.0	12.0	---	---	---
23	0.0	0.0	0.0	5.0	2.0	4.0	13.5	11.0	12.5	---	---	---
24	0.0	0.0	0.0	3.5	0.5	2.5	14.0	11.0	12.5	---	---	---
25	0.0	0.0	0.0	2.5	0.5	1.5	13.0	10.5	11.5	---	---	---
26	0.0	0.0	0.0	2.5	1.0	2.0	10.5	6.5	8.5	---	---	---
27	0.0	0.0	0.0	4.0	1.0	2.5	8.0	5.5	7.0	---	---	---
28	0.0	0.0	0.0	4.5	1.5	3.0	8.5	6.5	7.0	20.0	15.0	17.0
29	---	---	---	5.5	2.0	4.0	7.0	5.5	6.0	21.0	18.5	20.0
30	---	---	---	7.5	4.0	5.5	9.5	6.5	7.5	20.0	16.5	18.5
31	---	---	---	8.0	6.0	7.0	---	---	---	16.5	14.5	15.0
MONTH	2.0	0.0	0.0	8.0	0.0	1.5	14.0	2.0	8.0	---	---	---

		JUNE			JULY			AUGUST			SEPTEMBER	
1	17.0	14.0	15.5	24.0	19.0	21.5	24.5	17.5	21.5	19.0	15.0	17.5
2	16.5	14.5	15.5	23.0	18.5	20.5	22.5	17.5	20.5	19.0	14.0	16.5
3	15.0	13.0	14.0	21.0	17.5	19.0	23.0	19.0	21.0	18.5	14.0	16.5
4	16.0	13.5	15.0	21.5	14.5	17.5	22.0	19.0	20.5	18.0	13.5	16.0
5	18.0	13.0	15.5	21.0	14.5	18.0	22.0	16.5	19.0	18.5	14.5	16.5
6	18.0	14.0	16.0	21.0	16.5	19.0	22.5	17.5	19.0	19.0	15.0	17.0
7	18.5	13.5	16.0	22.5	17.0	19.5	21.5	15.5	19.0	19.5	16.0	17.5
8	19.0	16.0	17.5	21.0	18.5	19.5	23.5	18.0	21.0	17.5	14.0	16.0
9	20.0	16.5	18.0	21.5	16.0	18.5	24.5	19.5	22.0	16.0	12.5	14.0
10	20.0	17.0	18.5	23.5	14.5	19.0	24.5	20.0	22.5	15.0	13.0	14.0
11	18.5	15.0	17.0	25.0	16.0	20.5	23.0	19.0	21.0	14.5	12.5	13.5
12	21.0	14.5	17.5	25.5	17.0	21.5	22.0	18.5	20.0	14.0	11.5	12.5
13	20.0	16.0	18.0	23.0	18.0	21.0	22.5	18.0	20.5	13.5	10.0	11.5
14	21.0	15.0	18.0	22.5	17.0	20.0	23.0	18.5	21.0	13.5	10.5	12.0
15	22.5	17.0	19.5	24.0	16.5	20.5	23.0	19.5	21.5	15.0	12.5	13.5
16	24.0	17.5	20.5	25.5	20.5	23.0	22.0	19.5	21.0	13.5	10.5	12.0
17	25.0	18.0	21.5	25.5	19.0	22.5	21.0	17.5	19.5	10.5	8.5	9.5
18	26.0	19.5	22.5	25.5	19.0	22.5	22.0	18.0	20.0	11.0	8.0	9.5
19	24.5	20.0	22.0	26.0	19.5	23.0	22.5	18.5	20.5	12.5	9.0	10.5
20	20.0	16.0	18.0	25.5	20.0	23.0	22.5	19.0	21.0	14.0	10.5	12.0
21	16.0	13.0	14.5	25.5	19.0	22.5	21.0	17.5	19.5	13.5	10.0	12.0
22	13.5	11.5	12.5	25.0	19.0	22.5	20.0	18.0	19.0	13.5	10.0	12.0
23	15.5	11.0	13.5	25.5	19.0	22.5	19.5	17.0	18.5	14.0	11.0	12.5
24	17.0	14.5	15.5	23.5	19.5	21.0	20.0	16.0	18.0	14.0	10.5	12.5
25	18.5	13.5	16.0	23.0	18.5	20.5	20.5	16.5	18.5	14.5	10.5	12.5
26	20.0	14.0	17.0	23.5	19.0	21.5	20.5	17.0	19.0	15.5	12.0	14.0
27	22.0	15.0	18.5	24.5	18.5	21.5	19.5	18.0	18.5	15.0	11.5	13.5
28	23.0	16.0	19.5	24.5	19.0	22.0	19.0	15.0	17.0	14.5	10.5	12.5
29	24.5	15.5	20.0	24.5	18.0	21.5	18.0	14.5	16.5	13.0	10.5	12.0
30	24.5	17.5	21.0	24.5	18.5	22.0	18.5	14.0	16.5	12.0	8.0	10.0
31	---	---	---	24.5	17.5	21.0	19.0	14.5	17.0	---	---	---
MONTH	26.0	11.0	17.5	26.0	14.5	21.0	24.5	14.0	19.5	19.5	8.0	13.5

PEND OREILLE RIVER BASIN

12338300 NORTH FORK BLACKFOOT RIVER ABOVE DRY GULCH, NEAR OVANDO, MT

LOCATION.--Lat 46°58'48", 1ong 113°05'25" (NAD 27), in NW$^1/_4$SW$^1/_4$SW$^1/_4$ sec.11, T.14 N., R.12 W., Powell County, Hydrologic Unit 17010203, on right bank 400 ft upstream from county road bridge, 0.9 mi upstream from Dry Gulch, 3.2 mi southeast of Ovando, and at river mile 2.5.
DRAINAGE AREA.--314 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1997 to current year.
GAGE.--Water-stage recorder. Elevation of gage is 4,060 ft (NGVD 29).
REMARKS.--Water-discharge records good. Numerous diversions for irrigation upstream from station. U.S. Geological Survey satellite telemeter at station.
EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 8, 1964 reached a discharge of 11,800 ft^3/s, from slope-area measurement of peak flow, as determined at North Fork Blackfoot River near Ovando (station 12338000), 9 mi upstream. Flood of about May 22, 1948 reached a discharge of 4,380 ft^3/s, from slope-area measurement of peak flow at same site.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	170	132	118	107	143	89	146	689	2610	466	229	170
2	170	132	118	107	122	89	147	742	2420	450	225	168
3	168	132	118	107	110	89	148	775	2000	432	223	167
4	167	132	118	105	105	89	141	786	1690	411	222	168
5	166	131	117	105	103	88	140	793	1450	396	217	167
6	163	131	116	104	101	87	140	739	1360	387	217	164
7	162	131	116	104	98	87	140	687	1250	376	222	163
8	160	131	115	104	99	86	140	632	1230	368	216	164
9	159	130	115	103	99	86	146	593	1430	362	211	164
10	159	128	114	102	98	86	161	558	1380	347	207	164
11	159	128	115	102	98	88	190	532	1400	337	205	164
12	159	126	114	102	97	94	269	548	1250	329	203	178
13	158	127	114	102	97	102	363	584	1170	319	202	177
14	157	126	114	102	97	102	468	672	1120	314	199	173
15	155	126	113	101	96	104	443	906	1090	308	197	169
16	154	125	111	100	96	122	415	1170	1020	301	197	169
17	154	125	111	100	96	120	410	1010	976	294	197	169
18	152	123	111	100	96	114	428	899	971	288	193	168
19	151	123	111	99	94	111	410	791	948	282	190	166
20	150	124	110	98	94	110	444	729	956	271	186	163
21	149	123	109	98	93	111	556	718	862	267	184	158
22	148	124	110	97	93	113	758	737	768	260	182	151
23	149	126	109	96	e92	124	940	989	685	248	184	155
24	148	122	109	96	e90	118	1280	1480	664	248	182	165
25	146	121	109	95	e90	114	1540	2370	609	248	179	164
26	146	121	108	96	90	113	1340	3140	567	245	177	153
27	145	120	109	96	89	111	1040	2930	538	243	177	151
28	145	119	109	96	89	109	888	2810	526	242	176	150
29	142	119	108	96	---	110	780	3160	499	237	175	149
30	138	118	107	96	---	117	709	3370	481	233	174	149
31	134	---	107	100	---	132	---	3000	---	231	173	---
TOTAL	4783	3776	3483	3116	2765	3215	15120	39539	33920	9740	6121	4900
MEAN	154	126	112	101	98.8	104	504	1275	1131	314	197	163
MAX	170	132	118	107	143	132	1540	3370	2610	466	229	178
MIN	134	118	107	95	89	86	140	532	481	231	173	149
AC-FT	9490	7490	6910	6180	5480	6380	29990	78430	67280	19320	12140	9720

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1998 - 2003, BY WATER YEAR (WY)

MEAN	156	140	120	103	95.6	99.7	331	1203	1287	435	222	171
MAX	183	160	137	117	113	122	542	1372	1940	626	280	197
(WY)	1998	1998	2000	2000	2000	2000	2000	1999	1999	1999	1999	1999
MIN	119	114	99.5	90.6	82.3	77.5	121	801	766	265	167	128
(WY)	2002	2002	2002	2002	2001	2001	2001	2001	2001	2001	2001	2001

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1998 - 2003	
ANNUAL TOTAL	157683		130478			
ANNUAL MEAN	432		357		364	
HIGHEST ANNUAL MEAN					456	1999
LOWEST ANNUAL MEAN					242	2001
HIGHEST DAILY MEAN	3370	May 21	3370	May 30	3870	May 26 1999
LOWEST DAILY MEAN	84	Mar 2	86	Mar 8	72	Mar 18 2001
ANNUAL SEVEN-DAY MINIMUM	84	Mar 2	87	Mar 5	73	Mar 5 2001
MAXIMUM PEAK FLOW			3770	May 30	b4280	May 26 1999
MAXIMUM PEAK STAGE			5.81	May 30	5.92	May 20 2003
INSTANTANEOUS LOW FLOW			a85	Mar 6	c69	Mar 18 2001
ANNUAL RUNOFF (AC-FT)	312800		258800		264000	
10 PERCENT EXCEEDS	1490		920		980	
50 PERCENT EXCEEDS	159		155		160	
90 PERCENT EXCEEDS	87		97		90	

a--Gage height, 2.37 ft.
b--Gage height, 5.75 ft.
c--Gage height, 2.35 ft.
e--Estimated.

PEND OREILLE RIVER BASIN

12340000 BLACKFOOT RIVER NEAR BONNER, MT

LOCATION.--Lat 46°53'59", long 113°45'20" (NAD 27), in $SE^1/_4SE^1/_4NW^1/_4$ sec.9, T.13 N., R.17 W., Missoula County, Hydrologic Unit 17010203, Lolo National Forest, on right bank 5.0 mi downstream from Union Creek, 5.6 mi northeast of Bonner, and at river mile 7.9.

DRAINAGE AREA.--2,290 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July to November 1898, March 1899 to September 1901, May 1903 to January 1905, March to October 1905, October 1939 to current year. Monthly discharge only for some periods, published in WSP 1316. Published as "at Bonner" 1898-99 and as Big Blackfoot near Bonner 1903-05.

REVISED RECORDS.--WSP 1216: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 3,344.76 ft (NGVD 29). July 7, 1898 to June 30, 1901, and May 15, 1903, to Oct. 31, 1905, nonrecording gage at site 7 mi downstream at different elevation. Oct. 4, 1939, to Sept. 30, 1955, nonrecording gage at site 1.3 mi downstream at elevation 21.82 ft lower.

REMARKS.--Water-discharge records good except those for estimated daily discharges, which are fair. Flow slightly regulated by Nevada Creek Reservoir (station number 12336500). Diversions for irrigation of about 20,000 acres upstream from station. U.S. Geological Survey satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	556	394	464	446	1080	478	1470	3560	7360	1600	597	491
2	557	470	466	437	1200	466	1620	3490	6800	1500	593	483
3	552	494	471	452	940	456	1650	3490	6190	1430	591	475
4	547	523	458	440	721	432	1560	3540	5500	1370	592	464
5	542	522	461	443	639	438	1470	3760	4890	1310	584	461
6	544	532	458	433	592	448	1400	3720	4440	1280	590	456
7	541	547	449	402	532	449	1320	3540	4160	1230	599	456
8	536	519	434	e370	562	402	1280	3360	3950	1210	600	462
9	537	526	e420	e340	534	397	1310	3170	3940	1200	596	470
10	529	507	413	e300	517	457	1470	3020	3960	1140	581	479
11	527	496	422	e320	504	566	1780	2880	3940	1090	578	479
12	529	492	453	e370	483	641	2270	2810	3820	1030	576	533
13	528	490	447	e420	473	946	2830	2830	3600	991	566	547
14	525	498	452	e450	490	1600	3420	2890	3470	959	565	541
15	523	495	452	e430	479	1590	3710	3140	3380	939	560	522
16	518	490	448	e410	475	1410	3630	3610	3260	917	556	521
17	517	488	450	e380	479	1440	3460	3680	3120	885	552	527
18	515	485	424	e370	475	1210	3300	3510	3000	851	547	528
19	511	483	e380	e400	464	1030	3120	3290	2950	827	541	519
20	511	483	e370	e430	461	953	3000	3060	3030	795	531	505
21	508	491	e400	e400	464	944	3010	2920	3050	766	517	499
22	502	494	e430	e370	474	966	3260	2900	2830	748	511	488
23	500	522	e450	e350	426	1190	3730	3110	2590	710	527	483
24	498	508	437	e380	301	1190	4310	3650	2390	686	534	485
25	497	e420	e410	e450	342	1090	4940	4620	2260	691	528	492
26	498	e440	e400	e550	424	1050	5170	6080	2120	684	514	489
27	500	e450	e450	662	465	1030	4860	6960	1970	678	508	476
28	506	e440	472	640	483	990	4420	6990	1890	667	522	473
29	503	e450	457	606	---	950	4030	7290	1810	650	513	466
30	452	e460	448	573	---	961	3750	7830	1700	628	497	462
31	418	---	464	644	---	1140	---	7820	---	609	494	---
TOTAL	16027	14609	13610	13668	15479	27310	86550	126520	107370	30071	17160	14732
MEAN	517	487	439	441	553	881	2885	4081	3579	970	554	491
MAX	557	547	472	662	1200	1600	5170	7830	7360	1600	600	547
MIN	418	394	370	300	301	397	1280	2810	1700	609	494	456
AC-FT	31790	28980	27000	27110	30700	54170	171700	251000	213000	59650	34040	29220
CFSM	0.23	0.21	0.19	0.19	0.24	0.38	1.26	1.78	1.56	0.42	0.24	0.21
IN.	0.26	0.24	0.22	0.22	0.25	0.44	1.41	2.06	1.74	0.49	0.28	0.24

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1898 - 2003, BY WATER YEAR (WY)*

MEAN	656	652	608	554	601	780	2052	4905	4931	1863	838	672
MAX	1547	1480	1555	1069	1668	2351	4727	9802	13610	6557	1921	1250
(WY)	1960	1960	1996	1976	1971	1986	1943	1997	1899	1899	1899	1899
MIN	370	369	332	348	359	435	463	1096	1158	533	365	363
(WY)	1988	1988	1988	1988	1993	1988	1905	1941	1987	1977	1988	1988

12340000 BLACKFOOT RIVER NEAR BONNER, MT--Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1898 - 2003*	
ANNUAL TOTAL	547464		483106			
ANNUAL MEAN	1500		1324		1578	
HIGHEST ANNUAL MEAN					2480	1976
LOWEST ANNUAL MEAN					558	1941
HIGHEST DAILY MEAN	8080	May 31	7830	May 30	18000	Jun 10 1964
LOWEST DAILY MEAN	320	Feb 25	300	Jan 10	200	Jan 4 1950
ANNUAL SEVEN-DAY MINIMUM	397	Jan 28	360	Jan 7	239	Dec 21 1983
MAXIMUM PEAK FLOW			8100	May 30	b19200	Jun 10 1964
MAXIMUM PEAK STAGE			7.43	May 30	c16.00	Feb 9 1996
INSTANTANEOUS LOW FLOW			a268	Feb 25	d156	Feb 2 1989
ANNUAL RUNOFF (AC-FT)	1086000		958200		1143000	
ANNUAL RUNOFF (CFSM)	0.65		0.58		0.69	
ANNUAL RUNOFF (INCHES)	8.89		7.85		9.36	
10 PERCENT EXCEEDS	4890		3550		4120	
50 PERCENT EXCEEDS	561		541		733	
90 PERCENT EXCEEDS	430		431		450	

*--During periods of operation (1900-01, 1904, 1940 to current year).
a--Gage height, 1.52 ft, but may have been lower during period of ice effect.
b--Gage height, 10.89 ft.
c--Backwater from ice.
d--Gage height, 1.20 ft, but may have been lower during 1989 period of ice effect.
e--Estimated.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1956-59, 1985 to current year.
PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: October 1955 to September 1959, October 1999 to current year.
SUSPENDED-SEDIMENT DISCHARGE: July 1986 to April 1987, June 1988 to September 1995.
INSTRUMENTATION.--Temperature recorder installed Aug. 3, 1999.
REMARKS.--Daily water temperature record good. Missing water temperature data from May 9-12 due to equipment problems. Unpublished records of instantaneous water temperature and specific conductance are available in files of District office.
EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Maximum, 22.5°C, July 19, 2003; minimum, 0.0°C on many days during winter periods.
SEDIMENT CONCENTRATION: Maximum daily mean, 335 mg/L, May 19, 1991; minimum daily mean, 1 mg/L on many days.
SEDIMENT LOAD: Maximum daily, 8,100 tons, May 19, 1991; minimum daily, 0.54 ton, Feb. 8, 1995.
EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE : Maximum, 22.5°C, July 19; minimum, 0.0°C on many days November through March.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instantaneous discharge, cfs (00061)	pH, water, unfltrd field, std units (00400)	Specif. conductance, wat unf uS/cm 25 degC (00095)	Temperature, air, deg C (00020)	Temperature, water, deg C (00010)	Hardness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnesium, water, fltrd, mg/L (00925)	Potassium, water, fltrd, mg/L (00935)	Sodium adsorption ratio (00931)
APR 2003											
03...	1550	1630	8.6	203	4.5	5.5	--	--	--	--	--
MAY											
28...	0800	6980	8.2	150	15.0	11.0	67	17.4	5.84	.63	.1
JUN											
02...	1120	6860	8.2	155	15.0	11.0	--	--	--	--	--
AUG											
26...	1440	512	8.6	268	33.0	18.0	140	33.8	13.0	1.01	.1
SEP											
22...	1425	489	8.6	271	23.0	12.5	140	34.3	12.8	--	--

Date	Sodium, water, fltrd, mg/L (00930)	Alkalinity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chloride, water, fltrd, mg/L (00940)	Fluoride, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of constituents mg/L (70301)	Residue water, fltrd, tons/acre-ft (70303)	Residue water, fltrd, tons/d (70302)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Nitrite + nitrate water fltrd, mg/L as N (00631)
APR 2003											
03...	--	--	--	--	--	--	--	--	--	.27	<.022
MAY											
28...	1.44	75	.47	<.2	7.01	3.0	81	.11	1520	.34	E.020
JUN											
02...	--	--	--	--	--	--	--	--	--	.24	<.022
AUG											
26...	3.41	136	1.05	<.2	10.1	5.5	149	.20	206	.14	<.022
SEP											
22...	--	--	--	--	--	--	--	--	--	--	--

12340000 BLACKFOOT RIVER NEAR BONNER, MT--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003--Continued

Date	Nitrite water, fltrd, mg/L as N (00613)	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Phos-phorus, water, unfltrd mg/L (00665)	Arsenic water, fltrd, ug/L (01000)	Arsenic water unfltrd ug/L (01002)	Cadmium water, fltrd, ug/L (01025)	Cadmium water, unfltrd ug/L (01027)	Chrom-ium, water, unfltrd recover-able, ug/L (01034)	Copper, water, fltrd, ug/L (01040)	Copper, water, unfltrd recover-able, ug/L (01042)	Iron, water, fltrd, ug/L (01046)
APR 2003											
03...	<.002	.009	.048	--	--	--	--	--	--	--	--
MAY											
28...	<.002	.007	.081	--	<2	--	<.2	E.6	--	4.3	--
JUN											
02...	.003	<.007	.053	--	--	--	--	--	--	--	--
AUG											
26...	<.002	<.007	.006	1.4	E2	<.04	<.04	<.8	.5	E.6	E4
SEP											
22...	--	--	--	1.2	E1	<.04	<.04	--	.4	.6	<8

Date	Iron, water, unfltrd recover-able, ug/L (01045)	Lead, water, fltrd, ug/L (01049)	Lead, water, unfltrd recover-able, ug/L (01051)	Mangan-ese, water, fltrd, ug/L (01056)	Mangan-ese, water, unfltrd recover-able, ug/L (01055)	Nickel, water, unfltrd recover-able, ug/L (01067)	Zinc, water, fltrd, ug/L (01090)	Zinc, water, unfltrd recover-able, ug/L (01092)	Suspnd. sedi-ment, sieve diametr percent <.063mm (70331)	Sus-pended sedi-ment concen-tration mg/L (80154)	Sus-pended sedi-ment load, tons/d (80155)
APR 2003											
03...	--	--	--	--	--	--	--	--	90	14	62
MAY											
28...	--	--	1.54	--	--	1.50	--	7	81	102	1920
JUN											
02...	--	--	--	--	--	--	--	--	83	59	1090
AUG											
26...	20	<.08	<.06	1.4	4	1.80	<1	<2	79	1	1.4
SEP											
22...	10	<.08	<.06	1.1	3	--	3	<2	82	1	1.3

E--Estimated.

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	9.5	7.5	8.5	2.0	0.5	1.0	1.0	0.5	0.5	0.5	0.0	0.5
2	9.0	6.5	8.0	1.0	0.5	0.5	1.0	0.5	1.0	0.5	0.5	0.5
3	9.0	7.5	8.5	0.5	0.5	0.5	1.5	0.5	1.0	1.0	0.5	0.5
4	10.0	8.5	9.0	0.5	0.5	0.5	2.0	1.0	1.5	1.0	0.5	0.5
5	9.5	8.5	9.0	0.5	0.5	0.5	2.5	1.5	2.0	1.5	1.0	1.5
6	10.0	8.5	9.0	0.5	0.0	0.5	2.5	1.5	2.0	1.5	0.5	1.0
7	10.5	8.0	9.5	0.5	0.0	0.5	1.5	1.0	1.5	0.5	0.0	0.5
8	10.5	8.5	9.5	0.5	0.5	0.5	1.5	1.0	1.5	0.5	0.0	0.5
9	10.0	8.0	9.0	0.5	0.5	0.5	1.0	1.0	1.0	0.5	0.0	0.5
10	9.0	7.0	8.5	2.5	0.5	1.5	1.0	0.5	0.5	0.5	0.0	0.5
11	8.0	7.0	7.5	3.5	2.5	3.0	1.0	0.5	1.0	0.0	0.0	0.0
12	7.0	5.5	6.5	3.0	2.5	3.0	1.5	0.5	1.0	0.0	0.0	0.0
13	6.5	4.0	5.5	3.5	3.0	3.5	2.0	1.0	1.5	0.5	0.0	0.0
14	6.5	4.0	5.5	4.0	3.5	3.5	2.5	2.0	2.5	0.5	0.0	0.0
15	6.5	4.5	5.5	4.0	3.0	3.5	3.0	2.0	2.5	0.5	0.0	0.5
16	6.5	4.5	5.5	3.0	2.5	3.0	2.5	2.0	2.0	0.5	0.0	0.5
17	6.5	4.5	5.5	3.5	3.0	3.5	2.5	1.0	2.0	0.5	0.0	0.5
18	6.5	4.5	6.0	4.0	3.0	3.5	1.0	0.5	0.5	0.5	0.0	0.5
19	6.0	4.5	5.5	4.5	3.5	4.0	0.5	0.0	0.5	0.5	0.0	0.0
20	7.0	5.0	6.0	5.0	4.5	4.5	0.5	0.5	0.5	0.0	0.0	0.0
21	7.0	5.0	6.0	5.5	4.5	5.0	0.5	0.0	0.5	0.0	0.0	0.0
22	6.5	5.5	6.0	6.0	5.0	5.5	0.5	0.0	0.5	1.0	0.0	0.5
23	6.0	4.5	5.0	5.5	3.5	4.5	0.5	0.0	0.5	0.5	0.5	0.5
24	4.5	2.0	3.5	3.5	1.0	2.0	0.5	0.5	0.5	0.5	0.5	0.5
25	3.0	1.0	2.0	1.0	0.0	0.5	0.5	0.0	0.5	0.5	0.0	0.5
26	2.5	0.5	2.0	0.5	0.0	0.5	0.5	0.0	0.0	1.0	0.0	0.5
27	2.5	0.5	2.0	0.5	0.0	0.5	0.5	0.0	0.5	0.5	0.0	0.5
28	3.5	2.5	3.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.0	0.5
29	3.0	1.5	2.5	0.5	0.5	0.5	1.0	0.5	0.5	0.5	0.0	0.0
30	1.5	0.5	1.0	0.5	0.0	0.5	0.5	0.0	0.5	1.0	0.0	0.5
31	1.0	0.5	1.0	---	---	---	0.5	0.0	0.5	1.0	0.5	1.0
MONTH	10.5	0.5	6.0	6.0	0.0	2.0	3.0	0.0	1.0	1.5	0.0	0.5

PEND OREILLE RIVER BASIN

12340000 BLACKFOOT RIVER NEAR BONNER, MT--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003--Continued

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	1.0	1.0	1.0	0.5	0.0	0.5	7.0	5.5	6.5	9.0	8.0	8.5
2	1.5	1.0	1.0	1.0	0.0	0.5	6.0	5.0	5.5	9.5	8.0	9.0
3	1.5	1.0	1.5	0.5	0.0	0.5	5.5	4.0	4.5	9.0	7.5	8.0
4	1.5	1.0	1.0	1.0	0.0	0.5	6.0	3.5	4.5	8.5	7.5	8.0
5	1.5	1.0	1.0	0.5	0.0	0.5	6.0	4.0	5.0	8.5	7.0	8.0
6	1.5	0.5	1.0	1.0	0.0	0.5	6.5	4.5	5.0	8.0	6.5	7.5
7	0.5	0.0	0.0	1.0	0.0	0.5	6.5	4.0	5.0	8.0	7.0	7.5
8	1.0	0.0	0.5	0.5	0.0	0.5	8.0	4.5	6.0	8.0	6.5	7.0
9	1.5	0.5	1.0	0.5	0.0	0.5	9.5	6.5	7.5	---	---	---
10	1.5	1.0	1.5	3.0	0.5	1.5	9.5	6.5	8.0	---	---	---
11	1.5	0.5	1.0	3.0	1.5	2.0	10.5	7.5	9.0	---	---	---
12	1.0	0.0	0.5	4.5	2.5	3.5	9.5	7.5	8.5	---	---	---
13	1.0	0.0	0.5	4.5	2.5	3.5	8.0	7.0	7.5	10.5	8.5	9.5
14	2.0	0.5	1.5	3.5	2.5	3.0	7.0	6.0	6.5	11.5	9.0	10.0
15	3.0	2.0	2.5	3.5	2.5	3.0	7.0	6.0	6.5	12.0	10.5	11.0
16	3.0	2.0	2.5	5.0	3.5	4.0	7.0	5.0	6.0	11.0	8.5	9.5
17	2.5	1.5	2.0	5.0	3.0	4.0	7.5	5.5	6.5	8.5	7.5	8.0
18	3.0	1.5	2.0	5.0	3.0	4.0	7.0	6.5	7.0	8.0	7.0	7.5
19	3.0	1.5	2.5	6.0	3.0	4.5	8.0	5.5	6.5	9.0	6.5	7.5
20	3.0	2.0	2.5	6.0	3.0	4.5	8.5	6.5	7.5	9.5	8.0	9.0
21	3.5	2.5	3.0	6.0	4.5	5.5	9.5	7.0	8.0	10.5	9.5	10.0
22	4.0	2.0	2.5	5.5	5.0	5.5	10.0	8.0	9.0	12.0	9.5	10.5
23	2.0	0.0	0.5	5.5	4.5	5.0	9.5	9.0	9.0	13.0	11.5	12.0
24	1.5	0.5	1.0	5.5	4.0	4.5	9.5	8.5	9.0	13.0	11.5	12.5
25	1.0	0.5	0.5	4.0	3.0	3.5	9.0	8.0	8.5	13.0	11.5	12.5
26	0.5	0.0	0.5	4.0	3.5	4.0	8.0	6.5	7.0	11.5	10.5	11.0
27	0.5	0.0	0.5	5.5	3.0	4.0	7.5	5.5	6.5	12.0	9.5	10.5
28	0.5	0.0	0.5	6.0	3.5	4.5	7.5	6.5	7.0	12.5	11.0	11.5
29	---	---	---	6.0	3.5	5.0	7.0	6.0	6.5	13.0	12.0	12.5
30	---	---	---	8.5	5.0	6.5	8.5	7.0	7.5	13.0	11.0	12.0
31	---	---	---	7.5	6.5	7.0	---	---	---	11.5	10.5	11.0
MONTH	4.0	0.0	1.5	8.5	0.0	3.0	10.5	3.5	7.0	---	---	---

		JUNE			JULY			AUGUST			SEPTEMBER	
1	11.5	10.0	11.0	19.5	16.5	18.0	21.5	17.5	19.5	17.0	14.0	15.5
2	11.5	10.5	11.0	19.0	16.5	17.5	21.0	17.5	19.5	17.0	14.0	15.5
3	11.5	9.5	10.5	17.5	15.5	16.5	20.5	18.0	19.5	17.5	14.0	16.0
4	12.0	10.5	11.0	18.0	14.5	16.0	20.5	17.5	19.0	17.0	14.0	15.5
5	12.0	10.5	11.5	18.5	14.5	16.5	19.5	16.0	18.0	17.5	15.0	16.0
6	12.5	11.0	11.5	18.5	15.0	16.5	19.5	16.0	18.0	17.5	15.0	16.0
7	12.5	11.0	12.0	19.0	14.5	17.0	20.0	16.5	18.5	18.0	15.5	16.5
8	13.0	12.0	12.5	18.0	16.5	17.0	20.5	17.5	19.0	17.0	14.5	16.0
9	14.0	12.5	13.5	18.5	14.5	16.5	21.0	17.0	19.0	15.5	13.5	14.5
10	14.0	13.0	13.5	20.0	15.5	17.5	21.0	17.5	19.5	14.5	12.5	13.5
11	14.0	12.5	13.0	21.0	16.5	18.5	19.5	16.5	18.0	13.5	12.5	13.0
12	14.0	11.5	13.0	21.5	17.5	19.5	17.5	16.0	16.5	13.0	12.0	12.5
13	14.0	13.0	13.5	20.5	18.0	19.0	18.5	15.5	17.0	13.0	10.5	12.0
14	14.5	13.0	14.0	19.5	16.0	18.0	19.0	16.0	17.5	13.0	10.0	12.0
15	15.5	13.5	14.5	20.5	16.0	18.5	19.0	16.5	18.0	14.0	11.5	13.0
16	16.0	14.0	15.0	21.5	17.0	19.5	20.0	17.5	18.5	13.5	12.0	13.0
17	17.0	15.0	16.0	22.0	18.0	20.0	19.0	16.0	17.5	12.0	10.5	11.0
18	18.0	16.0	17.0	22.0	18.0	20.0	18.5	15.5	17.0	11.5	9.0	10.5
19	17.5	16.5	17.0	22.5	18.5	20.5	19.0	16.0	17.5	12.5	9.5	11.0
20	16.5	14.0	15.0	22.0	18.5	20.5	19.0	16.5	18.0	13.5	11.0	12.0
21	14.0	12.0	13.0	22.0	18.0	20.5	18.0	15.5	17.0	13.0	10.0	11.5
22	12.5	11.0	12.0	22.0	18.0	20.5	17.0	15.5	16.0	13.0	10.0	11.5
23	13.5	11.0	12.0	21.5	18.0	20.0	18.0	15.0	16.5	13.0	10.5	12.0
24	14.5	12.5	13.5	21.0	18.0	19.0	18.5	14.5	16.5	13.5	10.5	12.0
25	14.5	12.5	13.5	19.5	16.5	18.0	18.5	15.0	17.0	13.5	11.0	12.5
26	16.0	13.0	14.0	20.0	17.0	19.0	18.0	15.0	17.0	14.0	11.5	13.0
27	17.5	14.0	15.5	21.5	17.5	19.5	18.0	16.5	17.0	14.0	11.5	13.0
28	18.0	14.5	16.5	21.0	17.5	19.5	17.5	14.5	16.0	13.5	11.0	12.5
29	18.5	15.0	16.5	21.5	17.0	19.5	17.5	14.0	16.0	13.0	10.5	12.0
30	20.0	16.5	18.0	21.5	17.5	19.5	17.5	14.0	15.5	12.0	9.5	11.0
31	---	---	---	21.0	17.0	19.5	17.0	13.5	15.5	---	---	---
MONTH	20.0	9.5	13.5	22.5	14.5	18.5	21.5	13.5	17.5	18.0	9.0	13.0

PEND OREILLE RIVER BASIN

12340500 CLARK FORK ABOVE MISSOULA, MT

LOCATION.--Lat 46°52'38", long 113°55'53" (NAD 27), in $NW^1/_4NW^1/_4NW^1/_4$ sec.19, T.13 N., R.18 W., Missoula County, Hydrologic Unit 17010204, on right bank 0.2 mi downstream from county road bridge, 2.8 mi east of Missoula, 2.8 mi downstream from Milltown Dam, 3.0 mi downstream from Blackfoot River, and at river mile 361.6.

DRAINAGE AREA.--5,999 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1929 to current year. Monthly discharge only for some periods, published in WSP 1316.

REVISED RECORDS.--WSP 1042: 1936. WSP 1152: 1942. WSP 1246: 1929-30, 1935, drainage area. WSP 1316: 1932-33.

GAGE.--Water-stage recorder. Elevation of gage is 3,198.30 ft (NGVD 29) (levels by U.S. Army Corps of Engineers). Prior to May 27, 1929, nonrecording gage.

REMARKS.--Water-discharge records good. Diurnal fluctuation caused by powerplant at Milltown. Diversions for irrigation of about 120,000 acres upstream from station. U. S. Geological Survey satellite telemeter at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1908 reached a discharge of 48,000 ft^3/s, provided by The Montana Power Company.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1180	942	1110	1050	3130	1130	2980	5980	14900	2860	1090	984
2	1130	1040	1100	1020	3090	1130	3470	5880	13500	2760	1090	979
3	1130	1160	e1100	1060	2200	1100	3420	5890	11900	2630	1080	960
4	1150	1150	1100	1080	1760	1060	3200	5990	10400	2550	1070	941
5	1160	1200	1070	1070	1580	1050	3040	6620	9160	2500	1090	933
6	1150	1190	1120	1060	1430	1080	2830	6670	8200	2500	1090	927
7	1170	1190	1090	995	1290	1110	2740	6370	7570	2350	1110	927
8	1160	1260	1010	902	1290	1050	2610	6040	7090	2260	1110	950
9	1150	1270	953	e800	1310	1000	2610	e5700	6910	2410	1210	962
10	1160	1260	927	e700	1320	1160	2850	e5400	6980	2320	1190	972
11	1160	1230	1010	e750	1200	1390	3410	e5200	7130	2220	1120	964
12	1180	1210	1090	877	1160	1680	4040	e5000	6950	2080	1090	1010
13	1180	1210	1090	1070	1130	3430	4830	5090	6350	2000	1070	1090
14	1190	1230	1140	1190	1160	5740	5660	5110	6100	2010	1050	1080
15	1180	1220	1090	1110	1190	5170	6060	5410	5950	1860	995	1050
16	1180	1190	1120	1040	1160	3900	5870	6110	5680	1760	914	1050
17	1170	1170	1100	859	1170	3940	5540	6430	5400	1730	905	1070
18	1180	1170	1060	797	1160	3180	5270	6190	5140	1620	933	1090
19	1180	1170	916	835	1130	2620	4950	5880	4980	1590	1010	1100
20	1160	1160	862	954	1120	2370	4750	5490	5080	1580	995	1080
21	1160	1180	e900	1020	1120	2300	4760	5180	5420	1420	974	1050
22	1150	1190	1020	843	1180	2280	5040	5040	5140	1460	963	1040
23	1140	1230	1040	737	1090	2580	5710	5300	4720	1370	1000	1040
24	1170	1250	999	772	769	2730	6670	6220	4340	1380	1060	1030
25	1110	1090	948	1020	677	2430	7600	8020	4070	1350	1050	1020
26	1130	1050	913	1180	846	2310	8080	10800	3870	1360	1010	1040
27	1140	1090	969	1820	946	2230	7660	12700	3560	1320	990	1020
28	1160	1080	1090	2550	1050	2110	6990	12900	3390	1290	994	999
29	1190	1090	1110	1530	---	2000	6360	13500	3200	1260	1000	996
30	1130	1140	1030	1420	---	2000	6150	14500	3060	1180	986	989
31	986	---	972	1610	---	2200	---	15100	---	1140	972	---
TOTAL	35766	35012	32049	33721	37658	69460	145150	225710	196140	58120	32211	30343
MEAN	1154	1167	1034	1088	1345	2241	4838	7281	6538	1875	1039	1011
MAX	1190	1270	1140	2550	3130	5740	8080	15100	14900	2860	1210	1100
MIN	986	942	862	700	677	1000	2610	5000	3060	1140	905	927
AC-FT	70940	69450	63570	66890	74690	137800	287900	447700	389000	115300	63890	60190

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1929 - 2003, BY WATER YEAR (WY)

MEAN	1559	1555	1415	1327	1474	1865	3723	7887	8266	3159	1487	1399
MAX	2987	2852	3323	2546	3431	4124	10080	17240	19270	8759	3448	2874
(WY)	1960	1960	1976	1976	1996	1986	1934	1976	1975	1975	1975	1965
MIN	854	882	874	606	674	1037	1191	2005	2122	868	627	653
(WY)	1936	1938	1945	1937	1933	1937	1941	1941	1992	1931	1988	1937

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1929 - 2003	
ANNUAL TOTAL	886957		931340			
ANNUAL MEAN	2430		2552		2934	
HIGHEST ANNUAL MEAN					5071	1976
LOWEST ANNUAL MEAN					1344	1941
HIGHEST DAILY MEAN	11500	Jun 1	15100	May 31	30800	Jun 21 1975
LOWEST DAILY MEAN	650	Feb 26	677	Feb 25	340	Sep 27 1937
ANNUAL SEVEN-DAY MINIMUM	911	Feb 25	851	Jan 18	446	Jan 7 1937
MAXIMUM PEAK FLOW			a15900	Jun 1	32300	Jun 21 1975
MAXIMUM PEAK STAGE			9.48	Jun 1	13.75	Jun 21 1975
INSTANTANEOUS LOW FLOW			b351	Jul 23	c115	Oct 25 1943
ANNUAL RUNOFF (AC-FT)	1759000		1847000		2126000	
10 PERCENT EXCEEDS	6910		6050		6920	
50 PERCENT EXCEEDS	1200		1180		1660	
90 PERCENT EXCEEDS	981		967		1000	

a--Result of regulation.
b--Gage height, 1.61 ft, result of regulation.
c--Gage height, 0.64 ft.
e--Estimated.

12340500 CLARK FORK ABOVE MISSOULA, MT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1969-71, 1977-83, 1986 to current year. Water years 1969-71 samples collected 3.4 miles downstream from gaging station.

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: June 1977 to September 1983, February 2002 to September 2002.

SUSPENDED-SEDIMENT DISCHARGE: July 1986 to April 1987, June 1988 to January 1996, March 1996 to March 2003, August 2003 to September 2003.

REMARKS.--Missing daily sediment data for Apr. 1 through July 28 due to temporary suspension of daily sediment program. Unpublished records of instantaneous water temperature and specific conductance are available in files of District office.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE (water years 1977-83, 2002-03): Maximum, 22.5°C, Aug. 7, 8, 1983, July 13-15, 2002; minimum, 0.0°C on many days during winter periods.

SEDIMENT CONCENTRATION: Maximum daily mean, 592 mg/L, May 18, 1997; minimum daily mean, 1 mg/L, on many days from 1990 to 1994, and 1999 to 2001.

SEDIMENT LOAD: Maximum daily, 42,200 tons, May 18, 1997; minimum daily, 1.6 tons, Dec. 27, 1992.

EXTREMES FOR CURRENT YEAR.--

SEDIMENT CONCENTRATION: During period of operation, maximum daily mean, 372 mg/L, Mar. 14; minimum daily mean, 2 mg/L, Dec. 19-21 and Jan. 17. High-flow period of April through July was not sampled; higher maximum daily mean concentrations may have occurred during those months.

SEDIMENT LOAD: Maximum daily,7,260 tons, May 31; minimum daily, 4.6 tons, Jan. 17.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instan-taneous dis-charge, cfs (00061)	pH, water, unfltrd field, std units (00400)	Specif. conduc-tance, wat unf uS/cm 25 degC (00095)	Temper-ature, air, deg C (00020)	Temper-ature, water, deg C (00010)	Hard-ness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Arsenic water, fltrd, ug/L (01000)	Arsenic water, unfltrd ug/L (01002)
MAR 2003											
15...	1540	5140	7.9	233	14.0	4.0	93	25.9	6.78	9.0	19
APR											
04...	0800	3290	8.3	271	4.0	5.0	120	32.2	9.15	3.6	5
29...	1350	6150	8.3	193	10.5	7.0	89	23.9	7.07	2.3	3
MAY											
28...	0910	12800	8.0	148	17.0	12.0	71	19.4	5.34	3.4	8
*29...	1215	13500	7.9	140	--	14.0	61	17.6	4.25	6.2	13
*30...	1300	14700	7.9	147	--	13.0	67	18.6	5.01	4.0	7
*31...	1100	15100	7.9	145	--	11.0	67	18.6	5.06	4.2	9
JUN											
*01...	1230	14700	7.8	151	--	11.5	69	19.1	5.11	4.8	9
02...	0945	13500	8.1	156	15.5	11.5	74	20.7	5.54	4.6	9
*02...	1400	13400	7.8	159	--	12.0	73	20.3	5.54	4.8	9
17...	0720	5470	8.3	200	14.5	15.5	91	23.8	7.57	3.3	4
JUL											
29...	1335	1280	8.6	278	34.5	21.0	130	34.6	10.9	4.0	4
AUG											
26...	1600	999	8.5	311	37.0	19.5	150	38.0	12.7	3.6	4

*--Supplemental samples collected by sediment observer during high flow through Milltown Reservoir. Samples were collected by depth integration at a single vertical near midstream.

Date	Cadmium water, fltrd, ug/L (01025)	Cadmium water unfltrd ug/L (01027)	Copper, water, fltrd, ug/L (01040)	Copper, water, unfltrd recover -able, ug/L (01042)	Iron, water, fltrd, ug/L (01046)	Iron, water, unfltrd recover -able, ug/L (01045)	Lead, water, fltrd, ug/L (01049)	Lead, water, unfltrd recover -able, ug/L (01051)	Mangan- ese, water, fltrd, ug/L (01056)	Mangan- ese, water, unfltrd recover -able, ug/L (01055)
MAR 2003										
15...	.08	.64	12.6	107	77	3040	.34	17.8	21.2	314
APR										
04...	E.02	.11	3.4	18.6	47	490	.15	2.97	22.6	53
29...	E.02	.09	2.3	10.5	26	420	.08	1.78	13.2	42
MAY										
28...	E.02	.27	3.8	39.8	40	1680	.17	7.50	13.2	143
*29...	.04	.40	7.6	68.0	49	2430	.29	12.8	3.1	218
*30...	E.03	.20	4.9	35.4	32	1610	.17	6.87	1.6	136
*31...	.04	.29	5.0	45.7	38	1910	.23	9.14	2.0	157
JUN										
*01...	E.03	.29	6.2	46.1	34	1740	.20	8.65	1.9	154
02...	E.03	.32	5.1	46.0	41	1480	.22	7.93	14.2	137
*02...	.05	.22	5.7	36.9	26	1320	.17	6.72	1.7	119
17...	E.02	.07	2.8	8.5	13	230	<.08	1.17	13.5	33
JUL										
29...	<.04	E.02	1.9	3.5	<8	70	<.08	.32	15.9	28
AUG										
26...	<.04	E.03	2.0	4.3	E5	70	<.08	.39	14.5	28

Date	Zinc, water, fltrd, ug/L (01090)	Zinc, water, unfltrd recover -able, ug/L (01092)	Suspnd. sedi- ment, sieve diametr percent <.063mm (70331)	Sus- pended sedi- ment concen- tration mg/L (80154)	Sus- pended sedi- ment load, tons/d (80155)
MAR 2003					
15...	8	155	85	169	2350
APR					
04...	3	28	82	26	231
29...	1	16	85	29	482
MAY					
28...	1	77	75	137	4730
*29...	4	105	--	137	4990
*30...	3	68	--	169	6710
*31...	8	85	--	174	7090
JUN					
*01...	6	81	--	168	6670
02...	4	79	68	123	4480
*02...	4	64	--	122	4410
17...	3	12	89	14	207
JUL					
29...	1	4	82	5	17
AUG					
26...	1	5	89	3	8.1

*--Supplemental samples collected by sediment observer during high flow through Milltown Reservoir. Samples were collected by depth integration at a single vertical near midstream.
E--Estimated.

PEND OREILLE RIVER BASIN

12340500 CLARK FORK ABOVE MISSOULA, MT--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

DAY	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN-TRATION (MG/L)	LOAD (TONS/ DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	8	25	4	10	4	12	3	8.5	161	1360	3	9.2
2	6	18	4	11	4	12	4	11	88	734	3	9.2
3	6	18	4	13	10	30	3	8.6	26	154	4	12
4	6	19	4	12	5	15	3	8.7	16	76	4	11
5	7	22	4	13	8	23	3	8.7	11	47	3	8.5
6	8	25	4	13	6	18	3	8.6	9	35	5	15
7	8	25	5	16	4	12	4	11	7	24	6	18
8	7	22	8	27	4	11	5	12	7	24	3	8.5
9	7	22	10	34	4	10	4	8.6	7	25	3	8.1
10	7	22	9	31	3	7.5	4	7.6	6	21	7	22
11	7	22	8	27	3	8.2	3	6.1	5	16	9	34
12	6	19	7	23	3	8.8	4	9.5	5	16	20	91
13	6	19	6	20	4	12	5	14	5	15	188	1740
14	5	16	6	20	9	28	5	16	6	19	372	5770
15	5	16	6	20	8	24	4	12	7	22	160	2230
16	6	19	5	16	5	15	3	8.4	8	25	82	863
17	6	19	6	19	4	12	2	4.6	9	28	63	670
18	6	19	7	22	3	8.6	3	6.5	9	28	53	455
19	6	19	8	25	2	4.9	3	6.8	10	31	40	283
20	7	22	10	31	2	4.7	4	10	8	24	22	141
21	7	22	9	29	2	4.9	4	11	7	21	20	124
22	6	19	8	26	3	8.3	5	11	6	19	20	123
23	6	18	7	23	3	8.4	68	135	5	15	23	160
24	5	16	6	20	3	8.1	8	17	4	8.3	27	199
25	5	15	5	15	3	7.7	11	30	3	5.5	19	125
26	4	12	5	14	4	9.9	15	48	3	6.9	16	100
27	4	12	5	15	3	7.8	66	324	4	10	15	90
28	5	16	4	12	3	8.8	170	1170	5	14	14	80
29	5	16	4	12	3	9.0	47	194	---	---	14	76
30	5	15	4	12	3	8.3	19	73	---	---	15	81
31	4	11	---	---	3	7.9	20	87	---	---	16	95
TOTAL	---	580	---	581	---	365.8	---	2287.2	---	2823.7	---	13651.5

DAY	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	---	---	---	---	*169	6800	---	---	5	15	5	13
2	---	---	---	---	*124	4520	---	---	5	15	5	13
3	---	---	---	---	---	---	---	---	5	15	5	13
4	---	---	---	---	---	---	---	---	4	12	5	13
5	---	---	---	---	---	---	---	---	4	12	5	13
6	---	---	---	---	---	---	---	---	4	12	5	13
7	---	---	---	---	---	---	---	---	4	12	5	13
8	---	---	---	---	---	---	---	---	6	18	6	15
9	---	---	---	---	---	---	---	---	8	26	8	21
10	---	---	---	---	---	---	---	---	10	32	8	21
11	---	---	---	---	---	---	---	---	11	33	7	18
12	---	---	---	---	---	---	---	---	11	32	6	16
13	---	---	---	---	---	---	---	---	10	29	6	18
14	---	---	---	---	---	---	---	---	9	26	6	17
15	---	---	---	---	---	---	---	---	8	21	5	14
16	---	---	---	---	---	---	---	---	7	17	5	14
17	---	---	---	---	---	---	---	---	7	17	5	14
18	---	---	---	---	---	---	---	---	7	18	5	15
19	---	---	---	---	---	---	---	---	7	19	5	15
20	---	---	---	---	---	---	---	---	8	21	5	15
21	---	---	---	---	---	---	---	---	7	18	5	14
22	---	---	---	---	---	---	---	---	6	16	5	14
23	---	---	---	---	---	---	---	---	6	16	5	14
24	---	---	---	---	---	---	---	---	5	14	7	19
25	---	---	---	---	---	---	---	---	4	11	8	22
26	---	---	---	---	---	---	---	---	3	8.2	8	22
27	---	---	---	---	---	---	---	---	3	8.0	8	22
28	---	---	*136	4740	---	---	---	---	5	13	8	22
29	---	---	*139	5070	---	---	5	17	5	14	7	19
30	---	---	*164	6420	---	---	5	16	5	13	7	19
31	---	---	*178	7260	---	---	5	15	5	13	---	---
TOTAL	---	---	---	---	---	---	---	---	---	546.2	---	491

*--Daily mean concentrations derived from supplemental high-flow samples (daily sediment program temporarily suspended April 1 to July 30).

PEND OREILLE RIVER BASIN

12342500 WEST FORK BITTERROOT RIVER NEAR CONNER, MT

LOCATION.--Lat 45°43'30", long 114°16'50" (NAD 27), in $SE^1/_4NE^1/_4NW^1/_4$ sec.26, T.1 S., R.22 W., Ravalli County, Hydrologic Unit 17010205, on right bank 0.6 mi downstream from Painted Rocks Lake, 6.4 mi upstream from Nez Perce Creek, 16.1 mi southwest of Conner, and at river mile 19.2.
DRAINAGE AREA.--317 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1941 to current year.
REVISED RECORDS.--WSP 1246: Drainage area.
GAGE.--Water-stage recorder. Elevation of gage is 4,581.36 ft (NGVD 29) (U.S. Forest Service bench mark).
REMARKS.--Water-discharge records good. Flow regulated by Painted Rocks Lake (station 12342000). Diversions for irrigation of about 200 acres upstream from station. U.S. Geological Survey satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	172	67	67	64	63	64	126	355	2490	207	363	262
2	140	67	67	64	64	64	174	355	2110	207	361	259
3	109	67	67	64	64	64	174	418	1800	207	360	258
4	108	67	67	64	64	64	175	567	1630	207	360	256
5	108	67	66	64	64	64	177	602	1410	207	363	254
6	108	67	66	64	64	64	178	585	1270	207	353	251
7	88	66	66	64	64	63	178	560	1180	188	307	251
8	67	66	66	64	64	63	178	533	1110	162	307	247
9	68	66	66	64	64	63	199	519	1060	162	307	246
10	69	67	66	62	64	63	217	504	1010	133	307	243
11	69	66	66	61	64	63	218	494	951	108	304	201
12	69	66	66	61	64	64	222	507	930	127	303	168
13	69	66	66	61	64	65	226	538	836	127	303	168
14	69	66	66	61	64	66	230	608	763	127	288	167
15	69	66	66	61	64	66	233	718	709	127	274	165
16	69	66	66	61	64	67	236	1030	670	127	274	165
17	69	67	66	61	64	69	278	1100	626	166	274	165
18	69	66	66	61	64	69	318	980	592	204	271	162
19	69	66	66	61	64	70	320	848	537	204	299	162
20	69	66	66	61	64	71	320	756	506	204	331	162
21	69	66	66	61	64	71	320	712	507	203	329	162
22	69	67	66	61	64	71	322	727	502	236	325	160
23	69	67	66	61	64	72	325	901	501	287	324	103
24	69	67	66	61	64	73	333	1390	501	315	322	64
25	69	67	66	61	64	73	337	2000	501	338	320	64
26	69	67	65	61	64	73	341	2360	431	338	316	64
27	69	67	64	63	64	73	344	2340	360	337	315	65
28	68	67	65	63	64	73	346	2350	359	335	286	65
29	69	67	64	62	---	73	347	2500	356	333	266	66
30	67	67	64	63	---	73	355	2710	279	333	266	66
31	67	---	64	63	---	74	---	2810	---	349	263	---
TOTAL	2481	1997	2040	1928	1791	2105	7747	33377	26487	6812	9641	5091
MEAN	80.0	66.6	65.8	62.2	64.0	67.9	258	1077	883	220	311	170
MAX	172	67	67	64	64	74	355	2810	2490	349	363	262
MIN	67	66	64	61	63	63	126	355	279	108	263	64
AC-FT	4920	3960	4050	3820	3550	4180	15370	66200	52540	13510	19120	10100

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1941 - 2003, BY WATER YEAR (WY)

MEAN	156	112	90.9	83.7	80.1	93.7	204	811	916	266	202	177
MAX	484	416	270	243	215	277	719	2011	1960	633	439	385
(WY)	1943	1945	1960	1957	1957	1952	1956	1947	1964	1975	1995	1973
MIN	52.3	53.3	27.8	21.4	6.80	7.85	8.65	119	118	127	84.5	62.4
(WY)	1999	1988	1958	1977	1944	1944	1944	1977	1987	1973	1945	1944

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1941 - 2003	
ANNUAL TOTAL	86766		101497			
ANNUAL MEAN	238		278		268	
HIGHEST ANNUAL MEAN					457	1976
LOWEST ANNUAL MEAN					120	1977
HIGHEST DAILY MEAN	1690	May 31	2810	May 31	3900	May 9 1947
LOWEST DAILY MEAN	64	Dec 27	a61	Jan 11	b0.60	May 3 1954
ANNUAL SEVEN-DAY MINIMUM	65	Dec 25	61	Jan 11	0.66	May 1 1954
MAXIMUM PEAK FLOW			3070	May 31	4060	May 9 1947
MAXIMUM PEAK STAGE			5.21	May 31	6.18	May 9 1947
INSTANTANEOUS LOW FLOW					c0.20	Nov 25 1952
ANNUAL RUNOFF (AC-FT)	172100		201300		194100	
10 PERCENT EXCEEDS	564		596		636	
50 PERCENT EXCEEDS	80		88		116	
90 PERCENT EXCEEDS	66		64		58	

a--January 11-26.
b--May 3-7, 1954
c--Dam shutdown.

12342500 WEST FORK BITTERROOT RIVER NEAR CONNER, MT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--March 2001 to current year.
REMARKS.--Unpublished records of instantaneous water temperature and specific conductance are available in files of the District office.

WATER QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instan-taneous dis-charge, cfs (00061)	pH, water, unfltrd field, std units (00400)	Specif. conduc-tance, wat unf uS/cm 25 degC (00095)	Temper-ature, air, deg C (00020)	Temper-ature, water, deg C (00010)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Partic-ulate nitro-gen, susp, water, mg/L (49570)
APR 2003											
23...	1700	324	8.1	64	9.5	4.0	.23	.135	E.002	<.007	.06
MAY											
29...	0830	2560	7.5	45	10.0	9.0	.24	.054	E.002	E.004	.09
JUN											
13...	0800	853	7.6	44	10.5	8.5	.19	.039	<.002	E.005	.07
AUG											
20...	0830	329	7.7	60	12.0	15.5	.17	.024	<.002	E.004	.02

Date	Phos-phorus, water, unfltrd mg/L (00665)	Organic carbon, suspnd sedimnt total, mg/L (00689)	Organic carbon, water, fltrd, mg/L (00681)	Suspnd. sedi-ment, sieve diametr percent <.063mm (70331)	Sus-pended sedi-ment concen-tration mg/L (80154)	Sus-pended sedi-ment load, tons/d (80155)
APR 2003						
23...	.024	.5	4.1	85	4	3.5
MAY						
29...	.038	.8	4.1	96	13	90
JUN						
13...	.024	.3	3.5	97	9	21
AUG						
20...	.015	.2	2.1	86	5	4.4

Date	Time	Hard-ness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Potas-sium, water, fltrd, mg/L (00935)	Sodium adsorp-tion ratio (00931)	Sodium, water, fltrd, mg/L (00930)	Alka-linity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chlor-ide, water, fltrd, mg/L (00940)	Fluor-ide, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)
APR 2003											
23...	1700	25	7.67	1.32	.81	.2	2.71	28	.65	.23	12.8
MAY											
29...	0830	18	5.59	.873	.66	.2	1.86	19	.59	<.2	11.2

Date	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of consti-tuents mg/L (70301)	Residue water, fltrd, tons/ acre-ft (70303)	Residue water, fltrd, tons/d (70302)	Arsenic water, fltrd, ug/L (01000)	Arsenic water unfltrd ug/L (01002)	Cadmium water, fltrd, ug/L (01025)	Cadmium water, unfltrd ug/L (01027)	Chrom-ium, water, fltrd, ug/L (01030)	Chrom-ium, water, unfltrd recover-able, ug/L (01034)
APR 2003										
23...	3.5	47	.06	41.3	E.2	<2	<.04	<.2	<.8	<.8
MAY										
29...	1.9	34	.05	235	.3	<2	.04	<.2	<.8	E.5

Date	Copper, water, fltrd, ug/L (01040)	Copper, water, unfltrd recover-able, ug/L (01042)	Lead, water, fltrd, ug/L (01049)	Lead, water, unfltrd recover-able, ug/L (01051)	Nickel, water, fltrd, ug/L (01065)	Nickel, water, unfltrd recover-able, ug/L (01067)	Zinc, water, fltrd, ug/L (01090)	Zinc, water, unfltrd recover-able, ug/L (01092)
APR 2003								
23...	1.8	2.0	<.08	.44	.52	.45	12	4
MAY								
29...	4.3	8.1	.17	1.67	.32	.52	5	7

E--Estimated.

455550113432001 MOOSE CREEK NEAR SULA, MT

LOCATION.--Lat 45°55'50", long 113°43'20" (NAD 27), in $SE^1/_4SE^1/_4SW^1/_4$ sec.9, T.2 N., R.17 W., Ravalli, Hydrologic Unit 17010205, 50 ft upstream from culvert at U.S. Forest Service campground, 0.6 mi north of East Fork Service Station (U.S. Forest Service), and 13.5 mi northeast of Sula.

PERIOD OF RECORD.--March 2001 to August 2003 (discontinued).

GAGE.--Elevation at site is 5,260 ft (NGVD 29).

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instan-taneous dis-charge, cfs (00061)	pH, water, unfltrd field, std units (00400)	Specif. conduc-tance, wat unf uS/cm 25 degC (00095)	Temper-ature, air, deg C (00020)	Temper-ature, water, deg C (00010)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Ortho-phos-phate, water, fltrd, mg/L as P (00671)
APR 2003										
24...	0900	43	8.1	67	7.0	1.0	.26	.053	E.002	E.004
MAY										
29...	1330	305	7.4	37	27.0	6.0	.31	E.016	E.002	E.004
JUN										
13...	1130	105	7.8	62	21.0	6.0	.13	<.022	<.002	E.004
AUG										
20...	1200	7.6	8.1	88	22.5	12.0	E.07	<.022	<.002	.007

Date	Partic-ulate nitro-gen, susp, water, mg/L (49570)	Phos-phorus, water, unfltrd mg/L (00665)	Organic carbon, suspnd sedimnt total, mg/L (00689)	Organic carbon, water, fltrd, mg/L (00681)	Suspnd. sedi-ment, sieve diametr percent <.063mm (70331)	Sus-pended sedi-ment concen-tration mg/L (80154)	Sus-pended sedi-ment load, tons/d (80155)
APR 2003							
24...	.07	.021	1.1	6.5	47	9	1.0
MAY							
29...	.12	.031	2.3	6.9	28	40	33
JUN							
13...	.05	.011	.4	3.8	46	6	1.7
AUG							
20...	<.02	.014	.1	1.6	46	2	.04

Date	Time	Hard-ness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Potas-sium, water, fltrd, mg/L (00935)	Sodium adsorp-tion ratio (00931)	Sodium, water, fltrd, mg/L (00930)	Alka-linity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chlor-ide, water, fltrd, mg/L (00940)	Fluor-ide, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)
APR 2003											
24...	0900	31	10.2	1.37	1.27	.1	1.64	33	.34	<.17	11.3
MAY											
29...	1330	16	5.43	.578	.86	.1	.92	16	.30	<.2	7.9

Date	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of consti-tuents mg/L (70301)	Residue water, fltrd, tons/ acre-ft (70303)	Residue water, fltrd, tons/d (70302)	Arsenic water, fltrd, ug/L (01000)	Arsenic water unfltrd ug/L (01002)	Cadmium water, fltrd, ug/L (01025)	Cadmium water, unfltrd ug/L (01027)	Chrom-ium, water, fltrd, ug/L (01030)	Chrom-ium, water, unfltrd recover-able, ug/L (01034)
APR 2003										
24...	2.3	48	.07	5.63	.5	<2	<.04	<.2	<.8	<.8
MAY										
29...	1.1	27	.04	22.2	.5	<2	<.04	<.2	<.8	E.4

Date	Copper, water, fltrd, ug/L (01040)	Copper, water, unfltrd recover-able, ug/L (01042)	Lead, water, fltrd, ug/L (01049)	Lead, water, unfltrd recover-able, ug/L (01051)	Nickel, water, fltrd, ug/L (01065)	Nickel, water, unfltrd recover-able, ug/L (01067)	Zinc, water, fltrd, ug/L (01090)	Zinc, water, unfltrd recover-able, ug/L (01092)
APR 2003								
24...	.5	.8	<.08	.10	.48	.34	2	2
MAY								
29...	.6	.9	<.08	.24	.25	.37	5	6

E--Estimated.

PEND OREILLE RIVER BASIN

12343400 EAST FORK BITTERROOT RIVER NEAR CONNER, MT

LOCATION.--Lat 45°53'00", long 114°03'53" (NAD 27), in $NE^1/_4SW^1/_4NE^1/_4$ sec.34, T.2 N., R.20 W., Ravalli County, Hydrologic Unit 17010205, on right bank 10 ft downstream from private bridge, 4.3 mi southwest of Conner, and at river mile 6.1.
DRAINAGE AREA.--381 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1956 to September 1972, October 2000 to current year.
GAGE.--Water-stage recorder. Elevation of gage is 4,191.81 ft (NGVD 29).
REMARKS.--Water-discharge records good except those for Apr. 13-18, which are fair, and those for May 24 to Aug. 5, and periods of estimated daily discharges, which are poor. Diversions for irrigation of about 2,200 acres above station. U.S. Geological Survey satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	96	e43	e80	e75	235	e90	277	600	2890	326	114	90
2	94	e50	e80	e80	171	e85	279	595	2410	317	109	87
3	102	e60	e80	e95	134	e90	254	594	2060	304	115	86
4	102	e65	84	94	118	e85	223	613	1760	285	134	82
5	102	e70	85	96	101	83	213	608	1550	268	120	79
6	100	e75	78	e85	e90	79	198	577	1440	256	123	82
7	97	e80	e60	e75	e70	81	179	566	1320	243	132	86
8	94	e85	e45	e65	e85	82	182	542	1260	275	118	85
9	94	92	e50	e60	e90	87	200	521	1250	270	114	89
10	91	89	e65	e55	e80	110	255	497	1200	237	109	89
11	90	88	e75	e60	e70	140	317	493	1120	221	104	89
12	89	85	e80	e85	e65	278	417	521	987	211	102	92
13	88	89	e80	e95	e70	326	501	557	923	203	102	92
14	90	88	e80	91	e80	333	537	639	871	198	99	88
15	88	85	e85	90	e75	289	485	771	824	190	98	85
16	88	80	84	e80	e75	289	451	934	781	183	97	87
17	86	88	84	e70	e75	256	397	917	713	175	100	91
18	85	84	64	e65	e70	221	374	870	677	161	101	89
19	84	83	e55	e70	e65	193	347	774	667	156	96	88
20	86	85	e60	e75	e65	186	355	741	701	150	94	85
21	86	91	e60	e75	e70	188	404	752	675	145	89	83
22	86	88	e65	81	e70	186	502	777	620	142	93	82
23	84	97	e70	88	e60	232	684	1000	571	139	132	81
24	77	89	e60	90	e40	194	792	1450	522	140	114	76
25	74	57	e55	84	e50	179	929	1940	489	150	102	75
26	75	e60	e60	110	e75	173	843	2450	450	158	96	74
27	78	e80	e75	244	e95	164	742	2460	415	149	97	73
28	96	e95	e90	155	e95	162	678	2530	381	137	99	73
29	88	e90	e85	112	---	163	642	2850	355	129	95	73
30	59	e85	e75	118	---	166	611	3090	338	124	93	74
31	e37	---	e80	159	---	191	---	3320	---	121	93	---
TOTAL	2686	2396	2229	2877	2439	5381	13268	35549	30220	6163	3284	2505
MEAN	86.6	79.9	71.9	92.8	87.1	174	442	1147	1007	199	106	83.5
MAX	102	97	90	244	235	333	929	3320	2890	326	134	92
MIN	37	43	45	55	40	79	179	493	338	121	89	73
AC-FT	5330	4750	4420	5710	4840	10670	26320	70510	59940	12220	6510	4970

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1956 - 2003, BY WATER YEAR (WY)*

MEAN	115	103	88.9	84.6	90.2	111	254	955	1106	299	128	112
MAX	206	137	168	115	170	215	476	1482	1962	520	203	187
(WY)	2001	1960	1965	1969	1963	1972	1969	1971	1972	1964	1965	1965
MIN	83.3	78.5	39.4	56.8	51.6	74.4	109	520	355	126	72.6	81.1
(WY)	1967	1967	1961	1961	2001	2002	1970	1966	1966	1966	1961	2001

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1956 - 2003*	
ANNUAL TOTAL	85566		108997			
ANNUAL MEAN	234		299		285	
HIGHEST ANNUAL MEAN					400	1965
LOWEST ANNUAL MEAN					170	1966
HIGHEST DAILY MEAN	1510	Jun 2	3320	May 31	3640	Jun 2 1972
LOWEST DAILY MEAN	37	Oct 31	37	Oct 31	25	Dec 8 1960
ANNUAL SEVEN-DAY MINIMUM	55	Oct 30	55	Oct 30	27	Dec 6 1960
MAXIMUM PEAK FLOW			3620	May 31	4000	Jun 2 1972
MAXIMUM PEAK STAGE			6.88	May 31	7.17	Jun 2 1972
INSTANTANEOUS LOW FLOW					a23	Nov 29 1960
ANNUAL RUNOFF (AC-FT)	169700		216200		206600	
10 PERCENT EXCEEDS	745		741		803	
50 PERCENT EXCEEDS	94		97		115	
90 PERCENT EXCEEDS	67		70		72	

*--During period of operation (April 1956 to September 1972, and October 2000 to current year).
a--Discharge measurement, result of freezeup.
e--Estimated.

