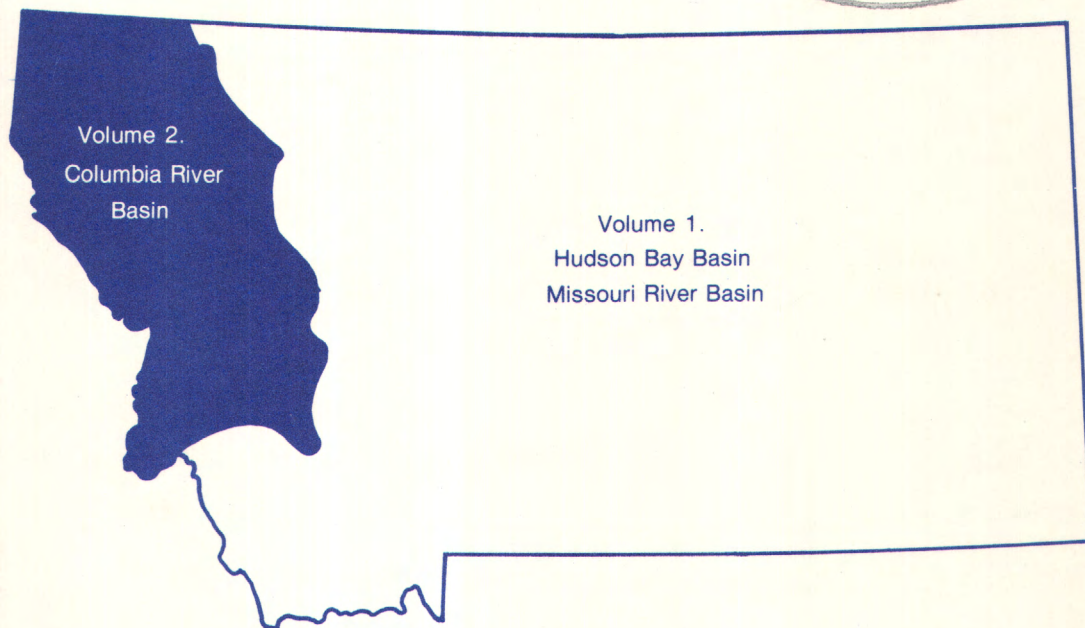
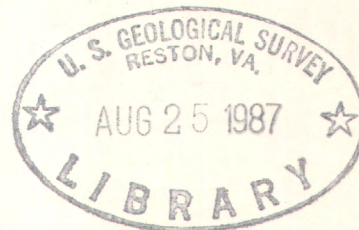


Water Resources Data Montana Water Year 1986

Volume 2. Columbia River Basin



U.S. GEOLOGICAL SURVEY WATER DATA REPORT MT-86-2
Prepared in cooperation with the State of Montana
and with other agencies

CALENDAR FOR WATER YEAR 1986

1985

OCTOBER							NOVEMBER							DECEMBER								
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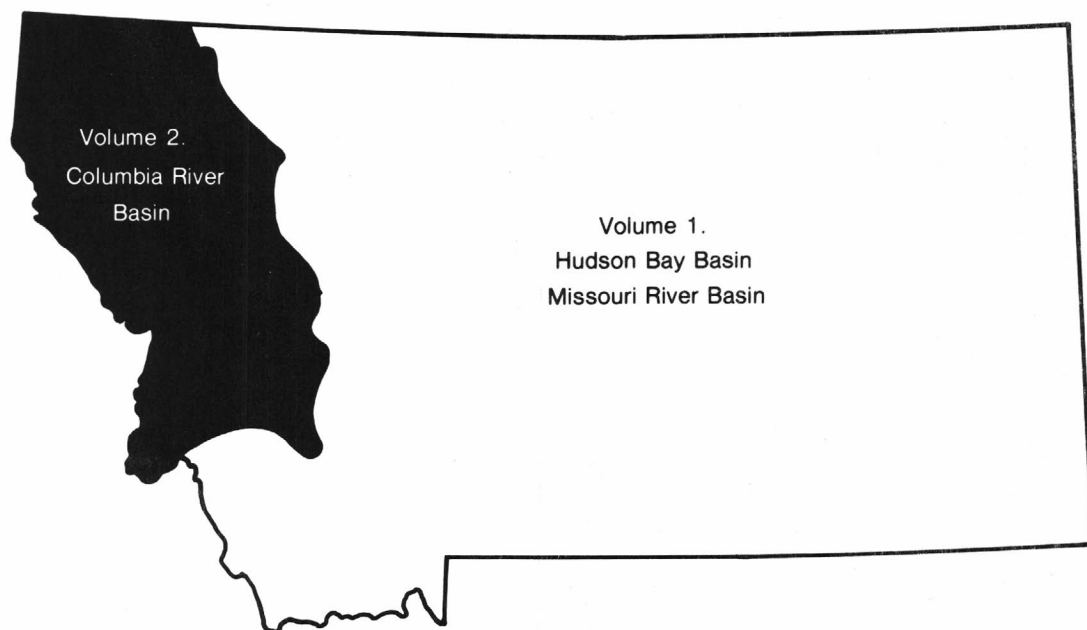
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Water Resources Data Montana Water Year 1986

Volume 2. Columbia River Basin

by R.R. Shields, J.R. Knapton, M.K. White, T.M. Brosten, and J.H. Lambing



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT MT-86-2
Prepared in cooperation with the State of Montana
and with other agencies

DEPARTMENT OF THE INTERIOR
DONALD PAUL HODEL, Secretary

U.S. GEOLOGICAL SURVEY
Dallas L. Peck, Director

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District Chief, Water Resources Division
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Federal Office Building, Room 428
Drawer 10076
Helena, Montana, 59626

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 Montana district, 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:

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Karen S. Midtlyng typed the text of this report.

This report is one of a series issued State by State under the general direction of Philip Cohen, Chief Hydrologist, and J. F. Daniel, Assistant Chief Hydrologist for Scientific Publications and Data Management. This report was prepared by the U.S. Geological Survey in cooperation with the State of Montana and with other agencies, under the supervision of J. A. Moreland, District Chief, and J. F. Blakey, Jr., Regional Hydrologist, Central Region.

Hydrologic data for Montana are contained in two volumes:

Volume 1. Hudson Bay and Missouri River
Basins

Volume 2. Columbia River Basin

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17. Document Analysis a. Descriptors *Montana, *Hydrologic data, *Surface water, *Ground water, *Water quality, Flow rate, Gaging stations, Lakes, Reservoirs, Chemical analyses, Sediments, Water temperatures, Sampling sites, Water levels, Water analyses. b. Identifiers/Open-Ended Terms c. COSATI Field/Group			
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(s) sediment, (e) elevations or contents)

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WATER RESOURCES DATA FOR MONTANA, 1986

Volume 1: Hudson Bay and Missouri River Basins
Volume 2: Columbia River Basin

INTRODUCTION

The Water Resources Division of the U.S. Geological Survey, in cooperation with State and other Federal agencies, obtains a large amount of data pertaining to the water resources of Montana each water year. These data, accumulated during many water 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 Geological Survey, the data are published annually in this report series entitled, "Water Resources Data, Montana."

Water resources data for the 1986 water year for Montana consist of records of stage, discharge, and water quality of streams; stage, contents, and water quality of lakes and reservoirs; and water levels of ground-water wells. This volume contains records for water discharge at 60 gaging stations; stage and contents at 3 lakes and reservoirs; water quality at 15 gaging stations, 5 water-quality stations; and 3 lake stations; and water levels at 9 observation wells and 3 long-term observation wells equipped with continuous recorders. Also included are data for 24 crest-stage partial-record stations and 20 smaller reservoirs. Additional water data were collected at various sites, not involved in the systematic data collection program, and are published as miscellaneous measurements. A few pertinent stations in bordering States are also included in this report. In this volume the locations of gaging stations are shown in figure 7, water-quality stations are shown in figure 8, and ground-water observation wells are shown on figure 10. These data represent that part of the National Water Data System collected by the U.S. Geological Survey and cooperating State and Federal agencies in Montana.

Records of discharge or stage of streams, and contents or stage of lakes and reservoirs were first published in a series of U.S. Geological Survey water-supply papers entitled "Surface Water Supply of the United States." Through September 30, 1960, these water-supply papers were in an annual series and then in a 5-year series for 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 consulted in the libraries of the principal cities of the United States or may be purchased from U.S. Geological Survey, Books and Open-File Reports, Federal Center, Building 41, Box 25425, Denver, Colorado 80225.

For water years 1961 through 1970, streamflow data were released by the Geological Survey in annual reports on a State-boundary basis. Water-quality records for water years 1964 through 1970 were similarly released either in separate reports or in conjunction with streamflow records.

Beginning with the 1971 water year, water data for streamflow, water quality, and ground water are published in official Survey reports on a State-boundary basis. These official Survey 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-86-2". 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.

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 (406) 449-5263.

COOPERATION

The U.S. Geological Survey and organizations of the State of Montana have had cooperative agreements for the systematic collection of streamflow records since 1906, for water-quality records since 1946, and for ground-water levels since 1964. Organizations that assisted in collecting data through cooperative agreement with the Survey are:

Montana Department of Natural Resources and Conservation
L. Fasbender, director

Montana State Highway Commission
G. Wicks, director of highways

Montana Department of Fish, Wildlife and Parks
J. W. Flynn, director

Montana Department of Health and Environmental Sciences
Dr. J. J. Drynan, director

Montana Department of State Lands
D. Hemmer, commissioner of state lands

Montana Bureau of Mines and Geology
E. T. Ruppel, director

The following organizations aided in collecting records:

The Montana Power Company, the Washington Power Company, and Pacific Power and Light Company.

Organizations that supplied data are acknowledged in station descriptions.

GENERAL HYDROLOGIC SETTING

The upper Columbia River basin in western Montana is composed of two major river systems: the Kootenai River system, which originates in British Columbia, Canada, and the Pend Oreille River system, which originates in Montana. In Montana, the principal drainages in the Pend Oreille system are the Clark Fork (River), which originates in Montana, and the Flathead River, the North Fork of which originates in British Columbia. The Flathead River joins the Clark Fork near Paradise, Mont.

Major multipurpose reservoirs have been constructed on the Kootenai and the Flathead Rivers. Lake Koocanusa, which was formed by Libby Dam in 1972, has a usable capacity of 5,748,000 acre-feet. In the Flathead River basin the largest storage projects are Hungry Horse Reservoir (completed in 1952)--a multipurpose project on the South Fork Flathead River with a capacity of about 3.5 million acre-ft, and Flathead Lake--a natural lake (surface area 195 mi²) whose capacity was increased by about 1.7 million acre-ft with the construction of Kerr Dam in 1937.

Annual precipitation varies considerably throughout the basin, from about 15 inches in the lower valleys to about 120 inches along the Continental Divide in Glacier National Park. Much of this precipitation occurs as snow during the winter. Peak runoff from the basin can result from either spring snowmelt or spring snowmelt mixed with rain during May and June. Flooding in June 1964 was an example of mixed snowmelt-rainfall runoff. The northwestern part of the basin is sometimes affected by warm, wet Pacific storm fronts during the winter that can bring intense rains and thawing conditions that can cause major flooding. Flooding in January 1974 was an example of this type of runoff.

Water generally is suitable for all uses throughout the basin, being a calcium bicarbonate type with relatively small concentrations of dissolved solids. Water from alluvial, glacial-deposit, basin-fill, and bedrock aquifers supplies most domestic and livestock needs. The largest supplies of ground water generally occur in the alluvium of the intermontane valleys.

HYDROLOGIC ACTIVITY--WATER YEAR 1986

Three streamflow-gaging stations were installed in the upper Columbia River basin during water year 1986. They were Clark Fork at Turah Bridge, near Bonner, Mont. (station 12334550), Starvation Creek near Flathead, B.C. (station 12355100), and Tuchuck Creek near Flathead, B.C. Two daily sediment stations were installed in the upper Clark Fork--Blackfoot River near Bonner, Mont. (station 12340000) and Clark Fork above Missoula, Mont. (station 12340500). These stations were installed to aid in the study preliminary to the repair of Milltown Dam. One daily sediment station was installed in the Flathead drainage--Flathead River at Flathead, B.C. (station 12355000). This site was installed jointly by the United States and Canada to obtain information in anticipation of coal-mining activity in Canada. Three thermograph stations were discontinued--Tobacco River near Eureka, Mont. (station 12301300), Fisher River near Libby, Mont. (station 12302055), and Yaak River near Troy, Mont. (station 12304500). Six water-quality stations in the upper Clark Fork basin were discontinued in June 1986. Two of the stations, Clark Fork at Deer Lodge, Mont., (station 12324200) and Clark Fork at Turah Bridge, near Bonner, Mont. (station 12334550) were also discontinued as daily sediment stations. Daily sediment sampling was resumed at Clark Fork at Turah Bridge, near Bonner in July 1986 as part of a study preliminary to the repair of Milltown Dam. No other streamflow-gaging or water-quality stations were discontinued during water year 1986.

SUMMARY OF HYDROLOGIC CONDITIONS--WATER YEAR 1986

Water year 1986 in the upper Columbia River basin was characterized by major variations in hydrologic conditions. Precipitation and temperature were near normal for the year; however, both were markedly greater than normal during various periods, resulting in substantial fluctuations in streamflow.

Precipitation and Temperature

Precipitation data for 42 stations in western Montana, generally in valley locations, are published by the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service. Data for mountain precipitation occurring as snow during the winter are published by the U.S. Department of Agriculture, Soil Conservation Service, in the report "Montana Water Supply Outlook."

Average precipitation at the 42 stations operated by the National Weather Service for water year 1986 was 20.71 inches, which is 0.69 inch (3 percent) greater than normal. The precipitation for the winter, as indicated by the National Weather Service reporting stations from October 1985 through March 1986, averaged 10.02 inches (93 percent of normal), or 0.71 inch less than normal. According to the April 1, and May 1, 1986, Soil Conservation Service reports, snowpack generally was 55 to 88 percent of normal for most of the basin. From April 1986 through September 1986, precipitation reported by the National Weather Service averaged 10.69 inches (115 percent of normal), or 1.40 inches greater than normal, with all the greater than normal precipitation occurring in July and September. September precipitation averaged 1.56 inches greater than normal.

Temperatures for the year generally were normal. However, November temperatures were 12 °Fahrenheit less than normal, whereas January through March temperatures averaged 6 to 8 °Fahrenheit greater than normal.

Streamflow

Streamflow data for water year 1986 are compared to data for water years 1961-85 at three long-term streamflow-gaging stations (fig. 1). Although the effect of near normal annual precipitation is reflected in the bar graphs showing the mean yearly discharge for 1961-85 and the yearly mean discharge for 1986, the year was far from normal. The three long-term stations recorded 93 to 101 percent of the 1961-85 mean yearly discharge, as compared to 72 to 92 percent a year ago. Large fluctuations in discharge were recorded during the year and are apparent in the graphs of the three long-term stations. Effects of greater than normal precipitation in September 1985 and October 1985 are reflected in the graphs of all three long-term stations. The stations recorded from 118 to 322 percent of the long-term mean monthly flow for October. About 1 inch of rain fell on the Flathead and Kootenai River basins during November 1-2, 1985, resulting in substantial runoff. At this time of year, precipitation normally occurs as snow. At two of the long-term stations, the Yaak River and the Middle Fork Flathead River, monthly mean discharge for November exceeded the previous maximum monthly mean discharge for the 1961-85 period of record.

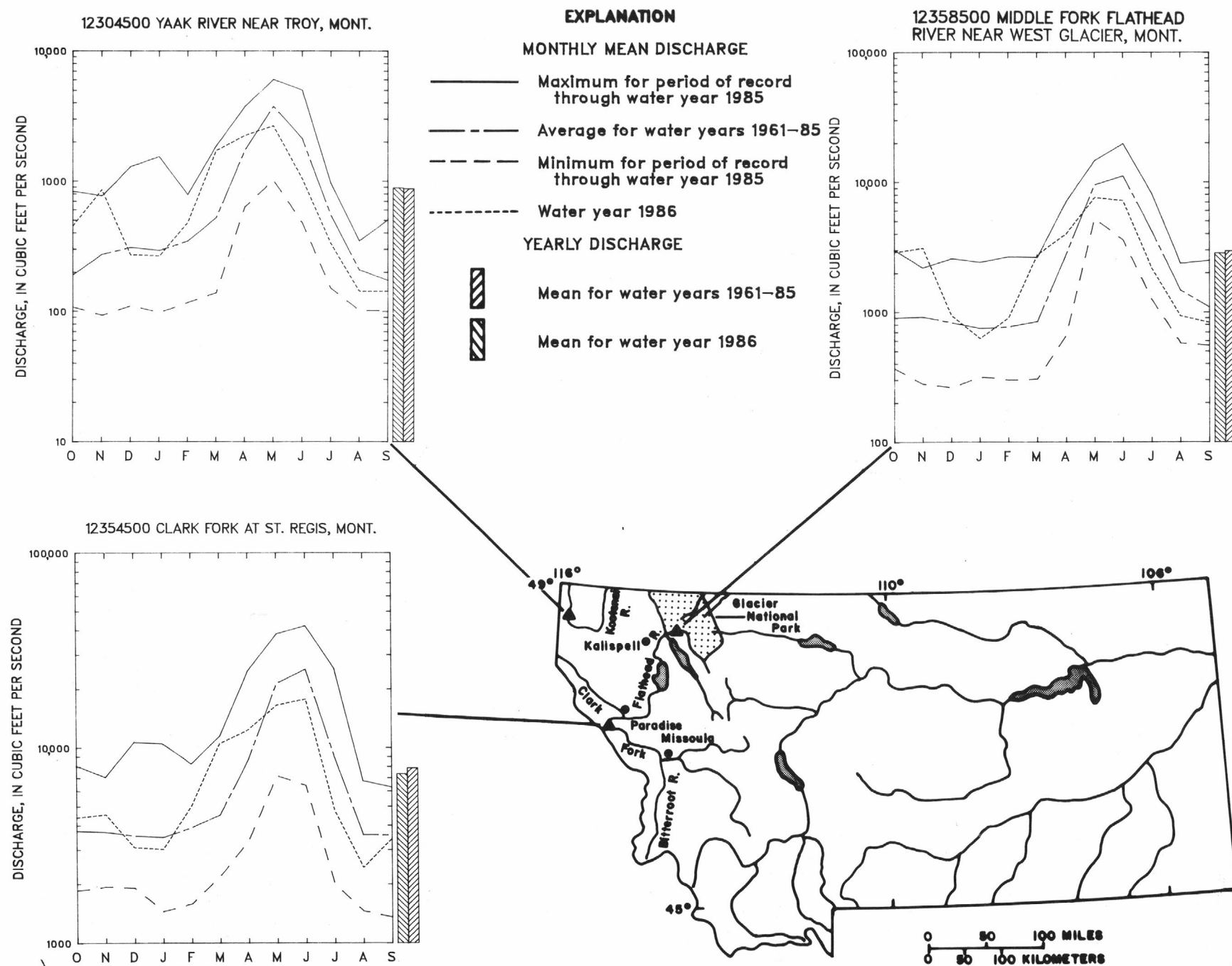


Figure 1.--Streamflow data for water year 1986 compared to data for water years 1961-85 at long-term streamflow-gaging stations.

Flows receded to near normal during December and January. Temperatures increased rapidly during the latter part of February (chinook wind), and greater than normal temperatures extended into the first week of March. Monthly mean discharge for February ranged from 117 to 140 percent of the 1961-85 mean values. Monthly mean discharges for March ranged from 232 to 327 percent of the 1961-85 mean values. At the Middle Fork Flathead River, monthly mean discharge for March was the maximum recorded for this station.

The effects of the less than average snowpack are apparent in graphs of streamflow (fig. 1) at the three long-term stations for May through August. For example, during June, which had near normal precipitation, the monthly mean discharge at the three long-term stations ranged from 50 to 70 percent of the 1961-85 mean. The lack of normal snowpack kept flows low throughout the summer. In September, when precipitation became greater than normal, the three long-term stations recorded near normal flows.

Generally no extraordinary flood flows were recorded this year, except during the warm period in February in the Little Bitterroot River and Camas Creek drainages in northwestern Montana. An indirect determination of flow in the Little Bitterroot River at the mouth, near Hot Springs, Mont., indicated a discharge of 2,520 ft³/s, which was estimated to have a recurrence interval of 50 years. Flows were greater than normal during this period at most other stations, but no extraordinary flood flows were recorded elsewhere. Peak discharges for water year 1986 at several representative streamflow-gaging stations in the basin are compared to peak discharges for the period of record in table 1.

Table 1.--Comparison of instantaneous peak discharge for water year 1986 with peak discharge for period of record at long-term stations
[<, less than]

Station number	Station name	Drainage area (square miles)	Date	Peak discharge, water year 1986		Date	Peak discharge, period of record	
				Cubic feet per second	Recurrence interval (years)		Cubic feet per second	
12301300	Tobacco River near Eureka, Mont.	440	05-29	1,370	<2	06-18-74	2,470	
12304500	Yaak River near Troy, Mont.	766	04-23	4,550	<2	05-21-56	12,100	
12332000	Middle Fork Rock Creek near Philipsburg, Mont.	123	05-30	1,380	8	06-16-74	1,680	
12335500	Nevada Creek above reservoir, near Finn, Mont.	116	02-26	1,100	8	06-02-53	1,800	
12340000	Blackfoot River near Bonner, Mont.	2,290	05-30	7,300	<2	06-10-64	19,200	
12340500	Clark Fork above Missoula, Mont.	5,999	05-30	13,600	<2	06-21-75	32,300	
12354500	Clark Fork at St. Regis, Mont.	10,709	06-01	38,800	<2	05-24-48	68,900	
12355500	North Fork Flathead River near Columbia Falls, Mont.	1,548	05-29	22,900	2	06-09-64	69,100	
12358500	Middle Fork Flathead River near West Glacier, Mont.	1,128	05-30	19,400	<2	06-09-64	140,000	
12370000	Swan River near Bigfork, Mont.	671	06-01	6,340	5	06-20-74	8,890	

No periods of extended low flows were recorded during water year 1986. Minimum daily discharges for the same streamflow-gaging stations used in the peak-flow comparison are listed in table 2. The recurrence interval of low flows was less than the 2-year recurrence interval for the minimum daily flows.

Table 2.--Comparison of minimum daily discharge for water year 1986 with minimum discharge for period of record at long-term stations
[<, less than]

Station number	Station name	Drainage area (square miles)	Date	Minimum daily discharge, water year 1986		Date	Minimum discharge, period of record	
				Cubic feet per second	Recurrence interval (years)		Cubic feet per second	
12301300	Tobacco River near Eureka, Mont.	440	02-14	75	<2	01-11-63	20	
12304500	Yaak River near Troy, Mont.	766	08-29	100	<2	12-09-72	50	
12332000	Middle Fork Rock Creek near Philipsburg, Mont.	123	12-11	20	<2	02-09-53	5.3	
12335500	Nevada Creek above reservoir, near Finn, Mont.	116	08-20	6.2	<2	At times	<2.0	
12340000	Blackfoot River near Bonner, Mont.	2,290	02-11	460	<2	01-4,5-50	200	
12340500	Clark Fork above Missoula, Mont.	5,999	08-20,21	979	<2	09-27-37	340	
12354500	Clark Fork at St. Regis, Mont.	10,709	08-22	2,220	<2	01-10-80	870	
12355500	North Fork Flathead River near Columbia Falls, Mont.	1,548	02-21	450	<2	01-08-53	198	
12358500	Middle Fork Flathead River near West Glacier, Mont.	1,128	02-21	420	<2	11-27-52	<173	
12370000	Swan River near Bigfork, Mont.	671	01-27	461	<2	01-26-29-30	193	

Quality of Streamflow

Nutrient enrichment in the form of phosphorus in the Kootenai River and Lake Koocanusa has been a concern since completion of Libby Dam in 1972. Selected water-quality constituents, including nutrients, are routinely monitored at Kootenai River below Libby Dam, near Libby, Mont. (station 12301933). For water year 1986, monthly measurements of dissolved and total phosphorus can be summarized as follows:

	<u>Range</u>	<u>Mean</u>
Dissolved phosphorus (milligrams per liter)	0.001 - 0.007	0.003
Total phosphorus (milligrams per liter)	0.004 - 0.007	0.005

The measurements indicate that outflow from Lake Koocanusa continues to maintain relatively small concentrations of phosphorus in the Kootenai River, similar to those of the past 10 years.

In the Pend Oreille River basin of Montana, water quality is monitored routinely at three National Stream Quality Accounting Network (NASQAN) stations:

12353000 Clark Fork below Missoula, Mont.;
 12355000 Flathead River at Flathead, B.C.; and
 12363000 Flathead River at Columbia Falls, Mont.

Minimum and maximum values for selected key water-quality parameters measured in water year 1986 along with the minimum and maximum values for the period of record prior to water year 1986 are listed in table 3 for each NASQAN station. In addition to the values, the number of samples for each of the groups is given. The minimum and maximum values listed in the table for measurements made during water year 1986 were within the ranges for periods of record. This condition generally was the same for all water-quality measurements made at the NASQAN stations during water year 1986. The small ranges of water-quality values were a reflection of the streamflow pattern for the year where extreme high- and low-flow conditions were absent. Snowmelt runoff was less than normal, resulting in smaller peak flows. Late summer precipitation increased streamflow during the period of normal low flows.

Table 3.--Comparison of minimum and maximum values for selected water-quality measurements for water year 1986 to minimum and maximum values for period of record prior to water year 1986
 [<, less than]

Station number	Station name	Water year 1986			Period of record through water year 1985		
		Number of samples	Min- imum	Max- imum	Number of samples	Min- imum	Max- imum
<u>Dissolved solids, in milligrams per liter</u>							
12353000	Clark Fork below Missoula, Mont.	6	98	160	55	59	218
12355000	Flathead River at Flathead, B.C.	4	89	147	97	79	176
12363000	Flathead River at Columbia Falls, Mont.	4	78	95	45	68	128
<u>Dissolved phosphorus, in milligrams per liter</u>							
12353000	Clark Fork below Missoula, Mont.	6	0.010	0.030	55	0.010	0.290
12355000	Flathead River at Flathead, B.C.	4	<.005	.006	65	<.001	.034
12363000	Flathead River at Columbia Falls, Mont.	4	.003	.005	44	<.001	.030
<u>Dissolved oxygen, in percent saturation</u>							
12353000	Clark Fork below Missoula, Mont.	6	91	111	80	82	127
12355000	Flathead River at Flathead, B.C.	3	98	102	121	91	110
12363000	Flathead River at Columbia Falls, Mont.	4	94	105	95	92	107
<u>Turbidity, in nephelometric turbidity units</u>							
12353000	Clark Fork below Missoula, Mont.	6	1.2	10	55	0.4	100
12355000	Flathead River at Flathead, B.C.	4	.2	43	58	<.05	55
12363000	Flathead River at Columbia Falls, Mont.	4	.4	25	45	.2	90
<u>Dissolved arsenic, in micrograms per liter</u>							
12353000	Clark Fork below Missoula, Mont.	3	<1	4	29	1	12
12355000	Flathead River at Flathead, B.C.	4	<1	<1	42	<1	2
12363000	Flathead River at Columbia Falls, Mont.	4	<1	<1	27	<1	2
<u>Dissolved iron, in micrograms per liter</u>							
12353000	Clark Fork below Missoula, Mont.	3	13	34	29	3	820
12355000	Flathead River at Flathead, B.C.	3	3	35	42	<3	300
12363000	Flathead River at Columbia Falls, Mont.	3	4	16	27	<3	70
<u>Dissolved copper, in micrograms per liter</u>							
12353000	Clark Fork below Missoula, Mont.	3	2	7	29	1	26
12355000	Flathead River at Flathead, B.C.	3	<1	1	42	<1	8
12363000	Flathead River at Columbia Falls, Mont.	3	<1	1	27	<1	4

Suspended-sediment and trace-metal sampling in the upper Clark Fork basin that began in March 1985 as part of a cooperative study with the State was discontinued in June 1986. Samples were periodically collected at six stations--two on the Clark Fork and four on major tributaries.

12324200 Clark Fork at Deer Lodge, Mont.
 12324590 Little Blackfoot River near Garrison, Mont.
 12331500 Flint Creek near Philipsburg, Mont.
 12334510 Rock Creek near Clinton, Mont.
 12334550 Clark Fork at Turah Bridge, near Bonner, Mont.
 12340000 Blackfoot River near Bonner, Mont.

A large streamflow and sediment peak occurred in the upper Clark Fork basin in late February as a result of snowmelt. Samples collected during this peak had the largest concentrations measured during the study for many of the trace metals that were analyzed. Because of the large suspended-sediment concentrations, total-recoverable (dissolved plus suspended) concentrations were much larger than in previous samples. Dissolved, total, and total-recoverable concentrations of arsenic and copper at the stations during the February 24-26 peak are compared in figures 2 and 3.

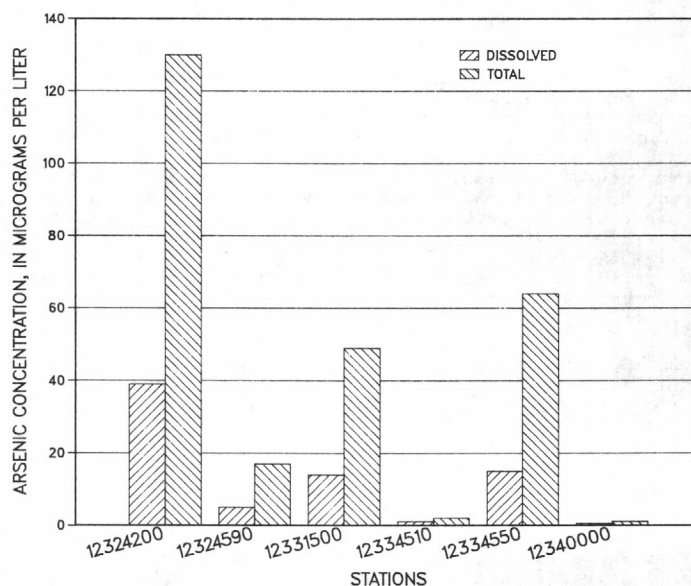


Figure 2.--Concentrations of dissolved and total arsenic at two stations on the Clark Fork and at four stations on tributaries during February 24-26, 1986.

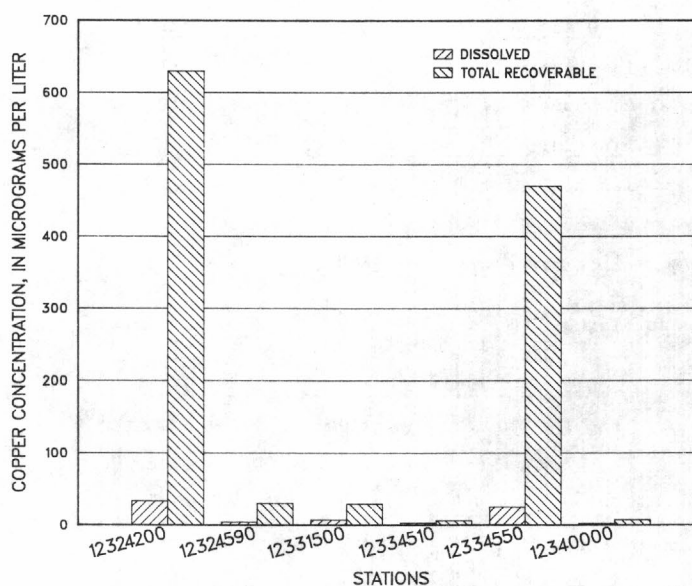


Figure 3.--Concentrations of dissolved and total-recoverable copper at two stations on the Clark Fork and at four stations on tributaries during February 24-26, 1986.

The two Clark Fork stations, Clark Fork at Deer Lodge, Mont. and Clark Fork at Turah Bridge, near Bonner, Mont., also were operated as daily suspended-sediment stations. Hydrographs of daily suspended-sediment discharge for the two stations are presented in figure 4.

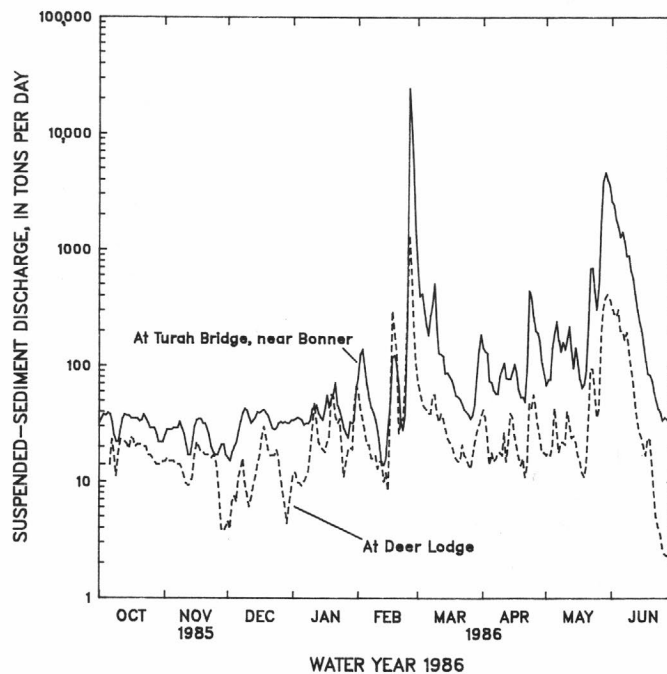


Figure 4.--Hydrographs of suspended-sediment discharge of the Clark Fork at Deer Lodge, Mont. (station 12324200) and Clark Fork at Turah Bridge, near Bonner, Mont. (station 12334550) from October 1985 to June 1986.

Total sediment discharge for the 9 months of record in water year 1986 was 15,587 tons at Deer Lodge, Mont. and 97,689 tons at Turah Bridge, near Bonner, Mont. Monthly sediment discharge at Deer Lodge compared to Turah Bridge ranged from 11 to 56 percent. Sediment at Deer Lodge comprised a large percentage of the sediment transported past Turah Bridge, during months of low flow, indicating either relatively minor sediment contributions from tributary and channel sources or temporary channel storage in the approximately 100-mile reach between the stations. During high-flow periods, sediment input from widespread sources was substantially greater, and sediment discharge at Deer Lodge comprised a smaller percentage of the sediment discharge at Turah Bridge.

Ground-water levels

Water levels in 9 wells, which are part of a statewide network of 308 observation wells, were measured in water year 1986 in the Columbia River basin (table 4). Although network wells typically are measured each fall, many measurements were not made in water year 1986. State network wells measured in September 1985 and October 1986 are not included in this report. Most wells in the network are measured annually; however, some wells are measured more frequently. An additional three wells are equipped with continuous recorders. These wells are in areas where water use may cause both seasonal fluctuations and long-term trends in water levels. Hydrographs (graphs showing water level versus time) for wells with recorders are shown in figure 5.

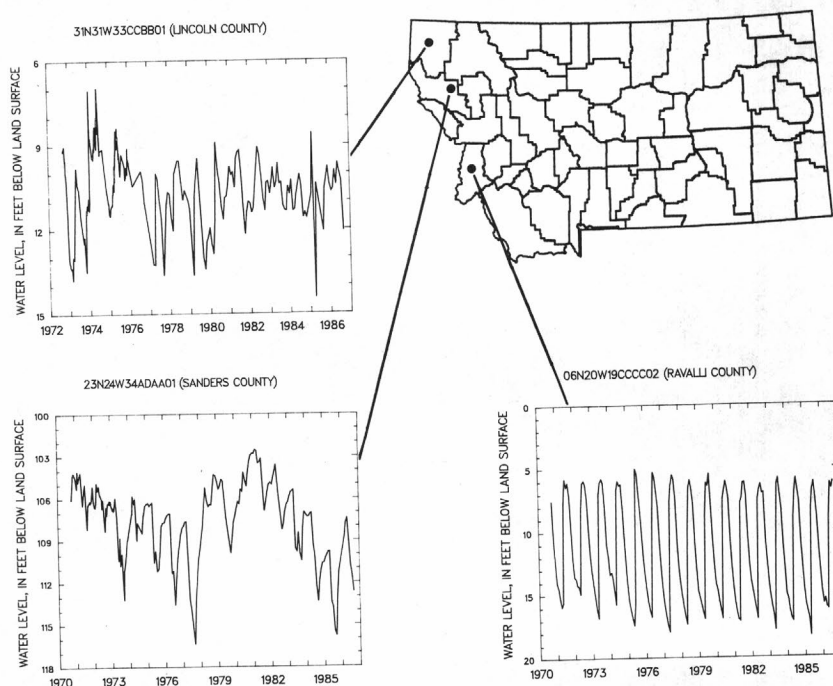


Figure 5.--Long-term hydrographs for observation wells equipped with continuous recorders.

The observation well in Lincoln County (well 31N31W33CCBB01) is completed in alluvium of a major river valley. The hydrograph for this well shows erratic fluctuations in water level, with maximum seasonal change of about 7 feet. The hydrograph shows no long-term progressive change in the water level of this well. The alluvial aquifer is composed of coarse sand and gravel and is hydraulically connected to the river. Rapid fluctuations in water level in the well result from changes in river stage and recharge from precipitation.

Table 4.--Water-level measurements in observation wells
 [Depth of well--in feet below land surface.
 Water level--in feet below land surface]

Local number	Depth of well	Aquifer	Water- level date	Water level
24N23W21BCDA01	250	Glacial till	10/28/85	34.38
			01/08/86	34.59
			04/02/86	31.74
			07/08/86	31.97
23N24W27CDD01	--	Alluvium	10/28/85	30.19
			01/08/86	29.20
			04/03/86	29.59
			07/07/86	30.72
21N20W24CAA02	290	Glacial till	10/22/85	5.18
			01/06/86	6.44
			04/07/86	7.33
			07/01/86	50.96
20N22W30DADD01	155	Alluvium	10/24/85	3.29
			01/10/86	3.80
			04/02/86	4.29
			07/09/86	3.67
20N20W26CCBD01	200	Glaciolacustrine deposits	10/22/85	150.13
			01/03/86	154.30
			04/04/86	158.34
			06/30/86	159.55
19N20W35AAA 01	54	Glaciolacustrine deposits	10/21/85	39.30
			01/02/86	39.35
			04/04/86	38.65
			06/30/86	41.90
18N20W14DBDC01	30	Glacial till	10/21/85	12.43
			01/02/86	13.90
			04/04/86	13.87
			06/30/86	12.89
05N10W10CCBC01	115	Tertiary sediment	03/19/86	77.81
			04/02/86	78.43
			04/16/86	79.14
			05/05/86	79.85
			05/28/86	79.92
			06/25/86	77.59
			07/17/86	75.75
			08/12/86	73.06
			09/25/86	71.22
04N10W10DC 02	20	Alluvium	11/21/85	4.85
			01/08/86	4.55
			02/20/86	4.34
			04/08/86	4.67
			05/22/86	4.30
			07/02/86	4.13
			08/20/86	4.29

The observation well in Sanders County (well 23N24W34ADAA01) is completed in a confined sand and gravel aquifer. The hydrograph for this well shows seasonal fluctuations in water levels and an overall decrease in water levels from 1971 to 1977 and from 1981 to 1985. The aquifer is used extensively for irrigation, and seasonal declines in water levels reflect times of water pumped for irrigation. The long-term declines are a result of withdrawals exceeding local ground-water recharge. Recovery of water levels from 1978 to 1980 are a result of greater precipitation during these years, causing less demand for irrigation water.

The hydrograph for the observation well in Ravalli County (well 06N20W19CCCC02) shows seasonal fluctuations of 8 to 12 feet. The well is completed in alluvium of a major river valley and is largely affected by seasonal recharge from irrigation water and fluctuations in the water level in the river. The water level in the well generally is highest in early summer and lowest in the winter. The water level appears to have no net change from year to year.

Withdrawals from wells to meet domestic and livestock needs in the basin generally are small and have little effect on long-term trends of ground-water levels. Local areas of moderate water-level decline occur where water is used for irrigation. Water levels in some wells completed in shallow alluvial aquifers also decline or rise moderately from year to year as a result of climatic conditions. However, hydrographs for a few wells in the network show long-term declines in water levels as a result of human activities.

SPECIAL NETWORKS AND PROGRAMS

Hydrologic Bench-Mark Network is a network of 57 sites in small drainage basins around the country whose purpose is to provide consistent data on the hydrology, including water quality, and related factors in representative undeveloped watersheds nationwide, and to provide analyses on a continuing basis to compare and contrast conditions observed in basins more obviously affected by the activities of man.

National Stream Quality Accounting Network (NASQAN) is a nationwide data-collection network designed by the U.S. Geological Survey to meet many of the information needs of government agencies and other groups involved in natural or regional water-quality planning and management. The 500 or so sites in NASQAN are generally located at the downstream ends of hydrologic accounting units designated by the U.S. Geological Survey Office of Water Data Coordination in consultation with the Water Resources Council. The objectives of NASQAN are (1) to obtain information on the quality and quantity of water moving within and from the United States through a systematic and uniform process of data collection, summarization, analysis, and reporting such that the data may be used for, (2) description of the areal variability of water quality in the Nation's rivers through analysis of data from this and other programs, (3) detection of changes or trends with time in the pattern of occurrence of water-quality characteristics, and (4) providing a nationally consistent data base useful for water-quality assessment and hydrologic research. Stations in this network in this volume are listed below:

12353000	Clark Fork below Missoula, Mt.
12355000	Flathead River at Flathead, British Columbia
12363000	Flathead River at Columbia Falls, Mt.

EXPLANATION OF THE RECORDS

The surface-water and ground-water records published in this report are for the 1986 water year that began October 1, 1985, and ended September 30, 1986. 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 7 through 10. 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.

Station Identification Numbers

Each data station, whether streamsite or well, in this report is assigned a unique identification number. This number is unique in that it applies specifically to a given station and to no other. The number usually is assigned when a station is first established and is retained for that station indefinitely. The systems used by the U.S. Geological Survey to assign identification numbers for surface-water stations and for ground-water well sites differ, but both are based on geographic location. Generally, the "downstream order" system is used for regular surface-water stations and the "latitude-longitude" system is used for wells and surface-water stations where only miscellaneous measurements are made.

Downstream Order System

Since October 1, 1950, the order of listing hydrologic-station records in Survey reports is in a downstream direction along the main stream. All stations on a tributary entering upstream from a mainstream station are listed before that station. A station on a tributary that enters between two mainstream stations is listed between them. A similar order is followed in listing stations on first rank, second rank, and other ranks of tributaries. The rank of any tributary with respect to the stream to which it is immediately tributary is indicated by an indentation in the "List of Stations" in the front of this report. Each indentation represents one rank. This downstream order and system of indentation shows which stations are on tributaries between any two stations and the rank of the tributary on which each station is situated.

The station-identification number is assigned according to downstream order. In assigning station numbers, 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 made up of both types of stations. Gaps are left in the series of numbers to allow for new stations that may be established; hence, the numbers are not consecutive. The complete eight-digit number for each station, such as 06090300, which appears just to the left of the station name, includes the two-digit Part number "06" plus the six-digit downstream-order number "090300." The Part number designates the major river basin; for example, Part "06" is the Missouri River basin. All records for a drainage basin encompassing more than one State can be arranged in downstream order by assembling pages from the various State reports by station number to include all records in the basin.

Latitude-Longitude System

The identification numbers for wells and miscellaneous surface-water sites are assigned according to the grid system of latitude and longitude. The number consists of 15 digits. The first six digits denote the degrees, minutes, and seconds of latitude, the next seven digits denote degrees, minutes, and seconds of longitude, and the last two digits (assigned sequentially) identify the wells or other sites within a 1-second grid. This site-identification number, once assigned, is a pure number and has no locational significance. In the rare instance where the initial determination of latitude and longitude are found to be in error, the station will retain its initial identification number; however, its true latitude and longitude will be listed in the LOCATION paragraph of the station description. (See figure below.)

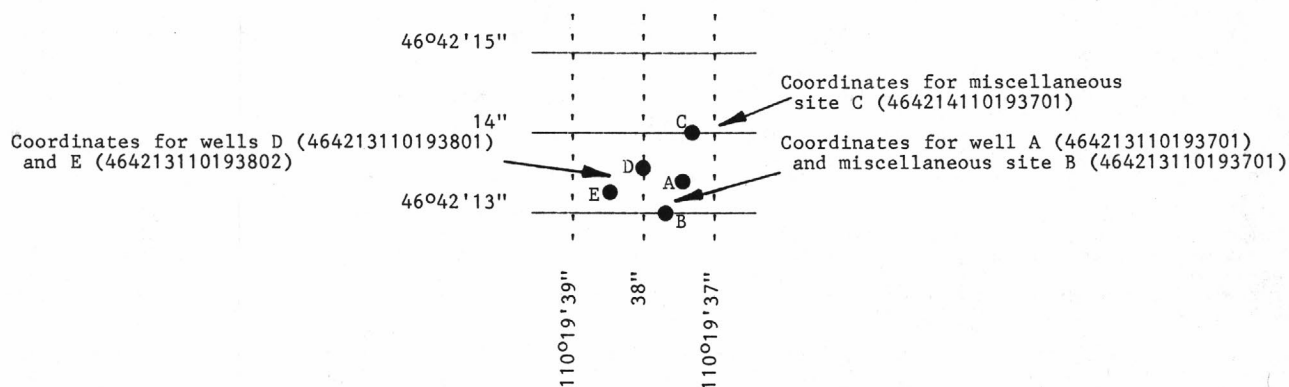


Figure 6.--System for numbering wells and miscellaneous sites (latitude and longitude).

Records of Stage and Water Discharge

Records of stage and water discharge may be complete or partial. Complete records of discharge are those obtained using a continuous stage-recording device through which either instantaneous or mean daily discharges may be computed for any time, or any period of time, during the period of record. Complete records of lake or reservoir content, similarly, are those for which stage or content may be computed or estimated with reasonable accuracy for any time, or period of time. They may be obtained using a continuous stage-recording device, but need not be. Because daily mean discharges and end-of-day contents commonly are published for such stations, they are referred to as "daily stations."

By contrast, partial records are obtained through discrete measurements without using a continuous stage-recording device and pertain only to a few flow characteristics, or perhaps only one. The nature of the partial record is indicated by table titles such as "Crest-stage partial records," or "Low-flow partial records." Records of miscellaneous discharge measurements or of measurements from special studies, such as low-flow seepage studies, may be considered as partial records, but they are presented separately in this report.

Data Collection and Computation

The data obtained at a complete-record gaging station on a stream or canal consist of a continuous record of stage, individual measurements of discharge throughout a range of stages, and notations regarding factors that may affect the relationships between stage and discharge. These data, together with supplemental information, such as weather records, are used to compute daily discharges. The data obtained at a complete-record gaging station on a lake or reservoir consist of a record of stage and of notations regarding factors that may affect the relationship between stage and lake content. These data are used with stage-area and stage-capacity curves or tables to compute water-surface areas and lake storage.

Continuous records of stage are obtained with analog recorders that trace continuous graphs of stage or with digital recorders that punch stage values on paper tapes at selected time intervals. Measurements of discharge are made with current meters using methods adopted by the Geological Survey as a result of experience accumulated since 1880. These methods are described in standard textbooks, in Water-Supply Paper 2175, and in U.S. Geological Survey Techniques of Water-Resources Investigations, Book 3, Chapter A6.

In computing discharge records, results of individual measurements are plotted against the corresponding stages, and stage-discharge relation curves are then constructed. From these curves, rating tables indicating the approximate discharge for any stage within the range of the measurements are prepared. If it is necessary to define extremes of discharge outside the range of the current-meter measurements, the curves are extended using: (1) logarithmic plotting; (2) velocity-area studies; (3) results of indirect measurements of peak discharge, such as slope-area or contracted-opening measurements, and computations of flow over dams or weirs; or (4) step-backwater techniques.

Daily mean discharges are computed by applying the daily mean stages (gage heights) to the stage-discharge curves or tables. If the stage-discharge relation is subject to change because of frequent or continual change in the physical features that form the control, the daily mean discharge is determined by the shifting-control method, in which correction factors based on the individual discharge measurements and notes of the personnel making the measurements are applied to the gage heights before the discharges are determined from the curves or tables. This shifting-control method also is used if the stage-discharge relation is changed temporarily because of aquatic growth or debris on the control. For some stations, formation of ice in the winter may so obscure the stage-discharge relations that daily mean discharges must be estimated from other information such as temperature and precipitation records, notes of observations, and records for other stations in the same or nearby basins for comparable periods.

At some stream-gaging stations, the stage-discharge relation is affected by the backwater from reservoirs, tributary streams, or other sources. This necessitates the use of the slope method in which the slope or fall in a reach of the stream is a factor in computing discharge. The slope or fall is obtained by means of an auxiliary gage set at some distance from the base gage. At some stations the 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 Montana the stage-discharge relation is usually affected by ice from November to March, and it becomes impossible to compute the discharge in the usual manner. 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 for other stations in the same or nearby basins.

In computing records of lake or reservoir contents, it is necessary to have available from surveys, curves or tables defining the relationship of stage and content. The application of stage to the stage-content curves or tables gives the contents from which daily, monthly, or yearly changes then are determined. If the stage-content relationship changes because of deposition of sediment in a lake or reservoir, periodic resurveys may be necessary to redefine the relationship. Even when this is done, the contents computed may become increasingly in error as the lapsed time since the last survey increases. Discharges over lake or reservoir spillways are computed from stage-discharge relationships much as other stream discharges are computed.

For some gaging stations, there are periods when no gage-height record is obtained, or the recorded gage height is so faulty that it cannot be used to compute daily discharge or contents. This happens when the recorder stops or otherwise fails to operate properly, intakes are plugged, the float is frozen in the well, or for various other reasons. For such periods, the daily discharges are estimated from the recorded range in stage, previous or following record, discharge measurements, weather records, and comparison with other station records from the same or nearby basins. Likewise, daily contents may be estimated from operator's logs, previous or following record, inflow-outflow studies, and other information. Information explaining how estimated daily-discharge values are identified in station records is included in the next two sections, "Data Presentation" (REMARKS paragraph) and "Identifying Estimated Daily Discharge."

Data Presentation

The records published for each gaging station consist of two parts, the manuscript or station description and the data table for the current water year. The manuscript provides, under various headings, descriptive information, such as station location; period of record; average discharge; historical extremes; 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 to follow clarify information presented under the various headings of the station description.

LOCATION.--Information on locations is obtained from the most accurate maps available. The location of the gage 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 many stations, were determined by methods given in "River Mileage Measurement," Bulletin 14, Revision of October 1968, prepared by the Water Resources Council or were provided by the U.S. Army Corps of Engineers, or Montana Department of Natural Resources and Conservation, Water Resources Division.

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 indicates the period for which there are published records 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 records from it can reasonably be considered equivalent with records from the present station.

REVISED RECORDS.--Previously, if a significant error in published records was discovered, a revision was published in the first report following discovery of the error. This paragraph then served to document for users all the reports in which revisions had been published for the station and the water years to which the revisions applied. However, beginning with the 1983 water year, revisions will no longer be published but appropriate changes will be made in WATSTORE files. All previous revisions are, of course, in WATSTORE, and users are encouraged to obtain all required data from the WATSTORE computer files (see the section, "Access to WATSTORE Data").

Under "Revised Records," a year listed without qualification indicates that daily, monthly, or annual discharges were revised. The qualifications (M), (m), and (P) mean only that the instantaneous maximum, the instantaneous or daily minimum, and flood peaks above the base, respectively, have been revised. A "W" for "WATSTORE" will be shown, replacing the name of the data report in which the revised values would previously have been published, for all revisions made after 1982. For example, the notation for indicating that the 1979 water-year daily values for a particular station in Montana have been revised during the 1983 water year would no longer be "WDR MT-83-1: 1979," but "W 1983: 1979." If the drainage area has been revised, the report in which the most recently revised figure was first published is given.

GAGE.--The type of gage in current use, the datum of the current gage referred to National Geodetic Vertical Datum of 1929 (see glossary), and a condensed history of the types, locations, and datums of previous gages are given under this heading.

REMARKS.--All periods of estimated daily-discharge record will either be identified by date in this paragraph of the station description for water-discharge stations or flagged in the daily-discharge table. (See next section, "Identifying Estimated Daily Discharge.") If a remarks statement is used to identify estimated record, the paragraph will begin with this information presented as the first entry. The paragraph is also used to present information relative to the accuracy of the records, to special methods of computation, to conditions that affect natural flow at the station and, possibly, to other pertinent items. For reservoir stations, information is given on the dam forming the reservoir, the capacity, outlet works and spillway, and purpose and use of the reservoir.

COOPERATION.--Records provided by a cooperating organization or obtained for the Geological Survey by a cooperating organization are identified here.

AVERAGE DISCHARGE.--The discharge value given is the arithmetic mean of the water-year mean discharges. It is computed only for stations having at least 5 water years of complete record, and only water years of complete record are included in the computation. It is not computed for stations where diversions, storage, or other water-use practices cause the value to be meaningless. If water developments significantly altering flow at a station are put into use after the station has been in operation for a period of years, a new average is computed as soon as 5 water years of record have accumulated following the development. The median of yearly mean discharges also is given under this heading for stations having 10 or more water years of record, if the median differs from the average given by more than 10 percent.

EXTREMES FOR PERIOD OF RECORD.--Extremes may include maximum and minimum stages and maximum and minimum discharges or content. Unless otherwise qualified, the maximum discharge or content is the instantaneous maximum corresponding to the highest stage that occurred. The highest stage may have been obtained from a graphic or digital recorder, a crest-stage gage, or by direct observation of a nonrecording gage. If the maximum stage did not occur on the same day as the maximum discharge or content, it is given separately. Similarly, the minimum is the instantaneous minimum discharge, unless otherwise qualified, and was determined and is reported in the same manner as the maximum.

EXTREMES OUTSIDE PERIOD OF RECORD.--Included here is information concerning 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 U.S. Geological Survey.

EXTREMES FOR CURRENT YEAR.--Extremes given here are similar to those for the period of record, except the peak discharge listing may include secondary peaks. For stations meeting certain criteria, all peak discharges and stages occurring during the water year and greater than a selected base discharge are presented under this heading. The peaks greater than the base discharge, excluding the highest one, are referred to as secondary peaks. Peak discharges are not published for canals, ditches, drains, or streams for which the peaks are subject to substantial control by man. The time of occurrence for peaks is expressed in 24-hour local standard time. For example, 12:30 a.m. is 0030, and 1:30 p.m. is 1330. The minimum for the current water year appears below the table of peak data.

REVISIONS.--If a critical error in published records is discovered, a revision is included in the first report published following discovery of the error.

Although rare, occasionally the records of a discontinued gaging station may need revision. Because, for these stations, there would be no current or, possibly, future station manuscript published 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 offices whose addresses are given on the back of the title page of this report to determine if the published records were ever revised after the station was discontinued. Of course, if the data were obtained by computer retrieval, the data would be current and there would be no need to check because 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 skeleton stage-capacity table when daily contents are given.

The daily table for stream-gaging stations gives mean discharge for each day and is followed by monthly and yearly summaries. In the monthly summary below the daily table, the line headed "TOTAL" gives the sum of the daily figures. The line headed "MEAN" gives the average flow in cubic feet per second during the month. The lines headed "MAX" and "MIN" give the maximum and minimum daily discharges, respectively, for the month. Discharge for the month also is usually 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"). Figures for cubic feet per second per square mile and runoff in inches are omitted if there is extensive regulation or diversion, if the drainage area includes large noncontributing areas, or if the average annual rainfall over the drainage basin is usually less than 20 inches. In the yearly summary below the monthly summary, the figures shown are the appropriate discharges for the calendar and water years. At some stations monthly and (or) yearly observed discharges are adjusted for reservoir storage or diversion, or diversions or reservoir contents are given. These figures are identified by a symbol and corresponding footnote.

Data collected at partial-record stations follow the information for continuous-record sites. Data for partial-record discharge stations are presented in two tables. The first is a table of annual maximum stage and discharge at crest-stage stations, and the second is a table of discharge measurements at low-flow partial-record stations. The tables of partial-record stations are followed by a listing of discharge measurements made at sites other than continuous-record or partial-record stations. These measurements are generally made in times of drought or flood to give better areal coverage to those events. Those measurements and others collected for some special reason are called measurements at miscellaneous sites.

Identifying Estimated Daily Discharge

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

Accuracy of the Records

The accuracy of streamflow records 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 measurements of stage, measurements of discharge, and interpretation of records.

The accuracy attributed to the records is indicated under "REMARKS." "Excellent" means that about 95 percent of the daily discharges are within 5 percent of their true values; "good," within 10 percent; and "fair," within 15 percent. Records that do not meet the criteria mentioned are rated "poor." Different accuracies may be attributed to different parts of a given record.

Daily mean discharges in this report are given to the nearest hundredth of a cubic foot per second for values less than 1 ft³/s; to the nearest tenth between 1.0 and 10 ft³/s; to whole numbers between 10 and 1,000 ft³/s; and to 3 significant figures for more than 1,000 ft³/s. The number of significant figures used is based solely on the magnitude of the discharge value. No rounding rules apply to discharges listed for partial-record stations and miscellaneous sites. Listed discharges are those actually computed.

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, figures 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 Records Available

Information used in the preparation of the records in this publication, such as discharge-measurement notes, gage-height records, temperature measurements, and rating tables is on file in the Montana district office. Also, most of the daily mean discharges are in computer-readable form and have been analyzed statistically. Information on the availability of the unpublished information or on the results of statistical analyses of the published records may be obtained from the office whose address is given 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 the following table. 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 5.--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	36,37	38				
1900	49	49	51,52				
1901	65,66,75	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	128,130	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				
1930	700	701	707				
1931	715	716	722	1950	1308	1309	1316
1932	730	731	737	Compilation			
1933	745	746	752				
1934	760	761	767	1960	1728	1729	1736
1935	785	786	792	Compilation			

Records of Surface-Water Quality

Records of surface-water quality ordinarily are obtained at or near stream-gaging stations because interpretation of records of surface-water quality nearly always requires corresponding discharge data. Records of surface-water quality in this report may 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 continuing-record station is a site where data are collected on a regularly scheduled basis. Frequency may be once 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 continuing or partial-record station where random 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 "continuing records", as used in this report, and "continuous recordings," which refers to a continuous graph or a series of discrete values punched at short intervals on a paper tape. 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 8.

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 needs to be assuring that the data obtained represent the in situ quality of the water. To assure this, certain measurements, such as water temperature, pH, and dissolved oxygen, need to be made onsite when the samples are taken. To assure that measurements made in the laboratory also represent the in situ water, carefully prescribed procedures need to 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 onsite measurements and for collecting, treating, and shipping samples are given in publications on "Techniques of Water-Resources Investigations," Book 1, Chap. D2; Book 3, Chap. C2; Book 5, Chap. A1, A3, and A4. All of these references are listed under "PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS" which appears at the end of the introductory text. Also, detailed information on collecting, treating, and shipping samples may be obtained from the Geological Survey Montana district office.

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. Most streams must be sampled through several vertical sections to obtain a representative sample needed for an accurate mean concentration and for use in calculating load. Samples for analysis of the water-sediment mixture are collected using modified suspended-sediment samplers. All samples obtained for the National Stream Quality Accounting Network (see definitions) are obtained from at least several verticals.

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, minimum, and mean values for each constituent measured and are based upon hourly punches beginning at 0100 hours and ending at 2400 hours for the day of record. More detailed records (hourly values) may be obtained from the Geological Survey Montana district office whose address is given on the back of the title page of this report.

Water Temperature

Water temperatures are measured at most of the water-quality stations. In addition, water temperatures are taken at time of discharge measurements for water-discharge stations. For stations where water temperatures are taken manually once 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 and those taken manually once daily are on file in the Montana district office.

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 sections.

During periods of rapidly changing flow or rapidly changing concentration, samples may have been 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 were collected periodically at many verticals in the stream cross section. Although data collected periodically may represent conditions only at the time of observations, 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

Sediment samples, samples for indicator bacteria, and daily samples for specific conductance are analyzed locally. All other samples are analyzed in the Geological Survey laboratory in Arvada, Colorado, or the Montana Bureau of Mines and Geology laboratory in Butte, Montana. Methods used in analyzing sediment samples and computing sediment records are given in TWRI, Book 5, Chap. C1. Methods used by the Geological Survey laboratory are given in TWRI, Book 1, Chap. D2; Book 3, Chap. C2; Book 5, Chap. A1, A3, and A4.

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, as appropriate, 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 under "Records of Stage and Water Discharge;" same comments apply.

DRAINAGE AREA.--See Data Presentation under "Records of Stage and Water Discharge;" same comments apply.

PERIOD OF RECORD.--This indicates the periods for which there are published water-quality records for the station. 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 Geological Survey by a cooperating organization are identified here.

EXTREMES.--Maximums and minimums are given only for parameters measured daily or more frequently. None are given for parameters measured weekly or less frequently, because the true maximums or minimums may not have been sampled. Extremes, when given, are provided for both the period of record and for the current water year.

REVISIONS.--If errors in published water-quality records are discovered after publication, appropriate updates are made to the Water-Quality File in the U.S. Geological Survey's computerized data system, WATSTORE, and subsequently by monthly transfer of update transactions to the U.S. Environmental Protection Agency's STORET system. Because the usual volume of updates makes it impractical to document individual changes in the State data-report series or elsewhere, potential users of U.S. Geological Survey water-quality data are encouraged to obtain all required data from the appropriate computer file to insure the most recent updates.

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.

Table 6.--Descriptor values for weather conditions

0	Cloudless	70	Snow or sleet
1	Partly cloudy	71	Slight snow in flakes, intermittent
2	Cloudy	72	Slight snow in flakes, continuous
3	Overcast	73	Moderate snow in flakes, intermittent
10	Precipitation within sight	74	Moderate snow in flakes, continuous
13	Ugly, threatening sky	75	Heavy snow in flakes, intermittent
40	Fog	76	Heavy snow in flakes, continuous
50	Drizzle	77	Snow and fog
51	Slight drizzle, intermittent	78	Granular snow (frozen drizzles)
52	Slight drizzle, continuous	79	Ice crystals
53	Moderate drizzle, intermittent	80	Showers
54	Moderate drizzle, continuous	81	Slight or moderate rain shower (s)
55	Thick drizzle, intermittent	82	Heavy rain shower (s)
56	Thick drizzle, continuous	83	Slight or moderate snow shower (s)
57	Drizzle and fog	84	Heavy snow shower (s)
58	Slight or moderate drizzle and rain	85	Slight or moderate rain and snow shower (s)
59	Thick drizzle and rain	86	Heavy rain and snow shower (s)
60	Rain	87	Granular snow shower (s)
61	Slight rain, intermittent	88	Slight or moderate hail or rain and hail shower (s)
62	Slight rain, continuous	90	Thunderstorm
63	Moderate rain, intermittent	93	Slight thunderstorm with rain or snow
64	Moderate rain, continuous	94	Slight thunderstorm with hail
65	Heavy rain, intermittent	95	Moderate thunderstorm with rain or snow
66	Heavy rain, continuous	96	Moderate thunderstorm with hail
67	Rain and fog	97	Heavy thunderstorm with rain or snow
68	Slight or moderate mixed rain and snow	99	Heavy thunderstorm with hail
69	Heavy mixed rain and snow		

Remark Codes

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

PRINTED OUTPUT

E
>
<
K

REMARK

Estimated value
Actual value is known to be greater than the value shown
Actual value is known to be less than the value shown
Results based on colony count outside the acceptance range (non-ideal colony count)

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 7.--Water-supply paper numbers and parts for water-quality stations, 1947-70

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

Records of Ground-Water Levels

Only water-level data from a national network of observation wells are given in this report. These data are intended to provide a sampling and historical record of water-level changes in the Nation's most important aquifers. Locations of the observation wells in this network in Montana are shown in figure 10.

Data Collection and Computation

Measurements of water levels are made in many types of wells under varying conditions, but the methods of measurement are standardized to the extent possible. The equipment and measuring techniques used at each observation well ensure that measurements at each well are of consistent accuracy and reliability.

Water-level records are obtained from direct measurements with a steel tape or from the graph or punched tape of a water-stage recorder. The 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 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 to water of several hundred feet, the error of 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 to a tenth of a foot or a larger unit.

Publications

Publication of ground-water level data for the United States in water-supply papers was begun by the Geological Survey 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.

Table 8.--Water-supply paper numbers and parts for ground-water stations for northwestern United States, 1940-1974

<u>Year</u>	<u>WSP No.</u>	<u>Year</u>	<u>WSP No.</u>	<u>Year</u>	<u>WSP No.</u>
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	1927	1952	1225	1971-74	2161
1946	1075	1953	1269		

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.

ACCESS TO WATSTORE DATA

The National WATER Data STORage and RETrieval System (WATSTORE) was established for handling water data collected through the activities of the U.S. Geological Survey and to provide for more effective and efficient means of releasing the data to the public. The system is operated and maintained on the central computer facilities of the Survey at its National Center in Reston, Virginia.

WATSTORE can provide a variety of useful products ranging from simple data tables to complex statistical analyses. A minimal fee, plus the actual computer cost incurred in producing a desired product, is charged to the requester. Information about the availability of specific types of data, the acquisition of data or products, and user charges can be obtained locally from the office whose addresses are given on the back of the title page.

General inquiries about WATSTORE may be directed to:

Chief Hydrologist
U.S. Geological Survey
437 National Center
Reston, Virginia 22092

DEFINITION OF TERMS

Terms related to streamflow, water-quality, and other hydrologic data, as used in this report, are defined below. See also table for converting English units to International System (SI) Units on the inside of the back cover.

Acre-foot (AC-FT, acre-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.

Algae are mostly aquatic single-celled, colonial, or multi-celled plants, containing chlorophyll and lacking roots, stems, and leaves.

Aquifer is a geologic formation, group of formations, or part of a formation that contains sufficient saturated permeable material to yield significant quantities of water to wells and springs.

Artesian means confined and is used to describe a well in which the water level stands above the top of the aquifer tapped by the well. A flowing artesian well is one in which the water level is above the land surface.

Bacteria are microscopic unicellular organisms, typically spherical, rodlike, or spiral and threadlike in shape, often clumped into colonies. Some bacteria cause disease, while 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.

Total coliform bacteria are a particular group of bacteria that are used as indicators of possible sewage pollution. They are characterized as aerobic or facultative anaerobic, gram-negative, nonspore-forming, rod-shaped bacteria which 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 mL of sample.

Fecal coliform bacteria are bacteria that are present in the intestine or feces of warm-blooded animals. They are often 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.

Fecal streptococcal bacteria are bacteria found also in the intestine of warm-blooded animals. Their presence in water is considered to verify fecal pollution. They are characterized as Gram-positive, cocci bacteria which are capable of growth in brain-heart infusion broth. In the laboratory they are defined as all the organisms which 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.

Non-ideal colony count (K) is a remark code used in reporting bacteria densities when plate counts fall outside of an ideal range. The lower limit of 20 colonies is set as the number below which statistically valid results become increasingly questionable. The upper limit, which differs according to type of bacteria, represents numbers above which interference from colony crowding, deposition of extraneous material, and other factors appear to result in increasingly questionable results.

Bed material is the sediment mixture of which a streambed, lake, pond, reservoir, or estuary bottom is composed.

Bottom material: See Bed material.

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 natural water color or with carbonaceous organic pollution from sewage or industrial wastes.

Chlorophyll refers to the green pigments of plants. Chlorophyll a and b are the two most common green pigments in plants.

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

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.

Control designates a feature downstream from the gage that determines the stage-discharge relation at the gage. This feature may be a natural constriction of the channel, 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 salt water.

Cubic feet per second per square mile [(ft³/s)/mi²] is the average number of cubic feet of water flowing per second from each square mile of area drained, assuming that the runoff is distributed uniformly in time and area.

Cubic foot per second (ft³/s) is the rate of discharge representing a volume of 1 cubic foot passing a given point during 1 second and is equivalent to 7.48 gallons per second or 448.8 gallons per minute or 0.02832 cubic meters per second.

Cubic-foot-per-second day (cfs-day) 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, approximately 1.9835 acre-feet, about 646,000 gallons, or 2,447 cubic meters.

Discharge is the volume of water (or more broadly, volume of fluid plus suspended sediment) that passes a given point within a given period of time.

Instantaneous discharge is the discharge at a particular instant of time.

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

Dissolved refers to that material in a representative water sample which passes through a 0.45 µm membrane filter. This is a convenient operational definition used by Federal agencies that collect water data. Determination of "dissolved" constituents are made on subsamples of the filtrate.

Dissolved-solids concentration of water 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 of dissolved solids, the bicarbonate (generally a major dissolved component of water) is converted to carbonate. Therefore, in the mathematical calculation of dissolved-solids concentration, the bicarbonate value, in milligrams per liter, is multiplied by 0.492 to reflect the change.

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

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

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. Diversity index values range from zero, when all the organisms in the samples are the same, to some positive number, when some or all the organisms in the sample are different.

Drainage area of a stream at a specified location is that area, measured in a horizontal plane, enclosed by a topographic divide from which direct surface runoff from precipitation normally drains by gravity into the stream above the specified point. Figures of drainage area given herein include all closed basins, or noncontributing areas, within the area unless otherwise specified.

Drainage basin is a part of the surface of the earth that is occupied by a drainage system, which consists of a surface stream or a body of impounded surface water together with all tributary surface streams and bodies of impounded surface water.

Gage height (G.H.) is the water-surface elevation referred to some arbitrary gage datum. Gage height is often used interchangeably with the more general term "stage," although gage height is more appropriate when used with a reading on a gage.

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

Hardness of water is a physical-chemical characteristic that is commonly recognized by the increased quantity of soap required to produce lather. It is computed as the sum of equivalents of polyvalent cations and is expressed as the equivalent concentration of calcium carbonate (CaCO₃).

Hydrologic Bench-Mark Network is a network of 57 sites in small drainage basins around the country whose purpose is to provide consistent data on the hydrology, including water quality, and related factors in representative undeveloped watersheds nationwide, and to provide analyses on a continuing basis to compare and contrast conditions observed in basins more obviously affected by the activities of man.

Hydrologic unit is a geographic area representing part or all of a surface drainage basin or distinct hydrologic feature as delineated by the Office of Water Data Coordination on the State Hydrologic Unit Maps; each hydrologic unit is identified by an eight-digit number.

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

Less than (<) is a remark code indicating that the analyzed value was found to be less than the numeric value listed. The value associated with the "<" remark indicates the detection limit of the applied laboratory.

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

Micrograms per gram ($\mu\text{g/g}$) 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 liter (UG/L, $\mu\text{g/L}$) is a unit expressing the concentration of chemical constituents in solution as mass (micrograms) of solute per unit volume (liter) of water. One thousand micrograms per liter is equivalent to one milligram per liter.

Microsiemens per centimeter at 25°C ($\mu\text{S/cm}$) is a unit for reporting specific electrical conductance.

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

National Geodetic Vertical Datum of 1929 (NGVD of 1929) is a geodetic datum derived from a general adjustment of the first order level nets of both the United States and Canada. It was formerly called "Sea Level Datum of 1929" or "mean sea level" in this series of reports. Although the datum was derived from the average sea level over a period of many years at 26 tide stations along the Atlantic, Gulf of Mexico, and Pacific Coasts, it does not necessarily represent local mean sea level at any particular place.

National Stream Quality Accounting Network (NASQAN) is a nationwide data-collection network designed by the U.S. Geological Survey to meet many of the information needs of government agencies and other groups involved in natural or regional water-quality planning and management. The 500 or so sites in NASQAN are generally located at the downstream ends of hydrologic accounting units designated by the U.S. Geological Survey Office of Water Data Coordination in consultation with the Water Resources Council. The objectives of NASQAN are (1) to obtain information on the quality and quantity of water moving within and from the United States through a systematic and uniform process of data collection, summarization, analysis, and reporting such that the data may be used for, (2) description of the areal variability of water quality in the Nation's rivers through analysis of data from this and other programs, (3) detection of changes or trends with time in the pattern of occurrence of water-quality characteristics, and (4) providing a nationally consistent data base useful for water-quality assessment and hydrologic research.

The National Trends Network (NTN) is a 150-station network for sampling atmospheric deposition in the United States. The purpose of the network is to determine the variability, both in location and in time, of the composition of atmospheric deposition, which includes snow, rain, dust particles, aerosols, and gases. The core from which the NTN was built was the already-existing deposition-monitoring network of the National Atmospheric Deposition Program (NADP).

Organism is any living entity.

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.

Total organism count is the total number of organisms collected and enumerated in any particular sample.

Parameter Code is a 5-digit number used in the U.S. Geological Survey computerized data system, WATSTORE, to uniquely identify a specific constituent. The codes used in WATSTORE are the same as those used in the U.S. Environmental Protection Agency data system, STORET. The Environmental Protection Agency assigns and approves all requests for new codes.

Partial-record station is a particular site where limited streamflow and/or water-quality data are collected systematically over a period of years for use in hydrologic analyses.

Particle size is the diameter, in millimeters (mm), of a particle determined by either sieve or sedimentation methods. Sedimentation methods (pipet, bottom-withdrawal tube, visual-accumulation tube) 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 used in this report agrees with the recommendation made by the American Geophysical Union Subcommittee on Sediment Terminology. The classification is as follows:

<u>Classification</u>	<u>Size (mm)</u>	<u>Method of analysis</u>
Clay.....	0.00024 - 0.004	Sedimentation
Silt.....	.004 - .062	Sedimentation
Sand.....	.062 - 2.0	Sedimentation or sieve
Gravel.....	2.0 - 64.0	Sieve

The particle-size distributions given in this report are not necessarily representative of all particles in transport in the stream. 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.

Percent composition 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, mass, or volume.

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

pH indicates the degree of acidity or alkalinity of water and is expressed in logarithmic units. The pH value of a solution is the negative logarithm of the hydrogen-ion activity, in moles per liter.

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

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 by the plants (carbon method).

Milligrams of carbon per area or volume per unit time [$\text{mg C}/(\text{m}^2 \cdot \text{time})$] for periphyton and macrophytes and [$\text{mg C}/(\text{m}^3 \cdot \text{time})$] for phytoplankton are units for expressing primary productivity. They define 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 in unenriched waters. Unit time may be either the hour or day, depending on the incubation period.

Radiochemical program is a network of regularly sampled water-quality stations where samples are collected to be analyzed for radioisotopes. The streams that are sampled represent major drainage basins in the conterminous United States.

Recoverable from 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.

Return period is the average time interval between occurrences of a hydrological event of a given or greater magnitude, usually expressed in years. May also be called recurrence interval.

Runoff in inches (IN., in.) shows the depth to which the drainage area would be covered if all the runoff for a given time period were uniformly distributed on it.

Sediment is solid material that originates mostly from disintegrated rocks and is transported by, suspended in, or deposited from water; it 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 influenced by environmental factors. Some major factors are degree of slope, length of slope, soil characteristics land usage, and quantity and intensity of precipitation.

Suspended sediment is the sediment that at any given time is maintained in suspension by the upward components of turbulent currents or that exists in suspension as a colloid.

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 ft above the bed) expressed as milligrams of dry sediment per liter of water-sediment mixture (mg/L).

Mean concentration is the time-weighted concentration of suspended sediment passing a stream section during a 24-hour day.

Suspended-sediment discharge (tons/day) is the rate at which dry mass of sediment passes a section of a stream or is the quantity of sediment, as measured by dry mass or volume, that passes a section in a given time. It is calculated in units of tons per day as follows: concentration (mg/L) \times discharge (ft^3/s) \times 0.0027.

Suspended-sediment load is a general term that refers to material in suspension. It is not synonymous with either discharge or concentration.

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. Waters range in respect to sodium hazard from those which can be used for irrigation on almost all soils to those which are generally unsatisfactory for irrigation.

Solute is any substance that is dissolved in water.

Specific conductance is a measure of the ability of a water to conduct an electrical current. It is expressed in microsiemens per centimeter at 25°C. Specific conductance is related to the type and concentration of ions in solution and can be used for approximating the dissolved-solids content of the water. Commonly, the concentration of dissolved solids (in milligrams per liter) is about 65 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.

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

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.

Surface area of a lake is that area outlined on the latest U.S.G.S. topographic map as the boundary of the lake and measured by a planimeter in acres. In localities not covered by topographic maps, the areas are computed from the best maps available at the time planimeted. All areas shown are those for the stage when the planimeted map was made.

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

Suspended (as used in tables of chemical analyses) refers to the amount (concentration) of undissolved material in a water-sediment mixture. It is associated with 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 water-suspended sediment sample that is retained on a 0.45 μ m 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 analyzing portions of the material collected on the filter or, more commonly, by difference, based on determinations of (1) dissolved and (2) total recoverable concentrations of the constituent.

Suspended, total is the total amount of a given constituent in the part of a representative water-suspended sediment sample that is retained on a 0.45 μ m membrane filter. 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 determine when the results should be reported as "suspended, total."

Determinations of "suspended, total" constituents are made either by analyzing portions of the material collected on the filter or, more commonly, by difference, based on determinations of (1) dissolved and (2) total concentrations of the constituent.

Thermograph is an instrument that continuously records variations of temperature on a chart. The more general term "temperature recorder" is used in the table headings 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 concentration 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 that would be contained in a vessel or reservoir that had received equal quantities of water from the stream each day for the year.

Tons per acre-foot indicates the dry mass of dissolved solids in 1 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) is the quantity of a substance in solution or suspension that passes a stream section during a 24-hour period.

Total is the total amount of a given constituent in a representative water-suspended sediment 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 all of the constituent in the sample.)

Total discharge is the total quantity of any individual constituent, as measured by dry mass or volume, that passes through a stream cross-section per unit of time. This term needs to be qualified, such as "total sediment discharge," "total chloride discharge," and so on.

Total in bottom material is the total 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 load (tons) is the total quantity of any individual constituent, as measured by dry mass or volume, that is dissolved in a specific amount of water (discharge) during a given time. It is computed by multiplying the total discharge, times the mg/L of the constituent, times the factor 0.0027, times the number of days.

Total, recoverable is the amount of a given constituent that is in solution after a representative water-suspended sediment 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, equivalent digestion procedures are required of all laboratories performing such analyses because different digestion procedures are likely to produce different analytical results.

Turbidity of a sample is the reduction of transparency due to the presence of particulate matter. In this report it is expressed in Nephelometric turbidity units (NTU), obtained from the Nephelometric method for turbidity determination which measures the intensity of light scattered by suspended particles at 90 degrees from the path of an incident light source.

Water year in Geological Survey 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, 1985, is called the "1985 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.

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

The U.S. Geological Survey publishes a series of manuals describing procedures for planning and conducting specialized work in water-resources investigations. The material is grouped under major subject headings called books and is further divided into sections and chapters. For example, Section A of Book 3 (Applications of Hydraulics) pertains to surface water. The chapter, the unit of publication, is limited to a narrow field of subject matter. This format permits flexibility in revision and publication as the need arises.

The reports listed below are for sale by the U.S. Geological Survey, Books and Open-File Reports Section, Federal Center, Box 25425, Denver, Colorado 80225 (authorized agent of the Superintendent of Documents, Government Printing Office). Prepayment is required. Remittance should be sent by check or money order payable to the U.S. Geological Survey. Prices are not included because they are subject to change. Current prices can be obtained by writing to the above address. When ordering or inquiring about prices for any of these publications, please give the title, book number, chapter number, and "U.S. Geological Survey Techniques of Water-Resources Investigations."

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- 1-D2. *Guidelines for collection and field analysis of ground-water samples for selected unstable constituents*, by W. W. Wood: USGS--TWRI Book 1, Chapter D2. 1976. 24 pages.
- 2-D1. *Application of surface geophysics to ground-water investigations*, by A. A. R. Zohdy, G. P. Eaton, and D. R. Mabey: USGS--TWRI Book 2, Chapter D1. 1974. 116 pages.
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- 3-A1. *General field and office procedures for indirect discharge measurements*, by M. A. Benson and Tate Dalrymple: USGS--TWRI Book 3, Chapter A1. 1967. 30 pages.
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- 3-A5. *Measurement of peak discharge at dams by indirect methods*, by Harry Hulsing: USGS--TWRI Book 3, Chapter A5. 1967. 29 pages.
- 3-A6. *General procedure for gaging streams*, by R. W. Carter and Jacob Davidian: USGS--TWRI Book 3, Chapter A6. 1968. 13 pages.
- 3-A7. *Stage measurements at gaging stations*, by T. J. Buchanan and W. P. Somers: USGS--TWRI Book 3, Chapter A7. 1968. 28 pages.
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- 3-A10. *Discharge ratings at gaging stations*, by E. J. Kennedy: USGS--TWRI Book 3, Chapter A10. 1984. 59 pages.
- 3-A11. *Measurement of discharge by moving-boat method*, by G. F. Smoot and C. E. Novak: USGS--TWRI Book 3, Chapter A11. 1969. 22 pages.
- 3-A13. *Computation of continuous records of streamflow*, by E. J. Kennedy: USGS--TWRI Book 3, Chapter A13. 1983. 53 pages.
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- 3-B2. *Introduction to ground-water hydraulics, a programed text for self-instruction*, by G. D. Bennett: USGS--TWRI Book 3, Chapter B2. 1976. 172 pages.
- 3-B3. *Type curves for selected problems of flow to wells in confined aquifers*, by J. E. Reed: USGS--TWRI Book 3, Chapter B3. 1980. 106 pages.

- 3-C1. *Fluvial sediment concepts* by H. P. Guy: USGS--TWRI Book 3, Chapter C1. 1970. 55 pages.
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- 5-A1. *Methods for determination of inorganic substances in water and fluvial sediments* by M. W. Skougstad and others, editors: USGS--TWRI Book 5, Chapter A1. 1979. 626 pages.
- 5-A2. *Determination of minor elements in water by emission spectroscopy*. by P. R. Barnett and E. C. Mallory, Jr.: USGS--TWRI Book 5, Chapter A2. 1971. 31 pages.
- 5-A3. *Methods for analysis of organic substances in water*, by D. F. Goerlitz and Eugene Brown: USGS--TWRI Book 5, Chapter A3. 1972. 40 pages.
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- 5-A5. *Methods for determination of radioactive substances in water and fluvial sediments*. by L. L. Thatcher, V. J. Janzer, and K. W. Edwards: USGS--TWRI Book 5, Chapter A5. 1977. 95 pages.
- 5-A6. *Quality assurance practices for the chemical and biological analyses of water and fluvial sediments*, by L. C. Friedman and D. E. Erdmann: USGS--TWRI Book 5, Chapter A6. 1982. 181 pages.
- 5-C1. *Laboratory theory and methods for sediment analysis*. by H. P. Guy: USGS--TWRI Book 5, Chapter C1. 1969. 58 pages.
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- 7-C3. *A model for simulation of flow in singular and interconnected channels* by R. W. Schaffranek, R. A. Baltzer, and D. E. Goldberg: USGS--TWRI Book 7, Chapter C3. 1981. 110 pages.
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- 8-A2. *Installation and service manual for U.S. Geological Survey manometers* by J. D. Craig: USGS--TWRI Book 8, Chapter A2. 1983. 57 pages.
- 8-B2. *Calibration and maintenance of vertical-axis type current meters*. by G. F. Smoot and C. E. Novak: USGS--TWRI Book 8, Chapter B2. 1968. 15 pages.