12343400 EAST FORK BITTERROOT RIVER NEAR CONNER, MT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--March 2001 to current year.
REMARKS.--Unpublished records of instantaneous water temperature and specific conductance are available in files of the District office.

WATER QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instan-taneous dis-charge, cfs (00061)	pH, water, unfltrd field, std units (00400)	Specif. conduc-tance, wat unf uS/cm 25 degC (00095)	Temper-ature, air, deg C (00020)	Temper-ature, water, deg C (00010)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)
APR 2003									
24...	0700	793	7.8	84	1.0	4.0	.66	.291	E.002
MAY									
29...	1100	2870	7.4	49	28.0	7.5	.58	.130	.003
JUN									
13...	1000	933	7.8	61	21.0	8.5	.16	.044	<.002
AUG									
20...	1030	96	8.1	114	23.0	15.5	.14	<.022	<.002

Date	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Phos-phorus, water, unfltrd mg/L (00665)	Organic carbon, suspnd sedimnt total, mg/L (00689)	Organic carbon, water, fltrd, mg/L (00681)	Suspnd. sedi-ment, sieve diametr percent <.063mm (70331)	Sus-pended sedi-ment concen-tration mg/L (80154)	Sus-pended sedi-ment load, tons/d (80155)
APR 2003							
24...	.017	.121	5.7	5.5	58	83	178
MAY							
29...	.025	.123	5.6	5.5	52	115	891
JUN							
13...	.012	.031	1.0	3.0	50	16	40
AUG							
20...	.009	.022	.3	1.9	73	4	1.0

Date	Time	Hard-ness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Potas-sium, water, fltrd, mg/L (00935)	Sodium adsorp-tion ratio (00931)	Sodium, water, fltrd, mg/L (00930)	Alka-linity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chlor-ide, water, fltrd, mg/L (00940)	Fluor-ide, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)
APR 2003											
24...	0700	33	10.5	1.73	1.33	.2	2.94	35	1.36	<.17	14.1
MAY											
29...	1100	20	6.39	.962	1.00	.2	1.66	20	.70	<.2	10.0

Date	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of consti-tuents mg/L (70301)	Residue water, fltrd, tons/ acre-ft (70303)	Residue water, fltrd, tons/d (70302)	Arsenic water, fltrd, ug/L (01000)	Arsenic water unfltrd ug/L (01002)	Cadmium water, fltrd, ug/L (01025)	Cadmium water, unfltrd ug/L (01027)	Chrom-ium, water, fltrd, ug/L (01030)	Chrom-ium, water, unfltrd recover-able, ug/L (01034)	Copper, water, fltrd, ug/L (01040)
APR 2003											
24...	4.7	59	.08	127	.5	E1	<.04	<.2	<.8	1.3	1.1
MAY											
29...	2.1	36	.05	275	.5	<2	<.04	<.2	<.8	1.8	1.0

Date	Copper, water, unfltrd recover-able, ug/L (01042)	Lead, water, fltrd, ug/L (01049)	Lead, water, unfltrd recover-able, ug/L (01051)	Nickel, water, fltrd, ug/L (01065)	Nickel, water, unfltrd recover-able, ug/L (01067)	Zinc, water, fltrd, ug/L (01090)	Zinc, water, unfltrd recover-able, ug/L (01092)
APR 2003							
24...	2.5	E.05	2.00	.56	1.10	5	9
MAY							
29...	4.2	E.07	2.95	.33	1.38	2	11

E--Estimated.

PEND OREILLE RIVER BASIN

12344000 BITTERROOT RIVER NEAR DARBY, MT

LOCATION.--Lat 45°58'20", long 114°08'26" (NAD 27), in $SW^1/_4SE^1/_4NE^1/_4$ sec.36, T.3 N., R.21 W., Ravalli County, Hydrologic Unit 17010205, on left bank 50 ft upstream from bridge on U.S. Highway 93, 0.3 mi downstream from Chaffin Creek, 4.1 mi southeast of Darby, and at river mile 77.2.
DRAINAGE AREA.--1,049 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1937 to current year. Monthly discharge only for April 1937, published in WSP 1316.
REVISED RECORDS.--WSP 1246: Drainage area.
GAGE.--Water-stage recorder. Elevation of gage is 3,942.14 ft (NGVD 29). Prior to Oct. 1, 1987, at elevation 1.00 ft higher. Prior to Aug. 2, 1939, nonrecording gage at highway bridge 45 ft upstream at same elevation.
REMARKS.--Water-discharge records good except those for estimated daily discharges, which are fair. Some regulation by Painted Rocks Lake (station number 12342000). Diversions for irrigation of about 5,000 acres upstream from station. Ditch bypassing station irrigates about 500 acres downstream from station. U.S. Geological Survey satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	316	e130	209	202	697	243	930	1640	7700	1180	544	387
2	310	157	207	207	582	233	1070	1600	6480	1110	538	380
3	272	180	208	248	465	240	983	1630	5480	1010	554	377
4	270	202	216	236	404	233	870	1830	4780	929	591	371
5	269	205	217	243	347	230	806	1880	4260	881	559	365
6	267	213	203	216	326	232	746	1800	3990	841	569	375
7	261	218	159	188	258	235	682	1740	3800	795	532	374
8	229	221	e130	177	297	238	669	1660	3650	812	502	372
9	222	220	e140	169	311	247	749	1620	3790	805	488	381
10	217	216	187	156	300	304	995	1550	3730	721	475	379
11	215	214	211	168	262	359	1250	1530	3570	608	462	368
12	215	212	215	219	250	604	1650	1590	3170	613	453	324
13	212	219	217	242	261	751	2070	1690	2990	595	449	322
14	214	220	220	232	283	885	2040	1880	2810	574	439	309
15	212	214	223	223	273	859	1820	2330	2790	542	416	301
16	211	207	214	204	273	870	1570	3140	2700	517	409	303
17	210	218	212	183	271	796	1440	3090	2610	508	412	309
18	207	213	164	181	257	683	1420	2780	2560	543	414	308
19	206	210	162	192	246	596	1310	2450	2450	530	408	302
20	206	214	169	209	247	568	1310	2230	2330	515	455	297
21	206	225	172	210	255	567	1440	2150	2130	499	447	292
22	206	225	193	213	257	582	1680	2230	1870	488	453	289
23	205	248	200	237	e200	723	2190	2990	1720	539	527	274
24	198	237	183	237	e140	670	2400	4820	1610	552	496	205
25	192	172	162	225	e160	615	2600	6660	1560	610	469	196
26	191	174	159	297	e220	578	2420	7610	1490	621	452	191
27	195	208	212	526	251	522	2110	7640	1410	614	457	187
28	219	230	249	448	251	480	1890	7820	1430	583	451	185
29	217	225	232	351	---	453	1780	8610	1390	552	405	185
30	169	219	204	355	---	472	1690	8770	1330	537	397	185
31	e120	---	217	452	---	581	---	9280	---	533	392	---
TOTAL	6859	6266	6066	7646	8344	15649	44580	108240	91580	20757	14615	9093
MEAN	221	209	196	247	298	505	1486	3492	3053	670	471	303
MAX	316	248	249	526	697	885	2600	9280	7700	1180	591	387
MIN	120	130	130	156	140	230	669	1530	1330	488	392	185
AC-FT	13600	12430	12030	15170	16550	31040	88420	214700	181600	41170	28990	18040

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1937 - 2003, BY WATER YEAR (WY)

MEAN	356	314	280	250	270	354	972	2877	3067	979	409	348
MAX	1020	788	765	421	791	1011	2530	5995	6235	2608	751	634
(WY)	1947	1947	1947	1947	1996	1972	1943	1947	1964	1975	1975	1941
MIN	143	144	138	125	125	139	306	1110	678	210	141	129
(WY)	1938	1988	1988	1988	1941	1944	1937	1977	1987	1940	1940	1937

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1937 - 2003	
ANNUAL TOTAL	295014		339695			
ANNUAL MEAN	808		931		880	
HIGHEST ANNUAL MEAN					1423	1976
LOWEST ANNUAL MEAN					454	1987
HIGHEST DAILY MEAN	5700	May 31	9280	May 31	11000	May 9 1947
LOWEST DAILY MEAN	120	Oct 31	120	Oct 31	80	Feb 9 1939
ANNUAL SEVEN-DAY MINIMUM	166	Oct 30	166	Oct 30	98	Jan 1 1988
MAXIMUM PEAK FLOW			10300	May 31	a11500	May 9 1947
MAXIMUM PEAK STAGE			8.45	May 31	8.45	May 31 2003
INSTANTANEOUS LOW FLOW					b71	Feb 9 1939
ANNUAL RUNOFF (AC-FT)	585200		673800		637400	
10 PERCENT EXCEEDS	2550		2330		2370	
50 PERCENT EXCEEDS	299		380		368	
90 PERCENT EXCEEDS	205		194		195	

a--Gage height, 8.18 ft, datum then in use.
b--Observed.
e--Estimated.

12344000 BITTERROOT RIVER NEAR DARBY, MT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1997-98, October 2000 to to current year.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Seasonal records, April 2001 to current year.

INSTRUMENTATION.--Temperature probe installed Mar. 27, 2001.

REMARKS.--Daily water temperature records excellent. Unpublished records of instantaneous water temperature and specific conductance are available in files of the District office.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE (Seasonal records): Maximum, 24.5°C, Aug. 8, 2001; minimum,0.5°C, Apr.2, 3, 2002.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: During period of seasonal operation, maximum, 21.0°C, July 20; minimum, 1.0°C, Apr.4.

WATER QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instan-taneous dis-charge, cfs (00061)	pH, water, unfltrd field, std units (00400)	Specif. conduc-tance, wat unf uS/cm 25 degC (00095)	Temper-ature, air, deg C (00020)	Temper-ature, water, deg C (00010)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)
APR 2003									
23...	1500	2280	8.2	60	14.0	6.0	.67	.127	E.002
MAY									
28...	1615	7540	7.4	40	34.0	10.5	.33	.070	E.002
JUN									
12...	1430	3070	7.7	40	23.5	11.0	.12	E.021	<.002
AUG									
19...	1630	403	7.5	72	31.0	20.5	.12	E.015	<.002

Date	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Phos-phorus, water, unfltrd mg/L (00665)	Organic carbon, suspnd sedimnt total, mg/L (00689)	Organic carbon, water, fltrd, mg/L (00681)	Suspnd. sedi-ment, sieve diametr percent <.063mm (70331)	Sus-pended sedi-ment concen-tration mg/L (80154)	Sus-pended sedi-ment load, tons/d (80155)
APR 2003							
23...	.012	.128	5.3	4.8	54	114	702
MAY							
28...	.008	.077	6.8	4.2	45	76	1550
JUN							
12...	E.005	.021	.7	2.7	32	23	191
AUG							
19...	<.007	.013	.2	1.9	53	4	4.4

Date	Time	Hard-ness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Potas-sium, water, fltrd, mg/L (00935)	Sodium adsorp-tion ratio (00931)	Sodium, water, fltrd, mg/L (00930)	Alka-linity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chlor-ide, water, fltrd, mg/L (00940)	Fluor-ide, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)
APR 2003											
23...	1500	23	7.27	1.25	1.02	.2	2.65	26	.66	<.17	12.5
MAY											
28...	1615	16	5.04	.786	.65	.2	1.58	17	.88	<.2	9.7

E--Estimated.

12344000 BITTERROOT RIVER NEAR DARBY, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003--Continued

Date	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of consti-tuents mg/L (70301)	Residue water, fltrd, tons/ acre-ft (70303)	Residue water, fltrd, tons/d (70302)	Arsenic water, fltrd, ug/L (01000)	Arsenic water unfltrd ug/L (01002)	Cadmium water, fltrd, ug/L (01025)	Cadmium water, unfltrd ug/L (01027)	Chrom-ium, water, fltrd, ug/L (01030)	Chrom-ium, water, unfltrd recover-able, ug/L (01034)
APR 2003										
23...	3.3	45	.06	277	.3	<2	<.04	<.2	<.8	1.7
MAY										
28...	1.7	31	.04	624	.3	<2	E.02	<.2	<.8	1.3

Date	Copper, water, fltrd, ug/L (01040)	Copper, water, unfltrd recover-able, ug/L (01042)	Lead, water, fltrd, ug/L (01049)	Lead, water, unfltrd recover-able, ug/L (01051)	Nickel, water, fltrd, ug/L (01065)	Nickel, water, unfltrd recover-able, ug/L (01067)	Zinc, water, fltrd, ug/L (01090)	Zinc, water, unfltrd recover-able, ug/L (01092)
APR 2003								
23...	1.3	5.8	E.07	2.31	.45	1.33	4	13
MAY								
28...	1.8	7.0	.10	2.30	.28	.99	2	8

E--Estimated.

WATER TEMPERATURE, DEGREES CELSIUS, APRIL 2003 TO SEPTEMBER 2003

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		APRIL			MAY			JUNE			JULY	
1	6.0	3.0	4.5	8.5	5.0	6.5	10.5	6.5	8.5	16.0	11.5	14.0
2	4.0	3.0	3.5	8.0	4.5	6.0	10.0	7.0	8.5	16.0	11.5	13.5
3	4.5	2.0	3.0	6.5	4.0	5.5	10.5	6.0	8.0	16.0	11.0	13.5
4	5.0	1.0	3.0	7.0	5.0	6.0	11.0	6.5	8.5	17.0	11.5	14.0
5	5.0	2.0	3.5	8.5	4.5	6.0	11.0	6.0	8.5	17.0	11.0	14.5
6	6.0	2.0	4.0	7.0	3.5	5.5	11.0	6.5	9.0	17.5	11.5	14.5
7	7.0	1.5	4.0	9.0	4.0	6.0	11.5	6.5	9.0	17.5	12.0	15.0
8	9.0	2.5	5.5	9.0	4.5	6.5	11.5	7.0	9.0	17.0	13.0	15.0
9	9.5	4.0	7.0	7.5	5.0	6.0	12.5	8.0	10.0	18.0	12.0	15.0
10	7.5	4.0	6.0	9.0	4.5	6.5	11.5	8.0	10.0	18.5	12.5	15.5
11	7.5	4.0	6.0	7.5	4.5	6.0	11.5	7.5	9.5	19.5	13.5	16.5
12	7.5	4.0	6.0	7.5	5.0	6.0	12.5	7.5	10.0	20.0	14.5	17.0
13	6.5	4.5	5.0	11.0	5.0	7.5	11.0	8.0	9.5	18.5	14.5	17.0
14	6.0	3.5	5.0	10.0	5.5	8.0	12.5	8.0	10.0	19.5	13.5	16.5
15	5.5	4.0	4.5	10.5	6.5	8.5	13.5	8.5	10.5	19.5	14.0	17.0
16	6.0	2.5	4.0	8.5	5.0	7.0	13.5	8.5	11.0	19.5	14.5	17.0
17	7.0	3.0	5.0	7.0	4.5	5.5	14.0	9.0	11.5	20.0	14.5	17.5
18	6.5	4.0	5.0	6.5	4.5	5.5	13.5	9.5	11.5	20.5	14.5	17.5
19	8.5	2.5	5.5	9.5	4.0	6.5	12.5	10.0	11.5	20.5	15.0	17.5
20	9.0	3.5	6.0	9.5	4.5	7.0	11.0	9.5	10.0	21.0	15.5	18.5
21	8.0	4.0	6.5	9.0	6.5	7.5	10.5	8.0	9.5	20.5	15.0	18.0
22	9.5	5.0	7.0	11.0	6.0	8.5	10.5	7.5	9.0	20.5	14.5	17.5
23	7.5	5.0	6.0	11.5	6.5	9.0	12.5	6.5	9.5	19.5	14.5	17.0
24	8.0	3.5	6.0	11.0	6.0	8.5	11.5	8.0	9.5	18.0	14.5	16.0
25	7.0	4.5	5.5	9.0	6.0	7.5	13.0	8.5	10.5	17.5	14.5	15.5
26	5.5	3.0	4.0	9.5	6.5	7.5	14.5	8.5	11.5	18.0	14.0	16.0
27	7.0	2.5	4.5	10.5	5.5	8.0	15.5	9.5	12.5	19.5	13.0	16.0
28	7.0	3.0	5.0	11.0	6.0	8.5	15.5	10.0	13.0	19.5	13.5	16.5
29	6.0	4.5	5.0	11.0	7.0	9.0	16.5	10.5	13.5	19.5	13.5	16.5
30	8.5	4.0	6.0	9.5	7.0	8.5	17.0	11.5	14.0	19.5	13.0	16.5
31	---	---	---	9.5	6.5	8.0	---	---	---	19.5	14.0	17.0
MONTH	9.5	1.0	5.0	11.5	3.5	7.0	17.0	6.0	10.0	21.0	11.0	16.0

WATER TEMPERATURE, DEGREES CELSIUS, APRIL 2003 TO SEPTEMBER 2003--Continued

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN
		AUGUST			SEPTEMBER	
1	19.0	13.0	16.0	18.5	13.5	16.5
2	18.0	13.5	16.0	18.5	14.0	16.5
3	17.5	14.5	16.0	19.0	14.0	16.5
4	19.0	13.5	16.5	18.0	14.0	16.0
5	17.5	13.0	15.5	18.5	15.0	16.5
6	18.0	13.5	16.0	18.0	15.0	16.5
7	19.0	13.5	16.5	19.0	14.5	16.5
8	19.0	14.0	16.5	17.0	13.5	15.5
9	19.0	14.0	17.0	15.5	12.0	13.5
10	20.0	14.0	17.0	15.0	13.0	14.0
11	18.5	13.5	16.5	15.5	13.0	14.0
12	18.5	14.5	16.5	14.5	13.0	14.0
13	19.5	14.0	17.0	15.0	10.5	13.0
14	19.0	14.5	17.0	15.5	10.5	13.0
15	19.0	15.0	17.0	14.5	12.5	13.5
16	20.5	16.5	18.5	13.5	11.5	12.5
17	18.0	15.0	16.5	12.5	9.5	11.0
18	19.0	14.0	16.5	13.0	8.5	10.5
19	20.0	14.5	17.5	14.5	9.5	12.0
20	20.0	15.5	18.0	15.0	10.5	13.0
21	18.5	14.0	17.0	14.0	10.0	12.0
22	17.5	15.5	16.5	14.5	9.5	12.0
23	19.0	15.0	17.0	14.5	10.0	12.5
24	19.5	14.5	17.0	15.0	10.0	12.5
25	20.0	14.5	17.5	15.5	10.0	12.5
26	19.0	14.5	17.0	15.5	10.5	13.0
27	19.5	16.0	17.5	15.0	10.0	12.5
28	18.5	14.5	17.0	14.5	10.0	12.5
29	18.5	13.5	16.0	14.5	10.0	12.0
30	19.0	13.5	16.0	13.5	9.0	11.5
31	19.0	13.5	16.5	---	---	---
MONTH	20.5	13.0	16.5	19.0	8.5	13.5

PEND OREILLE RIVER BASIN

12346500 SKALKAHO CREEK NEAR HAMILTON, MT

LOCATION.--Lat 46°09'40", long 113°56'52" (NAD 27), in $SE^1/_4SE^1/_4NE^1/_4$, sec. 27, T.5 N., R.19 W., Ravalli County, Hydrologic Unit 17010205, Bitterroot National Forest, on right bank 2 mi downstream from Daly Creek, 11.4 mi southeast of Hamilton, and at river mile 13.3.
DRAINAGE AREA.--87.8 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--December 1948 to September 1953, August 1957 to September 1979, October 2000 to September 2003 (discontinued). Apr. 20, 1920 to September 1924 at site 3 mi downstream; records not equivalent owing to inflow and minor diversions.
GAGE.--Water-stage recorder. Elevation of gage is 4,393.16 ft (NGVD 29).
REMARKS,--Water-discharge records good except those for estimated daily discharges and those for May 23 to June 24, which are poor. During irrigation season, flow is supplemented by releases from Kent and Dam Creek Lakes, combined capacity, 200 acre-ft. U.S. Geological Survey satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	38	e17	30	25	46	e27	43	144	659	131	59	41
2	37	e20	30	25	32	26	39	142	574	126	58	40
3	37	e25	28	26	28	24	37	141	486	120	59	40
4	37	e30	28	25	27	24	36	145	456	116	60	39
5	37	e33	28	25	25	24	35	144	446	113	58	39
6	37	e35	27	23	25	24	34	139	423	109	58	39
7	36	e37	e23	22	e23	24	33	136	396	108	58	40
8	36	39	e17	e20	e25	23	34	132	378	122	56	41
9	35	36	e20	e18	26	23	39	129	370	113	54	41
10	35	32	e25	e15	25	24	52	126	407	107	52	40
11	35	30	e27	e17	e23	24	68	127	410	102	52	40
12	34	30	29	e23	e27	26	89	134	384	98	55	44
13	35	31	29	e27	e30	27	113	145	365	95	55	40
14	34	30	27	28	25	31	111	165	347	92	53	39
15	34	29	27	25	23	31	101	195	325	90	53	38
16	34	29	27	23	22	34	93	231	308	86	53	38
17	33	30	26	e20	22	31	88	197	286	83	53	38
18	33	29	e22	e18	22	29	86	177	266	80	52	38
19	33	29	e23	e20	22	28	82	163	247	77	50	37
20	33	30	e23	e23	22	29	87	158	252	75	50	36
21	32	31	e25	23	22	29	101	159	231	74	48	36
22	32	31	e26	23	e20	31	130	178	212	71	48	36
23	32	37	27	24	e17	39	182	254	201	70	60	35
24	31	31	24	22	e13	33	194	359	177	70	50	35
25	31	e25	e22	22	e15	32	221	425	171	75	48	34
26	31	e27	e25	23	e17	32	198	612	161	73	46	34
27	31	e30	e27	33	e20	31	175	719	152	71	47	34
28	31	32	30	25	e26	30	161	735	148	68	46	34
29	29	31	28	24	---	30	154	858	141	65	44	33
30	e25	29	26	24	---	31	147	810	137	64	43	33
31	e15	---	26	33	---	35	---	837	---	61	42	---
TOTAL	1023	905	802	724	670	886	2963	9016	9516	2805	1620	1132
MEAN	33.0	30.2	25.9	23.4	23.9	28.6	98.8	291	317	90.5	52.3	37.7
MAX	38	39	30	33	46	39	221	858	659	131	60	44
MIN	15	17	17	15	13	23	33	126	137	61	42	33
AC-FT	2030	1800	1590	1440	1330	1760	5880	17880	18870	5560	3210	2250

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1949 - 2003, BY WATER YEAR (WY)*

MEAN	40.6	34.7	29.3	26.4	25.2	25.9	52.4	232	373	147	66.6	46.8
MAX	66.9	59.5	52.6	49.0	43.1	39.0	98.8	449	644	329	109	74.3
(WY)	1976	1976	1976	1976	1976	1976	2003	1976	1972	1975	1975	1975
MIN	28.5	23.7	21.4	17.6	17.3	17.8	25.2	88.7	109	55.9	38.6	34.8
(WY)	1953	1953	2001	2001	2001	1950	1975	1977	1977	1977	1977	1977

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1949 - 2003*	
ANNUAL TOTAL	27692		32062			
ANNUAL MEAN	75.9		87.8		91.5	
HIGHEST ANNUAL MEAN					138	1976
LOWEST ANNUAL MEAN					48.5	1977
HIGHEST DAILY MEAN	437	May 30	858	May 29	1010	Jun 3 1972
LOWEST DAILY MEAN	15	Oct 31	13	Feb 24	a13	Dec 22 1966
ANNUAL SEVEN-DAY MINIMUM	20	Mar 2	18	Feb 21	15	Mar 24 1950
MAXIMUM PEAK FLOW			1090	May 30	b1210	Jun 1 1972
MAXIMUM PEAK STAGE			4.64	May 30	c5.18	Feb 29 1960
INSTANTANEOUS LOW FLOW					d10	Apr 2 1953
ANNUAL RUNOFF (AC-FT)	54930		63590		66280	
10 PERCENT EXCEEDS	235		196		256	
50 PERCENT EXCEEDS	36		36		40	
90 PERCENT EXCEEDS	22		23		23	

*--During periods of operation (December 1948 to September 1953, August 1957 to September 1979, and October 2000 to September 2003).
a--Also January 8, 2000.
b--Gage height, 4.84 ft.
c--Backwater from ice.
d--Gage height, 1.26 ft, result of freezeup.
e--Estimated.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1955, June to July 1980, March 2001 to current year.

REMARKS.--Unpublished records of instantaneous water temperature and specific conductance are available in files of the District office.

WATER QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instan-taneous dis-charge, cfs (00061)	pH, water, unfltrd field, std units (00400)	Specif. conduc-tance, wat unf uS/cm 25 degC (00095)	Temper-ature, air, deg C (00020)	Temper-ature, water, deg C (00010)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)
APR 2003									
23...	1230	185	8.1	143	9.5	4.5	.43	.357	E.002
MAY									
28...	1330	732	8.0	119	27.0	6.0	.32	.247	.003
JUN									
12...	1245	342	8.2	129	19.5	7.0	.11	.127	<.002
AUG									
19...	1400	51	8.5	193	31.0	12.0	E.08	.067	<.002

Date	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Phos-phorus, water, unfltrd mg/L (00665)	Organic carbon, suspnd sedimnt total, mg/L (00689)	Organic carbon, water, fltrd, mg/L (00681)	Suspnd. sedi-ment, sieve diametr percent <.063mm (70331)	Sus-pended sedi-ment concen-tration mg/L (80154)	Sus-pended sedi-ment load, tons/d (80155)
APR 2003							
23...	.016	.094	4.8	5.0	44	55	27
MAY							
28...	.014	.055	5.3	4.3	46	65	128
JUN							
12...	.009	.022	1.0	2.5	44	20	18
AUG							
19...	.007	.011	.2	1.4	50	3	.41

Date	Time	Hard-ness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Potas-sium, water, fltrd, mg/L (00935)	Sodium adsorp-tion ratio (00931)	Sodium, water, fltrd, mg/L (00930)	Alka-linity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chlor-ide, water, fltrd, mg/L (00940)	Fluor-ide, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)
APR 2003											
23...	1230	69	19.2	5.17	1.66	.1	1.83	68	.81	<.17	12.4
MAY											
28...	1330	61	16.6	4.68	1.09	.1	1.18	57	.60	<.2	9.3

Date	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of consti-tuents mg/L (70301)	Residue water, fltrd, tons/ acre-ft (70303)	Residue water, fltrd, tons/d (70302)	Arsenic water, fltrd, ug/L (01000)	Arsenic water unfltrd ug/L (01002)	Cadmium water, fltrd, ug/L (01025)	Cadmium water, unfltrd ug/L (01027)	Chrom-ium, water, fltrd, ug/L (01030)	Chrom-ium, water, unfltrd recover-able, ug/L (01034)	Copper, water, fltrd, ug/L (01040)
APR 2003											
23...	5.3	89	.12	44.4	.7	E1	<.04	<.2	<.8	.8	1.2
MAY											
28...	3.1	72	.10	142	.6	E1	<.04	<.2	<.8	.9	1.6

Date	Copper, water, unfltrd recover-able, ug/L (01042)	Lead, water, fltrd, ug/L (01049)	Lead, water, unfltrd recover-able, ug/L (01051)	Nickel, water, fltrd, ug/L (01065)	Nickel, water, unfltrd recover-able, ug/L (01067)	Zinc, water, fltrd, ug/L (01090)	Zinc, water, unfltrd recover-able, ug/L (01092)
APR 2003							
23...	9.9	.21	.65	1.03	1.07	1	4
MAY							
28...	8.7	.20	1.26	.70	1.05	4	4

E--Estimated.

PEND OREILLE RIVER BASIN

12350250 BITTERROOT RIVER AT BELL CROSSING, NEAR VICTOR, MT

LOCATION.--Lat 46°26'36", long 114°07'22" (NAD 27), in $NW^1/_4NW^1/_4NE^1/_4$ sec. 20, T.8 N., R.20 W., Ravalli County, Hydrologic Unit 17010205, on right bank 20 ft downstream from highway bridge at Bell Crossing, 1.5 mi northeast of Victor, 2.0 mi upstream from Big Creek, and at river mile 38.3.

DRAINAGE AREA.--1,963 mi^2.

PERIOD OF RECORD.--April 1987 to current year (seasonal records only).

GAGE.--Water-stage recorder. Elevation of gage is 3,330 ft (NGVD 29).

REMARKS.--Seasonal records good. Some regulation by Painted Rocks Lake (station number 12342000). Diversions for irrigation of about 80,000 acres upstream from station. Several observations of water temperature and specific conductance were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY TO DECEMBER 2003
DAILY MEAN VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1				e1900	2690	14500	2260	324	320			
2				2130	2620	12700	2030	328	311			
3				2030	2600	10900	1750	336	318			
4				1850	2680	9470	1570	392	324			
5				1720	2750	8600	1420	391	310			
6				1600	2630	8090	1290	388	304			
7				1490	2540	7750	1200	393	306			
8				1410	2430	7500	1130	357	308			
9				1430	2350	7770	1160	337	319			
10				1720	2260	8160	989	323	347			
11				2130	2200	8350	837	305	346			
12				2640	2220	7220	735	295	338			
13				3270	2340	6570	692	298	321			
14				3430	2520	6200	659	304	315			
15				3130	3000	6250	584	303	303			
16				2820	3940	6030	527	285	295			
17				2590	4000	5830	483	284	302			
18				2500	3550	5850	421	301	315			
19				2370	3140	5680	401	270	334			
20				2290	2810	5460	393	269	321			
21				2340	2670	4880	369	287	316			
22				2580	2720	4080	346	295	313			
23				3210	3610	3530	338	360	307			
24				3670	5760	2990	345	399	294			
25				3840	8650	2730	368	374	264			
26				3740	11000	2660	413	338	268			
27				3310	12000	2620	434	335	273			
28				2990	11100	2700	403	363	269			
29				2830	14200	2590	367	355	267			
30				2760	16700	2490	329	336	266			
31				---	16800	---	322	332	---			
TOTAL				75720	160480	190150	24565	10257	9194			
MEAN				2524	5177	6338	792	331	306			
MAX				3840	16800	14500	2260	399	347			
MIN				1410	2200	2490	322	269	264			
AC-FT				150200	318300	377200	48720	20340	18240			

STATISTICS OF MONTHLY MEAN DATA FOR SEASONS 1987 - 2003

MEAN	1713	3769	5158	1225	381	375	541
MAX	3052	5177	11060	2665	670	595	947
(WY)	1990	2003	1996	1996	1993	1996	1996
MIN	747	3092	1372	207	95.8	145	397
(WY)	1991	1987	1987	1987	1988	1987	1989

SUMMARY STATISTICS	FOR 2003 SEASON		SEASONS 1987 - 2003	
HIGHEST DAILY MEAN	16800	May 31	17500	Jun 9 1996
LOWEST DAILY MEAN	264	Sep 25	63	Jul 16 1987
MAXIMUM PEAK FLOW	17600	May 31	a18700	Jun 9 1996
MAXIMUM PEAK STAGE	10.82	May 31	10.82	May 31 2003
INSTANTANEOUS LOW FLOW			60	Jul 16 1987

a--Gage height, 10.07 ft.
e--Estimated.

12351200 BITTERROOT RIVER NEAR FLORENCE, MT

LOCATION.--Lat 46°38'00", long 114°03'00" (NAD 27), in $SW^1/_4SE^1/_4SE^1/_4$ sec. 12, T.10 N., R.20 W., Ravalli County, Hydrologic Unit 17010205, on right bank 85 ft upstream from bridge on State secondary Highway 203, 1.3 mi east of Florence, 240 ft upstream from Eightmile Creek, and at river mile 22.7.

DRAINAGE AREA.--2,354 mi^2.

PERIOD OF RECORD.--September 1957 to December 1965, October 2002 to September 2003.

GAGE.--Water-stage recorder. Elevation of gage is 3,200 ft (NGVD 29). Prior to Jan. 1, 1966, nonrecording gage at different datum.

REMARKS.--Records good except those for estimated daily discharges, which are fair. Some regulation by Painted Rocks Lake (station number 12342000). Diversions for irrigation of about 105,000 acres upstream from station. U.S. Geological Survey satellite telemeter at station. Several observations of water temperature and specific conductance were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY TO DECEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e720	e480	626	597	2560	e800	2170	3700	18100	2830	592	616
2	e740	e470	608	575	2630	e770	2570	3560	15400	2580	589	596
3	e760	e470	611	598	2020	e750	2480	3520	13200	2280	601	599
4	e750	e500	614	660	1720	e760	2270	3630	11200	2060	650	618
5	e730	e530	620	661	1510	e730	2100	3850	10100	1910	668	596
6	e710	e550	622	655	1340	e740	1960	3640	9390	1780	675	582
7	e700	e570	588	593	1190	e760	1830	3450	8970	1660	703	578
8	e700	e580	518	534	1120	e770	1730	3250	8600	1620	690	582
9	e690	e600	476	518	1140	e780	1720	3070	8770	1640	664	599
10	e660	e610	464	464	1100	e900	1950	2960	9060	1510	636	627
11	e640	e600	508	438	1040	e1100	2450	2840	9550	1350	613	634
12	e630	e590	570	448	e930	e1500	e2800	2870	8440	1230	591	642
13	e630	e610	579	588	e860	e1900	e4000	3020	7560	1160	583	615
14	e630	612	593	650	e920	e2100	e5000	3250	7160	1080	590	602
15	e625	605	609	639	e940	e2250	e4500	3960	7150	996	587	587
16	e620	591	618	603	e900	e2200	e4000	5510	6960	912	580	572
17	e620	584	607	549	e890	e2150	3440	5980	6760	858	569	581
18	e610	589	572	519	e880	e2000	3220	5270	6890	794	604	591
19	e600	580	515	503	e850	e1850	3020	4650	6860	760	556	611
20	e595	573	479	524	e830	e1700	2860	4050	6660	729	537	593
21	e590	580	497	561	e820	e1600	2890	3710	5830	693	548	580
22	e585	606	504	566	e880	e1600	3280	3720	4800	659	562	571
23	e580	670	519	564	e850	e1900	4200	4780	4060	638	635	558
24	e570	735	530	611	e650	e2000	5280	7690	3410	643	708	544
25	e565	668	483	628	e520	e1850	5610	11400	3090	651	703	508
26	e560	584	461	649	e500	e1800	5660	14700	3000	696	660	491
27	e560	569	505	1330	e600	e1700	4960	15700	3020	730	629	487
28	e580	592	621	1640	e760	e1600	4310	15200	3140	709	659	477
29	e590	620	660	1320	---	e1500	3940	16100	3070	655	662	471
30	e570	630	618	1180	---	e1400	3880	17400	3000	618	632	471
31	e520	---	592	1450	---	e1500	---	18400	---	588	628	---
TOTAL	19630	17548	17387	21815	30950	44960	100080	204830	223200	37019	19304	17179
MEAN	633	585	561	704	1105	1450	3336	6607	7440	1194	623	573
MAX	760	735	660	1640	2630	2250	5660	18400	18100	2830	708	642
MIN	520	470	461	438	500	730	1720	2840	3000	588	537	471
AC-FT	38940	34810	34490	43270	61390	89180	198500	406300	442700	73430	38290	34070

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1957 - 2003, BY WATER YEAR (WY)*

MEAN	1233	1100	986	825	1003	1014	2348	6266	9038	2221	739	978
MAX	3025	2019	1604	1365	1795	1450	3599	9886	13180	4060	1288	2012
(WY)	1960	1960	1959	1965	1963	2003	1965	1958	1964	1964	1965	1965
MIN	566	585	561	588	646	644	1279	4321	5936	935	399	573
(WY)	1961	2003	2003	1961	1964	1964	1964	1960	1958	1961	1961	2003

SUMMARY STATISTICS	FOR 2003 WATER YEAR		WATER YEARS 1957 - 2003*	
ANNUAL TOTAL	753902			
ANNUAL MEAN	2065		2306	
HIGHEST ANNUAL MEAN			3070	1965
LOWEST ANNUAL MEAN			1730	1961
HIGHEST DAILY MEAN	18400	May 31	19600	Jun 9 1964
LOWEST DAILY MEAN	438	Jan 11	365	Aug 20 1961
ANNUAL SEVEN-DAY MINIMUM	493	Sep 24	372	Aug 17 1961
MAXIMUM PEAK FLOW	19200	Jun 1	a20300	Jun 9 1964
MAXIMUM PEAK STAGE	13.43	Jun 1	13.43	Jun 1 2003
INSTANTANEOUS LOW FLOW	384	Jan 11	b365	Aug 20 1961
ANNUAL RUNOFF (AC-FT)	1495000		1671000	
10 PERCENT EXCEEDS	4980		6600	
50 PERCENT EXCEEDS	703		1040	
90 PERCENT EXCEEDS	541		588	

*--During period of record, September 1957 to December 1965, October 2002 to September 2003.
a--Gage height, 10.82 ft, from graph based on gage readings, datum then in use.
b--Observed.
e--Estimated.

PEND OREILLE RIVER BASIN

12352500 BITTERROOT RIVER NEAR MISSOULA, MT

LOCATION--Lat 46°49'55", long 114°03'11" (NAD 27), in SW¼NW¼NE¼ sec. 1, T.12 N., R.20 W., Missoula County, Hydrologic Unit 17010205, on right bank 40 ft downstream from bridge on U.S. Highway 93, 0.5 mi south of Fort Missoula, and at river mile 5.7.
DRAINAGE AREA.--2,814 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1898 to November 1901, May 1903 to December 1904, July 1989 to current year.
GAGE.--Water-stage recorder. Elevation of gage is 3,110 ft (NGVD 29). Prior to Jan. 1, 1905, nonrecording gage at site 1.5 mi upstream at different elevation.
REMARKS.--Water-discharge records good. Some regulation by Painted Rocks Lake (station number 12342000). Diversions for irrigation of about 111,000 acres upstream from station. U.S. Geological Survey satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	767	550	706	679	2890	852	2430	4550	21300	3440	665	659
2	807	539	689	660	3280	831	3080	4370	19000	3170	653	637
3	823	541	681	669	2530	807	3060	4270	15900	2850	658	634
4	823	581	690	726	2110	819	2810	4310	13300	2570	695	647
5	802	617	698	750	1840	787	2580	4620	11600	2350	727	638
6	792	642	701	737	1620	796	2430	4420	10600	2170	733	621
7	781	666	675	678	1420	817	2270	4170	10000	2020	760	615
8	779	677	611	597	1300	828	2150	3950	9630	1960	764	613
9	772	702	553	566	1310	829	2110	3730	9670	1990	728	630
10	746	709	521	512	1270	916	2280	3580	9930	1850	705	650
11	719	702	545	465	1190	1200	2780	3430	10600	1660	672	670
12	709	684	639	471	1080	1640	3600	3400	9960	1500	647	686
13	708	699	654	590	1010	2090	4930	3570	8830	1420	637	682
14	706	711	670	720	1050	2310	5940	3790	8350	1330	635	653
15	705	701	693	720	1060	2510	5540	4430	8160	1230	636	638
16	703	676	708	691	1020	2470	4900	5880	8020	1140	633	627
17	699	669	705	624	1010	2410	4360	6760	7770	1060	622	635
18	693	670	665	585	997	2250	4020	6100	7800	995	647	649
19	684	661	603	556	957	2060	3790	5440	7840	943	618	663
20	676	653	531	565	924	1930	3550	4790	7670	908	585	656
21	671	659	530	613	912	1870	3520	4380	6880	865	580	637
22	667	682	580	694	999	1870	3860	4300	5890	819	594	633
23	663	730	575	648	961	2130	4720	5090	5050	780	649	619
24	654	813	598	638	739	2330	6010	7610	4290	764	727	599
25	646	754	563	692	578	2190	6390	10900	3830	772	744	578
26	640	658	517	700	559	2110	6600	14500	3650	788	713	547
27	634	629	554	1220	674	2000	5960	16700	3610	821	669	536
28	654	646	665	1850	818	1870	5210	17000	3710	820	682	528
29	657	680	756	1590	---	1760	4760	17400	3660	762	698	514
30	640	702	714	1370	---	1690	4710	19000	3580	721	677	509
31	592	---	685	1530	---	1770	---	20400	---	681	664	---
TOTAL	22012	20003	19675	24106	36108	50742	120350	226840	260080	45149	20817	18603
MEAN	710	667	635	778	1290	1637	4012	7317	8669	1456	672	620
MAX	823	813	756	1850	3280	2510	6600	20400	21300	3440	764	686
MIN	592	539	517	465	559	787	2110	3400	3580	681	580	509
AC-FT	43660	39680	39030	47810	71620	100600	238700	449900	515900	89550	41290	36900

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1898 - 2003, BY WATER YEAR (WY)*

MEAN	1002	1068	986	895	1003	1276	2806	6736	8533	3174	1027	877
MAX	1570	2211	3141	1791	3030	2021	4944	13430	21880	14510	3412	1623
(WY)	1904	1996	1996	1997	1996	1997	1996	1997	1899	1899	1899	1899
MIN	568	614	530	542	477	801	1336	4039	2397	980	503	455
(WY)	1905	1905	1905	1993	1994	2002	2001	1990	1992	1994	2000	1904

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1898 - 2003*	
ANNUAL TOTAL	816484		864485			
ANNUAL MEAN	2237		2368		2445	
HIGHEST ANNUAL MEAN					4864	1899
LOWEST ANNUAL MEAN					1366	1992
HIGHEST DAILY MEAN	14300	May 31	21300	Jun 1	37400	Jun 20 1899
LOWEST DAILY MEAN	517	Dec 26	465	Jan 11	300	Feb 9 1994
ANNUAL SEVEN-DAY MINIMUM	556	Dec 20	544	Sep 24	370	Sep 16 1904
MAXIMUM PEAK FLOW			21600	Jun 1	a38300	Jun 20 1899
MAXIMUM PEAK STAGE			12.65	Jun 1	13.11	May 18 1997
INSTANTANEOUS LOW FLOW			412	Jan 10	300	Feb 9 1994
ANNUAL RUNOFF (AC-FT)	1619000		1715000		1771000	
10 PERCENT EXCEEDS	7560		5910		6270	
50 PERCENT EXCEEDS	823		781		1100	
90 PERCENT EXCEEDS	656		599		638	

*During period of operation (July 1898 to November 1901, May 1903 to December 1904, and July 1989 to current year).
a--Observed gage height, 11.55 ft, site and datum then in use.

12352500 BITTERROOT RIVER NEAR MISSOULA, MT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--May 1997 to current year.
PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: November 1999 to current year; seasonal records beginning water year 2003.
INSTRUMENTATION.--Temperature probe installed Nov. 4, 1999.
REMARKS.--Seasonal daily water temperature record good. Unpublished records of instantaneous water temperature and specific conductance are available in files of the District office.
EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE : Maximum, 24.5°C, Aug. 1, 2000; July 20, 22 and Aug. 1, 2003; minimum, 0.0°C, many days during winter months.
EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: Maximum, 24.5°C, July 20, 22, and Aug. 1; minimum for seasonal period, 4.5°C, April 4.

WATER QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instan-taneous dis-charge, cfs (00061)	pH, water, unfltrd field, std units (00400)	Specif. conduc-tance, wat unf uS/cm 25 degC (00095)	Temper-ature, air, deg C (00020)	Temper-ature, water, deg C (00010)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Partic-ulate nitro-gen, susp, water, mg/L (49570)
APR 2003											
23...	0930	4500	8.1	67	11.0	9.5	.35	.050	E.002	.007	.07
MAY											
28...	1000	17200	7.3	44	23.0	10.5	.36	.049	E.002	.010	.13
JUN											
12...	0930	10000	7.7	49	16.0	11.0	.18	.027	<.002	E.006	.11
AUG											
19...	1100	620	8.2	162	24.0	18.0	.18	.036	<.002	<.007	.04

Date	Phos-phorus, water, unfltrd mg/L (00665)	Organic carbon, suspnd sedimnt total, mg/L (00689)	Organic carbon, water, fltrd, mg/L (00681)	Suspnd. sedi-ment, sieve diametr percent <.063mm (70331)	Sus-pended sedi-ment concen-tration mg/L (80154)	Sus-pended sedi-ment load, tons/d (80155)
APR 2003						
23...	.043	.9	3.5	60	38	462
MAY						
28...	.098	1.6	4.6	31	155	7200
JUN						
12...	.032	1.1	3.0	55	43	1160
AUG						
19...	.014	.2	2.2	83	2	3.3

Date	Time	Hard-ness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Potas-sium, water, fltrd, mg/L (00935)	Sodium adsorp-tion ratio (00931)	Sodium, water, fltrd, mg/L (00930)	Alka-linity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chlor-ide, water, fltrd, mg/L (00940)	Fluor-ide, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)
APR 2003											
23...	0930	27	7.91	1.80	1.00	.2	2.79	31	.90	<.17	11.6
MAY											
28...	1000	18	5.29	1.16	1.13	.2	1.75	19	.68	<.2	8.8

Date	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of consti-tuents mg/L (70301)	Residue water, fltrd, tons/ acre-ft (70303)	Residue water, fltrd, tons/d (70302)	Arsenic water, fltrd, ug/L (01000)	Arsenic water unfltrd ug/L (01002)	Cadmium water, fltrd, ug/L (01025)	Cadmium water, unfltrd ug/L (01027)	Chrom-ium, water, fltrd, ug/L (01030)	Chrom-ium, water, unfltrd recover-able, ug/L (01034)
APR 2003										
23...	2.8	48	.07	582	.3	<2	.06	E.2	<.8	E.4
MAY										
28...	1.7	32	.04	1510	.3	<2	E.02	<.2	<.8	1.0

E--Estimated.

WATER QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003--Continued

Date	Copper, water, fltrd, ug/L (01040)	Copper, water, unfltrd recover -able, ug/L (01042)	Lead, water, fltrd, ug/L (01049)	Lead, water, unfltrd recover -able, ug/L (01051)	Nickel, water, fltrd, ug/L (01065)	Nickel, water, unfltrd recover -able, ug/L (01067)	Zinc, water, fltrd, ug/L (01090)	Zinc, water, unfltrd recover -able, ug/L (01092)
APR 2003								
23...	3.3	6.1	.16	2.04	.45	.65	4	11
MAY								
28...	3.7	8.2	.23	2.04	.37	.91	4	9

E--Estimated.

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR APRIL 2003 TO SEPTEMBER 2003

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		APRIL			MAY			JUNE			JULY	
1	9.0	7.5	8.0	11.0	8.5	9.5	12.5	10.5	11.5	19.5	17.0	18.0
2	7.5	6.0	6.5	10.0	8.5	9.5	12.5	11.5	12.0	19.0	16.5	17.5
3	6.0	5.0	5.5	9.5	7.5	8.5	12.5	10.0	11.5	19.0	16.0	17.5
4	6.5	4.5	5.5	9.0	7.5	8.0	13.0	10.5	12.0	19.5	16.0	17.5
5	7.0	5.5	6.0	10.0	7.5	8.5	13.0	11.0	12.0	19.0	16.5	18.0
6	7.5	5.5	6.5	9.5	7.5	8.5	13.5	11.5	12.5	19.5	16.5	18.0
7	8.0	5.0	6.5	9.0	7.5	8.0	13.5	11.0	12.5	20.5	16.5	18.5
8	10.0	6.0	8.0	9.0	7.5	8.5	13.5	11.5	12.5	19.0	17.0	18.0
9	10.5	8.0	9.5	9.5	8.5	9.0	13.5	12.0	13.0	20.0	16.0	18.0
10	11.0	8.5	10.0	11.0	8.0	9.5	14.5	12.5	13.5	21.0	17.0	19.0
11	11.0	9.5	10.5	11.0	9.0	10.0	14.5	12.0	13.0	21.5	17.5	19.5
12	10.5	9.0	10.0	10.0	9.0	9.5	14.0	11.5	13.0	22.5	18.5	20.5
13	9.5	7.5	8.5	11.5	8.5	9.5	14.0	12.5	13.5	21.5	19.0	20.0
14	8.0	6.5	7.5	13.0	10.0	11.5	14.5	11.5	13.0	21.5	17.0	19.5
15	7.5	6.5	7.0	13.0	11.5	12.0	15.5	13.5	14.5	22.0	17.5	20.0
16	7.5	6.0	7.0	12.0	9.5	10.5	16.0	13.5	15.0	23.0	18.5	21.0
17	8.5	6.0	7.5	10.0	8.0	8.5	16.5	14.0	15.5	23.5	19.0	21.5
18	8.5	7.5	8.0	8.5	7.0	7.5	17.0	15.0	16.0	24.0	19.5	21.5
19	9.5	6.0	7.5	10.0	6.5	8.0	17.0	15.5	16.0	24.0	20.0	22.0
20	10.0	7.5	9.0	11.0	8.5	10.0	15.5	13.0	14.0	24.5	20.0	22.0
21	11.0	8.5	9.5	11.5	10.0	10.5	13.5	12.0	12.5	24.0	19.5	22.0
22	12.0	10.0	10.5	13.5	10.0	11.5	13.0	11.5	12.0	24.5	20.0	22.0
23	11.0	8.5	10.0	14.5	12.0	13.0	14.5	11.5	13.0	24.0	19.5	22.0
24	10.0	7.5	8.5	14.0	11.5	13.0	15.0	13.0	14.0	22.0	19.0	20.0
25	10.0	8.5	9.0	13.5	11.0	12.0	15.0	13.5	14.5	22.5	18.0	19.5
26	8.5	6.0	7.0	11.5	9.5	10.5	16.0	13.0	14.5	22.5	19.0	20.5
27	8.5	6.0	7.0	12.5	10.0	11.0	18.0	14.5	16.0	23.0	18.5	20.5
28	9.0	6.5	8.0	13.0	11.0	12.0	17.5	15.5	16.5	23.5	19.0	21.5
29	9.0	7.5	8.0	14.0	11.5	13.0	18.5	16.0	17.0	24.0	19.0	21.5
30	9.5	6.5	8.0	14.0	11.5	12.5	19.5	17.0	18.0	24.0	19.5	21.5
31	---	---	---	12.0	10.5	11.0	---	---	---	23.5	19.0	21.5
MONTH	12.0	4.5	8.0	14.5	6.5	10.0	19.5	10.0	14.0	24.5	16.0	20.0

12352500 BITTERROOT RIVER NEAR MISSOULA, MT--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR APRIL 2003 TO SEPTEMBER 2003--Continued

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN
		AUGUST			SEPTEMBER	
1	24.5	19.5	21.5	20.5	16.5	18.5
2	22.5	19.5	21.0	20.0	16.5	18.0
3	21.0	19.5	20.5	20.0	16.0	18.0
4	22.5	18.5	20.5	19.5	16.5	18.0
5	21.5	18.5	20.0	19.5	16.5	18.0
6	20.5	18.0	19.5	20.0	17.0	18.5
7	21.5	17.5	19.5	20.0	17.0	18.5
8	22.5	19.0	20.5	18.5	15.5	17.5
9	22.5	18.5	20.5	17.5	15.0	16.0
10	22.5	19.0	21.0	16.5	14.5	15.5
11	21.5	18.5	20.0	17.0	14.5	15.5
12	19.5	17.5	18.5	15.0	14.0	14.5
13	20.5	16.5	18.5	16.5	12.5	14.5
14	20.5	17.5	19.0	16.5	13.0	15.0
15	20.5	17.5	19.0	17.0	14.0	15.5
16	22.0	19.0	20.0	16.0	13.0	14.5
17	21.0	18.0	19.5	13.5	12.0	12.5
18	21.0	17.5	19.5	15.0	11.0	13.0
19	22.0	18.0	19.5	15.0	12.5	13.5
20	21.5	18.0	20.0	16.0	13.0	14.5
21	20.0	17.5	19.0	16.5	13.0	14.5
22	19.0	17.0	18.0	16.5	13.0	14.5
23	19.5	16.5	17.5	16.5	13.0	14.5
24	20.0	16.5	18.5	17.0	13.0	15.0
25	21.5	17.0	19.0	17.0	13.5	15.0
26	21.0	17.5	19.5	17.5	14.0	15.5
27	20.5	18.5	19.5	17.0	14.0	15.5
28	20.5	16.5	18.5	17.0	13.5	15.0
29	20.5	16.5	18.5	16.0	13.0	14.5
30	20.5	16.0	18.0	15.5	12.0	14.0
31	20.5	16.0	18.5	---	---	---
MONTH	24.5	16.0	19.5	20.5	11.0	15.5

PEND OREILLE RIVER BASIN

12353000 CLARK FORK BELOW MISSOULA, MT

LOCATION.--Lat 46°52'09", long 114°07'33" (NAD 27), in NW$^1/_4$NE$^1/_4$SE$^1/_4$ sec.21, T.13 N., R.20 W., Missoula County, Hydrologic Unit 17010204, on right bank 1.0 mi downstream from Bitterroot River, 4.5 mi west of Missoula, and at river mile 349.5.

DRAINAGE AREA.--9,003 mi^2.

PERIOD OF RECORD.--October 1929 to current year.

REVISED RECORDS.--WSP 1042: 1931. WSP 1246: Drainage area. WSP 1316: 1932(M), 1935(M), 1946(M).

GAGE.--Water-stage recorder. Elevation of gage is 3,083.88 ft (NGVD 29) (levels by U.S. Army Corps of Engineers).

REMARKS.--Records good. Some diurnal fluctuation at low flow caused by powerplant at Milltown 14.9 mi upstream. Diversions for irrigation of about 235,000 acres upstream from station. U.S. Geological Survey satellite telemeter at station. Several observations of water temperature and specific conductance were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2070	1600	1960	1850	5580	2100	5330	10900	38300	6220	1760	1600
2	2070	1590	1910	1850	6510	2120	6620	10500	34800	5820	1720	1590
3	2070	1760	1980	1800	4930	2080	6650	10500	29700	5380	1730	1560
4	2090	1780	1970	1910	4000	2050	6210	10600	25200	5020	1740	1560
5	2080	1810	1860	1930	3540	2000	5810	11500	22100	4740	1790	1540
6	2060	1920	1930	1920	3160	2040	5440	11500	20000	4520	1790	1520
7	2070	1980	1910	1820	2830	2090	5170	11000	18700	4250	1820	1510
8	2050	2030	1800	1660	2660	2060	4890	10400	17700	4060	1840	1530
9	2020	2080	1680	1500	2690	1990	4810	9830	17400	4150	1870	1560
10	2030	2100	1630	1400	2670	2160	5150	9370	17700	4020	1850	1600
11	2000	2060	1690	1190	2520	2590	6150	8910	18400	3690	1770	1600
12	2000	2030	1860	1300	2380	3230	7530	8690	17600	3450	1700	1650
13	2000	2020	1880	1730	2290	5150	9620	8860	15800	3250	1680	1720
14	2000	2070	1940	2040	2330	7660	11600	9090	14900	3180	1650	1710
15	2000	2060	1890	1960	2380	7910	11800	9970	14500	3020	1610	1660
16	1990	2010	1940	1880	2310	6640	11100	12100	14100	2790	1540	1650
17	1990	1970	1930	1640	2320	6530	10200	13500	13500	2670	1500	1680
18	1990	1960	1870	1520	2300	5680	9560	12700	13100	2580	1520	1720
19	1980	1980	1710	1530	2230	4900	9010	11800	13100	2440	1590	1750
20	1950	1930	1530	1630	2190	4470	8540	10700	13000	2410	1560	1730
21	1940	1960	1560	1780	2170	4300	8450	9920	12600	2260	1540	1680
22	1930	1990	1750	1650	2300	4260	9010	9630	11400	2190	1540	1650
23	1920	2050	1770	1430	2210	4760	10400	10500	10000	2110	1610	1650
24	1930	2160	1750	1500	1720	5240	12700	13900	8860	2100	1720	1630
25	1900	2030	1680	1800	1340	4840	14100	19100	8050	2060	1740	1600
26	1900	1810	1610	1970	1460	4620	15000	25200	7590	2090	1690	1590
27	1890	1880	1650	2800	1770	4410	14100	29900	7210	2080	1620	1580
28	1930	1860	1860	4350	2020	4160	12700	31000	7040	2060	1620	1550
29	1950	1890	1980	3290	---	3940	11600	31700	6840	1990	1640	1520
30	1920	1940	1890	2830	---	3830	11200	34600	6590	1890	1620	1520
31	1700	---	1780	3060	---	4050	---	37000	---	1810	1600	---
TOTAL	61420	58310	56150	60520	76810	123860	270450	464870	475780	100300	51970	48410
MEAN	1981	1944	1811	1952	2743	3995	9015	15000	15860	3235	1676	1614
MAX	2090	2160	1980	4350	6510	7910	15000	37000	38300	6220	1870	1750
MIN	1700	1590	1530	1190	1340	1990	4810	8690	6590	1810	1500	1510
AC-FT	121800	115700	111400	120000	152400	245700	536400	922100	943700	198900	103100	96020

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1930 - 2003, BY WATER YEAR (WY)

MEAN	2715	2728	2473	2244	2494	3097	6401	14790	16730	5831	2296	2281
MAX	6617	5110	6064	4401	6697	7012	16500	30440	33970	16320	5530	5160
(WY)	1960	1960	1996	1934	1996	1972	1934	1997	1972	1975	1975	1965
MIN	1393	1471	1414	871	1108	1743	2302	5113	4619	1361	810	909
(WY)	1938	1938	1988	1937	1933	1937	1941	1941	1987	1931	1931	1937

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1930 - 2003	
ANNUAL TOTAL	1773330		1848850			
ANNUAL MEAN	4858		5065		5342	
HIGHEST ANNUAL MEAN					8832	1976
LOWEST ANNUAL MEAN					2582	1937
HIGHEST DAILY MEAN	27000	Jun 1	38300	Jun 1	54100	May 18 1997
LOWEST DAILY MEAN	1420	Feb 26	1190	Jan 11	580	Jan 19 1933
ANNUAL SEVEN-DAY MINIMUM	1660	Dec 20	1510	Jan 7	660	Dec 8 1932
MAXIMUM PEAK FLOW			38700	Jun 1	55100	May 18 1997
MAXIMUM PEAK STAGE			10.24	Jun 1	12.18	May 18 1997
INSTANTANEOUS LOW FLOW			a1000	Jan 12	b388	Jan 18 1933
ANNUAL RUNOFF (AC-FT)	3517000		3667000		3870000	
10 PERCENT EXCEEDS	15100		12300		13300	
50 PERCENT EXCEEDS	2090		2060		2790	
90 PERCENT EXCEEDS	1780		1600		1620	

a--Result of freezeup.
b--Gage height, 0.58 ft, result of freezeup.

PEND OREILLE RIVER BASIN

12354000 ST. REGIS RIVER NEAR ST. REGIS, MT

LOCATION.--Lat 47°17'49", long 115°07'18", (NAD 27) near center of $NW^1/_4NE^1/_4$ sec.26, T.18 N., R.28 W., Mineral County, on left bank 50 ft downstream from road bridge, 500 ft upstream from Little Joe Creek, 1.2 mi west of St. Regis, and at river mile 1.7.

DRAINAGE AREA.--303 mi^2.

PERIOD OF RECORD.--September 1910 to September 1917 (no winter records), annual maximum, water year 1948, published in WSP 1080, September 1958 to September 1975, February 2002 to current year. Monthly discharge only for some periods, published in WSP 1316, 1736.

REVISED RECORDS.--WSP 1246: water year 1912; WSP 1316: drainage area, 1911.

GAGE.--Water-stage recorder. Elevation of gage is 2,645.00 ft (NGVD 29). September 1910 to September 1917, non-recording gage at site 2 mi upstream at different elevation.

REMARKS.--Records good. Minor diversions for irrigation of hay meadows above station. U.S. Geological Survey satellite telemeter at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood on or about Dec. 20, 1933, reached a stage of about 14.5 ft, from information by local residents (discharge unknown). Flood of May 19, 1954, reached a discharge of about 11,000 ft^3/s, gage height, 9.4 ft, from rating curve extended above 5,100 ft^3/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	113	68	97	106	1370	184	1450	1110	1430	299	109	75
2	110	76	92	104	881	177	1330	1110	1310	280	107	74
3	109	82	95	119	670	173	1190	1150	1190	267	117	72
4	110	84	92	133	544	169	1070	1170	1120	254	130	72
5	109	86	91	134	459	166	980	1140	1060	242	118	71
6	108	89	90	134	395	169	901	1090	1030	234	112	70
7	106	91	89	120	349	167	832	1030	997	223	109	72
8	103	95	88	109	331	162	794	975	956	231	107	73
9	100	108	86	100	301	165	826	932	933	219	105	84
10	99	107	86	77	280	182	854	904	922	208	101	88
11	98	109	89	e76	259	225	954	887	866	197	99	83
12	97	115	88	e78	241	356	1070	906	792	190	99	109
13	97	144	92	e80	237	430	1160	959	751	183	100	98
14	97	145	112	e90	237	578	1240	1010	705	179	98	88
15	97	130	189	e100	222	689	1220	1130	657	175	96	83
16	97	115	187	e105	217	689	1140	1130	622	169	94	81
17	96	115	171	98	219	682	1100	1070	592	161	93	91
18	95	113	144	90	214	646	1060	1000	571	157	91	96
19	94	108	131	89	205	617	1010	934	574	152	89	89
20	93	115	109	97	201	603	988	882	628	145	88	84
21	92	119	111	99	e203	579	1010	856	551	143	87	81
22	92	116	110	99	e200	840	1100	859	506	140	86	80
23	91	148	106	94	194	1520	1280	945	469	133	92	78
24	90	148	102	99	151	1250	1310	1180	438	130	92	76
25	88	118	92	105	162	1070	1390	1620	419	127	87	76
26	89	111	92	161	180	987	1370	1820	388	124	84	73
27	89	106	103	415	190	883	1270	1680	369	125	81	72
28	94	101	127	299	190	793	1180	1640	354	119	79	72
29	96	100	121	246	---	737	1130	1760	337	115	79	71
30	84	100	111	238	---	716	1100	1700	320	113	78	71
31	65	---	110	525	---	950	---	1590	---	111	76	---
TOTAL	2998	3262	3403	4419	9302	17554	33309	36169	21857	5545	2983	2403
MEAN	96.7	109	110	143	332	566	1110	1167	729	179	96.2	80.1
MAX	113	148	189	525	1370	1520	1450	1820	1430	299	130	109
MIN	65	68	86	76	151	162	794	856	320	111	76	70
AC-FT	5950	6470	6750	8770	18450	34820	66070	71740	43350	11000	5920	4770
CFSM	0.32	0.36	0.36	0.47	1.10	1.87	3.66	3.85	2.40	0.59	0.32	0.26
IN.	0.37	0.40	0.42	0.54	1.14	2.16	4.09	4.44	2.68	0.68	0.37	0.30

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1910 - 2003, BY WATER YEAR (WY)*

MEAN	141	229	209	274	302	415	1242	2173	1535	397	163	130
MAX	350	590	555	1363	759	1366	2057	4700	3367	1150	313	204
(WY)	1960	1915	1959	1974	1971	1972	1916	1917	1974	1916	1916	1914
MIN	85.5	101	92.4	89.3	86.6	94.2	349	671	388	155	83.1	77.3
(WY)	1974	1962	1964	1964	1964	1964	1975	1915	1915	1973	1973	1973

12354000 ST. REGIS RIVER NEAR ST. REGIS, MT--Continued

SUMMARY STATISTICS	FOR 2003 WATER YEAR		WATER YEARS 1910 - 2003*	
ANNUAL TOTAL	143204			
ANNUAL MEAN	392		570	
HIGHEST ANNUAL MEAN			938	1974
LOWEST ANNUAL MEAN			256	1973
HIGHEST DAILY MEAN	1820	May 26	8500	Jan 16 1974
LOWEST DAILY MEAN	65	Oct 31	45	Dec 11 1961
ANNUAL SEVEN-DAY MINIMUM	72	Sep 2	59	Dec 5 1972
MAXIMUM PEAK FLOW	1910	May 26	a9640	Jan 16 1974
MAXIMUM PEAK STAGE	5.74	May 26	7.54	Apr 14 2002
INSTANTANEOUS LOW FLOW	53	Oct 31	b41	Dec 30 2001
ANNUAL RUNOFF (AC-FT)	284000		412800	
ANNUAL RUNOFF (CFSM)	1.29		1.88	
ANNUAL RUNOFF (INCHES)	17.58		25.55	
10 PERCENT EXCEEDS	1100		1580	
50 PERCENT EXCEEDS	144		218	
90 PERCENT EXCEEDS	84		99	

*--During period of operation (September 1910 to September 1917 (no winter records), September 1958 to September 1975, February 2002 to current year).
a--Gage height, 7.38 ft.
b--Result of freezeup.
e--Estimated.

PEND OREILLE RIVER BASIN

12354500 CLARK FORK AT ST. REGIS, MT

LOCATION.--Lat 47°18'07", long 115°05'11" (NAD 27), in NW$^1/_4$SE$^1/_4$SW$^1/_4$ sec.19, T.18 N., R.27 W., Mineral County, Hydrologic Unit 17010204, on left bank at St. Regis, 0.4 mi downstream from St. Regis River, and at river mile 270.3.

DRAINAGE AREA.--10,709 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1910 to current year. Monthly discharge only for some periods, published in WSP 1316.

REVISED RECORDS.--WSP 1246: Drainage area. WSP 1316: 1916-17, 1920, 1929-31(M), 1933(M).

GAGE.--Water-stage recorder. Elevation of gage is 2,600.37 ft (NGVD 29) (levels by U.S. Army Corps of Engineers). Prior to Nov. 29, 1933, nonrecording gage at same site and elevation.

REMARKS.--Water-discharge records good. Diversions for irrigation of about 244,000 acres upstream from station. U.S. Geological Survey satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2640	2140	2410	2270	6780	2790	7810	14400	43700	8160	2460	2080
2	2710	2100	2420	2320	8430	2850	9300	14000	42900	7690	2390	2070
3	2700	2090	2390	2360	7760	2880	9820	13900	38000	7260	2370	2050
4	2700	2230	2460	2350	e6560	2840	9450	14000	32700	6780	2390	2020
5	2710	2260	2450	2440	e4980	2790	8810	14400	28400	6370	2370	2010
6	2700	2290	2340	2460	e4450	2790	8300	14900	25700	6080	2420	1990
7	2660	2400	2400	2420	e4200	2840	7790	14500	23900	5860	2410	1970
8	2670	2470	2370	2300	e3920	2850	7440	13800	22500	5600	2430	1960
9	2660	2550	2250	2150	e3830	2820	7220	13100	21700	5430	2440	1990
10	2640	2590	2130	1890	e3790	2780	7280	12500	21600	5440	2430	2020
11	2620	2580	2090	1810	3770	3050	8000	12000	21900	5170	2410	2050
12	2590	2560	2130	1800	3570	3770	9480	11600	22000	4880	2340	2160
13	2600	2580	2290	1820	3410	4710	11700	11700	20300	4580	2270	2170
14	2580	2580	2350	2190	3310	7140	14400	12000	18700	4370	2240	2210
15	2580	2590	2530	2490	3300	10000	15600	12800	17900	4270	2210	2200
16	2580	2560	2500	2430	3320	9380	15000	14300	17500	4050	2170	2180
17	2560	2520	2520	2330	3280	8460	14000	16300	16800	3810	2090	2210
18	2540	2490	2460	2110	3270	8270	13100	16500	16300	3670	2050	2230
19	2530	2460	2380	1970	3210	7360	12400	15400	16100	3510	2060	2260
20	2520	2470	2200	1980	3130	6660	11800	14200	16100	3370	2110	2260
21	2490	2460	2020	2080	3100	6270	11400	13200	15700	3280	2070	2230
22	2470	2470	2030	2270	3150	6430	11800	12700	14800	3130	2050	2190
23	2440	2610	2190	2130	3190	7720	13100	13000	13300	3040	2090	2160
24	e2430	2640	2220	1940	2920	7980	15300	15600	11900	2930	2140	2140
25	e2420	2660	2190	1980	2390	7820	17500	21600	10700	2890	2220	2120
26	2410	2520	2120	2310	2150	7380	18700	28600	9950	2820	2240	2080
27	2410	2320	2090	3010	2320	6970	18600	34000	9530	2820	2190	2060
28	2420	2360	2200	3860	2560	6590	17000	36900	9060	2790	2130	2050
29	2460	2330	2370	4930	---	6220	15600	38000	8820	2740	2110	2010
30	2440	2370	2460	4010	---	5950	14700	39900	8480	2660	2120	1980
31	2370	---	2390	4090	---	6250	---	42500	---	2560	2110	---
TOTAL	79250	73250	71350	76500	110050	172610	362400	572300	596940	138010	69530	63110
MEAN	2556	2442	2302	2468	3930	5568	12080	18460	19900	4452	2243	2104
MAX	2710	2660	2530	4930	8430	10000	18700	42500	43700	8160	2460	2260
MIN	2370	2090	2020	1800	2150	2780	7220	11600	8480	2560	2050	1960
MED	2580	2470	2350	2300	3310	6250	11800	14300	17700	4050	2220	2080
AC-FT	157200	145300	141500	151700	218300	342400	718800	1135000	1184000	273700	137900	125200
CFSM	0.24	0.23	0.21	0.23	0.37	0.52	1.13	1.72	1.86	0.42	0.21	0.20
IN.	0.28	0.25	0.25	0.27	0.38	0.60	1.26	1.99	2.07	0.48	0.24	0.22

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1930 - 2003, BY WATER YEAR (WY)*

MEAN	3405	3559	3436	3113	3476	4295	9250	20180	21520	7656	3147	2970
MAX	8042	7047	10710	8520	10660	11490	24880	42140	42410	19460	6747	6252
(WY)	1960	1934	1934	1934	1996	1972	1934	1997	1972	1975	1975	1965
MIN	1854	1942	1909	1474	1592	2199	3333	7190	6021	1998	1454	1351
(WY)	1938	1932	1937	1937	1936	1937	1937	1941	1987	1931	1931	1937

12354500 CLARK FORK AT ST. REGIS, MT--Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1930 - 2003*	
ANNUAL TOTAL	2540630		2385300			
ANNUAL MEAN	6961		6535		7171	
HIGHEST ANNUAL MEAN					11560	1997
LOWEST ANNUAL MEAN					3420	1941
HIGHEST DAILY MEAN	38200	Jun 1	43700	Jun 1	68500	May 18 1997
LOWEST DAILY MEAN	2020	Jan 3	1800	Jan 12	800	Feb 3 1989
ANNUAL SEVEN-DAY MINIMUM	2120	Dec 21	1990	Jan 8	1130	Jan 31 1936
MAXIMUM PEAK FLOW			44300	Jun 2	b68900	May 18 1997
MAXIMUM PEAK STAGE			16.39	Jun 2	20.27	May 18 1997
INSTANTANEOUS LOW FLOW			a1680	Jan 11	c732	Feb 3 1989
ANNUAL RUNOFF (AC-FT)	5039000		4731000		5195000	
ANNUAL RUNOFF (CFSM)	0.65		0.61		0.67	
ANNUAL RUNOFF (INCHES)	8.83		8.29		9.10	
10 PERCENT EXCEEDS	22200		15600		17800	
50 PERCENT EXCEEDS	2890		2700		3680	
90 PERCENT EXCEEDS	2260		2100		2200	

*--Statistics not computed prior to 1930 as the 1924 to 1929 period of record was estimated.
a--Gage Height, 4.51ft; also occurred Jan. 12, 13.
b--Also May 24, 1948; gage height, 19.96 ft.
c--Gage height, 3.29 ft, result of upstream freezeup.
e--Estimated.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--September 1998 to current year.
PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: April 2002 to September 2002.
REMARKS.--Unpublished records of instantaneous water temperature and specific conductance are available in files of the District office.
EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE (seasonal records): Maximum, 20.5°C, several days in July and August, 2003; minimum, 3.0°C, Apr. 4, 2003.

WATER QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instan-taneous dis-charge, cfs (00061)	pH, water, unfltrd field, std units (00400)	Specif. conduc-tance, wat unf uS/cm 25 degC (00095)	Temper-ature, air, deg C (00020)	Temper-ature, water, deg C (00010)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)
MAY 2003									
22...	0915	12700	8.2	159	10.5	7.5	.17	.034	E.002
JUN									
13...	0815	20700	8.1	120	11.5	11.0	.22	.046	E.002
JUL									
09...	1145	5390	8.4	197	21.0	13.5	.13	<.022	<.002
AUG									
14...	1000	2240	8.3	228	18.5	17.5	.13	<.022	E.002

Date	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Phos-phorus, water, unfltrd mg/L (00665)	Suspnd. sedi-ment, sieve diametr percent <.063mm (70331)	Sus-pended sedi-ment concen-tration mg/L (80154)	Sus-pended sedi-ment load, tons/d (80155)
MAY 2003					
22...	E.006	.028	74	15	514
JUN					
13...	.008	.042	71	44	2460
JUL					
09...	<.007	.011	86	3	44
AUG					
14...	<.007	.010	67	2	12

E--Estimated.

Date	Time	Hard-ness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Potas-sium, water, fltrd, mg/L (00935)	Sodium adsorp-tion ratio (00931)	Sodium, water, fltrd, mg/L (00930)	Alka-linity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chlor-ide, water, fltrd, mg/L (00940)	Fluor-ide, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)
JUN 2003											
13...	0815	54	15.0	3.90	.91	.2	2.91	52	1.21	<.2	9.40
AUG											
14...	1000	100	26.5	8.16	1.6	.3	6.23	98	2.96	<.2	10.8

Date	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of consti-tuents mg/L (70301)	Residue water, fltrd, tons/ acre-ft (70303)	Residue water, fltrd, tons/d (70302)	Arsenic water unfltrd ug/L (01002)	Cadmium water, unfltrd ug/L (01027)	Chrom-ium, water, unfltrd recover -able, ug/L (01034)	Copper, water, unfltrd recover -able, ug/L (01042)	Lead, water, unfltrd recover -able, ug/L (01051)	Nickel, water, unfltrd recover -able, ug/L (01067)	Zinc, water, unfltrd recover -able, ug/L (01092)
JUN 2003											
13...	5.8	71	.10	3950	3	<.22	<.8	12.0	1.76	.82	14
AUG											
14...	11	126	.17	763	2	<.04	<.8	2.1	.10	1.36	E2

E--Estimated.

PEND OREILLE RIVER BASIN

12355000 FLATHEAD RIVER AT FLATHEAD, BRITISH COLUMBIA

LOCATION.--Lat 49°00'05", long 114°28'34" (NAD 27), Hydrologic Unit 17010206, on leftt bank 200 ft north of international boundary at Flathead, British Columbia, 1.6 mi upstream from Sage Creek, 6.5 mi northwest of Trail Creek, MT, and at river mile 216.6.

DRAINAGE AREA.--427 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1929 to June 1995 (no winter records prior to 1952). Prior to 1934, published as Flathead River near Trail Creek, MT. October 1970 to September 1972, published as North Fork Flathead River at Flathead British Columbia. October 1999 to current year gage re-established and operated by USGS at site on left bank in British Columbia.

GAGE.--Water-stage recorder. Elevation of gage is 3,964.95 ft (NGVD 29). Prior to Sept. 1, 1949, nonrecording gage and Sept. 1, 1949 to Oct. 4, 1964, water-stage recorder at site 1,200 ft upstream at elevation 11.01 ft higher. Oct. 5, 1964, to Aug. 1, 1973, water-stage recorder at site on left bank 155 ft upstream at elevation 1.79 ft higher. Aug. 2, 1973 to June 28, 1995 operated by Water Survey Canada at site on right bank at elevation 3.21 ft. higher. October 1999 to current year at site 200 ft upstream from International Border in British Columbia on left bank.

REMARKS.--Water-discharge records good except those for estimated daily discharges, which are poor. U.S. Geological Survey satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	257	e140	e150	e150	e200	e145	397	1150	4340	987	286	160
2	245	e145	e145	e150	e180	e145	373	1220	4270	909	277	157
3	238	e150	e145	e150	e165	e140	338	1310	3920	845	280	156
4	238	e150	e145	e155	155	e130	314	1350	3250	789	282	155
5	232	e160	e145	e160	151	e130	296	1260	3020	748	276	152
6	228	172	145	e150	144	e120	278	1160	2910	722	271	149
7	223	159	141	e140	144	e100	266	1060	2920	680	267	147
8	219	164	140	e130	137	e95	266	1000	3000	652	257	155
9	215	171	139	e120	134	e120	318	943	3430	620	247	165
10	213	164	140	e100	131	e150	376	919	3010	586	236	164
11	215	161	141	e105	130	e200	439	930	2860	563	229	163
12	210	162	140	e130	129	e230	525	986	2600	542	225	182
13	205	172	142	e150	131	e270	564	1070	2470	523	219	173
14	203	166	163	e170	141	e300	632	1300	2310	508	213	164
15	201	162	210	e160	130	242	664	1860	2140	490	209	159
16	200	160	194	e145	126	191	666	2030	2010	481	209	159
17	198	164	178	e140	126	181	664	1750	1930	456	210	161
18	197	161	168	e150	122	170	671	1540	1940	435	204	158
19	195	168	162	e140	119	166	681	1320	2040	419	198	156
20	193	196	e140	e145	122	163	704	1200	2320	404	193	163
21	190	188	e130	e135	121	166	811	1190	2190	391	191	156
22	188	185	e120	e110	109	199	1030	1280	1930	380	188	151
23	183	185	e120	e115	e80	250	1400	1500	1740	367	188	147
24	178	e170	e130	e135	e90	211	2000	2400	1610	354	184	145
25	175	e150	e135	e140	e120	192	2690	4540	1460	341	179	143
26	173	e160	e140	e160	e135	179	2690	5910	1350	333	174	140
27	171	e165	e150	e180	e150	172	2130	5370	1280	323	168	139
28	171	e160	e150	e160	e145	163	1690	4990	1220	314	169	137
29	170	e160	e155	e155	---	157	1390	5710	1130	304	168	135
30	e150	e155	e145	e165	---	160	1220	e6000	1050	298	165	135
31	e130	---	e150	e175	---	273	---	e5010	---	291	163	---
TOTAL	6204	4925	4598	4470	3767	5510	26483	69258	71650	16055	6725	4626
MEAN	200	164	148	144	135	178	883	2234	2388	518	217	154
MAX	257	196	210	180	200	300	2690	6000	4340	987	286	182
MIN	130	140	120	100	80	95	266	919	1050	291	163	135
AC-FT	12310	9770	9120	8870	7470	10930	52530	137400	142100	31850	13340	9180
CFSM	0.47	0.38	0.35	0.34	0.32	0.42	2.07	5.23	5.59	1.21	0.51	0.36
IN.	0.54	0.43	0.40	0.39	0.33	0.48	2.31	6.03	6.24	1.40	0.59	0.40

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1929 - 2003, BY WATER YEAR (WY)*

MEAN	325	345	237	186	172	199	913	3493	3086	981	382	289
MAX	1285	1261	881	458	345	685	2957	5584	6691	2418	937	785
(WY)	1948	2000	1976	1981	1971	1986	1934	1948	1974	1954	1976	1951
MIN	127	124	97.0	87.3	83.3	97.7	189	1540	824	279	188	132
(WY)	2002	1937	2001	2001	2001	2001	1970	1977	1977	1977	1931	2001

12355000 FLATHEAD RIVER AT FLATHEAD, BRITISH COLUMBIA--Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1929 - 2003*	
ANNUAL TOTAL	399461		224271			
ANNUAL MEAN	1094		614		902	
HIGHEST ANNUAL MEAN					1376	1974
LOWEST ANNUAL MEAN					377	2001
HIGHEST DAILY MEAN	8480	May 31	6000	May 30	a16800	Jun 7 1995
LOWEST DAILY MEAN	75	Jan 1	80	Feb 23	62	Jan 2 1977
ANNUAL SEVEN-DAY MINIMUM	106	Mar 17	109	Feb 19	71	Dec 31 1976
MAXIMUM PEAK FLOW			6650	May 30	b16300	Jun 8 1964
MAXIMUM PEAK STAGE			9.03	May 30	c10.00	May 31 2002
INSTANTANEOUS LOW FLOW			59	Feb 23	59	Feb 23 2003
INSTANTANEOUS LOW STAGE			3.95	Feb 23	3.95	Feb 23 2003
ANNUAL RUNOFF (AC-FT)	792300		444800		653600	
ANNUAL RUNOFF (CFSM)	2.56		1.44		2.11	
ANNUAL RUNOFF (INCHES)	34.80		19.54		28.71	
10 PERCENT EXCEEDS	4660		1790		2720	
50 PERCENT EXCEEDS	247		188		295	
90 PERCENT EXCEEDS	143		135		135	

*--During periods of operation, (no winter records prior to 1952).
a--Instantaneous peak flow not determined.
b--Gage height, 8.00 ft, site and datum then in use.
c--At present site and datum. Flood of June 7, 1995 reached a stage of 9.66 ft (site and datum then in use), which is 12.86 ft at present site and datum.
e--Estimated.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1949-50, 1965, 1970, 1975-93 and August 1999 to current year.
REMARKS.--Missing metals data for June 17 due to sample loss in transit to lab.
PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: November 1974 to September 1981.
WATER TEMPERATURE: November 1974 to September 1991.
SUSPENDED-SEDIMENT DISCHARGE: April 1975 to October 1978, August 1985 to June 1991.
EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 309 microsiemens per centimeter (µS/cm) at 25.0°C, Jan. 12, 28, 1975, Jan. 20, 1980; minimum daily, 130 µS/cm at 25.0°C, May 20, 1976.
WATER TEMPERATURE: Maximum 19.5°C, Aug 2, 1977; minimum 0.0°C on many days during winters.
SEDIMENT CONCENTRATION: Maximum daily mean, 1,310 mg/L, June 20,1975; minimum daily mean, 1 mg/L on many days most years.
SEDIMENT LOAD: Maximum daily, 36,100 tons, June 20, 1975; minimum daily, 0.24 ton, Feb. 1, 23, 1988.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instan-taneous dis-charge, cfs (00061)	Turbid-ity, wat unf lab, Hach 2100AN NTU (99872)	pH, water, unfltrd field, std units (00400)	Specif. conduc-tance, wat unf uS/cm 25 degC (00095)	Temper-ature, air, deg C (00020)	Temper-ature, water, deg C (00010)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Ammonia water, fltrd, mg/L as N (00608)
MAY 2003									
21...	1015	1130	2.0	8.3	218	11.0	5.5	E.09	<.015
JUN									
10...	0915	3100	16	8.2	166	11.5	6.5	.13	<.015
JUL									
07...	0915	701	2.4	8.4	232	15.0	9.5	<.10	<.015
AUG									
21...	0830	193	1.4	8.2	275	10.0	9.5	<.10	<.015

Date	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Phos-phorus, water, unfltrd mg/L (00665)	Suspnd. sedi-ment, sieve diametr percent <.063mm (70331)	Sus-pended sedi-ment concen-tration mg/L (80154)	Sus-pended sedi-ment load, tons/d (80155)
MAY 2003							
21...	<.022	<.002	<.007	.008	79	12	37
JUN							
10...	<.022	<.002	<.007	.033	71	44	368
JUL							
07...	<.022	<.002	<.007	.005	86	3	5.7
AUG							
21...	<.022	<.002	<.007	E.004	52	21	11

E--Estimated.

Date	Time	Organic carbon, water, unfltrd mg/L (00680)	Arsenic water unfltrd ug/L (01002)	Cadmium water, unfltrd ug/L (01027)	Chrom-ium, water, unfltrd recover -able, ug/L (01034)	Copper, water, unfltrd recover -able, ug/L (01042)	Lead, water, unfltrd recover -able, ug/L (01051)	Nickel, water, unfltrd recover -able, ug/L (01067)	Zinc, water, unfltrd recover -able, ug/L (01092)
JUN 2003									
10...	0915	2.4	<2	<.2	E.6	2.1	.71	1.23	3
AUG									
21...	0830	.6	<2	<.04	E.4	E.3	<.06	1.97	<2

E--Estimated.

PEND OREILLE RIVER BASIN

12355500 NORTH FORK FLATHEAD RIVER NEAR COLUMBIA FALLS, MT

LOCATION.--Lat 48°29'44", long 114°07'36" (NAD 27), in $NE^1/_4SW^1/_4NW^1/_4$ sec.35, T.32 N., R.20 W., Flathead County, Hydrologic Unit 17010206, on right bank 1.5 mi downstream from Canyon Creek, 3.8 mi upstream from Middle Fork, 8.8 mi northeast of Columbia Falls, and at river mile 162.1.

DRAINAGE AREA.--1,548 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1910 to September 1917 (no winter records in water years 1913, 1916, 1917), April 1929 to February 1935 (incomplete), June 1935 to current year. Monthly discharge only for some periods, published in WSP 1316. Published as Flathead River near Columbia Falls 1915-17, 1929-70.

REVISED RECORDS.--WSP 1216: Drainage area. WSP 1246: 1911, 1912(M), 1915-17(M), 1929 (M), 1938-39(M), 1946(M).

GAGE.--Water-stage recorder. Elevation of gage is 3,145.59 ft (NGVD 29). September 1910 to September 1917 and April to August 1929, nonrecording gages, and May 1, 1930, to Sept. 30, 1962, water-stage recorder, all at site 2.7 mi downstream at different elevations.

REMARKS.--Water-discharge records good except those for estimated daily discharges, which are poor. A few small diversions from tributaries for irrigation of hay meadows upstream from station. Bureau of Reclamation satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	999	e560	674	691	936	591	2700	4990	13600	4270	1340	744
2	957	e580	648	654	911	586	2660	4980	13000	4110	1300	724
3	926	e600	636	706	852	593	2340	5250	12400	3850	1280	711
4	911	e610	648	669	811	570	2120	5430	11000	3580	1300	703
5	897	e620	630	664	765	579	1950	5320	9990	3340	1280	694
6	888	e650	624	647	753	e430	1820	5040	9430	3200	1240	678
7	871	664	616	619	719	e380	1730	4720	9230	3020	1220	670
8	855	658	605	596	707	e360	1740	4400	9240	2880	1200	684
9	848	700	594	536	687	519	2190	4120	10500	2750	1150	782
10	837	666	589	e400	668	680	2560	3880	10700	2620	1110	782
11	834	643	590	e430	634	829	3160	3720	10400	2540	1070	774
12	836	641	586	e540	598	904	3660	3730	9570	2480	1060	806
13	823	676	594	828	583	938	4150	3880	8950	2430	1030	797
14	809	683	665	801	612	1030	4370	4130	8620	2370	1010	769
15	799	663	813	756	643	1070	4400	4990	8090	2300	986	748
16	791	644	861	696	619	1130	4180	5990	7540	2250	987	749
17	783	646	833	709	614	1280	4070	5810	7210	2170	990	779
18	775	643	744	738	596	1250	4000	5320	7190	2090	971	748
19	767	673	728	676	579	1170	3870	4840	7700	2030	946	726
20	760	775	657	647	581	1150	3800	4410	8230	1940	923	724
21	751	826	e600	e550	600	1160	3980	4180	8210	1860	906	721
22	740	822	e540	e440	575	1430	4490	4140	7140	1810	893	696
23	725	845	e570	e460	e370	1890	5420	4390	6330	1740	885	674
24	700	814	e600	610	e330	1740	6620	5650	5760	1690	866	657
25	687	707	e640	670	e430	1530	8470	9170	5240	1650	839	646
26	680	732	e680	740	e520	1390	9220	14000	4850	1600	816	629
27	674	760	e700	827	e560	1310	8190	14700	4680	1560	798	617
28	683	706	e720	834	e580	1230	6970	13500	4660	1500	780	611
29	668	715	e740	768	---	1170	6010	14400	4550	1440	782	604
30	601	691	e720	744	---	1140	5390	16400	4380	1400	772	596
31	e560	---	743	804	---	1790	---	14700	---	1370	757	---
TOTAL	24435	20613	20588	20450	17833	31819	126230	210180	248390	73840	31487	21243
MEAN	788	687	664	660	637	1026	4208	6780	8280	2382	1016	708
MAX	999	845	861	834	936	1890	9220	16400	13600	4270	1340	806
MIN	560	560	540	400	330	360	1730	3720	4380	1370	757	596
AC-FT	48470	40890	40840	40560	35370	63110	250400	416900	492700	146500	62450	42140
CFSM	0.51	0.44	0.43	0.43	0.41	0.66	2.72	4.38	5.35	1.54	0.66	0.46
IN.	0.59	0.50	0.49	0.49	0.43	0.76	3.03	5.05	5.97	1.77	0.76	0.51

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1940 - 2003, BY WATER YEAR (WY)

MEAN	1175	1193	938	762	739	882	3278	9879	10070	4082	1641	1159
MAX	3650	3733	3388	2131	2017	2597	6877	15160	20780	9262	3232	2653
(WY)	1952	1990	1996	1974	1996	1986	1943	1954	1974	1954	1976	1959
MIN	517	486	433	398	342	406	833	4986	3353	1436	747	552
(WY)	2002	1988	2001	1988	2001	1944	1975	1944	1941	1977	1941	2001

12355500 NORTH FORK FLATHEAD RIVER NEAR COLUMBIA FALLS, MT--Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1940 - 2003	
ANNUAL TOTAL	1295937		847108			
ANNUAL MEAN	3551		2321		2990	
HIGHEST ANNUAL MEAN					4721	1974
LOWEST ANNUAL MEAN					1383	1944
HIGHEST DAILY MEAN	21800	May 31	16400	May 30	58000	Jun 9 1964
LOWEST DAILY MEAN	330	Jan 1	330	Feb 24	200	Nov 24 1993
ANNUAL SEVEN-DAY MINIMUM	590	Oct 30	481	Feb 22	289	Nov 22 1993
MAXIMUM PEAK FLOW			16800	May 30	a69100	Jun 9 1964
MAXIMUM PEAK STAGE			8.79	May 30	b18.60	Jun 9 1964
INSTANTANEOUS LOW FLOW			314	Feb 24	c187	Feb 8 2001
INSTANTANEOUS LOW STAGE			1.18	Feb 24	d0.86	Jan 8 1953
ANNUAL RUNOFF (AC-FT)	2570000		1680000		2166000	
ANNUAL RUNOFF (CFSM)	2.29		1.50		1.93	
ANNUAL RUNOFF (INCHES)	31.14		20.36		26.24	
10 PERCENT EXCEEDS	13000		6000		8550	
50 PERCENT EXCEEDS	1030		836		1200	
90 PERCENT EXCEEDS	638		595		556	

a--From rating curve extended above 30,000 ft^3/s on basis of slope-area measurement of peak flow.
b--From floodmark.
c--Gage height, 0.87 ft, result of freezeup.
d--Discharge, 198 ft^3/s, site and datum then in use.
e--Estimated.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1950, 1970, 1976 to current year.
PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1975 to October 1978.
WATER TEMPERATURE: October 1975 to current year.
SUSPENDED-SEDIMENT DISCHARGE: October 1975 to November 1978.
INSTRUMENTATION.--Temperature recorder since Oct. 1, 1975.
REMARKS.--Daily temperature record fair. Missing temperature data for Feb. 28 to Mar. 3 due to equipment problems. Unpublished records of instantaneous water temperature and specific conductance are available in files of the District office.
EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 246 microsiemens per centimeter (μS/cm) at 25.0°C, Dec. 31, 1976; minimum daily, 128 μS/cm at 25.0°C, June 30, July 1, 1976.
WATER TEMPERATURE: Maximum, 23.0°C, Aug. 12, 1997; minimum, 0.0°C on many days during winter periods.
SEDIMENT CONCENTRATION: Maximum daily mean, 931 mg/L, May 11, 1976; minimum daily mean, 1 mg/L on many days each year.
SEDIMENT LOAD: Maximum daily, 56,800 tons, May 11, 1976; minimum daily, 1.1 tons, Mar. 3, 1978.
EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: Maximum, 19.5°C, July 23; minimum, 0.0°C on many days from October through March.

WATER QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instan-taneous dis-charge, cfs (00061)	pH, water, unfltrd field, std units (00400)	Specif. conduc-tance, wat unf uS/cm 25 degC (00095)	Temper-ature, air, deg C (00020)	Temper-ature, water, deg C (00010)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)
MAY 2003									
21...	1430	4160	8.5	172	8.0	7.5	E.08	E.014	<.002
JUN									
10...	1300	10600	8.2	135	15.5	9.0	.17	E.020	<.002
JUL									
08...	1345	2850	8.1	169	18.0	13.5	E.08	<.022	<.002
AUG									
21...	1130	901	8.1	211	17.5	14.5	<.10	<.022	<.002

Date	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Phos-phorus, water, unfltrd mg/L (00665)	Suspnd. sedi-ment, sieve diametr percent <.063mm (70331)	Sus-pended sedi-ment concen-tration mg/L (80154)	Sus-pended sedi-ment load, tons/d (80155)
MAY 2003					
21...	<.007	E.003	86	5	56
JUN					
10...	<.007	.058	76	44	1260
JUL					
08...	<.007	E.003	83	2	15
AUG					
21...	<.007	.004	77	1	2.4

E--Estimated.

12355500 NORTH FORK FLATHEAD RIVER NEAR COLUMBIA FALLS, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003--Continued

Date	Time	Hardness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnesium, water, fltrd, mg/L (00925)	Potassium, water, fltrd, mg/L (00935)	Sodium adsorption ratio (00931)	Sodium, water, fltrd, mg/L (00930)	Alkalinity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chloride, water, fltrd, mg/L (00940)	Fluoride, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)
MAY 2003											
21...	1430	84	24.0	5.85	.32	.0	.86	86	.22	<.2	4.34
JUL											
08...	1345	90	25.6	6.29	.35	.0	.88	84	.33	<.2	4.60

Date	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of constituents mg/L (70301)	Residue water, fltrd, tons/acre-ft (70303)	Residue water, fltrd, tons/d (70302)	Arsenic water unfltrd ug/L (01002)	Cadmium water, unfltrd ug/L (01027)	Chromium, water, unfltrd recoverable, ug/L (01034)	Copper, water, unfltrd recoverable, ug/L (01042)	Lead, water, unfltrd recoverable, ug/L (01051)	Nickel, water, unfltrd recoverable, ug/L (01067)	Zinc, water, unfltrd recoverable, ug/L (01092)
MAY 2003											
21...	4.7	92	.12	1030	<2	<.2	<.8	2.3	.53	.38	E2
JUL											
08...	4.8	93	.13	719	<2	<.2	<.8	2.6	.21	.52	2

E--Estimated.

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	8.5	7.5	8.0	0.5	0.0	0.0	1.0	0.5	1.0	0.0	0.0	0.0
2	8.5	6.5	7.5	0.5	0.0	0.0	1.0	1.0	1.0	0.0	0.0	0.0
3	8.5	7.5	8.0	0.5	0.0	0.0	1.0	0.5	1.0	0.5	0.0	0.0
4	9.0	7.5	8.5	0.5	0.0	0.0	1.0	0.5	1.0	0.5	0.0	0.0
5	8.5	7.5	8.0	0.5	0.0	0.0	1.5	1.0	1.0	1.5	0.5	1.0
6	8.0	7.0	7.5	0.0	0.0	0.0	2.0	1.5	1.5	1.5	1.0	1.0
7	9.5	8.0	8.5	0.5	0.0	0.0	2.0	1.5	2.0	1.5	1.0	1.0
8	9.0	7.5	8.5	1.0	0.0	0.5	2.0	2.0	2.0	1.0	0.0	0.5
9	9.0	7.5	8.5	3.0	1.0	2.0	2.0	1.5	2.0	0.0	0.0	0.0
10	8.5	7.0	8.0	3.5	3.0	3.0	1.5	1.0	1.5	0.5	0.0	0.0
11	7.5	5.5	6.5	3.5	3.0	3.0	1.5	1.0	1.5	0.0	0.0	0.0
12	5.5	4.0	4.5	3.5	3.0	3.5	1.5	1.0	1.5	0.0	0.0	0.0
13	5.0	3.5	4.5	4.0	3.5	4.0	3.0	1.5	2.5	0.0	0.0	0.0
14	5.0	3.5	4.5	4.0	3.5	4.0	3.0	3.0	3.0	0.0	0.0	0.0
15	5.5	4.0	4.5	4.5	3.5	3.5	3.5	3.0	3.5	0.0	0.0	0.0
16	5.5	4.0	5.0	3.5	2.5	3.0	3.0	2.0	2.5	0.0	0.0	0.0
17	6.0	4.0	5.0	4.0	3.0	3.5	2.5	1.5	2.0	0.0	0.0	0.0
18	6.5	4.5	5.5	3.5	3.0	3.5	1.5	0.5	0.5	0.0	0.0	0.0
19	6.0	4.5	5.5	4.0	3.5	3.5	1.0	0.0	0.5	0.0	0.0	0.0
20	6.5	4.5	5.5	5.0	4.0	4.5	0.0	0.0	0.0	0.0	0.0	0.0
21	6.0	5.0	5.5	5.0	4.5	5.0	0.0	0.0	0.0	0.0	0.0	0.0
22	6.0	4.0	5.0	5.0	5.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0
23	4.0	2.5	3.0	5.0	2.5	4.0	0.0	0.0	0.0	0.0	0.0	0.0
24	2.5	1.0	2.0	2.5	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0
25	2.0	1.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	2.0	1.0	1.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27	2.0	1.0	1.5	1.0	0.5	0.5	0.0	0.0	0.0	0.5	0.0	0.0
28	3.0	2.0	2.5	0.5	0.0	0.5	0.0	0.0	0.0	1.5	0.5	1.0
29	2.0	0.0	1.0	1.0	0.5	0.5	0.0	0.0	0.0	1.5	0.0	0.5
30	0.5	0.0	0.0	1.0	0.5	0.5	0.0	0.0	0.0	1.5	0.0	1.0
31	0.5	0.0	0.0	---	---	---	0.0	0.0	0.0	2.0	1.5	1.5
MONTH	9.5	0.0	5.0	5.0	0.0	2.0	3.5	0.0	1.0	2.0	0.0	0.0

12355500 NORTH FORK FLATHEAD RIVER NEAR COLUMBIA FALLS, MT--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003--Continued

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	2.0	1.5	1.5	0.0	0.0	0.0	4.0	3.0	3.5	7.5	5.0	6.5
2	2.0	1.0	1.5	0.0	0.0	0.0	3.5	2.0	2.5	7.5	6.0	6.5
3	1.0	0.5	1.0	0.0	0.0	0.0	2.5	1.0	2.0	8.0	5.0	6.5
4	1.0	0.0	0.5	0.0	0.0	0.0	4.0	1.5	2.5	7.0	5.5	6.0
5	1.0	0.0	0.5	0.0	0.0	0.0	4.5	2.0	3.0	6.5	5.0	5.5
6	1.0	0.5	0.5	0.0	0.0	0.0	5.0	3.0	4.0	7.0	5.0	6.0
7	1.0	0.5	0.5	0.0	0.0	0.0	5.5	3.0	4.0	7.0	5.0	6.0
8	1.5	0.5	1.0	0.0	0.0	0.0	7.0	4.5	5.5	7.5	5.0	6.0
9	1.0	1.0	1.0	0.0	0.0	0.0	7.0	4.5	5.5	7.0	5.5	6.0
10	1.5	1.0	1.0	0.0	0.0	0.0	7.0	3.5	5.0	7.5	5.0	6.5
11	2.0	0.5	1.0	0.0	0.0	0.0	6.5	4.5	5.0	9.0	5.5	7.0
12	1.0	0.0	0.5	0.0	0.0	0.0	5.0	3.0	4.0	8.5	7.0	7.5
13	0.5	0.0	0.0	0.0	0.0	0.0	4.5	3.5	4.0	8.5	6.5	7.5
14	1.0	0.0	0.5	2.0	0.0	0.5	4.5	3.0	4.0	9.5	6.5	8.0
15	2.0	0.5	1.5	2.0	1.0	1.5	5.0	3.0	4.0	9.0	7.5	8.0
16	2.0	1.5	2.0	2.5	1.5	2.0	5.5	3.5	4.5	7.5	5.0	6.0
17	2.5	1.5	2.0	3.5	1.0	2.5	5.5	4.0	5.0	6.0	4.5	5.0
18	3.0	1.5	2.0	3.0	1.0	2.0	6.0	4.0	5.0	6.0	4.0	5.0
19	3.5	1.5	2.5	3.5	1.5	3.0	6.0	4.0	5.0	8.0	5.0	6.5
20	2.5	0.5	2.0	4.0	2.0	3.0	7.5	4.0	5.5	8.0	5.5	7.0
21	2.5	0.5	1.5	3.5	3.0	3.0	8.0	5.0	6.5	8.0	7.0	7.5
22	2.0	0.0	1.0	3.5	3.0	3.0	8.0	5.5	7.0	8.5	7.0	7.5
23	1.0	0.0	0.0	3.0	2.0	2.5	8.0	5.5	6.5	10.0	7.0	8.5
24	1.0	0.0	0.0	3.0	2.0	2.5	7.5	5.5	6.5	11.5	8.0	9.5
25	0.5	0.0	0.0	3.0	2.0	2.5	7.0	5.0	5.5	11.0	8.5	9.5
26	0.5	0.0	0.0	3.0	2.0	2.0	5.5	4.5	5.0	8.5	6.5	7.5
27	0.5	0.0	0.0	4.0	1.5	2.5	5.5	4.0	4.5	8.5	6.0	7.0
28	0.0	0.0	0.0	4.0	3.0	3.5	6.0	4.0	5.0	9.5	7.0	8.0
29	---	---	---	4.0	3.0	3.5	6.5	4.5	5.5	10.0	8.0	9.0
30	---	---	---	6.0	3.0	4.0	7.0	5.0	6.0	9.5	7.0	7.5
31	---	---	---	6.0	4.0	5.0	---	---	---	7.5	7.0	7.5
MONTH	3.5	0.0	1.0	6.0	0.0	1.5	8.0	1.0	4.5	11.5	4.0	7.0

		JUNE			JULY			AUGUST			SEPTEMBER	
1	9.0	6.5	7.5	15.5	12.0	14.0	18.0	16.0	17.0	14.5	12.0	13.5
2	8.5	7.5	8.0	15.0	12.5	14.0	17.5	16.0	16.5	15.0	13.0	14.0
3	9.5	7.0	8.0	14.5	11.5	13.0	16.5	15.5	16.0	15.0	12.5	14.0
4	9.5	7.0	8.5	15.0	11.5	13.0	16.5	15.0	15.5	14.0	12.5	13.5
5	10.0	8.0	9.0	15.0	12.5	13.5	17.0	14.5	16.0	15.0	12.5	13.5
6	10.5	8.0	9.5	15.0	11.5	13.0	17.0	15.0	16.0	14.5	12.5	13.5
7	11.0	8.0	9.5	16.0	13.0	14.5	17.5	15.0	16.5	15.5	13.0	14.5
8	11.0	9.0	9.5	15.5	13.0	14.0	17.5	15.5	16.5	14.5	12.0	13.5
9	10.0	8.5	9.0	15.5	12.0	14.0	18.0	15.5	17.0	12.0	10.0	11.0
10	9.5	8.5	9.0	16.5	13.5	15.0	18.0	16.0	17.5	11.5	9.5	10.5
11	9.5	8.0	9.0	17.5	14.5	16.0	17.5	15.5	16.0	11.5	11.0	11.0
12	10.5	8.0	9.0	17.5	15.5	16.5	15.5	14.0	15.0	12.0	10.5	11.0
13	10.5	8.5	9.0	17.5	15.0	15.5	16.0	14.0	15.0	12.0	9.5	11.0
14	10.0	8.0	9.0	16.0	13.0	14.5	16.5	14.5	15.5	12.0	10.0	11.0
15	11.5	8.0	9.5	16.5	13.5	15.0	16.0	14.5	15.5	13.0	11.0	12.0
16	12.5	9.0	10.5	18.5	15.5	17.0	17.0	15.5	16.0	12.0	9.5	11.0
17	13.5	9.5	11.5	18.5	16.0	17.5	16.5	14.5	15.5	9.5	8.0	9.0
18	14.5	11.5	13.0	18.0	15.5	17.0	17.5	15.0	16.5	10.0	8.5	9.5
19	14.0	12.0	13.0	18.0	15.5	17.0	17.5	15.5	16.5	11.0	9.0	10.0
20	12.5	11.0	11.5	18.5	16.0	17.0	17.5	15.5	16.5	12.0	10.0	11.0
21	11.0	9.0	10.0	18.5	16.0	17.5	16.0	14.0	15.0	11.0	9.0	10.5
22	10.0	8.5	9.5	19.0	16.5	17.5	15.0	14.0	14.5	12.0	9.5	11.0
23	10.5	9.0	9.5	19.5	16.5	18.0	15.0	14.0	14.5	13.0	10.5	11.5
24	12.0	9.0	10.0	19.0	16.5	17.5	15.5	13.0	14.5	12.0	9.5	11.0
25	13.0	10.0	11.5	18.0	16.5	17.5	16.0	13.5	15.0	12.5	10.5	11.5
26	14.0	11.0	12.5	18.0	16.0	17.0	16.0	14.0	15.0	13.5	11.0	12.5
27	15.0	12.0	13.5	17.5	15.5	16.5	16.5	15.0	15.5	13.0	10.5	12.0
28	15.0	12.0	13.5	17.5	15.5	17.0	15.5	13.5	14.5	12.5	10.0	11.5
29	15.5	12.0	14.0	18.0	16.0	17.0	14.0	12.0	13.0	12.0	10.0	11.0
30	16.0	13.0	14.5	18.0	16.0	17.0	14.0	12.0	13.0	11.0	9.0	10.0
31	---	---	---	18.0	16.0	17.0	13.5	12.0	13.0	---	---	---
MONTH	16.0	6.5	10.5	19.5	11.5	16.0	18.0	12.0	15.5	15.5	8.0	11.5

PEND OREILLE RIVER BASIN

12358500 MIDDLE FORK FLATHEAD RIVER NEAR WEST GLACIER, MT

LOCATION.--Lat 48°29'43", long 114°00'33" (NAD 27), in S1/2SW$^1/_4$NE$^1/_4$ sec.34, T.32 N., R.19 W., Flathead County, Hydrologic Unit 17010207, on left bank 0.8 mi downstream from McDonald Creek, 1.3 mi west of West Glacier, and at river mile 3.8.
DRAINAGE AREA.--1,128 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1939 to current year. Prior to October 1947, published as "near Belton."
REVISED RECORDS.--WSP 1216: Drainage area.
GAGE.--Water-stage recorder. Elevation of gage is 3,128.72 ft (NGVD 29). Prior to Nov. 22, 1950, nonrecording gage at present site and elevation.
REMARKS.--Water-discharge records good, except those for estimated daily discharges, which are fair. Bureau of Reclamation satellite at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	643	365	482	464	1150	495	e3820	5050	13700	4300	e1130	540
2	612	366	467	453	1300	485	3800	5090	12900	4000	e1070	530
3	594	375	467	464	1130	483	3310	5400	11400	3690	e1050	522
4	579	379	461	471	1030	466	2930	5590	10200	3380	e1070	517
5	566	382	452	470	960	473	2620	5500	9330	3200	e1030	520
6	577	397	444	467	901	499	2390	5160	9090	3040	975	517
7	600	402	440	458	846	418	2180	4780	8830	2900	950	514
8	614	412	432	440	811	370	2030	4400	8680	2790	921	520
9	621	443	423	399	779	376	2060	4070	9360	2660	900	569
10	612	426	416	314	745	412	2280	3780	9330	2550	875	572
11	612	415	416	299	712	546	2880	3550	9450	2490	858	547
12	607	415	419	368	683	652	3720	3540	8600	2460	830	691
13	594	432	422	437	662	713	4980	3720	8150	2430	798	688
14	580	448	455	459	650	922	6030	4220	7870	2320	762	644
15	570	438	508	442	642	1060	5730	5530	7580	2170	741	593
16	561	426	528	425	629	1180	5140	6960	7290	2070	735	557
17	552	418	529	402	626	1280	4780	6510	7140	2030	739	585
18	544	415	516	387	613	1230	4570	5690	7500	1970	728	564
19	537	419	499	374	594	1170	4330	5020	7990	1900	718	538
20	531	443	475	393	584	1150	4240	4560	7670	1810	710	538
21	521	451	436	391	599	1170	4510	4380	6890	1760	695	571
22	512	488	410	340	586	1380	5310	4360	6000	1710	677	557
23	504	527	439	338	540	2090	6560	4940	5300	1640	670	531
24	490	538	444	383	473	2150	7550	7200	4770	e1600	666	511
25	474	493	440	399	433	1930	9050	11600	4390	e1530	648	494
26	462	476	441	446	465	1770	9380	18200	4220	e1470	630	480
27	455	506	457	617	496	1640	8180	16200	4370	e1430	620	474
28	451	506	462	680	496	1500	6960	14500	4490	e1370	603	470
29	450	502	479	650	---	1390	6040	16400	4410	e1300	590	464
30	425	494	472	637	---	1330	5430	17600	4310	e1230	569	455
31	386	---	464	654	---	e1750	---	14300	---	e1170	555	---
TOTAL	16836	13197	14195	13921	20135	32480	142790	227800	231210	70370	24513	16273
MEAN	543	440	458	449	719	1048	4760	7348	7707	2270	791	542
MAX	643	538	529	680	1300	2150	9380	18200	13700	4300	1130	691
MIN	386	365	410	299	433	370	2030	3540	4220	1170	555	455
MED	561	429	455	440	646	1150	4540	5160	7770	2070	739	535
AC-FT	33390	26180	28160	27610	39940	64420	283200	451800	458600	139600	48620	32280
CFSM	0.48	0.39	0.41	0.40	0.64	0.93	4.22	6.51	6.83	2.01	0.70	0.48
IN.	0.56	0.44	0.47	0.46	0.66	1.07	4.71	7.51	7.63	2.32	0.81	0.54

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1940 - 2003, BY WATER YEAR (WY)

MEAN	1043	1162	907	701	710	856	3199	9559	10060	3948	1353	940
MAX	3004	5598	3750	2420	2686	2779	7093	14670	19870	8162	2364	2510
(WY)	1960	1990	1996	1974	1971	1986	1943	1957	1964	1954	1976	1968
MIN	367	279	262	282	244	307	664	5259	3576	1249	576	420
(WY)	1940	1953	1953	2001	2001	1944	1975	1941	1941	1944	1941	1988

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1940 - 2003	
ANNUAL TOTAL	1199145		823720			
ANNUAL MEAN	3285		2257		2875	
HIGHEST ANNUAL MEAN					4071	1974
LOWEST ANNUAL MEAN					1437	1941
HIGHEST DAILY MEAN	21700	May 31	18200	May 26	92700	Jun 9 1964
LOWEST DAILY MEAN	284	Jan 2	299	Jan 11	189	Nov 27 1952
ANNUAL SEVEN-DAY MINIMUM	376	Jan 1	372	Jan 18	205	Nov 26 1952
MAXIMUM PEAK FLOW			19800	May 26	a140000	Jun 9 1964
MAXIMUM PEAK STAGE			8.32	May 26	36.46	Jun 9 1964
INSTANTANEOUS LOW FLOW			284	Jan 11	b173	Nov 27 1952
INSTANTANEOUS LOW STAGE			1.39	Jan 11	b0.72	Nov 27 1952
ANNUAL RUNOFF (AC-FT)	2379000		1634000		2083000	
ANNUAL RUNOFF (CFSM)	2.91		2.00		2.55	
ANNUAL RUNOFF (INCHES)	39.55		27.17		34.63	
10 PERCENT EXCEEDS	11900		6530		8440	
50 PERCENT EXCEEDS	893		652		1100	
90 PERCENT EXCEEDS	441		423		435	

a--About 140,000 ft^3/s, from rating curve extended above 31,000 ft^3/s, on basis of a contracted opening measurement at gage height, 19.42 ft, and flood volume-hydrographic comparison.
b--Stage below intakes.
e--Estimated.

12358500 MIDDLE FORK FLATHEAD RIVER NEAR WEST GLACIER, MT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--1949-50, 1970, 1998 to current year.

REMARKS.--Unpublished records of instantaneous water temperature and specific conductance are available in files of the District office.

WATER QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instan-taneous dis-charge, cfs (00061)	pH, water, unfltrd field, std units (00400)	Specif. conduc-tance, wat unf uS/cm 25 degC (00095)	Temper-ature, air, deg C (00020)	Temper-ature, water, deg C (00010)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)
MAY 2003									
20...	1145	4570	8.2	149	8.0	7.5	E.08	.102	<.002
JUN									
11...	0915	9660	8.0	127	11.0	8.5	.11	.074	<.002
JUL									
08...	1215	2810	8.3	138	18.0	11.5	E.05	.081	<.002
AUG									
20...	1315	722	8.3	158	23.0	8.0	<.10	.056	<.002

Date	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Phos-phorus, water, unfltrd mg/L (00665)	Suspnd. sedi-ment, sieve diametr percent <.063mm (70331)	Sus-pended sedi-ment concen-tration mg/L (80154)	Sus-pended sedi-ment load, tons/d (80155)
MAY 2003					
20...	<.007	E.003	74	4	49
JUN					
11...	<.007	.018	62	34	887
JUL					
08...	<.007	E.003	81	1	7.6
AUG					
20...	<.007	.004	75	1	2.0

Date	Time	Hard-ness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Potas-sium, water, fltrd, mg/L (00935)	Sodium adsorp-tion ratio (00931)	Sodium, water, fltrd, mg/L (00930)	Alka-linity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chlor-ide, water, fltrd, mg/L (00940)	Fluor-ide, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)
MAY 2003											
20...	1145	76	21.1	5.62	.33	.0	.76	76	.21	<.2	4.02
JUL											
08...	1215	70	19.6	5.24	.31	.0	.70	67	E.15	<.2	3.81

Date	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of consti-tuents mg/L (70301)	Residue water, fltrd, tons/ acre-ft (70303)	Residue water, fltrd, tons/d (70302)	Arsenic water unfltrd ug/L (01002)	Cadmium water, unfltrd ug/L (01027)	Chrom-ium, water, unfltrd recover-able, ug/L (01034)	Copper, water, unfltrd recover-able, ug/L (01042)	Lead, water, unfltrd recover-able, ug/L (01051)	Nickel, water, unfltrd recover-able, ug/L (01067)	Zinc, water, unfltrd recover-able, ug/L (01092)
MAY 2003											
20...	3.2	81	.11	1000	<2	<.2	<.8	2.5	.29	.47	2
JUL											
08...	3.0	E73	E.10	E557	<2	<.2	<.8	2.4	.39	.38	2

E--Estimated.

12359800 SOUTH FORK FLATHEAD RIVER ABOVE TWIN CREEK, NEAR HUNGRY HORSE, MT

LOCATION.--Lat 47°58'45", long 113°33'36" (NAD 27), in $NE^1/_4NW^1/_4NE^1/_4$ sec.36, T.26 N., R.16 W., Flathead County, Hydrologic Unit 17010209, Flathead National Forest, on left bank 0.1 mi downstream from Tin Creek, 0.4 mi upstream from Twin Creek, 36.3 mi southeast of Hungry Horse, and at river mile 42.2.

DRAINAGE AREA.--1,160 mi^2.

PERIOD OF RECORD.--October 1964 to September 1982, October 1984 to current year (no winter records).

GAGE.--Water-stage recorder. Elevation of gage is 3,575 ft (NGVD 29), from river-profile map.

REMARKS.--Seasonal records good except those for Apr. 15 to May 15, which are fair. No known regulation or diversions upstream from station. Bureau of Reclamation satellite telemeter at station. Several observations of water temperature and specific conductance were made during the year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 8, 1964, reached a stage of 20.87 ft, from high-water profile; discharge, 50,900 ft^3/s, by slope-area measurement of peak flow.

DISCHARGE, CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY TO DECEMBER 2003
DAILY MEAN VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1				1730	3710	13800	2770	597	336	328	1030	
2				1710	3850	12900	2580	580	330	322	983	
3				1550	4120	10400	2340	569	326	316	903	
4				1390	4250	9150	2100	558	321	312	793	
5				1270	4390	8330	1920	550	316	306	703	
6				1170	4170	7970	1810	553	311	302	579	
7				1080	3810	7660	1710	542	308	298	545	
8				1030	3430	7760	1660	529	315	294	560	
9				1140	3120	8660	1630	539	331	304	580	
10				1350	2880	8660	1530	515	330	297	630	
11				1900	2690	8870	1450	494	330	298	637	
12				2700	2720	7840	1390	484	412	312	587	
13				4720	2870	7420	1340	470	420	329	539	
14				5270	3250	7170	1290	454	397	325	504	
15				4610	4650	6920	1210	442	371	319	512	
16				3970	5910	6680	1130	439	381	337	499	
17				3550	5300	6500	1080	435	467	352	513	
18				3280	4530	6720	1040	425	469	403	511	
19				2990	3940	6860	994	418	443	420	546	
20				2930	3530	6540	945	412	455	408	585	
21				3250	3450	5540	909	401	442	406	536	
22				4090	3470	4540	875	392	426	411	465	
23				5050	4440	3760	839	399	406	421	437	
24				5970	6780	3210	804	396	390	434	466	
25				7180	10900	2860	778	385	376	421	476	
26				7210	16300	2670	749	371	362	407	477	
27				6150	15200	2720	720	363	351	398	459	
28				5160	14700	2860	688	358	344	448	430	
29				4420	16800	2880	661	353	337	1800	492	
30				3930	17700	2800	639	346	331	1680	499	
31				---	14900	---	616	342	---	1230	---	
TOTAL				101750	201760	200650	40197	14111	11134	14638	17476	
MEAN				3392	6508	6688	1297	455	371	472	583	
MAX				7210	17700	13800	2770	597	469	1800	1030	
MIN				1030	2690	2670	616	342	308	294	430	
AC-FT				201800	400200	398000	79730	27990	22080	29030	34660	
CFSM				2.92	5.61	5.77	1.12	0.39	0.32	0.41	0.50	
IN.				3.26	6.47	6.43	1.29	0.45	0.36	0.47	0.56	

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1965 - 2003, BY WATER YEAR (WY)*

MEAN	479	520	588	2468	7714	8426	2721	781	571	566	701	514
MAX	1197	2285	1342	4490	12580	15910	5904	1331	1853	1878	3098	1323
(WY)	1974	1971	1972	1990	1997	1974	1975	1972	1985	1986	1990	1976
MIN	207	201	252	464	4738	2522	844	339	245	225	204	249
(WY)	1980	1980	1980	1975	1977	1987	1977	1988	1988	1988	1988	1972

SUMMARY STATISTICS	FOR 2003 SEASON		FOR 1985 - 2003 SEASONS		WATER YEARS 1965 - 1982	
ANNUAL MEAN					2310	
HIGHEST ANNUAL MEAN					2988	1971
LOWEST ANNUAL MEAN					1175	1977
HIGHEST DAILY MEAN	17700	May 30	28500	May 17 1997	29500	Jun 16 1974
LOWEST DAILY MEAN	294	Oct 8	176	Nov 30 1987	135	Jan 29 1980
ANNUAL SEVEN-DAY MINIMUM					155	Jan 26 1980
MAXIMUM PEAK FLOW	18800	May 30	29100	May 17 1997	30200	Jun 16 1974
MAXIMUM PEAK STAGE	12.65	May 30	15.01	May 17 1997	15.20	Jun 16 1974
INSTANTANEOUS LOW FLOW					a127	Nov 30 1979
ANNUAL RUNOFF (AC-FT)					1673000	
ANNUAL RUNOFF (CFSM)					1.99	
ANNUAL RUNOFF (INCHES)					27.06	
10 PERCENT EXCEEDS					7420	
50 PERCENT EXCEEDS					646	
90 PERCENT EXCEEDS					290	

*--During periods of operation. Seasonal records only October 1984 to current year.
a--Gage height, 4.13 ft.

12362000 HUNGRY HORSE RESERVOIR NEAR HUNGRY HORSE, MT

LOCATION.--Lat 48°20'28", long 114°00'48" (NAD 27), in $NE^1/_4NE^1/_4NW^1/_4$ sec.27, T.30 N., R.19 W., Flathead County, Hydrologic Unit 17010209, in block 14 of Hungry Horse Dam on South Fork Flathead River, 3.8 mi southeast of Hungry Horse, and at river mile 5.3.

DRAINAGE AREA.--1,654 mi^2.

PERIOD OF RECORD.--September 1951 to current year.

GAGE.--Water-stage recorder equipped with remote indicator in power house. Elevation of gage is 3,196 ft (NGVD 29) (levels by U.S. Bureau of Reclamation). During construction and prior to May 1, 1953, various types of nonrecording gages were used.

REMARKS.--Reservoir and flow completely controlled by concrete arch-gravity dam; construction began in 1948; completed in 1952. Storage began Sept. 21, 1951. Usable capacity, 3,451,000 acre-ft, top of 1.0 ft flash-boards; 3,427,000 acre-ft between elevations 3,196 ft, lowest outlet, and 3,560 ft, controlled spillway elevation. Dead storage, 39,730 acre-ft below elevation 3,196 ft. Minimum operating level, 445,400 acre-ft, elevation, 3,336 ft for on-site power generation. All elevations are referenced to the National Geodetic Vertical Datum of 1929. Water is used for power production, flood control, irrigation and recreation. Controlled spillway is an adjustable ring gate with 1.0 ft flashboards. Figures given herein represent usable contents. Capacity table in use is dated August 1969.

COOPERATION.--Capacity table and daily elevations provided by U.S. Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 3,461,000 acre-ft, July 3, 4, 1955, Aug. 6, 1956; maximum elevation observed, 3,561.40 ft, July 3, 4, 1955; minimum contents observed since normal low operating level reached in May 1952, 607,700 acre-ft, Jan. 13, 1953, elevation, 3,362.50 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 3,378,000 acre-ft, July 1, 2, elevation, 3,557.89 ft; minimum, 2,320,000 acre-ft, Mar. 14, elevation, 3,507.45 ft.