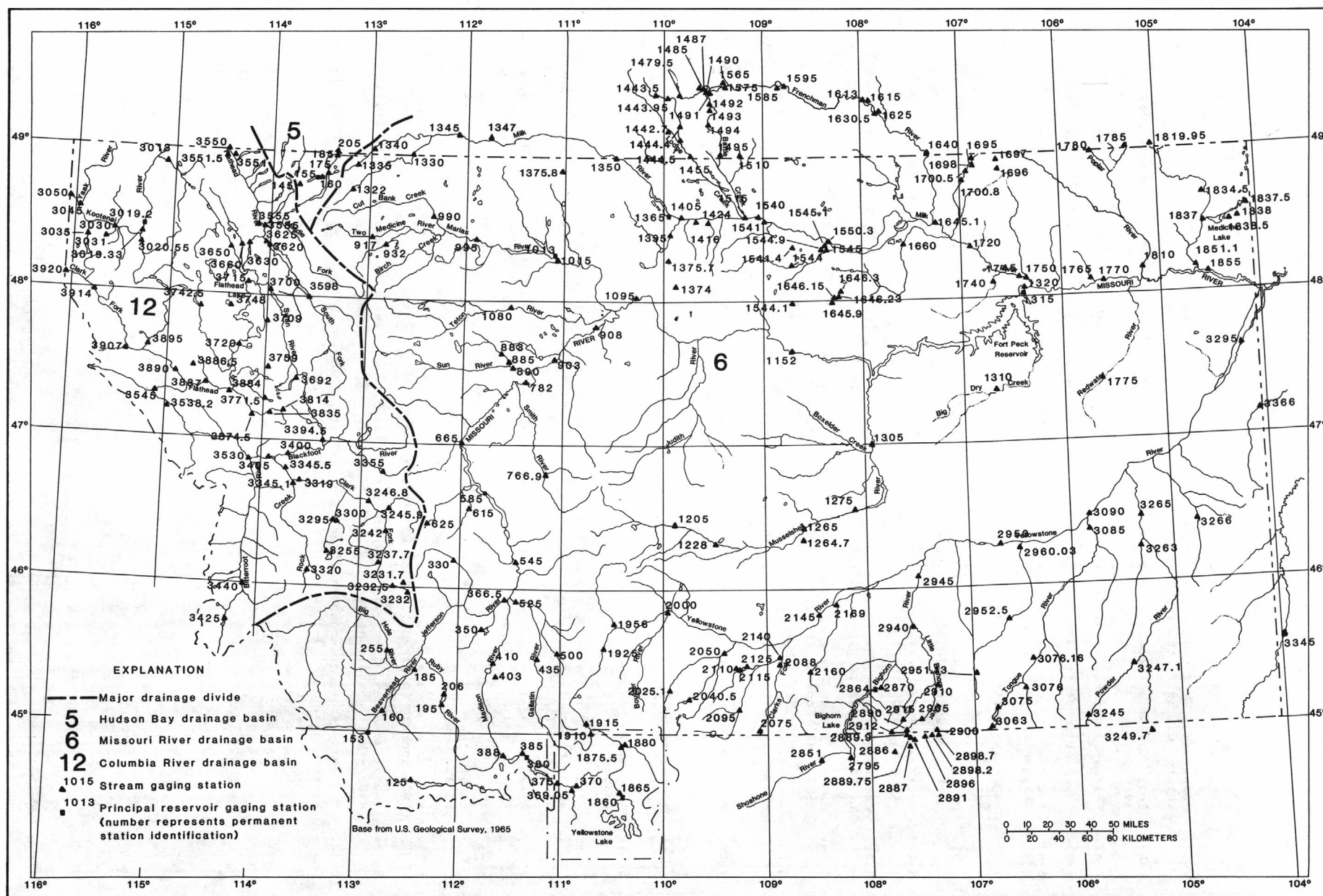


Figure 7.--Location of surface-water gaging stations, water year 1986.

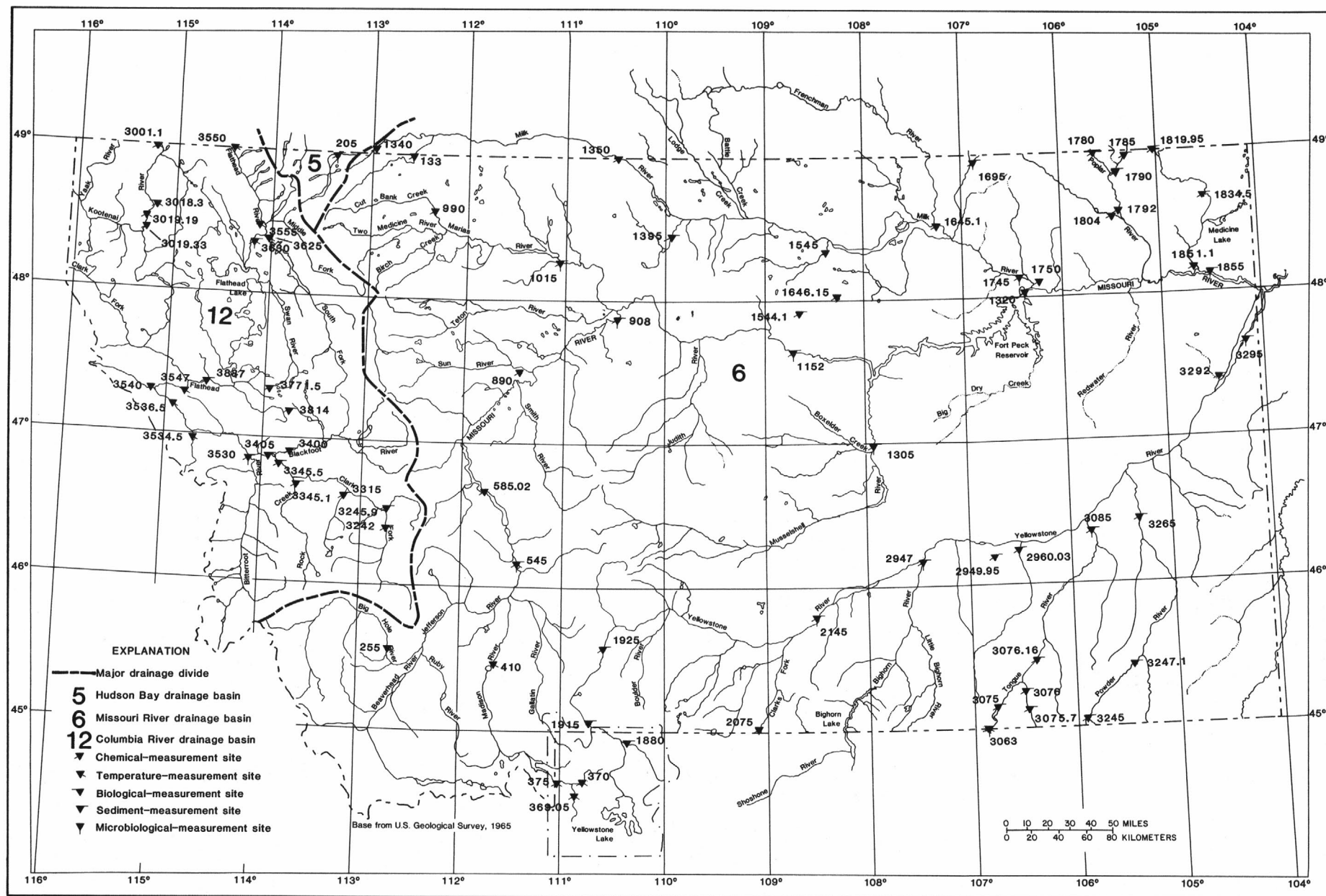


Figure 8.--Location of water-quality stations, water year 1986.

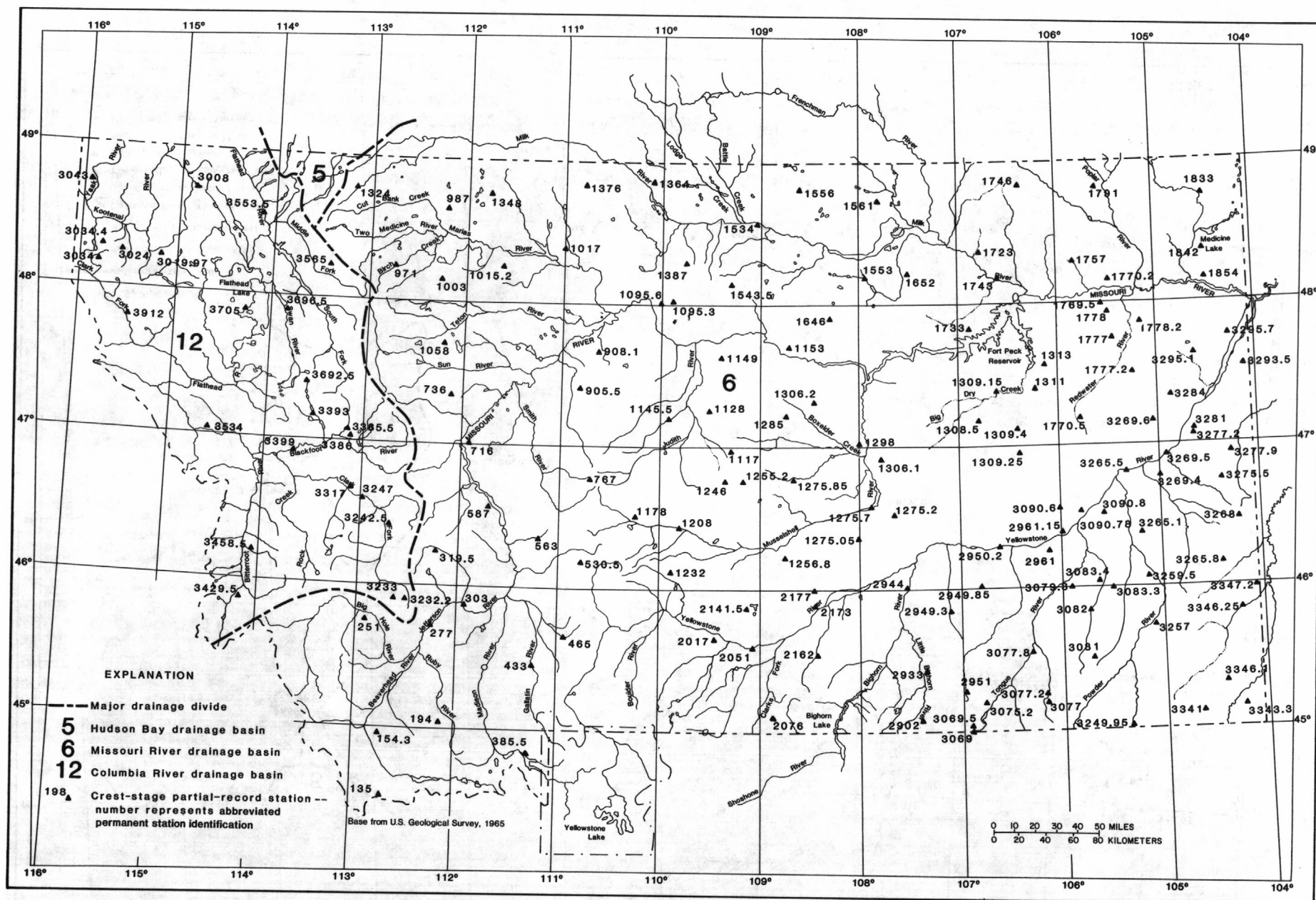


Figure 9.--Location of crest-stage partial-record stations, water year 1986.

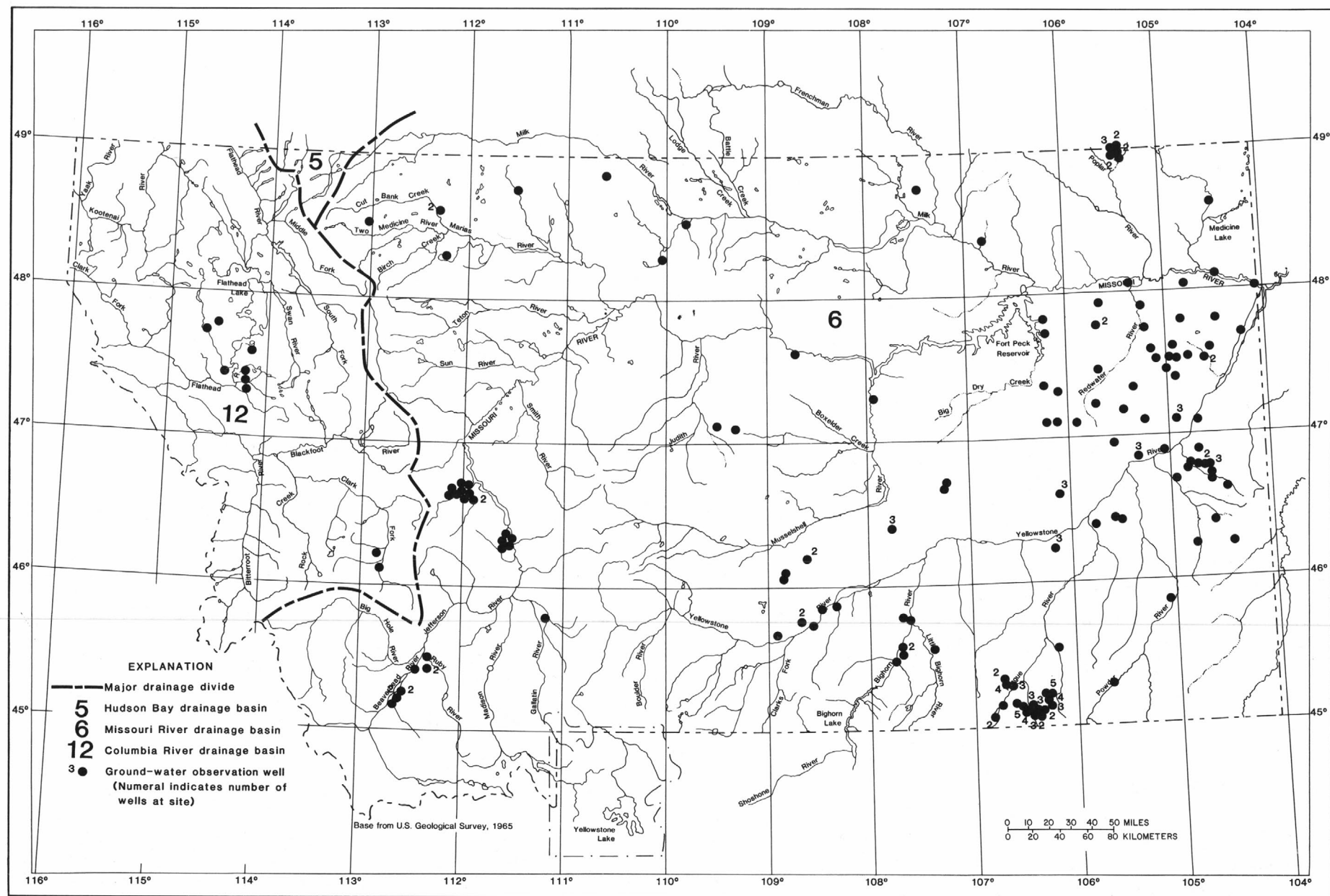


Figure 10.--Location of ground-water observation wells, water year 1986.

STATION RECORDS, SURFACE WATER AND WATER QUALITY

PART 12. UPPER COLUMBIA RIVER BASIN

KOOTENAI RIVER BASIN

12300110 LAKE KOOCANUSA AT INTERNATIONAL BOUNDARY

LOCATION.--Lat 48°59'44", long 115°10'43", in NE&SW&SE& sec.1, T.37 N., R.28 W., Lincoln County, Hydrologic Unit 17010101, 0.3 mi south of international boundry, 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 1985 TO SEPTEMBER 1986

		DATE	TIME	SAM- PLING DEPTH (FEET) (00003)	WEATHER (WMO CODE NUMBER) (00041)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH (STAND- ARD UNITS) (00400)	TEMPER- ATURE, AIR (DEG C) (00020)	TEMPER- ATURE (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)			
		OCT											
		08...	1400	10.0	3	200	8.3	4.0	12.1	9.2			
		08...	1500	118	3	225	7.7	--	8.0	6.2			
		JUN											
		18...	1000	10.0	3	197	7.9	15.0	16.3	9.0			
		18...	1100	130	3	259	7.9	--	6.6	9.5			
		JUL											
		16...	0930	10.0	2	200	8.0	16.0	17.2	9.1			
		16...	1030	137	2	240	7.7	--	7.9	8.7			
		AUG											
		20...	1100	10.0	1	204	8.5	20.0	20.6	8.8			
		20...	1200	135	1	242	7.9	--	7.7	7.8			
		SEP											
		17...	0930	10.0	3	225	8.4	9.0	16.4	8.6			
		17...	1030	130	3	244	7.9	--	8.2	7.2			
		1											
		DATE		SILICA, DIS- SOLVED (MG/L AS SiO2) (00955)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO- GEN, TOTAL (MG/L AS N) (00600)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P) (00671)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)			
		OCT											
		08...	5.2	<0.10	--	<0.2	--	0.005	0.004	1.4			
		08...	5.2	0.20	--	<0.2	--	0.008	0.003	1.7			
		JUN											
		18...	4.5	<0.10	<0.10	0.2	--	0.008	<0.001	1.8			
		18...	5.7	0.20	0.16	0.2	0.4	0.017	0.001	1.6			
		JUL											
		16...	4.4	<0.10	--	0.2	--	0.015	<0.001	1.7			
		16...	5.6	0.20	--	0.2	0.4	0.021	0.005	1.8			
		AUG											
		20...	3.4	<0.10	<0.10	<0.2	--	0.007	0.002	2.6			
		20...	5.9	0.20	0.21	<0.2	--	0.018	0.005	1.9			
		SEP											
		17...	3.2	<0.10	--	<0.2	--	<0.005	0.002	1.3			
		17...	5.6	0.20	--	<0.2	--	<0.005	0.002	1.8			
		DATE	TIME	SAM- PLING DEPTH (FEET) (00003)	HARD- NESS (MG/L AS CaCO3) (00900)	HARD- NESS NONCARB WH WAT TOT FLD MG/L AS CaCO3 (00902)	CALCIUM DIS- SOLVED (MG/L AS Ca) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS Mg) (00925)	SODIUM, DIS- SOLVED (MG/L AS Na) (00930)	SODIUM AD- SORP- TION RATIO (00931)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	ALKA- LINITY LAB (MG/L AS CaCO3) (90410)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)
JUN		18...	1000	10.0	110	26	33	7.0	1.7	0.1	0.5	91	14
		18...	1100	130	130	18	35	9.9	3.1	0.1	0.5	113	24
AUG		20...	1100	10.0	100	15	29	7.6	2.0	0.1	0.5	95	14
		20...	1200	135	130	25	36	9.9	3.1	0.1	0.7	109	21

KOOTENAI RIVER BASIN

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12300110 LAKE KOOCANUSA AT INTERNATIONAL BOUNDARY--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	ARSENIC TOTAL (UG/L AS AS) (01002)	IRON, TOTAL RECOVERABLE (UG/L AS FE) (01045)	LEAD, TOTAL RECOVERABLE (UG/L AS PB) (01051)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN) (01055)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN) (01092)
JUN									
18...	1.5	<0.1	110	0.15	<1	150	<5	<10	<10
18...	3.2	0.1	150	0.2	<1	320	<5	<10	<10
AUG									
20...	1.8	0.1	110	0.15	<1	20	<5	<10	<10
20...	2.6	0.1	140	0.19	<1	460	<5	20	<10

DATE	SAM- PLING DEPTH (FEET) (00003)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH (STAND- ARD UNITS) (00400)	TEMPER- ATURE (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)	LIGHT INCI- DENT PERCENT REMAIN- ING AT DEPTH (00031)	LIGHT TRANS- MISSION 1 METER PATH- LENGTH (%) (00074)
OCT							
08...	0.0	201	8.3	12.1	9.4	100	--
08...	0.5	--	--	--	--	90	--
08...	2.00	200	8.3	12.1	9.3	--	--
08...	3.30	--	--	--	--	60	--
08...	5.00	200	8.3	12.1	9.2	--	--
08...	10.0	200	8.3	12.1	9.2	--	--
08...	10.2	--	--	--	--	30	--
08...	15.0	200	8.3	12.1	9.0	--	--
08...	19.0	--	--	--	--	15	--
08...	20.0	200	8.3	12.1	8.7	--	--
08...	30.0	200	8.2	12.1	8.4	--	--
08...	32.2	--	--	--	--	5.0	--
08...	40.0	200	8.2	12.1	8.1	--	--
08...	47.9	--	--	--	--	1.0	--
08...	50.0	200	8.2	12.1	7.8	--	--
08...	60.0	216	8.1	12.1	7.5	--	--
08...	65.6	--	--	--	--	0.1	--
08...	70.0	219	8.1	12.0	7.2	--	--
08...	80.0	217	8.0	11.9	7.0	--	--
08...	90.0	219	8.0	11.3	6.8	--	--
08...	100	223	7.9	8.2	6.5	--	--
08...	110	223	7.8	8.0	6.3	--	--
08...	118	225	7.7	8.0	6.2	--	--
08...	128	225	7.7	8.0	6.2	--	--

KOOTENAI RIVER BASIN

12300110 LAKE KOOCANUSA AT INTERNATIONAL BOUNDARY--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	SAM- PLING DEPTH (FEET) (00003)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH (STAND- ARD UNITS) (00400)	TEMPER- ATURE (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)	LIGHT INCI- DENT PERCENT REMAIN- ING AT DEPTH (00031)	LIGHT TRANS- MISSION 1 METER PATH- LENGTH (%) (00074)
JUN							
18...	0.0	191	8.0	17.8	9.0	100	2.3
18...	0.5	--	--	--	--	90	--
18...	1.20	--	--	--	--	60	--
18...	2.00	192	8.0	17.8	9.0	--	2.3
18...	3.70	--	--	--	--	30	--
18...	5.00	194	8.0	17.7	9.0	--	2.1
18...	7.00	--	--	--	--	15	--
18...	10.0	197	7.9	16.3	9.0	--	1.9
18...	14.6	--	--	--	--	5.0	--
18...	15.0	196	7.9	16.0	9.0	--	0.23
18...	20.0	196	7.9	15.7	9.0	--	0.23
18...	25.0	198	7.9	14.6	9.0	--	0.13
18...	30.0	195	7.9	14.6	9.2	--	<0.01
18...	35.0	192	7.9	13.8	9.2	--	<0.01
18...	40.0	194	7.9	13.1	9.2	--	<0.01
18...	45.0	191	7.9	12.4	9.3	--	--
18...	50.0	191	7.9	12.2	9.4	--	--
18...	55.0	185	7.9	11.9	9.3	--	--
18...	60.0	186	7.9	11.7	9.4	--	--
18...	65.0	184	7.9	11.4	9.4	--	--
18...	70.0	186	7.9	11.3	9.4	--	--
18...	75.0	185	7.9	10.8	9.4	--	--
18...	80.0	186	7.8	10.7	9.4	--	--
18...	85.0	185	7.8	9.8	9.3	--	--
18...	90.0	195	7.8	9.7	9.2	--	--
18...	95.0	207	7.8	9.0	9.3	--	--
18...	100	216	7.7	8.6	9.4	--	--
18...	105	232	7.7	7.8	9.3	--	<0.01
18...	110	248	7.7	7.4	9.2	--	<0.01
18...	115	254	7.7	6.8	9.4	--	<0.01
18...	120	259	7.8	6.7	9.4	--	<0.01
18...	125	257	7.8	6.6	9.5	--	<0.01
18...	130	259	7.9	6.6	9.5	--	<0.01
18...	140	259	7.9	6.6	9.5	--	<0.01

DATE	SAM- PLING DEPTH (FEET) (00003)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH (STAND- ARD UNITS) (00400)	TEMPER- ATURE (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)	LIGHT INCI- DENT PERCENT REMAIN- ING AT DEPTH (00031)	LIGHT TRANS- MISSION 1 METER PATH- LENGTH (%) (00074)
JUL							
16...	0.0	198	8.1	17.3	9.2	100	6.8
16...	0.5	--	--	--	--	90	--
16...	1.60	--	--	--	--	60	--
16...	2.00	198	8.0	17.5	9.2	--	5.8
16...	5.00	199	8.1	17.4	9.2	--	5.8
16...	5.90	--	--	--	--	30	--
16...	10.0	200	8.0	17.2	9.1	--	7.3
16...	10.2	--	--	--	--	15	--
16...	15.0	201	8.0	16.9	9.1	--	7.9
16...	19.4	--	--	--	--	5.0	--
16...	20.0	199	8.0	16.7	9.0	--	8.5
16...	25.0	200	8.0	16.7	8.9	--	7.9
16...	30.0	200	8.0	16.6	8.9	--	4.1
16...	35.0	200	8.0	16.6	8.9	--	5.8
16...	40.0	201	8.0	16.3	8.7	--	6.8
16...	45.0	204	7.9	15.8	8.8	--	6.3
16...	50.0	203	7.9	15.3	8.8	--	3.8
16...	55.0	205	7.9	14.9	8.7	--	3.1
16...	60.0	203	7.9	14.5	8.8	--	2.6
16...	65.0	205	7.9	14.3	8.9	--	1.7
16...	70.0	204	7.9	14.1	8.9	--	1.5
16...	75.0	204	7.9	13.9	8.9	--	1.5
16...	80.0	203	7.9	13.7	9.0	--	0.92
16...	85.0	206	7.8	13.1	8.7	--	0.46
16...	90.0	203	7.8	11.5	8.8	--	0.02
16...	95.0	212	7.8	10.6	8.7	--	<0.01
16...	100	212	7.8	9.7	9.0	--	<0.01
16...	105	217	7.8	9.5	9.0	--	<0.01
16...	110	219	7.8	9.2	9.0	--	<0.01
16...	115	223	7.8	9.1	9.0	--	<0.01
16...	120	223	7.8	8.9	8.9	--	<0.01
16...	125	237	7.8	8.2	8.7	--	<0.01
16...	130	239	7.7	8.0	8.7	--	<0.01
16...	135	240	7.7	7.9	8.7	--	<0.01
16...	137	240	7.7	7.9	8.7	--	<0.01
16...	147	239	7.7	7.9	8.7	--	<0.01

12300110 LAKE KOOCANUSA AT INTERNATIONAL BOUNDARY--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	SAM- PLING DEPTH (FEET) (00003)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH (STAND- ARD UNITS) (00400)	TEMPER- ATURE (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)	LIGHT INCI- DENT PERCENT REMAIN- ING AT DEPTH (00031)	LIGHT TRANS- MISSION 1 METER PATH- LENGTH (%) (00074)
AUG							
20...	0.0	202	8.5	20.8	8.8	100	24
20...	0.5	--	--	--	--	90	--
20...	2.00	203	8.5	20.8	8.8	--	23
20...	3.90	--	--	--	--	60	--
20...	5.00	203	8.5	20.7	8.8	--	23
20...	10.0	204	8.5	20.6	8.8	--	23
20...	11.5	--	--	--	--	30	--
20...	14.8	--	--	--	--	15	--
20...	15.0	203	8.5	20.6	8.8	--	21
20...	20.0	203	8.3	20.5	8.8	--	21
20...	25.0	204	8.3	20.5	8.7	--	21
20...	29.2	--	--	--	--	5.0	--
20...	30.0	204	8.3	20.4	8.7	--	21
20...	35.0	206	8.2	19.3	8.7	--	20
20...	40.0	211	8.2	18.4	8.8	--	21
20...	42.7	--	--	--	--	1.0	--
20...	45.0	219	8.1	17.1	8.7	--	25
20...	50.0	244	8.0	16.6	8.4	--	35
20...	55.0	242	7.9	16.2	8.4	--	28
20...	60.0	244	7.9	15.7	8.3	--	24
20...	60.4	--	--	--	--	0.1	--
20...	65.0	247	7.8	14.0	8.1	--	15
20...	70.0	243	7.8	13.6	8.0	--	11
20...	75.0	230	7.7	13.0	8.2	--	7.9
20...	80.0	227	7.7	12.7	8.3	--	4.5
20...	85.0	221	7.6	11.7	8.3	--	2.6
20...	90.0	210	7.8	11.3	8.3	--	1.9
20...	95.0	209	7.8	10.7	8.5	--	0.81
20...	100	210	7.8	10.3	8.6	--	0.39
20...	105	212	7.8	10.0	8.5	--	0.19
20...	110	214	7.8	9.8	8.5	--	0.16
20...	115	215	7.9	9.4	8.3	--	0.08
20...	120	223	7.9	9.1	8.1	--	0.02
20...	125	229	7.9	8.7	8.0	--	<0.01
20...	130	239	7.9	8.0	7.7	--	<0.01
20...	135	242	7.9	7.7	7.8	--	<0.01
20...	140	245	7.9	7.7	7.8	--	<0.01
20...	145	245	7.9	7.7	7.8	--	--

DATE	SAM- PLING DEPTH (FEET) (00003)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH (STAND- ARD UNITS) (00400)	TEMPER- ATURE (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)	LIGHT INCI- DENT PERCENT REMAIN- ING AT DEPTH (00031)	LIGHT TRANS- MISSION 1 METER PATH- LENGTH (%) (00074)
SEP							
17...	0.0	225	8.3	16.4	8.6	100	25
17...	0.5	--	--	--	--	90	--
17...	2.00	225	8.4	16.4	8.6	--	24
17...	4.00	--	--	--	--	60	--
17...	5.00	225	8.4	16.4	8.6	--	23
17...	9.00	--	--	--	--	30	--
17...	10.0	225	8.4	16.4	8.6	--	23
17...	15.0	225	8.4	16.4	8.5	15	23
17...	20.0	225	8.3	16.4	8.4	--	23
17...	25.0	225	8.3	16.4	8.3	--	23
17...	26.0	--	--	--	--	5.0	--
17...	30.0	226	8.3	16.4	8.2	--	23
17...	35.0	229	8.3	16.4	8.1	--	23
17...	40.0	234	8.3	16.3	7.9	--	23
17...	43.0	--	--	--	--	1.0	--
17...	45.0	244	8.1	15.8	7.6	--	23
17...	50.0	250	8.0	15.6	7.4	--	21
17...	55.0	248	8.0	15.0	7.3	--	21
17...	59.0	--	--	--	--	0.1	--
17...	60.0	250	8.0	14.7	7.1	--	17
17...	65.0	248	8.0	14.6	7.1	--	15
17...	70.0	244	8.0	14.5	7.1	--	14
17...	75.0	237	8.0	13.9	6.9	--	11
17...	80.0	226	8.0	13.4	6.9	--	11
17...	85.0	222	8.0	12.6	6.9	--	11
17...	90.0	217	8.0	12.2	7.0	--	5.3
17...	95.0	219	8.0	11.6	7.1	--	4.1
17...	100	221	8.0	10.1	7.2	--	1.1
17...	110	231	8.0	8.9	7.4	--	0.62
17...	120	245	7.9	8.1	7.3	--	0.03
17...	125	243	7.9	8.1	7.2	--	0.01
17...	130	244	7.9	8.2	7.2	--	0.01
17...	140	244	7.9	8.2	7.2	--	0.01

KOOTENAI RIVER BASIN

12301300 TOBACCO RIVER NEAR EUREKA, MT

LOCATION.--Lat 48°53'37", long 115°05'13", in NW¼SE¼SE¼ 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 mi².

PERIOD OF RECORD.--September 1958 to current year.

GAGE.--Water-stage recorder. Datum of gage is 2,518.85 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Nov. 14 to Dec. 22, 30, 31, Jan. 4, Feb. 8-22. Records good except those for estimated daily discharges, which are poor. Diversions for irrigation of about 4,500 acres upstream from station. Several observations of water temperature and specific conductance were made during the year and are published as miscellaneous water-quality data in the back of this report.

AVERAGE DISCHARGE.--28 years, 268 ft³/s, 8.27 in/yr, 194,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,470 ft³/s June 18, 1974, gage height, 6.86 ft; maximum gage height, 7.12 ft May 27, 1961; minimum daily discharge, 20 ft³/s Jan. 11, 1963.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of about May 22, 1948, reached a discharge of 2,810 ft³/s, from slope-area measurement of peak flow at site 1.5 mi downstream.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,370 ft³/s May 29, gage height, 5.11 ft; minimum, 69 ft³/s Feb. 5, gage height, 2.07 ft, result of freezeup.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	114	219	135	119	112	252	819	357	1110	249	147	96		
2	116	231	130	116	119	261	660	349	1030	234	142	100		
3	116	283	135	112	119	281	569	401	944	231	137	94		
4	110	413	140	110	119	324	527	526	864	228	135	90		
5	106	557	145	100	116	355	505	701	905	234	128	92		
6	112	514	150	104	110	383	492	693	852	237	125	90		
7	114	427	150	110	94	433	492	606	745	222	121	88		
8	112	376	150	116	90	495	501	550	713	213	119	88		
9	102	335	140	108	85	567	528	527	668	213	114	118		
10	106	262	130	110	80	536	585	522	597	210	114	128		
11	108	237	135	108	80	489	600	496	549	219	112	119		
12	121	207	140	108	85	450	554	467	509	228	116	112		
13	119	195	145	102	80	430	489	462	475	219	114	106		
14	116	190	150	106	75	398	454	517	438	210	110	104		
15	123	195	155	102	80	377	430	483	462	201	106	104		
16	128	190	160	106	85	346	430	446	434	192	100	112		
17	132	180	155	104	85	335	424	430	402	222	98	110		
18	132	170	150	102	80	318	398	430	383	222	94	106		
19	128	160	145	144	75	304	379	446	368	207	94	104		
20	130	155	150	137	75	304	375	513	346	198	92	104		
21	135	145	140	123	85	324	379	647	335	186	92	100		
22	137	135	130	125	110	353	478	745	314	187	90	98		
23	144	130	128	121	132	348	711	664	297	195	90	96		
24	152	135	125	114	160	346	639	592	281	189	90	100		
25	206	140	123	110	411	357	546	591	274	181	92	102		
26	260	135	116	110	291	342	489	722	261	184	86	121		
27	261	130	112	119	232	342	450	974	255	187	84	121		
28	258	120	112	137	222	390	426	1200	249	181	82	123		
29	258	130	104	117	---	504	402	1290	277	170	80	119		
30	246	140	110	112	---	628	379	1220	271	160	96	128		
31	234	---	115	110	---	907	---	1160	---	152	98	---		
TOTAL	4636	6836	4205	3522	3487	12479	15110	19727	15608	6361	3298	3173		
MEAN	150	228	136	114	125	403	504	636	520	205	106	106		
MAX	261	557	160	144	411	907	819	1290	1110	249	147	128		
MIN	102	120	104	100	75	252	375	349	249	152	80	88		
CFSM	.34	.52	.31	.26	.28	.92	1.15	1.45	1.18	.47	.24	.24		
IN.	.39	.58	.36	.30	.29	1.06	1.28	1.67	1.32	.54	.28	.27		
AC-FT	9200	13560	8340	6990	6920	24750	29970	39130	30960	12620	6540	6290		
CAL YR 1985	TOTAL	84998	MEAN	233	MAX	1420	MIN	28	CFSM	.53	IN.	7.19	AC-FT	168600
WTR YR 1986	TOTAL	98442	MEAN	270	MAX	1290	MIN	75	CFSM	.61	IN.	8.32	AC-FT	195300

KOOTENAI RIVER BASIN

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12301830 LAKE KOOCANUSA AT TENMILE CREEK, NEAR LIBBY, MT

LOCATION.--Lat 48°35'06", long 115°13'52", in NW¼NE¼NW¼ 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.

REMARKS.--Depth-distribution profile of primary productivity are available in file in Helena district office.

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

		SAM- PLING DEPTH (FEET) (000003)	WEATHER (WMO CODE NUMBER) (00041)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH (STAND- ARD UNITS) (00400)	TEMPER- ATURE, AIR (DEG C) (00020)	TEMPER- ATURE (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)				
OCT												
10...		1030	10.0	3	218	8.5	3.0	9.2				
10...		1130	220	3	287	7.8	--	7.8				
APR												
16...		1100	10.0	1	258	8.2	8.0	11.7				
16...		1300	152	1	263	8.0	--	11.8				
MAY												
13...		1300	10.0	60	254	8.1	5.0	11.4				
13...		1400	180	60	262	7.8	--	11.1				
JUN												
17...		1100	10.0	1	214	8.4	28.0	9.3				
17...		1200	240	1	262	8.1	--	10.8				
JUL												
15...		1030	10.0	1	201	8.2	18.0	10.3				
15...		1130	231	1	264	7.8	--	10.4				
AUG												
19...		1000	10.0	1	203	8.2	22.0	9.0				
19...		1100	250	1	264	7.8	--	9.6				
SEP												
16...		1030	10.0	3	208	8.4	12.0	8.7				
16...		1130	233	3	266	8.0	--	9.7				
		SILICA, DIS- SOLVED (MG/L AS SiO2) (00955)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO- GEN, TOTAL (MG/L AS N) (00600)	PHOS- PHORUS, TOTAL (MG/L AS P) (00665)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P) (00671)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)			
OCT												
10...		4.7	0.20	--	<0.2	--	0.01	0.004	1.6			
10...		3.0	<0.10	--	<0.2	--	0.003	0.002	1.3			
APR												
16...		5.1	0.10	0.11	0.3	0.4	0.012	0.01	1.5			
16...		5.4	0.10	0.43	0.3	0.4	0.008	0.005	2.2			
MAY												
13...		6.3	0.10	--	0.2	0.3	0.007	0.001	2.4			
13...		5.8	0.10	--	0.3	0.4	0.007	0.002	2.1			
JUN												
17...		4.9	<0.10	--	0.2	--	<0.005	0.004	1.7			
17...		5.6	0.10	--	0.2	0.3	0.008	0.003	1.6			
JUL												
15...		4.4	<0.10	--	0.3	--	0.011	0.001	1.8			
15...		5.7	0.20	--	<0.2	--	0.009	0.008	1.3			
AUG												
19...		3.6	<0.10	<0.10	0.6	--	0.025	<0.001	2.2			
19...		5.9	<0.10	0.15	<0.2	--	0.006	0.005	3.7			
SEP												
16...		5.7	0.20	--	0.2	0.4	0.006	0.007	0.8			
16...		3.1	<0.10	--	0.3	--	<0.005	0.002	1.3			
			HARD- NESS NONCARB WH WAT TOT FLD MG/L AS CaCO3 (00902)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM AD- SORP- TION RATIO (00931)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	ALKA- LINITY LAB (MG/L AS CaCO3) (90410)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)		
APR												
16...		1100	10.0	130	24	36	10	11	0.4	0.7	114	30
16...		1300	152	130	24	37	10	3.6	0.1	0.7	116	17
AUG												
19...		1000	10.0	110	18	30	7.7	1.9	0.1	0.6	93	15
19...		1100	250	140	25	38	10	3.4	0.1	0.7	114	24

KOOTENAI RIVER BASIN

12301830 LAKE KOOCANUSA AT TENMILE CREEK, NEAR LIBBY, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	ARSENIC TOTAL (UG/L AS AS) (01002)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE) (01045)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB) (01051)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN) (01055)	ZINC, TOTAL RECOV- ERABLE (UG/L AS ZN) (01092)
APR									
16...	3.3	<0.1	160	0.22	<1	80	4	20	10
16...	3.4	<0.1	140	0.19	<1	170	3	30	<10
AUG									
19...	1.7	0.1	110	0.15	<1	20	<5	<10	20
19...	3.2	0.1	150	0.21	<1	110	<5	20	10

DATE	SAM- PLING DEPTH (FEET) (00003)	CHLOR-A PHYTO- PLANK- TON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTO- PLANK- TON CHROMO FLUOROM (UG/L) (70954)
OCT			
10...	0.5	1.71	<0.10
10...	5.00	1.87	<0.10
10...	10.0	1.74	<0.10
10...	30.0	1.60	<0.10
10...	70.0	1.57	<0.10
10...	140	0.136	<0.10
10...	210	<0.10	<0.10
APR			
16...	0.5	1.95	<0.10
16...	11.0	3.02	<0.10
16...	19.0	2.34	<0.10
16...	26.6	2.34	<0.10
16...	42.0	2.34	<0.10
16...	100	2.15	<0.10
16...	152	1.95	<0.10
MAY			
13...	8.00	1.05	<0.10
13...	20.0	1.40	<0.10
13...	28.0	1.27	<0.10
13...	40.0	0.931	<0.10
13...	66.0	0.595	<0.10
13...	100	1.19	<0.10
JUN			
17...	0.5	2.73	0.13
17...	1.00	3.13	0.13
17...	3.00	2.50	0.086
17...	10.5	4.04	0.13

DATE	SAM- PLING DEPTH (FEET) (00003)	CHLOR-A PHYTO- PLANK- TON CHROMO FLUOROM (UG/L) (70953)	CHLOR-B PHYTO- PLANK- TON CHROMO FLUOROM (UG/L) (70954)
JUN			
17...	16.7	0.682	<0.10
17...	35.0	0.346	<0.10
17...	70.0	0.144	<0.10
JUL			
15...	0.5	2.88	<0.10
15...	9.20	2.49	<0.10
15...	20.2	1.11	<0.10
15...	36.3	0.197	<0.10
15...	50.0	0.868	<0.10
15...	100	0.157	<0.10
15...	150	<0.10	<0.10
AUG			
19...	0.5	0.937	<0.10
19...	11.8	1.50	<0.10
19...	20.0	1.08	<0.10
19...	31.8	3.20	0.10
19...	67.3	0.591	<0.10
19...	135	0.147	<0.10
19...	250	0.10	<0.10
SEP			
16...	0.5	0.329	<0.10
16...	4.50	0.392	<0.10
16...	22.0	2.77	0.122
16...	46.0	2.14	<0.081
16...	69.0	0.95	<0.10
16...	112	0.158	<0.10
16...	224	0.059	<0.10

PRIMARY PRODUCTIVITY IN THE EUPHOTIC ZONE, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	PRIMARY PRODUCTIVITY (MG C/M ² /DAY)
OCT	
10...	110

(carbon-14, light and dark bottle method)

12301830 LAKE KOOCANUSA AT TENMILE CREEK, NEAR LIBBY, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	SAM- PLING DEPTH (FEET) (00003)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH (STAND- ARD UNITS) (00400)	TEMPER- ATURE (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)	LIGHT INCI- DENT PERCENT REMAIN- ING AT DEPTH (00031)	LIGHT TRANS- MISSION 1 METER PATH- LENGTH (%) (00074)
OCT							
10...	0.0	218	8.5	12.2	9.2	100	43
10...	0.5	--	--	--	--	90	--
10...	2.00	218	8.5	12.2	9.2	--	41
10...	5.00	218	8.5	12.2	9.2	--	41
10...	6.60	--	--	--	--	60	--
10...	10.0	218	8.5	12.2	9.2	--	41
10...	15.0	218	8.5	12.2	9.2	--	41
10...	17.4	--	--	--	--	30	--
10...	20.0	218	8.5	12.2	9.2	--	41
10...	25.0	218	8.6	12.2	9.2	--	41
10...	27.6	--	--	--	--	15	--
10...	30.0	218	8.6	12.2	9.1	--	41
10...	35.0	218	8.6	12.2	9.3	--	41
10...	40.0	218	8.6	12.2	9.4	--	41
10...	50.0	219	8.6	12.2	9.2	--	41
10...	52.5	--	--	--	--	5.0	--
10...	60.0	218	8.6	12.2	9.2	--	42
10...	70.0	219	8.5	12.2	9.2	--	42
10...	80.0	218	8.5	12.1	9.1	--	41
10...	90.0	218	8.5	12.1	9.1	--	42
10...	100	216	8.4	12.1	8.9	--	42
10...	110	214	8.3	12.0	8.8	--	43
10...	120	215	8.1	10.9	8.6	--	42
10...	130	233	7.9	8.8	8.6	--	35
10...	140	243	7.9	7.8	8.6	--	33
10...	150	253	7.9	7.1	8.4	--	25
10...	160	270	7.8	5.9	8.2	--	17
10...	170	275	7.8	5.6	8.1	--	14
10...	180	276	7.8	5.5	7.9	--	13
10...	190	280	7.8	5.2	7.8	--	13
10...	200	282	7.8	5.1	7.8	--	12
10...	210	285	7.8	4.9	7.8	--	11
10...	220	287	7.8	4.8	7.8	--	9.8
10...	230	287	7.8	4.7	7.8	--	9.2
APR							
16...	0.0	258	8.2	3.7	11.7	100	19
16...	0.5	--	--	--	--	90	--
16...	2.00	258	8.2	3.7	11.7	--	18
16...	5.00	258	8.2	3.7	11.7	60	18
16...	10.0	258	8.2	3.7	11.7	--	17
16...	11.0	--	--	--	--	30	--
16...	19.0	--	--	--	--	15	--
16...	20.0	259	8.2	3.6	11.7	--	17
16...	26.6	--	--	--	--	5.0	--
16...	30.0	258	8.2	3.6	11.7	--	17
16...	40.0	258	8.2	3.6	11.7	--	17
16...	42.0	--	--	--	--	1.0	--
16...	50.0	258	8.2	3.6	11.7	--	17
16...	60.0	258	8.2	3.6	11.7	--	16
16...	70.0	258	8.1	3.6	11.7	--	15
16...	80.0	258	8.1	3.6	11.7	--	15
16...	90.0	259	8.1	3.6	11.7	--	15
16...	100	259	8.1	3.5	11.7	--	13
16...	110	258	8.1	3.5	11.7	--	11
16...	120	261	8.0	3.5	11.7	--	8.5
16...	130	261	8.0	3.4	11.7	--	5.3
16...	140	262	8.0	3.4	11.9	--	3.4
16...	152	263	8.0	3.4	11.8	--	1.5
16...	162	262	8.1	3.4	11.8	--	0.92

KOOTENAI RIVER BASIN

12301830 LAKE KOOCANUSA AT TENMILE CREEK, NEAR LIBBY, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	SAM- PLING DEPTH (FEET) (00003)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH (STAND- ARD UNITS) (00400)	TEMPER- ATURE (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)	LIGHT INCI- DENT PERCENT REMAIN- ING AT DEPTH (00031)	LIGHT TRANS- MISSION 1 METER PATH- LENGTH (%) (00074)
MAY							
13...	0.0	255	8.1	7.6	11.4	100	13
13...	0.5	--	--	--	--	90	--
13...	2.00	254	8.1	7.6	11.4	--	13
13...	5.00	255	8.1	7.6	11.4	--	13
13...	8.00	--	--	--	--	60	--
13...	10.0	254	8.1	7.6	11.4	--	13
13...	15.0	255	8.1	7.6	11.4	--	13
13...	20.0	255	8.1	7.5	11.4	30	13
13...	28.0	--	--	--	--	15	--
13...	30.0	257	8.1	7.2	11.4	--	12
13...	40.0	258	8.0	6.6	11.4	5.0	12
13...	50.0	264	8.0	5.7	11.4	--	11
13...	60.0	261	8.0	5.4	11.4	--	8.5
13...	66.0	--	--	--	--	1.0	--
13...	70.0	262	8.0	5.2	11.6	--	9.8
13...	80.0	262	8.0	4.8	11.6	--	9.8
13...	90.0	262	8.0	4.6	11.6	--	9.2
13...	100	261	8.0	4.5	11.6	--	6.3
13...	110	262	7.9	4.4	11.5	--	4.9
13...	120	262	7.9	4.4	11.5	--	1.9
13...	130	262	7.9	4.4	11.5	--	1.2
13...	140	261	7.8	4.4	11.4	--	1.1
13...	150	261	7.8	4.3	11.4	--	0.71
13...	160	262	7.8	4.3	11.3	--	0.53
13...	170	262	7.8	4.3	11.3	--	0.13
13...	180	262	7.8	4.2	11.1	--	0.03
13...	190	262	7.8	4.2	11.0	--	<0.01
JUN							
17...	0.0	216	8.5	18.0	9.2	100	3.1
17...	0.5	--	--	--	--	90	--
17...	1.00	--	--	--	--	60	--
17...	2.00	217	8.5	17.2	9.3	--	2.8
17...	3.00	--	--	--	--	30	--
17...	5.00	217	8.5	17.0	9.3	--	1.7
17...	6.60	--	--	--	--	15	--
17...	10.0	214	8.4	15.5	9.3	--	0.08
17...	10.5	--	--	--	--	5.0	--
17...	15.0	217	8.4	14.3	9.3	--	<0.01
17...	16.7	--	--	--	--	1.0	--
17...	20.0	212	8.3	13.0	9.3	--	<0.01
17...	25.0	206	8.3	11.7	9.1	--	--
17...	30.0	196	8.2	11.0	9.4	--	--
17...	35.0	190	8.2	10.8	9.4	--	--
17...	40.0	189	8.1	10.8	9.3	--	--
17...	50.0	189	8.1	10.7	9.4	--	--
17...	60.0	192	8.0	10.5	9.4	--	--
17...	70.0	191	7.9	10.2	9.5	--	--
17...	80.0	203	7.9	10.0	9.6	--	<0.01
17...	90.0	214	7.9	9.7	9.6	--	<0.01
17...	100	221	7.8	9.3	9.7	--	<0.01
17...	110	246	7.9	8.7	9.9	--	2.3
17...	120	255	8.0	8.2	10.0	--	4.9
17...	130	257	8.0	7.7	10.0	--	7.9
17...	140	264	8.0	7.1	10.1	--	7.9
17...	150	264	8.0	6.0	10.3	--	11
17...	160	271	8.1	5.2	10.5	--	11
17...	170	266	8.1	4.6	10.5	--	9.2
17...	180	266	8.1	4.5	10.5	--	6.8
17...	190	264	8.1	4.4	10.5	--	4.9
17...	200	264	8.1	4.4	10.5	--	3.4
17...	210	263	8.1	4.4	10.5	--	1.9
17...	220	263	8.1	4.4	10.6	--	1.7
17...	230	262	8.1	4.4	10.8	--	1.2
17...	240	262	8.1	4.4	10.8	--	0.28
17...	250	262	8.1	4.4	10.8	--	0.28

KOOTENAI RIVER BASIN

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12301830 LAKE KOOCANUSA AT TENMILE CREEK, NEAR LIBBY, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	SAM- PLING DEPTH (FEET) (00003)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH (STAND- ARD UNITS) (00400)	TEMPER- ATURE (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)	LIGHT INCI- DENT PERCENT REMAIN- ING AT DEPTH (00031)	LIGHT TRANS- MISSION 1 METER PATH- LENGTH (%) (00074)
JUL							
15...	0.0	200	8.2	17.5	10.2	100	20
15...	0.5	--	--	--	--	90	--
15...	2.00	200	8.2	17.6	10.2	--	19
15...	3.00	--	--	--	--	60	--
15...	5.00	201	8.2	17.6	10.2	--	19
15...	9.20	--	--	--	--	30	--
15...	10.0	201	8.2	17.2	10.3	--	18
15...	13.2	--	--	--	--	15	--
15...	15.0	202	8.2	16.7	10.4	--	18
15...	20.0	204	8.2	16.3	10.1	--	18
15...	20.2	--	--	--	--	5.0	--
15...	25.0	205	8.1	15.9	9.9	--	17
15...	30.0	206	8.0	14.2	9.6	--	6.8
15...	35.0	208	7.9	13.4	9.4	--	1.9
15...	36.3	--	--	--	--	1.0	--
15...	40.0	203	7.9	12.9	9.4	--	1.2
15...	45.0	204	7.8	12.5	9.3	--	0.92
15...	50.0	199	7.8	12.4	9.3	--	0.71
15...	60.0	198	7.8	11.9	9.3	--	0.39
15...	70.0	195	7.8	11.5	9.3	--	0.08
15...	80.0	194	7.8	11.1	9.4	--	0.01
15...	90.0	190	7.8	10.7	9.4	--	<0.01
15...	100	193	7.8	10.4	9.4	--	<0.01
15...	110	206	7.8	9.6	9.7	--	<0.01
15...	120	236	7.8	9.0	10.0	--	0.16
15...	130	252	7.8	8.4	10.0	--	1.5
15...	140	256	7.8	7.7	10.1	--	2.6
15...	150	262	7.8	7.0	10.1	--	1.9
15...	160	258	7.8	6.7	10.1	--	0.53
15...	170	268	7.8	5.8	10.5	--	1.1
15...	180	265	7.8	5.0	10.6	--	2.3
15...	190	267	7.8	4.8	10.6	--	1.1
15...	200	264	7.8	4.7	10.4	--	1.2
15...	210	266	7.8	4.6	10.4	--	0.81
15...	220	264	7.8	4.6	10.4	--	0.62
15...	231	264	7.8	4.6	10.4	--	0.53
15...	241	263	7.8	4.6	10.4	--	0.53
AUG							
19...	0.0	202	8.2	20.5	9.0	100	43
19...	0.5	--	--	--	--	90	--
19...	2.00	203	8.2	20.5	9.0	--	43
19...	4.30	--	--	--	--	60	--
19...	5.00	203	8.2	20.5	9.0	--	43
19...	10.0	203	8.2	20.4	9.0	--	43
19...	11.8	--	--	--	--	30	--
19...	15.0	203	8.2	20.3	9.0	--	41
19...	20.0	203	8.2	20.2	9.0	15	39
19...	25.0	207	8.2	19.7	9.0	--	37
19...	30.0	207	8.1	18.3	9.0	--	37
19...	31.8	--	--	--	--	5.0	--
19...	35.0	210	7.9	16.3	8.8	--	41
19...	40.0	206	7.8	15.4	8.6	--	41
19...	45.0	213	7.8	15.1	8.5	--	37
19...	48.2	--	--	--	--	1.0	--
19...	50.0	212	7.8	14.9	8.6	--	33
19...	60.0	214	7.8	14.4	8.5	--	28
19...	67.3	--	--	--	--	0.1	--
19...	70.0	214	7.8	13.8	8.3	--	23
19...	80.0	211	7.7	13.2	8.3	--	24
19...	90.0	205	7.7	12.2	8.3	--	13
19...	100	206	7.7	11.4	8.5	--	4.1
19...	110	200	7.7	10.4	8.7	--	0.46
19...	120	209	7.8	10.0	8.8	--	0.28
19...	130	219	7.8	9.1	8.9	--	0.53
19...	135	--	--	--	--	--	--
19...	140	234	7.7	8.6	9.2	--	1.2
19...	150	245	7.7	7.8	9.4	--	6.3
19...	160	253	7.8	7.3	9.5	--	6.8
19...	170	254	7.8	6.8	9.5	--	2.8
19...	180	260	7.8	6.4	9.6	--	4.1
19...	190	260	7.8	5.7	9.6	--	5.3
19...	200	263	7.8	5.3	9.7	--	2.8
19...	210	264	7.8	5.0	9.6	--	2.6
19...	220	265	7.8	4.8	9.7	--	4.1
19...	230	264	7.8	4.8	9.6	--	4.1
19...	240	264	7.8	4.7	9.6	--	3.1
19...	250	264	7.8	4.7	9.6	--	1.7
19...	260	264	7.8	4.7	9.6	--	1.7

KOOTENAI RIVER BASIN

12301830 LAKE KOOCANUSA AT TENMILE CREEK, NEAR LIBBY, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	SAM- PLING DEPTH (FEET) (00003)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH (STAND- ARD UNITS) (00400)	TEMPER- ATURE (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)	LIGHT INCI- DENT PERCENT REMAIN- ING AT DEPTH (00031)	LIGHT TRANS- MISSION 1 METER PATH- LENGTH (%) (00074)
SEP							
16...	0.0	208	8.3	16.4	8.7	100	55
16...	0.5	--	--	--	--	90	--
16...	2.00	208	8.3	16.3	8.7	--	55
16...	4.50	--	--	--	--	60	--
16...	5.00	207	8.4	16.3	8.7	--	55
16...	10.0	208	8.4	16.3	8.7	--	52
16...	15.0	207	8.4	16.3	8.7	--	52
16...	20.0	207	8.4	16.3	8.7	--	52
16...	22.0	--	--	--	--	30	--
16...	29.0	--	--	--	--	15	--
16...	30.0	207	8.4	16.3	8.7	--	55
16...	40.0	207	8.4	16.3	8.6	--	55
16...	46.0	--	--	--	--	5.0	--
16...	50.0	206	8.4	16.3	8.6	--	55
16...	55.0	206	8.4	16.3	8.6	--	55
16...	60.0	203	8.5	16.2	8.3	--	55
16...	65.0	207	8.4	16.0	8.3	--	55
16...	69.0	--	--	--	--	1.0	--
16...	70.0	205	8.1	14.3	8.0	--	55
16...	80.0	199	8.0	13.4	8.2	--	45
16...	90.0	196	8.0	11.8	8.5	--	39
16...	100	200	8.0	11.5	8.8	--	28
16...	110	206	8.0	10.2	8.9	--	8.5
16...	112	--	--	--	--	0.1	--
16...	120	220	8.0	9.5	9.1	--	3.4
16...	130	235	8.0	8.3	9.4	--	1.5
16...	140	240	8.0	7.7	9.4	--	1.3
16...	150	245	8.0	7.0	9.4	--	0.92
16...	160	249	8.0	6.9	9.5	--	1.9
16...	170	253	8.0	6.3	9.5	--	2.3
16...	180	256	8.0	6.0	9.6	--	5.3
16...	190	259	8.0	5.5	9.6	--	3.8
16...	200	261	8.0	5.2	9.6	--	0.81
16...	210	263	8.0	5.0	9.6	--	2.6
16...	220	264	8.0	4.9	9.6	--	3.4
16...	224	--	--	--	--	--	--
16...	233	266	8.0	4.9	9.7	--	2.6
16...	243	270	8.1	4.9	9.6	--	1.3

KOOTENAI RIVER BASIN

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12301919 LAKE KOOCANUSA AT FOREBAY, NEAR LIBBY, MT

LOCATION.--Lat 48°24'43", long 115°18'35", in SW¼NW¼ 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 1985 TO SEPTEMBER 1986

		SAM- PLING DEPTH (FEET) (00003)	WEATHER (WMO CODE NUMBER) (00041)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH (STAND- ARD UNITS) (00400)	TEMPER- ATURE, AIR (DEG C) (00020)	TEMPER- ATURE (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)			
OCT											
09...		1300	10.0	3	208	8.3	2.0	12.9			
09...		1400	292	3	296	7.8	--	4.0			
APR											
17...		0900	10.0	2	257	8.0	--	3.3			
17...		1000	220	2	285	7.6	8.0	3.9			
MAY											
13...		1030	10.0	60	257	8.1	8.5	4.3			
13...		1130	236	--	284	7.7	--	3.7			
JUN											
17...		1500	10.0	--	246	8.4	30.0	19.4			
17...		1600	300	--	272	7.8	--	3.8			
JUL											
16...		1300	10.0	3	199	8.1	18.0	16.0			
16...		1400	307	3	270	7.7	--	4.0			
AUG											
19...		1400	10.0	0	203	8.2	25.0	20.7			
19...		1500	305	0	270	7.8	--	4.2			
SEP											
16...		1330	10.0	3	204	8.6	15.0	17.1			
16...		1430	300	3	278	7.8	--	4.3			
DATE		SILICA, DIS- SOLVED (MG/L AS SiO2) (00955)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO- GEN, TOTAL (MG/L AS N) (00600)	PHOS- PHORUS, TOTAL (MG/L AS P) (00665)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P) (00671)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)		
OCT											
09...		3.4	<0.10	--	0.2	--	0.015	0.001	1.5		
09...		4.9	0.20	--	0.2	0.4	0.011	0.003	1.1		
APR											
17...		7.7	0.10	0.22	<0.2	--	--	0.019	1.6		
17...		5.0	0.20	0.16	0.3	0.5	0.024	0.002	2.7		
MAY											
13...		7.7	0.20	--	0.2	0.4	0.024	0.019	1.8		
13...		5.3	0.10	--	0.2	0.3	<0.005	0.001	4.1		
JUN											
17...		5.0	<0.10	--	0.2	--	0.007	0.002	1.4		
17...		6.4	0.20	--	0.2	0.4	0.015	0.009	2.0		
JUL											
16...		4.4	<0.10	--	0.3	--	0.015	0.001	2.0		
16...		6.4	0.20	--	<0.2	--	0.021	0.012	1.3		
AUG											
19...		3.4	<0.10	<0.10	0.2	--	0.007	0.002	21		
19...		6.0	0.20	0.17	0.2	0.4	0.016	0.011	27		
SEP											
16...		3.1	<0.10	--	0.3	--	<0.005	0.002	1.6		
16...		6.3	0.20	--	0.2	0.4	0.011	0.013	1.6		
DATE	TIME	SAM- PLING DEPTH (FEET) (00003)	HARD- NESS (MG/L AS CaCO3) (00900)	HARD- NESS NONCARB TOT FLD MG/L AS CaCO3 (00902)	CALCIUM DIS- SOLVED (MG/L AS Ca) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS Mg) (00925)	SODIUM, DIS- SOLVED (MG/L AS Na) (00930)	SODIUM AD- SORP- TION RATIO (00931)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	ALKA- LITY LAB (MG/L AS CaCO3) (90410)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)
APR											
17...	0900	10.0	150	43	41	12	3.7	0.1	0.7	115	19
17...	1000	220	140	15	37	11	3.4	0.1	0.7	130	19
AUG											
19...	1400	10.0	100	13	29	7.3	2.0	0.1	0.6	93	14
19...	1500	305	130	18	36	10	3.3	0.1	0.7	117	22

KOOTENAI RIVER BASIN

12301919 LAKE KOOCANUSA AT FOREBAY NEAR LIBBY, MT--Continued
 WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	ARSENIC TOTAL (UG/L AS AS) (01002)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE) (01045)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB) (01051)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN) (01055)	ZINC, TOTAL RECOV- ERABLE (UG/L AS ZN) (01092)
APR 17...	3.6	0.1	150	0.21	<1	50	6	<10	20
17...	3.3	0.1	150	0.21	1	80	4	50	<10
AUG 19...	2.0	0.1	110	0.15	<1	30	<5	<10	20
19...	3.1	0.2	150	0.2	<1	60	<5	20	40

DATE	SAM- PLING DEPTH (FEET) (00003)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH (STAND- ARD UNITS) (00400)	TEMPER- ATURE (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)	LIGHT INCI- DENT PERCENT REMAIN- ING AT DEPTH (00031)	LIGHT TRANS- MISSION 1 METER PATH- LENGTH (%) (00074)
OCT 09...	0.0	209	8.10	12.9	9.3	100	43
09...	0.5	--	--	--	--	90	--
09...	2.00	209	8.10	12.9	9.3	--	41
09...	4.60	--	--	--	--	60	--
09...	5.00	208	8.10	12.9	9.3	--	41
09...	9.80	--	--	--	--	30	--
09...	10.0	208	8.30	12.9	9.2	--	41
09...	18.7	--	--	--	--	15	--
09...	20.0	209	8.10	12.9	9.2	--	41
09...	30.0	210	8.10	12.9	9.2	--	41
09...	37.4	--	--	--	--	5.0	--
09...	40.0	210	8.10	12.9	9.2	--	41
09...	50.0	210	8.20	12.9	9.2	--	41
09...	60.0	210	8.10	12.9	9.1	--	41
09...	70.0	209	8.10	12.9	9.0	--	41
09...	75.5	--	--	--	--	1.0	--
09...	80.0	208	8.10	12.9	8.9	--	41
09...	90.0	205	8.10	12.8	8.8	--	41
09...	100	204	7.70	11.3	8.8	--	50
09...	110	204	7.60	10.4	8.8	--	55
09...	120	217	7.70	9.4	9.1	--	57
09...	130	239	7.70	8.8	9.3	--	55
09...	140	251	7.70	8.1	9.4	--	50
09...	150	256	7.70	7.7	9.4	--	55
09...	160	258	7.60	7.3	9.4	--	57
09...	170	261	7.60	6.8	9.3	--	55
09...	180	266	7.60	6.1	9.2	--	60
09...	190	276	7.50	5.3	9.0	--	60
09...	200	279	7.40	5.0	8.8	--	60
09...	210	285	7.40	4.7	8.6	--	60
09...	220	288	7.30	4.5	8.5	--	52
09...	230	290	7.30	4.4	8.4	--	50
09...	240	292	7.30	4.2	8.3	--	55
09...	250	293	7.30	4.2	8.2	--	43
09...	260	294	7.30	4.1	8.1	--	39
09...	270	294	7.30	4.1	8.1	--	39
09...	280	296	7.40	4.0	7.9	--	39
09...	292	296	7.80	4.0	7.8	--	27
09...	302	296	7.80	4.0	7.8	--	25

KOOTENAI RIVER BASIN

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12301919 LAKE KOOCANUSA AT FOREBAY NR LIBBY, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	SAM- PLING DEPTH (FEET) (00003)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH (STAND- ARD UNITS) (00400)	TEMPER- ATURE (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)	LIGHT INCI- DENT PERCENT REMAIN- ING AT DEPTH (00031)	LIGHT TRANS- MISSION 1 METER PATH- LENGTH (%) (00074)
APR							
17...	0.0	256	8.0	3.3	11.6	100	15
17...	0.5	--	--	--	--	90	--
17...	2.00	257	8.0	3.4	11.6	--	15
17...	2.30	--	--	--	--	60	--
17...	5.00	257	8.0	3.3	11.6	--	15
17...	7.20	--	--	--	--	30	--
17...	10.0	257	8.0	3.3	11.6	--	14
17...	12.8	--	--	--	--	15	--
17...	20.0	257	8.0	3.3	11.6	--	14
17...	23.0	--	--	--	--	5.0	--
17...	30.0	257	8.0	3.3	11.6	--	14
17...	40.0	257	8.0	3.3	11.6	--	14
17...	43.3	--	--	--	--	1.0	--
17...	50.0	257	8.0	3.3	11.6	--	14
17...	60.0	257	8.0	3.3	11.6	--	13
17...	70.0	257	8.0	3.3	11.5	--	13
17...	80.0	257	7.9	3.3	11.5	--	13
17...	90.0	257	7.9	3.3	11.5	--	13
17...	100	257	7.9	3.3	11.5	--	13
17...	110	257	7.9	3.3	11.5	--	13
17...	120	257	7.9	3.3	11.5	--	13
17...	130	257	7.9	3.3	11.5	--	13
17...	140	257	7.9	3.3	11.5	--	13
17...	150	257	8.0	3.3	11.5	--	13
17...	160	257	7.9	3.3	11.5	--	12
17...	170	257	7.9	3.3	11.4	--	9.2
17...	175	273	7.7	2.8	9.3	--	11
17...	180	275	7.7	2.9	9.1	--	12
17...	190	275	7.6	3.2	6.9	--	13
17...	200	282	7.6	3.8	5.7	--	16
17...	210	284	7.6	3.9	5.2	--	11
17...	220	285	7.6	3.9	4.8	--	6.8
17...	230	287	7.6	4.0	4.0	--	1.1
MAY							
13...	0.0	257	8.1	4.3	11.3	100	20
13...	0.5	--	--	--	--	90	--
13...	2.00	257	8.1	4.3	11.4	--	19
13...	3.90	--	--	--	--	60	--
13...	5.00	257	8.1	4.3	11.6	--	19
13...	10.0	257	8.1	4.3	11.6	--	19
13...	13.5	--	--	--	--	30	--
13...	15.0	257	8.1	4.2	11.3	--	19
13...	20.0	257	8.1	4.2	11.2	--	19
13...	22.0	--	--	--	--	15	--
13...	30.0	258	8.1	4.0	11.2	--	17
13...	40.0	258	8.1	4.0	11.1	--	17
13...	41.0	--	--	--	--	5.0	--
13...	50.0	258	8.0	4.0	11.1	--	15
13...	60.0	257	8.0	4.0	11.1	--	15
13...	70.0	258	8.0	3.9	11.1	--	13
13...	80.0	258	8.0	3.9	11.1	--	13
13...	90.0	258	8.0	3.9	11.1	--	9.8
13...	100	258	8.0	3.8	11.0	--	11
13...	110	259	7.9	3.8	11.0	--	11
13...	120	259	7.9	3.8	10.9	--	11
13...	130	259	7.9	3.8	10.9	--	9.8
13...	140	260	7.9	3.8	10.9	--	8.5
13...	150	260	7.9	3.8	10.8	--	3.4
13...	160	261	7.9	3.7	10.7	--	2.6
13...	170	264	7.9	3.7	10.4	--	2.6
13...	180	266	7.9	3.5	10.0	--	3.1
13...	190	269	7.9	3.5	9.5	--	3.4
13...	200	272	7.8	3.5	9.0	--	2.1
13...	210	275	7.8	3.5	8.6	--	2.3
13...	220	278	7.8	3.5	7.8	--	1.9
13...	230	281	7.8	3.6	6.9	--	1.5
13...	236	284	7.7	3.7	6.2	--	1.1
13...	246	285	7.7	3.7	6.0	--	0.39

KOOTENAI RIVER BASIN

12301919 LAKE KOOCANUSA AT FOREBAY NR LIBBY, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	SAM- PLING DEPTH (FEET) (00003)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH (STAND- ARD UNITS) (00400)	TEMPER- ATURE (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)	LIGHT INCI- DENT PERCENT REMAIN- ING AT DEPTH (00031)	LIGHT TRANS- MISSION 1 METER PATH- LENGTH (%) (00074)
JUN							
17...	0.0	240	8.3	20.1	8.9	100	37
17...	0.5	--	--	--	--	90	--
17...	2.00	244	8.3	20.0	9.0	--	37
17...	3.00	--	--	--	--	60	--
17...	5.00	244	8.3	19.6	9.1	--	32
17...	8.50	--	--	--	--	30	--
17...	10.0	246	8.4	19.4	9.3	--	28
17...	15.0	244	8.4	19.2	9.5	--	28
17...	15.7	--	--	--	--	15	--
17...	20.0	244	8.4	19.2	9.6	--	28
17...	25.0	244	8.3	18.7	9.7	--	27
17...	26.2	--	--	--	--	5.0	--
17...	30.0	248	8.3	18.0	9.9	--	28
17...	35.0	256	8.3	14.6	9.9	--	35
17...	40.0	263	8.1	12.6	10.5	--	37
17...	45.0	256	8.0	11.6	10.0	--	0.25
17...	50.0	251	8.0	11.3	9.8	--	6.3
17...	54.1	--	--	--	--	1.0	--
17...	60.0	237	7.9	10.7	9.9	--	25
17...	70.0	234	7.9	10.6	9.9	--	0.92
17...	80.0	237	7.9	10.3	9.8	--	1.9
17...	90.0	246	8.1	9.9	9.9	--	12
17...	100	250	8.1	9.2	9.8	--	20
17...	110	261	8.1	8.5	10.0	--	21
17...	120	260	8.1	7.9	10.3	--	27
17...	130	262	8.0	7.6	10.3	--	25
17...	140	263	8.0	6.9	10.3	--	25
17...	150	264	7.9	6.4	10.4	--	25
17...	160	263	7.9	5.6	10.5	--	25
17...	170	265	7.9	5.3	10.6	--	25
17...	185	263	7.9	4.8	10.7	--	23
17...	200	264	8.0	4.5	10.4	--	20
17...	215	263	8.0	4.3	10.2	--	20
17...	230	265	8.0	4.2	10.0	--	15
17...	245	264	8.0	4.1	9.6	--	11
17...	250	267	7.9	4.0	9.3	--	9.2
17...	260	269	7.9	4.0	9.1	--	7.9
17...	275	270	7.9	3.9	8.9	--	5.8
17...	290	270	7.8	3.9	8.8	--	5.3
17...	300	272	7.8	3.8	8.8	--	4.1
17...	310	272	7.8	3.8	8.8	--	2.8
JUL							
16...	0.0	195	8.1	17.0	9.9	100	18
16...	0.5	--	--	--	--	90	--
16...	2.00	197	8.1	17.0	9.9	--	18
16...	3.90	--	--	--	--	60	--
16...	5.00	199	8.2	16.9	10.0	--	17
16...	8.20	--	--	--	--	30	--
16...	10.0	199	8.1	16.0	10.0	--	13
16...	15.0	201	8.1	15.5	9.9	--	13
16...	17.1	--	--	--	--	15	--
16...	20.0	200	8.0	14.9	9.5	--	12
16...	30.0	202	7.9	14.3	9.2	--	11
16...	40.0	201	7.9	13.8	8.9	--	9.8
16...	50.0	200	7.8	13.4	8.8	--	7.9
16...	60.0	196	7.8	12.4	8.8	--	4.1
16...	70.0	197	7.8	12.0	8.9	--	0.81
16...	80.0	193	7.7	11.4	8.9	--	0.23
16...	90.0	195	7.7	11.0	9.1	--	0.02
16...	100	195	7.7	10.4	9.2	--	<0.01
16...	110	211	7.8	10.0	9.4	--	0.08
16...	120	227	7.8	9.5	9.5	--	0.53
16...	130	249	7.8	8.7	9.7	--	2.1
16...	140	250	7.8	7.8	10.0	--	9.2
16...	150	263	7.8	7.3	10.2	--	15
16...	160	262	7.8	6.6	10.5	--	17
16...	170	265	7.8	6.3	10.5	--	15
16...	180	263	7.8	5.8	10.5	--	16
16...	190	266	7.8	5.1	10.8	--	18
16...	200	263	7.8	4.9	10.7	--	19
16...	210	265	7.8	4.7	10.7	--	19
16...	220	262	7.8	4.5	10.6	--	16
16...	230	264	7.8	4.4	10.5	--	19
16...	240	263	7.8	4.3	10.2	--	16
16...	250	265	7.8	4.2	10.0	--	16
16...	260	265	7.7	4.1	9.7	--	19
16...	270	266	7.7	4.1	9.5	--	19
16...	280	267	7.7	4.1	9.2	--	17
16...	290	268	7.7	4.0	8.9	--	19
16...	300	268	7.7	4.0	8.8	--	18
16...	307	270	7.7	4.0	8.8	--	16
16...	317	270	7.7	4.0	8.8	--	16

KOOTENAI RIVER BASIN

45

12301919 LAKE KOOCANUSA AT FOREBAY NR LIBBY, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	SAM- PLING DEPTH (FEET) (00003)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH (STAND- ARD UNITS) (00400)	TEMPER- ATURE (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)	LIGHT INCI- DENT PERCENT REMAIN- ING AT DEPTH (00031)	LIGHT TRANS- MISSION 1 METER PATH- LENGTH (%) (00074)
AUG							
19...	0.0	203	8.2	21.2	9.2	100	50
19...	0.5	--	--	--	--	90	--
19...	2.00	203	8.2	21.2	9.2	--	50
19...	4.30	--	--	--	--	60	--
19...	5.00	204	8.2	21.1	9.1	--	50
19...	10.0	203	8.2	20.7	9.2	--	45
19...	15.0	205	8.2	20.6	9.4	--	43
19...	16.1	--	--	--	--	30	--
19...	20.0	205	8.2	19.7	9.9	--	33
19...	24.9	--	--	--	--	15	--
19...	25.0	208	8.3	18.8	10.0	--	33
19...	30.0	209	8.2	16.6	9.5	--	43
19...	35.0	214	7.9	15.4	9.0	--	41
19...	37.7	--	--	--	--	5.0	--
19...	40.0	208	7.8	14.7	8.5	--	39
19...	45.0	207	7.8	14.6	8.4	--	37
19...	55.0	205	7.7	14.0	8.3	--	28
19...	60.7	--	--	--	--	1.0	--
19...	65.0	205	7.7	13.8	8.2	--	27
19...	80.0	202	7.7	13.3	8.2	--	28
19...	95.0	204	7.6	12.0	8.4	--	18
19...	110	202	7.6	10.6	8.7	--	0.81
19...	125	227	7.6	9.6	9.0	--	3.4
19...	140	247	7.6	8.4	9.3	--	14
19...	155	264	7.8	7.5	9.5	--	25
19...	170	261	7.8	6.7	9.7	--	33
19...	185	266	7.9	6.2	10.0	--	32
19...	200	265	7.9	5.5	10.2	--	21
19...	215	269	7.9	4.8	10.2	--	28
19...	230	264	7.9	4.7	10.2	--	25
19...	245	267	7.9	4.5	9.9	--	30
19...	260	266	7.9	4.3	9.6	--	28
19...	275	269	7.8	4.3	9.5	--	27
19...	290	268	7.8	4.3	9.1	--	23
19...	305	270	7.8	4.2	8.8	--	19
19...	315	272	7.8	4.2	8.8	--	19
SEP							
16...	0.0	203	8.5	17.5	8.8	100	55
16...	0.5	--	--	--	--	90	--
16...	2.00	203	8.6	17.3	8.8	60	55
16...	5.00	203	8.6	17.1	8.9	--	52
16...	10.0	204	8.6	17.1	8.8	--	48
16...	12.0	--	--	--	--	30	--
16...	15.0	203	8.6	17.1	8.8	--	48
16...	20.0	203	8.6	17.1	8.8	--	48
16...	23.0	--	--	--	--	15	--
16...	25.0	202	8.6	17.1	8.8	--	48
16...	30.0	203	8.6	17.0	8.9	--	48
16...	35.0	202	8.6	17.0	8.8	--	48
16...	40.0	202	8.6	17.0	8.8	5.0	48
16...	45.0	200	8.6	17.0	8.8	--	50
16...	50.0	201	8.6	17.0	9.0	--	50
16...	55.0	200	8.5	17.0	9.0	--	52
16...	60.0	197	8.4	16.8	9.0	--	52
16...	62.0	--	--	--	--	1.0	--
16...	65.0	197	8.0	15.1	8.8	--	52
16...	70.0	194	7.9	13.5	8.9	--	55
16...	80.0	191	7.8	13.0	9.1	--	55
16...	89.0	--	--	--	--	0.1	--
16...	90.0	191	7.8	11.9	9.4	--	55
16...	100	200	7.9	11.1	9.8	--	43
16...	110	212	7.9	9.9	9.9	--	21
16...	120	234	8.0	9.0	10.2	--	8.5
16...	135	248	8.0	7.6	10.5	--	13
16...	150	252	8.0	6.8	10.5	--	24
16...	165	255	8.0	5.8	10.3	--	25
16...	180	259	8.0	5.4	10.3	--	24
16...	195	260	8.0	4.9	10.2	--	28
16...	210	262	8.0	4.7	10.0	--	33
16...	225	263	8.0	4.5	9.8	--	25
16...	240	264	8.0	4.4	9.7	--	28
16...	255	266	8.0	4.3	9.5	--	35
16...	270	267	8.0	4.3	9.4	--	24
16...	285	270	8.0	4.3	9.2	--	19
16...	300	278	7.8	4.3	8.8	--	20
16...	310	278	7.8	4.3	8.8	--	11

KOOTENAI RIVER BASIN

12301920 LAKE KOOCANUSA NEAR LIBBY, MT

LOCATION.--Lat 48°24'38", long 115°18'47", in NW¼ 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 mile 221.9.

DRAINAGE AREA.--8,985 mi², approximately.

PERIOD OF RECORD.--March 1972 to current year.

GAGE.--Water-stage recorder. Datum of gage is at National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to July 2, 1973, nonrecording gage on upstream face of dam at same datum.

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. 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, 5,748,000 acre-ft July 20, elevation, 2,458.99 ft; minimum, 2,080,000 acre-ft Feb. 24, elevation, 2,353.81 ft.

Capacity table (elevation, in feet, and contents, in acre-feet)

Elevation	Contents	Elevation	Contents
2,340	1,759,000	2,420	4,085,000
2,360	2,232,000	2,440	4,899,000
2,380	2,765,000	2,460	5,795,000
2,400	3,367,000		

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2443.90	2426.01	2404.61	2386.03	2356.13	2355.17	2360.54	2373.97	2422.24	2457.27	2458.45	2458.23
2	2443.40	2425.38	2403.58	2384.99	2356.13	2355.40	2360.77	2374.42	2426.14	2457.29	2458.53	2458.10
3	2443.17	2424.74	2402.64	2383.89	2356.12	2355.66	2360.96	2374.95	2429.67	2457.45	2458.61	2457.64
4	2442.79	2424.23	2401.66	2382.77	2356.08	2355.85	2361.13	2375.67	2432.62	2457.83	2458.45	2457.17
5	2442.42	2424.07	2400.70	2381.60	2356.00	2356.11	2361.38	2376.56	2435.11	2458.10	2458.52	2456.46
6	2442.10	2424.35	2399.78	2380.45	2355.91	2356.32	2361.66	2377.50	2437.28	2458.15	2458.51	2456.29
7	2441.43	2424.62	2399.04	2379.27	2355.83	2356.57	2361.80	2378.34	2439.22	2458.12	2458.57	2456.38
8	2440.86	2424.86	2398.74	2378.06	2355.69	2356.98	2361.95	2379.14	2440.97	2458.24	2458.70	2456.21
9	2440.15	2424.43	2398.84	2377.00	2355.60	2357.36	2362.34	2379.92	2442.46	2458.14	2458.70	2455.62
10	2439.48	2423.65	2398.80	2375.91	2355.47	2357.68	2362.84	2380.76	2443.80	2458.10	2458.83	2454.89
11	2439.11	2422.77	2398.73	2374.89	2355.37	2357.91	2363.46	2381.57	2444.98	2458.24	2458.83	2454.19
12	2438.60	2421.92	2398.75	2373.74	2355.26	2358.12	2363.93	2382.42	2446.28	2458.54	2458.90	2453.47
13	2438.11	2421.07	2398.66	2372.59	2355.12	2358.25	2364.29	2383.23	2447.42	2458.85	2458.93	2452.67
14	2437.50	2420.21	2398.66	2371.64	2355.04	2358.41	2364.72	2384.05	2448.37	2458.88	2458.88	2451.89
15	2436.81	2419.35	2398.65	2370.55	2354.93	2358.60	2365.05	2384.80	2449.39	2458.79	2458.84	2451.09
16	2436.28	2418.51	2398.60	2369.49	2354.80	2358.72	2365.38	2385.46	2450.36	2458.73	2458.87	2450.33
17	2435.32	2417.79	2398.59	2368.46	2354.73	2358.74	2365.67	2386.12	2451.06	2458.66	2458.84	2449.58
18	2434.70	2416.86	2398.54	2367.80	2354.53	2358.76	2365.91	2386.75	2451.60	2458.64	2458.81	2448.73
19	2434.01	2416.07	2398.60	2367.88	2354.40	2358.73	2366.21	2387.48	2452.31	2458.86	2458.84	2447.98
20	2433.31	2415.20	2398.59	2367.90	2354.21	2358.72	2366.50	2388.46	2452.92	2458.99	2458.80	2447.42
21	2432.54	2414.32	2397.86	2367.23	2354.11	2358.73	2366.75	2390.05	2453.70	2458.85	2458.62	2447.34
22	2431.88	2413.30	2396.83	2366.24	2353.98	2358.85	2367.18	2392.04	2454.30	2458.76	2458.47	2447.30
23	2431.22	2412.40	2395.83	2365.15	2353.88	2359.00	2368.30	2393.89	2454.66	2458.80	2458.43	2447.00
24	2430.56	2411.51	2394.80	2364.07	2353.81	2358.84	2369.36	2395.45	2455.14	2458.67	2458.46	2446.61
25	2429.92	2410.55	2393.75	2362.98	2353.96	2358.85	2370.29	2396.90	2455.64	2458.58	2458.28	2446.14
26	2429.44	2409.64	2392.74	2361.84	2354.34	2358.97	2371.07	2398.71	2456.00	2458.70	2458.12	2445.73
27	2428.79	2408.65	2391.65	2360.64	2354.69	2358.96	2371.69	2401.63	2456.20	2458.73	2458.01	2445.41
28	2428.20	2407.64	2390.56	2359.53	2354.97	2359.12	2372.35	2405.55	2456.40	2458.72	2457.99	2445.41
29	2427.63	2406.61	2389.40	2358.45	---	2359.36	2372.98	2409.77	2456.66	2458.73	2458.00	2445.41
30	2427.10	2405.60	2388.29	2357.31	---	2359.79	2373.43	2413.91	2457.00	2458.66	2458.02	2445.24
31	2426.67	---	2387.18	2356.21	---	2360.24	---	2418.19	---	2458.58	2458.10	---
MAX	2443.90	2426.01	2404.61	2386.03	2356.13	2360.24	2373.43	2418.19	2457.00	2458.99	2458.93	2458.23
MIN	2426.67	2405.60	2387.18	2356.21	2353.81	2355.17	2360.54	2373.97	2422.24	2457.27	2457.99	2445.24
†	4,347	3,556	2,971	2,139	2,108	2,238	2,583	4,016	5,656	5,729	5,706	5,126
††	-739,000	-791,000	-585,000	-832,000	-31,000	+130,000	+345,000	+1,433,000	+1,640,000	+73,000	-23,000	-580,000

CAL YR 1985†† -141,000

WTR YR 1986†† + 40,000

† Contents, in thousands of acre-ft, at end of month.

†† Change in contents, in acre-ft.

KOOTENAI RIVER BASIN

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12301933 KOOTENAI RIVER BELOW LIBBY DAM, NEAR LIBBY, MT

LOCATION.--Lat 48°24'03", long 115°19'11", in SW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ 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 mile 221.0.

DRAINAGE AREA.--8,985 mi², approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1971 to current year.

GAGE.--Water-stage recorder. Datum of gage is 2,100.00 ft above National Geodetic Vertical Datum of 1929 (U.S. Army Corps of Engineers bench mark). Prior to Feb. 13, 1974, nonrecording gage at site 0.4 mi upstream at same datum.

REMARKS.--No estimated daily discharges. Water-discharge records excellent. Flow completely regulated by Lake Koocanusa since Mar. 21, 1972 (see preceding page). Diversions for irrigation of about 14,000 acres, from tributaries upstream from station in Canada and the United States.

AVERAGE DISCHARGE.--15 years, 11,162 ft³/s 16.86 in/yr, 8,087,000 acre-ft/yr, adjusted for change in contents in Lake Koocanusa since Mar. 21, 1972.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 47,200 ft³/s Aug. 5, 1974, gage height, 27.50 ft; minimum daily, 1,900 ft³/s Jan. 29, 1972.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 24,500 ft³/s Sept. 15, gage height, 23.64 ft; minimum daily, 2,960 ft³/s May 19.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15000	21200	21000	19800	4080	4000	5620	3110	4020	19400	15100	4600
2	15000	21600	20300	19900	3950	3980	5580	3120	4000	21700	8980	10900
3	14300	21700	20400	19900	4000	3980	5540	3110	7330	17300	8940	18600
4	13500	21700	20400	19700	4000	3990	5550	3100	10100	13200	14900	20400
5	14900	14100	20300	19700	4030	3990	4040	3110	9450	15000	10700	21900
6	15000	4060	20400	19700	4030	4010	4050	3090	9300	18700	9630	9330
7	15900	4060	17900	19400	4040	3980	5670	3040	9350	19700	8730	3930
8	17800	4060	8090	19300	4030	3990	5630	3050	9290	17500	9230	10000
9	20100	15900	4000	18700	4030	3970	4070	3000	9630	17500	7680	20500
10	20300	21500	3990	18800	4040	3960	4070	3010	9830	17500	5910	23900
11	20000	21600	3990	18800	4000	3960	4050	3000	12700	15500	8820	23900
12	19500	21500	4010	18800	4010	3940	4030	3000	9700	9150	7930	24000
13	14000	21100	4010	18600	4000	5290	4030	3050	9590	9170	8380	24100
14	19400	21600	4020	16200	4030	3890	4040	3040	9570	16000	10100	24100
15	20600	21700	3990	17200	4040	3910	4040	3010	9530	17200	10200	24200
16	20700	21700	3940	17600	4050	3910	4040	2960	11200	16700	7890	24200
17	20700	21800	3950	17600	4070	5160	4040	2970	12100	16800	7760	24100
18	20800	21800	3930	11800	4180	5040	4050	2970	14300	17700	7990	24100
19	20800	21100	3980	3920	4120	5340	4040	2960	14300	10400	7930	22900
20	20800	20900	3970	3910	4120	5350	4060	2960	14200	14200	7070	16800
21	20900	21000	15400	12900	4020	5280	4070	3030	8120	20800	10500	6220
22	20900	20900	20200	17400	4030	3890	4060	3140	7910	17500	10300	6210
23	21100	20700	20200	17600	4010	3950	4060	3010	11000	17500	6910	11400
24	20900	20700	20200	17500	4050	7100	4040	3020	9600	18700	6860	14400
25	21000	20800	20300	17700	4020	5410	3580	3010	10100	18200	9160	14400
26	21200	20700	20200	17900	4000	3960	3150	3000	15300	12100	10300	14500
27	21200	20800	20100	17700	4010	5430	3130	3050	16700	13500	8480	14000
28	21200	20900	20100	17700	4000	3940	3130	3050	16000	14800	6120	6170
29	20800	21000	20000	17700	---	3940	3110	3400	14100	13500	6080	6150
30	18400	21000	20000	17500	---	4060	3120	4080	16700	14900	7070	11000
31	17000	---	19900	17000	---	5460	---	4050	---	14900	4610	---
TOTAL	583700	573180	413170	527930	112990	138060	125690	96500	325020	496720	270260	480910
MEAN	18830	19110	13330	17030	4035	4454	4190	3113	10830	16020	8718	16030
MAX	21200	21800	21000	19900	4180	7100	5670	4080	16700	21700	15100	24200
MIN	13500	4060	3930	3910	3950	3890	3110	2960	4000	9150	4610	3930
CFSM	2.10	2.13	1.48	1.90	.45	.50	.47	.35	1.21	1.78	.97	1.78
IN.	2.42	2.37	1.71	2.19	.47	.57	.52	.40	1.35	2.06	1.12	1.99
AC-FT	1158000	1137000	819500	1047000	224100	273800	249300	191400	644700	985200	536100	953900
MEAN †	6814	5815	3814	3497	3477	6567	9987	26418	38395	17210	8345	6284
CFSM †	0.76	0.65	0.42	0.39	0.39	0.73	1.11	2.94	4.27	1.92	0.93	0.70
IN †	0.82	0.72	0.49	0.45	0.40	0.84	1.24	3.39	4.77	2.21	1.07	0.78
AC-FT †	419000	346000	234500	215000	193100	403800	594300	1624400	2284700	1058200	513100	373900

OBSERVED

CAL YR 1985	TOTAL	3463170	MEAN	9488	MAX	23400	MIN	2720	AC-FT	6869000
WTR YR 1986	TOTAL	4144130	MEAN	11350	MAX	24200	MIN	2960	AC-FT	8220000

ADJUSTED

CAL YR 1985	TOTAL	3392085	MEAN	9293	CFSM	1.03	IN	14.04	AC-FT	6728000
WTR YR 1986	TOTAL	4164355	MEAN	11409	CFSM	1.27	IN	17.24	AC-FT	8260000

(†) Adjusted for change in contents in Lake Koocanusa.

KOOTENAI RIVER BASIN

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.

SUSPENDED SEDIMENT DISCHARGE: October 1967 to January 1976.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE (water years 1968-69): Maximum, 525 microsiemens, Dec. 24, 1967; minimum, 174 microsiemens, May 26, 1969.

WATER TEMPERATURE (water years 1967-76): 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 (water years 1967-76): 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 (water years 1967-76): Maximum daily, 200,000 tons, June 5, 1968; minimum daily, 5.4 tons, Jan. 28, 1972.

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	CLOUD COVER (PER- CENT) (00032)	WEATHER (WMO CODE NUMBER) (00041)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH (STAND- ARD UNITS) (00400)	TEMPER- ATURE, AIR (DEG C) (00020)	TEMPER- ATURE (DEG C) (00010)	METRIC PRES- SURE (MM OF HG) (00025)	OXYGEN, DIS- SOLVED (MG/L) (00300)
OCT										
03...	1400	12600	--	--	230	--	10.0	12.0	--	--
09...	0900	19900	95	2	215	8.1	-4.0	11.5	709	9.0
NOV										
14...	1415	21500	0	0	244	8.1	0.0	8.5	715	9.4
DEC										
18...	1300	3890	100	40	260	8.0	1.0	4.5	716	11.0
JAN										
16...	1230	17900	75	1	243	8.0	4.0	3.0	701	10.9
FEB										
19...	1100	4100	20	1	255	8.0	-2.0	2.0	700	12.4
MAR										
17...	0930	11900	60	1	277	7.9	5.0	2.5	702	11.6
APR										
17...	1300	4020	70	1	270	8.0	10.5	3.5	704	12.2
MAY										
14...	0800	3060	50	1	275	8.0	0.0	4.0	699	11.4
JUN										
18...	1430	14500	95	3	250	8.3	20.0	11.0	703	10.0
JUL										
15...	1500	22900	90	2	214	8.2	22.0	12.0	703	9.5
AUG										
21...	1200	13700	100	3	223	8.1	16.0	12.5	706	8.8
SEP										
17...	1400	24200	83	2	223	8.2	16.5	12.0	705	8.8
DATE		OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO- GEN, TOTAL (MG/L AS N) (00600)	PHOS- PHORUS, TOTAL (MG/L AS P) (00665)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P) (00671)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)
OCT										
03...		--	--	--	--	--	--	--	--	--
09...		89	3.1	<0.10	--	0.2	--	0.005	0.005	1.7
NOV										
14...		86	3.5	<0.10	--	<0.2	--	0.005	0.002	1.4
DEC										
18...		91	4.0	0.10	--	<0.2	--	0.005	0.007	1.0
JAN										
16...		88	4.0	<0.10	--	0.3	--	0.007	0.002	1.0
FEB										
19...		98	4.5	<0.10	--	0.3	--	0.005	0.002	--
MAR										
17...		92	4.9	0.10	--	0.2	0.3	0.005	0.003	1.0
APR										
17...		100	5.1	0.10	0.11	0.2	0.3	0.004	0.002	1.7
MAY										
14...		95	5.4	0.10	--	0.4	0.5	0.005	0.002	3.4
JUN										
18...		98	5.4	0.10	--	0.2	0.3	0.005	0.002	1.6
JUL										
15...		96	4.6	0.10	--	0.4	0.5	0.006	0.001	1.7
AUG										
21...		89	4.6	<0.10	0.13	<0.2	--	<0.005	0.002	2.0
SEP										
17...		88	4.2	0.10	--	0.3	0.4	<0.005	0.003	1.6

KOOTENAI RIVER BASIN

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12301933 KOOTENAI RIVER BL LIBBY DAM, NEAR LIBBY, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	HARD- NESS (MG/L AS CACO3) (00900)	HARD- NESS NONCARB WH WAT TOT FLD MG/L AS CACO3 (00902)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM AD- SORP- TION RATIO (00931)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	
APR 17...	1300	140	23	37	11	3.4	0.1	0.6	116	18	
AUG 21...	1200	110	20	32	8.2	2.3	0.1	0.8	97	19	
DATE		CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	ARSENIC TOTAL (UG/L AS AS) (01002)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE) (01045)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB) (01051)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN) (01055)	ZINC, TOTAL RECOV- ERABLE (UG/L AS ZN) (01092)
APR 17...	3.4	0.1	150	0.2	1600	<1	50	4	<10	30	
AUG 21...	2.1	0.3	130	0.17	4650	<1	30	<5	<10	<10	

KOOTENAI RIVER BASIN

12302055 FISHER RIVER NEAR LIBBY, MT

LOCATION.--Lat 48°21'20", long 115°18'50", in NW¼NE¼NW¼ 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 mi².

PERIOD OF RECORD.--September 1967 to current year.

GAGE.--Water-stage recorder. Datum of gage is 2,134.10 ft above National Geodetic Vertical Datum of 1929 (U.S. Army of Engineers bench mark).

REMARKS.--Estimated daily discharges: Nov. 13 to Jan. 6, Jan. 15-17, 28, 29, Feb. 8-19, Sept. 1-3. Records good except those for estimated daily discharges, which are poor. Diversions of about 700 acres upstream from station. Several observations of water temperature and specific conductance were made during the year and are published as miscellaneous water-quality data in the back of this report.

AVERAGE DISCHARGE.--19 years, 490 ft³/s, 7.94 in/yr, 355,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,720 ft³/s Jan. 16, 1974, gage height, 9.29 ft; minimum, 29 ft³/s Jan. 2, 1977, gage height, 2.37 ft, result of freezeup.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of about May 22, 1948, reached a discharge of 6,560 ft³/s, by slope-area measurement at site 0.5 mi upstream.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,120 ft³/s Mar. 9, gage height, 6.54 ft; minimum, 84 ft³/s Aug. 28, 29, gage height, 2.87 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	134	475	180	200	259	1750	2640	796	1060	250	124	110		
2	130	771	200	205	265	1860	2290	767	990	235	122	110		
3	138	1160	220	210	272	2030	2030	854	909	226	119	110		
4	140	1710	250	200	277	2090	1840	1020	807	221	113	107		
5	134	2110	270	190	283	2130	1690	1310	770	225	111	104		
6	137	1620	280	200	279	2120	1570	1350	714	223	109	101		
7	157	1300	290	209	241	2260	1500	1240	655	212	107	99		
8	149	1110	300	220	225	2920	1470	1160	609	202	107	98		
9	142	946	260	238	215	3010	1510	1120	577	193	105	103		
10	139	802	220	245	225	2670	1630	1080	547	190	104	111		
11	142	655	180	245	215	2330	1600	1020	519	204	105	114		
12	157	559	190	242	210	2140	1500	958	495	215	105	108		
13	155	480	200	196	200	2010	1360	991	458	200	105	107		
14	150	440	200	186	190	1880	1270	1090	433	194	102	112		
15	173	420	205	180	200	1710	1200	1000	468	188	100	117		
16	197	400	210	180	230	1580	1180	931	420	185	98	137		
17	211	380	210	190	270	1490	1140	877	385	191	96	129		
18	200	350	210	203	300	1400	1100	865	368	191	96	135		
19	192	320	210	228	250	1290	1030	930	355	180	94	170		
20	189	300	220	315	261	1250	983	1100	330	170	92	147		
21	193	280	220	290	301	1270	974	1210	317	163	92	138		
22	206	250	220	269	282	1330	1100	1180	301	159	94	129		
23	239	220	210	273	274	1310	1400	1040	288	156	92	125		
24	277	215	220	267	522	1330	1290	941	277	152	94	123		
25	877	230	220	246	1620	1380	1160	909	268	148	92	122		
26	1120	230	220	215	2200	1340	1050	1020	259	147	91	121		
27	846	220	220	216	2010	1330	975	1230	253	143	90	121		
28	755	210	220	230	1820	1490	963	1370	250	141	87	121		
29	672	200	210	240	---	1950	903	1340	269	138	85	123		
30	588	190	190	248	---	2360	845	1230	270	131	92	132		
31	527	---	190	256	---	2980	---	1150	---	126	111	---		
TOTAL	9466	18553	6845	7032	13896	57990	41193	33079	14621	5699	3134	3584		
MEAN	305	618	221	227	496	1871	1373	1067	487	184	101	119		
MAX	1120	2110	300	315	2200	3010	2640	1370	1060	250	124	170		
MIN	130	190	180	180	190	1250	845	767	250	126	85	98		
CFSM	.36	.74	.26	.27	.59	2.23	1.64	1.27	.58	.22	.12	.14		
IN.	.42	.82	.30	.31	.62	2.57	1.83	1.47	.65	.25	.14	.16		
AC-FT	18780	36800	13580	13950	27560	115000	81710	65610	29000	11300	6220	7110		
CAL YR 1985	TOTAL	161766	MEAN	443	MAX	2500	MIN	50	CFSM	.53	IN.	7.18	AC-FT	320900
WTR YR 1986	TOTAL	215092	MEAN	589	MAX	3010	MIN	85	CFSM	.70	IN.	9.55	AC-FT	426600

12303000 KOOTENAI RIVER AT LIBBY, MT

LOCATION.--Lat 48°24'03", long 115°33'08", in SW¼SE¼SW¼ sec.34, T.31 N., R.31 W., Lincoln County, Hydrologic Unit 17010101, on right bank 1,800 ft downstream from highway bridge at Libby, 0.8 mi downstream from Libby Creek, and at mile 204.3.

DRAINAGE AREA.--10,240 mi², approximately.

PERIOD OF RECORD.--October 1910 to current year. Monthly discharge only for some periods, published in WSP 1316. REVISED RECORDS.--WSP 1042: 1933. WSP 1246: 1912(M), 1915(M), 1916, 1918-19(M), 1924-27(M).

GAGE.--Water-stage recorder. Datum of gage is 2,041.54 ft National Geodetic Vertical Datum of 1929. Prior to Apr. 28, 1931, nonrecording gages at site 1,800 ft upstream at different datum.

REMARKS.--No estimated daily discharges this year. Records fair. Flow regulated by Lake Koocanusa (station number 12301920) since Mar. 21, 1972. Diversions for irrigation of about 14,500 acres from tributaries upstream from station in Canada and the United States. Several observations of water temperature and specific conductance were made during the year and are published as miscellaneous water-quality data in the back of this report. AVERAGE DISCHARGE.--76 years, 12,100 ft³/s, 16.04 in/yr, 8,766,000 acre-ft/yr, adjusted for change in contents in Lake Koocanusa since Mar. 21, 1972.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 121,000 ft³/s June 21, 1916, gage height, 20.7 ft, present datum, derived from gage-relation study; minimum observed, 895 ft³/s Jan. 11, 1930, result of discharge measurement.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 25,900 ft³/s Nov. 4, gage height, 8.47 ft; minimum daily, 4,210 ft³/s Dec. 18.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14700	21200	20600	19700	6260	6840	9670	4330	6560	18700	15000	4960
2	14700	22200	20000	19700	4490	6950	9020	4290	6340	22300	9650	9360
3	14100	23200	20100	19700	4500	7080	8490	4600	8330	16900	9100	16800
4	13300	24800	20200	19600	4500	7100	8190	4940	11800	14000	14400	19900
5	14700	20600	20100	19500	4520	7130	6540	5240	11200	14400	11700	21700
6	14900	7120	20200	19500	4490	7070	6390	5230	10800	18700	9800	11200
7	15100	6390	19200	19300	4460	7280	7850	4990	10700	20100	9290	4800
8	17400	6000	9530	19300	4410	8560	7820	4890	10500	17500	8960	8470
9	19600	14000	4380	18700	4410	8520	6440	4820	10600	17300	7930	18800
10	19700	21900	4310	18800	4470	7910	6680	4780	10900	17200	6410	23100
11	19400	21700	4230	18800	4370	7370	6580	4650	13000	15600	8700	23100
12	19800	21500	4270	18800	4380	7000	6390	4510	11400	9910	8150	23100
13	12900	21100	4300	18500	4350	8070	6120	4740	10600	9470	8490	23200
14	18900	21500	4260	16400	4320	6580	5930	4950	10500	15600	10200	23200
15	20000	21600	4250	17200	4410	6380	5800	4690	10600	16900	10300	23300
16	20200	21700	4240	17700	4390	6190	5740	4490	12100	16100	8340	23400
17	20300	21700	4230	17600	4570	7180	5720	4420	12100	17100	8100	23400
18	20200	21600	4210	14000	4660	7050	5620	4400	15000	16900	8700	23500
19	20300	21400	4260	4440	4580	7200	5520	4670	14900	11100	8180	22700
20	20300	20500	4250	4680	4480	7130	5440	5330	14800	13800	7290	18100
21	20400	20900	12900	11200	4450	7110	5490	5580	9650	20300	10100	7270
22	20500	20900	19800	17600	4430	5910	6040	5440	8560	17500	10600	6490
23	20700	20500	19800	17800	4420	5900	6570	4880	11500	17300	7960	10400
24	20700	20500	19900	17700	4950	7880	6160	4670	10100	18500	7260	14500
25	22400	20700	20000	17800	7280	8500	5600	4740	9960	18400	9340	14500
26	22500	20600	19800	17900	8430	5920	4830	5340	15000	12300	9570	14500
27	22100	20600	19800	17900	7750	7280	4670	6160	16800	13600	10200	14500
28	22000	20700	19800	17800	7130	6220	4630	6670	16400	14900	6630	7220
29	21400	20700	19700	17900	---	6950	4520	6530	14400	13600	6480	6410
30	19700	20700	19700	17600	---	8050	4420	6990	16500	14700	6600	10100
31	16800	---	19700	17700	---	10400	---	6800	---	14900	5670	---
TOTAL	579700	588510	412020	530820	139860	224710	188880	158760	351600	495580	279100	471980
MEAN	18700	19620	13290	17120	4995	7249	6296	5121	11720	15990	9003	15730
MAX	22500	24800	20600	19700	8430	10400	9670	6990	16800	22300	15000	23500
MIN	12900	6000	4210	4440	4320	5900	4420	4290	6340	9470	5670	4800
CFSM	1.83	1.92	1.30	1.67	.49	.71	.61	.50	1.14	1.56	.88	1.54
IN	2.11	2.14	1.50	1.93	.51	.82	.69	.58	1.28	1.80	1.01	1.71
AC-FT	1150000	1167000	817200	1053000	277400	445700	374600	314900	697400	983000	553600	936200
MEAN †	6684	6319	3776	3594	4437	9363	12093	28426	39281	17174	8629	5986
CFSM †	0.65	0.62	0.37	0.35	0.43	0.91	1.18	2.78	3.84	1.68	0.84	0.58
IN †	0.75	0.69	0.43	0.40	0.45	1.05	1.32	3.20	4.28	1.93	0.97	0.65
AC-FT†	411000	376000	232200	221000	246400	575700	719600	1747900	2337400	1056000	530600	356200

OBSERVED

CAL YR 1985	TOTAL	3720600	MEAN	10190	MAX	24800	MIN	3390	AC-FT	7380000
WTR YR 1986	TOTAL	4421520	MEAN	12110	MAX	24800	MIN	4210	AC-FT	8770000

ADJUSTED

CAL YR 1985	TOTAL	3649357	MEAN	9998	CFSM	0.98	IN	13.25	AC-FT	7239000
CAL YR 1986	TOTAL	4441644	MEAN	12169	CFSM	1.19	IN	16.13	AC-FT	8810000

(†) Adjusted for change in contents in Lake Koocanusa.

KOOTENAI RIVER BASIN

12303100 FLOWER CREEK NEAR LIBBY, MT

LOCATION.--Lat 48°20'41", long 115°36'20", in NW¼SE¼SE¼ sec.19, T.30 N., R.31 W., Lincoln County, Hydrologic Unit 17010101, Kootenai National Forest, on left bank 30 ft downstream from road bridge, 0.3 mi upstream from South Fork, 1.0 mi upstream from reservoir, 4.0 mi southwest of Libby, and at mile 4.5 mi.

DRAINAGE AREA.--11.1 mi².

PERIOD OF RECORD.--September 1960 to current year.

REVISED RECORDS.--WDR MT-1972: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 2,866 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Estimated daily discharges: Nov. 10-16, 22-27, Jan. 26, 27, Feb. 7-17. 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 and are published as miscellaneous water-quality data in the back of this report.

AVERAGE DISCHARGE.--26 years, 26.7 ft³/s, 32.65 in/yr, 19,340 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 709 ft³/s Jan. 16, 1974, gage height, 5.53 ft; maximum gage height, 6.10 ft Jan. 15, 1974 (backwater from ice); minimum discharge, 3.1 ft³/s Nov. 20, 1979; minimum gage height, 1.35 ft Jan. 11, 1975.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 200 ft³/s and maximums (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 28	2200	*298	*3.77	Only peak greater than base discharge.			

Minimum discharge, 5.3 ft³/s Aug. 28, 29, gage height, 1.66 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	8.1	26	11	6.5	8.7	28	47	21	185	22	9.3	6.5		
2	8.1	32	11	6.8	8.7	31	36	22	179	21	9.0	7.1		
3	8.4	45	10	6.8	8.7	31	30	45	147	20	8.7	6.3		
4	8.4	103	10	6.5	8.4	30	28	65	122	20	8.4	6.0		
5	8.1	94	10	6.5	8.4	30	26	60	107	19	8.1	5.8		
6	8.7	60	10	6.5	7.9	28	26	47	97	18	8.1	5.8		
7	9.0	43	9.7	6.5	7.8	32	26	40	83	17	7.9	5.6		
8	8.4	36	9.0	6.5	7.8	44	30	37	70	16	7.6	5.6		
9	7.9	31	9.0	6.5	7.6	40	40	37	62	15	7.6	5.8		
10	7.9	29	8.7	6.8	7.6	33	51	40	59	16	7.6	6.0		
11	8.4	28	8.1	6.8	7.6	28	45	36	62	21	7.3	5.8		
12	9.0	27	8.4	6.5	7.6	26	37	30	61	23	7.3	5.6		
13	8.1	26	8.1	6.3	7.4	23	30	42	53	20	7.3	5.6		
14	8.4	25	7.9	6.3	7.4	21	26	37	51	18	7.1	6.0		
15	11	24	7.9	6.3	7.2	19	25	32	53	17	6.8	6.0		
16	15	20	7.6	6.0	7.6	18	25	30	49	16	6.5	6.3		
17	15	17	7.3	5.8	8.0	17	24	28	44	17	6.5	6.0		
18	13	16	7.3	6.8	8.4	16	22	34	43	16	6.3	11		
19	13	15	7.3	14	7.9	15	21	64	37	15	6.0	8.7		
20	15	14	7.3	12	7.6	15	22	122	34	14	6.0	8.1		
21	16	14	7.3	11	7.3	16	31	116	32	14	5.8	7.6		
22	18	13	7.3	9.7	7.1	18	77	88	30	13	5.8	7.3		
23	20	12	7.1	9.7	7.1	17	79	64	29	13	5.8	7.3		
24	23	12	7.1	9.0	13	18	51	58	29	12	5.6	8.1		
25	93	12	6.8	8.4	26	18	40	83	28	12	5.6	8.1		
26	62	11	6.8	8.4	32	17	31	148	28	12	5.6	8.1		
27	53	11	6.8	8.4	30	18	28	211	26	12	5.6	7.6		
28	66	11	6.8	8.4	28	26	27	259	25	11	5.3	7.6		
29	47	11	6.8	8.1	---	40	24	228	26	11	5.3	8.1		
30	36	11	6.5	8.1	---	59	22	222	24	10	5.6	10		
31	29	---	6.5	8.1	---	65	---	201	---	9.7	6.5	---		
TOTAL	661.9	829	251.4	240.0	308.8	837	1027	2547	1875	490.7	211.9	209.4		
MEAN	21.4	27.6	8.11	7.74	11.0	27.0	34.2	82.2	62.5	15.8	6.84	6.98		
MAX	93	103	11	14	32	65	79	259	185	23	9.3	11		
MIN	7.9	11	6.5	5.8	7.1	15	21	21	24	9.7	5.3	5.6		
CFSM	1.93	2.49	.73	.70	.99	2.43	3.08	7.41	5.63	1.42	.62	.63		
IN.	2.22	2.78	.84	.80	1.03	2.81	3.44	8.54	6.28	1.64	.71	.70		
AC-FT	1310	1640	499	476	613	1660	2040	5050	3720	973	420	415		
CAL YR 1985	TOTAL	8984.9	MEAN	24.6	MAX	202	MIN	4.2	CFSM	2.22	IN.	30.11	AC-FT	17820
WTR YR 1986	TOTAL	9489.1	MEAN	26.0	MAX	259	MIN	5.3	CFSM	2.34	IN.	31.80	AC-FT	18820

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LOCATION.--Lat 48°26'49", long 115°52'34" in SE¼NW¼ sec.18, T.31 N., R.33 W., Lincoln County, Hydrologic Unit 17010101, Kootenai National Forest, on right bank 1,000 ft upstream from bridge on U.S. Highway 2, 0.4 mi upstream from mouth, 0.6 mi downstream from Montana Light and Power Company Dam (Troy Dam), and 1.3 mi southeast of Troy.

REVISED RECORDS.--WSP 1216: Drainage area.

REMARKS.--Estimated daily discharges: Sept. 18-30. Records good. Diurnal fluctuation caused by small hydroelectric plant 0.6 mi upstream. Several observations of water temperature and specific conductance were made during the year and published as miscellaneous water-quality data in the back of this report.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,250 ft³/s May 30, 1948, gage height, 8.28 ft; minimum, 2.0 ft³/s Sept. 1, 1947, Sept. 15, 1948.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,560 ft³/s May 29, gage height, 4.30 ft; minimum daily, 72 ft³/s Oct. 19.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	127	272	569	158	189	635	849	501	1320	292	175	136
2	126	355	841	160	198	635	774	488	1240	281	172	141
3	127	482	531	155	195	641	732	552	1150	274	167	131
4	126	856	310	155	197	620	685	658	1080	274	167	131
5	125	911	295	155	196	629	668	683	995	274	164	122
6	128	761	240	152	192	618	629	648	911	257	160	123
7	131	652	204	154	187	699	628	638	848	255	161	121
8	128	604	196	154	188	937	605	649	776	252	156	121
9	127	537	191	159	185	903	657	658	700	244	153	123
10	125	462	187	154	183	848	708	666	684	246	154	133
11	129	432	182	154	179	776	715	647	662	260	152	197
12	138	399	191	151	182	712	712	621	623	260	150	131
13	132	381	179	147	171	686	665	774	590	242	152	126
14	131	351	173	145	170	635	635	797	552	235	145	128
15	133	340	176	151	170	606	592	747	548	230	144	130
16	135	332	173	144	247	563	597	690	520	224	143	130
17	136	324	169	167	255	549	571	676	504	231	140	135
18	97	309	167	164	219	523	550	661	487	225	138	135
19	72	300	164	247	205	496	527	715	454	214	138	140
20	110	291	165	235	196	516	514	943	420	212	137	138
21	130	281	164	209	197	459	513	1080	415	207	132	138
22	131	262	168	195	194	511	586	1030	405	206	139	130
23	167	255	165	195	193	482	726	911	381	202	129	128
24	175	259	154	193	341	502	675	845	364	201	130	128
25	581	257	158	182	507	517	640	852	359	196	131	135
26	411	265	155	180	727	488	600	1070	346	202	128	135
27	363	261	157	179	692	483	576	1310	325	194	126	135
28	355	308	154	182	660	500	576	1450	315	192	126	135
29	319	404	156	175	---	576	542	1480	317	185	122	80
30	297	356	156	183	---	741	517	1450	303	179	154	115
31	276	---	153	182	---	913	---	1400	---	178	139	---
TOTAL	5688	12259	7043	5316	7415	19399	18964	26290	18594	7124	4524	3931
MEAN	183	409	227	171	265	626	632	848	620	230	146	131
MAX	581	911	841	247	727	937	849	1480	1320	292	175	197
MIN	72	255	153	144	170	459	513	488	303	178	122	80
CFSM	.87	1.95	1.08	.81	1.26	2.98	3.01	4.04	2.95	1.10	.70	.62
IN.	1.01	2.17	1.25	.94	1.31	3.44	3.36	4.66	3.29	1.26	.80	.70
AC-FT	11280	24320	13970	10540								

GAL YR 1985	TOTAL	129179	MEAN	354	MAX	1830	MIN	72	CFSM	1.69	IN.	22.88	AC-FT	256200
WTR YR 1986	TOTAL	136547	MEAN	374	MAX	1480	MIN	72	CFSM	1.78	IN.	24.19	AC-FT	270800

KOOTENAI RIVER BASIN

12304500 YAAK RIVER NEAR TROY, MT

LOCATION.--Lat 48°33'43", long 115°58'09", in NE¼SE¼SE¼ 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, 0.2 mi upstream from mouth, and 7.7 mi northwest of Troy.

DRAINAGE AREA.--766 mi².

PERIOD OF RECORD.--October 1910 to September 1916 (fragmentary record), March 1956 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,839.2 ft above National Geodetic Vertical Datum of 1929. Oct. 15, 1910, to Sept. 30, 1916, nonrecording gage at several sites within 11 mi of present site at various datums.

REMARKS.--Estimated daily discharges: Oct. 1, Nov. 12 to Jan. 7, 14-25. Records good except those for estimated daily discharges, which are poor. Diversions for irrigation of about 30 acres upstream from station. Several observations of water temperature and specific conductance were made during the year and are published as miscellaneous water-quality data in the back of this report.

AVERAGE DISCHARGE.--30 years, 888 ft³/s, 15.74 in/yr, 643,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,100 ft³/s May 21, 1956, gage height, 9.70 ft, in gage well, 10.8 ft, from outside gage; minimum daily, 50 ft³/s Dec. 9, 1972.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in May to June 1948 reached a stage of 11.0 ft, from floodmarks; discharge, 12,500 ft³/s. Flood in May 1954 reached a stage of 11.4 ft, from floodmarks; discharge, 13,400 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 5,000 ft³/s and maximums (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Apr. 23	0200	*4,550	*7.10	No peaks greater than base discharge.			

Minimum, 98 ft³/s Aug. 29, gage height, 2.98 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	165	734	260	210	353	1430	3050	1710	2800	447	218	171		
2	165	1350	270	220	420	1530	2510	1690	2520	411	207	159		
3	168	2180	280	215	421	1530	2200	2060	2240	401	200	148		
4	162	2810	290	210	406	1500	2050	2490	1960	389	190	135		
5	159	2820	310	200	391	1560	1980	2870	1940	391	184	134		
6	187	1990	320	210	367	1530	1960	2720	1790	386	174	129		
7	222	1590	330	220	322	1780	1960	2530	1550	363	174	122		
8	204	1370	350	225	304	2940	2040	2440	1330	340	168	122		
9	174	1190	320	233	340	2690	2280	2420	1220	331	159	127		
10	165	967	300	244	358	2230	2580	2470	1140	331	153	134		
11	187	776	280	244	313	1930	2530	2320	1050	344	148	140		
12	214	700	270	236	322	1740	2280	2120	982	400	145	132		
13	207	660	265	214	296	1620	2000	2600	894	406	145	132		
14	204	620	260	205	279	1490	1860	2760	831	382	145	132		
15	240	570	270	200	313	1370	1730	2370	823	335	137	132		
16	334	540	270	205	313	1280	1730	2090	768	309	129	134		
17	435	520	280	210	335	1760	1700	1970	714	322	124	137		
18	387	490	280	220	322	1150	1590	2010	680	349	122	140		
19	336	450	280	300	309	1090	1490	2330	674	322	119	148		
20	340	410	280	400	292	1080	1450	3060	624	296	114	142		
21	358	380	275	380	313	1150	1630	3530	623	271	112	140		
22	391	360	270	360	292	1370	2850	3320	587	255	110	134		
23	421	330	265	340	283	1320	4380	2790	545	259	110	129		
24	436	310	260	330	376	1420	3750	2500	507	279	110	129		
25	1360	315	255	310	921	1500	3040	2550	484	263	107	142		
26	1430	320	250	297	1540	1380	2600	3080	462	316	107	142		
27	1190	310	240	304	1550	1310	2320	3700	441	353	105	156		
28	1180	290	230	340	1440	1630	2180	3940	416	317	102	184		
29	1040	280	220	331	---	2310	2000	3830	452	279	100	174		
30	891	270	210	326	---	3130	1850	3490	478	255	132	204		
31	782	---	200	322	---	3750	---	3160	---	233	183	---		
TOTAL	14134	25902	8440	8261	13491	53500	67570	82920	31525	10335	4433	4284		
MEAN	456	863	272	266	482	1726	2252	2675	1051	333	143	143		
MAX	1430	2820	350	400	1550	3750	4380	3940	2800	447	218	204		
MIN	159	270	200	200	279	1080	1450	1690	416	233	100	122		
CFSM	.60	1.13	.36	.35	.63	2.25	2.94	3.49	1.37	.43	.19	.19		
IN.	.69	1.26	.41	.40	.66	2.60	3.28	4.03	1.53	.50	.22	.21		
AC-FT	28030	51380	16740	16390	26760	106100	134000	164500	62530	20500	8790	8500		
CAL YR 1985	TOTAL	266721	MEAN	731	MAX	4550	MIN	60	CFSM	.95	IN.	12.95	AC-FT	529000
WTR YR 1986	TOTAL	324795	MEAN	890	MAX	4380	MIN	100	CFSM	1.16	IN.	15.77	AC-FT	644200

KOOTENAI RIVER BASIN

55

12305000 KOOTENAI RIVER AT LEONIA, ID

LOCATION.--Lat 48°37'04", long 116°02'47", in NW¼NW¼ sec.20, T.33 N., R.34 W., Principal meridian, Lincoln County, MT, Hydrologic Unit 17010104, 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 mi², approximately.

PERIOD OF RECORD.--March 1928 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,790.25 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 1, 1970, at datum 90 ft lower. Prior to Nov. 13, 1928, nonrecording gage on bridge 250 ft upstream at datum 90.41 ft lower.

REMARKS.--Estimated daily discharges: Nov. 23 to Jan. 9, June 3 to July 21, records fair. Diversions upstream from station for irrigation of about 14,600 acres. Flow regulated by Lake Koocanusa since Mar. 21, 1972. Corps of Engineers radio telemeter at station.

AVERAGE DISCHARGE.--58 years, 13,910 ft³/s, 16.09 in./yr, 10,080,000 acre-ft/yr (flows not adjusted for storage change in upstream reservoir).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 123,000 ft³/s May 28, 1948, gage height, 33.40 ft; minimum, 996 ft³/s Dec. 9, 1936; minimum gage height, 7.56 ft Dec. 10, 1929.

EXTREMES OUTSIDE PERIOD OF RECORD.--Floods of June 1894 and 1916 reached stages of 34.6 and 31.6 ft, respectively, present datum, from information by Great Northern Railway.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 37,000 ft³/s gage height, 20.17 ft Nov. 4; minimum discharge, 4,760 ft³/s Sept. 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15200	22500	22200	21000	11300	10500	16500	7940	12500	19400	15600	5610
2	15100	26700	21700	20900	5840	10800	14800	7760	12000	22600	12700	7830
3	14700	29700	21500	21000	5800	10900	13600	8620	11900	19000	9920	15400
4	13800	33700	21700	21000	5760	10900	13100	9740	15000	16900	12700	21100
5	15100	33300	21600	21000	5720	11000	10900	10600	15100	15200	13400	22400
6	16100	12600	21700	20400	5690	10900	10700	10400	14400	18800	10400	15000
7	16700	10500	21200	20600	5590	11500	12300	9930	14000	20600	10400	7050
8	17500	9600	13500	20600	5450	15400	12400	9710	13400	19000	9510	6450
9	20100	13200	6960	20100	5480	15000	11200	9640	13200	18600	9640	17100
10	20500	25400	5390	19500	5520	13700	11900	9670	13300	18500	7730	24300
11	20300	24800	5060	19500	5480	12400	11800	9280	14200	17600	8020	24500
12	20900	24300	5020	19600	5380	11500	11300	8800	14600	13400	9400	24500
13	13700	23600	5090	19200	5310	10900	10500	9980	12600	10500	8840	24600
14	20300	24000	5110	17600	5250	10600	9980	10400	12300	14000	9530	24700
15	20600	24000	5080	17400	5410	10000	9620	9500	12400	17300	10700	24800
16	21500	24300	5040	18200	5480	9620	9550	8850	13200	17400	10500	25000
17	21800	24300	5060	18300	5640	9330	9430	8600	13600	17900	8770	25000
18	21600	24000	4970	17500	5650	9140	9110	8620	16000	18000	8910	25200
19	21600	23700	4900	6370	5650	8830	8850	9380	16200	14800	8700	24200
20	21700	22200	4900	6240	5440	8620	8690	11400	16300	13400	8470	20000
21	21800	22600	9830	9010	5430	8690	8970	12700	12700	21400	8660	10400
22	22000	22400	10800	18500	5410	9190	11200	11700	10100	19500	11000	7240
23	22200	22400	20800	18700	5400	9090	14000	10600	11500	17700	9890	9100
24	22500	22200	21100	18600	6260	10900	12600	9760	11600	19100	7850	14600
25	27300	22200	21200	18600	9990	12600	11200	9830	10800	19300	8680	14800
26	27800	22400	21100	18700	12400	9230	9690	11400	14500	14200	9930	14700
27	26300	22400	21100	18700	11800	10600	9090	13400	17400	14200	11200	14800
28	26000	22500	21100	18600	10900	9860	8870	14600	17700	14800	7840	9870
29	25200	22300	21000	18800	---	11600	8530	14200	16200	13900	6960	7160
30	23600	22400	20900	18500	---	14400	8200	14100	16800	15400	6900	8950
31	18400	---	20900	18500	---	18600	---	13400	---	15500	7460	---
TOTAL	631900	680200	437510	561220	184430	346300	328580	324510	415500	527900	300210	496360
MEAN	20380	22670	14110	18100	6587	11170	10950	10470	13850	17030	9684	16550
MAX	27800	33700	22200	21000	12400	18600	16500	14600	17700	22600	15600	25200
MIN	13700	9600	4900	6240	5250	8620	8200	7760	10100	10500	6900	5610
AC-FT	1253000	1349000	867800	1113000	365800	686900	651700	643700	824100	1047000	595500	984500
CAL YR 1985	TOTAL	4340110	MEAN	11890	MAX	33700	MIN	3680	AC-FT	8609000		
WTR YR 1986	TOTAL	5234620	MEAN	14340	MAX	33700	MIN	4900	AC-FT	10383000		

PEND OREILLE RIVER BASIN

12323170 SILVER BOW CREEK ABOVE BLACKTAIL CREEK, AT BUTTE, MT

LOCATION.--Lat 46°00'08", long 112°30'43", in SE~~1~~NE~~1~~NE~~1~~ sec.19, T.3 N., R.7 W., Silver Bow County, Hydrologic Unit 17010201, on right bank in Butte, about 200 ft west of Continental Drive and Texas Avenue, 0.3 mi downstream of Horse Canyon, about 0.3 mi upstream of Harrison Ave. bridge, 1.2 mi upstream of Blacktail Creek, and at mile 22.7.

DRAINAGE AREA.--Indeterminate.

PERIOD OF RECORD.--October 1983 to current year.

GAGE.--Water-stage recorder and V-notch sharp-crested weir. Datum of gage is 5,470.80 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Mar. 3-6. Records good. Flow regulated by Anaconda Minerals Company operations. Several observations of water temperature and specific conductance were made during the water year and are published as miscellaneous water-quality data in the back of this report.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 15 ft³/s June 28, 1986, gage height, 2.80 ft; no flow on many days most years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 15 ft³/s June 28, gage height, 2.80 ft; no flow on many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.32	.00	.00	.00	.15	.52	.00
2	.00	.00	.00	.00	.00	.21	.00	.00	.00	.15	.52	.00
3	.00	.00	.00	.00	.00	.04	.00	.00	.00	.19	.52	.00
4	.00	.00	.00	.00	.00	.02	.00	.00	.00	.39	.51	.00
5	.00	.00	.00	.00	.00	.01	.00	.00	.02	.33	.51	.00
6	.00	.00	.00	.00	.00	.00	.00	.00	.00	.31	.51	.00
7	.01	.00	.00	.00	.00	.00	.00	.00	.39	.31	.29	.00
8	.00	.00	.00	.00	.00	.02	.00	.00	.00	.37	.00	.04
9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.43	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.44	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.01	.00	.45	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	.00	.45	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	.00	.00	.45	.00	.01
14	.00	.00	.00	.00	.00	.00	.00	.00	.00	.45	.00	.02
15	.00	.00	.00	.00	.00	.00	.00	.00	.00	.40	.00	.01
16	.00	.00	.00	.00	.00	.00	.00	.00	.00	.12	.04	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	.00	.50	.01	.30
18	.00	.00	.00	.00	.00	.00	.00	.00	.00	.55	.00	.52
19	.00	.00	.00	.00	.00	.00	.00	.00	.00	.57	.00	.04
20	.00	.00	.00	.00	.00	.00	.00	.00	.00	.61	.00	.01
21	.00	.00	.00	.00	.00	.00	.00	.00	.00	.62	.38	.00
22	.00	.00	.00	.00	.00	.00	.00	.00	.00	.92	.00	.01
23	.00	.00	.00	.00	.00	.00	.00	.00	.00	.51	.00	.01
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.53	.00	.00
25	.00	.00	.00	.00	.22	.00	.00	.00	.00	.54	.00	.00
26	.00	.00	.00	.00	.72	.00	.00	.00	.01	.54	.00	.00
27	.00	.00	.00	.00	.43	.00	.00	.00	.06	.53	.00	.00
28	.00	.00	.00	.00	.34	.00	.00	.00	.59	.53	.00	.01
29	.00	.00	.00	.00	---	.00	.00	.00	.16	.54	.00	.00
30	.00	.00	.00	.00	---	.00	.00	.00	.13	.52	.00	.02
31	.00	---	.00	.00	---	.00	---	.00	---	.50	.16	---
TOTAL	.01	.00	.00	.00	1.71	.62	.00	.01	1.36	13.90	3.97	1.00
MEAN	.00	.00	.00	.00	.06	.02	.00	.00	.04	.45	.13	.03
MAX	.01	.00	.00	.00	.72	.32	.00	.01	.59	.92	.52	.52
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.12	.00	.00
AC-FT	.02	.00	.00	.00	3.4	1.2	.00	.02	2.7	28	7.9	2.0
CAL YR 1985	TOTAL	13.81	MEAN	.04	MAX	1.7	MIN	.00	AC-FT	27		
WTR YR 1986	TOTAL	22.58	MEAN	.06	MAX	.92	MIN	.00	AC-FT	45		

12323200 BLACKTAIL CREEK NEAR BUTTE, MT

LOCATION.--Lat 45°53'22", long 112°27'50", in SW¼SW¼ sec.27, T.2 N., R.7 W., Silver Bow County, Hydrologic Unit 17010201, on left bank, at road leading into Eagles Nest Campground in Thompson Park, 1.7 mi upstream of Little Blacktail Creek, and 5.8 mi south of Butte, MT.

DRAINAGE AREA.--14.7 mi².

PERIOD OF RECORD.--October 1983 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 5,720 ft, from topographic map.

REMARKS.--Estimated daily discharges for water year: Oct. 8-10, 13, 30, Nov. 8 to Dec. 1, Jan. 21-22, Feb. 7-15, 20, 24-28, Mar. 3, 5, 10-11, 14-27, Mar. 31 to Apr. 1, Apr. 4, 12-14, Sept. 17-19. Records fair except those for estimated daily discharges, which are poor. No known regulation or diversions upstream from gage. Several observations of water temperature and specific conductance were made during the water year and are published as miscellaneous water-quality data in the back of this report.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 40 ft³/s May 15, 1984, gage height, 1.96 ft; maximum gage height, 2.49 ft Sept. 30, 1986; minimum discharge, 0.14 ft³/s July 27, 28, 1985, gage height, 0.95 ft; minimum gage height, 0.82 ft July 10, 1985.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 20 ft³/s, revised, and maximums (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 13	2230	20	1.65	Sept. 30	2300	---	a*2.49
May 22	0100	*24	1.73				

a--control change

Minimum discharge, 0.58 ft³/s Aug. 11, gage height, 1.13 ft, minimum gage height, 1.11 ft Feb. 7.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.0	2.0	1.2	1.5	1.7	3.4	6.6	6.9	10	2.1	1.1	2.5
2	2.1	2.0	1.3	1.5	1.7	3.8	5.8	7.9	8.9	2.1	1.2	2.3
3	2.2	2.0	1.5	1.5	1.7	3.9	5.0	9.0	8.5	2.0	1.3	1.9
4	2.2	2.0	1.6	1.5	1.7	3.6	5.0	10	9.1	2.8	1.1	1.6
5	2.1	2.0	1.6	1.4	1.7	3.5	5.1	9.7	8.9	4.7	.89	1.9
6	2.2	1.9	1.6	1.4	1.7	3.5	5.5	8.6	10	3.0	.93	1.7
7	2.9	1.9	1.6	1.4	1.6	4.1	6.1	10	10	2.6	.86	1.7
8	3.7	1.8	1.6	1.4	1.5	5.5	6.5	11	12	2.3	.83	1.8
9	3.3	1.7	1.6	1.5	1.5	4.3	6.2	10	10	2.2	.74	2.0
10	2.9	1.5	1.6	1.5	1.6	3.5	6.0	11	9.2	2.2	.74	1.9
11	2.8	1.4	1.5	1.5	1.4	3.2	5.9	12	7.4	2.4	1.1	1.8
12	2.7	1.4	1.5	1.5	1.4	3.0	5.6	11	6.1	2.4	2.0	1.8
13	2.6	1.5	1.6	1.5	1.5	2.6	5.3	15	5.5	2.0	1.6	1.8
14	2.5	1.5	1.6	1.4	1.6	2.2	5.2	15	5.2	2.0	1.4	2.5
15	3.0	1.5	1.6	1.4	1.6	2.0	5.2	14	6.5	1.9	1.2	2.3
16	3.6	1.6	1.6	1.4	1.7	2.1	5.4	13	5.4	1.8	1.2	2.5
17	3.0	1.6	1.6	1.5	1.7	2.2	5.5	12	4.6	1.7	1.6	4.0
18	2.7	1.5	1.6	1.6	1.7	2.1	4.6	12	4.7	1.4	1.2	5.0
19	2.5	1.4	1.6	1.6	1.7	2.1	4.1	13	3.9	1.3	1.0	3.5
20	2.3	1.4	1.6	1.6	1.6	2.2	5.1	14	3.6	1.2	1.0	3.0
21	2.5	1.3	1.6	1.5	1.7	2.7	6.3	19	3.4	1.4	1.4	2.9
22	3.1	1.2	1.6	1.5	1.7	3.0	7.1	18	3.0	1.5	2.3	2.6
23	2.7	1.1	1.6	1.6	1.8	3.4	8.9	14	2.8	1.4	2.0	2.6
24	2.5	1.1	1.6	1.6	2.2	3.8	7.8	13	2.7	.94	2.1	2.4
25	2.8	1.1	1.6	1.6	3.0	4.5	8.2	13	2.7	1.2	1.8	2.5
26	2.4	1.2	1.5	1.6	4.0	5.5	8.7	14	2.4	1.7	1.5	2.6
27	2.3	1.3	1.5	1.5	3.5	6.5	6.5	14	2.3	1.7	1.5	2.5
28	2.3	1.3	1.4	1.6	3.2	8.7	8.2	13	2.4	1.5	1.5	2.9
29	2.3	1.3	1.4	1.7	---	11	7.6	12	2.6	1.4	1.2	3.2
30	2.0	1.2	1.5	1.7	---	9.4	6.3	12	2.5	1.3	.98	3.2
31	2.0	---	1.5	1.7	---	9.0	---	9.9	---	1.2	1.3	---
TOTAL	80.2	45.7	47.8	47.2	53.4	130.3	185.3	377.0	176.3	59.34	40.57	74.9
MEAN	2.59	1.52	1.54	1.52	1.91	4.20	6.18	12.2	5.88	1.91	1.31	2.50
MAX	3.7	2.0	1.6	1.7	4.0	11	8.9	19	12	4.7	2.3	5.0
MIN	2.0	1.1	1.2	1.4	1.4	2.0	4.1	6.9	2.3	.94	.74	1.6
AC-FT	159	91	95	94	106	258	368	748	350	118	80	149
CAL YR 1985	TOTAL	921.42		MEAN	2.52	MAX	14	MIN	.15	AC-FT	1830	
WTR YR 1986	TOTAL	1318.01		MEAN	3.61	MAX	19	MIN	.74	AC-FT	2610	

PEND OREILLE RIVER BASIN

12323250 SILVER BOW CREEK BELOW BLACKTAIL CREEK, AT BUTTE, MT

LOCATION.--Lat 45°59'49", long 112°33'43", in SWSE¼NW¼ sec.23, T.3 N., R.8 W., Silver Bow County, Hydrologic Unit 17010201, on right bank 150 ft upstream of Interstate Highway 90 overpass in Butte, 0.8 mi upstream of Whiskey Gulch, 1.3 mi downstream of Blacktail Creek, and at mile 20.2.

DRAINAGE AREA.--103 mi².

PERIOD OF RECORD.--October 1983 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 5,410.87 ft above National Geodetic Vertical Datum of 1929 (levels by Stiller and Associates).

REMARKS.--No estimated daily discharges this year. Records good except those for August to September, which are fair. Flow slightly regulated by Silver Bow County sewage treatment plant. Several observations of water temperature and specific conductance were made during the water year and are published as miscellaneous water-quality data in the back of this report.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 350 ft³/s Sept. 18, 1986, gage height, 3.41 ft; maximum gage height, 3.91 ft, June 28, 1986; minimum daily discharge, 14 ft³/s Aug. 28, 31, Sept. 1, 1985.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 350 ft³/s Sept. 18, gage height, 3.41 ft; maximum gage height, 3.91 ft June 28; minimum daily discharge, 15 ft³/s on many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18	19	16	15	18	34	30	24	26	17	17	18
2	20	18	16	15	17	34	28	23	24	16	17	18
3	23	18	17	15	18	32	25	24	25	18	18	18
4	19	18	15	15	17	31	25	33	26	33	18	18
5	19	18	16	15	17	30	25	29	40	23	17	18
6	21	17	16	15	17	31	24	27	31	20	17	18
7	24	17	16	15	16	34	25	27	57	19	17	19
8	19	18	16	15	17	37	26	31	34	19	15	31
9	20	17	16	16	17	33	25	33	33	17	17	22
10	20	16	16	16	17	28	25	46	32	17	17	21
11	22	16	16	16	16	28	25	46	28	18	17	20
12	21	16	16	15	17	27	27	39	24	17	27	20
13	20	16	16	15	17	26	24	34	22	17	19	18
14	21	16	16	15	17	23	23	35	21	17	18	23
15	21	16	16	15	17	23	26	32	23	18	17	22
16	21	16	16	15	22	22	28	31	22	21	17	21
17	21	17	16	15	19	24	25	29	20	20	17	45
18	20	16	16	16	19	22	23	29	20	18	17	58
19	20	16	16	16	16	22	21	30	18	17	16	23
20	19	16	15	17	17	22	21	31	18	17	17	23
21	21	17	16	16	16	23	22	35	18	18	64	24
22	23	16	15	16	16	26	26	38	17	19	21	24
23	21	16	16	16	20	25	28	35	18	18	19	23
24	20	16	16	16	51	26	27	31	17	18	17	22
25	19	17	15	15	91	24	25	28	17	18	18	21
26	19	16	15	15	59	23	25	28	16	23	18	20
27	18	16	15	16	42	27	25	29	17	20	17	22
28	18	17	15	17	39	30	27	28	47	20	18	26
29	18	16	15	16	---	35	29	27	21	19	18	21
30	18	16	15	18	---	37	26	26	18	19	19	27
31	18	---	15	20	---	34	---	27	---	18	25	---
TOTAL	622	500	487	488	682	873	761	965	750	589	606	704
MEAN	20.1	16.7	15.7	15.7	24.4	28.2	25.4	31.1	25.0	19.0	19.5	23.5
MAX	24	19	17	20	91	37	30	46	57	33	64	58
MIN	18	16	15	15	16	22	21	23	16	16	15	18
AC-FT	1230	992	966	968	1350	1730	1510	1910	1490	1170	1200	1400
CAL YR 1985	TOTAL	7852	MEAN	21.5	MAX	100	MIN	14	AC-FT	15570		
WTR YR 1986	TOTAL	8027	MEAN	22.0	MAX	91	MIN	15	AC-FT	15920		

PEND OREILLE RIVER BASIN

59

12323770 WARM SPRINGS CREEK AT WARM SPRINGS, MT

LOCATION.--Lat 46°10'51", long 112°47'07", in SW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.18, T.5 N., R.9 W., Deer Lodge County, Hydrologic Unit 17010201, on left bank at county road bridge 0.2 mi southeast of Warm Springs post office, and at mile 0.9.

DRAINAGE AREA.--163 mi².

PERIOD OF RECORD.--October 1983 to current year.

GAGE.--Water-stage recorder. Datum of gage is 4,811.25 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Nov. 9 to Feb. 23. Records good except those for flows less than 10 ft³/s, which are fair, and those for estimated daily discharges, which are poor. Numerous diversions upstream from station for irrigation and municipal use.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 462 ft³/s June 21, 1984, gage height, 4.61 ft; maximum gage height, 5.7 ft, in winter of 1985-86 (backwater from ice); minimum daily discharge, 0.04 ft³/s July 11, 1985.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 397 ft³/s May 31, gage height, 4.04 ft; maximum gage height, 5.7 ft, date unknown (backwater from ice); minimum daily discharge, 1.9 ft³/s Aug. 6.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP			
1	63	73	26	50	65	56	56	64	343	22	8.5	8.1			
2	62	73	25	48	70	56	57	62	313	20	3.2	10			
3	62	71	28	45	75	54	53	56	293	22	2.7	32			
4	61	71	35	42	80	53	50	71	275	27	2.5	29			
5	61	73	40	40	75	54	49	73	271	42	2.2	28			
6	62	71	40	45	70	51	49	65	273	33	1.9	37			
7	67	72	37	55	65	52	51	63	242	27	3.6	49			
8	64	73	35	70	60	56	54	58	251	26	3.0	57			
9	63	70	30	80	55	53	56	54	220	30	2.7	67			
10	65	60	25	90	50	51	59	55	185	28	2.6	59			
11	67	40	22	95	40	51	60	53	171	27	3.2	54			
12	68	35	20	90	30	52	65	48	156	26	4.6	52			
13	66	35	25	85	35	51	68	45	136	23	4.3	59			
14	65	37	30	80	40	49	66	46	122	21	3.8	58			
15	65	37	35	75	45	49	68	44	133	21	3.4	60			
16	66	40	40	75	50	49	67	44	113	23	3.5	53			
17	68	38	45	70	60	51	62	41	129	30	3.4	59			
18	67	35	55	70	70	49	53	43	131	23	3.3	61			
19	67	35	50	80	80	49	57	45	130	20	3.2	59			
20	66	33	45	90	70	47	57	62	114	18	3.0	56			
21	67	33	40	80	50	48	59	89	94	17	4.8	57			
22	71	31	35	65	40	49	66	103	87	15	6.7	53			
23	73	31	40	50	50	49	88	84	80	14	4.7	51			
24	72	30	45	50	157	49	82	69	68	13	4.0	51			
25	71	30	50	45	90	47	77	78	33	12	4.0	50			
26	71	28	40	40	73	46	76	130	32	13	4.0	50			
27	73	28	35	35	62	47	72	217	28	13	4.2	46			
28	73	30	32	40	57	52	71	277	26	11	4.4	45			
29	73	28	35	50	---	56	70	334	31	9.5	4.1	45			
30	75	27	40	55	---	59	65	357	26	9.4	4.7	45			
31	74	---	45	60	---	60	---	370	---	9.4	6.6	---			
TOTAL	2088	1368	1125	1945	1764	1595	1883	3200	4506	645.3	120.8	1440.1			
MEAN	67.4	45.6	36.3	62.7	63.0	51.5	62.8	103	150	20.8	3.90	48.0			
MAX	75	73	55	95	157	60	88	370	343	42	8.5	67			
MIN	61	27	20	35	30	46	49	41	26	9.4	1.9	8.1			
CFSM	.41	.28	.22	.38	.39	.32	.39	.63	.92	.13	.02	.29			
IN.	.48	.31	.26	.44	.40	.36	.43	.73	1.03	.15	.03	.33			
AC-FT	4140	2710	2230	3860	3500	3160	3730	6350	8940	1280	240	2860			
CAL YR 1985	TOTAL	17429.17		MEAN	47.8	MAX	154	MIN	.04	CFSM	.29	IN.	3.98	AC-FT	34570
WTR YR 1986	TOTAL	21680.2		MEAN	59.4	MAX	370	MIN	1.9	CFSM	.36	IN.	4.95	AC-FT	43000

PEND OREILLE RIVER BASIN

12324200 CLARK FORK AT DEER LODGE, MT

LOCATION.--Lat 46°23'52", long 112°44'31", in SW¼SW¼SW¼ 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 mile 461.2.

DRAINAGE AREA.--1,005 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1978 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 4,502.24 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges; Nov. 11 to Jan. 8, Jan. 12-14, 22-28, Feb. 6-15, 20, 21. Water-discharge records good except those 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.

AVERAGE DISCHARGE.--8 years, 335 ft³/s, 242,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,500 ft³/s May 23, 1981, gage height, 5.35 ft; minimum daily, 25 ft³/s July 20, 23, 28, 1985.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,000 ft³/s and maximums (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Feb. 25	1730	*2,090	*5.20	No other peak discharge greater than base discharge.			

Minimum daily discharge, 32 ft³/s Aug. 9, 10.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	254	248	170	220	299	409	340	310	896	235	46	193
2	252	257	160	240	291	392	328	307	874	191	42	205
3	258	252	180	210	283	379	301	309	852	138	41	190
4	256	251	200	200	274	369	283	313	937	151	42	180
5	258	249	190	190	268	360	283	370	851	232	38	161
6	256	246	190	210	245	356	278	359	891	280	35	166
7	263	247	190	220	230	358	277	338	835	272	36	190
8	266	251	180	240	220	380	282	345	882	240	35	214
9	248	244	180	261	220	385	285	345	858	229	32	260
10	261	208	170	276	210	373	282	341	693	255	32	242
11	289	200	150	299	200	355	298	403	571	259	34	241
12	293	190	160	290	210	382	308	370	491	236	38	233
13	285	200	180	280	220	383	307	339	393	202	39	283
14	284	200	190	270	220	354	331	323	344	182	40	319
15	275	210	200	270	240	341	346	310	331	173	37	320
16	285	230	210	273	302	325	325	294	315	150	38	305
17	270	210	230	288	372	320	324	285	284	178	42	326
18	264	200	250	285	372	314	295	269	285	171	41	333
19	268	200	240	308	332	307	289	261	280	151	40	343
20	260	190	240	291	270	283	287	273	256	145	40	361
21	265	190	230	265	260	277	281	326	214	121	47	360
22	264	190	220	240	251	267	286	432	185	106	68	345
23	263	180	210	250	268	259	345	453	169	100	79	313
24	252	180	220	255	1240	264	374	415	169	76	85	294
25	256	180	230	250	1610	257	390	374	142	63	85	293
26	252	170	220	240	870	256	374	400	128	60	85	278
27	256	170	200	230	543	249	353	505	124	62	98	274
28	248	180	190	240	463	263	337	640	125	61	93	275
29	241	170	180	246	---	274	315	759	165	56	89	275
30	243	170	190	281	---	291	326	849	230	56	100	282
31	246	---	200	304	---	316	---	886	---	50	130	---
TOTAL	8131	6263	6150	7922	10783	10098	9430	12503	13770	4881	1727	8054
MEAN	262	209	198	256	385	326	314	403	459	157	55.7	268
MAX	293	257	250	308	1610	409	390	886	937	280	130	361
MIN	241	170	150	190	200	249	277	261	124	50	32	161
AC-FT	16130	12420	12200	15710	21390	20030	18700	24800	27310	9680	3430	15980
CAL YR 1985	TOTAL	78181	MEAN	214	MAX	469	MIN	25	AC-FT	155100		
WTR YR 1986	TOTAL	99712	MEAN	273	MAX	1610	MIN	32	AC-FT	197800		

PEND OREILLE RIVER BASIN

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12324200 CLARK FORK AT DEER LODGE, MT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1969-71, 1979-83, 1985 to current year (discontinued).

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: October 1978 to September 1983.

SUSPENDED-SEDIMENT DISCHARGE: March 1985 to August 1986 (discontinued).

REMARKS.--Once-daily or less frequent water temperatures are available in the Helena district office.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE (water years 1978-1983): Maximum, 23.0°C, on several days in 1979, 1980, and 1983; minimum, 0.0°C on many days during winter periods.

SEDIMENT CONCENTRATION: Maximum daily mean, 684 mg/L, Feb. 24, 1986; minimum daily mean, 3 mg/L, Aug. 3, 4, 1986.

SEDIMENT LOAD: Maximum daily, 2,840 tons, Feb. 24, 1986; minimum daily, .33 ton, Aug. 3, 1986.

EXTREMES FOR CURRENT YEAR.--

SEDIMENT CONCENTRATION: Maximum daily mean, 684 mg/L Feb.24; minimum daily mean, 3 mg/L, Aug. 3, 4.

SEDIMENT LOAD: Maximum daily, 2,840 tons, Feb. 24; minimum daily, .33 ton Aug. 3.

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	CLOUD COVER (PER- CENT) (00032)	WEATHER (WHO CODE NUMBER) (00041)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	TEMPER- ATURE, AIR (DEG C) (00020)	TEMPER- ATURE (DEG C) (00010)					
OCT												
03...	1035	260	--	--	557	5.5	7.0					
DEC												
05...	1100	191	--	--	609	-5.0	0.0					
JAN												
08...	1225	241	--	--	519	6.0	0.0					
FEB												
16...	1650	345	100	60	--	--	3.0					
20...	1300	255	--	--	571	-4.0	0.0					
24...	1715	1920	30	1	262	15.0	3.0					
25...	1650	2050	--	--	473	9.0	3.0					
26...	1730	744	--	--	479	8.5	5.0					
APR												
08...	1440	284	--	--	521	17.0	10.0					
15...	1205	347	70	2	510	5.5	7.5					
MAY												
07...	1500	332	--	--	455	10.0	7.5					
22...	1215	434	--	--	379	8.0	10.0					
27...	1800	560	75	2	295	27.0	19.0					
JUN												
03...	1420	869	--	--	239	14.5	14.0					
JUL												
02...	1420	196	--	--	465	29.5	21.0					
AUG												
20...	1330	40	--	--	535	28.5	17.5					
DATE	TIME	PH (STAND- ARD UNITS) (00400)	HARD- NESS (MG/L AS CA CO3) (00900)	HARD- NESS, NONCAR- BONATE (MG/L CA CO3) (00902)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	BICAR- BONATE FET-FLD (MG/L AS HCO3) (00440)	CAR- BONATE FET-FLD (MG/L AS CO3) (00445)	SOLIDS, RESIDUE AT 105 DEG. C, SUS- PENDED (MG/L) (00530)	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	CADMIUM TOTAL RECOV- ERABLE (UG/L AS CD) (01027)
FEB												
16...	1650	--	--	--	--	--	--	--	--	53	18	2
24...	1715	7.7	--	--	--	--	100	0	964	130	39	<1
APR												
15...	1205	7.9	220	96	66	14	160	0	12	16	10	<1
MAY												
27...	1800	7.7	120	43	37	7.2	99	0	--	53	19	2

PEND OREILLE RIVER BASIN

12324200 CLARK FORK AT DEER LODGE, MT--Continued

WATER-QUALITY RECORDS

DATE	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)	COPPER, TOTAL RECOV- ERABLE (UG/L AS CU) (01042)	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE) (01045)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB) (01051)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN) (01055)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	ZINC, TOTAL RECOV- ERABLE (UG/L AS ZN) (01092)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)
FEB 16...	1	300	14	16000	20	46	6	1200	10	370	20
24...	<1	630	33	29000	65	100	2	1800	78	770	16
APR 15...	<1	51	7	640	11	6	<1	210	57	70	15
MAY 27...	<1	290	8	5300	17	49	1	840	46	340	14

DATE	TIME	TEMPER- ATURE (DEG C) (00010)	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	SEDI- MENT, SUS- PENDE (MG/L) (80154)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY) (80155)	SED. SUSP. FALL DIAM. % FINER THAN .002 MM (70337)	SED. SUSP. FALL DIAM. % FINER THAN .004 MM (70338)
FEB 24...	1715	3.0	1920	1390	7210	35	45
APR 15...	1205	7.5	347	35	33	--	--
MAY 27...	1800	19.0	560	201	304	--	--

DATE	SED. SUSP. FALL DIAM. % FINER THAN .008 MM (70339)	SED. SUSP. FALL DIAM. % FINER THAN .016 MM (70340)	SED. SUSP. FALL DIAM. % FINER THAN .062 MM (70342)	SED. SUSP. FALL DIAM. % FINER THAN .125 MM (70343)	SED. SUSP. FALL DIAM. % FINER THAN .250 MM (70344)	SED. SUSP. FALL DIAM. % FINER THAN .500 MM (70345)	SED. SUSP. FALL SIEVE DIAM. % FINER THAN .062 MM (70331)
FEB 24...	57	67	86	91	98	100	--
APR 15...	--	--	--	--	--	--	46
MAY 27...	--	--	--	--	--	--	58

PEND OREILLE RIVER BASIN

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12324200 CLARK FORK AT DEER LODGE, MT--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DAY	MEAN CONCEN- TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN- TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN- TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN- TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN- TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN- TRATION (MG/L)	LOADS (T/DAY)
OCTOBER			NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	20	14	22	15	10	4.6	20	12	73	59	65	72
2	20	14	23	16	9	3.9	19	12	54	42	57	60
3	20	14	22	15	14	6.8	18	10	45	34	48	49
4	20	14	22	15	14	7.6	18	9.7	36	27	44	44
5	20	14	22	15	13	6.7	18	9.2	29	21	43	42
6	20	14	21	14	22	11	18	10	32	21	41	39
7	33	23	21	14	26	13	18	11	25	16	40	39
8	24	17	20	14	33	16	18	12	27	16	55	56
9	17	11	20	13	20	9.7	25	18	29	17	55	57
10	25	18	19	11	17	7.8	39	29	23	13	39	39
11	30	23	18	9.7	15	6.1	59	48	28	15	34	33
12	28	22	18	9.2	17	7.3	42	33	27	15	38	39
13	29	22	18	9.7	19	9.2	29	22	17	10	34	35
14	27	21	20	11	22	11	27	20	21	12	30	29
15	26	19	30	17	25	13	26	19	13	8.4	26	24
16	31	24	35	22	30	17	25	18	223	212	25	22
17	31	23	36	20	39	24	28	22	300	301	24	21
18	28	20	34	18	45	30	31	24	402	418	21	18
19	29	21	33	18	37	24	68	57	145	130	19	16
20	30	21	33	17	29	19	69	54	35	26	19	15
21	30	21	33	17	28	17	52	37	50	35	20	15
22	28	20	33	17	29	17	50	32	50	34	29	21
23	28	20	33	16	30	17	52	35	100	72	25	17
24	25	17	34	17	32	19	28	19	684	2840	23	16
25	24	17	33	16	25	16	16	11	310	1350	20	14
26	23	16	27	12	18	11	23	15	280	658	19	13
27	22	15	16	7.3	15	8.1	30	19	150	220	25	17
28	21	14	8	3.9	12	6.2	31	20	85	106	31	22
29	21	14	8	3.7	9	4.4	29	19	---	---	36	27
30	22	14	9	4.1	12	6.2	64	49	---	---	40	31
31	22	15	---	---	16	8.6	82	67	---	---	43	37
TOTAL	---	552	---	407.6	---	378.2	---	772.9	---	6728.4	---	979
APRIL			MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	46	42	20	17	135	327	22	14	5	.62		
2	40	35	22	18	120	283	18	9.3	4	.45		
3	29	24	20	17	115	265	14	5.2	3	.33		
4	18	14	25	21	120	304	15	6.1	3	.34		
5	23	18	44	44	88	202	24	15	4	.41		
6	20	15	30	29	84	202	24	18	5	.47		
7	21	16	20	18	74	167	22	16	6	.58		
8	24	18	24	22	82	195	20	13	6	.57		
9	23	18	24	22	60	139	19	12	5	.43		
10	23	18	23	21	52	97	20	14	5	.43		
11	34	27	38	41	47	72	19	13	7	.64		
12	18	15	32	32	38	50	16	10	7	.72		
13	26	22	26	24	32	34	12	6.5	6	.63		
14	44	39	29	25	29	27	10	4.9	5	.54		
15	39	36	26	22	27	24	9	4.2	5	.50		
16	29	25	22	17	24	20	8	3.2	5	.51		
17	23	20	20	15	22	17	19	9.1	8	.91		
18	20	16	16	12	31	24	15	6.9	9	1.0		
19	18	14	15	11	30	23	8	3.3	8	.86		
20	21	16	19	14	20	14	7	2.7	7	.76		
21	15	11	38	33	14	8.1	6	2.0	10	1.3		
22	18	14	82	96	10	5.0	6	1.7	15	2.8		
23	52	48	77	94	9	4.1	6	1.6	11	2.3		
24	44	44	54	61	8	3.7	6	1.2	9	2.1		
25	54	57	36	36	7	2.7	6	1.0	9	2.1		
26	43	43	40	43	7	2.4	5	.81	10	2.3		
27	33	31	125	170	7	2.3	5	.84	12	3.2		
28	26	24	185	320	7	2.4	5	.82	10	2.5		
29	21	18	190	389	10	4.5	6	.91	9	2.2		
30	20	18	180	413	19	12	7	1.1	10	2.7		
31	---	---	160	383	---	---	6	.81	---	---		
TOTAL	---	756	---	2480	---	2533.2	---	199.19	---	35.20		
TOTAL LOAD FOR YEAR:			15821.69	TONS.								

PEND OREILLE RIVER BASIN

12324590 LITTLE BLACKFOOT RIVER NEAR GARRISON, MT

LOCATION.--Lat 46°32'12", long 112°43'33", in SE¼NE¼ sec.16, T.9 N., R.9 W., Powell County, Hydrologic Unit 1701020, on left bank 200 ft downstream from bridge on county road, 4 mi east of Garrison, and at mile 4.0.

DRAINAGE AREA.--398 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1972 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 4,430 ft, from topographic map.

REMARKS.--Estimated daily discharges: Nov. 7, 9-14, Nov. 17 to Jan. 30, Feb. 7-24. 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 10,500 acres. Several observations of water temperature and specific conductance were made during the year and are published as miscellaneous water-quality data in the back of this report.

AVERAGE DISCHARGE.--14 years, 180 ft³/s, 130,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,650 ft³/s May 21, 1981, gage height, 8.79 ft, from floodmark; minimum, 6.0 ft³/s Aug. 24, 1977, gage height, 2.94 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 900 ft³/s and maximums (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Feb. 24	2000	*1,710	*5.71	Mar. 8	0115	942	4.85

Minimum daily discharge, 18.0 ft³/s Aug. 29.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	89	118	72	70	76	291	306	297	411	101	59	35
2	87	119	70	74	80	311	303	300	382	94	58	36
3	92	118	95	70	83	319	287	321	356	90	56	33
4	96	117	90	66	81	338	278	360	385	96	54	33
5	93	119	90	60	78	404	262	404	439	156	62	31
6	93	117	90	62	73	304	260	378	407	151	66	32
7	93	115	88	66	56	425	262	367	343	134	56	32
8	90	119	88	70	54	632	262	373	329	129	39	47
9	87	110	84	75	50	348	259	375	328	125	36	69
10	101	95	80	80	48	281	263	394	293	124	33	68
11	108	90	75	76	40	260	270	500	259	129	36	64
12	111	85	70	72	38	262	274	428	221	127	43	64
13	112	88	78	72	44	259	265	397	209	119	43	65
14	114	90	80	68	42	231	287	413	184	112	37	70
15	114	99	80	68	48	215	310	388	182	107	35	68
16	116	110	85	70	50	201	310	359	176	110	32	67
17	124	95	86	70	52	197	301	333	152	143	30	74
18	121	80	90	75	56	187	270	328	136	122	29	83
19	120	85	86	90	50	179	253	331	140	109	30	84
20	122	85	80	86	44	180	245	348	130	102	30	85
21	123	80	76	70	40	196	251	410	120	99	34	104
22	131	75	78	60	42	227	271	538	110	94	40	98
23	133	78	78	63	50	201	324	502	104	91	40	98
24	132	76	80	66	400	206	326	455	94	86	38	94
25	130	76	76	60	830	192	323	427	99	80	35	102
26	127	74	72	62	923	185	352	417	111	66	37	103
27	124	80	68	62	478	207	353	444	103	72	35	103
28	123	78	64	64	322	250	360	477	92	68	30	98
29	121	76	66	68	---	281	331	485	96	68	18	95
30	120	74	66	72	---	320	314	472	110	65	21	96
31	119	---	68	75	---	325	---	442	---	63	25	---
TOTAL	3466	2821	2449	2162	4228	8414	8732	12463	6501	3232	1217	2131
MEAN	112	94.0	79.0	69.7	151	271	291	402	217	104	39.3	71.0
MAX	133	119	95	90	923	632	360	538	439	156	66	104
MIN	87	74	64	60	38	179	245	297	92	63	18	31
AC-FT	6870	5600	4860	4290	8390	16690	17320	24720	12890	6410	2410	4230
CAL YR 1985	TOTAL	35501		MEAN	97.3	MAX	540	MIN	11	AC-FT	70420	
WTR YR 1986	TOTAL	57816		MEAN	158	MAX	923	MIN	18	AC-FT	114700	

PEND OREILLE RIVER BASIN

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12324590 LITTLE BLACKFOOT RIVER NEAR GARRISON, MT--Continued

WATER QUALITY RECORDS

PERIOD OF RECORD.--Water years 1985 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

			STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	CLOUD COVER (PER- CENT) (00032)	WEATHER (WMO CODE NUMBER) (00041)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	TEMPER- ATURE, AIR (DEG C) (00020)	TEMPER- ATURE (DEG C) (00010)				
OCT 03...			1245	89	--	--	277	4.0	7.0			
DEC 05...			1700	87	--	--	259	-7.0	0.0			
JAN 08...			1700	68	--	--	265	1.0	0.0			
FEB 20...			1100	42	--	--	285	-7.0	0.0			
24...			1415	E550	50	1	125	11.0	0.5			
26...			1115	744	--	--	128	5.5	0.5			
APR 08...			1010	261	--	--	208	9.0	6.0			
15...			0945	310	80	1	215	4.0	5.0			
MAY 22...			1030	569	--	--	192	7.5	6.5			
JUN 19...			1640	143	--	--	262	22.0	18.5			
JUL 02...			1045	93	--	--	276	25.0	15.0			
AUG 20...			0955	29	--	--	283	17.0	12.0			
DATE			TIME	PH (STAND- ARD UNITS) (00400)	HARD- NESS (MG/L AS CACO3) (00900)	HARD- NESS NONCARB WH WAT TOT FLD MG/L AS CACO3 (00902)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM AD- SORP- TION RATIO (00931)	BICAR- BONATE WH WAT TOTAL FIELD MG/L AS HCO3 (00440)	
FEB 24...			1415	7.6	--	--	--	--	--	--	52	
APR 15...			0945	7.9	95	5	27	6.6	5.3	0.2	110	
DATE			TIME	CAR- BONATE WH WAT TOTAL FIELD MG/L AS CO3 (00445)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	CADMIUM TOTAL RECOV- ERABLE (UG/L AS CD) (01027)	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)	COPPER, TOTAL RECOV- ERABLE (UG/L AS CU) (01042)	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	
FEB 24...			0	--	17	5	<1	<1	30	4		
APR 15...			0	17	5	5	<1	<1	6	4		
DATE			TIME	IRON, TOTAL RECOV- ERABLE (UG/L AS FE) (01045)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB) (01051)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN) (01055)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	ZINC, TOTAL RECOV- ERABLE (UG/L AS ZN) (01092)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	
FEB 24...			12000	71	25	3	1100	10	--	4		
APR 15...			310	33	1	<1	30	8	<10	8		
DATE			TIME	TEMPER- ATURE (DEG C) (00010)	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	SEDI- MENT, SUS- PENDE (MG/L) (80154)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY) (80155)	SED. SUSP. FALL DIAM. % FINER THAN .002 MM (70337)	SED. SUSP. FALL DIAM. % FINER THAN .004 MM (70338)			
FEB 24...			1415	0.5	550	728	E1080	25	33			
APR 15...			0945	5.0	310	15	13	--	--			

12324680 CLARK FORK AT GOLDCREEK, MT

LOCATION.--Lat 46°35'26", long 112°55'40", in SE¼NW¼SW¼ sec.25, T.10 N., R.11 W., Powell County, Hydrologic Unit 17010203, 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 mile 436.9.

DRAINAGE AREA.--1,704 mi².

PERIOD OF RECORD.--October 1977 to current year.

GAGE.--Water-stage recorder. Datum of gage is 4,172.80 ft above National Geodetic Vertical Datum of 1929. June 13 to Oct. 21, 1982, nonrecording gage at site 350 ft downstream at same datum.

REMARKS.--Estimated daily discharges: Nov. 18 to Feb. 19, Feb. 21, 24. Records good except those for estimated periods, which are fair. Some regulation by settling ponds on Silver Bow Creek near Anaconda Diversions for irrigation of about 40,100 acres upstream from station. Several observations of water temperature and specific conductance were made during the year and are published as miscellaneous water-quality data in the back of this report.