Capacity table (elevation, in feet, and contents, in acre-ft)

Elevation	Contents
3,500	2,185,000
3,530	2,761,000
3,560	3,427,000

ELEVATION (FEET NGVD 1929), WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY OBSERVATION AT 2359 HOURS

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3537.15	3531.31	3525.67	3519.39	3513.22	3509.57	3509.69	3525.74	3542.27	3557.89	3549.66	3539.65
2	3537.07	3531.09	3525.44	3519.19	3513.25	3509.39	3509.99	3525.89	3543.51	3557.89	3549.30	3539.51
3	3536.89	3530.89	3525.27	3519.00	3513.24	3509.20	3510.24	3525.97	3544.37	3557.88	3548.90	3539.35
4	3536.72	3530.69	3525.05	3518.79	3513.24	3509.03	3510.53	3526.15	3545.19	3557.84	3548.53	3539.19
5	3536.63	3530.47	3524.82	3518.58	3513.20	3508.87	3510.73	3526.34	3546.00	3557.77	3548.14	3539.01
6	3536.46	3530.24	3524.62	3518.40	3513.15	3508.72	3510.87	3526.50	3546.76	3557.71	3547.71	3538.86
7	3536.37	3530.03	3524.38	3518.24	3513.06	3508.47	3511.04	3526.56	3547.48	3557.52	3547.36	3538.66
8	3536.20	3529.91	3524.18	3518.00	3512.98	3508.22	3511.17	3526.57	3548.25	3557.28	3546.99	3538.54
9	3536.11	3529.72	3523.97	3517.72	3512.87	3508.05	3511.33	3526.58	3549.07	3557.05	3546.60	3538.41
10	3535.94	3529.53	3523.72	3517.45	3512.79	3507.89	3511.55	3526.60	3549.96	3556.81	3546.20	3538.27
11	3535.68	3529.34	3523.53	3517.17	3512.65	3507.75	3511.89	3526.59	3550.77	3556.56	3545.78	3538.07
12	3535.59	3529.18	3523.33	3516.93	3512.53	3507.59	3512.40	3526.45	3551.48	3556.27	3545.38	3538.08
13	3535.41	3528.98	3523.13	3516.62	3512.34	3507.50	3513.20	3526.28	3552.14	3555.99	3544.98	3537.96
14	3535.33	3528.82	3522.99	3516.41	3512.19	3507.45	3514.04	3526.20	3552.73	3555.72	3544.57	3537.82
15	3535.15	3528.63	3522.87	3516.22	3512.05	3507.48	3514.80	3526.30	3553.30	3555.44	3544.17	3537.69
16	3534.89	3528.40	3522.68	3516.03	3511.95	3507.56	3515.43	3526.53	3553.86	3555.14	3543.76	3537.60
17	3534.37	3528.20	3522.48	3515.78	3511.77	3507.67	3515.97	3526.82	3554.39	3554.84	3543.34	3537.46
18	3534.20	3528.00	3522.29	3515.52	3511.62	3507.74	3516.49	3527.08	3554.91	3554.53	3542.96	3537.33
19	3534.04	3527.88	3522.10	3515.24	3511.46	3507.80	3516.96	3527.23	3555.52	3554.21	3542.64	3537.25
20	3533.85	3527.68	3521.88	3515.00	3511.33	3507.75	3517.40	3527.31	3556.04	3553.88	3542.23	3537.11
21	3533.68	3527.50	3521.64	3514.76	3511.19	3507.70	3517.93	3527.41	3556.49	3553.57	3541.93	3537.00
22	3533.45	3527.35	3521.39	3514.52	3511.05	3507.92	3518.56	3527.49	3556.78	3553.24	3541.64	3536.84
23	3533.25	3527.19	3521.17	3514.29	3510.86	3508.19	3519.37	3527.74	3557.05	3552.90	3541.36	3536.67
24	3533.08	3526.99	3520.93	3514.04	3510.61	3508.39	3520.37	3528.36	3557.35	3552.56	3541.09	3536.53
25	3532.90	3526.84	3520.69	3513.82	3510.36	3508.56	3521.52	3529.82	3557.61	3552.20	3540.87	3536.36
26	3532.69	3526.69	3520.42	3513.71	3510.17	3508.72	3522.67	3531.92	3557.71	3551.86	3540.67	3536.21
27	3532.43	3526.43	3520.29	3513.48	3509.95	3508.85	3523.57	3533.73	3557.73	3551.50	3540.47	3536.04
28	3532.25	3526.28	3520.12	3513.35	3509.76	3508.94	3524.31	3535.41	3557.76	3551.15	3540.29	3535.87
29	3532.04	3526.04	3519.93	3513.30	---	3509.01	3524.92	3537.20	3557.83	3550.78	3540.12	3535.69
30	3531.84	3525.85	3519.77	3513.23	---	3509.10	3525.48	3539.01	3557.88	3550.41	3539.96	3535.52
31	3531.59	---	3519.58	3513.20	---	3509.37	---	3540.69	---	3550.00	3539.81	---
MAX	3537.15	3531.31	3525.67	3519.39	3513.25	3509.57	3525.48	3540.69	3557.88	3557.89	3549.66	3539.65
MIN	3531.59	3525.85	3519.58	3513.20	3509.76	3507.45	3509.69	3525.74	3542.27	3550.00	3539.81	3535.52

CONTENTS, IN THOUSANDS OF ACRE-FEET, AT END OF MONTH

OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
2794	2676	2551	2427	2362	2355	2668	2988	3377	3195	2968	2876

CHANGE IN CONTENTS, IN ACRE-FEET

OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
-117000	-118000	-125000	-124000	-65000	-7000	+313000	+320000	+389000	-182000	-227000	-92000

CALENDAR YEAR 2002 . . . . . -9000
WATER YEAR 2003 . . . . . -35000

PEND OREILLE RIVER BASIN

12362500 SOUTH FORK FLATHEAD RIVER NEAR COLUMBIA FALLS, MT

LOCATION.--Lat 48°21'24", long 114°02'12" (NAD 27), in $SW^1/_4SE^1/_4SW^1/_4$ sec.16, T.30 N., R.19 W., Flathead County, Hydrologic Unit 17010209, on right bank 1.7 mi downstream from Hungry Horse Dam, 6.8 mi east of Columbia Falls, and at river mile 3.5.
DRAINAGE AREA.--1,663 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1910 to January 1911 (discharge measurements only), February 1911 to September 1913 (no winter records), October 1913 to August 1916 (scattered daily discharge only), water years 1917-22 (annual maximum), April 1923 to November 1924 (no winter records), July to October 1925, May to November 1927, May 1928 to current year. Monthly discharge only for some periods, published in WSP 1316.
REVISED RECORDS.--WSP 1216: Drainage area. WSP 1316: 1923-24(M), 1926-27(M), 1932(M), 1935-36(M). WSP 1636: 1958 (adjusted runoff).
GAGE.--Water-stage recorder. Elevation of gage is 3,040 ft (NGVD 29) (levels by the U.S. Bureau of Reclamation). September 1910 to September 1916, nonrecording gage, Apr. 23, 1923, to Sept. 30, 1928, water-stage recorder at site 3 mi downstream at different elevation. Oct. 1, 1928, to Sept. 30, 1952, water-stage recorder at site 1.5 mi downstream at different elevation.
REMARKS.--Water-discharge records excellent . Flow regulated by Hungry Horse Reservoir since Sept. 21, 1951 (see preceding page). U.S. Bureau of Reclamation satellite telemeter at station.
AVERAGE DISCHARGE.--75 years (water years, 1929-2003), 3,503 ft^3/s, 28.61 in/yr, 2,538,000 acre-ft/yr, adjusted for change in contents in Hungry Horse Reservoir since Oct. 1, 1951.
EXTREMES FOR PERIOD OF RECORD.--Maximum discharge observed, 46,200 ft^3/s, June 19, 1916, gage height, 16.6 ft, site and elevation then in use, from rating curve extended above 20,000 ft^3/s; minimum observed, 7.3 ft^3/s, Sept. 24, 1951, gage height, 0.52 ft, dam closure, site and elevation then in use; minimum daily, 7.3 ft^3/s, Sept. 24, 1951.
EXTREMES FOR CURRENT YEAR.--Maximum discharge, 6,740 ft^3/s, May 12, gage height, 8.67 ft; minimum daily, 691 ft^3/s, Apr. 21.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2000	3090	2470	2660	2210	2430	714	3530	2380	3290	5060	2010
2	2000	2710	2470	2700	1870	2310	707	5380	3760	3290	5050	1990
3	2030	2490	2490	2670	1670	2280	716	5430	4340	3300	5060	2150
4	2070	2350	2550	2590	1570	2330	708	5460	3460	3300	5110	2130
5	2080	2540	2680	2470	1570	2330	702	5370	2300	3300	5100	2090
6	2090	2710	2670	2440	1690	2360	699	5330	2310	3300	5090	2180
7	2090	2650	2650	2470	1820	2600	698	5340	2330	4520	5100	2200
8	2060	2640	2620	2710	1860	2840	740	5340	2330	5030	5090	2180
9	2120	2610	2600	2810	1860	2800	710	4460	2310	5040	5090	2050
10	2140	2570	2630	2780	1860	2660	715	4440	2290	5040	5100	1960
11	2140	2540	2640	3130	1850	2450	715	4400	2310	5040	5110	1890
12	2150	2540	2640	3550	1990	2090	716	5860	2280	4870	5200	1910
13	2130	2540	2640	3380	2180	1750	722	6600	2280	4980	5230	1910
14	2130	2540	2640	2660	2140	1640	717	6620	2270	5040	5170	1880
15	2180	2540	2620	2360	2110	1340	720	6620	2270	5050	5130	1850
16	2240	2540	2400	2320	2100	1180	740	6610	2260	5070	5120	1960
17	2250	2530	2240	2630	2100	874	759	4690	2250	5030	5130	2030
18	2250	2530	2320	2920	2090	816	782	4620	2250	5050	5100	2000
19	2240	2540	2520	2950	2150	1040	742	4500	2280	5050	4700	1990
20	2270	2530	2620	2880	2190	2060	731	4410	2280	5040	4300	2040
21	2400	2500	2650	2860	2160	1920	691	4400	2280	5040	3890	2030
22	2440	2460	2800	2830	2140	1330	705	4430	2250	5030	3620	2030
23	2380	2340	2830	2910	2220	835	712	4430	1670	5020	3640	2100
24	2230	2140	2830	2980	2580	745	707	4340	921	5020	3290	2160
25	2290	2200	2830	2960	2660	698	704	2370	896	5040	3080	2170
26	2510	2400	2810	2790	2490	735	713	2380	2740	5050	2590	2180
27	2630	2550	2800	2450	2430	713	715	2360	3600	5090	2370	2230
28	2450	2570	2660	2120	2430	718	714	2800	3600	5070	2370	2260
29	2370	2530	2560	1870	---	720	706	4420	3220	5080	2360	2250
30	2380	2480	2420	1700	---	719	700	4330	3200	5070	2080	2270
31	2890	---	2470	2310	---	723	---	2400	---	5070	2100	---
TOTAL	69630	75900	80770	82860	57990	50036	21520	143670	74917	145210	132430	62080
MEAN	2246	2530	2605	2673	2071	1614	717	4635	2497	4684	4272	2069
MAX	2890	3090	2830	3550	2660	2840	782	6620	4340	5090	5230	2270
MIN	2000	2140	2240	1700	1570	698	691	2360	896	3290	2080	1850
MED	2230	2540	2630	2700	2100	1640	714	4460	2300	5040	5060	2040
AC-FT	138100	150500	160200	164400	115000	99250	42680	285000	148600	288000	262700	123100
CFSM	1.35	1.52	1.57	1.61	1.25	0.97	0.43	2.79	1.50	2.82	2.57	1.24
IN.	1.56	1.70	1.81	1.85	1.30	1.12	0.48	3.21	1.68	3.25	2.96	1.39
MEAN †	343	546	572	657	900	1500	5977	9839	9035	1724	581	523
CFSM †	0.21	0.33	0.34	0.40	0.54	0.90	3.59	5.92	5.43	1.04	0.35	0.31
IN †	0.24	0.37	0.40	0.46	0.56	1.04	4.01	6.82	6.06	1.20	0.40	0.35
AC-FT†	21100	32500	35200	40400	50000	92250	355680	605000	537600	106000	35700	31100

OBSERVED

CALENDAR YEAR	2002	TOTAL	1269209	MEAN	3477	MAX	10000	MIN	463	AC-FT	2517000
WATER YEAR	2003	TOTAL	997013	MEAN	2732	MAX	6620	MIN	691	AC-FT	1978000

ADJUSTED

CALENDAR YEAR	2002	TOTAL	1264683	MEAN	3465	CFSM	2.08	IN	28.28	AC-FT	2508000
WATER YEAR	2003	TOTAL	979345	MEAN	2683	CFSM	1.61	IN	21.19	AC-FT	1943000

†--Adjusted for change in contents in Hungry Horse Reservoir.

12362500 SOUTH FORK FLATHEAD RIVER NEAR COLUMBIA FALLS, MT--Continued

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: October 1964 to September 1968, March 1979 to current year.

INSTRUMENTATION.--Temperature recorder since Mar. 30, 1979.

REMARKS.-Prior to March 1979, thermograph records furnished by Montana Department of Fish, Wildlife, and Parks. Daily temperature record good from April through September, fair from October through March due to equipment problems. Missing data from Mar. 7-12 due to equipment problems. Unpublished records of instantaneous water temperature and specific conductance are available in files of District office.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Maximum, 19.0°C Aug. 9-11, 1966, Aug. 2-6, 1968, Aug. 6, 2003; minimum (water years 1965-68, 1979-81, 1983-88), 2.0°C on many days during winter most years.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: Maximum, 19.0°C, Aug. 6; minimum, 3.0°C, Apr. 9, 10.

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	12.5	12.0	12.0	7.0	5.5	6.5	4.5	4.5	4.5	4.0	4.0	4.0
2	12.5	11.5	12.0	7.0	7.0	7.0	4.5	4.5	4.5	4.0	4.0	4.0
3	11.5	10.5	11.0	7.0	6.5	6.5	5.0	4.5	4.5	4.0	4.0	4.0
4	11.5	10.0	11.0	6.5	6.0	6.5	5.0	4.5	5.0	4.0	4.0	4.0
5	11.0	9.0	10.0	6.0	5.0	5.5	5.0	4.5	5.0	4.0	4.0	4.0
6	10.5	9.5	10.0	5.0	5.0	5.0	5.0	4.5	5.0	4.0	4.0	4.0
7	10.5	9.0	10.0	5.0	5.0	5.0	5.0	4.5	4.5	4.0	3.5	4.0
8	10.0	9.0	9.5	5.0	5.0	5.0	4.5	4.5	4.5	4.0	4.0	4.0
9	11.0	9.0	10.0	5.0	5.0	5.0	5.0	4.5	4.5	4.0	3.5	4.0
10	10.5	9.0	10.0	5.0	4.5	5.0	5.0	4.5	5.0	4.0	3.5	4.0
11	10.0	8.0	9.0	5.0	4.5	5.0	5.0	4.5	5.0	4.0	3.5	4.0
12	9.5	8.0	9.0	5.0	4.5	4.5	5.0	4.5	5.0	4.0	4.0	4.0
13	10.0	8.5	9.5	5.0	4.5	4.5	5.0	4.5	5.0	4.0	4.0	4.0
14	10.0	9.5	9.5	5.0	4.5	4.5	5.0	5.0	5.0	4.0	4.0	4.0
15	9.5	9.5	9.5	5.0	4.5	4.5	5.0	4.5	5.0	4.0	4.0	4.0
16	9.5	9.5	9.5	5.0	4.5	5.0	5.0	4.5	5.0	4.0	4.0	4.0
17	9.5	9.5	9.5	5.0	5.0	5.0	5.0	4.5	4.5	4.0	3.5	4.0
18	10.0	9.5	9.5	5.0	4.5	5.0	4.5	4.5	4.5	4.0	3.5	4.0
19	9.5	9.5	9.5	5.0	4.5	5.0	4.5	4.5	4.5	4.0	3.5	4.0
20	9.5	9.0	9.5	5.0	5.0	5.0	4.5	4.5	4.5	4.0	3.5	4.0
21	9.5	9.0	9.0	5.0	5.0	5.0	4.5	4.5	4.5	4.0	3.5	4.0
22	9.5	9.0	9.0	5.0	5.0	5.0	4.5	4.5	4.5	4.0	3.5	4.0
23	9.0	9.0	9.0	5.0	5.0	5.0	4.5	4.5	4.5	4.0	4.0	4.0
24	9.0	8.5	9.0	5.0	5.0	5.0	4.5	4.5	4.5	4.0	4.0	4.0
25	8.5	8.5	8.5	5.0	5.0	5.0	4.5	4.5	4.5	4.0	4.0	4.0
26	8.5	8.5	8.5	5.0	5.0	5.0	4.5	4.5	4.5	4.0	4.0	4.0
27	8.5	8.0	8.5	5.0	4.5	4.5	4.5	4.0	4.5	4.0	4.0	4.0
28	8.5	8.0	8.0	4.5	4.5	4.5	4.5	4.0	4.5	4.0	4.0	4.0
29	8.0	7.5	8.0	4.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0
30	8.0	7.5	7.5	4.5	4.5	4.5	4.0	4.0	4.0	4.0	4.0	4.0
31	7.5	5.5	7.0	---	---	---	4.0	4.0	4.0	4.0	4.0	4.0
MONTH	12.5	5.5	9.5	7.0	4.5	5.0	5.0	4.0	4.5	4.0	3.5	4.0

12362500 SOUTH FORK FLATHEAD RIVER NEAR COLUMBIA FALLS, MT--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003--Continued

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	4.0	4.0	4.0	3.5	3.5	3.5	4.0	3.5	4.0	4.0	4.0	4.0
2	4.0	3.5	4.0	4.0	3.5	3.5	4.0	3.5	4.0	4.5	4.0	4.0
3	4.0	3.5	4.0	4.0	3.5	3.5	4.0	3.5	4.0	4.5	4.0	4.5
4	4.0	3.5	4.0	4.0	3.5	3.5	4.0	3.5	4.0	4.5	4.0	4.0
5	4.0	3.5	4.0	4.0	3.5	4.0	4.0	3.5	4.0	4.5	4.0	4.0
6	4.0	3.5	4.0	4.0	3.5	3.5	4.0	3.5	4.0	4.5	4.0	4.5
7	4.0	4.0	4.0	---	---	---	4.0	3.5	3.5	4.5	4.0	4.0
8	4.0	4.0	4.0	---	---	---	4.0	3.5	3.5	4.5	4.0	4.5
9	4.0	4.0	4.0	---	---	---	3.5	3.0	3.5	4.5	4.0	4.0
10	4.0	4.0	4.0	---	---	---	4.0	3.0	3.5	4.5	4.0	4.0
11	4.0	3.5	4.0	---	---	---	4.0	3.5	4.0	4.5	4.0	4.0
12	4.0	3.5	4.0	---	---	---	4.5	3.5	4.0	4.0	4.0	4.0
13	4.0	3.5	4.0	4.0	3.5	4.0	4.0	4.0	4.0	4.5	4.0	4.0
14	4.0	3.5	4.0	4.0	3.5	4.0	4.0	4.0	4.0	4.5	4.0	4.0
15	4.0	3.5	4.0	4.0	3.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0
16	4.0	3.5	4.0	4.0	3.5	4.0	4.5	4.0	4.0	4.0	4.0	4.0
17	4.0	3.5	4.0	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
18	4.0	3.5	4.0	4.5	4.0	4.0	4.5	4.0	4.0	4.0	4.0	4.0
19	4.0	3.5	4.0	4.5	3.5	4.0	4.5	4.0	4.0	4.0	4.0	4.0
20	4.0	3.5	4.0	4.0	3.5	4.0	4.5	4.0	4.0	4.0	4.0	4.0
21	4.0	3.5	4.0	4.0	3.5	4.0	4.5	4.0	4.0	4.5	4.0	4.0
22	4.0	3.5	3.5	4.0	3.5	4.0	4.5	3.5	4.0	4.5	4.0	4.0
23	4.0	3.5	3.5	4.0	3.5	4.0	4.0	3.5	4.0	4.5	4.0	4.0
24	4.0	3.5	3.5	4.5	4.0	4.0	4.5	4.0	4.0	4.5	4.0	4.0
25	4.0	3.5	3.5	4.5	4.0	4.0	4.0	4.0	4.0	4.5	4.0	4.0
26	3.5	3.5	3.5	4.0	4.0	4.0	4.5	4.0	4.0	4.5	4.0	4.0
27	3.5	3.5	3.5	4.0	4.0	4.0	4.5	4.0	4.0	4.5	4.0	4.0
28	3.5	3.5	3.5	4.0	4.0	4.0	4.5	4.0	4.0	4.5	4.0	4.0
29	---	---	---	4.0	3.5	4.0	5.0	4.5	4.5	4.5	4.0	4.0
30	---	---	---	4.5	4.0	4.0	4.5	4.0	4.5	4.0	4.0	4.0
31	---	---	---	4.0	4.0	4.0	---	---	---	4.5	4.0	4.0
MONTH	4.0	3.5	4.0	---	---	---	5.0	3.0	4.0	4.5	4.0	4.0

		JUNE			JULY			AUGUST			SEPTEMBER	
1	4.5	4.0	4.5	13.0	11.5	13.0	17.5	14.6	17.5	15.0	14.4	15.0
2	4.5	4.0	4.5	12.0	9.5	12.0	17.0	16.0	17.0	15.5	14.1	15.5
3	4.5	4.0	4.5	12.0	10.5	12.0	16.5	12.9	16.5	15.5	14.6	15.5
4	4.5	4.0	4.5	13.0	11.5	13.0	15.5	12.4	15.5	16.0	14.8	16.0
5	4.5	4.0	4.5	13.0	11.5	13.0	17.5	14.2	17.5	16.0	14.5	16.0
6	4.5	4.0	4.5	13.0	11.5	13.0	19.0	17.1	19.0	15.5	13.5	15.5
7	4.5	4.0	4.5	13.5	12.5	13.5	17.5	15.4	17.5	15.5	14.5	15.5
8	4.5	4.0	4.5	14.5	13.0	14.5	16.5	14.9	16.5	15.5	13.9	15.5
9	4.5	4.0	4.5	14.5	13.0	14.5	18.5	14.7	18.5	15.5	15.2	15.5
10	4.5	4.0	4.5	14.5	13.0	14.5	17.0	15.1	17.0	15.5	14.5	15.5
11	4.5	4.0	4.5	14.0	13.0	14.0	17.0	14.9	17.0	15.0	12.3	15.0
12	8.0	4.0	8.0	14.5	13.0	14.5	16.0	13.7	16.0	14.0	10.5	14.0
13	11.5	7.5	11.5	14.5	12.0	14.5	15.0	14.2	15.0	13.5	11.2	13.5
14	11.5	9.5	11.5	14.0	12.0	14.0	15.0	13.9	15.0	14.5	13.0	14.5
15	11.0	10.0	11.0	14.5	13.0	14.5	15.0	14.1	15.0	14.0	12.6	14.0
16	11.0	9.5	11.0	14.5	13.5	14.5	16.0	13.6	16.0	13.5	12.4	13.5
17	11.0	10.5	11.0	14.5	13.5	14.5	15.5	12.8	15.5	13.0	11.0	13.0
18	12.0	11.0	12.0	15.0	13.5	15.0	15.5	14.0	15.5	13.0	11.9	13.0
19	12.5	11.0	12.5	15.5	14.0	15.5	16.5	14.6	16.5	13.0	12.6	13.0
20	12.0	10.5	12.0	15.0	14.0	15.0	18.0	16.2	18.0	13.0	12.0	13.0
21	11.5	9.5	11.5	16.0	13.0	16.0	16.5	14.1	16.5	12.5	12.0	12.5
22	12.5	10.5	12.5	15.5	13.5	15.5	16.0	12.9	16.0	13.0	12.2	13.0
23	12.0	10.5	12.0	16.0	14.5	16.0	15.5	13.0	15.5	12.5	10.6	12.5
24	11.5	10.0	11.5	17.0	13.9	17.0	15.5	13.8	15.5	12.0	11.0	12.0
25	12.5	10.5	12.5	17.0	13.9	17.0	15.5	13.8	15.5	12.5	11.5	12.5
26	12.5	10.5	12.5	15.5	14.0	15.5	15.0	10.5	15.0	12.5	11.5	12.5
27	11.5	10.5	11.5	16.0	14.2	16.0	12.0	10.0	12.0	12.5	12.0	12.5
28	11.5	10.5	11.5	16.5	14.8	16.5	14.5	9.2	14.5	12.5	12.0	12.5
29	12.0	11.0	12.0	17.0	14.7	17.0	15.0	13.8	15.0	13.0	12.5	13.0
30	12.5	11.5	12.5	16.5	15.0	16.5	15.5	13.8	15.5	13.0	12.0	13.0
31	---	---	---	18.0	14.9	18.0	15.0	14.3	15.0	---	---	---
MONTH	12.5	4.0	9.0	18.0	9.5	15.0	19.0	9.0	16.0	16.0	10.5	14.0

PEND OREILLE RIVER BASIN

12363000 FLATHEAD RIVER AT COLUMBIA FALLS, MT

LOCATION.--Lat 48°21'43", long 114°11'02" (NAD 27), in NW$^1/_4$NW$^1/_4$SE$^1/_4$ sec.17, T.30 N., R.20 W., Flathead County, Hydrologic Unit 17010208, on right bank 200 ft downstream from county road bridge at Columbia Falls, 5.7 mi downstream from South Fork, and at river mile 143.0.
DRAINAGE AREA.--4,464 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1922 to September 1923 (fragmentary), June 1928 to current year. Monthly discharge only for some periods, published in WSP 1316.
REVISED RECORDS.--WSP 1092: 1923. WSP 1216: Drainage area. WSP 1636: 1958 (adjusted runoff).
GAGE.--Water-stage recorder. Elevation of gage is 2,977.67 ft (NGVD 29) (levels by U.S. Army Corps of Engineers). Prior to Nov. 12, 1928, nonrecording gage on bridge 200 ft upstream at elevation 0.19 ft higher.
REMARKS.--Water-discharge records excellent. South Fork Flathead River, which contributes about one-third of flow, is completely regulated by Hungry Horse Reservoir 10.9 mi upstream since Sept. 21, 1951 (see station number 12362000). Bureau of Reclamation satellite telemeter at station.
AVERAGE DISCHARGE.--75 years, 9,608 ft^3/s, 29.23 in/yr, 6,961,000 acre-ft/yr, adjusted for change in contents in Hungry Horse Reservoir since Oct. 1, 1951.
EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 176,000 ft^3/s, June 9, 1964, gage height, 25.58 ft, from floodmarks, from rating curve extended above 95,000 ft^3/s on basis of slope-area measurement of peak flow; minimum, 798 ft^3/s, Dec. 8, 1929, gage height, -0.08 ft.
EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1894 reached a stage of 22.7 ft, from floodmarks, discharge, 142,000 ft^3/s, from rating curve extended above 95,000 ft^3/s on basis of slope-area measurement of peak flow in 1964.
EXTREMES FOR CURRENT YEAR.--Maximum discharge, 39,700 ft^3/s, May 30, gage height, 12.33 ft; minimum daily, 3,390 ft^3/s, Feb. 24, Mar. 7.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3800	3870	3840	3740	3850	3570	6190	12700	30300	12700	7490	3560
2	3810	3960	3810	3790	4110	3570	7150	15000	30100	12400	7440	3410
3	3800	3860	3780	3860	4080	3510	6610	15700	29100	11800	7380	3440
4	3790	3760	3760	3910	3920	3470	5960	16100	26200	11200	7390	3460
5	3780	3650	3770	3880	3750	3470	5460	16200	22800	10700	7360	3440
6	3760	3740	3830	3810	3630	3450	5100	15500	21800	10200	7280	3420
7	3760	3810	3840	3760	3590	3390	4780	14900	21400	10300	7220	3460
8	3750	3840	3820	3760	3570	3400	4580	14200	21200	11100	7160	3470
9	3750	3880	3800	3810	3550	3500	4770	12800	22600	10900	7120	3510
10	3780	3880	3790	3750	3520	3590	5200	12200	23400	10500	7040	3520
11	3780	3850	3790	3660	3470	3660	6090	11800	23200	10300	6990	3470
12	3770	3820	3770	3840	3410	3720	7260	12700	21900	9940	6970	3470
13	3770	3810	3770	4120	3470	3650	8880	14100	20600	9790	7000	3560
14	3760	3820	3790	4190	3500	3600	10600	14800	20000	9720	6900	3540
15	3750	3830	3860	3980	3500	3640	10700	16500	19300	9570	6810	3470
16	3750	3810	3920	3730	3520	3640	10100	19400	18400	9380	6750	3410
17	3770	3800	3890	3640	3500	3670	9500	17800	17700	9220	6740	3470
18	3770	3780	3830	3680	3490	3620	9150	16200	17800	9070	6730	3490
19	3760	3760	3800	3820	3460	3550	8810	15000	18700	8940	6560	3460
20	3750	3820	3830	3870	3470	3750	8470	13900	19200	8780	6220	3450
21	3770	3870	3810	3880	3500	4120	8550	13400	18900	8620	5830	3480
22	3800	3890	3780	3830	3490	4200	9580	13400	17100	8500	5460	3460
23	3830	3890	3790	3740	3420	4360	11600	13900	15100	8370	5330	3440
24	3780	3860	3820	3790	3390	4600	13900	16600	12900	8260	5120	3430
25	3710	3740	3850	3880	3440	4560	17100	21700	11900	8150	4880	3450
26	3700	3680	3880	3940	3510	4380	19000	33000	12300	8040	4490	3420
27	3790	3750	3910	3990	3520	4190	17300	34100	13500	7970	4090	3420
28	3840	3840	3930	3970	3550	3980	14900	30900	13600	7870	3950	3430
29	3780	3870	3910	3830	---	3800	12900	34600	13400	7750	3910	3430
30	3700	3870	3850	3610	---	3640	11600	38700	12700	7650	3750	3420
31	3660	---	3770	3550	---	3610	---	32700	---	7570	3620	---
TOTAL	116770	114610	118590	118610	100180	116860	281790	580500	587100	295260	190980	103860
MEAN	3767	3820	3825	3826	3578	3770	9393	18730	19570	9525	6161	3462
MAX	3840	3960	3930	4190	4110	4600	19000	38700	30300	12700	7490	3560
MIN	3660	3650	3760	3550	3390	3390	4580	11800	11900	7570	3620	3410
AC-FT	231600	227300	235200	235300	198700	231800	558900	1151000	1165000	585600	378800	206000
CFSM	0.84	0.86	0.86	0.86	0.80	0.84	2.10	4.19	4.38	2.13	1.38	0.78
IN.	0.97	0.96	0.99	0.99	0.83	0.97	2.35	4.84	4.89	2.46	1.59	0.87
MEAN †	1864	1837	1792	1810	2407	3656	14650	23920	26120	6564	2469	1916
CFSM †	0.42	0.41	0.40	0.41	0.54	0.82	3.28	5.36	5.85	1.47	0.55	0.43
IN. †	0.48	0.46	0.46	0.47	0.56	0.94	3.66	6.18	6.53	1.70	0.64	0.48
AC-FT†	114600	109300	110200	111300	133700	224800	871900	1471000	1554000	403600	151800	114000

OBSERVED

CALENDAR YEAR 2002	TOTAL	3846730	MEAN	10540	MAX	44800	MIN	3440	AC-FT	7630000
WATER YEAR 2003	TOTAL	2725110	MEAN	7466	MAX	38700	MIN	3390	AC-FT	5405000

ADJUSTED

CALENDAR YEAR 2002	TOTAL	3842199	MEAN	10530	CFSM	2.36	IN	32.01	AC-FT	7621000
WATER YEAR 2003	TOTAL	2707436	MEAN	7418	CFSM	1.66	IN	22.56	AC-FT	5370000

†--Adjusted for change in contents in Hungry Horse Reservoir.

12363000 FLATHEAD RIVER AT COLUMBIA FALLS, MT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1949-50, 1963-67, 1970, 1979 to September 1994. March 2002 to current year. Water years 1968-69 published as Flathead River near Kalispell (station 12363500) 15 mi downstream. No appreciable inflow or outflow occurs between the two points.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1964 to September 1967, March 1979 to September 1981.
WATER TEMPERATURE: January 1949 to September 1950, August 1963 to September 1969, March 1979 to current year.
SUSPENDED-SEDIMENT DISCHARGE: July 1965 to September 1969.

INSTRUMENTATION.--Temperature recorder since Mar. 27, 1979.

REMARKS.--Daily water temperature record good. Unpublished records of instantaneous water temperature and specific conductance are available in files of District office.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE (water years 1965-67, 1979-81): Maximum daily, 290 microsiemens per centimeter (µS/cm) at 25.0°C, April 6, 1980; minimum daily, 121 µS/cm at 25.0°C, May 28, 1979.
WATER TEMPERATURE: Maximum, 21.0°C, Aug. 23, 1963, Aug. 8, 1968; minimum, 0.0°C on several days during winter periods most years.
SEDIMENT CONCENTRATION (water years 1965-69): Maximum daily, 980 mg/L, May 21, 1967; Minimum daily, 1 mg/L on several days most years.
SEDIMENT LOAD (water years 1965-69): Maximum daily, 140,000 tons, May 23, 1967; minimum daily, 4 tons, Mar. 4-6, 1967.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: Maximum, 19.5°C, Aug. 6 and 9; minimum, 0.5°C, Feb. 23, 24, and Mar. 7, 8.

WATER QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instan-taneous dis-charge, cfs (00061)	pH, water, unfltrd field, std units (00400)	Specif. conduc-tance, wat unf uS/cm 25 degC (00095)	Temper-ature, air, deg C (00020)	Temper-ature, water, deg C (00010)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Ammonia water, fltrd, mg/L as N (00608)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)
MAY 2003										
20...	1000	14000	8.1	156	8.0	6.0	E.07	<.015	.064	<.002
JUN										
11...	1045	23300	8.0	130	10.5	8.5	E.09	<.015	.059	<.002
JUL										
08...	1045	11100	8.3	154	18.0	14.0	E.08	<.015	.036	<.002
AUG										
21...	1230	5800	8.3	157	24.0	15.5	E.07	<.015	E.017	<.002

Date	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Phos-phorus, water, unfltrd mg/L (00665)	Suspnd. sedi-ment, sieve diametr percent <.063mm (70331)	Sus-pended sedi-ment concen-tration mg/L (80154)	Sus-pended sedi-ment load, tons/d (80155)
MAY 2003					
20...	<.007	E.004	71	6	227
JUN					
11...	<.007	.019	79	36	2260
JUL					
08...	<.007	E.002	71	2	60
AUG					
21...	<.007	E.003	76	1	16

E--Estimated.

PEND OREILLE RIVER BASIN

12363000 FLATHEAD RIVER AT COLUMBIA FALLS, MT--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	12.0	9.5	10.5	5.0	3.0	4.0	3.5	3.0	3.5	3.5	2.5	3.0
2	11.5	9.0	10.0	5.5	4.0	4.5	3.5	3.5	3.5	3.0	3.0	3.0
3	11.0	10.0	10.5	5.5	3.5	4.5	3.5	3.0	3.5	4.0	3.0	3.5
4	11.0	9.5	10.0	5.5	4.0	4.5	3.5	3.0	3.5	3.0	2.5	3.0
5	10.0	9.5	10.0	5.0	3.5	4.0	3.5	3.5	3.5	3.5	3.0	3.0
6	10.5	9.0	10.0	5.0	3.5	4.0	4.0	3.5	4.0	3.5	3.0	3.0
7	11.5	9.5	10.5	4.5	3.5	4.0	4.0	3.5	4.0	3.0	3.0	3.0
8	11.0	9.0	10.0	4.0	3.5	4.0	4.0	3.5	4.0	3.0	2.5	3.0
9	11.5	9.0	10.0	4.5	4.0	4.0	4.0	3.5	4.0	3.0	1.5	2.5
10	10.5	9.0	9.5	4.5	4.0	4.0	4.0	3.5	3.5	2.5	1.5	2.0
11	9.5	7.5	8.5	4.5	4.0	4.5	4.0	3.5	3.5	3.0	1.5	2.5
12	9.0	6.5	7.5	4.5	4.0	4.5	4.0	3.5	3.5	3.0	2.5	3.0
13	9.0	6.5	7.5	5.0	4.5	4.5	4.5	3.5	4.0	3.5	3.0	3.0
14	9.0	6.5	8.0	4.5	4.5	4.5	4.5	4.0	4.5	3.0	2.5	2.5
15	9.0	7.0	8.0	5.0	4.0	4.5	4.5	4.0	4.5	3.0	2.0	2.5
16	9.0	7.0	8.0	5.0	4.0	4.5	4.5	4.0	4.0	3.0	2.0	2.5
17	9.5	7.0	8.0	4.5	4.0	4.5	4.5	3.5	4.0	3.0	2.0	2.5
18	9.5	7.5	8.0	4.5	4.5	4.5	3.5	3.0	3.0	3.0	2.5	2.5
19	9.0	7.5	8.0	5.0	4.5	4.5	4.0	2.5	3.5	3.0	2.5	2.5
20	9.0	7.5	8.0	5.0	4.5	5.0	3.0	2.0	2.5	3.0	2.5	3.0
21	9.0	7.0	8.0	6.0	4.5	5.0	3.0	2.0	2.5	2.5	1.0	2.0
22	8.5	6.5	7.5	5.5	5.0	5.0	3.5	3.0	3.0	2.0	1.0	1.5
23	8.0	6.0	7.0	5.0	3.5	4.5	3.0	2.5	3.0	3.5	1.5	2.5
24	7.5	5.5	6.5	4.0	3.0	3.5	3.0	2.5	3.0	3.0	2.5	3.0
25	7.0	5.0	6.0	3.5	2.5	3.0	3.0	2.5	3.0	3.0	2.5	3.0
26	7.0	5.0	6.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0
27	6.5	5.0	6.0	4.0	3.0	3.5	3.0	2.5	2.5	3.5	3.0	3.0
28	6.5	5.0	6.0	3.5	3.0	3.0	3.5	2.5	3.0	4.0	2.5	3.0
29	5.5	4.0	5.0	4.0	3.0	3.5	3.0	2.5	2.5	3.0	2.5	2.5
30	5.5	3.5	4.5	3.5	3.0	3.5	2.5	2.5	2.5	4.0	2.5	3.0
31	6.0	4.0	4.5	---	---	---	3.0	2.5	2.5	3.5	3.0	3.5
MONTH	12.0	3.5	8.0	6.0	2.5	4.0	4.5	2.0	3.5	4.0	1.0	3.0

		FEBRUARY			MARCH			APRIL			MAY	
1	4.0	3.0	3.5	3.5	2.0	2.5	5.0	3.0	4.0	6.5	5.5	6.0
2	3.5	2.5	3.0	2.5	2.5	2.5	3.5	2.5	3.0	6.5	6.0	6.0
3	2.5	2.5	2.5	3.5	2.0	2.5	3.5	2.0	2.5	6.5	5.5	6.0
4	2.5	2.0	2.5	4.5	1.5	2.5	4.0	2.5	3.5	6.5	5.5	6.0
5	3.5	2.0	2.5	3.0	2.0	2.5	4.0	3.0	3.5	6.0	5.0	5.0
6	3.0	2.0	2.5	2.5	1.0	1.5	5.5	3.0	4.0	6.0	5.0	5.5
7	2.5	2.0	2.5	1.5	0.5	1.0	6.0	4.0	5.0	5.5	5.0	5.5
8	3.5	2.5	2.5	2.5	0.5	1.5	8.0	4.5	6.0	6.5	5.0	5.5
9	2.5	2.5	2.5	2.5	1.5	2.0	6.5	5.5	6.0	6.5	5.5	6.0
10	3.0	2.5	3.0	3.5	2.5	3.0	7.0	4.5	5.5	6.5	5.0	6.0
11	4.0	2.5	3.0	3.0	2.5	3.0	6.0	5.5	6.0	7.5	5.5	6.5
12	4.0	2.0	3.0	3.0	2.0	2.5	5.5	4.0	5.0	7.0	6.0	6.5
13	3.5	2.0	2.5	5.0	2.0	3.0	4.5	4.5	4.5	7.0	6.0	6.5
14	3.0	2.0	2.5	3.5	2.5	3.0	4.5	3.5	4.0	7.0	6.0	6.5
15	4.0	3.0	3.0	3.5	2.5	3.0	4.5	4.0	4.5	7.0	6.5	7.0
16	3.5	3.0	3.0	4.0	2.5	3.0	5.5	4.0	5.0	6.5	5.0	5.5
17	3.5	3.0	3.0	5.0	3.0	4.0	5.5	4.5	5.0	5.5	4.5	5.0
18	5.0	3.0	3.5	5.0	2.5	4.0	6.0	4.5	5.5	5.5	4.5	5.0
19	4.0	3.0	3.5	5.5	2.5	4.0	6.5	4.5	5.5	6.5	5.0	5.5
20	4.0	3.0	3.5	5.5	2.5	4.0	6.5	5.0	6.0	7.0	6.0	6.5
21	3.5	3.0	3.0	4.5	3.5	4.0	7.0	5.5	6.5	7.0	6.5	6.5
22	3.0	1.0	2.5	4.5	3.5	4.0	7.5	6.0	7.0	7.0	6.0	6.5
23	3.0	0.5	1.5	4.0	3.0	3.5	7.5	6.0	6.5	8.5	7.0	7.5
24	3.5	0.5	2.0	3.5	2.5	3.0	7.0	5.5	6.5	9.0	7.5	8.5
25	4.0	1.0	2.0	3.5	2.5	3.0	7.0	5.5	6.0	9.5	8.5	9.0
26	3.5	1.0	2.0	3.0	2.5	3.0	5.5	5.0	5.5	9.0	6.5	7.5
27	4.0	1.5	2.5	4.0	2.5	3.5	5.5	4.5	5.0	7.5	6.5	7.0
28	3.0	2.0	2.5	5.0	3.0	4.0	6.0	4.5	5.0	8.5	7.0	7.5
29	---	---	---	4.5	3.5	4.0	6.5	4.5	5.5	9.0	8.0	8.5
30	---	---	---	6.5	3.5	5.0	6.5	5.5	6.0	9.0	7.0	7.5
31	---	---	---	6.5	5.0	5.5	---	---	---	7.5	7.0	7.5
MONTH	5.0	0.5	2.5	6.5	0.5	3.0	8.0	2.0	5.0	9.5	4.5	6.5

PEND OREILLE RIVER BASIN

12363000 FLATHEAD RIVER AT COLUMBIA FALLS, MT--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003--Continued

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	8.5	7.0	7.5	14.0	13.0	13.5	18.0	16.0	17.0	16.5	13.5	15.0
2	8.5	7.0	7.5	14.0	12.5	13.5	19.0	16.0	17.5	16.5	14.0	15.0
3	8.5	7.0	8.0	13.5	12.0	13.0	17.0	14.5	15.5	16.0	14.0	15.0
4	9.0	7.5	8.0	14.0	12.5	13.0	16.5	13.5	15.0	16.0	14.5	15.0
5	9.0	8.0	8.5	14.0	12.5	13.0	18.0	14.5	16.0	16.5	14.5	15.0
6	10.0	8.5	9.5	14.5	12.5	13.0	19.5	16.5	17.5	16.0	14.0	15.0
7	10.0	8.5	9.5	15.0	13.5	14.0	18.0	16.0	17.0	16.5	14.5	15.5
8	10.0	9.0	9.5	14.5	13.5	14.0	18.0	16.0	17.0	15.0	14.0	14.5
9	10.0	9.0	9.5	15.0	12.5	14.0	19.5	15.5	17.5	14.0	13.0	13.5
10	9.5	9.0	9.0	15.5	14.0	14.5	18.0	16.0	17.0	14.0	12.5	13.0
11	9.0	8.5	8.5	16.5	14.5	15.5	17.5	15.5	16.5	14.5	12.5	13.5
12	10.5	8.0	9.0	17.0	14.5	15.5	16.0	15.0	15.5	13.5	11.5	12.5
13	10.0	9.5	9.5	15.5	14.0	15.0	16.5	14.5	15.5	14.0	11.0	12.0
14	10.0	9.0	9.5	15.5	13.5	14.5	16.5	14.5	15.5	14.0	11.5	13.0
15	11.0	9.0	10.0	16.0	13.5	14.5	16.5	14.5	15.5	15.5	12.5	13.5
16	12.0	10.0	11.0	17.0	15.0	15.5	16.5	15.0	15.5	13.0	11.5	12.0
17	13.0	11.0	12.0	17.5	15.0	16.0	16.0	14.0	15.0	12.0	10.5	11.0
18	14.0	12.5	13.0	17.0	15.0	16.0	17.0	14.5	15.5	13.5	10.0	11.5
19	14.0	12.5	13.0	17.5	15.0	16.0	17.5	15.0	16.0	13.0	11.5	12.0
20	12.5	11.0	12.0	17.5	15.5	16.5	19.0	16.5	17.5	13.5	11.5	12.5
21	11.0	9.5	10.0	17.5	15.5	16.5	17.0	15.5	16.0	14.0	11.0	12.5
22	10.0	9.0	9.5	18.0	15.5	16.5	16.0	14.0	15.5	14.0	11.0	12.0
23	10.5	9.0	10.0	18.0	16.0	17.0	16.0	14.0	15.0	13.5	11.5	12.5
24	11.5	9.5	10.5	18.0	16.0	17.0	16.5	14.0	15.5	13.3	10.6	11.8
25	13.0	11.0	12.0	17.5	16.0	16.5	17.0	14.0	15.5	14.4	11.0	12.5
26	13.0	11.5	12.5	17.5	15.5	16.5	17.0	13.5	15.0	14.5	11.7	12.8
27	13.5	12.0	13.0	18.0	15.0	16.5	15.5	12.5	13.5	14.0	11.6	12.5
28	14.0	12.5	13.0	18.0	16.0	17.0	15.0	12.5	13.5	14.0	11.4	12.5
29	14.0	12.5	13.5	18.0	16.0	17.0	15.5	13.0	14.5	13.8	11.4	12.4
30	15.0	14.0	14.5	18.0	16.5	17.0	16.0	13.0	14.5	13.7	10.8	12.1
31	---	---	---	18.0	16.0	17.0	15.5	13.5	14.5	---	---	---
MONTH	15.0	7.0	10.5	18.0	12.0	15.5	19.5	12.5	16.0	16.5	10.0	13.0

PEND OREILLE RIVER BASIN

12365000 STILLWATER RIVER NEAR WHITEFISH, MT

LOCATION.--Lat 48°19'08", long 114°23'11" (NAD 27), in $NE^1/_4SW^1/_4$ sec.34, T.30 N., R.22 W., Flathead County, Hydrologic Unit 17010210, on right bank 600 ft downstream from road bridge, 6.2 mi southwest of Whitefish, 14.8 mi upstream from Whitefish River, and at river mile 16.2.

DRAINAGE AREA.--524 mi^2.

PERIOD OF RECORD.--October and November 1930 (monthly discharge only, published in WSP 1316), December 1930 to September 1950, October 1972 to September 1985, April 1986 to September 1999 (seasonal records only), October 1999 to current year.

REVISED RECORDS.--WSP 1736: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 2,953.26 ft (NGVD 29).

REMARKS.--Records good except those for estimated daily discharges, which are poor. U.S. Geological Survey satellite telemeter at station. Diversions for irrigation of about 200 acres upstream from station. Several observations of water temperature and specific conductance were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR, OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	100	90	81	e105	138	e107	177	595	612	295	88	53
2	101	86	81	e106	142	122	213	562	636	280	90	51
3	100	86	80	e107	140	120	242	544	641	266	91	48
4	99	87	80	e106	e137	119	258	543	635	252	94	48
5	98	89	81	e105	e134	123	259	585	626	239	94	50
6	97	91	80	e103	e132	125	251	631	603	230	91	50
7	95	94	79	e102	129	120	242	656	574	222	92	50
8	94	96	79	e100	e126	108	230	653	548	210	93	52
9	93	97	78	e98	e124	e100	225	623	546	205	92	56
10	91	99	78	80	e121	e96	229	586	553	197	87	61
11	91	99	78	90	e118	e94	248	551	584	188	85	62
12	90	98	78	110	e116	e90	289	518	609	179	82	64
13	88	99	78	120	113	e86	343	496	607	172	81	65
14	88	96	79	118	e110	e88	399	481	590	165	81	65
15	87	97	83	117	e110	e90	458	467	563	159	79	63
16	87	98	90	115	e109	e94	500	461	534	155	76	62
17	86	97	95	112	e109	e100	515	460	501	152	74	63
18	86	97	95	110	e108	e110	519	460	470	144	74	65
19	86	96	90	112	e107	e120	513	465	447	138	75	65
20	86	96	91	112	e107	e125	502	461	466	135	74	65
21	85	97	e88	112	e107	132	491	443	477	127	72	66
22	84	98	e86	101	e105	134	491	426	468	124	68	66
23	83	100	e88	109	e101	144	513	411	461	119	66	65
24	82	101	e90	119	82	151	551	401	444	115	64	64
25	78	85	94	130	e98	153	603	396	420	107	63	62
26	78	e86	92	128	e103	152	664	408	397	103	60	61
27	78	e84	93	127	e101	153	704	449	375	98	60	60
28	79	e84	98	128	e105	156	706	508	353	93	59	58
29	e76	e82	e98	128	---	153	678	549	335	92	57	57
30	e74	e82	e100	125	---	151	637	560	318	90	55	56
31	70	---	102	132	---	153	---	574	---	89	54	---
TOTAL	2710	2787	2683	3467	3232	3769	12650	15923	15393	5140	2371	1773
MEAN	87.4	92.9	86.5	112	115	122	422	514	513	166	76.5	59.1
MAX	101	101	102	132	142	156	706	656	641	295	94	66
MIN	70	82	78	80	82	86	177	396	318	89	54	48
AC-FT	5380	5530	5320	6880	6410	7480	25090	31580	30530	10200	4700	3520
CFSM	0.17	0.18	0.17	0.21	0.22	0.23	0.80	0.98	0.98	0.32	0.15	0.11
IN.	0.19	0.20	0.19	0.25	0.23	0.27	0.90	1.13	1.09	0.36	0.17	0.13

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1931 - 2003, BY WATER YEAR (WY)*

MEAN	113	127	120	114	115	161	659	1177	863	375	176	124
MAX	271	300	582	495	588	548	1857	3125	1916	952	505	315
(WY)	1948	1990	1996	1934	1996	1996	1996	1997	1974	1993	1993	1993
MIN	46.5	53.9	50.7	59.2	60.1	76.7	138	265	235	94.5	55.5	43.1
(WY)	2002	1945	1945	1940	1993	1977	1945	1944	1977	1977	1941	2001

12365000 STILLWATER RIVER NEAR WHITEFISH, MT--Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1931 - 2003*	
ANNUAL TOTAL	124452		71898			
ANNUAL MEAN	341		197		339	
HIGHEST ANNUAL MEAN					747	1996
LOWEST ANNUAL MEAN					124	1944
HIGHEST DAILY MEAN	1990	May 26	706	Apr 28	4560	May 18 1997
LOWEST DAILY MEAN	61	Jan 1	a48	Sep 3	17	Aug 17 1992
ANNUAL SEVEN-DAY MINIMUM	71	Jan 1	50	Sep 2	37	Sep 6 1988
MAXIMUM PEAK FLOW			b711	Apr 27	4570	May 18 1997
MAXIMUM PEAK STAGE			6.23	Apr 27	c20.90	May 26 1948
INSTANTANEOUS LOW FLOW			48	Sep 3	d2.9	Aug 18 1992
ANNUAL RUNOFF (AC-FT)	246900		142600		245700	
ANNUAL RUNOFF (CFSM)	0.65		0.38		0.65	
ANNUAL RUNOFF (INCHES)	8.84		5.10		8.79	
10 PERCENT EXCEEDS	957		538		948	
50 PERCENT EXCEEDS	107		105		140	
90 PERCENT EXCEEDS	81		66		70	

*--During periods of operation [October and November 1930 (monthly discharge only, published in WSP 1316), December 1930 to September 1950, October 1972 to September 1985, April 1986 to September 1999 (seasonal record only), October 1999 to current year].
a--Also occurred Sept. 4.
b--Also occurred Apr. 28.
c--From floodmark.
d--Result of upstream mudslide.
e--Estimated.

PEND OREILLE RIVER BASIN

12366000 WHITEFISH RIVER NEAR KALISPELL, MT

LOCATION.--Lat 48°19'13", long 114°16'39" (NAD 27), in $SW^1/_4SE^1/_4NW^1/_4$ sec.34, T.30 N., R.21 W., Flathead County, Hydrologic Unit 17010210, on right bank 160 ft upstream from road bridge, 8.0 mi north of Kalispell, and at river mile 12.8.

DRAINAGE AREA.--170 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July to November 1928, April 1929 to September 1950, annual maximum 1964, October 1972 to September 1985, April 1986 to September 1995, October 1995 to September 1999 (seasonal record only), October 1999 to current year. Prior to 1964, published as Whitefish Creek near Kalispell.

GAGE.--Water-stage recorder. Elevation of gage is 2,969.83 ft (NGVD 29). Prior to Oct. 16, 1930, nonrecording gage at site 200 ft downstream at elevation 10.00 ft lower. Oct. 16, 1930, to Sept. 30, 1950, water-stage recorder on left bank at same elevation.

REMARKS.--Water-discharge records good except those for estimated daily discharges, which are poor. Some regulation by Whitefish Lake. Diversion for irrigation of about 650 acres upstream from station. U.S. Geological Survey satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	57	e45	53	e52	59	49	106	333	548	316	96	45
2	57	e44	52	54	58	47	119	331	562	300	93	49
3	56	e42	52	54	57	e47	121	337	573	285	93	48
4	55	e42	52	54	57	e51	121	349	578	270	91	47
5	55	e41	51	54	58	e53	120	363	575	257	91	47
6	54	40	51	54	62	e54	119	371	568	243	89	47
7	53	39	51	54	55	e56	118	365	563	234	86	46
8	53	40	51	54	54	e56	118	362	560	229	85	48
9	52	42	49	e51	54	e57	124	351	565	217	83	54
10	52	43	49	e48	54	e58	133	343	574	208	80	55
11	52	43	49	e46	54	e60	146	332	581	197	79	55
12	52	44	49	e45	53	e60	160	324	574	188	75	56
13	51	46	49	e44	e53	e58	178	322	565	181	72	56
14	51	47	50	e43	e53	60	195	316	556	174	71	53
15	51	49	52	43	52	68	201	314	546	167	70	50
16	49	49	53	e45	52	81	201	313	530	161	68	47
17	49	49	55	e47	52	99	203	316	514	155	66	48
18	49	49	54	e49	51	93	210	318	496	150	65	48
19	49	49	54	51	51	87	211	321	483	144	66	49
20	48	62	53	e54	51	86	213	316	479	139	64	51
21	48	67	e54	e53	54	83	218	310	471	135	63	50
22	49	63	e51	e48	55	81	226	305	458	129	62	49
23	48	61	e50	e42	55	87	243	301	446	125	62	48
24	48	59	e49	e39	e49	88	262	298	431	120	61	48
25	48	57	e50	e44	e37	86	286	310	414	116	58	48
26	47	55	e51	e48	e38	87	314	354	399	114	57	47
27	46	55	49	e50	e41	88	327	403	384	110	55	48
28	47	54	51	e51	e44	91	331	432	368	107	55	47
29	46	54	e52	e54	---	91	336	458	350	103	52	47
30	45	54	e50	55	---	91	336	493	334	101	51	45
31	e45	---	e48	57	---	94	---	522	---	99	44	---
TOTAL	1562	1484	1584	1537	1463	2247	5996	10883	15045	5474	2203	1476
MEAN	50.4	49.5	51.1	49.6	52.2	72.5	200	351	502	177	71.1	49.2
MAX	57	67	55	57	62	99	336	522	581	316	96	56
MIN	45	39	48	39	37	47	106	298	334	99	44	45
AC-FT	3100	2940	3140	3050	2900	4460	11890	21590	29840	10860	4370	2930
CFSM	0.30	0.29	0.30	0.29	0.31	0.43	1.18	2.07	2.95	1.04	0.42	0.29
IN.	0.34	0.32	0.35	0.34	0.32	0.49	1.31	2.38	3.29	1.20	0.48	0.32

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1930 - 2003, BY WATER YEAR (WY)*

MEAN	68.3	71.1	71.2	67.1	65.2	95.1	226	531	608	275	111	80.5
MAX	150	177	231	209	157	212	549	895	1194	695	238	149
(WY)	1948	1934	1934	1934	1934	1936	1934	1997	1974	1974	1993	1947
MIN	9.98	20.1	23.0	13.9	15.5	48.2	83.4	214	211	88.5	29.5	23.9
(WY)	1931	1937	1936	1938	1938	2001	2001	1944	1977	1941	1931	1931

12366000 WHITEFISH RIVER NEAR KALISPELL, MT--Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1930 - 2003*	
ANNUAL TOTAL	64910		50954			
ANNUAL MEAN	178		140		186	
HIGHEST ANNUAL MEAN					320	1974
LOWEST ANNUAL MEAN					88.9	2001
HIGHEST DAILY MEAN	809	Jun 8	581	Jun 11	1580	Jun 23 1974
LOWEST DAILY MEAN	38	Feb 11	37	Feb 25	5.0	Oct 17 1934
ANNUAL SEVEN-DAY MINIMUM	40	Feb 6	41	Nov 3	5.3	Oct 15 1934
MAXIMUM PEAK FLOW			a583	Jun 10	1580	Jun 24 1974
MAXIMUM PEAK STAGE			3.15	Jun 10	4.91	Jun 24 1974
INSTANTANEOUS LOW FLOW			23	Feb 23	4.5	Oct 18 1934
ANNUAL RUNOFF (AC-FT)	128700		101100		134800	
ANNUAL RUNOFF (CFSM)	1.05		0.82		1.09	
ANNUAL RUNOFF (INCHES)	14.20		11.15		14.88	
10 PERCENT EXCEEDS	595		362		509	
50 PERCENT EXCEEDS	68		57		91	
90 PERCENT EXCEEDS	45		47		42	

*--During periods of operation [July to November 1928, April 1929 to September 1950, annual maximum 1964, October 1972 to September 1985, April 1986 to September 1995, October 1995 to September 1999 (seasonal record only), October 1999 to current year].
a--Also occurred June 11.
e--Estimated.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--May 1999 to current year.

REMARKS.--Unpublished records of instantaneous water temperature and specific conductance are available in files of District office.

WATER QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instantaneous discharge, cfs (00061)	pH, water, unfltrd field, std units (00400)	Specif. conductance, wat unf uS/cm 25 degC (00095)	Temperature, air, deg C (00020)	Temperature, water, deg C (00010)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)
MAY 2003									
20...	0815	318	8.2	175	6.5	9.5	.15	E.019	.003
JUN									
11...	1200	583	8.0	167	15.0	14.0	.17	E.012	E.002
JUL									
07...	1300	231	8.3	155	32.0	20.5	.11	.035	.004
AUG									
20...	1445	65	8.7	177	26.0	22.0	.12	<.022	<.002

Date	Orthophosphate, water, fltrd, mg/L as P (00671)	Phosphorus, water, unfltrd mg/L (00665)	Suspnd. sediment, sieve diametr percent <.063mm (70331)	Suspended sediment concentration mg/L (80154)	Suspended sediment load, tons/d (80155)
MAY 2003					
20...	<.007	.016	93	16	14
JUN					
11...	<.007	.014	78	15	24
JUL					
07...	<.007	.009	92	5	3.1
AUG					
20...	<.007	.016	94	9	1.6

Date	Time	Hardness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnesium, water, fltrd, mg/L (00925)	Potassium, water, fltrd, mg/L (00935)	Sodium adsorption ratio (00931)	Sodium, water, fltrd, mg/L (00930)	Alkalinity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chloride, water, fltrd, mg/L (00940)	Fluoride, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)
MAY 2003											
20...	0815	87	24.7	6.05	.43	.1	1.47	91	.77	<.2	6.90
JUL											
07...	1300	88	24.8	6.30	.41	.1	1.58	87	.70	<.2	6.17

E--Estimated.

Date	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of consti-tuents mg/L (70301)	Residue water, fltrd, tons/ acre-ft (70303)	Residue water, fltrd, tons/d (70302)	Arsenic water unfltrd ug/L (01002)	Cadmium water, unfltrd ug/L (01027)	Chrom-ium, water, unfltrd recover -able, ug/L (01034)	Copper, water, unfltrd recover -able, ug/L (01042)	Lead, water, unfltrd recover -able, ug/L (01051)	Nickel, water, unfltrd recover -able, ug/L (01067)	Zinc, water, unfltrd recover -able, ug/L (01092)
MAY 2003											
20...	1.8	96	.13	82.8	<2	<.2	<.8	.9	.35	.67	E1
JUL											
07...	1.8	94	.13	58.8	<2	<.2	<.8	.7	.16	.60	E1

E--Estimated.

PEND OREILLE RIVER BASIN

12370000 SWAN RIVER NEAR BIGFORK, MT

LOCATION.--Lat 48°01'28", long 113°58'44" (NAD 27), near center of $S^1/_2SW^1/_4$ sec.11, T.26 N., R.19 W., Lake County, Hydrologic Unit 17010211, on left bank 0.2 mi downstream from Johnson Creek, 0.4 mi downstream from Swan Lake, 5.1 mi southeast of Bigfork, and at river mile 14.0.
DRAINAGE AREA.--671 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1910 to May 1911 (gage heights only), April 1922 to current year. Monthly discharge only for some periods, published in WSP 1316.
REVISED RECORDS.--WSP 1216: Drainage area. WSP 1246: 1923-24(M), 1930. WSP 1316: 1923.
GAGE.--Water-stage recorder. Elevation of gage is 3,062.6 ft (NGVD 29) (from river-profile survey). Oct. 10, 1910, to May 22, 1911, nonrecording gage at site 10 mi upstream at different elevation. Apr. 28, 1922, to Oct. 14, 1930, nonrecording gage at site 800 ft upstream at elevation 1.9 ft higher.
REMARKS.-Water-discharge records good. Diversions for irrigation of about 360 acres upstream from station. U.S. Geological Survey satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	400	299	372	355	475	317	979	1640	5100	1370	533	314
2	406	293	362	354	567	317	1120	1540	5220	1370	514	305
3	398	296	357	353	622	328	1210	1490	5010	1350	491	306
4	397	295	352	361	635	327	1230	1450	4530	1300	494	305
5	395	304	348	359	614	324	1200	1540	4020	1240	505	294
6	392	305	344	362	594	321	1150	1610	3560	1180	484	291
7	389	315	342	362	560	320	1090	1600	3230	1140	474	288
8	388	324	339	355	523	321	1020	1550	2990	1090	464	287
9	386	323	343	350	509	327	971	1460	2870	1060	464	307
10	377	334	338	332	487	336	955	1370	2880	1030	448	317
11	375	345	324	308	468	346	960	1290	2970	996	432	319
12	373	355	333	299	450	358	1020	1210	2990	966	419	351
13	373	358	335	305	426	373	1190	1170	2890	923	412	358
14	366	372	348	314	411	402	1470	1160	2770	910	407	367
15	359	386	356	319	401	452	1700	1170	2640	895	395	351
16	356	388	373	324	399	521	1790	1270	2540	845	394	351
17	356	375	368	313	391	598	1750	1400	2470	827	384	348
18	355	371	375	308	383	659	1670	1480	2430	804	386	363
19	352	381	369	302	376	693	1590	1500	2450	781	382	364
20	346	397	360	297	374	705	1490	1450	2530	755	371	392
21	350	396	342	298	374	708	1410	1370	2560	725	365	393
22	347	388	330	307	371	735	1350	1310	2470	710	357	394
23	339	402	328	298	365	840	1390	1270	2290	691	359	380
24	334	397	329	295	349	1010	1540	1310	2070	670	363	373
25	333	394	329	301	324	1060	1700	1510	1870	651	358	367
26	328	386	325	310	311	1060	1950	2090	1670	627	356	358
27	327	382	331	324	307	1040	2070	2920	1530	621	341	352
28	329	384	347	359	311	1010	2060	3670	1440	606	333	348
29	340	374	353	377	---	955	1930	4090	1420	586	326	341
30	317	374	364	389	---	914	1780	4460	1390	573	326	326
31	313	---	359	411	---	904	---	4910	---	549	319	---
TOTAL	11196	10693	10775	10301	12377	18581	42735	57260	84800	27841	12656	10210
MEAN	361	356	348	332	442	599	1424	1847	2827	898	408	340
MAX	406	402	375	411	635	1060	2070	4910	5220	1370	533	394
MIN	313	293	324	295	307	317	955	1160	1390	549	319	287
AC-FT	22210	21210	21370	20430	24550	36860	84760	113600	168200	55220	25100	20250
CFSM	0.54	0.53	0.52	0.50	0.66	0.89	2.12	2.75	4.21	1.34	0.61	0.51
IN.	0.62	0.59	0.60	0.57	0.69	1.03	2.37	3.17	4.70	1.54	0.70	0.57

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1922 - 2003, BY WATER YEAR (WY)

MEAN	549	592	567	496	498	626	1516	2825	3294	1630	695	534
MAX	1682	1514	1796	1298	1627	1813	3228	5469	5803	3310	1225	1096
(WY)	1960	1928	1934	1934	1971	1986	1925	1928	1974	1950	1950	1965
MIN	308	290	307	271	236	244	675	1670	1433	609	322	285
(WY)	1938	1937	1937	1930	1930	1930	1937	1941	1941	1941	1941	1988

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1922 - 2003	
ANNUAL TOTAL	370160		309425			
ANNUAL MEAN	1014		848		1153	
HIGHEST ANNUAL MEAN					1860	1928
LOWEST ANNUAL MEAN					607	1941
HIGHEST DAILY MEAN	4410	Jun 3	5220	Jun 2	8800	Jun 21 1974
LOWEST DAILY MEAN	293	Nov 2	287	Sep 8	193	Jan 26 1930
ANNUAL SEVEN-DAY MINIMUM	301	Oct 31	297	Sep 2	195	Jan 26 1930
MAXIMUM PEAK FLOW			5290	Jun 2	8890	Jun 20 1974
MAXIMUM PEAK STAGE			5.65	Jun 2	7.34	Jun 20 1974
INSTANTANEOUS LOW FLOW			248	Sep 8	a193	Jan 26 1930
ANNUAL RUNOFF (AC-FT)	734200		613700		835200	
ANNUAL RUNOFF (CFSM)	1.51		1.26		1.72	
ANNUAL RUNOFF (INCHES)	20.52		17.15		23.35	
10 PERCENT EXCEEDS	2940		1780		2850	
50 PERCENT EXCEEDS	404		394		630	
90 PERCENT EXCEEDS	333		317		362	

a--Jan. 26-29, 1930, site and datum then in use.

12370000 SWAN RIVER NEAR BIGFORK, MT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--May 1999 to current year.
PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: October 1999 to current year.
INSTRUMENTATION.--Temperature recorder since Aug. 20, 1999.
REMARKS--Daily water temperature records excellent. Unpublished records of instantaneous specific conductance and temperature data are available in files of the District office.
EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Maximum, 23.5°C, July 2, 27-31, Aug. 1, 2, 2003; minimum, 0.0°C, many days during winter months.
EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: Maximum, 23.5°C, July 2, 27-31 and Aug. 1, 2; minimum, 0.0°C, Jan 22, 23, Feb. 23, 24.

WATER QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instan-taneous dis-charge, cfs (00061)	pH, water, unfltrd field, std units (00400)	Specif. conduc-tance, wat unf uS/cm 25 degC (00095)	Temper-ature, air, deg C (00020)	Temper-ature, water, deg C (00010)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)
MAY 2003									
19...	1215	1480	8.2	174	10.0	10.5	E.06	E.017	<.002
JUN									
11...	1345	2970	8.0	146	17.0	14.0	.12	E.015	<.002
JUL									
10...	0915	1030	8.2	145	18.0	17.5	E.09	<.022	<.002
AUG									
20...	1130	362	8.4	157	25.0	21.0	E.06	<.022	<.002

Date	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Phos-phorus, water, unfltrd mg/L (00665)	Suspnd. sedi-ment, sieve diametr percent <.063mm (70331)	Sus-pended sedi-ment concen-tration mg/L (80154)	Sus-pended sedi-ment load, tons/d (80155)
MAY 2003					
19...	<.007	E.003	92	3	12
JUN					
11...	<.007	.004	75	2	16
JUL					
10...	<.007	E.003	89	1	2.8
AUG					
20...	<.007	.004	68	2	2.0

Date	Time	Hard-ness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Potas-sium, water, fltrd, mg/L (00935)	Sodium adsorp-tion ratio (00931)	Sodium, water, fltrd, mg/L (00930)	Alka-linity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chlor-ide, water, fltrd, mg/L (00940)	Fluor-ide, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)
MAY 2003											
19...	1215	87	24.9	6.03	.52	.1	1.13	96	.47	<.2	6.00
JUL											
10...	0915	81	23.3	5.54	.42	.0	.85	77	E.19	<.2	5.48

Date	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of consti-tuents mg/L (70301)	Residue water, fltrd, tons/ acre-ft (70303)	Residue water, fltrd, tons/d (70302)	Arsenic water unfltrd ug/L (01002)	Cadmium water, unfltrd ug/L (01027)	Chrom-ium, water, unfltrd recover-able, ug/L (01034)	Copper, water, unfltrd recover-able, ug/L (01042)	Lead, water, unfltrd recover-able, ug/L (01051)	Nickel, water, unfltrd recover-able, ug/L (01067)	Zinc, water, unfltrd recover-able, ug/L (01092)
MAY 2003											
19...	1.6	98	.13	393	<2	<.2	<.8	2.9	.34	.62	6
JUL											
10...	1.2	E83	E.11	E231	<2	<.2	<.8	E.3	E.03	.41	<2

E--Estimated.