AVERAGE DISCHARGE.--9 years, 660 ft³/s, 478,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,000 ft³/s May 22, 1981, gage height, 11.17 ft, from flood-marks, from rating curve extended above 6,500 ft³/s on basis of contracted-opening measurement of peak flow; minimum, 64 ft³/s July 31, Aug. 1, 2, 1985, gage height, 3.74 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 6,350 ft³/s Feb. 24, gage height, 8.50 ft; maximum gage height, 9.48 ft Feb. 17 (ice jam); minimum discharge, 113 ft³/s Aug. 20, gage height, 3.98 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	416	444	260	300	410	853	732	657	1860	404	197	234
2	409	442	250	320	400	843	736	638	1750	365	185	255
3	412	440	300	300	400	831	696	658	1650	308	176	240
4	423	438	350	280	380	777	651	693	1790	313	175	231
5	419	445	370	260	350	905	629	818	1720	462	175	217
6	419	436	350	270	330	756	613	806	1750	513	177	218
7	431	440	350	290	310	795	613	769	1570	506	162	234
8	432	442	330	320	290	1150	619	778	1520	469	144	270
9	421	439	300	330	290	831	624	780	1510	445	134	345
10	431	371	280	360	290	740	630	789	1260	467	129	334
11	458	352	260	380	270	694	634	972	1050	487	131	320
12	473	335	250	370	290	708	660	892	872	471	137	320
13	478	361	260	350	310	723	640	811	753	436	137	343
14	474	384	270	340	320	673	677	801	664	398	129	408
15	464	398	280	330	350	633	720	771	630	376	125	405
16	462	431	290	340	420	606	706	738	608	371	122	402
17	474	447	310	350	500	590	695	707	536	445	119	422
18	468	390	330	370	540	572	644	678	494	429	117	455
19	469	370	310	380	500	555	606	674	528	380	117	464
20	466	350	310	350	397	537	583	671	500	364	116	473
21	459	340	300	330	380	536	578	755	452	335	131	498
22	471	330	290	300	367	570	596	1030	408	302	157	497
23	472	300	280	310	368	541	689	1070	386	294	174	474
24	463	280	290	320	2800	542	754	1010	353	264	179	445
25	460	270	300	310	3970	527	768	933	338	242	184	455
26	460	270	280	300	2850	509	799	948	332	231	181	452
27	454	260	270	290	1410	527	781	1180	311	224	188	457
28	454	280	260	300	981	571	767	1500	296	213	192	444
29	445	270	250	320	---	627	702	1760	317	206	177	444
30	444	260	270	350	---	687	687	1900	384	206	182	438
31	448	---	290	420	---	725	---	1930	---	202	189	---
TOTAL	13929	11015	9090	10140	20473	21134	20229	29117	26592	11128	4838	11194
MEAN	449	367	293	327	731	682	674	939	886	359	156	373
MAX	478	447	370	420	3970	1150	799	1930	1860	513	197	498
MIN	409	260	250	260	270	509	578	638	296	202	116	217
AC-FT	27630	21850	18030	20110	40610	41920	40120	57750	52750	22070	9600	22200
CAL YR 1985	TOTAL	140263		MEAN	384	MAX	1010	MIN	64	AC-FT	278200	
WTR YR 1986	TOTAL	188879		MEAN	517	MAX	3970	MIN	116	AC-FT	374600	

PEND OREILLE RIVER BASIN

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12325500 FLINT CREEK NEAR SOUTHERN CROSS, MT

LOCATION.--Lat 46°13'59", long 113°17'56", in SE¼NW¼ sec.36, T.6 N., R.14 W., Granite County, Hydrologic Unit 17010202, on left wing 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 mile 36.8.

DRAINAGE AREA.--52.6 mi².

PERIOD OF RECORD.--October 1940 to current year.

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, from topographic map. Prior to June 3, 1982, nonrecording gage at same site and datum. Prior to Nov. 27, 1973, gage at same site and datum 0.20 ft higher.

REMARKS.--No estimated daily discharges during year. Records good. Flow regulated by Georgetown Lake (station number 12325000). Several observations of water temperature and specific conductance were made during the water year and are published as miscellaneous water-quality data in the back of this report. Flow may be augmented by transbasin diversion from Silver Lake to Georgetown Lake or reduced by pumping from Georgetown Lake to Silver Lake.

AVERAGE DISCHARGE.--46 years, 30.1 ft³/s, 21,810 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 174 ft³/s June 13, 1942, gage height, 1.86 ft; maximum gage height observed, 2.60 ft June 19-23, 1980; probably no flow for parts of May 23, 1942, Aug. 20, 1943, Oct. 6, 1954, Nov. 29, Dec. 1, 1966, and no flow Nov. 30, 1966, when generator was shut down.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 124 ft³/s June 8, gage height, 2.19 ft; minimum daily, 11 ft³/s Oct. 9-15.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	26	12	12	12	12	14	13	19	30	35	27	27
2	26	12	12	12	12	14	13	19	30	36	28	26
3	26	12	12	12	12	14	13	20	53	36	29	29
4	26	12	12	12	12	14	13	17	86	35	27	29
5	26	12	12	12	12	14	13	16	88	34	25	29
6	26	12	12	12	12	14	13	15	104	34	27	29
7	21	12	13	12	12	14	14	15	120	33	27	29
8	12	12	12	12	12	14	14	19	122	37	27	29
9	11	12	12	12	12	14	15	30	122	51	27	30
10	11	12	12	12	12	14	18	30	106	56	28	29
11	11	12	12	12	12	14	18	30	80	64	28	29
12	11	12	12	12	12	14	18	30	54	70	29	29
13	11	12	12	12	12	14	18	30	33	57	28	29
14	11	12	12	12	12	14	18	30	31	44	27	29
15	11	12	12	12	13	14	18	30	31	39	27	30
16	12	12	12	12	13	14	18	30	33	53	27	26
17	12	12	12	12	13	14	18	30	47	72	27	26
18	12	12	12	12	13	13	17	30	76	53	27	26
19	12	12	12	12	13	13	17	30	72	39	27	27
20	12	12	12	12	13	13	17	30	67	39	30	26
21	12	12	12	12	13	13	17	30	67	34	27	26
22	12	12	12	12	13	13	18	30	68	31	27	30
23	12	12	12	12	13	13	18	29	53	30	26	30
24	12	12	12	12	13	13	18	29	38	30	26	29
25	12	12	12	12	13	13	18	29	37	28	26	30
26	12	12	12	12	13	13	18	29	35	26	26	30
27	12	12	12	12	13	13	19	29	35	25	26	30
28	12	12	12	12	13	13	19	29	33	26	27	30
29	12	12	12	12	---	13	19	30	33	26	27	30
30	12	12	12	12	---	13	19	30	35	24	27	30
31	12	---	12	12	---	13	---	30	---	28	27	---
TOTAL	458	360	373	372	350	420	499	824	1819	1225	841	858
MEAN	14.8	12.0	12.0	12.0	12.5	13.5	16.6	26.6	60.6	39.5	27.1	28.6
MAX	26	12	13	12	13	14	19	30	122	72	30	30
MIN	11	12	12	12	12	13	13	15	30	24	25	26
AC-FT	908	714	740	738	694	833	990	1630	3610	2430	1670	1700
CAL YR 1985	TOTAL	8552		MEAN	23.4	MAX	30	MIN	11	AC-FT	16960	
WTR YR 1986	TOTAL	8399		MEAN	23.0	MAX	122	MIN	11	AC-FT	16660	

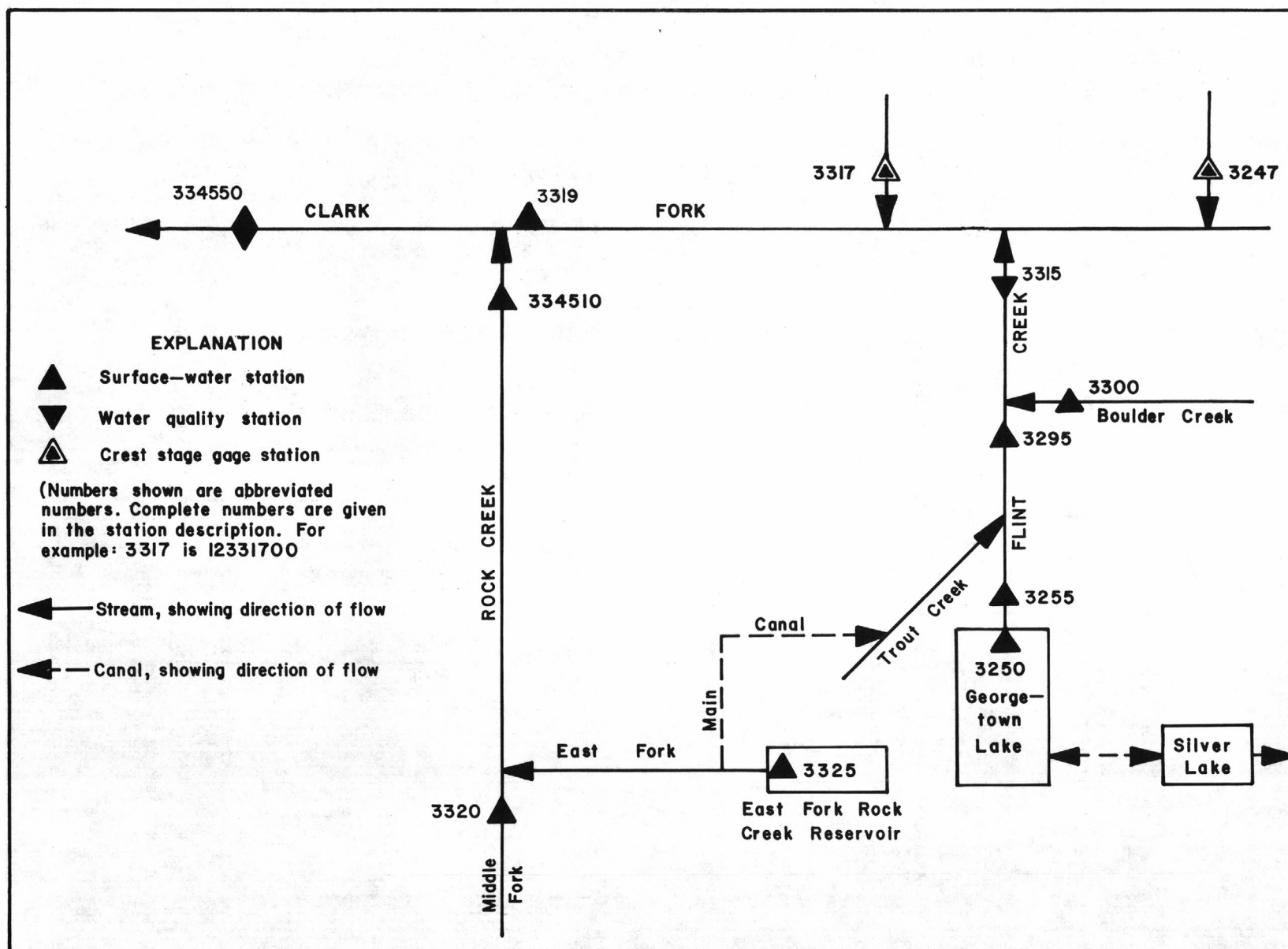


Figure 11.--Schematic diagram showing diversions and storage in Flint and Rock Creek basins.

PEND OREILLE RIVER BASIN

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12329500 FLINT CREEK AT MAXVILLE, MT

LOCATION.--Lat 46°27'50", long 113°14'20", in NE¼SW¼NW¼ 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 mi².

PERIOD OF RECORD.--August 1941 to current year. April 1939 to September 1941 at site 0.5 mi upstream (above Maxville siding); records not equivalent owing to diversions.

REVISED RECORDS.--WSP 1216: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 4,828.38 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Nov. 11 to Feb. 25, Feb. 28 to Mar. 7. Records good except those for periods of estimated daily discharges, which are poor. Several observations of water temperature and specific conductance were made during the year and are published as miscellaneous water-quality data in the back of this report. Some regulation by Georgetown Lake (station number 12325000). 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.

AVERAGE DISCHARGE.--45 years, 102 ft³/s, 73,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,680 ft³/s Mar. 28, 1943, gage height, 6.79 ft, from rating curve extended above 600 ft³/s; maximum gage height, 8.08 ft Feb. 4, 1963 (backwater from ice); minimum daily discharge, 15 ft³/s Feb. 25, 1962.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, about 900 ft³/s Feb. 24, gage height, 6.54 ft from crest-stage gage, backwater from ice; minimum daily, 30 ft³/s Dec. 11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	88	66	36	46	65	140	95	86	203	91	95	135
2	91	67	38	47	64	135	104	86	194	94	97	120
3	92	64	45	47	60	125	96	92	209	103	105	117
4	92	63	43	46	56	120	97	108	236	116	105	117
5	92	66	41	46	52	120	98	110	242	150	108	111
6	91	65	43	45	50	115	95	93	361	130	106	114
7	97	66	42	44	47	120	91	88	321	136	106	115
8	84	66	40	47	45	127	92	86	299	135	94	138
9	81	60	35	52	42	102	94	89	305	137	88	169
10	81	45	32	60	40	94	101	93	261	135	91	143
11	81	48	30	58	35	92	104	108	226	144	97	130
12	81	52	35	54	39	93	103	100	201	130	115	126
13	76	54	39	50	43	90	95	95	167	120	122	128
14	74	56	42	50	48	87	96	97	145	122	119	135
15	72	56	45	52	57	85	102	93	151	122	109	142
16	72	56	48	52	62	84	101	92	128	122	107	136
17	73	54	50	54	64	83	95	88	118	141	107	143
18	71	52	54	54	60	79	89	87	113	138	106	148
19	70	50	52	58	56	78	86	86	119	127	101	134
20	70	53	50	56	52	78	85	96	115	121	97	127
21	71	48	52	50	56	80	85	122	110	118	112	128
22	73	45	54	45	60	84	94	147	101	115	134	120
23	71	46	56	48	70	78	118	131	96	116	113	119
24	70	44	54	47	450	80	110	114	88	113	112	116
25	68	43	45	48	700	77	104	117	75	119	109	118
26	68	44	40	52	410	77	104	122	74	127	112	114
27	68	45	42	58	176	81	100	139	71	120	104	111
28	67	43	45	63	145	87	92	177	71	120	104	109
29	66	37	52	65	---	91	91	192	83	120	109	109
30	66	35	50	68	---	98	89	225	97	122	117	111
31	66	---	48	70	---	99	---	202	---	116	123	---
TOTAL	2383	1589	1378	1632	3104	2979	2906	3561	4980	3820	3324	3783
MEAN	76.9	53.0	44.5	52.6	111	96.1	96.9	115	166	123	107	126
MAX	97	67	56	70	700	140	118	225	361	150	134	169
MIN	66	35	30	44	35	77	85	86	71	91	88	109
AC-FT	4730	3150	2730	3240	6160	5910	5760	7060	9880	7580	6590	7500
CAL YR 1985	TOTAL	29358		MEAN	80.4	MAX	220	MIN	30	AC-FT	58230	
WTR YR 1986	TOTAL	35439		MEAN	97.1	MAX	700	MIN	30	AC-FT	70290	

PEND OREILLE RIVER BASIN

12330000 BOULDER CREEK AT MAXVILLE, MT

LOCATION.--Lat 46°28'20", long 113°13'59", in SE~~NE~~SW~~SE~~ 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 mi².

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 above National Geodetic Vertical Datum of 1929, from topographic map. Apr. 15, 1939, to July 7, 1941, nonrecording gage at site 75 ft upstream at different datum. July 8-20, 1941, nonrecording gage at site 175 ft upstream at datum 1.03 ft higher.

REMARKS.--Estimated daily discharges: Oct. 9, Nov. 10 to Apr. 1. Records good except those for estimated daily discharges, which are poor. Several observations of water temperature and specific conductance were made during the year and are published as miscellaneous water-quality data in the back of this report. Diversions upstream for irrigation of about 240 acres near the station.

AVERAGE DISCHARGE.--47 years, 48.3 ft³/s, 34,990 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,460 ft³/s June 19, 1975, gage height, 4.55 ft, in gage well, 4.80 ft, from floodmarks; minimum, 3.0 ft³/s about Mar. 24, 1964, gage height, 0.73 ft, result of freezeup.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 220 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 28	2400	*531	*3.71	June 5	2230	396	3.39

Minimum daily discharge, 6.0 ft³/s Aug. 9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15	21	13	15	21	27	32	40	398	40	11	26
2	15	22	14	16	20	26	31	44	347	36	11	15
3	18	22	15	16	19	25	30	57	335	35	10	11
4	23	22	17	16	19	24	29	79	285	41	8.8	9.7
5	23	23	16	16	18	24	29	73	298	56	8.6	8.6
6	23	22	17	17	18	24	30	65	323	49	7.9	8.3
7	24	22	16	19	17	23	31	61	255	44	6.5	8.4
8	21	22	16	20	17	23	33	56	259	46	6.2	15
9	22	20	13	21	16	23	34	53	228	50	6.0	33
10	23	18	12	22	16	22	34	53	190	57	6.1	20
11	24	16	11	21	15	22	33	52	168	56	6.1	15
12	23	15	12	20	17	21	33	48	157	51	8.2	16
13	23	16	14	19	18	22	33	47	142	46	11	26
14	22	17	15	18	20	23	36	47	130	43	9.0	30
15	23	18	17	19	22	24	31	45	138	41	8.0	28
16	24	17	19	19	23	25	30	43	119	44	7.7	32
17	24	16	21	20	22	25	29	43	108	54	7.8	33
18	23	16	22	20	21	25	28	44	101	45	8.0	36
19	23	15	20	22	19	24	27	58	96	40	7.6	33
20	23	16	21	20	18	25	27	99	84	32	7.3	30
21	23	15	21	18	20	26	31	164	72	26	11	30
22	25	14	20	17	20	26	50	175	62	23	16	29
23	24	14	19	18	20	25	75	130	57	22	10	27
24	23	14	17	19	21	28	67	114	52	21	8.9	25
25	23	13	14	19	21	30	61	144	49	18	8.3	27
26	24	14	13	20	23	35	55	240	46	14	7.8	27
27	23	15	14	21	24	38	50	338	45	14	7.3	26
28	23	15	16	22	25	36	45	455	43	13	7.0	25
29	22	13	18	22	---	35	43	455	44	13	7.2	25
30	22	12	17	23	---	34	41	471	44	12	8.1	26
31	22	---	17	22	---	33	---	441	---	11	13	---
TOTAL	693	515	507	597	550	823	1138	4234	4675	1093	267.4	701.0
MEAN	22.4	17.2	16.4	19.3	19.6	26.5	37.9	137	156	35.3	8.63	23.4
MAX	25	23	22	23	25	38	75	471	398	57	16	36
MIN	15	12	11	15	15	21	27	40	43	11	6.0	8.3
AC-FT	1370	1020	1010	1180	1090	1630	2260	8400	9270	2170	530	1390
CAL YR 1985	TOTAL	10800		MEAN	29.6	MAX	131	MIN	11	AC-FT	21420	
WTR YR 1986	TOTAL	15793.4		MEAN	43.3	MAX	471	MIN	6.0	AC-FT	31330	

PEND OREILLE RIVER BASIN

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12331500 FLINT CREEK NEAR DRUMMOND, MT

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

LOCATION.--Lat 46°37'44", long 113°09'00", in NE¼NW¼NE¼ sec. 18, T.10 N., R.12 W., Granite County, at former gaging station site at bridge on county road, 2.0 mi upstream from mouth, and 2.7 mi south of Drummond.

DRAINAGE AREA.--490 mi².

PERIOD OF RECORD.--Water years 1972-73, 1985 to current year.

REMARKS.--Flow affected by diversions for irrigation upstream from station.

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	CLOUD COVER (PER- CENT) (00032)	WEATHER (WMO CODE NUMBER) (00041)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	TEMPER- ATURE, AIR (DEG C) (00020)	TEMPER- ATURE (DEG C) (00010)	PH (STAND- ARD UNITS) (00400)	HARD- NESS (MG/L AS CACO3) (00900)	HARD- NESS, NONCAR- BONATE (MG/L AS CACO3) (00902)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)
FEB 25...	1030	892	75	1	157	8.0	0.5	7.5	--	--	--	--
APR 15...	1545	214	90	1	260	10.5	8.5	8.1	110	1	29	9.1
MAY 28...	1405	386	0	0	140	25.0	11.5	7.6	60	0	17	4.3

DATE	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM AD- SORP- TION RATIO (00931)	BICAR- BONATE FET-FLD (MG/L AS HCO3) (00440)	CAR- BONATE FET-FLD (MG/L AS CO3) (00445)	SILICA, DIS- SOLVED (MG/L AS SiO2) (00955)	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	CADMIUM TOTAL RECOV- ERABLE (UG/L AS CD) (01027)	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)	COPPER, TOTAL RECOV- ERABLE (UG/L AS CU) (01042)	COPPER, DIS- SOLVED (UG/L AS CU) (01040)
FEB 25...	--	--	79	0	--	49	14	<1	<1	29	7
APR 15...	7.0	0.3	130	0	17	11	7	<1	<1	9	3
MAY 28...	--	--	76	0	--	31	8	<1	<1	15	3

DATE	IRON, TOTAL RECOV- ERABLE (UG/L AS FE) (01045)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB) (01051)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN) (01055)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	ZINC, TOTAL RECOV- ERABLE (UG/L AS ZN) (01092)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	SEDI- MENT, SUS- PENDED (MG/L) (80154)	SEDI- MENT, DIS- CHARGE, SUS- PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
FEB 25...	4700	180	56	4	940	97	170	20	230	554	55
APR 15...	600	62	9	1	110	23	30	6	28	16	80

PEND OREILLE RIVER BASIN

12331900 CLARK FORK NEAR CLINTON, MT

LOCATION.--Lat 46°43'05", long 113°35'17", in SE $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.10, T.11 N., R.16 W., Missoula County, Hydrologic Unit 17010201, on downstream side of county road bridge, 4.5 mi above Rock Creek, 6.5 mi southeast of Clinton, and at mile 386.6.

DRAINAGE AREA.--2,629 mi².

PERIOD OF RECORD.--June 1979 to current year.

REVISED RECORDS.--WDR MT-81-2: Drainage area.

GAGE.--Nonrecording gage and crest-stage gage. Elevation of gage is 3,580 ft, from topographic map.

REMARKS.--Estimated daily discharges: Oct. 16-17, 26, Nov. 1, 13-16, 20-23, Nov. 26 to Dec. 17, Dec. 21-31, Jan. 5-26, Feb. 9-14, 20, Mar. 25, Apr. 2, May 23, June 7, July 7, 12, 17, 31, Aug. 12, Sept. 5, 7, 12. Records good except those for estimated daily discharges, which are poor. Several observations of water temperature and specific conductance were made during the year and are published as miscellaneous water-quality data in the back of this report. 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 88,400 acres upstream from station.

AVERAGE DISCHARGE.--7 years, 991 ft³/s, 718,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,000 ft³/s May 24, 1981, gage height, 10.90 ft, from floodmarks; minimum observed, 118 ft³/s Aug. 1, 1985, gage height, 3.45 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 8,760 ft³/s Feb. 25, gage height, 9.61 ft; minimum observed, 194 ft³/s Aug. 9, gage height, 3.69 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	698	625	370	517	682	1580	1170	1010	2540	501	331	452
2	705	698	370	502	711	1640	1170	964	2300	527	310	501
3	712	684	450	502	712	1350	1170	892	2200	512	287	512
4	698	678	600	497	685	1560	1130	1030	2350	488	260	473
5	698	678	580	490	653	1620	1080	1210	2290	680	242	465
6	698	678	560	479	551	1400	1040	1190	2380	731	245	463
7	705	698	560	521	460	1370	1040	1090	2250	730	232	490
8	719	698	520	512	414	1980	990	1130	2200	691	202	528
9	685	684	480	577	400	1490	1040	1100	2190	718	194	701
10	665	604	450	572	400	1340	1040	1080	1940	705	211	691
11	704	590	410	572	390	1270	1040	1310	1650	746	201	659
12	731	529	370	561	410	1180	1140	1310	1280	730	230	660
13	754	480	400	549	430	1150	1100	1150	1100	698	250	684
14	726	490	450	518	450	1220	1120	1090	941	646	248	759
15	712	530	520	507	482	1120	1150	1060	979	627	234	775
16	680	580	560	571	521	1060	1190	1010	908	664	242	804
17	680	620	600	584	708	1010	1120	940	807	690	232	834
18	712	585	614	590	788	932	1080	907	734	684	226	897
19	705	550	568	602	790	930	1020	836	732	621	216	859
20	666	550	549	651	620	907	956	812	747	602	203	874
21	690	520	540	652	590	890	830	865	685	562	216	913
22	712	500	520	540	638	906	920	1260	640	549	258	859
23	719	450	520	450	603	930	1100	1300	597	483	271	835
24	719	366	520	581	1810	867	1220	1270	556	445	281	791
25	705	349	500	494	6810	850	1240	1210	484	430	284	790
26	650	380	470	450	5800	825	1270	1250	467	413	287	783
27	698	370	450	407	3260	827	1270	1600	458	392	290	783
28	684	400	420	525	2090	881	1220	2060	418	388	316	761
29	684	380	400	589	---	906	1110	2370	426	372	327	761
30	678	370	440	556	---	1080	1100	2620	476	346	324	783
31	678	---	480	601	---	1120	---	2690	---	340	403	---
TOTAL	21670	16314	15241	16719	32858	36191	33066	39616	37725	17711	8053	21140
MEAN	699	544	492	539	1174	1167	1102	1278	1258	571	260	705
MAX	754	698	614	652	6810	1980	1270	2690	2540	746	403	913
MIN	650	349	370	407	390	825	830	812	418	340	194	452
AC-FT	42980	32360	30230	33160	65170	71780	65590	78580	74830	35130	15970	41930
CAL YR 1985	TOTAL	205290		MEAN	562	MAX	1590	MIN	119	AC-FT	407200	
WTR YR 1986	TOTAL	296304		MEAN	812	MAX	6810	MIN	194	AC-FT	587700	

PEND OREILLE RIVER BASIN

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12332000 MIDDLE FORK ROCK CREEK NEAR PHILIPSBURG, MT

LOCATION.--Lat 46°11'42", long 113°30'00", in SW¼SE¼ sec.8, T.5 N., R.15 W., Granite County, Hydrologic Unit 17010202, on right bank 0.3 mi upstream from East Fork, 2.3 mi upstream from West Fork, and 13.7 mi southwest of Philipsburg.

DRAINAGE AREA.--123 mi².

PERIOD OF RECORD.--September 1937 to current year. Monthly discharges only January to March 1938, published in WSP 1316.

GAGE.--Water-stage recorder. Datum of gage is 5,385.84 ft above National Geodetic Vertical Datum of 1929. Sept. 21, 1937, to May 10, 1942, nonrecording gage at site 600 ft upstream at different datum. May 11, 1942, to May 11, 1954, nonrecording gages at site 400 ft downstream at different datum. May 12, 1954, to Sept. 30, 1955, nonrecording gage at site 300 ft upstream at datum 5.74 ft higher.

REMARKS.--Estimated daily discharges: Nov. 12 to Apr. 16. Records good except those for estimated daily discharges, which are poor. Several observations of water temperature and specific conductance were made during the year and are published as miscellaneous water-quality data in the back of this report. A few small diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--49 years, 123 ft³/s, 13.58 in/yr, 89,110 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,680 ft³/s June 16, 1974, gage height, 5.58 ft; minimum daily, 5.3 ft³/s Feb. 9, 1953.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 650 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 30	0600	*1,380	*5.18	June 8	0730	1,210	4.93

Minimum daily discharge, 20 ft³/s Dec. 11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	49	45	25	27	47	80	74	120	1080	183	76	67
2	49	46	27	29	45	78	70	131	1120	171	74	61
3	50	48	32	30	45	76	70	160	1060	169	72	57
4	49	47	30	30	43	76	72	205	907	184	72	55
5	48	48	29	32	40	72	73	205	961	218	71	53
6	50	47	30	31	38	74	74	198	974	187	68	51
7	57	47	29	30	35	72	77	198	857	165	67	52
8	49	46	26	33	32	70	83	188	1080	154	65	70
9	45	42	23	37	30	68	90	175	896	155	63	98
10	50	36	21	40	28	66	88	175	766	151	63	78
11	52	31	20	38	25	64	85	171	696	151	62	68
12	52	27	22	35	27	60	84	156	653	142	71	63
13	49	29	24	33	29	64	84	153	591	133	72	66
14	47	35	27	34	33	62	83	155	539	127	67	73
15	48	40	30	35	36	60	82	143	538	122	63	77
16	49	39	35	36	39	60	82	135	476	130	60	73
17	48	36	40	38	43	60	80	135	433	150	58	76
18	46	34	42	36	40	58	76	136	405	127	57	86
19	45	32	40	41	35	56	73	163	387	117	55	80
20	45	35	38	45	32	58	73	219	340	111	53	76
21	45	32	38	42	36	58	84	346	306	107	63	74
22	50	29	38	35	40	56	128	440	278	113	85	73
23	48	30	37	38	45	54	175	378	259	104	66	70
24	47	27	33	36	50	60	165	353	248	99	63	66
25	47	25	27	34	60	64	163	390	240	96	61	68
26	52	28	25	35	70	90	155	555	232	103	59	68
27	51	30	28	38	68	120	146	820	218	94	57	66
28	50	29	30	40	74	110	140	1150	207	89	54	63
29	47	25	33	39	---	95	134	1210	208	84	58	62
30	46	24	34	42	---	87	126	1240	203	82	68	62
31	45	---	30	45	---	80	---	1150	---	79	65	---
TOTAL	1505	1069	943	1114	1165	2208	2989	11353	17158	4097	2008	2052
MEAN	48.5	35.6	30.4	35.9	41.6	71.2	99.6	366	572	132	64.8	68.4
MAX	57	48	42	45	74	120	175	1240	1120	218	85	98
MIN	45	24	20	27	25	54	70	120	203	79	53	51
CFSM	.39	.29	.25	.29	.34	.58	.81	2.98	4.65	1.07	.53	.56
IN.	.46	.32	.29	.34	.35	.67	.90	3.43	5.19	1.24	.61	.62
AC-FT	2990	2120	1870	2210	2310	4380	5930	22520	34030	8130	3980	4070
CAL YR 1985	TOTAL	32286	MEAN	88.5	MAX	473	MIN	18	CFSM	.72	IN.	9.76
WTR YR 1986	TOTAL	47661	MEAN	131	MAX	1240	MIN	20	CFSM	1.07	IN.	14.41
											AC-FT	64040
											AC-FT	94540

PEND OREILLE RIVER BASIN

12334510 ROCK CREEK NEAR CLINTON, MT

LOCATION.--Lat 46°43'21", long 113°40'56", in NW¼NE¼SW¼ 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 south-east of Clinton.

DRAINAGE AREA.--885 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1972 to current year.

GAGE.--Water-stage recorder. Datum of gage is 3,519.46 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Nov. 11-16, Nov. 21 to Dec. 14, Feb. 9-11. Water-discharge records good except those for estimated daily discharges, which are poor. 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.

AVERAGE DISCHARGE.--14 years, 590 ft³/s, 9.05 in/yr, 427,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,520 ft³/s June 20, 1975, gage height, 7.49 ft, rating then in use; maximum gage height, 7.53 ft May 22, 1981, and June 17, 1982; minimum discharge, 45 ft³/s Jan. 3, 1974, gage height, 1.65 ft.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1972 reached a stage of 8.52 ft, from floodmark, discharge, 6,500 ft³/s; local residents report flood of 1927 reached a stage of about 9.5 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,610 ft³/s and maximums (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 29	2330	*4,060	*7.11	No other peak greater than base discharge.			

Minimum daily discharge, 90 ft³/s Dec. 11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	296	270	140	174	216	439	708	818	3700	672	317	324		
2	297	272	120	178	220	465	708	826	3430	629	299	306		
3	300	277	140	189	216	467	637	930	3260	611	294	280		
4	301	282	130	175	204	451	605	1140	3170	628	290	268		
5	295	297	130	158	200	459	586	1260	3000	753	285	262		
6	291	297	130	164	189	455	590	1210	3270	733	276	265		
7	309	290	140	175	161	478	615	1170	2850	665	263	265		
8	309	285	150	175	136	630	665	1160	2960	612	237	297		
9	270	268	120	178	120	551	728	1110	2950	615	228	399		
10	268	222	100	189	120	479	797	1080	2370	607	228	409		
11	303	200	90	185	130	447	829	1110	2030	602	231	348		
12	309	180	110	182	136	426	833	1040	1840	601	257	322		
13	302	195	150	161	151	412	779	992	1710	563	269	322		
14	289	210	180	161	171	388	725	1020	1590	538	258	323		
15	284	230	202	164	178	367	733	969	1610	523	248	347		
16	293	250	202	175	185	353	715	906	1490	508	232	364		
17	302	269	231	189	224	347	689	870	1330	540	225	362		
18	294	249	222	189	216	335	644	868	1240	510	222	403		
19	279	217	201	185	210	323	608	921	1220	469	211	413		
20	275	210	190	200	188	317	586	1140	1140	444	202	388		
21	276	200	168	193	180	326	611	1470	1040	423	215	366		
22	285	180	167	175	194	348	753	1890	955	407	273	346		
23	294	150	178	168	195	338	1140	1760	888	409	281	337		
24	284	160	182	185	224	338	1180	1660	835	388	265	323		
25	276	170	177	175	536	334	1130	1670	796	379	259	327		
26	281	180	155	145	721	321	1080	1940	770	383	251	330		
27	292	180	136	151	606	340	1010	2480	727	378	247	321		
28	286	170	126	178	466	410	957	3140	692	358	243	310		
29	279	160	123	193	---	519	905	3610	700	347	251	302		
30	271	150	163	196	---	666	860	3870	722	343	283	297		
31	273	---	165	204	---	738	---	3810	---	331	312	---		
TOTAL	8963	6670	4818	5509	6693	13267	23406	47840	54285	15969	7952	9926		
MEAN	289	222	155	178	239	428	780	1543	1810	515	257	331		
MAX	309	297	231	204	721	738	1180	3870	3700	753	317	413		
MIN	268	150	90	145	120	317	586	818	692	331	202	262		
CFSM	.33	.25	.18	.20	.27	.48	.88	1.74	2.05	.58	.29	.37		
IN.	.38	.28	.20	.23	.28	.56	.98	2.01	2.28	.67	.33	.42		
AC-FT	17780	13230	9560	10930	13280	26320	46430	94890	107700	31670	15770	19690		
CAL YR 1985	TOTAL	149818	MEAN	410	MAX	1800	MIN	90	CFSM	.46	IN.	6.30	AC-FT	29720
WTR YR 1986	TOTAL	205298	MEAN	562	MAX	3870	MIN	90	CFSM	.64	IN.	8.63	AC-FT	40720

12334510 ROCK CREEK NEAR CLINTON, MT--Continued

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.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE (water years 1979-83): Maximum, 20.5°C, July 23, 1980; minimum, 0.0°C on many days during winter periods.

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	CLOUD COVER (PER- CENT) (00032)	WEATHER (WMO CODE NUMBER) (00041)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	TEMPER- ATURE, AIR (DEG C) (00020)	TEMPER- ATURE (DEG C) (00010)
OCT							
03...	1110	305	--	--	139	7.0	6.5
NOV							
15...	0840	218	--	--	155	-10.0	0.0
JAN							
02...	1110	184	--	--	145	-4.0	0.0
FEB							
18...	1415	217	--	--	142	0.5	1.5
26...	1345	816	70	2	100	12.0	0.5
APR							
11...	1600	821	--	--	93	10.0	5.0
15...	1800	720	50	1	95	12.0	6.5
MAY							
22...	1515	1860	--	--	66	9.0	8.5
30...	1110	3950	--	--	60	22.0	10.5
JUN							
03...	1320	3200	--	--	72	20.0	10.0
06...	0945	3110	--	--	73	14.5	10.0
30...	1350	727	--	--	259	21.5	14.0
JUL							
09...	1000	624	--	--	134	15.0	12.5
AUG							
11...	1400	229	--	--	145	24.0	18.0
SEP							
29...	1510	306	--	--	148	11.5	8.0

DATE	TIME	PH (STAND- ARD UNITS) (00400)	HARD- NESS (MG/L AS CACO3) (00900)	HARD- NESS, NONCAR- BONATE (MG/L CACO3) (00902)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	BICAR- BONATE FET-FLD (MG/L AS HCO3) (00440)	CAR- BONATE FET-FLD (MG/L AS CO3) (00445)	ARSENIC TOTAL (UG/L AS AS) (01002)
FEB									
26...	1345	7.5	--	--	--	--	57	0	2
APR									
15...	1800	7.7	39	0	10	3.5	52	0	<1

PEND OREILLE RIVER BASIN

12334510 ROCK CREEK NEAR CLINTON, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	CADMIUM TOTAL RECOV- ERABLE (UG/L AS CD) (01027)	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)	COPPER, TOTAL RECOV- ERABLE (UG/L AS CU) (01042)	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE) (01045)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB) (01051)
FEB 26...	1	3	<1	6	3	800	110	5
APR 15...	<1	<1	<1	3	1	150	50	1
DATE	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN) (01055)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	ZINC, TOTAL RECOV- ERABLE (UG/L AS ZN) (01092)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (MG/L) (80154)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
FEB 26...	3	40	8	30	<3	36	79	63
APR 15...	<1	10	<1	<10	3	7	14	51

PEND OREILLE RIVER BASIN

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12334550 CLARK FORK AT TURAH BRIDGE, NEAR BONNER, MT

LOCATION.--Lat 46°49'34", long 113°48'48", in SW $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 1, T.12, N., R.18 W., Missoula County, Hydrologic Unit 17010203, on left bank 0.8 mi southeast of Turah, 4 mi southeast of Bonner, and at mile 370.2.

DRAINAGE AREA.--3.641 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1985 to September 1986. 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, from topographic map. Prior to May 9, 1986, non-recording gage at same site at datum 2.00 ft higher.

REMARKS.--Water-discharge records good except those for the period Oct. 1 to May 8, which are poor. Several observations of water temperature and specific conductance were made during the year and are published as miscellaneous water-quality data in the back of this report. 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.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,700 ft³/s Feb. 25, 1986, gage height, 6.52 ft, from graph based on gage readings, datum then in use; maximum gage height, 6.72 ft May 30, 1986; minimum discharge, 408 ft³/s Aug. 21, 1986, gage height, 2.11 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,000 ft³/s and maximums (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Feb. 25	1200	*9,700	(a) 6.52	May 30	2300	6,760	*6.72

(a)--from graph based on gage readings.

Minimum discharge, 408 ft³/s Aug. 21, gage height, 2.11 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1070	1030	650	750	1010	2340	1960	1940	6050	1260	699	788
2	1090	1040	605	770	1070	2170	1970	1890	5830	1210	671	848
3	1090	1050	660	780	1100	2150	1970	2010	5480	1160	636	838
4	1060	1050	740	770	959	1960	1700	2230	5320	1140	620	811
5	1030	1060	800	730	880	1870	1670	2680	5150	1350	600	797
6	1010	1070	840	720	822	1690	1630	2620	5340	1510	580	788
7	1010	1090	860	740	778	1490	1660	2470	5020	1460	561	795
8	1020	1110	900	750	741	1570	1660	2370	4780	1400	522	861
9	1020	1090	880	790	715	2310	1690	2280	4870	1380	492	1060
10	1030	971	840	830	699	1980	1830	2240	4260	1380	478	1150
11	1050	857	750	862	704	1840	1990	2350	3730	1390	468	1060
12	1080	800	660	845	715	1780	1940	2450	3290	1420	498	1010
13	1070	784	700	806	725	1790	1890	2290	3010	1340	550	1020
14	1040	811	750	794	735	1680	1800	2230	2720	1250	555	1080
15	1050	851	820	789	757	1630	1830	2140	2650	1200	531	1150
16	1070	891	860	862	800	1570	1930	2010	2520	1150	519	1200
17	1080	933	900	939	1120	1480	1870	1910	2280	1220	496	1210
18	1090	939	910	823	1150	1460	1770	1850	2110	1240	476	1320
19	1070	915	905	868	1050	1470	1670	1850	2050	1160	464	1360
20	1030	900	860	939	922	1430	1650	2030	1990	1070	440	1330
21	1040	840	820	958	823	1370	1640	2410	1840	1030	440	1320
22	1070	760	760	857	800	1340	1760	3030	1720	980	526	1300
23	1070	660	740	834	828	1310	2620	3210	1590	933	583	1250
24	1070	600	770	800	1300	1350	2630	3030	1500	878	578	1210
25	1070	620	780	762	7940	1390	2570	2910	1400	831	577	1180
26	1090	640	770	751	6000	1290	2570	3150	1330	817	584	1190
27	1070	720	750	746	4480	1280	2520	3850	1280	807	583	1150
28	1050	780	725	822	2810	1340	2380	5030	1220	776	588	1140
29	1040	760	700	839	---	1580	2210	5900	1210	754	608	1120
30	1030	720	700	856	---	1770	2130	6360	1250	735	656	1110
31	1030	---	730	975	---	1910	---	6470	---	721	724	---
TOTAL	32690	26342	24135	25357	42433	51590	59110	89190	92790	34952	17303	32446
MEAN	1055	878	779	818	1515	1664	1970	2877	3093	1127	558	1082
MAX	1090	1110	910	975	7940	2340	2630	6470	6050	1510	724	1360
MIN	1010	600	605	720	699	1280	1630	1850	1210	721	440	788
AC-FT	64840	52250	47870	50300	84170	102300	117200	176900	184000	69330	34320	64360
WTR YR 1986	TOTAL	528338		MEAN	1448	MAX	7940	MIN	440	AC-FT	1048000	

PEND OREILLE RIVER BASIN

12334550 CLARK FORK AT TURAH BRIDGE, NEAR BONNER, MT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1985 to current year.

PERIOD OF DAILY RECORD.--

SUSPENDED-SEDIMENT DISCHARGE: March 1985 to September 1986.

REMARKS.--Once-daily or less frequent water temperatures are available in the Helena district office.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SEDIMENT CONCENTRATION: Maximum daily mean, 1,140 mg/L, Feb. 25, 1986; minimum daily mean, 4 mg/L on several days during July and August, 1986.

SEDIMENT LOAD: Maximum daily, 24,400 tons, Feb. 25, 1986; minimum daily 4.8, tons Aug. 20, 21, 1986.

EXTREMES FOR CURRENT YEAR.--

SEDIMENT CONCENTRATION: Maximum daily mean, 1,140 mg/L, Feb. 25; minimum daily mean, 4 mg/L on several days during July and August.

SEDIMENT LOAD: Maximum daily, 24,400 tons, Feb. 25; minimum daily, 4.8 tons, Aug. 20, 21.

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	CLOUD COVER (PER- CENT) (00032)	WEATHER (WMO CODE NUMBER) (00041)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	TEMPER- ATURE, AIR (DEG C) (00020)	TEMPER- ATURE (DEG C) (00010)					
FEB												
25...	1530	9370	75	2	165	11.0	0.5					
APR												
16...	1130	1970	100	51	285	5.5	7.0					
MAY												
14...	1400	2200	--	--	259	9.5	8.0					
20...	1230	1980	--	--	233	21.5	13.0					
22...	1140	3120	--	--	189	8.5	6.0					
28...	0845	4820	0	0	165	18.0	12.0					
30...	1020	5870	--	--	147	23.0	13.5					
JUN												
03...	0930	5670	--	--	153	15.0	13.5					
11...	1000	3910	--	--	219	18.0	13.0					
30...	1545	1250	--	--	295	23.0	17.0					
AUG												
11...	1640	446	--	--	336	23.5	20.5					
SEP												
29...	1800	1110	--	--	390	12.0	--					
DATE	TIME	PH (STAND- ARD UNITS) (00400)	HARD- NESS (MG/L AS CACO3) (00900)	HARD- NESS, NONCAR- BONATE (MG/L CACO3) (00902)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	BICAR- BONATE FET-FLD (MG/L AS HCO3) (00440)	CAR- BONATE FET-FLD (MG/L AS CO3) (00445)	SOLIDS, RESIDUE AT 105 DEG. C, SUS- PENDED (MG/L) (00530)	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	CADMIUM TOTAL RECOV- ERABLE (UG/L AS CD) (01027)
FEB												
25...	1530	7.6	--	--	--	--	74	0	284	64	15	3
APR												
16...	1130	8.0	130	32	36	9.1	120	0	9	7	5	<1
MAY												
28...	0845	7.6	67	10	19	4.8	70	0	--	13	5	1

12334550 CLARK FORK AT TURAH BRIDGE, NEAR BONNER, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)	COPPER, TOTAL RECOV- ERABLE (UG/L AS CU) (01042)	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE) (01045)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB) (01051)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN) (01055)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	ZINC, TOTAL RECOV- ERABLE (UG/L AS ZN) (01092)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)
FEB 25...	<1	470	25	17000	170	92	5	1700	31	1100	27
APR 16...	<1	36	4	410	19	11	<1	50	7	40	5
MAY 28...	<1	100	5	3700	32	19	1	320	9	160	8

DATE	TIME	TEMPER- ATURE (DEG C) (00010)	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	SEDI- MENT, SUS- PENDE (MG/L) (80154)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY) (80155)	SED. SUSP. FALL DIAM. % FINER THAN .002 MM (70337)	SED. SUSP. FALL DIAM. % FINER THAN .004 MM (70338)
FEB 25...	1530	0.5	9370	1370	34700	16	21
APR 16...	1130	7.0	1970	23	122	--	--
MAY 28...	0845	12.0	4820	242	3150	--	--
JUL 17...	1100	12.5	1200	7	23	--	--
AUG 15...	1015	16.0	540	6	8.7	--	--
SEP 15...	1110	10.5	1150	26	81	--	--

DATE	SED. SUSP. FALL DIAM. % FINER THAN .016 MM (70340)	SED. SUSP. FALL DIAM. % FINER THAN .062 MM (70342)	SED. SUSP. FALL DIAM. % FINER THAN .125 MM (70343)	SED. SUSP. FALL DIAM. % FINER THAN .250 MM (70344)	SED. SUSP. FALL DIAM. % FINER THAN .500 MM (70345)	SED. SUSP. FALL DIAM. % FINER THAN .062 MM (70331)
FEB 25...	33	52	66	87	100	--
APR 16...	--	--	--	--	--	67
MAY 28...	--	--	--	--	--	47
JUL 17...	--	--	--	--	--	72
AUG 15...	--	--	--	--	--	53
SEP 15...	--	--	--	--	--	66

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DAY	MEAN CONCEN- TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN- TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN- TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN- TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN- TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN- TRATION (MG/L)	LOADS (T/DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	11	32	9	25	9	16	17	34	30	82	110	695
2	12	35	10	28	9	15	17	35	44	127	68	398
3	13	38	10	28	10	18	17	36	47	140	72	418
4	13	37	10	28	10	20	17	35	38	98	57	302
5	14	39	10	29	10	22	17	34	29	69	44	222
6	14	38	10	29	12	27	16	31	24	53	40	183
7	12	33	10	29	14	33	16	32	21	44	68	274
8	9	25	11	33	16	39	16	32	20	40	82	348
9	8	22	10	29	18	43	16	34	18	35	82	511
10	8	22	10	26	18	41	19	43	15	28	40	214
11	10	28	9	21	18	36	18	42	11	21	26	129
12	12	35	8	17	18	32	20	46	7	14	26	125
13	13	38	8	17	18	34	18	39	7	14	25	121
14	13	37	10	22	18	36	17	36	8	16	19	86
15	13	37	13	30	18	40	16	34	14	29	20	88
16	12	35	14	34	17	39	18	42	22	48	19	81
17	12	35	14	35	17	41	22	56	40	121	19	76
18	12	35	14	35	17	42	20	44	40	124	17	67
19	12	35	13	32	16	39	22	52	36	102	14	56
20	12	33	13	32	16	37	23	58	28	70	14	54
21	12	34	13	29	15	33	28	72	15	33	14	52
22	13	38	12	25	14	29	20	46	13	28	13	47
23	12	35	11	20	14	28	18	41	17	38	12	42
24	11	32	11	18	14	29	16	35	70	246	11	40
25	10	29	10	17	15	32	14	29	1140	24400	10	38
26	10	29	10	17	16	33	13	26	730	11800	10	35
27	10	29	10	19	16	32	12	24	410	4960	11	38
28	9	26	10	21	17	33	15	33	190	1440	13	47
29	8	22	10	21	17	32	14	32	---	---	19	81
30	8	22	9	17	17	32	15	35	---	---	28	134
31	8	22	---	---	17	34	25	66	---	---	36	186
TOTAL	---	987	---	763	---	997	---	1234	---	44220	---	5188
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	27	143	13	68	159	2600	10	34	5	9.4	14	30
2	25	133	15	77	153	2410	10	33	5	9.1	17	39
3	24	128	14	76	123	1820	10	31	5	8.6	14	32
4	16	73	24	145	110	1580	10	31	5	8.4	10	22
5	16	72	27	195	92	1280	15	55	6	9.7	10	22
6	14	62	34	241	98	1410	15	61	6	9.4	9	19
7	13	58	25	167	87	1180	12	47	6	9.1	8	17
8	13	58	21	134	68	878	12	45	6	8.5	13	30
9	18	82	26	160	68	894	11	41	5	6.6	30	86
10	19	94	23	139	57	656	11	41	5	6.5	34	106
11	20	107	27	171	56	564	10	38	5	6.3	20	57
12	15	79	33	218	47	418	9	35	6	8.1	14	38
13	15	77	22	136	38	309	8	29	5	7.4	13	36
14	16	78	16	96	33	242	8	27	5	7.5	16	47
15	18	89	25	144	28	200	8	26	5	7.2	25	78
16	20	104	20	109	22	150	8	25	4	5.6	28	91
17	17	86	15	77	18	111	8	26	4	5.4	25	82
18	13	62	13	65	15	85	5	17	4	5.1	28	100
19	12	54	14	70	15	83	4	13	4	5.0	26	95
20	12	53	17	93	14	75	4	12	4	4.8	19	68
21	11	49	35	228	12	60	5	14	4	4.8	18	64
22	20	95	85	695	11	51	6	16	4	5.7	16	56
23	63	446	81	702	10	43	6	15	5	7.9	14	47
24	54	383	55	450	10	40	5	12	5	7.8	12	39
25	38	264	39	306	9	34	5	11	5	7.8	11	35
26	29	201	58	493	10	36	4	8.8	5	7.9	10	32
27	28	191	164	1700	10	35	4	8.7	6	9.4	8	25
28	25	161	293	3980	10	33	4	8.4	6	9.5	6	18
29	18	107	291	4640	10	33	5	10	6	9.8	7	21
30	15	86	232	3980	9	30	4	7.9	9	16	8	24
31	---	---	202	3530	---	---	5	9.7	12	23	---	---
TOTAL	---	3675	---	23285	---	17340	---	788.5	---	257.3	---	1456
TOTAL LOAD FOR YEAR:		100190.8 TONS.										

12335500 NEVADA CREEK ABOVE RESERVOIR, NEAR FINN, MT

LOCATION.--Lat 46°46'42", long 112°46'00", in SW¼NW¼SW¼ 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, and 4.0 mi west of Finn.

DRAINAGE AREA.--116 mi².

PERIOD OF RECORD.--April 1939 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 4,640 ft, from topographic map. Prior to Apr. 30, 1942, nonrecording gage at site 1.0 mi downstream at different datum. Apr. 30, 1942 to July 26, 1953, water-stage recorder at site 0.2 mi downstream at different datum. July 26, 1953, to Nov. 6, 1978, water-stage recorder at site 0.8 mi upstream at different datum.

REMARKS.--Estimated daily discharges: Oct. 8, 9, and Nov. 10 to Feb. 24. Records good except those for discharges greater than 200 ft³/s and those for the period Sept. 9-30, which are fair, and those for periods of estimated daily discharges, which are poor. Diversions for irrigation of about 2,900 acres upstream from station. Several observations of water temperature and specific conductance were made during the year and are published as miscellaneous water-quality data in the back of this report.

AVERAGE DISCHARGE.--47 years, 38.3 ft³/s, 27,750 acre-ft/yr

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,800 ft³/s June 2, 1953, gage height, 6.00 ft, site and datum then in use, from rating curve extended above 400 ft³/s on basis of inflow-outflow study of Nevada Lake; maximum gage height, 7.40 ft May 29, 1953, site and datum then in use (backwater from diversion dam); minimum discharge, probably less than 2.0 ft³/s at times in 1944, 1957, 1972, and 1973.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 290 ft³/s and maximums (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Feb. 24	2000	ice jam	*5.11	Feb. 26	1630	*1,100	4.52

Minimum discharge, 6.0 ft³/s Aug. 18-21, gage height 1.16 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17	21	10	12	18	147	68	41	84	19	16	10
2	19	22	10	13	18	183	67	39	77	17	15	9.5
3	29	22	11	12	17	183	60	40	73	17	14	8.8
4	27	21	12	11	16	235	51	57	68	26	15	8.3
5	24	23	12	10	15	223	47	68	95	72	15	8.1
6	23	22	11	12	14	133	45	66	81	39	15	8.2
7	24	24	11	13	13	240	43	64	55	38	13	8.4
8	20	23	12	13	12	194	45	60	58	37	11	9.6
9	21	19	11	14	11	94	51	52	52	44	10	16
10	25	16	10	15	10	78	55	52	42	38	9.8	12
11	25	13	9.5	17	10	64	56	85	36	38	9.4	11
12	24	12	9.0	17	9.6	68	60	59	31	33	9.6	13
13	23	13	9.0	14	10	56	56	48	30	29	9.7	16
14	22	13	10	12	11	46	63	41	30	28	8.3	20
15	22	14	11	12	12	42	58	38	52	27	7.9	20
16	22	15	13	13	13	41	54	38	32	31	6.9	23
17	21	16	16	15	17	40	47	37	28	33	6.5	24
18	21	13	15	15	22	37	41	39	30	28	6.5	27
19	21	12	13	14	19	35	40	38	26	26	6.4	23
20	21	12	13	14	14	39	38	38	21	24	6.2	21
21	21	12	12	14	11	50	36	68	20	22	7.5	22
22	24	11	12	12	13	54	38	111	19	20	8.6	18
23	22	10	12	11	20	41	55	111	18	21	7.5	17
24	22	11	13	13	100	41	66	91	17	20	6.8	17
25	22	11	12	12	753	38	67	77	16	19	7.0	20
26	22	11	12	10	690	35	76	72	20	19	7.3	18
27	22	11	12	10	341	40	68	90	17	18	7.3	16
28	21	12	11	12	158	46	57	110	15	18	7.3	16
29	21	11	11	14	---	58	50	113	17	18	7.3	16
30	21	11	12	16	---	72	45	105	25	17	7.7	15
31	21	---	12	17	---	72	---	94	---	17	8.6	---
TOTAL	690	457	359.5	409	2367.6	2725	1603	2042	1185	853	294.1	471.9
MEAN	22.3	15.2	11.6	13.2	84.6	87.9	53.4	65.9	39.5	27.5	9.49	15.7
MAX	29	24	16	17	753	240	76	113	95	72	16	27
MIN	17	10	9.0	10	9.6	35	36	37	15	17	6.2	8.1
AC-FT	1370	906	713	811	4700	5410	3180	4050	2350	1690	583	936
CAL YR 1985	TOTAL	8168.3		MEAN	22.4	MAX	509	MIN	3.2	AC-FT	16200	
WTR YR 1986	TOTAL	13457.1		MEAN	36.9	MAX	753	MIN	6.2	AC-FT	26690	

PEND OREILLE RIVER BASIN

12339450 CLEARWATER RIVER NEAR CLEARWATER, MT

LOCATION.--Lat 47°01'09", long 113°23'12", in NW¼NW¼NW¼ sec.33, T.15 N., R.14 W., Missoula County, Hydrologic Unit 17010203, Clearwater State Forest, on left bank 700 ft upstream from Blanchard Lake, 1.3 mi northwest of Clearwater, and at mile 5.2, revised.

DRAINAGE AREA.--345 mi².

PERIOD OF RECORD.--October 1974 to current year.

GAGE.--Water-stage recorder. Datum of gage is 3,814.23 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Nov. 23 to Dec. 5, Dec. 9-15, Dec. 21 to Jan. 9, Jan. 12-17, 21-28, Feb. 6-16, 19, 20. Records good except those for periods of estimated record, which are poor. A few minor diversions for irrigation upstream from station. During summer months Elbow Lake, 1.5 mi upstream, may be regulated for recreational purposes. Several observations of water temperature and specific conductance were made during the year and are published as miscellaneous water-quality data in the back of this report.

AVERAGE DISCHARGE.--12 years, 295 ft³/s, 11.61 in/yr, 213,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,900 ft³/s May 17, 1975, gage height, 7.85 ft; minimum, 27 ft³/s Aug. 25, 26, 1977, gage height, 3.69 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,350 ft³/s May 31, gage height, 6.58 ft; minimum, 36 ft³/s Aug. 29, gage height, 3.81 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	189	161	120	90	93	346	1180	596	1320	178	61	42		
2	180	174	125	85	98	377	1230	563	1240	171	59	44		
3	187	184	130	80	104	392	1210	544	1140	163	58	45		
4	186	191	140	75	111	411	1140	569	1040	160	57	46		
5	183	209	150	80	117	433	1080	655	949	157	55	46		
6	184	229	150	82	115	451	1020	735	885	157	53	44		
7	188	253	155	84	110	479	978	759	807	155	51	43		
8	183	267	155	84	110	524	948	749	766	152	49	44		
9	174	274	150	88	105	598	948	723	718	151	47	49		
10	169	263	130	87	105	651	980	694	668	147	46	54		
11	164	250	110	91	100	682	1020	677	619	148	46	57		
12	162	231	115	88	105	701	1030	655	571	148	45	57		
13	158	215	115	85	110	709	1010	628	523	148	45	57		
14	156	203	115	82	120	703	960	603	480	144	46	57		
15	156	194	115	80	125	703	899	577	454	122	45	57		
16	157	190	117	80	130	708	847	548	420	128	45	57		
17	158	189	116	88	131	651	797	525	383	129	45	57		
18	158	181	114	92	132	634	753	503	356	128	44	59		
19	156	177	112	90	135	620	714	490	332	127	43	59		
20	154	176	109	93	125	579	678	486	310	127	43	60		
21	153	171	105	92	130	564	649	559	289	137	42	60		
22	151	159	100	85	131	564	642	722	270	134	42	61		
23	151	150	96	90	134	572	691	830	255	128	41	61		
24	151	140	93	90	146	583	766	817	240	123	40	63		
25	152	140	90	85	159	596	793	779	228	117	40	64		
26	152	130	88	85	177	603	786	781	212	107	40	64		
27	154	130	90	88	217	605	749	860	195	93	39	64		
28	157	130	95	90	290	630	712	1020	163	72	37	64		
29	158	130	100	88	---	705	675	1180	184	67	36	65		
30	159	125	100	89	---	851	634	1280	182	66	36	66		
31	159	---	90	90	---	1040	---	1340	---	62	38	---		
TOTAL	5099	5616	3590	2676	3665	18665	26519	22447	16199	4046	1414	1666		
MEAN	164	187	116	86.3	131	602	884	724	540	131	45.6	55.5		
MAX	189	274	155	93	290	1040	1230	1340	1320	178	61	66		
MIN	151	125	88	75	93	346	634	486	163	62	36	42		
CFSM	.48	.54	.34	.25	.38	1.74	2.56	2.10	1.57	.38	.13	.16		
IN.	.55	.61	.39	.29	.40	2.01	2.86	2.42	1.75	.44	.15	.18		
AC-FT	10110	11140	7120	5310	7270	37020	52600	44520	32130	8030	2800	3300		
CAL YR 1985	TOTAL	91033	MEAN	249	MAX	1310	MIN	41	CFSM	.72	IN.	9.82	AC-FT	180600
WTR YR 1986	TOTAL	111602	MEAN	306	MAX	1340	MIN	36	CFSM	.89	IN.	12.03	AC-FT	221400

83

LOCATION.--Lat 46°53'59", long 113°45'20", in SE¹SE¹NW¹ 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 mile 7.9, revised.

WATER-DISCHARGE RECORDS

REVISED RECORDS.--WSP 1216: Drainage area.

REMARKS.--Estimated daily discharges: Nov. 22 to Mar. 2. Water-discharge records good except those for estimated daily discharges, which are poor. Diversions for irrigation of about 20,000 acres upstream from station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 19,200 ft³/s June 10, 1964, gage height, 10.89 ft; minimum daily, 200 ft³/s Jan. 4, 5, 1950.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 7,300 ft³/s May 30, gage height, 7.10 ft; minimum daily, 460 ft³/s Feb. 11.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	888	984	540	610	540	1900	3300	2490	6760	1300	638	552
2	874	1060	510	640	560	1900	3330	2390	6350	1250	627	538
3	888	1080	520	660	580	1970	3210	2400	5900	1210	620	529
4	924	1090	600	640	590	2060	3060	2720	5310	1180	620	520
5	915	1180	680	600	580	2270	2940	3100	4880	1250	605	509
6	899	1230	680	600	540	2560	2850	3200	4790	1330	598	504
7	932	1260	660	600	500	2580	2810	3170	4440	1270	580	505
8	898	1270	680	580	480	3000	2840	3090	4210	1180	569	517
9	852	1240	650	600	470	3060	2960	2980	3910	1140	555	585
10	843	1120	600	660	470	2870	3160	2910	3550	1120	554	608
11	853	1020	560	650	460	2720	3280	2890	3270	1110	568	595
12	863	913	510	620	470	2620	3280	2850	3070	1120	572	566
13	854	901	520	580	480	2610	3170	2750	2840	1080	579	555
14	838	931	580	550	500	2460	3040	2680	2670	1040	585	550
15	837	961	620	550	520	2330	2940	2570	2700	994	576	569
16	861	1010	640	560	560	2310	2840	2450	2570	964	563	577
17	888	955	680	570	600	2180	2720	2330	2380	969	557	583
18	885	889	690	580	650	2110	2580	2260	2220	962	560	615
19	871	829	700	580	620	2060	2470	2270	2110	944	553	598
20	869	874	660	580	550	2040	2370	2510	2000	918	552	583
21	871	839	640	580	560	2070	2330	3260	1890	892	554	592
22	884	650	620	580	580	2140	2470	4390	1770	870	571	592
23	906	550	620	570	620	2110	2950	4460	1660	844	573	579
24	897	510	640	570	800	2100	3240	4090	1570	820	558	574
25	909	520	640	560	1000	2100	3230	3910	1480	796	547	572
26	952	550	620	560	1200	2060	3140	4210	1410	766	538	574
27	970	600	620	550	1600	2040	3010	5130	1340	742	530	571
28	970	620	560	540	2100	2150	2910	6190	1310	719	516	572
29	968	620	540	540	---	2460	2770	6810	1400	690	513	573
30	959	600	540	530	---	2870	2630	7120	1360	655	529	579
31	970	---	570	530	---	3180	---	7120	---	645	545	---
TOTAL	27788	26856	18890	18120	19180	72890	87830	110700	91120	30770	17605	16946
MEAN	896	895	609	585	685	2351	2928	3571	3037	993	568	565
MAX	970	1270	700	660	2100	3180	3330	7120	6760	1330	638	615
MIN	837	510	510	530	460	1900	2330	2260	1310	645	513	504
CFSM	.39	.39	.27	.26	.30	1.03	1.28	1.56	1.33	.43	.25	.25

PEND OREILLE RIVER BASIN

12340000 BLACKFOOT RIVER NEAR BONNER, MT--Continued

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.

SUSPENDED-SEDIMENT DISCHARGE: July to September 1986.

REMARKS.--Once daily water temperature for July to September 1986 are available in the Helena District Office.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE (water years 1956-59): Maximum, 21.0°C, Jul. 23-25, 30, 1956; minimum, 0.0°C on many days during winter periods.

SEDIMENT CONCENTRATION: Maximum daily mean, 6 mg/L, Jul. 25, 1986; minimum daily mean, 1 mg/L on many days during Aug. and Sep. 1986.

SEDIMENT LOAD: Maximum daily, 14 tons, Jul. 14, 1986; minimum daily, 1.5 tons Sep. 13-15, 24, 26, 27, 1986.

EXTREMES FOR CURRENT YEAR.--

SEDIMENT CONCENTRATION: Maximum daily mean, 6 mg/L, Jul. 25; minimum daily mean, 1 mg/L, on many days during Aug. and Sep.

SEDIMENT LOAD: Maximum daily 14 tons, Jul. 14; minimum daily, 1.5 tons, Sep. 13-15, 24, 26, 27.

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

			STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	CLOUD COVER (PER- CENT) (00032)	WEATHER (WMO CODE NUMBER) (00041)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	TEMPER- ATURE, AIR (DEG C) (00020)	TEMPER- ATURE (DEG C) (00010)			
	DATE	TIME									
	OCT										
	01...	0845	--	--	--	239	1.0	6.0			
	NOV										
	13...	0820	--	--	--	237	-10.0	0.0			
	JAN										
	07...	1300	606	--	--	188	-7.0	0.0			
	FEB										
	20...	1220	552	--	--	244	-7.0	0.0			
	26...	1015	1200	50	1	167	7.0	0.0			
	APR										
	09...	1100	2900	--	--	174	16.0	7.0			
	16...	0830	2850	100	51	185	4.0	6.5			
	MAY										
	19...	1750	2300	--	--	195	22.0	13.0			
	28...	0850	6100	--	--	161	16.5	12.0			
	JUL										
	02...	1730	1230	--	--	238	27.0	20.0			
	AUG										
	14...	1400	591	--	--	256	25.5	18.0			
			HARD- NESS	NONCARB WH WAT	CALCIUM DIS- SOLVED	MAGNE- SIUM, DIS- SOLVED	BICAR- BONATE WH WAT TOTAL FIELD	CAR- BONATE WH WAT TOTAL FIELD	ARSENIC TOTAL	ARSENIC DIS- SOLVED	CADMIUM TOTAL RECOV- ERABLE
	DATE	TIME	PH (STAND- ARD UNITS) (00400)	HARD- NESS (MG/L AS CACO3) (00900)	TOT FLD MG/L AS CACO3 (00902)	AS MG (00915)	MG/L AS HCO3 (00440)	MG/L AS CO3 (00445)	AS AS (01002)	AS AS (01000)	AS CD (01027)
FEB											
26...	1015	7.6	--	--	--	--	100	0	1	<1	2
APR											
16...	0830	8.0	90	1	23	8.0	110	0	1	<1	<1

PEND OREILLE RIVER BASIN

12340500 CLARK FORK ABOVE MISSOULA, MT

LOCATION.--Lat 46°52'38", long 113°55'53", in NW¼NW¼ 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 mile 361.6.

DRAINAGE AREA.--5,999 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1929 to current year. Monthly discharge only for some period, 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. Datum of gage is 3,198.30 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to May 27, 1929, nonrecording gage.

REMARKS.--Estimated daily discharges: Nov. 23 to Jan. 30, Feb. 12-14. Water-discharge records good except those for estimated daily discharges, which are fair. Diurnal fluctuation caused by powerplant at Milltown. Diversions for irrigation of about 120,000 acres upstream from station.

AVERAGE DISCHARGE.--57 years, 3,035 ft³/s, 2,199,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 32,300 ft³/s June 21, 1975, gage height, 13.75 ft; minimum, 115 ft³/s Oct. 25, 1943, gage height, 0.64 ft, powerplant shutdown; minimum daily, 340 ft³/s Sept. 27, 1937.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1908 reached a discharge of 48,000 ft³/s, provided by The Montana Power Company.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 13,600 ft³/s May 30, gage height, 8.67 ft; minimum, 920 ft³/s Aug. 13, gage height, 2.34 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1880	1900	1100	1400	1520	4460	5260	4430	12900	2600	1400	1360
2	1880	2010	1100	1450	1560	4220	5320	4260	12200	2510	1310	1370
3	1900	2030	1200	1500	1600	4220	5160	4320	11500	2410	1300	1370
4	1930	2070	1400	1450	1600	4110	4940	4900	10800	2390	1250	1320
5	1930	2140	1500	1400	1550	4380	4760	5570	10200	2610	1250	1310
6	1910	2200	1500	1300	1470	4600	4640	5730	10100	2890	1170	1280
7	2030	2250	1600	1400	1310	4570	4570	5650	9640	2790	1170	1260
8	1970	2250	1700	1500	1280	5320	4620	5520	9050	2630	1140	1340
9	1870	2210	1500	1550	1230	5430	4760	5380	8890	2560	1050	1570
10	1820	1960	1400	1550	1320	4960	5090	5220	7940	2560	1050	1760
11	1860	1740	1200	1500	1220	4640	5300	5280	7070	2560	1050	1690
12	1910	1550	1100	1400	1100	4470	5350	5330	6360	2590	1070	1580
13	1920	1500	1200	1350	1150	4440	5190	5040	5840	2500	1140	1570
14	1890	1570	1300	1300	1150	4230	4970	4890	5370	2320	1130	1640
15	1860	1670	1400	1300	1310	4020	4910	4750	5290	2260	1090	1720
16	1860	1920	1400	1350	1520	3910	4840	4530	5090	2160	1080	1790
17	1910	1950	1500	1400	1580	3760	4690	4320	4720	2240	1060	1790
18	1910	1940	1500	1500	1680	3630	4460	4180	4330	2250	1020	1920
19	1880	1640	1450	1500	1680	3530	4210	4130	4170	2180	999	1980
20	1850	1640	1400	1600	1520	3480	4040	4500	4010	2040	979	1930
21	1860	1660	1300	1500	1430	3460	3970	5560	3800	1970	979	1910
22	1870	1450	1200	1400	1460	3550	4170	7310	3530	1860	1050	1920
23	1930	1300	1150	1300	1490	3550	4990	7740	3280	1840	1130	1840
24	1910	1050	1200	1300	2050	3500	5630	7180	3100	1740	1090	1780
25	1930	1200	1300	1300	8340	3500	5670	6870	2910	1650	1090	1770
26	1920	1250	1350	1200	7850	3390	5520	7260	2790	1660	1090	1780
27	1970	1300	1350	1150	6850	3390	5340	8740	2640	1580	1090	1750
28	1920	1400	1300	1200	5330	3410	5150	11000	2570	1580	1080	1740
29	1940	1350	1200	1300	---	3980	4910	12500	2550	1460	1100	1690
30	1910	1300	1250	1400	---	4640	4670	13200	2550	1480	1140	1720
31	1950	---	1300	1430	---	5090	---	13400	---	1390	1280	---
TOTAL	59080	51400	41350	43180	63150	127840	147100	198690	185190	67260	34827	49450
MEAN	1906	1713	1334	1393	2255	4124	4903	6409	6173	2170	1123	1648
MAX	2030	2250	1700	1600	8340	5430	5670	13400	12900	2890	1400	1980
MIN	1820	1050	1100	1150	1100	3390	3970	4130	2550	1390	979	1260
AC-FT	117200	102000	82020	85650	125300	253600	291800	394100	367300	133400	69080	98080
CAL YR 1985	TOTAL	826951		MEAN	2266	MAX	8680	MIN	750	AC-FT	1640000	
WTR YR 1986	TOTAL	1068517		MEAN	2927	MAX	13400	MIN	979	AC-FT	2119000	

12340500 CLARK FORK ABOVE MISSOULA, MT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1969-71, 1977-83, 1986.

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: June 1977 to September 1983.

SUSPENDED-SEDIMENT DISCHARGE: July to September 1986.

REMARKS.--Once daily water temperature from July to September 1986 are available in the Helena District Office.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE (water years 1977-83): Maximum, 22.5°C, Aug. 7, 8, 1983; minimum, 0.0°C on many days during winter periods.

SEDIMENT CONCENTRATION: Maximum daily mean, 39 mg/L, Sept. 10, 1986; minimum daily mean, 4 mg/L, Aug. 1, 5, 20, 1986.

SEDIMENT LOAD: Maximum daily, 185 tons, Sept. 10, 1986; minimum daily, 11 tons, Aug. 20, 1986.

EXTREMES FOR CURRENT YEAR.--

SEDIMENT CONCENTRATION: Maximum daily mean, 39 mg/L, Sept. 10; minimum daily mean, 4 mg/L, Aug. 1, 5, 20.

SEDIMENT LOAD: Maximum daily, 185 tons Sept. 10; minimum daily, 11 tons, Aug. 20.

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	CLOUD COVER (PER- CENT) (00032)	WEATHER (WMO CODE NUMBER) (00041)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	TEMPER- ATURE, AIR (DEG C) (00020)	TEMPER- ATURE (DEG C) (00010)	SEDI- MENT, SUS- PENDED (MG/L) (80154)	SEDI- MENT, DIS- CHARGE, SUS- PENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT										
03...	0820	--	--	--	330	6.5	7.5	--	--	--
NOV										
13...	1320	1400	--	--	331	-5.5	0.0	--	--	--
JAN										
10...	0930	1560	--	--	358	0.0	0.0	--	--	--
FEB										
18...	1740	1660	--	--	317	1.0	1.0	--	--	--
APR										
11...	1250	5200	--	--	205	10.0	4.0	--	--	--
MAY										
28...	1130	11000	--	--	161	22.0	12.5	--	--	--
JUL										
02...	1120	2470	--	--	279	23.0	17.0	--	--	--
17...	1540	2230	25	1	--	25.0	15.0	8	48	60
AUG										
14...	0900	1130	--	--	300	18.0	16.5	--	--	--
15...	1200	1050	0	0	--	21.0	19.0	14	40	52
SEP										
15...	1340	1790	60	1	--	15.0	13.0	24	116	44

PEND OREILLE RIVER BASIN

12340500 CLARK FORK ABOVE MISSOULA, MT--Continued

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DAY	MEAN CONCEN- TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN- TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN- TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN- TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN- TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN- TRATION (MG/L)	LOADS (T/DAY)
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1							---	---	4	15	16	59
2							---	---	6	21	19	70
3							---	---	5	18	14	52
4							---	---	5	17	11	39
5							---	---	4	13	10	35
6							---	---	5	16	8	28
7							---	---	5	16	7	24
8							---	---	6	18	11	40
9							---	---	6	17	28	119
10							---	---	6	17	39	185
11							---	---	6	17	23	105
12							---	---	6	17	18	77
13							---	---	6	18	15	64
14							13	81	6	18	15	66
15							10	61	9	26	20	93
16							10	58	5	15	23	111
17							8	48	5	14	23	111
18							8	49	6	17	31	161
19							7	41	5	13	30	160
20							6	33	4	11	26	135
21							7	37	5	13	19	98
22							6	30	5	14	18	93
23							5	25	7	21	17	84
24							6	28	6	18	14	67
25							6	27	9	26	11	53
26							7	31	14	41	13	62
27							7	30	19	56	13	61
28							7	30	22	64	11	52
29							7	28	12	36	10	46
30							6	24	8	25	11	51
31							5	19	14	48	---	---
TOTAL							---	680	---	696	---	2401
TOTAL LOAD FOR PERIOD:			3777	TONS.								

PEND OREILLE RIVER BASIN

89

12342500 WEST FORK BITTERROOT RIVER NEAR CONNER, MT

LOCATION.--Lat 45°43'30", long 114°16'50", in SE¼NE¼NW¼ 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 mile 19.2.

DRAINAGE AREA.--317 mi².

PERIOD OF RECORD.--April 1941 to current year.

REVISED RECORDS.--WSP 1246: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 4,581.4 ft above National Geodetic Vertical Datum of 1929 (U.S. Forest Service bench mark).

REMARKS.--Estimated daily discharges: Dec. 9-11, 19-21, 25-29, 31, Jan. 2, 4-8, 11-15, 21-22, 25-27, Feb. 8-15. Records good except those for estimated daily discharges, which are fair. Flow regulated by Painted Rocks Lake (station 12342000). Diversions for irrigation of about 200 acres upstream from station. Several observations of water temperature and specific conductance were made during the year and are published as miscellaneous water-quality data in the back of this report.

AVERAGE DISCHARGE.--45 years, 288 ft³/s, 208,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,060 ft³/s May 9, 1947, gage height, 6.18 ft; minimum, 0.2 ft³/s Nov. 25, 1952; minimum daily, 0.6 ft³/s May 3-7, 1954.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,160 ft³/s May 30, gage height, 4.54 ft; minimum daily, 58 ft³/s Jan. 1-8, 26-28.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	118	107	92	58	61	95	159	190	1890	234	295	262
2	118	104	90	58	61	98	161	190	1690	222	293	261
3	117	104	90	58	61	101	163	192	1630	211	293	261
4	116	104	90	58	62	102	164	193	1470	208	361	248
5	116	104	88	58	62	105	166	196	1320	216	434	234
6	116	104	88	58	62	108	166	197	1180	214	367	231
7	116	104	88	58	62	110	168	200	1070	205	293	229
8	116	104	86	58	62	112	169	200	1020	203	292	227
9	114	102	84	59	62	114	170	201	892	203	291	227
10	113	102	82	59	61	116	172	203	791	203	289	226
11	113	102	81	59	61	118	174	204	716	203	289	224
12	113	102	81	59	60	114	175	299	657	203	289	224
13	113	102	79	59	60	111	175	451	607	203	289	224
14	111	102	79	59	59	112	177	478	563	203	288	220
15	111	101	75	59	59	113	178	459	542	203	285	220
16	111	100	72	59	59	113	178	436	495	203	285	218
17	111	100	70	60	61	113	178	429	452	203	285	217
18	111	100	69	59	61	113	178	429	421	203	282	215
19	109	100	67	60	61	113	178	475	389	203	281	174
20	109	99	66	59	61	146	178	612	361	203	281	213
21	109	98	65	59	61	146	178	894	341	203	279	213
22	109	98	65	59	62	146	179	1090	315	247	277	211
23	109	97	64	59	62	146	181	1020	295	306	276	210
24	109	96	64	59	67	146	181	916	285	303	273	208
25	109	95	64	59	79	146	182	890	275	296	272	207
26	107	94	62	58	83	146	184	1040	265	293	269	204
27	107	94	61	58	88	146	185	1420	256	293	269	203
28	107	94	60	58	91	147	187	1810	245	294	267	200
29	107	93	59	59	---	149	187	2010	251	298	265	199
30	107	92	59	59	---	152	189	2120	251	297	265	197
31	107	---	59	59	---	155	---	2060	---	297	265	---
TOTAL	3459	2998	2299	1820	1811	3852	5260	21504	20935	7276	9039	6607
MEAN	112	99.9	74.2	58.7	64.7	124	175	694	698	235	292	220
MAX	118	107	92	60	91	155	189	2120	1890	306	434	262
MIN	107	92	59	58	59	95	159	190	245	203	265	174
AC-FT	6860	5950	4560	3610	3590	7640	10430	42650	41520	14430	17930	13100
CAL YR 1985	TOTAL	65638	MEAN	180	MAX	824	MIN	59	AC-FT	130200		
WTR YR 1986	TOTAL	86860	MEAN	238	MAX	2120	MIN	58	AC-FT	172300		

PEND OREILLE RIVER BASIN

12344000 BITTERROOT RIVER NEAR DARBY, MT

LOCATION.--Lat 45°58'20", long 114°08'26", in SW¼SE¼NE¼ sec.36, T.3 N., R.21 W., Ravalli County, Hydrologic Unit 17010205, on left bank 50 ft upstream, revised, from bridge on U.S. Highway 93, 0.3 mi downstream from Chaffin Creek, 4.1 mi southeast of Darby, and at mile 77.2.

DRAINAGE AREA.--1,049 mi².

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. Datum of gage is 3,943.14 ft above National Geodetic Vertical Datum of 1929. Prior to Aug. 2, 1939, nonrecording gage at highway bridge 45 ft upstream at same datum.

REMARKS.--Estimated daily discharges: Dec. 11-14, Dec. 29 to Jan. 1. 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 of station. Ditch bypassing station irrigates about 500 acres downstream from station. Several observations of water temperature and specific conductance were made during the year and are published as miscellaneous water-quality data in the back of this report.

AVERAGE DISCHARGE.--49 years, 926 ft³/s, 670,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,500 ft³/s May 9, 1947, gage height, 8.18 ft; maximum gage height, 8.42 ft June 17, 1974 (backwater from log jam); minimum discharge observed, about 71 ft³/s Feb. 9, 1939; minimum gage height, 0.04 ft Nov. 21, 1979, result of freezeup and regulation.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 7,560 ft³/s May 30, gage height, 6.44 ft; minimum, 152 ft³/s Feb. 8, gage height, 0.06 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	312	348	253	195	275	662	1120	949	6260	834	489	488
2	310	380	244	197	274	683	1020	1000	5780	771	488	454
3	331	407	271	198	274	696	890	1300	5460	751	485	434
4	346	393	251	190	260	681	839	1780	4910	758	488	423
5	325	403	249	193	251	678	812	1680	4650	856	590	395
6	318	385	250	199	231	666	831	1540	4420	782	566	383
7	343	379	252	197	190	709	896	1460	3990	711	450	380
8	328	373	249	194	177	949	1050	1420	3990	674	441	442
9	289	335	215	201	205	876	1130	1350	3420	684	434	526
10	312	277	203	206	231	765	1270	1340	3010	676	431	471
11	338	269	200	203	204	690	1240	1320	2840	714	437	439
12	331	268	210	195	202	636	1180	1280	2750	677	425	418
13	319	257	220	195	211	578	1060	1440	2510	622	426	416
14	313	276	230	196	210	538	948	1540	2320	592	421	425
15	322	300	235	199	219	502	897	1450	2390	568	410	440
16	337	344	233	205	246	478	868	1370	2130	564	403	442
17	333	339	236	226	326	461	822	1350	1960	584	398	430
18	322	307	225	216	312	438	769	1370	1860	539	397	445
19	310	275	212	221	273	412	736	1760	1780	514	396	411
20	310	281	207	230	241	439	720	2430	1510	495	395	464
21	311	281	205	222	240	454	806	3320	1360	491	428	466
22	324	261	205	206	237	468	1520	3390	1250	498	478	444
23	339	234	207	215	286	458	2180	2980	1160	571	443	420
24	329	234	206	215	466	469	1780	2720	1100	554	438	427
25	344	260	201	185	595	462	1570	2890	1100	544	423	445
26	418	277	198	183	843	452	1390	3770	1110	550	412	441
27	398	276	197	206	812	478	1240	5230	1010	538	401	437
28	399	269	184	224	686	591	1170	6240	939	523	393	429
29	379	257	180	236	---	866	1080	6770	967	511	402	427
30	365	265	185	258	---	1180	996	7020	939	500	438	423
31	357	---	190	269	---	1240	---	6780	---	493	481	---
TOTAL	10412	9210	6803	6475	8977	19655	32830	80239	78875	19139	13707	13085
MEAN	336	307	219	209	321	634	1094	2588	2629	617	442	436
MAX	418	407	271	269	843	1240	2180	7020	6260	856	590	526
MIN	289	234	180	183	177	412	720	949	939	491	393	380
AC-FT	20650	18270	13490	12840	17810	38990	65120	159200	156400	37960	27190	25950
CAL YR 1985	TOTAL	227983	MEAN	625	MAX	3220	MIN	180	AC-FT	452200		
WTR YR 1986	TOTAL	299407	MEAN	820	MAX	7020	MIN	177	AC-FT	593900		

PEND OREILLE RIVER BASIN

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12353000 CLARK FORK BELOW MISSOULA, MT

LOCATION.--Lat 46°52'09", long 114°07'33", in NW¼NE¼SE¼ 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 mile 348.8, revised.