12370000 SWAN RIVER NEAR BIGFORK, MT--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	13.5	11.5	12.0	5.0	2.5	3.5	3.5	3.0	3.0	2.0	1.5	1.5
2	14.0	11.0	12.0	5.0	3.0	3.5	3.5	3.0	3.0	2.0	1.5	1.5
3	13.0	12.0	12.5	5.5	3.0	4.0	3.5	3.0	3.5	2.5	1.5	2.0
4	13.5	11.5	12.5	5.5	3.5	4.0	3.5	3.0	3.5	2.0	1.5	1.5
5	14.0	12.0	12.5	5.0	3.5	4.0	3.5	3.5	3.5	2.5	1.5	2.0
6	13.5	12.0	12.5	6.5	4.0	5.0	4.0	3.5	3.5	2.5	2.0	2.0
7	14.5	12.0	12.5	6.0	4.5	5.0	3.5	3.5	3.5	2.0	1.5	2.0
8	14.0	11.5	12.5	5.5	5.0	5.0	4.0	3.5	3.5	1.5	1.0	1.5
9	14.5	12.0	12.5	5.5	5.0	5.0	3.5	2.5	3.0	1.5	0.5	1.0
10	13.0	10.5	12.0	5.5	5.0	5.0	2.5	2.5	2.5	1.5	0.5	0.5
11	12.0	10.5	11.0	5.5	5.0	5.0	3.5	2.5	3.0	1.5	0.5	1.0
12	12.0	9.5	10.5	5.0	5.0	5.0	3.5	2.5	3.0	1.5	1.0	1.5
13	12.0	9.5	10.5	5.5	5.0	5.0	3.5	2.5	3.0	2.0	1.5	1.5
14	12.5	9.5	10.5	5.0	5.0	5.0	4.0	3.0	3.5	2.0	1.0	1.5
15	12.0	9.5	10.5	6.0	4.5	5.0	4.0	3.0	3.5	1.5	1.0	1.5
16	12.0	9.5	10.5	5.5	4.0	4.5	3.5	3.0	3.0	1.5	1.0	1.0
17	12.0	9.0	10.0	5.5	4.5	5.0	3.5	2.5	3.0	1.5	1.0	1.5
18	12.0	9.0	10.0	5.0	4.5	5.0	2.5	2.0	2.5	2.0	1.0	1.5
19	11.5	9.0	10.0	5.0	4.5	5.0	3.0	2.0	2.5	1.5	1.0	1.5
20	12.0	9.0	10.0	6.0	5.0	5.5	2.0	1.5	1.5	2.0	1.0	1.5
21	11.5	9.0	10.0	6.0	5.0	5.5	2.5	1.5	2.0	1.5	0.5	1.0
22	10.5	7.5	9.0	5.5	5.0	5.5	2.5	1.5	2.0	0.5	0.0	0.5
23	9.5	7.5	8.0	5.5	3.5	4.5	2.5	1.5	2.0	1.5	0.0	1.0
24	9.5	7.0	7.5	4.0	2.5	3.0	2.5	2.0	2.0	1.5	1.0	1.5
25	9.0	6.5	7.5	4.0	3.0	3.0	2.0	1.5	2.0	1.5	1.0	1.5
26	9.0	6.5	7.0	4.0	3.5	3.5	1.5	1.0	1.5	2.0	1.5	1.5
27	8.0	6.5	7.0	4.0	3.0	3.5	2.0	1.5	1.5	2.0	1.5	1.5
28	8.0	6.0	7.5	4.0	3.0	3.5	2.0	2.0	2.0	2.5	1.0	1.5
29	6.0	3.5	5.0	4.0	3.5	3.5	2.5	1.5	2.0	1.5	1.0	1.5
30	5.5	3.5	4.0	4.0	3.5	3.5	1.5	0.5	1.0	3.0	1.5	2.0
31	4.5	2.5	3.5	---	---	---	2.0	1.0	1.5	2.0	1.5	2.0
MONTH	14.5	2.5	10.0	6.5	2.5	4.5	4.0	0.5	2.5	3.0	0.0	1.5
		FEBRUARY			MARCH			APRIL			MAY	
1	2.5	1.5	2.0	2.5	1.5	2.0	4.0	3.0	3.5	9.5	7.5	8.5
2	2.5	1.5	2.0	2.0	1.5	1.5	3.5	3.0	3.0	10.0	8.0	8.5
3	1.5	0.5	1.5	2.0	1.0	1.5	3.5	2.5	3.0	10.0	8.0	9.0
4	2.0	1.0	1.5	3.0	0.5	1.5	4.0	2.5	3.5	9.5	8.5	9.0
5	2.5	1.0	1.5	2.5	1.5	1.5	4.0	3.0	3.5	9.5	8.0	8.5
6	1.5	1.0	1.0	2.5	0.5	1.5	5.0	3.0	3.5	9.5	8.0	9.0
7	1.5	1.0	1.0	1.5	0.5	1.0	5.0	3.0	4.0	9.0	8.0	8.5
8	2.0	1.0	1.5	1.5	0.5	1.0	6.0	3.5	4.5	10.0	8.0	9.0
9	1.5	1.0	1.5	1.5	1.0	1.0	5.0	3.5	4.0	9.5	8.5	9.0
10	2.0	1.0	1.5	2.5	1.0	1.5	6.0	3.5	4.5	10.5	8.5	9.5
11	3.0	1.5	2.0	2.0	1.5	2.0	6.0	4.0	5.0	11.0	8.0	9.5
12	3.0	1.0	1.5	3.0	1.5	2.0	5.5	4.0	5.0	10.0	8.5	9.5
13	2.5	1.0	1.5	4.0	2.0	2.5	5.0	4.5	4.5	11.0	9.0	9.5
14	2.0	1.5	1.5	4.0	2.5	3.0	5.0	4.0	4.5	11.5	9.0	10.0
15	3.0	1.5	2.0	3.5	2.0	2.5	5.0	4.0	4.5	11.5	10.0	10.5
16	2.5	1.5	2.0	4.0	2.5	2.5	6.0	4.0	5.0	11.0	9.0	10.0
17	2.5	1.5	2.0	4.5	2.0	3.0	6.5	4.5	5.0	10.5	9.0	9.5
18	3.5	1.0	2.0	4.5	2.0	3.0	6.0	5.0	5.5	10.5	9.0	9.5
19	3.5	1.5	2.0	4.5	2.0	3.0	7.0	5.0	5.5	11.0	9.0	10.0
20	2.5	1.5	2.0	5.0	2.0	3.0	7.5	5.0	6.0	11.0	9.0	10.0
21	2.5	1.5	2.0	4.0	2.5	3.5	7.5	5.0	6.5	10.5	9.5	10.0
22	2.5	0.5	1.5	3.5	3.0	3.0	8.0	5.5	6.5	11.5	9.5	10.5
23	2.0	0.0	1.0	3.5	2.5	3.0	7.0	6.0	6.5	12.5	10.5	11.5
24	2.0	0.0	1.0	3.5	2.5	3.0	8.0	6.5	7.0	13.5	11.0	12.0
25	2.5	0.5	1.0	3.0	2.5	2.5	8.0	7.0	7.5	13.5	11.5	12.5
26	3.0	1.0	1.5	3.0	2.5	2.5	8.0	6.5	7.0	13.0	11.5	12.0
27	3.5	1.5	2.0	3.5	2.5	3.0	8.5	7.0	7.5	14.0	12.0	13.0
28	2.5	2.0	2.0	3.5	2.5	3.0	9.0	7.0	8.0	14.0	12.5	13.0
29	---	---	---	3.5	2.5	3.0	9.0	7.5	8.0	13.0	11.5	12.5
30	---	---	---	6.0	3.0	4.0	9.0	7.5	8.0	13.0	11.5	12.0
31	---	---	---	4.5	3.5	3.5	---	---	---	13.0	13.0	13.0
MONTH	3.5	0.0	1.5	6.0	0.5	2.5	9.0	2.5	5.5	14.0	7.5	10.5

PEND OREILLE RIVER BASIN

12370000 SWAN RIVER NEAR BIGFORK, MT--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003--Continued

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	14.0	13.0	13.0	18.0	16.0	17.0	23.5	20.0	21.5	20.5	16.5	18.5
2	13.0	12.0	12.5	18.0	16.0	17.0	23.5	20.0	21.5	20.5	17.0	18.5
3	13.5	11.0	12.5	18.5	15.5	17.0	21.5	20.5	21.0	20.0	16.5	18.0
4	12.5	10.5	11.5	18.5	15.5	17.0	22.5	19.5	20.5	19.0	16.5	17.5
5	13.0	11.0	12.0	18.0	16.5	17.5	22.5	19.0	20.5	19.5	16.5	18.0
6	13.5	11.5	12.5	18.5	16.0	17.5	21.5	18.5	19.5	20.0	16.5	18.0
7	13.5	12.0	13.0	19.0	16.5	18.0	23.0	18.5	20.5	19.5	17.0	18.0
8	13.5	12.5	13.0	18.0	17.0	17.5	23.0	19.5	21.0	17.5	16.0	17.0
9	14.5	12.5	13.5	19.5	16.5	18.0	23.0	19.0	20.5	16.5	15.0	15.5
10	14.0	12.5	13.5	19.5	17.0	18.5	23.0	19.5	21.0	17.0	15.0	15.5
11	14.0	13.0	13.5	20.0	17.5	18.5	22.5	19.0	20.5	16.0	15.5	15.5
12	14.0	13.0	13.5	20.5	17.5	19.0	22.0	19.0	20.0	16.5	15.0	15.5
13	13.5	12.5	13.0	19.0	18.0	18.5	22.5	19.0	20.5	18.0	14.5	16.0
14	14.0	13.0	13.0	20.0	17.0	18.5	23.0	19.0	20.5	16.5	14.5	15.5
15	14.0	12.5	13.5	20.5	17.5	19.0	22.5	19.0	20.5	18.0	14.5	16.0
16	15.0	12.5	13.5	21.5	18.5	20.0	22.0	20.0	20.5	16.0	14.0	15.0
17	16.0	13.5	14.5	21.5	18.5	20.0	21.5	19.5	20.0	15.5	14.0	14.5
18	17.0	15.0	15.5	21.5	18.5	20.0	22.0	18.5	20.0	16.0	13.0	14.5
19	17.5	15.0	16.0	22.5	19.0	20.5	22.5	19.0	20.5	16.5	14.0	15.0
20	16.0	15.5	16.0	22.5	19.0	20.5	22.5	19.0	20.5	16.5	14.0	15.0
21	15.5	14.5	14.5	22.0	19.0	20.5	22.0	18.5	20.0	17.0	13.5	14.5
22	15.5	14.5	15.0	22.5	19.0	21.0	20.5	18.5	19.5	16.0	13.0	14.5
23	16.0	14.0	15.0	22.5	19.5	21.0	21.0	18.5	19.5	16.5	14.0	14.5
24	16.0	14.0	15.0	22.5	19.5	20.5	21.5	18.0	19.5	16.5	13.0	14.5
25	16.0	14.0	15.0	23.0	19.5	21.0	21.5	18.0	19.5	17.0	13.5	15.0
26	16.5	14.5	15.5	23.0	20.0	21.5	21.5	17.5	19.5	17.5	14.0	15.0
27	17.0	15.0	16.0	23.5	20.5	22.0	21.0	18.5	19.5	17.0	13.5	15.0
28	17.5	15.0	16.5	23.5	20.0	22.0	21.5	18.0	19.0	16.5	13.5	14.5
29	18.0	15.5	17.0	23.5	20.5	21.5	20.5	17.5	19.0	16.0	13.0	14.0
30	18.5	16.0	17.5	23.5	20.0	21.5	20.5	17.0	18.5	16.0	12.0	13.5
31	---	---	---	23.5	20.0	21.5	20.0	16.5	18.0	---	---	---
MONTH	18.5	10.5	14.0	23.5	15.5	19.5	23.5	16.5	20.0	20.5	12.0	15.5

PEND OREILLE RIVER BASIN

12371550 FLATHEAD LAKE AT POLSON, MT

LOCATION.--Lat 47°41'50", long 114°09'37" (NAD 27), in $SW^1/_4SE^1/_4NE^1/_4$ sec.4, T.22 N., R.20 W., Lake County, Hydrologic Unit 17010208, at Polson.

DRAINAGE AREA.--7,086 mi^2.

PERIOD OF RECORD.--October 1, 1998 to current year. April to August 1900, daily lake elevations only, at site near Holt, 6 mi east of Somers (elevation unknown). August 1908 to November 1909 (fragmentary), January 1910 to Sept.30, 1998 published as "at Somers". Monthend contents only for some periods, published in WSP 1316. Prior to April 1923, published as "at Polson." Oct. 1, 1941 to Sept. 30, 1998, unpublished daily lake elevations at Polson are available in files of Helena district office.

GAGE.--Water-stage recorder. Elevation of gage is 2,878 ft (NGVD 29). July 1 to Dec. 12, 1923, nonrecording gage at Somers site.

REMARKS--Natural storage in Flathead Lake increased by construction of Kerr Dam 4 mi downstream from natural lake outlet; storage began Apr. 11, 1938. Usable capacity, 1,791,000 acre-ft at controlled spillway elevation 2,893.00 ft. Dead storage unknown below 2,878 ft, elevation of natural outlet. Minimum operating level, 572,300 acre-ft, elevation 2,883.00 ft for on-site power generation. All elevations are referenced to the National Geodetic Vertical Datum of 1929. Water is used for power production, flood control, recreation, and irrigation. Figures given herein represent usable contents.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 2,208,000 acre-ft, June 19, 1933, elevation, 2,896.26 ft; minimum, 347,000 acre-ft, Dec. 5, 1936, elevation, 2,881.07 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 1,782,000 acre-ft, June 23, elevation, 2,892.93 ft; minimum, 1,085,000 acre-ft, Apr. 12, elevation, 2,887.28 ft.

Capacity table (elevation, in feet and contents, in acre-ft)

Elevation	Contents
2,883	572,300
2,886	930,300
2,888	1,172,000
2,890	1,417,000
2,892	1,665,000
2,894	1,917,000

ELEVATION (FEET NGVD 1929), WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2892.61	2892.56	2891.00	2888.11	2888.42	2887.75	2887.50	2888.31	2891.33	2892.80	2892.66	2892.59
2	2892.61	2892.55	2890.93	2888.06	2888.46	2887.68	2887.55	2888.37	2891.57	2892.78	2892.64	2892.59
3	2892.60	2892.55	2890.87	2888.03	e2888.48	2887.72	2887.54	2888.45	2891.80	2892.76	2892.68	2892.57
4	2892.60	2892.54	2890.78	2888.07	e2888.51	2887.66	2887.56	e2888.54	2891.93	2892.75	2892.62	2892.56
5	2892.55	2892.53	2890.66	2888.07	e2888.54	2887.54	2887.53	e2888.59	2891.98	2892.74	2892.67	2892.56
6	2892.58	2892.53	2890.57	2888.08	2888.57	2887.52	2887.51	2888.66	2892.01	2892.77	2892.69	2892.56
7	2892.61	2892.52	2890.45	2888.06	2888.56	2887.59	2887.46	2888.68	2892.00	2892.76	2892.70	2892.55
8	2892.63	2892.50	2890.36	2888.06	2888.55	2887.53	2887.42	2888.76	2892.03	2892.73	2892.72	2892.53
9	2892.60	2892.48	2890.25	2888.08	2888.51	2887.48	2887.35	2888.78	2892.06	2892.76	2892.73	2892.57
10	2892.59	2892.47	2890.14	2888.10	2888.51	2887.43	2887.34	2888.72	2892.22	2892.80	2892.74	2892.59
11	2892.61	2892.43	2890.02	2888.08	2888.49	2887.33	2887.30	2888.67	2892.38	2892.82	2892.75	2892.50
12	2892.62	2892.39	2889.95	2888.07	2888.46	2887.34	2887.28	2888.63	2892.54	2892.81	2892.76	2892.57
13	2892.62	2892.34	2889.84	2888.10	2888.41	2887.33	2887.30	2888.62	2892.66	2892.78	2892.78	2892.55
14	2892.63	2892.28	2889.76	2888.13	2888.38	2887.31	2887.32	2888.63	2892.75	2892.79	2892.78	2892.53
15	2892.63	2892.22	2889.65	2888.15	2888.34	2887.32	2887.38	2888.62	2892.79	2892.83	2892.80	2892.57
16	2892.63	2892.13	2889.55	2888.15	2888.28	2887.32	2887.41	2888.62	2892.81	2892.84	2892.77	2892.53
17	2892.63	2892.00	2889.46	2888.16	2888.23	2887.37	2887.48	2888.78	2892.80	2892.82	2892.79	2892.55
18	2892.64	2891.93	2889.36	2888.15	2888.21	2887.38	2887.51	2888.86	2892.80	2892.82	2892.81	2892.49
19	2892.64	2891.85	2889.27	2888.16	2888.16	2887.39	2887.53	2888.93	2892.83	2892.83	2892.80	2892.49
20	2892.66	2891.79	2889.19	2888.18	2888.10	2887.39	2887.55	2888.95	2892.88	2892.81	2892.78	2892.55
21	2892.68	2891.72	2889.07	2888.26	2888.07	2887.39	2887.55	2888.96	2892.89	2892.81	2892.81	2892.54
22	2892.69	2891.65	2888.97	2888.25	2888.11	2887.41	2887.56	2888.97	2892.90	2892.81	2892.78	2892.51
23	2892.65	2891.62	2888.88	2888.23	2888.06	2887.40	2887.58	2888.98	2892.93	2892.80	2892.75	2892.50
24	2892.64	2891.51	2888.76	2888.25	2887.96	2887.44	2887.64	2889.00	2892.92	2892.76	2892.78	2892.54
25	2892.63	2891.44	2888.65	2888.27	2887.92	2887.48	2887.71	2889.08	2892.83	2892.74	2892.77	2892.49
26	2892.63	2891.35	2888.51	2888.25	2887.88	2887.51	2887.81	2889.30	2892.75	2892.78	2892.77	2892.50
27	2892.62	2891.28	2888.44	2888.30	2887.84	2887.54	2888.01	2889.67	2892.76	2892.72	2892.70	2892.53
28	2892.66	2891.21	2888.38	2888.35	2887.78	2887.56	2888.19	2890.03	2892.79	2892.72	2892.72	2892.54
29	2892.71	2891.14	2888.26	2888.36	---	2887.55	2888.23	2890.32	2892.81	2892.72	2892.70	2892.54
30	2892.59	2891.07	2888.21	2888.36	---	2887.51	2888.28	2890.70	2892.80	2892.69	2892.65	2892.51
31	2892.57	---	2888.16	2888.38	---	2887.44	---	2891.05	---	2892.68	2892.61	---
MAX	2892.71	2892.56	2891.00	2888.38	2888.57	2887.75	2888.28	2891.05	2892.93	2892.84	2892.81	2892.59
MIN	2892.55	2891.07	2888.16	2888.03	2887.78	2887.31	2887.28	2888.31	2891.33	2892.68	2892.61	2892.49

CONTENTS, IN THOUSANDS OF ACRE-FEET, AT END OF MONTH

1737	1550	1192	1218	1145	1104	1206	1547	1766	1751	1742	1729

CHANGE IN CONTENTS, IN ACRE-FEET

+6000	-187000	-358000	+26000	-73000	-41000	+102000	+341000	+219000	-15000	-9000	-13000

CALENDAR YEAR 2002: -245000
WATER YEAR 2003: -2000

e--Estimated.

PEND OREILLE RIVER BASIN

12372000 FLATHEAD RIVER NEAR POLSON, MT

LOCATION.--Lat 47°40'49", long 114°14'45" (NAD 27), in SW$^1/_4$NE$^1/_4$SE$^1/_4$ sec. 11, T.22 N., R.21 W., Lake County, Hydrologic Unit 17010212, on left bank 0.5 mi downstream from Kerr Dam, 4.0 mi west of Polson, 5.0 mi downstream from Flathead Lake, and at river mile 71.5.

DRAINAGE AREA.--7,096 mi^2.

PERIOD OF RECORD.--July 1907 to current year.

REVISED RECORDS.--WSP 652: 1926. WSP 752: 1932. WSP 1182: 1948. WSP 1216: Drainage area. WSP 1246: 1928(M). WSP 1636: 1958 (adjusted runoff).

GAGE.--Water-stage recorder. Elevation of gage is 2,692.70 ft (NGVD 29) (levels by The Montana Power Co.). Prior to Oct. 1, 1941, nonrecording gages or water-stage recorder at several sites near highway bridge at old site of Michell's ferry 6 mi downstream from present site, all at elevation 2,629.20 ft (from river-profile survey).

REMARKS.--Records excellent. Flow regulated by Flathead Lake (Kerr Dam) since April 1938 (station number 12371500) and Hungry Horse Reservoir (station number 12362000) since September 1951. Diversions upstream from station for irrigation of about 10,000 acres. Flathead project pumps can divert up to 12,000 acre-ft per month when required for irrigation of lands downstream from station. U.S.Geological Survey satellite telemeter at station. Two observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--96 years, 11,506 ft^3/s, 22.02 in/yr, 8,336,000 acre-ft/yr, adjusted for change in contents in Hungry Horse Reservoir and Flathead Lake.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 82,800 ft^3/s, May 29, 1928, gage height, 17.2 ft, site and elevation then in use; minimum probably less than 5.0 ft^3/s, Apr. 13, 1938; minimum daily, 32 ft^3/s, Apr. 12, 1938.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1894 reached a stage of about 21 ft, present elevation; discharge, about 110,000 ft^3/s, from lake elevation-discharge study.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 27,400 ft^3/s, June 6, gage height, 11.63 ft; minimum daily, 3,410 ft^3/s, Sept. 4.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3470	4230	8550	6950	3550	6520	7040	12000	20100	13300	7480	4020
2	3460	4230	9080	6020	3540	6480	7590	12600	20600	12800	7010	3750
3	3440	4210	10100	5090	3540	6480	8000	13600	24300	12000	7010	3500
4	3440	4250	10500	4590	3760	6520	8400	14700	26800	11300	6740	3410
5	3440	4270	10500	4570	4310	6530	8970	15700	26900	11200	6140	3420
6	3430	4320	10500	4570	4550	6500	9000	16100	25500	11100	6070	3430
7	3570	4420	10500	4580	4860	6510	9020	16100	23700	10700	6050	3430
8	3670	4750	10500	4280	5320	6570	9040	16000	23600	10300	6000	3440
9	3630	5320	10500	3800	5350	6530	9010	15900	20800	10200	5980	3430
10	3530	6030	10500	3530	5460	6490	9490	15900	16700	10100	5970	3440
11	3540	6790	10500	3550	6050	6540	10000	15900	15600	10000	5970	3420
12	3560	7250	10400	3560	6500	6530	10000	15900	15700	9860	5990	3420
13	3580	8080	10400	3600	6530	5990	9990	15900	16500	9690	6010	3430
14	3580	9030	10500	3590	6510	5250	10100	15900	18900	9710	6020	3430
15	3580	9450	10500	3610	6530	4730	10100	15900	20100	9710	6020	3430
16	3590	9490	10400	3600	6510	4230	10000	15700	20100	9700	5970	3420
17	3590	9470	10400	3560	6510	4040	10100	15000	20100	9690	5970	3430
18	3580	9460	10400	3550	6440	4020	10100	14700	18500	9520	6020	3430
19	3580	9520	10400	3550	6530	4010	10300	14500	17300	9080	6030	3430
20	3560	9550	10400	3550	6590	4010	10200	14500	17800	9080	6050	3430
21	3560	9650	10400	3520	6560	4280	10600	14500	18500	9090	6060	3420
22	3640	9370	10400	3500	6540	4800	11100	14500	18600	8980	5510	3420
23	3700	8500	10400	3480	6550	4790	11600	14500	18300	8930	5080	3420
24	3720	7860	10500	3510	6550	4790	12100	14500	18200	8940	5060	3430
25	3720	8410	10400	3540	6550	4670	12200	14400	16600	8950	5060	3430
26	3690	8790	10400	3520	6550	4550	12200	14500	14400	8940	5090	3430
27	3650	8750	10500	3500	6570	4690	12000	14300	13500	8970	5050	3480
28	3640	8560	10500	3500	6560	5590	12100	15300	13500	8960	5120	3450
29	3910	8550	9890	3510	---	6030	12100	17100	13500	8940	5080	3520
30	4190	8510	8860	3510	---	6030	12100	18700	13200	8940	5130	3530
31	4200	---	7990	3580	---	6610	---	20000	---	8390	4520	---
TOTAL	112440	221070	315770	122370	161370	171310	304550	474800	567900	307070	181260	104070
MEAN	3627	7369	10190	3947	5763	5526	10150	15320	18930	9905	5847	3469
MAX	4200	9650	10500	6950	6590	6610	12200	20000	26900	13300	7480	4020
MIN	3430	4210	7990	3480	3540	4010	7040	12000	13200	8390	4520	3410
AC-FT	223000	438500	626300	242700	320100	339800	604100	941800	1126000	609100	359500	206400
CFSM	0.51	1.04	1.44	0.56	0.81	0.78	1.43	2.16	2.67	1.40	0.82	0.49
IN.	0.59	1.16	1.66	0.64	0.85	0.90	1.60	2.49	2.98	1.61	0.95	0.55
†	-111000	-305000	-483000	-98000	-138000	-48000	+415000	+661000	+608000	-197000	-236000	-105000
MEAN ††	1821	2244	2331	2353	3279	4746	17130	26070	29140	6702	2009	1704
CFSM ††	0.26	0.32	0.33	0.33	0.46	0.67	2.42	3.69	4.12	0.95	0.28	0.24
IN. ††	0.30	0.35	0.38	0.38	0.48	0.77	2.70	4.25	4.60	1.09	0.33	0.27
AC-FT††	112000	133500	143300	144700	182100	291800	1019100	1602800	1734000	412100	123500	101400

OBSERVED

CALENDAR YEAR 2002	TOTAL	4435930	MEAN	12150	MAX	47700	MIN	3430	AC-FT	8799000	†	-254000
WATER YEAR 2003	TOTAL	3043980	MEAN	8340	MAX	26900	MIN	3410	AC-FT	6038000	†	-37000

ADJUSTED

CALENDAR YEAR 2002	TOTAL	4308243	MEAN	11800	CFSM	1.67	IN	22.66	AC-FT	8545000		
WATER YEAR 2003	TOTAL	3025107	MEAN	8288	CFSM	1.17	IN	15.92	AC-FT	6001000		

† Change in contents in acre-feet, in Hungry Horse Reservoir and Flathead Lake.
†† Adjusted for change in contents.

12374250 MILL CREEK ABOVE BASSOO CREEK, NEAR NIARADA, MT

LOCATION.--Lat 47°49'47", long 114°41'48" (NAD 27), in $SE^1/_4NW^1/_4NE^1/_4$ sec.20, T.24 N., R.24 W., Sanders County, Hydrologic Unit 17010212, Flathead Indian Reservation, on right bank 0.3 mi upstream from Bassoo Creek, and 4.1 mi northwest of Niarada.
DRAINAGE AREA.--19.6 mi^2.
PERIOD OF RECORD.--October 1982 to current year.
GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 3,000 ft (NGVD 29)
. Prior to Sept. 23, 1987, at site 305 ft downstream at different elevation. Prior to July 23, 1991, at site 275 ft downstream at different elevation.
REMARKS.--Records good except those for estimated daily discharges, which are poor. No known regulation or diversion upstream from station. Several observations of water temperature and specific conductance were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.5	e3.1	2.9	2.8	e5.1	e2.7	9.6	15	19	4.5	2.4	1.6
2	2.5	e3.3	2.9	2.8	4.0	e2.6	8.9	14	17	4.4	2.4	1.6
3	2.5	e3.3	2.9	3.3	3.3	e2.6	7.9	13	16	4.3	2.6	1.5
4	2.6	e3.4	2.9	3.2	3.1	2.6	7.0	15	15	4.2	3.0	1.5
5	2.4	e3.8	2.9	2.9	3.0	2.4	6.4	14	14	4.1	2.6	1.5
6	2.5	e3.9	2.9	e3.0	e2.8	2.4	5.9	14	13	4.1	2.6	1.4
7	2.3	e3.8	2.9	e2.8	e2.7	2.4	5.5	15	12	4.2	3.0	1.5
8	2.2	e3.5	2.9	3.0	e2.8	2.2	5.4	15	11	4.2	2.6	1.7
9	2.2	e3.6	2.9	e2.3	2.8	2.1	5.7	14	11	4.2	2.3	2.3
10	2.2	3.5	2.9	e2.1	2.7	2.2	6.9	13	11	3.9	2.2	2.3
11	2.2	3.1	2.9	e2.8	e2.6	2.7	8.7	12	10	3.8	2.2	2.0
12	2.3	3.1	2.9	e3.4	e2.5	e3.2	11	12	9.1	3.6	2.1	2.1
13	2.5	3.7	2.9	e3.2	e2.5	e3.7	13	12	8.7	3.5	2.1	1.9
14	2.5	3.3	e2.7	3.0	e2.4	e3.9	15	11	8.4	3.6	2.0	1.7
15	2.5	3.0	e2.5	2.8	e2.3	e3.9	14	11	7.9	3.4	2.0	1.6
16	2.4	2.9	e2.4	2.6	e2.3	e4.0	13	12	7.5	3.3	2.0	1.6
17	2.4	3.1	e2.2	2.5	e2.2	e3.9	12	13	7.0	3.2	2.2	1.9
18	2.4	3.0	e2.0	2.5	e2.1	3.6	12	14	6.9	3.0	2.2	2.1
19	2.3	3.0	e1.9	2.5	e2.1	3.5	11	14	7.3	2.9	2.1	1.9
20	2.3	3.1	e1.8	2.5	e2.3	3.4	11	13	7.4	2.9	2.1	2.5
21	2.3	2.9	e2.1	2.5	e2.3	3.5	11	13	6.5	2.8	2.0	2.0
22	2.3	3.1	e2.6	2.5	2.4	4.6	12	12	6.1	2.7	2.1	1.8
23	2.3	e3.3	e2.7	2.6	e2.3	e5.4	15	11	6.0	2.6	2.4	1.7
24	e2.0	e3.2	2.9	2.6	e2.4	5.4	16	11	5.8	2.6	2.2	1.6
25	e1.8	e2.3	2.9	2.7	e2.6	4.7	18	11	5.7	2.6	1.9	1.6
26	e1.9	e2.8	3.1	e3.1	e2.7	4.6	19	13	5.4	2.5	1.8	1.5
27	e2.1	e3.1	3.2	e3.4	e2.7	4.3	19	17	5.1	2.6	1.8	1.4
28	e2.2	3.0	3.6	e3.2	e2.7	4.1	18	17	5.0	2.6	1.8	1.4
29	e2.1	2.9	3.0	2.9	---	4.0	17	18	4.8	2.5	1.8	1.4
30	e2.4	2.9	2.9	2.9	---	4.2	16	19	4.6	2.4	1.7	1.4
31	e2.9	---	2.9	3.6	---	6.3	---	20	---	2.4	1.7	---
TOTAL	72.0	96.0	85.1	88.0	75.7	111.1	350.9	428	274.2	103.6	67.9	52.0
MEAN	2.32	3.20	2.75	2.84	2.70	3.58	11.7	13.8	9.14	3.34	2.19	1.73
MAX	2.9	3.9	3.6	3.6	5.1	6.3	19	20	19	4.5	3.0	2.5
MIN	1.8	2.3	1.8	2.1	2.1	2.1	5.4	11	4.6	2.4	1.7	1.4
AC-FT	143	190	169	175	150	220	696	849	544	205	135	103
CFSM	0.12	0.16	0.14	0.14	0.14	0.18	0.60	0.70	0.47	0.17	0.11	0.09
IN.	0.14	0.18	0.16	0.17	0.14	0.21	0.67	0.81	0.52	0.20	0.13	0.10

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1983 - 2003, BY WATER YEAR (WY)

MEAN	2.63	3.46	3.57	3.28	3.87	7.35	20.2	25.2	15.4	5.67	3.04	2.46
MAX	5.05	8.60	16.9	9.83	13.6	35.1	49.7	86.8	37.7	13.0	5.61	3.39
(WY)	1986	1986	1996	1990	1996	1986	1996	1997	1997	1991	1997	1996
MIN	1.85	2.00	2.12	1.94	1.71	2.55	5.03	11.4	4.89	2.50	1.88	1.53
(WY)	2002	1988	1988	1985	1994	1985	1984	1992	1987	1994	2001	2001

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1983 - 2003	
ANNUAL TOTAL	3278.5		1804.5			
ANNUAL MEAN	8.98		4.94		8.01	
HIGHEST ANNUAL MEAN					18.8	1997
LOWEST ANNUAL MEAN					3.86	2001
HIGHEST DAILY MEAN	118	May 23	20	May 31	155	Apr 28 1997
LOWEST DAILY MEAN	1.8	Jan 27	a1.4	Sep 6	1.2	Feb 4 1989
ANNUAL SEVEN-DAY MINIMUM	1.9	Feb 15	1.5	Sep 24	1.3	Sep 21 2001
MAXIMUM PEAK FLOW			b21	May 31	d173	Apr 28 1997
MAXIMUM PEAK STAGE			c2.20	Jan 10	f6.83	May 20 1991
INSTANTANEOUS LOW FLOW			1.3	Sep 7	g0.85	Jan 6 1988
ANNUAL RUNOFF (AC-FT)	6500		3580		5800	
ANNUAL RUNOFF (CFSM)	0.46		0.25		0.41	
ANNUAL RUNOFF (INCHES)	6.22		3.42		5.55	
10 PERCENT EXCEEDS	24		13		20	
50 PERCENT EXCEEDS	2.9		2.9		3.3	
90 PERCENT EXCEEDS	2.1		2.0		2.0	

a--Also occurred September 27-30.
b--Gage height 1.90 ft.
c--Backwater from ice.
d--Gage height, 2.60 ft.
f--Site and datum then in use.
g--Gage height, 5.00 ft, site and datum then in use.
e--Estimated.

PEND OREILLE RIVER BASIN

12375900 SOUTH CROW CREEK NEAR RONAN, MT

LOCATION.--Lat 47°29'30", long 114°01'33" (NAD 27), in $NW^1/_4NE^1/_4SW^1/_4$ sec.16, T.20 N., R.19 W., Lake County, Hydrologic Unit 17010212, Flathead Indian Reservation, on right bank 200 ft upstream from Pablo Feeder Canal, 2.2 mi northeast of Kicking Horse Reservoir, 4.5 mi southeast of Ronan, and at river mile 2.6.

DRAINAGE AREA.--7.57 mi^2.

PERIOD OF RECORD.--October 1982 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 3,320 ft (NGVD 29).

REMARKS.--Records fair except those for estimated daily discharges and those for May 24 to June 5, which are poor. No known regulation or diversion upstream from station. Several observations of water temperature and specific conductance were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.1	e5.0	5.3	5.8	8.9	5.1	11	12	190	46	12	8.3
2	6.6	e5.5	5.3	5.8	9.5	5.1	9.9	13	130	43	12	8.1
3	6.6	6.1	5.3	6.0	8.6	5.2	8.8	15	100	39	12	8.0
4	6.9	5.9	5.3	6.1	8.2	5.3	8.1	17	88	35	12	7.9
5	6.9	5.8	5.3	6.4	7.5	5.3	7.7	20	79	33	11	7.8
6	6.9	5.9	5.3	6.3	7.0	5.3	7.4	18	75	31	11	7.8
7	6.8	5.9	5.3	6.3	7.0	5.1	7.1	16	72	29	11	7.8
8	6.6	5.9	5.2	6.3	7.4	5.1	6.8	14	72	29	11	8.3
9	6.6	5.8	5.1	6.1	7.5	5.2	7.0	14	79	28	11	9.2
10	6.5	5.9	5.1	5.9	7.5	5.4	8.8	13	80	27	11	8.8
11	6.4	5.9	5.1	5.7	7.1	5.5	12	13	86	25	10	8.5
12	6.5	5.9	5.1	5.7	6.8	5.6	16	13	76	24	10	8.3
13	6.4	6.0	5.1	5.8	6.6	6.0	20	16	69	23	10	8.1
14	6.3	6.2	5.1	6.0	6.6	7.2	19	17	65	22	9.7	8.0
15	6.4	6.0	5.2	6.1	6.4	9.1	15	22	64	21	9.6	7.8
16	6.4	5.8	5.3	6.0	6.5	10	13	25	63	20	9.6	7.3
17	6.4	5.7	5.1	5.8	6.6	9.2	11	24	64	19	9.6	7.8
18	6.4	5.6	5.1	5.8	6.3	8.2	11	22	70	18	9.4	8.1
19	6.3	5.6	4.9	5.8	6.3	7.5	11	20	84	18	9.2	7.9
20	6.4	5.6	4.9	5.8	6.2	7.1	11	18	84	17	8.7	7.6
21	6.2	5.6	4.9	5.8	6.1	6.9	11	18	70	16	8.9	7.6
22	5.4	5.7	4.9	e5.5	6.0	7.0	15	18	61	16	8.8	7.4
23	5.9	6.6	4.9	e5.0	e4.0	7.7	20	23	53	15	9.9	7.2
24	6.3	6.1	4.9	6.1	e3.0	7.8	18	34	47	15	9.5	7.2
25	6.4	5.7	4.9	6.4	e3.5	7.2	23	45	42	14	9.1	6.9
26	6.3	5.6	4.9	6.5	e4.0	7.1	20	63	39	14	8.9	6.9
27	6.3	5.4	5.2	7.1	e4.3	6.9	16	74	40	14	8.8	6.9
28	6.3	5.2	5.8	7.2	e4.7	6.7	14	87	44	13	8.8	6.6
29	5.6	5.4	5.8	6.9	---	6.6	12	90	47	13	8.6	6.1
30	e4.0	5.3	5.8	6.9	---	6.3	12	96	47	13	8.6	6.4
31	e5.0	---	5.8	7.2	---	7.1	---	191	---	12	8.5	---
TOTAL	195.1	172.6	161.2	190.1	180.1	204.8	382.6	1081	2180	702	308.2	230.6
MEAN	6.29	5.75	5.20	6.13	6.43	6.61	12.8	34.9	72.7	22.6	9.94	7.69
MAX	7.1	6.6	5.8	7.2	9.5	10	23	191	190	46	12	9.2
MIN	4.0	5.0	4.9	5.0	3.0	5.1	6.8	12	39	12	8.5	6.1
AC-FT	387	342	320	377	357	406	759	2140	4320	1390	611	457
CFSM	0.83	0.76	0.69	0.81	0.85	0.87	1.68	4.61	9.60	2.99	1.31	1.02
IN.	0.96	0.85	0.79	0.93	0.89	1.01	1.88	5.31	10.71	3.45	1.51	1.13

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1982 - 2003, BY WATER YEAR (WY)

MEAN	9.06	9.43	7.80	7.11	6.69	7.82	15.8	44.7	68.5	36.1	13.4	9.50
MAX	13.9	19.2	15.2	11.0	9.97	12.9	25.2	68.6	104	73.6	21.6	19.6
(WY)	1983	1990	1990	1984	1986	1986	1990	1993	1984	1983	1983	1985
MIN	6.06	5.75	5.20	5.45	5.03	4.86	8.80	25.3	35.9	15.5	7.87	6.88
(WY)	2002	2003	2003	2000	1993	2002	1995	1999	1987	1988	1988	1988

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1982 - 2003	
ANNUAL TOTAL	6648.1		5988.3			
ANNUAL MEAN	18.2		16.4		19.7	
HIGHEST ANNUAL MEAN					27.2	1983
LOWEST ANNUAL MEAN					13.7	1992
HIGHEST DAILY MEAN	115	Jun 29	191	May 31	276	Jun 30 1983
LOWEST DAILY MEAN	4.0	Feb 26	3.0	Feb 24	3.0	Feb 24 2003
ANNUAL SEVEN-DAY MINIMUM	4.4	Feb 25	4.1	Feb 23	4.1	Feb 23 2003
MAXIMUM PEAK FLOW			277	Jun 1	b312	Jun 30 1991
MAXIMUM PEAK STAGE			3.52	Jun 1	3.67	Jun 30 1991
INSTANTANEOUS LOW FLOW			a2.0	Oct 30	a2.0	Oct 30 2002
ANNUAL RUNOFF (AC-FT)	13190		11880		14270	
ANNUAL RUNOFF (CFSM)	2.41		2.17		2.60	
ANNUAL RUNOFF (INCHES)	32.67		29.43		35.36	
10 PERCENT EXCEEDS	62		42		53	
50 PERCENT EXCEEDS	6.8		7.5		9.5	
90 PERCENT EXCEEDS	4.9		5.3		6.1	

a--Result of freezeup.
b--From rating curve extended above 185 ft^3/s, on basis of step-backwater study.
e--Estimated.

PEND OREILLE RIVER BASIN

12377150 MISSION CREEK ABOVE RESERVOIR, NEAR ST. IGNATIUS, MT

LOCATION.--Lat 47°19'23", long 113°58'43" (NAD 27), in NW$^1/_4$SW$^1/_4$NE$^1/_4$ sec.14, T.18 N., R.19 W., Lake County, Hydrologic Unit 17010212, Flathead Indian Reservation, on right bank, 0.2 mi southwest of upper BIA campground, 0.5 mi upstream from Mission Reservoir, and 5.3 mi east of St. Ignatius.

DRAINAGE AREA.--12.4 mi^2.

PERIOD OF RECORD.--October 1982 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 3,460 ft (NGVD 29).

REMARKS.--Records good except those for estimated discharges, which are poor. No known regulation or diversions upstream from station. Several observations of water temperature and specific conductance were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	19	e11	10	9.8	12	8.8	12	29	376	159	43	21
2	18	e11	10	9.8	14	8.8	12	30	250	142	42	21
3	18	11	9.8	9.9	13	8.9	12	32	186	118	41	20
4	18	11	9.8	9.9	12	9.1	11	36	168	105	41	20
5	18	11	9.8	10	11	9.1	11	43	161	100	40	20
6	17	12	9.9	10	11	9.2	10	37	161	96	39	20
7	17	12	9.8	9.7	9.9	9.1	9.8	34	157	94	38	20
8	17	12	9.8	9.2	9.6	8.9	9.5	31	168	98	37	23
9	17	12	9.6	8.9	9.2	9.0	9.7	29	216	96	36	25
10	17	12	9.5	e8.0	9.1	9.2	10	27	218	92	35	23
11	17	13	9.5	e8.3	9.0	9.3	12	26	203	90	34	21
12	16	13	9.7	8.6	8.8	9.3	15	27	175	91	33	24
13	16	13	9.8	9.1	8.6	10	22	30	173	92	32	25
14	16	13	9.9	9.1	8.5	11	28	33	162	86	31	22
15	16	13	10	9.1	8.5	12	26	41	162	79	30	20
16	16	12	10	8.9	8.7	13	23	49	180	74	33	23
17	16	12	10	8.7	8.8	13	21	46	196	74	32	26
18	16	11	9.7	8.5	8.8	12	20	41	238	73	29	24
19	15	11	9.4	8.5	8.8	11	18	37	271	70	28	22
20	15	11	9.1	8.8	8.8	10	17	33	234	68	28	23
21	15	11	9.1	8.6	8.6	9.9	17	31	184	66	28	24
22	15	12	9.1	e8.5	8.9	9.8	20	32	139	63	27	23
23	15	13	9.1	e8.7	e8.0	10	28	43	110	61	31	22
24	14	12	9.1	9.1	e6.0	10	35	85	97	60	32	22
25	14	11	9.1	9.1	e6.5	9.8	46	195	93	56	28	21
26	14	11	9.1	9.5	e7.5	10	47	367	94	53	26	21
27	14	11	9.2	9.9	e8.3	10	38	331	111	50	26	21
28	14	11	9.4	9.8	8.6	9.9	33	340	143	49	25	21
29	14	11	9.6	9.6	---	9.6	31	393	158	48	23	20
30	e12	10	9.5	9.5	---	9.5	30	392	158	46	22	19
31	e11	---	9.7	10	---	10	---	461	---	44	21	---
TOTAL	487	350	297.1	285.1	260.5	309.2	634.0	3361	5342	2493	991	657
MEAN	15.7	11.7	9.58	9.20	9.30	9.97	21.1	108	178	80.4	32.0	21.9
MAX	19	13	10	10	14	13	47	461	376	159	43	26
MIN	11	10	9.1	8.0	6.0	8.8	9.5	26	93	44	21	19
AC-FT	966	694	589	565	517	613	1260	6670	10600	4940	1970	1300
CFSM	1.27	0.94	0.77	0.74	0.75	0.80	1.70	8.74	14.4	6.49	2.58	1.77
IN.	1.46	1.05	0.89	0.86	0.78	0.93	1.90	10.08	16.03	7.48	2.97	1.97

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1982 - 2003, BY WATER YEAR (WY)

MEAN	24.9	18.9	13.1	10.5	9.02	10.5	25.3	101	173	114	48.3	29.8
MAX	36.8	28.5	21.3	14.9	12.6	15.4	43.9	168	222	181	74.9	67.4
(WY)	1983	1990	1990	1984	1986	1986	1990	1993	1997	1983	1997	1985
MIN	14.1	11.7	9.58	8.20	6.71	7.23	10.6	54.0	104	53.4	25.2	15.8
(WY)	2002	2003	2003	2000	1985	2002	2002	1984	1987	1988	1988	1988

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1982 - 2003	
ANNUAL TOTAL	15165.3		15466.9			
ANNUAL MEAN	41.5		42.4		48.4	
HIGHEST ANNUAL MEAN					61.0	1997
LOWEST ANNUAL MEAN					35.6	1988
HIGHEST DAILY MEAN	361	Jun 29	461	May 31	472	Jul 4 1995
LOWEST DAILY MEAN	6.2	Feb 26	6.0	Feb 24	5.5	Feb 28 2001
ANNUAL SEVEN-DAY MINIMUM	6.6	Feb 25	7.7	Feb 23	6.3	Feb 15 1985
MAXIMUM PEAK FLOW			552	May 31	a892	Jun 30 1991
MAXIMUM PEAK STAGE			4.33	May 31	b5.16	Jun 30 1991
INSTANTANEOUS LOW FLOW					4.4	Dec 28 2001
ANNUAL RUNOFF (AC-FT)	30080		30680		35050	
ANNUAL RUNOFF (CFSM)	3.35		3.42		3.90	
ANNUAL RUNOFF (INCHES)	45.50		46.40		53.02	
10 PERCENT EXCEEDS	132		110		137	
50 PERCENT EXCEEDS	13		16		22	
90 PERCENT EXCEEDS	7.5		9.1		9.0	

a--Gage height, 4.72 ft.
b--Backwater from debris dam.
e--Estimated.

12381400 SOUTH FORK JOCKO RIVER NEAR ARLEE, MT

LOCATION.--Lat 47°11'44", long 113°50'59" (NAD 27), in NE$^1/_4$NW$^1/_4$NE$^1/_4$ sec.35, T.17 N., R.18 W., Lake County, Hydrologic Unit 17010212, Flathead Indian Reservation, on right bank 600 ft upstream from confluence with Jocko River and Twin Campground and 12 mi northeast of Arlee, MT.

DRAINAGE AREA.--56.0 mi^2.

PERIOD OF RECORD.--October 1982 to current year. Records published as "near Jocko" 1912-16 and in WSP 1246, 1316 are not equivalent.

GAGE.--Water-stage recorder. Elevation of gage is 3,970 ft (NGVD 29).

REMARKS.--Records good except those for estimated daily discharges, which are poor. Several observations of water temperature and specific conductance were made during the year. No known regulation or diversion upstream from station. U.S. Geological Survey telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	28	e10	e11	14	e17	e9.0	23	68	394	100	45	28
2	27	e13	e11	14	e16	e9.0	23	74	357	96	44	28
3	26	e15	e11	15	e16	e9.0	22	79	323	93	44	27
4	26	e17	e11	14	16	e9.0	21	87	299	90	44	27
5	26	e17	e11	15	16	e9.0	20	97	284	87	43	27
6	25	e20	e11	14	16	e9.0	19	88	267	84	43	26
7	24	e22	e12	13	e15	e9.0	17	82	250	82	42	26
8	24	e25	e12	e12	e15	e9.0	17	75	243	88	41	27
9	23	e23	e12	e11	e14	e9.0	19	70	239	83	40	29
10	23	e21	e13	e9.0	e14	e9.0	22	66	236	77	38	27
11	23	20	e14	e10	e13	e10	31	64	236	73	38	27
12	23	20	e15	e12	e13	e10	42	66	218	72	37	40
13	23	21	16	e17	e13	e11	58	79	206	70	37	32
14	23	21	16	e16	e12	e13	59	88	198	68	36	29
15	23	20	18	e14	e12	14	54	111	188	66	35	28
16	23	19	16	e12	12	17	49	127	178	66	35	38
17	22	19	16	e11	12	15	46	120	171	64	34	34
18	22	18	e12	e12	12	14	45	119	165	62	34	31
19	22	18	e10	e14	11	14	43	113	161	60	34	29
20	21	19	e11	e15	11	14	44	110	164	58	33	29
21	21	19	e11	e13	11	14	48	114	156	57	32	28
22	21	e18	e12	e12	e10	15	63	122	151	56	33	27
23	21	e15	e11	e11	e7.0	21	85	147	146	54	36	e26
24	21	e13	e10	e12	e5.0	18	96	194	139	54	34	e25
25	e18	e11	e11	e13	e6.0	17	114	275	134	54	32	e24
26	e18	e10	e12	e14	e7.0	17	105	355	125	52	31	e24
27	e19	e11	e14	e15	e8.0	16	88	356	120	51	30	e24
28	20	e12	e17	14	e10	14	76	366	113	49	30	e23
29	e18	e12	e16	13	---	14	68	406	109	48	30	e21
30	e13	e12	e15	13	---	15	66	430	104	47	29	e22
31	e9.0	---	e14	15	---	18	---	462	---	46	29	---
TOTAL	676.0	511	402	409.0	340.0	401.0	1483	5010	6074	2107	1123	833
MEAN	21.8	17.0	13.0	13.2	12.1	12.9	49.4	162	202	68.0	36.2	27.8
MAX	28	25	18	17	17	21	114	462	394	100	45	40
MIN	9.0	10	10	9.0	5.0	9.0	17	64	104	46	29	21
AC-FT	1340	1010	797	811	674	795	2940	9940	12050	4180	2230	1650
CFSM	0.39	0.30	0.23	0.24	0.22	0.23	0.88	2.89	3.62	1.21	0.65	0.50
IN.	0.45	0.34	0.27	0.27	0.23	0.27	0.99	3.33	4.03	1.40	0.75	0.55

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1983 - 2003, BY WATER YEAR (WY)

MEAN	21.8	18.1	14.4	11.9	10.5	15.0	55.5	196	193	76.7	37.7	26.0
MAX	42.2	26.3	37.4	22.2	22.8	56.0	113	459	446	140	53.5	44.5
(WY)	1986	1986	1996	1986	1986	1986	1990	1997	1997	1997	1997	1985
MIN	13.0	11.1	9.33	3.66	4.45	7.68	24.8	119	70.2	37.0	21.6	15.8
(WY)	1988	1988	1988	1985	1985	1985	1995	1995	1992	1992	1992	1987

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1983 - 2003	
ANNUAL TOTAL	23173.9		19369.0			
ANNUAL MEAN	63.5		53.1		56.5	
HIGHEST ANNUAL MEAN					108	1997
LOWEST ANNUAL MEAN					35.0	1992
HIGHEST DAILY MEAN	452	Jun 2	462	May 31	1060	May 17 1997
LOWEST DAILY MEAN	3.0	Feb 25	5.0	Feb 24	2.0	Feb 4 1989
ANNUAL SEVEN-DAY MINIMUM	5.7	Feb 25	7.4	Feb 23	2.6	Feb 1 1989
MAXIMUM PEAK FLOW			a489	May 31	c1220	May 17 1997
MAXIMUM PEAK STAGE			b4.11	Jan 21	b4.98	Feb 15 1989
ANNUAL RUNOFF (AC-FT)	45970		38420		40930	
ANNUAL RUNOFF (CFSM)	1.13		0.95		1.01	
ANNUAL RUNOFF (INCHES)	15.39		12.87		13.71	
10 PERCENT EXCEEDS	240		123		154	
50 PERCENT EXCEEDS	23		23		23	
90 PERCENT EXCEEDS	9.0		11		9.5	

a--Gage height, 3.22 ft.
b--Backwater due to ice.
c--Gage height, 4.31 ft.
e--Estimated.

12383500 BIG KNIFE CREEK NEAR ARLEE, MT

LOCATION.--Lat 47°08'51", long 113°58'24" (NAD 27), in NW$^1/_4$SW$^1/_4$NW/4 sec.14, T.16 N., R.19 W., Lake County, Hydrologic Unit 17010212, Flathead Indian Reservation, on left bank, 150 ft upstream from S Canal, 1 mi upstream from mouth, and 5.5 mi east of Arlee.

DRAINAGE AREA.--6.88 mi^2.

PERIOD OF RECORD.--August 1910 to September 1916 (no winter records), October 1982 to current year. Monthly discharge only for some periods, published in WSP 1316. Published as "near Jocko" 1910-16 and in WSP 916, and as "above Big Knife Canal, near Jocko" in WSP 1246, 1316.

REVISED RECORDS.--WSP 1246: 1916. WSP 1316: 1910-12, 1915-16.

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 3,720 ft (NGVD 29). Prior to July 28, 1998, at site 38 ft upstream at different elevation.

REMARKS.--Records fair. No known regulation or diversion upstream from station. Several observations of water temperature and specific conductance were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	7.5	6.2	5.5	5.8	4.3	4.6	6.3	44	14	10	7.6
2	11	7.5	6.1	5.5	5.1	4.3	4.8	6.3	46	13	10	7.4
3	11	7.5	6.0	5.5	5.0	4.3	4.6	6.8	36	13	10	7.3
4	11	7.5	6.0	5.5	5.0	4.3	4.4	8.1	28	13	10	7.3
5	11	7.5	6.0	5.5	4.9	4.3	4.4	8.4	25	13	9.9	7.2
6	11	7.5	6.0	5.5	4.7	4.3	4.3	7.8	23	13	9.7	7.2
7	10	7.6	6.0	5.4	4.7	4.3	4.2	7.4	21	12	9.7	7.2
8	10	7.8	6.0	5.2	4.7	4.1	4.2	7.1	22	14	9.7	7.6
9	10	7.8	6.0	5.2	4.7	4.2	4.3	6.8	23	13	9.3	7.3
10	9.7	7.8	5.8	5.1	4.7	4.4	4.3	6.6	24	12	9.2	7.3
11	9.7	7.5	5.9	5.0	4.7	4.6	4.3	6.5	25	12	9.3	7.1
12	9.6	7.4	5.9	5.0	4.7	4.7	4.6	6.6	24	12	8.9	7.5
13	9.4	7.6	5.9	5.2	4.7	4.9	5.9	6.7	24	12	9.0	7.1
14	9.3	7.5	6.1	5.1	4.7	4.9	5.9	7.1	23	12	8.9	7.0
15	9.3	7.3	6.0	5.0	4.7	4.7	6.1	8.2	23	12	8.9	6.8
16	9.3	7.2	6.0	5.0	4.7	5.5	5.9	9.7	22	12	8.8	7.8
17	9.3	7.2	6.0	5.0	4.7	4.8	5.7	9.2	22	12	8.7	7.5
18	9.2	7.2	5.8	5.0	4.6	4.6	5.6	8.9	22	12	8.7	6.8
19	9.2	7.1	5.7	4.9	4.5	4.5	5.4	8.4	23	11	8.4	6.6
20	9.1	7.1	5.7	4.9	4.5	4.4	5.2	7.7	23	11	8.4	6.7
21	8.9	7.0	5.7	4.9	4.6	4.4	5.2	7.3	21	11	8.5	6.6
22	8.9	7.2	5.7	5.0	4.6	4.6	5.2	7.2	19	11	8.5	6.5
23	8.9	7.4	5.7	4.9	4.4	4.8	5.8	7.7	18	11	8.9	6.3
24	8.8	6.9	5.5	4.7	3.3	4.5	6.5	11	16	11	8.6	6.3
25	8.5	6.9	5.5	4.9	3.6	4.5	7.1	18	16	11	8.4	6.1
26	8.2	6.7	5.5	5.3	4.6	4.7	7.4	32	15	11	8.3	6.1
27	8.2	6.4	5.8	5.2	4.5	4.6	7.1	40	15	11	8.3	6.1
28	8.3	6.3	5.6	5.0	4.4	4.3	6.7	43	14	10	8.1	6.0
29	8.2	6.3	5.5	4.9	---	4.3	6.4	47	14	10	8.0	6.0
30	7.9	6.3	5.5	5.0	---	4.3	6.6	55	14	10	8.0	6.1
31	7.8	---	5.5	5.2	---	4.5	---	52	---	10	7.8	---
TOTAL	291.7	216.5	180.6	159.0	129.8	139.9	162.7	470.8	685	365	276.9	206.4
MEAN	9.41	7.22	5.83	5.13	4.64	4.51	5.42	15.2	22.8	11.8	8.93	6.88
MAX	11	7.8	6.2	5.5	5.8	5.5	7.4	55	46	14	10	7.8
MIN	7.8	6.3	5.5	4.7	3.3	4.1	4.2	6.3	14	10	7.8	6.0
AC-FT	579	429	358	315	257	277	323	934	1360	724	549	409
CFSM	1.37	1.05	0.85	0.75	0.67	0.66	0.79	2.21	3.32	1.71	1.30	1.00
IN.	1.58	1.17	0.98	0.86	0.70	0.76	0.88	2.55	3.70	1.97	1.50	1.12

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1983 - 2003, BY WATER YEAR (WY)

MEAN	8.11	6.90	5.80	5.11	4.53	4.54	6.19	15.5	25.3	18.2	12.8	9.75
MAX	10.3	8.95	7.38	6.33	6.49	7.07	8.93	28.0	48.4	29.2	16.9	12.0
(WY)	1983	1986	1985	1985	1986	1986	1986	1997	1997	1984	1983	1984
MIN	5.27	4.47	4.05	3.65	2.96	2.96	3.92	9.23	8.49	9.60	8.06	6.55
(WY)	1993	1993	1993	1989	1989	1989	1991	1995	1992	1992	1992	1992

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1983 - 2003	
ANNUAL TOTAL	4086.6		3284.3			
ANNUAL MEAN	11.2		9.00		10.3	
HIGHEST ANNUAL MEAN					14.6	1997
LOWEST ANNUAL MEAN					6.60	1992
HIGHEST DAILY MEAN	47	Jun 29	55	May 30	65	May 30 1986
LOWEST DAILY MEAN	3.4	Mar 24	3.3	Feb 24	1.7	Feb 4 1989
ANNUAL SEVEN-DAY MINIMUM	3.5	Mar 19	4.1	Feb 24	2.0	Feb 1 1989
MAXIMUM PEAK FLOW			67	May 30	b78	Jun 30 1916
MAXIMUM PEAK STAGE			5.90	May 30	5.91	Jun 29 2002
INSTANTANEOUS LOW FLOW			a2.7	Feb 24	c1.3	Feb 4 1989
INSTANTANEOUS LOW STAGE			a5.08	Feb 24	c0.89	Feb 4 1989
ANNUAL RUNOFF (AC-FT)	8110		6510		7430	
ANNUAL RUNOFF (CFSM)	1.63		1.31		1.49	
ANNUAL RUNOFF (INCHES)	22.10		17.76		20.25	
10 PERCENT EXCEEDS	26		14		20	
50 PERCENT EXCEEDS	7.2		7.1		7.5	
90 PERCENT EXCEEDS	3.7		4.6		4.1	

a--Feb. 24, 25.
b--Gage height, 3.65 ft, site and datum then in use.
c--Result of freezeup.

PEND OREILLE RIVER BASIN

12387450 VALLEY CREEK NEAR ARLEE, MT

LOCATION.--Lat 47°10'13", long 114°13'47" (NAD 27), in $NE^1/_4SE^1/_4SE^1/_4$ sec.3, T.16 N., R.21 W., Sanders County, Hydrologic Unit 17010212, Flathead Indian Reservation, on right bank, 1.4 mi upstream from East Fork, 6.7 mi west of Arlee, and 7.4 mi southwest of Ravalli.

DRAINAGE AREA.--15.3 mi^2.

PERIOD OF RECORD.--October 1982 to current season (seasonal records only).

GAGE.--Water-stage recorder. Elevation of gage is 3,450 ft (NGVD 29).

REMARKS.--Seasonal records good except those for estimated daily discharges, which are poor. No known regulation or diversion upstream from station. Several observations of water temperature and specific conductance were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY TO DECEMBER 2003
DAILY MEAN VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1				e9.2	18	46	13	8.9	7.3	6.9		
2				8.8	20	40	13	8.7	7.3	6.8		
3				8.1	20	35	13	8.8	7.3	6.8		
4				7.9	21	31	13	9.0	7.2	6.8		
5				7.6	21	29	12	8.8	7.1	6.7		
6				7.3	21	28	12	8.9	7.1	6.7		
7				7.2	20	26	12	8.7	7.1	6.7		
8				7.2	19	26	12	8.7	7.3	6.7		
9				7.4	19	25	12	8.6	7.5	6.6		
10				8.1	18	26	12	8.4	7.3	6.6		
11				9.3	17	26	11	8.3	7.5	6.7		
12				11	17	23	11	8.3	9.6	7.1		
13				16	18	22	11	8.2	7.5	6.8		
14				15	18	21	11	8.2	7.3	6.9		
15				15	22	20	11	8.1	7.2	7.0		
16				14	25	19	11	8.1	8.5	7.5		
17				14	25	19	10	8.1	8.1	7.1		
18				13	22	18	10	8.0	7.9	6.8		
19				13	21	18	10	7.9	7.5	6.7		
20				13	20	18	10	7.9	7.5	6.6		
21				13	19	17	9.9	7.8	7.2	6.4		
22				14	19	17	9.8	7.9	7.2	6.4		
23				16	22	16	9.7	8.3	7.2	6.4		
24				18	32	15	9.6	7.9	7.2	6.4		
25				19	54	15	9.5	7.8	7.1	6.4		
26				20	63	14	9.5	7.7	7.1	6.4		
27				19	58	14	9.4	7.7	7.0	6.4		
28				18	59	14	9.3	7.6	7.0	6.9		
29				18	64	14	9.2	7.5	7.0	8.1		
30				17	60	13	9.1	7.4	6.9	6.8		
31				---	55	---	9.0	7.4	---	e7.0		
TOTAL				384.1	907	665	334.0	253.6	222.0	210.1		
MEAN				12.8	29.3	22.2	10.8	8.18	7.40	6.78		
MAX				20	64	46	13	9.0	9.6	8.1		
MIN				7.2	17	13	9.0	7.4	6.9	6.4		
AC-FT				762	1800	1320	662	503	440	417		
CFSM				0.84	1.91	1.45	0.70	0.53	0.48	0.44		
IN.				0.93	2.21	1.62	0.81	0.62	0.54	0.51		

STATISTICS OF MONTHLY MEAN DATA FOR SEASONS 1983 - 2003

MEAN	14.5	32.3	28.7	14.7	10.6	9.10	8.48
MAX	30.3	75.5	66.7	31.8	19.6	14.0	12.2
(WY)	1996	1997	1997	1997	1997	1997	1998
MIN	6.27	21.5	11.6	8.47	6.72	6.21	5.97
(WY)	2002	1988	1987	2001	2001	2001	1989

SUMMARY STATISTICS	FOR 2003 SEASON		SEASONS 1983 - 2003	
HIGHEST DAILY MEAN	64	May 29	110	May 17 1997
LOWEST DAILY MEAN	6.4	Oct 21	5.0	Nov 22 1994
MAXIMUM PEAK FLOW	68	May 29	116	May 16 1997
MAXIMUM PEAK STAGE	2.44	May 29	3.04	May 16 1997

e--Estimated.

PEND OREILLE RIVER BASIN

12388200 JOCKO RIVER AT DIXON, MT

LOCATION.--Lat 47°18'43", long 114°17'48" (NAD 27), in NW$^1/_4$NW$^1/_4$NE$^1/_4$ sec. 20, T.18 N., R.21 W., Sanders County, Hydrologic Unit 17010212, Flathead Indian Reservation, on right bank 38 ft downstream from State Highway 212 bridge, 0.8 mi east of Dixon, and at river mile 0.8.

DRAINAGE AREA.--380 mi^2.

PERIOD OF RECORD.--April 1990 to current year. Miscellaneous measurements made at this site 1977 and 1987 water years.

GAGE.--Water-stage recorder. Elevation of gage is 2,521.87 ft (NGVD 29).

REMARKS.--Records good. Some regulation and diversion upstream from gage for irrigation. Several observations of water temperature and specific conductance were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	210	e153	158	140	156	110	147	229	966	166	121	127
2	209	e158	156	139	174	111	156	233	798	172	123	123
3	207	161	153	138	155	112	162	235	629	171	124	128
4	204	166	153	139	149	113	156	253	538	164	130	127
5	201	167	153	137	144	112	153	294	488	159	132	126
6	200	167	153	136	140	113	149	281	437	156	138	125
7	198	169	153	136	132	114	143	272	401	154	138	124
8	197	168	153	133	134	113	142	260	372	155	135	131
9	194	169	152	130	134	114	141	249	372	160	132	133
10	193	169	144	120	133	115	146	239	359	155	131	131
11	192	169	148	110	129	121	155	230	365	146	131	132
12	194	167	149	112	127	127	179	227	342	144	134	138
13	195	164	149	126	124	130	240	241	310	143	134	143
14	193	164	148	128	127	133	281	239	293	147	133	134
15	192	161	150	130	124	141	239	248	284	144	135	132
16	192	159	152	126	124	145	221	275	271	140	134	143
17	191	158	148	122	124	153	201	280	247	135	133	160
18	189	155	145	121	124	146	194	278	223	132	134	155
19	187	153	144	120	122	140	187	271	218	133	133	147
20	186	151	137	120	122	136	182	256	231	132	132	144
21	184	160	136	123	119	135	179	244	228	128	130	143
22	183	163	136	125	122	134	181	239	228	128	132	140
23	183	176	139	120	123	139	200	245	225	128	141	139
24	183	178	140	121	110	143	221	284	214	127	139	142
25	183	163	136	123	107	140	234	426	205	130	131	143
26	184	157	137	126	98	143	257	723	196	126	133	141
27	184	160	140	145	101	144	251	797	191	126	131	140
28	186	158	153	138	106	138	236	737	186	126	132	139
29	187	159	146	131	---	135	221	850	181	129	132	138
30	178	161	140	130	---	133	228	988	176	123	132	139
31	e160	---	140	132	---	136	---	1030	---	121	129	---
TOTAL	5919	4883	4541	3977	3584	4019	5782	11653	10174	4400	4099	4107
MEAN	191	163	146	128	128	130	193	376	339	142	132	137
MAX	210	178	158	145	174	153	281	1030	966	172	141	160
MIN	160	151	136	110	98	110	141	227	176	121	121	123
AC-FT	11740	9690	9010	7890	7110	7970	11470	23110	20180	8730	8130	8150

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1991 - 2003, BY WATER YEAR (WY)

MEAN	185	174	158	133	131	148	213	420	529	260	167	176
MAX	227	227	265	188	208	246	390	1303	1537	512	222	225
(WY)	1998	1996	1996	1996	1996	1997	1997	1997	1997	1997	1997	1997
MIN	145	138	123	102	108	118	130	203	149	140	131	137
(WY)	1995	1995	1993	1995	1993	1994	1995	1992	1992	1994	1994	2003

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1991 - 2003	
ANNUAL TOTAL	94097		67138			
ANNUAL MEAN	258		184		225	
HIGHEST ANNUAL MEAN					445	1997
LOWEST ANNUAL MEAN					157	1992
HIGHEST DAILY MEAN	1140	Jun 25	1030	May 31	2540	May 18 1997
LOWEST DAILY MEAN	96	Feb 28	98	Feb 26	74	Feb 2 1996
ANNUAL SEVEN-DAY MINIMUM	102	Feb 25	106	Feb 24	82	Jan 3 1995
MAXIMUM PEAK FLOW			1100	May 31	2710	May 17 1997
MAXIMUM PEAK STAGE			3.09	May 31	4.68	May 17 1997
ANNUAL RUNOFF (AC-FT)	186600		133200		162700	
10 PERCENT EXCEEDS	724		252		358	
50 PERCENT EXCEEDS	170		147		169	
90 PERCENT EXCEEDS	118		123		122	

e--Estimated.

PEND OREILLE RIVER BASIN

12388400 REVAIS CREEK BELOW WEST FORK, NEAR DIXON, MT

LOCATION.--Lat 47°15'59", long 114°24'21" (NAD 27), in $SE^1/_4NE^1/_4NW^1/_4$ sec.4, T.17 N., R.22 W., Sanders County, Hydrologic Unit 17010212, Flathead Indian Reservation, on right bank, 0.3 mi downstream from West Fork, 7.3 mi southwest of Dixon, and at river mile 5.2.

DRAINAGE AREA.--23.4 mi^2.

PERIOD OF RECORD.--October 1982 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 3,420 ft (NGVD 29).

REMARKS.--Records good except those for estimated daily discharges, which are poor. No known regulation or diversion upstream from station. Several observations of water temperature and specific conductance were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.1	e4.1	e4.2	4.0	13	e3.6	12	28	106	16	6.6	4.3
2	5.0	e4.3	e4.2	4.1	7.0	e3.7	10	30	85	15	6.5	4.3
3	4.9	e4.4	4.4	4.6	5.9	4.0	9.2	32	70	15	6.6	4.3
4	5.0	e4.5	4.3	4.2	5.4	4.0	8.3	39	62	14	6.8	4.2
5	4.9	e4.5	4.3	4.3	5.1	4.0	7.7	37	58	14	6.4	4.1
6	4.8	4.7	4.2	4.0	4.9	3.9	7.3	35	55	14	6.7	4.1
7	4.7	4.8	4.2	4.0	9.4	3.8	6.8	32	53	13	6.4	4.1
8	4.6	5.0	4.2	e3.8	11	3.6	6.6	30	51	13	6.1	4.4
9	4.6	4.9	4.2	e3.7	6.5	3.7	7.0	28	50	12	6.0	4.7
10	4.5	4.8	4.2	e3.5	4.4	4.0	7.7	26	49	12	5.8	4.4
11	4.5	4.6	4.2	e3.3	4.8	4.3	12	24	46	11	5.7	4.5
12	4.6	4.7	4.2	e3.5	5.3	4.7	15	27	42	11	5.7	5.7
13	4.6	4.9	4.3	e3.6	6.3	5.4	25	28	39	11	5.6	4.6
14	4.6	4.6	4.8	e3.7	4.2	6.6	23	30	36	10	5.4	4.3
15	4.5	4.5	5.1	3.9	4.2	6.4	20	49	33	10	5.3	4.1
16	4.5	4.4	4.7	3.8	4.3	6.2	19	51	31	9.8	5.3	4.4
17	4.5	4.7	4.5	e3.7	4.2	5.9	18	46	29	9.5	5.3	4.5
18	4.4	4.4	4.2	e3.8	4.1	5.6	16	39	28	9.1	5.2	4.5
19	4.4	4.4	4.2	e3.8	4.0	5.2	16	34	27	8.9	5.1	4.1
20	4.4	4.4	e3.9	e3.8	4.0	5.1	15	31	27	8.7	5.1	4.3
21	4.4	4.4	e3.8	4.0	4.1	5.2	17	30	26	8.4	4.9	4.2
22	4.4	e4.2	e3.9	e3.7	4.2	5.9	22	31	25	8.2	4.8	4.1
23	4.4	e4.3	4.2	e3.7	e3.7	7.4	28	47	24	8.0	5.3	3.9
24	4.4	e4.2	e3.9	3.9	e3.3	6.4	31	73	22	7.7	5.0	3.9
25	4.4	e4.1	e3.8	3.9	e3.0	6.3	36	128	21	7.7	4.8	3.8
26	4.4	e4.3	e3.7	5.2	e3.1	6.6	33	154	20	7.5	4.7	3.8
27	4.4	e4.2	e3.9	5.5	e3.2	6.0	28	133	19	7.4	4.7	3.7
28	4.5	e4.2	e3.9	4.6	e3.3	5.6	26	129	18	7.1	4.6	3.7
29	e4.4	e4.2	4.2	4.2	---	5.4	25	157	17	7.0	4.6	3.7
30	e4.2	4.4	4.0	4.4	---	5.7	26	146	16	6.8	4.5	3.7
31	e3.8	---	4.2	8.7	---	8.2	---	131	---	6.7	4.4	---
TOTAL	140.8	134.1	130.0	128.9	145.9	162.4	533.6	1835	1185	319.5	169.9	126.4
MEAN	4.54	4.47	4.19	4.16	5.21	5.24	17.8	59.2	39.5	10.3	5.48	4.21
MAX	5.1	5.0	5.1	8.7	13	8.2	36	157	106	16	6.8	5.7
MIN	3.8	4.1	3.7	3.3	3.0	3.6	6.6	24	16	6.7	4.4	3.7
AC-FT	279	266	258	256	289	322	1060	3640	2350	634	337	251
CFSM	0.19	0.19	0.18	0.18	0.22	0.22	0.76	2.53	1.69	0.44	0.23	0.18
IN.	0.22	0.21	0.21	0.20	0.23	0.26	0.85	2.92	1.88	0.51	0.27	0.20

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1983 - 2003, BY WATER YEAR (WY)

MEAN	6.34	6.75	6.56	5.36	5.67	7.91	22.9	66.9	55.7	16.4	7.95	6.28
MAX	12.5	14.8	27.9	12.3	19.9	23.7	56.4	165	134	25.9	11.0	10.9
(WY)	1986	1986	1996	1996	1996	1986	1996	1997	1997	1991	1997	1985
MIN	4.03	4.31	3.82	3.55	3.49	3.97	9.07	44.9	18.6	10.2	5.47	4.19
(WY)	2002	1988	2002	2002	1993	2001	2001	1992	1987	1986	1988	1988

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1983 - 2003	
ANNUAL TOTAL	8141.6		5011.5			
ANNUAL MEAN	22.3		13.7		17.9	
HIGHEST ANNUAL MEAN					35.2	1997
LOWEST ANNUAL MEAN					11.6	1992
HIGHEST DAILY MEAN	244	May 30	157	May 29	316	Jun 1 1997
LOWEST DAILY MEAN	3.2	Feb 25	3.0	Feb 25	2.5	Feb 4 1989
ANNUAL SEVEN-DAY MINIMUM	3.4	Jan 29	3.3	Feb 23	2.7	Feb 2 1989
MAXIMUM PEAK FLOW			170	May 29	a382	Jun 1 1997
MAXIMUM PEAK STAGE			4.01	May 29	b6.93	Dec 5 1984
ANNUAL RUNOFF (AC-FT)	16150		9940		12990	
ANNUAL RUNOFF (CFSM)	0.95		0.59		0.77	
ANNUAL RUNOFF (INCHES)	12.94		7.97		10.41	
10 PERCENT EXCEEDS	84		31		47	
50 PERCENT EXCEEDS	5.0		4.9		7.3	
90 PERCENT EXCEEDS	3.6		3.9		4.1	

a--Gage height, 4.36 ft.
b--Backwater from ice.
e--Estimated.

PEND OREILLE RIVER BASIN

12388700 FLATHEAD RIVER AT PERMA, MT

LOCATION.--Lat 47°22'03", long 114°35'03" (NAD 27), in $SE^1/_4NE^1/_4NE^1/_4$ sec.36, T.19 N., R.24 W., Sanders County, Hydrologic Unit 17010212, Flathead Indian Reservation, on right bank 0.3 mi north of Perma, 0.4 mi downstream from Camas Creek, and at river mile 10.9.

DRAINAGE AREA.--8,795 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1983 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 2,469.31 ft (NGVD 29).

REMARKS.--Water-discharge records excellent. Flow affected by regulation from Hungry Horse Reservoir (station no. 12362000) and by Flathead Lake (station no. 12371500). Diversions for irrigation of about 160,500 acres upstream from station. U.S. Geological Survey satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4190	4700	8920	8170	4280	6960	7330	12900	23100	13600	8500	4840
2	4140	4720	8950	7140	4260	6930	7600	12900	23000	13600	7660	4510
3	4130	4720	9790	6380	4190	6910	8400	13600	23400	12900	7480	4210
4	4120	4720	10800	5490	4180	6930	8560	14500	26900	12200	7470	4000
5	4120	4770	11000	5220	4420	7020	9220	15500	27000	11800	6970	3880
6	4140	4800	11000	5180	4930	7050	9470	16400	26600	11800	6610	3860
7	4110	4850	11000	5140	5050	6970	9520	16300	24200	11800	6580	3870
8	4260	4960	11000	5090	5460	6930	9520	16200	23700	11200	6540	3960
9	4310	5360	11000	4740	5880	7020	9710	16000	23700	10900	6440	3950
10	4250	5900	11000	4260	5810	7000	9520	15900	19800	10800	6460	3910
11	4190	6700	11000	4050	5970	7060	10500	15900	17200	10700	6450	3940
12	4160	7300	10900	4090	6650	7130	10700	15900	16800	10600	6420	3960
13	4190	7840	10900	4150	6900	7100	10800	15900	16500	10400	6430	3920
14	4210	8810	10900	4140	6930	6340	10900	15900	18100	10300	6410	3900
15	4200	9720	11000	4160	6920	5710	11100	15900	20300	10300	6440	3910
16	4200	9890	11000	4140	6980	5290	10900	16000	20500	10300	6500	3930
17	4200	10000	10900	4130	6970	4860	10900	15600	20400	10300	6350	3940
18	4220	9890	10900	4090	6940	4700	11000	15300	20200	10200	6410	3960
19	4190	9900	10900	4090	6860	4620	10900	14800	17800	9880	6480	3950
20	4200	9980	10900	4110	6970	4600	11100	14800	17700	9610	6500	3940
21	4160	9980	10900	4100	7160	4580	10800	14700	18500	9570	6460	3940
22	4140	10100	10900	4080	7030	4940	11700	14700	18800	9620	6510	3930
23	4220	9760	10900	4110	6960	5420	11900	14700	18500	9450	5840	3920
24	4270	8710	10900	4030	6920	5330	12700	14700	18500	9420	5580	3900
25	4280	8310	10900	4080	6860	5340	12900	15200	18100	9410	5520	3960
26	4290	9050	10900	4120	6890	5220	13200	16000	16000	9420	5560	3920
27	4270	9220	11000	4230	6910	5150	12900	16600	14200	9420	5560	3910
28	4250	9090	11000	4210	6990	5350	12800	16700	14000	9420	5520	3930
29	4260	8940	11000	4150	---	6300	12800	18900	14000	9370	5560	3910
30	4530	8960	9990	4160	---	6500	12900	20200	13800	9350	5520	3960
31	4670	---	9030	4190	---	6560	---	22600	---	9330	5570	---
TOTAL	131070	231650	331180	143420	172270	187820	322250	491200	591300	326970	198300	119620
MEAN	4228	7722	10680	4626	6152	6059	10740	15850	19710	10550	6397	3987
MAX	4670	10100	11000	8170	7160	7130	13200	22600	27000	13600	8500	4840
MIN	4110	4700	8920	4030	4180	4580	7330	12900	13800	9330	5520	3860
AC-FT	260000	459500	656900	284500	341700	372500	639200	974300	1173000	648500	393300	237300

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1984 - 2003, BY WATER YEAR (WY)

MEAN	8667	10570	11070	10430	9754	9281	10410	15500	22890	13150	8068	7949
MAX	12070	13150	17260	15200	18340	23420	23370	36930	45490	22780	12690	13090
(WY)	1992	2000	1996	1996	1996	1996	1996	1997	1997	1991	1996	1989
MIN	4228	4052	6160	4626	4234	4121	4397	5877	9092	6279	4164	3987
(WY)	2003	2002	2002	2003	2001	2001	2001	1995	1987	1994	1994	2003

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1984 - 2003	
ANNUAL TOTAL	4661530		3247050			
ANNUAL MEAN	12770		8896		11480	
HIGHEST ANNUAL MEAN					18030	1996
LOWEST ANNUAL MEAN					7040	2001
HIGHEST DAILY MEAN	47200	Jun 9	27000	Jun 5	53400	Jun 6 1997
LOWEST DAILY MEAN	4110	Oct 7	3860	Sep 6	2670	May 29 1984
ANNUAL SEVEN-DAY MINIMUM	4140	Oct 1	3910	Sep 5	3110	May 25 1984
MAXIMUM PEAK FLOW			27500	Jun 4	54700	Jun 7 1997
MAXIMUM PEAK STAGE			15.37	Jun 4	21.65	Jun 7 1997
ANNUAL RUNOFF (AC-FT)	9246000		6441000		8314000	
10 PERCENT EXCEEDS	25400		16000		17100	
50 PERCENT EXCEEDS	9760		7050		10300	
90 PERCENT EXCEEDS	4720		4110		5440	

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1971-73, 1984-92, 1997 to current year.
RPERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Seasonal records, April 2001 to current year.
INSTRUMENTATION.--Temperature probe installed Aug. 30, 2000.
REMARKS.--Seasonal daily water temperature record good. Unpublished records of instantaneous water temperature and specific conductance are available in files of the District office.
EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE (seasonal records): maximum, 30.0°C, Sept. 5-7, 2003; minimum, 2.5°C, Apr. 2, 2002.
EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: During period of seasonal operation, maximum, 30.0°C, Sept. 5-7; minimum, 5.5°C, Apr. 3, 4, and 6.

WATER QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instan-taneous dis-charge, cfs (00061)	pH, water, unfltrd field, std units (00400)	Specif. conduc-tance, wat unf uS/cm 25 degC (00095)	Temper-ature, air, deg C (00020)	Temper-ature, water, deg C (00010)	Ammonia + org-N, water, unfltrd mg/L as N (00625)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)
MAY 2003									
22...	1045	14700	8.3	175	13.0	11.0	E.09	E.020	<.002
JUN									
13...	1045	16600	8.5	175	13.5	17.5	.13	E.014	<.002
JUL									
09...	1000	10800	8.3	189	16.0	18.5	1.7	E.020	<.002
AUG									
14...	0830	6430	8.2	177	15.0	22.0	.12	<.022	<.002

Date	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Phos-phorus, water, unfltrd mg/L (00665)	Suspnd. sedi-ment, sieve diametr percent <.063mm (70331)	Sus-pended sedi-ment concen-tration mg/L (80154)	Sus-pended sedi-ment load, tons/d (80155)
MAY 2003					
22...	<.007	E.002	83	5	198
JUN					
13...	<.007	.009	85	70	3140
JUL					
09...	.010	.047	76	2	58
AUG					
14...	<.007	.009	32	25	434

Date	Time	Hard-ness, water, unfltrd mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Potas-sium, water, fltrd, mg/L (00935)	Sodium adsorp-tion ratio (00931)	Sodium, water, fltrd, mg/L (00930)	Alka-linity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chlor-ide, water, fltrd, mg/L (00940)	Fluor-ide, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)
MAY 2003											
22...	1045	89	25.3	6.25	.49	.1	1.29	89	.45	<.2	4.63
JUL											
09...	1000	90	25.5	6.41	1.34	.2	3.68	88	3.42	<.2	5.27

Date	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of consti-tuents mg/L (70301)	Residue water, fltrd, tons/ acre-ft (70303)	Residue water, fltrd, tons/d (70302)	Arsenic water unfltrd ug/L (01002)	Cadmium water, unfltrd ug/L (01027)	Chrom-ium, water, unfltrd recover -able, ug/L (01034)	Copper, water, unfltrd recover -able, ug/L (01042)	Lead, water, unfltrd recover -able, ug/L (01051)	Nickel, water, unfltrd recover -able, ug/L (01067)	Zinc, water, unfltrd recover -able, ug/L (01092)
MAY 2003											
22...	3.0	95	.13	3760	<2	<.2	<.8	4.8	.66	.31	2
JUL											
09...	3.5	102	.14	2970	--	--	--	--	--	--	--

E--Estimated.

PEND OREILLE RIVER BASIN

12388700 FLATHEAD RIVER AT PERMA, MT--Continued

WATER TEMPERATURE, DEGREES CELSIUS, APRIL 2002 TO SEPTEMBER 2002

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		APRIL			MAY			JUNE			JULY	
1	9.5	7.5	8.5	11.5	9.5	10.5	17.0	15.0	15.5	21.0	18.0	19.5
2	8.0	6.5	7.0	12.5	10.0	11.0	16.0	15.0	15.5	21.0	18.5	19.5
3	8.0	5.5	6.5	11.5	10.0	10.5	16.0	14.5	15.0	21.0	18.0	19.5
4	8.5	5.5	7.0	10.5	9.0	10.0	15.5	14.0	15.0	21.5	18.0	20.0
5	8.0	6.0	7.0	10.5	9.0	9.5	16.5	14.5	15.5	21.5	18.5	20.0
6	9.0	5.5	7.0	10.0	9.0	9.5	17.0	15.0	16.0	22.0	18.0	20.0
7	9.5	6.0	7.5	10.0	9.0	9.5	18.0	15.5	16.5	22.5	18.5	20.5
8	10.5	6.5	8.5	10.5	8.5	9.5	18.0	16.5	17.0	21.0	19.0	20.0
9	9.5	7.5	8.5	9.5	9.0	9.5	18.5	16.5	17.5	22.5	18.5	20.5
10	11.0	7.0	8.5	11.0	9.0	10.0	18.0	17.0	17.5	24.0	19.5	21.5
11	11.0	8.5	9.5	11.0	9.5	10.5	18.0	16.5	17.0	24.5	20.0	22.0
12	10.5	8.0	9.5	11.0	10.5	10.5	18.5	16.5	17.5	24.5	20.5	22.5
13	10.0	8.5	9.0	12.0	10.0	11.0	18.0	17.0	17.5	22.5	20.5	21.5
14	10.0	8.5	9.0	12.5	10.5	11.5	18.5	16.5	17.5	23.5	19.5	21.5
15	10.5	8.0	9.0	12.0	11.0	11.5	19.0	17.0	18.0	24.5	20.5	22.5
16	10.5	8.0	9.0	11.0	10.0	10.5	19.0	17.5	18.5	25.5	21.5	23.0
17	11.0	8.0	9.5	10.5	9.5	10.0	19.5	18.0	18.5	25.5	21.0	23.0
18	11.0	8.5	9.5	10.5	9.5	9.5	20.0	18.5	19.5	25.5	21.0	23.5
19	11.5	8.0	9.5	12.0	9.5	10.5	20.0	19.0	19.5	26.5	22.0	24.0
20	12.5	8.5	10.5	12.0	10.0	11.0	19.5	18.5	19.0	26.0	22.0	24.0
21	12.5	9.0	10.5	11.5	10.5	11.0	19.0	18.0	18.5	26.5	22.0	24.0
22	13.0	10.0	11.5	13.0	10.5	11.5	18.5	17.0	17.5	27.0	22.5	24.5
23	11.5	10.5	11.0	15.0	11.5	13.0	18.5	16.5	17.5	27.0	23.0	25.0
24	13.0	9.5	11.0	15.0	12.5	13.5	18.0	16.5	17.0	26.5	23.0	24.5
25	12.0	10.5	11.5	15.5	13.5	14.5	17.5	16.0	16.5	26.5	23.0	24.5
26	11.0	9.5	10.5	14.5	14.0	14.0	18.0	16.0	17.0	26.0	23.0	24.5
27	11.5	9.5	10.5	16.5	14.0	15.0	19.0	16.5	17.5	26.5	23.0	24.5
28	11.5	9.0	10.0	16.5	14.5	15.5	19.5	16.5	18.0	26.5	23.0	24.5
29	10.5	9.0	9.5	17.5	15.5	16.5	20.0	17.0	18.5	27.0	23.0	25.0
30	11.5	9.0	10.0	17.0	15.5	16.0	21.0	18.0	19.0	27.0	23.0	25.0
31	---	---	---	16.0	15.5	15.5	---	---	---	27.0	23.0	25.0
MONTH	13.0	5.5	9.0	17.5	8.5	11.5	21.0	14.0	17.5	27.0	18.0	22.5

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN
		AUGUST			SEPTEMBER	
1	27.0	23.0	25.0	23.5	19.5	21.5
2	26.5	23.0	25.0	25.5	20.0	22.0
3	25.0	22.0	23.0	24.5	19.0	21.5
4	25.5	21.5	23.5	27.5	18.0	21.5
5	26.5	22.5	24.0	30.0	17.5	21.5
6	25.5	21.5	23.0	30.0	15.5	22.0
7	25.5	21.5	23.5	30.0	17.0	21.0
8	26.5	22.0	24.5	20.0	16.0	18.0
9	27.5	22.5	24.5	20.5	15.5	17.5
10	26.5	22.5	24.5	21.0	13.5	17.0
11	25.5	22.0	23.5	20.0	16.0	17.0
12	25.5	21.0	23.0	18.5	13.5	16.5
13	26.5	21.5	23.5	20.5	12.0	15.5
14	26.5	21.5	24.0	21.0	12.0	16.0
15	25.5	22.0	24.0	24.0	14.0	17.5
16	25.0	22.0	23.5	17.0	13.0	15.0
17	25.0	21.0	22.5	16.0	10.5	13.0
18	25.5	21.5	23.5	18.5	12.0	15.0
19	26.5	22.0	24.0	18.5	13.0	15.5
20	25.0	22.0	23.5	21.0	13.0	16.5
21	24.5	21.5	23.0	20.5	13.0	16.0
22	23.5	21.5	22.0	20.0	12.5	15.5
23	23.5	21.0	22.0	17.5	12.5	15.5
24	23.5	20.5	22.0	22.0	11.5	16.5
25	25.0	20.5	22.5	18.0	13.5	16.0
26	24.5	21.0	23.0	20.5	13.5	17.0
27	23.5	21.5	22.5	23.5	13.5	17.5
28	24.5	20.0	22.0	21.5	13.5	16.5
29	24.0	19.5	21.5	20.0	12.0	16.0
30	24.5	19.5	21.5	20.0	12.5	15.5
31	24.0	19.5	21.5	---	---	---
MONTH	27.5	19.5	23.0	30.0	10.5	17.5

PEND OREILLE RIVER BASIN

12389000 CLARK FORK NEAR PLAINS, MT

LOCATION.--Lat 47°25'47", long 114°51'18" (NAD 27), in E1/2SW$^1/_4$ sec.1, T.19 N., R.26 W., Sanders County, Hydrologic Unit 17010213, on right bank 2.4 mi southeast of Plains, 6.0 mi downstream from Flathead River, and at river mile 239.0.

DRAINAGE AREA.--19,958 mi^2.

PERIOD OF RECORD.--October 1910 to current year. Monthly discharge only for some periods, published in WSP 1316.

REVISED RECORDS.--WSP 1246: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 2,449.11 ft (NGVD 29) (levels by U.S. Army Corps of Engineers). Prior to Nov. 28, 1911, nonrecording gage at site 50 ft upstream at same elevation.

REMARKS.--Records good. Flow partly regulated by Hungry Horse Reservoir (station number 12362000) and by Flathead Lake (station number 12371500). Diversions for irrigation of about 335,000 acres upstream from station. U. S. Geological Survey satellite telemeter at station. Several observations of water temperature and specific conductance were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6440	6570	10900	10300	9550	9140	13600	26900	65600	21300	10500	6630
2	6370	6510	11000	9260	11300	9170	15500	26600	65500	20900	9640	6100
3	6380	6470	11600	8500	11600	9220	17100	27100	61900	19800	9210	5910
4	6340	6650	12600	7680	10200	9220	17300	28300	61000	18500	9260	5640
5	6350	6700	13100	7250	9300	9160	17200	29800	57500	17500	8940	5520
6	6340	6730	12900	7250	9230	9190	17100	31400	54300	17100	8450	5510
7	6340	6870	12900	7220	9040	9230	16600	31300	49900	16800	8420	5500
8	6400	7030	12900	7110	8930	9210	16300	30600	47100	16000	8360	5500
9	6510	7340	12800	6730	9100	9310	16000	29800	46100	15500	8320	5570
10	6460	7940	12700	6120	9100	9180	16000	29000	41700	15300	8250	5570
11	6370	8650	12600	5560	9120	9270	17100	28500	38500	15100	8250	5590
12	6350	9380	12600	5710	9550	9910	18900	28000	38200	14600	8200	5690
13	6360	9860	12700	5630	9770	10700	21000	28000	36800	14200	8130	5690
14	6390	10700	12800	5870	9700	12000	23700	28200	36300	13800	8100	5720
15	6390	11700	13000	6200	9670	14200	25600	28800	37800	13700	8070	5740
16	6410	12000	13000	6270	9680	14100	25400	30100	38000	13500	8050	5700
17	6380	12000	13000	6160	9670	12700	24400	31800	37500	13300	7960	5760
18	6380	12000	12900	5970	9650	12200	23500	32200	36800	13100	7890	5790
19	6360	11900	12900	5820	9530	11400	22800	30800	34200	12700	7920	5790
20	6350	12000	12700	5760	9530	10700	22300	29500	33600	12200	7980	5810
21	6330	12000	12500	5850	9540	10200	21700	28400	34000	12100	7970	5790
22	6280	12200	12500	6010	9610	10300	22400	27700	33800	12000	7960	5730
23	6320	12100	12600	5980	9570	11900	23800	27700	32300	11700	7550	5680
24	6380	11200	12700	5730	9440	12400	26700	29600	30700	11700	7170	5690
25	6390	10600	12700	5700	8960	12400	29300	35100	29100	11600	7140	5660
26	6410	11100	12600	5930	8610	11900	31000	42700	26200	11500	7120	5640
27	6340	11200	12600	6490	8660	11400	31300	49000	23600	11500	7100	5620
28	6320	11100	12700	7020	8900	11200	29900	52500	22600	11500	6990	5640
29	6410	10900	12800	8360	---	11600	28300	55600	22300	11400	7010	5600
30	6520	11000	12200	7870	---	11700	27300	58600	21800	11300	6990	5620
31	6760	---	11200	7470	---	11800	---	63400	---	11200	7040	---
TOTAL	198130	292400	388700	208780	266510	336010	659100	1057000	1194700	442400	249940	171400
MEAN	6391	9747	12540	6735	9518	10840	21970	34100	39820	14270	8063	5713
MAX	6760	12200	13100	10300	11600	14200	31300	63400	65600	21300	10500	6630
MIN	6280	6470	10900	5560	8610	9140	13600	26600	21800	11200	6990	5500
AC-FT	393000	580000	771000	414100	528600	666500	1307000	2097000	2370000	877500	495800	340000
CFSM	0.32	0.49	0.63	0.34	0.48	0.54	1.10	1.71	2.00	0.72	0.40	0.29
IN.	0.37	0.55	0.72	0.39	0.50	0.63	1.23	1.97	2.23	0.82	0.47	0.32

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1911 - 2003, BY WATER YEAR (WY)

MEAN	10540	11470	12030	11980	11830	11900	19400	44380	54780	25750	11010	9616
MAX	23550	21170	27630	22320	30070	31390	47830	89760	101600	76930	24840	16920
(WY)	1960	1928	1996	1934	1996	1996	1934	1928	1948	1916	1916	1985
MIN	4760	4588	4075	3344	3940	4636	6112	13010	13560	7843	5656	4768
(WY)	1932	1937	1937	1937	1937	1937	1937	1941	1977	1940	1988	1931

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1911 - 2003	
ANNUAL TOTAL	7120110		5465070			
ANNUAL MEAN	19510		14970		19570	
HIGHEST ANNUAL MEAN					29420	1996
LOWEST ANNUAL MEAN					8845	1941
HIGHEST DAILY MEAN	85400	Jun 4	65600	Jun 1	133000	May 31 1948
LOWEST DAILY MEAN	6280	Oct 22	5500	Sep 7	b3200	Feb 8 1936
ANNUAL SEVEN-DAY MINIMUM	6340	Oct 17	5540	Sep 5	3250	Jan 11 1937
MAXIMUM PEAK FLOW			66400	Jun 2	134000	Jun 5 1948
MAXIMUM PEAK STAGE			12.74	Jun 2	19.17	Jun 5 1948
INSTANTANEOUS LOW FLOW			a5450	Jan 11	c3200	Dec 10 1940
ANNUAL RUNOFF (AC-FT)	14120000		10840000		14180000	
ANNUAL RUNOFF (CFSM)	0.98		0.75		0.98	
ANNUAL RUNOFF (INCHES)	13.27		10.19		13.32	
10 PERCENT EXCEEDS	48700		30900		44600	
50 PERCENT EXCEEDS	12500		11000		13200	
90 PERCENT EXCEEDS	6720		5890		6500	

a--Gage height, 3.40 ft.
b--Estimated during period of ice-affected gage-height record.
c--Gage height, 2.85 ft.
e--Estimated.

PEND OREILLE RIVER BASIN

12389500 THOMPSON RIVER NEAR THOMPSON FALLS, MT

LOCATION.--Lat 47°35'31", long 115°13'43" (NAD 27), in $NW^1/_4NE^1/_4SE^1/_4$ sec.7, T.21 N., R.28 W., Sanders County, Hydrologic Unit 17010213, Lolo National Forest, on right bank 1.2 mi upstream from mouth and 5.5 mi east of Thompson Falls.

DRAINAGE AREA.--642 mi^2.

PERIOD OF RECORD.--March to September 1911, October 1911 to September 1916 (occasional gage heights, discharges, and discharge measurements), April 1956 to current year. Records for January and February 1911, published in WSP 916, have been found to be unreliable and should not be used.

REVISED RECORDS.--WSP 1246: 1911. See also PERIOD OF RECORD.

GAGE.--Water-stage recorder. Elevation of gage is 2,429.97 ft (NGVD 29) (Bureau of Public Roads bench mark). October 1911 to September 1916, nonrecording gage at site 0.2 mi upstream at different elevation.

REMARKS.--Records good. Minor diversions upstream from station for irrigation, acreage unknown. Diversion from headwaters of Alder Creek in $SW^1/_4$ sec.16, T.23 N., R.25 W., to supplement water supply for storage in Upper Dry Fork Reservoir in Little Bitterroot River basin. U.S. Geological Survey satellite telemeter at station. Several observations of water temperature and specific conductance were made during the year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in May to June 1948 reached a discharge of 6,190 ft^3/s, by slope-area measurement of peak flow at site 0.2 mi downstream.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	188	e130	150	150	435	165	655	706	1050	280	165	129
2	186	e140	150	149	348	162	712	695	975	274	164	129
3	184	e150	150	163	277	161	642	711	891	268	176	128
4	184	160	150	163	242	158	576	774	818	260	179	126
5	182	155	150	159	221	158	527	819	754	255	171	126
6	182	162	149	152	206	160	485	784	701	251	166	123
7	178	163	149	145	189	157	447	736	662	244	168	123
8	176	168	148	140	194	152	424	681	639	245	164	126
9	175	171	148	123	191	158	430	630	631	243	160	137
10	174	174	147	91	186	166	457	587	626	234	155	137
11	174	170	150	128	180	182	529	557	600	227	152	137
12	174	169	148	147	175	211	627	550	557	222	150	138
13	175	175	150	157	172	257	724	570	524	217	150	133
14	175	175	156	151	178	332	780	609	501	216	147	131
15	175	170	172	145	175	352	768	707	470	213	145	127
16	174	164	174	139	174	346	718	774	444	210	146	127
17	173	167	166	131	176	341	674	745	425	207	145	134
18	173	162	153	136	170	318	645	693	414	204	143	132
19	173	161	151	133	167	296	602	632	413	201	142	130
20	173	162	133	132	168	289	576	578	459	198	140	131
21	172	162	136	131	172	286	590	546	427	195	138	131
22	169	164	149	126	175	321	680	530	403	194	139	129
23	169	184	146	131	155	470	822	546	382	191	146	126
24	168	171	144	141	118	459	906	679	363	188	144	124
25	165	148	142	144	138	415	980	1020	350	187	140	123
26	165	154	142	175	163	399	999	1270	331	185	138	121
27	165	158	155	212	176	377	912	1190	316	182	136	119
28	172	155	160	200	169	353	824	1130	306	177	133	119
29	e130	152	161	185	---	334	763	1220	296	173	132	117
30	e110	152	154	186	---	327	726	1240	289	170	131	117
31	e120	---	153	237	---	404	---	1140	---	167	131	---
TOTAL	5253	4848	4686	4702	5490	8666	20200	24049	16017	6678	4636	3830
MEAN	169	162	151	152	196	280	673	776	534	215	150	128
MAX	188	184	174	237	435	470	999	1270	1050	280	179	138
MIN	110	130	133	91	118	152	424	530	289	167	131	117
AC-FT	10420	9620	9290	9330	10890	17190	40070	47700	31770	13250	9200	7600
CFSM	0.26	0.25	0.24	0.24	0.31	0.44	1.05	1.21	0.83	0.34	0.23	0.20
IN.	0.30	0.28	0.27	0.27	0.32	0.50	1.17	1.39	0.93	0.39	0.27	0.22

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1957 - 2003, BY WATER YEAR (WY)

MEAN	182	199	207	207	253	353	766	1306	1019	405	237	193
MAX	343	501	880	719	1226	1344	1674	3154	2369	724	382	288
(WY)	1960	1996	1996	1974	1996	1972	1996	1997	1974	1974	1997	1997
MIN	112	115	101	112	103	120	238	374	244	140	113	105
(WY)	1995	1988	1993	1988	1994	1964	1977	1977	1977	1977	1977	1994

12389500 THOMPSON RIVER NEAR THOMPSON FALLS, MT--Continued

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1957 - 2003	
ANNUAL TOTAL	196832		109055			
ANNUAL MEAN	539		299		444	
HIGHEST ANNUAL MEAN					804	1997
LOWEST ANNUAL MEAN					176	1977
HIGHEST DAILY MEAN	4120	May 23	1270	May 26	5360	Jun 9 1964
LOWEST DAILY MEAN	110	Oct 30	91	Jan 10	67	Nov 24 1993
ANNUAL SEVEN-DAY MINIMUM	115	Jan 1	120	Sep 24	73	Dec 31 1994
MAXIMUM PEAK FLOW			1300	May 26	6080	Jun 9 1964
MAXIMUM PEAK STAGE			4.31	May 26	8.53	Jun 9 1964
INSTANTANEOUS LOW FLOW			74	Jan 10	a48	Dec 4 1992
INSTANTANEOUS LOW STAGE			2.38	Jan 10	b1.01	Dec 17 1964
ANNUAL RUNOFF (AC-FT)	390400		216300		321900	
ANNUAL RUNOFF (CFSM)	0.84		0.47		0.69	
ANNUAL RUNOFF (INCHES)	11.41		6.32		9.40	
10 PERCENT EXCEEDS	1500		694		1080	
50 PERCENT EXCEEDS	214		174		237	
90 PERCENT EXCEEDS	133		131		133	

a--Gage height 2.02 ft, result of freezeup.
b--Result of freezeup.
e--Estimated.

PEND OREILLE RIVER BASIN

12390700 PROSPECT CREEK AT THOMPSON FALLS, MT

LOCATION.--Lat 47°35'10", long 115°21'15" (NAD 27), in lot 12, $SE^1/_4SE^1/_4SE^1/_4$ sec.7, T.21 N., R.29 W., Sanders County, Hydrologic Unit 17010213, on right bank 500 ft downstream from Dry Creek, 0.5 mi upstream from mouth, and 0.7 mi south of Thompson Falls.

DRAINAGE AREA.--182 mi^2.

PERIOD OF RECORD.--April 1956 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 2,382.40 ft (NGVD 29).

REMARKS.--Records good. No known regulation or diversions upstream from station. U.S. Geological Survey satellite telemeter at station. Several observations of water temperature and specific conductance were made during the year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	58	43	37	38	293	93	463	427	662	122	69	50
2	57	43	37	38	447	91	520	421	612	119	68	49
3	57	42	36	40	354	90	486	433	565	116	71	49
4	57	42	36	39	292	89	441	452	521	114	69	48
5	56	42	36	40	255	89	401	455	478	112	68	48
6	55	42	36	39	226	88	369	440	449	109	67	47
7	55	42	36	38	202	86	338	417	430	107	66	47
8	54	42	36	38	185	83	317	391	416	108	65	48
9	54	42	35	38	170	84	316	366	402	104	64	48
10	53	42	35	37	157	86	324	345	388	101	63	46
11	53	41	36	37	147	92	356	334	362	99	62	46
12	51	41	35	38	139	108	408	339	329	97	62	45
13	51	42	36	39	132	116	444	356	304	95	61	44
14	51	41	38	39	125	130	472	386	283	94	60	43
15	50	40	40	39	120	208	480	454	260	92	60	43
16	50	40	39	39	118	284	462	485	240	90	60	44
17	50	40	38	39	117	283	442	462	224	88	59	45
18	49	39	36	39	113	267	420	430	212	86	59	43
19	49	39	36	39	109	254	393	393	205	85	57	42
20	48	39	36	39	107	248	373	365	209	83	58	41
21	48	38	36	39	109	242	371	345	195	82	57	41
22	47	39	36	39	109	286	403	335	185	80	57	40
23	47	48	36	40	104	515	476	353	173	79	57	40
24	47	41	36	39	98	548	529	465	163	78	56	39
25	46	39	36	40	96	481	567	686	156	76	54	38
26	46	38	36	46	96	431	576	797	147	75	54	38
27	45	38	39	46	95	380	541	747	140	74	52	38
28	46	37	39	44	95	340	497	743	135	73	52	38
29	45	37	41	43	---	313	464	797	130	72	52	38
30	44	37	39	46	---	296	445	776	125	71	51	37
31	43	---	39	60	---	334	---	715	---	69	50	---
TOTAL	1562	1216	1143	1254	4610	7035	13094	14910	9100	2850	1860	1303
MEAN	50.4	40.5	36.9	40.5	165	227	436	481	303	91.9	60.0	43.4
MAX	58	48	41	60	447	548	576	797	662	122	71	50
MIN	43	37	35	37	95	83	316	334	125	69	50	37
AC-FT	3100	2410	2270	2490	9140	13950	25970	29570	18050	5650	3690	2580
CFSM	0.28	0.22	0.20	0.22	0.90	1.25	2.40	2.64	1.67	0.51	0.33	0.24
IN.	0.32	0.25	0.23	0.26	0.94	1.44	2.68	3.05	1.86	0.58	0.38	0.27

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1957 - 2003, BY WATER YEAR (WY)

MEAN	54.7	80.6	113	117	161	221	479	789	538	162	83.5	61.6
MAX	168	469	701	735	875	828	877	1425	1468	317	109	79.9
(WY)	1960	1996	1996	1974	1996	1972	1969	1997	1974	1997	1982	1959
MIN	28.7	28.8	29.9	29.1	26.4	31.8	84.5	297	142	73.7	48.5	35.8
(WY)	2002	2002	1988	2001	2001	2001	2001	1977	1987	1977	1977	2001

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1957 - 2003	
ANNUAL TOTAL	108005		59937			
ANNUAL MEAN	296		164		238	
HIGHEST ANNUAL MEAN					441	1974
LOWEST ANNUAL MEAN					85.8	2001
HIGHEST DAILY MEAN	1860	May 30	a797	May 26	4960	Jan 16 1974
LOWEST DAILY MEAN	35	Dec 9	35	Dec 9	25	Feb 19 2001
ANNUAL SEVEN-DAY MINIMUM	36	Dec 6	36	Dec 6	25	Feb 27 2001
MAXIMUM PEAK FLOW			a817	May 26	5490	Jan 16 1974
MAXIMUM PEAK STAGE			a3.79	May 26	9.86	Jan 16 1974
INSTANTANEOUS LOW FLOW			b35	Dec 8	22	Feb 8 2001
ANNUAL RUNOFF (AC-FT)	214200		118900		172700	
ANNUAL RUNOFF (CFSM)	1.63		0.90		1.31	
ANNUAL RUNOFF (INCHES)	22.08		12.25		17.79	
10 PERCENT EXCEEDS	861		446		652	
50 PERCENT EXCEEDS	108		69		101	
90 PERCENT EXCEEDS	39		38		43	

a--Also occurred on May 29.
b--Also occurred on December 9-13, 19-22.

PEND OREILLE RIVER BASIN

12391400 CLARK FORK BELOW NOXON RAPIDS DAM, NEAR NOXON, MT

LOCATION.--Lat 47°57'40", long 115°43'58" (NAD 27), in SW$^1/_4$ sec.33, T.26 N., R. 32 W., Sanders County, Hydrologic Unit 17010213, at Noxon Rapids Dam, 1 mi upstream from Rock Creek, 3 mi southeast of Noxon, and at river mile 169.7.

DRAINAGE AREA.--21,833 mi^2.

PERIOD OF RECORD.--May 1960 to current year.

GAGE.--Plant generator rating or discharge through powerplant. Water-stage recorder on reservoir determines head on taintor gates. Elevation of gage is 2,320 ft (NGVD 29) (levels by The Washington Water Power Co.).

REMARKS.--Records good. Flow regulated by Hungry Horse Reservoir (station 12362000) and Flathead Lake (station 12371500). Diversions for irrigation of about 350,000 acres upstream from station. Some sub-surface flow indicated by comparison with records for adjacent gaging stations. Figures of discharge given herein are combined flows through turbines and spillway. Several observations of water temperature and specific conductance were made during the year.

COOPERATION.--Records collected by the Avista Corporation., under general supervision of the Geological Survey, in connection with a Federal Power Commission project.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7990	6450	7940	10400	13600	3580	18100	35300	67900	26000	12700	8640
2	5380	7230	14600	9840	13000	7680	22200	29900	70200	22500	6710	9020
3	6460	7120	11200	9820	14500	12600	22900	25100	63600	21500	5920	7130
4	8570	8340	12300	6890	15900	8980	23000	25700	62500	17200	11100	6440
5	5600	8110	12400	7400	11200	11500	17000	30900	60000	21600	11700	4960
6	5230	4940	12800	8620	12200	10700	12300	34400	56200	16400	11300	6050
7	6140	7110	12600	7720	10600	11600	21500	35800	52400	19300	8940	4760
8	6600	5910	12100	8110	6390	7190	19200	33600	50300	16300	9890	5130
9	7400	8720	15500	7050	8020	8870	20100	33400	49600	14100	6770	4850
10	7660	6770	14200	6910	11200	12000	22500	29700	44800	17000	8340	6530
11	7930	9590	14400	5650	10300	12500	23000	30200	41000	17900	9570	5000
12	4730	10800	13400	4750	12000	12500	16500	33800	41700	15200	8060	5670
13	7430	13700	13800	5710	14300	14900	19600	33200	41900	13000	8580	5760
14	7370	12800	10300	6300	12800	15800	24300	30900	40600	12000	8410	4970
15	6450	14200	12400	5830	5800	11500	26100	31100	35600	16300	8320	5780
16	6290	8460	14300	5960	7250	11000	30200	31900	40800	18700	7660	6390
17	6430	8200	15000	7030	11300	15100	29000	28600	37300	16600	7850	6220
18	8660	14800	16400	7220	12400	16100	28300	27700	39400	16000	8800	6160
19	4870	14200	14700	5340	13300	17500	22900	31200	40200	9960	8450	6110
20	5520	13600	14700	5820	12100	11700	26600	33100	31800	11400	7990	5890
21	6740	15700	11700	6360	11200	9100	26400	31300	32700	15100	8660	6030
22	6860	12800	7430	6420	6580	9740	24200	32800	29900	14600	10500	6880
23	6290	10500	13900	6130	6410	10900	24800	32900	34200	15400	7200	5520
24	7920	8520	15100	6820	14200	15800	29200	29100	35300	14700	7320	6920
25	6630	17300	10600	5420	12900	16700	33600	30700	31000	10100	10300	5600
26	7620	11900	16100	5490	16700	18500	28600	46100	35800	8260	7640	6880
27	8030	10500	11400	5980	9030	16700	33700	47200	26300	12400	5550	4910
28	5770	11300	12800	8640	8470	14300	32800	56000	22200	14900	7450	5120
29	8790	10100	11700	8900	---	8200	31700	61600	18800	12600	8600	5810
30	8310	10700	14800	11200	---	9590	30200	62600	25800	14100	6310	5360
31	7030	---	12800	7640	---	13800	---	65800	---	12400	6450	---
TOTAL	212700	310370	403370	221370	313650	376630	740500	1121600	1259800	483520	263040	180490
MEAN	6861	10350	13010	7141	11200	12150	24680	36180	41990	15600	8485	6016
MAX	8790	17300	16400	11200	16700	18500	33700	65800	70200	26000	12700	9020
MIN	4730	4940	7430	4750	5800	3580	12300	25100	18800	8260	5550	4760
AC-FT	421900	615600	800100	439100	622100	747000	1469000	2225000	2499000	959100	521700	358000

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1960 - 2003, BY WATER YEAR (WY)

MEAN	11650	13090	14140	14280	15040	16270	22690	40480	50570	23130	10580	10150
MAX	16160	19890	31480	22230	34640	33700	46450	88150	92590	40730	17720	16410
(WY)	1976	1996	1996	1974	1996	1996	1996	1997	1974	1982	1997	1985
MIN	6172	6830	8606	7141	6185	6925	4873	14460	13400	8330	5350	4838
(WY)	1961	2002	2002	2003	2001	2001	1977	1973	1977	1977	1988	1973

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1960 - 2003	
ANNUAL TOTAL	7790340		5887040			
ANNUAL MEAN	21340		16130		20180	
HIGHEST ANNUAL MEAN					31870	1996
LOWEST ANNUAL MEAN					11170	1977
HIGHEST DAILY MEAN	88500	Jun 4	70200	Jun 2	125000	Jun 12 1964
LOWEST DAILY MEAN	4660	Jan 1	3580	Mar 1	60	Jan 29 1989
ANNUAL SEVEN-DAY MINIMUM	6280	Oct 2	5330	Sep 5	2250	Aug 30 1963
ANNUAL RUNOFF (AC-FT)	15450000		11680000		14620000	
10 PERCENT EXCEEDS	54700		33300		40700	
50 PERCENT EXCEEDS	13900		11700		15000	
90 PERCENT EXCEEDS	7120		5920		7260	

SMALLER RESERVOIRS IN PEND OREILLE RIVER BASIN IN MONTANA

All elevations listed for the following reservoirs are referenced to the National Geodetic Vertical Datum of 1929.

CAMAS RESERVOIRS.--A group of four reservoirs in the Little Bitterroot River basin operated for irrigation and recreation. Nonrecording gages are set to approximate sea level and are read on the last day of the month. Figures given herein represent usable contents. Records furnished by Bureau of Indian Affairs. May to July 1948 scattered daily contents for individual reservoirs, published in WSP 1080.

12372500 LITTLE BITTERROOT LAKE.--Lat 48°05'34", long 114°41'51" (NAD 27), in $SE^1/_4SE^1/_4SW^1/_4$ sec.16, T.27 N., R.24 W., Flathead County, Hydrologic Unit 17010212, at dam on Little Bitterroot River, 2 mi southwest of Marion and at river mile 70.3. DRAINAGE AREA, 31.8 mi^2. PERIOD OF RECORD, December 1939, April 1940, September 1940 to current year.

Reservoir is formed by earthfill dam; storage began in 1918. Usable capacity, 26,400 acre-ft between elevation 3,897.98 ft and 3,906.48 ft. No dead storage. Prior to 1960, usable capacity, 24,000 acre-ft.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 27,570 acre-ft, Apr. 30, 1997, elevation, 3,906.74 ft; no storage at times in 1939-46.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 9,000 acre-ft, Apr. 30, elevation, 3,901.57 ft; minimum observed, 5,300 acre-ft, Sept. 30, elevation, 3,900.28 ft.

12373500 HUBBART RESERVOIR.--Lat 47°55'43", long 114°43'53" (NAD 27), in $SE^1/_4NE^1/_4$ sec.18, T.25 N., R.24 W., Flathead County, Hydrologic Unit 17010212, at dam on Little Bitterroot River, 9 mi northwest of Niarada and at river mile 55.8. DRAINAGE AREA: 114 mi^2. PERIOD OF RECORD, December 1939, April 1940, September 1940 to current year.

Reservoir is formed by concrete variable-radium dam; storage began in 1924. Usable capacity, 12,120 acre-ft between elevation 3,140.0 ft and 3,210.0 ft. No dead storage.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 13,050 acre-ft, May 31, 1959, elevation, 3,220.92 ft; no storage September to December 1959, Sept. 30, Oct. 1, 1973, October through November 1987.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 9,260 acre-ft, May 31, elevation, 3,212.10 ft; minimum observed, 383 acre-ft, Sept. 30, elevation, 3,166.50 ft.

12375000 UPPER DRY FORK RESERVOIR.--Lat 47°44'55", long 114°40'53" (NAD 27), in $SE^1/_4SE^1/_4SW^1/_4$ sec. 16, T.23 N., R.24 W., Sanders County, Hydrologic Unit 17010212, at dam on Dry Fork Creek, 4 mi northwest of Lonepine. DRAINAGE AREA, 8.53 mi^2. PERIOD OF RECORD. April 1940, September 1940 to current year.

Reservoir is formed by earthfill dam; storage began in 1940. Usable capacity, 2,810 acre-ft between elevation 2,900.0 ft and 2,928.5 ft. No dead storage. Prior to 1960, usable capacity, 2,700 acre-ft. Natural flow of Alder Creek in Thompson River basin is diverted in $SW^1/_4$ sec 16, T.23 N., R.25 W., and carried by inter-basin canal to upper Dry Fork Creek for storage in this reservoir.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 3,140 acre-ft, May 31, 1980, elevation, 2,929.5 ft; no storage at times in 1940, 1942, 1943.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 2,810 acre-ft, June 30, elevation, 2,928.50 ft; minimum, 493 acre-ft, Aug. 31, elevation, 2,916.00 ft.

12375500 DRY FORK RESERVOIR.--Lat 47°42'00", long 114°40'02" (NAD 27), in $SW^1/_4NW^1/_4NW^1/_4$ sec.3, T.22 N., R.24 W., Sanders County, Hydrologic Unit 17010212, at dam on Dry Fork Creek, 1 mi west of Lonepine. DRAINAGE AREA, 17.8 mi^2. PERIOD OF RECORD, December 1939, April 1940, September 1940 to current year. Records published in WSP 1316 were listed in error and should not be used.

Reservoir is formed by earthfill dam; storage began in 1921. Usable capacity, 3,890 acre-ft, between elevation 2,830.5 ft and 2,856.3 ft. Prior to 1960, usable capacity, 4,000 acre-ft. No dead storage.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 4,270 acre-ft, May 31, 1980, elevation, 2,857.4 ft; no storage Aug. 31, 1944, Aug. 31, Sept. 30, 1946, Oct. 31, 1951.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 3,000 acre-ft, June 30, elevation, 2,853.70 ft; minimum observed, 740 acre-ft, Sept. 30, elevation, 2,842.90 ft.

MISSION VALLEY RESERVOIRS.--A group of eight reservoirs, in an area east of and tributary to Flathead River and between Flathead Lake and Jocko River, Lake County, Hydrologic Unit 17010212, is operated for irrigation.

PERIOD OF RECORD, December 1939, September 1940 to current year. Nonrecording gages are set to approximate sea level, and are read on the last day of the month. Figures given herein represent usable contents. Records furnished by Bureau of Indian Affairs. April to July 1948 monthend contents and daily maximum for individual reservoirs, published in WSP 1080.

12371000 TURTLE LAKE.--Lat 47°40'19", long 114°04'32" (NAD 27), in $SW^1/_4NW^1/_4NE^1/_4$ sec.18, T.22 N., R.19 W., at outlet works 4 mi southeast of Polson, fed entirely by various canals; storage began in 1932. Prior to October 1968, published as "Twin Reservoir." Usable capacity, 899 acre-ft between elevation 3,061.0 ft and 3,090.5 ft. No dead storage.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 1,000 acre-ft, June 30, 1996, elevation, 3,092.02 ft; no storage at times in July 1941, August and September 1944, October 1957, July, August and September 1977, July through October 1992, March 1994, October through December 1994, August 2001, and August 2003.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 336 acre-ft, June 30, elevation, 3,078.60 ft; no storage, Aug. 31.

SMALLER RESERVOIRS IN PEND OREILLE RIVER BASIN IN MONTANA--Continued

12376700 LOWER CROW RESERVOIR.--Lat 47°30'09", long 114°13'35" (NAD 27), in $SW^1/_4SE^1/_4SE^1/_4$ sec.11, T.20 N., R.21 W., at outlet works on Crow Creek, 5.2 mi northwest of Charlo, at river mile 3.44; storage began in 1933. Usable capacity 10,350 acre-ft between elevation 2,800 ft and 2,877.0 ft. No dead storage.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 10,770 acre-ft, May 21, 22, 1948, elevation, 2,878.2 ft; no storage Sept. 30, 1963, Oct. 31, Nov. 30, 1981.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 10,160 acre-ft, Dec. 31, elevation, 2,876.43 ft; minimum observed, 1,630 acre-ft, Sept. 30, elevation 2,835.30 ft.

12377200 MISSION RESERVOIR.--Lat 47°18'54", long 114°01'15" (NAD 27), in $NW^1/_4SW^1/_4SE^1/_4$ sec.15, T.18 N., R.19 W., at outlet works on Mission Creek, 4 mi east of St. Ignatius and at river mile 16.7; storage began in 1935. Usable capacity 8,130 acre-ft between elevation 3,340.7 ft and 3,406.0 ft. Prior to 1993, usable capacity, 7,250 acre-ft. No dead storage.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 8,400 acre-ft, June 30, 2002, elevation, 3,409.86 ft; no storage at times during September 1949, February, March, 1964.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 7,900 acre-ft, June 30, elevation, 3,408.21 ft; minimum observed, 794 acre-ft, Oct. 31, elevation, 3,377.28 ft.

12377300 ST. MARYS LAKE.--Lat 47°15'58", long 113°56'08" (NAD 27), in $SW^1/_4NE^1/_4NE^1/_4$ sec.6, T.17 N., R.18 W., at outlet works on Dry Creek, 8 mi southwest of St. Ignatius, fed by water diverted from Jocko River; storage began in 1919. Prior to October 1968, published as "Tabor Reservoir." Usable capacity, 23,500 acre-ft between elevation 3,911.5 ft and 4,025.0 ft, not including contents of natural lake. Prior to 1993, usable capacity, 23,300 acre-ft. No dead storage.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 23,510 acre-ft, June 30, 1976, June 30, 1978, elevation, 4,025.7 ft; no storage Sept. 30, 1969, Feb. 28, 1995, and December 2001 through March, 2002.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 23,400 acre-ft, June 30, elevation, 4,025.30 ft; minimum observed, 268 acre-ft, Nov. 30, elevation, 3,913.26 ft.

12377900 PABLO RESERVOIR.--Lat 47°38'25", long 114°08'33" (NAD 27), in $SW^1/_4SW^1/_4NE^1/_4$ sec.27, T.22 N., R.20 W., at outlet works 3 mi south of Polson, 3 mi northwest of Pablo, fed entirely by various canals, some water supplies by Flathead pumping plant; storage began in 1914. Usable capacity, 28,400 acre-ft between elevation 3,179 ft, gate sill, and 3,210.2 ft. Prior to 1994 water year, published as usable capacity, 27,100 acre-ft. No dead storage.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 28,760 acre-ft, June 30, 1998, elevation, 3,211.07 ft; no storage at times in several years.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 15,450 acre-ft, June 30, elevation, 3,203.60 ft; minimum observed, 893 acre-ft, Aug. 31, elevation, 3,186.31 ft.

12378200 McDONALD RESERVOIR.--Lat 47°25'31", long 113°59'27" (NAD 27), in $SE^1/_4NE^1/_4NE^1/_4$ sec.10, T.19 N., R.19 W., at outlet works on Post Creek, 9 mi east of Charlo, and at river mile 12.4; storage began in 1919. Usable capacity, 7,220 acre-ft between elevation 3,545.0 ft, and 3,598.0 ft, not including contents of natural lake. Prior to 1993, usable capacity, 8,220 acre-ft. No dead storage.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 8,330 acre-ft, June 30, 1983, elevation, 3,598.5 ft; no storage Aug. 31, 1961, Aug. 30, 1966, Oct. 31, 1971, Apr. 30, 1972, October 1994 through April 1995, August 1999 to Apr. 30, 2000, December 2001 through February 2002.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 7,340 acre-ft, June 30, elevation, 3,593.60 ft; minimum observed, 335 acre-ft, Sept. 30, elevation, 3,548.50 ft.

12378300 KICKING HORSE RESERVOIR.--Lat 47°27'25", long 114°04'35" (NAD 27), in $SE^1/_4NE^1/_4NE^1/_4$ sec.36, T.20 N., R.20 W., at outlet works 4 mi northeast of Charlo, fed entirely by various canals; storage began in 1930. Usable capacity, 9,200 acre-ft between elevation 3,042.00 ft and 3,061.94 ft. Prior to 1993, usable capacity, 8,350 acre-ft. Dead storage, 70 acre-ft below elevation 3,042.0 ft. Formerly published as 12379700 Kicking Horse Reservoir prior to 1988 water year.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 10,320 acre-ft, June 30, 1976, May 31, 1980, elevation, 3,064.4 ft; no storage Aug. 31, 1961.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 7,190 acre-ft, June 30, elevation, 3,060.50 ft; minimum observed, 1,300 acre-ft, Aug. 31, elevation, 3,049.30 ft.

12378400 NINEPIPE RESERVOIR.--Lat 47°27'20", long 114°08'08" (NAD 27), in $NE^1/_4NW^1/_4NW^1/_4$ sec.34, T.20 N., R.20 W., at outlet works 2 mi northeast of Charlo, fed entirely by various canals; storage began in 1911. Usable capacity 15,000 acre-ft between elevation 2,895.4 ft and 3,010.0 ft. Prior to 1993, usable capacity, 14,870 acre-ft. No dead storage. Formerly published as 12380000 Ninepipe Reservoir prior to 1988 water year.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 16,950 acre-ft, June 30, 1974, elevation, 3,012.3 ft; no storage Aug. 31, 1961.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 9,700 acre-ft, June 30, elevation, 3,006.46 ft; minimum observed, 836 acre-ft, Aug. 31, elevation, 2,995.00 ft.

SMALLER RESERVOIRS IN PEND OREILLE RIVER BASIN IN MONTANA--Continued

12380000 UPPER JOCKO LAKE.--Lat 47°11'34", long 113°42'44" (NAD 27), in $NE^1/_4NW^1/_4$ sec. 36, T. 17 N., R. 17 W., Missoula County, Hydrologic Unit 17010212, at dam on Jocko River, 17.3 mi southeast of Arlee, and at river mile 41.8. DRAINAGE AREA, 2.99 mi^2. PERIOD OF RECORD, April 1968 to current year. Nonrecording gage read at end of month. U.S. Geological Survey began publishing data October 1988. Elevation of gage is at sea level (levels by Bureau of Indian Affairs).

Reservoir is formed by earthfill dam; storage began in 1967. Was previously known as "Black Lake" prior to dam construction. Usable capacity, 5,200 acre-ft, between elevation 4,390.0 ft, outlet sill, and 4,440.0 ft, spillway elevation. Prior to 1993, usable capacity, 4,440 acre-ft. Dead storage, 763 acre-ft. Transmountain diversion takes water from Placid Creek in Clearwater River basin in $SW^1/_4$ sec. 29, T. 17 N., R. 16 W., to Upper Jocko Lake, thence to Lower Jocko Lake. Some water may then be diverted to St. Mary's Lake for use in the Mission Valley. Figures given herein represent usable contents. Water is used for irrigation and recreation. Records furnished by Bureau of Indian Affairs.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 4,290 acre-ft, May 31, 1971, elevation, 4,439.1 ft; no storage at times each year.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 1,540 acre-ft, May 31, elevation, 4,415.10 ft; no storage most of year.

12380500 LOWER JOCKO LAKE.--Lat 47°12'10", long 113°45'35" (NAD 27), in $NW^1/_4SW^1/_4NW^1/_4$ sec.27, T.17 N., R.17 W., Missoula County, Hydrologic Unit 17010212, at dam on Jocko River, 15 mi east of Arlee, and at river mile 39.3. DRAINAGE AREA, 7.39 mi^2. PERIOD OF RECORD, December 1939, April 1940, September, 1940, to current year (no winter records most years since 1947). Records for November 1957, published only in WSP 1736. May to July 1948 scattered daily contents, published in WSP 1080. Nonrecording gage read at end of month. Elevation of gage is at sea level (levels by Bureau of Indian Affairs).

Reservoir is formed by earthfill dam; storage began in 1937. Usable capacity, 6,380 acre-ft between elevation 4,267.0 ft and 4,340.0 ft. Prior to 1960, usable capacity, 7,600 acre-ft at elevation 4,350 ft and 1960-1992, usable capacity, 5,380 acre-ft. Dead storage unknown below elevation 4,267 ft, elevation of natural lake outlet. Transmountain diversion takes water from Placid Creek in Clearwater River basin in $SW^1/_4$ sec.29, T.17 N., R.16 W., to Upper Jocko Lake, thence to Lower Jocko Lake. Some water may then be diverted to St. Mary's Lake for use in the Mission Valley. Figures given herein represent usable contents. Water is used for irrigation and recreation. Records furnished by Bureau of Indian Affairs.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 6,700 acre-ft, June 9, 1948, elevation, 4,342.7 ft; no storage at times each year.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 3,530 acre-ft, June 30, elevation, 4,312.76 ft; no storage most of year.

12390000 THOMPSON FALLS RESERVOIR.--Lat 47°35'42", long 115°21'36" (NAD 27), in $NE^1/_4$ sec.7, T.21 N., R.29 W., Sanders County, Hydrologic Unit 17010213, at dam on Clark Fork at Thompson Falls, at river mile 208.0. DRAINAGE AREA, 20,968 mi^2. PERIOD OF RECORD, October 1939 to current year. Nonrecording gage is read several times daily but only monthend figures supplied. Elevation of gage is at sea level (levels by The Montana Power Company).

Reservoir is formed by two concrete dams, first generator installed July 1915. Usable capacity, 14,970 acre-ft between elevation 2,380.0 ft, spillway crest, and 2,396.0 ft, top of flashboards. Dead storage unknown. Figures given herein represent usable contents. Water is used for power development and recreation. Records furnished by PPL EnergyPlus, LLC.

EXTREMES FOR PERIOD OF RECORD: Maximum monthend contents observed, 16,420 acre-ft, May 12, 1997, elevation, 2,396.95 ft; no storage July 31, 1958.

EXTREMES FOR CURRENT YEAR: Maximum monthend contents observed, 15,440 acre-ft, May 26, elevation, 2,396.31 ft; minimum observed, 14,100 acre-ft, Feb. 28, elevation, 2,395.40 ft.

12391300 NOXON RAPIDS RESERVOIR.--Lat 47°57'38", long 115°44'00" (NAD 27), in $NE^1/_4SW^1/_4SW^1/_4$ sec.33, T.26 N., R.32 W., Sanders County, Hydrologic Unit 17010213, at dam on Clark Fork, 3 mi southeast of Noxon, 7.2 mi upstream from Bull River, and at river mile 169.7. DRAINAGE AREA, 21,833 mi^2. PERIOD OF RECORD, April 1959 to current year. Prior to October 1962, published as "Noxon Reservoir." Record of daily elevation on file in Helena district office. Water-stage recorder, midnight readings. Elevation of gage is at sea level (levels by the Washington Water Power Company).