DRAINAGE AREA.--9,003 mi².

WATER-DISCHARGE RECORDS

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. Datum of gage is 3,083.88 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers).

REMARKS.--No estimated daily discharges this year. Water-discharge records excellent. 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.

AVERAGE DISCHARGE.--57 years, 5,521 ft³/s, 4,000,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 52,800 ft³/s May 23, 1948, gage height, 12.08 ft; minimum, 388 ft³/s Jan. 18, 1933; minimum gage height, 0.30 ft about Jan. 16, 1954, Mar. 24, 1964.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 32,300 ft³/s May 31, gage height, 9.27 ft; minimum, 1,610 ft³/s Aug. 11, 21, gage height, 1.08 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3250	3530	2000	2170	2640	7990	9370	7140	32000	4690	2140	2310
2	3240	3600	1970	2220	2760	7480	9230	6730	30800	4380	2060	2500
3	3260	3770	2130	2260	2780	7480	8840	6850	28700	4150	1990	2430
4	3330	3930	2490	2180	2770	7340	8310	8370	26600	4100	1970	2350
5	3340	4030	2590	1950	2690	7450	7910	10100	25500	4480	1940	2290
6	3270	4120	2640	2060	2590	7680	7660	9960	26000	4960	1910	2200
7	3390	4100	2780	2140	2390	7600	7620	9550	23700	4770	1900	2170
8	3450	4060	2910	2130	2170	8650	7860	9180	21800	4390	1870	2250
9	3350	3950	2650	2310	2120	9500	8430	8850	20700	4190	1750	2530
10	3230	3600	2370	2400	2250	8660	9080	8610	17900	4200	1710	2850
11	3260	3250	2110	2400	2120	7980	9510	8620	15900	4230	1680	2800
12	3330	2940	1940	2300	1860	7540	9440	8600	14700	4420	1660	2630
13	3330	2800	2160	2170	1910	7300	9150	8190	13500	4290	1760	2610
14	3290	2830	2290	2040	2080	6940	8640	8100	12300	3980	1820	2660
15	3210	2940	2450	2080	2100	6480	8260	7990	12000	3820	1790	2790
16	3280	3290	2530	2210	2250	6220	8050	7610	11700	3670	1750	2940
17	3370	3440	2670	2380	3440	5980	7740	7270	10600	3660	1750	2960
18	3400	3190	2690	2550	4190	5730	7380	7060	9790	3650	1690	3140
19	3340	2810	2590	2520	3920	5560	6960	7250	9270	3500	1700	3230
20	3290	2810	2520	2770	3150	5410	6640	9280	8560	3280	1670	3160
21	3300	2850	2360	2740	2800	5340	6480	12600	7730	3140	1620	3170
22	3320	2560	2120	2480	2740	5400	6880	15800	6970	2970	1700	3200
23	3390	2190	2050	2330	3090	5420	9450	15400	6400	2820	1820	3100
24	3400	1900	2190	2340	4580	5360	11200	13700	5960	2680	1870	3020
25	3420	2120	2210	2320	10200	5390	10500	13000	5570	2570	1820	2980
26	3730	2120	2190	2100	11400	5270	9820	15100	5320	2490	1820	2970
27	3930	2390	2040	2020	11000	5220	9240	19500	5040	2370	1790	2970
28	3810	2500	1920	2180	9380	5340	8670	24700	4760	2370	1750	2950
29	3780	2410	1830	2320	---	6200	8150	28500	4950	2280	1730	2900
30	3660	2310	1890	2400	---	7730	7630	30800	4960	2240	1780	2940
31	3620	---	2040	2490	---	9020	---	32100	---	2170	1970	---
TOTAL	105570	92340	71320	70960	107370	210660	254100	386510	429680	110910	56180	83000
MEAN	3405	3078	2301	2289	3835	6795	8470	12470	14320	3578	1812	2767
MAX	3930	4120	2910	2770	11400	9500	11200	32100	32000	4960	2140	3230
MIN	3210	1900	1830	1950	1860	5220	6480	6730	4760	2170	1620	2170
AC-FT	209400	183200	141500	140700	213000	417800	504000	766600	852300	220000	111400	164600
CAL YR 1985	TOTAL	1550070		MEAN	4247	MAX	20200	MIN	1070	AC-FT	3075000	
WTR YR 1986	TOTAL	1978600		MEAN	5421	MAX	32100	MIN	1620	AC-FT	3925000	

PEND OREILLE RIVER BASIN

12353000 CLARK FORK BELOW MISSOULA, MT--Continued
(National Stream Quality Accounting Network)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1960-64, 1977 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1978 to September 1981.

WATER TEMPERATURE: October 1959 to September 1964, June 1977 to September 1982.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE (water years 1979-81): Maximum, 351 microsiemens, Jan. 27, 1980; minimum, 119 microsiemens, Jun. 21, 1980.

WATER TEMPERATURE (water years 1960-64, 1977-1982): Maximum, 25.0°C, Aug. 19, 22, 24, 1961; minimum, 0.0°C on many days during winter periods.

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (000061)	CLOUD COVER (PER- CENT) (000032)	WEATHER (WMO CODE NUMBER) (000041)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (000095)	TEMPER- ATURE, AIR (DEG C) (000020)	TEMPER- ATURE (DEG C) (000010)	BARO- METRIC PRES- SURE (MM OF HG) (000025)	OXYGEN, DIS- SOLVED (MG/L) (003000)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (003011)	COLI- FORM, FECAL, UM-MF (COLS./ 100 ML) (31625)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
OCT												
02...	1540	3240	--	--	301	9.0	8.0	--	--	--	--	--
23...	1450	3390	40	61	237	9.0	7.5	678	11.7	110	K1300	51
NOV												
13...	1230	--	--	--	288	-8.0	0.0	--	--	--	--	--
JAN												
08...	1245	2160	90	2	277	-3.0	0.0	686	13.3	101	39	35
MAR												
20...	1000	5440	0	0	218	8.0	5.0	692	11.5	99	140	36
MAY												
09...	1130	9010	80	1	170	16.0	8.5	683	10.8	103	K15	93
JUL												
08...	1300	4480	70	1	212	22.0	17.0	683	9.6	111	K15	110
AUG												
12...	1230	1650	100	95	252	16.5	17.0	684	7.9	91	31	920

DATE	TIME	PH (STAND- ARD UNITS) (00400)	TUR- BID- ITY (NTU) (00076)	HARD- NESS (MG/L AS CACO3) (00900)	HARD- NESS, NONCAR- BONATE (MG/L CACO3) (00902)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM AD- SORP- TION RATIO (00931)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	BICAR- BONATE FET-FLD (MG/L AS HCO3) (00440)
OCT											
23...	1450	8.1	10	110	15	30	8.1	5.9	0.3	1.6	120
JAN											
08...	1245	7.8	1.4	130	20	37	9.7	6.7	0.3	2.0	140
MAR											
20...	1000	8.0	3.9	99	11	27	7.6	5.2	0.2	1.6	110
MAY											
09...	1130	7.7	1.2	71	2	19	5.6	3.5	0.2	1.3	83
JUL											
08...	1300	8.1	1.5	110	16	29	7.9	5.9	0.3	1.7	110
AUG											
12...	1230	7.9	1.6	120	7	32	9.3	6.2	0.3	1.9	140

DATE	CAR- BONATE FET-FLD (MG/L AS CO3) (00445)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SiO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)
OCT											
23...	0	93	20	2.2	0.2	12	135	140	0.18	1240	<0.01
JAN											
08...	0	111	20	2.7	0.2	13	160	160	0.22	933	0.01
MAR											
20...	0	87	16	1.9	0.2	13	129	130	0.18	1890	<0.01
MAY											
09...	0	72	15	1.2	0.1	10	98	97	0.13	2380	<0.01
JUL											
08...	0	96	17	1.9	0.2	12	132	130	0.18	1600	<0.01
AUG											
12...	0	114	19	2.4	0.2	12	150	150	0.2	668	<0.01

PEND OREILLE RIVER BASIN

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12353000 CLARK FORK BELOW MISSOULA, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE		NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS- PHORUS, TOTAL (MG/L AS P) (00665)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P) (00671)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (MG/L) (80154)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT 23...		<0.10	0.04	0.04	<0.2	0.03	0.02	0.01	8	73	51
JAN 08...		0.20	0.07	0.08	0.3	0.03	0.02	0.02	26	152	85
MAR 20...		0.10	0.04	0.04	0.4	0.03	0.02	0.02	24	353	58
MAY 09...		<0.10	0.03	0.03	0.3	0.03	0.01	0.01	25	608	42
JUL 08...		<0.10	0.04	0.01	0.3	0.03	0.02	0.01	10	121	59
AUG 12...		0.14	<0.01	0.03	0.3	0.05	0.03	0.03	9	40	54

DATE	TIME	ALUM- INUM, DIS- SOLVED (UG/L AS AL) (01106)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE) (01010)	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR) (01030)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)
OCT 23...	1450	<10	2	95	<0.5	<1	<1	<3	3	13	1
MAR 20...	1000	40	<1	9	<0.5	1	<1	<3	2	34	<1
JUL 08...	1300	10	4	98	<0.5	<1	1	<3	7	17	<5

DATE		LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MERCURY DIS- SOLVED (UG/L AS HG) (71890)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	NICKEL, DIS- SOLVED (UG/L AS NI) (01065)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	SILVER, DIS- SOLVED (UG/L AS AG) (01075)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	VANA- DIUM, DIS- SOLVED (UG/L AS V) (01085)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)
OCT 23...		8	5	<0.1	<10	2	<1	<1	120	<6	9
MAR 20...		6	12	<0.1	<10	1	<1	<1	120	<6	17
JUL 08...		8	5	<0.1	<10	1	<1	<1	110	<6	12

PEND OREILLE RIVER BASIN

12353450 FISH CREEK BELOW WEST FORK NEAR TARKIO, MT

LOCATION.--Lat 46°57'22", long 114°40'12", in NW¼NW¼SW¼ sec. 20, T.14 N., R.24 W., Mineral County, Hydrologic Unit 17010204, on right bank, at bridge on county road, 5.5 miles southeast of Tarkio, 9 miles southwest of Alberton, and at mile 6.5.

DRAINAGE AREA.--242 mi².

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: July 1985 to current year.

INSTRUMENTATION.--Temperature recorder since July 20, 1985.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum, 17.0, July 20, 21, 23-25, 1985; minimum, 0.0°C, Nov. 22-23, 1985, Feb. 15, 20, 1986.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum, 16.5°C, Aug. 4, 7-9, 11; minimum, 0.0°C, Nov. 22-23, Feb. 15, 20.

TEMPERATURE, WATER (DEG C), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DAY	MAX	MIN OCTOBER	MEAN	MAX	MIN NOVEMBER	MEAN	MAX	MIN DECEMBER	MEAN	MAX	MIN JANUARY	MEAN
1	7.0	5.0	6.0	5.0	4.0	4.5	2.0	1.0	1.0	2.5	2.0	2.0
2	7.5	5.5	6.5	6.0	4.5	5.0	2.0	.5	1.5	3.0	1.5	2.0
3	10.5	6.5	8.0	6.5	5.0	6.0	3.0	.5	2.0	3.5	2.0	2.5
4	9.5	5.0	6.5	6.0	5.0	5.5	2.5	1.0	1.5	2.5	1.0	1.5
5	10.5	6.0	7.5	5.5	3.5	4.0	2.5	1.5	2.0	3.0	1.0	2.0
6	9.0	7.0	8.0	4.5	3.5	4.0	2.5	2.0	2.0	3.5	2.0	2.5
7	6.5	5.0	5.5	5.0	4.0	4.5	2.5	2.0	2.5	3.0	1.5	2.0
8	6.0	4.0	5.0	4.5	3.0	3.5	3.0	1.5	2.5	4.0	1.5	2.5
9	8.0	3.5	5.0	3.0	2.0	2.5	2.5	1.0	1.5	3.5	2.5	3.0
10	7.5	4.0	5.5	2.0	1.0	1.5	2.0	1.0	1.5	3.5	2.5	3.0
11	7.5	5.5	6.0	2.0	1.0	1.5	2.5	.5	1.5	3.5	1.5	2.5
12	7.5	5.5	6.5	2.5	1.0	1.0	2.0	1.5	2.0	3.0	1.0	2.0
13	7.0	5.0	6.0	2.5	1.0	1.5	2.5	1.0	1.5	3.0	1.0	1.5
14	7.0	5.5	6.5	2.5	1.0	1.5	2.5	1.5	2.0	3.0	1.5	2.0
15	8.5	6.5	7.0	2.5	1.0	1.5	3.0	1.5	2.0	3.0	1.0	2.0
16	7.5	5.5	6.5	2.5	1.5	2.0	3.0	1.5	2.0	3.5	2.0	3.0
17	8.5	5.0	6.5	3.5	2.5	2.5	3.5	2.0	2.5	3.5	2.0	2.5
18	8.0	4.5	6.0	2.5	1.5	1.5	3.0	1.5	2.0	3.5	2.0	2.5
19	7.5	4.5	6.0	2.0	1.0	1.5	3.0	2.0	2.5	4.0	2.5	3.0
20	8.0	5.0	6.5	2.5	1.5	2.0	3.0	2.0	2.5	4.0	2.5	3.0
21	7.5	6.5	7.0	2.0	1.0	1.5	3.0	1.5	2.0	3.5	2.0	3.0
22	6.5	5.5	6.0	1.0	.0	.5	2.5	1.5	1.5	3.0	1.0	2.0
23	6.5	5.5	6.0	2.0	.0	1.0	3.0	1.5	2.0	4.5	2.0	3.0
24	7.0	5.0	6.0	2.0	.5	1.5	2.5	1.5	2.0	3.5	2.0	3.0
25	7.0	5.0	6.0	2.0	1.0	1.5	3.0	1.5	2.0	3.5	1.0	2.0
26	5.5	4.0	5.0	1.5	1.0	1.5	3.0	1.5	2.0	3.5	1.0	2.0
27	7.0	4.5	5.5	2.0	1.5	1.5	2.5	1.0	2.0	4.0	1.5	2.0
28	5.5	4.0	5.0	1.5	1.0	1.5	2.5	1.0	1.5	3.5	2.0	2.5
29	5.0	2.5	3.5	2.0	1.0	1.5	2.5	1.0	1.5	3.0	2.0	2.5
30	5.0	2.5	4.0	1.5	1.0	1.5	3.0	1.0	2.0	3.5	3.0	3.0
31	4.5	4.0	4.5				2.5	1.0	2.0	4.0	3.0	3.5
MONTH	10.5	2.5	6.0	6.5	.0	2.5	3.5	.5	2.0	4.5	1.0	2.5

PEND OREILLE RIVER BASIN

12353650 CLARK FORK AT SUPERIOR, MT

LOCATION.--Lat 47°11'47", long 114°53'22", in NW¼NW¼NE¼ sec.34, T.17 N., R.26 W., Mineral County, Hydrologic Unit 17010204, on left bank, at bridge on River Street in town of Superior and at mile 282.2.

DRAINAGE AREA.--10,210 mi².

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: July 1985 to current year.

INSTRUMENTATION.--Temperature recorder since July 19, 1985.

REMARKS.--No record Oct. 1-27 (digital recorder tape jammed).

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum, 22.5°C, Aug. 9, 1986; minimum, 0.0°C on many days during winter period.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum, 22.5°C, Aug. 9; minimum, 0.0°C on many days during winter period.

TEMPERATURE, WATER (DEG C), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1				5.0	4.5	5.0	.0	.0	.0	.5	.0	.5
2				5.5	5.0	5.5	.0	.0	.0	.5	.0	.5
3				6.5	5.5	6.0	.0	.0	.0	.5	.0	.5
4				7.0	6.5	6.5	.0	.0	.0	.0	.0	.0
5				7.0	6.0	6.5	.0	.0	.0	.5	.0	.0
6				6.0	5.5	6.0	.5	.0	.5	.5	.0	.5
7				6.0	5.5	5.5	.5	.0	.5	.5	.0	.5
8				5.5	4.5	5.0	.5	.0	.5	.5	.0	.5
9				4.5	3.5	4.5	.5	.0	.0	1.0	.5	.5
10				3.5	1.0	2.5	.0	.0	.0	1.0	.5	.5
11				1.0	.0	.5	.0	.0	.0	1.0	.0	.5
12				.5	.0	.0	.0	.0	.0	.5	.0	.0
13				.5	.0	.0	.5	.0	.0	.5	.0	.0
14				.5	.0	.0	.5	.0	.0	.5	.0	.0
15				.5	.0	.5	.5	.0	.0	.5	.0	.0
16				1.5	.5	1.0	.5	.0	.0	1.0	.5	.5
17				2.0	1.0	1.5	.5	.0	.5	1.0	.5	.5
18				1.5	.5	1.0	.5	.0	.5	1.0	.5	.5
19				.5	.0	.5	.5	.0	.5	1.0	.5	.5
20				.5	.0	.5	.5	.0	.5	1.0	.5	.5
21				.5	.0	.5	.5	.0	.0	1.0	.0	.5
22				.0	.0	.0	.5	.0	.0	.5	.0	.5
23				.0	.0	.0	.5	.0	.0	1.0	.5	.5
24				.0	.0	.0	.5	.0	.0	1.0	.5	1.0
25				.0	.0	.0	.5	.0	.0	1.0	.0	.5
26				.0	.0	.0	.5	.0	.0	1.0	.0	.5
27				.0	.0	.0	.5	.0	.0	.5	.0	.5
28	7.0			.0	.0	.0	.0	.0	.0	1.0	.5	1.0
29	6.0	5.0	5.5	.0	.0	.0	.0	.0	.0	1.5	.5	1.0
30	5.5	4.5	5.0	.0	.0	.0	.5	.0	.0	2.0	1.5	2.0
31	5.0	4.5	4.5				.0	.0	.0	2.5	2.0	2.5
MONTH	7.0	4.5	5.0	7.0	.0	2.0	.5	.0	.0	2.5	.0	.5

POND OREILLE RIVER BASIN

12353820 DRY CREEK NEAR SUPERIOR, MT

LOCATION.--Lat 47°13'17", long 114°58'19", in NW¼Sec.24, T.17 N., R.27 W., Mineral County, Hydrologic Unit 17010204, at bridge on county road 700 ft downstream from Murphy Creek, 0.5 mi upstream from mouth, and 4.3 mi northwest of Superior.

DRAINAGE AREA.--46.3 mi².

PERIOD OF RECORD.--May 1982 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 2,700 ft. from topographic map.

REMARKS.--Estimated daily discharges: Oct. 1-24, Oct. 27 to Nov. 2, Nov. 11 to Apr. 18, and July 7-10. Records poor. Upstream diversion may seriously affect low flow periods. Several observations of water temperature and specific conductance were made during the year and are published as miscellaneous water-quality data in the back of this report.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 506 ft³/s May 31, 1984, gage height, 3.86 ft; maximum gage height, 3.98 ft May 26, 1982, from outside gage; no flow on many days each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 360 ft³/s May 29, gage height, 3.49 ft; no flow many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	.00	14	1.0	.00	.00	31	92	59	264	7.2	.00	.00		
2	.00	17	1.0	.00	.00	34	87	58	233	5.7	.00	.00		
3	.00	20	1.0	.00	.00	38	77	69	201	4.6	.00	.00		
4	.00	30	1.0	.00	.00	38	67	105	170	4.5	.00	.00		
5	.00	42	1.0	.00	.00	45	64	102	162	4.7	.00	.00		
6	.00	35	1.0	.00	.00	48	64	95	141	3.5	.00	.00		
7	.00	29	1.0	.00	.00	60	60	89	121	3.0	.00	.00		
8	.00	24	1.0	.00	.00	85	75	92	105	2.0	.00	.00		
9	.00	20	.00	.00	.00	77	82	95	90	1.0	.00	.00		
10	.00	16	.00	.00	.00	67	90	92	81	.50	.00	.00		
11	.00	15	.00	.00	.00	60	87	87	72	.46	.00	.00		
12	2.0	5.0	.00	.00	.00	48	87	79	66	.00	.00	.00		
13	2.0	8.0	.00	.00	.00	45	82	92	59	.00	.00	.00		
14	2.0	11	.00	.00	.00	41	72	94	54	.00	.00	.00		
15	3.0	11	.00	.00	.00	38	66	84	53	.00	.00	.00		
16	5.0	11	.00	.00	.00	31	66	81	44	.00	.00	.00		
17	8.0	14	.00	.00	.00	28	64	84	39	.00	.00	.00		
18	8.0	14	.00	.00	.00	24	60	95	36	.00	.00	.00		
19	8.0	11	.00	.00	.00	24	57	131	33	.00	.00	.00		
20	8.0	11	.00	.00	.00	20	54	181	29	.00	.00	.00		
21	8.0	8.0	.00	.00	.00	17	60	220	26	.00	.00	.00		
22	11	5.0	.00	.00	.00	17	88	188	23	.00	.00	.00		
23	11	3.0	.00	.00	.00	17	104	153	20	.00	.00	.00		
24	11	3.0	.00	.00	17	24	97	147	18	.00	.00	.00		
25	21	3.0	.00	.00	34	24	91	171	16	.00	.00	.00		
26	21	3.0	.00	.00	45	24	81	231	15	.00	.00	.00		
27	17	3.0	.00	.00	41	28	76	295	13	.00	.00	.00		
28	17	3.0	.00	.00	31	38	72	334	11	.00	.00	.00		
29	17	3.0	.00	.00	---	64	67	333	13	.00	.00	.00		
30	17	2.0	.00	.00	---	85	62	317	9.5	.00	.00	.00		
31	14	---	.00	.00	---	94	---	286	---	.00	.00	---		
TOTAL	211.00	394.0	8.00	.00	168.00	1314	2251	4539	2217.5	37.16	.00	.00		
MEAN	6.81	13.1	.26	.00	6.00	42.4	75.0	146	73.9	1.20	.00	.00		
MAX	21	42	1.0	.00	45	94	104	334	264	7.2	.00	.00		
MIN	.00	2.0	.00	.00	.00	17	54	58	9.5	.00	.00	.00		
CFSM	.15	.28	.01	.00	.13	.92	1.62	3.15	1.60	.03	.00	.00		
IN.	.17	.32	.01	.00	.13	1.06	1.81	3.65	1.78	.03	.00	.00		
AC-FT	419	781	16	.00	333	2610	4460	9000	4400	74	.00	.00		
CAL YR 1985	TOTAL	9963.80	MEAN	27.3	MAX	343	MIN	.00	CFSM	.59	IN.	8.01	AC-FT	19760
WTR YR 1986	TOTAL	11139.66	MEAN	30.5	MAX	334	MIN	.00	CFSM	.66	IN.	8.95	AC-FT	22100

PEND OREILLE RIVER BASIN

99

12354000 ST. REGIS RIVER NEAR ST. REGIS, MT

LOCATION.--Lat 47°17'49", long 115°07'18", near center of NW¼NE¼ sec. 26, T.18 N., R.28 W., Mineral County, Hydrologic Unit 17010204, on left bank 50 ft downstream from road bridge, 500 ft upstream from Little Joe Creek, 1.2 mi west of St. Regis, and 1.7 mi upstream from mouth.

DRAINAGE AREA.--303 mi².

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: July 1985 to current year.

INSTRUMENTATION.--Temperature recorder since July 31, 1985.

REMARKS.--Records good.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum, 19.0°C, Aug. 1, 1985, July 21, 1986; minimum, 0.0°C on many days during winter period.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum, 19.0°C, July 21; minimum, 0.0°C on many days during winter period.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DAY	MAX	MIN OCTOBER	MEAN	MAX	MIN NOVEMBER	MEAN	MAX	MIN DECEMBER	MEAN	MAX	MIN JANUARY	MEAN
1	7.0	5.5	6.5	4.5	4.0	4.5	.0	.0	.0	.5	.0	.5
2	7.0	6.0	6.5	6.0	4.5	5.0	.0	.0	.0	.5	.0	.5
3	10.5	7.0	8.0	6.0	5.5	5.5	.0	.0	.0	.5	.5	.5
4	9.0	5.0	7.0	6.0	5.5	6.0	.5	.0	.0	.5	.0	.5
5	10.0	6.5	8.0	5.5	4.0	4.5	.5	.0	.5	.5	.0	.5
6	9.0	7.0	8.5	4.5	3.5	4.0	.5	.5	.5	2.0	.5	1.0
7	6.5	4.5	5.5	5.0	4.0	4.5	2.5	.5	2.0	2.0	.5	1.0
8	5.0	3.0	4.0	4.5	4.0	4.0	3.0	2.0	2.5	1.5	.0	1.0
9	5.5	2.0	3.5	4.0	2.5	3.5	2.0	1.0	1.5	3.0	1.5	2.5
10	6.5	4.0	5.0	2.0	.5	1.0	1.0	.0	.0	3.5	2.5	3.0
11	6.5	5.5	6.0	1.0	.5	.5	.0	.0	.0	3.0	1.5	2.0
12	7.5	5.5	6.5	.5	.0	.5	.5	.0	.0	1.0	.0	1.0
13	7.5	5.0	6.5	1.0	.0	.5	.0	.0	.0	.5	.0	.0
14	7.5	6.0	6.5	1.0	.0	.5	.5	.0	.0	.0	.0	.0
15	8.5	7.0	8.0	2.5	.0	1.0	.5	.0	.5	.5	.0	.5
16	7.5	6.5	7.0	3.0	2.0	2.5	.5	.0	.5	2.5	.0	1.0
17	7.5	5.0	6.5	3.0	2.5	2.5	2.0	.5	1.5	3.0	2.0	2.5
18	7.5	5.0	6.0	2.0	1.0	1.5	2.0	1.5	2.0	2.5	1.5	2.0
19	7.5	5.0	6.5	1.5	.5	1.0	2.5	1.5	2.0	3.5	2.5	3.0
20	8.0	5.5	7.0	1.5	1.0	1.0	2.5	2.0	2.0	3.0	2.5	3.0
21	8.0	7.0	7.5	1.5	.0	1.0	2.0	.5	1.0	3.0	1.5	2.5
22	7.0	5.5	6.5	.0	.0	.0	.5	.0	.0	1.5	.5	1.0
23	7.0	6.0	6.5	.0	.0	.0	.5	.0	.0	2.5	1.0	2.0
24	6.5	5.5	6.0	.0	.0	.0	.5	.0	.0	3.0	1.5	2.5
25	6.5	6.0	6.5	.0	.0	.0	.5	.0	.0	1.0	.0	.5
26	6.0	5.0	5.5	.0	.0	.0	.5	.0	.0	.5	.0	.5
27	6.5	5.5	6.0	.0	.0	.0	.5	.0	.0	.5	.0	.5
28	6.5	5.0	6.0	.0	.0	.0	.5	.0	.0	2.0	.5	1.0
29	5.0	3.5	4.5	.0	.0	.0	.0	.0	.0	2.5	1.0	2.0
30	4.5	3.0	4.0	.0	.0	.0	.5	.0	.5	3.0	2.5	3.0
31	4.5	4.0	4.5	.0	.0	.0	.5	.0	.5	3.0	2.5	3.0
MONTH	10.5	2.0	6.0	6.0	.0	2.0	3.0	.0	.5	3.5	.0	1.5

12354000 ST. REGIS RIVER NEAR ST. REGIS, MT--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DAY	MAX	MIN FEBRUARY	MEAN	MAX	MIN MARCH	MEAN	MAX	MIN APRIL	MEAN	MAX	MIN MAY	MEAN
1	3.5	2.5	3.0	4.0	2.0	3.0	5.0	2.5	3.5	8.5	3.5	6.0
2	3.0	2.0	2.5	4.0	2.5	3.5	4.5	3.5	4.0	8.5	5.0	6.5
3	3.5	2.5	3.0	4.0	2.0	3.0	6.5	3.0	4.5	7.5	6.0	7.0
4	3.5	3.0	3.5	4.5	2.5	3.5	6.0	2.5	4.5	6.5	5.5	6.0
5	3.5	2.5	3.0	4.0	2.0	3.0	6.5	3.0	4.5	7.5	4.0	6.0
6	2.5	1.0	2.0	5.0	3.0	4.0	7.0	3.0	5.0	8.0	3.5	6.0
7	1.0	.5	1.0	4.0	3.0	3.5	7.5	3.0	5.0	8.0	4.5	6.5
8	.5	.0	.0	4.0	3.0	3.5	7.5	3.5	5.5	8.5	5.5	7.0
9	1.0	.0	.5	4.0	3.0	3.5	7.0	4.0	5.5	8.5	5.0	6.5
10	2.0	.5	1.0	4.0	3.0	3.5	6.5	4.5	5.0	7.5	5.0	6.0
11	.5	.0	.0	4.5	3.0	3.5	5.5	3.0	4.0	7.5	4.5	6.0
12	.5	.0	.0	4.5	3.0	3.5	4.5	3.5	4.0	7.5	4.0	5.5
13	.0	.0	.0	4.5	3.0	3.5	5.0	2.5	3.5	7.0	5.0	6.0
14	.0	.0	.0	4.5	2.5	3.0	6.5	3.0	4.5	7.0	3.5	5.0
15	.0	.0	.0	4.5	2.0	3.0	6.5	3.5	5.0	6.5	3.5	5.0
16	.5	.0	.5	4.0	2.5	3.5	6.5	4.5	5.5	9.0	3.5	6.0
17	1.0	.5	.5	5.0	3.0	4.0	7.0	3.5	5.0	8.5	4.5	6.5
18	2.0	1.0	1.5	4.0	2.5	3.0	5.0	3.5	4.5	10.5	5.5	8.0
19	1.5	.0	.5	5.5	3.0	4.0	5.5	3.0	4.5	11.0	6.0	8.5
20	.5	.0	.5	5.5	2.5	4.0	8.0	4.5	6.0	9.0	6.0	7.5
21	2.5	.5	1.5	4.0	2.5	3.5	9.0	4.5	7.0	7.5	5.5	6.5
22	2.5	.5	1.5	5.0	2.5	4.0	7.0	5.0	6.0	6.5	4.5	5.5
23	3.0	2.0	2.5	5.0	2.5	3.5	6.0	4.0	4.5	9.0	3.5	6.0
24	2.5	.5	1.5	5.5	3.5	4.0	6.5	2.5	4.5	10.5	5.0	7.5
25	1.5	.5	1.5	4.5	2.5	3.5	6.5	4.0	5.0	12.0	6.5	9.0
26	3.0	1.5	2.0	5.5	3.0	4.0	6.5	3.5	5.0	12.5	6.5	9.5
27	3.5	2.0	2.5	6.5	3.0	5.0	6.0	4.0	5.0	12.0	7.0	9.5
28	4.0	2.0	3.0	7.0	3.5	5.0	6.5	4.0	5.0	12.0	7.5	9.5
29				6.0	4.0	5.0	5.5	3.0	4.0	13.0	7.5	10.0
30				4.5	3.0	4.0	7.0	3.0	5.0	12.5	8.0	10.5
31				5.0	2.5	3.5				13.5	8.5	10.5
MONTH	4.0	.0	1.5	7.0	2.0	3.5	9.0	2.5	5.0	13.5	3.5	7.0
		JUNE			JULY			AUGUST			SEPTEMBER	
1	12.0	9.0	10.5	17.5	11.5	14.0						
2	13.5	9.0	11.0	17.5	12.5	15.0				16.0		
3	13.0	9.5	11.0	14.5	12.0	13.5				17.0	12.5	15.0
4	13.0	9.5	11.0	13.0	10.5	11.5				18.5	13.0	15.5
5	11.5	9.5	10.5	10.5	9.5	10.0				14.5	11.5	13.0
6	13.5	9.0	11.0	16.0	9.0	12.5				15.0	10.5	12.5
7	12.0	9.5	11.0	16.5	10.5	13.5				16.0	10.0	13.0
8	11.0	9.0	9.5	14.0	11.5	13.0				14.5	12.5	13.5
9	14.0	8.0	10.5	14.5	11.0	13.0				12.5	11.5	12.0
10	14.5	9.0	11.5	13.5	11.5	12.0				13.5	11.0	12.0
11	15.5	10.0	12.5	15.0	10.5	12.5				15.0	10.0	12.0
12	15.0	10.0	12.5	14.5	11.0	12.5				12.0	9.0	10.5
13	14.5	10.0	12.5	16.0	10.0	12.5				12.0	10.0	11.0
14	13.0	10.5	12.0	15.5	11.0	13.5				11.5	10.5	11.0
15	14.0	9.5	12.0	16.5	11.0	13.5				13.0	10.5	11.5
16	16.5	10.0	13.0	14.0	11.0	12.5				13.5	10.5	12.0
17	17.0	11.0	14.0	14.0	10.0	11.5				13.5	10.0	11.5
18	14.5	10.5	12.0	17.0	9.5	13.0				12.5	10.5	11.0
19	14.0	8.5	11.0	18.0	11.5	14.5				11.5	10.0	11.0
20	11.5	8.5	10.0	18.5	12.5	15.5				11.0	9.5	10.0
21	14.5	8.5	11.5	19.0	12.5	15.5				12.0	9.5	10.5
22	15.0	9.5	12.5	17.5	13.0	15.0				13.0	9.5	10.5
23	17.0	10.5	13.5	16.5	12.5	14.5				12.0	8.5	10.0
24	17.5	11.5	14.5							12.0	10.0	10.5
25	17.5	12.0	14.5							10.5	9.5	10.0
26	14.5	11.5	13.0							12.0	8.5	9.5
27	16.5	11.0	14.0							11.0	8.5	9.5
28	17.5	12.0	14.5							10.5	9.0	9.5
29	15.0	12.0	13.0							10.0	9.0	9.5
30	15.0	10.5	13.0							10.5	9.0	9.5
31												
MONTH YEAR	17.5 19.0	8.0 .0	12.0 5.5	19.0	9.0	13.0				18.5	8.5	11.5

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LOCATION.--Lat 47°18'07", long 115°05'11", in NW¼SE¼SW¼ 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 mile 270.3.

PERIOD OF RECORD.--October 1910 to current year. Monthly discharge only for some periods, published in WSP 1316.

GAGE.--Water-stage recorder. Datum of gage is 2,600.37 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Nov. 29, 1933, nonrecording gage at same site and datum.

AVERAGE DISCHARGE.--76 years, 7,552 ft³/s, 5,471,000 acre-ft/yr.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 38,800 ft³/s June 1, gage height, 15.35 ft; minimum, 2,200 ft³/s Aug. 22.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4080	4960	2800	2700	3340	12200	14900	10300	38500	6330	2920	2730
2	4060	5140	2600	2800	3530	11100	14300	9820	37600	6050	2870	3000
3	4040	5690	2700	2900	3630	10900	13600	9830	35500	5730	2770	3060
4	4040	6050	2900	3000	3650	10800	12800	11300	32900	5500	2690	3020
5	4100	6500	3200	2800	3650	10900	12100	13600	31300	5620	2640	2930
6	4100	6420	3400	2600	3540	11100	11600	14200	31000	5980	2600	2880
7	4130	6380	3500	2700	3370	11600	11400	13700	29800	6200	2560	2800
8	4230	6230	3700	2800	3100	13400	11600	13300	26700	5940	2520	2840
9	4210	6020	3900	2900	2950	14800	12300	13000	25100	5620	2490	3020
10	4100	5720	3500	3100	2960	14300	13300	12700	22800	5520	2390	3210
11	4000	5170	3100	3200	2960	13000	13900	12300	19900	5560	2330	3440
12	4070	4640	2800	3200	2790	12000	14000	12200	18100	5560	2310	3370
13	4110	4360	2700	3100	2650	11400	13500	12200	16900	5640	2330	3270
14	4070	4250	2900	2900	2720	10800	12700	11900	15500	5410	2410	3280
15	4060	4280	3000	2700	2750	10200	12100	11700	14600	5090	2410	3360
16	4040	4470	3300	2800	3040	9660	11700	11300	14400	4940	2370	3480
17	4120	4730	3500	3000	3650	9300	11300	10900	13400	4820	2340	3610
18	4190	4730	3600	3200	4910	8890	10800	10700	12400	4820	2330	3790
19	4180	4380	3600	3300	5110	8530	10300	11000	11500	4690	2280	3930
20	4120	4080	3500	3400	4640	8280	9770	12700	10900	4510	2260	3970
21	4090	4050	3300	3500	4070	8170	9670	16400	10000	4270	2240	3930
22	4130	3810	3200	3600	3780	8190	10300	19900	9240	4100	2220	3900
23	4200	3210	2900	3300	3730	8220	12100	20900	8520	3890	2280	3890
24	4320	3030	2700	3130	4900	8380	15000	19100	7910	3750	2400	3820
25	5210	2970	2900	3080	9390	8460	14900	17900	7440	3560	2410	3740
26	5660	3210	3000	2940	16200	8360	13900	19000	7020	3430	2390	3710
27	5540	3150	2900	2750	16100	8260	13100	23500	6750	3330	2350	3710
28	5540	3280	2700	2830	14200	8590	12400	29600	6440	3200	2320	3700
29	5330	3200	2600	2930	---	9820	11700	34400	6410	3160	2280	3690
30	5200	3000	2500	3100	---	12200	11000	37000	6440	3050	2320	3690
31	5050	---	2600	3230	---	14600	---	38300	---	3000	2470	---
TOTAL	136320	137110	95500	93490	141310	326410	372040	514650	534970	148270	75500	102770
MEAN	4397	4570	3081	3016	5047	10530	12400	16600	17830	4783	2435	3426

PEND OREILLE RIVER BASIN

12354700 CLARK FORK NEAR PARADISE, MT

LOCATION.--Lat 47°19'19", long 114°53'24", in NE¼SW¼NE¼ sec. 15, T.18 N., R.25 W., Sanders County, Hydrologic Unit 17010204, on right bank at bridge on State Highway 461, 6.3 mi southwest of Paradise, 12.5 road miles downstream from St. Regis and at mile 255.5.

DRAINAGE AREA.--10,794 mi².

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: July 1985 to current year.

INSTRUMENTATION.--Temperature recorder since July 31, 1985.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum, 22.0°C, Aug. 11, 1986; minimum, 0.0°C on many days during winter period.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum, 22.0°C, Aug. 11; minimum, 0.0°C on many days during winter period.

TEMPERATURE, WATER (DEG C), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DAY	MAX	MIN OCTOBER	MEAN	MAX	MIN NOVEMBER	MEAN	MAX	MIN DECEMBER	MEAN	MAX	MIN JANUARY	MEAN
1	8.5	7.5	8.0	5.0	4.5	5.0	.0	.0	.0	.0	.0	.0
2	8.0	7.5	7.5	5.5	5.0	5.5	.0	.0	.0	.0	.0	.0
3	9.0	7.5	8.5	6.5	6.0	6.0	.5	.0	.0	.0	.0	.0
4	9.5	7.5	8.5	7.0	6.5	6.5	.0	.0	.0	.0	.0	.0
5	10.0	8.5	9.0	6.5	6.0	6.5	.0	.0	.0	.0	.0	.0
6	10.0	9.5	9.5	6.0	5.5	6.0	.0	.0	.0	.0	.0	.0
7	9.5	8.0	8.5	6.0	5.5	5.5	.0	.0	.0	.0	.0	.0
8	8.0	6.5	7.0	5.5	5.0	5.0	.0	.0	.0	.0	.0	.0
9	6.5	5.0	5.5	5.0	4.0	4.5	.0	.0	.0	.0	.0	.0
10	6.0	5.0	5.5	3.5	2.0	2.5	.0	.0	.0	.0	.0	.0
11	6.0	5.5	5.5	2.0	.0	1.0	.0	.0	.0	.5	.0	.0
12	6.5	5.5	6.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
13	7.0	6.0	6.5	.0	.0	.0	.0	.0	.0	.0	.0	.0
14	7.5	7.0	7.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
15	8.0	7.5	8.0	.5	.0	.0	.0	.0	.0	.0	.0	.0
16	8.0	7.5	8.0	1.5	.5	1.0	.0	.0	.0	.0	.0	.0
17	8.5	7.5	8.0	1.5	1.0	1.5	.0	.0	.0	.0	.0	.0
18	8.5	7.5	8.0	1.5	1.0	1.0	.0	.0	.0	.0	.0	.0
19	8.5	7.5	8.0	1.0	.0	.5	.0	.0	.0	.0	.0	.0
20	8.5	7.5	8.0	.5	.0	.0	.0	.0	.0	.0	.0	.0
21	8.5	8.0	8.5	.0	.0	.0	.0	.0	.0	.0	.0	.0
22	8.5	8.0	8.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
23	8.0	7.5	8.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
24	7.5	7.0	7.5	.0	.0	.0	.0	.0	.0	.0	.0	.0
25	7.5	7.5	7.5	.0	.0	.0	.0	.0	.0	.0	.0	.0
26	7.5	6.5	7.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
27	7.5	7.0	7.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
28	7.0	6.5	7.0	.0	.0	.0	.0	.0	.0	.5	.0	.0
29	6.5	5.5	6.0	.0	.0	.0	.0	.0	.0	.5	.0	.5
30	5.5	4.5	5.0	.0	.0	.0	.0	.0	.0	1.0	.5	.5
31	5.0	4.5	5.0	.0	.0	.0	.0	.0	.0	2.0	1.0	1.5
MONTH	10.0	4.5	7.5	7.0	.0	2.0	.5	.0	.0	2.0	.0	.0

TEMPERATURE, WATER (DEG C), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	2.5	2.0	2.5	3.5	2.5	3.0	6.5	6.0	6.5	9.5	7.5	8.5
2	3.0	2.5	2.5	4.5	3.0	3.5	6.5	6.0	6.0	11.0	9.0	10.0
3	3.0	3.0	3.0	4.5	3.0	4.0	7.5	5.5	6.5	11.5	10.5	11.0
4	3.5	3.0	3.0	5.0	3.5	4.0	7.5	6.0	6.5	11.0	10.0	11.0
5	3.0	3.0	3.0	5.0	3.5	4.5	8.0	6.5	7.0	10.0	9.0	9.5
6	3.0	2.0	2.5	5.5	4.0	5.0	9.0	6.5	7.5	9.5	8.5	9.0
7	2.0	1.5	2.0	5.5	5.0	5.0	9.5	7.0	8.5	9.5	8.5	9.0
8	1.5	.5	1.0	5.5	4.5	5.0	10.0	7.5	9.0	10.5	9.0	9.5
9	.5	.5	.5	5.0	4.5	5.0	10.0	8.5	9.0	10.5	9.0	10.0
10	1.0	.5	.5	4.5	4.5	4.5	9.5	8.5	9.0	10.0	9.0	9.5
11	.5	.0	.0	5.5	4.0	4.5	8.5	7.5	8.0	10.0	8.5	9.0
12	.0	.0	.0	5.5	4.5	5.0	7.5	6.5	7.0	9.5	8.5	9.0
13	.0	.0	.0	6.0	5.0	5.5	6.5	5.5	6.0	9.0	8.5	9.0
14	.0	.0	.0	6.0	5.0	5.5	6.5	5.0	6.0	9.0	7.5	8.5
15	.0	.0	.0	6.0	4.5	5.0	7.5	5.5	6.5	9.0	7.5	8.5
16	.0	.0	.0	5.5	4.5	5.0	8.0	7.0	7.5	10.0	7.5	8.5
17	.5	.0	.0	6.5	5.0	5.5	8.5	7.0	8.0	10.0	8.5	9.0
18	.5	.0	.5	6.0	5.0	5.5	8.0	7.0	7.5	11.5	9.5	10.5
19	1.0	.5	.5	6.0	5.0	5.5	7.5	6.5	7.0	13.0	10.5	12.0
20	1.0	.5	.5	7.0	5.0	6.0	8.5	7.0	8.0	13.0	12.0	12.5
21	1.5	.5	1.0	6.5	5.5	6.0	10.0	7.5	9.0	13.0	12.0	12.5
22	2.0	1.0	1.5	7.0	5.5	6.5	10.0	9.0	9.5	12.0	9.5	11.0
23	3.0	2.0	2.5	6.5	5.0	6.0	9.5	9.0	9.0	9.5	9.0	9.5
24	4.0	3.0	3.5	7.0	5.5	6.0	9.5	8.0	9.0	11.0	9.5	10.0
25	3.0	2.5	3.0	6.5	5.5	6.0	9.0	8.0	8.5	13.0	11.0	12.0
26	2.5	2.0	2.0	6.5	5.0	6.0	8.0	7.5	8.0	14.5	12.5	13.5
27	3.0	2.0	2.5	7.5	5.5	6.5	8.0	7.0	7.5	14.5	13.5	14.0
28	3.5	2.0	2.5	8.5	6.0	7.5	8.5	7.0	8.0	14.5	13.5	14.0
29				9.0	7.0	8.0	8.0	7.0	7.5	14.5	13.5	14.0
30				8.5	7.0	7.5	8.5	7.0	8.0	15.0	14.0	14.5
31				7.5	6.5	7.0				15.0	14.5	15.0
MONTH	4.0	.0	1.5	9.0	2.5	5.5	10.0	5.0	7.5	15.0	7.5	11.0
		JUNE			JULY			AUGUST			SEPTEMBER	
1	15.0	14.5	15.0	19.5	17.0	18.5	19.5	17.0	18.5	17.5	17.0	17.0
2	15.0	14.0	14.5	20.0	17.5	19.0	20.0	18.0	19.0	18.0	17.0	17.5
3	15.5	15.0	15.0	20.0	18.0	19.0	20.5	19.0	20.0	18.5	17.0	17.5
4	15.0	14.5	14.5	19.0	16.5	17.5	21.0	19.0	20.0	18.5	17.0	18.0
5	14.5	14.0	14.0	16.5	15.0	15.5	20.5	19.0	20.0	18.5	15.5	17.0
6	14.0	13.5	14.0	16.5	14.0	15.0	21.0	18.5	20.0	16.5	15.0	15.5
7	14.5	14.0	14.5	18.0	14.5	16.0	21.0	19.0	20.0	16.5	15.0	15.5
8	14.5	13.5	14.0	18.0	16.0	17.0	21.0	19.0	20.0	16.0	15.0	15.5
9	14.0	13.0	13.5	18.0	16.5	17.0	21.5	19.0	20.5	15.0	14.5	14.5
10	15.0	13.0	14.0	17.5	16.5	16.5	21.5	19.5	20.5	14.5	14.0	14.5
11	16.0	14.5	15.0	17.0	15.5	16.5	22.0	20.0	21.0	15.0	13.5	14.0
12	16.5	15.5	16.0	17.0	15.5	16.5	21.0	19.5	20.0	15.0	13.0	13.5
13	17.0	16.0	16.5	18.0	15.0	16.5	20.0	18.5	19.5	13.5	13.0	13.5
14	16.5	15.5	16.0	18.5	16.0	17.0	20.0	18.0	19.0	13.0	12.5	12.5
15	16.5	15.0	15.5	18.5	16.5	17.5	20.0	18.0	19.0	13.5	12.5	13.0
16	17.0	15.0	16.0	18.5	16.0	17.0	20.0	18.0	19.0	13.5	13.0	13.0
17	18.0	16.0	17.0	16.0	15.0	15.5	20.5	18.0	19.5	13.5	12.5	13.0
18	18.0	17.0	17.5	17.0	14.5	15.5	20.5	18.5	19.5	13.0	12.5	13.0
19	18.0	16.0	17.0	18.0	15.5	16.5	20.5	18.5	19.5	13.0	12.5	13.0
20	16.5	15.0	15.5	19.5	16.5	18.0	20.0	18.0	19.0	13.0	12.0	12.5
21	16.5	14.5	15.5	20.0	18.0	19.0	19.5	18.0	18.5	12.5	12.0	12.5
22	17.0	14.0	15.5	20.0	18.5	19.5	19.0	16.5	18.0	12.5	11.5	12.0
23	18.5	15.0	17.0	20.0	18.5	19.0	19.0	17.0	18.0	12.5	11.5	12.0
24	19.5	16.5	18.0	20.0	18.0	19.0	18.0	16.5	17.5	12.5	11.5	12.0
25	20.0	17.5	19.0	19.5	18.0	19.0	19.0	17.0	18.0	12.0	11.5	12.0
26	19.5	17.5	18.5	19.0	18.0	18.5	19.5	17.5	18.5	11.5	11.0	11.0
27	20.0	17.5	18.5	18.5	17.5	18.0	20.0	17.5	19.0	11.5	10.5	11.0
28	20.0	18.0	19.0	19.0	17.0	18.0	20.5	18.0	19.5	11.0	10.5	10.5
29	19.5	18.0	18.5	18.5	17.5	18.0	20.0	19.0	19.5	10.5	10.5	10.5
30	19.0	17.0	18.0	18.5	16.5	17.5	19.0	18.0	18.5	11.0	10.0	10.5
31				18.5	16.5	17.5	18.5	17.5	18.0			
MONTH	20.0	13.0	16.0	20.0	14.0	17.5	22.0	16.5	19.0	18.5	10.0	13.5
YEAR	22.0	.0	8.5									

PEND OREILLE RIVER BASIN

12355000 FLATHEAD RIVER AT FLATHEAD, BRITISH COLUMBIA
(National Stream Quality Accounting Network)
(International gaging station)

LOCATION.--Lat 49°00'02", long 114°28'35", Hydrologic Unit 17010206, on right bank 45 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 mile 216.6.

DRAINAGE AREA.--427 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1929 to current year (no winter records prior to 1952). Prior to October 1934, published as Flathead River near Trail Creek, MT. October 1970 to September 1972, published as North Fork Flathead River at Flathead, British Columbia.

REVISED RECORDS.--WSP 1092: 1933 (maximum gage height only).

GAGE.--Water-stage recorder. Datum of gage is 3,968.16 ft above National Geodetic Vertical Datum of 1929. 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 datum 7.80 ft higher. Oct. 5, 1964, to Aug. 1, 1973, water-stage recorder at site on left bank 155 ft upstream at datum 1.42 ft lower.

REMARKS.--Estimated daily discharges: Nov. 10 to Mar. 4. Water-discharge records good except those for estimated daily discharges, which are poor.

COOPERATION.--This is one of a number of stations which are maintained jointly by Canada and the United States.

AVERAGE DISCHARGE.--35 years (1951-86), 933 ft³/s, 29.67 in/yr, 676,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,300 ft³/s June 8, 1964, gage height, 8.00 ft, in gage well, 8.6 ft, from outside floodmarks, site and datum then in use, from rating curve extended above 8,000 ft³/s on basis of slope-area measurement of peak flow; minimum daily, 62 ft³/s Jan. 2, 1977, but may have been less during periods of no winter record.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 7,910 ft³/s May 29, gage height, 6.04 ft; minimum daily, 134 ft³/s Feb. 18.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	437	944	298	198	202	833	1120	1190	5790	862	377	222		
2	420	932	304	197	200	826	1020	1180	5360	801	363	219		
3	432	1090	323	195	198	788	939	1540	4750	791	354	213		
4	419	1420	350	189	189	777	924	2420	4200	779	341	207		
5	397	1370	350	180	182	756	924	2540	4150	789	332	208		
6	405	1190	360	182	180	692	950	2260	4180	760	322	205		
7	401	1070	353	186	174	697	1020	2010	3640	718	313	204		
8	374	953	353	192	171	823	1170	1990	3170	671	299	205		
9	353	826	325	198	170	799	1430	2110	2800	650	293	221		
10	346	600	318	205	173	730	1670	2180	2510	630	283	224		
11	353	558	321	205	170	675	1620	2070	2340	615	277	222		
12	357	512	328	199	170	644	1440	1880	2210	604	270	218		
13	343	487	335	193	157	623	1270	1970	1930	634	274	217		
14	344	477	335	191	152	582	1180	1920	1770	614	256	209		
15	413	484	350	191	152	565	1090	1690	1820	569	248	208		
16	600	505	346	194	148	539	1070	1550	1620	541	241	208		
17	738	484	353	198	138	514	1030	1530	1470	581	239	207		
18	676	445	339	207	134	493	973	1590	1430	611	236	204		
19	634	434	339	228	139	477	931	2030	1370	586	228	201		
20	667	410	332	219	147	475	914	3470	1260	535	226	201		
21	694	392	325	212	157	512	1070	5180	1170	502	225	200		
22	734	371	314	205	170	539	2460	5710	1090	482	222	196		
23	741	353	283	205	191	520	4180	4110	1030	478	221	192		
24	702	335	275	205	247	547	2910	3370	1000	480	218	192		
25	1040	321	265	194	590	532	2220	3690	973	459	220	197		
26	1210	307	254	191	1480	504	1860	4890	943	478	219	227		
27	1130	298	219	192	1250	531	1650	6320	887	472	213	238		
28	1290	297	205	198	936	710	1490	7240	859	461	207	244		
29	1230	296	198	196	---	972	1370	7550	944	432	201	239		
30	1100	298	191	198	---	1260	1260	6700	917	411	226	242		
31	1020	---	192	201	---	1290	---	6270	---	396	222	---		
TOTAL	20000	18459	9433	6144	8367	21225	43155	100150	67583	18392	8166	6390		
MEAN	645	615	304	198	299	685	1439	3231	2253	593	263	213		
MAX	1290	1420	360	228	1480	1290	4180	7550	5790	862	377	244		
MIN	343	296	191	180	134	475	914	1180	859	396	201	192		
CFSM	1.51	1.44	.71	.46	.70	1.60	3.37	7.57	5.28	1.39	.62	.50		
IN.	1.74	1.61	.82	.54	.73	1.85	3.76	8.73	5.89	1.60	.71	.56		
AC-FT	39670	36610	18710	12190	16600	42100	85600	198600	134100	36480	16200	12670		
CAL YR 1985	TOTAL	309799	MEAN	849	MAX	6430	MIN	83	CFSM	1.99	IN.	26.99	AC-FT	614500
WTR YR 1986	TOTAL	327464	MEAN	897	MAX	7550	MIN	134	CFSM	2.10	IN.	28.53	AC-FT	649500

12355000 FLATHEAD RIVER AT FLATHEAD, BRITISH COLUMBIA--Continued
(National Stream Quality Accounting Network)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1949-50, 1965, 1970, 1975 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: November 1974 to September 1981.

WATER TEMPERATURE: November 1974 to current year.

SUSPENDED-SEDIMENT DISCHARGE: April 1975 to October 1978, August 1985 to current year.

INSTRUMENTATION.--Temperature recorder since Oct. 1, 1975.

REMARKS.--Temperature records good.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE (water years 1975-81): Maximum, 309 microsiemens, Jan. 12, 28, 1975, Jan. 20, 1980; minimum, 130 microsiemens, May 20, 1976.

WATER TEMPERATURE: Maximum (water years 1975-80, 1982-85), 19.5°C Aug. 2, 1977; minimum, 0.0°C on many days during winter periods.

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, 0.25, ton Jan. 2, 1978.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURES: Maximum recorded, 17.5°C, Aug. 7, 9, 10, 13; minimum, 0.0°C on many days during winter period.

SEDIMENT CONCENTRATION: Maximum daily mean, 530 mg/L, May 21; minimum daily mean, 1 mg/L on many days throughout the year.

SEDIMENT LOAD: Maximum daily, 8,110 tons, May 28; minimum daily, 0.36 tons, Feb.18.

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	CLOUD COVER (PER- CENT) (00032)	WEATHER (WMO CODE NUMBER) (00041)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	TEMPER- ATURE, AIR (DEG C) (00020)	TEMPER- ATURE (DEG C) (00010)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)
NOV 13...	1145	489	0	0	245	-10.0	0.0	662	13.0	102
MAR 21...	1130	491	100	52	265	7.0	2.5	655	11.9	102
MAY 30...	0930	6610	0	0	154	35.0	6.0	660	10.6	98
AUG 14...	1000	269	10	2	262	10.0	10.5	655	9.6	100
DATE	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP- TOCOCCI FECAL, KF AGAR (COLS./ PER 100 ML) (31673)	PH (STAND- ARD UNITS) (00400)	TUR- BID- ITY (NTU) (00076)	HARD- NESS (MG/L AS CACO3) (00900)	HARD- NESS NONCARB WH WAT TOT FLD MG/L AS CACO3 (00902)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM AD- SORP- TION RATIO (00931)
NOV 13...	K2	K1	8.2	0.5	130	10	38	8.4	1.0	0
MAR 21...	110	K10	7.7	1.3	130	7	39	8.7	1.0	0
MAY 30...	46	21	8.0	43	83	4	25	4.9	0.7	0
AUG 14...	K6	97	8.3	0.2	140	0	42	9.0	0.8	0
DATE	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	BICAR- BONATE WH WAT TOTAL FIELD MG/L AS HCO3 (00440)	CAR- BONATE WH WAT TOTAL FIELD MG/L AS CO3 (00445)	ALKA- LINEITY LAB (MG/L CACO3) (90410)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SiO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L) (70301)
NOV 13...	0.4	--	--	120	6.0	0.2	0.1	4.5	--	130
MAR 21...	0.4	160	0	128	6.4	0.4	0.1	4.5	141	140
MAY 30...	0.4	97	0	81	4.3	0.4	<0.1	3.8	89	87
AUG 14...	0.4	160	7	142	4.9	0.3	<0.1	4.8	147	160

PEND OREILLE RIVER BASIN

12355000 FLATHEAD RIVER AT FLATHEAD, BRITISH COLUMBIA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS- PHORUS, TOTAL (MG/L AS P) (00665)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P) (00671)
NOV 13...	0.18	173	<0.01	<0.10	0.03	--	0.3	0.008	0.005	0.004
MAR 21...	0.19	187	<0.01	<0.10	0.02	0.02	0.3	0.009	<0.005	0.002
MAY 30...	0.12	1590	<0.01	<0.10	0.01	0.02	0.5	0.114	0.006	0.009
AUG 14...	0.2	107	<0.01	<0.10	0.02	<0.01	<0.2	<0.005	<0.005	0.002

DATE	TIME	ALUM- INUM, DIS- SOLVED (UG/L AS AL) (01106)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE) (01010)	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR) (01030)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)
NOV 13...	1145	10	<1	52	<0.5	1	<1	<3	<1	3	1
MAR 21...	1130	40	<1	50	<0.5	1	3	<3	<1	35	<1
MAY 30...	0930	30	<1	32	<0.5	<1	<1	<3	1	22	1

DATE	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MERCURY DIS- SOLVED (UG/L AS HG) (71890)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	NICKEL, DIS- SOLVED (UG/L AS NI) (01065)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	SILVER, DIS- SOLVED (UG/L AS AG) (01075)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	VANA- DIUM, DIS- SOLVED (UG/L AS V) (01085)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)
NOV 13...	4	<1	<0.1	<10	2	<1	<1	54	<6	10
MAR 21...	<4	3	<0.1	<10	<1	<1	<1	60	<6	15
MAY 30...	<4	2	<0.1	<10	4	<1	1	34	<6	<3

DATE	TIME	TEMPER- ATURE (DEG C) (00010)	STREAM- INSTAN- TANEOUS (CFS) (00061)	SEDI- SUS- PENDE (MG/L) (80154)	SEDI- MENT, DIS- SUS- PENDE (T/DAY) (80155)	SED. SUSP. SIEVE % FINER THAN .062 MM (70331)
OCT 29...	1440	2.0	1200	26	84	82
NOV 13...	1145	0.0	489	5	6.6	82
MAR 21...	1130	2.5	491	11	15	85
MAY 30...	0930	6.0	6610	220	3930	72
AUG 14...	1000	10.5	269	1	0.73	67

PEND OREILLE RIVER BASIN

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12355000 FLATHEAD RIVER AT FLATHEAD, BRITISH COLUMBIA--Continued

TEMPERATURE, WATER (DEG. C) WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	5.5	5.0	5.5	2.5	1.0	1.5	.0	.0	.0	.0	.0	.0
2	5.5	5.0	5.5	4.0	1.0	3.0	.0	.0	.0	.0	.0	.0
3	7.0	4.5	5.5	5.0	4.0	4.5	.0	.0	.0	.0	.0	.0
4	7.0	3.5	5.5	4.0	3.5	4.0	.0	.0	.0	.0	.0	.0
5	8.0	5.0	6.5	3.5	2.0	2.5	.0	.0	.0	.0	.0	.0
6	7.0	2.5	4.5	2.5	1.5	2.0	.0	.0	.0	.0	.0	.0
7	3.0	1.5	2.5	3.0	1.5	2.0	.0	.0	.0	.0	.0	.0
8	3.0	1.0	2.0	1.5	1.0	1.0	.0	.0	.0	.0	.0	.0
9	2.5	.0	1.0	.5	.0	.0	.0	.0	.0	.0	.0	.0
10	4.0	2.0	3.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
11	4.0	3.5	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
12	5.5	3.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
13	4.5	4.0	4.5	.0	.0	.0	.0	.0	.0	.0	.0	.0
14	4.5	3.5	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
15	5.5	4.5	5.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
16	6.5	4.5	5.5	.0	.0	.0	.0	.0	.0	.0	.0	.0
17	5.0	3.0	4.5	.0	.0	.0	.0	.0	.0	.0	.0	.0
18	6.0	4.0	5.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
19	5.5	3.5	5.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
20	6.5	4.5	5.5	.0	.0	.0	.0	.0	.0	.0	.0	.0
21	5.5	4.5	5.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
22	5.5	3.5	4.5	.0	.0	.0	.0	.0	.0	.0	.0	.0
23	4.0	3.0	3.5	.0	.0	.0	.0	.0	.0	.0	.0	.0
24	3.5	3.0	3.5	.0	.0	.0	.0	.0	.0	.0	.0	.0
25	4.5	3.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
26	3.0	2.0	2.5	.0	.0	.0	.0	.0	.0	.0	.0	.0
27	5.5	3.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
28	4.5	3.0	4.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
29	3.0	1.5	2.5	.0	.0	.0	.0	.0	.0	.0	.0	.0
30	2.5	1.5	2.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
31	2.5	2.0	2.5	.0	.0	.0	.0	.0	.0	.0	.0	.0
MONTH	8.0	.0	4.0	5.0	.0	.5	.0	.0	.0	.0	.0	.0
	FEBRUARY			MARCH			APRIL			MAY		
1	.0	.0	.0	.0	.0	.0	4.5	1.5	3.0	8.5	3.0	5.5
2	.0	.0	.0	.0	.0	.0	5.5	2.5	4.0	6.5	4.0	5.5
3	.0	.0	.0	1.5	.0	.5	5.5	1.5	3.5	7.5	5.0	6.0
4	.0	.0	.0	2.5	1.0	1.5	5.5	2.0	4.0	6.5	4.5	5.0
5	.0	.0	.0	3.0	.5	2.0	6.5	2.5	4.5	5.5	3.5	4.5
6	.0	.0	.0	2.0	1.5	2.0	6.5	2.5	4.5	5.0	3.5	4.5
7	.0	.0	.0	3.0	2.0	2.5	7.0	2.5	5.0	8.0	3.0	5.5
8	.0	.0	.0	3.0	1.5	2.0	7.5	2.5	5.0	9.0	3.5	6.0
9	.0	.0	.0	3.0	1.0	2.0	6.5	3.0	5.0	7.5	4.0	6.0
10	.0	.0	.0	3.5	1.0	2.5	6.0	3.5	4.5	7.5	4.0	6.0
11	.0	.0	.0	3.5	1.5	2.5	4.0	2.5	3.5	6.5	3.5	5.0
12	.0	.0	.0	4.0	1.5	2.5	2.5	1.0	2.0	5.5	3.5	4.5
13	.0	.0	.0	3.5	1.5	2.5	4.5	.0	2.0	6.0	4.0	5.0
14	.0	.0	.0	4.0	.5	2.0	5.0	2.0	3.5	4.5	3.0	3.5
15	.0	.0	.0	3.0	1.5	2.5	6.0	2.0	4.0	6.5	3.0	4.5
16	.0	.0	.0	3.5	1.5	2.5	6.5	3.5	4.5	8.5	4.0	6.0
17	.0	.0	.0	4.0	1.0	2.5	6.0	3.0	4.5	7.0	5.0	6.0
18	.0	.0	.0	3.0	.5	2.0	6.0	3.0	4.5	7.0	4.5	5.5
19	.0	.0	.0	5.0	1.0	3.0	5.0	3.5	4.5	10.0	5.0	7.5
20	.0	.0	.0	5.5	1.5	3.5	5.0	4.0	4.5	8.5	5.5	7.0
21	.0	.0	.0	4.0	2.5	3.0	8.0	4.5	6.0	7.0	5.0	5.5
22	.0	.0	.0	5.0	1.5	3.0	6.0	3.5	4.5	5.5	4.0	4.5
23	.0	.0	.0	4.0	1.0	2.5	4.0	2.0	3.0	8.0	3.5	5.5
24	.0	.0	.0	3.5	2.5	3.0	5.0	1.5	3.5	9.5	4.0	6.5
25	.0	.0	.0	4.0	1.5	2.5	4.5	2.5	3.5	10.5	5.0	7.5
26	.0	.0	.0	4.0	2.0	3.0	4.5	3.0	4.0	10.5	5.5	8.0
27	.0	.0	.0	6.0	2.5	4.5	5.0	3.0	4.0	10.0	5.5	8.0
28	.0	.0	.0	5.5	3.0	4.5	5.5	3.0	4.5	10.0	6.5	8.0
29	.0	.0	.0	4.5	3.0	4.0	5.5	2.5	4.0	10.0	6.0	8.0
30	.0	.0	.0	3.5	1.5	3.0	7.0	2.0	4.5	10.5	6.0	8.0
31	.0	.0	.0	4.0	1.0	2.5				10.5	6.5	8.5
MONTH	.0	.0	.0	6.0	.0	2.5	8.0	.0	4.0	10.5	3.0	6.0

PEND OREILLE RIVER BASIN

12355000 FLATHEAD RIVER AT FLATHEAD, BRITISH COLUMBIA--Continued

TEMPERATURE, WATER (DEG. C) WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DAY	MAX	MIN JUNE	MEAN	MAX	MIN JULY	MEAN	MAX	MIN AUGUST	MEAN	MAX	MIN SEPTEMBER	MEAN
1	11.0	6.5	8.5	15.5	8.5	12.0	16.0	10.0	13.0	12.5	9.5	11.0
2	10.5	7.0	8.5	15.0	10.5	13.0	16.5	10.5	14.0	16.0	11.0	13.0
3	10.5	7.0	9.0	14.0	10.0	12.0	17.0	11.5	14.0	15.0	10.5	12.5
4	9.0	7.0	8.0	11.0	9.0	10.0	16.5	11.5	14.5	14.5	9.5	12.0
5	10.0	7.0	8.5	9.5	8.5	9.0	15.5	11.0	13.5	11.5	9.0	10.0
6	10.0	7.5	8.5	13.0	8.0	10.5	17.0	10.5	13.5	12.0	6.0	9.0
7	10.0	7.0	8.5	14.5	8.5	11.5	17.5	10.5	14.5	12.5	6.5	9.5
8	9.5	7.5	8.5	14.0	9.5	12.0	16.5	11.5	14.5	12.0	9.0	10.5
9	11.0	6.5	9.0	13.5	9.5	11.5	17.5	12.0	14.5	11.0	9.5	10.5
10	12.5	7.0	9.5	12.0	9.5	11.0	17.5	11.0	14.5	10.5	9.0	10.0
11	13.0	8.0	10.5	14.0	9.5	11.0	17.0	12.5	15.0	11.5	8.0	9.5
12	12.0	7.5	10.0	13.0	9.5	11.0	17.0	11.5	14.5	9.0	7.0	8.0
13	13.0	7.5	10.0	14.0	9.5	11.5	17.5	12.0	14.5	7.5	6.5	7.0
14	11.5	8.0	10.0	15.0	9.0	12.5	16.5	11.0	14.0	10.5	6.5	8.5
15	12.0	8.0	10.0	14.0	9.5	12.0	17.0	11.5	14.5	9.5	8.0	8.5
16	12.5	8.0	10.0	12.5	10.0	11.0	16.5	11.0	14.0	10.0	7.5	9.0
17	14.0	8.0	11.0	10.5	8.5	9.5	17.0	10.5	14.0	9.0	6.5	8.0
18	12.0	9.5	10.5	14.5	8.0	11.0	16.0	10.5	13.5	8.0	7.0	7.5
19	11.0	8.0	9.5	15.5	9.0	12.5	16.0	11.0	13.5	8.0	5.0	7.0
20	10.0	6.5	8.5	16.5	9.5	13.0	16.0	9.5	13.0	8.0	6.5	7.5
21	12.5	7.0	10.0	16.5	10.0	13.5	14.0	10.5	12.0	9.0	5.5	7.5
22	13.5	8.0	10.5	14.0	10.5	12.5	15.0	9.0	12.0	9.0	6.5	7.5
23	15.0	9.0	12.0	13.0	10.0	11.5	13.5	10.0	12.0	9.5	6.5	8.0
24	15.0	9.5	12.5	15.5	9.5	12.5	12.5	10.0	11.5	9.5	7.5	8.5
25	15.0	10.0	12.5	14.0	11.0	11.5	16.0	10.0	13.0	8.0	7.0	7.5
26	13.5	9.5	12.0	13.5	9.5	11.5	16.5	10.5	13.5	7.5	6.5	7.0
27	15.0	9.5	12.0	14.5	10.0	12.0	16.5	10.5	13.5	8.0	6.0	7.0
28	14.0	10.0	12.0	14.0	9.0	12.0	17.0	11.0	14.0	7.5	6.0	7.0
29	13.5	10.5	11.5	15.0	9.5	12.0	16.5	12.0	14.5	7.0	6.0	6.5
30	11.0	9.5	10.0	15.5	9.5	12.5	16.0	12.5	14.0	8.5	6.5	7.5
31				15.5	9.5	12.5	14.0	12.0	13.0			
MONTH	15.0	6.5	10.0	16.5	8.0	11.5	17.5	9.0	13.5	16.0	5.0	9.0
YEAR	17.5	.0	5.0									

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DAY	MEAN CONCENTRATION (MG/L)	LOADS (T/DAY)	MEAN CONCENTRATION (MG/L)	LOADS (T/DAY)	MEAN CONCENTRATION (MG/L)	LOADS (T/DAY)	MEAN CONCENTRATION (MG/L)	LOADS (T/DAY)	MEAN CONCENTRATION (MG/L)	LOADS (T/DAY)	MEAN CONCENTRATION (MG/L)	LOADS (T/DAY)
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	5	5.9	19	48	3	2.4	1	.53	5	2.7	110	247
2	4	4.5	19	48	3	2.5	1	.53	5	2.7	110	245
3	4	4.7	23	68	2	1.7	1	.53	6	3.2	115	245
4	4	4.5	33	127	3	2.8	1	.51	7	3.6	21	44
5	4	4.3	32	118	4	3.8	1	.49	5	2.5	9	18
6	5	5.5	27	87	6	5.8	1	.49	4	1.9	9	17
7	5	5.4	22	64	7	6.7	1	.50	3	1.4	23	43
8	5	5.0	18	46	8	7.6	1	.52	2	.92	29	64
9	5	4.8	11	25	9	7.9	1	.53	1	.46	19	41
10	5	4.7	8	13	8	6.9	1	.55	1	.47	15	30
11	5	4.8	7	11	7	6.1	1	.55	1	.46	13	24
12	5	4.8	6	8.3	6	5.3	1	.54	1	.46	11	19
13	5	4.6	5	6.6	4	3.6	1	.52	1	.42	11	19
14	5	4.6	4	5.2	3	2.7	1	.52	1	.41	9	14
15	6	6.7	3	3.9	2	1.9	1	.52	1	.41	7	11
16	6	9.7	3	4.1	2	1.9	1	.52	1	.40	7	10
17	14	28	3	3.9	2	1.9	1	.53	1	.37	7	9.7
18	11	20	3	3.6	2	1.8	1	.56	1	.36	7	9.3
19	9	15	3	3.5	3	2.7	2	1.2	1	.38	6	7.7
20	11	20	3	3.3	3	2.7	2	1.2	1	.40	6	7.7
21	9	17	3	3.2	4	3.5	2	1.1	1	.42	11	15
22	9	18	3	3.0	3	2.5	2	1.1	1	.46	10	15
23	10	20	3	2.9	3	2.3	2	1.1	3	1.5	8	11
24	10	19	3	2.7	2	1.5	2	1.1	20	13	12	18
25	47	132	3	2.6	3	2.1	2	1.0	55	88	9	13
26	19	62	3	2.5	4	2.7	3	1.5	90	360	7	9.5
27	13	40	3	2.4	4	2.4	3	1.6	70	236	10	14
28	22	77	3	2.4	4	2.2	3	1.6	93	235	22	42
29	26	86	3	2.4	3	1.6	4	2.1	---	---	41	108
30	23	68	3	2.4	2	1.0	4	2.1	---	---	57	194
31	21	58	---	---	1	.52	4	2.2	---	---	53	185
TOTAL	---	764.5	---	723.9	---	101.02	---	28.34	---	958.30	---	1749.9

SUSPENDED-SEDIMENT, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DAY	MEAN CONCEN- TRATION (MG/L)		MEAN CONCEN- TRATION (MG/L)		MEAN CONCEN- TRATION (MG/L)		MEAN CONCEN- TRATION (MG/L)		MEAN CONCEN- TRATION (MG/L)		MEAN CONCEN- TRATION (MG/L)	
	LOADS (T/DAY)	LOADS (T/DAY)	LOADS (T/DAY)	LOADS (T/DAY)	LOADS (T/DAY)	LOADS (T/DAY)	LOADS (T/DAY)	LOADS (T/DAY)	LOADS (T/DAY)	LOADS (T/DAY)	LOADS (T/DAY)	
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	37	112	24	77	145	2270	13	30	2	2.0	2	1.2
2	35	96	19	61	175	2530	11	24	2	2.0	2	1.2
3	22	56	45	187	110	1410	10	21	2	1.9	1	.58
4	18	45	101	660	81	919	10	21	2	1.8	1	.56
5	27	67	68	466	68	762	10	21	2	1.8	1	.56
6	29	74	43	262	78	880	10	21	2	1.7	1	.55
7	31	85	34	185	52	511	10	19	2	1.7	1	.55
8	36	114	31	167	41	351	9	16	3	2.4	2	1.1
9	69	266	38	216	42	318	8	14	2	1.6	3	1.8
10	104	469	39	230	39	264	9	15	2	1.5	3	1.8
11	49	214	30	168	38	240	11	18	2	1.5	2	1.2
12	32	124	20	102	38	227	7	11	2	1.5	2	1.2
13	28	96	36	191	24	125	7	12	2	1.5	3	1.8
14	17	54	30	156	22	105	8	13	1	.69	5	2.8
15	11	32	15	68	30	147	7	11	1	.67	5	2.8
16	13	38	13	54	30	131	5	7.3	1	.65	2	1.1
17	12	33	18	74	26	103	6	9.4	2	1.3	1	.56
18	10	26	18	77	24	93	5	8.2	2	1.3	1	.55
19	9	23	41	225	26	96	6	9.5	2	1.2	2	1.1
20	9	22	470	4400	17	58	6	8.7	3	1.8	4	2.2
21	22	64	530	7410	15	47	4	5.4	3	1.8	5	2.7
22	413	3210	290	4470	16	47	5	6.5	3	1.8	3	1.6
23	350	3950	115	1280	13	36	5	6.5	3	1.8	2	1.0
24	84	660	73	664	13	35	4	5.2	3	1.8	3	1.6
25	63	378	75	747	13	34	3	3.7	3	1.8	3	1.6
26	49	246	178	2350	13	33	4	5.2	3	1.8	4	2.5
27	42	187	382	6520	11	26	3	3.8	2	1.2	3	1.9
28	37	149	415	8110	11	26	4	5.0	2	1.1	2	1.3
29	27	100	326	6650	19	48	3	3.5	3	1.6	2	1.3
30	27	92	190	3440	14	35	3	3.3	4	2.4	3	2.0
31	---	---	162	2740	---	---	2	2.1	1	.60	---	---
TOTAL	---	11082	---	52407	---	11907	---	360.3	---	48.21	---	42.71
TOTAL LOAD FOR YEAR:		80173.18		TONS.								

PEND OREILLE RIVER BASIN

12355100 STARVATION CREEK NEAR FLATHEAD, BRITISH COLUMBIA

LOCATION.--Lat 48°56'15", long 114°23'27", in NE¼SW¼SE¼ sec. 25, T.37 N., R.22 W., Flathead County, Hydrologic Unit 17010206, Glacier National Park, on right bank 900 ft upstream from mouth and 14 mi north of Polebridge, MT.

DRAINAGE AREA.--16.4 mi².

PERIOD OF RECORD.--October 1985 to September 1986.

GAGE.--Water-stage recorder. Elevation of gage is 3,850 ft, from topographic map.

REMARKS.--Estimated daily discharges: Oct. 1-18, Nov. 10 to Mar. 8, July 24 to Sept. 10. Records good except those for periods of estimated daily discharges, which are poor. No known regulations or diversions upstream from station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 350 ft³/s May 28, 1986, gage height, 3.16 ft; minimum daily, 3.0 ft³/s Feb. 20, 1986.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 350 ft³/s May 28, gage height, 3.16 ft; minimum daily, 3.0 ft³/s Feb. 20.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	23	4.5	4.3	4.7	25	22	28	177	35	15	8.5
2	10	23	4.8	4.3	5.0	23	20	28	170	31	15	8.5
3	10	26	5.0	4.3	4.7	22	19	33	149	36	14	8.3
4	11	36	5.5	4.0	4.3	21	18	54	125	30	14	8.3
5	11	40	6.0	4.0	4.0	20	18	75	131	27	13	8.3
6	10	36	6.4	3.8	3.8	19	19	67	125	25	13	8.3
7	10	31	6.6	4.0	3.8	18	20	57	96	25	12	8.0
8	9.5	28	6.3	4.0	4.0	17	22	49	83	25	12	8.3
9	9.0	22	6.0	4.3	4.2	15	25	46	79	26	12	8.5
10	9.0	18	5.5	4.5	4.5	14	28	46	73	26	11	8.5
11	9.5	15	5.0	4.5	4.0	13	35	45	73	25	11	8.3
12	10	13	5.0	4.5	3.8	13	24	41	75	24	11	7.9
13	10	12	5.2	4.5	3.7	12	31	41	60	23	10	7.9
14	11	11	5.4	4.3	3.5	12	28	39	55	22	10	7.6
15	13	12	5.6	4.2	3.5	11	25	36	65	21	9.7	7.6
16	15	13	5.8	4.2	3.5	11	24	34	57	20	9.5	7.9
17	14	11	6.0	4.5	3.3	11	23	32	49	20	9.3	7.6
18	14	10	6.0	5.0	3.2	11	22	31	55	20	9.0	7.3
19	15	9.0	6.0	5.5	3.1	10	21	32	52	18	8.7	6.9
20	16	8.5	6.0	6.0	3.0	10	20	54	41	18	8.7	6.7
21	18	8.0	5.5	5.5	3.2	11	20	121	33	18	8.6	6.7
22	18	7.5	5.5	5.0	3.5	11	46	135	28	19	8.5	6.4
23	18	7.0	5.5	5.0	4.5	11	100	101	26	20	8.5	6.4
24	18	6.5	5.0	4.5	6.0	11	83	82	35	19	8.5	6.1
25	22	6.0	5.0	4.5	18	11	65	86	44	18	8.5	6.7
26	23	5.8	5.0	4.0	35	11	51	148	44	19	8.4	7.6
27	23	5.5	5.0	4.0	30	12	44	244	36	19	8.3	6.9
28	23	5.0	4.8	4.0	27	14	37	277	30	18	8.0	6.7
29	24	4.7	4.5	4.3	---	17	35	258	41	17	7.7	6.4
30	24	4.3	4.2	4.5	---	23	31	209	42	16	8.6	6.4
31	23	---	4.3	4.5	---	24	---	196	---	16	8.3	---
TOTAL	462.0	457.8	166.9	138.5	204.8	464	976	2725	2149	696	319.8	225.5
MEAN	14.9	15.3	5.38	4.47	7.31	15.0	32.5	87.9	71.6	22.5	10.3	7.52
MAX	24	40	6.6	6.0	35	25	100	277	177	36	15	8.5
MIN	9.0	4.3	4.2	3.8	3.0	10	18	28	26	16	7.7	6.1
CFSM	.91	.93	.33	.27	.45	.91	1.98	5.36	4.37	1.37	.63	.46
IN.	1.05	1.04	.38	.31	.46	1.05	2.21	6.18	4.87	1.58	.73	.51
AC-FT	916	908	331	275	406	920	1940	5410	4260	1380	634	447

WTR YR 1986 TOTAL 8985.3 MEAN 24.6 MAX 277 MIN 3.0 CFSM 1.50 IN. 20.38 AC-FT 1780

12355150 TUCHUCK CREEK NEAR FLATHEAD, BRITISH COLUMBIA

LOCATION.--Lat 48°55'25", long 114°35'56", Flathead County, Hydrologic Unit 17010206, on right bank, Flathead National Forest, at wooden wingwall of bridge 400 ft upstream from Tuchuck Campground, 1,300 ft upstream from Yakinikak Creek, and 18 mi northwest of Polebridge, MT.

DRAINAGE AREA.--10.1 mi².

PERIOD OF RECORD.--October 1985 to September 1986.

GAGE.--Water-stage recorder. Elevation of gage is 4,630 ft, from topographic map.

REMARKS.--Estimated daily discharges: Oct. 1-16, Nov. 9 to Mar. 26. Records good except those for estimated daily discharges, which are poor.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 263 ft³/s May 28, 1986, gage height, 2.90 ft; maximum gage height, 4.91 ft Nov. 14, 1985 (backwater from ice); minimum daily discharge, 4.0 ft³/s Feb. 20, 1986.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 263 ft³/s May 28, gage height, 2.90 ft; maximum gage height, 4.91 ft Nov. 14 (backwater from ice); minimum daily discharge 4.0 ft³/s Feb. 20.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16	25	6.5	6.2	6.4	22	27	27	150	21	13	9.0
2	15	26	7.0	6.2	6.6	21	26	28	139	20	13	9.4
3	16	34	7.5	6.2	6.4	20	24	45	122	20	12	8.3
4	16	47	8.0	6.0	6.0	19	24	64	106	20	12	8.3
5	15	44	8.5	5.8	5.8	18	24	64	118	20	12	9.0
6	15	36	9.0	5.6	5.6	17	25	58	101	18	12	8.3
7	14	33	9.5	5.8	5.6	17	26	50	85	18	11	7.9
8	14	27	9.0	5.8	5.6	18	29	48	80	16	11	8.3
9	13	24	8.5	5.8	5.7	18	35	50	71	17	11	11
10	13	20	8.0	6.0	5.8	17	38	50	67	17	11	9.4
11	13	17	7.5	6.2	5.7	17	37	47	60	17	10	9.0
12	14	15	7.5	6.3	5.5	16	33	41	48	17	10	8.6
13	13	14	7.5	6.2	5.2	16	30	47	42	17	10	8.6
14	15	14	8.0	6.0	5.1	15	27	42	41	15	9.8	8.6
15	18	14	8.0	6.0	5.0	15	26	37	40	14	9.4	8.6
16	22	15	8.0	6.0	4.8	14	26	34	36	14	9.0	9.0
17	21	14	8.3	6.0	4.6	14	24	34	34	16	8.6	8.6
18	20	13	8.3	7.0	4.5	13	23	42	33	15	8.6	8.6
19	20	12	8.3	8.0	4.3	12	22	58	30	15	8.6	8.6
20	21	12	8.0	8.5	4.0	12	22	85	28	14	8.3	8.6
21	23	11	7.8	7.6	4.5	12	26	112	26	14	8.6	8.6
22	24	11	7.6	7.2	5.0	13	72	101	26	15	8.6	8.3
23	23	10	7.4	7.0	7.0	13	90	78	25	15	8.3	8.3
24	23	9.5	7.4	6.6	10	14	65	71	24	15	8.3	8.6
25	40	9.0	7.5	6.4	20	15	53	87	23	15	8.3	8.3
26	37	8.5	7.2	6.2	30	15	44	125	21	15	8.3	10
27	35	8.0	7.0	6.0	25	16	40	158	21	15	7.9	9.8
28	40	7.5	6.8	6.2	23	18	35	186	21	14	7.9	9.4
29	36	7.0	6.4	6.2	---	22	31	175	25	13	7.9	9.0
30	33	7.0	6.0	6.2	---	28	28	150	23	13	10	9.4
31	27	---	6.2	6.0	---	30	---	158	---	13	8.6	---
TOTAL	665	544.5	238.2	197.2	232.7	527	1032	2352	1666	498	303.0	265.4
MEAN	21.5	18.1	7.68	6.36	8.31	17.0	34.4	75.9	55.5	16.1	9.77	8.85
MAX	40	47	9.5	8.5	30	30	90	186	150	21	13	11
MIN	13	7.0	6.0	5.6	4.0	12	22	27	21	13	7.9	7.9
CFSM	2.13	1.79	.76	.63	.82	1.68	3.41	7.51	5.50	1.59	.97	.88
IN.	2.45	2.01	.88	.73	.86	1.94	3.80	8.66	6.14	1.83	1.12	.98
AC-FT	1320	1080	472	391	462	1050	2050	4670	3300	988	601	526

WTR YR 1986 TOTAL 8521.0 MEAN 23.3 MAX 186 MIN 4.0 CFSM 2.31 IN. 31.38 AC-FT 1690

PEND OREILLE RIVER BASIN

12355500 NORTH FORK FLATHEAD RIVER NEAR COLUMBIA FALLS, MT

LOCATION.--Lat 48°29'44", long 114°07'36", in NE¼SW¼NW¼ 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 mile 162.1.

DRAINAGE AREA.--1,548 mi².

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. Datum of gage is 3,145.59 ft above National Geodetic Vertical Datum of 1929. 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 datums.

REMARKS.--Estimated daily discharges: Nov. 23-30, Dec. 3 to Feb. 23. Water-discharge records good except those for periods of estimated daily discharges, which are poor. A few small diversions from tributaries for irrigation of hay meadows upstream from station.

AVERAGE DISCHARGE.--55 years (1910-12, 1913-15, 1935-86), 2,971 ft³/s, 26.06 in/yr, 2,152,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 69,100 ft³/s June 9, 1964, gage height, 18.60 ft, from flood-mark, from rating curve extended above 37,000 ft³/s on basis of slope-area measurement of peak flow; minimum, 198 ft³/s Jan. 8, 1953, gage height, 0.86 ft, site and datum then in use.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 22,900 ft³/s May 29, gage height, 10.25 ft; minimum daily, 450 ft³/s Feb. 21.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	1550	2950	805	780	700	3110	4560	3680	18900	3410	1480	933		
2	1520	3050	812	800	740	2710	4060	3540	17600	3160	1440	933		
3	1520	3540	950	780	740	2580	3700	3810	16100	3030	1390	924		
4	1490	5280	1200	700	730	2560	3520	5710	14100	2980	1360	889		
5	1440	6690	1450	630	720	2470	3410	7510	13100	2980	1340	889		
6	1470	5720	1400	660	680	2430	3380	7210	12800	2920	1320	907		
7	1490	4880	1350	670	650	2460	3410	6550	11600	2760	1290	872		
8	1380	4280	1250	700	640	2970	3590	6100	10400	2590	1260	846		
9	1320	3670	1200	750	660	3130	4010	5940	9420	2490	1230	951		
10	1300	2970	1100	730	640	2980	4660	5960	8630	2440	1200	998		
11	1290	2500	1050	720	620	2820	4960	5850	7910	2410	1190	979		
12	1310	2400	1100	720	600	2670	4670	5510	7690	2400	1170	952		
13	1280	2330	1150	640	550	2580	4110	5340	7140	2370	1190	924		
14	1280	2300	1100	620	500	2460	3900	5470	6530	2310	1170	907		
15	1380	2260	1050	660	480	2360	3610	5040	6540	2190	1130	889		
16	1610	2360	1050	680	520	2260	3540	4710	6210	2110	1100	898		
17	1970	2260	1030	680	580	2160	3430	4410	5720	2150	1080	889		
18	2080	1910	1000	660	560	2050	3260	4330	5420	2200	1050	863		
19	1990	1790	960	680	520	1970	3090	4570	5270	2130	1030	837		
20	1950	1770	930	720	480	1950	2980	5860	4940	2040	1010	820		
21	2010	1690	900	700	450	2000	3030	9010	4550	1950	988	803		
22	2120	1480	860	690	550	2110	3880	12200	4060	1870	988	795		
23	2240	1350	840	680	700	2090	7840	11000	3770	1880	970	778		
24	2260	1300	820	680	986	2120	7650	8970	3630	1890	961	778		
25	2650	1200	800	660	1330	2230	6410	8570	3590	1830	933	778		
26	3320	1100	760	610	2070	2130	5610	10400	3550	1830	916	812		
27	3410	1000	730	580	3690	2120	5050	14200	3480	1810	895	888		
28	3450	950	680	700	3570	2550	4710	18300	3300	1740	872	916		
29	3570	900	660	680	---	3290	4310	21400	3410	1670	863	924		
30	3330	850	720	680	---	4050	3950	21400	3540	1600	880	961		
31	3110	---	760	680	---	5140	---	20100	---	1540	951	---		
TOTAL	62090	76730	30467	21320	25656	80510	128290	262650	232900	70680	34647	26533		
MEAN	2003	2558	983	688	916	2597	4276	8473	7763	2280	1118	884		
MAX	3570	6690	1450	800	3690	5140	7840	21400	18900	3410	1480	998		
MIN	1280	850	660	580	450	1950	2980	3540	3300	1540	863	778		
CFSM	1.29	1.65	.64	.44	.59	1.68	2.76	5.47	5.01	1.47	.72	.57		
IN.	1.49	1.84	.73	.51	.62	1.93	3.08	6.31	5.60	1.70	.83	.64		
AC-FT	123200	152200	60430	42290	50890	159700	254500	521000	462000	140200	68720	52630		
CAL YR 1985	TOTAL	1061579	MEAN	2908	MAX	18300	MIN	300	CFSM	1.88	IN.	25.51	AC-FT	2106000
WTR YR 1986	TOTAL	1052473	MEAN	2883	MAX	21400	MIN	450	CFSM	1.86	IN.	25.29	AC-FT	2088000

12355500 NORTH FORK FLATHEAD RIVER NEAR COLUMBIA FALLS, MT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1950, 1965, 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.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE (water years 1976-79): Maximum daily, 246 microsiemens, Dec. 31, 1976; minimum daily, 128 microsiemens, June 30, July 1, 1976.

WATER TEMPERATURE: Maximum, 19.0°C, July 22, 23, 1977; minimum, 0.0°C on many days during winter periods.

SEDIMENT CONCENTRATION (water years 1976-79): Maximum daily mean, 931 mg/L, May 11, 1976; minimum daily mean, 1 mg/L on many days each year.

SEDIMENT LOAD (water years 1976-79): Maximum daily, 56,800 tons, May 11, 1976; minimum daily, 1.1 tons, Mar. 3, 1978.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum, 18.0°C, Aug. 8, 10, 11, 13; minimum, 0.0°C on many days during winter period.

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	TEMPER- ATURE, AIR (DEG C) (00020)	TEMPER- ATURE (DEG C) (00010)
OCT					
09...	0845	1330	201	-8.0	1.5
NOV					
14...	0930	2220	186	-7.0	0.0
DEC					
19...	0915	961	205	-2.0	0.0
JAN					
08...	0915	684	217	-6.0	0.0
MAR					
11...	1500	2770	163	6.0	3.0
APR					
24...	1400	7530	157	9.0	4.5
MAY					
23...	1430	10700	142	17.5	6.0
29...	1135	21100	133	33.0	9.0
AUG					
27...	1355	830	208	29.0	16.5

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	6.0	5.5	6.0	3.0	2.5	3.0	.0	.0	.0	.0	.0	.0
2	6.5	6.0	6.0	4.5	3.0	3.5	.0	.0	.0	.0	.0	.0
3	7.5	6.0	7.0	5.0	4.5	5.0	.0	.0	.0	.0	.0	.0
4	7.0	5.5	6.5	5.0	4.5	5.0	.0	.0	.0	.0	.0	.0
5	8.0	6.5	7.0	4.5	3.0	3.5	.0	.0	.0	.0	.0	.0
6	8.0	4.5	6.5	3.5	3.0	3.0	.0	.0	.0	.0	.0	.0
7	4.5	3.5	4.0	3.5	3.0	3.5	.0	.0	.0	.0	.0	.0
8	3.5	2.0	2.5	3.5	2.0	2.5	.0	.0	.0	.0	.0	.0
9	2.5	1.0	2.0	2.0	.5	1.5	.0	.0	.0	.0	.0	.0
10	4.5	2.5	3.5	.5	.0	.0	.0	.0	.0	.0	.0	.0
11	5.0	4.5	4.5	.0	.0	.0	.0	.0	.0	.0	.0	.0
12	5.5	4.5	5.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
13	5.5	5.0	5.5	.0	.0	.0	.0	.0	.0	.0	.0	.0
14	5.5	5.0	5.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
15	6.5	5.5	6.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
16	6.0	5.5	6.0	.5	.0	.0	.0	.0	.0	.0	.0	.0
17	6.0	5.5	5.5	.5	.0	.0	.0	.0	.0	.0	.0	.0
18	6.0	4.5	5.5	.0	.0	.0	.0	.0	.0	.0	.0	.0
19	6.5	5.0	5.5	.0	.0	.0	.0	.0	.0	.0	.0	.0
20	7.0	5.5	6.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
21	6.5	5.5	6.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
22	6.5	5.5	5.5	.0	.0	.0	.0	.0	.0	.0	.0	.0
23	5.0	4.5	5.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
24	5.0	4.5	4.5	.0	.0	.0	.0	.0	.0	.0	.0	.0
25	6.0	5.0	5.5	.0	.0	.0	.0	.0	.0	.0	.0	.0
26	5.0	4.0	4.5	.0	.0	.0	.0	.0	.0	.0	.0	.0
27	5.5	4.0	4.5	.0	.0	.0	.0	.0	.0	.0	.0	.0
28	5.5	4.5	5.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
29	4.0	3.0	3.5	.0	.0	.0	.0	.0	.0	.0	.0	.0
30	3.0	2.0	3.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
31	3.5	3.0	3.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
MONTH	8.0	1.0	5.0	5.0	.0	1.0	.0	.0	.0	.0	.0	.0

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DAY	MAX	MIN FEBRUARY	MEAN	MAX	MIN MARCH	MEAN	MAX	MIN APRIL	MEAN	MAX	MIN MAY	MEAN
1	.0	.0	.0	.0	.0	.0	4.5	2.5	3.5	8.0	5.0	6.5
2	.0	.0	.0	.0	.0	.0	5.5	3.5	4.5	8.0	6.5	7.5
3	.0	.0	.0	.5	.0	.0	5.5	3.0	4.5	8.0	6.5	7.5
4	.0	.0	.0	2.0	.5	1.0	5.5	3.0	4.5	8.0	5.5	6.5
5	.0	.0	.0	2.5	.5	1.5	6.0	4.0	5.0	6.5	5.0	5.5
6	.0	.0	.0	3.0	1.5	2.5	6.5	4.0	5.5	6.5	4.5	5.5
7	.0	.0	.0	2.5	2.0	2.5	7.0	4.0	5.5	7.5	4.0	6.0
8	.0	.0	.0	2.5	2.0	2.5	7.0	4.5	6.0	8.0	5.5	7.0
9	.0	.0	.0	2.5	1.5	2.0	7.0	5.0	6.0	8.0	6.0	7.0
10	.0	.0	.0	3.0	2.0	2.5	6.5	5.0	5.5	7.5	6.0	6.5
11	.0	.0	.0	4.0	2.0	3.0	5.0	4.0	4.5	6.5	5.5	6.0
12	.0	.0	.0	4.0	2.5	3.5	4.0	2.5	3.0	6.5	5.0	5.5
13	.0	.0	.0	4.0	2.5	3.5	4.0	1.0	2.5	7.0	5.5	6.0
14	.0	.0	.0	3.5	1.5	2.5	5.5	3.0	4.5	6.0	4.5	5.0
15	.0	.0	.0	3.5	2.0	3.0	6.0	3.5	4.5	6.0	4.0	5.0
16	.0	.0	.0	4.0	2.0	3.0	6.0	5.0	5.5	8.0	5.0	6.5
17	.0	.0	.0	4.0	2.5	3.0	6.5	4.5	5.0	7.5	6.0	7.0
18	.0	.0	.0	3.0	2.0	2.5	6.0	4.5	5.0	7.5	6.0	6.5
19	.0	.0	.0	4.5	2.0	3.0	5.0	4.5	5.0	10.0	6.5	8.0
20	.0	.0	.0	5.0	3.0	4.0	6.0	4.5	5.5	9.5	8.0	9.0
21	.0	.0	.0	4.5	3.0	3.5	8.0	5.5	6.5	8.5	6.5	7.5
22	.0	.0	.0	4.5	3.0	3.5	8.0	6.5	7.5	6.5	5.0	5.5
23	.0	.0	.0	4.0	2.5	3.5	6.0	4.0	4.5	8.0	4.5	6.0
24	.0	.0	.0	4.0	3.0	3.5	5.5	3.0	4.5	9.5	6.0	7.5
25	.0	.0	.0	3.5	2.5	3.0	5.0	4.0	4.5	10.5	7.5	9.0
26	.0	.0	.0	3.5	3.0	3.0	5.5	4.5	5.0	11.0	8.5	9.5
27	.0	.0	.0	6.0	3.0	4.5	6.0	4.0	5.0	10.5	8.5	9.5
28	.0	.0	.0	6.0	4.5	5.0	6.0	5.0	5.5	10.5	8.5	9.5
29				5.0	4.0	4.5	5.0	4.0	4.5	10.5	9.0	10.0
30				4.5	3.5	3.5	6.0	4.0	5.0	10.5	8.5	9.5
31				4.0	2.0	3.0				11.0	9.0	10.0
MONTH	.0	.0	.0	6.0	.0	3.0	8.0	1.0	5.0	11.0	4.0	7.0
		JUNE			JULY			AUGUST			SEPTEMBER	
1	11.0	9.0	10.0	15.5	11.0	13.0	16.5	13.5	15.0	14.5	13.0	13.5
2	11.0	9.5	10.0	16.0	13.5	15.0	17.0	14.0	16.0	15.0	12.5	14.0
3	11.0	9.0	10.0	15.5	13.5	14.5	17.0	14.5	16.0	15.5	13.0	14.0
4	10.5	9.0	9.5	14.0	12.0	12.5	17.5	14.5	16.5	15.5	12.5	14.0
5	10.0	8.5	9.0	12.5	10.5	11.0	17.0	14.5	16.0	14.5	11.0	12.0
6	10.5	9.0	9.5	13.0	10.5	11.5	16.5	14.0	15.5	11.5	10.0	11.0
7	10.0	9.0	9.5	15.0	11.5	13.5	17.5	14.5	16.0	12.0	9.5	11.0
8	10.5	9.0	9.5	14.5	13.0	14.0	18.0	15.0	17.0	13.0	11.5	12.5
9	11.5	9.0	10.0	15.0	13.0	14.0	17.5	15.5	17.0	12.5	11.5	12.0
10	12.5	9.5	11.0	14.0	13.0	13.5	18.0	15.0	17.0	11.5	11.0	11.5
11	13.0	10.5	11.5	13.0	12.0	12.5	18.0	15.5	17.0	12.0	10.0	11.0
12	12.5	10.5	11.5	13.0	11.5	12.0	17.5	15.5	16.5	11.0	9.0	10.0
13	13.5	10.5	11.5	14.0	12.0	13.0	18.0	15.5	17.0	9.5	8.5	8.5
14	12.5	11.0	12.0	15.5	12.0	14.0	17.5	15.0	16.5	10.0	8.0	9.0
15	13.0	10.5	11.5	15.5	13.0	14.5	17.5	15.0	16.5	11.0	9.5	10.5
16	14.0	10.5	12.0	14.5	12.5	13.5	17.0	14.5	16.0	11.5	10.0	10.5
17	14.5	11.0	13.0	12.5	11.0	11.5	17.0	14.5	16.0	12.0	10.0	11.0
18	14.5	12.5	13.5	14.5	10.5	12.5	16.0	14.5	15.5	11.0	9.0	10.0
19	13.0	10.5	11.5	15.5	12.5	14.0	16.5	14.0	15.5	9.5	7.5	8.5
20	11.0	9.5	10.5	16.5	13.5	15.0	16.0	13.5	15.0	9.0	8.5	9.0
21	12.5	9.5	10.5	17.0	13.5	15.5	15.5	13.0	14.0	9.5	8.0	8.5
22	14.0	10.5	12.0	16.5	14.5	15.5	15.0	12.0	13.5	9.0	8.0	8.5
23	15.5	11.5	13.5	16.0	13.5	14.5	15.0	12.5	13.5	9.5	7.0	8.5
24	15.5	13.0	14.5	16.5	13.5	15.0	14.0	12.0	13.0	9.5	9.0	9.0
25	15.5	13.5	14.5	15.5	14.0	14.5	16.0	13.0	14.5	9.0	8.5	9.0
26	15.0	13.0	14.0	14.5	13.0	14.0	16.0	13.5	15.5	8.0	7.5	8.0
27	15.0	12.5	14.0	15.0	13.0	14.0	16.5	13.5	15.5	8.5	7.0	7.5
28	15.5	13.5	14.5	15.0	12.5	14.0	16.5	14.0	16.0	8.5	7.5	8.0
29	15.0	13.5	14.0	14.5	13.0	14.0	16.5	15.0	16.0	8.0	7.5	8.0
30	13.5	12.0	12.5	15.5	12.5	14.0	17.0	14.5	15.5	8.0	8.0	8.0
31				15.5	13.0	14.5	16.0	14.5	15.0			
MONTH YEAR	15.5 18.0	8.5 .0	11.5 6.0	17.0	10.5	13.5	18.0	12.0	15.5	15.5	7.0	10.0

PEND OREILLE RIVER BASIN

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12358500 MIDDLE FORK FLATHEAD RIVER NEAR WEST GLACIER, MT

LOCATION.--Lat 48°29'43", long 114°00'33", in S½SW¼NE¼ 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 mile 3.8.

DRAINAGE AREA.--1,128 mi².

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. Datum of gage is 3,128.72 ft above National Geodetic Vertical Datum of 1929. Prior to Nov. 22, 1950, nonrecording gage at present site and datum.

REMARKS.--Estimated daily discharges: Oct. 1-9, Nov. 23 to Dec. 3, Jan. 5-8, Feb. 19-23. Records good except those for periods of estimated daily discharges, which are fair. Several observations of water temperature and specific conductance were made during the year and are published as miscellaneous water-quality data in the back of this report.

AVERAGE DISCHARGE.--47 years, 2,918 ft³/s, 35.13 in/yr, 2,114,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 140,000 ft³/s June 9, 1964, gage height, 36.46 ft, from floodmarks, from rating curve extended above 31,000 ft³/s, on basis of contracted opening measurement at gage height, 19.42 ft and flood volume-hydrographic comparison; minimum, less than 173 ft³/s Nov. 27, 1952 (stage below intake pipe).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 19,400 ft³/s May 30, gage height, 8.27 ft; minimum daily, 420 ft³/s Feb. 21.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	2200	4120	1250	718	636	2750	5700	3210	17000	3010	1240	882		
2	2000	4050	1300	718	667	2880	4840	3070	15900	2750	1200	831		
3	2600	4470	1400	700	667	3010	4270	3320	14800	2750	1190	774		
4	1800	6150	1480	659	667	2980	3870	5370	13000	2610	1180	727		
5	1900	7640	1290	560	659	2880	3620	7370	11700	2730	1160	718		
6	2000	7100	1240	580	636	2730	3430	7020	10700	2940	1140	700		
7	2150	6120	1190	600	597	2750	3320	6150	9820	2730	1100	667		
8	1700	5400	1130	600	590	3470	3430	5550	9000	2550	1070	651		
9	1500	4700	1040	676	605	3700	3870	5120	8500	2450	1050	899		
10	1640	3980	984	659	597	3460	4620	4830	8010	2410	1030	1180		
11	1640	3490	927	659	568	3160	4800	4630	7740	2470	1020	1180		
12	1620	3160	993	636	548	2920	4440	4390	7780	2670	1010	1090		
13	1560	3010	1020	590	541	2730	3970	4260	6920	2570	994	984		
14	1520	2880	972	568	522	2590	3670	4280	6380	2380	983	916		
15	1730	2710	949	612	528	2450	3410	4050	6600	2230	949	862		
16	2640	2690	926	636	562	2320	3210	3820	6020	2120	926	840		
17	3030	2550	915	628	619	2190	3050	3620	5490	2140	893	821		
18	2900	2210	893	612	529	2100	2880	3500	5330	2140	872	801		
19	2750	2080	861	628	470	1980	2710	3670	5330	2050	851	801		
20	2690	1980	830	659	450	1910	2610	5680	4620	1960	821	782		
21	2690	1850	811	651	420	1900	2610	9430	4130	1900	801	773		
22	2730	1580	773	628	500	1950	3490	11700	3670	1850	792	754		
23	2750	1400	736	620	550	1900	6400	9380	3430	1810	764	745		
24	2730	1350	736	620	819	2000	6310	7600	3460	1750	754	727		
25	3940	1300	718	605	1900	2140	5400	7340	3500	1690	736	727		
26	6280	1250	692	562	3290	2070	4780	9970	3460	1620	718	773		
27	5730	1200	651	548	3320	2070	4310	14500	3180	1560	704	792		
28	6010	1150	628	643	2960	2470	4050	17500	3030	1480	700	782		
29	5790	1150	597	620	---	3540	3720	18300	3430	1390	709	801		
30	5160	1200	675	620	---	4680	3430	18800	3410	1330	718	821		
31	4590	---	692	620	---	6480	---	18400	---	1280	829	---		
TOTAL	89970	93920	29299	19435	25417	86160	120220	235830	215340	67320	28904	24801		
MEAN	2902	3131	945	627	908	2779	4007	7607	7178	2172	932	827		
MAX	6280	7640	1480	718	3320	6480	6400	18800	17000	3010	1240	1180		
MIN	1500	1150	597	548	420	1900	2610	3070	3030	1280	700	651		
CFSM	2.57	2.78	.84	.56	.80	2.46	3.55	6.74	6.36	1.93	.83	.73		
IN.	2.97	3.10	.97	.64	.84	2.84	3.96	7.78	7.10	2.22	.95	.82		
AC-FT	178500	186300	58110	38550	50410	170900	238500	467800	427100	133500	57330	49190		
CAL YR 1985	TOTAL	1139475	MEAN	3122	MAX	19000	MIN	240	CFSM	2.77	IN.	37.58	AC-FT	226000
WTR YR 1986	TOTAL	1036616	MEAN	2840	MAX	18800	MIN	420	CFSM	2.52	IN.	34.19	AC-FT	205600

12359800 SOUTH FORK FLATHEAD RIVER ABOVE TWIN CREEK, NEAR HUNGRY HORSE, MT

LOCATION.--Lat 47°58'45", long 113°33'36", in NE¼NW¼NE¼ 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 mile 46.7.

DRAINAGE AREA.--1,160 mi².

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, from river-profile map.

REMARKS.--Estimated daily discharges: Nov. 26-30. Seasonal records good. No known regulation or diversions upstream of station.

AVERAGE DISCHARGE.--18 years (water years, 1965-82), 2,310 ft³/s, 27.05 in/yr, 1,674,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 30,200 ft³/s June 16, 1974, gage height, 15.20 ft; minimum, 127 ft³/s Nov. 30, 1979, gage height, 4.13 ft.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 8, 1964, reached a stage of 20.87 ft, from high-water profile; discharge, 50,900 ft³/s, by slope-area measurement of peak flow.

EXTREMES FOR CURRENT SEASON.--Maximum discharge, 21,900 ft³/s May 30, gage height, 13.28 ft; minimum daily, 362 ft³/s Aug. 28.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1680	2480					4710	2870	18100	2100	724	583
2	1600	2580					4150	2850	16300	1900	704	526
3	1760	2840					3650	3560	14600	1800	677	471
4	1770	3250					3340	5850	12800	1780	651	444
5	1670	4110					3190	6710	11700	1930	639	419
6	1650	3890					3060	5900	11600	1870	620	409
7	1620	3570					3060	5190	10400	1720	601	394
8	1510	3200					3290	4650	9430	1600	583	409
9	1370	2870					3870	4240	8460	1530	565	755
10	1360	2460					4530	4010	7600	1500	548	802
11	1340	2160					4500	3820	7240	1770	548	678
12	1310	1920					4140	3570	7180	2280	536	602
13	1260	1870					3710	3410	6370	2120	542	554
14	1250	1840					3360	3370	5810	1880	536	525
15	1430	1800					3120	3170	5800	1710	519	492
16	1680	1820					2980	2960	5280	1570	497	481
17	1720	1730					2820	2840	4810	1500	481	470
18	1670	1510					2660	2850	4580	1410	465	460
19	1610	1450					2510	3400	4420	1300	449	455
20	1610	1360					2400	6250	3810	1200	441	455
21	1630	1280					2600	10700	3330	1130	429	486
22	1740	1110					3920	12300	2930	1090	429	492
23	1800	1030					6290	9700	2710	1050	419	486
24	1780	1050					5840	7810	2640	1010	409	476
25	2390	1080					5060	8270	2580	961	394	476
26	3190	1000					4450	11600	2510	929	380	492
27	3060	980					3960	16000	2310	898	371	486
28	3170	950					3660	19400	2190	860	362	486
29	3060	970					3370	20400	2470	809	366	486
30	2870	1000					3090	20700	2410	772	385	503
31	2660	---					---	19800	---	751	587	---
TOTAL	58220	59160					111290	238150	202370	44730	15857	15253
MEAN	1878	1972					3710	7682	6746	1443	512	508
MAX	3190	4110					6290	20700	18100	2280	724	802
MIN	1250	950					2400	2840	2190	751	362	394
CFSM	1.62	1.70					3.20	6.62	5.82	1.24	.44	.44
IN.	1.87	1.90					3.57	7.64	6.49	1.43	.51	.49
AC-FT	115500	117300					220700	472400	401400	88720	31450	30250

12362000 HUNGRY HORSE RESERVOIR NEAR HUNGRY HORSE, MT

LOCATION.--Lat 48°20'28", long 114°00'48", in NE¼NE¼NW¼ 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 mile 5.2.

DRAINAGE AREA.--1,654 mi².

PERIOD OF RECORD.--September 1951 to current year.

GAGE.--Water-stage recorder equipped with remote indicator in power house. Datum of gage is at National Geodetic Vertical Datum of 1929 (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 flashboards; 3,428,000 acre-ft between elevations 3,196 ft, lowest outlet, and 3,560 ft, controlled spillway elevation. Dead storage, 40,140 acre-ft below elevation 3,196 ft. Minimum operating level, 445,900 acre-ft, elevation, 3,336 ft for on-site power generation. 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.

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, 3,453,000 acre-ft July 13, elevation, 3,561.04 ft; minimum, 2,241,000 acre-ft Feb. 23, elevation, 3,503.11 ft.

Capacity table (elevation, in feet, and contents, in acre-ft)

3,500	2,186,000	3,540	2,974,000
3,520	2,560,000	3,565	3,548,000

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3525.37	3524.84	3532.76	3518.34	3506.08	3505.82	3518.32	3528.74	3553.21	3560.03	3560.86	3555.35
2	3524.66	3525.31	3532.69	3517.44	3505.99	3506.33	3518.92	3528.87	3554.44	3559.97	3560.90	3555.28
3	3524.35	3525.94	3532.70	3516.55	3505.92	3506.86	3519.47	3529.33	3555.34	3559.93	3560.93	3554.80
4	3523.94	3526.75	3532.72	3515.63	3505.83	3507.31	3520.01	3530.32	3555.96	3560.09	3560.72	3554.28
5	3523.49	3527.62	3532.74	3514.68	3505.73	3507.67	3520.52	3531.00	3556.36	3560.33	3560.33	3553.79
6	3523.06	3528.30	3532.72	3513.75	3505.63	3507.86	3520.98	3531.81	3556.72	3560.52	3560.00	3553.27
7	3522.84	3528.95	3532.72	3512.83	3505.48	3508.34	3521.44	3532.40	3556.94	3560.48	3559.71	3552.81
8	3522.51	3529.48	3532.68	3511.87	3505.31	3508.94	3521.98	3533.00	3557.26	3560.44	3559.37	3552.36
9	3521.97	3529.95	3532.63	3510.93	3505.13	3509.56	3522.55	3533.63	3557.32	3560.44	3559.36	3552.20
10	3521.42	3530.25	3532.53	3510.00	3504.97	3509.94	3523.28	3534.17	3557.40	3560.49	3559.36	3551.93
11	3520.67	3530.56	3532.39	3509.76	3504.82	3510.37	3523.98	3534.70	3557.49	3560.59	3559.15	3551.63
12	3519.87	3530.85	3532.26	3509.52	3504.60	3510.80	3524.61	3535.10	3557.56	3560.84	3558.80	3551.28
13	3519.07	3531.12	3532.17	3509.10	3504.41	3511.20	3525.13	3535.03	3557.52	3561.04	3558.48	3550.96
14	3518.38	3531.38	3532.08	3508.66	3504.24	3511.55	3525.51	3535.42	3557.46	3560.85	3558.18	3550.66
15	3518.55	3531.65	3532.00	3508.29	3504.12	3511.89	3525.95	3535.77	3557.82	3560.67	3557.84	3550.17
16	3518.80	3531.93	3531.53	3508.12	3504.06	3512.20	3526.15	3536.00	3557.91	3560.84	3557.77	3549.75
17	3519.04	3532.15	3531.00	3508.04	3503.90	3512.31	3526.51	3536.40	3557.92	3560.68	3557.71	3549.25
18	3519.29	3532.34	3530.31	3507.92	3503.79	3512.50	3526.43	3536.79	3558.36	3560.45	3557.47	3548.80
19	3519.51	3532.54	3529.53	3507.77	3503.61	3512.77	3526.44	3536.79	3558.69	3560.59	3557.12	3548.31
20	3519.74	3532.63	3528.71	3507.63	3503.43	3513.02	3526.75	3537.25	3559.04	3560.71	3556.78	3547.62
21	3520.00	3532.77	3527.88	3507.51	3503.31	3513.32	3526.76	3538.13	3559.42	3560.68	3556.44	3546.90
22	3520.33	3532.77	3527.00	3507.34	3503.19	3513.55	3526.97	3539.06	3559.71	3560.62	3556.32	3546.14
23	3520.54	3532.77	3526.16	3507.24	3503.11	3513.82	3527.70	3539.57	3559.55	3560.61	3556.21	3545.41
24	3520.94	3532.83	3525.32	3507.10	3503.19	3514.00	3528.20	3539.90	3559.50	3560.62	3556.09	3544.65
25	3521.35	3532.86	3524.47	3506.95	3503.56	3514.25	3528.28	3540.24	3559.51	3560.60	3556.00	3543.95
26	3521.89	3532.86	3523.60	3506.76	3504.20	3514.55	3528.57	3541.04	3559.54	3560.70	3555.88	3543.21
27	3522.47	3532.89	3522.70	3506.57	3504.78	3514.86	3528.68	3542.48	3559.52	3560.80	3555.78	3542.45
28	3523.00	3532.89	3521.82	3506.40	3505.32	3515.27	3528.60	3544.60	3559.75	3560.78	3555.67	3542.31
29	3523.47	3532.89	3520.94	3506.29	---	3515.88	3528.44	3547.04	3560.04	3560.75	3555.55	3541.68
30	3523.97	3532.82	3520.09	3506.22	---	3516.80	3528.66	3549.41	3560.04	3560.75	3555.40	3540.95
31	3524.32	---	3519.16	3506.13	---	3517.70	---	3551.48	---	3560.80	3555.42	---
MAX	3525.37	3532.89	3532.76	3518.34	3506.08	3517.70	3528.68	3551.48	3560.04	3561.04	3560.93	3555.35
MIN	3518.38	3524.84	3519.16	3506.13	3503.11	3505.82	3518.32	3528.74	3553.21	3559.93	3555.40	3540.95
†	2,646	2,821	2,543	2,295	2,281	2,515	2,734	3,230	3,429	3,447	3,322	2,995
††	-32,000	+175,000	-278,000	-248,000	-14,000	+234,000	+219,000	+496,000	+199,000	+18,000	-125,000	-327,000

CAL YR 1985 †† -121,000

WTR YR 1986 †† +317,000

† Contents, in thousands of acre-feet, at end of month.

†† Change in contents, in acre-feet.

PEND OREILLE RIVER BASIN

12362500 SOUTH FORK FLATHEAD RIVER NEAR COLUMBIA FALLS, MT

LOCATION.--Lat 48°21'24", long 114°02'12", in SW¼SE¼SW¼ sec.16, T.30 N., R.19 W., Flathead County, Hydrologic Unit 17010209, on right bank 1.7 mi downstream from Hungry Horse Dam, 3.5 mi upstream from mouth, and 6.8 mi east of Columbia Falls and at mile 152.2.

DRAINAGE AREA.--1,663 mi².

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. Datum of gage is 3,040 ft above National Geodetic Vertical Datum of 1929 (levels by the U.S. Bureau of Reclamation). September 1910 to September 1916, nonrecording gage, and Apr. 23, 1923, to Sept. 30, 1928, water-stage recorder at site 3 mi downstream at different datum. Oct. 1, 1928, to Sept. 30, 1952, water-stage recorder at site 1.5 mi downstream at different datum.

REMARKS.--No estimated daily discharges during year. Water-discharge records excellent. Flow regulated by Hungry Horse Reservoir since Sept. 21, 1951 (see preceding page).

AVERAGE DISCHARGE.--58 years (water years, 1929-86), 3,557 ft³/s, 29.05 in/yr, 2,577,000 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 ft³/s June 19, 1916, gage height, 16.6 ft, site and datum then in use, from rating curve extended above 20,000 ft³/s; minimum observed, 7.3 ft³/s Sept. 24, 1951, gage height, 0.52 ft, dam closure, site and datum then in use; minimum daily, 7.3 ft³/s Sept. 24, 1951.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 10,800 ft³/s June 4, gage height, 10.63 ft; minimum daily, 154 ft³/s Apr. 17.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8050	185	1840	9770	2250	197	1410	2980	4060	2930	458	1770
2	9660	185	1820	9800	2410	200	1130	2990	7030	3260	522	1770
3	6220	187	1890	9840	2240	205	588	554	8830	3000	794	6230
4	6820	199	1380	9910	2140	209	180	212	9370	186	3400	6690
5	7010	204	1350	9920	2090	1210	182	2980	10100	194	5560	6440
6	6650	205	1530	9960	2090	2590	180	1340	10000	189	4980	6290
7	4840	203	1530	9960	2410	772	182	1730	9980	2950	4680	6010
8	5660	199	1550	9990	2590	198	183	875	8600	2400	4690	6610
9	7330	186	1860	9980	2590	205	183	191	9680	2390	918	4500
10	7540	183	2110	9960	2520	1490	184	197	8550	1750	953	4500
11	9860	183	2410	3130	2440	721	187	199	8090	1710	3520	4540
12	9850	182	2320	3180	2580	216	187	1620	8060	188	4660	4550
13	9860	187	2220	4770	2580	320	189	5110	8540	1040	4650	4470
14	9470	193	2110	4660	2580	174	1140	2090	8060	4800	4650	4500
15	629	201	2110	4430	2580	178	180	1300	2830	4580	4650	6320
16	333	202	5990	2340	2580	180	3050	1670	5320	197	1480	6280
17	234	194	7230	2210	2570	2060	154	161	6170	4630	1290	6160
18	232	191	8090	2210	2270	1040	5360	168	236	4740	3640	6050
19	236	185	9490	2210	2450	178	3760	5340	962	214	4730	6560
20	239	1050	9620	2210	2460	425	163	4250	206	220	4730	8790
21	233	606	9610	2210	2220	185	3890	6260	192	2380	4730	9340
22	231	1280	9630	2230	2190	194	4430	6910	181	2480	1970	9340
23	228	1290	9700	2230	2190	202	1770	6920	5840	1560	1730	9140
24	218	1290	9690	2230	2020	2490	3460	6670	3620	1470	1750	9400
25	220	1340	9690	2230	1040	341	6730	7050	3020	1390	1750	9430
26	215	1400	9680	2410	196	234	3290	7160	3150	176	1840	9420
27	212	1450	9730	2550	202	235	4630	7060	2950	179	1780	9420
28	215	1520	9760	2520	193	241	7110	3060	495	1400	1780	2830
29	224	1730	9780	2240	---	171	6360	295	208	1420	1770	8370
30	192	1770	9800	2240	---	216	2490	863	2940	881	2580	9500
31	186	---	9780	2240	---	1170	---	2230	---	376	1780	---
TOTAL	113097	18380	175300	155770	58671	18447	62932	90435	157270	55280	88415	195220
MEAN	3648	613	5655	5025	2095	595	2098	2917	5242	1783	2852	6507
MAX	9860	1770	9800	9990	2590	2590	7110	7160	10100	4800	5560	9500
MIN	186	182	1350	2210	193	171	154	161	181	176	458	1770
CFSM	2.19	.37	3.40	3.02	1.26	.36	1.26	1.75	3.15	1.07	1.71	3.91
IN.	2.53	.41	3.92	3.48	1.31	.41	1.41	2.02	3.52	1.24	1.98	4.37
AC-FT	224300	36460	347700	309000	116400	36590	124800	179400	311900	109600	175400	387200
MEAN†	3127	3554	1134	992	1844	4401	5778	10984	8586	2075	820	1012
CFSM†	1.88	2.14	.68	.60	1.11	2.65	3.47	6.60	5.16	1.25	.49	.61
IN†	2.17	2.38	.79	.69	1.15	3.05	3.88	7.61	5.76	1.44	.57	.68
AC-FT†	192300	211460	69700	61000	102400	270590	343800	675400	510900	127600	50400	60200

OBSERVED

CAL YR 1985	TOTAL	1469676	MEAN	4027	MAX	10700	MIN	169	AC-FT	2915000
WTR YR 1986	TOTAL	1189217	MEAN	3258	MAX	10100	MIN	154	AC-FT	2359000

ADJUSTED

CAL YR 1985	TOTAL	1408645	MEAN	3859	CFSM	2.32	IN	31.50	AC-FT	2794000
WTR YR 1986	TOTAL	1349005	MEAN	3696	CFSM	2.22	IN	30.17	AC-FT	2676000

† Adjusted for change in contents in Hungry Horse Reservoir.

PEND OREILLE RIVER BASIN

119

12362500 SOUTH FORK FLATHEAD RIVER NEAR COLUMBIA FALLS, MT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1949-50, 1965-68, 1979 to current year.

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.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum, 19.0°C Aug. 9-11, 1966, Aug. 2-6, 1968; minimum (water years 1965-68, 1979-81, 1983-85), 2.0°C on many days during winter periods most years.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum, 7.0°C June 28; minimum, 2.0°C on Jan. 8, 9.

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	TEMPER- ATURE, AIR (DEG C) (00020)	TEMPER- ATURE (DEG C) (00010)
OCT 11...	0845	9920	150	2.0	5.0
APR 23...	1000	8810	152	2.0	3.5
23...	1330	202	149	2.0	3.5
JUL 10...	1310	4450	162	14.5	4.0

TEMPERATURE (DEC. C), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	5.5	4.5	5.0	5.5	4.5	5.0	4.0	3.5	4.0	3.5	3.0	3.5
2	5.0	4.5	5.0				4.5	3.5	4.0	4.0	3.0	3.5
3	5.5	4.5	5.0				4.5	3.0	4.0	4.0	3.0	3.5
4	5.5	4.5	5.0				4.0	3.0	3.5	4.0	3.0	3.5
5	5.5	4.5	5.0				4.0	3.0	3.5	4.0	3.0	3.5
6	5.5	4.5	5.0				4.0	3.0	3.5	4.0	3.0	3.5
7	5.5	4.5	5.0				4.0	3.5	3.5	3.5	2.5	3.0
8	5.5	4.5	5.0	5.5	4.5	5.0	4.5	3.0	3.5	3.0	2.0	2.5
9	5.0	4.0	4.5	6.0	5.0	5.0	4.0	3.0	3.5	3.5	2.0	3.0
10	5.5	4.5	5.0	5.5	4.5	5.0	4.0	3.0	3.5	3.5	2.5	3.0
11	5.5	4.5	5.0	6.0	5.0	5.5	4.0	3.0	3.5	4.0	3.0	3.0
12	6.0	5.0	5.5	5.5	4.5	5.0	4.0	3.0	3.5	4.0	2.5	3.0
13	5.5	5.0	5.0	5.0	3.5	4.5	4.0	3.0	3.5	3.5	2.5	3.0
14	6.5	5.0	5.5	5.5	4.0	4.5	4.0	3.0	3.5	4.0	2.5	3.0
15	6.5			5.5	4.0	4.5	4.0	2.5	3.5	4.0	3.0	3.5
16	5.0			5.5	4.0	5.0	3.5	2.5	3.0	4.0	3.0	3.5
17	5.5	4.5	5.5	5.5	4.5	5.0	3.5	2.5	3.0	4.5	3.5	4.0
18	6.0	5.0	5.5	5.0	4.0	4.5	4.0	2.5	3.5	4.0	3.5	3.5
19	5.5	5.5	5.5	5.5	3.5	4.5	4.0	3.0	3.5	4.0	3.0	3.5
20	6.0	5.0	5.5	5.0	3.5	4.5	4.0	3.0	3.5	4.5	3.5	4.0
21	6.0	5.0	5.5	5.0	3.5	4.5	4.0	3.0	3.5	4.5	3.5	3.5
22	6.0	5.0	5.5	5.0	4.0	4.5	4.0	3.0	3.5	4.0	3.0	3.5
23	5.5	5.0	5.5	5.0	4.0	4.5	4.0	3.0	3.5	4.0	3.5	3.5
24	6.0	5.5	5.5	5.0	4.0	4.5	4.0	3.0	3.5	4.0	3.5	3.5
25	6.5	5.0	6.0	5.0	4.0	4.5	4.0	3.0	3.5	4.0	3.5	3.5
26	6.0	5.5	6.0	4.5	4.0	4.5	4.0	3.0	3.5	4.0	3.5	3.5
27	5.5	5.0	5.5	5.0	4.0	4.5	4.0	3.5	3.5	4.0	3.0	3.5
28	6.0	5.0	5.5	4.5	4.0	4.5	4.0	3.0	3.5	4.5	3.5	3.5
29	5.5	4.5	5.0	5.0	4.0	4.5	3.5	3.5	3.5	4.0	3.0	3.5
30	6.0	4.0	5.0	4.5	4.0	4.0	3.5	3.5	3.5	4.0	3.0	3.5
31	6.0	5.0	5.5				3.5	3.5	3.5	4.0	3.0	3.5
MONTH	6.5	4.0	5.5	6.0	3.5	4.5	4.5	2.5	3.5	4.5	2.0	3.5

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DAY	MAX	MIN FEBRUARY	MEAN	MAX	MIN MARCH	MEAN	MAX	MIN APRIL	MEAN	MAX	MIN MAY	MEAN
1	4.0	3.5	3.5	5.0	3.5	4.0	4.5	3.0	4.0	4.5	3.5	4.0
2	4.0	3.5	3.5	4.5	3.5	4.0	4.5	3.5	4.0	4.5	3.0	4.0
3	4.0	3.5	3.5	5.0	3.5	4.0	5.0	3.5	4.0	4.5	3.5	4.0
4	4.0	3.0	3.5	5.0	3.5	4.0	5.0	3.5	4.0	4.5	3.5	4.0
5	4.0	3.0	3.5	5.0	3.5	4.0	5.0	4.0	4.5	4.0	3.5	3.5
6	4.0	3.0	3.5	4.0	3.5	3.5	5.0	4.0	4.5	5.0	3.0	4.0
7	4.0	3.0	3.5	4.5	3.5	4.0	5.5	4.0	4.5	4.5	3.0	4.0
8	4.0	3.5	3.5	4.5	3.5	4.0	5.5	4.0	4.5	5.0	3.0	4.0
9	4.0	3.0	3.5	4.5	3.0	4.0	5.5	4.0	4.5	5.5	4.0	4.5
10	4.0	3.0	3.5	4.5	3.5	4.0	5.0	4.0	4.5	5.0	4.0	4.5
11	4.0	3.5	3.5	4.5	3.5	4.0	5.0	4.0	4.5	5.0	3.5	4.0
12	4.0	3.5	3.5	4.5	3.0	4.0	4.5	3.5	4.0	4.0	3.0	3.5
13	4.5	3.5	3.5	4.5	3.5	4.0	4.5	3.0	4.0	4.0	3.0	3.5
14	4.0	3.5	3.5	4.5	3.5	4.0	4.5	3.5	4.0	4.0	3.0	3.5
15	4.0	3.0	3.5	5.0	3.5	4.0	5.0	4.0	4.5	4.5	3.5	4.0
16	4.0	3.5	3.5	4.5	4.0	4.0	4.5	3.5	4.0	5.0	3.0	4.0
17	4.0	3.0	3.5	4.5	3.0	4.0	4.5	3.5	4.0	5.0	4.0	4.5
18	4.0	3.5	3.5	4.5	3.5	4.0	4.5	3.5	4.0	5.0	4.0	4.5
19	4.0	3.5	3.5	5.0	3.5	4.0	4.5	3.5	4.0	4.5	3.0	3.5
20	4.0	3.5	3.5	4.5	3.0	4.0	5.0	4.0	4.5	4.0	3.0	3.5
21	4.0	3.0	3.5	4.5	3.0	4.0	4.5	3.5	4.0	4.0	3.0	3.5
22	4.0	3.0	3.5	5.0	3.5	4.0	4.0	3.5	3.5	3.5	3.0	3.5
23	4.0	3.0	3.5	5.0	3.0	4.0	4.5	3.5	4.0	4.5	3.0	3.5
24	4.0	3.0	3.5	4.5	3.5	4.0	4.5	3.5	4.0	3.5	3.0	3.5
25	4.0	3.5	3.5	4.5	3.5	4.0	4.0	3.0	3.5	4.0	3.5	3.5
26	4.5	3.5	4.0	4.5	3.5	4.0	4.0	3.0	3.5	3.5	3.0	3.5
27	4.5	3.0	4.0	5.0	3.5	4.0	4.0	3.0	3.5	4.0	3.0	3.5
28	5.0	3.5	4.0	4.5	3.5	4.0	4.0	3.5	4.0	3.5	2.5	3.0
29				4.5	3.5	4.0	4.0	3.5	3.5	6.5	3.0	5.0
30				4.5	3.5	4.0	4.5	3.0	4.0	6.5	3.5	4.5
31				4.5	3.5	4.0				4.5	3.0	3.5
MONTH	5.0	3.0	3.5	5.0	3.0	4.0	5.5	3.0	4.0	6.5	2.5	4.0
		JUNE			JULY			AUGUST			SEPTEMBER	
1	4.5	3.0	3.5	4.5	3.0	4.0	6.0	3.5	4.5	5.0	4.0	4.0
2	4.0	3.0	3.5	4.5	3.0	3.5	5.0	3.0	4.5	5.5	3.5	4.5
3	4.0	2.5	3.5	5.0	3.0	4.0	5.0	3.5	4.5	4.5	3.5	4.5
4	5.0	3.0	3.5	5.5	3.5	4.5	5.0	3.0	4.0	4.5	3.5	4.0
5	4.0	3.5	4.0	6.0	4.5	5.0	5.0	2.5	4.0	5.0	3.5	4.0
6	4.0	3.5	4.0	6.0	4.5	5.0	4.5	3.0	4.0	5.0	3.5	4.5
7	4.0	3.5	4.0	5.0	3.5	4.0	4.5	3.0	4.0	5.0	4.0	4.5
8	4.0	3.5	4.0	5.0	3.0	4.0	4.5	3.0	4.0	4.5	3.5	4.0
9	4.0	3.5	4.0	5.5	3.0	4.0	5.0	3.0	4.5	5.0	3.5	4.5
10	4.0	3.5	4.0	5.0	3.0	4.0	5.0	3.5	4.0	5.0	4.0	4.5
11	4.0	3.5	3.5	6.0	3.5	4.0	4.5	3.5	4.0	5.0	3.5	4.5
12	4.0	3.5	3.5	6.0	3.0	5.0	5.0	3.0	4.0	5.0	3.5	4.0
13	4.0	3.0	3.5	5.5	3.5	4.5	5.0	3.5	4.0	5.0	4.0	4.5
14	4.0	3.0	3.5	4.5	3.5	4.0	5.0	3.0	4.0	4.5	4.0	4.0
15	4.5	3.5	4.0	5.0	3.0	4.0	4.5	3.0	4.0	5.0	4.0	4.5
16	4.5	3.0	3.5	6.0	3.0	5.0	4.5	3.0	4.0	5.0	4.0	4.5
17	4.5	3.0	3.5	5.5	3.0	4.0	4.5	3.5	4.0	5.0	4.0	4.5
18	6.5	3.0	5.0	4.5	3.5	4.0	4.5	3.0	4.0	4.5	4.0	4.5
19	5.5	3.0	4.0	6.5	3.5	5.0	5.0	3.0	4.0	5.0	4.0	4.5
20	6.0	3.0	4.5	6.5	3.5	5.5	5.0	3.0	4.0	5.0	4.0	4.5
21	6.5	3.5	5.0	5.5	3.0	4.0	5.0	3.5	4.0	4.5	4.0	4.5
22	6.5	4.5	5.5	4.5	3.0	4.0	5.0	3.0	4.0	5.0	4.0	4.5
23	6.0	3.0	4.5	5.0	3.5	4.0	5.0	3.5	4.0	5.0	4.0	4.5
24	4.0	3.0	4.0	4.5	3.5	4.0	5.5	3.5	4.5	5.0	4.0	4.5
25	4.5	3.0	3.5	5.0	3.5	4.0	4.5	3.0	4.0	5.0	4.0	4.5
26	4.5	3.5	4.0	6.5	3.5	5.0	5.5	3.5	4.5	5.5	4.0	4.5
27	5.0	3.0	4.0	6.0	3.5	5.0	5.0	3.0	4.0	5.0	4.0	4.5
28	7.0	3.5	5.0	5.5	3.0	4.5	5.0	3.0	4.5	5.0	4.5	4.5
29	6.5	3.0	5.5	5.0	3.0	4.0	5.0	3.5	4.5	5.0	4.5	4.5
30	5.5	3.0	4.0	5.0	3.0	4.0	5.0	4.0	4.5	5.0	4.5	4.5
31				5.5	3.5	4.5	5.0	3.5	4.0			
MONTH YEAR	7.0 7.0	2.5 2.0	4.0 4.0	6.5	3.0	4.5	6.0	2.5	4.0	5.5	3.5	4.5

12363000 FLATHEAD RIVER AT COLUMBIA FALLS, MT
(National stream quality accounting network station)

LOCATION.--Lat 48°21'43", long 114°11'02", in NW¼NW¼SE¼ 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 mile 143.0.
DRAINAGE AREA.--4,464 mi².

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. Datum of gage is 2,977.67 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Nov. 12, 1928, nonrecording gage on bridge 200 ft upstream at datum 0.19 ft higher.

REMARKS.--No estimated daily discharges this year. Water-discharge records excellent. South Fork Flathead River, which contributes about one-third of flow, completely regulated by Hungry Horse Reservoir 10.9 mi upstream since Sept. 21, 1951 (see station number 12362000).

AVERAGE DISCHARGE.--58 years, 9,709 ft³/s, 29.53 in/yr, 7,034,000 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 ft³/s June 9, 1964, gage height, 25.58 ft, from flood marks, from rating curve extended above 95,000 ft³/s on basis of slope-area measurement of peak flow; minimum, 798 ft³/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 ft³/s, from rating curve extended above 95,000 ft³/s on basis of slope-area measurement of peak flow in 1964.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 41,800 ft³/s May 28, gage height, 12.54 ft; minimum daily, 3,530 ft³/s July 31, Aug. 2.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12000	7710	4530	11500	3990	6310	12700	10500	40100	9940	3540	3980
2	13400	7700	4350	11600	4200	6270	11100	10200	40800	9470	3530	3940
3	10600	8300	4450	11600	4020	6380	9540	8220	40200	9600	3720	7320
4	10300	11300	4510	11600	3950	6350	8480	11400	37000	6640	5680	9030
5	10600	14700	4330	11300	3840	6950	8080	18500	35300	6450	8360	8360
6	10300	13500	4450	11500	3750	8410	7810	16400	33900	6630	7780	8240
7	8730	11800	4500	11700	3850	6580	7680	15300	31900	8730	7630	7910
8	8950	10500	4360	11600	4020	7210	7870	13300	28500	8090	7380	8450
9	10200	9210	4390	11800	4070	7840	8650	12100	28100	7780	4020	6760
10	10700	7800	4340	11800	4110	8710	10100	11800	25600	7320	3620	7080
11	12900	6900	4430	5560	3790	7440	10800	11500	23800	7050	5690	7070
12	13000	6430	4540	4840	3850	6500	10200	12000	23600	5980	7170	6960
13	12900	6020	4530	6400	3840	6330	9260	15500	22900	6210	7170	6760
14	12900	5800	4470	6020	3810	5890	9590	12800	21200	9640	7160	6720
15	4790	5510	4440	5900	3890	5610	8030	11200	17000	9490	7090	8290
16	4660	5580	7830	4100	3840	5350	10500	11000	17500	5490	4310	8360
17	5460	5410	9340	3980	4000	6990	7500	8970	17800	8520	3700	8150
18	5550	4920	10000	3900	3760	5810	11300	8700	12300	9490	5550	8020
19	5310	4400	11500	3920	3810	4720	11000	13200	12100	5600	6930	8170
20	5170	5030	11600	4090	3860	4850	6440	16000	10500	4670	6890	10600
21	5210	4310	11600	4110	3780	4600	9600	23700	9580	6410	6840	11200
22	5350	4680	11500	4010	3730	4750	11700	31100	8630	6420	4530	11200
23	5520	4430	11400	3970	3750	4740	16300	28600	12600	5860	3860	11000
24	5510	4520	11300	4000	3840	6310	18200	24400	11800	5650	3850	11200
25	6580	4440	11400	3890	3900	6080	18800	23100	10700	5400	3790	11200
26	9970	4430	11400	3840	4790	5010	14800	27200	10500	4270	3830	11300
27	9740	4480	11400	3950	6580	4910	14500	35400	10400	3950	3730	11400
28	9860	4480	11400	4210	6720	5630	16200	39600	7680	4820	3710	5580
29	10000	4420	11400	3940	---	7430	15800	39800	7560	4930	3690	9730
30	9170	4480	11400	3950	---	9480	10800	41100	10300	4450	4140	11600
31	8400	---	11400	3960	---	13500	---	41000	---	3530	4270	---
TOTAL	273730	203190	242490	208540	115340	202940	333330	603590	619850	208480	163160	255580
MEAN	8830	6773	7822	6727	4119	6546	11110	19470	20660	6725	5263	8519
MAX	13400	14700	11600	11800	6720	13500	18800	41100	40800	9940	8360	11600
MIN	4660	4310	4330	3840	3730	4600	6440	8220	7560	3530	3530	3940
CFSM	1.98	1.52	1.75	1.51	.92	1.47	2.49	4.36	4.63	1.51	1.18	1.91
IN	2.28	1.69	2.02	1.74	.96	1.69	2.78	5.03	5.17	1.74	1.36	2.13
AC-FT	542900	403000	481000	413600	228800	402500	661200	1197000	1229000	413500	323600	506900
MEAN †	8309	9713	3301	2693	3868	10352	14792	27534	23998	7018	3230	3023
CFSM †	1.86	2.18	.74	.60	.87	2.32	3.31	6.17	5.38	1.57	.72	.68
IN †	2.15	2.43	.85	.70	.90	2.67	3.70	7.11	6.00	1.81	.83	.76
AC-FT †	510900	578000	203000	165600	214800	636500	880200	1693000	1428000	431500	198600	179900

OBSERVED

CAL YR 1985	TOTAL	3831540	MEAN	10500	MAX	37900	MIN	3990	AC-FT	7600000
WTR YR 1986	TOTAL	3430220	MEAN	9398	MAX	41100	MIN	3530	AC-FT	6803000

ADJUSTED

CAL YR 1985	TOTAL	3770355	MEAN	10330	CFSM	2.31	IN	31.41	AC-FT	7478000
WTR YR 1986	TOTAL	3589613	MEAN	9835	CFSM	2.20	IN	29.91	AC-FT	7120000

†Adjusted for change in contents in Hungry Horse Reservoir.

PEND OREILLE RIVER BASIN

12363000 FLATHEAD RIVER AT COLUMBIA FALLS, MT--Continued
(National Stream Quality Accounting Network)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1949-50, 1963-69, 1979 to current year. Water years 1968-69 published as Flathead River near Kalispell (station 12363500) 1.5 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.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE (water years 1965-67, 1979-81): Maximum daily, 290 microsiemens, April 6, 1980;

minimum daily, 121 microsiemens, 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, March 4-6, 1967.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum, 18.0°C, July 20,22; minimum, 0.0°C on several days in November and February.

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	CLOUD COVER (PER- CENT) (00032)	WEATHER (WMO CODE NUMBER) (00041)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	TEMPER- ATURE, AIR (DEG C) (00020)	TEMPER- ATURE (DEG C) (00010)	BARO- METRIC PRES- SURE (MM HG) (00025)	OXYGEN, DIS- SOLVED OF (MG/L) (00300)	OXYGEN, (PER- CENT SATUR- ATION) (00301)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP- TOCOCCI KF AGAR (COLS. PER 100 ML) (31673)
OCT												
08...	1000	13000	--	--	172	-3.0	4.0	--	--	--	--	--
DEC												
17...	1030	9490	100	2	165	1.0	3.0	693	11.5	94	<1	K2
MAR												
19...	1100	4780	30	1	187	8.0	3.5	687	12.6	105	<1	<1
APR												
24...	1230	24000	--	--	153	10.0	4.5	--	--	--	--	--
MAY												
22...	1530	33600	--	--	146	7.5	5.5	--	--	--	--	--
27...	1230	38800	10	1	149	29.0	8.0	678	10.4	99	48	49
JUL												
11...	0940	5150	--	--	172	21.0	12.5	--	--	--	--	--
AUG												
19...	1200	6940	5	1	162	28.0	8.5	681	10.5	101	<1	<1

DATE	TIME	PH (STAND- ARD UNITS) (00400)	TUR- BID- ITY (NTU) (00076)	HARD- NESS (MG/L AS CACO3) (00900)	HARD- NESS NONCARB WH WAT TOT FLD MG/L AS CACO3 (00902)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM AD- SORP- TION RATIO (00931)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	BICAR- BONATE WH WAT TOTAL FIELD MG/L AS HCO3 (00440)
DEC											
17...	1030	7.50	1.0	83	8	24	5.6	0.8	0	0.5	94
MAR											
19...	1100	8.10	1.3	96	8	27	7.0	1.1	0	0.4	110
MAY											
27...	1230	7.90	25	73	3	21	4.9	0.9	0	0.4	84
AUG											
19...	1200	8.00	0.4	82	1	23	6.0	0.9	0	0.5	100

PEND OREILLE RIVER BASIN

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12363000 FLATHEAD RIVER AT COLUMBIA FALLS, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	CAR- BONATE WH WAT TOTAL FIELD MG/L AS CO3 (00445)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)
DEC 17...	0	78	4.3	0.3	<1.0	4.0	78	86	0.11	2000	<0.01
MAR 19...	0	90	6.9	0.3	0.1	5.0	95	100	0.13	1230	<0.01
MAY 27...	0	73	3.8	0.4	<0.1	4.0	78	77	0.11	8170	<0.01
AUG 19...	0	84	4.3	0.7	<0.1	4.2	90	89	0.12	1690	<0.01

DATE	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P) (00665)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P) (00671)	SEDI- MENT, SUS- PENDEDED (MG/L) (80154)	SEDI- MENT, DIS- CHARGE, SUS- PENDEDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
DEC 17...	<0.10	0.02	0.02	0.3	0.005	0.003	0.005	9	231	41
MAR 19...	<0.10	0.01	0.02	0.3	0.005	<0.005	<0.001	6	77	79
MAY 27...	<0.10	0.04	0.05	0.3	0.174	0.005	0.005	449	47000	49
AUG 19...	<0.10	0.02	0.01	0.2	<0.005	<0.005	<0.001	5	94	84

DATE	TIME	ALUM- INUM, DIS- SOLVED (UG/L AS AL) (01106)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE) (01010)	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR) (01030)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)
DEC 17...	1030	10	<1	93	<0.5	<1	<1	<3	1	4	1
MAR 19...	1100	10	<1	110	0.9	1	1	<3	<1	14	<1
MAY 27...	1230	30	<1	70	0.8	<1	<1	<3	1	16	<1

DATE	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MERCURY DIS- SOLVED (UG/L AS HG) (71890)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	NICKEL, DIS- SOLVED (UG/L AS NI) (01065)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	SILVER, DIS- SOLVED (UG/L AS AG) (01075)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	VANA- DIUM, DIS- SOLVED (UG/L AS V) (01085)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)
DEC 17...	<4	3	<0.1	<10	<1	<1	<1	37	<6	12
MAR 19...	4	4	<0.1	<10	<1	<1	1	57	<6	13
MAY 27...	4	6	<0.1	<10	<1	<1	<1	38	<6	16

PEND OREILLE RIVER BASIN

12363000 FLATHEAD RIVER AT COLUMBIA FALLS, MT--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DAY	MAX	MIN OCTOBER	MEAN	MAX	MIN NOVEMBER	MEAN	MAX	MIN DECEMBER	MEAN	MAX	MIN JANUARY	MEAN
1	5.5	5.0	5.5	3.5	3.0	3.5	.5	.5	.5	3.5	3.0	3.0
2	5.5	5.0	5.5	4.5	3.5	4.0	.5	.5	.5	3.5	3.0	3.5
3	7.0	5.5	6.0	5.5	4.5	5.0	1.0	.5	1.0	3.5	3.0	3.0
4	6.0	5.5	6.0	5.5	5.5	5.5	1.0	1.0	1.0	3.5	3.0	3.0
5	6.5	6.0	6.0	5.0	3.5	4.5	1.5	1.0	1.0	3.5	3.0	3.0
6	6.5	5.0	5.5	3.5	3.5	3.5	1.5	1.0	1.0	3.5	3.0	3.5
7	5.0	4.0	4.5	4.0	3.5	3.5	1.5	1.5	1.5	3.5	3.0	3.5
8	5.0	4.0	4.0	4.0	2.5	3.0	1.5	1.5	1.5	3.5	3.0	3.5
9	4.0	3.0	3.5	2.5	1.5	2.0	1.5	1.0	1.0	3.5	3.5	3.5
10	5.0	3.5	4.5	1.0	.0	1.0	1.5	1.0	1.0	3.5	3.5	3.5
11	5.0	4.5	5.0	1.0	.0	.5	1.5	1.0	1.5	4.0	2.5	3.0
12	5.5	5.0	5.0	1.0	.0	.5	1.5	1.0	1.5	3.0	2.0	2.5
13	5.5	5.0	5.0	1.0	.0	.5	2.0	1.5	1.5	3.5	2.0	2.5
14	5.5	5.0	5.5	1.0	.0	.5	2.0	1.5	1.5	3.5	1.5	2.5
15	6.5	5.5	6.0	1.0	.5	.5	2.0	1.5	2.0	3.0	2.0	2.5
16	6.5	6.0	6.0	1.5	1.0	1.0	3.0	2.0	2.5	2.5	2.5	2.5
17	6.0	5.5	6.0	1.5	.5	1.0	3.5	3.0	3.0	2.5	2.5	2.5
18	6.5	5.0	5.5	.5	.0	.5	3.5	3.0	3.0	2.5	2.0	2.5
19	6.5	5.5	6.0	.5	.0	.5	3.5	3.5	3.5	3.0	2.5	3.0
20	7.0	6.0	6.5	1.0	.0	.5	3.5	3.5	3.5	3.0	2.5	2.5
21	6.5	6.0	6.5	1.0	.5	.5	3.5	3.5	3.5	3.0	2.0	2.5
22	6.0	5.5	6.0	.5	.5	.5	3.5	3.0	3.5	2.5	1.5	2.0
23	5.5	5.0	5.0	.5	.5	.5	3.5	3.0	3.5	2.5	2.0	2.5
24	4.5	4.5	4.5	.5	.5	.5	3.5	3.5	3.5	3.0	2.5	2.5
25	5.5	5.0	5.5	.5	.5	.5	3.5	3.0	3.5	3.0	2.0	2.5
26	5.5	4.0	4.5	.5	.5	.5	3.5	3.0	3.5	3.0	1.0	2.0
27	6.0	4.0	5.0	.5	.5	.5	3.5	3.0	3.5	2.5	1.5	2.0
28	6.0	5.0	5.5	.5	.5	.5	3.5	3.0	3.5	3.0	2.0	2.5
29	5.0	3.5	4.0	.5	.5	.5	3.5	3.0	3.5	2.0	2.0	2.0
30	3.5	3.0	3.5	.5	.5	.5	3.5	3.0	3.5	2.5	2.0	2.5
31	3.5	3.5	3.5	.5	.5	.5	3.5	3.0	3.0	3.0	2.5	2.5
MONTH	7.0	3.0	5.0	5.5	.0	1.5	3.5	.5	2.5	4.0	1.0	2.5
	FEBRUARY			MARCH			APRIL			MAY		
1	3.0	2.5	3.0	2.5	1.0	1.5	4.5	3.0	4.0	7.5	5.0	6.0
2	3.0	2.5	2.5	3.0	1.5	2.0	5.5	4.0	5.0	8.0	5.5	7.0
3	3.0	2.5	3.0	2.5	1.5	2.0	5.0	4.0	4.5	8.0	7.5	8.0
4	3.5	2.5	3.0	3.0	2.0	2.5	5.5	4.0	5.0	8.0	6.0	7.0
5	4.0	2.5	3.0	4.5	2.0	3.0	6.0	4.5	5.5	6.5	5.0	6.0
6	3.0	1.5	2.5	3.5	2.5	3.0	6.0	4.5	5.5	6.5	5.0	6.0
7	3.0	1.0	2.0	3.5	3.0	3.5	7.0	5.0	6.0	7.0	5.0	6.0
8	3.0	1.5	2.0	3.5	3.0	3.5	7.0	5.5	6.5	8.0	6.5	7.0
9	2.5	2.0	2.0	3.0	2.5	3.0	7.0	6.0	6.5	7.5	6.5	7.0
10	3.0	1.5	2.0	3.5	2.5	3.5	7.0	6.0	6.5	7.5	6.5	7.0
11	2.5	.5	1.5	4.5	3.0	3.5	5.5	4.5	5.0	7.0	6.5	6.5
12	1.5	1.0	1.5	4.5	3.5	4.0	4.5	3.0	3.5	6.0	5.5	6.0
13	2.5	1.0	1.5	5.0	3.5	4.0	3.5	2.0	3.0	6.5	5.0	5.5
14	2.0	1.0	1.5	4.0	3.0	3.5	5.0	3.5	4.5	5.5	4.5	5.0
15	1.5	.5	1.0	4.5	3.0	4.0	5.5	4.5	5.0	6.0	4.5	5.0
16	3.0	1.0	2.0	4.0	3.0	3.5	5.5	5.0	5.5	8.5	5.5	7.0
17	3.0	2.0	2.5	4.5	3.0	4.0	6.0	5.0	5.5	9.5	7.0	7.5
18	3.0	2.0	2.5	4.0	3.0	3.5	5.5	4.5	5.0	7.5	6.5	7.0
19	3.5	1.5	2.5	4.5	3.0	4.0	5.0	4.5	4.5	9.0	6.5	7.5
20	2.5	1.0	1.5	6.0	3.5	4.5	6.0	5.0	5.0	9.5	7.5	8.5
21	3.5	2.0	2.5	5.0	3.5	4.0	7.0	5.5	6.0	9.5	7.0	8.0
22	3.0	1.5	2.5	4.5	3.0	4.0	7.5	5.5	6.5	8.0	5.0	6.0
23	3.0	2.5	2.5	4.5	3.5	4.0	6.5	4.5	5.5	7.5	4.5	5.5
24	3.5	2.5	3.0	4.5	3.5	4.0	5.5	4.0	4.5	9.0	6.5	7.0
25	2.5	1.0	2.0	4.0	3.0	3.5	5.5	4.5	5.0	8.5	7.5	8.0
26	1.5	.5	1.0	4.0	3.0	3.5	5.5	5.0	5.0	10.5	8.0	9.0
27	1.0	.0	.5	6.0	3.5	5.0	5.0	5.0	5.0	10.0	8.0	9.0
28	1.5	.0	1.0	6.5	5.5	6.0	6.0	5.0	5.5	10.5	8.5	9.5
29				5.5	5.0	5.5	5.0	4.5	4.5	10.5	9.0	10.0
30				5.0	3.5	4.5	6.0	4.5	5.0	11.0	9.5	10.0
31				4.0	3.0	3.5				11.0	9.0	10.0
MONTH	4.0	.0	2.0	6.5	1.0	3.5	7.5	2.0	5.0	11.0	4.5	7.0

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DAY	MAX	MIN JUNE	MEAN	MAX	MIN JULY	MEAN	MAX	MIN AUGUST	MEAN	MAX	MIN SEPTEMBER	MEAN
1	12.0	9.5	10.5	14.0	10.5	12.0	16.0	12.5	14.5	10.5	9.0	9.5
2	11.5	9.0	10.0	15.5	11.0	13.0	16.5	13.0	15.0	10.5	8.5	9.5
3	11.5	8.5	10.0	14.5	10.5	12.5	16.0	12.5	14.5	9.5	6.0	8.0
4	11.5	8.5	9.5	15.5	11.0	13.0	15.5	9.0	12.0	8.0	6.0	6.5
5	10.5	8.0	9.0	13.0	10.5	11.5	11.0	8.0	9.0	9.0	5.0	6.0
6	11.0	8.5	9.5	13.0	10.5	12.0	12.0	7.5	9.5	8.5	6.0	7.0
7	11.0	8.0	9.0	13.0	10.5	12.0	11.5	7.5	9.5	8.5	6.5	7.5
8	10.5	8.0	9.0	14.0	10.5	12.5	10.5	8.5	9.5	8.5	6.5	7.5
9	10.5	8.0	9.0	14.5	10.5	12.5	16.5	9.0	13.5	9.0	7.0	8.0
10	11.5	8.5	10.0	14.5	10.5	12.0	15.5	12.5	14.0	9.0	7.0	8.0
11	12.0	9.0	10.0	14.5	9.5	12.0	13.5	9.0	11.5	10.0	6.0	8.0
12	12.0	9.0	10.5	15.5	10.0	12.0	11.5	8.5	9.5	6.5	5.5	6.0
13	12.5	10.0	11.5	14.0	12.0	13.0	10.5	8.0	9.0	6.5	5.0	5.5
14	12.5	9.5	11.0	11.5	9.5	10.5	10.5	8.0	9.0	6.0	5.0	5.5
15	12.5	10.0	11.0	11.5	9.0	10.5	11.0	8.0	9.0	7.5	5.5	6.0
16	12.0	9.5	10.5	14.5	9.5	12.5	14.0	8.0	11.5	6.0	5.5	6.0
17	14.0	10.0	11.5	14.5	8.0	11.0	14.0	11.0	12.5	6.5	5.5	6.0
18	15.5	10.5	13.5	12.5	7.5	9.0	12.0	8.0	10.0	6.0	5.0	5.5
19	13.0	10.5	11.5	15.0	8.0	12.5	9.5	7.5	8.5	6.0	5.0	5.0
20	14.0	10.5	11.5	18.0	13.5	15.0	9.5	7.0	8.5	6.0	4.5	5.0
21	13.5	10.5	11.5	16.0	10.5	14.0	8.0	7.0	7.5	5.5	4.5	5.0
22	13.0	10.5	12.0	18.0	9.5	12.5	11.5	6.5	9.5	5.5	4.5	5.0
23	14.0	9.5	11.5	15.0	9.5	12.5	11.0	9.0	9.5	5.5	4.5	5.0
24	13.0	10.0	11.5	15.0	11.0	13.0	11.5	8.5	10.0	6.5	4.5	5.0
25	14.0	11.0	12.5	15.0	11.5	13.0	12.5	9.0	10.5	7.5	4.5	5.5
26	13.5	10.5	12.0	15.5	11.0	13.5	12.5	9.5	11.0	6.0	4.5	5.0
27	13.0	10.5	11.5	15.5	13.5	14.5	12.5	9.5	11.0	6.0	4.5	5.0
28	16.0	11.5	14.0	14.5	10.5	13.0	12.5	9.5	11.0	6.5	4.5	5.5
29	16.0	14.0	14.5	14.0	10.0	12.0	11.5	9.5	10.5	5.5	4.5	5.0
30	14.5	9.5	12.0	15.5	10.0	12.0	12.5	8.0	10.5	5.0	4.5	5.0
31				15.5	12.5	14.0	11.5	8.0	10.0			
MONTH YEAR	16.0 18.0	8.0 .0	11.0 6.0	18.0	7.5	12.5	16.5	6.5	10.5	10.5	4.5	6.0

PEND OREILLE RIVER BASIN

12365000 STILLWATER RIVER NEAR WHITEFISH, MT

LOCATION.--Lat 48°19'08", long 114°23'11", in NE¼SW¼ 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, 10.6 mi upstream from Whitefish River, and at mile 13.6.

DRAINAGE AREA.--524 mi².

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 current year.

REVISED RECORDS.--WSP 1736: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 2,953.26 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges this year. Seasonal records good. Diversions for irrigation of about 200 acres upstream from station. Several observations of water temperatures and specific conductance were made during the year and are published as miscellaneous water-quality data in the back of this report.

AVERAGE DISCHARGE.--33 years (water years 1931-50, 1973-85), 336 ft³/s, 8.71 in/yr, 243,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,330 ft³/s May 26, 1948, gage height, 20.90 ft, from floodmark; minimum daily, 40 ft³/s Dec. 24, 1944.

EXTREMES FOR CURRENT SEASON.--Maximum discharge, 1,300 ft³/s May 9, gage height, 10.20 ft; minimum daily, 88 ft³/s Aug. 28, 29.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1							1070	872	1040	288	146	104
2							1160	831	1040	281	146	109
3							1210	810	1000	272	144	112
4							1210	845	959	262	141	112
5							1180	956	912	260	135	107
6							1130	1090	874	258	132	94
7							1080	1190	828	254	128	89
8							1050	1260	791	243	124	90
9							1050	1290	779	238	121	101
10							1070	1280	744	235	122	128
11							1110	1240	701	229	122	142
12							1150	1180	651	226	116	142
13							1180	1120	602	225	115	139
14							1170	1070	555	227	116	135
15							1130	1030	526	221	116	133
16							1080	992	518	213	111	134
17							1040	955	498	211	110	141
18							1010	904	471	208	108	145
19							973	871	448	207	105	141
20							943	846	426	203	101	142
21							911	846	409	202	98	139
22							899	881	391	196	94	136
23							924	913	376	191	96	133
24							980	929	359	185	98	131
25							1020	933	342	180	98	131
26							1020	913	324	175	97	132
27							1010	888	309	174	92	131
28							985	879	296	174	88	128
29							956	894	297	167	88	126
30							915	946	298	159	91	131
31							---	1010	---	150	97	---
TOTAL							31616	30664	17764	6714	3496	3758
MEAN							1054	989	592	217	113	125
MAX							1210	1290	1040	288	146	145
MIN							899	810	296	150	88	89
CFSM							2.01	1.89	1.13	.41	.22	.24
IN.							2.24	2.18	1.26	.48	.25	.27
AC-FT							62710	60820	35230	13320	6930	7450

PEND OREILLE RIVER BASIN

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12366000 WHITEFISH RIVER NEAR KALISPELL, MT

LOCATION.--Lat 48°19'13", long 114°16'39", in SW¼SE¼NW¼ 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 mile 8.3.

DRAINAGE AREA.--170 mi².

PERIOD OF RECORD.--July to November 1928, April 1929 to September 1950, annual maximum, water year 1964, October 1972 to September 1985, April 1986 to current year. Prior to 1964, published as Whitefish Creek near Kalispell.

GAGE.--Water-stage recorder. Datum of gage is 2,969.83 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 16, 1930, nonrecording gage at site 200 ft downstream at datum 10.00 ft lower. Oct. 16, 1930, to Sept. 30, 1950, water-stage recorder on left bank at same datum.

REMARKS.--Estimated daily discharges: Apr. 22 to May 8, July 1 to Aug. 7. Seasonal 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.

AVERAGE DISCHARGE.--34 years (1929-50, 1972-85), 192 ft³/s, 139,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,580 ft³/s June 24, 1974, gage height, 4.91 ft; minimum, 4.5 ft³/s Oct. 18, 1934, gage height, 0.83 ft.

EXTREMES FOR CURRENT SEASON.--Maximum discharge, 656 ft³/s June 4, gage height, 3.10 ft; minimum daily, 50 ft³/s Sept. 7, 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1							227	290	634	195	94	59
2							230	280	643	185	94	57
3							233	271	647	180	92	57
4							236	300	647	170	90	55
5							238	350	643	170	88	53
6							242	390	628	165	86	51
7							248	380	609	165	82	50
8							254	376	600	160	79	50
9							270	376	588	155	75	57
10							287	372	559	155	74	63
11							296	372	535	150	73	59
12							297	372	503	145	67	59
13							293	365	472	145	65	57
14							293	365	449	150	67	57
15							290	358	434	145	65	57
16							296	347	404	140	67	57
17							306	337	381	140	65	58
18							300	330	354	135	65	55
19							290	330	333	135	63	53
20							283	323	313	130	61	53
21							280	344	300	130	58	53
22							277	383	279	125	57	53
23							280	404	261	125	57	53
24							290	412	248	120	55	55
25							290	415	239	115	55	57
26							290	423	224	115	53	55
27							300	442	209	115	53	53
28							310	483	200	115	52	56
29							320	539	212	105	52	57
30							300	580	203	100	52	63
31							---	613	---	98	59	---
TOTAL							8346	11922	12751	4378	2115	1672
MEAN							278	385	425	141	68.2	55.7
MAX							320	613	647	195	94	63
MIN							227	271	200	98	52	50
AC-FT							16550	23650	25290	8680	4200	3320

PEND OREILLE RIVER BASIN

12369200 SWAN RIVER NEAR CONDON, MT

LOCATION.--Lat 47°25'21", long 113°40'12", NE¼SW¼NW¼ sec.8, T.19 N., R.16 W., Missoula County, Hydrologic Unit 17010211, Flathead National Forest, on right bank 25 ft downstream from road bridge, 0.5 mi downstream from Beaver Creek, 4.0 mi downstream from Lindberg Lake, 8.1 mi southeast of Condon, and at mile 66.5.

DRAINAGE AREA.--69.1 mi².

PERIOD OF RECORD.--October 1972 to current year.

REVISED RECORDS.--WDR MT-80-2: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 4,015 ft, by barometer.

REMARKS.--Estimated daily discharges: Nov. 22 to Dec. 6, Dec. 9-16, 19, Dec. 21 to Jan. 16, Jan. 22-28, Feb. 7-21. Records good except those for estimated daily discharges, which are poor. Several observations of water temperature and specific conductance were made during the year and are published as miscellaneous water-quality data in the back of this report.