Reservoir is formed by concrete and earthfill dam, construction began in 1955, completed in 1959. Storage began Apr. 3, 1959. Usable capacity, 334,600 acre-ft between elevation 2,270.00 ft, minimum operating level, and 2,331.00 ft. Figures given herein represent usable contents. Water is used for power production, flood control, and recreation. Records furnished by the Avista Corporation.

EXTREMES FOR PERIOD OF RECORD: Maximum contents, 335,400 acre-ft, Apr. 7, 1960, elevation, 2,331.10 ft; minimum since first filling, 26,380 acre-ft, May 10, 1967, elevation, 2,277.15 ft.

EXTREMES FOR CURRENT YEAR: Maximum contents, 334,100 acre-ft, May 28, elevation, 2,330.94 ft; minimum, 300,700 acre-ft, Apr. 11, elevation, 2,326.60 ft.

COLUMBIA RIVER BASIN
PEND OREILLE RIVER BASIN

SMALLER RESERVOIRS IN PEND OREILLE RIVER BASIN IN MONTANA--Continued

MONTHEND CONTENTS, IN ACRE-FEET, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Camas Reservoirs	Mission Valley Reservoirs	Upper Jocko Lake	Lower Jocko Lake	Thompson Falls Reservoir	Noxon Rapids Reservoir
Oct. 31	15,550	26,520	0	0	14,460	320,800
Nov. 30	e14,720	e26,750	0	0	14,550	319,900
Dec. 30	e14,720	e28,200	0	0	14,710	323,400
Jan. 31	15,970	e27,310	0	0	14,620	329,500
Feb. 28	e17,020	e27,930	0	0	14,100	307,600
Mar. 31	19,010	29,370	0	0	14,590	327,200
Apr 30.	21,910	33,400	0	1,820	15,100	319,700
May 31	23,130	45,290	1,540	3,430	15,430	332,700
June 30	20,780	79,200	1,490	3,530	14,560	315,200
July 31	13,650	38,860	0	1,860	14,910	312,200
Aug. 31	8,540	9,850	0	277	14,590	328,000
Sept. 30	6,950	17,540	0	0	14,620	329,100

e--Estimated.

12391950 CLARK FORK BELOW CABINET GORGE DAM, NEAR CABINET, ID

LOCATION.--Lat 48°05'18", long 116°04'16" (NAD 27), in $SW^1/_4SW^1/_4NW^1/_4$ sec.27, T.55 N., R.3 E., Cabinet Quad., Bonner County, Hydrologic Unit 17010213, on right bank 0.7 mi downstream from Cabinet Gorge Dam at cableway, 2.1 mi downstream from Blue Creek, 6.1 mi southeast of Clark Fork, and at mile 149.2.

DRAINAGE AREA.--22,067 mi^2.

PERIOD OF RECORD.--October 1995 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 2,060.00 ft (NGVD 29) (levels by Washington Water Power Co). See WSP 1933 for history of changes made prior to Sept. 30, 1952. Water-stage recorder at site 0.4 mi upstream at elevation 60.00 ft lower Oct. 1, 1952, to Sept. 30, 1964, and at present elevation Oct. 1, 1964, to May 21, 1973.

REMARKS.--Records good. Flow regulated by Hungry Horse Reservoir, Flathead Lake, and Noxon Rapids Reservoir. Extreme diurnal fluctuation caused by powerplant at Cabinet Gorge Dam. Diversions above station for irrigation of about 354,000 acres.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 134,000 ft^3/s, May 18, 1997, gage height, 29.14 ft; minimum daily, 3,330 ft^3/s, Feb. 8, 1998.

EXTREMES FOR CURRENT PERIOD.--Maximum discharge, 81,500 ft^3/s, June 2, gage height, 22.10 ft; minimum daily, 5,440 ft^3/s, Sept. 9.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8240	6970	7940	9990	15700	5460	20100	33700	70000	27100	12400	8920
2	7290	6670	15700	10800	15400	6640	23500	35200	73400	22600	6910	9660
3	6280	6030	10500	9060	14500	13200	27300	25200	66600	23300	7800	7660
4	6930	9660	12000	7370	16500	9600	23800	28400	65400	18200	9960	5840
5	6180	7460	12700	7280	11800	11200	17700	33100	63300	21800	13100	5590
6	6150	5690	12800	9400	12900	10700	13800	36200	59300	17600	11100	5650
7	6140	6830	12200	7080	11700	11800	23300	36300	55700	20400	9560	5650
8	5930	6170	13000	8670	6360	8610	21300	36300	53900	17700	9170	5460
9	8030	8490	14800	6720	8820	9070	20200	36300	53200	14800	6480	5440
10	6570	7380	15300	8010	11900	11300	24500	31700	48900	17800	8570	5560
11	7660	8370	13100	5780	10400	13200	24600	32700	44700	19200	11200	5650
12	6320	10500	13500	5500	13200	12900	17900	36100	43300	14100	7870	5560
13	6470	14900	14000	5490	14400	16300	21000	34900	45100	14700	7450	5520
14	7570	12300	10200	5510	13700	15900	26200	34200	43200	11200	8720	5630
15	6990	13800	12900	5870	6270	12400	28100	34000	39200	18100	9920	5660
16	6510	8850	13800	5890	7730	14200	32500	33200	43000	18200	6430	5640
17	6800	7730	15000	6390	11700	15100	32100	31100	40300	21400	8510	5710
18	7940	15200	17100	7830	13200	19700	30100	29900	41900	14500	7660	5710
19	6170	13900	14700	5590	13100	17600	24600	33100	42400	9670	8320	7000
20	5590	12900	14200	5530	12400	11700	29600	36000	36600	10400	8830	5810
21	6470	15900	12000	5790	12700	10700	26200	32600	34300	16900	8750	5820
22	7140	13500	7490	7300	5970	9760	26400	34000	34200	15200	9430	6510
23	6590	10400	14600	5540	7530	14300	28500	36200	36200	14500	7460	6740
24	8780	8500	15100	7030	14000	17800	29400	31900	36200	15300	7510	5760
25	9130	17200	10200	5950	13500	18000	36300	33900	33300	11600	12000	6010
26	5530	11600	16200	5710	17700	19600	34400	49800	35600	7190	6890	6510
27	7600	10800	12500	6410	9990	18300	36100	51300	30100	13300	5580	5760
28	6360	12400	12600	9420	7560	16600	35500	57200	23500	14800	7830	5480
29	8250	8650	11800	8780	---	8850	35700	62500	20000	13700	8120	5630
30	7720	10700	14500	11900	---	10700	32500	65100	27300	12900	6260	5490
31	7740	---	12700	8980	---	14400	---	69400	---	12700	6330	---
TOTAL	217070	309450	405130	226570	330630	405590	803200	1191500	1340100	500860	266120	183030
MEAN	7002	10320	13070	7309	11810	13080	26770	38440	44670	16160	8585	6101
MAX	9130	17200	17100	11900	17700	19700	36300	69400	73400	27100	13100	9660
MIN	5530	5690	7490	5490	5970	5460	13800	25200	20000	7190	5580	5440
AC-FT	430600	613800	803600	449400	655800	804500	1593000	2363000	2658000	993500	527800	363000

CAL YR 2002 TOTAL 8233640 MEAN 22560 MAX 94200 MIN 5350 AC-FT 16330000
WTR YR 2003 TOTAL 6179250 MEAN 16930 MAX 73400 MIN 5440 AC-FT 12260000

WATER-QUALITY RECORDS

PERIOD OF RECORD.--May 1984 to October 2002, July to September 2003.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: May to July 1998, April to September 2000, November 2001 to October 2002, July 2003 to September 2003 (discontinued).

INSTRUMENTATION.--Temperature recording data logger.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Maximum, 22.5 °C Aug. 9-11, 2003; minimum, 1.5°C Feb. 15, Mar. 22, 2002.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: During period of collection, maximum, 22.5 °C Aug. 9-11; minimum, 16.5°C Sept. 26-30.

REMARKS.--Water-quality data previously published as Clark Fork at Whitehorse Rapids near Cabinet, ID (station 12392000).

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Time	Instan-taneous dis-charge, cfs (00061)	Specif. conduc-tance, wat unf uS/cm 25 degC (00095)	pH, water, unfltrd field, std units (00400)	Temper-ature, air, deg C (00020)	Temper-ature, water, deg C (00010)	Turbid-ity, wat unf lab, Hach 2100AN NTU (99872)	Dis-solved oxygen, mg/L (00300)	Dis-solved oxygen, percent of sat-uration (00301)	Fecal coli-form, M-FC 0.7u MF col/ 100 mL (31625)	Hard-ness, water, unfltrd mg/L as CaCO3 (00900)
JUL											
09...	1115	7850	162	8.0	21.5	18.1	1.1	8.4	96	S1	--
AUG											
12...	1200	7290	178	8.0	28.0	22.6	<1.0	7.3	91	S5	--
SEP											
04...	1040	5390	185	7.5	18.0	20.7	1.0	8.1	98	S1	93

Date	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Sodium, water, fltrd, mg/L (00930)	Sodium, percent (00932)	Potas-sium, water, fltrd, mg/L (00935)	Sulfate water, fltrd, mg/L (00945)	Chlor-ide, water, fltrd, mg/L (00940)	Fluor-ide, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)	Ammonia water, fltrd, mg/L as N (00608)	Ammonia + org-N, water, unfltrd mg/L as N (00625)
JUL											
09...	--	--	--	--	--	--	--	--	--	<.015	.12
AUG											
12...	--	--	--	--	--	--	--	--	--	<.015	.13
SEP											
04...	25.4	7.08	2.41	5	.78	5.0	1.18	<.2	7.5	<.015	.17

Date	Nitrite + nitrate water fltrd, mg/L as N (00631)	Ortho-phos-phate, water, fltrd, mg/L as P (00671)	Phos-phorus, water, unfltrd mg/L (00665)	Sus-pended sedi-ment concen-tration mg/L (80154)	Sus-pended sedi-ment load, tons/d (80155)
JUL					
09...	<.022	<.007	.009	1	21
AUG					
12...	E.011	<.007	.013	6	118
SEP					
04...	E.020	<.007	.024	1	15

E--Estimated.
S--Most probable value.

PEND OREILLE RIVER BASIN

12391950 CLARK FORK BELOW CABINET GORGE DAM, NEAR CABINET, ID--Continued

WATER TEMPERATURE, DEGREES CELSIUS, APRIL 2003 TO SEPTEMBER 2003

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1				---	---	---	22.0	20.0	21.4	21.0	20.0	20.5
2				---	---	---	21.5	21.0	21.4	21.0	20.0	20.5
3				---	---	---	22.0	21.0	21.4	20.5	20.0	20.0
4				---	---	---	22.0	21.0	21.5	20.5	20.0	20.0
5				---	---	---	22.0	20.5	21.5	20.5	19.5	20.0
6				---	---	---	21.5	20.0	21.0	20.5	19.5	20.0
7				---	---	---	21.5	20.5	21.0	20.0	20.0	20.0
8				---	---	---	22.0	21.0	21.5	20.0	19.5	20.0
9				---	---	---	22.5	21.0	21.5	20.5	19.5	20.0
10				18.5	17.0	18.0	22.5	21.0	21.5	19.5	19.0	19.5
11				19.0	17.5	18.5	22.5	21.0	22.0	19.5	19.0	19.0
12				19.0	17.5	18.5	22.0	21.5	22.0	19.0	18.5	19.0
13				19.0	18.0	18.5	22.0	21.0	21.5	19.0	18.0	18.5
14				19.0	17.5	18.5	22.0	21.0	21.5	18.5	18.0	18.0
15				19.0	17.5	19.0	22.0	21.0	21.5	18.5	18.0	18.0
16				19.5	18.0	19.0	22.0	20.5	21.5	18.0	17.5	17.5
17				20.0	18.0	19.0	21.5	20.5	21.5	18.0	17.5	17.5
18				20.0	19.0	19.0	21.5	20.0	21.0	18.0	17.5	17.5
19				20.0	19.0	19.5	22.0	20.5	21.0	17.5	17.0	17.5
20				20.0	19.0	19.5	21.5	20.5	21.0	18.0	17.0	17.5
21				20.5	19.0	20.0	21.5	20.5	21.0	17.5	17.0	17.5
22				20.5	19.0	20.0	21.5	20.5	21.0	17.5	17.0	17.0
23				20.5	19.4	20.0	21.5	20.5	21.0	17.5	17.0	17.0
24				21.0	19.4	20.5	21.5	20.5	21.0	17.5	17.0	17.0
25				21.0	19.5	20.5	21.5	20.0	21.0	17.5	17.0	17.0
26				21.0	19.5	20.5	21.0	20.0	20.5	17.5	16.5	17.0
27				21.5	19.5	20.5	21.0	20.0	20.5	17.5	16.5	17.0
28				21.5	20.0	21.0	21.0	19.5	20.5	17.5	16.5	17.0
29				21.5	20.0	21.0	21.5	20.0	20.5	17.5	16.5	17.0
30				21.5	20.0	21.0	21.0	20.0	20.5	17.0	16.5	17.0
31				22.0	20.5	21.0	21.0	20.5	20.5			
MONTH				---	---	---	22.5	19.5	21.0	21.0	16.5	18.5

PEND OREILLE RIVER BASIN

12392000 CLARK FORK AT WHITEHORSE RAPIDS, NEAR CABINET, ID

LOCATION.--Lat 48°05'30", long 116°07'00" (NAD 27), in NW$^1/_4$ sec.30, T.55 N., R.3 E., Cabinet Quad., Bonner County, Hydrologic Unit 17010213, on right bank 3.0 mi downstream from Cabinet Gorge Dam, 4.5 mi southeast of Clark Fork, and at mile 146.9.

DRAINAGE AREA.--22,073 mi^2.

PERIOD OF RECORD.--September 1928 to current year. Prior to October 1952, published as "near Heron, Mont."

REVISED RECORDS.--WSP 1182: 1936. WSP 1736: 1931, 1936(m), 1937. WRD-ID-1973-1: 1972(M). WDR-ID-1973-1: 1972(M).

REMARKS.--Flow regulated by Hungry Horse Reservoir, Flathead Lake, and Noxon Rapids Reservoir. Extreme diurnal fluctuation caused by powerplant at Cabinet Gorge Dam. Diversions above station for irrigation of about 354,000 acres. Discharge measurements made at Whitehorse Rapids indicate about 600 ft^3/s ground-water inflow between the measuring cableway for Clark Fork River below Cabinet Gorge Dam (12391950) and Whitehorse Rapids. Records given herein represent flow at Whitehorse Rapids, computed by adding this 600 ft^3/s to observed flows at 12391950, and are considered comparable to records at former site near Heron, except for minor surface inflow from additional drainage area.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 153,000 ft^3/s, May 29 to June 1, 1948; maximum gage height, 50.97 ft, May 31, 1948, site and elevation then in use; minimum observed, 270 ft^3/s, Aug. 12, 1952 (discharge measurement), at sites in use since October 1952, during filling of Cabinet Gorge Reservoir; minimum daily since reservoir filled, 762 ft^3/s, Sept. 2, 1962.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1894 reached a discharge of 195,000 ft^3/s from floodmark, elevation of 2,137.1 ft, at site about 4 mi upstream and 0.1 mi below "near Heron" site.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 74,000 ft^3/s, June 2; minimum daily, 6,040 ft^3/s, Sept. 9.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8840	7570	8540	10600	16300	6060	20700	34300	70600	27700	13000	9520
2	7890	7270	16300	11400	16000	7240	24100	35800	74000	23200	7510	10300
3	6880	6630	11100	9660	15100	13800	27900	25800	67200	23900	8400	8260
4	7530	10300	12600	7970	17100	10200	24400	29000	66000	18800	10600	6440
5	6780	8060	13300	7880	12400	11800	18300	33700	63900	22400	13700	6190
6	6750	6290	13400	10000	13500	11300	14400	36800	59900	18200	11700	6250
7	6740	7430	12800	7680	12300	12400	23900	36900	56300	21000	10200	6250
8	6530	6770	13600	9270	6960	9210	21900	36900	54500	18300	9770	6060
9	8630	9090	15400	7320	9420	9670	20800	36900	53800	15400	7080	6040
10	7170	7980	15900	8610	12500	11900	25100	32300	49500	18400	9170	6160
11	8260	8970	13700	6380	11000	13800	25200	33300	45300	19800	11800	6250
12	6920	11100	14100	6100	13800	13500	18500	36700	43900	14700	8470	6160
13	7070	15500	14600	6090	15000	16900	21600	35500	45700	15300	8050	6120
14	8170	12900	10800	6110	14300	16500	26800	34800	43800	11800	9320	6230
15	7590	14400	13500	6470	6870	13000	28700	34600	39800	18700	10500	6260
16	7110	9450	14400	6490	8330	14800	33100	33800	43600	18800	7030	6240
17	7400	8330	15600	6990	12300	15700	32700	31700	40900	22000	9110	6310
18	8540	15800	17700	8430	13800	20300	30700	30500	42500	15100	8260	6310
19	6770	14500	15300	6190	13700	18200	25200	33700	43000	10300	8920	7600
20	6190	13500	14800	6130	13000	12300	30200	36600	37200	11000	9430	6410
21	7070	16500	12600	6390	13300	11300	26800	33200	34900	17500	9350	6420
22	7740	14100	8090	7900	6570	10400	27000	34600	34800	15800	10000	7110
23	7190	11000	15200	6140	8130	14900	29100	36800	36800	15100	8060	7340
24	9380	9100	15700	7630	14600	18400	30000	32500	36800	15900	8110	6360
25	9730	17800	10800	6550	14100	18600	36900	34500	33900	12200	12600	6610
26	6130	12200	16800	6310	18300	20200	35000	50400	36200	7790	7490	7110
27	8200	11400	13100	7010	10600	18900	36700	51900	30700	13900	6180	6360
28	6960	13000	13200	10000	8160	17200	36100	57800	24100	15400	8430	6080
29	8850	9250	12400	9380	---	9450	36300	63100	20600	14300	8720	6230
30	8320	11300	15100	12500	---	11300	33100	65700	27900	13500	6860	6090
31	8340	---	13300	9580	---	15000	---	70000	---	13300	6930	---
TOTAL	235670	327490	423730	245160	347440	424230	821200	1210100	1358100	519490	284750	201070
MEAN	7602	10920	13670	7908	12410	13680	27370	39040	45270	16760	9185	6702
MAX	9730	17800	17700	12500	18300	20300	36900	70000	74000	27700	13700	10300
MIN	6130	6290	8090	6090	6570	6060	14400	25800	20600	7790	6180	6040
AC-FT	467500	649600	840500	486300	689100	841500	1629000	2400000	2694000	1030000	564800	398800

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1929 - 2003, BY WATER YEAR (WY)

MEAN	11890	13200	14380	14330	14820	15790	24820	49010	57110	26370	11670	10520
MAX	25670	21970	34850	28020	38150	36480	59140	93830	115800	57650	19680	18300
(WY)	1960	1996	1996	1934	1996	1996	1934	1997	1948	1950	1997	1985
MIN	5466	5008	4732	3527	4217	5122	6165	16450	15480	9214	6320	5448
(WY)	1937	1937	1937	1937	1936	1937	1977	1941	1977	1940	1994	1994

SUMMARY STATISTICS	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1929 - 2003	
ANNUAL TOTAL	8452540		6398430			
ANNUAL MEAN	23160		17530		22000	
HIGHEST ANNUAL MEAN					34250	1996
LOWEST ANNUAL MEAN					10180	1941
HIGHEST DAILY MEAN	94800	Jun 4	74000	Jun 2	153000	May 30 1948
LOWEST DAILY MEAN	5950	Jan 1	6040	Sep 9	762	Sep 2 1962
ANNUAL SEVEN-DAY MINIMUM	7010	Oct 2	6150	Sep 8	2710	Feb 10 1936
ANNUAL RUNOFF (AC-FT)	16770000		12690000		15940000	
10 PERCENT EXCEEDS	59500		36600		48000	
50 PERCENT EXCEEDS	15000		12900		15600	
90 PERCENT EXCEEDS	7760		6460		7170	

GROUND-WATER LEVELS

BEAVERHEAD COUNTY

SITE IDENTIFICATION.--450937112393701. Local number 08S09W01CCCC01.

LOCATION.--Lat 45°09'37", long 112°39'37" (NAD 27), Hydrologic Unit 10020002. Owner: U.S. Geological Survey.

HYDROGEOLOGIC UNIT.--Tertiary sediments.

WELL CHARACTERISTICS.--Drilled in 1966, casing diameter 6 in., depth 47 ft.

INSTRUMENTATION.--Graphical water-level recorder from April 1967 to January 1981. Digital water-level recorder set to record every hour from July 1991 to current year.

DATUM.--Elevation of land-surface is 5,240 ft (NGVD 29) (from topographic map.) Measuring point: top of casing, 2.15 ft above land-surface datum. Reference point established May 16, 2003: rebar 20 ft west of well casing at base of power pole, 1.34 ft below measuring point.

REMARKS.--Water levels affected by irrigation. All water levels reported below land-surface datum.

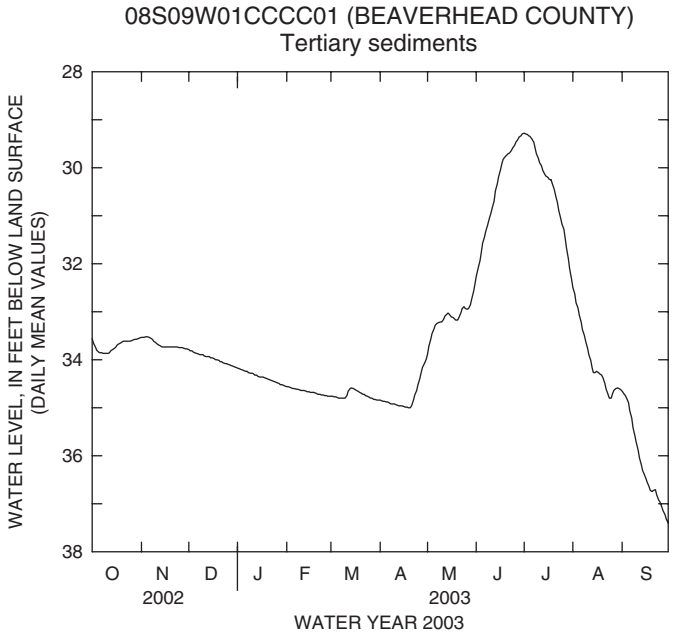
PERIOD OF RECORD.--August 1966 to current year.

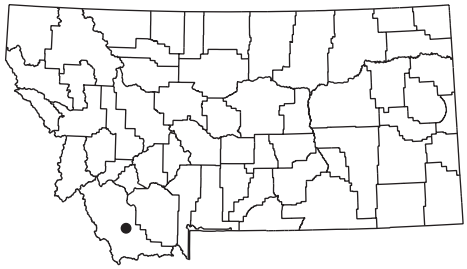
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 10.43 ft, Aug. 10, 1971 (from recorder); lowest, 37.44 ft, Sept. 30, 2003 (from recorder).

EXTREMES FOR CURRENT YEAR.--Highest water level, 29.26 ft, July 1 and 2 (from recorder); lowest, 37.44 ft, Sept. 30 (from recorder).

MEASURED WATER LEVELS IN FEET BELOW LAND-SURFACE DATUM,
WATER YEAR OCTOBER 2002 THROUGH SEPTEMBER 2003

DATE	WATER LEVEL	DATE	WATER LEVEL
Oct 23	33.66	Apr 23	34.81
Dec 3	33.78	Jun 4	31.81
Jan 16	34.35	Jul 17	30.22
Mar 13	34.74	Sep 3	34.73





GROUND-WATER LEVELS

BEAVERHEAD COUNTY

SITE IDENTIFICATION.--450524112380701. Local number 08S08W31CCAA01.

LOCATION.--Lat 45°05'24", long 112°38'07" (NAD 27), Hydrologic Unit 10020002. Owner: Matador Cattle Company.

HYDROGEOLOGIC UNIT.--Tertiary sediments.

WELL CHARACTERISTICS.--Drilled in December 1992, casing diameter 5 in., depth 217 ft.

INSTRUMENTATION.--Digital water-level recorder set to record every 4 hours from November 1997 to Aug. 1, 2003. Pressure transducer, data logger, and satellite transmitter, with data recorded every hour and transmitted every 4 hours, from Aug. 1, 2003 to Sept. 30, 2003.

DATUM.--Elevation of land surface is 5,520.7 ft (NGVD 29). Measuring point: top of PVC cap, 2.00 ft above land-surface datum. Prior to Feb. 3, 2000, measuring point was top of PVC casing, 2.20 ft above land-surface datum. Reference point established May 20, 1999: top of steel rod near well casing along fence line, 8.71 ft below measuring point.

REMARKS.--All water levels reported below land-surface datum.

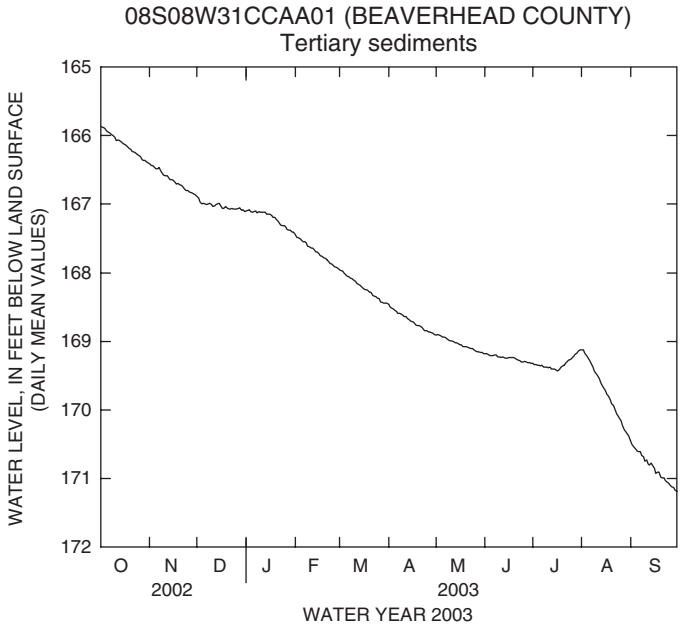
PERIOD OF RECORD.--Measured periodically December 1992 to November 1997 and continuously recorded every 4 hours from November 1997 to Aug. 1, 2003; data collected hourly from Aug. 1, 2003 to September 30, 2003.

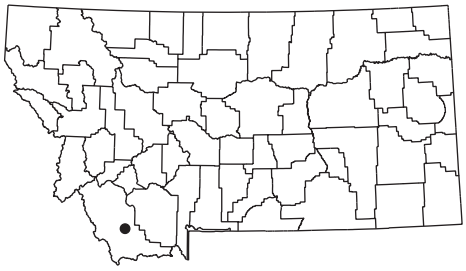
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 138.72 ft, Oct. 23, 1995 (measured); lowest, 171.25 ft, Sept. 29, 2003 (from recorder)

EXTREMES FOR CURRENT YEAR.--Highest water level 165.84 ft, Oct. 2 (from recorder); lowest 171.25 ft, Sept. 29 (from recorder).

MEASURED WATER LEVELS IN FEET BELOW LAND-SURFACE DATUM,
WATER YEAR OCTOBER 2002 THROUGH SEPTEMBER 2003

DATE	WATER LEVEL	DATE	WATER LEVEL
Oct 23	166.24	Jun 4	169.19
Dec 3	166.91	Jul 17	169.45
Jan 16	167.13	Aug 1	169.09
Apr 23	168.83	Sep 3	170.49





GROUND-WATER LEVELS

CASCADE COUNTY

SITE IDENTIFICATION.--473031111185001. Local number 20N03E11ABAD01.

LOCATION.--Lat 47°30'30", long 111°18'50" (NAD 27), Hydrologic Unit 10030102. Owner: R. Volk.

HYDROGEOLOGIC UNIT.--Mississippian Madison Group.

WELL CHARACTERISTICS.--Drilled in October 1959, casing diameter 8 in. to depth of 206 ft and 6 in. to depth of 369 ft.

INSTRUMENTATION.--Digital water-level recorder set to record every 4 hours from Dec. 18, 2001 to current year.

DATUM.--Elevation of land surface is 3,320 ft (NGVD 29) (from topographic map). Measuring point: top of casing, 1.80 ft above land-surface datum. Reference point established June 25, 2003: top of steel rod 10 ft north northeast of well casing, 2.16 ft below measuring point.

REMARKS.--All water levels reported below land-surface datum.

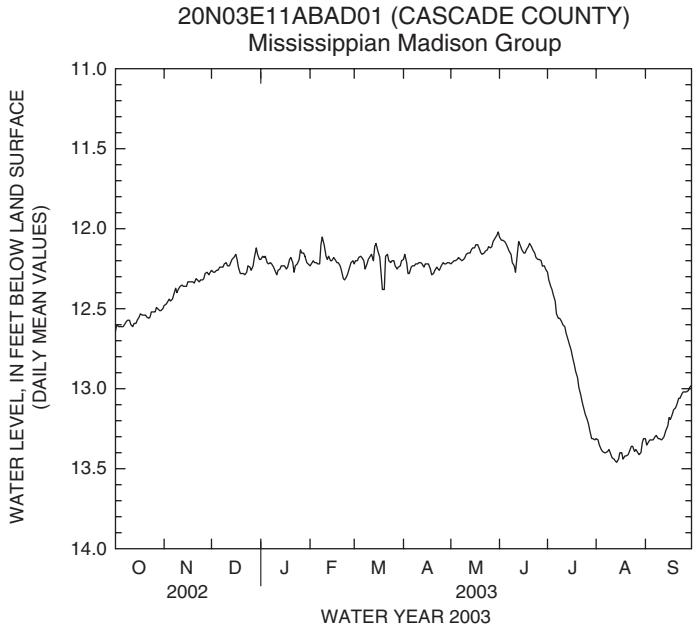
PERIOD OF RECORD.--December 2001 to current year.

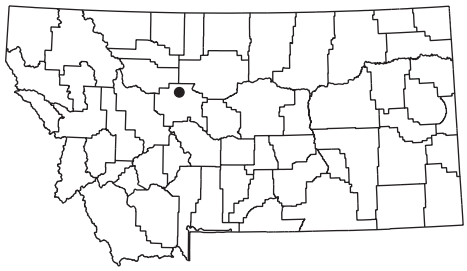
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 12.00 ft, Mar. 15, 2003 (from recorder); lowest, 13.46 ft, at various times Aug. 13-15, 2003 (from recorder).

EXTREMES FOR CURRENT YEAR.--Highest water level, 12.00 ft, Mar. 15 (from recorder); lowest, 13.46 ft, at various times Aug. 13-15 (from recorder).

MEASURED WATER LEVELS IN FEET BELOW LAND-SURFACE DATUM,
WATER YEAR OCTOBER 2002 THROUGH SEPTEMBER 2003

DATE	WATER LEVEL	DATE	WATER LEVEL
Oct 11	12.55	Jun 24	12.18
Dec 10	12.19	Sep 10	13.31
Mar 17	12.14		





GROUND-WATER LEVELS

CASCADE COUNTY

SITE IDENTIFICATION.--472203111112602. Local number 19N04E26CACC02.

LOCATION.--Lat 47°22'03", long 111°11'26" (NAD 27), Hydrologic Unit 10030102. Owner: E. Chartier.

HYDROGEOLOGIC UNIT.--Lower Cretaceous Kootenai Formation.

WELL CHARACTERISTICS.--Drilled in December 1992, casing diameter 4 in., depth 198 ft.

INSTRUMENTATION.--Digital water-level recorder set to record every 4 hours from Dec. 16, 1998 to current year (Montana Bureau of Mines and Geology operated site from May 1987 to October 1998).

DATUM.--Elevation of land surface is 3,817 ft (NGVD 29) (from topographic map). Measuring point: top of casing, 1.10 ft above land-surface datum. Reference point established Apr. 26, 1999: top of steel rod near well casing, elevation 3,817.19 ft.

REMARKS.--No record from Oct. 11 to Dec. 10. All water levels reported below land-surface datum.

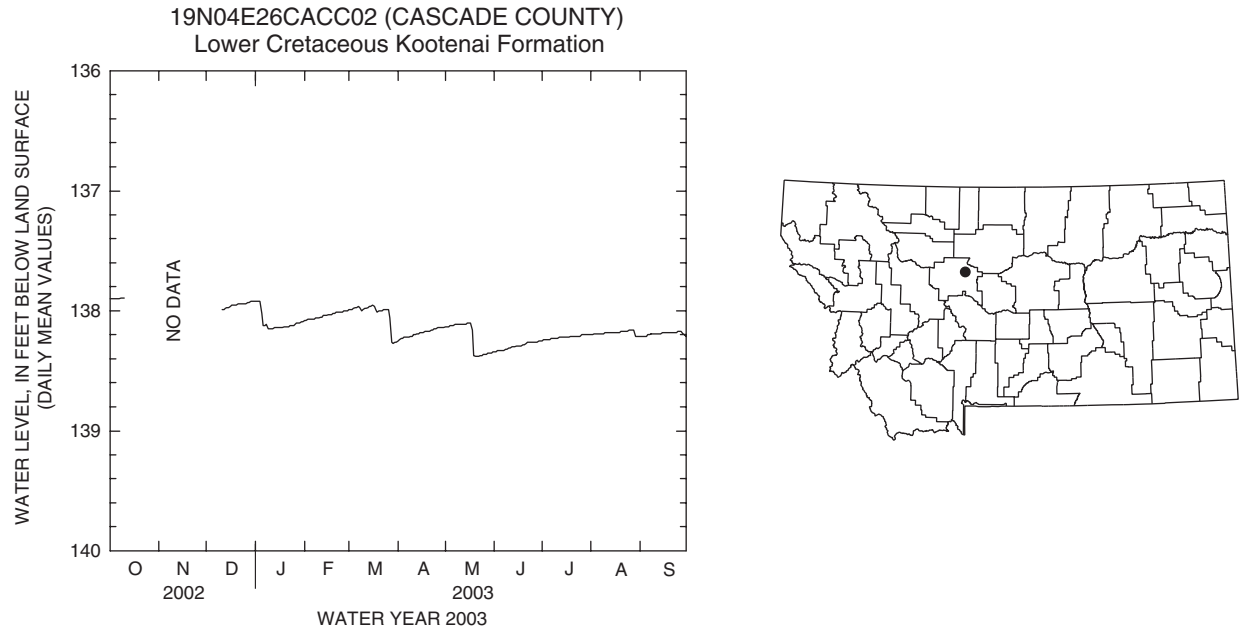
PERIOD OF RECORD.--August 1984 to May 1987 and December 1998 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 137.03 ft, at various times Apr. 8-13, 1999 (from recorder); lowest, 138.38 ft, at various times Mar. 19-23, 2003 (from recorder).

EXTREMES FOR CURRENT YEAR.--Highest water level, 137.87 ft, Oct. 11 (measured); lowest, 138.38 ft, at various times May 19-23 (from recorder).

MEASURED WATER LEVELS IN FEET BELOW LAND-SURFACE DATUM,
WATER YEAR OCTOBER 2002 THROUGH SEPTEMBER 2003

DATE	WATER LEVEL	DATE	WATER LEVEL
Oct 11	137.87	Jun 24	138.27
Dec 10	138.00	Sep 10	138.21
Mar 17	137.96		



GROUND-WATER LEVELS

GALLATIN COUNTY

SITE IDENTIFICATION.--454809111095401. Local number 01N04E25DCDD01.

LOCATION.--Lat 45°48'09", long 111°09'54" (NAD 27), Hydrologic Unit 10020008. Owner: U.S. Geological Survey.

HYDROGEOLOGIC UNIT.--Quaternary alluvium.

WELL CHARACTERISTICS.--Drilled in August 1951, casing diameter 6 in. to depth of 400 ft. Well filled with gravel to within 101 ft of land surface.

INSTRUMENTATION.--Graphic recorder from May 1954 to August 1977. Digital water-level recorder set to record every hour from May 1991 to current year.

DATUM.--Elevation of land surface is 4,385 ft (NGVD 29) (from topographic map). Measuring point: top of casing 1.60 ft above land-surface datum. Reference point established Sept. 17, 2003: top of steel rod, 2 ft southwest of well near east fence post, 1.05 ft below measuring point.

REMARKS.--All water levels reported below land-surface datum.

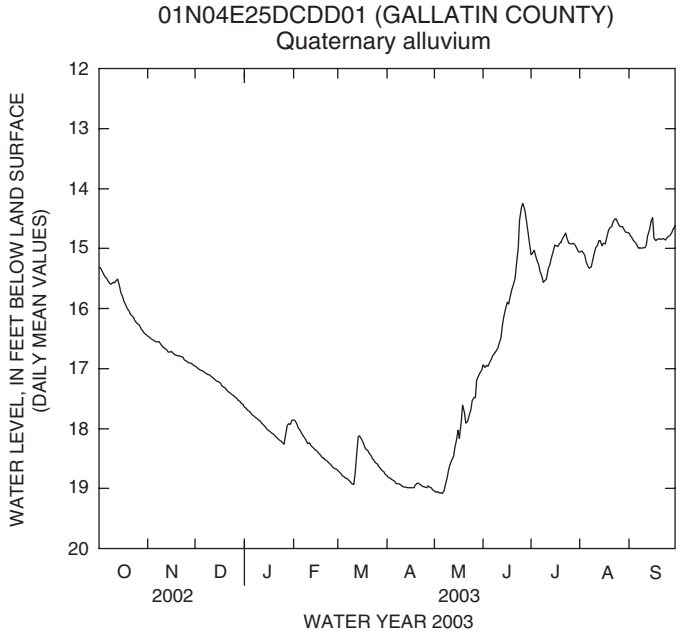
PERIOD OF RECORD.--1954 to current year.

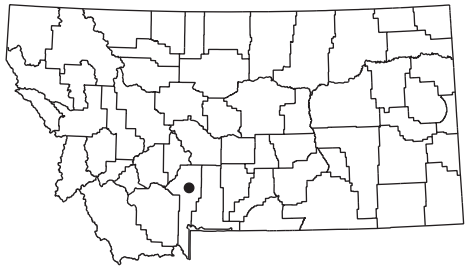
EXTREMES FOR PERIOD OF RECORD.--Highest water level 5.91 ft, Aug. 13, 1968 (from recorder); lowest, 19.86 ft, May 6, 2002 (from recorder).

EXTREMES FOR CURRENT YEAR.--Highest water level, 14.23 ft, June 26 (from recorder); lowest, 19.09 ft, May 6 (from recorder).

MEASURED WATER LEVELS IN FEET BELOW LAND-SURFACE DATUM,
WATER YEAR OCTOBER 2002 THROUGH SEPTEMBER 2003

DATE	WATER LEVEL	DATE	WATER LEVEL
Oct 22	16.33	Apr 8	18.92
Oct 24	16.19	Jun 5	17.39
Feb 10	18.20	Sep 17	14.83





GROUND-WATER LEVELS

GARFIELD COUNTY

SITE IDENTIFICATION.--470709106061401. Local number 16N44E25BBAC01.

LOCATION.--Lat 47°07'09", long 106°06'14" (NAD 27), Hydrologic Unit 10040104. Owner: Burlington Northern Santa Fe Railroad.

HYDROGEOLOGIC UNIT.--Paleocene Tongue River Member of Fort Union Formation.

WELL CHARACTERISTICS.--Drilled in October 1980, casing diameter 4 in., depth 103 ft.

INSTRUMENTATION.--Digital water-level recorder set to record every 4 hours from Apr. 13, 1998 to current year.

DATUM.--Elevation of land surface is 2,645 ft (NGVD 29) (from topographic map). Measuring point: top of casing, 1.10 ft above land-surface datum. Reference point established Oct. 12, 1999: top of steel rod near casing, 2.99 ft below measuring point.

REMARKS.--No record for Oct. 22-23. All water levels reported below land-surface datum.

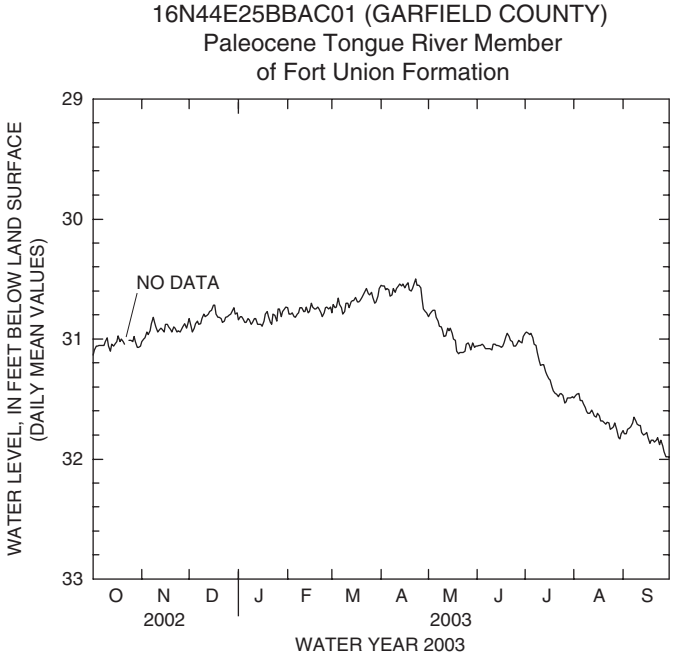
PERIOD OF RECORD.--Measured annually from 1984 to 1992 and recorded every 4 hours from Apr. 13, 1998 to current year.

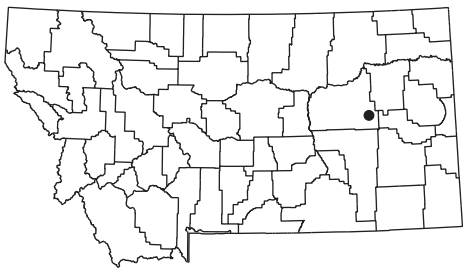
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 29.73 ft, Apr. 13, 1999 (from recorder); lowest, 32.08 ft, Oct. 20, 2001 (from recorder).

EXTREMES FOR CURRENT YEAR.--Highest water level, 30.50 ft, Apr. 23 (from recorder); lowest, 31.99 ft, at various times Sept. 28-30 (from recorder).

MEASURED WATER LEVELS IN FEET BELOW LAND-SURFACE DATUM,
WATER YEAR OCTOBER 2002 THROUGH SEPTEMBER 2003

DATE	WATER LEVEL	DATE	WATER LEVEL
Oct 23	31.07	Mar 12	30.69
Dec 10	30.80	May 27	31.08





GROUND-WATER LEVELS

LAKE COUNTY

SITE IDENTIFICATION.--470946114013201. Local number 16N19W08ACBD01.

LOCATION.--Lat 47°09'46", long 114°01'32" (NAD 27), Hydrologic Unit 17010212. Owner: Makespeace.

HYDROGEOLOGIC UNIT.--Pleistocene alluvium.

WELL CHARACTERISTICS.--Drilled in August 1988, casing diameter 6 in. to depth of 322 ft and 5 in. from 322 ft to 398 ft.

INSTRUMENTATION.--Digital water-level recorder set to record every hour from Sept. 13, 1990 to current year.

DATUM.--Elevation of land surface is 3,300 ft (NGVD 29) (from topographic map). Measuring point: top of casing, 1.50 ft above land-surface datum. Reference point established July 14, 2003: top of steel rod 1.0 ft southeast of well casing, 1.12 ft below measuring point.

REMARKS.--No record from Feb. 5 to May 21. All water levels reported below land-surface datum.

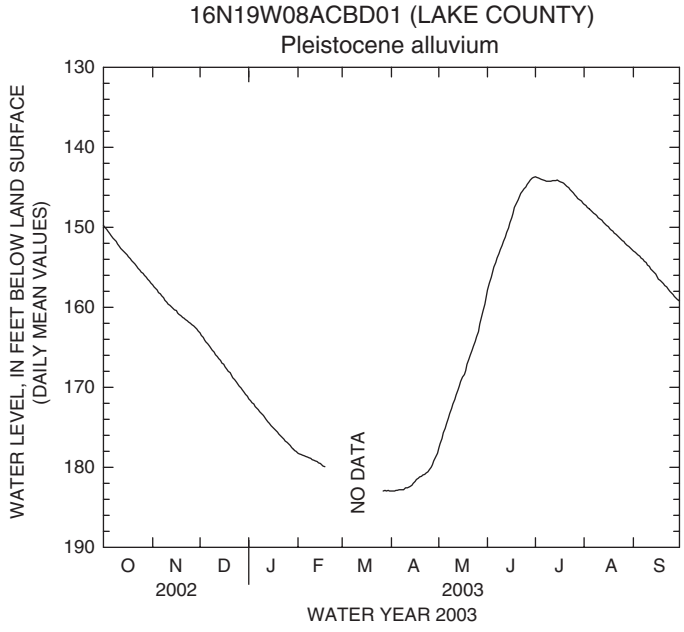
PERIOD OF RECORD.--Annually from 1988 to 1990 and recorded every hour from Sept. 13, 1990 to current year.

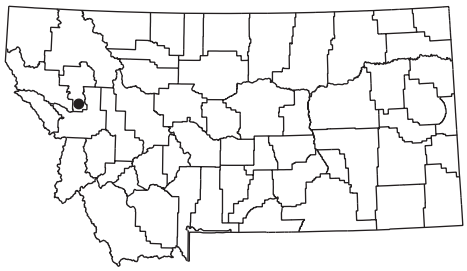
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 137.92 ft, July 14, 1993 (from recorder); lowest, 189.22 ft, Apr. 11 and 12, 2002 (from recorder).

EXTREMES FOR CURRENT YEAR.--Highest water level, 143.65 ft, July 1 (from recorder); lowest, 183.02 ft, Apr. 3 (from recorder).

MEASURED WATER LEVELS IN FEET BELOW LAND-SURFACE DATUM,
WATER YEAR OCTOBER 2002 THROUGH SEPTEMBER 2003

DATE	WATER LEVEL	DATE	WATER LEVEL
Oct 22	154.74	May 29	160.61
Jan 28	177.52	Sep 23	157.72
Apr 9	182.83	Sep 30	159.10





GROUND-WATER LEVELS

MC CONE COUNTY

SITE IDENTIFICATION.--480034105195401. Local number 26N49E13ACAB01.

LOCATION.--Lat 48°00'34", long 105°19'54" (NAD 27), Hydrologic Unit 10060002. Owner: U.S. Geological Survey and Bureau of Land Management.

HYDROGEOLOGIC UNIT.--Upper Cretaceous Hell Creek Formation and Fox Hills Sandstone.

WELL CHARACTERISTICS.--Drilled in August 1981, casing diameter 4 in., depth 180 ft.

INSTRUMENTATION.--Digital water-level recorder set to record every 6 hours from April 1998 to Aug. 3, 1999. Electronic water-level recorder set to record every 4 hours from Aug. 3, 1999 to current year.

DATUM.--Elevation of land surface is 2,040 ft (NGVD 29) (from topographic map). Measuring point: top of casing, 1.60 ft above land-surface datum. Reference point established May 11, 1999: top of steel rod near well casing, 0.15 ft below measuring point.

REMARKS.--All water levels reported below land-surface datum.

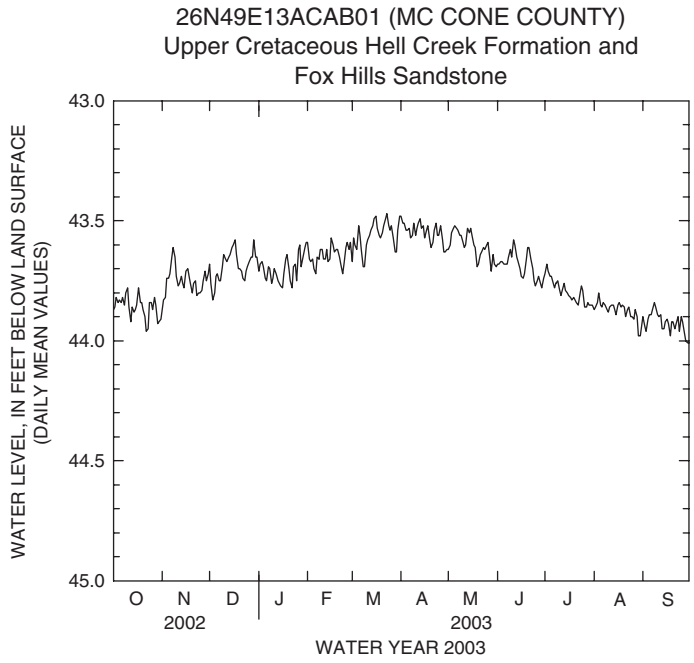
PERIOD OF RECORD.--Measured annually from 1982 to 1992, recorded every 6 hours from Apr. 14, 1998 to Aug. 3, 1999 and recorded every 4 hours from Aug. 3, 1999 to current year.

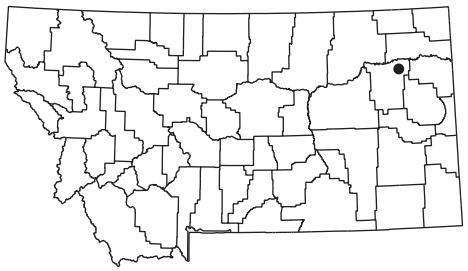
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 42.37 ft, Aug. 28, 1992 (measured); lowest, 44.04 ft, Sept. 21, 1990 (measured).

EXTREMES FOR CURRENT YEAR.--Highest water level, 43.45 ft, Mar. 23 (from recorder); lowest, 44.02 ft, on Sept. 29 and 30 (from recorder).

MEASURED WATER LEVELS IN FEET BELOW LAND-SURFACE DATUM,
WATER YEAR OCTOBER 2002 THROUGH SEPTEMBER 2003

DATE	WATER LEVEL	DATE	WATER LEVEL
Oct 23	43.95	May 27	43.64
Dec 11	43.64	Sep 8	43.74
Mar 3	43.60		





GROUND-WATER LEVELS

POWDER RIVER COUNTY

SITE IDENTIFICATION.--453107106110601. Local number 04S45E04BDDB01.

LOCATION.--Lat 45°31'07", long 106°11'06" (NAD 27), Hydrologic Unit 10090102. Owner: U.S. Geological Survey.

HYDROGEOLOGIC UNIT.--Quaternary alluvium.

WELL CHARACTERISTICS.--Drilled in December 1979, casing diameter 4 in., depth 68 ft.

INSTRUMENTATION.--Graphical water-level recorder from April 1980 to October 1982. Digital water-level recorder set to record every 12 hours from October 1982 to November 1996, and reset to record every hour from November 1996 to current year.

DATUM.--Elevation of land surface is 3,020 ft (NGVD 29) (from topographic map). Measuring point: top of casing, 1.70 ft above land-surface datum. Reference point established Sept. 16, 2003: top of steel rod 21 ft northeast of well casing, 1.66 ft below measuring point.

REMARKS.--No record from Jan. 23 to May 19. All water levels reported below land-surface datum.

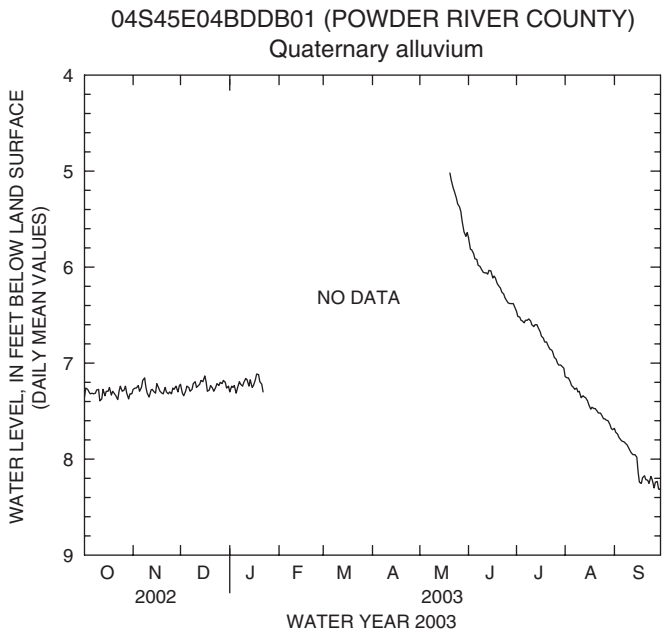
PERIOD OF RECORD.--Measured intermittently from December 1979 to April 1980 and recorded April 1980 to current year.

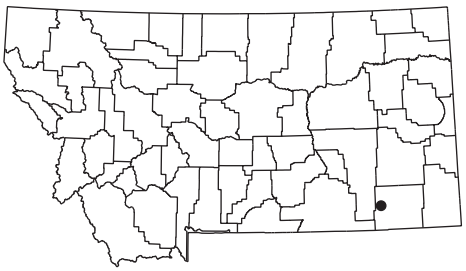
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 3.67 ft, Apr. 11, 1997 (from recorder); lowest, 11.45 ft, Oct. 5, 1992 (from recorder).

EXTREMES FOR CURRENT YEAR.--Highest water level, 4.99 ft, May 20 (from recorder); lowest, 8.32 ft, Sept. 29 and 30 (from recorder).

MEASURED WATER LEVELS IN FEET BELOW LAND-SURFACE DATUM,
WATER YEAR OCTOBER 2002 THROUGH SEPTEMBER 2003

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
Oct 2	7.29	Feb 6	6.78	May 19	5.05
Oct 22	7.37	Mar 7	6.53	Sep 16	8.11
Nov 21	7.30				





GROUND-WATER LEVELS

POWELL COUNTY

SITE IDENTIFICATION.--470049113035401. Local number 15N12W36BCDD01.

LOCATION.--Lat 47°00'49", long 113°03'54" (NAD 27), Hydrologic Unit 17010203. Owner: Montana Department of Transportation.

HYDROGEOLOGIC UNIT.--Cenozoic rocks.

WELL CHARACTERISTICS.--Drilled in September 1964, casing diameter 6 in., depth 206 ft.

INSTRUMENTATION.--Digital water-level recorder installed April 1991 and set to record every hour from April 1991 to current year.

DATUM.--Elevation of land surface is 4,278 ft (NGVD 29) (from topographic map). Measuring point: top of casing, 1.0 ft above land-surface datum. Reference point established July 15, 2003: top of steel rod 40 ft northwest of well by fence corner, 3.14 ft above measuring point.

REMARKS.--Well was pumped extensively May 7 for collection of sample by Montana Bureau of Mines and Geology. All water levels reported below land-surface datum.

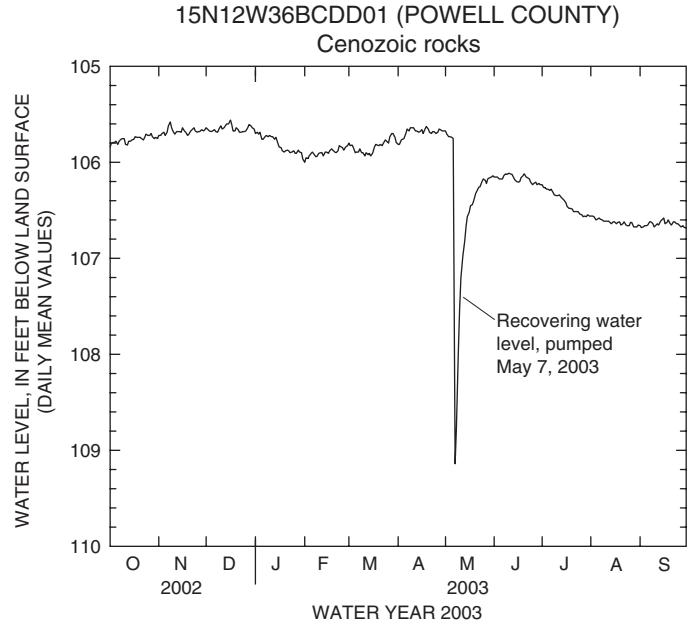
PERIOD OF RECORD.--Measured periodically from 1975 to 1991 and continuously recorded every hour from April 1991 to current year.

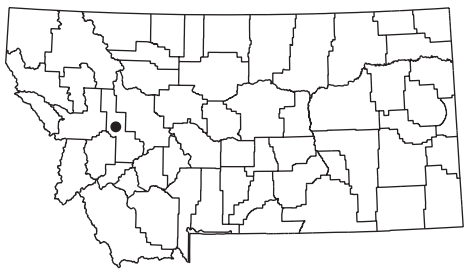
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 95.90 ft, Dec. 12, 1991 (measured); lowest, 126.72 ft, Oct. 11, 1984 (measured).

EXTREMES FOR CURRENT YEAR.--Highest water level, 105.52, Dec. 16 (from recorder); lowest, 106.70 ft, Sept. 3, 29, and 30 (from recorder). (Extremes resulting from pumping in May not included).

MEASURED WATER LEVELS IN FEET BELOW LAND-SURFACE DATUM,
WATER YEAR OCTOBER 2002 THROUGH SEPTEMBER 2003

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
Oct 3	105.75	Jan 16	105.82	Jul 15	106.43
Oct 11	105.78	Apr 9	105.63	Jul 25	106.53
Dec 14	105.55	May 7	105.75		





GROUND-WATER LEVELS

RAVALLI COUNTY

SITE IDENTIFICATION.--463750114033001. Local number 10N20W13BBA 01.

LOCATION.--Lat 46°37'50", long 114°03'30" (NAD 27), Hydrologic Unit 17010205. Owner: Bonneville Power Administration.

HYDROGEOLOGIC UNIT.--Quaternary alluvium.

WELL CHARACTERISTICS.--Drilled in September 1959, casing diameter 6 in., depth 50 ft.

INSTRUMENTATION.--Digital water-level recorder set to record every hour from April 1991 to current year.

DATUM.--Elevation of land surface is 3,204 ft (NGVD 29) (from topographic map). Measuring point: top of casing, 2.00 ft above land-surface datum. Reference point established July 14, 2003: top of steel rod 45 ft east of well in southwest corner of concrete pad, 0.58 ft below measuring point.

REMARKS.--All water levels reported below land-surface datum.

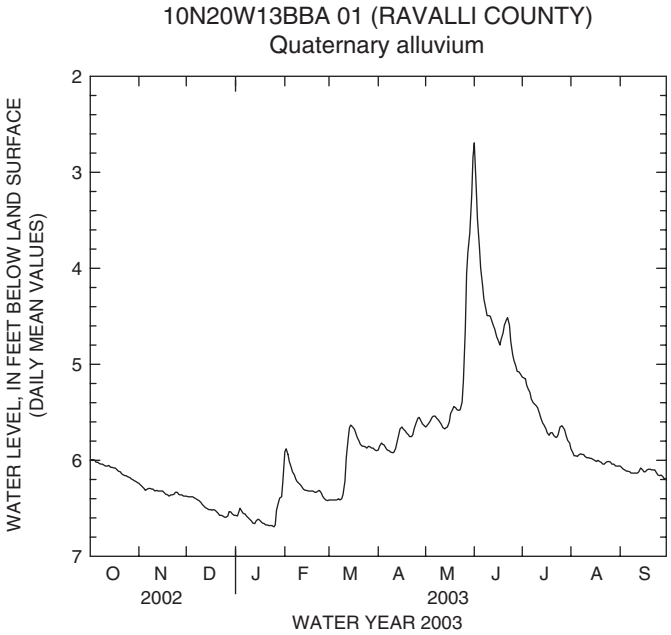
PERIOD OF RECORD.--Measured periodically from 1959 to 1982 and recorded every hour from April 1991 to current year.

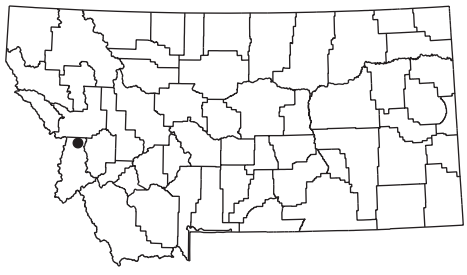
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 2.48 ft, June 15, 1959 (measured); lowest, 7.21 ft, Sept. 21, 1977 (measured).

EXTREMES FOR CURRENT YEAR.--Highest water level, 2.56 ft, June 1 (from recorder); lowest, 6.69 ft, at various times Jan. 24-26 (from recorder).

MEASURED WATER LEVELS IN FEET BELOW LAND-SURFACE DATUM,
WATER YEAR OCTOBER 2002 THROUGH SEPTEMBER 2003

DATE	WATER LEVEL	DATE	WATER LEVEL
Oct 1	6.00	Apr 4	5.83
Dec 10	6.45	Sep 17	6.08
Feb 12	6.29		





GROUND-WATER LEVELS

RAVALLI COUNTY

SITE IDENTIFICATION.--461518114090802. Local number 06N20W19CCCC02.

LOCATION.--Lat 46°15'18", long 114°09'08" (NAD 27), Hydrologic Unit 17010205. Owner: Bonneville Power Administration.

HYDROGEOLOGIC UNIT.--Quaternary alluvium.

WELL CHARACTERISTICS.--Drilled in September 1970, casing diameter 6 in., depth 40 ft.

INSTRUMENTATION.--Graphic recorder from September 1970 to January 1985. Digital water-level recorder set to record every hour from January 1985 to current year.

DATUM.--Elevation of land surface is 3,558.3 ft (NGVD 29). Measuring point: top of casing, 1.30 ft above land-surface datum. Reference point established July 14, 2003: north plug of 4 in. round ring on fire hydrant, 0.57 ft below measuring point.

REMARKS.--No record Dec. 12 and Apr. 3. All water levels reported below land-surface datum.

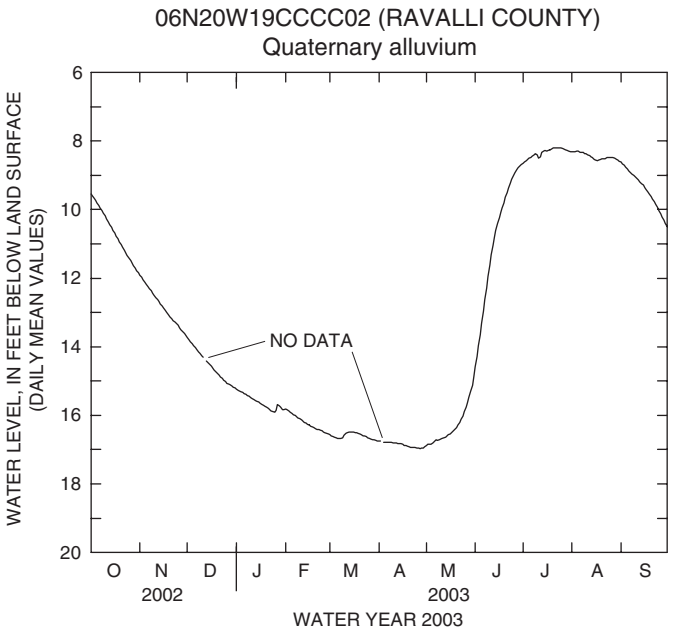
PERIOD OF RECORD.--September 1970 to current year.

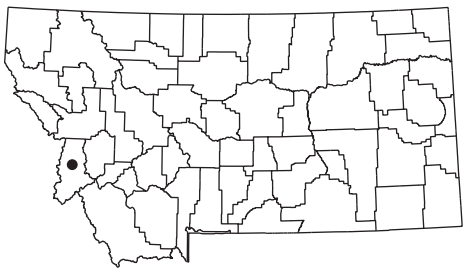
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 5.48 ft, Sept. 2, 1979 (from recorder); lowest, 18.32 ft, May 1, 1985 (measured).

EXTREMES FOR CURRENT YEAR.--Highest water level, 8.18 ft, at various times July 21-25 (from recorder); lowest, 16.97 ft, at various times Apr. 27 and 28 (from recorder).

MEASURED WATER LEVELS IN FEET BELOW LAND-SURFACE DATUM,
WATER YEAR OCTOBER 2002 THROUGH SEPTEMBER 20033

DATE	WATER LEVEL	DATE	WATER LEVEL
Oct 20	9.61	Apr 3	16.84
Dec 12	14.37	Sep 17	9.47
Feb 13	16.22		





GROUND-WATER LEVELS

ROSEBUD COUNTY

SITE IDENTIFICATION.--451746106301101. Local number 06S43E19DDBA02.

LOCATION.--Lat 45°17'46", long 106°30'11" (NAD 27), Hydrologic Unit 10090101. Owner: U.S. Geological Survey and Art Hayes.

HYDROGEOLOGIC UNIT.--Quaternary alluvium.

WELL CHARACTERISTICS.--Drilled in October 1986, casing diameter 4 in., depth 67 ft.

INSTRUMENTATION.--Digital water-level recorder from April 1989 to current year.

DATUM.--Elevation of land surface is 3,170 ft (NGVD 29) (from topographic map). Measuring point: top of casing, 1.40 ft above land-surface datum. Reference point established Sept. 16, 2003: top of steel rod 1.0 ft south of southwest corner of recorder box, 1.13 ft below measuring point.

REMARKS.--No record from Feb. 5 to May 21. All water levels reported below land-surface datum.

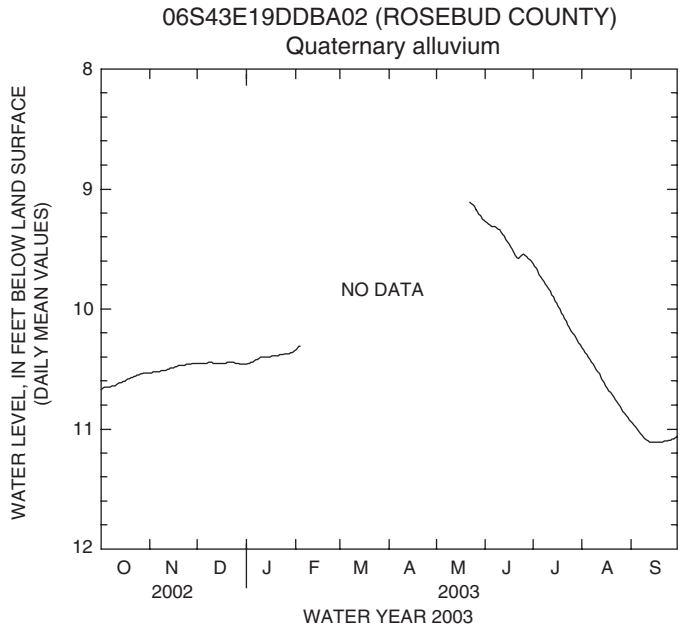
PERIOD OF RECORD.--April 1987 to current year.

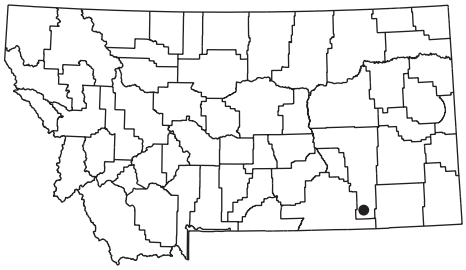
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 6.47 ft, Apr. 7, 1987 (measured); lowest, 11.40 ft, Jan. 11, 1995 (measured).

EXTREMES FOR CURRENT YEAR.--Highest water level, 9.06 ft, May 21 (measured); lowest, 11.12 ft, Sept. 15 and 16 (from recorder).

MEASURED WATER LEVELS IN FEET BELOW LAND-SURFACE DATUM,
WATER YEAR OCTOBER 2002 THROUGH SEPTEMBER 2003

DATE	WATER LEVEL	DATE	WATER LEVEL
Oct 1	10.67	Mar 7	10.06
Oct 22	10.59	May 21	9.06
Nov 2	10.47	Jul 1	9.58
Feb 6	10.31	Sep 2	10.93





GROUND-WATER LEVELS

SANDERS COUNTY

SITE IDENTIFICATION.--474251114385201. Local number 23N24W34ADAA01.

LOCATION.--Lat 47°42'51", long 114°38'52" (NAD 27), Hydrologic Unit 17010212. Owner: Bureau of Indian Affairs.

HYDROGEOLOGIC UNIT.--Quaternary alluvium.

WELL CHARACTERISTICS.--Drilled in February 1941, casing diameter 20 in. from 1.00 ft above land surface to 300 ft below land surface, and 18 in. from 300 ft to 377 ft.

INSTRUMENTATION.--Graphical water-level recorder from January 1971 to January 1985. Digital water-level recorder set to record every hour from January 1985 to current year.

DATUM.--Elevation of land surface is 2,878.57 ft (NGVD 29). Measuring point: top of casing, 1.00 ft above land-surface datum. Reference point established Oct. 29, 2003: rebar 3 ft northeast of well shelter outside of northeast corner of shelter fence, 1.79 ft below measuring point.

REMARKS.--Water levels affected by pumpage. Well located near Lonepine. All water levels reported below land-surface datum.

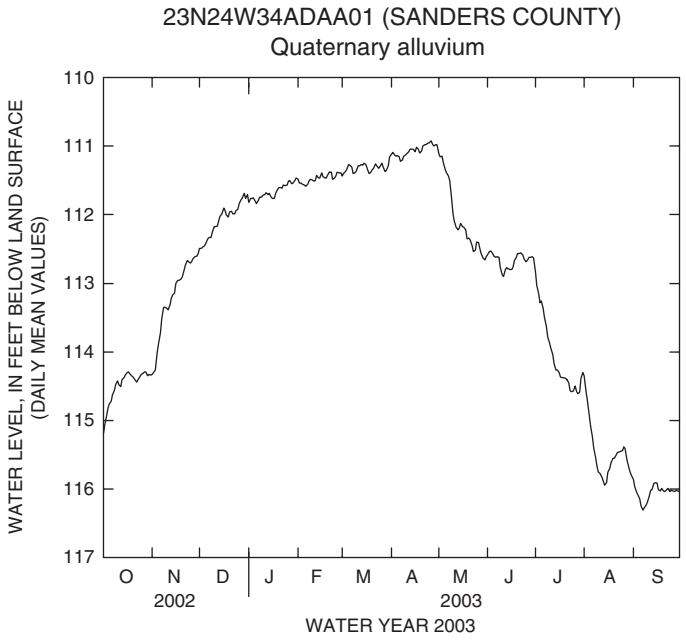
PERIOD OF RECORD.--March to May 1943, October 1970 to current year.

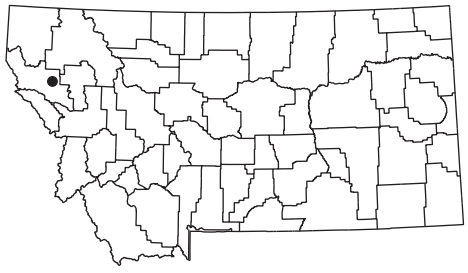
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 102.43 ft, Mar. 20, 1981 (from recorder); lowest, 119.96 ft, Sept. 6, 1995 (from recorder).

EXTREMES FOR CURRENT YEAR.--Highest water level, 110.90 ft, Apr. 26 (from recorder); lowest, 116.35 ft, Sept. 7 (from recorder).

MEASURED WATER LEVELS IN FEET BELOW LAND-SURFACE DATUM,
WATER YEAR OCTOBER 2002 THROUGH SEPTEMBER 2003

DATE	WATER LEVEL	DATE	WATER LEVEL
Oct 25	114.38	Jan 31	111.54





GROUND-WATER LEVELS

SHERIDAN COUNTY

SITE IDENTIFICATION.--483650104084001. Local number 33N58E17ADDD01.

LOCATION.--Lat 48°36'50", long 104°08'40" (NAD 27), Hydrologic Unit 10060006. Owner: Vern Guenther.

HYDROGEOLOGIC UNIT.--Pleistocene outwash.

WELL CHARACTERISTICS.--Drilled in 1984, casing diameter 4 in., depth 130 ft.

INSTRUMENTATION.--Digital water-level recorder set to record every hour from April to Oct. 18 1985, every 12 hours from Oct. 19, 1985 to Apr. 7, 1993, and every 4 hours from Apr. 8, 1993 to current year.

DATUM.--Elevation of land surface is 1,992 ft (NGVD 29) (from topographic map). Measuring point: top of casing, 2.10 ft above land-surface datum. Reference point established Sept. 15, 2003: top of steel rod 3 ft north of well, 0.77 ft below measuring point.

REMARKS.--All water levels reported below land-surface datum.

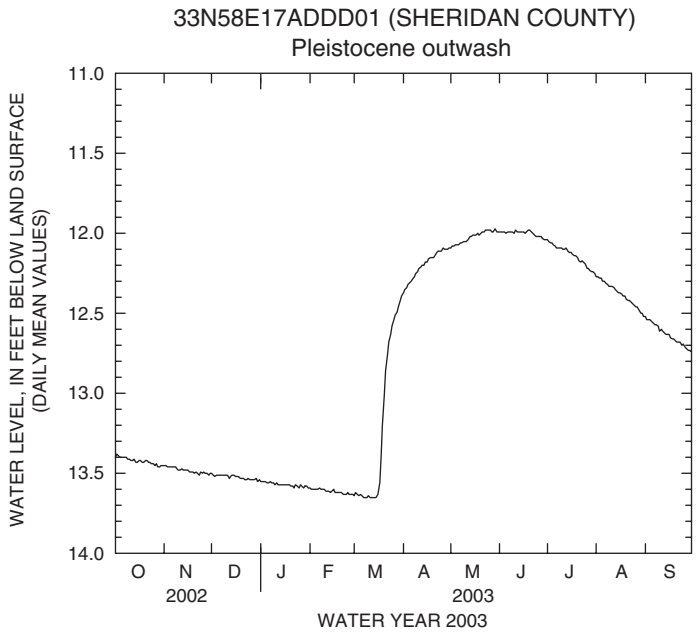
PERIOD OF RECORD.--August 1984 to current year.

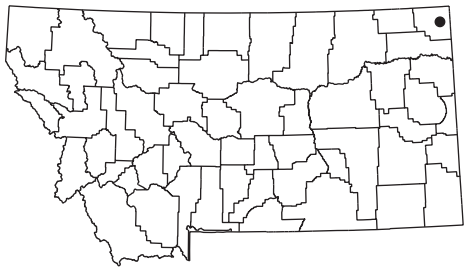
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 11.73 ft, at various times June 19-26, 1999 (from recorder); lowest, 15.51 ft, Aug. 20-23, 1992 (from recorder).

EXTREMES FOR CURRENT YEAR.--Highest water level, 11.96 ft, May 29 (measured); lowest, 13.65 ft, Mar. 6-16 (from recorder).

MEASURED WATER LEVELS IN FEET BELOW LAND-SURFACE DATUM,
WATER YEAR OCTOBER 2002 THROUGH SEPTEMBER 2003

DATE	WATER LEVEL	DATE	WATER LEVEL
Oct 23	13.43	May 29	11.96
Dec 12	12.51	Sep 10	12.59
Feb 27	13.63		





GROUND-WATER LEVELS

SHERIDAN COUNTY

SITE IDENTIFICATION.--483318104105402. Local number 33N58E04DBBD02.

LOCATION.--Lat 48°33'18", long 104°10'54" (NAD 27), Hydrologic Unit 10060006. Owner: U.S. Fish and Wildlife Service.

HYDROGEOLOGIC UNIT.--Pleistocene outwash.

WELL CHARACTERISTICS.--Drilled in July 1984, casing diameter 4 in., depth 143 ft.

INSTRUMENTATION.--Graphical water-level recorder from August 1984 through May 1985. Digital water-level recorder set to record every 24 hours from May 1985 to April 1996. Digital recorder set to record every 4 hours from April 1996 to current year.

DATUM.--Elevation of land surface is 1,977 ft (NGVD 1929) (from topographic map). Measuring point: top of recorder shelf, 2.20 ft above land-surface datum. From August 1984 to April 1994, measuring point was top of PVC casing, 1.50 ft above land-surface datum. Reference point established Sept. 15, 2003: top of steel rod 4 ft north of northeast fence post, 1.37 ft below measuring point.

REMARKS.--All water levels reported below land-surface datum.

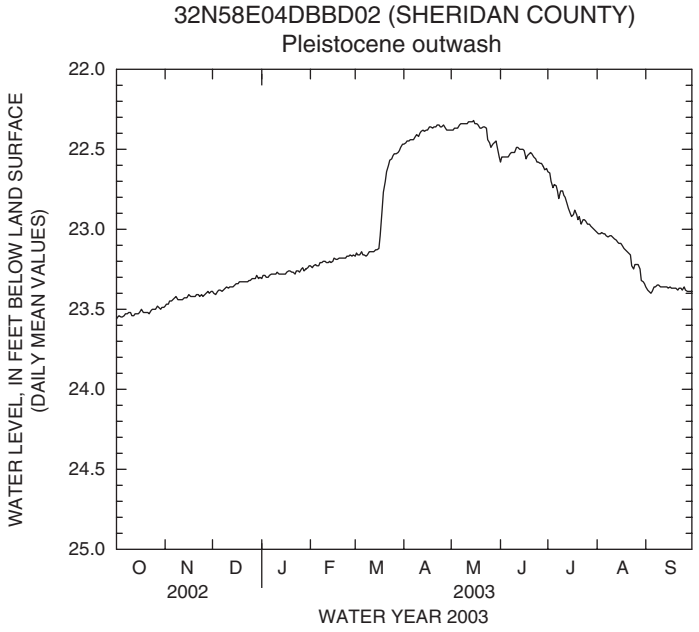
PERIOD OF RECORD.--August 1984 to current year.

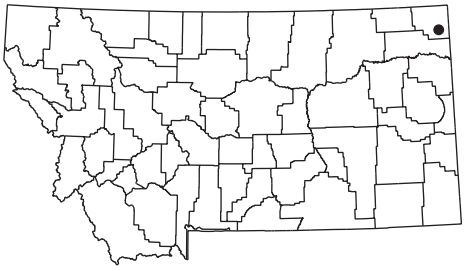
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 22.32 ft, at various times May 13-16, 2003 (from recorder); lowest, 25.90 ft, Aug. 18 and 19, 1992 (from recorder).

EXTREMES FOR CURRENT YEAR.--Highest water level, 22.32 ft, at various times May 13-16 (from recorder); lowest, 23.56 ft, Oct. 1 and 2 (from recorder).

MEASURED WATER LEVELS IN FEET BELOW LAND-SURFACE DATUM,
WATER YEAR OCTOBER 2002 THROUGH SEPTEMBER 2003

DATE	WATER LEVEL	DATE	WATER LEVEL
Oct 23	23.51	Mar 26	22.50
Dec 12	23.36	May 29	22.42
Jan 10	23.35	Sep 10	23.35





GROUND-WATER LEVELS

TETON COUNTY

SITE IDENTIFICATION.--474005111583803. Local number 22N03W15BAAD03.

LOCATION.--Lat 47°40'05", long 111°58'38" (NAD 27), Hydrologic Unit 10030104. Owner: Marvin Klinker.

HYDROGEOLOGIC UNIT.--Pleistocene terrace deposits.

WELL CHARACTERISTICS.--Drilled in 1991, casing diameter 4 in., depth 47 ft.

INSTRUMENTATION.--Digital water-level recorder set to record every hour from November 1991 to current year.

DATUM.--Elevation of land surface is 5,240 ft (NGVD 29) (from topographic map). Measuring point: top of casing, 1.90 ft above land-surface datum from November 1991 to Mar. 12, 2001 and 1.80 ft above land-surface datum from Mar. 12, 2001 to current year. Reference point established June 14, 2003: top of steel rod at base of large stump 36 ft northwest of well, 1.24 ft below measuring point.

REMARKS.--Water levels affected by irrigation. All water levels reported below land-surface datum.

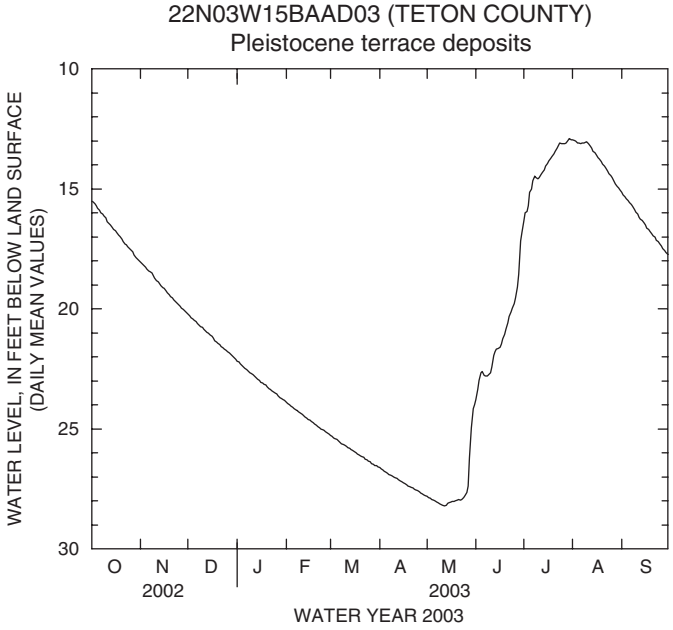
PERIOD OF RECORD.--November 1991 to current year.

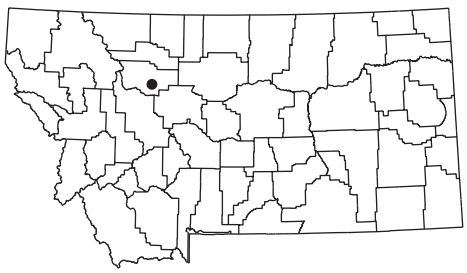
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 9.69 ft, Aug. 8, 2002 (from recorder); lowest, 28.74 ft, May 6 and 7, 2002 (from recorder).

EXTREMES FOR CURRENT YEAR.--Highest water level, 12.87 ft, July 29 (from recorder); lowest, 28.22 ft, May 12 and 13 (from recorder).

MEASURED WATER LEVELS IN FEET BELOW LAND-SURFACE DATUM,
WATER YEAR OCTOBER 2002 THROUGH SEPTEMBER 2003

DATE	WATER LEVEL	DATE	WATER LEVEL
Oct 11	16.29	Jun 24	20.05
Dec 10	20.74	Sep 10	15.97
Mar 17	25.98		





Periodic water levels in selected observation wells in Montana, water year 2003

[Local number--composed of township, range, section, position within a section, and a sequence number. Depth of well--in feet below land-surface datum. Water level--in feet below or above (+) land surface. --, no data]

Local number	Depth of well	Hydrogeologic unit	Date of measurement	Water level
		BEAVERHEAD COUNTY		
07S08W17DDC 02	50	Tertiary sediments	10-23-02	29.81
08S09W01CCCC01	47	Tertiary sediments	10-23-02	33.66
			12-03-02	33.78
			01-16-03	34.35
			03-13-03	34.74
			04-23-03	34.81
			06-04-03	31.81
			07-17-03	30.22
			09-03-03	34.73
08S08W31CCAA01	217	Tertiary sediments	10-23-02	166.24
			12-03-02	166.91
			01-16-03	167.13
			04-23-03	168.83
			06-04-03	169.19
			07-17-03	169.45
			08-01-03	169.09
			09-03-03	170.49
		CASCADE COUNTY		
20N03E11ABAD01	369	Mississippian Madison Group	10-11-02	12.55
			12-10-02	12.19
			03-17-03	12.14
			06-24-03	12.18
			09-10-03	13.31
19N04E26CACC02	198	Lower Cretaceous Kootenai Formation	10-11-02	137.87
			12-10-02	138.00
			03-17-03	137.96
			06-24-03	138.27
			09-10-03	138.21
		GALLATIN COUNTY		
01N04E25DCDD01	101	Quaternary alluvium	10-22-02	16.33
			10-24-02	16.19
			02-10-03	18.20
			04-08-03	18.92
			06-05-03	17.39
			09-17-03	14.83
		GARFIELD COUNTY		
16N44E25BBAC01	103	Paleocene Tongue River Member of Fort Union Formation	10-23-02	31.07
			12-10-02	30.80
			03-12-03	30.69
			05-27-03	31.08
		JEFFERSON COUNTY		
09N03W14DACC01	145	Upper Cambrian Hasmark Formation	10-30-02	25.78
			11-26-02	27.46
			01-03-03	24.65
			01-27-03	27.66
			02-27-03	26.05
			03-27-03	27.95
			04-25-03	24.48
			05-27-03	20.70
			06-27-03	29.21
			07-29-03	30.49
			08-27-03	22.42
			09-25-03	24.39

Periodic water levels in selected observation wells in Montana, water year 2003--Continued

Local number	Depth of well	Hydrogeologic unit	Date of measurement	Water level
		JEFFERSON COUNTY--Continued		
09N03W17DBC 01	207	Upper Cretaceous Boulder batholith intrusives	10-30-02	37.06
			11-26-02	39.24
			01-03-03	37.43
			01-27-03	37.38
			02-27-03	38.02
			03-27-03	35.29
			04-25-03	38.71
			05-27-03	34.30
			06-27-03	34.95
			07-29-03	36.53
			08-27-03	36.75
			09-25-03	36.98
		LAKE COUNTY		
16N19W08ACBD01	398	Pleistocene alluvium	10-22-02	154.74
			01-28-03	177.52
			04-09-03	182.83
			05-29-03	160.61
			09-23-03	157.72
			09-30-03	159.10
		LEWIS AND CLARK COUNTY		
12N06W36BCDD01	70	Upper Cretaceous Marysville intrusives	10-30-02	21.20
			11-26-02	22.07
			01-06-03	21.69
			01-27-03	21.40
			02-27-03	21.08
			03-27-03	19.35
			04-25-03	14.94
			05-28-03	15.13
			06-27-03	16.60
			07-29-03	21.59
			08-27-03	19.48
			09-25-03	19.97
11N05W14DDDD01	500	Middle Proterozoic Helena Formation	10-30-02	32.01
			11-26-02	32.46
			01-06-03	32.60
			01-27-03	32.43
			02-27-03	32.26
			03-27-03	33.29
			04-25-03	33.03
			05-28-03	32.16
			06-27-03	32.04
			07-29-03	32.14
			08-27-03	32.06
			09-25-03	32.16
11N04W06DACA01	114	Middle Proterozoic Spokane Formation	10-30-02	43.85
			11-26-02	44.94
			01-06-03	43.70
			01-27-03	43.55
			02-27-03	43.42
			03-25-03	43.35
11N04W09ADAD01	250	Middle Proterozoic Spokane Formation	06-27-03	30.69
			07-29-03	30.63
			08-27-03	30.98
			09-25-03	31.45

Periodic water levels in selected observation wells in Montana, water year 2003--Continued

Local number	Depth of well	Hydrogeologic unit	Date of measurement	Water level
		LEWIS AND CLARK COUNTY--Continued		
11N04W12CDDD01	176	Middle Proterozoic Spokane Formation	10-30-02	134.73
			11-26-02	133.76
			01-06-03	136.33
			01-28-03	136.67
			02-27-03	138.26
			03-27-03	131.97
			04-25-03	137.00
			05-28-03	141.39
			06-30-03	142.30
			07-30-03	146.34
			08-28-03	155.43
			09-25-03	154.34
11N04W34DCBA01	125	Upper Cretaceous Scratchgravel Hills intrusives	10-30-02	16.83
			11-26-02	17.08
			01-06-03	17.07
			01-27-03	16.99
			02-27-03	16.86
			03-13-03	15.52
			03-19-03	14.05
			03-27-03	17.27
			03-29-03	14.48
			04-25-03	15.86
			05-27-03	16.17
			06-27-03	16.83
			07-29-03	16.28
			08-27-03	17.23
			09-25-03	17.38
11N03W05CCBC01	110	Middle Proterozoic Spokane Formation	03-27-03	64.91
			04-25-03	63.50
			05-28-03	63.08
			06-27-03	64.64
			07-30-03	64.97
11N03W08BCBA01	208	Middle Proterozoic Spokane Formation	11-26-02	62.57
			01-06-03	57.28
			01-28-03	57.04
			02-27-03	56.77
			03-27-03	56.01
			04-25-03	55.81
			05-28-03	56.24
			06-27-03	57.84
			07-30-03	59.42
			08-28-03	59.46
			09-25-03	59.54
11N03W11BBBA01	350	Middle Proterozoic Spokane Formation	11-26-02	169.81
			01-06-03	163.76
			01-28-03	163.58
			02-27-03	163.71
			03-27-03	165.21
			04-25-03	163.88
			05-28-03	162.47
			06-30-03	197.50
			07-30-03	159.85
			08-28-03	167.56
			09-26-03	177.06

Periodic water levels in selected observation wells in Montana, water year 2003--Continued

Local number	Depth of well	Hydrogeologic unit	Date of measurement	Water level
		LEWIS AND CLARK COUNTY--Continued		
10N05W03ABDD01	140	Middle Cambrian Wolsey Shale	10-30-02	21.40
			11-26-02	23.26
			01-06-03	23.10
			01-27-03	21.21
			02-27-03	22.70
			03-27-03	21.42
			04-25-03	22.15
			05-28-03	22.48
			06-27-03	22.08
			07-29-03	23.94
			08-27-03	23.42
			09-25-03	22.92
10N05W09BDBC01	280	Upper Cretaceous Boulder batholith intrusives	10-30-02	41.69
			11-26-02	47.23
			01-06-03	43.25
			01-27-03	42.44
			02-27-03	43.86
			03-27-03	27.75
			04-25-03	22.01
			05-28-03	23.38
			06-27-03	29.73
			07-29-03	41.45
			08-27-03	35.73
			09-25-03	36.42
10N05W25DBDA02	100	Upper Cretaceous Boulder batholith intrusives	10-30-02	79.06
			11-26-02	78.97
			01-06-03	78.89
			01-27-03	78.82
			02-27-03	78.28
			03-27-03	77.78
			04-25-03	77.10
			05-27-03	76.69
			06-27-03	76.60
			07-29-03	78.08
			08-27-03	77.23
			09-25-03	77.39
10N05W33CDCD01	135	Upper Cretaceous Boulder batholith intrusives	10-30-02	16.70
			11-26-02	17.17
			01-06-03	16.79
			01-27-03	16.35
			02-27-03	15.61
			03-27-03	14.68
			04-25-03	13.40
			05-28-03	12.57
			06-27-03	12.97
			07-29-03	14.96
			08-27-03	15.47
			09-25-03	15.51
10N04W02CBAA01	110	Upper Cretaceous Scratchgravel Hills intrusives	11-26-02	36.75
			03-12-03	36.96
			03-19-03	35.54
			03-27-03	30.84
			04-29-03	35.49
			05-27-03	35.64
			06-27-03	36.04
			07-29-03	37.43
			08-27-03	36.56
			09-25-03	37.16

Periodic water levels in selected observation wells in Montana, water year 2003--Continued

Local number	Depth of well	Hydrogeologic unit	Date of measurement	Water level
		LEWIS AND CLARK COUNTY--Continued		
10N04W03CDBA01	206	Upper Cretaceous Scratchgravel Hills intrusives	10-30-02	27.57
			11-26-02	27.19
			01-06-03	27.30
			01-27-03	27.47
			02-27-03	27.55
			03-27-03	25.66
			04-25-03	25.98
			05-27-03	26.37
			06-27-03	28.04
			07-29-03	27.65
			08-27-03	27.25
			09-25-03	27.14
10N04W08DCAC01	120	Middle Proterozoic Helena Formation	10-30-02	48.76
			11-26-02	48.23
			01-06-03	48.09
			01-27-03	47.50
			02-27-03	46.99
			03-27-03	44.25
			04-25-03	44.43
			05-28-03	44.83
			06-27-03	51.28
			07-25-03	54.51
			08-27-03	53.77
			09-25-03	52.87
10N04W15BDAC01	260	Middle Proterozoic Spokane Formation	10-30-02	41.28
			11-26-02	41.32
			01-06-03	41.29
			01-27-03	41.13
			02-27-03	41.45
			03-27-03	40.77
			04-25-03	40.77
			05-28-03	40.83
			06-27-03	43.06
			07-29-03	44.48
			08-27-03	46.25
			09-25-03	45.84
10N04W23CADD01	130	Middle Proterozoic Helena Formation	10-30-02	57.59
			11-26-02	57.65
			01-03-03	58.23
			01-27-03	58.39
			02-27-03	52.35
			03-27-03	59.00
			04-25-03	58.80
			05-27-03	56.89
			06-27-03	59.34
			07-29-03	61.32
			08-27-03	59.74
			09-25-03	59.83
10N03W20CCAA01	100	Middle Proterozoic Helena Formation	10-30-02	37.62
			11-26-02	38.77
			01-03-03	39.68
			01-27-03	40.25
			02-27-03	40.69
			03-27-03	39.96
			04-25-03	39.19
			05-27-03	38.31
			06-27-03	38.15
			07-30-03	39.88

Periodic water levels in selected observation wells in Montana, water year 2003--Continued

Local number	Depth of well	Hydrogeologic unit	Date of measurement	Water level
		LEWIS AND CLARK COUNTY--Continued		
10N03W20CCAA01	100	Middle Proterozoic Helena Formation	08-27-03	39.23
Continued			09-25-03	38.70
10N03W32BCBD01	140	Middle Proterozoic Helena Formation	10-30-02	31.28
			11-26-02	31.30
			01-03-03	43.88
			01-27-03	44.69
			02-27-03	45.38
			03-27-03	43.56
			04-25-03	42.15
			05-27-03	40.49
			06-27-03	40.25
			07-29-03	40.69
			08-27-03	40.13
			09-25-03	40.17
09N05W12CCDA01	260	Upper Cretaceous Boulder batholith intrusives	10-30-02	35.75
			11-26-02	35.75
			01-02-03	37.84
			01-27-03	43.18
			02-27-03	33.76
			03-27-03	35.96
			04-25-03	28.85
			05-27-03	28.60
			06-27-03	29.54
			08-27-03	33.38
			09-25-03	34.63
09N04W11CCCB01	122	Upper Cretaceous Boulder batholith intrusives	10-30-02	22.58
			11-26-02	22.72
			01-03-03	22.25
			01-27-03	22.25
			02-27-03	21.56
			03-27-03	19.61
			04-25-03	18.41
			05-27-03	18.00
			06-27-03	19.52
			07-29-03	22.02
			08-27-03	24.24
			09-25-03	25.33
09N04W11CDBD01	124	Upper Cretaceous Boulder batholith intrusives	10-30-02	75.50
			11-26-02	77.03
			01-03-03	76.27
			01-27-03	76.68
			02-27-03	78.39
			03-27-03	75.99
			04-26-03	75.90
			05-27-03	75.57
			06-27-03	75.45
			09-25-03	72.50
		MC CONE COUNTY		
26N49E13ACAB01	180	Upper Cretaceous Hell Creek Formation and Fox Hills Sandstone	10-23-02	43.95
			12-11-02	43.64
			03-03-03	43.60
			05-27-03	43.64
			09-08-03	43.74

Periodic water levels in selected observation wells in Montana, water year 2003--Continued

Local number	Depth of well	Hydrogeologic unit	Date of measurement	Water level
		MINERAL COUNTY		
18N28W24DCBA01	199	Quaternary alluvium	10-01-02	+25.55
			11-20-02	+25.10
			02-04-03	+24.87
			06-03-03	+20.48
			08-14-03	+15.18
18N27W19CBBD01	58	Quaternary alluvium	10-01-02	11.98
			11-20-02	12.15
			02-04-03	11.80
			06-03-03	5.26
			08-14-03	11.95
18N27W30ABBA01	192	Quaternary alluvium	10-01-02	146.03
			11-20-02	145.68
			02-04-03	145.64
			08-14-03	145.88
17N26W30DAAD01	318	Quaternary alluvium	10-01-02	192.22
			11-20-02	192.48
			02-04-03	192.28
			08-26-03	192.25
		POWDER RIVER COUNTY		
04S45E04BDDB01	68	Quaternary alluvium	10-02-02	7.29
			10-22-02	7.37
			11-21-02	7.30
			02-06-03	6.78
			03-07-03	6.53
			05-19-03	5.05
			09-16-03	8.11
		POWELL COUNTY		
15N12W36BCDD01	206	Cenozoic rocks	10-03-02	105.75
			10-11-02	105.78
			12-14-02	105.55
			01-16-03	105.82
			04-09-03	105.63
			05-07-03	105.75
			07-15-03	106.43
			07-25-03	106.53
		RAVALLI COUNTY		
10N20W13BBA 01	50	Quaternary alluvium	10-01-02	6.00
			12-10-02	6.45
			02-12-03	6.29
			04-04-03	5.83
			09-17-03	6.08
06N20W19CCCC02	40	Quaternary alluvium	10-02-02	9.61
			12-12-02	14.37
			02-13-03	16.22
			04-03-03	16.84
			09-17-03	9.47
		ROSEBUD COUNTY		
06S43E19DDBA02	67	Quaternary alluvium	10-01-02	10.67
			10-22-02	10.59
			11-02-02	10.47
			02-06-03	10.31
			03-07-03	10.06
			05-27-03	9.06
			07-01-03	9.58
			09-02-03	10.93

Periodic water levels in selected observation wells in Montana, water year 2003--Continued

Local number	Depth of well	Hydrogeologic unit	Date of measurement	Water level
		SANDERS COUNTY		
26N34W03BDAD01	400	Quaternary alluvium	11-12-02	255.95
			03-25-03	253.66
			06-02-03	246.50
			08-12-03	255.30
25N31W30DCCC01	282	Quaternary alluvium	11-12-02	223.55
			03-25-03	223.15
23N24W34ADAA01	377	Quaternary alluvium	10-25-02	114.38
			01-31-03	114.54
22N29W32ACDD01	308	Quaternary alluvium	11-12-02	228.82
20N26W22CBBA01	50	Quaternary alluvium	11-12-02	19.81
			03-25-03	17.69
			08-12-03	17.18
19N25W07CDDA01	--	Quaternary alluvium	11-12-02	+14.34
			03-25-03	+15.03
			06-02-03	+15.73
			08-12-03	+13.88
19N25W28BABB01	369	Middle Proterozoic Belt Supergroup	11-12-02	17.36
			03-25-03	10.31
			06-02-03	4.54
			08-12-03	18.77
		SHERIDAN COUNTY		
33N58E17ADDD01	130	Pleistocene outwash	10-23-02	13.43
			12-12-02	13.51
			02-27-03	13.63
			05-29-03	11.96
			09-10-03	12.59
32N58E04DBBD02	143	Pleistocene outwash	10-23-02	23.51
			12-12-02	23.36
			01-10-03	23.35
			03-26-03	22.50
			05-29-03	22.42
			09-10-03	23.35
		TETON COUNTY		
22N03W15BAAD03	47	Pleistocene terrace deposits	10-11-02	16.29
			12-10-02	20.74
			03-17-03	25.98
			06-24-03	20.05
			09-10-03	15.97

QUANTITY AND QUALITY OF PRECIPITATION
PRICKLY PEAR CREEK BASIN

462905112035401 MCBEATH RESIDENCE NEAR CLANCY, MT (MT07)

(National trends network)

LOCATION.--Lat 46°29'05", long 112°03'54" (NAD 27), in $NE^1/_4NW^1/_4NE^1/_4$ sec.2, T.8 N., R.4 W., Jefferson County, Hydrologic Unit 10030101, at National Forest boundary fence at private residence on Lump Gulch Road, 5.1 mi west of Clancy and 10 mi south of Helena.

PERIOD OF RECORD.--Water years 1981-1982, 1984 to current year. Prior to Oct. 1984, published as 462905112034001.

EQUIPMENT.--The sample collector is an Aerochem Metrics Model 301 precipitation collector. An automatic sensor detects occurrences of precipitation, activating a motor which removes a cover from the wetfall collection vessel. When precipitation ceases, the cycle is reversed. The sampling vessel is polyethylene and has a collection diameter of 28.6 cm and a capacity of 13 liters. Precipitation is measured using a Belfort Universal rain gage, series 5-780 with an event recorder. Snowfall precipitation is measured as a water equivalent.

REMARKS.--Samples from this site were analyzed by the Illinois Water Survey Laboratory in Champaign, Illinois. Chemical data are also available through the internet at http://nadp.sws.uiuc.edu/sites/sitemap.asp?net=NTN&state=MT07.

DAILY PRECIPITATION, TOTAL (INCHES), WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.00	0.00	0.00	0.00	0.01	0.05	0.23	0.01	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.05	0.00	0.40	0.00	0.06	0.00	0.00	0.00
3	0.00	0.00	0.04	0.02	0.09	0.17	0.07	0.34	0.00	0.00	0.29	0.00
4	0.00	0.00	0.00	0.00	0.13	0.03	0.00	0.21	0.00	0.00	0.02	0.00
5	0.00	0.00	0.00	0.02	0.09	0.00	0.00	0.10	0.00	0.00	0.18	0.00
6	0.00	0.00	0.00	0.00	0.00	0.11	0.02	0.00	0.20	0.00	0.00*	0.00
7	0.00	0.00	0.00	0.00	0.00	0.58	0.00	0.04	0.00	0.00	0.00	0.00
8	0.00	0.04	0.00	0.00	0.16	0.28	0.00	0.00	0.00	0.01	0.00*	0.02
9	0.00	0.00*	0.00	0.00	0.00	0.00*	0.00	0.07	0.02	0.00	0.00*	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.31	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.03	0.01
12	0.00*	0.02	0.00	0.00	0.00	0.00*	0.00	0.10	0.00	0.00	0.00	0.30
13	0.00*	0.00	0.00	0.00*	0.00	0.00	0.01	0.00	0.06	0.00	0.08	0.00
14	0.00	0.00	0.00	e0.02	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00
15	0.00	0.00	0.01	0.04	0.00	0.04	0.04	0.06	0.11	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.03	0.00	0.00*	0.00	0.00	0.01	0.21	0.33
17	0.00	0.00	0.00	0.00	0.04	0.00	0.00*	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.03	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.19	0.00	0.00*	0.00
20	0.00	0.00	0.03	0.00*	0.00	0.00	0.00	0.00	0.38	0.00	0.05	0.00
21	0.00	0.00	0.00	0.21	0.06	0.00	0.00	0.00	0.00*	0.00	0.00	0.00
22	0.00*	0.22	0.00	0.18	0.36	0.04	0.14	0.00	0.00	0.00	0.44	0.00
23	0.00	0.39	0.00	0.18	0.01	0.04	0.09	0.00	0.00*	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00*	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.24	0.00*	0.01	0.00	0.00
26	0.00	0.00	0.00	0.00*	0.00	0.10	0.03	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.01	0.00	0.09	0.00	0.00	0.00	0.00	0.06	0.00
28	0.00	0.00	0.07	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00
29	0.33	0.00	0.02	0.00	---	0.00	0.18	0.00	0.00	0.00	0.00	0.00
30	0.02	0.00	0.00	0.01	---	0.00	0.13	0.22	0.00	0.00	0.00	0.00
31	0.00	---	0.00*	0.05	---	0.03	---	0.01	---	0.00	0.00	---
TOTAL	0.35	0.67	0.17	0.72	1.03	1.57	1.64	1.56	1.37	0.03	1.36	0.66
MEAN	0.01	0.02	0.01	0.02	0.04	0.05	0.05	0.05	0.05	0.00	0.04	0.02
MAX	0.33	0.39	0.07	0.21	0.36	0.58	0.40	0.34	0.38	0.01	0.44	0.33
MIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

*--Trace amount of precipitation.

QUANTITY AND QUALITY OF PRECIPITATION
PRICKLY PEAR CREEK BASIN

462905112035401 MCBEATH RESIDENCE NEAR CLANCY, MT (MT07)--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Precip-itation total for defined period, inches (00193)	pH, wet atm dep unfltrd field, std units (83106)	pH wet atm dep unfltrd lab, std units (83107)	Specif. conduc-tance, wet dep unfltrd field, uS/cm (83154)	Specif. conduc-tance, wet dep unfltrd lab, uS/cm (83156)	Calcium wet atm dep fltrd, mg/L (82932)	Magnes-ium, wet atm dep fltrd, mg/L (83002)	Potas-sium, wet atm dep fltrd, mg/L (83120)
OCT 2002 01-08	0.0	--	--	--	--	--	--	--
OCT 08-15	0.0	--	--	--	--	--	--	--
OCT 15-22	0.0	--	--	--	--	--	--	--
OCT 22-29	.33	5.27	5.30	6.6	4.4	.08	.008	.024
OCT 29-NOV 05	.02	--	--	--	--	--	--	--
NOV 05-12	.04	--	5.84	--	2.9	.15	.016	.020
NOV 12-19	.02	--	5.60	--	3.3	.10	<.009	<.009
NOV 19-26	.61	5.17	5.28	4.2	3.6	.02	.006	.005
NOV 26-DEC 03	.03	--	4.85	--	9.5	.10	.010	.010
DEC 03-10	.01	--	--	--	--	--	--	--
DEC 10-17	.01	--	5.72	--	3.3	.07	<.014	.019
DEC 17-24	.03	--	--	--	--	--	--	--
DEC 24-31	.09	5.33	5.63	3.0	2.6	.05	.006	.008
DEC 31 2002-JAN 07 2003	.04	--	5.58	--	3.7	.05	.006	.014
JAN 07-14	0.0	--	--	--	--	--	--	--
JAN 14-21	.04	4.81	4.92	7.9	7.1	.06	.008	.005
JAN 21-28	.58	4.95	5.08	4.4	5.1	.04	<.003	.003
JAN 28-FEB 04	.34	5.17	5.22	3.4	4.0	<.01	<.003	.005

Date	Sodium, wet atm dep fltrd, mg/L (83138)	Chlor-ide, wet atm dep fltrd, mg/L (82944)	Sulfate wet atm dep fltrd, mg/L (83160)	Ammonia wet atm dep fltrd, mg/L as NH4 (83047)	Nitrate wet atm dep fltrd, mg/L (83071)
OCT 2002 01-08	--	--	--	--	--
OCT 08-15	--	--	--	--	--
OCT 15-22	--	--	--	--	--
OCT 22-29	.003	.01	.37	.14	.48
OCT 29-NOV 05	--	--	--	--	--
NOV 05-12	.011	.03	.09	.12	.28
NOV 12-19	.009	.06	.12	.09	.27
NOV 19-26	.003	.02	.11	.07	.42
NOV 26-DEC 03	.010	.09	.46	.28	1.70
DEC 03-10	--	--	--	--	--
DEC 10-17	.014	.06	<.05	.17	.22
DEC 17-24	--	--	--	--	--
DEC 24-31	.016	.02	.08	.08	.22
DEC 31 2002-JAN 07 2003	.011	.04	<.01	.13	.19
JAN 07-14	--	--	--	--	--
JAN 14-21	.010	.03	.53	.02	.52
JAN 21-28	.003	--	.08	<.02	.45
JAN 28-FEB 04	<.003	.02	.13	.11	.46

QUANTITY AND QUALITY OF PRECIPITATION
PRICKLY PEAR CREEK BASIN

462905112035401 MCBEATH RESIDENCE NEAR CLANCY, MT (MT07)--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003--Continued

Date	Precip-itation total for defined period, inches (00193)	pH, wet atm dep unfltrd field, std units (83106)	pH wet atm dep unfltrd lab, std units (83107)	Specif. conduc-tance, wet dep unfltrd field, uS/cm (83154)	Specif. conduc-tance, wet dep unfltrd lab, uS/cm (83156)	Calcium wet atm dep fltrd, mg/L (82932)	Magnes-ium, wet atm dep fltrd, mg/L (83002)	Potas-sium, wet atm dep fltrd, mg/L (83120)
FEB 2003 04-11	.25	4.83	5.05	6.9	5.2	.02	.004	<.003
FEB 11-18	.07	5.15	5.59	3.3	2.2	.02	<.003	.006
FEB 18-25	.43	5.21	5.29	3.5	3.2	.04	.005	<.003
FEB 25-MAR 04	.25	5.11	5.27	6.6	4.4	.08	.009	.014
MAR 04-11	.97	5.36	5.25	5.6	3.6	.04	.005	.005
MAR 11-18	.04	--	5.56	--	4.6	.03	<.003	<.003
MAR 18-25	.09	5.26	5.35	3.0	2.9	.03	<.003	.021
MAR 25-APR 01	.29	5.20	5.36	9.2	5.3	.06	.006	.006
APR 01-08	.65	5.09	5.33	5.4	3.7	.04	.005	.006
APR 08-15	.04	--	--	--	--	--	--	--
APR 15-22	.23	5.22	5.64	6.1	4.4	.11	.012	.006
APR 22-29	.36	5.26	5.7	16.3	9.2	.34	.034	.024
APR 29-MAY 06	.95	5.28	5.32	10.9	3.4	.02	<.003	<.003
MAY 06-13	.32	5.15	5.61	21.0	4.2	.05	.005	.006
MAY 13-20	.11	4.85	5.42	18.1	7.1	.30	.030	.057
MAY 20-27	.24	--	--	--	--	--	--	--
MAY 27-JUN 03	.29	4.93	5.60	18.4	7.6	.28	.037	.032

Date	Sodium, wet atm dep fltrd, mg/L (83138)	Chlor-ide, wet atm dep fltrd, mg/L (82944)	Sulfate wet atm dep fltrd, mg/L (83160)	Ammonia wet atm dep fltrd, mg/L as NH4 (83047)	Nitrate wet atm dep fltrd, mg/L (83071)
FEB 2003 04-11	.003	.02	.18	.07	.67
FEB 11-18	.005	.02	.06	.07	.14
FEB 18-25	<.003	.02	.12	.04	.32
FEB 25-MAR 04	.003	.02	.32	.12	.54
MAR 04-11	<.003	.01	.16	<.02	.32
MAR 11-18	.011	.03	.08	.28	.43
MAR 18-25	.026	.06	.06	.04	.10
MAR 25-APR 01	.006	.02	.27	.16	.41
APR 01-08	.020	.02	.15	.12	.46
APR 08-15	--	--	--	--	--
APR 15-22	.014	.03	.18	.25	.57
APR 22-29	.065	.09	.97	.66	1.50
APR 29-MAY 06	<.003	.01	.13	.10	.28
MAY 06-13	.004	.02	.34	.31	.38
MAY 13-20	.028	.05	.71	.33	.87
MAY 20-27	--	--	--	--	--
MAY 27-JUN 03	.052	.12	.74	.46	1.14

QUANTITY AND QUALITY OF PRECIPITATION
PRICKLY PEAR CREEK BASIN

462905112035401 MCBEATH RESIDENCE NEAR CLANCY, MT (MT07)--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003--Continued

Date	Precip-itation total for defined period, inches (00193)	pH, wet atm dep unfltrd field, std units (83106)	pH wet atm dep unfltrd lab, std units (83107)	Specif. conduc-tance, wet dep unfltrd field, uS/cm (83154)	Specif. conduc-tance, wet dep unfltrd lab, uS/cm (83156)	Calcium wet atm dep fltrd, mg/L (82932)	Magnes-ium, wet atm dep fltrd, mg/L (83002)	Potas-sium, wet atm dep fltrd, mg/L (83120)
JUN 2003 03-10	.44	4.83	5.04	16.9	7.1	.11	.016	.025
JUN 10-17	.30	5.02	4.99	14.4	9.9	.21	.033	.111
JUN 17-24	.57	5.71	5.56	15.1	7.1	.37	.038	.064
JUN 24-JUL 01	0.0	--	--	--	--	--	--	--
JUL 01-08	.01	--	--	--	--	--	--	--
JUL 08-15	0.0	--	--	--	--	--	--	--
JUL 15-22	.01	--	--	--	--	--	--	--
JUL 22-29	.01	--	4.47	--	29.0	.66	.087	.081
JUL 29-AUG 05	.31	4.37	4.87	20.4	8.4	.08	.010	.013
AUG 05-12	.21	5.80	6.07	23.9	11.3	.39	.040	.052
AUG 12-19	.29	6.07	6.11	19.7	11.1	.79	.074	.095
AUG 19-26	.49	5.80	5.81	14.5	6.5	.30	.023	.042
AUG 26-SEP 02	.06	5.12	5.02	16.2	9.5	.15	.020	.022
SEP 02-09	.02	--	6.38	--	19.6	1.01	.094	.126
SEP 09-16	.34	5.20	5.30	19.9	3.8	.06	.007	.012
SEP 16-23	.30	5.04	5.06	15.7	5.5	.07	.007	.017
SEP 23-30		--	--	--	--	--	--	--

Date	Sodium, wet atm dep fltrd, mg/L (83138)	Chlor-ide, wet atm dep fltrd, mg/L (82944)	Sulfate wet atm dep fltrd, mg/L (83160)	Ammonia wet atm dep fltrd, mg/L as NH4 (83047)	Nitrate wet atm dep fltrd, mg/L (83071)
JUN 2003 03-10	.017	.03	.56	.23	.63
JUN 10-17	.058	.06	.74	.25	.97
JUN 17-24	.069	.10	.70	.26	.90
JUN 24-JUL 01	--	--	--	--	--
JUL 01-08	--	--	--	--	--
JUL 08-15	--	--	--	--	--
JUL 15-22	--	--	--	--	--
JUL 22-29	.179	.30	1.52	.90	4.03
JUL 29-AUG 05	.014	.04	.25	.19	.93
AUG 05-12	.049	.16	.86	.95	2.26
AUG 12-19	.069	.14	.94	.56	1.68
AUG 19-26	.016	.06	.34	.44	1.09
AUG 26-SEP 02	.023	.08	.34	.42	1.24
SEP 02-09	.196	.34	1.45	1.42	3.76
SEP 09-16	.023	.02	.20	.08	.44
SEP 16-23	.031	.03	.30	.06	.48
SEP 23-30	--	--	--	--	--

QUANTITY AND QUALITY OF PRECIPITATION
MILK RIVER BASIN

482958109475101 NORTHERN MONTANA AGRICULTURAL RESEARCH CENTER NEAR HAVRE, MT (MT98)

(National trends network)

LOCATION.--Lat 48°29'58", long 109°47'51" (NAD 27), in $NE^1/_4SW^1/_4SW^1/_4$ sec.28, T.32 N., R.15 E., Hill County, Hydrologic Unit 10050004 at Northern Montana Agricultural Research Center Experiment Station, 3/4 mile south of U.S. Highway 87, 5.7 miles southwest of Havre.

PERIOD OF RECORD.--Water years 1986 to current year.

EQUIPMENT.--The sample collector is an Aerochem Metrics Model 301 precipitation collector. An automatic sensor detects occurrences of precipitation, activating a motor which removes a cover from the wetfall collection vessel. When precipitation ceases, the cycle is reversed. The sampling vessel is polyethylene and has a collection diameter of 28.6 cm and a capacity of 13 liters. Precipitation is measured using a Belfort Universal rain gage, series 5-780 with an event recorder. Snowfall accumulation is measured as a water equivalent.

REMARKS.--Samples from this site were analyzed by the Illinois Water Survey Laboratory in Champaign, Illinois. Chemical data are also available through the internet at http://nadp.sws.uiuc.edu/sites/sitemap.asp?net=NTN&state=MT98. Missing data for Jan. 22-27, Feb. 23, 24, and Mar. 4-11 are due to equipment failure resulting from freezing air temperatures.

DAILY PRECIPITATION, TOTAL (INCHES), WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.00	0.00	0.00	0.00	0.00	0.02	0.00*	0.00	0.00*	0.04	0.00	0.00
2	0.00	0.00	0.02	0.00	0.00	0.09	0.08	0.00*	0.03	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00*	0.15	0.00	0.00	0.00
4	0.15	0.00	0.00	0.01	0.00	---	0.00	0.33	0.03	0.00	0.00	0.00
5	0.05	0.00	0.00	0.00	0.02	---	0.00*	0.95	0.07	0.00	0.00*	0.00
6	0.00	0.00	0.00	0.00	0.00	---	0.00	0.05	0.00	0.00	0.49	0.00
7	0.08	0.00	0.00	0.00	0.00	---	0.00	0.00*	0.00	0.00	0.00	0.00
8	0.00	0.12	0.00	0.00	0.05	---	0.00	0.03	0.04	0.33	0.00	0.00
9	0.00	0.43	0.00	0.00	0.09	---	0.00	0.02	0.55	0.00	0.00	0.00
10	0.00	0.03	0.00	0.00	0.03	---	0.00	0.06	0.13	0.00	0.00	0.00
11	0.02	0.00	0.00	0.00	0.00	---	0.00*	0.00	0.03	0.00	0.00	0.01
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00*	0.05	0.00	0.00	0.00*	0.22
13	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.03	0.13	0.00*	0.00	0.00
14	0.00	0.00	0.00	0.15	0.00	0.00	0.18	0.00	0.00	0.00*	0.00	0.00
15	0.00	0.00	0.00	0.03	0.00	0.00	0.87	0.05	0.00	0.00	0.00	0.00*
16	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.02	0.00	0.02	0.85
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.10
18	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.01	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.37	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00*	1.10	0.00	0.00*	0.13
21	0.16	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	---	0.08	0.00	0.00	0.00	0.00	0.00	0.02	0.00
23	0.00	0.00	0.00	---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	---	---	0.00	0.03	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	---	0.00	0.00	0.02	0.00*	0.00	0.00	0.00	0.00
26	0.00	0.00*	0.00	---	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00
27	0.00	0.00	0.04	---	0.00	0.00	0.00	0.00	0.00*	0.00	0.00	0.00
28	0.03	0.00	0.01	0.02	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	---	0.00	0.00	0.00	0.00	0.02	0.00	0.00
30	0.00	0.00	0.00	0.00	---	0.00	0.00*	0.00	0.00	0.00*	0.00	0.00
31	0.00	---	0.01	0.00	---	0.00	---	0.10	---	0.00	0.00	---
TOTAL	0.49	0.58	0.08	---	---	---	1.43	1.68	2.81	0.39	0.56	1.31
MEAN	0.02	0.02	0.00	---	---	---	0.05	0.05	0.09	0.01	0.02	0.04
MAX	0.16	0.43	0.04	---	---	---	0.87	0.95	1.10	0.33	0.49	0.85
MIN	0.00	0.00	0.00	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00

*--Trace amount of precipitation.

QUANTITY AND QUALITY OF PRECIPITATION
MILK RIVER BASIN

482958109475101 NORTHERN MONTANA AGRICULTURAL RESEARCH CENTER NEAR HAVRE, MT--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Precip-itation total for defined period, inches (00193)	pH, wet atm dep unfltrd field, std units (83106)	pH wet atm dep unfltrd lab, std units (83107)	Specif. conduc-tance, wet dep unfltrd field, uS/cm (83154)	Specif. conduc-tance, wet dep unfltrd lab, uS/cm (83156)	Calcium wet atm dep fltrd, mg/L (82932)	Magnes-ium, wet atm dep fltrd, mg/L (83002)	Potas-sium, wet atm dep fltrd, mg/L (83120)
OCT 2002								
01-08	.28	5.13	5.36	6.8	6.9	.07	.011	.019
OCT								
08-15	.02	--	4.82	--	12.4	.09	.030	<.009
OCT								
15-22	.16	5.00	5.07	7.8	8.2	.05	.007	.009
OCT								
22-22	.03	--	--	--	--	--	--	--
OCT 22-								
NOV 05	0.0	--	--	--	--	--	--	--
NOV								
05-12	.58	5.32	5.69	3.3	2.9	.05	.004	<.003
NOV								
12-19	0.0	--	--	--	--	--	--	--
NOV								
19-26	.01	--	5.21	--	9.0	--	--	--
NOV 26-								
DEC 03	.02	--	5.31	--	9.7	.14	.016	.007
DEC								
03-10	0.0	--	--	--	--	--	--	--
DEC								
10-17	0.0	--	--	--	--	--	--	--
DEC								
17-24	0.0	--	--	--	--	--	--	--
DEC								
24-30	.05	5.55	5.65	2.2	2.6	.11	.016	.012
DEC 30 2002-								
JAN 07 2003	.02	--	5.82	--	3.2	.08	.013	<.008
JAN								
07-14	0.0	--	--	--	--	--	--	--
JAN								
14-21	.18	5.18	5.31	3.6	3.7	.03	.004	<.003
JAN								
21-28	--	--	5.61	--	4.8	.26	.058	.034
JAN 28-								
FEB 04	.02	--	--	--	--	--	--	--

Date	Sodium, wet atm dep fltrd, mg/L (83138)	Chlor-ide, wet atm dep fltrd, mg/L (82944)	Sulfate wet atm dep fltrd, mg/L (83160)	Ammonia wet atm dep fltrd, mg/L as NH4 (83047)	Nitrate wet atm dep fltrd, mg/L (83071)
OCT 2002					
01-08	.009	.03	.57	.37	.83
OCT					
08-15	<.009	.05	.64	.37	1.71
OCT					
15-22	.006	.02	.82	.30	.71
OCT					
22-22	--	--	--	--	--
OCT 22-					
NOV 05	--	--	--	--	--
NOV					
05-12	.009	.02	.09	.14	.39
NOV					
12-19	--	--	--	--	--
NOV					
19-26	--	--	--	--	--
NOV 26-					
DEC 03	.010	.05	1.37	.68	1.37
DEC					
03-10	--	--	--	--	--
DEC					
10-17	--	--	--	--	--
DEC					
17-24	--	--	--	--	--
DEC					
24-30	.009	.02	.09	.07	.30
DEC 30 2002-					
JAN 07 2003	.008	.05	.14	.19	.52
JAN					
07-14	--	--	--	--	--
JAN					
14-21	<.003	.01	.10	.08	.56
JAN					
21-28	.014	.04	.36	.06	1.15
JAN 28-					
FEB 04	--	--	--	--	--

QUANTITY AND QUALITY OF PRECIPITATION
MILK RIVER BASIN

482958109475101 NORTHERN MONTANA AGRICULTURAL RESEARCH CENTER NEAR HAVRE, MT--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Precip-itation total for defined period, inches (00193)	pH, wet atm dep unfltrd field, std units (83106)	pH wet atm dep unfltrd lab, std units (83107)	Specif. conduc-tance, wet dep unfltrd field, uS/cm (83154)	Specif. conduc-tance, wet dep unfltrd lab, uS/cm (83156)	Calcium wet atm dep fltrd, mg/L (82932)	Magnes-ium, wet atm dep fltrd, mg/L (83002)	Potas-sium, wet atm dep fltrd, mg/L (83120)
FEB 2003 04-11	.19	5.26	5.44	4.5	5.8	.04	.007	.003
FEB 11-18	.05	5.40	5.76	8.5	7.5	.04	.006	.003
FEB 18-25	.18	--	--	--	--	--	--	--
FEB 25-MAR 04	.11	5.43	5.62	3.3	3.5	.06	.008	.006
MAR 04-11	.05	4.95	5.00	6.3	6.7	.08	.021	.010
MAR 11-18	0.0	--	--	--	--	--	--	--
MAR 18-25	0.0	--	--	--	--	--	--	--
MAR 25-APR 01	0.0	--	--	--	--	--	--	--
APR 01-08	.08	--	6.55	--	6.5	.09	.013	.009
APR 08-15	1.13	6.26	6.48	7.3	9.0	.5	.042	.038
APR 15-22	.17	5.69	5.86	4.2	4.4	.05	.008	<.003
APR 22-29	.05	--	--	--	--	--	--	--
APR 29-MAY 06	1.33	--	--	--	--	--	--	--
MAY 06-13	.19	5.77	6.51	--	12.6	.17	.025	.303
MAY 13-20	.06	--	--	--	--	--	--	--
MAY 20-27	.01	--	5.19	--	13.5	.56	.080	.013
MAY 27-JUN 03	.16	5.64	5.90	8.9	8.6	.19	.033	.219

Date	Sodium, wet atm dep fltrd, mg/L (83138)	Chlor-ide, wet atm dep fltrd, mg/L (82944)	Sulfate wet atm dep fltrd, mg/L (83160)	Ammonia wet atm dep fltrd, mg/L as NH4 (83047)	Nitrate wet atm dep fltrd, mg/L (83071)
FEB 2003 04-11	.007	.03	.29	.26	.78
FEB 2003 11-18	<.003	.02	.70	.76	1.41
FEB 18-25	--	--	--	--	--
FEB 25-MAR 04	.014	.04	.20	.24	.44
MAR 04-11	.003	.03	.16	.04	.98
MAR 11-18	--	--	--	--	--
MAR 18-25	--	--	--	--	--
MAR 25-APR 01	--	--	--	--	--
APR 01-08	<.009	<.02	.52	.58	.98
APR 08-15	.300	.18	.62	.32	.41
APR 15-22	.003	.02	.18	.42	.67
APR 22-29	--	--	--	--	--
APR 29-MAY 06	--	--	--	--	--
MAY 06-13	.050	.12	1.15	.59	.90
MAY 13-20	--	--	--	--	--
MAY 20-27	.046	.11	.82	.74	1.87
MAY 27-JUN 03	.037	.23	.74	.65	1.18

QUANTITY AND QUALITY OF PRECIPITATION
MILK RIVER BASIN

482958109475101 NORTHERN MONTANA AGRICULTURAL RESEARCH CENTER NEAR HAVRE, MT--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Precip-itation total for defined period, inches (00193)	pH, wet atm dep unfltrd field, std units (83106)	pH wet atm dep unfltrd lab, std units (83107)	Specif. conduc-tance, wet dep unfltrd field, uS/cm (83154)	Specif. conduc-tance, wet dep unfltrd lab, uS/cm (83156)	Calcium wet atm dep fltrd, mg/L (82932)	Magnes-ium, wet atm dep fltrd, mg/L (83002)	Potas-sium, wet atm dep fltrd, mg/L (83120)
JUN 2003 03-10	.81	5.55	5.60	6.3	6.8	.17	.028	.050
JUN 10-17	.31	5.55	5.57	5.6	5.8	.16	.025	.053
JUN 17-24	1.47	5.64	5.74	4.5	4.8	.20	.029	.032
JUN 24-JUL 01	.18	--	--	--	--	--	--	--
JUL 01-08	.35	4.79	5.85	18.2	11.3	.41	.052	.104
JUL 08-15	0.0	--	--	--	--	--	--	--
JUL 15-22	0.0	--	--	--	--	--	--	--
JUL 22-29	.02	--	6.89	--	35.2	2.46	.325	.600
JUL 29-AUG 05	0.0	--	--	--	--	--	--	--
AUG 05-12	.49	5.79	5.91	7.8	7.9	.33	.044	.040
AUG 12-19	.05	--	5.98	--	23.8	1.26	.194	.294
AUG 19-26	.02	--	6.81	--	26.3	1.67	.234	.350
AUG 26-SEP 02	0.0	--	--	--	--	--	--	--
SEP 02-09	0.0	--	--	--	--	--	--	--
SEP 09-16	1.03	4.96	5.14	8.9	8.0	.16	.021	.023
SEP 16-23	.28	5.13	5.17	5.4	5.8	.06	.008	.016
SEP 23-30	0.0	--	--	--	--	--	--	--

Date	Sodium, wet atm dep fltrd, mg/L (83138)	Chlor-ide, wet atm dep fltrd, mg/L (82944)	Sulfate wet atm dep fltrd, mg/L (83160)	Ammonia wet atm dep fltrd, mg/L as NH4 (83047)	Nitrate wet atm dep fltrd, mg/L (83071)
JUN 2003 03-10	.008	.04	.73	.50	.87
JUN 10-17	.032	.05	.42	.36	.90
JUN 17-24	.031	.06	.39	.20	.60
JUN 24-JUL 01	--	--	--	--	--
JUL 01-08	.069	.12	1.06	.82	1.71
JUL 08-15	--	--	--	--	--
JUL 15-22	--	--	--	--	--
JUL 22-29	.149	.20	2.79	1.92	2.15
JUL 29-AUG 05	--	--	--	--	--
AUG 05-12	.019	.07	.64	.58	1.54
AUG 12-19	.084	.23	2.08	1.45	4.15
AUG 19-26	.159	.28	1.51	1.82	3.67
AUG 26-SEP 02	--	--	--	--	--
SEP 02-09	--	--	--	--	--
SEP 09-16	.012	.03	.78	.40	1.11
SEP 16-23	.006	.02	.46	.18	.61
SEP 23-30	--	--	--	--	--

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Conversion Factors

Multiply	By	To obtain
	Length	
inch (in.)	2.54×10^{1}	millimeter (mm)
	2.54×10^{-2}	meter
foot (ft)	3.048×10^{-1}	meter (m)
mile (mi)	1.609×10^{0}	kilometer (km)
	Area	
acre	4.047×10^{3}	square meter (m^2)
	4.047×10^{-1}	square hectometer (hm^2)
	4.047×10^{-3}	square kilometer (km^2)
square mile (mi^2)	2.590×10^{0}	square kilometer (km^2)
	Volume	
gallon (gal)	3.785×10^{0}	liter (L)
	3.785×10^{-3}	cubic meter (m^3)
	3.785×10^{0}	cubic decimeter (dm^3)
million gallons (Mgal)	3.785×10^{3}	cubic meter (m^3)
	3.785×10^{-3}	cubic hectometer (hm^3)
cubic foot (ft^3)	2.832×10^{-2}	cubic meter (m^3)
	2.832×10^{1}	cubic decimeter (dm^3)
cubic-foot-per-second-per-day [(ft^3/s/d]	2.447×10^{3}	cubic meter (m^3)
	2.447×10^{-3}	cubic hectometer (hm^3)
acre-foot (acre-ft)	1.223×10^{3}	cubic meter (m^3)
	1.223×10^{-3}	cubic hectometer (hm^3)
	1.223×10^{-6}	cubic kilometer (km^3)
	Flow rate	
cubic foot per second (ft^3/s)	2.832×10^{1}	liter (L/s)
	2.832×10^{-2}	cubic meter per second (m^3/s)
	2.832×10^{1}	cubic decimeter per second (dm^3/s)
gallon per minute (gal/min)	6.309×10^{-2}	liter per second (L/s)
	6.309×10^{-5}	cubic meter per second (m^3/s)
	6.309×10^{-2}	cubic decimeter per second (dm^3/s)
million gallons per day (Mgal/d)	4.381×10^{-2}	cubic meter per second
	4.381×10^{1}	cubic decimeter per second (dm^3/s)
	Mass	
ton, short (2,000 lb)	9.072×10^{-1}	megagram (Mg) or metric ton
	Water Temperature	
degrees Celsius (°C)	°F = (1.8 x °C) + 32	degrees Fahrenheit (°F)