AVERAGE DISCHARGE.--14 years, 164 ft³/s, 32.23 in/yr, 118,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,540 ft³/s June 18, 1974, gage height, 4.88 ft; minimum daily, 22 ft³/s Dec. 8, 1972.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,090 ft³/s May 31, gage height, 4.37 ft; minimum daily, 32 ft³/s Jan. 4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	99	104	54	40	71	223	342	173	1060	252	76	60		
2	96	126	50	38	77	221	316	167	996	235	74	56		
3	107	138	50	35	80	224	282	184	925	217	72	54		
4	105	166	52	32	80	224	255	314	825	212	69	53		
5	99	234	54	35	79	223	235	357	738	220	68	51		
6	97	246	56	39	75	219	222	326	677	220	66	50		
7	103	238	57	39	72	232	213	292	621	204	64	48		
8	98	217	54	38	68	273	215	266	630	189	63	54		
9	91	192	48	40	64	281	230	246	581	174	61	66		
10	90	161	44	45	66	268	253	235	512	167	60	60		
11	87	144	38	48	60	253	262	232	464	182	60	56		
12	87	125	40	45	64	237	259	223	450	217	60	53		
13	84	116	42	42	68	226	242	212	437	228	60	52		
14	83	109	45	39	70	208	221	206	416	218	60	54		
15	87	103	48	39	70	191	201	192	405	200	57	53		
16	90	101	48	39	76	177	190	180	396	183	55	55		
17	93	96	47	39	76	164	180	175	376	167	53	55		
18	91	88	44	39	74	151	173	177	368	149	52	56		
19	89	85	43	39	65	143	162	202	360	137	51	59		
20	87	81	42	42	55	139	153	284	343	126	50	60		
21	87	80	40	42	58	138	157	417	314	118	50	68		
22	88	70	38	38	59	140	206	504	278	112	49	66		
23	88	64	37	40	62	138	309	465	250	106	48	63		
24	87	58	36	42	76	155	323	403	234	102	47	61		
25	101	58	35	40	113	160	299	380	229	99	46	62		
26	116	60	35	38	193	156	269	430	228	97	45	64		
27	117	64	36	38	234	161	243	563	228	94	45	64		
28	117	68	38	40	231	190	229	748	224	90	44	62		
29	113	62	42	41	---	242	209	911	245	87	46	65		
30	107	58	45	49	---	299	189	1020	256	82	50	68		
31	104	---	42	61	---	364	---	1070	---	79	64	---		
TOTAL	2988	3512	1380	1261	2436	6420	7039	11554	14066	4963	1765	1748		
MEAN	96.4	117	44.5	40.7	87.0	207	235	373	469	160	56.9	58.3		
MAX	117	246	57	61	234	364	342	1070	1060	252	76	68		
MIN	83	58	35	32	55	138	153	167	224	79	44	48		
CFSM	1.32	1.60	.61	.56	1.19	2.82	3.21	5.09	6.40	2.18	.78	.80		
IN.	1.52	1.78	.70	.64	1.24	3.26	3.57	5.86	7.14	2.52	.90	.89		
AC-FT	5930	6970	2740	2500	4830	12730	13960	22920	27900	9840	3500	3470		
CAL YR 1985	TOTAL	53224	MEAN	146	MAX	840	MIN	25	CFSM	1.99	IN.	27.01	AC-FT	105600
WTR YR 1986	TOTAL	59132	MEAN	162	MAX	1070	MIN	32	CFSM	2.21	IN.	30.01	AC-FT	117300

12370000 SWAN RIVER NEAR BIGFORK, MT

LOCATION.--Lat 48°01'28", long 113°58'44", near center of S½SW¼ 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 mile 14.0.

DRAINAGE AREA.--671 mi².

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. Datum of gage is 3,062.6 ft above National Geodetic Vertical Datum of 1929 (from river-profile survey). Oct. 10, 1910, to May 22, 1911, nonrecording gage at site 10 mi upstream at different datum. Apr. 28, 1922, to Oct. 14, 1930, nonrecording gage at site 800 ft upstream at datum 1.9 ft higher.

REMARKS.--No estimated daily discharges during year. Records good. Diversions for irrigation of about 360 acres upstream from station. Several observations of water temperature and specific conductance were made during the year and are published as miscellaneous water-quality data in the back of this report.

AVERAGE DISCHARGE.--64 years, 1,170 ft³/s, 23.68 in/yr, 847,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,890 ft³/s June 20, 1974, gage height, 7.34 ft; minimum observed, 193 ft³/s Jan. 26-29, 1930, gage height, 0.04 ft, site and datum then in use.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 6,340 ft³/s June 1, gage height, 6.15 ft; minimum, 429 ft³/s Dec. 29, Jan. 27, 28.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	882	933	605	472	605	1500	2370	1480	6270	1470	705	547		
2	855	962	581	478	654	1580	2430	1390	6250	1420	691	559		
3	858	1060	589	484	687	1650	2360	1340	6050	1360	676	550		
4	865	1140	612	488	713	1690	2230	1470	5710	1320	663	543		
5	848	1250	624	483	724	1740	2080	1830	5220	1330	646	533		
6	835	1410	634	474	723	1770	1940	2140	4840	1320	626	522		
7	833	1520	645	483	701	1830	1830	2220	4550	1300	619	513		
8	801	1550	652	482	667	2010	1750	2170	4300	1260	611	516		
9	793	1560	636	482	654	2270	1700	2070	4110	1220	607	623		
10	768	1420	614	488	650	2380	1720	1960	3900	1210	607	681		
11	761	1280	585	490	643	2340	1780	1890	3580	1220	592	681		
12	749	1160	557	492	604	2270	1820	1830	3290	1300	577	662		
13	740	1060	553	479	574	2210	1780	1760	3110	1340	569	622		
14	732	996	555	469	562	2140	1750	1690	2940	1360	569	601		
15	723	952	563	463	580	2040	1670	1650	2790	1320	554	591		
16	717	948	563	467	597	1930	1600	1570	2670	1270	547	584		
17	709	934	563	485	654	1820	1540	1500	2540	1240	547	576		
18	713	908	561	494	680	1740	1490	1450	2450	1190	540	562		
19	703	865	557	484	679	1650	1430	1420	2360	1130	532	547		
20	690	819	552	494	658	1570	1370	1450	2260	1070	525	540		
21	682	812	547	510	645	1530	1330	1750	2140	1020	518	558		
22	700	759	537	514	647	1510	1310	2320	2000	976	525	572		
23	712	697	525	498	649	1510	1380	2810	1850	941	511	575		
24	737	658	517	496	681	1520	1550	2950	1740	906	504	560		
25	771	648	510	494	757	1590	1700	2810	1630	864	490	564		
26	820	645	501	473	905	1630	1730	2720	1560	839	497	571		
27	860	640	494	461	1120	1600	1720	2950	1510	816	490	567		
28	896	634	489	463	1350	1590	1680	3590	1450	806	483	579		
29	930	631	480	482	---	1650	1640	4570	1460	771	483	582		
30	924	621	471	514	---	1830	1560	5470	1480	750	483	588		
31	919	---	474	556	---	2100	---	6040	---	729	525	---		
TOTAL	24526	29472	17346	15092	19763	56190	52240	72260	96010	35068	17512	17269		
MEAN	791	982	560	487	706	1813	1741	2331	3200	1131	565	576		
MAX	930	1560	652	556	1350	2380	2430	6040	6270	1470	705	681		
MIN	682	621	471	461	562	1500	1310	1340	1450	729	483	513		
CFSM	1.18	1.46	.83	.73	1.05	2.70	2.59	3.47	4.77	1.69	.84	.86		
IN.	1.36	1.63	.96	.84	1.10	3.12	2.90	4.01	5.32	1.94	.97	.96		
AC-FT	48650	58460	34410	29930	39200	111500	103600	143300	190400	69560	34740	34250		
CAL YR 1985	TOTAL	410547	MEAN	1125	MAX	5000	MIN	323	CFSM	1.68	IN.	22.76	AC-FT	814300
WTR YR 1986	TOTAL	452748	MEAN	1240	MAX	6270	MIN	461	CFSM	1.85	IN.	25.10	AC-FT	898000

PEND OREILLE RIVER BASIN

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12371500 FLATHEAD LAKE AT SOMERS, MT

LOCATION.--Lat 48°04'22", long 114°13'30", in NE¼NE¼SE¼ sec.26, T.27 N., R.21 W., Flathead County, Hydrologic Unit 17010208, at steamboat dock at Somers.

DRAINAGE AREA.--7,086 mi².

PERIOD OF RECORD.--April to August 1900, daily lake elevations only, at site near Holt, 6 mi east of Somers (datum unknown). August 1908 to November 1909 (fragmentary), January 1910 to current year. Monthend contents only for some periods, published in WSP 1316. Prior to April 1923, published as "at Polson." Oct. 1, 1941, to current year, unpublished daily lake elevations at Polson are available in files of Helena district office.

GAGE.--Water-stage recorder. Datum of gage is at Somers datum. Subtract 1.00 ft to convert Somers datum to National Geodetic Vertical Datum of 1929, supplementary adjustment of 1947. July 1 to Dec. 12, 1923, non-recording gage at same site and datum.

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. 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 OUTSIDE PERIOD OF RECORD.--Lake reached an elevation of 2,900 ft during flood in June 1894.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 1,812,000 acre-ft Sept. 9, elevation, 2,893.17 ft; minimum, 785,000 acre-ft Mar. 29, elevation, 2,884.79 ft.

Capacity table (elevation, in feet and contents, in acre-ft)

2,884	690,700	2,890	1,417,000
2,886	930,300	2,892	1,665,000
2,888	1,172,000	2,894	1,917,000

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2892.82	2892.17	2890.36	2889.57	2887.51	2884.99	2885.13	2886.12	2891.40	2892.82	2892.61	2892.90
2	2892.86	2892.11	2890.30	2889.55	2887.40	2884.95	2885.23	2886.12	2891.60	2892.78	2892.60	2892.90
3	2892.91	2892.07	2890.22	2889.56	2887.31	2884.92	2885.28	2886.14	2891.74	2892.79	2892.60	2892.90
4	2892.88	2892.11	2890.17	2889.57	2887.20	2884.90	2885.36	2886.28	2891.86	2892.82	2892.62	2892.88
5	2892.90	2892.18	2890.15	2889.58	2887.08	2884.87	2885.35	2886.37	2891.94	2892.76	2892.65	2892.91
6	2892.83	2892.25	2890.12	2889.61	2886.97	2884.88	2885.32	2886.48	2892.00	2892.65	2892.70	2892.95
7	2892.83	2892.35	2890.00	2889.62	2886.85	2884.89	2885.29	2886.62	2892.13	2892.66	2892.76	2892.93
8	2892.78	2892.35	2889.90	2889.64	2886.73	2884.85	2885.29	2886.72	2892.19	2892.66	2892.78	2893.10
9	2892.77	2892.31	2889.78	2889.67	2886.63	2884.87	2885.32	2886.83	2892.21	2892.80	2892.81	2893.13
10	2892.76	2892.23	2889.70	2889.72	2886.52	2884.92	2885.34	2886.90	2892.28	2892.85	2892.84	2893.07
11	2892.83	2892.23	2889.61	2889.62	2886.43	2884.94	2885.29	2887.00	2892.35	2892.88	2892.86	2893.04
12	2892.87	2892.17	2889.51	2889.52	2886.30	2884.94	2885.31	2887.08	2892.49	2892.91	2892.91	2892.94
13	2892.90	2892.11	2889.41	2889.44	2886.18	2884.93	2885.35	2887.25	2892.60	2892.89	2892.91	2892.90
14	2892.93	2892.04	2889.31	2889.36	2886.10	2884.92	2885.36	2887.37	2892.74	2892.92	2892.95	2892.90
15	2892.83	2891.98	2889.22	2889.26	2886.07	2884.89	2885.35	2887.45	2892.76	2892.95	2892.98	2892.92
16	2892.75	2891.93	2889.15	2889.18	2885.99	2884.87	2885.41	2887.53	2892.74	2892.92	2892.95	2892.97
17	2892.64	2891.78	2889.13	2889.09	2885.95	2884.88	2885.41	2887.58	2892.81	2892.85	2892.95	2892.96
18	2892.56	2891.76	2889.11	2888.99	2885.84	2884.90	2885.40	2887.66	2892.88	2892.81	2892.96	2892.93
19	2892.50	2891.66	2889.12	2888.89	2885.72	2884.88	2885.46	2887.76	2892.82	2892.74	2892.94	2892.88
20	2892.43	2891.57	2889.15	2888.82	2885.62	2884.88	2885.39	2888.00	2892.79	2892.66	2892.94	2892.89
21	2892.38	2891.43	2889.19	2888.68	2885.49	2884.91	2885.36	2888.41	2892.73	2892.63	2892.98	2892.91
22	2892.34	2891.37	2889.31	2888.57	2885.40	2884.83	2885.39	2888.84	2892.69	2892.63	2892.96	2892.89
23	2892.23	2891.24	2889.34	2888.47	2885.32	2884.82	2885.45	2889.18	2892.70	2892.65	2892.93	2892.86
24	2892.20	2891.08	2889.36	2888.36	2885.27	2884.83	2885.57	2889.45	2892.77	2892.68	2892.89	2892.88
25	2892.18	2890.95	2889.39	2888.22	2885.20	2884.81	2885.70	2889.69	2892.78	2892.62	2892.84	2892.91
26	2892.18	2890.89	2889.40	2888.10	2885.11	2884.80	2885.82	2889.97	2892.81	2892.62	2892.85	2892.89
27	2892.18	2890.80	2889.44	2887.98	2885.05	2884.80	2885.89	2890.32	2892.79	2892.62	2892.82	2892.88
28	2892.19	2890.69	2889.44	2887.85	2885.02	2884.80	2885.95	2890.60	2892.80	2892.62	2892.83	2892.82
29	2892.19	2890.57	2889.47	2887.76	---	2884.79	2886.12	2890.82	2892.78	2892.62	2892.84	2892.76
30	2892.24	2890.46	2889.49	2887.68	---	2884.91	2886.12	2891.02	2892.81	2892.62	2892.84	2892.76
31	2892.21	---	2889.49	2887.60	---	2884.96	---	2891.22	---	2892.60	2892.87	---
MAX	2892.93	2892.35	2890.36	2889.72	2887.51	2884.99	2886.12	2891.22	2892.88	2892.95	2892.98	2893.13
MIN	2892.18	2890.46	2889.11	2887.60	2885.02	2884.79	2885.13	2886.12	2891.40	2892.60	2892.60	2892.76
(†)	1,691	1,474	1,354	1,124	812.5	805.3	944.8	1,568	1,767	1,741	1,775	1,761
(††)	-76,000	-217,000	-120,000	-230,000	-311,500	-7,200	+139,500	+623,200	+199,000	-26,000	+34,000	-14,000
CAL YR 1985	††	+337,000										
WTR YR 1986	††	- 6,000										

† Contents, in thousands of acre-feet, at end of month.

†† Change in contents, in acre-feet.

PEND OREILLE RIVER BASIN

12372000 FLATHEAD RIVER NEAR POLSON, MT

LOCATION.--Lat 47°40'49", long 114°14'45", in SW~~NE~~~~SE~~ 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 mile 71.5.

DRAINAGE AREA.--7,096 mi².

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. Datum of gage is 2,692.70 ft above National Geodetic Vertical Datum of 1929 (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 datum 2,629.20 ft National Geodetic Vertical Datum of 1929 (from river-profile survey).

REMARKS.--No estimated daily discharges during year. Water-discharge 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.

AVERAGE DISCHARGE.--79 years, 11,670 ft³/s, 22.34 in/yr, 8,455,000 acre-ft/yr, adjusted for change in contents in Hungry Horse Reservoir and Flathead Lake.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 82,800 ft³/s May 29, 1928, gage height, 17.2 ft, site and datum then in use; minimum probably less than 5.0 ft³/s Apr. 13, 1938; minimum daily, 32 ft³/s Apr. 12, 1938.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1894 reached a stage of about 21 ft, present datum; discharge, about 110,000 ft³/s, from lake elevation-discharge study.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 44,000 ft³/s June 4, gage height, 14.71 ft; minimum daily, 3,220 ft³/s May 20.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11200	11300	8290	10400	11100	10700	7360	11600	36400	10500	4200	4050
2	10300	11100	9150	11000	11600	10400	8280	11600	37100	11100	4410	4360
3	10800	11200	10300	11600	10700	10500	9760	12400	37900	10600	4510	3810
4	10900	10700	7280	11800	11300	10400	8610	12900	38700	9760	3790	4210
5	10700	11200	6970	11500	12200	10400	12600	12500	38600	9460	4150	5840
6	11100	8740	7720	10100	11300	9880	11600	12000	36300	11300	4080	7070
7	11900	7910	11000	10500	12000	9950	12100	11600	33300	7170	4200	7440
8	11800	10900	11200	11700	11800	10300	10900	11000	33800	9020	3960	6540
9	11200	11900	11400	10000	11200	10400	11200	10600	31700	5070	3810	10100
10	9850	12000	11400	10800	11400	9920	12100	9890	26700	5930	4080	10700
11	10600	10800	10900	11400	10500	10100	11900	9640	22800	5570	3640	7120
12	11100	10300	10900	11200	11800	10300	12500	9580	18100	4790	4780	9730
13	11200	10400	11100	11600	12000	10200	12200	7690	18500	7010	4240	8920
14	11400	10400	11300	11800	11000	10300	11300	8630	18800	8860	4280	7130
15	10500	11300	11100	11900	11100	10400	11500	8410	18800	8850	4470	6700
16	10500	11300	11000	11700	10700	10500	11500	8970	18600	9500	4030	7020
17	11200	11200	10800	10300	7700	7610	11200	8230	16900	11400	4440	6680
18	11300	8440	11300	10700	11800	7750	11700	6950	13700	10500	4800	9410
19	10000	10700	11600	11100	11100	7240	11900	6950	17600	11200	5190	10400
20	10400	11600	10200	12100	11500	6970	12300	3220	14500	10400	6830	10900
21	10800	11500	9890	11800	11100	7760	12000	3280	14800	8350	5000	11300
22	9800	11200	3810	11500	11800	9560	12100	4690	13100	6670	5370	11500
23	9460	11300	9600	11000	9070	10300	12700	11700	11700	5430	5390	11500
24	10200	11400	10900	11500	8610	7930	12400	12100	10800	5040	5770	11300
25	9350	10800	9880	11500	10200	7590	12700	11600	11000	6790	4780	10900
26	10200	9780	11100	12200	10900	8320	12700	11900	10300	5750	4550	10700
27	10500	9120	10500	11900	11200	9050	13400	15300	11100	5950	5080	10800
28	10200	9650	11100	11700	9730	9150	12300	26600	10900	5110	3670	10900
29	10700	9610	9360	11600	---	7430	11800	31100	10700	4080	4150	11100
30	9800	9770	9650	11900	---	7650	11600	34900	10400	3860	4260	11500
31	10600	---	11400	10900	---	7040	---	35700	---	3770	3360	---
TOTAL	329560	317520	312100	350700	306410	286000	346210	393230	643600	238790	139270	259630
MEAN	10630	10580	10070	11310	10940	9226	11540	12680	21450	7703	4493	8654
MAX	11900	12000	11600	12200	12200	10700	13400	35700	38700	11400	6830	11500
MIN	9350	7910	3810	10000	7700	6970	7360	3220	10300	3770	3360	3810
CFSM	1.50	1.49	1.42	1.59	1.54	1.30	1.63	1.79	3.02	1.09	.63	1.22
IN.	1.73	1.66	1.64	1.84	1.61	1.50	1.81	2.06	3.37	1.25	.73	1.36
AC-FT	653700	629800	619100	695600	607800	567300	686700	780000	1277000	473600	276200	515000
MEAN †	8875	9878	3596	3539	5083	12915	17565	30887	28149	7572	3012	2924
CFSM ††	1.25	1.39	.51	.50	.72	1.82	2.48	4.35	3.97	1.07	.42	.41
IN ††	1.44	1.55	.58	.57	.75	2.10	2.76	5.02	4.43	1.23	.49	.46
AC-FT ††	545700	587800	221100	217600	282300	794100	1045200	1899200	1675000	465600	185200	174000

OBSERVED

CAL YR 1985	TOTAL	4072580	MEAN	11160	MAX	33100	MIN	3810	AC-FT	8078000	(†) +216000
WTR YR 1986	TOTAL	3923020	MEAN	10750	MAX	38700	MIN	3220	AC-FT	7782000	(†) +311000

ADJUSTED

CAL YR 1985	TOTAL	4181599	MEAN	11460	CFSM	1.61	IN	21.92	AC-FT	8294000
WTR YR 1986	TOTAL	4080061	MEAN	11180	CFSM	1.58	IN	21.38	AC-FT	8093000

† Change in contents, in acre-ft, in Hungry Horse Reservoir and Flathead Lake.

†† Adjusted for change in contents.

12374250 MILL CREEK ABOVE BASSOO CREEK, NEAR NIARADA, MT

LOCATION.--Lat 47°49'49", long 114°41'45", in SE¼NW¼NE¼ sec.20, T.24 N., R.24 W., Sanders County, Hydrologic Unit 17010212, Flathead Indian Reservation, on right bank 0.2 mi upstream from Flathead Indian Reservation boundary and Bassoo Creek, and 4.1 mi northwest of Niarada.

DRAINAGE AREA.--19.6 mi².

PERIOD OF RECORD.--October 1982 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 3,000 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Estimated daily discharges: Oct. 9, Nov. 10 to Feb. 3, 8, 9, 25-28, Mar. 1. Records good except those for estimated daily discharges, which are poor. No known regulation or diversion upstream of station. Several observations of water temperature and specific conductance were made during the year and are published as miscellaneous water-quality data in the back of this report.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 75 ft³/s Mar. 30, 1986, gage height, 2.27 ft; maximum gage height, 4.35 ft Feb. 26, 1986 (backwater from ice); minimum daily discharge, 1.3 ft³/s Feb. 4, 1985.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 75 ft³/s Mar. 30, gage height, 2.27 ft; maximum gage height, 4.35 ft Feb. 26 (backwater from ice); minimum discharge, 1.4 ft³/s Aug. 19, gage height, 1.32 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	3.2	10	3.0	4.0	4.0	27	67	22	30	6.4	3.2	2.9		
2	3.2	10	2.5	4.0	4.5	25	59	21	29	6.0	3.2	2.9		
3	3.5	10	3.5	3.5	4.0	28	50	21	25	6.0	3.2	2.2		
4	3.5	11	4.0	3.0	3.8	30	42	21	25	6.0	2.9	2.0		
5	3.2	11	3.5	3.0	3.8	31	40	21	24	6.4	2.7	2.0		
6	3.2	12	3.5	3.5	3.8	32	34	27	22	6.0	2.7	2.0		
7	3.5	13	4.0	4.0	2.9	36	31	31	20	5.7	2.7	2.0		
8	3.5	13	4.5	3.5	3.0	53	31	32	18	5.3	2.4	2.2		
9	3.0	13	3.5	4.0	3.0	57	31	32	17	5.7	2.4	3.8		
10	3.2	12	3.0	4.0	3.5	54	36	32	15	5.7	2.4	2.9		
11	3.2	11	2.5	4.0	2.9	46	41	31	14	5.7	2.7	2.4		
12	3.5	10	3.0	3.5	3.5	42	42	30	13	5.3	2.4	2.0		
13	3.5	10	3.5	3.0	3.8	38	40	30	12	5.0	2.2	2.0		
14	3.5	10	3.5	2.5	3.8	33	36	30	11	5.0	2.2	2.4		
15	3.8	10	4.0	2.5	3.8	30	30	28	11	4.7	2.2	2.4		
16	4.1	12	4.5	3.0	4.4	29	29	27	10	4.7	2.0	2.9		
17	4.1	11	5.0	3.5	9.8	29	27	27	9.9	5.0	2.0	2.4		
18	3.8	9.0	4.5	4.0	5.3	27	25	26	9.4	4.7	1.8	5.0		
19	3.8	8.0	4.5	4.0	4.1	25	24	25	9.0	4.4	1.6	3.8		
20	3.8	7.0	4.5	4.5	3.5	25	23	26	9.0	4.4	2.0	3.2		
21	3.8	6.0	4.5	4.0	3.8	24	22	26	9.0	4.1	2.0	3.2		
22	3.8	5.0	4.0	4.0	3.5	24	22	30	8.5	3.8	2.2	2.7		
23	4.1	3.5	3.5	4.0	3.5	25	23	31	8.5	3.8	2.2	2.2		
24	4.7	4.0	3.5	4.0	7.2	25	24	29	8.1	3.5	2.2	2.7		
25	9.0	4.5	4.0	4.0	25	25	25	28	7.6	3.5	2.0	3.2		
26	11	5.0	4.0	3.5	70	25	27	27	7.6	3.5	2.0	2.7		
27	10	5.0	4.0	3.0	50	26	27	27	7.6	3.5	1.8	2.4		
28	10	4.5	4.0	3.5	30	29	26	29	7.6	3.5	1.7	2.4		
29	10	4.0	3.5	3.5	---	52	24	32	8.5	3.2	1.6	2.7		
30	10	3.5	3.5	4.0	---	65	23	32	7.2	3.5	2.0	2.7		
31	10	---	3.0	4.0	---	72	---	31	---	3.2	4.7	---		
TOTAL	156.5	258.0	116.0	112.5	274.2	1089	981	862	413.5	147.2	73.3	80.3		
MEAN	5.05	8.60	3.74	3.63	9.79	35.1	32.7	27.8	13.8	4.75	2.36	2.68		
MAX	11	13	5.0	4.5	70	72	67	32	30	6.4	4.7	5.0		
MIN	3.0	3.5	2.5	2.5	2.9	24	22	21	7.2	3.2	1.6	2.0		
CFSM	.26	.44	.19	.19	.50	1.79	1.67	1.42	.70	.24	.12	.14		
IN.	.30	.49	.22	.21	.52	2.07	1.86	1.64	.78	.28	.14	.15		
AC-FT	310	512	230	223	544	2160	1950	1710	820	292	145	159		
CAL YR 1985	TOTAL	2895.5	MEAN	7.93	MAX	43	MIN	1.3	CFSM	.40	IN.	5.50	AC-FT	5740
WTR YR 1986	TOTAL	4563.5	MEAN	12.5	MAX	72	MIN	1.6	CFSM	.64	IN.	8.66	AC-FT	9050

PEND OREILLE RIVER BASIN

12374800 CROMWELL CREEK NEAR NIARADA, MT

LOCATION.--Lat 47°52'54", long 114°30'04", in NW1/4 sec. 36, T.25 N., R.23 W., Flathead County, Hydrologic Unit 17010212, on left bank 6.7 mi northeast of Niarada and 8.2 mi northwest of Elmo.

DRAINAGE AREA.--14.3 mi².

PERIOD OF RECORD.--October 1982 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 3,220 ft above National Geodetic Vertical datum of 1929, from topographic map.

REMARKS.--Estimated daily discharges: Oct. 8, 9, Nov. 10-14, 18-30, Dec. 1, 2, 4-31, Jan. 1-31, Feb. 1, 7-9, 11-14, 20, 21, 24-27, Aug. 14-27. Records poor. No known regulation or diversion upstream from station. Several observations of water temperature and specific conductance were made during the year and are published as miscellaneous water-quality data in the back of this report.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14 ft³/s Mar. 4, 1986, gage height, 2.76 ft; maximum gage height, 3.10 ft Feb. 24, 1986 (backwater from ice); no flow Dec. 20, Jan. 1-16, Jan. 30 to Feb. 9, 1985, Feb. 15, 1986.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 14 ft³/s Mar. 4, gage height, 2.76 ft; maximum gage height, 3.10 ft Feb. 24 (backwater from ice); no flow Feb. 15.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	.19	.22	.13	.11	.03	9.2	7.5	2.1	.92	.36	.16	.17		
2	.19	.22	.10	.10	.03	11	7.2	1.9	.88	.32	.14	.18		
3	.24	.22	.21	.08	.03	10	6.9	1.7	.85	.32	.13	.14		
4	.22	.22	.17	.06	.03	11	6.5	4.4	.82	.36	.13	.12		
5	.22	.22	.15	.06	.03	11	6.4	5.0	.85	.42	.12	.12		
6	.22	.22	.17	.06	.03	11	6.2	4.5	.82	.34	.12	.13		
7	.22	.24	.19	.06	.02	11	5.5	4.0	.76	.32	.11	.12		
8	.20	.25	.20	.07	.02	12	5.0	3.8	.92	.29	.11	.15		
9	.18	.25	.17	.07	.02	11	4.7	3.7	.85	.39	.11	.42		
10	.21	.23	.12	.08	.02	10	4.3	3.7	.73	.48	.11	.30		
11	.22	.20	.08	.08	.01	9.4	4.2	3.3	.67	.38	.11	.25		
12	.22	.18	.10	.07	.01	9.0	4.0	3.1	.64	.34	.11	.22		
13	.22	.16	.11	.05	.01	8.9	3.8	3.3	.59	.32	.11	.21		
14	.22	.14	.13	.03	.01	8.5	3.5	3.1	.56	.30	.13	.22		
15	.22	.13	.14	.02	.02	8.4	3.3	3.0	.64	.27	.11	.24		
16	.22	.13	.16	.03	.07	8.2	3.8	3.0	.51	.24	.11	.27		
17	.22	.17	.18	.04	.10	7.9	3.7	2.8	.46	.29	.11	.34		
18	.22	.17	.15	.05	.04	7.5	3.1	3.0	.42	.27	.10	.38		
19	.22	.17	.15	.05	.02	7.7	3.1	2.8	.44	.24	.09	.32		
20	.21	.15	.16	.05	.01	7.7	3.1	2.3	.44	.22	.08	.30		
21	.21	.15	.13	.04	.01	7.5	3.1	3.1	.46	.21	.09	.32		
22	.22	.14	.11	.03	.01	7.5	3.0	2.8	.42	.19	.10	.29		
23	.22	.13	.09	.04	.01	7.4	3.0	2.3	.40	.21	.12	.27		
24	.22	.12	.09	.04	.30	7.4	2.8	1.7	.38	.22	.11	.40		
25	.24	.13	.10	.04	6.0	7.4	2.8	1.4	.36	.19	.10	.38		
26	.24	.14	.10	.03	5.2	7.2	2.6	1.3	.36	.18	.10	.34		
27	.24	.15	.10	.03	11	7.2	2.6	1.2	.34	.19	.09	.32		
28	.24	.15	.10	.04	10	7.5	2.6	1.2	.35	.18	.08	.30		
29	.24	.15	.10	.03	---	7.9	2.6	1.1	.49	.17	.08	.29		
30	.22	.15	.10	.03	---	7.9	2.3	.99	.38	.16	.09	.30		
31	.22	---	.09	.03	---	7.7	---	.95	---	.16	.24	---		
TOTAL	6.79	5.30	4.08	1.60	33.09	273.0	123.2	82.54	17.71	8.53	3.50	7.81		
MEAN	.22	.18	.13	.05	1.18	8.81	4.11	2.66	.59	.28	.11	.26		
MAX	.24	.25	.21	.11	11	12	7.5	5.0	.92	.48	.24	.42		
MIN	.18	.12	.08	.02	.01	7.2	2.3	.95	.34	.16	.08	.12		
CFSM	.02	.01	.01	.00	.08	.62	.29	.19	.04	.02	.01	.02		
IN.	.02	.01	.01	.00	.09	.71	.32	.21	.05	.02	.01	.02		
AC-FT	13	11	8.1	3.2	66	541	244	164	35	17	6.9	15		
CAL YR 1985	TOTAL	135.72	MEAN	.37	MAX	4.5	MIN	.00	CFSM	.03	IN.	.35	AC-FT	269
WTR YR 1986	TOTAL	567.15	MEAN	1.55	MAX	12	MIN	.01	CFSM	.11	IN.	1.48	AC-FT	1120

PEND OREILLE RIVER BASIN

135

12375900 SOUTH CROW CREEK NEAR RONAN, MT

LOCATION.--Lat 47°29'30", long 114°01'33", in NW¼NE¼SW¼ sec.16, T.20 N., R.19 W., Lake County, Hydrologic Unit 17010212, Flathead Indian Reservation, on right bank 200 ft upstream of Pablo Feeder Canal, 2.2 mi northeast of Kicking Horse Reservoir, and 4.5 mi southeast of Ronan.

DRAINAGE AREA.--7.57 mi².

PERIOD OF RECORD.--October 1982 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 3,320 ft, from topographic map.

REMARKS.--Estimated daily discharges: Oct. 1, 2, Nov. 12, 13, 17, 18, 22-27, Feb. 11-16, 20, 24, 25. Records good except those for estimated daily discharges, which are fair. No known regulation or diversion upstream from station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 480 ft³/s May 29, 1986, gage height, 3.52 ft; minimum, 5.3 ft³/s Mar. 10, 13, 1985, gage height, 1.74 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 175 ft³/s and maximums (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 29	2000	*480	*3.52	Only peak greater than base discharge.			

Minimum discharge, 7.3 ft³/s Dec. 29, 30, Jan. 16-20, gage height, 1.79 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	15	10	7.6	9.8	16	18	17	200	38	14	9.8
2	13	17	10	7.6	10	16	17	17	167	36	14	8.7
3	14	18	9.8	7.6	11	16	15	25	135	34	13	8.4
4	14	20	9.6	7.6	11	16	14	48	100	33	12	8.4
5	14	21	9.5	7.6	10	16	14	48	96	37	12	8.2
6	13	21	9.4	7.6	10	15	14	41	95	37	12	8.2
7	13	20	9.4	7.6	9.7	15	14	36	99	34	12	7.8
8	12	20	9.4	7.6	9.2	15	16	31	120	31	12	8.1
9	12	18	9.1	7.6	8.9	15	20	30	107	30	11	15
10	12	14	8.9	7.6	8.7	15	21	26	88	30	11	13
11	13	14	8.9	7.6	8.4	13	21	26	81	32	11	11
12	12	13	8.4	7.6	8.0	13	19	26	78	34	11	9.6
13	11	13	8.4	7.4	8.2	12	16	25	78	34	11	9.2
14	11	13	8.4	7.4	8.2	12	16	24	71	33	10	9.2
15	11	13	8.4	7.4	8.4	11	15	22	74	31	10	8.9
16	11	13	8.4	7.4	8.6	11	16	21	73	29	10	8.5
17	11	13	8.4	7.3	8.4	11	16	20	68	28	9.9	8.5
18	11	12	8.4	7.3	8.4	10	15	20	64	26	9.5	8.8
19	11	11	8.3	7.3	8.4	9.9	13	33	63	25	9.4	8.8
20	11	11	8.2	7.5	8.2	9.8	13	51	58	23	9.2	8.7
21	11	11	8.2	7.9	8.2	9.7	13	59	53	23	9.2	9.4
22	14	10	8.0	7.9	8.2	9.7	21	69	48	21	9.2	9.2
23	14	9.7	8.0	7.9	8.2	9.5	29	64	45	19	9.2	8.8
24	13	10	7.9	7.9	10	9.4	26	57	43	19	8.9	8.4
25	15	11	7.9	7.9	13	9.4	25	53	43	18	8.8	8.5
26	17	11	7.8	7.9	17	9.4	24	62	43	18	8.6	8.8
27	17	11	7.7	7.9	17	9.4	23	84	41	17	8.6	8.8
28	17	11	7.6	7.9	16	9.5	23	147	39	16	8.6	8.8
29	16	11	7.3	7.7	---	16	21	245	42	16	8.6	9.0
30	16	11	7.5	8.0	---	19	19	376	41	15	8.9	11
31	15	---	7.6	9.2	---	21	---	272	---	14	10	---
TOTAL	409	416.7	264.8	238.3	279.1	399.7	547	2075	2353	831	322.6	277.5
MEAN	13.2	13.9	8.54	7.69	9.97	12.9	18.2	66.9	78.4	26.8	10.4	9.25
MAX	17	21	10	9.2	17	21	29	376	200	38	14	15
MIN	11	9.7	7.3	7.3	8.0	9.4	13	17	39	14	8.6	7.8
CFSM	1.74	1.84	1.13	1.02	1.32	1.70	2.40	8.84	10.4	3.54	1.37	1.22
IN.	2.01	2.05	1.30	1.17	1.37	1.96	2.69	10.20	11.56	4.08	1.59	1.36
AC-FT	811	827	525	473	554	793	1080	4120	4670	1650	640	550

CAL YR 1985	TOTAL	7616.6	MEAN	20.9	MAX	111	MIN	5.4	CFSM	2.76	IN.	37.43	AC-FT	15110
WTR YR 1986	TOTAL	8413.7	MEAN	23.1	MAX	376	MIN	7.3	CFSM	3.05	IN.	41.35	AC-FT	16690

PEND OREILLE RIVER BASIN

12377150 MISSION CREEK ABOVE RESERVOIR, NEAR ST. IGNATIUS, MT

LOCATION.--Lat 47°19'23", long 113°58'43", in NW¼SW¼NE¼ 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 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1982 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 3,460 ft, from topographic map.

REMARKS.--Estimated daily discharges: Nov. 12-14, 22-26, Dec. 4, 10-12, 24, 29, Feb. 11-15, 20. Water-discharge records good except those for estimated daily discharges, which are fair. No known regulation or diversions upstream from station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 547 ft³/s June 30, 1983, gage height, 4.19 ft; minimum discharge, 5.9 ft³/s Feb. 18, 1985, gage height, 0.72 ft, but may have been less during period of ice effect.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 300 ft³/s and maximums (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 31	0245	*450	*3.95	No other peak greater than base discharge.			

Minimum daily discharge, 10 ft³/s on many days in January and February.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	38	28	15	11	15	18	21	25	384	111	48	35		
2	37	29	15	11	16	18	21	25	354	99	47	32		
3	38	28	15	11	15	19	20	33	328	103	47	30		
4	36	29	15	11	14	18	19	74	275	100	48	30		
5	35	31	15	11	14	18	18	72	273	102	48	28		
6	34	31	15	11	13	17	18	56	252	89	46	26		
7	35	30	15	11	12	17	18	47	226	96	45	24		
8	33	28	15	11	12	17	18	42	253	100	44	27		
9	32	27	14	11	11	17	21	38	218	95	44	40		
10	32	23	14	11	11	17	26	36	187	101	44	39		
11	31	21	13	11	11	16	27	38	204	139	43	34		
12	31	20	12	11	10	16	25	35	219	159	43	29		
13	30	20	13	11	11	15	23	33	190	121	41	27		
14	29	20	13	10	11	15	22	31	178	99	39	27		
15	29	21	13	10	11	14	21	30	205	87	39	26		
16	28	22	13	10	11	14	22	28	176	81	39	27		
17	28	21	13	10	11	14	22	29	183	75	37	26		
18	27	20	13	10	11	13	21	30	190	67	36	28		
19	26	20	13	11	11	13	20	45	169	63	36	29		
20	26	20	13	12	10	13	19	95	131	62	35	28		
21	27	19	12	12	10	13	19	173	109	63	34	29		
22	32	18	12	12	10	13	29	161	100	64	31	28		
23	30	16	12	12	10	13	56	99	103	66	30	27		
24	28	17	12	11	12	13	48	73	114	64	29	28		
25	28	17	11	11	15	13	42	76	130	62	29	29		
26	29	17	11	10	18	13	38	165	128	60	29	29		
27	29	17	11	10	19	13	34	315	109	57	29	28		
28	29	17	11	10	19	14	31	414	107	54	28	29		
29	29	16	11	10	---	16	29	401	170	52	29	30		
30	29	16	11	11	---	18	27	412	146	50	30	33		
31	28	---	11	13	---	20	---	415	---	48	35	---		
TOTAL	953	659	402	338	354	478	775	3546	5811	2589	1182	882		
MEAN	30.7	22.0	13.0	10.9	12.6	15.4	25.8	114	194	83.5	38.1	29.4		
MAX	38	31	15	13	19	20	56	415	384	159	48	40		
MIN	26	16	11	10	10	13	18	25	100	48	28	24		
CFSM	2.48	1.77	1.05	.88	1.02	1.24	2.08	9.19	15.6	6.73	3.07	2.37		
IN.	2.86	1.98	1.21	1.01	1.06	1.43	2.32	10.64	17.43	7.77	3.55	2.65		
AC-FT	1890	1310	797	670	702	948	1540	7030	11530	5140	2340	1750		
CAL YR 1985	TOTAL	16171.7	MEAN	44.3	MAX	341	MIN	6.0	CFSM	3.57	IN.	48.52	AC-FT	32080
WTR YR 1986	TOTAL	17969	MEAN	49.2	MAX	415	MIN	10	CFSM	3.97	IN.	53.91	AC-FT	35640

12377150 MISSION CREEK ABOVE RESERVOIR, NEAR ST. IGNATIUS, MT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1983 to current year (discontinued).

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

		STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	CLOUD COVER (PER- CENT) (00032)	WEATHER (WMO CODE NUMBER) (00041)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE (DEG C) (00010)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)
OCT	02...	1200	37	--	--	131	7.0	6.0	--	--
DEC	04...	1245	15	50	1	148	-1.0	0.0	678	12.8
FEB	06...	0900	13	50	1	149	-3.0	1.0	678	12.6
MAR	11...	1315	16	--	--	156	6.5	3.5	--	--
APR	23...	1300	63	95	1	148	4.5	3.5	672	12.5
MAY	28...	1300	404	0	0	119	27.0	7.0	675	11.3
JUN	04...	1105	270	--	--	115	20.0	7.5	--	--
JUN	12...	1200	225	--	--	123	18.5	8.0	--	--
JUL	09...	1000	97	20	1	117	17.0	10.0	675	10.0
AUG	26...	1130	31	0	0	138	19.5	11.0	680	9.7
DATE		TIME	PH (STAND- ARD UNITS) (00400)	HARD- NESS (MG/L AS CACO3) (00900)	HARD- NESS NONCARB WH WAT TOT FLD MG/L AS CACO3 (00902)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM AD- SORP- TION RATIO (00931)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)
DEC	04...	1245	8.2	75	5	19	6.6	0.7	0	0.4
FEB	06...	0900	7.6	77	6	19	7.2	0.7	0	0.4
APR	23...	1300	8.1	77	2	20	6.6	0.6	0	0.2
MAY	28...	1300	7.3	59	0	17	4.0	0.4	0	0.2
JUL	09...	1000	7.8	61	0	17	4.6	0.5	0	0.2
AUG	26...	1130	7.9	71	1	19	5.7	0.7	0	0.3
DATE		ALKA- LITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SiO2) (00955)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)
DEC	04...	71	3.0	0.3	<0.1	2.9	75	0.1	3.0	0.10
FEB	06...	75	3.1	0.2	<0.1	3.1	76	0.1	2.6	0.10
APR	23...	76	3.3	0.3	<0.1	2.9	79	0.11	13	0.20
MAY	28...	62	1.1	0.2	<0.1	2.4	62	0.08	68	0.10
JUL	09...	61	3.0	0.6	<0.1	2.5	65	0.09	17	<0.10
AUG	26...	70	2.3	0.2	<0.1	3.1	73	0.1	6.1	<0.10
DATE		NITRO- GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N) (00605)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS- PHORUS, TOTAL (MG/L AS P) (00665)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	SEDI- MENT, SUS- PENDE (MG/L) (80154)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY) (80155)	SIEVE DIAM. % FINER THAN .062 MM (70331)
DEC	04...	0.02	--	<0.2	<0.01	<10	<3	5	0.2	53
FEB	06...	0.02	0.48	0.5	<0.01	40	4	4	0.14	50
APR	23...	0.01	--	<0.2	<0.01	20	45	9	1.5	56
MAY	28...	0.04	0.26	0.3	<0.01	<10	13	75	82	57
JUL	09...	<0.01	--	<0.2	<0.01	<10	5	2	0.52	57
AUG	26...	<0.01	--	<0.2	0.01	<10	20	1	0.08	45

PEND OREILLE RIVER BASIN

12381400 SOUTH FORK JOCKO RIVER NEAR ARLEE, MT

LOCATION.--Lat 47°11'44", long 113°50'59", in NE¼NW¼NE¼ 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 mi².

WATER-DISCHARGE RECORDS

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, from topographic map.

REMARKS.--Estimated daily discharges: Oct. 9, Nov. 10-23, Jan. 14-15, 25-31, Feb. 1-25. Water-discharge records good except those for periods of estimated daily discharge, which are poor. No known regulation or diversion upstream from station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 587 ft³/s May 31, 1984, gage height recorded, 2.89 ft, 3.21 ft, from crest-stage gage; maximum gage height, 4.17 ft Nov. 21, 1985 (backwater from ice); minimum daily discharge, 2.5 ft³/s Feb. 4, 1985.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft³/s and maximums (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 21	1700	ice jam	*4.17	May 28	0230	*521	2.77

Minimum discharge, 5.8 ft³/s Dec. 28, 29, gage height, 0.95 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	42	43	22	19	23	44	100	106	379	94	47	41
2	42	47	23	20	22	46	96	111	342	86	46	37
3	46	47	31	20	21	47	92	126	283	85	44	34
4	46	49	33	18	21	49	87	193	253	90	41	33
5	42	59	33	16	21	50	85	196	250	102	41	31
6	42	55	34	24	21	51	85	184	242	88	41	30
7	43	54	36	24	21	57	86	176	273	82	40	29
8	42	54	40	24	20	71	91	174	310	79	39	31
9	40	50	33	26	19	72	101	173	206	76	39	37
10	41	40	29	26	18	68	120	174	201	76	37	34
11	41	25	18	25	17	64	120	174	197	86	38	32
12	41	16	30	24	18	60	114	164	180	83	39	29
13	41	16	35	23	18	56	104	161	173	77	40	29
14	40	16	34	22	18	54	99	159	163	72	38	29
15	40	17	31	22	19	51	97	151	163	71	36	29
16	41	18	33	23	19	49	97	144	155	68	35	30
17	41	17	33	24	18	48	96	143	144	68	35	30
18	41	16	32	23	18	47	94	145	138	64	33	34
19	40	15	30	23	18	47	90	163	132	62	33	36
20	40	13	25	22	17	46	88	198	125	60	32	34
21	40	11	17	26	16	46	97	257	123	57	32	36
22	43	9.0	17	26	20	45	121	273	115	56	33	33
23	41	7.6	18	29	24	44	162	213	110	57	33	31
24	41	7.4	15	23	28	46	152	205	108	54	31	30
25	45	8.0	9.3	23	35	47	144	207	105	53	31	29
26	47	10	8.7	20	42	47	135	245	99	52	29	29
27	46	12	9.9	18	43	48	126	340	97	52	29	29
28	46	16	6.8	18	43	56	122	437	95	48	29	29
29	43	20	7.7	18	---	77	114	457	108	48	31	32
30	42	22	16	19	---	96	110	451	100	47	35	32
31	42	---	17	21	---	107	---	406	---	47	46	---
TOTAL	1308	790.0	757.4	689	638	1736	3225	6706	5369	2140	1133	959
MEAN	42.2	26.3	24.4	22.2	22.8	56.0	108	216	179	69.0	36.5	32.0
MAX	47	59	40	29	43	107	162	457	379	102	47	41
MIN	40	7.4	6.8	16	16	44	85	106	95	47	29	29
CFSM	.75	.47	.44	.40	.41	.00	1.93	3.86	3.20	1.23	.65	.57
IN.	.87	.52	.50	.46	.42	1.15	2.14	4.45	3.57	1.42	.75	.64
AC-FT	2590	1570	1500	1370	1270	3440	6400	13300	10650	4240	2250	1900

CAL YR 1985	TOTAL	19426.4	MEAN	53.2	MAX	266	MIN	2.5	CFSM	.95	IN.	12.90	AC-FT	38530
WTR YR 1986	TOTAL	25450.4	MEAN	69.7	MAX	457	MIN	6.8	CFSM	1.24	IN.	16.91	AC-FT	50480

PEND OREILLE RIVER BASIN

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12381400 SOUTH FORK JOCKO RIVER NEAR ARLEE, MT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1983 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	CLOUD COVER (PER- CENT) (00032)	WEATHER (WMO CODE NUMBER) (00041)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	TEMPER- ATURE, AIR (DEG C) (00020)	TEMPER- ATURE (DEG C) (00010)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)
OCT 03...	0840	43	--	--	234	7.0	6.0	--	--	--
DEC 05...	0930	33	30	1	252	-1.0	0.0	660	12.4	98
FEB 05...	1200	21	--	--	241	1.0	1.0	--	--	--
MAR 13...	1130	55	90	1	241	2.0	3.0	655	11.6	100
APR 24...	1200	142	10	1	213	9.5	3.5	654	11.9	105
MAY 29...	1300	449	0	0	166	28.0	8.0	663	10.1	98
JUN 05...	1010	270	--	--	196	16.0	8.0	--	--	--
JUL 10...	0930	74	70	1	232	12.5	9.0	663	10.1	101
AUG 27...	1530	28	--	0	255	27.0	13.0	665	9.3	101

DATE	TIME	PH (STAND- ARD UNITS) (00400)	HARD- NESS (MG/L AS CACO3) (00900)	HARD- NESS NONCARB WH WAT TOT FLD MG/L AS CACO3 (00902)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM AD- SORP- TION RATIO (00931)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)
DEC 05...	0930	8.30	130	14	39	7.9	1.1	0	0.5
MAR 13...	1130	7.70	130	0	39	8.2	1.1	0	0.2
APR 24...	1200	8.30	110	1	34	6.9	1.0	0	0.4
MAY 29...	1300	7.80	86	0	27	4.5	0.7	0	0.6
JUL 10...	0930	8.20	130	3	40	7.5	1.1	0	0.6
AUG 27...	1530	8.50	130	0	39	8.1	1.3	0	0.7

DATE	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)
DEC 05...	127	2.6	0.6	<0.1	6.5	130	0.17	11	<0.10
MAR 13...	134	3.8	0.4	<0.1	7.0	140	0.19	21	<0.10
APR 24...	114	2.8	0.3	<0.1	6.5	120	0.16	46	<0.10
MAY 29...	87	5.2	0.3	<0.1	5.4	96	0.13	116	<0.10
JUL 10...	128	2.6	0.4	<0.1	6.4	140	0.18	27	<0.10
AUG 27...	137	2.6	0.3	<0.1	6.7	140	0.19	11	<0.10

PEND OREILLE RIVER BASIN

12381400 SOUTH FORK JOCKO RIVER NEAR ARLEE, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	NITRO- GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N) (00605)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS- PHORUS, TOTAL (MG/L AS P) (00665)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	SEDI- MENT, SUS- PENDE (MG/L) (80154)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
DEC 05...	0.02	0.28	0.3	<0.01	<10	<3	6	0.53	64
MAR 13...	0.01	0.19	0.2	<0.01	<10	5	4	0.59	56
APR 24...	<0.01	--	0.2	<0.01	<10	9	5	1.9	70
MAY 29...	0.02	0.28	0.3	<0.01	<10	36	24	29	66
JUL 10...	<0.01	--	<0.2	<0.01	<10	10	8	1.6	71
AUG 27...	<0.01	--	<0.2	0.02	<10	8	2	0.15	33

PEND OREILLE RIVER BASIN

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12383500 BIG KNIFE CREEK NEAR ARLEE, MT

LOCATION.--Lat 47°08'51", long 113°58'24", in NW¼SW¼NW¼ sec.14, T.16 N., R.19 W., Lake County, Hydrologic Unit 17020212, Flathead Indian Reservation, on left bank, 150 ft upstream of S Canal, 1 mi upstream of mouth, and 5.5 mi east of Arlee.

DRAINAGE AREA.--6.88 mi².

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, from topographic map.

REMARKS.--Estimated daily discharges: Nov. 22-24, Dec. 10, 11, 22, 28-30, Jan. 26, Feb. 7, 8, 11-13, 15, 20. Records good except those for estimated discharges, which are fair. No known regulation or diversion upstream from station. Several observations of water temperature and specific conductance were made during the year and are published as miscellaneous water-quality data in the back of this report.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge observed, 78 ft³/s June 30, 1916, gage height, 3.65 ft, site and datum then in use; minimum, 3.6 ft³/s Apr. 9, 10, 1985, gage height, 0.99 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 67 ft³/s May 30, gage height, 1.85 ft; minimum daily, 5.8 ft³/s Jan. 26.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	9.7	9.4	7.8	6.3	6.6	7.1	8.6	9.0	50	22	15	13		
2	9.4	9.7	7.8	6.2	6.6	7.1	9.4	9.0	48	21	15	13		
3	9.5	9.8	7.8	6.2	6.8	7.1	8.8	9.2	45	21	15	11		
4	9.4	9.8	7.7	6.0	6.5	7.1	8.6	15	41	20	15	11		
5	9.4	9.8	7.5	6.2	6.3	7.1	8.3	16	40	22	15	11		
6	9.4	9.8	7.5	5.9	6.2	7.1	8.2	14	37	22	15	11		
7	9.4	9.8	7.5	5.9	6.3	7.3	8.2	14	35	21	15	11		
8	9.4	9.8	7.4	6.0	6.4	7.6	8.2	13	37	20	14	11		
9	9.4	9.8	6.9	6.2	6.5	7.8	8.6	13	38	20	14	12		
10	9.4	9.5	6.8	5.9	6.5	7.8	9.1	13	35	21	14	11		
11	9.5	9.4	6.6	5.9	6.4	7.4	9.0	13	32	21	14	11		
12	9.8	9.7	7.1	5.9	6.2	7.1	9.0	12	32	22	14	10		
13	9.4	9.8	7.1	6.2	6.4	7.1	9.0	12	29	20	14	9.8		
14	9.4	9.3	7.1	6.2	6.5	6.9	9.0	12	28	20	14	10		
15	9.4	9.0	7.1	6.2	6.6	6.8	9.0	12	28	20	14	10		
16	9.4	9.0	7.0	6.0	6.8	6.8	8.9	12	27	20	13	11		
17	9.4	8.9	6.9	5.9	6.7	6.8	8.3	12	26	18	13	10		
18	9.4	8.6	6.8	5.9	6.5	6.8	8.2	11	26	18	13	11		
19	9.4	8.6	6.8	6.1	6.3	6.7	7.9	12	25	18	13	10		
20	9.4	8.2	6.8	6.3	6.0	6.5	7.8	16	24	18	12	10		
21	9.7	8.2	6.8	6.2	6.2	6.5	7.7	20	23	18	12	11		
22	10	8.0	6.8	6.0	6.1	6.5	7.9	22	22	18	12	9.6		
23	9.8	7.8	6.6	6.0	5.9	6.5	11	20	22	18	12	9.5		
24	9.8	8.0	6.5	5.9	6.2	6.7	11	19	22	17	12	9.8		
25	9.8	8.3	6.5	5.9	6.7	6.6	11	18	22	17	11	9.8		
26	9.8	8.2	6.5	5.8	7.5	6.5	10	22	21	16	11	9.4		
27	9.8	8.2	6.4	5.9	7.2	6.7	9.8	31	21	16	11	9.1		
28	9.8	8.2	6.4	6.0	7.1	6.9	9.5	48	21	16	11	9.0		
29	9.8	8.2	6.4	6.2	---	7.7	9.0	53	23	16	11	9.0		
30	9.8	7.9	6.4	6.4	---	8.3	9.0	65	22	16	12	9.9		
31	9.5	---	6.2	6.6	---	8.4	---	56	---	15	15	---		
TOTAL	296.5	268.7	215.5	188.3	182.0	219.3	268.0	623.2	902	588	411	313.9		
MEAN	9.56	8.96	6.95	6.07	6.50	7.07	8.93	20.1	30.1	19.0	13.3	10.5		
MAX	10	9.8	7.8	6.6	7.5	8.4	11	65	50	22	15	13		
MIN	9.4	7.8	6.2	5.8	5.9	6.5	7.7	9.0	21	15	11	9.0		
CFSM	1.39	1.30	1.01	.88	.94	1.03	1.30	2.92	4.37	2.76	1.93	1.53		
IN.	1.60	1.45	1.17	1.02	.98	1.19	1.45	3.37	4.88	3.18	2.22	1.70		
AC-FT	588	533	427	373	361	435	532	1240	1790	1170	815	623		
CAL YR 1985	TOTAL	3479.6	MEAN	9.53	MAX	31	MIN	3.6	CFSM	1.39	IN.	18.81	AC-FT	6900
WTR YR 1986	TOTAL	4476.4	MEAN	12.3	MAX	65	MIN	5.8	CFSM	1.79	IN.	24.20	AC-FT	8880

PEND OREILLE RIVER BASIN

12387450 VALLEY CREEK NEAR ARLEE, MT

LOCATION.--Lat 47°10'11", long 114°13'52", in NESESE sec.3, T.16 N., R.21 W., Sanders County, Hydrologic Unit 17010212, Flathead Indian Reservation, on right bank, 1.4 mi upstream of East Fork, 6.7 mi west of Arlee, and 7.4 mi southwest of Ravalli.

DRAINAGE AREA.--15.3 mi².

PERIOD OF RECORD.--October 1982 to current season (seasonal records only).

GAGE.--Water-stage recorder. Elevation of gage is 3,450 ft, from topographic map.

REMARKS.--No estimated discharges during year. Seasonal water-discharge records good. No known regulation or diversion upstream from station. Several observations of water temperature and specific conductance were made during the year and are published as miscellaneous water-quality data in the back of this report.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 85 ft³/s May 28, 1986, gage height, 2.92 ft; maximum gage height, 2.97 ft May 26, 1983; minimum daily discharge, 5.9 ft³/s Mar. 28, 29, 30, 1985.

EXTREMES FOR CURRENT SEASON.--Maximum discharge, 85 ft³/s May 28, gage height, 2.92 ft; minimum daily, 9.4 ft³/s Oct. 5.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.8						21	21	62	16	12	11
2	9.6						20	21	56	15	12	11
3	9.5						20	23	51	15	12	11
4	9.5						20	38	46	16	12	10
5	9.4						19	39	43	16	12	10
6	9.5						19	37	39	15	12	10
7	9.6						19	35	35	15	12	10
8	9.6						20	33	35	15	12	11
9	9.5						21	32	31	15	12	11
10	9.6						23	31	28	15	12	10
11	9.8						24	30	27	15	12	10
12	9.8						24	28	25	14	12	10
13	9.6						23	28	24	14	12	10
14	9.6						22	27	24	14	11	10
15	10						22	26	23	14	11	10
16	10						21	25	22	14	11	10
17	10						20	25	21	13	11	10
18	9.9						20	25	21	13	11	11
19	9.8						19	29	20	13	11	11
20	9.8						19	41	20	13	11	10
21	10						20	56	19	13	11	10
22	10						25	56	18	13	11	10
23	10						33	48	18	13	11	9.9
24	10						33	44	18	13	11	10
25	11						31	46	17	13	11	10
26	11						28	57	16	13	11	9.9
27	11						27	71	16	13	11	9.9
28	11						25	79	17	12	10	9.9
29	11						23	79	18	12	10	9.9
30	11						22	74	16	12	10	10
31	11						---	68	---	12	11	---
TOTAL	310.9						683	1272	826	429	351	306.5
MEAN	10.0						22.8	41.0	27.5	13.8	11.3	10.2
MAX	11						33	79	62	16	12	11
MIN	9.4						19	21	16	12	10	9.9
CFSM	.65						1.49	2.68	1.80	.90	.74	.67
IN.	.76						1.66	3.09	2.01	1.04	.85	.75
AC-FT	617						1350	2520	1640	851	696	608

12388400 REVAIS CREEK BELOW WEST FORK, NEAR DIXON, MT

LOCATION.--Lat 47°16'00", long 114°24'21", in SE¼NE¼NW¼ sec.4, T.17 N., R.22 W., Sanders County, Hydrologic Unit 17010212, Flathead Indian Reservation, on right bank, 0.3 mi downstream of West Fork, and 7.3 mi southwest of Dixon, MT.

DRAINAGE AREA.--23.4 mi², revised.

PERIOD OF RECORD.--October 1982 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Elevation of gage is 3,420 ft, from topographic map.

REMARKS.--Estimated daily discharges: Nov. 11-16, 19, 22-29, Dec. 1-3, Jan. 26, 27, Feb. 7-17. Records good except those for estimated periods, which are poor. No known regulation or diversion upstream of station. Several observations of water temperature and specific conductance were made during the year and are published as miscellaneous water-quality data in the back of this report.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 262 ft³/s May 28, 1986, gage height, 4.08 ft; maximum gage height, 6.93 ft Dec. 5, 1984 (backwater from ice); minimum daily discharge, 4.1 ft³/s Feb. 4, 5, 1985.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 262 ft³/s May 28, gage height, 4.08 ft; maximum gage height, 5.62 ft Nov. 14 (backwater from ice); minimum discharge, 5.8 ft³/s Aug. 28, 29, gage height, 2.65 ft, but may have been less during period of no gage-height record, Aug. 30 to Sept. 4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	11	15	11	8.2	7.3	20	41	30	123	14	7.8	7.0		
2	11	16	9.8	7.9	7.3	21	39	30	103	13	7.7	7.0		
3	11	16	10	7.9	7.5	22	35	36	91	13	7.8	6.5		
4	10	18	10	7.9	7.9	22	32	82	79	13	7.7	6.3		
5	10	23	10	7.6	7.9	24	30	74	71	13	7.5	6.3		
6	10	23	10	7.6	7.7	25	30	60	64	12	7.2	6.3		
7	11	23	10	7.6	7.5	29	29	54	56	12	7.1	6.3		
8	11	21	10	7.6	7.3	38	31	50	54	11	6.9	7.0		
9	10	20	9.8	7.6	7.3	35	37	49	48	11	6.8	8.0		
10	10	19	9.7	7.6	7.5	31	40	48	42	11	6.7	7.5		
11	10	15	9.5	7.6	7.0	29	39	47	37	11	6.8	7.0		
12	11	12	9.5	7.6	7.5	25	39	44	33	11	7.2	6.5		
13	11	13	9.4	7.6	7.5	24	37	43	31	11	7.1	6.6		
14	11	14	9.2	7.6	7.5	23	33	43	30	10	6.7	7.9		
15	11	14	9.2	7.6	8.0	22	31	40	28	10	6.6	7.9		
16	12	14	9.2	7.6	8.4	20	31	39	25	10	6.5	7.7		
17	13	15	9.2	7.7	8.2	19	30	38	24	9.9	6.4	7.6		
18	13	15	9.2	7.6	7.9	18	28	38	24	9.8	6.4	9.2		
19	13	14	8.6	7.6	7.8	18	26	48	22	9.7	6.4	9.0		
20	13	14	8.5	7.6	7.6	17	25	87	21	9.5	6.3	9.1		
21	13	13	8.5	7.4	7.6	16	27	119	20	9.0	6.4	9.8		
22	14	12	8.2	7.3	7.6	16	43	105	19	8.7	6.2	9.1		
23	14	9.8	8.2	7.1	7.6	16	55	80	18	8.5	6.3	8.5		
24	14	10	7.9	7.0	16	18	51	68	17	8.4	6.2	9.0		
25	16	11	7.9	6.7	21	18	46	74	16	8.2	6.1	9.6		
26	16	11	7.9	6.5	24	18	41	127	15	8.3	6.1	9.5		
27	16	11	7.9	7.0	23	19	38	196	15	8.1	6.0	9.1		
28	16	11	7.7	7.6	20	22	35	232	15	8.0	6.0	8.8		
29	16	11	7.7	7.3	---	30	32	197	16	8.1	5.9	8.8		
30	16	11	8.1	7.3	---	38	31	175	15	7.9	6.0	8.8		
31	15	---	8.0	7.3	---	42	---	148	---	7.9	8.0	---		
TOTAL	389	444.8	279.8	232.1	279.4	735	1062	2501	1172	316.0	208.8	237.7		
MEAN	12.5	14.8	9.03	7.49	9.98	23.7	35.4	80.7	39.1	10.2	6.74	7.92		
MAX	16	23	11	8.2	24	42	55	232	123	14	8.0	9.8		
MIN	10	9.8	7.7	6.5	7.0	16	25	30	15	7.9	5.9	6.3		
CFSM	.53	.63	.39	.32	.43	1.01	1.51	3.45	1.67	.44	.29	.34		
IN.	.62	.71	.44	.37	.44	1.17	1.69	3.98	1.86	.50	.33	.38		
AC-FT	772	882	555	460	554	1460	2110	4960	2320	627	414	471		
CAL YR 1985	TOTAL	6180.3	MEAN	16.9	MAX	117	MIN	4.1	CFSM	.72	IN.	9.83	AC-FT	12260
WTR YR 1986	TOTAL	7857.6	MEAN	21.5	MAX	232	MIN	5.9	CFSM	.92	IN.	12.49	AC-FT	15590

PEND OREILLE RIVER BASIN

12388650 CAMAS CREEK NEAR HOT SPRINGS, MT

LOCATION.--Lat 47°29'19", long 114°41'42", in NE¼SW¼SE¼ sec.18, T.20 N., R.24 W., Sanders County, Hydrologic Unit 17010212, Flathead Indian Reservation, on left bank 200 ft upstream from bridge, 4.6 mi northwest of former community of Camas Prairie, 7.7 mi southwest of Hot Springs, and 10.0 mi northwest of Perma.

DRAINAGE AREA.--4.46 mi².

PERIOD OF RECORD.--October 1982 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 3,120 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Estimated daily discharges: Oct. 1-4, 9, Nov. 10-14, 16, 17, 19, 20, 22-26, Dec. 1-13, Jan. 13-17, 22, 25-27, Feb. 7-12, 16-18, 20, 21, May 30 to June 4, Sept. 18-30. Records poor. No known regulation or diversion upstream of station. Several observations of water temperature and specific conductance were made during the year and published as miscellaneous water-quality data in the back of this report.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 32 ft³/s Feb. 26, 1986, gage height, 1.48 ft; minimum, 0.06 ft³/s Aug. 11, 12, 19, 20, 28-30, Sept. 3-5, 1986.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 32 ft³/s Feb. 26, gage height, 1.48 ft; minimum, 0.06 ft³/s Aug. 11, 12, 19, 20, 28-30, Sept. 3-5.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	.35	1.2	.45	.63	1.1	14	14	3.6	2.0	.54	.15	.12		
2	.35	1.8	.40	.63	1.2	12	13	3.4	1.9	.54	.18	.12		
3	.40	1.9	.50	.63	1.3	12	11	3.2	1.8	.49	.15	.10		
4	.40	1.9	.60	.63	1.4	12	9.6	4.8	1.6	.44	.16	.06		
5	.39	2.0	.55	.63	1.4	12	7.7	6.3	1.5	.49	.18	.06		
6	.42	2.0	.50	.63	1.4	11	7.2	7.7	1.5	.49	.15	.08		
7	.63	2.2	.55	.63	1.3	13	6.8	7.7	1.3	.49	.18	.08		
8	.74	2.2	.60	.63	1.2	14	6.3	7.7	1.3	.44	.15	.10		
9	.63	2.1	.50	.63	1.2	15	6.3	6.8	1.3	.49	.15	.12		
10	.63	1.7	.45	.63	1.2	14	6.3	5.9	1.2	.54	.11	.12		
11	.86	1.5	.40	.63	1.1	13	6.3	5.5	1.1	.49	.10	.12		
12	.99	1.3	.45	.63	1.0	11	6.8	4.8	.96	.44	.10	.10		
13	.80	1.1	.50	.55	1.1	9.6	6.8	4.8	.96	.44	.18	.10		
14	.68	1.1	.58	.50	1.1	7.2	5.9	4.8	1.0	.39	.15	.12		
15	.63	1.2	.63	.50	.99	6.8	5.2	4.5	1.1	.35	.15	.12		
16	.63	1.5	.63	.55	1.5	6.8	4.8	4.0	.89	.33	.12	.12		
17	.63	1.4	.63	.60	5.0	6.3	4.8	3.6	.89	.31	.12	.12		
18	.63	1.2	.68	.63	3.0	5.5	4.5	3.4	.82	.24	.12	.22		
19	.63	1.1	.68	.68	2.1	4.8	4.5	3.2	.76	.24	.10	.20		
20	.63	1.1	.68	.86	2.3	4.5	4.2	3.0	.76	.18	.08	.19		
21	.63	1.1	.68	.92	2.5	4.5	3.8	3.2	.76	.18	.10	.18		
22	.68	.90	.68	.90	2.4	5.2	4.5	3.0	.70	.20	.12	.17		
23	1.1	.75	.68	.92	2.8	5.2	4.8	2.9	.64	.15	.12	.16		
24	1.1	.60	.68	.92	9.1	5.2	5.2	2.6	.59	.15	.12	.18		
25	2.8	.65	.63	.90	19	5.5	5.2	2.5	.54	.15	.10	.20		
26	2.0	.70	.63	.85	24	5.9	4.8	2.5	.49	.15	.10	.18		
27	1.6	.74	.63	.85	21	5.9	4.5	2.2	.49	.18	.10	.17		
28	1.5	.74	.63	.93	17	6.3	4.2	2.1	.54	.18	.10	.17		
29	1.2	.74	.63	.99	---	6.8	3.8	1.9	.89	.18	.06	.18		
30	1.1	.74	.63	.99	---	12	3.4	2.0	.59	.18	.08	.18		
31	1.4	---	.63	.99	---	14	---	2.1	---	.18	.12	---		
TOTAL	27.16	39.16	18.09	22.59	129.69	281.0	186.2	125.7	30.87	10.24	3.90	4.14		
MEAN	.88	1.31	.58	.73	4.63	9.06	6.21	4.05	1.03	.33	.13	.14		
MAX	2.8	2.2	.68	.99	24	15	14	7.7	2.0	.54	.18	.22		
MIN	.35	.60	.40	.50	.99	4.5	3.4	1.9	.49	.15	.06	.06		
CFSM	.20	.29	.13	.16	1.04	2.03	1.39	.91	.23	.07	.03	.03		
IN.	.23	.33	.15	.19	1.08	2.34	1.55	1.05	.26	.09	.03	.03		
AC-FT	54	78	36	45	257	557	369	249	61	20	7.7	8.2		
CAL YR 1985	TOTAL	440.96	MEAN	1.21	MAX	7.9	MIN	.15	CFSM	.27	IN.	3.68	AC-FT	875
WTR YR 1986	TOTAL	878.74	MEAN	2.41	MAX	24	MIN	.06	CFSM	.54	IN.	7.33	AC-FT	1740

PEND ORILLE RIVER BASIN

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12388700 FLATHEAD RIVER AT PERMA, MT

LOCATION.--Lat 47°22'03", long 114°35'03", in SE¼NE¼NE¼ 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 mile 10.9.

DRAINAGE AREA.--8,795 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1983 to current year.

GAGE.--Water-stage recorder. Datum of gage is 2,469.31 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Nov. 23 to Dec. 18. Water-discharge records good except those for estimated daily discharges, which are poor. 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.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 40,700 ft³/s June 4, 1986, gage height, 18.50 ft; maximum gage height, 20.38 ft Nov. 29, 1985, backwater from ice; minimum daily discharge, 2,670 ft³/s May 29, 1984.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 40,700 ft³/s June 4, gage height, 18.50; maximum gage height, 20.38 ft Nov. 29, backwater from ice; minimum daily discharge, 4,670 ft³/s Aug. 12, Sept. 4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11400	11400	10000	12600	13000	12100	8300	12200	37800	11100	4800	4880
2	11400	11800	9000	12000	13200	12400	8770	12400	38800	11800	5260	5070
3	10900	11700	10000	13300	12400	12500	11000	12700	39300	12100	5440	5420
4	12100	12000	11500	13100	13400	11900	9060	13800	40300	11300	5360	4670
5	11400	11500	8000	13200	13100	12000	12400	14400	39900	10400	4820	5100
6	11200	11700	7500	12800	13600	11500	13100	13500	39600	11000	5160	7180
7	12000	8790	10000	11700	13200	12300	12600	13300	35400	11200	5240	8000
8	12400	9730	11500	12300	13400	11600	12800	12600	34700	9550	4950	8150
9	12400	11800	12000	12700	13200	11800	12000	12200	34700	8430	4800	7850
10	11200	12400	12500	12300	12400	12200	12300	11400	30700	6630	4780	12900
11	10400	12100	12500	12100	12700	11000	13300	10600	25600	7560	5090	9440
12	11400	11300	12000	13200	11900	11700	12900	10800	21500	6190	4670	8450
13	11700	11000	12500	12800	12900	12300	13300	10100	19700	6100	5670	11100
14	11900	10900	12500	13500	12300	11700	13000	9310	19400	9050	5380	8760
15	11900	11300	13000	12900	12600	11200	12300	9750	19500	9840	5200	8140
16	11000	12100	12500	13600	11900	11400	12600	9970	19500	9840	5380	7760
17	11100	11900	12500	12300	12100	11300	12200	10200	19800	10900	5160	7600
18	12100	11300	12500	12300	10200	8230	12300	9030	12800	12300	5520	7790
19	11800	9580	13100	12700	12600	8850	12600	8650	19900	11200	5940	11700
20	10200	11400	12900	13900	12900	8310	12800	8240	22200	11400	6500	11000
21	11400	11900	12000	13600	12200	8150	13200	4780	15500	11600	6820	11800
22	10600	12000	9660	13800	12600	9510	12700	5030	15200	8190	6250	12500
23	10600	12000	6380	13200	12200	10700	13500	8470	13400	7470	6390	12000
24	10700	12000	12600	12700	11500	11400	13500	13200	12100	6190	6230	12300
25	10000	12000	11900	13100	15300	8630	13400	13200	11900	6580	6630	12000
26	10700	11000	12000	13400	16000	8840	14000	12700	11400	7870	5650	11900
27	11000	10000	11900	13700	15200	9020	13700	13700	11800	6610	5800	11200
28	11400	9500	13200	13100	13400	10900	14200	22200	11800	7120	5700	12000
29	10800	10000	11400	13400	---	9380	12800	29900	12200	5790	4680	12000
30	11000	10500	10900	12900	---	8910	12600	35300	11400	5120	5180	12300
31	11400	---	12900	13000	---	9280	---	37100	---	4780	5660	---
TOTAL	349500	336600	352840	401200	361400	331010	373230	420730	697800	275210	170110	280960
MEAN	11270	11220	11380	12940	12910	10680	12440	13570	23260	8878	5487	9365
MAX	12400	12400	13200	13900	16000	12500	14200	37100	40300	12300	6820	12900
MIN	10000	8790	6380	11700	10200	8150	8300	4780	11400	4780	4670	4670
AC-FT	693200	667600	699900	795800	716800	656600	740300	834500	1384000	545900	337400	557300
GAL YR 1985	TOTAL	4361250		MEAN	11950	MAX	32900	MIN	6130	AC-FT	8651000	
WTR YR 1986	TOTAL	4350590		MEAN	11920	MAX	40300	MIN	4670	AC-FT	8629000	

PEND OREILLE RIVER BASIN

12388700 FLATHEAD RIVER AT PERMA, MT--Continued

WATER QUALITY DATA

PERIOD OF RECORD---Water years 1971-73, 1984 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	CLOUD COVER (PER- CENT) (00032)	WEATHER (WMO CODE NUMBER) (00041)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	TEMPER- ATURE, AIR (DEG C) (00020)	TEMPER- ATURE (DEG C) (00010)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)
OCT 04...	0830	12300	--	--	173	0.0	10.0	--	--	--
FEB 04...	1430	12600	100	2	140	4.5	2.5	696	13.2	106
MAR 06...	1430	11600	100	13	168	14.0	5.5	692	11.4	100
APR 14...	1500	13000	20	1	165	13.0	8.0	695	11.4	106
MAY 21...	1530	4810	100	97	175	13.0	13.5	685	9.6	103
JUN 03...	1500	39100	75	2	180	31.0	18.0	691	9.3	109
SEP 05...	1330	5320	100	3	180	13.5	18.0	700	8.4	97

DATE	TIME	PH (STAND- ARD UNITS) (00400)	HARD- NESS (MG/L AS CACO3) (00900)	HARD- NESS, NONCAR- BONATE (MG/L CACO3) (00902)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM AD- SORP- TION RATIO (00931)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)
FEB 04...	1430	7.9	86	1	24	6.4	1.8	0.1	0.8
MAR 06...	1430	8.2	89	0	25	6.5	2.6	0.1	0.8
APR 14...	1500	7.8	85	1	24	6.2	1.7	0.1	0.6
MAY 21...	1530	7.7	86	0	24	6.4	2.7	0.1	0.6
JUN 03...	1500	7.8	85	0	24	6.1	1.5	0.1	0.5
SEP 05...	1330	8.1	88	0	24	6.7	2.4	0.1	0.8

DATE	ALKA- LITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SiO2) (00955)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)
FEB 04...	89	4.0	0.6	<0.1	4.4	93	0.13	3160	<0.10
MAR 06...	89	5.1	0.7	0.1	5.1	99	0.13	3110	<0.10
APR 14...	90	3.9	0.6	<0.1	4.5	92	0.13	3250	<0.10
MAY 21...	92	4.5	0.7	<0.1	5.1	99	0.13	1290	<0.10
JUN 03...	89	3.8	0.6	<0.1	4.6	94	0.13	9970	<0.10
SEP 05...	92	6.7	1.3	<0.1	4.9	100	0.14	1460	<0.10

PEND OREILLE RIVER BASIN

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12388700 FLATHEAD RIVER AT PERMA, MT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	NITRO- GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N) (00605)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS- PHORUS, TOTAL (MG/L AS P) (00665)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	SEDI- MENT, SUS- PENDEDED (MG/L) (80154)	SEDI- MENT, DIS- CHARGE, SUS- PENDEDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
FEB 04...	0.04	0.36	0.4	0.02	10	10	9	306	81
MAR 06...	0.04	0.26	0.3	0.03	20	18	23	720	85
APR 14...	0.04	0.26	0.3	0.02	<10	5	9	316	83
MAY 21...	0.04	0.26	0.3	<0.01	<10	14	10	130	85
JUN 03...	0.02	0.28	0.3	0.02	<10	4	37	3910	85
SEP 05...	<0.01	--	0.4	0.02	<10	5	3	43	78

PEND OREILLE RIVER BASIN

12389000 CLARK FORK NEAR PLAINS, MT

LOCATION.--Lat 47°25'47", long 114°51'18", in E½SW¼ 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 mile 239.0.

DRAINAGE AREA.--19,958 mi².

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. Datum of gage is 2,449.11 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Nov. 28, 1911, nonrecording gage at site 50 ft upstream at same datum.

REMARKS.--Estimated daily discharges: Nov. 29 to Dec. 2, Dec. 8-17, June 24 to July 4. 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. Several observations of water temperature and specific conductance were made during the year and are published as miscellaneous water-quality data in the back of this report.

AVERAGE DISCHARGE.--76 years, 19,940 ft³/s, 14,450,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 134,000 ft³/s June 5, 1948, gage height, 19.17 ft; minimum, 3,200 ft³/s Feb. 8, 1936, Dec. 10, 1940; minimum gage height, 2.70 ft, from partly estimated gage-height record, Sept. 2, 1958.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 76,800 ft³/s June 2, gage height, 13.65 ft; minimum, 6,540 ft³/s Aug. 27, 29, 30, gage height, 3.63 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15900	16700	13500	14200	15700	25700	24100	24000	76200	18000	7490	7260
2	16000	17500	12500	14000	16000	24900	23900	23400	76400	18000	7740	7730
3	15100	17900	13000	15600	15900	24500	24900	23400	75200	18000	7940	7990
4	16400	18600	14900	15600	16100	24000	24000	25800	74000	17000	7850	7610
5	15800	18400	13000	15600	16300	24000	24200	28600	71900	16500	7270	7710
6	15800	19000	11400	15200	17000	23600	26100	29300	71000	17000	7400	9140
7	16600	15900	12900	13800	16100	24400	25100	28400	66500	17500	7470	10400
8	17300	15800	16000	14200	16500	25600	25500	27300	62400	16000	7420	10700
9	17200	18400	16500	15300	15900	27500	25100	26200	61100	14500	7190	10400
10	16000	19100	16700	14300	15000	27800	26400	25100	55700	13000	7000	15200
11	14600	18500	16500	14600	15500	25600	28200	24100	47600	13500	7050	14100
12	15600	16700	15500	15800	14400	24900	28200	24000	41700	12500	6860	11300
13	16100	15600	16000	15200	15400	24700	28200	23500	37900	12000	7540	14200
14	16400	15600	16300	15700	15100	23700	27300	21900	36400	15000	7420	12500
15	16400	15900	16500	15100	15100	22700	25700	22300	35600	15100	7430	11200
16	15300	17100	16500	15800	14700	22200	25400	22000	35100	14800	7400	10900
17	15500	17100	16500	15100	16000	21700	24800	22000	34600	15600	7060	11100
18	16500	16900	16100	14600	13800	18100	24300	20900	28200	17600	7470	11200
19	16500	14200	16400	15300	18200	17900	24100	19900	30700	16400	7690	15000
20	14800	15900	16400	16400	18000	17100	23700	21200	28700	16500	8130	15100
21	15600	16500	14800	17000	16700	16600	24000	20500	26800	16200	9110	16000
22	15300	16400	13300	16700	16400	17700	23700	24300	25800	12900	7910	16600
23	14900	15300	7820	16100	16500	19500	25900	28500	23200	11300	8210	16400
24	14900	15400	13800	15200	15900	20600	29100	33700	21000	10100	8210	16600
25	15600	15600	14300	15600	23500	17900	29600	32300	20000	9280	8620	16200
26	16400	13500	13900	15800	32900	17600	29300	31900	19000	10900	8000	16000
27	16800	13100	14300	16100	33200	17900	28100	36100	19000	9950	7470	15200
28	17500	12700	14900	15500	29700	19600	28100	48600	19000	9660	8040	15900
29	16600	13500	13600	15800	---	19900	26100	62900	19500	9060	6800	16100
30	16800	14000	12600	15600	---	20900	24900	71200	18500	7840	7060	16200
31	16600	---	14200	15900	---	24000	---	74900	---	7680	7730	---
TOTAL	496800	486800	450620	476700	501500	682800	778000	948200	1258700	429370	235980	381940
MEAN	16030	16230	14540	15380	17910	22030	25930	30590	41960	13850	7612	12730
MAX	17500	19100	16700	17000	33200	27800	29600	74900	76400	18000	9110	16600
MIN	14600	12700	7820	13800	13800	16600	23700	19900	18500	7680	6800	7260
AC-FT	985400	965600	893800	945500	994700	1354000	1543000	1881000	2497000	851700	468100	757600
CAL YR 1985	TOTAL	6570390		MEAN	18000	MAX	55100	MIN	7820	AC-FT	13032000	
WTR YR 1986	TOTAL	7127410		MEAN	19530	MAX	76400	MIN	6800	AC-FT	14137000	

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LOCATION.--Lat 47°35'31", long 115°13'43", in NW¼NE¼SE¼ sec.7, T.21 N., R.28 W., Sanders County, Hydrologic Unit 17010213, Lolo National Forest, on right bank 1.3 mi upstream from mouth and 5.5 mi east of Thompson Falls.

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.

GAGE.--Water-stage recorder. Datum of gage is 2,429.97 ft above National Geodetic Vertical Datum of 1929 (Bureau of Public Roads bench mark). October 1911 to September 1916, nonrecording gage at site 0.2 mi upstream at different datum.

REMARKS.--Estimated daily discharges: Oct. 31 to Dec. 7, Dec. 11-13. Records good except those for estimated daily discharges, which are fair. Minor diversions upstream from station for irrigation, acreage unknown. Diversion from headwaters of Alder Creek in SW $\frac{1}{4}$ sec.16, T.23 N., R.25 W., to supplement water supply for storage in Upper Dry Fork Reservoir in Little Bitterroot River basin. Several observations of water temperature and specific conductance were made during the year and are published as miscellaneous water-quality data in the back of this report.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,080 ft³/s June 9, 1964, gage height, 8.53 ft; minimum, 60 ft³/s Nov. 20, 1977, gage height, 1.96 ft, result of freezeup; minimum gage height, 1.01 ft Dec. 17, 1964, result of freezeup.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in May to June 1948 reached a discharge of 6,190 ft³/s, by slope-area measurement of peak flow at site 0.2 mi downstream.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,700 ft³/s May 29, gage height, 4.61 ft; minimum, 129 ft³/s Jan. 26, gage height, 2.25 ft.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	200	400	195	193	247	1080	1530	766	1420	374	234	205
2	196	500	192	200	264	1090	1410	744	1290	365	229	200
3	196	600	210	205	269	1140	1260	787	1170	360	225	193
4	196	654	220	174	264	1120	1160	915	1060	360	221	183
5	189	640	220	189	260	1110	1100	1130	1020	365	217	181
6	189	600	220	205	238	1110	1050	1160	972	355	213	177
7	205	550	230	200	213	1230	1030	1130	878	340	213	177
8	193	500	238	189	193	1530	1030	1080	832	330	209	181
9	185	480	205	205	205	1570	1090	1040	774	325	209	196
10	189	450	193	205	234	1460	1200	1030	717	325	205	205
11	189	430	175	196	186	1290	1240	987	675	345	205	193
12	193	400	180	189	200	1170	1220	947	648	330	200	185
13	193	380	190	177	196	1080	1130	947	615	316	200	181
14	189	350	200	170	193	1020	1050	963	595	311	196	185
15	193	330	213	177	200	964	996	909	582	301	196	185
16	196	320	209	200	234	909	964	862	557	297	193	185
17	196	300	209	205	286	877	924	832	532	311	193	185
18	193	275	209	196	273	839	885	817	514	301	189	213
19	189	250	209	213	242	795	847	847	496	292	189	221
20	185	240	213	225	194	780	817	978	484	283	185	209
21	185	230	213	221	259	795	817	1180	490	273	189	200
22	189	210	209	200	238	817	884	1280	461	269	189	193
23	205	195	200	217	242	795	994	1180	434	264	185	185
24	225	200	200	213	437	839	1020	1070	424	260	185	189
25	387	210	205	177	828	847	995	1020	409	256	181	189
26	531	210	200	158	1220	824	940	1120	399	251	177	189
27	440	210	205	174	1250	832	892	1450	389	251	177	181
28	414	200	205	213	1150	930	900	1650	389	247	174	181
29	389	210	189	209	---	1180	854	1690	424	242	174	185
30	369	200	193	217	---	1420	803	1620	394	238	177	189
31	370	---	181	225	---	1600	---	1530	---	238	213	---
TOTAL	7558	10724	6330	6137	10215	33043	31032	33661	20044	9375	6142	5721
MEAN	244	357	204	198	365	1066	1034	1086	668	302	198	191
MAX	531	654	238	225	1250	1600	1530	1690	1420	374	234	221
MIN	185	195	175	158	186	780	803	744	389	238	174	177
CFSM	.38	.56	.32	.31	.57	1.66	1.61	1.69	1.04	.47	.31	.30
IN.	.44	.62	.37	.36	.59	1.91	1.80	1.95	1.16	.54	.36	.33
AC-FT												

PEND OREILLE RIVER BASIN

12390700 PROSPECT CREEK AT THOMPSON FALLS, MT

LOCATION.--Lat 47°35'10", long 115°21'15", in lot 12, SE¼SE¼SE¼ 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 mi².

PERIOD OF RECORD.--April 1956 to current year.

GAGE.--Water-stage recorder. Datum of gage is 2,382.40 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Nov. 22 to Dec. 4. Records good. No known regulation or diversions upstream from station. Several observations of water temperature and specific conductance were made during the year and are published as miscellaneous water-quality data in the back of this report.

AVERAGE DISCHARGE.--30 years, 252 ft³/s, 18.80 in/yr, 182,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,490 ft³/s Jan. 16, 1974, gage height, 9.86 ft; minimum, 26 ft³/s Nov. 30, 1979, Feb. 3, 1985; minimum gage height, 0.19 ft Nov. 30, 1979.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,310 ft³/s Feb. 26, gage height, 4.85 ft; minimum, 47 ft³/s Sept. 28-30, gage height, 0.45 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	57	143	106	78	80	798	951	379	692	123	78	60		
2	57	266	104	77	83	789	819	366	625	122	77	57		
3	57	429	106	77	88	802	726	406	556	119	75	53		
4	56	536	109	76	89	761	662	466	508	121	74	51		
5	56	532	107	75	90	745	614	504	478	119	72	51		
6	59	480	105	75	89	729	579	504	434	115	71	51		
7	62	437	104	74	88	788	562	488	377	110	71	51		
8	58	393	104	72	87	1050	565	488	343	109	69	53		
9	56	346	102	73	87	1060	613	504	319	108	68	51		
10	56	309	98	72	89	911	667	519	293	108	68	51		
11	56	277	95	72	88	811	664	504	273	112	66	51		
12	56	243	98	71	91	726	646	479	254	108	66	51		
13	56	222	98	69	93	654	597	500	237	107	65	51		
14	56	205	96	69	97	607	549	500	228	103	64	51		
15	56	190	95	69	99	569	507	479	226	102	63	51		
16	56	185	93	70	102	532	484	458	208	103	63	51		
17	55	175	92	70	138	500	455	446	196	103	62	49		
18	55	163	91	70	128	464	429	452	189	100	62	64		
19	54	151	90	71	123	434	406	512	183	98	61	52		
20	54	146	88	72	119	420	390	652	177	95	61	50		
21	55	140	87	72	123	426	395	732	170	93	61	49		
22	56	135	86	72	123	443	463	698	162	92	60	48		
23	61	125	84	74	125	443	564	636	152	91	59	48		
24	64	120	83	74	313	476	572	563	146	89	58	48		
25	73	118	82	73	894	485	542	559	142	88	56	48		
26	63	116	81	71	1260	479	497	649	139	87	56	48		
27	60	114	80	72	1110	479	470	804	136	86	55	48		
28	64	112	79	72	889	535	476	886	133	82	54	48		
29	96	110	78	72	---	696	432	874	132	82	55	48		
30	138	108	78	74	---	897	404	835	129	81	56	47		
31	139	---	76	75	---	1070	---	754	---	79	61	---		
TOTAL	1997	7026	2875	2253	6805	20579	16700	17596	8237	3135	1987	1530		
MEAN	64.4	234	92.7	72.7	243	664	557	568	275	101	64.1	51.0		
MAX	139	536	109	78	1260	1070	951	886	692	123	78	64		
MIN	54	108	76	69	80	420	390	366	129	79	54	47		
CFSM	.35	1.29	.51	.40	1.34	3.65	3.06	3.12	1.51	.55	.35	.28		
IN.	.41	1.44	.59	.46	1.39	4.21	3.41	3.60	1.68	.64	.41	.31		
AC-FT	3960	13940	5700	4470	13500	40820	33120	34900	16340	6220	3940	3030		
CAL YR 1985	TOTAL	80697	MEAN	221	MAX	1200	MIN	28	CFSM	1.21	IN.	16.49	AC-FT	16010
WTR YR 1986	TOTAL	90720	MEAN	249	MAX	1260	MIN	47	CFSM	1.37	IN.	18.54	AC-FT	17990

PEND OREILLE RIVER BASIN

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12391400 CLARK FORK BELOW NOXON RAPIDS DAM, NEAR NOXON, MT

LOCATION.--Lat 47°57'40", long 115°43'58", in SW¼ 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 mile 169.7.

DRAINAGE AREA.--21,833 mi².

PERIOD OF RECORD.--May 1960 to current year.

GAGE.--Plant generator rating for discharge through powerplant. Water-stage recorder on reservoir determines head on taintor gates. Datum of gage is at National Geodetic Vertical Datum of 1929 (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 is indicated by comparison with records for adjacent gaging stations. Figures of discharge given herein are combined flows through turbines and spillway.

COOPERATION.--Records collected by The Washington Water Power Co., under general supervision of the Geological Survey, in connection with a Federal Power Commission project.

AVERAGE DISCHARGE.--26 years, 21,020 ft³/s, 15,230,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 124,900 ft³/s June 12, 1964; minimum daily, 80 ft³/s Oct. 16, 1960, Aug. 26, 1962, Aug. 18, 25, 31, Sept. 1, 1963, Sept. 11, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 78,000 ft³/s June 3; minimum daily, 2,890 ft³/s Aug. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12700	17600	9270	12400	16400	29500	36000	27300	77000	20800	7020	6360
2	16500	15000	15500	12400	9920	25200	34400	23200	76600	20100	6810	6770
3	14800	13400	11800	16700	18100	27200	31200	26500	78000	15300	6280	7430
4	16300	20800	16400	13900	17300	26500	30300	25700	75700	14200	7150	9730
5	15400	22500	13300	6770	18600	26600	17500	29600	74200	23600	7620	10500
6	14800	18900	10200	16900	16700	29000	18800	31400	71400	13000	6350	5970
7	22500	20800	15700	13600	19600	31400	21300	29000	68600	20200	6940	7220
8	17000	19000	12600	11800	17600	33800	24600	26900	63800	14700	8480	13000
9	14700	17000	21200	15300	6130	34600	20500	25600	61600	10900	5570	11700
10	14300	17300	19500	21900	13600	28600	26500	30100	57200	12600	7220	10200
11	14700	20500	18900	9750	17100	25200	29500	29400	50800	14300	7710	14100
12	18800	21000	17600	13700	15900	28300	31200	22500	44400	9610	9430	12800
13	9720	19300	17100	17700	18200	27800	30600	24600	38200	13000	9640	10900
14	16600	16100	15600	16000	14900	24600	30100	24900	36600	15700	4830	13900
15	11400	20000	8350	11900	15900	20200	27900	26700	37300	14900	4350	11900
16	14900	15900	19100	20900	12600	22800	32300	22900	38100	12100	6310	10800
17	18700	13700	19500	22200	15500	25400	27000	23300	37100	11700	5950	14200
18	14100	17700	17600	11200	17200	20300	27500	20500	30800	17600	7650	12900
19	14600	18000	15600	15300	15500	18500	24000	24400	27800	19000	6720	11500
20	13100	18000	8440	13600	14600	20600	21400	19100	27500	15100	9620	13300
21	14300	15100	12300	16700	11400	21400	28200	20000	29200	15800	11000	14700
22	16800	15300	7360	15800	16800	21600	25700	24100	23800	14900	8540	14900
23	15600	13800	15300	15800	18900	22500	31900	28500	26500	12600	8220	15400
24	13900	12500	10600	10200	16700	23100	17200	32900	25900	12700	6840	16200
25	15900	16100	4970	12400	18300	22000	23100	33400	20100	10500	9740	16200
26	17900	8880	18500	10800	32000	20500	33400	33700	14700	6150	6640	15800
27	13800	8210	21700	20400	39200	21800	26700	38600	18300	11100	14300	15300
28	17600	8550	14400	19000	36400	21500	28700	46600	19200	7420	8850	14100
29	18400	13300	5350	13300	---	22300	24700	61600	16200	8940	3770	15900
30	17900	17100	19200	12900	---	22900	24900	72200	20700	9490	2890	14100
31	19300	---	16000	14600	---	27000	---	75500	---	8210	4000	---
TOTAL	487020	491340	448940	455820	501050	772700	807100	980700	1287300	426220	226440	367780
MEAN	15710	16380	14480	14700	17890	24930	26900	31640	42910	13750	7305	12260
MAX	22500	22500	21700	22200	39200	34600	36000	75500	78000	23600	14300	16200
MIN	9720	8210	4970	6770	6130	18500	17200	19100	14700	6150	2890	5970
AC-FT	966000	974600	890500	904100	993800	1533000	1601000	1945000	2553000	845400	449100	729500
CAL YR 1985	TOTAL	6633480		MEAN	18170	MAX	54600	MIN	3540	AC-FT	13158000	
WTR YR 1986	TOTAL	7252410		MEAN	19870	MAX	78000	MIN	2890	AC-FT	14385000	

12392000 CLARK FORK AT WHITEHORSE RAPIDS, NEAR CABINET, ID

LOCATION.--Lat 48°05'18", long 116°04'16", in SW¼ sec.27, T.55 N., R.3 E., Bonner County, Hydrologic Unit 17010213, on right bank 0.8 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 149.1. Discharge computed at Whitehorse Rapids, 2.3 mi downstream.

DRAINAGE AREA.--22,073 mi², revised. (Based on area of 22,067 mi² for site 0.4 mi upstream prior to Oct. 1, 1964.)

PERIOD OF RECORD.--September 1928 to current year. Prior to October 1952, published as "near Heron, MT."

REVISED RECORDS.--WSP 1182: 1936. WSP 1736: 1931, 1936(m), 1937.

GAGE.--Water-stage recorder. Datum of gage is 2,060.00 ft above National Geodetic Vertical Datum of 1929 (levels by Washington Water Power Co). See WSP 1934 for history of changes made prior to Sept. 30, 1952. Water-stage recorder at site 0.4 mi upstream at datum 60.00 ft lower Oct. 1, 1952, to Sept. 30, 1964, and at present datum Oct. 1, 1964, to May 21, 1973.

REMARKS.--Estimated daily discharges: Apr. 10-22, July 24-28, Aug. 2-11, and Aug. 15 to Sept. 30. Records good except those for periods of estimated daily discharge, which are fair. Flow regulated by Hungry Horse Reservoir, Flathead Lake, and Noxon Rapids Reservoir. Extreme diurnal fluctuation caused by powerplant at Cabinet Gorge Dam. Diversions upstream from station for irrigation of about 354,000 acres. Discharge measurements indicate about 800 ft³/s ground-water inflow between Cabinet Gorge Dam and Whitehorse Rapids. Records given herein represent flow at Whitehorse Rapids, computed by adding 600 ft³/s to observed flows at the measuring cableway, and are considered comparable to records at former site near Heron, except for minor surface inflow from additional drainage area. To determine flow at Cabinet Gorge Dam, 800 ft³/s should be deducted from discharges published herein.

AVERAGE DISCHARGE.--58 years, 22,360 ft³/s, 16,200,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 153,000 ft³/s May 29 to June 1, 1948; maximum gage height, 50.97 ft May 31, 1948, site and datum then in use; minimum observed, 270 ft³/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 ft³/s Sept. 2, 1962.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1894 reached a discharge of 195,000 ft³/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 discharge, 88,700 ft³/s June 1, gage height, 23.03 ft; minimum recorded, 1,080 ft³/s Aug. 12, gage height, 4.25 ft, but may have been less during period of no gage-height record.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13200	20200	13800	14800	16700	33600	40000	30300	83500	23600	8260	7310
2	17200	15100	15100	12400	10800	28300	38400	25500	82800	23000	7550	7700
3	16900	16000	12800	17700	19500	30500	33900	29500	82700	17700	7990	9900
4	17500	23900	16500	15300	18700	29600	35100	29600	79400	16800	8320	9490
5	17100	25600	16300	9020	19900	30200	26400	32700	77900	25700	7840	10300
6	14100	23100	9440	16300	16400	32000	25600	34500	75800	16500	7830	6990
7	24600	22100	17300	14500	21400	34800	22700	32200	74100	21300	8820	8610
8	18100	22000	14000	12900	19800	36900	20600	30200	68000	17800	9060	16200
9	15700	17700	19400	17000	7620	38700	22000	27000	65100	13200	6640	14100
10	15200	19900	21700	21200	15300	33500	28700	35000	62200	14100	8910	9950
11	14900	22500	21800	12400	17900	28300	34600	32100	56100	16600	9540	15700
12	21000	22300	16500	14000	17400	31200	35700	27000	50200	12100	10400	12700
13	9390	19700	18100	20200	19000	31200	35700	27400	42000	13800	10100	12500
14	17000	21300	17600	15800	17400	28200	35300	29000	38800	17700	6760	15900
15	13700	19600	9990	12200	16400	23900	33400	30700	40000	18100	4720	15200
16	15000	17200	19200	21800	12100	23900	34600	25800	41200	14400	7370	13800
17	20300	14100	20000	23700	17900	27700	33400	23800	41600	12800	6670	13800
18	14600	18200	18700	12100	18000	24500	32300	23600	35100	19400	8370	14900
19	14700	19600	18200	16800	15800	20200	31500	27000	30900	21200	7570	11700
20	13900	18500	9810	15000	16600	23100	27700	23200	30700	18300	11600	14800
21	15600	17200	13200	16000	12200	25200	29500	23800	32700	17300	12900	16900
22	18900	15800	8820	17900	18300	23200	24500	26400	28000	18000	9240	17300
23	16400	14800	14000	17600	19600	23900	36800	32300	28100	15000	9480	18100
24	15500	12100	12400	11800	18700	24700	20700	35100	29700	14400	6540	18500
25	17000	16700	3900	12100	21000	24900	24200	36800	23700	12600	13000	16700
26	19400	11000	22200	10900	32700	24800	35700	38200	17200	8420	8270	16400
27	16600	9190	22600	22100	42000	23200	30500	42800	22200	12900	15200	16500
28	18700	8080	16300	20200	39800	23700	31900	53400	21200	8780	8050	16700
29	20600	16000	5760	14300	---	24000	25900	66800	17600	8490	4960	20000
30	19300	16700	18600	13200	---	24900	28500	77200	23600	9710	3680	13600
31	20000	---	17200	15600	---	29700	---	81400	---	10000	3720	---
TOTAL	522090	536170	481220	486820	538920	862500	915800	1090300	1402100	489700	259360	412250
MEAN	16840	17870	15520	15700	19250	27820	30530	35170	46740	15800	8366	13740
MAX	24600	25600	22600	23700	42000	38700	40000	81400	83500	25700	15200	20000
MIN	9390	8080	3900	9020	7620	20200	20600	23200	17200	8420	3680	6990
AC-FT	1036000	1063000	954500	965600	1069000	111000	1816000	2163000	2781000	971300	514400	817700
CAL YR 1985	TOTAL	7466890	MEAN	20460	MAX	60100	MIN	3900	AC-FT	14811000		
WTR YR 1986	TOTAL	7997230	MEAN	21910	MAX	83500	MIN	3680	AC-FT	15863000		

Smaller reservoirs in Pend Oreille River basin in Montana

12325000 GEORGETOWN LAKE.--Lat 46°12'55", long 113°16'40", in SW¼ sec.6, T.5 N., R.13 W., Granite County, Hydrologic Unit 17010202, at dam on Flint Creek, 2 mi west of Southern Cross, 8 mi south of Philipsburg, and at mile 38.8. DRAINAGE AREA, 50.1 mi². PERIOD OF RECORD, October 1939 to current year. May to July 1948 daily elevations and contents, published in WSP 1080. Records of daily elevations since October 1940 are in files of Helena district office. Nonrecording gage read daily. Datum of gage is at National Geodetic Vertical Datum of 1929 (levels by The Montana Power Co.).

Reservoir is formed by masonry and concrete dam. Storage began about 1905 to store water for pumpage into Warm Springs Creek for use of reduction works of Anaconda Copper Mining Co. at Anaconda, or for release through Flint Creek for irrigation, power development, and recreation. Usable capacity, 31,040 acre-ft between elevation 6,398.00 ft, bottom of outlet pipes, and 6,429.50 ft, maximum design level. Figures given herein represent usable contents. Records furnished by The Montana Power Co. REVISED RECORDS, WSP 1316: Drainage area.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 31,700 acre-ft July 8, 9, 1980, elevation, 6,429.72 ft; minimum observed, 15,990 acre-ft Apr. 28, 29, 1957, elevation, 6,424.15 ft.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 31,040 acre-ft July 6-12, 17, elevation, 6,429.50 ft; minimum observed, 22,830 acre-ft Oct. 6, elevation, 6,426.65 ft.

12332500 EAST FORK ROCK CREEK RESERVOIR.--Lat 46°07'54", long 113°22'48", in NE¼ sec.6, T.4 N., R.14 W., Granite County, Hydrologic Unit 17010202, at dam on East Fork Rock Creek, 14 mi southwest of Philipsburg, and at mile 9.7. DRAINAGE AREA, 30.3 mi². PERIOD OF RECORD, October 1939 to current year (seasonal records only for most years 1946-60, 1964, 1968). Records for October 1955 to April 1956, published in WSP 1446, have been found to be in error and should not be used. May to August 1948 scattered daily contents, published in WSP 1080. Elevations determined by hand levels from reference points at indefinite intervals. Datum of gage is at National Geodetic Vertical Datum of 1929 (levels by Montana Department of Natural Resources and Conservation).

Reservoir is formed by earthfill dam with concrete spillway completed in 1937; storage began in 1936. Usable capacity, 16,040 acre-ft between elevation 5,990.0 ft, bottom of outlet, and 6,055.5 ft, spillway crest. Dead storage unknown. Figures given herein represent usable contents. Water is used for irrigation and recreation. Records furnished by Montana Department of Natural Resources and Conservation. REVISED RECORDS, WSP 1316: Drainage area.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, in excess of 16,000 acre-ft when reservoir was full and spilling at times in several years; no storage at times in 1955, 1961, 1966, 1973, 1977, and 1978.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 13,770 acre-ft June 12, elevation, 6,049.6 ft; minimum, 1,450 acre-feet Sept. 30 (interpolated).

12336500 NEVADA LAKE.--Lat 46°48'06", long 112°48'42", in NE¼ sec.14, T.12 N., R.10 W., Powell County, Hydrologic Unit 17010203, at dam on Nevada Creek, 7 mi west of Finn. DRAINAGE AREA, 145 mi². PERIOD OF RECORD, October 1939 to current year (incomplete 1948, 1950-58, 1961-62, 1965-66, 1969-70). Nonrecording gage usually read at or near end of month. Prior to October 1976, published as Nevada Creek Reservoir near Finn. Prior to 1961, elevations determined by hand level from spillway. Datum of gage is at National Geodetic Vertical Datum of 1929 (levels by Montana Department of Natural Resources and Conservation).

Reservoir is formed by earthfill dam with concrete spillway completed in 1938. Usable capacity, 12,640 acre-ft between elevation, 4,551.5 ft, bottom of outlet, and 4,616.0 ft, spillway crest. Dead storage, 12 acre-ft below elevation, 4,551.5 ft. Figures given herein represent usable contents. Water is used for irrigation and recreation. Records furnished by Montana Department of Natural Resources and Conservation.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 13,520 acre-ft June 3, 1953, elevation, 4,618.3 ft; no storage Aug. 14 to Oct. 31, 1973, Sept. 18, 1977.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 12,790 acre-ft May 15, elevation, 4,617.1 ft; minimum contents, 2,330 acre-ft Oct. 1, elevation, 4,579.8 ft.

12342000 PAINTED ROCKS LAKE.--Lat 45°43'06", long 114°16'45", in NE¼SE¼ sec.26, T.1 S., R.22 W., Ravalli County, Hydrologic Unit 17010205, at dam on West Fork Bitterroot River, 7 mi upstream from Nez Perce Creek, 16.5 mi southwest of Conner, 23 mi south of Darby, and at mile 19.8. DRAINAGE AREA, 317 mi². PERIOD OF RECORD, June 1940 to current year (incomplete 1956-58, 1960-61). Prior to December 1958, figures of contents may be total or usable. Records for August 1954, published only in WSP 1736. May to September 1948 scattered daily contents, published in WSP 1080. Prior to October 1959, published as West Fork Bitterroot River Reservoir near Conner. Elevations determined at or near end of month by hand levels from spillway or from staff gage on right wingwall above spillway. Prior to 1959, elevations determined by measuring from floor of control tower. Datum of gage is at National Geodetic Vertical Datum of 1929.

Reservoir is formed by earthfill dam with concrete spillway completed in 1940. Usable capacity, 31,700 acre-ft between elevation 4,625.5 ft, bottom of outlet, and 4,725.5 ft, spillway crest. Dead storage, 656 acre-ft below elevation 4,625.5 ft. Figures given herein represent usable contents. Water is used for irrigation and recreation. Records furnished by Montana Department of Natural Resources and Conservation prior to December 1958; most monthly readings made by Geological Survey personnel thereafter. REVISED RECORDS, WSP 1316: Drainage area.

EXTREMES OF PERIOD OF RECORD: Maximum contents observed, 33,930 acre-ft June 18, 1974, elevation, 4,728.7 ft; no storage October 1940 to January 1941, March 1942, March, April 1954, Apr. 25, 1973, winter of 1973-74, 1974-75, November, December 1976, January through March 1982, November 1985 through February 1986.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 33,090 acre-ft May 30, elevation, 4,727.5 ft; no storage during winter months.

12344500 LAKE COMO.--Lat 46°03'40", long 114°14'00", in NE¼NW¼ sec.32, T.4 N., R.21 W., Ravalli County, Hydrologic Unit 17010205, at dam on Rock Creek, 4 mi northwest of Darby, and at mile 3.6. DRAINAGE AREA, 54.6 mi². PERIOD OF RECORD, October 1939 to current year. April to August 1948 scattered daily gage height and contents, published in WSP 1080. Prior to October 1967, published as Como Lake. Nonrecording gage read at or near end of month in winter and more often during irrigation season but only monthend figures supplied. Datum of gage is at National Geodetic Vertical Datum of 1929.

Reservoir is formed by earthfill dam with concrete spillway completed in 1909. Usable capacity, 34,920 acre-ft between elevation 4,188.0 ft, bottom of outlet, and 4,242.5 ft, spillway crest. Dead storage unknown below elevation, 4,188.0 ft, elevation of natural lake outlet. Figures given herein represent usable contents. Water is used for irrigation and recreation. Records furnished by Bitterroot Irrigation District. REVISED RECORDS, WSP 1316: Drainage area.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 36,920 acre-ft June 30, 1957, June 30, 1960, July 1, 1963, June 1, 1964, elevation, 4,244 ft; no storage at times in several years.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 34,410 acre-ft May 31, elevation, 4,243.0 ft; minimum contents observed, 1,000 acre-ft Aug. 31, elevation 4,193.0 ft.

Smaller reservoirs in Pend Oreille River basin in Montana--Continued

CAMAS RESERVOIRS.--A group of four reservoirs in the Little Bitterroot River basin operated for irrigation and recreation. Nonrecording gages are set to approximate National Geodetic Vertical Datum of 1929 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°14'51", in SE $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$ 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 mile 70.3. DRAINAGE AREA, 31.8 mi². 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, 26,800 acre-ft May 31, 1959, elevation, 3,906.60 ft; no storage at times in 1939-46.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 18,400 acre-ft May 31, elevation, 3,904.38 ft; minimum observed, 10,400 acre-ft Dec. 31, Jan. 31, elevation, 3,901.98 ft.

12372500 HUBBART RESERVOIR.--Lat 47°55'43", long 114°43'53", in SE $\frac{1}{4}$ NE $\frac{1}{4}$ 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 mile 55.8. DRAINAGE AREA, 114 mi². 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.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 12,120 acre-ft Apr. 30, May 31, elevation, 3,219.0 ft; minimum observed, 3,410 acre-ft Sept. 30, elevation, 3,193.2 ft.

12375000 UPPER DRY FORK RESERVOIR.--Lat 47°44'55", long 114°40'53", in SE $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$ 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 mi². 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 $\frac{1}{4}$ 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, 2,940 acre-ft Apr. 30, May 31, elevation, 2,928.9 ft; minimum observed, 837 acre-ft Oct. 31, elevation, 2,919.2 ft.

12375500 DRY FORK RESERVOIR.--Lat 47°42'00", long 114°40'02", in SW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec.3, T.22 N., R.24 W., Sanders County, Hydrologic Unit 17010202, at dam on Dry Fork Creek, 1 mi west of Lonepine. DRAINAGE AREA, 17.8 mi². 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, 3,860 acre-ft between elevation 2,830.5 ft and 2,856.3 ft. No dead storage. Prior to 1960, usable capacity, 4,000 acre-ft.

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, 3,890 acre-ft Mar. 31, elevation, 2,856.4 ft; minimum observed, 908 acre-ft Aug. 31, elevation, 2,844.4 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 National Geodetic Vertical Datum of 1929, 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", in SW $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ 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, 899 acre-ft June 30, 1956, June 30, 1964, elevation, 3,090.5 ft; no storage at times in July 1941, August, September 1944, October 1957, July, August September 1977.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 721 acre-ft May 31, elevation, 3,087.6 ft; minimum observed, 105 acre-ft Oct. 31, elevation, 3,068.6 ft.

12376700 LOWER CROW RESERVOIR.--Lat 47°30'09", long 114°13'35", in SW $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.11, T.20 N., R.21 W., at outlet works on Crow Creek, 5.2 mi northwest of Charlo, at 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, 8,370 acre-ft May 31, elevation, 2,870.8 ft; minimum observed, 2,420 acre-ft Dec. 31, elevation 2,842.0 ft.

12377200 MISSION RESERVOIR.--Lat 47°18'54", long 114°01'15", in NW $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.15, T.18 N., R.19 W., at outlet works on Mission Creek, 4 mi east of St. Ignatius and at mile 16.7; storage began in 1935. Usable capacity 7,250 acre-ft between elevation 3,340.7 ft and 3,406.0 ft.

EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 8,370 acre-ft June 30, 1970, June 30, 1976, elevation, 3,409.8 ft; no storage at times during September 1949, February, March, 1964.

EXTREMES FOR CURRENT YEAR: Maximum contents observed, 7,840 acre-ft June 30, elevation, 3,408.0 ft; minimum observed, 374 acre-ft Sept. 30, elevation, 3,371.5 ft.

Smaller reservoirs in Pend Oreille River Basin in Montana--Continued

MISSION VALLEY RESERVOIRS--Continued

- 12377300 ST. MARYS LAKE.--Lat 47°15'58", long 113°56'08", in SW¼NE¼NE¼ 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, 23,300 acre-ft between elevation 3,911.5 ft and 4,025.0 ft, not including contents of natural lake. 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.
EXTREMES FOR CURRENT YEAR: Maximum contents observed, 22,460 acre-ft June 30, elevation, 4,022.0 ft; minimum observed, 228 acre-ft on many days, elevation, 3,913.0 ft.
- 12377900 PABLO RESERVOIR.--Lat 47°38'25", long 114°08'33", in SW¼SW¼NE¼ 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 supplied by Flathead pumping plant; storage began in 1914. Usable capacity, 27,100 acre-ft between elevation 3,179 ft, gate sill, and 3,210.2 ft. No dead storage.
EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 28,120 acre-ft June 30, 1968, elevation, 3,210.77 ft; no storage at times in several years.
EXTREMES FOR CURRENT YEAR: Maximum contents observed, 27,270 acre-ft May 31, elevation, 3,210.4 ft; minimum observed, 4,080 acre-ft Aug. 31, elevation, 3,192.7 ft.
- 12378200 McDONALD RESERVOIR.--Lat 47°25'31", long 113°59'27", in SE¼NE¼NE¼ sec.10, T.19 N., R.19 W., at outlet works on Post Creek, 9 mi east of Charlo, and at mile 12.4; storage began in 1919. Usable capacity, 8,220 acre-ft between elevation 3,545.0 ft, and 3,598.0 ft, not including contents of natural lake. 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.
EXTREMES FOR CURRENT YEAR: Maximum contents observed, 8,020 acre-ft June 30, elevation, 3,597.0 ft; minimum observed, 628 acre-ft Aug. 31, elevation, 3,551.2 ft.
- 12379700 KICKING HORSE RESERVOIR.--Lat 47°27'25", long 114°04'35", in SE¼NE¼NE¼ 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, 8,350 acre-ft between elevation 3,042.0 ft and 3,061.94 ft. Dead storage, 70 acre-ft below elevation 3,042.0 ft.
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, 8,640 acre-ft May 31, elevation, 3,062.3 ft; minimum observed, 2,280 acre-ft Aug. 31, elevation, 3,052.0 ft.
- 12380000 NINEPIPE RESERVOIR.--Lat 47°27'20", long 114°08'08", in NE¼NW¼NW¼ 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, 14,870 acre-ft between elevation 2,895.4 ft and 3,010.0 ft. No dead storage.
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, 14,080 acre-ft May 31, elevation, 3,009.5 ft; minimum observed, 2,660 acre-ft Aug. 31, elevation, 2,999.3 ft.
- 12380500 LOWER JOCKO LAKE.--Lat 47°12'10", long 113°45'35", in NW¼SW¼NW¼ 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 mile 39.3. DRAINAGE AREA, 7.39 mi². 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. Datum of gage is at National Geodetic Vertical Datum of 1929 (levels by Bureau of Indian Affairs).
Reservoir is formed by earthfill dam; storage began in 1937. Usable capacity, 5,380 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. 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 SW¼ 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.
EXTREMES FOR CURRENT YEAR: Maximum contents observed, 4,030 acre-ft June 30, elevation, 4,318.0 ft; no storage Sept. 30.
- 12390000 THOMPSON FALLS RESERVOIR.--Lat 47°35'42", long 115°21'36", in NE¼ sec.7, T.21 N., R.29 W., Sanders County, Hydrologic Unit 17010213, at dam on Clark Fork at Thompson Falls, at mile 208.0. DRAINAGE AREA, 20,968 mi². PERIOD OF RECORD, October 1939 to current year. Nonrecording gage is read several times daily but only monthend figures supplied. Datum of gage is at National Geodetic Vertical Datum of 1929 (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 The Montana Power Company.
EXTREMES FOR PERIOD OF RECORD: Maximum contents observed, 16,060 acre-ft Nov. 30, 1949, elevation, 2,396.7 ft; no storage July 31, 1958.
EXTREMES FOR CURRENT YEAR: Maximum contents observed, 15,730 acre-ft Oct. 31, Mar. 31, Sept. 30, elevation, 2,396.5 ft; minimum observed, 14,100 acre-ft July 31, elevation, 2,395.40 ft.

Smaller reservoirs in Pend Oreille River basin in Montana--Continued

12391300 NOXON RAPIDS RESERVOIR.--Lat 47°57'38", long 115°44'00", in NE¼SW¼SW¼ 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 mile 169.7. DRAINAGE AREA, 21,833 mi². 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. Datum of gage is at National Geodetic Vertical Datum of 1929 (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 Washington Water Power Company.

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, 333,700 acre-ft June 2, elevation, 2,330.89 ft; minimum, 267,800 acre-ft Apr. 4, elevation, 2,322.12 ft.

Monthend contents, in acre-feet, water year October 1985 to September 1986

Date	Georgetown Lake	East Fork Rock Creek Reservoir	Nevada Lake	Painted Rocks Lake	Lake Como	Camas Reservoir	Mission Valley Reservoirs
Sept. 30	23,080	--	b 2,330	c 6,150	3,880	16,660	32,120
Oct. 31	23,110	--	b 3,770	a 3,080	5,560	17,710	35,880
Nov. 30	23,470	--	b 4,820	0	6,690	18,980	37,510
Dec. 31	23,770	--	b 5,220	0	11,800	18,330	37,570
Jan. 31	24,220	--	b 5,220	0	12,710	18,390	38,960
Feb. 28	24,910	--	b 9,570	0	16,070	20,530	44,270
Mar. 31	25,380	--	b11,210	6,960	22,970	31,310	50,320
Apr. 30	27,080	b 7,590	b12,450	b23,020	28,380	36,020	61,500
May 31	29,080	a12,000	a12,490	a32,910	35,410	37,320	94,950
June 30	30,890	a11,880	9,570	a27,380	33,140	35,020	86,880
July 31	30,800	a 7,950	10,240	a21,670	18,370	28,900	65,660
Aug. 31	30,390	a 4,000	b 6,900	c11,000	1,000	22,720	17,950
Sept. 30	30,480	b 1,360	a 4,920	c 8,000	2,360	20,830	23,280

Date	Lower Jocko Lake	Thompson Falls Reservoir	Noxon Rapids Reservoir
Sept. 30	0	14,970	317,600
Oct. 31	730	15,730	313,500
Nov. 30	730	15,120	316,600
Dec. 31	730	15,580	300,900
Jan. 31	730	15,580	315,100
Feb. 28	730	15,580	322,800
Mar. 31	730	15,730	304,400
Apr. 30	1,970	15,580	328,500
May 31	3,600	15,280	333,100
June 30	4,030	15,580	324,400
July 31	1,560	14,100	321,300
Aug. 31	72	14,680	327,100
Sept. 30	0	15,730	324,400

a Interpolated.

b Figure of contents for first day of following month.

c Estimate.

As the number of streams on which streamflow information is likely to be desired far exceeds the number of stream-gaging stations feasible to operate at one time, the Geological Survey collects limited streamflow data at sites other than stream-gaging stations. When limited streamflow data are collected on a systematic basis over a period of years for use in hydrologic analyses, the site at which the data are collected is called a partial-record station. Data collected at these partial-record stations are usable in low-flow or floodflow analyses, depending on the type of data collected. In addition, discharge measurements are made at other sites not included in the partial-record program. These measurements are generally made in times of drought or flood to give better areal coverage to those events. Those measurements and others collected for some special reason are called measurements at miscellaneous sites.

Records collected at partial-record stations are presented in a table of annual maximum stage and discharge at crest-stage stations. Discharge measurements made at miscellaneous sites for both low flow and high flow are given in a second table.

Crest-stage Partial-record Stations

The following table contains annual maximum discharge for crest-stage stations. A crest-stage gage is a device which will register the peak stage occurring between inspections of the gage. A stage-discharge relation for each gage is developed from discharge measurements made by indirect measurements of peak flow or by current meter. The date of the maximum discharge is not always certain, but it is usually determined by comparison with nearby continuous-record stations, weather records, or local inquiry. Only the maximum discharge for each water year is given. Information on some lower floods may have been obtained, but is not published herein. The years given in the period of record represent water years for which the annual maximum has been determined.

Annual maximum discharge at crest-stage partial-record stations

Station No.	Station name	Location	Drainage area (mi ²)	Period of record	Date	Annual maximum Gage height (ft)	Discharge (ft ³ /s)
KOOTENAI RIVER BASIN							
12300800	Deep Creek near Fortine	Lat 48°45'41", long 114°52'32", in SW¼ sec.30, T.35 N., R.25 W., Lincoln County, Hydrologic Unit 17010101, at culvert in county road, 1.2 mi east of Fortine.	18.9	1959-86	5-29-86	0.54	130
12301997	Richards Creek near Libby	Lat 48°15'31", long 115°11'57", in SE¼NW¼SE¼ sec.20, T.29 N., R.28 W., Lincoln County, Hydrologic Unit 17010102, at bridge on county road, 0.1 mi upstream from mouth, 18.5 mi southeast of Libby.	9.50	1973-86	3-31-86	.95	35
12302400	Shaughnessy Creek near Libby	Lat 48°18'11", long 115°35'37", in W½ sec.5, T.29 N., R.31 W., Lincoln County, Hydrologic Unit 17010101, at culvert in county road, 6.5 mi southwest of Libby.	1.16	1959-86	3-30-86	2.05	11
12303400	Ross Creek near Troy	Lat 48°12'26", long 115°52'08", in SE¼NE¼ sec.8, T.28 N., R.33 W., Lincoln County, Hydrologic Unit 17010101, at bridge on Forest Service road, 11.3 mi north of Heron, 17.5 mi south of Troy at site of former water-quality station.	23.8	1972-86	5-28-86	4.15	580
12303440	Camp Creek near Troy	Lat 48°18'46", long 115°50'35", in SW¼SE¼ sec.32, T.30 N., R.33 W., Lincoln County, Hydrologic Unit 17010101, at bridge on Forest Service road, 0.8 mi east of Highway 202, 12.6 mi south of Troy.	11.3	1972-86	5-29-86	1.92	265
12304300	Cyclone Creek near Yaak	Lat 48°45'01", long 115°54'06", SE¼ sec.32, T.35 N., R.33 W., Lincoln County, Hydrologic Unit 17010103, at bridge, 0.2 mi upstream from mouth, 10.5 mi southwest of Yaak.	5.71	1960-86	3-30-86	1.05	130

See footnotes at end of table.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Annual maximum discharge at crest-stage partial-record stations--Continued

Station No.	Station name	Location	Drainage area (mi ²)	Period of record	Date	Annual Gage height (ft)	maximum Dis- charge (ft ³ /s)
PEND OREILLE RIVER BASIN							
12323220	Basin Creek near Butte	Lat 45°55'09", long 112°30'26", in NW¼SW¼SW¼ sec.17, T.2 N., R.7 W., Silver Bow County, Hydrologic Unit 17010201, on left bank, at bridge on county road, 0.3 mi downstream of Little Basin Creek, and 4.7 mi south of Butte.	37.6	1985-86	2-25-86 a	4.10	b 15
12323300	Smith Gulch near Silver Bow	Lat 45°57'26", long 112°39'45", in N½ sec.1, T.2 N., R.9 W., Silver Bow County, Hydrologic Unit 17010201, at culvert in Interstate Highway 15 and U.S. Highway 91, 4 mi south of Silver Bow.	4.36	1959-86	2-24-86	5.20	92
12324250	Cottonwood Creek at Deer Lodge	Lat 46°23'59", long 112°43'02", in NE¼SW¼ sec.33, T.8 N., R.9 W., Powell County, Hydrologic Unit 17010201, at culverts in county road and U.S. Highway 10 in Deer Lodge.	45.4	1975-86	5-29-86	2.61	230
12324700	Clark Fork tributary near Drummond	Lat 46°36'58", long 113°02'08", in SW¼ sec.18, T.10 N., R.11 W., Powell County, Hydrologic Unit 17010201, 0.5 mi upstream from Interstate Highway 90 and U.S. Highway 10, 6.5 mi east of Drummond.	4.61	1958-86	2-24-86	3.04	280
12331700	Edwards Gulch at Drummond	Lat 46°40'16", long 113°08'39", in NE¼NE¼ sec.31, T.11 N., R.12 W., Granite County, Hydrologic Unit 17010201, at culvert on down- stream side of Interstate Highway 90 and U.S. Highway 10 at Drummond.	4.69	1960-62 1974-86	2-24-86 a	4.73	b 92
12338550	Dunham Creek near Ovando	Lat 47°07'24", long 113°09'50", in SW¼SE¼ sec.19, T.16 N., R.12 W., Powell County, Hydro- logic Unit 17010203, at bridge on Forest Service road 1 mi west of Monture Creek, 2.2 mi north of Forest Service boundary, and 7.3 mi north of Ovando.	31.7	1977-86	6-05-86	1.69	600
12338600	Monture Creek at Forest Service boundary, near Ovando	Lat 47°05'37", long 113°09'10", in SW¼SW¼ sec.32, T.16 N., R.12 W., Powell County, Hydrologic Unit 17010203, 800 ft upstream from Forest Service boundary, 5.2 mi north of Ovando.	105	1964 1974-86	6-05-86	--	c 1,590
12339300	Deer Creek near Seeley Lake	Lat 47°12'37", long 113°32'27", in SE¼SW¼ sec.20, T.17 N., R.15 W., Missoula County, Hydro- logic Unit 17010203, at bridge on county road, 3.5 mi north- west of Seeley Lake.	19.8	1974-86	4-01-86	2.20	230
12339900	West Twin Creek near Bonner	Lat 46°54'44", long 113°42'50", in SW¼ sec.2, T.13 N., R.17 W., Missoula County, Hydrologic Unit 17010203, at bridge on State Highway 200, 8 mi east of Bonner.	7.33	1959-86	2-26-86	2.40	330

See footnotes at end of table.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

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Annual maximum discharge at crest-stage partial-record stations--Continued

Station No.	Station name	Location	Drainage area (mi ²)	Period of record	Date	Annual Gage height (ft)	maximum Dis- charge (ft ³ /s)
PEND OREILLE RIVER BASIN--Continued							
12342950	Trapper Creek near Conner	Lat 45°53'43", long 114°10'51", in SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.27, T.2 N., R.21 W., Ravalli County, Hydro- logic Unit 17010205, at bridge on State Highway 473, 0.6 mi southwest of Trapper Creek Job Corps Center, 3.0 mi southwest of junction of State Highway 473 and turnoff to Conner, and 4.5 mi southwest of Conner.	28.5	1974-86	5-31-86	2.42	630
12345850	Sleeping Child Creek near Hamilton	Lat 46°07'58", long 114°03'26", in SE $\frac{1}{4}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec.2, T.4 N., R.20 W., Ravalli County, Hydro- logic Unit 17010205, Bitterroot National Forest, on right bank 5.8 mi upstream from mouth, and 10.8 mi southeast of Hamilton.	65.2	1958-59 †1973-77 1978-86	5-28-86	4.11	490
12353400	Negro Gulch near Alberton	Lat 47°01'22", long 114°31'22", in NW $\frac{1}{4}$ sec.33, T.15 N., R.23 W., Mineral County, at culvert on county road, 2.6 mi west of Alberton.	8.02	1959-73 1985-86	2-26-86	.99	72
12355350	Big Creek at Big Creek ranger station, near Columbia Falls	Lat 48°35'07", long 114°09'55", in SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.22, T.33 N., R.20 W., Flathead County, Hydrologic Unit 17010206, Flathead National Forest, on right bank at Big Creek Ranger Station, 300 ft upstream from North Fork road bridge, 0.4 mi upstream from mouth, 16.0 mi north of Columbia Falls.	82.1	1964 1973-86	5-29-86	4.83	1,050
12356500	Bear Creek near Essex	Lat 48°16'56", long 113°25'23", in SE $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec.16, T.29 N., R.14 W., Flathead County, Hydro- logic Unit 17010207, on left bank, 1.1 mi upstream from U.S. Highway 2 bridge crossing Bear Creek, 8.5 mi northeast of Essex, at site of former gaging station.	20.4	†1946-52 1964 1975-86	5-30-86	3.41	190
12369250	Holland Creek near Condon	Lat 47°26'20", long 113°40'11", in NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec.5, T.19 N., R.16 W., Missoula County, Hydro- logic Unit 17010211, at bridge on State Highway 209, at junction with road to Holland Lake, 6.8 mi south of Condon.	22.3	1974-86	5-31-86	2.88	315
12369650	North Fork Lost Creek near Swan Lake	Lat 47°53'06", long 113°47'53", in NE $\frac{1}{4}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.31, T.25 N., R.17 W., Lake County, Hydrologic Unit 17010211, Flathead National Forest, at U.S. Forest Service bridge on North Fork Lost Creek road 1.5 mi upstream of Lost Creek and 4 mi southwest of Swan Lake.	13.0	1982-86	5-28-86	3.62	245
12370500	Dayton Creek near Proctor	Lat 47°54'59", long 114°20'14", in NW $\frac{1}{4}$ sec.20, T.25 N., R.21 W., Lake County, Hydrologic Unit 17010208, at culvert in county road, 2.5 mi northwest of Proctor.	18.5	1959-86	3-09-86	1.36	33
12391200	Canyon Creek near Trout Creek	Lat 47°51'16", long 115°29'57", in SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec.7, T.24 N., R.30 W., Sanders County, Hydrologic Unit 17010213, at bridge on U.S. Forest Service road, 2.9 mi upstream from junction of road at mouth of Vermillion River, 4.6 mi northeast of Trout Creek.	8.64	1972 1974-86	2-26-86	1.91	82

† Operated as a continuous-record station.
a Backwater.
b Estimate.
c Combination of flows in Dunham and Monture Creeks.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Measurements at Miscellaneous Sites

Measurements of streamflow at points other than gaging stations are given in the following table.

Discharge measurements made at miscellaneous sites during water year 1986

Stream	Tributary to	Location	Drainage area (mi ²)	Measured previously (water years)	Measurements Date	Discharge (ft ³ /s)
PEND OREILLE RIVER BASIN						
Clark Fork at Warm Springs 4611171124612	Lake Pend Oreille	Lat 46°11'17", long 112°46'12", in SW1/4NE1/4 sec.18, T.5 N., R.9 W., Deer Lodge County, Hydrologic Unit 17010201, 400 ft downstream from county road bridge, 1,000 ft downstream from Warm Springs Creek, and 1 mi northeast of Warm Springs.		1970 1972 1985	08-20-86	26.6
Clark Fork near Galen 12323800	Lake Pend Oreille	Lat 46°12'30", long 112°45'56", in NE1/4NE1/4NE1/4 sec.7, T.5 N., R.9 W., Deer Lodge County, Hydrologic Unit 17010201, on upstream side county bridge, 1.6 mi downstream of Warm Springs Creek, 1.9 mi southeast of Galen, and at mi 481.9.	793	1971-74 1985	08-20-86	15.8
Clark Fork near Racetrack 4615591124433	Lake Pend Oreille	Lat 46°15'59", long 112°44'33", on line between sections 20, 21, T.6 N., R.9 W., Deer Lodge County, Hydrologic Unit 17010201, 200 ft above county road bridge, 1.5 mi upstream from Racetrack Creek, and 2.5 mi northeast of Galen.		1961 1985	08-20-86	5.21
Clark Fork ab Caribou Creek, near Dempsey 4619011124405	Lake Pend Oreille	Lat 46°19'01", long 112°44'05", in NE1/4SW1/4 sec. 33, T.7 N., R.9 W., Powell County, Hydrologic Unit 17010201, 10 ft downstream from county road bridge, 75 ft downstream from irrigation dam across river, and 2.7 mi north of Dempsey.		1985	08-20-86	2.71
Clark Fork at Kohrs fishing access, near Garrison 4629331124342	Lake Pend Oreille	Lat 46°29'33", long 112°43'42", in SW1/4WNE1/4 sec. 33, T.9 N., R.9 W., Deer Lodge County, Hydrologic Unit 17010201, 100 ft downstream from parking area in State of Montana Kohrs fishing access area and 4.5 mi southeast of Garrison.		1985	08-20-86	55.9
Clark Fork at Garrison 12324600	Lake Pend Oreille	Lat 46°31'11", long 112°48'27", near center of east line of sec. 23, T.9 N., R.10 W., Powell County, Hydrologic Unit 17010201, at county bridge at Garrison, 1 mi downstream from Little Blackfoot River, and at mile 444.5.	1,550	1969-72 1975 1985	08-20-86	87.1
Flint Creek near Drummond 12331500	Clark Fork	Lat 46°37'44", long 113°09'01", in NW1/4NE1/4 sec. 18, T.10 N., R.12 W., Granite County, Hydrologic Unit 17010202, at county highway bridge, 1.7 mi upstream from Clark Fork (River) and 2.5 mi south of Drummond.	490	1948-49 1972-73 1985	02-25-86 04-15-86 05-28-86	892 214 386
Clark Fork at Drummond 12331600	Lake Pend Oreille	Lat 46°39'45", long 113°08'57", in SE1/4NW1/4SE1/4 sec. 31, T.11 N., R.12 W., Granite County, Hydrologic Unit 17010201, at bridge on old U.S. Highway 10A, 0.4 mi southwest of Drummond, 0.9 mi downstream from Flint Creek, and at mile 417.0.	2,378	1967-68 1970-83 1985	08-20-86	127

SUPPLEMENTAL WATER-QUALITY DATA FOR GAGING STATIONS AND MISCELLANEOUS SITES

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DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	SPE- CIFIC CON- DUC- TANCE (US/CM) (00095)	TEMPER- ATURE, AIR (DEG C) (00020)	TEMPER- ATURE (DEG C) (00010)	DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	SPE- CIFIC CON- DUC- TANCE (US/CM) (00095)	TEMPER- ATURE, AIR (DEG C) (00020)	TEMPER- ATURE (DEG C) (00010)
12301300 TOBACCO RIVER NEAR EUREKA, MT. (LAT 48 53 37 LONG 115 05 13)											
DEC , 1985						APR , 1986					
05...	1045	143	285	-6.0	.5	21...	1200	367	243	19.0	7.5
JAN , 1986						MAY					
23...	1345	118	280	3.0	.5	22...	1355	760	200	9.0	7.0
MAR						JUL					
11...	0815	491	212	6.0	2.0	21...	1200	187	257	19.0	14.5
12302055 FISHER RIVER NEAR LIBBY, MT. (LAT 48 21 20 LONG 115 18 50)											
OCT , 1985						MAR , 1986					
03...	1530	135	204	11.0	10.5	17...	1430	1490	130	10.0	5.0
NOV						JUL					
14...	1230	415	136	-5.0	.0	09...	1130	191	181	25.0	16.0
DEC						SEP					
18...	1630	209	162	.0	.0	03...	1330	110	227	27.0	19.0
JAN , 1986											
16...	1100	182	202	.0	.0						
12303000 KOOTENAI RIVER AT LIBBY, MT. (LAT 48 24 03 LONG 115 33 08)											
OCT , 1985						JUL , 1986					
22...	0930	19800	229	4.0	9.5	10...	1500	21700	208	21.0	13.0
MAY , 1986											
23...	1230	4840	225	16.0	8.5						
12303100 FLOWER CREEK NEAR LIBBY, MT. (LAT 48 20 41 LONG 115 36 20)											
OCT , 1985						APR , 1986					
03...	1045	9.2	67	6.0	5.0	16...	1835	25	49	4.0	3.0
09...	1815	9.8	66	-1.0	1.0	MAY					
NOV						21...	1925	113	27	7.5	4.5
15...	1615	24	48	-3.0	.0	22...	1815	78	30	9.0	4.0
DEC						JUL					
19...	1345	9.1	69	.0	.0	10...	0920	15	63	12.0	9.0
JAN , 1986						SEP					
16...	1630	6.1	78	3.0	.0	03...	1815	6.1	85	17.0	12.0
12303500 LAKE CREEK AT TROY, MT. (LAT 48 26 40 LONG 115 52 30)											
OCT , 1985						MAY , 1986					
03...	0850	128	104	6.0	7.0	22...	1630	999	54	10.0	7.0
NOV						JUL					
15...	1245	368	73	-3.0	1.5	09...	1515	261	83	20.0	13.0
JAN , 1986						SEP					
17...	1100	182	103	3.0	.5	04...	1300	123	102	23.0	14.0
12304500 YAAK RIVER NEAR TROY, MT. (LAT 48 33 43 LONG 115 58 09)											
OCT , 1985						MAR , 1986					
02...	1600	156	113	9.0	6.0	18...	1300	1180	78	6.0	3.0
NOV						MAY					
15...	0950	569	72	-5.0	.0	22...	1200	3380	54	7.0	6.0
DEC						JUL					
19...	1050	282	109	-5.0	.0	09...	1730	327	102	21.0	16.0
JAN , 1986						SEP					
17...	0830	212	107	3.0	.0	04...	0845	138	124	8.5	15.0
12323170 SILVER BOW CREEK AB BLACKTAIL CREEK AT BUTTE MT (LAT 46 00 12 LONG 112 30 48)											
JUL , 1986						AUG , 1986					
08...	1100	.31	178	21.0	16.5	06...	1430	.59	177	25.0	24.0
12323200 BLACKTAIL CREEK NEAR BUTTE MT (LAT 45 53 21 LONG 112 27 50)											
OCT , 1985						MAY , 1986					
15...	1115	2.9	213	9.0	2.0	22...	1345	17	123	5.0	5.5
30...	1115	1.9	206	8.0	1.0	27...	1545	14	128	29.0	15.0
NOV						JUN					
21...	1430	1.3	214	-15.0	.0	02...	1530	9.1	142	27.0	15.5
JAN , 1986						11...	0930	6.9	147	17.0	9.5
06...	1200	1.5	210	.0	.0	23...	1245	2.8	179	26.0	14.5
FEB						JUL					
18...	1030	1.7	200	1.5	.5	08...	0900	2.2	188	16.0	9.0
25...	1600	2.8	193	8.5	.0	24...	0945	.93	209	18.0	10.5
MAR						AUG					
12...	1415	2.9	191	9.5	2.0	06...	1700	.99	214	25.0	15.5
31...	1315	9.1	163	7.5	2.0	13...	1000	1.7	219	14.0	10.0
APR						26...	1015	1.5	220	18.5	10.0
09...	1000	6.0	158	12.0	2.5	SEP					
29...	1100	7.8	149	1.0	2.0	04...	1315	1.8	221	22.0	12.5
MAY						18...	0945	5.3	192	9.0	5.5
12...	1145	9.9	159	4.0	2.5	29...	1230	3.1	191	12.5	4.5
20...	1115	14	132	20.5	8.5						

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	SPE- CIFIC CON- DUC- TANCE (US/CM) (00095)	TEMPER- ATURE, AIR (DEG C) (00020)	TEMPER- ATURE (DEG C) (00010)	DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	SPE- CIFIC CON- DUC- TANCE (US/CM) (00095)	TEMPER- ATURE, AIR (DEG C) (00020)	TEMPER- ATURE (DEG C) (00010)
12323250 SILVER BOW CREEK BL BLACKTAIL CREEK AT BUTTE MT (LAT 46 03 44 LONG 112 29 48)											
NOV , 1985						JUN , 1986					
21...	1715	18	432	-17.0	4.5	23...	1530	20	408	27.5	19.5
JAN , 1986						JUL					
06...	1530	17	439	-1.5	5.5	08...	1230	21	421	25.0	16.5
FEB						AUG					
18...	1300	21	522	5.0	7.0	06...	1230	19	420	22.0	17.0
25...	1415	127	271	10.5	3.0	SEP					
MAR						29...	1445	21	420	16.0	12.0
31...	1615	32	344	9.0	10.0						
MAY											
12...	1215	36	357	10.0	10.0						
12323770 WARM SPRINGS CREEK AT WARM SPRINGS MT (LAT 46 10 51 LONG 112 47 07)											
OCT , 1985						MAY , 1986					
01...	1130	64	413	11.0	4.0	07...	1150	62	404	6.0	5.0
NOV						22...	1330	107	282	10.0	8.0
21...	1200	33	556	7.0	.0	30...	1630	372	159	27.5	12.0
JAN , 1986						JUN					
08...	1400	67	389	3.5	1.0	03...	1140	288	165	15.5	8.0
FEB						JUL					
20...	1500	72	399	-2.0	.0	02...	1545	20	557	31.0	20.0
24...	1815	286	278	8.5	1.5	AUG					
APR						20...	1520	3.2	1180	26.5	20.0
08...	1610	55	436	19.0	12.0	27...	1430	4.5	1170	27.0	19.0
461117112461201 CLARK FORK AT WARM SPRINGS MT (LAT 46 11 17 LONG 112 46 12)											
AUG , 1986											
20...	1035	27	660	21.0	15.0						
12323800 CLARK FORK NEAR GALEN, MT. (LAT 46 12 30 LONG 112 46 00)											
AUG , 1986											
20...	1130	16	674	22.5	18.0						
461559112443301 CLARK FORK NR RACETRACK MT (LAT 46 15 59 LONG 112 44 33)											
AUG , 1986											
20...	1150	5.2	649	22.0	16.0						
461901112440501 CLARK FORK AB CARIBOU CREEK NR DEMPSEY MT (LAT 46 19 01 LONG 112 44 05)											
AUG , 1986											
20...	1315	2.7	559	24.0	17.0						
462933112434201 - CLARK FORK AT KOHRS FISHING ACCESS NR GARRISON (LAT 46 29 33 LONG 112 43 42)											
AUG , 1986											
20...	1500	56	551	25.0	20.5						
12324600 CLARK FORK AT GARRISON, MT. (LAT 46 31 11 LONG 112 48 27)											
AUG , 1986											
20...	1600	87	501	26.0	20.0						
12324680 CLARK FORK AT GOLDCREEK MT (LAT 46 35 26 LONG 112 55 40)											
OCT , 1985						MAY , 1986					
02...	1545	412	494	13.5	7.5	23...	1300	1130	293	16.0	9.0
DEC						JUN					
05...	1430	364	511	-3.0	.0	03...	0955	1560	232	19.5	14.0
JAN , 1986						JUL					
08...	1030	310	470	-12.0	.0	02...	1220	367	435	30.0	20.0
FEB						AUG					
20...	1725	380	505	2.0	.0	20...	1130	118	489	22.0	15.5
25...	1100	3000	266	8.0	.0	27...	1220	188	526	24.0	17.5
APR											
08...	1245	631	398	21.0	10.5						
12325500 FLINT CREEK NEAR SOUTHERN CROSS, MT. (LAT 46 13 59 LONG 113 17 56)											
OCT , 1985						APR , 1986					
01...	1730	26	152	7.0	8.0	01...	1025	14	285	9.0	4.5
NOV						MAY					
20...	1315	12	191	-5.5	2.5	22...	1530	29	204	10.0	7.5
JAN , 1986						AUG					
07...	1450	12	239	-1.0	3.0	19...	1705	28	160	26.0	17.0
FEB											
21...	1440	13	270	3.0	2.0						

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	SPE- CIFIC CON- DUC- TANCE (US/CM) (00095)	TEMPER- ATURE, AIR (DEG C) (00020)	TEMPER- ATURE (DEG C) (00010)	DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	SPE- CIFIC CON- DUC- TANCE (US/CM) (00095)	TEMPER- ATURE, AIR (DEG C) (00020)	TEMPER- ATURE (DEG C) (00010)
12329500 FLINT CREEK AT MAXVILLE, MT (LAT 46 27 50 LONG 113 14 20)											
OCT , 1985						APR , 1986					
02...	1000	93	295	9.0	5.0	01...	1500	93	228	13.0	5.5
NOV						MAY					
20...	1600	54	323	-6.0	.0	23...	1000	137	205	7.5	5.0
JAN , 1986						30...	1125	253	96	26.0	9.0
07...	1120		311	-3.0	.0	JUL					
FEB						08...	1745	141	282	22.0	15.0
21...	1130	56	313	3.0	.0	AUG					
26...	1445	352	154	8.0	1.0	19...	1400	104	283	29.5	15.0
12330000 BOULDER CREEK AT MAXVILLE, MT. (LAT 46 28 30 LONG 113 14 00)											
OCT , 1985						MAY , 1986					
02...	1215	14	184	10.0	5.0	23...	1110	127	107	6.0	3.0
JAN , 1986						30...	1010	447	74	22.0	3.5
07...	0950	19	201	-9.0	.0	JUN					
FEB						19...	1420	94	115	18.5	11.0
21...	1030	19	200	2.0	.0	AUG					
APR						19...	1220	7.8	191	27.0	10.0
01...	1620	32	179	11.0	5.5						
12331600 CLARK FORK AT DRUMMOND, MT. (LAT 46 39 45 LONG 113 08 57)											
AUG , 1986											
20...	1735	127	550	28.0	19.5						
12331900 CLARK FORK NEAR CLINTON MT (LAT 46 43 05 LONG 113 35 17)											
OCT , 1985						MAY , 1986					
03...	1420	714	503	13.0	9.0	22...	1830	1200	358	10.0	12.0
NOV						30...	1440	2530	267	28.0	18.0
15...	1120	528	545	-6.5	.0	JUN					
JAN , 1986						30...	1010	478	522	18.0	15.5
02...	1420	539	512	-5.0	.5	JUL					
FEB						09...	1230	735	490	18.0	17.5
18...	1010	775	423	1.0	1.0	AUG					
25...	1710	7760	186	8.0	1.0	11...	1125	201	574	21.0	19.5
APR						SEP					
09...	1600	1030	403	17.0	12.0	29...	1220	777	494	10.0	9.0
11...	1820	1010	403	12.5	9.5						
12332000 MIDDLE FORK ROCK CREEK NEAR PHILIPSBURG, MT. (LAT 46 11 42 LONG 113 30 00)											
OCT , 1985						MAY , 1986					
01...	1530	48	127	10.0	5.0	22...	1645	429	73	5.0	4.5
JAN , 1986						30...	1410	1220	60	28.0	7.5
07...	1325	30	139	-2.0	.0	JUL					
FEB						08...	1315	154	114	23.5	11.5
21...	1300	37	141	2.0	.0	AUG					
APR						19...	1555	55	128	28.0	14.5
01...	1240	75	110	8.0	3.0						
12335500 NEVADA CREEK ABOVE RESERVOIR NEAR FINN, MT. (LAT 46 46 25 LONG 112 45 25)											
NOV , 1985						MAY , 1986					
12...	--	12	269	-19.0	.0	27...	1000	89	230	22.0	10.5
JAN , 1986						JUL					
06...	1000	12	232	-.5	.0	03...	1700	19	317	22.0	18.5
FEB						AUG					
21...	1300	11	247	-.5	.0	15...	1510	7.9	293	30.0	20.5
APR						SEP					
08...	1010	47	247	9.0	4.5	08...	1215	9.8	315	21.5	16.0
MAY											
19...	0930	38	304	12.0	8.0						
12339450 CLEARWATER RIVER NEAR CLEARWATER, MT. (LAT 47 01 11 LONG 113 23 16)											
JAN , 1986						JUL , 1986					
07...	0900	84	153	-8.0	.5	03...	1300	160	129	21.0	21.0
FEB						AUG					
20...	1610	124	149	-3.5	.5	14...	1600	44	152	27.0	24.5
APR											
08...	1400	915	112	17.5	7.0						
12342500 WEST FORK BITTERROOT RIVER NEAR CONNER, MT. (LAT 45 43 30 LONG 114 16 50)											
OCT , 1985						MAY , 1986					
01...	1350	117	70	10.0	9.5	21...	1620	948	53	12.0	8.5
NOV						29...	1300	2020	52	27.0	9.0
14...	0905	97	70	-10.0	2.0	JUL					
JAN , 1986						01...	1320	232	43	23.0	9.5
09...	0905	58	74	2.0	.0	AUG					
FEB						13...	1430	290	54	21.0	13.0
19...	1230	62	83	-5.0	.0	SEP					
APR						30...	1130	206	69	12.0	10.0
10...	1250	171	63	12.0	4.5						

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	SPE- CIFIC CON- DUC- TANCE (US/CM) (00095)	TEMPER- ATURE, AIR (DEG C) (00020)	TEMPER- ATURE (DEG C) (00010)	DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	SPE- CIFIC CON- DUC- TANCE (US/CM) (00095)	TEMPER- ATURE, AIR (DEG C) (00020)	TEMPER- ATURE (DEG C) (00010)
12344000 BITTERROOT RIVER NEAR DARBY, MT. (LAT 45 58 20 LONG 114 08 26)											
OCT , 1985						MAY , 1986					
01...	1250	313	84	7.5	6.0	21...	0900	3310	42	12.0	6.5
NOV						29...	0950	7060	50	18.0	9.5
14...	1425	267	79	-6.0	.5	JUL					
JAN , 1986						01...	0910	855	62	15.0	11.0
09...	0940	198	108	1.5	.5	AUG					
FEB						13...	1000	432	71	19.0	12.5
19...	1400	267	92	-1.5	1.0	SEP					
APR						30...	0900	421	80	9.0	8.5
10...	0900	1300	51	8.0	3.5						
12353820 DRY CREEK NEAR SUPERIOR MT (LAT 47 13 17 LONG 114 58 19)											
APR , 1986						MAY , 1986					
18...	1130	62	199	--	5.0	21...	1100	213	126	--	5.5
12354500 CLARK FORK AT ST. REGIS, MT. (LAT 47 18 05 LONG 115 05 10)											
OCT , 1985						MAY , 1986					
01...	1120	4060	262	6.0	7.5	28...	1500	30400	170	33.0	10.0
MAR , 1986						JUL					
04...	1000	11400	173	7.0	4.5	15...	1545	5170	240	26.0	17.5
APR						SEP					
17...	1100	11600	167	18.0	8.0	02...	1500	3090	280	29.0	17.5
12355100 STARVATION CR NR FLATHEAD BC (LAT 48 56 15 LONG 114 23 27)											
OCT , 1985						JUN , 1986					
18...	1515	14	146	8.0	5.0	11...	1200	81	113	26.0	7.5
30...	1130	23	137	1.0	1.5	19...	1150	51	123	10.0	10.0
DEC						JUL					
17...	1200	6.0	165	3.0	1.5	23...	1530	21	146	18.0	11.5
FEB , 1986						SEP					
12...	1150	3.9	178	-10.0	.0	11...	1330	8.5	175	10.0	9.0
MAY											
14...	1130	38	139	4.0	1.5						
12355150 TUCHUCK CREEK NEAR FLATHEAD, B.C. (LAT 48 55 25 LONG 114 35 56)											
OCT , 1985						MAY , 1986					
16...	1430	22	130	7.0	4.0	28...	1315	170	110	27.0	6.5
30...	1500	34	130	2.0	2.5	JUN					
DEC						11...	0900	52	90	15.0	6.0
17...	1530	8.8	149	2.0	.5	19...	1445	29	112	12.0	9.0
FEB , 1986						JUL					
14...	1230	5.1	158	-10.0	.0	23...	1100	15	138	15.0	8.5
APR						SEP					
11...	1145	36	149	4.0	3.0	11...	1035	9.2	154	7.0	7.0
MAY											
14...	1500	43	126	3.0	3.0						
12358500 - M F FLATHEAD RIVER NEAR WEST GLACIER, MT. (LAT 48 29 43 LONG 114 00 33)											
OCT , 1985						APR , 1986					
09...	1130	1700	190	-4.0	2.5	24...	0955	6490	158	5.0	4.0
NOV						MAY					
14...	1300	2890	207	-4.0	.0	23...	0930	9840	144	9.0	3.0
DEC						29...	1550	18800	122	35.0	8.0
19...	1320	844	206	2.0	5.0	JUL					
JAN , 1986						11...	1415	2550	150	12.0	10.0
08...	1400	604	218	-3.0	1.0	AUG					
MAR						27...	1030	698	190	19.0	8.0
10...	1230	3510	175	4.0	3.0						
12359800 S F FLATHEAD R AB TWIN C, NR HUNGRY HORSE, MT. (LAT 47 58 45 LONG 113 33 36)											
OCT , 1985						JUL , 1986					
10...	1110	1390	174	3.0	3.0	09...	1300	1520	174	13.0	9.5
APR , 1986						AUG					
29...	1140	3320	185	4.5	4.0	20...	1120	449	214	18.0	14.5
MAY											
21...	1015	10800	139	11.0	6.0						
30...	1150	20200	123	28.0	6.5						
12365000 STILLWATER RIVER NEAR WHITEFISH, MT. (LAT 48 19 08 LONG 114 23 11)											
OCT , 1985						JUL , 1986					
09...	1500	188	241	3.0	4.0	01...	1420	286	225	25.0	18.0
MAR , 1986						AUG					
19...	0915	486	227	6.0	3.0	07...	0915	127	250	25.0	17.0
APR						29...	1300	88	243	30.0	20.5
22...	1730	901	212	12.0	8.0						

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	SPE- CIFIC CON- DUC- TANCE (US/CM) (00095)	TEMPER- ATURE, AIR (DEG C) (00020)	TEMPER- ATURE (DEG C) (00010)	DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	SPE- CIFIC CON- DUC- TANCE (US/CM) (00095)	TEMPER- ATURE, AIR (DEG C) (00020)	TEMPER- ATURE (DEG C) (00010)
12366000 WHITEFISH RIVER NEAR KALISPELL, MT. (LAT 48 19 13 LONG 114 16 39)											
OCT , 1985						JUL , 1986					
08...	0820	86	185	-6.0	5.0	01...	1100	198	170	22.0	17.5
MAR , 1986						AUG					
19...	1430	174	218	9.0	4.0	07...	1325	86	178	33.0	21.0
APR						SEP					
22...	1130	268	172	16.0	6.5	03...	1520	60	177	19.0	18.5
MAY											
29...	1030	531	162	25.0	14.0						
12369200 SWAN RIVER NEAR CONDON, MT. (LAT 47 25 21 LONG 113 40 12)											
NOV , 1985						MAY , 1986					
12...	1340	126	47	-5.0	2.0	27...	1900	556	44	23.0	14.0
JAN , 1986						JUL					
06...	1450	41	60	1.0	.0	03...	1000	214	37	16.5	17.5
FEB						AUG					
21...	0840	58	60	-2.0	.5	15...	0930	59	49	19.0	16.5
APR											
08...	1730	210	51	14.5	7.0						
12369250 HOLLAND CREEK NEAR CONDON MT (LAT 47 26 20 LONG 113 40 11)											
MAY , 1986											
22...	1020	159	176	--	8.5						
12369650 NORTH FORK LOST CREEK NEAR SWAN LAKE MT (LAT 47 53 06 LONG 113 47 53)											
MAY , 1986						AUG , 1986					
22...	0840	153	201	--	3.5	26...	0905	7.7	261	--	--
JUL											
11...	0925	36	218	--	8.0						
12370000 SWAN RIVER NEAR BIGFORK, MT. (LAT 48 01 28 LONG 113 58 44)											
OCT , 1985						JUN , 1986					
01...	1200	832	174	9.0	10.0	02...	1540	6090	159	28.0	16.0
MAR , 1986						AUG					
10...	1130	2470	170	5.0	2.5	25...	0830	472	157	13.0	18.0
MAY											
27...	0930	3040	139	16.0	12.0						
12370900 TEEPEE CREEK NEAR POLSON MT (LAT 47 49 00 LONG 114 01 00)											
OCT , 1985						MAY , 1986					
01...	1430	.94	84	7.0	5.5	27...	1300	4.7	53	16.0	8.0
NOV						JUN					
18...	1100	.59	98	-8.0	.0	03...	1340	6.1	48	23.5	8.0
FEB , 1986						JUL					
06...	1400	.64	89	.0	1.0	08...	1230	.97	80	15.5	9.5
MAR						AUG					
10...	1320	2.0	101	2.5	3.0	25...	1115	.70	84	13.5	10.5
APR											
22...	1030	1.4	94	15.0	7.0						
12372000 FLATHEAD RIVER NEAR POLSON, MT. (LAT 47 40 49 LONG 114 14 45)											
OCT , 1985						JUN , 1986					
07...	1200	13100	174	4.0	10.0	03...	1230	37100	176	26.5	16.0
MAY , 1986											
20...	0940	3100	162	18.5	10.5						
12374250 MILL CREEK ABOVE BASSOO CREEK NEAR NIARADA MT (LAT 47 49 49 LONG 114 41 45)											
OCT , 1985						MAY , 1986					
04...	1545	3.4	40	13.0	5.0	27...	1230	24	26	29.0	10.0
NOV						JUN					
18...	1415	8.7	30	-6.0	.0	04...	1145	23	24	23.0	8.0
FEB , 1986						JUL					
03...	1030	4.3	37	.0	1.0	17...	1230	4.9	37	11.0	9.0
MAR						AUG					
03...	1415	30	38	4.0	1.5	28...	1100	2.4	44	23.0	16.0
APR											
18...	1230	25	29	7.0	4.0						
12374800 CROMWELL CREEK NEAR NIARADA MT (LAT 47 52 53 LONG 114 30 04)											
FEB , 1986						APR , 1986					
25...	1510	5.5	122	9.5	.0	18...	1445	2.9	200	8.0	5.5
26...	1716	4.9	207	6.0	.0	MAY					
MAR						05...	1300	5.2	179	11.5	7.5
03...	1045	9.8	188	4.0	1.0						

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	SPE- CIFIC CON- DUC- TANCE (US/CM) (00095)	TEMPER- ATURE, AIR (DEG C) (00020)	TEMPER- ATURE (DEG C) (00010)	DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	SPE- CIFIC CON- DUC- TANCE (US/CM) (00095)	TEMPER- ATURE, AIR (DEG C) (00020)	TEMPER- ATURE (DEG C) (00010)
12375900 SOUTH CROW CREEK NEAR RONAN MT (LAT 47 29 30 LONG 114 01 33)											
OCT , 1985						MAY , 1986					
02...	1000	13	105	6.0	6.0	28...	0830	136	76	9.0	8.0
DEC						JUN					
04...	1000	10	118	-4.0	.0	04...	0915	103	87	12.0	7.5
FEB , 1986						JUL					
05...	1600	11	101	.0	2.0	08...	1450	26	95	21.5	13.0
MAR						AUG					
11...	1000	13	96	1.5	3.0	25...	1330	10	100	25.0	14.5
APR											
22...	1310	21	101	16.0	8.5						
12383500 BIG KNIFE CREEK NEAR ARLEE MT (LAT 47 08 51 LONG 113 58 24)											
OCT , 1985						MAY , 1986					
03...	1045	9.3	203	7.0	6.0	29...	0720	49	151	10.5	4.5
DEC						JUN					
04...	1615	7.0	208	.0	.0	05...	0810	40	158	10.5	6.0
FEB , 1986						12...	1430	34	178	23.0	10.0
05...	1330	6.2	198	-1.0	1.0	JUL					
MAR						09...	1545	22	188	18.0	9.5
11...	1515	7.3	206	8.0	6.0	AUG					
APR						27...	1320	11	199	26.5	11.5
24...	0835	11	201	1.0	4.0						
12387450 VALLEY CREEK NEAR ARLEE MT (LAT 47 10 11 LONG 114 13 52)											
OCT , 1985						JUN , 1986					
02...	1520	9.8	153	8.0	5.5	04...	1315	42	88	20.0	8.5
MAR , 1986						JUL					
12...	1000	16	158	.0	2.5	09...	1330	14	168	14.5	9.0
APR						AUG					
23...	1635	36	103	5.0	4.0	26...	1515	11	171	24.5	10.0
MAY											
28...	1645	74	58	27.5	7.5						
12388400 REVAIS CREEK BELOW WEST FORK NEAR DIXON MT (LAT 47 16 00 LONG 114 24 21)											
OCT , 1985						MAY , 1986					
03...	1345	11	21	13.0	6.0	29...	1715	175	10	34.5	9.0
DEC						JUN					
04...	1545	13	20	-2.0	.0	04...	0715	80	12	15.0	8.0
FEB , 1986						10...	1300	45	14	23.0	8.0
05...	0900	7.4	26	-1.0	1.0	JUL					
MAR						16...	1140	11	20	12.0	9.0
05...	1045	24	26	2.0	2.0	SEP					
APR						04...	1530	5.4	25	29.0	11.5
18...	0900	28	19	8.0	6.5						
12388650 CAMAS CREEK NEAR HOT SPRINGS MT (LAT 47 29 19 LONG 114 41 40)											
OCT , 1985						APR , 1986					
04...	1300	.37	134	14.0	6.0	17...	1700	4.8	49	--	--
DEC						MAY					
05...	1300	.53	122	-3.0	.0	05...	1045	7.3	55	11.0	6.5
FEB , 1986						30...	0945	1.9	78	23.0	15.0
03...	1300	1.4	105	2.0	1.5	JUL					
25...	1710	20	56	9.0	1.0	16...	1500	.29	114	12.0	12.0
26...	1400	27	53	--	--	17...	0950	.36	144	8.5	9.0
MAR						AUG					
04...	1830	12	57	14.0	2.5	28...	1400	.16	138	28.0	18.0
12389000 CLARK FORK NEAR PLAINS, MT. (LAT 47 25 47 LONG 114 51 18)											
OCT , 1985						MAY , 1986					
01...	1530	16200	195	9.0	10.0	29...	0850	64500	156	19.0	15.0
DEC						SEP					
03...	1700	12900	197	1.0	.5	03...	1330	7650	205	29.0	19.0
MAR , 1986											
04...	1315	24200	178	10.0	4.5						
12389500 THOMPSON RIVER NEAR THOMPSON FALLS, MT. (LAT 47 35 31 LONG 115 13 43)											
OCT , 1985						APR , 1986					
01...	1830	198	169	8.0	6.0	16...	1240	944	127	13.0	7.0
DEC						MAY					
04...	1045	223	152	-3.0	.5	28...	0900	1600	73	21.0	9.0
FEB , 1986						JUL					
04...	1015	247	147	3.0	3.5	14...	1150	309	160	24.0	11.0
MAR						SEP					
06...	0945	1120	108	4.0	3.0	04...	1210	192	175	27.0	12.0
12390700 PROSPECT CREEK AT THOMPSON FALLS, MT. (LAT 47 35 10 LONG 115 21 15)											
OCT , 1985						APR , 1986					
02...	0840	57	81	3.0	6.0	16...	1300	462	57	11.0	8.0
DEC						MAY					
04...	0945	109	54	-5.0	2.0	27...	1815	834	31	32.0	10.0
FEB , 1986						JUL					
04...	0845	91	60	1.5	4.0	14...	1300	105	74	24.0	12.0
MAR						SEP					
05...	1530	728	40	14.0	5.0	04...	0730	52	82	9.0	11.5

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FACTORS FOR CONVERTING INCH-POUND UNITS TO INTERNATIONAL SYSTEM UNITS (SI)

The following factors may be used to convert the inch-pound units published herein to the International System of Units (SI). This report contains both the inch-pound and SI unit equivalents in the station manuscript descriptions.

Multiply inch-pound units	By	To obtain SI units
<i>Length</i>		
inches (in)	2.54×10^1	millimeters (mm)
	2.54×10^{-2}	meters (m)
feet (ft)	3.048×10^{-1}	meters (m)
miles (mi)	1.609×10^0	kilometers (km)
<i>Area</i>		
acres	4.047×10^3	square meters (m ²)
	4.047×10^{-1}	square hectometers (hm ²)
	4.047×10^{-3}	square kilometers (km ²)
square miles (mi ²)	2.590×10^0	square kilometers (km ²)
<i>Volume</i>		
gallons (gal)	3.785×10^0	liters (L)
	3.785×10^0	cubic decimeters (dm ³)
	3.785×10^{-3}	cubic meters (m ³)
million gallons	3.785×10^3	cubic meters (m ³)
	3.785×10^{-3}	cubic hectometers (hm ³)
cubic feet (ft ³)	2.832×10^1	cubic decimeters (dm ³)
	2.832×10^{-2}	cubic meters (m ³)
cfs-days	2.447×10^3	cubic meters (m ³)
	2.447×10^{-3}	cubic hectometers (hm ³)
acre-feet (acre-ft)	1.233×10^3	cubic meters (m ³)
	1.233×10^{-3}	cubic hectometers (hm ³)
	1.233×10^{-6}	cubic kilometers (km ³)
<i>Flow</i>		
cubic feet per second (ft ³ /s)	2.832×10^1	liters per second (L/s)
	2.832×10^1	cubic decimeters per second (dm ³ /s)
	2.832×10^{-2}	cubic meters per second (m ³ /s)
gallons per minute (gal/min)	6.309×10^{-2}	liters per second (L/s)
	6.309×10^{-2}	cubic decimeters per second (dm ³ /s)
	6.309×10^{-5}	cubic meters per second (m ³ /s)
million gallons per day	4.381×10^1	cubic decimeters per second (dm ³ /s)
	4.381×10^{-2}	cubic meters per second (m ³ /s)
<i>Mass</i>		
tons (short)	9.072×10^{-1}	megagrams (Mg) or metric tons

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